Centek Engineering, Inc.
3-2 North Branford Road
Branford, Connecticut 06405
Phone: (203) 488-0580
Fax: (203) 488-8587

Steven L. Levine
Real Estate Consultant

HAND DELIVERED

April 14, 2014

Attorney Melanie Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 53 Slater Street, Manchester (owner, Crown Castle)

Dear Ms. Bachman:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and/or Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the chief elected official of the municipality in which the affected cell site is located.

UMTS technology offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile ("GSM") communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the Internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

LTE is a high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

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

1. The height of the overall structure will be unaffected.

2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound other than some enlarged equipment pads as may be noted in the attachments.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more.

4. Radio frequency power density may increase due to use of one or more GSM channel for UMTS transmissions. Moreover, LTE will utilize additional radio frequencies newly-licensed by the FCC for cellular mobile communications. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons, AT&T respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (860) 830-0380 with questions concerning this matter. Thank you for your consideration.

Sincerely,

Steven L. Levine
Real Estate Consultant

cc: Scott Shanley, General Manager, Town of Manchester

Attachments

NEW CINGULAR WIRELESS PCS, LLC
Equipment Modification

53 Slater Street, Manchester, CT
Site Number 5307
Exempt Modifications 4/02, 7/07, 12/09, and 7/12

Tower Owner/Manager: Crown Castle

Lease Area: Please refer to the attached site plan. Sprint was the original ground lessee (ground lease is now held by Crown Castle), and was AT&T's original landlord in 2002. The original Sprint ground lease was 50 ft x 50 ft, and AT&T's lease area is wholly within this space per EM-AT&T-077-020321. The Sprint lease area was subsequently expanded per EM-VER-077-021220 to accommodate colocation by Verizon. Since all proposed equipment modifications will take place either on the tower structure or on AT&T's existing equipment pad, the proposed changes will extend neither the existing fenced compound nor the site's overall boundaries.

Equipment configuration: Monopole

Current and/or approved:
Three T-Arm Mounts @ 143 ft
Three KMW AM-X-CD-16-65-00T-RET antennas @ 145 ft c.l.
Three Kathrein 800-10121 antennas @ 145 ft c.l.
Six TMA's @ 145 ft
One surge arrestor @ 145 ft
Three remote radio heads @ 145 ft
Twelve runs 1¼ inch coax
One fiber cable and two DC control cables
Radio cabinets on concrete pad.

Planned Modifications:
Remove all T-Arms, antennas, and associated equipment from the 143 and 145 ft levels.
Remove six runs of 1¼ inch coax.
Reinforce the tower per the attached Structural Analysis.
Install one Commscope MTC3607 antenna platform @ 145 ft level.
Install nine CCI HPA-65R-BUU-H6 antennas @ 145 ft c.l.
Reinstall three Kathrein 800-10121 antennas or equivalent @ 145 ft c.l.
Install three TMA's @ 145 ft.
Install 18 remote radio heads and six associated A2 modules @ 145 ft.
Install three Raycap DC6-48-60-18-8F surge arrestors @ 145 ft.
Install four additional DC control cables.

Power Density:

Worst-case calculations for existing wireless operations at the site indicate a radio frequency electromagnetic radiation power density, measured at ground level beside the tower, of approximately 82.3 % of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density following proposed modifications would be approximately 72.8 % of the standard.

Existing

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users *							65.50
AT&T LTE *	145	734	1	1313	0.0225	0.4893	4.59
AT&T GSM *	145	880	1	283	0.0048	0.5867	0.82
AT&T GSM *	145	1900 Band	4	646	0.0442	1.0000	4.42
AT&T UMTS *	145	880 - 894	2	565	0.0193	0.5867	3.29
AT&T UMTS *	145	1900 Band	2	1077	0.0368	1.0000	3.68
Total							82.3%

* Per CSC Records

Proposed

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users *							65.50
AT&T LTE	145	700 Band	1	500	0.0086	0.4667	1.83
AT&T LTE	145	1900 Band	1	500	0.0086	1.0000	0.86
AT&T LTE	145	2300 Band	1	500	0.0086	1.0000	0.86
AT&T UMTS	145	880 - 894	2	500	0.0171	0.5867	2.91
AT&T UMTS	145	1900 Band	1	500	0.0086	1.0000	0.86
Total							72.8%

* Per CSC Records

Structural information:

The attached structural analysis demonstrates that the tower will have adequate structural capacity to accommodate the proposed equipment modifications upon completion of the recommended structural modifications described in the attachments hereto. (Paul J. Ford & Co., 3/25/14)

PROJECT INFORMATION

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS
SITE ADDRESS:	53-73 SLATER STREET MANCHESTER, CT 06040
LATTITUDE:	41° 48' 18" N
LONGITUDE:	72° 32' 01" W
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
(P) USE:	TELECOMMUNICATIONS FACILITY
NOC#	800-832-6662

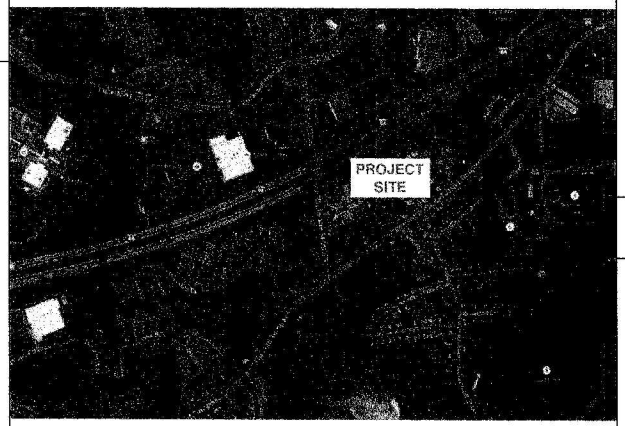
SITE NUMBER: CT5307
SITE NAME: MANCHESTER NORTH

DRAWING INDEX

COMMONWEALTH OF MASSACHUSETTS
MARC R. CHRETIEN
CIVIL
No. 40313
REGISTERED PROFESSIONAL ENGINEER

DIRECTIONS & VICINITY MAP

1. HEAD EAST ON COCHITUATE RD TOWARD BURR ST 285 FT
2. TAKE THE RAMP TO I-90 E/MASSPIKE W/SPRINGFIELD/BOSTON TOLL ROAD 0.6 MI
3. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR INTERSTATE 90 W/MASSACHUSETTS TURNPIKE/WORCHESTER/SPRINGFIELD AND MERGE ONTO I-90 W/MASSACHUSETTS TURNPIKE PARTIAL TOLL ROAD 38.3 MI
4. TAKE EXIT 9 TO MERGE ONTO I-84 TOWARD US-20/HARTFORD/NEW YORK CITY PARTIAL TOLL ROAD ENTERING CONNECTICUT 34.7 MI
5. TAKE EXIT 63 FOR CT-30 TOWARD CT-83/S WINDSOR/MANCHESTER 0.2 MI
6. KEEP RIGHT AT THE FORK, FOLLOW SIGNS FOR CONNECTICUT 30 N/COMMECTICUT 83 AND MERGE ONTO CT-30 N/DEMING ST 0.3 MI
7. TURN RIGHT ONTO TOLLAND TURNPIKE 1.0 MI
8. TURN RIGHT ONTO SLATER ST 0.1 MI
9. TURN RIGHT INTO DRIVEWAY 223 FT



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

UNDERGROUND SERVICE ALERT

CALL TOLL FREE
1-888-344-7233
72 HOURS BEFORE YOU DIG

ADVANCED ENGINEERING GROUP, P.C.
Civil Engineering - Site Development
Surveying - Telecommunications

SAI COMMUNICATIONS
27 NORTHWESTERN DRIVE
SALEM, NH 03079

SITE NUMBER: CT5307
SITE NAME: MANCHESTER NORTH
CROWN ID#: 876347
CROWN NAME: BUCKLAND MALL
53-73 SLATER STREET
MANCHESTER, CT 06040
HARTFORD COUNTY

550 COCHITUATE ROAD, SUITE 13,
FRAMINGHAM, MA 01701-4681

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	3/14/14	UPDATES	MER	MRC	MRC
1	1/21/14	UPDATES	MER	MRC	MRC
0	1/10/14	UPDATES	MER	MRC	MRC
A	1/2/14	LTE 2C ISSUED FOR REVIEW	MER	MRC	MRC

SCALE: AS SHOWN | DESIGNED BY: MRC | DRAWN BY: MER

AT&T

TITLE SHEET

JOB NUMBER	DRAWING NUMBER	REV
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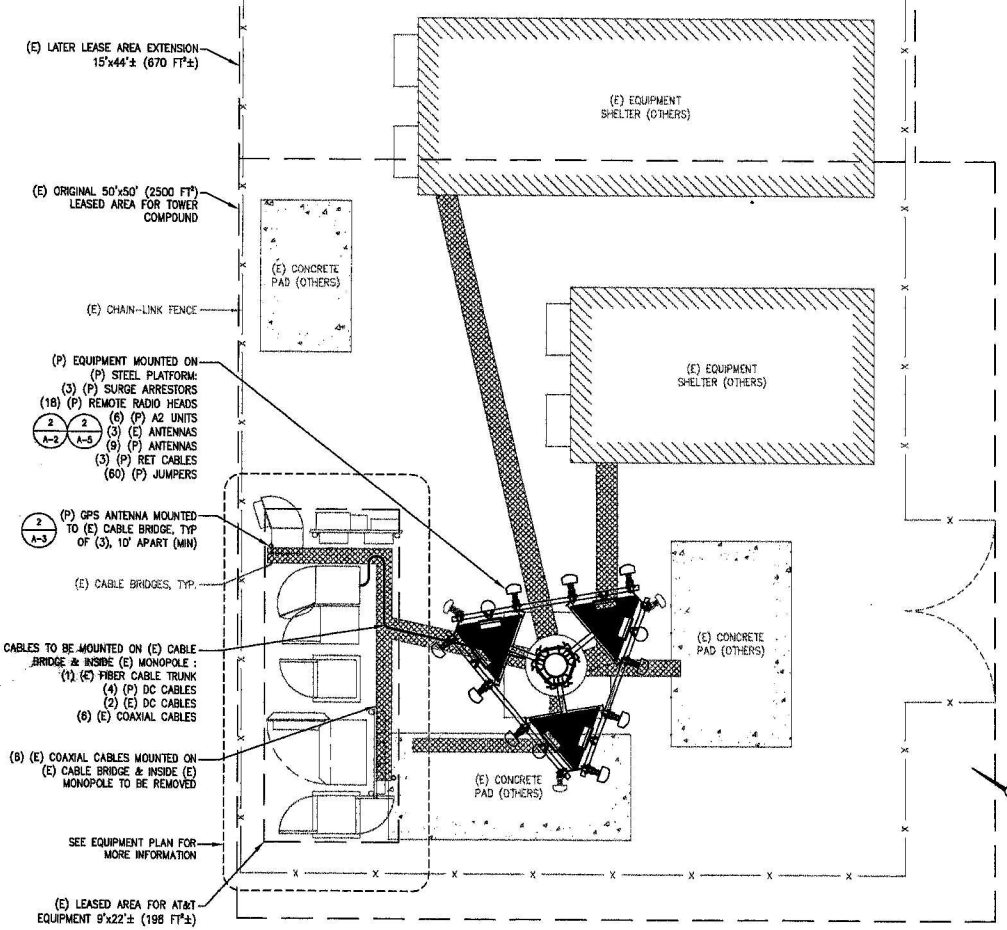
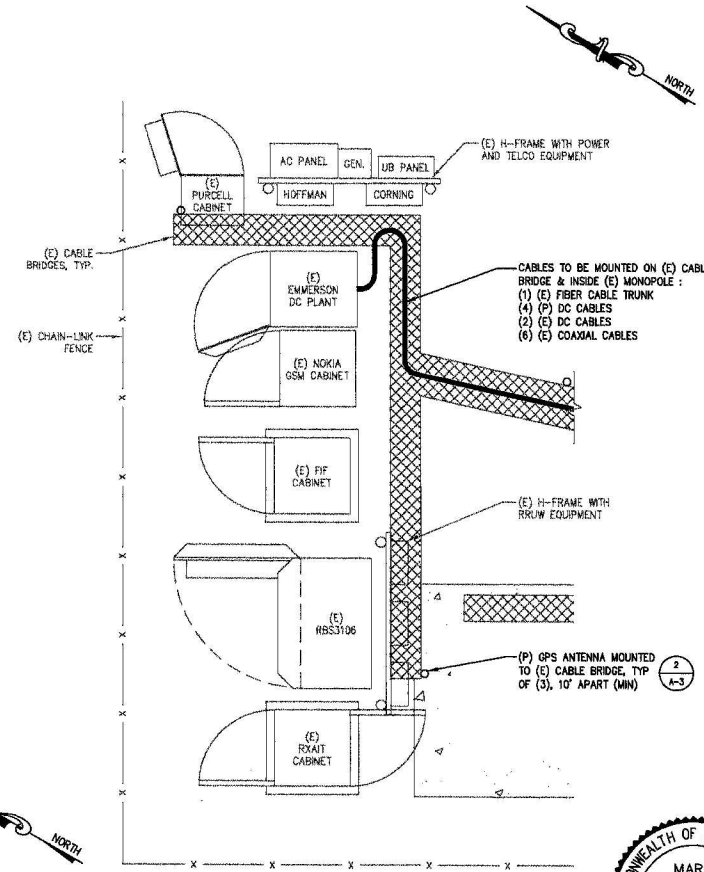


1 A-1 COMPOUND PLAN

SCALE: 1/4"=1'-0"

0' 2' 4' 8' 12'



2 A-1 EQUIPMENT PLAN

SCALE: 1/2"=1'-0"

0' 1' 2' 4' 6'

COMMONWEALTH OF MASSACHUSETTS
MARC R. CHRETIEN
CIVIL
No. 40313
REGISTERED PROFESSIONAL ENGINEER

ADVANCED ENGINEERING GROUP, P.C.
Civil Engineering - Site Development
Surveying - Telecommunications

SAI COMMUNICATIONS
27 NORTHWESTERN DRIVE
SALEM, NH 03079

SITE NUMBER: CT5307
SITE NAME: MANCHESTER NORTH
CROWN ID#: 876347
CROWN NAME: BUCKLAND MALL
53-73 SLATER STREET
MANCHESTER, CT 06040
HARTFORD COUNTY

at&t
550 COCHITUATE ROAD, SUITE 13,
FRAMINGHAM, MA 01701-4681

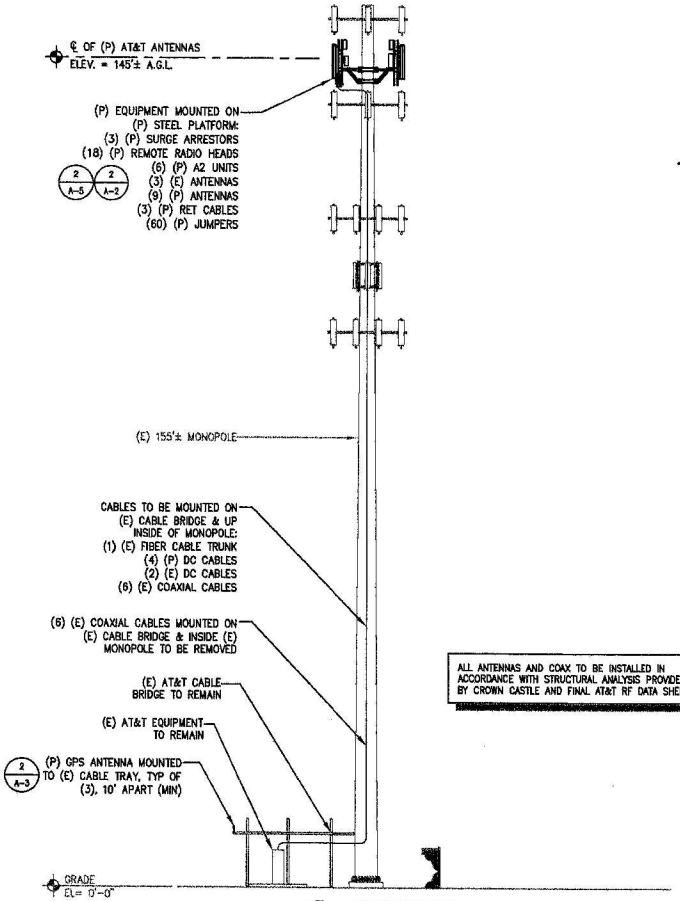
NO.	DATE	REVISIONS	BY	CHK	APP'D
2	3/14/14	UPDATES	MER	MRC	MRC
1	1/21/14	UPDATES	MER	MRC	MRC
0	1/10/14	UPDATES	MER	MRC	MRC
A	1/2/14	LTE 2C ISSUED FOR REVIEW	MER	MRC	MRC

SCALE: AS SHOWN | DESIGNED BY: MRC | DRAWN BY: MER

AT&T

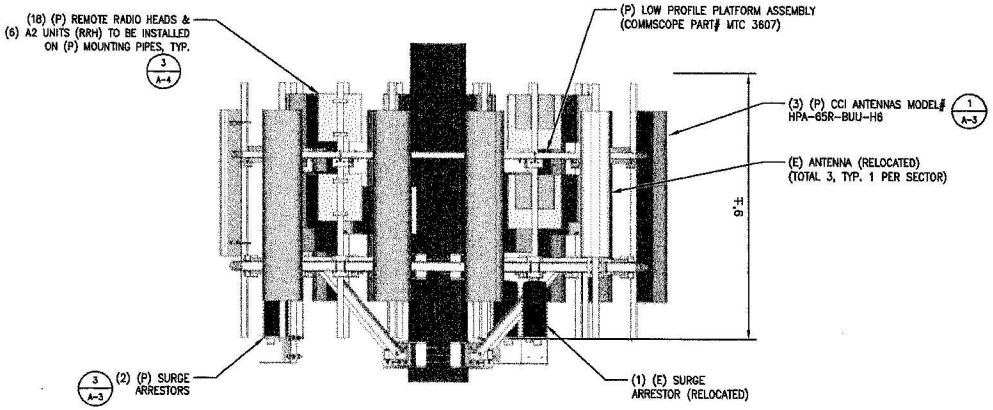
COMPOUND PLAN & EQUIPMENT PLAN

JOB NUMBER	DRAWING NUMBER	REV
5307 LTE 2C	A-1	2



ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET

1 A-2 **ELEVATION**
SCALE: 3/32" = 1'-0"



2 A-2 **ANTENNA SIDE VIEW**
SCALE: N.T.S.

COMMONWEALTH OF MASSACHUSETTS
MARC R. CHRETIEN
CIVIL
No. 40313
REGISTERED PROFESSIONAL ENGINEER

ADVANCED ENGINEERING GROUP, P.C.
Civil Engineering - Site Development
Surveying - Telecommunications
100 NORTH BROADWAY
EAST PROVIDENCE, RI 02914
PH: 401-330-3923
FAX: 401-405-9304

SAI COMMUNICATIONS
27 NORTHWESTERN DRIVE
SALEM, NH 03079

SITE NUMBER: CT5307
SITE NAME: MANCHESTER NORTH
CROWN ID#: 876347
CROWN NAME: BUCKLAND MALL
53-73 SLATER STREET
MANCHESTER, CT 06040
HARTFORD COUNTY

at&t
550 COCHITUATE ROAD, SUITE 13,
FRAMINGHAM, MA 01701-4681

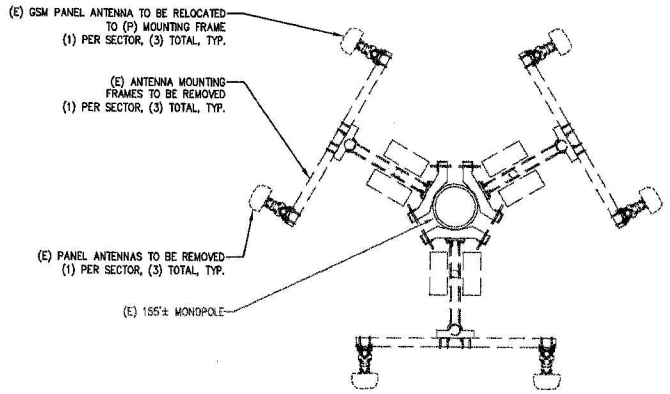
NO.	DATE	REVISIONS	BY	CHK	APP'D
2	3/14/14	UPDATES	MER	MRC	MRC
1	1/21/14	UPDATES	MER	MRC	MRC
0	1/10/14	UPDATES	MER	MRC	MRC
A	1/2/14	LTE 2C ISSUED FOR REVIEW	MER	MRC	MRC

SCALE: AS SHOWN | DESIGNED BY: MRC | DRAWN BY: MER

AT&T

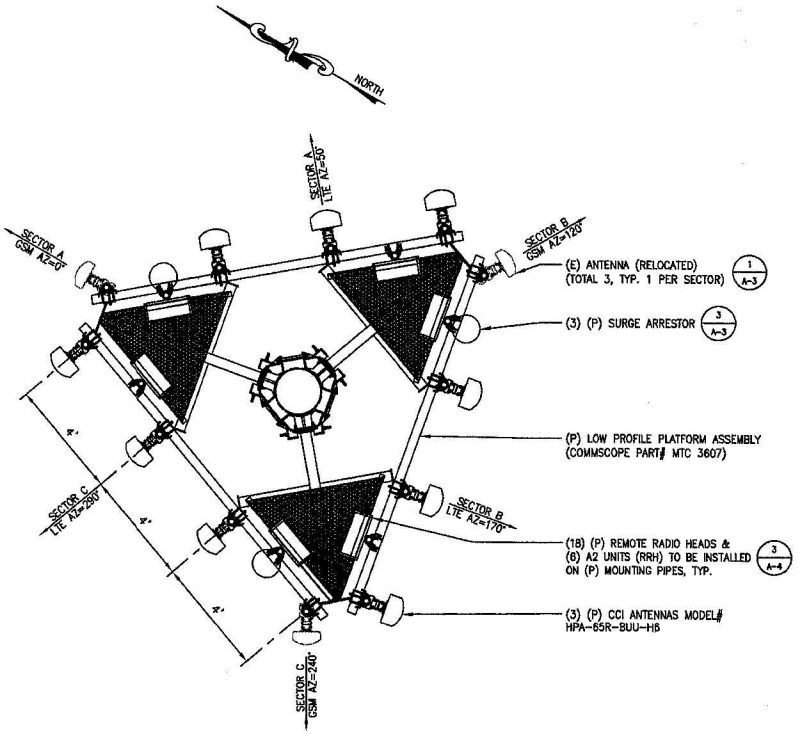
ELEVATIONS

JOB NUMBER	DRAWING NUMBER	REV
5307 LTE 2C	A-2	2



1 / A-5 EXISTING ANTENNA PLAN

SCALE: 3/8" = 1'-0"



2 / A-5 PROPOSED ANTENNA PLAN

SCALE: 3/8" = 1'-0"

ADVANCED ENGINEERING GROUP, P.C.
Civil Engineering - Site Development
Surveying - Telecommunications
100 NORTH BROADWAY
EAST PROVIDENCE, RI 02914
PH: 401-350-9400
FAX: 401-435-4994

SAI COMMUNICATIONS
27 NORTHWESTERN DRIVE
SALEM, NH 03079

SITE NUMBER: CT5307
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MANCHESTER, CT 06040
HARTFORD COUNTY

at&t
550 COCHITUATE ROAD, SUITE 13,
FRAMINGHAM, MA 01701-4681

NO.	DATE	REVISIONS	BY	CHK	APP'D
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1	1/21/14	UPDATES	MER	MRC	MRC
0	1/10/14	UPDATES	MER	MRC	MRC
A	1/2/14	LTE 2C ISSUED FOR REVIEW	MER	MRC	MRC

SCALE: AS SHOWN | DESIGNED BY: MRC | DRAWN BY: MER

AT&T

ANTENNA PLANS

JOB NUMBER	DRAWING NUMBER	REV
5307 LTE 2C	A-5	2

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

Date: **March 25, 2014**

Andrew Bazinet
Crown Castle
46 Broadway
Albany, NY 12204

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679
jwoolley@pjfweb.com

Subject: **Structural Modification Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5307
	Carrier Site Name:	Manchester North
Crown Castle Designation:	**Crown Castle BU Number:**	876347
	Crown Castle Site Name:	BUCKLAND MALL
	Crown Castle JDE Job Number:	256000
	Crown Castle Work Order Number:	727336
	Crown Castle Application Number:	204057 Rev. 2
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37514-0616 BP
Site Data:	**53 Slater Street, MANCHESTER, Hartford County, CT**	
	Latitude *41° 48' 18"*, Longitude *-72° 32' 1"*	
	155 Foot - Monopole Tower	

Dear Andrew Bazinet,

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 626712, in accordance with application 204057, revision 2.

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

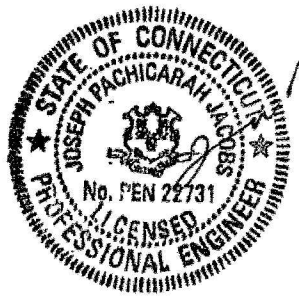
LC4.7: Modified Structure w/ Existing + Reserved + Proposed Equipment — **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

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

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

Respectfully submitted by:

John J. Woolley, E.I.
Structural Designer



tnxTower Report - version 6.1.4.1

MAR 31 2014

1) INTRODUCTION

This tower is a 155 ft Monopole tower designed by SUMMIT in February of 2002. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
143.0	145.0	9	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	4	7/8	-
		3	communication components inc.	DTMABP7819VG12A			
		3	ericsson	RRUS 11-700			
		6	ericsson	RRUS 12-B2			
		6	ericsson	RRUS A2 MODULE			
		3	ericsson	WCS RRUS-32-B30			
		3	ericsson	RRUS E2 B29			
		3	ericsson	RRUS-11 800MHz			
		2	raycap	DC6-48-60-18-8F			
	143.0	1	tower mounts	Commscope MTC3607R			

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
155.0	155.0	3	alcatel lucent	TD-RRH8x20-25	1	5/8	2
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
		3	argus technologies	LPX310R w/ Mount Pipe	3 3 5	1-1/4 5/16 1/2	1
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	samsung telecommunications	WIMAX DAP HEAD			
		1	tower mounts	Platform Mount [LP 713-1]			
	151.0	1	andrew	VHLP1-23			
		1	andrew	VHLP2-11			
		1	andrew	VHLP2.5-18			
		3	dragonwave	HORIZON COMPACT			
153.0	153.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-	1
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		1	tower mounts	Pipe Mount [PM 601-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
145.0	145.0	3	ericsson	RRUS 11	-	-	3
		1	tower mounts	Pipe Mount [PM 601-3]			
143.0	145.0	3	kathrein	800 10121 w/ Mount Pipe	1 2 6	3/8 3/4 1-1/4	1
		1	raycap	DC6-48-60-18-8F			
		6	kathrein	860 10025			
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe	-	-	3
		6	powerwave technologies	LGP21401			
	143.0	1	tower mounts	T-Arm Mount [TA 601-3]			
133.0	133.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	13	1-5/8	1
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
		1	tower mounts	Platform Mount [LP 403-1]			
113.0	113.0	3	alcatel lucent	RRH2X40-07-U	1 13	1/4 1-5/8	1
		3	alcatel lucent	RRH2x40-AWS			
		3	andrew	LNX-6512DS-T0M w/ Mount Pipe			
		3	antel	BXA-171063-12BF w/ Mount Pipe			
		2	antel	BXA-70063/6CFx2 w/ Mount Pipe			
		1	antel	BXA-70063/6CFx4 w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		3	rymsa wireless	MG D3-800Tx w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 712-1]			
103.0	103.0	3	rfs celwave	APXV18-206517S-C w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
78.0	78.0	12	decibel	844G65VTZASX w/ Mount Pipe	12	1-5/8	3
		1	tower mounts	Platform Mount [LP 303-1]			
60.0	60.0	1	tower mounts	Side Arm Mount [SO 701-1]	1	1/2	1
		1	trimble	ACUTIME 2000			

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

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 1204605EG1, 6/12/2012	1533476	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PJF/Summit, 29298-597, 9/11/1998	1615406	CCISITES
4-TOWER MANUFACTURER DRAWINGS	PJF/SEA, A02-T0021, 2/18/2002	2068033	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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	155 - 115.5	Pole	TP29.308x22x0.25	1	-10.29	1080.07	83.1	Pass
L2	115.5 - 98.25	Pole	TP31.999x28.114x0.313	2	-15.78	1636.48	96.7	Pass
L3	98.25 - 79.25	Pole	TP35.514x31.999x0.497	3	-19.14	2230.60	91.6	Pass
L4	79.25 - 67.5	Pole	TP37.063x33.688x0.547	4	-24.31	2629.86	96.7	Pass
L5	67.5 - 43.75	Pole	TP41.456x37.063x0.589	5	-30.14	3141.51	96.0	Pass
L6	43.75 - 31.25	Pole	TP43.019x39.306x0.64	6	-37.65	3627.25	96.4	Pass
L7	31.25 - 0	Pole	TP48.8x43.019x0.667	7	-50.04	4444.14	93.2	Pass
							Summary	
						Pole (L2)	96.7	Pass
						RATING =	**96.7**	**Pass**

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	87.3	Pass
1	Base Plate	0	67.7	Pass
1	Base Foundation Structural Steel	0	69.1	Pass
1	Base Foundation Soil Interaction	0	76.0	Pass

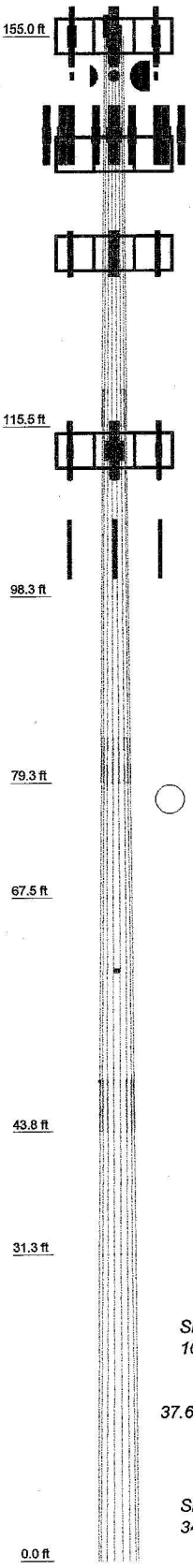
Structure Rating (max from all components) =	96.7%

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

4.1) Recommendations

See attached modification drawings.

Section	7	6	5	4	3	2	1
Length (ft)	31.2500	17.7500	23.7500	16.2500	19.0000	21.0000	39.5000
Number of Sides	18	18	18	18	18	18	18
Thickness (in)	0.667	0.640	0.589	0.547	0.497	0.313	0.250
Socket Length (ft)			5.2500		4.5000		3.7500
Top Dia (in)	43.019	39.306	37.063	33.688	31.999	28.114	22.000
Bot Dia (in)	48.800	43.019	41.456	37.063	35.514	31.999	29.308
Grade	Reinf 54.49 ksi	Reinf 52.69 ksi	Reinf 52.62 ksi	Reinf 51.84 ksi	Reinf 51.73 ksi	A607-65	A607-60
Weight (K)	32.6	10.2	5.0	5.8	3.3	3.4	2.1



AXIAL
71 K

SHEAR
10 K

MOMENT
1177 k-ft

TORQUE 0 kip-ft
37.60 mph WIND - 1.000 in ICE

AXIAL
50 K

SHEAR
34 K

MOMENT
4025 k-ft

TORQUE 1 kip-ft
REACTIONS - 80.00 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVSPP18-C-A20 w/ Mount Pipe	155	RRUS E2 B29	143
APXVSPP18-C-A20 w/ Mount Pipe	155	WCS RRUS-32-B30	143
APXVSPP18-C-A20 w/ Mount Pipe	155	WCS RRUS-32-B30	143
LPX310R w/ Mount Pipe	155	WCS RRUS-32-B30	143
LPX310R w/ Mount Pipe	155	DTMABP7819VG12A	143
LPX310R w/ Mount Pipe	155	DTMABP7819VG12A	143
HORIZON COMPACT	155	DTMABP7819VG12A	143
HORIZON COMPACT	155	Platform Mount [LP 301-1]	143
HORIZON COMPACT	155	800 10121 w/ Mount Pipe	143
WIMAX DAP HEAD	155	800 10121 w/ Mount Pipe	143
WIMAX DAP HEAD	155	800 10121 w/ Mount Pipe	143
WIMAX DAP HEAD	155	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	133
APXVTM14-C-120 w/ Mount Pipe	155	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	133
APXVTM14-C-120 w/ Mount Pipe	155		
APXVTM14-C-120 w/ Mount Pipe	155	KRY 112 144/1	133
TD-RRH8x20-25	155	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	133
TD-RRH8x20-25	155		
TD-RRH8x20-25	155	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	133
Platform Mount [LP 713-1]	155	KRY 112 144/1	133
6' x 2" Mount Pipe	155	Platform Mount [LP 403-1]	133
6' x 2" Mount Pipe	155	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	133
6' x 2" Mount Pipe	155		
Top Hat 14" Diameter x 2' 3" Tall	155	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	133
VHLP2.5-18	155		
VHLP1-23	155	KRY 112 144/1	133
VHLP2-11	155	BXA-171063-12BF w/ Mount Pipe	113
800MHz 2X50W RRH W/FILTER	153	BXA-171063-12BF w/ Mount Pipe	113
PCS 1900MHz 4x45W-65MHz	153	BXA-171063-12BF w/ Mount Pipe	113
800MHz 2X50W RRH W/FILTER	153	BXA-70063/6CFx2 w/ Mount Pipe	113
PCS 1900MHz 4x45W-65MHz	153	BXA-70063/6CFx2 w/ Mount Pipe	113
Pipe Mount [PM 601-3]	153	BXA-70063/6CFx4 w/ Mount Pipe	113
800MHz 2X50W RRH W/FILTER	153	MG D3-800Tx w/ Mount Pipe	113
PCS 1900MHz 4x45W-65MHz	153	MG D3-800Tx w/ Mount Pipe	113
(2) 860 10025	143	MG D3-800Tx w/ Mount Pipe	113
(2) 860 10025	143	RRH2X40-07-U	113
(2) 860 10025	143	RRH2X40-07-U	113
DC6-48-60-18-8F	143	RRH2X40-07-U	113
(3) HPA-65R-BUU-H6 w/ Mount Pipe	143	RRH2x40-AWS	113
(3) HPA-65R-BUU-H6 w/ Mount Pipe	143	RRH2x40-AWS	113
(3) HPA-65R-BUU-H6 w/ Mount Pipe	143	RRH2x40-AWS	113
RRUS-11 800MHz	143	DB-T1-6Z-8AB-0Z	113
RRUS-11 800MHz	143	Platform Mount [LP 712-1]	113
RRUS-11 800MHz	143	6' x 2" Mount Pipe	113
(2) RRUS 12-B2	143	6' x 2" Mount Pipe	113
(2) RRUS 12-B2	143	6' x 2" Mount Pipe	113
(2) RRUS 12-B2	143	LNX-6512DS-T0M w/ Mount Pipe	113
(2) RRUS A2 MODULE	143	LNX-6512DS-T0M w/ Mount Pipe	113
(2) RRUS A2 MODULE	143	LNX-6512DS-T0M w/ Mount Pipe	113
(2) RRUS A2 MODULE	143	Pipe Mount [PM 601-3]	103
DC6-48-60-18-8F	143	APXV18-206517S-C w/ Mount Pipe	103
DC6-48-60-18-8F	143	APXV18-206517S-C w/ Mount Pipe	103
RRUS 11-700	143	APXV18-206517S-C w/ Mount Pipe	103
RRUS 11-700	143	ACUTIME 2000	60
RRUS 11-700	143	Side Arm Mount [SO 701-1]	60
RRUS E2 B29	143		
RRUS E2 B29	143		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	Reinf 52.62 ksi	53 ksi	65 ksi
A607-65	65 ksi	80 ksi	Reinf 52.69 ksi	53 ksi	65 ksi
Reinf 51.73 ksi	52 ksi	65 ksi	Reinf 54.49 ksi	54 ksi	65 ksi
Reinf 51.84 ksi	52 ksi	65 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80.00 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 37.60 mph basic wind with 1.00 in ice.
4. Deflections are based upon a 50.00 mph wind.
5. TOWER RATING: 96.7%

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

Job: *155' Monopole / Buckland Mall*		
Project: *PJF 37514-0616 BP / BU 876347*		
Client: CCI	Drawn by: John J Woolley	App'd:
Code: TIA/EIA-222-F	Date: 04/09/14	Scale: NTS
Path: G:\TOWER\375...\Reinforced.eri		Dwg No. E-1

37514-0616 R1 PERMIT.DWG

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER; SITE NAME

BU #876347: BUCKLAND MALL

APP: 204057 REV. 2; WO: 727336

SITE ADDRESS

53 SLATER STREET
MANCHESTER, CT 06040
HARTFORD COUNTY

PROJECT NOTES

1. DETAILED FIELD INFORMATION REGARDING INTERFERENCES AND/OR EXISTING FIELD CONDITIONS MAY BE AVAILABLE ON CROWN'S CCISITES AND FROM CONTRACTOR'S PRE-MOD MAPPING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AND COORDINATE WITH THE AVAILABLE SOURCES OF INFORMATION ABOVE AND WITH THE PROJECT PLANS BEFORE PROCEEDING WITH THE WORK. CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL BEFORE PROCEEDING WITH THE WORK.

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

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

4. (A.) DTI'S REQUIRED: ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAILS ON SHEET S-3 FOR REQUIREMENTS ON THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

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

   (C.) REQUIREMENT EFFECTIVE 04/20/2013, PER CROWN CASTLE DIRECTIVE: ANY AND ALL STRUCTURAL BOLTS THAT ARE TIGHTENED TO THE PRETENSIONED CONDITION USING THE AISC "TURN-OF-NUT" TENSIONING PROCEDURE (NON-TENSION CONTROLLED [NON-TC] BOLTS AND/OR BOLTS WITHOUT DTI'S INSTALLED) SHALL BE INSPECTED ONSITE BY AN INDEPENDENT THIRD-PARTY BOLT INSPECTOR, AS APPROVED BY CROWN. **THIS INSPECTION IS REQUIRED TO BE AN ONSITE FIELD INSPECTION.** THE THIRD-PARTY BOLT INSPECTOR SHALL FOLLOW THE PUBLISHED CROWN CASTLE INSPECTION PROCEDURE "MI NON-TC BOLT INSPECTION", DATED APRIL 2013. THE THIRD-PARTY BOLT INSPECTOR SHALL PREPARE A FULLY DOCUMENTED BOLT INSPECTION REPORT, AS SPECIFIED BY CROWN, AND SHALL SUBMIT A COPY OF THE BOLT INSPECTION REPORT TO THE MI INSPECTOR, THE EOR, AND TO CROWN CASTLE.

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

PROJECT CONTACTS:

MONOPOLE OWNER:
CROWN CASTLE
46 BROADWAY, ALBANY, NY 12204
CONTACT: ANDREW BAZINET
PH: (585) 899-3442

STRUCTURAL ENGINEER OF RECORD (EOR):
PAUL J. FORD AND COMPANY
250 EAST BROAD STREET, SUITE 600
COLUMBUS, OHIO 43215-3708
CONTACT: JOHN WOOLLEY AT JWOOLLEY@PJFWEB.COM
PHONE: 614-221-6679

DESIGN STANDARD

THIS REINFORCEMENT DESIGN IS BASED UPON THE REQUIREMENTS OF THE TIA/EIA-222-F-1996 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, USING A DESIGN BASIC WIND SPEED OF 80 MPH WITH NO ICE, 37.60 MPH WITH 1 INCH ICE AND 50 MPH SERVICE LOADS.

REFER TO THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF STRUCTURAL ANALYSIS FOR THIS SITE (PJF#37514-0616 R1 BP), DATED 4-1-2014.

THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:

SHAFT REINFORCING
FIELD WELDED ANCHOR BRACKETS
1 POST INSTALLED ANCHOR RODS
ELEVATION REMOVAL

SHEET INDEX

SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
S-1	GENERAL NOTES
S-2	GENERAL NOTES
S-3	AJAX BOLT DETAIL
S-4	MONOPOLE PROFILE
S-5	BASE PLATE DETAILS
S-6	MISC DETAILS
S-7	MI CHECKLIST

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

APR 0 1 2014

1 4-1-2014 : REVISED MODIFICATION LIST

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street - Suite 600 - Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE
46 BROADWAY, ALBANY, NY 12204
PH: (585) 899-3442 FAX: (585) 899-3448

BU #876347: BUCKLAND MALL
MANCHESTER, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37514-0616	ISSUE DATE OF PERMIT R1: 4-1-2014
DRAWN BY: S.S.	
CHECKED BY: J.J.W.	
APPROVED BY:	T-1
DATE: 3-25-2014	

37514-0616 R1 PERMIT.DWG

CROWN CASTLE PROJECT: BU #876347: BUCKLAND MALL; MANCHESTER, CT
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

A. GENERAL NOTES

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

B. (SECTION NOT USED)

C. SPECIAL INSPECTION AND TESTING

1. ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY THE OWNER'S REPRESENTATIVE AND THE OWNER'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY. REFER TO CROWN CASTLE DOCUMENT ENG-SOW-10068 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 PERIODIC ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.

B. FOUNDATIONS, CONCRETE, AND SOIL PREPARATION - (NOT REQUIRED)

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

G. REPORTS:
   (1.) COMPILE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.

6. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES AND PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO THE OWNER'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT THE OWNER'S REVIEW AND SPECIFIC WRITTEN CONSENT. THE OWNER RESERVES THE RIGHT TO DETERMINE WHAT IS AN ACCEPTABLE RESOLUTION OF DISCREPANCIES AND PROBLEMS.
7. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO THE OWNER. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
8. RESPONSIBILITY: THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.

STATE OF CONNECTICUT
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1 4-1-2014

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BU #876347: BUCKLAND MALL
MANCHESTER, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:	37514-0616
DRAWN BY:	S.S.
CHECKED BY:	J.J.W.
APPROVED BY:	
DATE:	3-25-2014

ISSUE DATE OF PERMIT R1: 4-1-2014

S-1

D. STRUCTURAL STEEL

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

A. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
   (A.) "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
   (B.) "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
   (C.) "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (PARAGRAPH 4.2.1 SPECIFICALLY EXCLUDED).

B. BY THE AMERICAN WELDING SOCIETY (AWS):
   (A.) "STRUCTURAL WELDING CODE - STEEL D1.1."
   (B.) "SYMBOLS FOR WELDING AND NON-DESTRUCTIVE TESTING"

2. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
3. TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AJAX M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC "TURN OF THE NUT" METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.
4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO THE OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH-UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
8. UNLESS OTHERWISE NOTED, ALL STEEL MEMBERS SHALL BE HOT-DIP GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH ASTM A123. SEE SECTION J FOR FURTHER NOTES AND FOR EXCEPTIONS (IF ANY).
9. ALL WELDS SHALL BE VISUALLY INSPECTED BY THE OWNER'S APPROVED TESTING AGENCY. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY IN THEIR TESTING EFFORTS.
10. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
11. FIELD CUTTING OF STEEL:
   (A.) PRIOR TO ANY FIELD CUTTING, THE CONTRACTOR SHALL MARK THE CUT OUTLINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS.
   (B.) ANY REQUIRED CUTS IN THE STEEL SHALL BE CAREFULLY CUT BY MECHANICAL METHODS SUCH AS DRILLING, SAW CUTTING, AND GRINDING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE. DURING THE CUTTING WORK. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
   (C.) ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

E. BASE PLATE GROUT - (NOT REQUIRED)

F. FOUNDATION WORK - (NOT REQUIRED)

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

H. EPOXY GROUTED REINFORCING ANCHOR RODS

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

I. TOUCH UP OF GALVANIZING

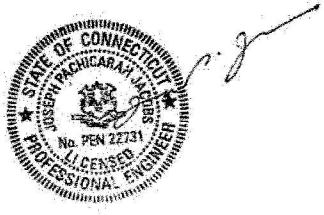
1. THE CONTRACTOR SHALL TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. **GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL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

J. HOT DIP GALVANIZING

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

K. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER

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



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BU #876347: BUCKLAND MALL
MANCHESTER, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37514-0616	ISSUE DATE OF PERMIT R1: 4-1-2014
DRAWN BY: S.S.	
CHECKED BY: J.J.W.	
APPROVED BY: JJW	S-2
DATE: 3-25-2014	

AJAX BOLT NOTE SHEET: REV. 1.4, 5-20-2013

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

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

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

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

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

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

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

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

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

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

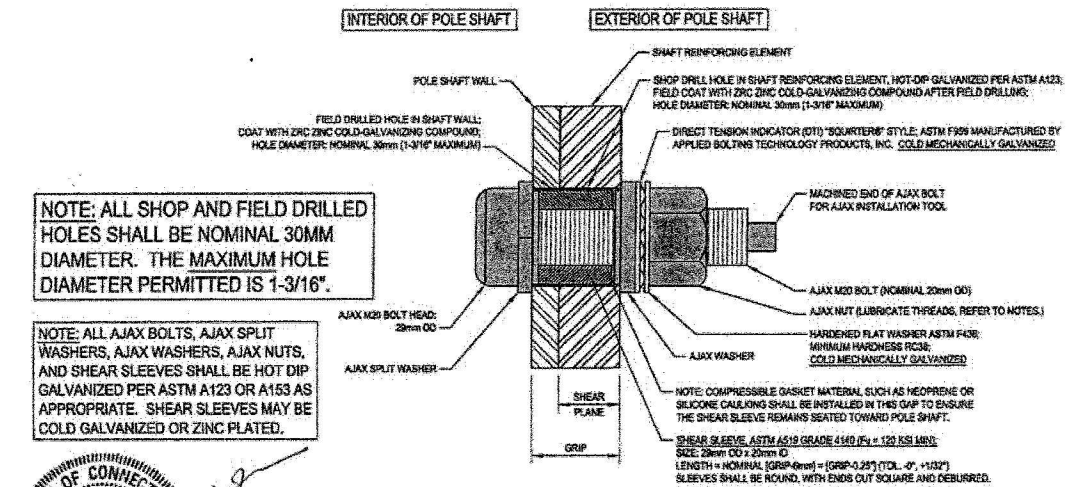
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY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

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

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

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

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



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

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

TYPICAL AJAX BOLT DETAIL 1/S-3

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37514-0616 R1 PERMIT.DWG

CROWN CASTLE US PATENT NOS 8,046,972; 8,156,712; 7,849,659; 8,424,269 AND PATENT PENDING

POLE SPECIFICATIONS	
POLE SHAPE TYPE:	18-SIDED POLYGON
TAPER:	0.1850 IN/FT
SHAFT STEEL:	ASTM A607 GRADE 65 & GRADE 80
BASE PL STEEL:	ASTM A572 GRADE 50 (50 KSI)
ANCHOR RODS:	2 1/4"ø 61EJ 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	39.58	0.2500	45.00	22.000	29.308
2	40.00	0.3125	54.00	28.114	35.514
3	40.00	0.3750	63.00	34.057	41.456
4	43.00	0.4375		39.735	46.800

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

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

MODIFICATIONS:

(A) INSTALL NEW ANCHOR RODS AND BRACKETS AT BASE PLATE. SEE SHEET S-5.

(B) REMOVE EXISTING MOUNTS, ANTENNA AND COAX AT EL. 78' & 145'.

(C) INSTALL NEW SHAFT REINFORCING. SEE CHART.

* EXISTING MOUNTS MAY NEED TO BE ADJUSTED, MOVED AND/OR TEMPORARILY SUPPORTED DURING THE INSTALLATION OF SHAFT REINFORCING.

NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE

BOTTOM ELEVATION	TOP ELEVATION	FLAT # / DEGREE SEPARATION	ELEMENT	ELEMENT LENGTH	CMRP 65 KSI CATALOG PART NUMBER	ELEMENT QUANTITY	APPROXIMATE AJAX BOLTS PER ELEMENT	APPROXIMATE TOTAL AJAX BOLT QUANTITY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	ESTIMATED TOTAL STEEL WEIGHT
0'-0"	35'-6"	4, 10 & 16	1-1/4" x 8-1/2"	35'-0"	CCI-AFP-06512535	3	52	156	17	17	17"	2796 LBS.
35'-6"	70'-6"	4, 10 & 16	1-1/4" x 6-1/2"	35'-0"	CCI-AFP-06512535	3	45	135	14	14	19"	2903 LBS.
70'-6"	100'-6"	4, 10 & 16	1" x 6"	30'-0"	CCI-AFP-06510035	3	42	126	10	10	16"	1838 LBS.
								417				8537 LBS.

NOTES:

1) AJAX BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.
2) ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF 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 REINFORCING SHALL BE ASTM A572 GR. 65.
4) WELDS SHALL BE E80XX OR GREATER. TERMINATION WELDS SHALL BE 3/8" FILLET WELDS.
5) HOLES FOR AJAX BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
6) ALL SHIMS SHALL BE ASTM A-36.

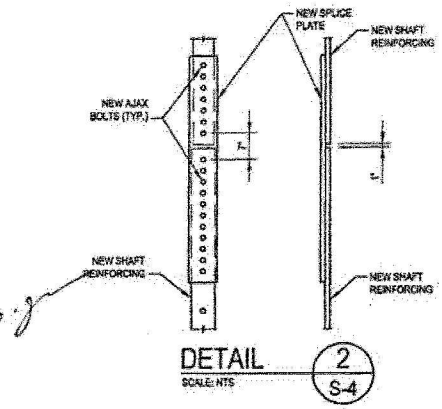
NEW SHIM CHART

SHIM QUANTITY	SHIM WIDTH	SHIM LENGTH	SHIM THICKNESS	HOLE DIAMETER
9	4"	4"	1/4"	1-1/4"
27	4"	4"	1/16"	1-1/4"

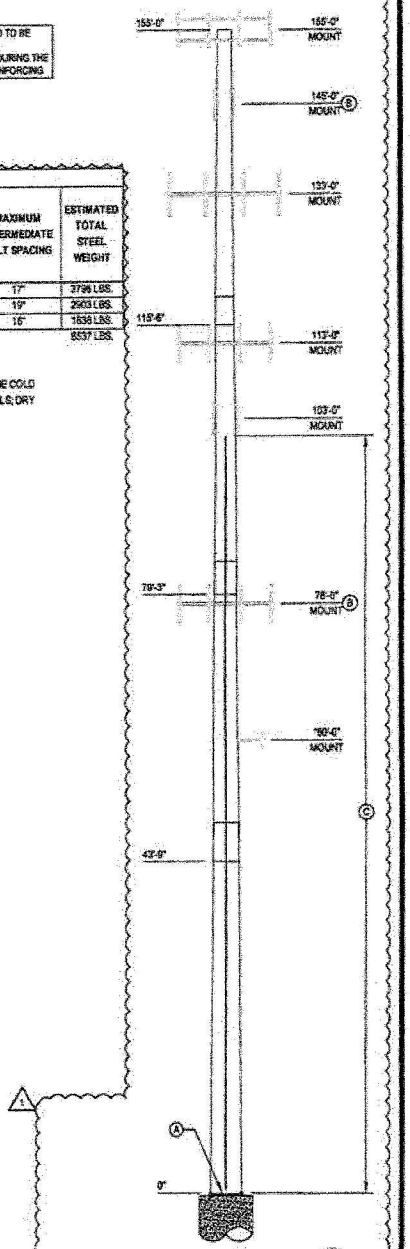
SPLICE PLATE INSTALLATION CHART

ELEVATION	FLAT PLATE THICKNESS	FLAT PLATE WIDTH	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	WELD LENGTH PER SIDE	TOTAL WELD LENGTH	AJAX BOLTS PER SPLICE*	TOTAL STEEL WEIGHT
35'-6"	1.25"	8.5"	6'-4"	3	-	-	31	906 LBS.
70'-6"	1.25"	6.5"	8'-7"	3	-	-	24	547 LBS.
						0"		1453 LBS.

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



DETAIL 2/S-4
SCALE: NTS



POLE ELEVATION 1/S-4

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

APR 0 1 2014

1 4-1-2014 : REVISED MODIFICATION LIST

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street - Suite 600 - Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE
46 BROADWAY, ALBANY, NY 12204
PH: (585) 899-3442 FAX: (585) 899-3448

BU #876347: BUCKLAND MALL
MANCHESTER, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37514-0616	ISSUE DATE OF PERMIT R1: 4-1-2014
DRAWN BY: S.S.	
CHECKED BY: J.J.W.	
APPROVED BY: JTK	S-4
DATE: 3-25-2014	

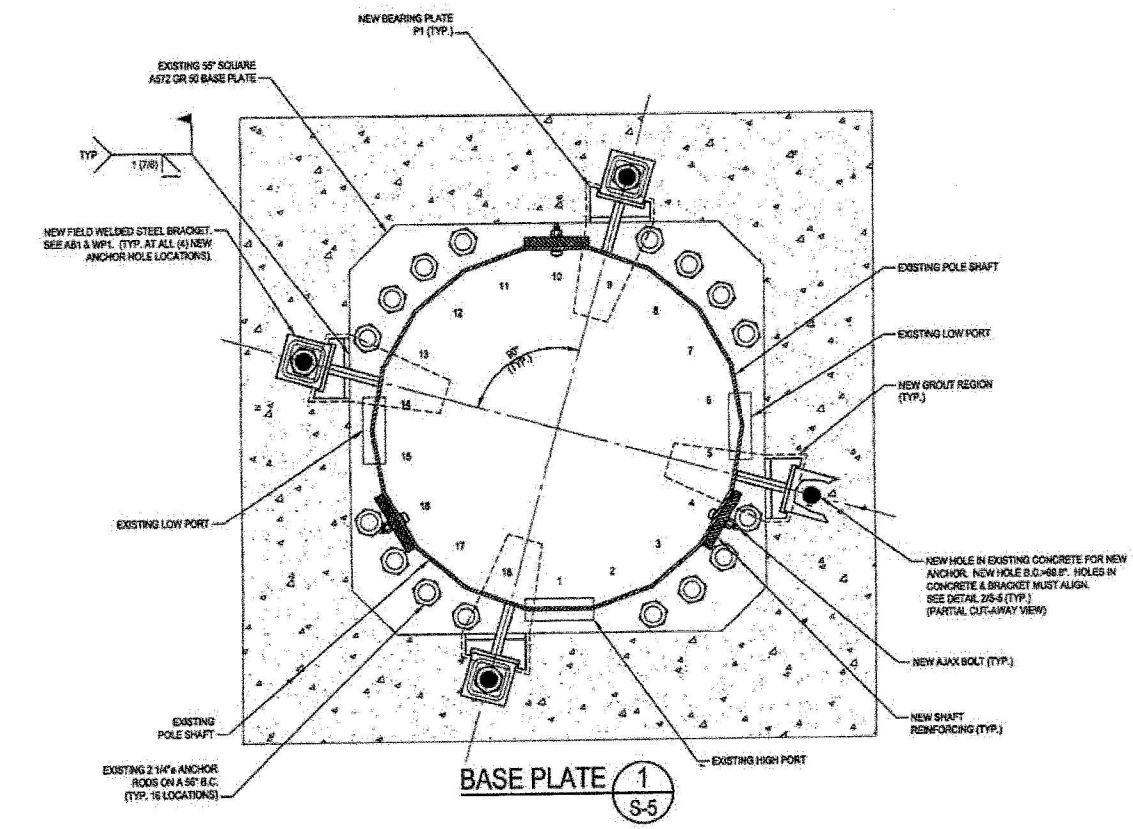
37514-0616 R1 PERMIT.DWG

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

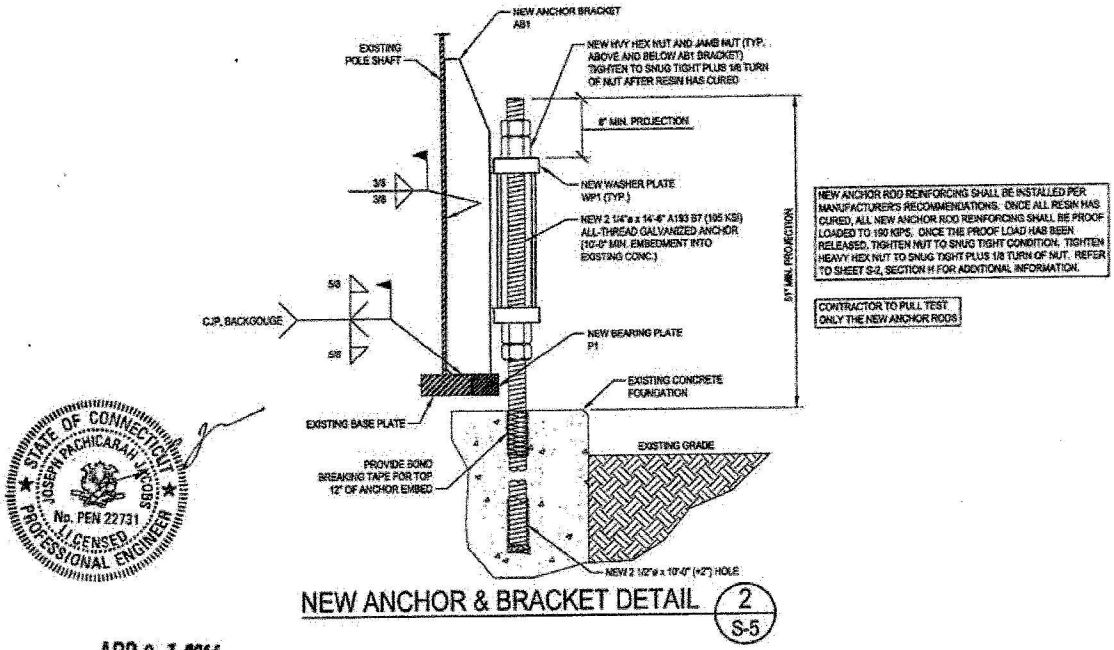
(1.) PRIOR TO CONSTRUCTION, CONTRACTOR'S INSPECTION AGENCY SHALL INSPECT CONDITION OF EXISTING SHAFT-TO-BASE-PLATE WELD CONNECTION. ALSO INSPECT EXISTING STIFFENERS IF PRESENT. THE CONTRACTOR'S INSPECTION AGENCY SHALL USE THE FOLLOWING INSPECTION METHODS AS REQUIRED TO IDENTIFY ANY CRACKS: VISUAL, MAGNETIC PARTICLE, AND 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 IN REGION AS SHOWN. GROUT SHALL BE INSTALLED TIGHT UNDER BASE PLATE WITH NO VOIDS REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF EXISTING BASE PLATE. GROUT COMPLETELY SOLID UNDER ENTIRE SURFACE OF BASE PLATE FROM OUTSIDE EDGE TO INSIDE EDGE WITHIN THE REGION INDICATED.



BASE PLATE 1 / S-5



NEW ANCHOR ROD REINFORCING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ONCE ALL RESIN HAS CURED, ALL NEW ANCHOR ROD REINFORCING SHALL BE PROOF LOADED TO 190 KIPS. ONCE THE PROOF LOAD HAS BEEN RELEASED, TIGHTEN NUT TO SNUG TIGHT CONDITION. TIGHTEN HEAVY HEX NUT TO SNUG TIGHT PLUS 1/8 TURN OF NUT. REFER TO SHEET S-2, SECTION H FOR ADDITIONAL INFORMATION.

CONTRACTOR TO PULL TEST ONLY THE NEW ANCHOR RODS

NEW ANCHOR & BRACKET DETAIL 2 / S-5

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

APR 0 1 2014

1 4-1-2014

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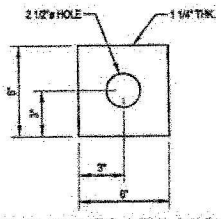
PROJECT No:	37514-0616
DRAWN BY:	S.S.
CHECKED BY:	J.J.W.
APPROVED BY:	JJK
DATE:	3-25-2014

ISSUE DATE OF PERMIT R1: 4-1-2014

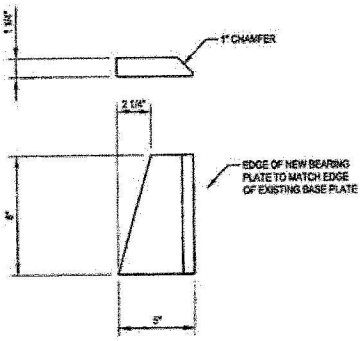
S-5

37514-0616 R1 PERMIT.DWG



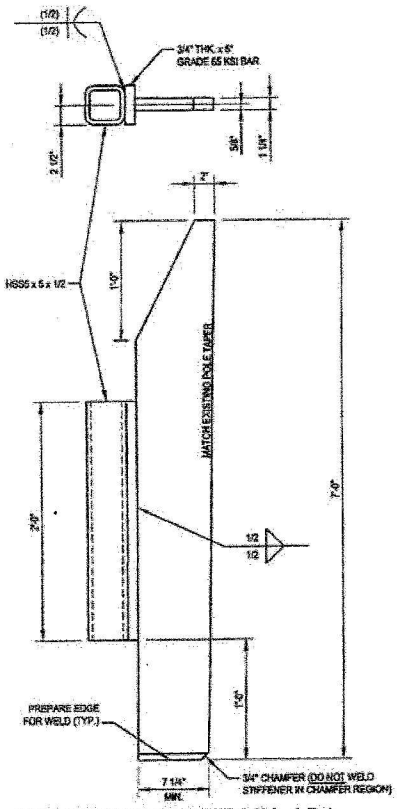
WASHER PLATE MK~WP1

(8 REQUIRED) (Fy = 50 KSI)



BEARING PLATE MK~P1

(4 REQUIRED) (Fy = 50 KSI)



ANCHOR BRACKET MK~AB1

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

STATE OF CONNECTICUT
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APR 0 1 2014

1 4-1-2014

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BU #876347: BUCKLAND MALL
MANCHESTER, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37514-0616	ISSUE DATE OF PERMIT R1: 4-1-2014
DRAWN BY: S.S.	
CHECKED BY: J.J.W.	
APPROVED BY: JJW	S-6
DATE: 3-25-2014	

37514-0615 R1 PERMIT.DWG

MODIFICATION INSPECTION NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

MI CHECKLIST

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

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

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

APR 0 1 2014

1 4-1-2014

PAUL J. FORD AND COMPANY
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CROWN CASTLE
46 BROADWAY, ALBANY, NY 12204
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BU #876347: BUCKLAND MALL
MANCHESTER, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:	37514-0615
DRAWN BY:	S.S.
CHECKED BY:	J.J.W.
APPROVED BY:	
DATE:	3-25-2014

ISSUE DATE OF PERMIT R1: 4-1-2014

S-7

Centek Engineering, Inc.
3-2 North Branford Road
Branford, Connecticut 06405
Phone: (203) 488-0580
Fax: (203) 488-8587

Steven L. Levine
Real Estate Consultant

April 14, 2014

Mr. Scott Shanley, General Manager
Town of Manchester
Town Hall, 41 Center Street
Manchester, CT 06045-0191

Re: Telecommunications Facility – 53 Slater Street, Manchester, CT

Dear Mr. Shanley:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review AT&T's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The enclosed Notice fully sets forth the AT&T proposal. However, if you have any questions or require any further information on the plans for the site or the Siting Council's procedures, please contact the undersigned at 860-830-0380 or Ms. Melanie Bachman, Acting Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Steven L. Levine
Real Estate Consultant

Enclosure

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

Date: **March 25, 2014**

Andrew Bazinet
Crown Castle
46 Broadway
Albany, NY 12204

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679
jwoolley@pjfweb.com

Subject: **Structural Modification Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5307
	Carrier Site Name:	Manchester North
Crown Castle Designation:	**Crown Castle BU Number:**	876347
	Crown Castle Site Name:	BUCKLAND MALL
	Crown Castle JDE Job Number:	256000
	Crown Castle Work Order Number:	727336
	Crown Castle Application Number:	204057 Rev. 2
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37514-0616 BP
Site Data:	**53 Slater Street, MANCHESTER, Hartford County, CT** **Latitude *41° 48' 18"*, Longitude *-72° 32' 1"*** **155 Foot - Monopole Tower**	

Dear Andrew Bazinet,

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 626712, in accordance with application 204057, revision 2.

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

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

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

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

Respectfully submitted by:

John J. Woolley, E.I.
Structural Designer

MAR 3 1 2014

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

Date: **March 25, 2014**

Andrew Bazinet
Crown Castle
46 Broadway
Albany, NY 12204

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679
jwoolley@pjfweb.com

Subject: Structural Modification Report

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5307
	Carrier Site Name:	Manchester North
Crown Castle Designation:	**Crown Castle BU Number:**	876347
	Crown Castle Site Name:	BUCKLAND MALL
	Crown Castle JDE Job Number:	256000
	Crown Castle Work Order Number:	727336
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Respectfully submitted by:

John J. Woolley, E.I.
Structural Designer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 155 ft Monopole tower designed by SUMMIT in February of 2002. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
143.0	145.0	9	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	4	7/8	-
		3	communication components inc.	DTMABP7819VG12A			
		3	ericsson	RRUS 11-700			
		6	ericsson	RRUS 12-B2			
		6	ericsson	RRUS A2 MODULE			
		3	ericsson	WCS RRUS-32-B30			
		3	ericsson	RRUS E2 B29			
		3	ericsson	RRUS-11 800MHz			
		2	raycap	DC6-48-60-18-8F			
	143.0	1	tower mounts	Commscope MTC3607R			

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
155.0	155.0	3	alcatel lucent	TD-RRH8x20-25	1	5/8	2
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
		3	argus technologies	LPX310R w/ Mount Pipe	3 3 5	1-1/4 5/16 1/2	1
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	samsung telecommunications	WIMAX DAP HEAD			
		1	tower mounts	Platform Mount [LP 713-1]			
	151.0	1	andrew	VHLP1-23			
		1	andrew	VHLP2-11			
		1	andrew	VHLP2.5-18			
		3	dragonwave	HORIZON COMPACT			
153.0	153.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-	1
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		1	tower mounts	Pipe Mount [PM 601-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
145.0	145.0	3	ericsson	RRUS 11	-	-	3
		1	tower mounts	Pipe Mount [PM 601-3]			
143.0	145.0	3	kathrein	800 10121 w/ Mount Pipe	1 2 6	3/8 3/4 1-1/4	1
		1	raycap	DC6-48-60-18-8F			
		6	kathrein	860 10025			
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe	-	-	3
		6	powerwave technologies	LGP21401			
	143.0	1	tower mounts	T-Arm Mount [TA 601-3]			
133.0	133.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	13	1-5/8	1
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
		1	tower mounts	Platform Mount [LP 403-1]			
113.0	113.0	3	alcatel lucent	RRH2X40-07-U	1 13	1/4 1-5/8	1
		3	alcatel lucent	RRH2x40-AWS			
		3	andrew	LNX-6512DS-T0M w/ Mount Pipe			
		3	antel	BXA-171063-12BF w/ Mount Pipe			
		2	antel	BXA-70063/6CFx2 w/ Mount Pipe			
		1	antel	BXA-70063/6CFx4 w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		3	rymsa wireless	MG D3-800Tx w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 712-1]			
103.0	103.0	3	rfs celwave	APXV18-206517S-C w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
78.0	78.0	12	decibel	844G65VTZASX w/ Mount Pipe	12	1-5/8	3
		1	tower mounts	Platform Mount [LP 303-1]			
60.0	60.0	1	tower mounts	Side Arm Mount [SO 701-1]	1	1/2	1
		1	trimble	ACUTIME 2000			

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

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 1204605EG1, 6/12/2012	1533476	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PJF/Summit, 29298-597, 9/11/1998	1615406	CCISITES
4-TOWER MANUFACTURER DRAWINGS	PJF/SEA, A02-T0021, 2/18/2002	2068033	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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	155 - 115.5	Pole	TP29.308x22x0.25	1	-10.29	1080.07	83.1	Pass
L2	115.5 - 98.25	Pole	TP31.999x28.114x0.313	2	-15.78	1636.48	96.7	Pass
L3	98.25 - 79.25	Pole	TP35.514x31.999x0.497	3	-19.14	2230.60	91.6	Pass
L4	79.25 - 67.5	Pole	TP37.063x33.688x0.547	4	-24.31	2629.86	96.7	Pass
L5	67.5 - 43.75	Pole	TP41.456x37.063x0.589	5	-30.14	3141.51	96.0	Pass
L6	43.75 - 31.25	Pole	TP43.019x39.306x0.64	6	-37.65	3627.25	96.4	Pass
L7	31.25 - 0	Pole	TP48.8x43.019x0.667	7	-50.04	4444.14	93.2	Pass
							Summary	
						Pole (L2)	96.7	Pass
						RATING =	**96.7**	**Pass**

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	87.3	Pass
1	Base Plate	0	67.7	Pass
1	Base Foundation Structural Steel	0	69.1	Pass
1	Base Foundation Soil Interaction	0	76.0	Pass

Structure Rating (max from all components) =	**96.7%**

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

4.1) Recommendations

See attached modification drawings.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

1) Tower is located in Hartford County, Connecticut.
2) Basic wind speed of 80.00 mph.
3) Nominal ice thickness of 1.000 in.
4) Ice density of 56.00 pcf.
5) A wind speed of 37.60 mph is used in combination with ice.
6) Temperature drop of 50 °F.
7) Deflections calculated using a wind speed of 50.00 mph.
8) A non-linear (P-delta) analysis was used.
9) Pressures are calculated at each section.
10) Stress ratio used in pole design is 1.333.
11) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	155.0000-115.5000	39.5000	3.75	18	22.000	29.308	0.250	1.000	A607-60 (60 ksi)
L2	115.5000-98.2500	21.0000	0.00	18	28.114	31.999	0.313	1.252	A607-65 (65 ksi)
L3	98.2500-79.2500	19.0000	4.50	18	31.999	35.514	0.497	1.988	Reinf 51.73 ksi (52 ksi)
L4	79.2500-67.5000	16.2500	0.00	18	33.688	37.063	0.547	2.189	Reinf 51.84 ksi (52 ksi)
L5	67.5000-43.7500	23.7500	5.25	18	37.063	41.456	0.589	2.358	Reinf 52.62 ksi (53 ksi)
L6	43.7500-31.2500	17.7500	0.00	18	39.306	43.019	0.640	2.560	Reinf 52.69 ksi (53 ksi)
L7	31.2500-0.0000	31.2500		18	43.019	48.800	0.667	2.670	Reinf 54.49 ksi (54 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.339	17.259	1031.483	7.721	11.176	92.294	2064.324	8.631	3.432	13.728
	29.760	23.058	2459.697	10.316	14.888	165.208	4922.630	11.531	4.718	18.873
L2	29.252	27.619	2696.990	9.869	14.282	188.838	5397.529	13.812	4.397	14.049
	32.493	31.479	3992.923	11.249	16.255	245.635	7991.101	15.742	5.081	16.233
L3	32.493	49.683	6229.075	11.183	16.255	383.198	12466.346	24.846	4.757	9.574
	36.062	55.226	8555.503	12.431	18.041	474.223	17122.263	27.618	5.376	10.819
L4	35.156	57.566	7987.690	11.765	17.113	466.752	15985.891	28.789	4.966	9.074
	37.635	63.429	10685.141	12.963	18.828	567.516	21384.342	31.720	5.560	10.159
L5	37.635	68.243	11469.587	12.948	18.828	609.180	22954.266	34.128	5.486	9.306
	42.096	76.463	16133.310	14.508	21.060	766.077	32287.848	38.239	6.259	10.617
L6	41.027	78.532	14833.520	13.726	19.967	742.887	29686.558	39.274	5.792	9.051
	43.682	86.073	19530.078	15.044	21.854	893.681	39085.855	43.045	6.445	10.072
L7	43.682	89.726	20332.377	15.035	21.854	930.393	40691.507	44.871	6.397	9.583
	49.553	101.974	29847.274	17.087	24.790	1203.985	59733.821	50.997	7.414	11.107

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 155.0000-115.5000				1	1	1		
L2 115.5000-98.2500				1	1	1		
L3 98.2500-79.2500				1	1	1		
L4 79.2500-67.5000				1	1	1		
L5 67.5000-43.7500				1	1	1		
L6 43.7500-31.2500				1	1	1		
L7 31.2500-0.0000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
ATCB-B01-005(5/16)	C	No	Inside Pole	155.0000 - 0.0000	3	No Ice	0.0000	0.07
						1/2" Ice	0.0000	0.07
						1" Ice	0.0000	0.07
FSJ4-50B(1/2")	C	No	Inside Pole	155.0000 - 0.0000	5	No Ice	0.0000	0.14
						1/2" Ice	0.0000	0.14
						1" Ice	0.0000	0.14
HB114-1-08U4-M5J(1 1/4")	C	No	Inside Pole	155.0000 - 0.0000	3	No Ice	0.0000	1.08
						1/2" Ice	0.0000	1.08
						1" Ice	0.0000	1.08
HB058-M12-XXXF(5/8")	C	No	Inside Pole	155.0000 - 0.0000	1	No Ice	0.0000	0.24
						1/2" Ice	0.0000	0.24
						1" Ice	0.0000	0.24
2" (Nominal) Conduit	C	No	CaAa (Out Of Face)	155.0000 - 0.0000	1	No Ice	0.0000	0.72
						1/2" Ice	0.0000	2.48
						1" Ice	0.0000	4.84
2" (Nominal) Conduit	C	No	CaAa (Out Of Face)	155.0000 - 0.0000	1	No Ice	0.2375	0.72
						1/2" Ice	0.3375	2.48
						1" Ice	0.4375	4.84
LDF6-50A(1-1/4")	C	No	Inside Pole	143.0000 - 0.0000	6	No Ice	0.0000	0.66
						1/2" Ice	0.0000	0.66
						1" Ice	0.0000	0.66

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
FB-L98B-002-75000(3/8")	C	No	Inside Pole	143.0000 - 0.0000	1	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	143.0000 - 0.0000	2	No Ice	0.0000	0.59
						1/2" Ice	0.0000	0.59
						1" Ice	0.0000	0.59
WR-VG86ST-BRDA(7/8)	C	No	Inside Pole	143.0000 - 0.0000	4	No Ice	0.0000	0.88
						1/2" Ice	0.0000	0.88
						1" Ice	0.0000	0.88
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	Inside Pole	133.0000 - 0.0000	1	No Ice	0.0000	1.07
						1/2" Ice	0.0000	1.07
						1" Ice	0.0000	1.07
LCF158-50JA-A0(1 5/8")	C	No	Inside Pole	133.0000 - 0.0000	12	No Ice	0.0000	0.08
						1/2" Ice	0.0000	0.08
						1" Ice	0.0000	0.08
561(1-5/8")	C	No	Inside Pole	113.0000 - 0.0000	12	No Ice	0.0000	1.35
						1/2" Ice	0.0000	1.35
						1" Ice	0.0000	1.35
LDF1-50A(1/4")	C	No	Inside Pole	113.0000 - 0.0000	1	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	113.0000 - 0.0000	1	No Ice	0.0000	1.30
						1/2" Ice	0.0000	1.30
						1" Ice	0.0000	1.30
AVA7-50(1-5/8)	C	No	CaAa (Out Of Face)	103.0000 - 0.0000	5	No Ice	0.0000	0.70
						1/2" Ice	0.0000	2.23
						1" Ice	0.0000	4.38
AVA7-50(1-5/8)	C	No	CaAa (Out Of Face)	103.0000 - 0.0000	1	No Ice	0.2010	0.70
						1/2" Ice	0.3010	2.23
						1" Ice	0.4010	4.38
LDF7-50A(1-5/8")	C	No	Inside Pole	78.0000 - 0.0000	12	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
LDF4-50A(1/2")	C	No	Inside Pole	60.0000 - 0.0000	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.15
						1" Ice	0.0000	0.15
**								
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	70.5000 - 0.0000	1	No Ice	0.2083	0.00
						1/2" Ice	0.3194	0.00
						1" Ice	0.4306	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	100.5000 - 70.5000	1	No Ice	0.1667	0.00
						1/2" Ice	0.2778	0.00
						1" Ice	0.3889	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	155.0000-115.5000	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	9.381	0.51
L2	115.5000-98.2500	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	5.427	0.57
L3	98.2500-79.2500	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	11.498	0.73
L4	79.2500-67.5000	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	7.236	0.55
L5	67.5000-43.7500	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	15.362	1.15
L6	43.7500-31.2500	A	0.000	0.000	0.000	0.000	0.00
		B	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
		C	0.000	0.000	0.000	8.085	0.60
L7	31.2500-0.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	20.214	1.51

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	155.0000-115.5000	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	17.281	0.83
L2	115.5000-98.2500	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	10.327	0.81
L3	98.2500-79.2500	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	23.320	1.30
L4	79.2500-67.5000	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	14.547	0.91
L5	67.5000-43.7500	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	30.140	1.87
L6	43.7500-31.2500	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	15.863	0.98
L7	31.2500-0.0000	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	39.658	2.46

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	155.0000-115.5000	-0.278	0.160	-0.443	0.256
L2	115.5000-98.2500	-0.367	0.212	-0.604	0.349
L3	98.2500-79.2500	-0.647	0.374	-1.066	0.616
L4	79.2500-67.5000	-0.664	0.383	-1.094	0.632
L5	67.5000-43.7500	-0.702	0.405	-1.146	0.662
L6	43.7500-31.2500	-0.708	0.409	-1.167	0.674
L7	31.2500-0.0000	-0.719	0.415	-1.199	0.692

Discrete Tower Loads

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
****									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.0000 0.00	65.000	155.0000	No Ice 1/2"	8.4975 9.1490	6.9458 8.1266	0.08 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
			0.00			Ice	9.7672	9.0212	0.23
						1" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	50.000	155.0000	No Ice 1/2" Ice 1" Ice	8.4975 9.1490 9.7672	6.9458 8.1266 9.0212	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	60.000	155.0000	No Ice 1/2" Ice 1" Ice	8.4975 9.1490 9.7672	6.9458 8.1266 9.0212	0.08 0.15 0.23
LPX310R w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	45.000	155.0000	No Ice 1/2" Ice 1" Ice	2.3071 2.6367 2.9856	2.3393 2.8683 3.4139	0.03 0.05 0.08
LPX310R w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	50.000	155.0000	No Ice 1/2" Ice 1" Ice	2.3071 2.6367 2.9856	2.3393 2.8683 3.4139	0.03 0.05 0.08
LPX310R w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	40.000	155.0000	No Ice 1/2" Ice 1" Ice	2.3071 2.6367 2.9856	2.3393 2.8683 3.4139	0.03 0.05 0.08
HORIZON COMPACT	A	From Leg	4.0000 0.00 -4.00	0.000	155.0000	No Ice 1/2" Ice 1" Ice	0.8409 0.9658 1.0993	0.4295 0.5249 0.6289	0.01 0.02 0.03
HORIZON COMPACT	B	From Leg	4.0000 0.00 -4.00	0.000	155.0000	No Ice 1/2" Ice 1" Ice	0.8409 0.9658 1.0993	0.4295 0.5249 0.6289	0.01 0.02 0.03
HORIZON COMPACT	C	From Leg	4.0000 0.00 -4.00	0.000	155.0000	No Ice 1/2" Ice 1" Ice	0.8409 0.9658 1.0993	0.4295 0.5249 0.6289	0.01 0.02 0.03
WIMAX DAP HEAD	A	From Leg	4.0000 0.00 0.00	45.000	155.0000	No Ice 1/2" Ice 1" Ice	1.8044 1.9877 2.1795	0.7778 0.9182 1.0673	0.03 0.04 0.06
WIMAX DAP HEAD	B	From Leg	4.0000 0.00 0.00	50.000	155.0000	No Ice 1/2" Ice 1" Ice	1.8044 1.9877 2.1795	0.7778 0.9182 1.0673	0.03 0.04 0.06
WIMAX DAP HEAD	C	From Leg	4.0000 0.00 0.00	40.000	155.0000	No Ice 1/2" Ice 1" Ice	1.8044 1.9877 2.1795	0.7778 0.9182 1.0673	0.03 0.04 0.06
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	65.000	155.0000	No Ice 1/2" Ice 1" Ice	7.1342 7.6618 8.1830	4.9591 5.7544 6.4723	0.08 0.13 0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	50.000	155.0000	No Ice 1/2" Ice 1" Ice	7.1342 7.6618 8.1830	4.9591 5.7544 6.4723	0.08 0.13 0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	60.000	155.0000	No Ice 1/2" Ice 1" Ice	7.1342 7.6618 8.1830	4.9591 5.7544 6.4723	0.08 0.13 0.19
TD-RRH8x20-25	A	From Leg	4.0000 0.00 0.00	65.000	155.0000	No Ice 1/2" Ice 1" Ice	4.7198 5.0138 5.3165	1.7027 1.9196 2.1453	0.07 0.10 0.13
TD-RRH8x20-25	B	From Leg	4.0000 0.00 0.00	50.000	155.0000	No Ice 1/2" Ice	4.7198 5.0138 5.3165	1.7027 1.9196 2.1453	0.07 0.10 0.13

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
						1" Ice			
TD-RRH8x20-25	C	From Leg	4.0000 0.00 0.00	60.000	155.0000	No Ice 1/2" Ice 1" Ice	4.7198 5.0138 5.3165	1.7027 1.9196 2.1453	0.07 0.10 0.13
Platform Mount [LP 713-1]	C	None		0.000	155.0000	No Ice 1/2" Ice 1" Ice	31.2700 39.6800 48.0900	31.2700 39.6800 48.0900	1.51 1.93 2.35
6' x 2" Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	155.0000	No Ice 1/2" Ice 1" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.02 0.03 0.05
6' x 2" Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	155.0000	No Ice 1/2" Ice 1" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.02 0.03 0.05
6' x 2" Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	155.0000	No Ice 1/2" Ice 1" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.02 0.03 0.05
Top Hat 14" Diameter x 2' 3" Tall	C	From Leg	0.0000 0.00 1.00	0.000	155.0000	No Ice 1/2" Ice 1" Ice	3.6750 3.9451 4.2238	3.6750 3.9451 4.2238	0.10 0.13 0.17
***									
Pipe Mount [PM 601-3]	C	None		0.000	153.0000	No Ice 1/2" Ice 1" Ice	4.3900 5.4800 6.5700	4.3900 5.4800 6.5700	0.20 0.24 0.28
800MHz 2X50W RRH W/FILTER	A	From Leg	4.0000 0.00 0.00	65.000	153.0000	No Ice 1/2" Ice 1" Ice	2.4014 2.6131 2.8335	2.2536 2.4602 2.6753	0.06 0.09 0.11
PCS 1900MHz 4x45W-65MHz	A	From Leg	4.0000 0.00 0.00	65.000	153.0000	No Ice 1/2" Ice 1" Ice	2.7087 2.9477 3.1953	2.6111 2.8475 3.0925	0.06 0.08 0.11
800MHz 2X50W RRH W/FILTER	B	From Leg	4.0000 0.00 0.00	50.000	153.0000	No Ice 1/2" Ice 1" Ice	2.4014 2.6131 2.8335	2.2536 2.4602 2.6753	0.06 0.09 0.11
PCS 1900MHz 4x45W-65MHz	B	From Leg	4.0000 0.00 0.00	50.000	153.0000	No Ice 1/2" Ice 1" Ice	2.7087 2.9477 3.1953	2.6111 2.8475 3.0925	0.06 0.08 0.11
800MHz 2X50W RRH W/FILTER	C	From Leg	4.0000 0.00 0.00	60.000	153.0000	No Ice 1/2" Ice 1" Ice	2.4014 2.6131 2.8335	2.2536 2.4602 2.6753	0.06 0.09 0.11
PCS 1900MHz 4x45W-65MHz	C	From Leg	4.0000 0.00 0.00	60.000	153.0000	No Ice 1/2" Ice 1" Ice	2.7087 2.9477 3.1953	2.6111 2.8475 3.0925	0.06 0.08 0.11
**** ***									
800 10121 w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	50.000	143.0000	No Ice 1/2" Ice 1" Ice	6.0334 6.7136 7.2991	4.9479 6.0222 6.8104	0.07 0.12 0.18
800 10121 w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	50.000	143.0000	No Ice 1/2" Ice 1" Ice	6.0334 6.7136 7.2991	4.9479 6.0222 6.8104	0.07 0.12 0.18
800 10121 w/ Mount Pipe	C	From Leg	4.0000	50.000	143.0000	No Ice	6.0334	4.9479	0.07

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
			0.00			1/2" Ice	6.7136	6.0222	0.12
			2.00			1" Ice	7.2991	6.8104	0.18
(2) 860 10025	A	From Leg	4.0000	50.000	143.0000	No Ice	0.1633	0.1361	0.00
			0.00			1/2" Ice	0.2286	0.1988	0.00
			2.00			1" Ice	0.3025	0.2701	0.01
(2) 860 10025	B	From Leg	4.0000	50.000	143.0000	No Ice	0.1633	0.1361	0.00
			0.00			1/2" Ice	0.2286	0.1988	0.00
			2.00			1" Ice	0.3025	0.2701	0.01
(2) 860 10025	C	From Leg	4.0000	50.000	143.0000	No Ice	0.1633	0.1361	0.00
			0.00			1/2" Ice	0.2286	0.1988	0.00
			2.00			1" Ice	0.3025	0.2701	0.01
DC6-48-60-18-8F	A	From Leg	4.0000	50.000	143.0000	No Ice	2.5667	2.5667	0.02
			0.00			1/2" Ice	2.7978	2.7978	0.04
			2.00			1" Ice	3.0377	3.0377	0.07
(3) HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.0000	50.000	143.0000	No Ice	10.5975	8.1125	0.08
			0.00			1/2" Ice	11.2684	9.3041	0.16
			2.00			1" Ice	11.9061	10.2095	0.25
(3) HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.0000	50.000	143.0000	No Ice	10.5975	8.1125	0.08
			0.00			1/2" Ice	11.2684	9.3041	0.16
			2.00			1" Ice	11.9061	10.2095	0.25
(3) HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.0000	50.000	143.0000	No Ice	10.5975	8.1125	0.08
			0.00			1/2" Ice	11.2684	9.3041	0.16
			2.00			1" Ice	11.9061	10.2095	0.25
RRUS-11 800MHz	A	From Leg	4.0000	50.000	143.0000	No Ice	2.9419	1.5206	0.05
			0.00			1/2" Ice	3.1718	1.6947	0.08
			2.00			1" Ice	3.4103	1.8775	0.10
RRUS-11 800MHz	B	From Leg	4.0000	50.000	143.0000	No Ice	2.9419	1.5206	0.05
			0.00			1/2" Ice	3.1718	1.6947	0.08
			2.00			1" Ice	3.4103	1.8775	0.10
RRUS-11 800MHz	C	From Leg	4.0000	50.000	143.0000	No Ice	2.9419	1.5206	0.05
			0.00			1/2" Ice	3.1718	1.6947	0.08
			2.00			1" Ice	3.4103	1.8775	0.10
(2) RRUS 12-B2	A	From Leg	4.0000	50.000	143.0000	No Ice	3.6674	1.4828	0.06
			0.00			1/2" Ice	3.9238	1.6678	0.08
			2.00			1" Ice	4.1888	1.8614	0.11
(2) RRUS 12-B2	B	From Leg	4.0000	50.000	143.0000	No Ice	3.6674	1.4828	0.06
			0.00			1/2" Ice	3.9238	1.6678	0.08
			2.00			1" Ice	4.1888	1.8614	0.11
(2) RRUS 12-B2	C	From Leg	4.0000	50.000	143.0000	No Ice	3.6674	1.4828	0.06
			0.00			1/2" Ice	3.9238	1.6678	0.08
			2.00			1" Ice	4.1888	1.8614	0.11
(2) RRUS A2 MODULE	A	From Leg	4.0000	50.000	143.0000	No Ice	1.8667	0.4231	0.02
			0.00			1/2" Ice	2.0512	0.5324	0.03
			2.00			1" Ice	2.2443	0.6504	0.04
(2) RRUS A2 MODULE	B	From Leg	4.0000	50.000	143.0000	No Ice	1.8667	0.4231	0.02
			0.00			1/2" Ice	2.0512	0.5324	0.03
			2.00			1" Ice	2.2443	0.6504	0.04
(2) RRUS A2 MODULE	C	From Leg	4.0000	50.000	143.0000	No Ice	1.8667	0.4231	0.02
			0.00			1/2" Ice	2.0512	0.5324	0.03

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
			2.00			Ice	2.2443	0.6504	0.04
						1" Ice			
DC6-48-60-18-8F	B	From Leg	4.0000	50.000	143.0000	No Ice	2.5667	2.5667	0.02
			0.00			1/2"	2.7978	2.7978	0.04
			2.00			Ice	3.0377	3.0377	0.07
						1" Ice			
DC6-48-60-18-8F	C	From Leg	4.0000	50.000	143.0000	No Ice	2.5667	2.5667	0.02
			0.00			1/2"	2.7978	2.7978	0.04
			2.00			Ice	3.0377	3.0377	0.07
						1" Ice			
RRUS 11-700	A	From Leg	4.0000	50.000	143.0000	No Ice	2.9419	1.2460	0.06
			0.00			1/2"	3.1718	1.4124	0.07
			2.00			Ice	3.4103	1.5874	0.10
						1" Ice			
RRUS 11-700	B	From Leg	4.0000	50.000	143.0000	No Ice	2.9419	1.2460	0.06
			0.00			1/2"	3.1718	1.4124	0.07
			2.00			Ice	3.4103	1.5874	0.10
						1" Ice			
RRUS 11-700	C	From Leg	4.0000	50.000	143.0000	No Ice	2.9419	1.2460	0.06
			0.00			1/2"	3.1718	1.4124	0.07
			2.00			Ice	3.4103	1.5874	0.10
						1" Ice			
RRUS E2 B29	A	From Leg	4.0000	0.000	143.0000	No Ice	3.6692	1.4875	0.06
			0.00			1/2"	3.9256	1.6727	0.08
			2.00			Ice	4.1907	1.8665	0.11
						1" Ice			
RRUS E2 B29	B	From Leg	4.0000	0.000	143.0000	No Ice	3.6692	1.4875	0.06
			0.00			1/2"	3.9256	1.6727	0.08
			2.00			Ice	4.1907	1.8665	0.11
						1" Ice			
RRUS E2 B29	C	From Leg	4.0000	0.000	143.0000	No Ice	3.6692	1.4875	0.06
			0.00			1/2"	3.9256	1.6727	0.08
			2.00			Ice	4.1907	1.8665	0.11
						1" Ice			
WCS RRUS-32-B30	A	From Leg	4.0000	0.000	143.0000	No Ice	3.8662	2.7616	0.08
			0.00			1/2"	4.1506	3.0213	0.10
			2.00			Ice	4.4435	3.2896	0.14
						1" Ice			
WCS RRUS-32-B30	B	From Leg	4.0000	0.000	143.0000	No Ice	3.8662	2.7616	0.08
			0.00			1/2"	4.1506	3.0213	0.10
			2.00			Ice	4.4435	3.2896	0.14
						1" Ice			
WCS RRUS-32-B30	C	From Leg	4.0000	0.000	143.0000	No Ice	3.8662	2.7616	0.08
			0.00			1/2"	4.1506	3.0213	0.10
			2.00			Ice	4.4435	3.2896	0.14
						1" Ice			
DTMABP7819VG12A	A	From Leg	4.0000	50.000	143.0000	No Ice	1.1389	0.3907	0.02
			0.00			1/2"	1.2835	0.4884	0.03
			2.00			Ice	1.4368	0.5947	0.04
						1" Ice			
DTMABP7819VG12A	B	From Leg	4.0000	50.000	143.0000	No Ice	1.1389	0.3907	0.02
			0.00			1/2"	1.2835	0.4884	0.03
			2.00			Ice	1.4368	0.5947	0.04
						1" Ice			
DTMABP7819VG12A	C	From Leg	4.0000	50.000	143.0000	No Ice	1.1389	0.3907	0.02
			0.00			1/2"	1.2835	0.4884	0.03
			2.00			Ice	1.4368	0.5947	0.04
						1" Ice			
Platform Mount [LP 301-1]	C	None		0.000	143.0000	No Ice	30.1000	30.1000	1.59
						1/2"	40.8000	40.8000	2.03
						Ice	51.5000	51.5000	2.47
						1" Ice			
***									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.0000 0.00	0.000	133.0000	No Ice 1/2"	6.8253 7.3471	5.6424 6.4800	0.11 0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			Ice	7.8631	7.2567	0.23
						1" Ice			
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice	6.8155 7.3373 7.8532	5.6334 6.4717 7.2478	0.11 0.17 0.23
KRY 112 144/1	A	From Leg	4.0000 0.00 0.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice	0.4083 0.4969 0.5941	0.2042 0.2733 0.3511	0.01 0.01 0.02
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice	6.8253 7.3471 7.8631	5.6424 6.4800 7.2567	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice	6.8155 7.3373 7.8532	5.6334 6.4717 7.2478	0.11 0.17 0.23
KRY 112 144/1	B	From Leg	4.0000 0.00 0.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice	0.4083 0.4969 0.5941	0.2042 0.2733 0.3511	0.01 0.01 0.02
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice	6.8253 7.3471 7.8631	5.6424 6.4800 7.2567	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice	6.8155 7.3373 7.8532	5.6334 6.4717 7.2478	0.11 0.17 0.23
KRY 112 144/1	C	From Leg	4.0000 0.00 0.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice	0.4083 0.4969 0.5941	0.2042 0.2733 0.3511	0.01 0.01 0.02
Platform Mount [LP 403-1]	C	None		0.000	133.0000	No Ice 1/2" Ice 1" Ice	18.8500 24.3000 29.7500	18.8500 24.3000 29.7500	1.50 1.80 2.09
***									
LNX-6512DS-T0M w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	5.8487 6.3070 6.7737	4.5452 5.2251 5.9124	0.05 0.09 0.15
LNX-6512DS-T0M w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	5.8487 6.3070 6.7737	4.5452 5.2251 5.9124	0.05 0.09 0.15
LNX-6512DS-T0M w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	5.8487 6.3070 6.7737	4.5452 5.2251 5.9124	0.05 0.09 0.15
BXA-171063-12BF w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	4.9710 5.5211 6.0361	5.2283 6.3892 7.2610	0.04 0.09 0.14
BXA-171063-12BF w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	4.9710 5.5211 6.0361	5.2283 6.3892 7.2610	0.04 0.09 0.14
BXA-171063-12BF w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	4.9710 5.5211 6.0361	5.2283 6.3892 7.2610	0.04 0.09 0.14
BXA-70063/6CFx2 w/ Mount Pipe	A	From Leg	4.0000 0.00	0.000	113.0000	No Ice 1/2"	7.9686 8.6091	5.3981 6.5465	0.04 0.10

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
			0.00			Ice	9.2158	7.4089	0.17
						1" Ice			
BXA-70063/6CFx2 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	7.9686 8.6091 9.2158	5.3981 6.5465 7.4089	0.04 0.10 0.17
BXA-70063/6CFx4 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	7.9686 8.6091 9.2158	5.3981 6.5465 7.4089	0.04 0.10 0.17
MG D3-800Tx w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	3.5703 3.9790 4.3870	3.4178 4.1193 4.7842	0.03 0.07 0.11
MG D3-800Tx w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	3.5703 3.9790 4.3870	3.4178 4.1193 4.7842	0.03 0.07 0.11
MG D3-800Tx w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	3.5703 3.9790 4.3870	3.4178 4.1193 4.7842	0.03 0.07 0.11
RRH2X40-07-U	A	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	2.2458 2.4472 2.6572	1.2277 1.3850 1.5509	0.05 0.07 0.09
RRH2X40-07-U	B	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	2.2458 2.4472 2.6572	1.2277 1.3850 1.5509	0.05 0.07 0.09
RRH2X40-07-U	C	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	2.2458 2.4472 2.6572	1.2277 1.3850 1.5509	0.05 0.07 0.09
RRH2x40-AWS	A	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	2.9764 3.2363 3.5048	1.5960 1.8239 2.0605	0.04 0.06 0.08
RRH2x40-AWS	B	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	2.9764 3.2363 3.5048	1.5960 1.8239 2.0605	0.04 0.06 0.08
RRH2x40-AWS	C	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	2.9764 3.2363 3.5048	1.5960 1.8239 2.0605	0.04 0.06 0.08
DB-T1-6Z-8AB-0Z	A	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	5.6000 5.9154 6.2395	2.3333 2.5580 2.7914	0.04 0.08 0.12
Platform Mount [LP 712-1]	C	None		0.000	113.0000	No Ice 1/2" Ice 1" Ice	24.5300 29.9400 35.3500	24.5300 29.9400 35.3500	1.34 1.65 1.96
6' x 2" Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.02 0.03 0.05
6' x 2" Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice 1" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.02 0.03 0.05
6' x 2" Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	113.0000	No Ice 1/2" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.02 0.03 0.05

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
						1" Ice			
***									
APXV18-206517S-C w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	103.0000	No Ice 1/2" Ice 1" Ice	5.4042 5.9597 6.4808	4.7000 5.8600 6.7338	0.05 0.10 0.15
APXV18-206517S-C w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	103.0000	No Ice 1/2" Ice 1" Ice	5.4042 5.9597 6.4808	4.7000 5.8600 6.7338	0.05 0.10 0.15
APXV18-206517S-C w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	103.0000	No Ice 1/2" Ice 1" Ice	5.4042 5.9597 6.4808	4.7000 5.8600 6.7338	0.05 0.10 0.15
Pipe Mount [PM 601-3]	C	None		0.000	103.0000	No Ice 1/2" Ice 1" Ice	4.3900 5.4800 6.5700	4.3900 5.4800 6.5700	0.20 0.24 0.28
***									
***									
Side Arm Mount [SO 701-1]	A	None		0.000	60.0000	No Ice 1/2" Ice 1" Ice	0.8500 1.1400 1.4300	1.6700 2.3400 3.0100	0.07 0.08 0.09
ACUTIME 2000	A	From Leg	4.0000 0.00 0.00	0.000	60.0000	No Ice 1/2" Ice 1" Ice	0.2975 0.3739 0.4589	0.2975 0.3739 0.4589	0.00 0.00 0.01

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP2.5-18	B	Paraboloid w/Shroud (HP)	From Leg	1.0000 0.00 -4.00	21.000		155.0000	2.9167	No Ice 1/2" Ice 1" Ice	6.6800 7.0700 7.4600	0.05 0.08 0.12
VHLP1-23	A	Paraboloid w/o Radome	From Leg	1.0000 0.00 -4.00	-64.000		155.0000	1.2750	No Ice 1/2" Ice 1" Ice	1.2800 1.4500 1.6200	0.01 0.02 0.03
VHLP2-11	C	Paraboloid w/o Radome	From Leg	1.0000 0.00 -4.00	13.000		155.0000	2.1750	No Ice 1/2" Ice 1" Ice	3.7200 4.0100 4.3000	0.03 0.05 0.07

Tower Pressures - No Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % 	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 155.0000-115.5000	134.5176	1.494	24.45	84.444	A B	0.000 0.000	84.444 84.444	84.444	100.00 100.00	0.000 0.000	0.000 0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.000	84.444		100.00	0.000	9.381
L2 115.5000-98.2500	106.7241	1.398	22.91	43.705	A	0.000	43.705	43.705	100.00	0.000	0.000
					B	0.000	43.705		100.00	0.000	0.000
					C	0.000	43.705		100.00	0.000	5.427
L3 98.2500-79.2500	88.5851	1.326	21.72	53.448	A	0.000	53.448	53.448	100.00	0.000	0.000
					B	0.000	53.448		100.00	0.000	0.000
					C	0.000	53.448		100.00	0.000	11.498
L4 79.2500-67.5000	73.3083	1.256	20.58	35.096	A	0.000	35.096	35.096	100.00	0.000	0.000
					B	0.000	35.096		100.00	0.000	0.000
					C	0.000	35.096		100.00	0.000	7.236
L5 67.5000-43.7500	55.4035	1.16	19.00	77.701	A	0.000	77.701	77.701	100.00	0.000	0.000
					B	0.000	77.701		100.00	0.000	0.000
					C	0.000	77.701		100.00	0.000	15.362
L6 43.7500-31.2500	37.4347	1.037	16.99	43.449	A	0.000	43.449	43.449	100.00	0.000	0.000
					B	0.000	43.449		100.00	0.000	0.000
					C	0.000	43.449		100.00	0.000	8.085
L7 31.2500-0.0000	15.2971	1	16.38	119.556	A	0.000	119.556	119.556	100.00	0.000	0.000
					B	0.000	119.556		100.00	0.000	0.000
					C	0.000	119.556		100.00	0.000	20.214

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 155.0000-115.5000	134.5176	1.494	5.40	1.000	91.028	A	0.000	91.028	91.028	100.00	0.000	0.000
						B	0.000	91.028		100.00	0.000	0.000
						C	0.000	91.028		100.00	0.000	17.281
L2 115.5000-98.2500	106.7241	1.398	5.06	1.000	46.580	A	0.000	46.580	46.580	100.00	0.000	0.000
						B	0.000	46.580		100.00	0.000	0.000
						C	0.000	46.580		100.00	0.000	10.327
L3 98.2500-79.2500	88.5851	1.326	4.80	1.000	56.614	A	0.000	56.614	56.614	100.00	0.000	0.000
						B	0.000	56.614		100.00	0.000	0.000
						C	0.000	56.614		100.00	0.000	23.320
L4 79.2500-67.5000	73.3083	1.256	4.55	1.000	37.054	A	0.000	37.054	37.054	100.00	0.000	0.000
						B	0.000	37.054		100.00	0.000	0.000
						C	0.000	37.054		100.00	0.000	14.547
L5 67.5000-43.7500	55.4035	1.16	4.20	1.000	81.659	A	0.000	81.659	81.659	100.00	0.000	0.000
						B	0.000	81.659		100.00	0.000	0.000
						C	0.000	81.659		100.00	0.000	30.140
L6 43.7500-31.2500	37.4347	1.037	3.75	1.000	45.533	A	0.000	45.533	45.533	100.00	0.000	0.000
						B	0.000	45.533		100.00	0.000	0.000
						C	0.000	45.533		100.00	0.000	15.863
L7 31.2500-0.0000	15.2971	1	3.62	1.000	124.764	A	0.000	124.764	124.764	100.00	0.000	0.000
						B	0.000	124.764		100.00	0.000	0.000
						C	0.000	124.764		100.00	0.000	39.658

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 155.0000-115.5000	134.5176	1.494	9.55	84.444	A	0.000	84.444	84.444	100.00	0.000	0.000
					B	0.000	84.444		100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.000	84.444		100.00	0.000	9.381
L2 115.5000-98.2500	106.7241	1.398	8.95	43.705	A	0.000	43.705	43.705	100.00	0.000	0.000
					B	0.000	43.705		100.00	0.000	0.000
					C	0.000	43.705		100.00	0.000	5.427
L3 98.2500-79.2500	88.5851	1.326	8.49	53.448	A	0.000	53.448	53.448	100.00	0.000	0.000
					B	0.000	53.448		100.00	0.000	0.000
					C	0.000	53.448		100.00	0.000	11.498
L4 79.2500-67.5000	73.3083	1.256	8.04	35.096	A	0.000	35.096	35.096	100.00	0.000	0.000
					B	0.000	35.096		100.00	0.000	0.000
					C	0.000	35.096		100.00	0.000	7.236
L5 67.5000-43.7500	55.4035	1.16	7.42	77.701	A	0.000	77.701	77.701	100.00	0.000	0.000
					B	0.000	77.701		100.00	0.000	0.000
					C	0.000	77.701		100.00	0.000	15.362
L6 43.7500-31.2500	37.4347	1.037	6.63	43.449	A	0.000	43.449	43.449	100.00	0.000	0.000
					B	0.000	43.449		100.00	0.000	0.000
					C	0.000	43.449		100.00	0.000	8.085
L7 31.2500-0.0000	15.2971	1	6.40	119.556	A	0.000	119.556	119.556	100.00	0.000	0.000
					B	0.000	119.556		100.00	0.000	0.000
					C	0.000	119.556		100.00	0.000	20.214

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	155 - 115.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-21.66	0.42	-0.41
			Max. Mx	5	-10.30	-514.22	-5.29
			Max. My	2	-10.32	2.30	509.68
			Max. Vy	5	19.86	-514.22	-5.29
			Max. Vx	2	-19.72	2.30	509.68
			Max. Torque	10			-0.29
L2	115.5 - 98.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30.92	0.81	-0.00
			Max. Mx	5	-15.79	-1014.75	-8.44
			Max. My	2	-15.80	3.68	1009.50
			Max. Vy	5	26.47	-1014.75	-8.44
			Max. Vx	2	-26.47	3.68	1009.50
			Max. Torque	11			-0.67
L3	98.25 - 79.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-35.08	1.44	-0.36
			Max. Mx	5	-19.15	-1407.51	-10.77
			Max. My	2	-19.16	4.68	1402.21
			Max. Vy	5	27.74	-1407.51	-10.77
			Max. Vx	2	-27.74	4.68	1402.21
			Max. Torque	11			-0.65
L4	79.25 - 67.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41.22	2.17	-0.79
			Max. Mx	5	-24.32	-1870.58	-13.38
			Max. My	2	-24.32	5.82	1865.24
			Max. Vy	5	29.21	-1870.58	-13.38
			Max. Vx	2	-29.20	5.82	1865.24
			Max. Torque	11			-0.60
L5	67.5 - 43.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-48.18	3.09	-1.27
			Max. Mx	5	-30.15	-2424.57	-16.34
			Max. My	2	-30.15	7.11	2419.20
			Max. Vy	5	30.71	-2424.57	-16.34
			Max. Vx	2	-30.71	7.11	2419.20
			Max. Torque	11			-0.59
L6	43.75 - 31.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-56.83	4.02	-1.81
			Max. Mx	5	-37.65	-2982.27	-19.17
			Max. My	2	-37.66	8.36	2976.88
			Max. Vy	5	32.05	-2982.27	-19.17
			Max. Vx	2	-32.04	8.36	2976.88
			Max. Torque	11			-0.55
L7	31.25 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-71.29	5.84	-2.87
			Max. Mx	5	-50.04	-4012.49	-24.07
			Max. My	2	-50.04	10.53	4007.10
			Max. Vy	5	33.94	-4012.49	-24.07
			Max. Vx	2	-33.93	10.53	4007.10
			Max. Torque	9			-0.59

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	71.29	-0.00	0.00
	Max. H_x	11	50.06	33.84	0.24
	Max. H_z	2	50.06	0.06	33.91
	Max. M_x	2	4007.10	0.06	33.91
	Max. M_z	5	4012.49	-33.91	-0.15

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. Torsion	2	0.50	0.06	33.91
	Min. Vert	5	50.06	-33.91	-0.15
	Min. H_x	5	50.06	-33.91	-0.15
	Min. H_z	8	50.06	-0.20	-33.83
	Min. M_x	8	-3995.74	-0.20	-33.83
	Min. M_z	11	-4002.94	33.84	0.24
	Min. Torsion	9	-0.59	16.73	-29.26

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	50.06	-0.00	0.00	0.41	0.95	0.00
Dead+Wind 0 deg - No Ice	50.06	-0.06	-33.91	-4007.10	10.53	-0.50
Dead+Wind 30 deg - No Ice	50.06	16.88	-29.27	-3454.71	-1994.34	-0.42
Dead+Wind 60 deg - No Ice	50.06	29.39	-16.74	-1970.04	-3478.74	-0.42
Dead+Wind 90 deg - No Ice	50.06	33.91	0.15	24.07	-4012.49	-0.37
Dead+Wind 120 deg - No Ice	50.06	29.48	16.93	2001.27	-3491.99	-0.06
Dead+Wind 150 deg - No Ice	50.06	17.14	29.29	3459.17	-2035.36	0.27
Dead+Wind 180 deg - No Ice	50.06	0.20	33.83	3995.74	-30.29	0.42
Dead+Wind 210 deg - No Ice	50.06	-16.73	29.26	3454.91	1972.59	0.59
Dead+Wind 240 deg - No Ice	50.06	-29.22	16.81	1981.23	3453.00	0.51
Dead+Wind 270 deg - No Ice	50.06	-33.84	-0.24	-37.65	4002.94	0.42
Dead+Wind 300 deg - No Ice	50.06	-29.35	-17.09	-2025.59	3473.94	0.01
Dead+Wind 330 deg - No Ice	50.06	-17.06	-29.37	-3471.11	2023.77	-0.37
Dead+Ice+Temp	71.29	0.00	-0.00	2.87	5.84	-0.00
Dead+Wind 0 deg+Ice+Temp	71.29	-0.01	-9.59	-1167.48	7.90	-0.25
Dead+Wind 30 deg+Ice+Temp	71.29	4.78	-8.28	-1006.80	-577.46	-0.17
Dead+Wind 60 deg+Ice+Temp	71.29	8.31	-4.74	-573.95	-1010.20	-0.10
Dead+Wind 90 deg+Ice+Temp	71.29	9.59	0.03	8.58	-1165.85	-0.01
Dead+Wind 120 deg+Ice+Temp	71.29	8.33	4.79	586.93	-1013.01	0.12
Dead+Wind 150 deg+Ice+Temp	71.29	4.84	8.28	1013.26	-587.13	0.22
Dead+Wind 180 deg+Ice+Temp	71.29	0.05	9.57	1170.44	-1.52	0.23
Dead+Wind 210 deg+Ice+Temp	71.29	-4.74	8.28	1012.68	583.49	0.22
Dead+Wind 240 deg+Ice+Temp	71.29	-8.27	4.76	582.84	1015.07	0.12
Dead+Wind 270 deg+Ice+Temp	71.29	-9.57	-0.06	-6.14	1174.95	0.02
Dead+Wind 300 deg+Ice+Temp	71.29	-8.30	-4.83	-587.44	1019.91	-0.13
Dead+Wind 330 deg+Ice+Temp	71.29	-4.82	-8.30	-1010.53	595.66	-0.24
Dead+Wind 0 deg - Service	50.06	-0.02	-13.24	-1567.19	4.72	-0.20
Dead+Wind 30 deg - Service	50.06	6.60	-11.43	-1351.27	-779.61	-0.16
Dead+Wind 60 deg - Service	50.06	11.48	-6.54	-770.45	-1360.35	-0.17
Dead+Wind 90 deg - Service	50.06	13.24	0.06	9.68	-1568.98	-0.15
Dead+Wind 120 deg - Service	50.06	11.51	6.61	783.21	-1365.58	-0.03
Dead+Wind 150 deg - Service	50.06	6.70	11.44	1353.57	-795.69	0.11
Dead+Wind 180 deg - Service	50.06	0.08	13.21	1563.25	-11.25	0.17
Dead+Wind 210 deg - Service	50.06	-6.54	11.43	1351.85	772.30	0.23
Dead+Wind 240 deg - Service	50.06	-11.41	6.57	775.34	1351.46	0.20
Dead+Wind 270 deg -	50.06	-13.21	-0.09	-14.47	1566.34	0.16

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Service						
Dead+Wind 300 deg - Service	50.06	-11.46	-6.68	-792.21	1359.70	0.01
Dead+Wind 330 deg - Service	50.06	-6.66	-11.47	-1357.73	792.36	-0.14

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-50.06	0.00	0.00	50.06	-0.00	0.000%
2	-0.06	-50.06	-33.91	0.06	50.06	33.91	0.005%
3	16.88	-50.06	-29.27	-16.88	50.06	29.27	0.000%
4	29.39	-50.06	-16.74	-29.39	50.06	16.74	0.000%
5	33.91	-50.06	0.15	-33.91	50.06	-0.15	0.005%
6	29.48	-50.06	16.93	-29.48	50.06	-16.93	0.000%
7	17.14	-50.06	29.29	-17.14	50.06	-29.29	0.000%
8	0.20	-50.06	33.83	-0.20	50.06	-33.83	0.005%
9	-16.73	-50.06	29.26	16.73	50.06	-29.26	0.000%
10	-29.22	-50.06	16.81	29.22	50.06	-16.81	0.000%
11	-33.84	-50.06	-0.24	33.84	50.06	0.24	0.002%
12	-29.35	-50.06	-17.09	29.35	50.06	17.09	0.000%
13	-17.06	-50.06	-29.37	17.06	50.06	29.37	0.000%
14	0.00	-71.29	0.00	-0.00	71.29	0.00	0.001%
15	-0.01	-71.29	-9.59	0.01	71.29	9.59	0.000%
16	4.78	-71.29	-8.28	-4.78	71.29	8.28	0.000%
17	8.31	-71.29	-4.74	-8.31	71.29	4.74	0.000%
18	9.59	-71.29	0.03	-9.59	71.29	-0.03	0.000%
19	8.33	-71.29	4.79	-8.33	71.29	-4.79	0.000%
20	4.84	-71.29	8.28	-4.84	71.29	-8.28	0.000%
21	0.05	-71.29	9.57	-0.05	71.29	-9.57	0.000%
22	-4.74	-71.29	8.28	4.74	71.29	-8.28	0.000%
23	-8.27	-71.29	4.76	8.27	71.29	-4.76	0.000%
24	-9.57	-71.29	-0.06	9.57	71.29	0.06	0.000%
25	-8.30	-71.29	-4.83	8.30	71.29	4.83	0.000%
26	-4.82	-71.29	-8.30	4.82	71.29	8.30	0.000%
27	-0.02	-50.06	-13.25	0.02	50.06	13.24	0.006%
28	6.60	-50.06	-11.43	-6.60	50.06	11.43	0.000%
29	11.48	-50.06	-6.54	-11.48	50.06	6.54	0.000%
30	13.25	-50.06	0.06	-13.24	50.06	-0.06	0.006%
31	11.51	-50.06	6.61	-11.51	50.06	-6.61	0.000%
32	6.70	-50.06	11.44	-6.70	50.06	-11.44	0.000%
33	0.08	-50.06	13.22	-0.08	50.06	-13.21	0.006%
34	-6.54	-50.06	11.43	6.54	50.06	-11.43	0.000%
35	-11.41	-50.06	6.57	11.41	50.06	-6.57	0.000%
36	-13.22	-50.06	-0.09	13.21	50.06	0.09	0.006%
37	-11.46	-50.06	-6.68	11.46	50.06	6.68	0.000%
38	-6.66	-50.06	-11.47	6.66	50.06	11.47	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	14	0.00005163	0.00008295
3	Yes	19	0.00000001	0.00005821
4	Yes	19	0.00000001	0.00005848
5	Yes	14	0.00005161	0.00006230
6	Yes	19	0.00000001	0.00005940
7	Yes	19	0.00000001	0.00005993
8	Yes	14	0.00005166	0.00010667
9	Yes	18	0.00000001	0.00014994
10	Yes	18	0.00000001	0.00014922
11	Yes	15	0.00000001	0.00008688
12	Yes	19	0.00000001	0.00006020

13	Yes	19	0.00000001	0.00005983
14	Yes	6	0.00000001	0.00003614
15	Yes	16	0.00000001	0.00013697
16	Yes	17	0.00000001	0.00007589
17	Yes	17	0.00000001	0.00007602
18	Yes	16	0.00000001	0.00013697
19	Yes	17	0.00000001	0.00007709
20	Yes	17	0.00000001	0.00007707
21	Yes	16	0.00000001	0.00013703
22	Yes	17	0.00000001	0.00007658
23	Yes	17	0.00000001	0.00007655
24	Yes	16	0.00000001	0.00013773
25	Yes	17	0.00000001	0.00007762
26	Yes	17	0.00000001	0.00007762
27	Yes	13	0.00013388	0.00007598
28	Yes	16	0.00000001	0.00007849
29	Yes	16	0.00000001	0.00007981
30	Yes	13	0.00013392	0.00007490
31	Yes	16	0.00000001	0.00008051
32	Yes	16	0.00000001	0.00008163
33	Yes	13	0.00013388	0.00007447
34	Yes	16	0.00000001	0.00007889
35	Yes	16	0.00000001	0.00007734
36	Yes	13	0.00013391	0.00008928
37	Yes	16	0.00000001	0.00008249
38	Yes	16	0.00000001	0.00008162

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	155 - 115.5	43.09	31	2.584	0.002
L2	119.25 - 98.25	24.81	31	2.136	0.001
L3	98.25 - 79.25	16.37	31	1.646	0.001
L4	83.75 - 67.5	11.79	31	1.369	0.000
L5	67.5 - 43.75	7.54	31	1.093	0.000
L6	49 - 31.25	3.96	31	0.757	0.000
L7	31.25 - 0	1.58	31	0.491	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
155.0000	APXVSPP18-C-A20 w/ Mount Pipe	31	43.09	2.584	0.002	17882
153.0000	Pipe Mount [PM 601-3]	31	42.01	2.567	0.002	17882
151.0000	VHLP2.5-18	31	40.93	2.550	0.002	17882
143.0000	800 10121 w/ Mount Pipe	31	36.65	2.476	0.002	7450
133.0000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	31	31.45	2.363	0.001	4063
113.0000	LNX-6512DS-T0M w/ Mount Pipe	31	22.07	1.997	0.001	2437
103.0000	APXV18-206517S-C w/ Mount Pipe	31	18.08	1.756	0.001	2344
60.0000	Side Arm Mount [SO 701-1]	31	5.94	0.955	0.000	3227

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	155 - 115.5	109.82	6	6.594	0.003
L2	119.25 - 98.25	63.31	6	5.453	0.002
L3	98.25 - 79.25	41.80	6	4.205	0.001
L4	83.75 - 67.5	30.11	6	3.498	0.001

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L5	67.5 - 43.75	19.27	6	2.794	0.001
L6	49 - 31.25	10.12	6	1.934	0.000
L7	31.25 - 0	4.05	6	1.255	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
155.0000	APXVSPP18-C-A20 w/ Mount Pipe	6	109.82	6.594	0.005	7191
153.0000	Pipe Mount [PM 601-3]	6	107.07	6.550	0.005	7191
151.0000	VHLP2.5-18	6	104.33	6.506	0.005	7191
143.0000	800 10121 w/ Mount Pipe	6	93.44	6.319	0.004	2995
133.0000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	6	80.21	6.030	0.004	1631
113.0000	LNX-6512DS-T0M w/ Mount Pipe	6	56.33	5.100	0.002	972
103.0000	APXV18-206517S-C w/ Mount Pipe	6	46.17	4.484	0.002	931
60.0000	Side Arm Mount [SO 701-1]	6	15.18	2.441	0.001	1269

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	155 - 115.5 (1)	TP29.308x22x0.25	39.5000	0.0000	0.0	36.00	22.507	-10.29	810.25	0.013
L2	115.5 - 98.25 (2)	TP31.999x28.114x0.313	21.0000	0.0000	0.0	39.00	31.479	-15.78	1227.67	0.013
L3	98.25 - 79.25 (3)	TP35.514x31.999x0.497	19.0000	0.0000	0.0	31.04	53.914	-19.14	1673.37	0.011
L4	79.25 - 67.5 (4)	TP37.063x33.688x0.547	16.2500	0.0000	0.0	31.10	63.429	-24.31	1972.89	0.012
L5	67.5 - 43.75 (5)	TP41.456x37.063x0.589	23.7500	0.0000	0.0	31.57	74.646	-30.14	2356.72	0.013
L6	43.75 - 31.25 (6)	TP43.019x39.306x0.64	17.7500	0.0000	0.0	31.61	86.073	-37.65	2721.12	0.014
L7	31.25 - 0 (7)	TP48.8x43.019x0.667	31.2500	0.0000	0.0	32.69	101.974	-50.04	3333.94	0.015

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	155 - 115.5 (1)	TP29.308x22x0.25	516.12	39.35	36.00	1.093	0.00	0.00	36.00	0.000
L2	115.5 - 98.25 (2)	TP31.999x28.114x0.313	1018.18	49.74	39.00	1.275	0.00	0.00	39.00	0.000
L3	98.25 - 79.25 (3)	TP35.514x31.999x0.497	1412.25	37.51	31.04	1.209	0.00	0.00	31.04	0.000
L4	79.25 - 67.5 (4)	TP37.063x33.688x0.547	1876.80	39.68	31.10	1.276	0.00	0.00	31.10	0.000
L5	67.5 - 43.75 (5)	TP41.456x37.063x0.589	2432.47	39.99	31.57	1.267	0.00	0.00	31.57	0.000
L6	43.75 - 31.25 (6)	TP43.019x39.306x0.64	2991.78	40.17	31.61	1.271	0.00	0.00	31.61	0.000
L7	31.25 - 0 (7)	TP48.8x43.019x0.667	4024.81	40.11	32.69	1.227	0.00	0.00	32.69	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	155 - 115.5 (1)	TP29.308x22x0.25	19.91	0.88	24.00	0.074	0.16	0.01	24.00	0.000
L2	115.5 - 98.25 (2)	TP31.999x28.114x0.313	26.56	0.84	26.00	0.065	0.52	0.01	26.00	0.000
L3	98.25 - 79.25 (3)	TP35.514x31.999x0.497	27.83	0.52	20.69	0.050	0.45	0.01	20.69	0.000
L4	79.25 - 67.5 (4)	TP37.063x33.688x0.547	29.29	0.46	20.74	0.045	0.37	0.00	20.74	0.000
L5	67.5 - 43.75 (5)	TP41.456x37.063x0.589	30.80	0.41	21.05	0.039	0.32	0.00	21.05	0.000
L6	43.75 - 31.25 (6)	TP43.019x39.306x0.64	32.13	0.37	21.08	0.035	0.23	0.00	21.08	0.000
L7	31.25 - 0 (7)	TP48.8x43.019x0.667	34.02	0.33	21.80	0.031	0.07	0.00	21.80	0.000

Pole Interaction Design Data

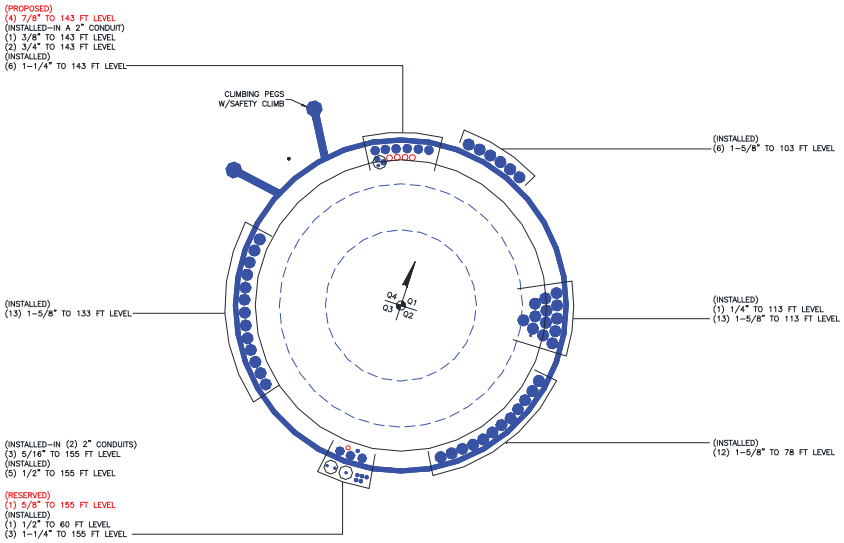
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	155 - 115.5 (1)	0.013	1.093	0.000	0.074	0.000	1.107 ✔	1.333	H1-3+VT ✔
L2	115.5 - 98.25 (2)	0.013	1.275	0.000	0.065	0.000	1.289 ✔	1.333	H1-3+VT ✔
L3	98.25 - 79.25 (3)	0.011	1.209	0.000	0.050	0.000	1.221 ✔	1.333	H1-3+VT ✔
L4	79.25 - 67.5 (4)	0.012	1.276	0.000	0.045	0.000	1.289 ✔	1.333	H1-3+VT ✔
L5	67.5 - 43.75 (5)	0.013	1.267	0.000	0.039	0.000	1.280 ✔	1.333	H1-3+VT ✔
L6	43.75 - 31.25 (6)	0.014	1.271	0.000	0.035	0.000	1.285 ✔	1.333	H1-3+VT ✔
L7	31.25 - 0 (7)	0.015	1.227	0.000	0.031	0.000	1.242 ✔	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	155 - 115.5	Pole	TP29.308x22x0.25	1	-10.29	1080.07	83.1	Pass
L2	115.5 - 98.25	Pole	TP31.999x28.114x0.313	2	-15.78	1636.48	96.7	Pass
L3	98.25 - 79.25	Pole	TP35.514x31.999x0.497	3	-19.14	2230.60	91.6	Pass
L4	79.25 - 67.5	Pole	TP37.063x33.688x0.547	4	-24.31	2629.86	96.7	Pass
L5	67.5 - 43.75	Pole	TP41.456x37.063x0.589	5	-30.14	3141.51	96.0	Pass
L6	43.75 - 31.25	Pole	TP43.019x39.306x0.64	6	-37.65	3627.25	96.4	Pass
L7	31.25 - 0	Pole	TP48.8x43.019x0.667	7	-50.04	4444.14	93.2	Pass
							Summary	
						Pole (L2)	96.7	Pass
						RATING =	**96.7**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

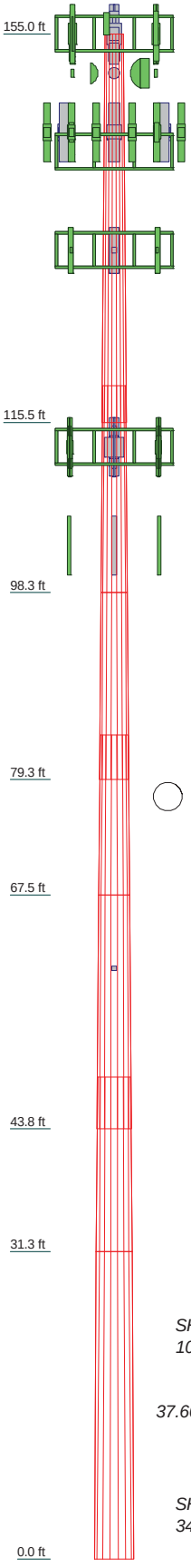

(PROPOSED)
(4) 7/8" TO 143 FT LEVEL
(INSTALLED-IN A 2" CONDUIT)
(1) 3/8" TO 143 FT LEVEL
(2) 3/4" TO 143 FT LEVEL
(INSTALLED)
(6) 1-1/4" TO 143 FT LEVEL
CLIMBING PEGS
W/SAFETY CLIMB
(INSTALLED)
(6) 1-5/8" TO 103 FT LEVEL
(INSTALLED)
(13) 1-5/8" TO 133 FT LEVEL
Q4
Q1
Q3
Q2
(INSTALLED)
(1) 1/4" TO 113 FT LEVEL
(13) 1-5/8" TO 113 FT LEVEL
(INSTALLED-IN (2) 2" CONDUITS)
(3) 5/16" TO 155 FT LEVEL
(INSTALLED)
(5) 1/2" TO 155 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 78 FT LEVEL
(RESERVED)
(1) 5/8" TO 155 FT LEVEL
(INSTALLED)
(1) 1/2" TO 60 FT LEVEL
(3) 1-1/4" TO 155 FT LEVEL

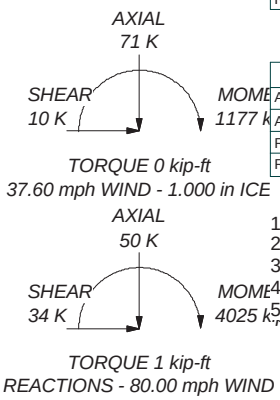
APPENDIX C

ADDITIONAL CALCULATIONS

Program Version 6.1.4.1 - 12/17/2013 File:G:/TOWER/375_Crown_Castle/2014/37514-0616 BU 876347/37514-0616 BP WO 727336 BU 876347 - 7700/37514-0616 BP_Reinforced.eri

Section	1	2	3	4	5	6	7
Length (ft)	39.5000	21.0000	19.0000	16.2500	23.7500	17.7500	31.2500
Number of Sides	18	18	18	18	18	18	18
Thickness (in)	0.250	0.313	0.497	0.547	0.589	0.640	0.667
Socket Length (ft)	3.7500		4.5000		5.2500		
Top Dia (in)	22.000	28.114	31.999	33.688	37.063	39.306	43.019
Bot Dia (in)	29.308	31.999	35.514	37.063	41.456	43.019	48.800
Grade	A607-60		A607-65	Reinf 51.73 ksi	Reinf 51.84 ksi	Reinf 52.62 ksi	Reinf 52.69 ksi / Reinf 54.49 ksi
Weight (K)	2.7	2.1	3.4	3.3	5.8	5.0	10.2





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVSPP18-C-A20 w/ Mount Pipe	155	RRUS E2 B29	143
APXVSPP18-C-A20 w/ Mount Pipe	155	WCS RRUS-32-B30	143
APXVSPP18-C-A20 w/ Mount Pipe	155	WCS RRUS-32-B30	143
LPX310R w/ Mount Pipe	155	WCS RRUS-32-B30	143
LPX310R w/ Mount Pipe	155	DTMABP7819VG12A	143
LPX310R w/ Mount Pipe	155	DTMABP7819VG12A	143
HORIZON COMPACT	155	DTMABP7819VG12A	143
HORIZON COMPACT	155	Platform Mount [LP 301-1]	143
HORIZON COMPACT	155	800 10121 w/ Mount Pipe	143
WIMAX DAP HEAD	155	800 10121 w/ Mount Pipe	143
WIMAX DAP HEAD	155	800 10121 w/ Mount Pipe	143
WIMAX DAP HEAD	155	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	133
APXVTM14-C-120 w/ Mount Pipe	155	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	133
APXVTM14-C-120 w/ Mount Pipe	155	KRY 112 144/1	133
APXVTM14-C-120 w/ Mount Pipe	155	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	133
TD-RRH8x20-25	155	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	133
TD-RRH8x20-25	155	KRY 112 144/1	133
TD-RRH8x20-25	155	Platform Mount [LP 403-1]	133
Platform Mount [LP 713-1]	155	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	133
6' x 2" Mount Pipe	155	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	133
6' x 2" Mount Pipe	155	KRY 112 144/1	133
6' x 2" Mount Pipe	155	BXA-171063-12BF w/ Mount Pipe	113
Top Hat 14" Diameter x 2' 3" Tall	155	BXA-171063-12BF w/ Mount Pipe	113
VHLP2.5-18	155	BXA-171063-12BF w/ Mount Pipe	113
VHLP1-23	155	BXA-70063/6CFx2 w/ Mount Pipe	113
VHLP2-11	155	BXA-70063/6CFx2 w/ Mount Pipe	113
800MHz 2X50W RRH W/FILTER	153	BXA-70063/6CFx4 w/ Mount Pipe	113
PCS 1900MHz 4x45W-65MHz	153	MG D3-800Tx w/ Mount Pipe	113
800MHz 2X50W RRH W/FILTER	153	MG D3-800Tx w/ Mount Pipe	113
PCS 1900MHz 4x45W-65MHz	153	MG D3-800Tx w/ Mount Pipe	113
Pipe Mount [PM 601-3]	153	RRH2X40-07-U	113
800MHz 2X50W RRH W/FILTER	153	RRH2X40-07-U	113
PCS 1900MHz 4x45W-65MHz	153	RRH2X40-07-U	113
(2) 860 10025	143	RRH2x40-AWS	113
(2) 860 10025	143	RRH2x40-AWS	113
(2) 860 10025	143	RRH2x40-AWS	113
DC6-48-60-18-8F	143	DB-T1-6Z-8AB-0Z	113
(3) HPA-65R-BUU-H6 w/ Mount Pipe	143	Platform Mount [LP 712-1]	113
(3) HPA-65R-BUU-H6 w/ Mount Pipe	143	6' x 2" Mount Pipe	113
(3) HPA-65R-BUU-H6 w/ Mount Pipe	143	6' x 2" Mount Pipe	113
RRUS-11 800MHz	143	6' x 2" Mount Pipe	113
RRUS-11 800MHz	143	LNX-6512DS-T0M w/ Mount Pipe	113
RRUS-11 800MHz	143	LNX-6512DS-T0M w/ Mount Pipe	113
(2) RRUS 12-B2	143	LNX-6512DS-T0M w/ Mount Pipe	113
(2) RRUS 12-B2	143	Pipe Mount [PM 601-3]	103
(2) RRUS 12-B2	143	APXV18-206517S-C w/ Mount Pipe	103
(2) RRUS A2 MODULE	143	APXV18-206517S-C w/ Mount Pipe	103
(2) RRUS A2 MODULE	143	APXV18-206517S-C w/ Mount Pipe	103
(2) RRUS A2 MODULE	143	ACUTIME 2000	60
DC6-48-60-18-8F	143	Side Arm Mount [SO 701-1]	60
DC6-48-60-18-8F	143		
RRUS 11-700	143		
RRUS 11-700	143		
RRUS 11-700	143		
RRUS E2 B29	143		
RRUS E2 B29	143		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	Reinf 52.62 ksi	53 ksi	65 ksi
A607-65	65 ksi	80 ksi	Reinf 52.69 ksi	53 ksi	65 ksi
Reinf 51.73 ksi	52 ksi	65 ksi	Reinf 54.49 ksi	54 ksi	65 ksi
Reinf 51.84 ksi	52 ksi	65 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80.00 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 37.60 mph basic wind with 1.00 in ice.
4. Deflections are based upon a 50.00 mph wind.
5. TOWER RATING: 96.7%

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

Job:	***155' Monopole / Buckland Mall***		
Project:	***PJF 37514-0616 BP / BU 876347***		
Client: CCI	Drawn by: John J Woolley		App'd:
Code: TIA/EIA-222-F	Date: 04/09/14		Scale: NTS
Path: G:\TOWER\375_Crown_Castle\2014\37514-0616 BU 876347\37514-0616 BP WO 727336 BU 876347 - 770037514-0616 BP_Reinforced.eri			Dwg No. E-1

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

v4.4 - Effective 7-12-13

Date: 4/9/2014
PJF Project: 37514-0616 BP
Client Ref. # 876347
Site Name:
Description:
Owner:
Engineer: JJW

Asymmetric Anchor Rod Analysis

Moment =	4025	k-ft	TIA Ref.	F	Location =	Base Plate		
Axial =	50.0	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	34.0	kips	Max Ratio =	105.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	20							

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

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	2.250	#18J A615 Gr 75	75	100	6.0	56.00	0.00	3.98	157.85	152.85	152.85	0.00	195.00	78.4%
2	2.250	#18J A615 Gr 75	75	100	18.0	56.00	0.00	3.98	157.85	152.85	152.85	0.00	195.00	78.4%
3	2.250	#18J A615 Gr 75	75	100	72.0	56.00	0.00	3.98	157.85	152.85	152.85	0.00	195.00	78.4%
4	2.250	#18J A615 Gr 75	75	100	84.0	56.00	0.00	3.98	157.85	152.85	152.85	0.00	195.00	78.4%
5	2.250	#18J A615 Gr 75	75	100	96.0	56.00	0.00	3.98	157.85	152.85	152.85	0.00	195.00	78.4%
6	2.250	#18J A615 Gr 75	75	100	108.0	56.00	0.00	3.98	157.85	152.85	152.85	0.00	195.00	78.4%
7	2.250	#18J A615 Gr 75	75	100	162.0	56.00	0.00	3.98	157.85	152.85	152.85	0.00	195.00	78.4%
8	2.250	#18J A615 Gr 75	75	100	174.0	56.00	0.00	3.98	157.85	152.85	152.85	0.00	195.00	78.4%
9	2.250	#18J A615 Gr 75	75	100	186.0	56.00	0.00	3.98	157.85	152.85	152.85	0.00	195.00	78.4%
10	2.250	#18J A615 Gr 75	75	100	198.0	56.00	0.00	3.98	157.85	152.85	152.85	0.00	195.00	78.4%
11	2.250	#18J A615 Gr 75	75	100	252.0	56.00	0.00	3.98	157.85	152.85	152.85	0.00	195.00	78.4%
12	2.250	#18J A615 Gr 75	75	100	264.0	56.00	0.00	3.98	157.85	152.85	152.85	0.00	195.00	78.4%
13	2.250	#18J A615 Gr 75	75	100	276.0	56.00	0.00	3.98	157.85	152.85	152.85	0.00	195.00	78.4%
14	2.250	#18J A615 Gr 75	75	100	288.0	56.00	0.00	3.98	157.85	152.85	152.85	0.00	195.00	78.4%
15	2.250	#18J A615 Gr 75	75	100	342.0	56.00	0.00	3.98	157.85	152.85	152.85	0.00	195.00	78.4%
16	2.250	#18J A615 Gr 75	75	100	354.0	56.00	0.00	3.98	157.85	152.85	152.85	0.00	195.00	78.4%
17	2.250	A193 Gr B7	105	125	30.0	69.80	0.00	3.98	195.94	190.94	190.94	0.00	218.68	87.3%
18	2.250	A193 Gr B7	105	125	120.0	69.80	0.00	3.98	195.94	190.94	190.94	0.00	218.68	87.3%
19	2.250	A193 Gr B7	105	125	210.0	69.80	0.00	3.98	195.94	190.94	190.94	0.00	218.68	87.3%
20	2.250	A193 Gr B7	105	125	300.0	69.80	0.00	3.98	195.94	190.94	190.94	0.00	218.68	87.3%
								79.58						

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

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

Site Data

BU#:
Site Name:
App #:

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	56	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	55	in
Thick:	3.25	in
Grade:	50	ksi
Clip Distance:	0	in

Stiffener Data (Welding at both sides)		
Configuration:	Unstiffened	
Weld Type:		**
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	48.8	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	2899.8	ft-kips
Unfactored Axial, P:	40	kips
Unfactored Shear, V:	27.2	kips

Reactions adjusted to account for additional anchors

Anchor Rod Results

TIA F --> Maximum Rod Tension	152.8	Kips
Allowable Tension:	195.0	Kips
Anchor Rod Stress Ratio:	78.4%	**Pass**

Base Plate Results	Flexural Check	
Base Plate Stress:	33.8	ksi
Allowable PL Bending Stress:	50.0	ksi
Base Plate Stress Ratio:	67.7%	**Pass**

PL Ref. Data	
Yield Line (in):	28.98
Max PL Length:	28.98

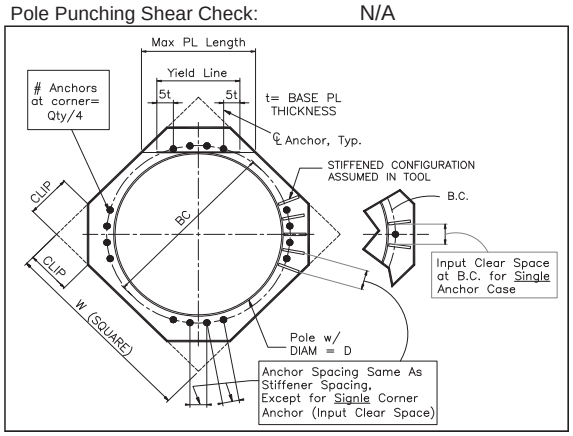
N/A - Unstiffened

Stiffener Results

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

Pole Results

Pole Punching Shear Check:	N/A



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

Foundation Loads:

Pole weight or tower leg compression =	**50**	(kips)
Horizontal load at top of pier =	**34**	(kips)
Overturning moment at top of pier=	**4025**	(ft-kips)

Design criteria:

Safety factor against overturning =	**1.5**	

Soil Properties:

Soil density =	**105**	(pcf)
Allowable soil bearing =	**30**	(ksf)
Depth to water table =	**99**	(ft)

Dimensions:

Pier shape (round or square)	**S**	("R" or "S")
Pier width =	**7**	(ft)
Pier height above grade =	**0.5**	(ft)
depth to bottom of footing =	**10**	(ft)
Footing thickness =	**3**	(ft)
Footing width =	**23**	(ft)
Footing length =	**23**	(ft)

Concrete:

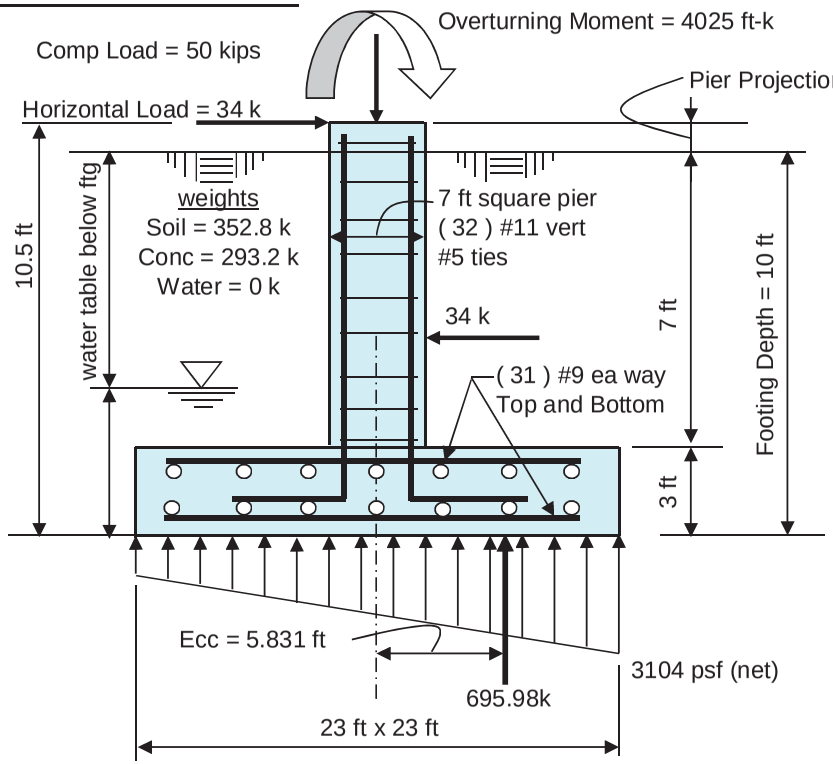
Concrete strength =	**3**	(ksi)
Rebar strength =	**60**	(ksi)
ultimate load factor =	**1.3**	

Reinforcing Steel:

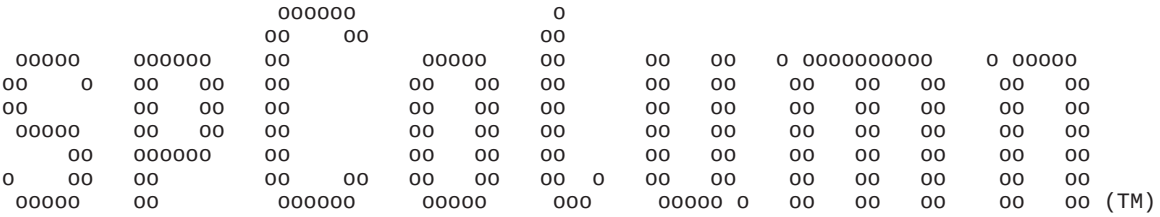
	Pad	
minimum cover over rebar =	**3**	inches
size of pad rebar =	**#9**	bar
quantity of pad rebar =	**31**	(ea direction)

Reinforcing Steel:

	Pier	
size of vert rebar in pier=	**#11**	bar
vertical rebar quantity =	**32**	
size of pier ties =	**#5**	bar
minimum cover over rebar =	**3**	inches
Total volume of concrete =	72.4	cu yd



Summary of analysis results	
Maximum Net Soil Bearing = 3.104 ksf Allowable Net Soil Bearing = 30 ksf **Soil Bearing Stress Ratio = 0.1 Okay**	Ult Bending Shear Capacity = 110 psi Ult Bending Shear Stress = 46 psi **Bending Shear Stress Ratio = 0.42 Okay**
Ftg Overturning Resistance = 8004 ft-kips Overturning Moment = 4058 ft-kips Required Overturning Safety Factor = 1.5 Overturning Safety Factor = 1.972 **Ratio = 0.76 Okay**	Pad Bending Moment Capacity= 4184 ft-k Pad Bending Moment = 1737 ft-k **Bending Moment Stress Ratio = 0.42 OK**



spColumn v4.80 (TM)
Computer program for the Strength Design of Reinforced Concrete Sections

General Information:
==========
File Name: g:\tower\375_crown_castle\2014\37514-0616 bu 876347\37514-0616 bp wo...\37514-0616 bp.col
Project:
Column: Engineer:
Code: ACI 318-11 Units: English

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

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

Section:
========
Rectangular: Width = 84 in Depth = 84 in

Gross section area, Ag = 7056 in^2
Ix = 4.14893e+006 in^4 Iy = 4.14893e+006 in^4
rx = 24.2487 in ry = 24.2487 in
Xo = 0 in Yo = 0 in

Reinforcement:
==========
Bar Set: ASTM A615

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

Confinement: Tied; #3 ties with #10 bars, #4 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

Layout: Circular
Pattern: All Sides Equal (Cover to transverse reinforcement)
Total steel area: As = 49.92 in^2 at rho = 0.71% (Note: rho < 1.0%)
Minimum clear spacing = 6.00 in

32 #11 Cover = 3 in

Factored Loads and Moments with Corresponding Capacities:
==========

No.	Pu kip	Mux k-ft	PhiMnx k-ft	PhiMn/Mu	NA depth in	Dt depth in	eps_t	Phi
1	50.00	5564.00	8052.86	1.447	13.66	79.79	0.01452	0.900

*** End of output ***

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER; SITE NAME

BU #876347: BUCKLAND MALL

APP: 204057 REV. 2; WO: 727336

SITE ADDRESS

53 SLATER STREET
MANCHESTER, CT 06040
HARTFORD COUNTY

PROJECT NOTES

1. DETAILED FIELD INFORMATION REGARDING INTERFERENCES AND/OR EXISTING FIELD CONDITIONS MAY BE AVAILABLE ON CROWN'S CCISITES AND FROM CONTRACTOR'S PRE-MOD MAPPING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AND COORDINATE WITH THE AVAILABLE SOURCES OF INFORMATION ABOVE AND WITH THE PROJECT PLANS BEFORE PROCEEDING WITH THE WORK. CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL BEFORE PROCEEDING WITH THE WORK.

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

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

4. (A.) DTI'S REQUIRED: ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAILS ON SHEET S-3 FOR REQUIREMENTS ON THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

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

   (C.) REQUIREMENT EFFECTIVE 04/20/2013, PER CROWN CASTLE DIRECTIVE: ANY AND ALL STRUCTURAL BOLTS THAT ARE TIGHTENED TO THE PRETENSIONED CONDITION USING THE AISC "TURN-OF-NUT" TENSIONING PROCEDURE (NON-TENSION CONTROLLED ['NON-TC'] BOLTS AND/OR BOLTS WITHOUT DTI'S INSTALLED) SHALL BE INSPECTED ONSITE BY AN INDEPENDENT THIRD-PARTY BOLT INSPECTOR, AS APPROVED BY CROWN. **THIS INSPECTION IS REQUIRED TO BE AN ONSITE FIELD INSPECTION.** THE THIRD-PARTY BOLT INSPECTOR SHALL FOLLOW THE PUBLISHED CROWN CASTLE INSPECTION PROCEDURE "MI NON-TC BOLT INSPECTION", DATED APRIL 2013. THE THIRD-PARTY BOLT INSPECTOR SHALL PREPARE A FULLY DOCUMENTED BOLT INSPECTION REPORT, AS SPECIFIED BY CROWN, AND SHALL SUBMIT A COPY OF THE BOLT INSPECTION REPORT TO THE MI INSPECTOR, THE EOR, AND TO CROWN CASTLE.

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

PROJECT CONTACTS:

MONOPOLE OWNER:
CROWN CASTLE
46 BROADWAY, ALBANY, NY 12204
CONTACT: ANDREW BAZINET
PH: (585) 899-3442

STRUCTURAL ENGINEER OF RECORD (EOR):
PAUL J. FORD AND COMPANY
250 EAST BROAD STREET, SUITE 600
COLUMBUS, OHIO 43215-3708
CONTACT: JOHN WOOLLEY AT JWOOLLEY@PJFWEB.COM
PHONE: 614-221-6679

DESIGN STANDARD

THIS REINFORCEMENT DESIGN IS BASED UPON THE REQUIREMENTS OF THE TIA/EIA-222-F-1996 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, USING A DESIGN BASIC WIND SPEED OF 80 MPH WITH NO ICE, 37.60 MPH WITH 1 INCH ICE AND 50 MPH SERVICE LOADS.

REFER TO THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF STRUCTURAL ANALYSIS FOR THIS SITE (PJF#37514-0616 R1 BP), DATED 4-1-2014.

THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:

SHAFT REINFORCING
FIELD WELDED ANCHOR BRACKETS
1 POST INSTALLED ANCHOR RODS
ELEVATION REMOVAL

SHEET INDEX

1 4-1-2014 : REVISED MODIFICATION LIST

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street - Suite 600 - Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE
46 BROADWAY, ALBANY, NY 12204
PH: (585) 899-3442 FAX: (585) 899-3448

BU #876347: BUCKLAND MALL
MANCHESTER, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37514-0616	
DRAWN BY: S.S.	
CHECKED BY: J.J.W.	
APPROVED BY:	
DATE: 3-25-2014	

ISSUE DATE OF PERMIT R1: 4-1-2014

T-1

CROWN CASTLE PROJECT: BU #876347: BUCKLAND MALL; MANCHESTER, CT
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

A. GENERAL NOTES

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

B. (SECTION NOT USED)

C. SPECIAL INSPECTION AND TESTING

1. ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY THE OWNER'S REPRESENTATIVE AND THE OWNER'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY. REFER TO CROWN CASTLE DOCUMENT ENG-SOW-10066 FOR SPECIFICATION.
2. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE PERFORMED SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
4. AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY THE OWNER FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
   (A.) ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
   (B.) THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
5. THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES FOR THE OWNER. THE TESTING AGENCY SHALL INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.

A. GENERAL:
   (1.) PERFORM PERIODIC ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.

B. FOUNDATIONS, CONCRETE, AND SOIL PREPARATION - (NOT REQUIRED)

C. CONCRETE TESTING PER 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 AS REQUIRED TO IDENTIFY ANY CRACKS: VISUAL, MAGNETIC PARTICLE, AND 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.

1 4-1-2014

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BU #876347: BUCKLAND MALL
MANCHESTER, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37514-0616	ISSUE DATE OF PERMIT R1: 4-1-2014
DRAWN BY: S.S.	
CHECKED BY: J.J.W.	
APPROVED BY:	S-1
DATE: 3-25-2014	

D. STRUCTURAL STEEL

1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
   - A. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (**AISC**):
     - (A.) "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
     - (B.) "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
     - (C.) "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (PARAGRAPH 4.2.1 SPECIFICALLY EXCLUDED).
   - B. BY THE AMERICAN WELDING SOCIETY (**AWS**):
     - (A.) "STRUCTURAL WELDING CODE - STEEL D1.1."
     - (B.) "SYMBOLS FOR WELDING AND NON-DESTRUCTIVE TESTING"
2. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
3. TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AJAX M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC "TURN OF THE NUT" METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.
4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO THE OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH-UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
8. UNLESS OTHERWISE NOTED, ALL STEEL MEMBERS SHALL BE HOT-DIP GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH ASTM A123. SEE SECTION J FOR FURTHER NOTES AND FOR EXCEPTIONS (IF ANY).
9. ALL WELDS SHALL BE VISUALLY INSPECTED BY THE OWNER'S APPROVED TESTING AGENCY. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY IN THEIR TESTING EFFORTS.
10. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
11. FIELD CUTTING OF STEEL:
    - (A.) PRIOR TO ANY FIELD CUTTING, THE CONTRACTOR SHALL MARK THE CUT OUTLINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS.
    - (B.) ANY REQUIRED CUTS IN THE STEEL SHALL BE CAREFULLY CUT BY MECHANICAL METHODS SUCH AS DRILLING, SAW CUTTING, AND GRINDING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, DURING THE CUTTING WORK. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
    - (C.) ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

E. BASE PLATE GROUT - (NOT REQUIRED)

F. FOUNDATION WORK - (NOT REQUIRED)

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

H. EPOXY GROUTED REINFORCING ANCHOR RODS

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

I. TOUCH UP OF GALVANIZING

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

J. HOT DIP GALVANIZING

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

K. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER

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

1 4-1-2014

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BU #876347: BUCKLAND MALL
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MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37514-0616	ISSUE DATE OF PERMIT R1: 4-1-2014
DRAWN BY: S.S.	
CHECKED BY: J.J.W.	
APPROVED BY:	S-2
DATE: 3-25-2014	

NOTES:

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

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

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

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

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

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

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

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

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

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

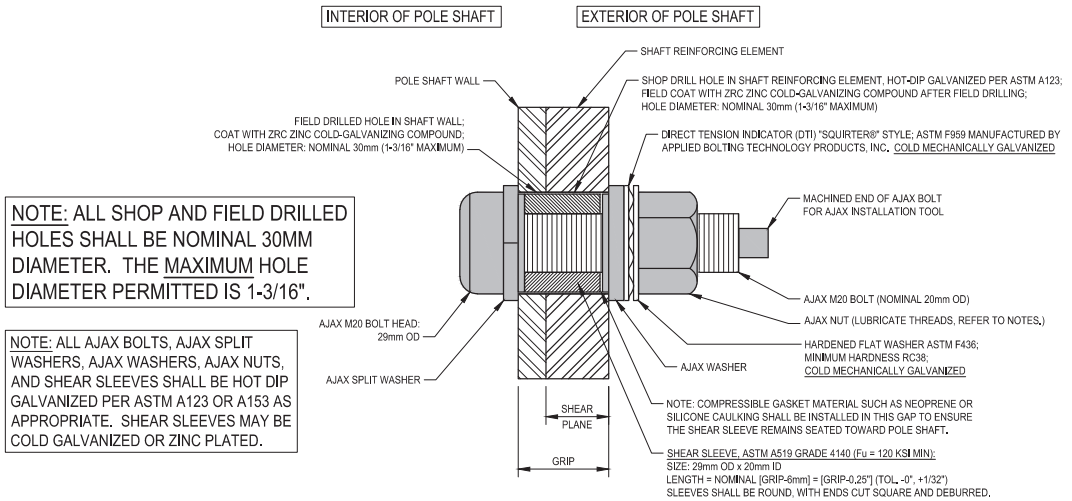
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY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

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

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

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

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



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

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

TYPICAL AJAX BOLT DETAIL 1/S-3

1 4-1-2014

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POLE SPECIFICATIONS	
POLE SHAPE TYPE:	18-SIDED POLYGON
TAPER:	0.1850 IN/FT
SHAFT STEEL:	ASTM A607 GRADE 65 & GRADE 60
BASE PL STEEL:	ASTM A572 GRADE 50 (50 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	@ BOTTOM
1	39.50	0.2500	45.00 54.00 63.00	22.000	29.308
2	40.00	0.3125		28.114	35.514
3	40.00	0.3750		34.057	41.456
4	49.00	0.4375		39.735	48.800
NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES					

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

MODIFICATIONS:

(A) INSTALL NEW ANCHOR RODS AND BRACKETS AT BASE PLATE. SEE SHEET S-5.

(B) REMOVE EXISTING MOUNTS, ANTENNA AND COAX AT EL. 78' & 145'.

(C) INSTALL NEW SHAFT REINFORCING. SEE CHART.

* EXISTING MOUNTS MAY NEED TO BE ADJUSTED, MOVED AND/OR TEMPORARILY SUPPORTED DURING THE INSTALLATION OF SHAFT REINFORCING

NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE

BOTTOM ELEVATION	TOP ELEVATION	FLAT # / DEGREE SEPARATION	ELEMENT	ELEMENT LENGTH	CMRP 65 KSI CATALOG PART NUMBER	ELEMENT QUANTITY	APPROXIMATE AJAX BOLTS PER ELEMENT	APPROXIMATE TOTAL AJAX BOLT QUANTITY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	ESTIMATED TOTAL STEEL WEIGHT
0' - 6"	35' - 6"	4, 10 & 16	1-1/4" x 8-1/2"	35' - 0"	CCI-AFP-08512535	3	52	156	17	17	17"	3796 LBS.
35' - 6"	70' - 6"	4, 10 & 16	1-1/4" x 6-1/2"	35' - 0"	CCI-AFP-06512535	3	45	135	14	14	19"	2903 LBS.
70' - 6"	100' - 6"	4, 10 & 16	1" x 6"	30' - 0"	CCI-AFP-06010035	3	42	126	10	10	16"	1838 LBS.
								417				8537 LBS.

NOTES:

1.) AJAX BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.
2.) ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF 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 REINFORCING SHALL BE ASTM A572 GR. 65.
4.) WELDS SHALL BE E80XX OR GREATER. TERMINATION WELDS SHALL BE 3/8" FILLET WELDS.
5.) HOLES FOR AJAX BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
6.) ALL SHIMS SHALL BE ASTM A-36.

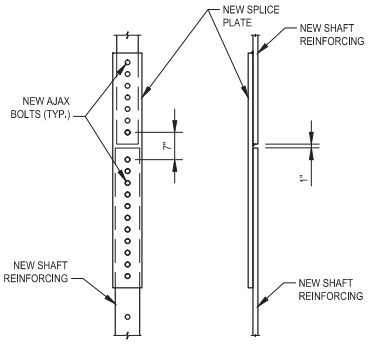
NEW SHIM CHART

SHIM QUANTITY	SHIM WIDTH	SHIM LENGTH	SHIM THICKNESS	HOLE DIAMETER
9	4"	4"	1/4"	1-1/4"
27	4"	4"	1/16"	1-1/4"

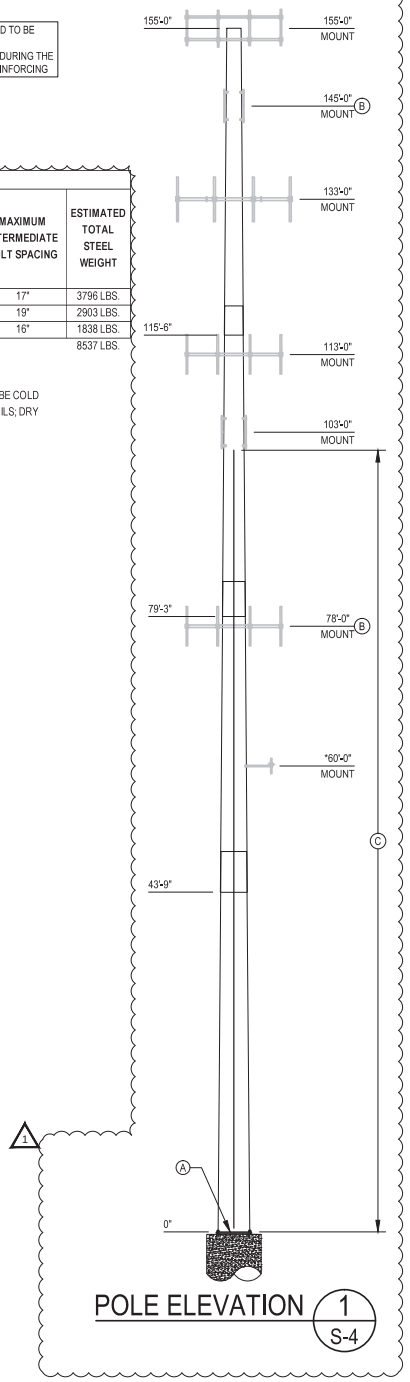
SPLICE PLATE INSTALLATION CHART

ELEVATION	FLAT PLATE THICKNESS	FLAT PLATE WIDTH	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	WELD LENGTH PER SIDE	TOTAL WELD LENGTH	AJAX BOLTS PER SPLICE*	TOTAL STEEL WEIGHT
35' - 6"	1.25"	8.5"	8' - 4"	3	-	-	31	906 LBS.
70' - 6"	1.25"	6.5"	6' - 7"	3	-	-	24	547 LBS.
						0"		1453 LBS.

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



DETAIL 2 S-4
SCALE: NTS



POLE ELEVATION 1 S-4

1 4-1-2014 : REVISED MODIFICATION LIST

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BU #876347: BUCKLAND MALL
MANCHESTER, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:	37514-0616
DRAWN BY:	S.S.
CHECKED BY:	J.J.W.
APPROVED BY:	
DATE:	3-25-2014

ISSUE DATE OF PERMIT R1: 4-1-2014

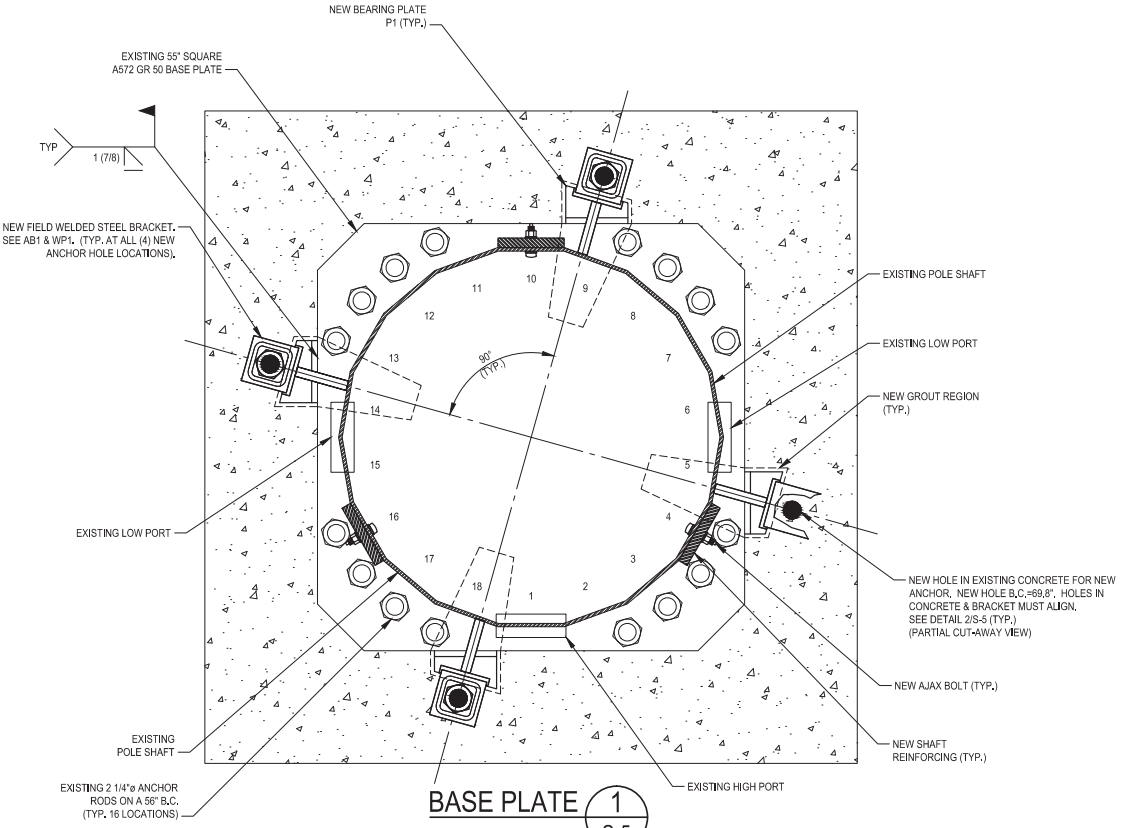
S-4

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

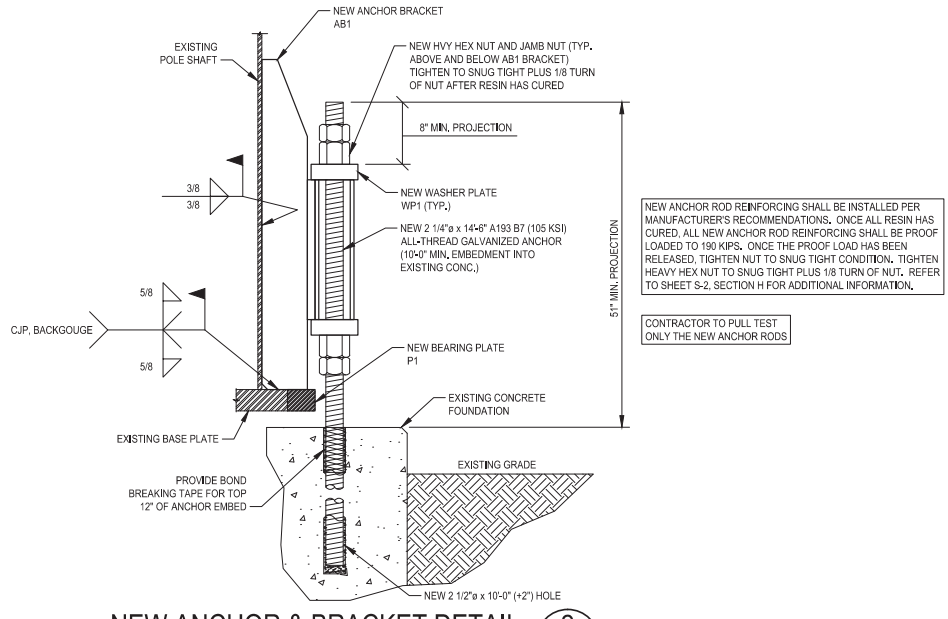
(1.) PRIOR TO CONSTRUCTION, CONTRACTOR'S INSPECTION AGENCY SHALL INSPECT CONDITION OF EXISTING SHAFT-TO-BASE-PLATE WELD CONNECTION. ALSO INSPECT EXISTING STIFFENERS IF PRESENT. THE CONTRACTOR'S INSPECTION AGENCY SHALL USE THE FOLLOWING INSPECTION METHODS AS REQUIRED TO IDENTIFY ANY CRACKS: VISUAL, MAGNETIC PARTICLE, AND 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 IN REGION AS SHOWN. GROUT SHALL BE INSTALLED TIGHT UNDER BASE PLATE WITH NO VOIDS REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF EXISTING BASE PLATE. GROUT COMPLETELY SOLID UNDER ENTIRE SURFACE OF BASE PLATE FROM OUTSIDE EDGE TO INSIDE EDGE WITHIN THE REGION INDICATED.



BASE PLATE 1 / S-5



NEW ANCHOR ROD REINFORCING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ONCE ALL RESIN HAS CURED, ALL NEW ANCHOR ROD REINFORCING SHALL BE PROOF LOADED TO 190 KIPS. ONCE THE PROOF LOAD HAS BEEN RELEASED, TIGHTEN NUT TO SNUG TIGHT CONDITION. TIGHTEN HEAVY HEX NUT TO SNUG TIGHT PLUS 1/8 TURN OF NUT. REFER TO SHEET S-2, SECTION H FOR ADDITIONAL INFORMATION.

CONTRACTOR TO PULL TEST ONLY THE NEW ANCHOR RODS

NEW ANCHOR & BRACKET DETAIL 2 / S-5

1 4-1-2014

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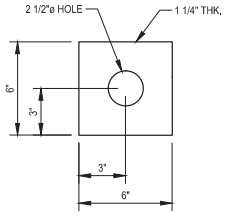
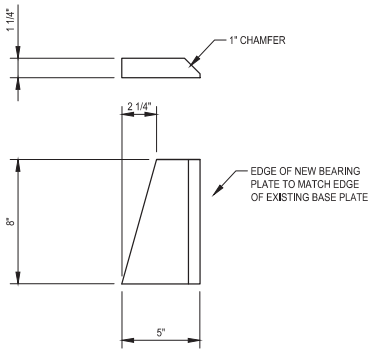


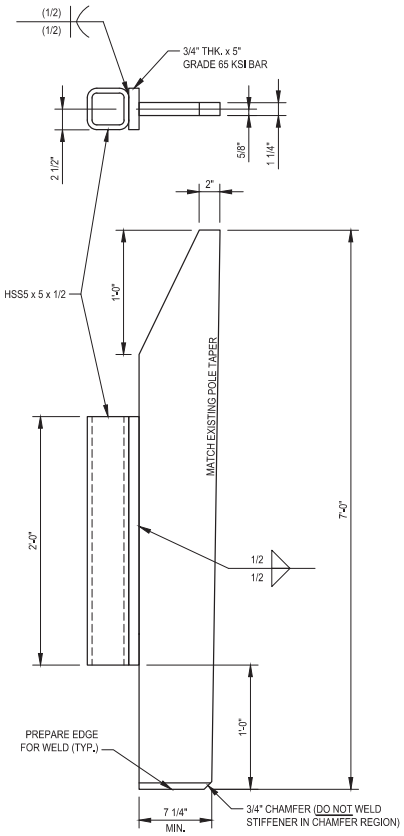
WASHER PLATE MK~WP1

(8 REQUIRED) (Fy = 50 KSI)



BEARING PLATE MK~P1

(4 REQUIRED) (Fy = 50 KSI)



ANCHOR BRACKET MK~AB1

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

1 4-1-2014

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S-6

MODIFICATION INSPECTION NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT 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
X	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
X	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
	CONSTRUCTION
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
X	POST INSTALLED ANCHOR ROD VERIFICATION
X	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
X	THIRD PARTY ONSITE INSPECTION OF BOLT PRETENSION PER CROWN REQUIREMENTS
X	INSPECTION OF AJAX BOLTS AND DTI'S PER REQUIREMENTS ON SHEET S-3
ADDITIONAL TESTING AND INSPECTIONS:	
	POST-CONSTRUCTION
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	THIRD PARTY ONSITE BOLT INSPECTION REPORT
X	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

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

1 4-1-2014

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S-7

37514-0616 R1 PERMIT.DWG

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER; SITE NAME

BU #876347: BUCKLAND MALL

APP: 204057 REV. 2; WO: 727336

SITE ADDRESS

53 SLATER STREET
MANCHESTER, CT 06040
HARTFORD COUNTY

PROJECT NOTES

1. DETAILED FIELD INFORMATION REGARDING INTERFERENCES AND/OR EXISTING FIELD CONDITIONS MAY BE AVAILABLE ON CROWN'S CCISITES AND FROM CONTRACTOR'S PRE-MOD MAPPING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AND COORDINATE WITH THE AVAILABLE SOURCES OF INFORMATION ABOVE AND WITH THE PROJECT PLANS BEFORE PROCEEDING WITH THE WORK. CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL BEFORE PROCEEDING WITH THE WORK.

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

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

4. (A.) DTI'S REQUIRED: ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAILS ON SHEET S-3 FOR REQUIREMENTS ON THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

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

   (C.) REQUIREMENT EFFECTIVE 04/20/2013, PER CROWN CASTLE DIRECTIVE: ANY AND ALL STRUCTURAL BOLTS THAT ARE TIGHTENED TO THE PRETENSIONED CONDITION USING THE AISC "TURN-OF-NUT" TENSIONING PROCEDURE (NON-TENSION CONTROLLED ['NON-TC'] BOLTS AND/OR BOLTS WITHOUT DTI'S INSTALLED) SHALL BE INSPECTED ONSITE BY AN INDEPENDENT THIRD-PARTY BOLT INSPECTOR, AS APPROVED BY CROWN. **THIS INSPECTION IS REQUIRED TO BE AN ONSITE FIELD INSPECTION.** THE THIRD-PARTY BOLT INSPECTOR SHALL FOLLOW THE PUBLISHED CROWN CASTLE INSPECTION PROCEDURE "MI NON-TC BOLT INSPECTION", DATED APRIL 2013. THE THIRD-PARTY BOLT INSPECTOR SHALL PREPARE A FULLY DOCUMENTED BOLT INSPECTION REPORT, AS SPECIFIED BY CROWN, AND SHALL SUBMIT A COPY OF THE BOLT INSPECTION REPORT TO THE MI INSPECTOR, THE EOR, AND TO CROWN CASTLE.

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

PROJECT CONTACTS:

MONOPOLE OWNER:
CROWN CASTLE
46 BROADWAY, ALBANY, NY 12204
CONTACT: ANDREW BAZINET
PH: (585) 899-3442

STRUCTURAL ENGINEER OF RECORD (EOR):
PAUL J. FORD AND COMPANY
250 EAST BROAD STREET, SUITE 600
COLUMBUS, OHIO 43215-3708
CONTACT: JOHN WOOLLEY AT JWOOLLEY@PJFWEB.COM
PHONE: 614-221-6679

DESIGN STANDARD

THIS REINFORCEMENT DESIGN IS BASED UPON THE REQUIREMENTS OF THE TIA/EIA-222-F-1996 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, USING A DESIGN BASIC WIND SPEED OF 80 MPH WITH NO ICE, 37.60 MPH WITH 1 INCH ICE AND 50 MPH SERVICE LOADS.

REFER TO THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF STRUCTURAL ANALYSIS FOR THIS SITE (PJF#37514-0616 R1 BP), DATED 4-1-2014.

THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:

SHAFT REINFORCING
FIELD WELDED ANCHOR BRACKETS
1 POST INSTALLED ANCHOR RODS
ELEVATION REMOVAL

SHEET INDEX

SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
S-1	GENERAL NOTES
S-2	GENERAL NOTES
S-3	AJAX BOLT DETAIL
S-4	MONOPOLE PROFILE
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APR 0 1 2014

1 4-1-2014 : REVISED MODIFICATION LIST

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BU #876347: BUCKLAND MALL
MANCHESTER, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37514-0616	ISSUE DATE OF PERMIT R1: 4-1-2014
DRAWN BY: S.S.	
CHECKED BY: J.J.W.	
APPROVED BY: JJW	T-1
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CROWN CASTLE PROJECT: BU #876347: BUCKLAND MALL: MANCHESTER, CT
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

A. GENERAL NOTES

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

B. (SECTION NOT USED)

C. SPECIAL INSPECTION AND TESTING

1. ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY THE OWNER'S REPRESENTATIVE AND THE OWNER'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY. REFER TO CROWN CASTLE DOCUMENT ENG-SOW-10066 FOR SPECIFICATION.
2. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE PERFORMED SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
4. AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY THE OWNER FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
   (A.) ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
   (B.) THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
5. THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES FOR THE OWNER. THE TESTING AGENCY SHALL INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.

A. GENERAL:
   (1.) PERFORM PERIODIC ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.

B. FOUNDATIONS, CONCRETE, AND SOIL PREPARATION - (NOT REQUIRED)

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

G. REPORTS:
   (1.) COMPILE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.

6. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES AND PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO THE OWNER'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT THE OWNER'S REVIEW AND SPECIFIC WRITTEN CONSENT. THE OWNER RESERVES THE RIGHT TO DETERMINE WHAT IS AN ACCEPTABLE RESOLUTION OF DISCREPANCIES AND PROBLEMS.
7. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO THE OWNER. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
8. RESPONSIBILITY: THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.

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D. **STRUCTURAL STEEL**

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

A. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (**AISC**):
   (A.) "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
   (B.) "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
   (C.) "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (PARAGRAPH 4.2.1 SPECIFICALLY EXCLUDED).

B. BY THE AMERICAN WELDING SOCIETY (**AWS**):
   (A.) "STRUCTURAL WELDING CODE - STEEL D1.1."
   (B.) "SYMBOLS FOR WELDING AND NON-DESTRUCTIVE TESTING"

2. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
3. TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AJAX M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC "TURN OF THE NUT" METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.
4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO THE OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH-UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
8. UNLESS OTHERWISE NOTED, ALL STEEL MEMBERS SHALL BE HOT-DIP GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH ASTM A123. SEE SECTION J FOR FURTHER NOTES AND FOR EXCEPTIONS (IF ANY).
9. ALL WELDS SHALL BE VISUALLY INSPECTED BY THE OWNER'S APPROVED TESTING AGENCY. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY IN THEIR TESTING EFFORTS.
10. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
11. FIELD CUTTING OF STEEL:
   (A.) PRIOR TO ANY FIELD CUTTING, THE CONTRACTOR SHALL MARK THE CUT OUTLINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS.
   (B.) ANY REQUIRED CUTS IN THE STEEL SHALL BE CAREFULLY CUT BY MECHANICAL METHODS SUCH AS DRILLING, SAW CUTTING, AND GRINDING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, DURING THE CUTTING WORK. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
   (C.) ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

E. **BASE PLATE GROUT** - (NOT REQUIRED)

F. **FOUNDATION WORK - (NOT REQUIRED)**

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

H. **EPOXY GROUTED REINFORCING ANCHOR RODS**

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

I. **TOUCH UP OF GALVANIZING**

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

J. **HOT DIP GALVANIZING**

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

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

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

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PROJECT No: 37514-0616	ISSUE DATE OF PERMIT R1: 4-1-2014
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CHECKED BY: J.J.W.	
APPROVED BY: JJW	S-2
DATE: 3-25-2014	

AJAX BOLT NOTE SHEET: REV. 1.4, 5-20-2013

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

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

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

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

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

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

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

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

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

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

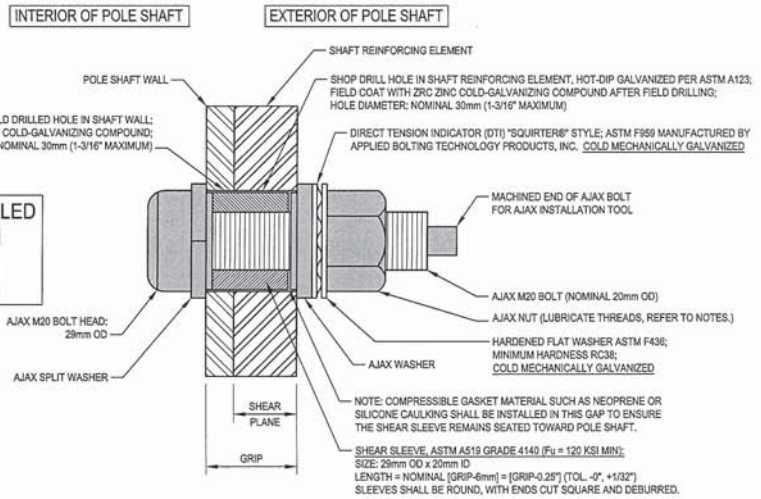
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY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

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

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

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

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



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

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

TYPICAL AJAX BOLT DETAIL 1/S-3

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POLE SPECIFICATIONS	
POLE SHAPE TYPE:	18-SIDED POLYGON
TAPER:	0.1850 IN/FT
SHAFT STEEL:	ASTM A607 GRADE 65 & GRADE 60
BASE PL STEEL:	ASTM A572 GRADE 50 (50 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	39.50	0.2500	45.00	22.000	29.308
2	40.00	0.3125	54.00	28.114	35.514
3	40.00	0.3750	63.00	34.057	41.456
4	49.00	0.4375		39.735	48.800

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

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

MODIFICATIONS:

(A) INSTALL NEW ANCHOR RODS AND BRACKETS AT BASE PLATE. SEE SHEET S-5.

(B) REMOVE EXISTING MOUNTS, ANTENNA AND COAX AT EL. 78' & 145'.

(C) INSTALL NEW SHAFT REINFORCING. SEE CHART.

* EXISTING MOUNTS MAY NEED TO BE ADJUSTED, MOVED AND/OR TEMPORARILY SUPPORTED DURING THE INSTALLATION OF SHAFT REINFORCING

NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE

BOTTOM ELEVATION	TOP ELEVATION	FLAT # / DEGREE SEPARATION	ELEMENT	ELEMENT LENGTH	CMRP 65 KSI CATALOG PART NUMBER	ELEMENT QUANTITY	APPROXIMATE AJAX BOLTS PER ELEMENT	APPROXIMATE TOTAL AJAX BOLT QUANTITY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	ESTIMATED TOTAL STEEL WEIGHT
0' - 6"	35' - 6"	4, 10 & 16	1-1/4" x 8-1/2"	35' - 0"	CCI-AFP-08512535	3	52	156	17	17	17"	3796 LBS.
35' - 6"	70' - 6"	4, 10 & 16	1-1/4" x 6-1/2"	35' - 0"	CCI-AFP-06512535	3	45	135	14	14	19"	2903 LBS.
70' - 6"	100' - 6"	4, 10 & 16	1" x 6"	30' - 0"	CCI-AFP-06010035	3	42	126	10	10	16"	1838 LBS.
								417				8537 LBS.

NOTES:

1.) AJAX BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.
2.) ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATMELY, 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 REINFORCING SHALL BE ASTM A572 GR. 65.
4.) WELDS SHALL BE E80XX OR GREATER. TERMINATION WELDS SHALL BE 3/8" FILLET WELDS.
5.) HOLES FOR AJAX BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
6.) ALL SHIMS SHALL BE ASTM A-36.

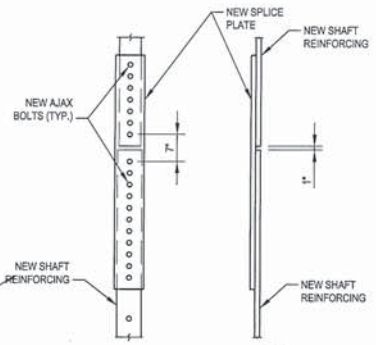
NEW SHIM CHART

SHIM QUANTITY	SHIM WIDTH	SHIM LENGTH	SHIM THICKNESS	HOLE DIAMETER
9	4"	4"	1/4"	1-1/4"
27	4"	4"	1/16"	1-1/4"

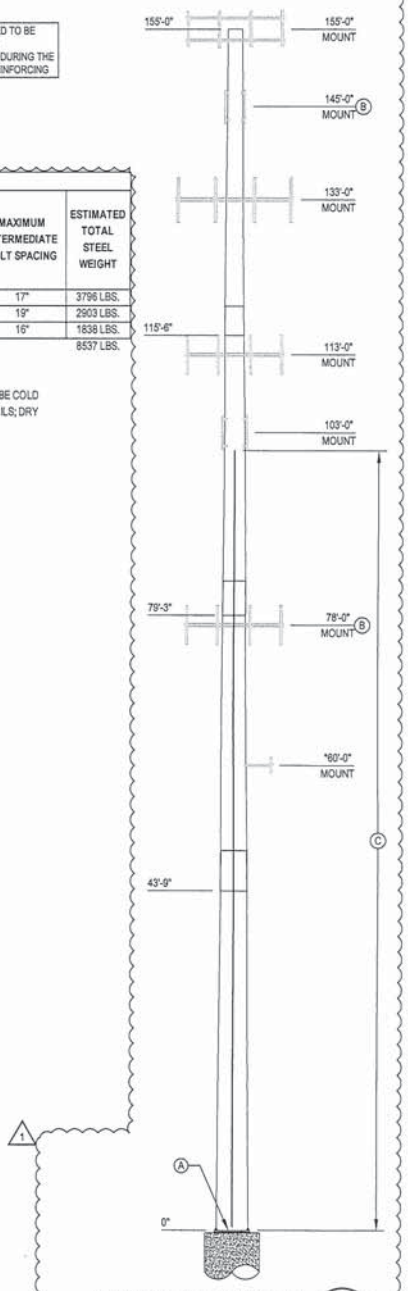
SPLICE PLATE INSTALLATION CHART

ELEVATION	FLAT PLATE THICKNESS	FLAT PLATE WIDTH	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	WELD LENGTH PER SIDE	TOTAL WELD LENGTH	AJAX BOLTS PER SPLICE*	TOTAL STEEL WEIGHT
35' - 6"	1.25"	8.5"	8' - 4"	3	-	-	31	906 LBS.
70' - 6"	1.25"	6.5"	6' - 7"	3	-	-	24	547 LBS.
						0"		1453 LBS.

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



DETAIL 2 / S-4
SCALE: NTS



POLE ELEVATION 1 / S-4

STATE OF CONNECTICUT
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APR 01 2014

1 4-1-2014 : REVISED MODIFICATION LIST

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APPROVED BY: JTK	S-4
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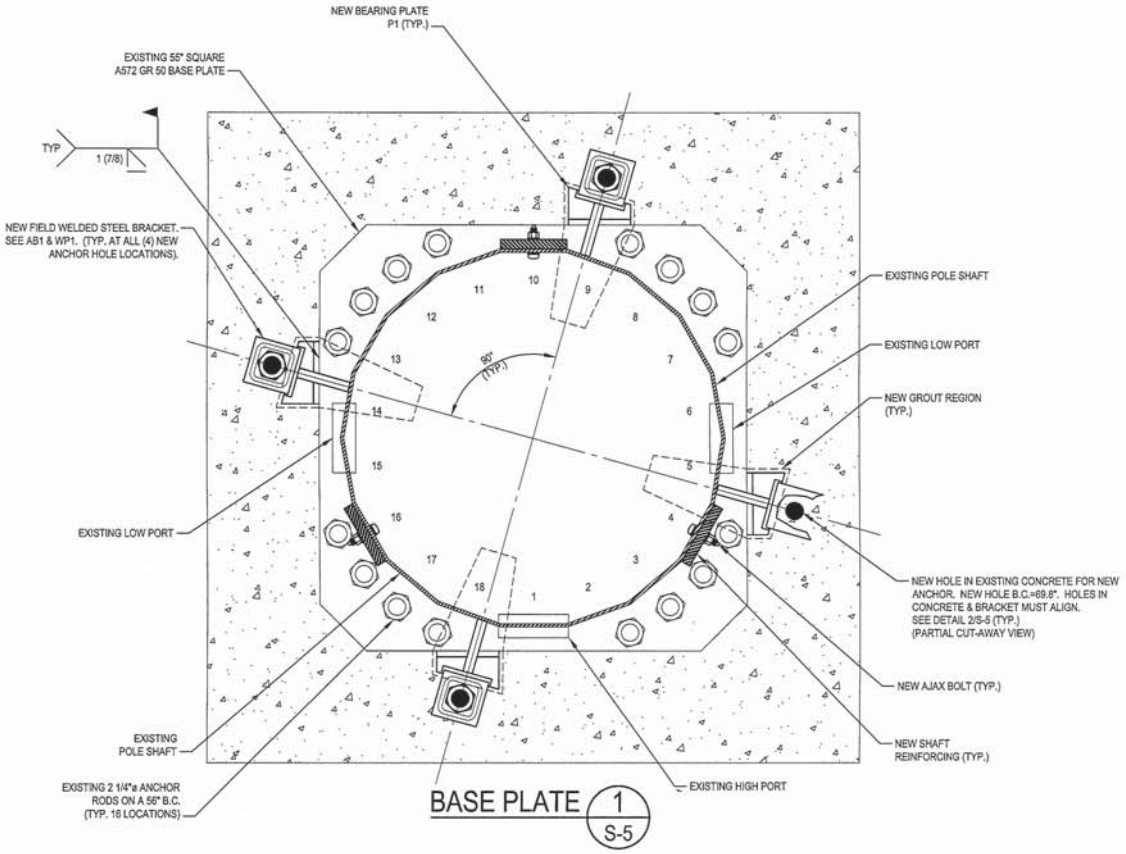
SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS:

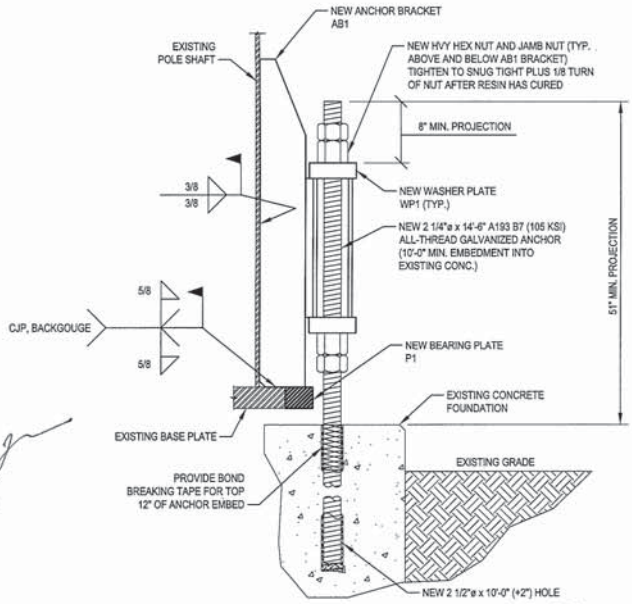
(1.) PRIOR TO CONSTRUCTION, CONTRACTOR'S INSPECTION AGENCY SHALL INSPECT CONDITION OF EXISTING SHAFT-TO-BASE-PLATE WELD CONNECTION. ALSO INSPECT EXISTING STIFFENERS IF PRESENT. THE CONTRACTOR'S INSPECTION AGENCY SHALL USE THE FOLLOWING INSPECTION METHODS AS REQUIRED TO IDENTIFY ANY CRACKS: VISUAL, MAGNETIC PARTICLE, AND 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 IN REGION AS SHOWN. GROUT SHALL BE INSTALLED TIGHT UNDER BASE PLATE WITH NO VOIDS REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF EXISTING BASE PLATE. GROUT COMPLETELY SOLID UNDER ENTIRE SURFACE OF BASE PLATE FROM OUTSIDE EDGE TO INSIDE EDGE WITHIN THE REGION INDICATED.



BASE PLATE 1 / S-5



NEW ANCHOR ROD REINFORCING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ONCE ALL RESIN HAS CURED, ALL NEW ANCHOR ROD REINFORCING SHALL BE PROOF LOADED TO 190 KIPS. ONCE THE PROOF LOAD HAS BEEN RELEASED, TIGHTEN NUT TO SNUG TIGHT CONDITION. TIGHTEN HEAVY HEX NUT TO SNUG TIGHT PLUS 1/8 TURN OF NUT. REFER TO SHEET S-2, SECTION H FOR ADDITIONAL INFORMATION.

CONTRACTOR TO PULL TEST ONLY THE NEW ANCHOR RODS

NEW ANCHOR & BRACKET DETAIL 2 / S-5

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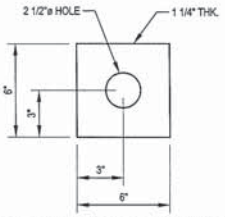
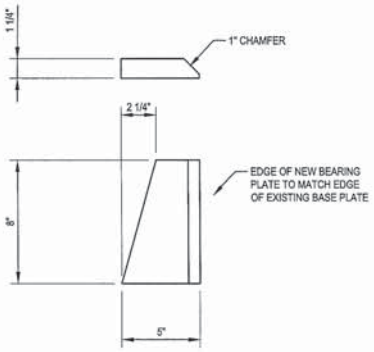


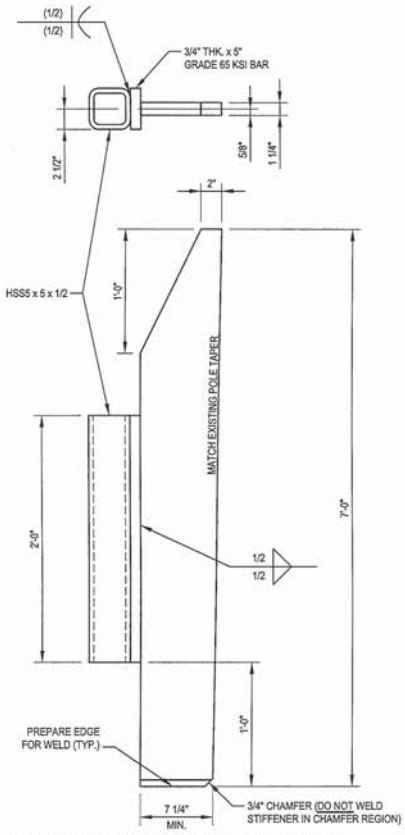
WASHER PLATE MK~WP1

(8 REQUIRED) (Fy = 50 KSI)



BEARING PLATE MK~P1

(4 REQUIRED) (Fy = 50 KSI)



ANCHOR BRACKET MK~AB1

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

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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.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT 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
X	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
X	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
X	POST INSTALLED ANCHOR ROD VERIFICATION
X	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
X	THIRD PARTY ONSITE INSPECTION OF BOLT PRETENSION PER CROWN REQUIREMENTS
X	INSPECTION OF AJAX BOLTS AND DTI'S PER REQUIREMENTS ON SHEET S-3
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	THIRD PARTY ONSITE BOLT INSPECTION REPORT
X	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

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

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

APR 01 2014

1 4-1-2014

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BU #876347: BUCKLAND MALL
MANCHESTER, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:	37514-0616
DRAWN BY:	S.S.
CHECKED BY:	J.J.W.
APPROVED BY:	JJW
DATE:	3-25-2014

ISSUE DATE OF PERMIT R1: 4-1-2014

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