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

August 17, 2015

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 528 Wheelers Farms Road, Milford, Connecticut.

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, copies of this letter are being sent to the chief elected official of the municipality in which the affected cell site is located, the property owner of record, and the tower owner or operator.

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 and environmental characteristics of the site 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 not increase.

2. The proposed changes will not extend the site boundaries.

3. The proposed changes will not increase the noise level at the site boundary by six decibels or more, or to levels that exceed state and local criteria.

4. The changes will not add radio frequency sending or receiving capability which increases the total radio frequency electromagnetic radiation power density measured at the site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996, as amended, and the State Department of Energy and Environmental Protection, pursuant to Section 22a-162 of the Connecticut General Statutes.

5. The proposed changes will not impair the structural integrity of the facility, as determined in a certification provided by a professional engineer licensed in Connecticut.

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: TownCEO – Mayor Benjamin G. Blake, Town of Milford
Land Owner of Record – The Village Foundation Inc.
Tower Owner / Operator – Crown Castle (by email)

Attachments

NEW CINGULAR WIRELESS PCS, LLC
Equipment Modification

528 Wheelers Farms Road, Milford, CT
Site Number 2083
Prior Decisions: Ex. Mods. 11/99, 8/02, 6/06, 10/11, and 7/13

Tower Owner/Manager: Crown Castle

Land Owner of Record: The Village Foundation Inc.

Lease Area: The Wheelers Farms Road cell site was originally approved by local Planning & Zoning authorities in or before 1999. The Council subsequently approved an expansion of the fenced compound in Petition 656 (Verizon, 2004). The attached exhibit from Petition 656 depicts the approved site boundaries. Since all proposed equipment modifications will occur either on the existing tower structure or within AT&T's existing equipment shelter, the proposed modifications will not extend either AT&T's lease area or the overall site boundaries approved in Petition 656.

Equipment configuration: Monopole

Current and/or Approved:
Six PowerWave 7770 antennas @ 97ft c.l.
Three PowerWave P65-16 antennas @ 97 ft c.l.
Twelve PowerWave TMA's @ 97 ft
One Raycap DC6-48-60-18-8F surge arrestor @ 97 ft
Six RRUS-11 remote radio heads @ 97 ft
Twelve runs 1 1/4 inch coax
One fiber cable and two DC control cables
Equipment shelter

Planned Modifications:
Install three CCI OPA-65R-LCUU-H6 antennas @ 97 ft c.l.
Install one additional Raycap DC6-48-60-18-8F surge arrestor @ 97 ft.
Install three Ericsson RRUS-32 remote radio heads modules @97 ft.
Install an additional one fiber cable and two 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 82.4 % 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 84.2 % 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 *							62.35
AT&T LTE *	97	740	1	500	0.0191	0.4933	3.87
AT&T GSM *	97	880 - 894	4	296	0.0452	0.5867	7.71
AT&T GSM *	97	1900 Band	2	427	0.0326	1.0000	3.26
AT&T UMTS *	97	880 - 894	1	500	0.0191	0.5867	3.26
AT&T UMTS *	97	1900 Band	1	500	0.0191	1.0000	1.91
Total							**82.4%**

***** Per CSC records.

Proposed

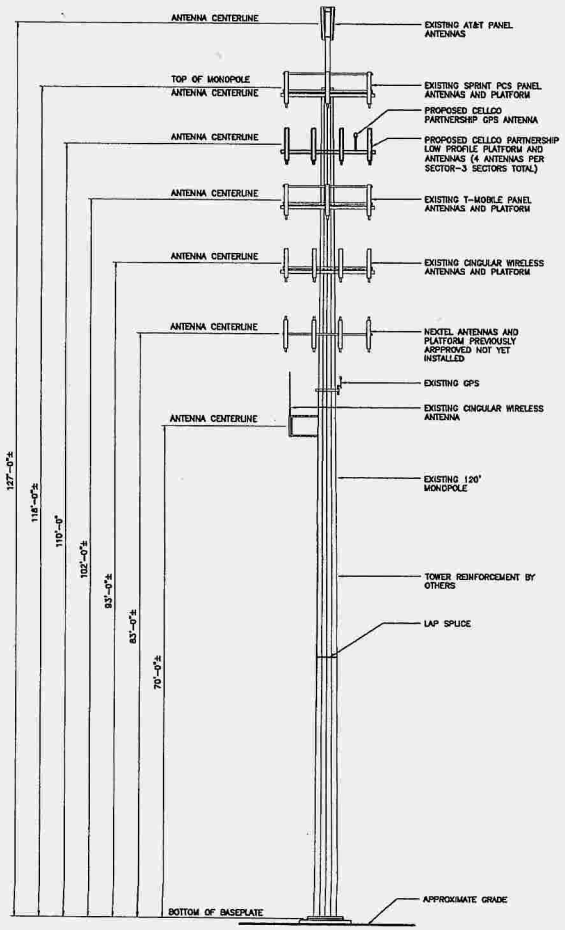
Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users *							62.35
AT&T LTE	97	700 Band	1	500	0.0191	0.4667	4.09
AT&T LTE	97	1900 Band	1	500	0.0191	1.0000	1.91
AT&T LTE	97	2300 Band	1	500	0.0191	1.0000	1.91
AT&T UMTS	97	880 - 894	2	500	0.0382	0.5867	6.51
AT&T UMTS	97	1900 Band	2	500	0.0382	1.0000	3.82
AT&T GSM	97	880 - 894	1	296	0.0113	0.5867	1.93
AT&T GSM	97	1900 Band	1	427	0.0163	1.0000	1.63
Total							**84.2%**

***** Per CSC records

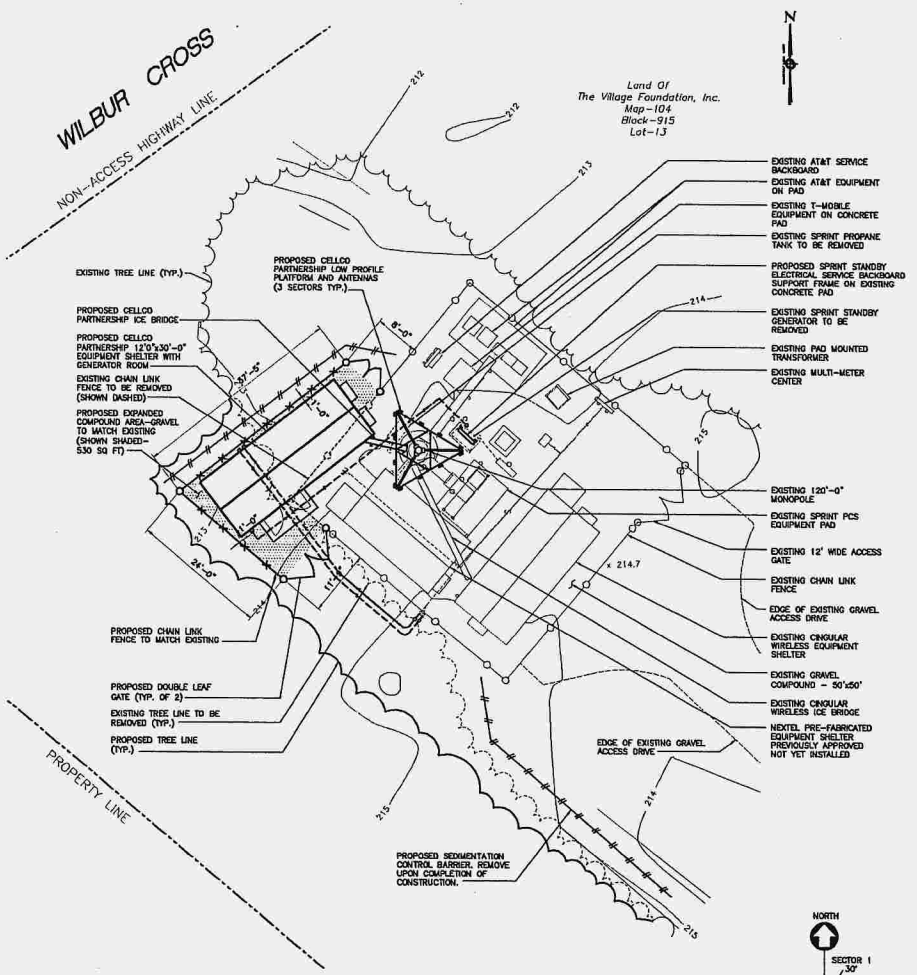
Structural information:

The attached structural analysis (Paul J. Ford & Company, 5/15/15) demonstrates that the tower and foundation have adequate structural capacity to accommodate the proposed equipment modifications. (Note: The accompanying Modifications Inspection Report pertains to tower modifications necessitated by EM-SPRINT-084-150402.)

Excerpt from Petition 656



2 SC-1 TOWER ELEVATION
SCALE: 1/8"=1'-0"
0 4 8 16 24



1 SC-1 SITE PLAN
SCALE: 1"=10'-0"
0 5 10 20 30

LATITUDE: 41°-14'-54.33" (NAD 83)
LONGITUDE: 73°-04'-44.69" (NAD 83)

ANTENNA ORIENTATION KEY

CELLCO PARTNERSHIP
DBA
verizon wireless

A&E FIRM
BBS CORPORATION AES
795 BROOK STREET, BLDG 5
ROCKY HILL, CONNECTICUT
1-(860)-529-8882

A&E SEAL

PROJECT NO: 36921253
JOB NO: VZ1-040
DRAWN BY: LMM
CHECKED BY:

ISSUED FOR

09-04-03	SITING COUNCIL REVIEW
12-22-03	SITING COUNCIL

MILFORD BOYS VILLAGE
528 WHEELERS FARM ROAD
MILFORD, CONNECTICUT 06460

SCALE: AS NOTED

SITE PLAN AND TOWER ELEVATION

SC-1

PROJECT INFORMATION

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS.
SITE ADDRESS:	528 WHEELERS FARM RD. MILFORD, CT 06460
LATITUDE:	41.248431 N 41° 14' 54.35" N
LONGITUDE:	73.079075 W 73° 04' 44.67" W
TYPE OF SITE:	TOWER / INDOOR EQUIPMENT
OVERALL TOWER HEIGHT:	120'-0"±
RAD CENTER:	97'-0"±

SITE NUMBER: CT2083
SITE NAME: MILFORD - BOYS VILLAGE

DRAWING INDEX

		REV
T-1	TITLE SHEET	1
GN-1	GENERAL NOTES	1
A-1	COMPOUND AND EQUIPMENT PLAN	1
A-2	ANTENNA LAYOUTS & ELEVATION	1
A-3	DETAILS	1
G-1	PLUMBING DIAGRAM & GROUNDING DETAILS	1

CROWN CASTLE SITE #: 876320
CROWN CASTLE SITE NAME: 528 WHEELERS FARM RD.

VICINITY MAP

DIRECTIONS TO SITE:
HEAD WEST ON COCHITUATE RD TOWARD BURR ST. 410 FT. TAKE THE 1ST RIGHT ONTO BURR ST. 443 FT. MAKE A U-TURN AT LEGGAT MCCALL CONN. 0.1 MI. TURN LEFT AT COCHITUATE RD. 295 FT. TAKE THE RAMP TO I-90 E/MASSPIKE W/SPRINGFIELD/BOSTON TOLL ROAD. 0.6 MI. KEEP RIGHT AT THE FORK AND MERGE ONTO I-90 E TOLL ROAD. 6.1 MI. TAKE EXIT 14 FOR I-95 N TOWARD N.H - MAINE PARTIAL TOLL ROAD. 1.2 MI. FOLLOW SIGNS FOR I-95 N/WALTHAM/PORTSMOUTH NH AND MERGE ONTO I-95 N. 10.4 MI. TAKE EXIT 32A TO MERGE ONTO US-3 N TOWARD LOWELL. 10.4 MI. SLIGHT RIGHT AT LOWELL CONNECTOR (SIGNS FOR I-495 N/LAWRENCE). 1.2 MI. TAKE EXIT 3 FOR INDUSTRIAL AVE. 0.2 MI. TURN RIGHT AT INDUSTRIAL AVE E. 0.1 MI. AT THE TRAFFIC CIRCLE, CONTINUE STRAIGHT ONTO INDUSTRIAL AVE. 495 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.

72 HOURS
BEFORE YOU DIG
CALL TOLL FREE 888-DIG-SAFE OR DIAL 811

UNDERGROUND SERVICE ALERT

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT2083
SITE NAME: MILFORD - BOYS VILLAGE
CCI SITE #876320
528 WHEELERS FARM RD.
MILFORD, CT 06460
NEW HAVEN COUNTY

550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	08/10/15	ISSUED FOR CONSTRUCTION	SG	AT	DPH
0	06/29/15	ISSUED FOR REVIEW	SG	AT	DPH
A	06/01/15	ISSUED FOR REVIEW	MR	AT	DPH

SCALE: AS SHOWN DESIGNED BY: AT DRAWN BY: MR

STATE OF CONNECTICUT · DANIEL P. HAMM · No. 24178 · LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET
(LTE-3C)

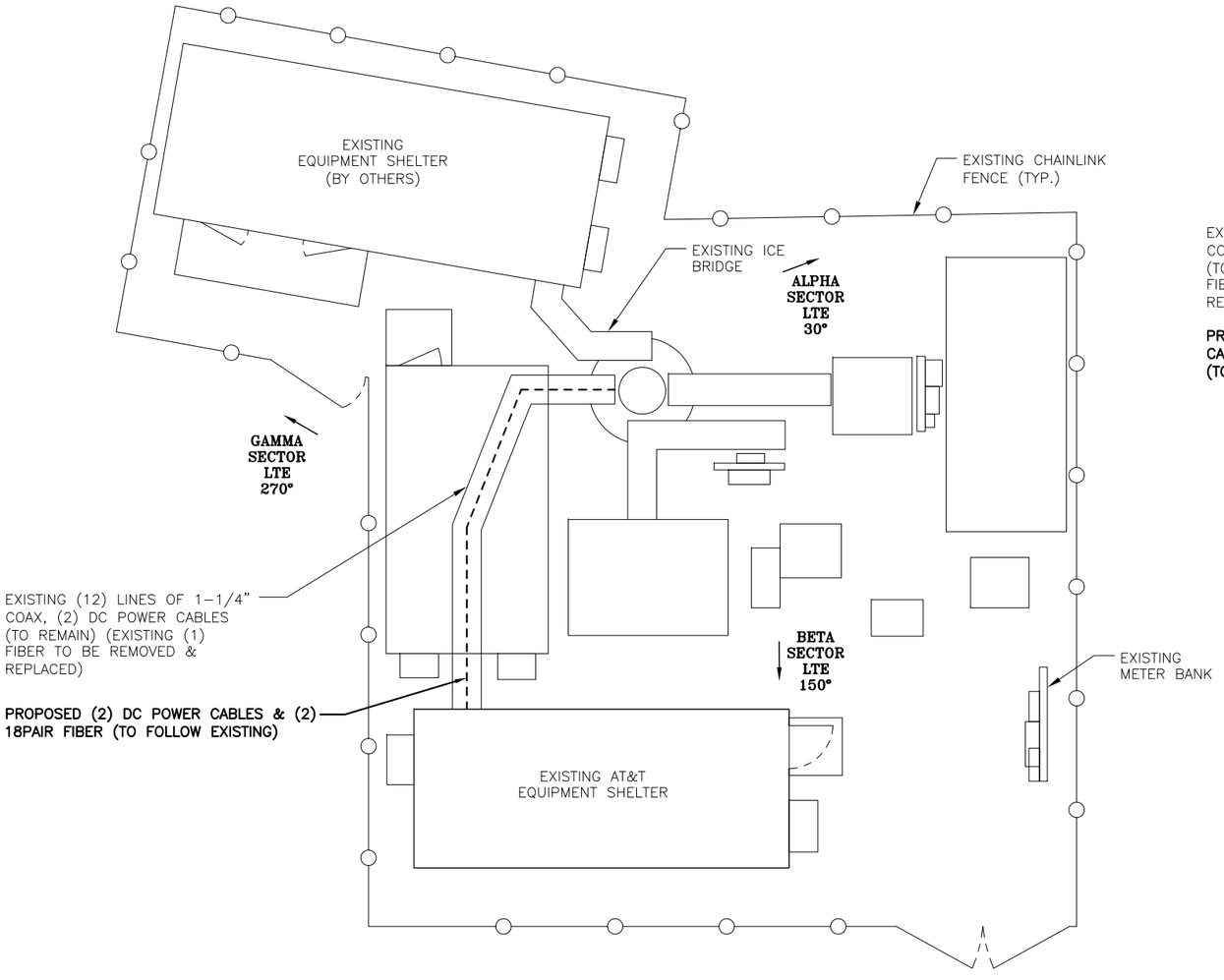
JOB NUMBER	DRAWING NUMBER	REV
2083.00	T-1	1

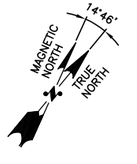
NOTE:

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

NOTE:

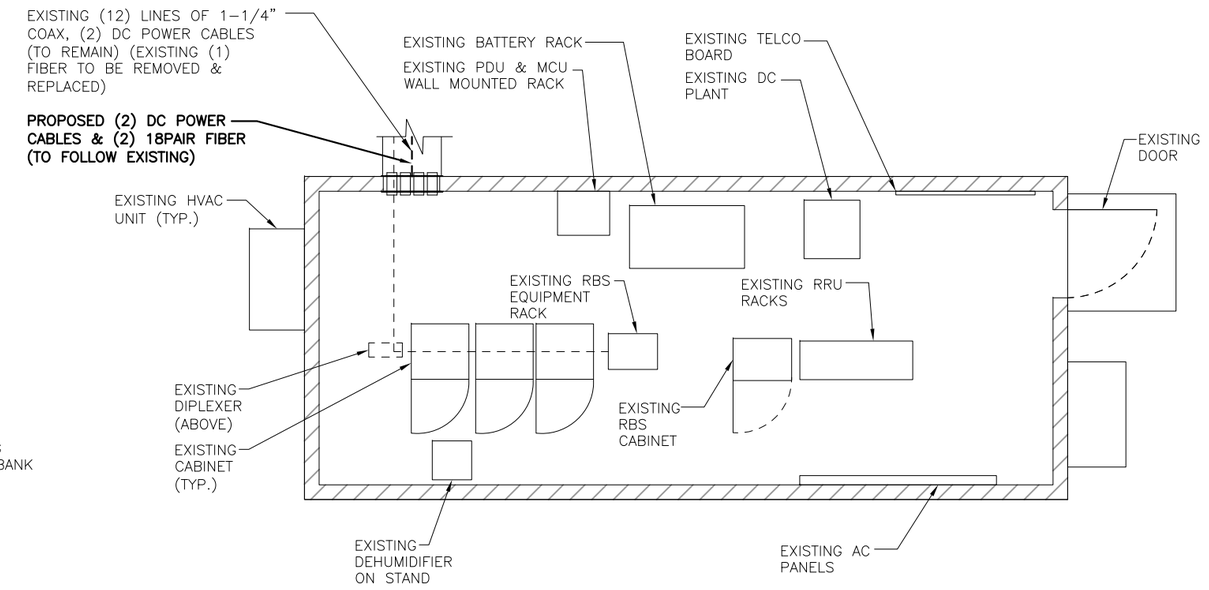
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

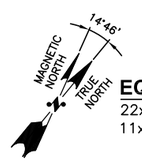




COMPOUND PLAN (1 / A-1)
22x34 SCALE: 3/16"=1'-0"
11x17 SCALE: 3/32"=1'-0"

0 2'-8" 5'-4" 10'-8" 16'-0"





EQUIPMENT ROOM PLAN (2 / A-1)
22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

0 1'-4" 2'-8" 5'-4" 8'-0"

Hudson Design Group LLC
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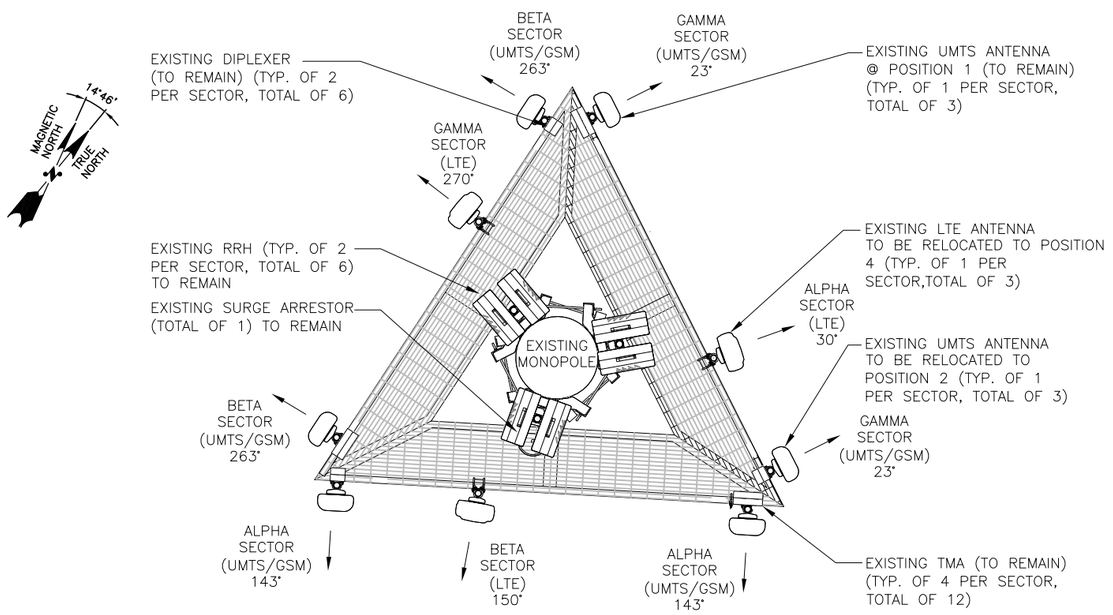
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: MR

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

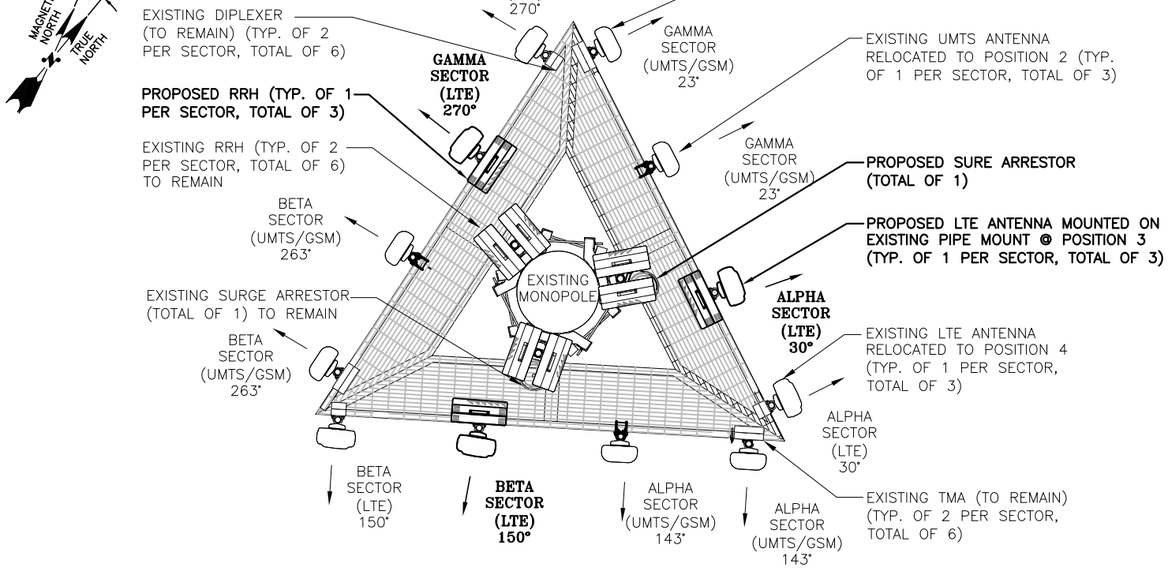
AT&T

COMPOUND AND EQUIPMENT PLAN
(LTE-3C)

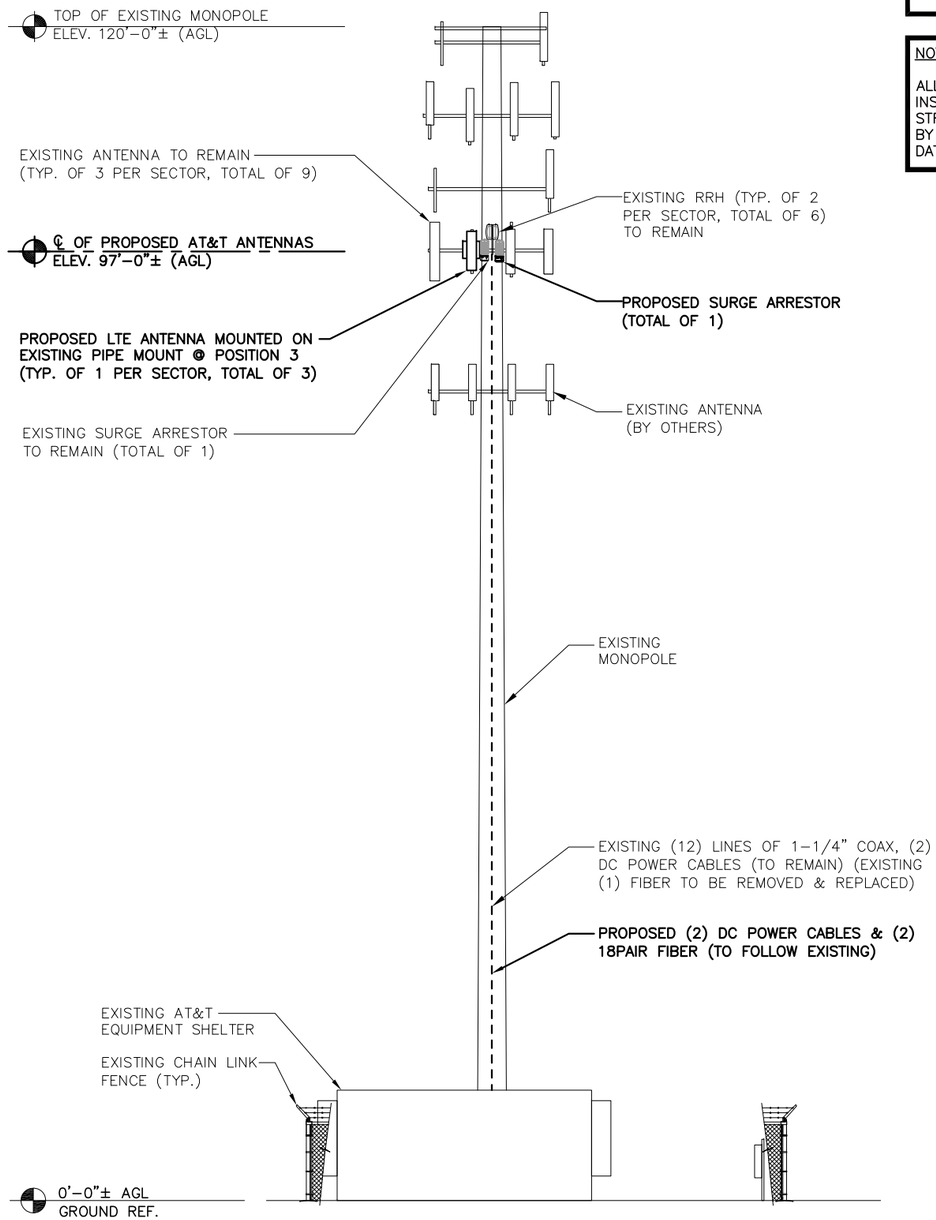
JOB NUMBER	DRAWING NUMBER	REV
2083.00	A-1	1



EXISTING ANTENNA LAYOUT (1 / A–2)
SCALE: N.T.S



PROPOSED ANTENNA LAYOUT (2 / A–2)
SCALE: N.T.S



SOUTH ELEVATION (3 / A–2)
22x34 SCALE: 1/8"=1'–0"
11x17 SCALE: 1/16"=1'–0"

0 4'–0" 8'–0" 16'–0" 24'–0"

NOTE:*

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

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

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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: MR

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AT&T

ANTENNA LAYOUT AND ELEVATION
(LTE–3C)

JOB NUMBER	DRAWING NUMBER	REV
2083.00	A–2	1

Excerpt from Passing Structural Analysis

PAUL J. FORD & COMPANY

Date: **May 15, 2015**

Jay Patton
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

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

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT2083
	Carrier Site Name:	Milford-Wheeler's Farm Road
Crown Castle Designation:	**Crown Castle BU Number:**	876320
	Crown Castle Site Name:	528 WHEELERS FARM RD
	Crown Castle JDE Job Number:	333360
	Crown Castle Work Order Number:	1060499
	Crown Castle Application Number:	293227 Rev. 1
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37515-1743.002.7805
Site Data:	**528 Wheelers Farm Road, MILFORD, New Haven County, CT** **Latitude *41° 14' 54.35"*, Longitude *-73° 4' 44.67"*** **120 Foot - Monopole Tower**	

Dear Jay Patton,

Paul J Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 786847, in accordance with application 293227, revision 1.

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

LC4.7: Existing + Reserved + Proposed Equipment + Proposed Modifications **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 the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 90 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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

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

Respectfully submitted by:

Corey McCartney, EI
Structural Designer

tnxTower Report - version 6.1.4.1

1) INTRODUCTION

This tower is a 120-ft Monopole tower designed by SUMMIT in February of 1997. 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 the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 90 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
97.0	97.0	3	ericsson	TME-RRUS-32 B30	1 2	3/8 5/8	-
		1	raycap	DC6-48-60-18-8F			
96.0	97.0	3	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe	-	-	-

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
127.0	128.0	3	rfs celwave	APXV18-206516S-C-A20 w/ Mount Pipe	6	1-5/8	3
	127.0	1	tower mounts	Pipe Mount (PM 701-1)			
122.0	125.0	2	andrew	VHLP2-11	6 4 3	5/16 1/2 1-1/4	1
	123.0	1	andrew	PX2F-52			
		1	mti wireless edge	MT-485025			
	122.0	3	argus technologies	LLPX310R w/ Mount Pipe			
		3	samsung	FDD_R6_RRH			
		1	tower mounts	Platform Mount [LP 713-1]			
	121.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		3	alcatel lucent	800MHZ RRH			
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		9	rfs celwave	ACU-A20-N			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	alcatel lucent	TD-RRH8x20-25	1	1-1/4	2
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
113.0	116.0	1	trimble	ACUTIME 2000	1 13	1/2 1-5/8	1
	114.0	3	alcatel lucent	RRH2x40-AWS			
		3	antel	BXA-171063-8BF-EDIN-0 w/ Mount Pipe			
		1	antel	BXA-70040/6CFx2 w/ Mount Pipe			
		1	antel	BXA-70040/6CFx4 w/ Mount Pipe			
		1	antel	BXA-70063/6CF w/ Mount Pipe			
		4	antel	LPA-80063/4CF w/ Mount Pipe			
		2	decibel	DB846F65ZAXY w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		6	rfs celwave	FD9R6004/2C-3L			
		3	rymsa wireless	MG D3-800Tx w/ Mount Pipe			
	113.0	1	tower mounts	Platform Mount [LP 303-1]			
105.0	107.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	6 7	1-1/4 1-5/8	1
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
	105.0	1	tower mounts	Platform Mount [LP 712-1]			
97.0	97.0	6	ericsson	RRUS 11	-	-	1
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Side Arm Mount [SO 102-3]			
96.0	97.0	6	powerwave	7770.00 w/ Mount Pipe	1 2 12	3/8 5/8 1-1/4	1
		3	powerwave	P65-16-XLH-RR w/ Mount Pipe			
	96.0	12	powerwave	LGP2140X			
		1	tower mounts	Platform Mount [LP 601-1]			
82.0	83.0	12	decibel	DB844H90-XY w/ Mount Pipe	12	7/8	3
	82.0	1	tower mounts	Platform Mount [LP 712-1]			
75.0	76.0	1	trimble	ACUTIME 2000	1	1/2	1
	75.0	1	tower mounts	Side Arm Mount [SO 701-1]			

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

Table 3 - Design Antenna and Cable Information

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

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 08-10145E G1, 10/22/2008	1613534	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit, 2249, 02/27/1997	1614583	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit, 2249, 02/27/1997	1614557	CCISITES
4-POST-MODIFICATION INSPECTION	Semaan, CT03XC038, 05/17/2004	3350209	CCISITES
4-POST-MODIFICATION INSPECTION	B&T, 80214, 07/15/2009	2460628	CCISITES
4-POST-MODIFICATION INSPECTION	B&T, 80214.003, 04/04/2012	3349204	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 1210009, 04/01/2013	3753892	CCISITES
4-PROPOSED TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37513-2328A, 2/10/2015	4961357	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 was reinforced in conformance with the referenced modification drawings.
5) Monopole will be reinforced in conformance with the referenced modification drawings.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	120 - 90.0833	Pole	TP28.0446x22x0.25	1	-11.04	1073.72	86.5	Pass
L2	90.0833 - 89.5	Pole	TP28.1625x28.0446x0.2893	2	-11.14	1092.90	87.5	Pass
L3	89.5 - 78	Pole	TP30.486x28.1625x0.4419	3	-12.61	1600.96	80.5	Pass
L4	78 - 72	Pole	TP31.1982x28.8446x0.4965	4	-15.29	1894.87	89.9	Pass
L5	72 - 70.5	Pole	TP31.5013x31.1982x0.4944	5	-15.62	1905.80	92.4	Pass
L6	70.5 - 69.75	Pole	TP31.6528x31.5013x0.5312	6	-15.81	2176.95	82.4	Pass
L7	69.75 - 54	Pole	TP34.8349x31.6528x0.685	7	-20.54	2930.68	81.4	Pass
L8	54 - 53.5	Pole	TP34.9359x34.8349x0.687	8	-20.70	3089.95	77.8	Pass
L9	53.5 - 39.75	Pole	TP37.714x34.9359x0.5346	9	-23.15	2759.23	97.3	Pass
L10	39.75 - 35	Pole	TP38.0487x35.6851x0.7536	10	-27.54	4011.97	76.8	Pass
L11	35 - 25	Pole	TP40.069x38.0487x0.7309	11	-31.26	4117.49	82.4	Pass
L12	25 - 14.5	Pole	TP42.1905x40.069x0.7714	12	-35.52	4590.76	81.0	Pass
L13	14.5 - 4.75	Pole	TP44.1603x42.1905x0.797	13	-39.77	4985.98	80.3	Pass
L14	4.75 - 0	Pole	TP45.12x44.1603x0.6706	14	-41.64	4303.94	95.7	Pass
							Summary	
						Pole (L9)	97.3	Pass
						RATING =	**97.3**	**Pass**

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	79.2	Pass
1	Base Plate	0	46.4	Pass
1	Base Foundation Steel	0	66.4	Pass
1, 2	Base Foundation Soil Interaction	0	88.3	Pass

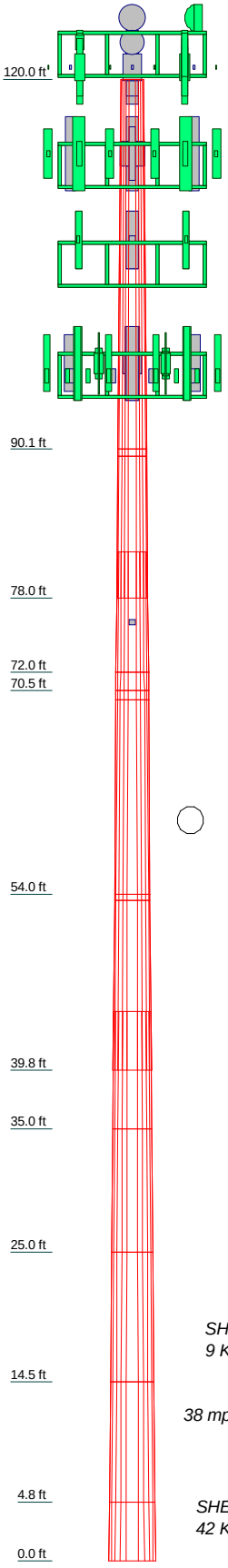
Structure Rating (max from all components) =	**97.3%**

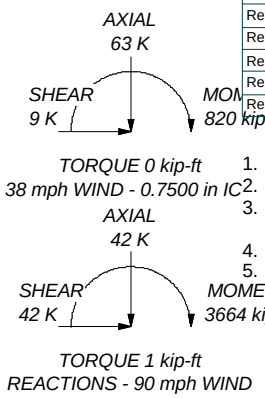
Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.
2) Foundation Analysis Notes: According to the procedures prescribed and agreed to by the Crown Castle Engineering Foundation Committee, held in January 2010, the existing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

4.1) Recommendations

- Install the modifications as per the proposed modification drawings referenced in Table 4.

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Length (ft)	29.92	0.58	11.50	9.75	0.75	0.75	15.75	0.50	13.75	9.50	10.00	10.50	9.75	4.75
Number of Sides	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Thickness (in)	0.2500	0.2893	0.4419	0.4965	0.5444	0.5444	0.6849	0.6870	0.5346	0.7536	0.7309	0.7714	0.7970	0.6705
Socket Length (ft)			3.75						4.75					
Top Dia (in)	22.0000	28.0446	28.1625	28.8446	31.0198	31.0198	31.6528	34.8349	34.9359	35.6851	38.0487	40.0690	42.1904	44.1603
Bot Dia (in)	28.0446	28.1625	30.4860	31.1982	31.3581	31.3581	34.8349	34.9359	37.7140	38.0487	40.0690	42.1904	44.1603	45.1200
Grade	A607-60	Reinf 52.62 ksi	Reinf 48.04 ksi	Reinf 48.27 ksi	Reinf 51.13 ksi	Reinf 51.13 ksi	Reinf 48.65 ksi	Reinf 48.65 ksi	Reinf 50.99 ksi	Reinf 55.43 ksi	Reinf 55.61 ksi	Reinf 55.79 ksi	Reinf 56.02 ksi	Reinf 56.07 ksi
Weight (K)	2.0	0.1	1.6	1.6	0.3	0.3	3.8	0.1	2.9	2.8	3.1	3.6	3.6	1.5





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
LLPX310R w/ Mount Pipe	122	DB-T1-6Z-8AB-0Z	113
LLPX310R w/ Mount Pipe	122	Platform Mount [LP 303-1]	113
LLPX310R w/ Mount Pipe	122	(2) DB846F65ZAXY w/ Mount Pipe	113
MT-485025	122	(2) LPA-80063/4CF w/ Mount Pipe	113
FDD_R6_RRH	122	(2) LPA-80063/4CF w/ Mount Pipe	113
FDD_R6_RRH	122	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	105
FDD_R6_RRH	122	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	105
APXVTM14-C-120 w/ Mount Pipe	122	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	105
APXVTM14-C-120 w/ Mount Pipe	122	KRY 112 144/1	105
APXVTM14-C-120 w/ Mount Pipe	122	KRY 112 144/1	105
TD-RRH8x20-25	122	KRY 112 144/1	105
TD-RRH8x20-25	122	Platform Mount [LP 712-1]	105
TD-RRH8x20-25	122	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
APXVSPP18-C-A20 w/ Mount Pipe	122	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
APXVSPP18-C-A20 w/ Mount Pipe	122	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
APXVSPP18-C-A20 w/ Mount Pipe	122	DC6-48-60-18-8F	97
PCS 1900MHz 4x45W-65MHz	122	DC6-48-60-18-8F	97
PCS 1900MHz 4x45W-65MHz	122	RRUS 11	97
PCS 1900MHz 4x45W-65MHz	122	RRUS 11	97
(3) ACU-A20-N	122	RRUS 11	97
(3) ACU-A20-N	122	RRUS 11	97
(3) ACU-A20-N	122	RRUS 11	97
800 EXTERNAL NOTCH FILTER	122	RRUS 11	97
800 EXTERNAL NOTCH FILTER	122	(2) 2.375" OD x 5' Mount Pipe	97
800 EXTERNAL NOTCH FILTER	122	(2) 2.375" OD x 5' Mount Pipe	97
800MHZ RRH	122	(2) 2.375" OD x 5' Mount Pipe	97
800MHZ RRH	122	Side Arm Mount [SO 102-3]	97
800MHZ RRH	122	RRUS-32 B30	97
Platform Mount [LP 713-1]	122	RRUS-32 B30	97
PX2F-52	122	RRUS-32 B30	97
VHLP2-11	122	(2) 7770.00 w/ Mount Pipe	96
VHLP2-11	122	(2) 7770.00 w/ Mount Pipe	96
MG D3-800Tx w/ Mount Pipe	113	(2) 7770.00 w/ Mount Pipe	96
MG D3-800Tx w/ Mount Pipe	113	P65-16-XLH-RR w/ Mount Pipe	96
MG D3-800Tx w/ Mount Pipe	113	P65-16-XLH-RR w/ Mount Pipe	96
(2) FD9R6004/2C-3L	113	P65-16-XLH-RR w/ Mount Pipe	96
(2) FD9R6004/2C-3L	113	(4) LGP2140X	96
(2) FD9R6004/2C-3L	113	(4) LGP2140X	96
ACUTIME 2000	113	(4) LGP2140X	96
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	113	Platform Mount [LP 601-1]	96
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	113	OPA-65R-LCUU-H6 w/ Mount Pipe	96
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	113	OPA-65R-LCUU-H6 w/ Mount Pipe	96
BXA-70063/6CF w/ Mount Pipe	113	OPA-65R-LCUU-H6 w/ Mount Pipe	96
BXA-70040/6CFx4 w/ Mount Pipe	113	Side Arm Mount [SO 701-1]	75
BXA-70040/6CFx2 w/ Mount Pipe	113	ACUTIME 2000	75
RRH2x40-AWS	113		
RRH2x40-AWS	113		
RRH2x40-AWS	113		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	Reinf 55.33 ksi	55 ksi	70 ksi
Reinf 52.62 ksi	53 ksi	66 ksi	Reinf 55.43 ksi	55 ksi	70 ksi
Reinf 48.04 ksi	48 ksi	61 ksi	Reinf 55.61 ksi	56 ksi	70 ksi
Reinf 48.27 ksi	48 ksi	61 ksi	Reinf 55.79 ksi	56 ksi	70 ksi
Reinf 51.13 ksi	51 ksi	64 ksi	Reinf 56.02 ksi	56 ksi	71 ksi
Reinf 48.65 ksi	49 ksi	61 ksi	Reinf 56.07 ksi	56 ksi	71 ksi
Reinf 50.99 ksi	51 ksi	64 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 97.3%

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

Job: **Ex 120 ft Monopole / 528 Wheelers Farm Rd**			
Project: **PJF 37515-1743.002.7805 / BU 876320**			
Client: CCI	Drawn by: Corey McCartney	App'd:	
Code: TIA/EIA-222-F	Date: 05/15/15	Scale: NTS	
Path:		Dwg No. E-1	

Excerpt from Modification Inspection Report

June 23, 2015

John McGee
Crown Castle
3530 Toringdon Way, STE 300
Charlotte, NC 28277
(980) 209-8253
John.McGee@crowncastle.com

Sinnott Gering and Schmitt Towers, INC
14301 First National Bank Pkwy, STE 100
Omaha, NE 68154
(402) 507-5170
SGS_PMI@sgstowers.com

Subject: ***Modification Inspection Report***

Crown Castle Designation:	**Crown Castle BU Number:**	876320
	Crown Castle Site Name:	528 WHEELERS FARM RD
	Crown Castle JDE Job Number:	246802
Engineering Firm Designation:	**SGS Project Number:**	145190
Site Data:	**528 Wheelers Farm Road Milford, CT 06460 N 41° 14' 54.35", W 73° 4' 44.67" 120 Foot Monopole**	

Dear Mr. McGee,

Sinnott Gering and Schmitt Towers, Inc. (SGS) is pleased to submit this "Modification Inspection Report" (MI Report) to Crown Castle for the modification/reinforcement to the subject structure. This Modification Inspection (MI) was performed in accordance with Crown Castle ENG-SOW-10007 Modification Inspection SOW, Contract Documents, and Crown Castle Purchase Order number 663673. The purpose of this MI is to confirm that the modification installation configuration and workmanship are in accordance with the contract document(s) listed in Table 2. The MI is not a review of the adequacy or effectiveness of the modification/reinforcement solution.

Table 1 – General Information

	Company	Contact	Dates on Site
MI Inspector	SGS	Nicholas J. Schmitt, P.E., S.E.	N/A
MI Inspector Field Representative (if applicable)	SGS	Luke Troxler	June 17, 2015
■ Independent	☐ EOR	☐ Turnkey	
Modification Design EOR	Paul J. Ford	Justin Kline, P.E.	N/A
General Contractor	Foss	Matt Hague	Unknown
Sub to the General Contractor	N/A	N/A	N/A
Field CWI for the General Contractor	N/A	N/A	N/A
Field NDE for the General Contractor	N/A	N/A	N/A

Table 2 – Documents

Document(s)	Remarks	Source
Modification Drawings Date: 2/11/2015 EOR: Justin Kline, P.E. Job#: 37513-2328A	Creator of Drawings: Paul J. Ford Job #: 37513-2328A Date of Drawings: 2/11/2015	CCI Sites Drawing File: 4961357

Based on our inspection, SGS determines this project:

X PASSING MI

The configuration, materials and/or workmanship of the modifications are installed in accordance with the Contract Documents and no deficiencies were found.

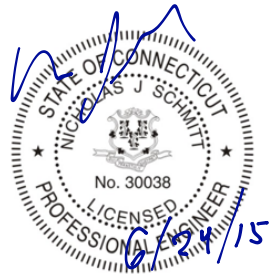
EXECUTIVE SUMMARY

MODIFICATION	CONFIGURATION	MATERIALS	WORKMANSHIP
Install Plate Shaft Reinforcement. Flats 3 & 11 from 52' to 72'.	Passing	Passing	Passing
Note: Installed Shaft Reinforcement was Different than Designed. Note: Shaft Reinforcement was Installed Lower than Designed. Note: Existing C Channel was Removed for Fit Up of Plate Shaft Reinforcement. See Section 6.3.2 for EOR Approval E-Mail.			
Install Plate Shaft Reinforcement. Flats 5 & 9 from 52' to 92' 1''.	Passing	Passing	Passing
Note: Extra Punched Holes were Noted on Newly Installed Plate Shaft Reinforcement. See Section 6.3.2 for EOR/Crown Approval E-Mail.			
Install Plate Shaft Reinforcement. Flats 1 & 10 from 67' to 92'.	Passing	Passing	Passing
Remove Existing Mount. 82'.	Passing	Passing	Passing
Note: Existing Mount Removed at 127' per CCI Instruction. See Section 6.3.2 for Photo/Crown Approval E-Mail.			

All observations were performed after the construction was complete. SGS was not present during the construction phase. The onsite PMI was performed by Luke Troxler, SGS.

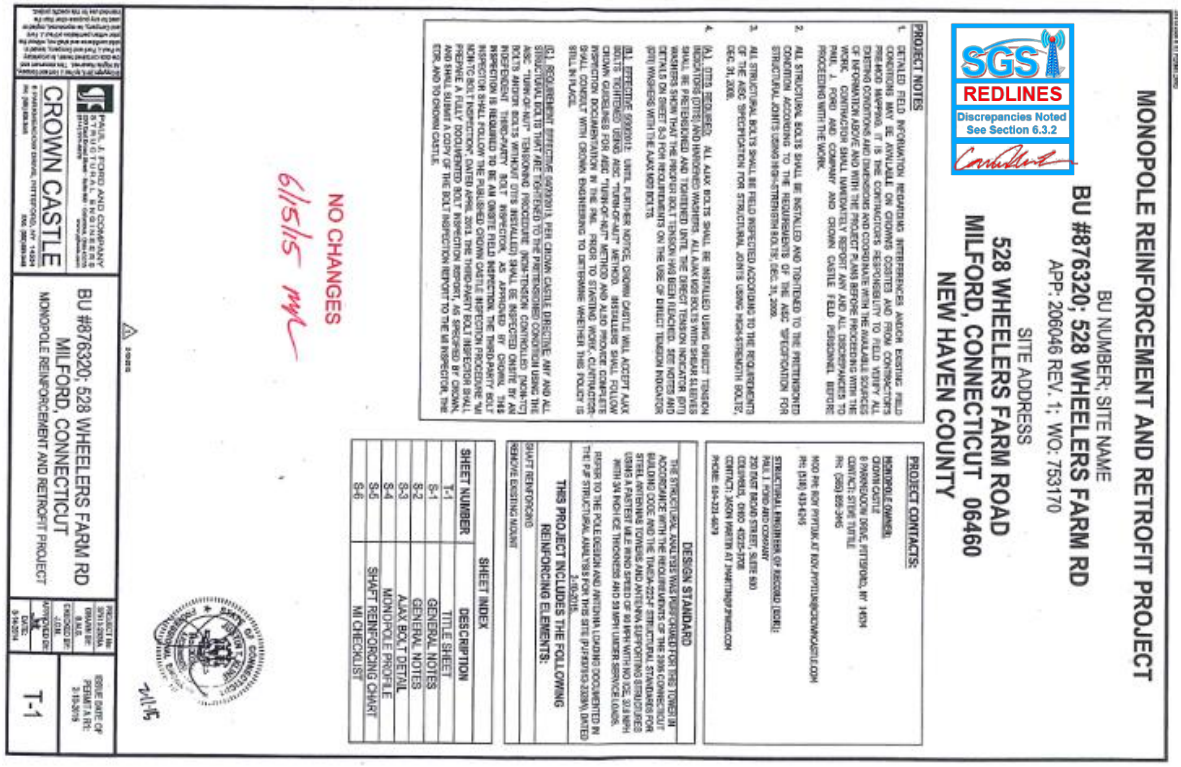
We at SGS appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted,



Nick Schmitt, P.E., S.E.

6.3.1 MI INSPECTOR REDLINE OR RECORD DRAWING(S)



MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER: SITE NAME

BU #876320; 528 WHEELERS FARM RD

APP: 206046 REV. 1; WO: 753170

SITE ADDRESS

528 WHEELERS FARM ROAD

MILFORD, CONNECTICUT 06460

NEW HAVEN COUNTY

SGS REDLINES Discrepancies Noted See Section 6.3.2

PROJECT NOTES

PROJECT CONTACTS:

DESIGN STANDARD

THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:

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	SHAFT REINFORCING CHART
S-6	MI CHECKLIST

NO CHANGES 6/15/15

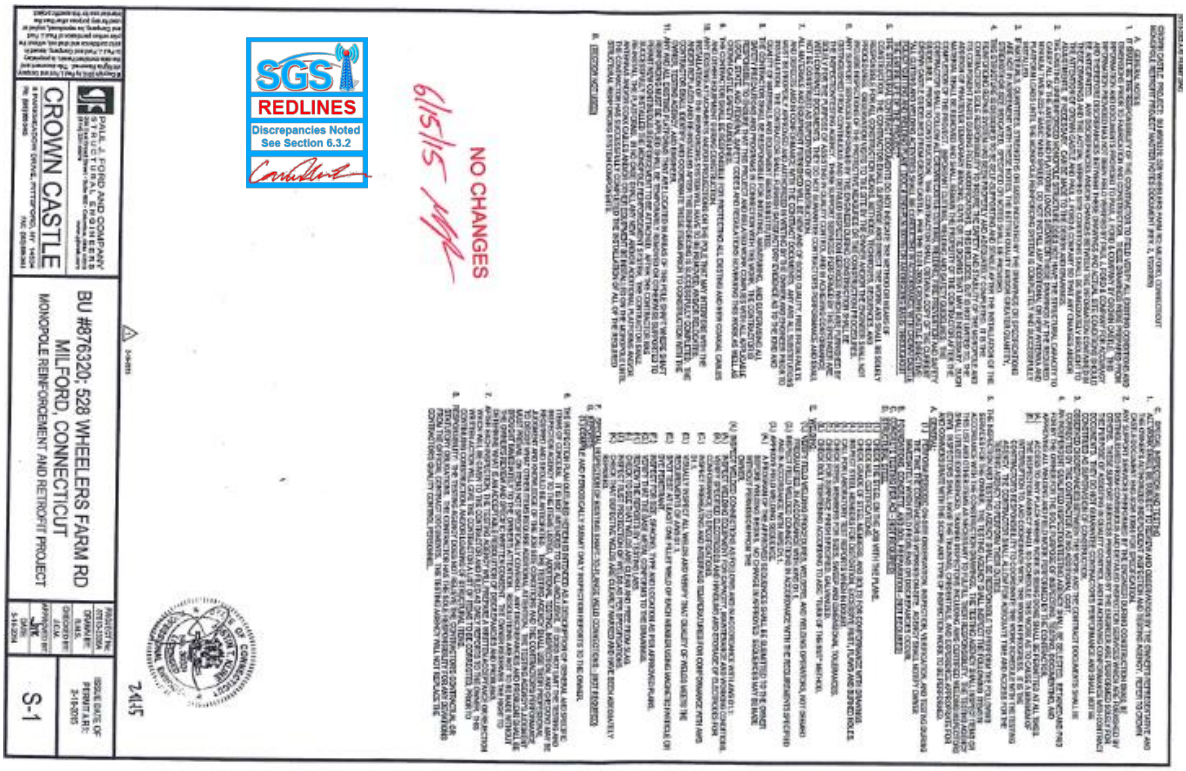
CROWN CASTLE

BU #876320; 528 WHEELERS FARM RD

MILFORD, CONNECTICUT

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

T-1



MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

SGS REDLINES Discrepancies Noted See Section 6.3.2

NO CHANGES 6/15/15

CROWN CASTLE

BU #876320; 528 WHEELERS FARM RD

MILFORD, CONNECTICUT

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

S-1

B. STRUCTURAL STEEL
C. 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".
(A.) "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"
(A.) "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 TO "SNUG TIGHT" TO CAUSE 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 E8XXX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' QUALIFICATION 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 F_Y = 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 ON 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 ARE 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, RESULTING FROM THE CONTRACTOR'S ACTIVITIES. SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTOR/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
(C.) ALL RECQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

E. BASE PLATE GROUT - (NOT REQUIRED)
F. FOUNDATION WORK - (NOT REQUIRED)

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

I. TOUCH UP OF GALVANIZING
1. THE CONTRACTOR SHALL "TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ARE AFFECTED 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 ZINC-RICH ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.6 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-631-3373 FOR PRODUCT INFORMATION.
2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS OR GALVANIZED AND PRE-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. NOT OF DISCERNED, ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
2. PREPARLY PREPARE STEEL ITEMS FOR GALVANIZING.
3. DRILL OR PUNCH WEEP HOLES AS SHOWN ON DRAWINGS AND AS REQUIRED.
4. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

K. PERIODIC 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 PERIODICAL 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 SIGNIFICANT UPON THE INSTALLED SIZE AND QUALITY. MAINTAINED SOUND CONDITION AND STRENGTH OF 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 FACTUAL 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 14.3, ASTIP 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".

SGS REDLINES Discrepancies Noted See Section 6.3.2

NO CHANGES
6/15/15

2-11-15

PAUL J. FORD AND COMPANY STRUCTURAL ENGINEERS
CROWN CASTLE
3 PARKMEADOW DRIVE, PITTSFORD, NY 14534
BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT
PROJECT No: 37513-239A
DRAWN BY: B.M.S.
CHECKED BY: J.C.M.
APPROVED BY: J.C.M.
DATE: 8-14-2014
ISSUE DATE OF PERMIT A'R1: 2-10-2015
S-2

AJAX BOLT NOTE SHEET: REV. 1.4, 9-26-2013

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 THEIM, 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

NO CHANGES
6/15/15

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.

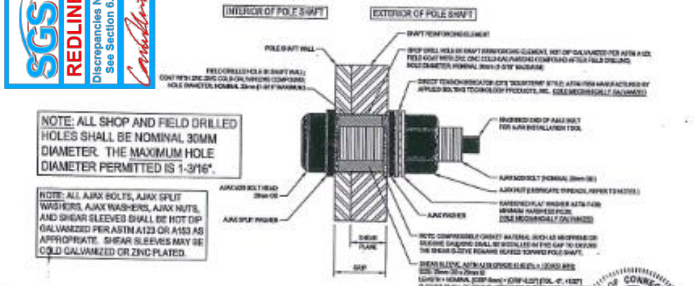
CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

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.

SGS REDLINES Discrepancies Noted See Section 6.3.2

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

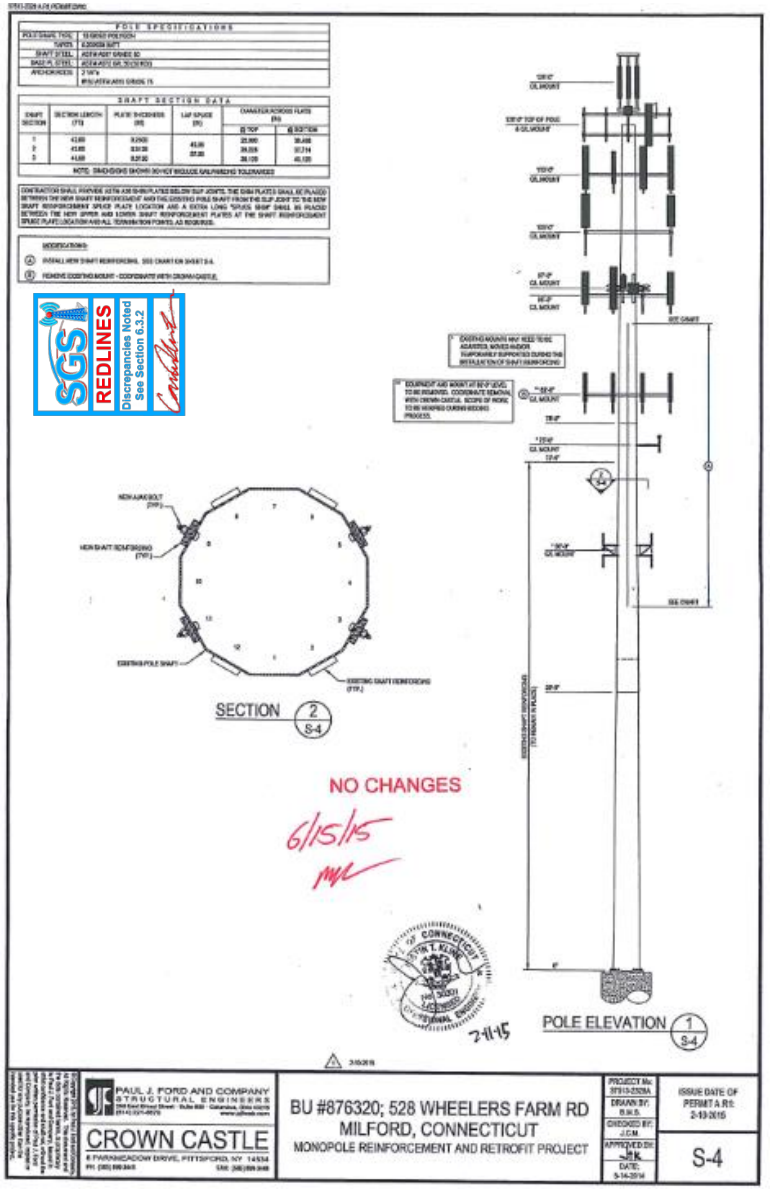
NOTE: ALL AJAX BOLTS, AJAX SPLIT WASHERS, AJAX WASHERS, AJAX NUTS, AND SHEAR SLEEVES SHALL BE HOT DIP GALVANIZED PER ASTM A123 OR A153 AS APPROPRIATE. SHEAR SLEEVES MAY BE COLD GALVANIZED OR ZINC PLATED.

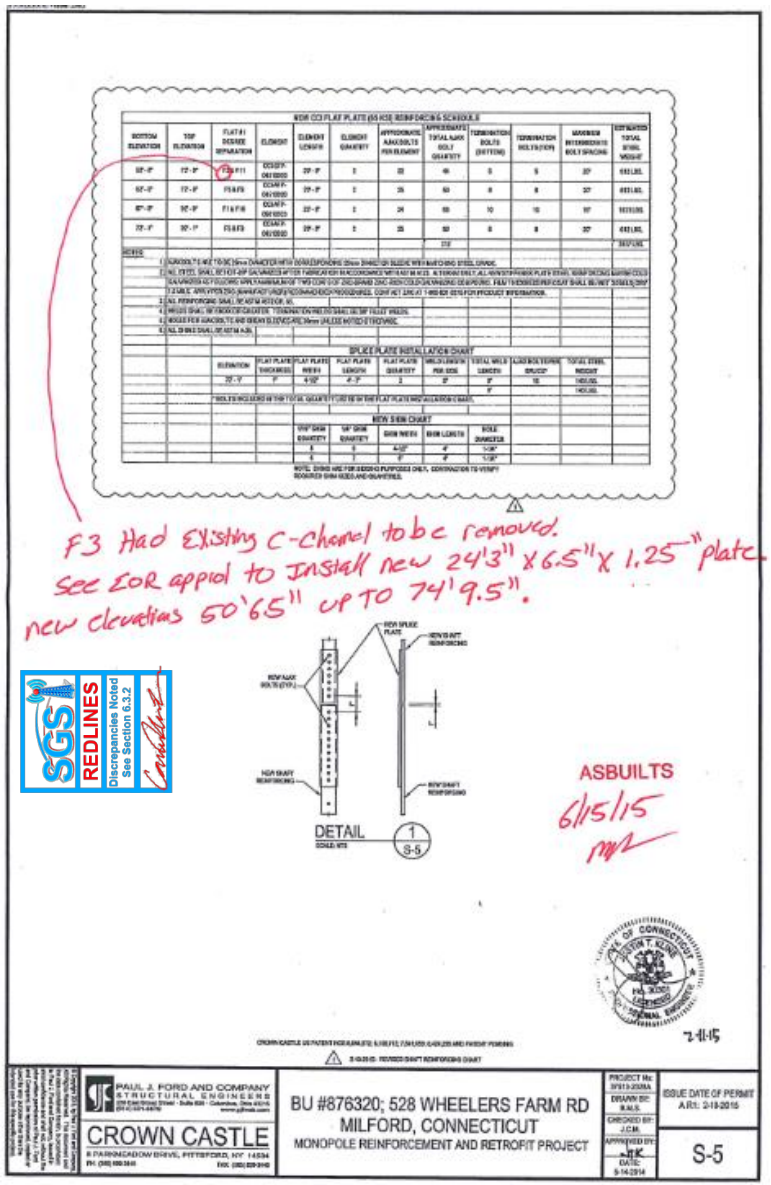


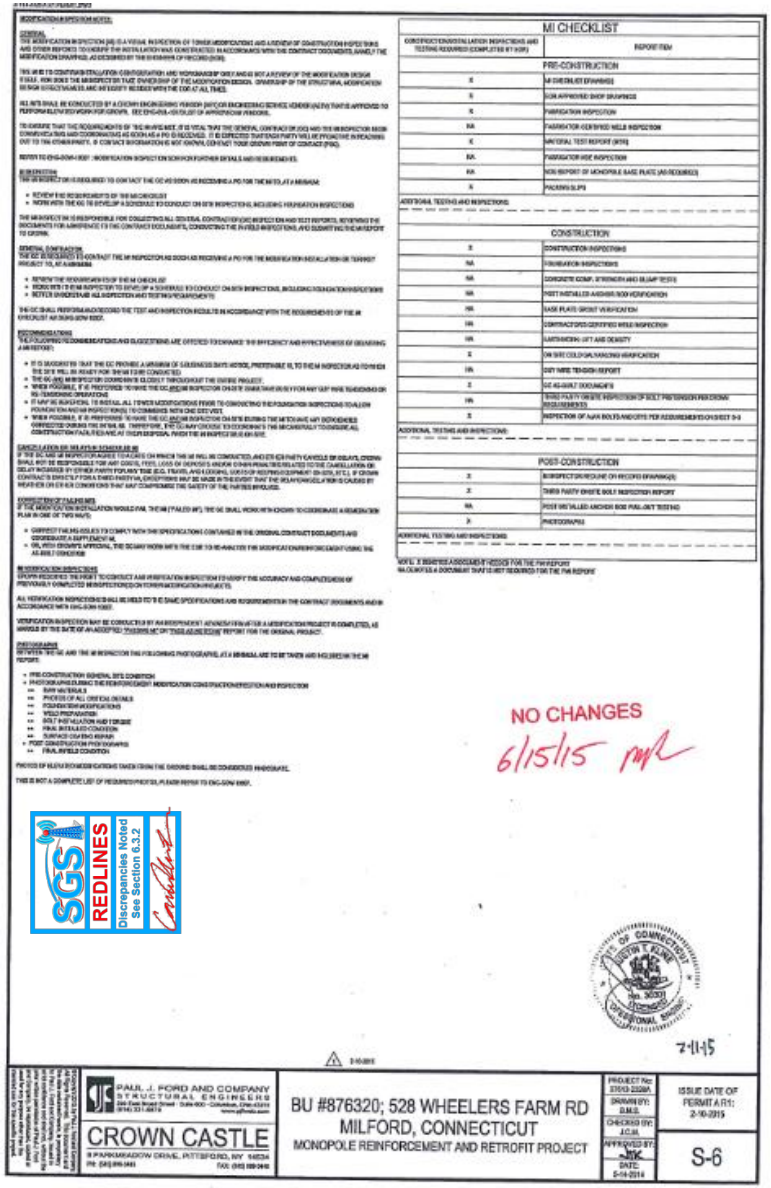
TYPICAL AJAX BOLT DETAIL 1 S-3

2-11-15

PAUL J. FORD AND COMPANY STRUCTURAL ENGINEERS
CROWN CASTLE
3 PARKMEADOW DRIVE, PITTSFORD, NY 14534
BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT
PROJECT No: 37513-239A
DRAWN BY: B.M.S.
CHECKED BY: J.C.M.
APPROVED BY: J.C.M.
DATE: 8-14-2014
ISSUE DATE OF PERMIT A'R1: 2-10-2015
S-3


POLE SPECIFICATIONS
SHAFT SECTION DATA
SGS
REDLINES
Discrepancies Noted
See Section 6.3.2
SECTION 2 S-4
POLE ELEVATION 1 S-4
NO CHANGES
6/15/15
2-11-15
PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
CROWN CASTLE
BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT
S-4


SPLICE PLATE INSTALLATION CHART
NEW SIGN CHART
F3 Had Existing C-channel to be removed.
See EOR appiol to Install new 24'3" X 6.5" X 1.25" plate
new elevations 50'6.5" up to 74'9.5".
SGS
REDLINES
Discrepancies Noted
See Section 6.3.2
DETAIL 1 S-5
ASBUILTS
6/15/15
2-11-15
PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
CROWN CASTLE
BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT
S-5



MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY MIR)	REPORT ITEM
	PRE-CONSTRUCTION
X	MI CHECKLIST (DRAWING)
X	SDR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	PAINTING INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
	CONSTRUCTION
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
NA	CONTRACTORS CERTIFIED WELD INSPECTION
NA	EARTHWORK: CUT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	DOT WIRE TEN-SION REPORT
X	GC AS-BUILT DOCUMENTS
NA	THIRD PARTY ON SITE INSPECTION OF BOLT PRETENSION PER DOWA REQUIREMENTS
X	INSPECTION OF NAVA BOLTS AND DITE PER ASSIGNMENT SHEET S-3
ADDITIONAL TESTING AND INSPECTIONS:	
	POST-CONSTRUCTION
X	INSPECTOR TO SIGN OFF ON RECORD DRAWINGS
X	THIRD PARTY ON SITE BOLT INSPECTION REPORT
NA	POST INSTALLED ANCHOR ROD PAIL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X INDICATES A REQUIREMENT NEEDED FOR THE FMI REPORT
NA OR NOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE FMI REPORT

NO CHANGES
6/15/15

REDLINES
Discrepancies Noted
See Section 6.3.2

7-11-15

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS

CROWN CASTLE

BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-230BA
DRAWN BY: D.M.S.
CHECKED BY: J.C.H.
APPROVED BY: [illegible]
DATE: 5-14-2014

ISSUE DATE OF PERMIT A R1: 2-10-2015

S-6

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

August 17, 2015

Mayor Benjamin G. Blake
Town of Milford
110 River Street
Milford, CT 06460

Re: Existing Telecommunications Facility – 528 Wheelers Farms Road, Milford

Dear Mayor Blake:

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

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

August 17, 2015

The Village Foundation Inc.
528 Wheelers Farms Road
Milford, CT 06461

Re: Existing Telecommunications Facility – 528 Wheelers Farms Road, Milford

To Whom It May Concern:

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.

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Sincerely,

Steven L. Levine
Real Estate Consultant

Enclosure

June 23, 2015

John McGee
Crown Castle
3530 Toringdon Way, STE 300
Charlotte, NC 28277
(980) 209-8253
John.McGee@crowncastle.com

Sinnott Gering and Schmitt Towers, INC
14301 First National Bank Pkwy, STE 100
Omaha, NE 68154
(402) 507-5170
SGS_PMI@sgstowers.com

Subject: ***Modification Inspection Report***

Crown Castle Designation:	**Crown Castle BU Number:**	876320
	Crown Castle Site Name:	528 WHEELERS FARM RD
	Crown Castle JDE Job Number:	246802
Engineering Firm Designation:	**SGS Project Number:**	145190
Site Data:	**528 Wheelers Farm Road** **Milford, CT 06460** **N 41° 14' 54.35", W 73° 4' 44.67"** **120 Foot Monopole**	

Dear Mr. McGee,

Sinnott Gering and Schmitt Towers, Inc. (SGS) is pleased to submit this "Modification Inspection Report" (MI Report) to Crown Castle for the modification/reinforcement to the subject structure. This Modification Inspection (MI) was performed in accordance with Crown Castle ENG-SOW-10007 Modification Inspection SOW, Contract Documents, and Crown Castle Purchase Order number 663673. The purpose of this MI is to confirm that the modification installation configuration and workmanship are in accordance with the contract document(s) listed in Table 2. The MI is not a review of the adequacy or effectiveness of the modification/reinforcement solution.

Table 1 – General Information

	Company	Contact	Dates on Site
MI Inspector	SGS	Nicholas J. Schmitt, P.E., S.E.	N/A
MI Inspector Field Representative (if applicable)	SGS	Luke Troxler	June 17, 2015
■ Independent	☐ EOR	☐ Turnkey	
Modification Design EOR	Paul J. Ford	Justin Kline, P.E.	N/A
General Contractor	Foss	Matt Hague	Unknown
Sub to the General Contractor	N/A	N/A	N/A
Field CWI for the General Contractor	N/A	N/A	N/A
Field NDE for the General Contractor	N/A	N/A	N/A

Table 2 – Documents

Document(s)	Remarks	Source
Modification Drawings Date: 2/11/2015 EOR: Justin Kline, P.E. Job#: 37513-2328A	Creator of Drawings: Paul J. Ford Job #: 37513-2328A Date of Drawings: 2/11/2015	CCI Sites Drawing File: 4961357

Based on our inspection, SGS determines this project:

X PASSING MI

The configuration, materials and/or workmanship of the modifications are installed in accordance with the Contract Documents and no deficiencies were found.

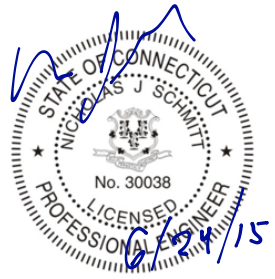
EXECUTIVE SUMMARY

MODIFICATION	CONFIGURATION	MATERIALS	WORKMANSHIP
Install Plate Shaft Reinforcement. Flats 3 & 11 from 52' to 72'.	Passing	Passing	Passing
Note: Installed Shaft Reinforcement was Different than Designed. Note: Shaft Reinforcement was Installed Lower than Designed. Note: Existing C Channel was Removed for Fit Up of Plate Shaft Reinforcement. See Section 6.3.2 for EOR Approval E-Mail.			
Install Plate Shaft Reinforcement. Flats 5 & 9 from 52' to 92' 1''.	Passing	Passing	Passing
Note: Extra Punched Holes were Noted on Newly Installed Plate Shaft Reinforcement. See Section 6.3.2 for EOR/Crown Approval E-Mail.			
Install Plate Shaft Reinforcement. Flats 1 & 10 from 67' to 92'.	Passing	Passing	Passing
Remove Existing Mount. 82'.	Passing	Passing	Passing
Note: Existing Mount Removed at 127' per CCI Instruction. See Section 6.3.2 for Photo/Crown Approval E-Mail.			

All observations were performed after the construction was complete. SGS was not present during the construction phase. The onsite PMI was performed by Luke Troxler, SGS.

We at SGS 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,



Nick Schmitt, P.E., S.E.

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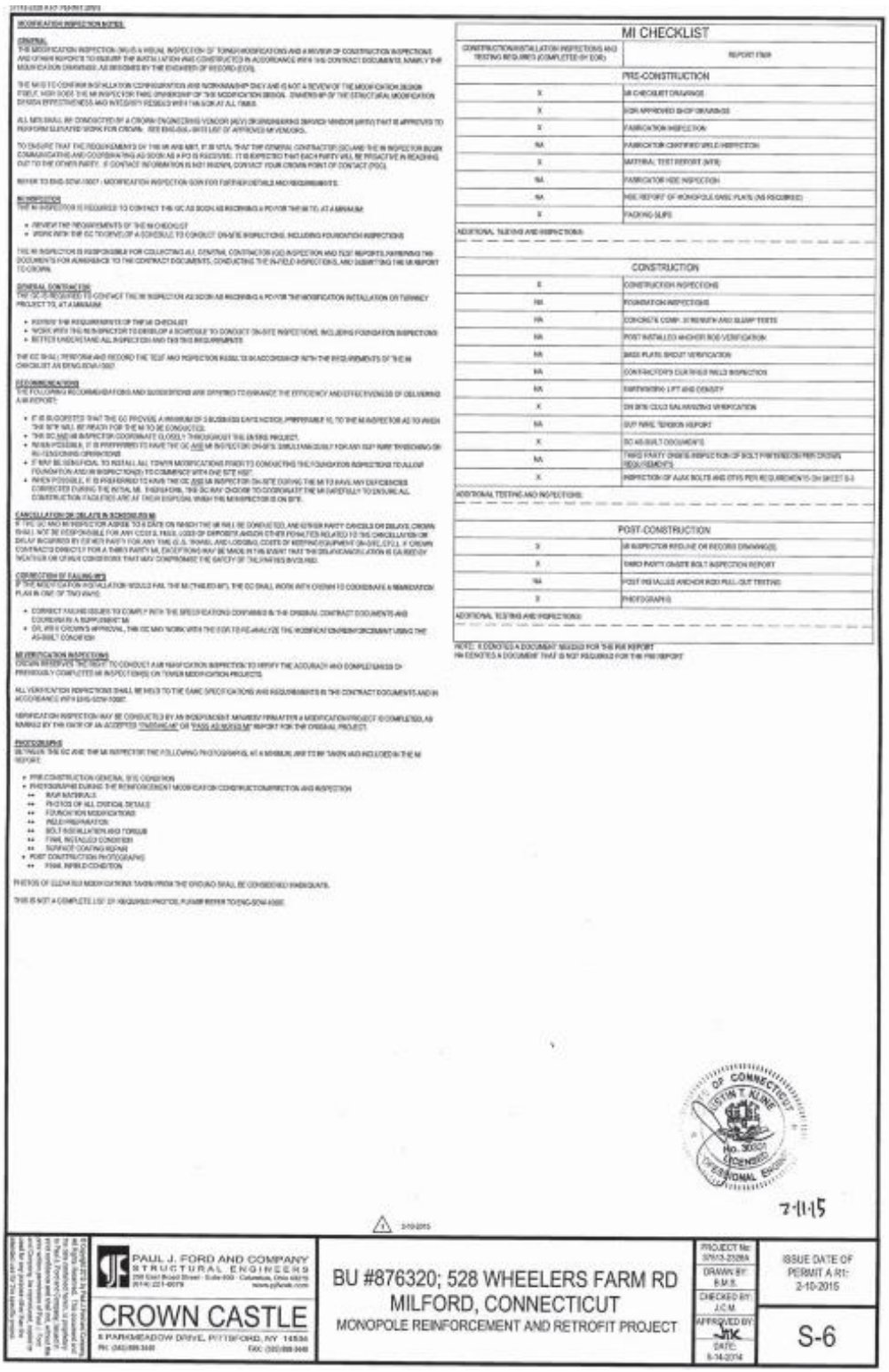
PRE-CONSTRUCTION

6.1.1 MI CHECKLIST DRAWING



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 REMAINS WITH THE EOR. THE MI INSPECTOR'S RESPONSIBILITY IS TO REVIEW THE EFFECTIVENESS AND INTEGRITY OF THE WORK AT ALL TIMES.

ALL MIS SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (ESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-SOW-0001 FOR LIST OF APPROVED MI VENDORS.

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

REFER TO ENG-SOW-0007 - MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTION
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 TOWER/C PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THIS 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-0007.

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 3 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 DESIRABLE TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTIONS TO COMPRISE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO AVOID ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI DATE FULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULING 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 MFS
IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI (THUS MF), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONFIRMED IN THE ORIGINAL CONTRACT DOCUMENTS AND COVERED IN A SUPPLEMENTAL MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION PER THE CONTRACT 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-0007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT MINIMUM THIRD-PARTY OR A MODIFICATION CONTRACTOR COMPLETED, AS MARKED BY THE ISSUE OF AN ACCEPTED "FINDINGS.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/INSTALLATION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - PIER PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INSTALLED CONDITION

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

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS. PLEASE REFER TO ENG-SOW-0007.

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
	PRE-CONSTRUCTION
X	MI CHECKLIST DRAWINGS
X	EOR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED MILL INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR HDG INSPECTION
NA	HDG REPORT OF MONOPOLE BASE PLATE (NS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
	CONSTRUCTION
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE SHIM VERIFICATION
NA	CONTRACTOR'S QUALIFIED WELD INSPECTION
NA	TIGHTENING LIFT AND CONSIST
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	EC AS-BUILT DOCUMENTS
NA	THIRD PARTY ONSITE INSPECTION OF BOLT PRETENSION PER CROWN SOW REQUIREMENTS
X	INSPECTION OF AJAX BOLTS AND DTIS PER REQUIREMENTS ON SHEET S-1
ADDITIONAL TESTING AND INSPECTIONS:	
	POST-CONSTRUCTION
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	THIRD PARTY ONSITE BOLT INSPECTION REPORT
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

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

CONNECTICUT — JUSTIN T. ALLINE — No. 30120 — LICENSED PROFESSIONAL ENGINEER

2-11-15

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street - Suite 900 - Columbus, Ohio 43215
(614) 221-6679
www.pjford.com

CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
PH: (585) 586-3440 FAX: (585) 586-3446

BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37613-2526A
DRAWN BY: B.M.S.
CHECKED BY: J.C.M.
APPROVED BY: JTK
DATE: 6-14-2014

ISSUE DATE OF PERMIT A R1: 2-10-2015

S-6

6.1.2 EOR APPROVED SHOP DRAWINGS

From: Jason Martin <jmartin@pjfweb.com>
Sent: Monday, June 15, 2015 12:59 PM
To: Matt Hague
Cc: pjfmod
Subject: RE: Emailing: 876320 Wheelers Farm existing conditions, New folder (2), New folder

Matt,

The shop drawing requirement may be waived. Thanks!

Jason C. Martin, E.I.
Main: 614.221-6679 ext 4175
Direct: 614.448-4175
E-Mail: jmartin@pjfweb.com
www.pauljford.com

PJF PAUL J. FORD & COMPANY

6.1.3 FABRICATION INSPECTION

ALLFASTENERS®

SERVICE | SOLUTIONS | SUPPLY FOR ALL YOUR FASTENING NEEDS

To: R F Telecom
1084 Bethlehem Pike
Montgomeryville, PA 18936

Subject: PO: 10995

June 12, 2015

Please accept this letter as certification that our work on Steel Package for 528 Wheelers Farm Rd - 876320 was performed in accordance with industry standards and the contractor documents.

Please contact me if you have any questions.

Thank you

Fabrication Project Manager

Allfasteners USA LLC.

New York
69 Orchard Street,
Ramsey, New Jersey 07446
Tel 1-800-577-3171
Fax +1 (201) 783-8840

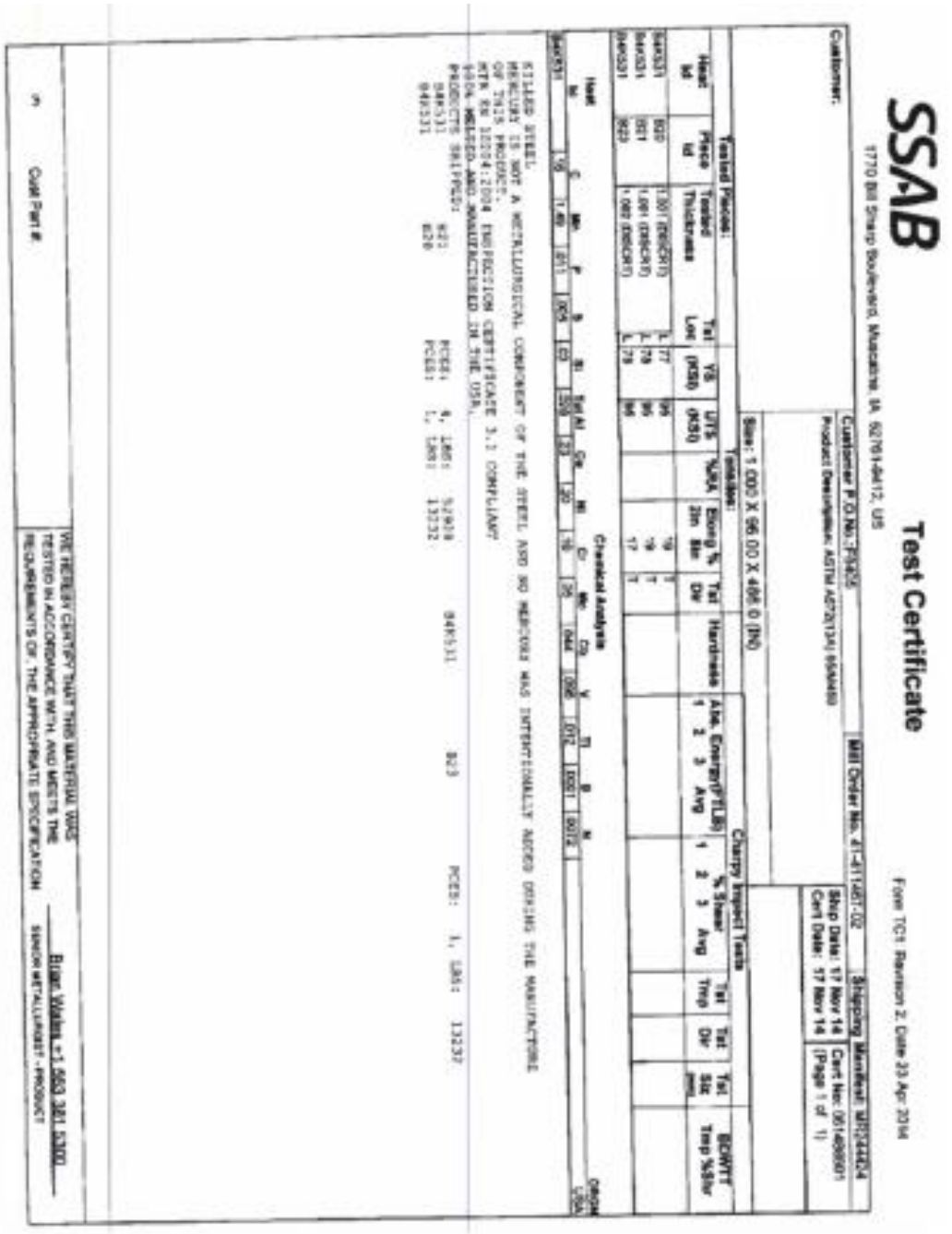
Cleveland
15401 Commerce Park Drive,
Cleveland, Ohio 44142
Tel 1-888-859-6060
Fax +1 (440) 232-6062

Los Angeles
5460 W. 83rd Street,
Los Angeles, California 90045
Tel +1 (310) 410-5007
Fax +1 (310) 410-5004

Nebraska
102 8th Street,
Gothenburg, Nebraska 69138
Tel 1-855-330-2210
Fax +1 (308) 537-3500

sales@allfasteners.com | www.allfasteners.com

6.1.4 MATERIAL TEST REPORT (MTR)



SSAB

Test Certificate

Form TC1 Revision 2, Date 23 Apr 2014

1770 Bill Sharp Boulevard, Muscatine, IA 52761-8412, US

Customer:

Customer P.O.No.:79425

Mill Order No.: 41-01146T-02

Shipping Manifest: MH244824

Product Description: ASTM A572(13A) 65KI/450

Ship Date: 17 Nov 14

Cert Date: 17 Nov 14

Cert No: 06140901

(Page 1 of 1)

Size: 1.000 X 96.00 X 408.0 (IN)

Tested Pieces:

Tensiles:

Charpy Impact Tests

Heat Id	Piece Id	Tested Thickness	Txt Loc	YS (KSI)	UTS (KSI)	%RA	Elong % 2in	Elong % 8in	Txt Dir	Hardness	Abs. Energy(FT-LBS) 1	2	3	Avg	% Shear 1	2	3	Avg	Txt Temp	Txt Dir	Txt Size mm	BCWPT Temp %Shr
949331	820	1.001 (DISCRT)	L 77	99			19	7														
949331	821	1.001 (DISCRT)	L 79	96			19	7														
949331	822	1.002 (DISCRT)	L 78	94			17	7														

Heat Chemical Analysis

Heat Id	C	Mn	P	S	Si	Sol Al	Cb	Ni	Cr	Mo	Cu	V	Ti	B	N	CEQ(IIW)
Specs	.16	1.40	.041	.005	.03	.020	.030	.20	.16	.05	.044	.006	.012	.0001	.0070	.39
949331	.16	1.41	.005	.03	.350	.030	.030	.20	.16	.05	.044	.006	.012	.0001	.0070	.39

SILICON KILLED STEEL.
MERCURY IS NOT A METALLURGICAL COMPONENT OF THE STEEL AND NO REPORTS WAS INTENTIONALLY ADDED DURING THE MANUFACTURE OF THIS PRODUCT.
MTR IS 10204:2004 INSPECTION CERTIFICATE 3.1 COMPLIANT
10204 WELDED AND MANUFACTURED IN THE USA.

PRODUCTS SHIPPED:

949331	821	PCS:	4, 1851	52918	949331	823	PCS: 1, 1851	13237
949331	820	PCS:	1, 1851	13232				

WE HEREBY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH AND MEETS THE REQUIREMENTS OF THE APPROPRIATE SPECIFICATION

Brian Wiebke +1 563 381 5300

SENIOR METALLURGIST - PRODUCT

Cust Part #:

SSAB

Test Certificate

Form TC1: Revision 2: Date 23 Apr 2014

1770 Bill Sharp Boulevard, Muscatine, IA 52761-9412, US

Customer:	Customer P.O.No.:F8442	Mill Order No. 41-413026-03	Shipping Manifest: MR245048
	Product Description: ASTM A572(13A) 65/M450 LCVN 15 FT.LBS.@ +40F / A673-H	Ship Date: 24 Nov 14 Cert Date: 24 Nov 14	Cert No: 061487839 (Page 1 of 1)
	Size: 1.250 X 96.00 X 480.0 (IN)		

Tested Pieces:				Tensiles:						Charpy Impact Tests								
Heat Id	Piece Id	Tested Thickness	Tst Loc	YS (KSI)	UTS (KSI)	%RA	Elong % 2in 8in	Tst Dir	Hardness	Abs. Energy(FTLB) 1 2 3 Avg	% Shear 1 2 3 Avg	Tst Tmp	Tst Dir	Tst Siz (mm)	BDWTT Tmp %Shr
A4K153	C15	1.249 (DISCRT)	L	75	95		22	T		107 109 106 107		40F	L	10.	
A4K153	C16	1.249 (DISCRT)	L	73	92		18	T		114 102 108 108		40F	L	10.	

Heat Id	Chemical Analysis C	Mn	P	S	Si	Tot Al	Cu	Ni	Cr	Mo	Cb	V	Ti	B	N	ORGN
A4K153	.17	1.43	.014	.002	.05	.033	.26	.20	.09	.03	.040	.093	.005	.0001	.0085	USA

KILLED STEEL
MERCURY IS NOT A METALLURGICAL COMPONENT OF THE STEEL AND NO MERCURY WAS INTENTIONALLY ADDED DURING THE MANUFACTURE OF THIS PRODUCT.
MTR EN 10204:2004 INSPECTION CERTIFICATE 3.1 COMPLIANT
100% MELTED AND MANUFACTURED IN THE USA.
PRODUCTS SHIPPED:
A4K153 C15 PCES: 4, LBS: 65340 A4K153 C16 PCES: 2, LBS: 32670

(P) Cust Part #:

WE HEREBY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH, AND MEETS THE REQUIREMENTS OF, THE APPROPRIATE SPECIFICATION

Brian Wales +1 563 381 5300
SENIOR METALLURGIST - PRODUCT

ALLFASTENERS USA

15401 Commerce Park Drive
Cleveland, OH 44142
Ph: 866 659 6060
Fax: 440 232 6062
Email: sales@allfasteners.com

69 Orchard Street
Ramsey, NJ 07446
Ph: 800 577 3171
Fax: 201 783 8840
Email: sales@allfasteners.com

5450 W. 83rd Street
Los Angeles, CA 90045
Ph: 310 410 5007
Fax: 310 410 5004
Email: sales@allfasteners.com

DELIVER
R F Telecom
528 Wheelers Farm Rd
Milford CT 06460

OFFICE COPY

Packing Slip
81036
Acc No: 7519

Order Date	Ship Date	Customer Order No.	Ordered By	Contact No.	Reference	Entered By
04.17.2015	06.05.2015	10995	Matt Hague	267 419 8190	528 WHEELERS FARM RD	BEC

Order Code	Description	Unit	Qty Ordered	Back Order	Supplied	BinCode
14OF700	Steel Package for 528 Wheelers Farm Rd - 876320 **Includes:** **2 pieces - (CCI-SFP-04510020) 1 x 4-1/2 x 20ft Flat Plate Grade 65 Galvanized with 22 Holes** **2 pieces - (CCI-AFP-04510020) 1 x 4-1/2 x 20ft Flat Plate Grade 65 Galvanized with 25 Holes** **2 pieces - (CCI-AFP-06010025) 1 x 6 x 25ft Flat Plate Grade 65 Galvanized with 34 Holes** **2 pieces - (CCI-AFP-04510020) 1 x 4-1/2 x 20ft Flat Plate Grade 65 Galvanized with 25 Holes** **2 pieces - 1 x 4-1/2 x 4ft 7in Splice Plate Grade 65 Galvanized with 16 Holes**	Each	1			
14SP412412G	1/16 x 4-1/2 x 4-1/2 Slotted Shim Plate for OneSide Bolt Galvanized	Each	10			1T3C
14SP600600G	1/16 x 6 x 6 Slotted Shim Plate for OneSide Bolt Galvanized	Each	10			
2AOSBSG20135	M20 x 135 AJAX ONESIDE™ Structural Bolt Set Galvanized with Serrated Head 24/Box	Each	216			
10RSBAO39	Round Seamless Bolt Sleeve 39~ Length to suit M20 AJAX ONESIDE™ Structural Bolt - 4140 Steel	Each	22			
2DTIM208MGAFSIF	M20 DTI PERMASquirter Washer Grade 8.8 Galvanized 100/Box 1000/Keg	Each	300			
2WRWGM020	M20 Structural Flat Washer F436 Galvanized	Each	300			
14RRG	1/8 thick Red Rubber Gasket 70 Durometer to suit M20 AJAX ONESIDE™ Structural Bolt Sleeve	100	300			
5CT20010316	1-3/16 x 2 Carbide Tipped Annular Cutter Bit	Each	2			
5CT30010316	1-3/16 x 3 Carbide Tipped Annular Cutter Bit	Each	1			
10BUS20112	1/2 Buckle for Banding Gr 201 Stainless Steel Box of 100	Each	1			

ALLFASTENERS USA

15401 Commerce Park Drive
Cleveland, OH 44142
Ph: 888 859 6060
Fax: 440 232 6062
Email: sales@allfasteners.com

69 Orchard Street
Ramsey, NJ 07446
Ph: 800 577 3171
Fax: 201 783 8840
Email: sales@allfasteners.com

5450 W. 83rd Street
Los Angeles, CA 90045
Ph: 800 410 5511
Fax: 310 410 5004
Email: sales@allfasteners.com

DELIVER
R F Telecom
1084 Bethlehem Pike
Montgomeryville PA 18936

CUSTOMER COPY

Backorder
69175
Acc No: 7519

Order Date	Ship Date	Customer Order No.	Ordered By	Contact No.	Reference	Entered By
08.28.2014	10.28.2014	10515	Matt Hague	267 419 8190	TEGA CAY-DUKE-813058	BEC

Order Code	Description	Unit	Back Order	Supplied	BinCode
14OF484	Add'l Steel Package for Tega Cay-Duke - 813058 Includes: 3 pieces - 1-1/4 x 6-1/2 x 35ft Flat Plate Grade 65 Galvanized with 35 Holes 3 pieces - 1 x 6 x 70in Splice Plate Grade 65 Galvanized with 21 Holes	Each	1	1	

PICKED BY	PACKED BY	CHECKED BY	DISPATCH VIA	SPECIAL MESSAGE	RECEIVED IN GOOD ORDER & CONDITION
			Transwest Capital Inc		PLEASE CHECK ALL ITEMS BEFORE SIGNING. DISCREPANCIES MUST BE REPORTED WITHIN 7 DAYS.
			PPA	TERMS	
				NET 90 Days	.....

12/8/14 3:38:06 PM

CONSTRUCTION

6.2.1 CONSTRUCTION INSPECTIONS

To Whom It May Concern,

The Wheelers Farm Rd project BU#876320 was completed on 6-15-15 according to the EOR approved design drawings dated 2-10-15. This work was satisfactorily completed within OSHA rules and regulations and per current industry standards, Crown Communications standards to meet the EOR specifications as designed and approved modifications to the original design.

Thank you,

JEREMY NORRIS

SE REGIONAL MANAGER

Mobile- 267-644-6531

6.2.2 ON SITE COLD GALVANIZING VERIFICATION

Robert Foss Electric, LLC
1084 Bethlehem Pike
Montgomeryville, PA 18936

Contact: Jeremy Norris
Project Manager: Matt Hague
Robert Foss Electric
Address: 1084 Bethlehem Pike
City/State/Zip: Montgomeryville, PA 18936

RE: Crown Castle Site 876320 Wheelers Farm Rd

Contact,

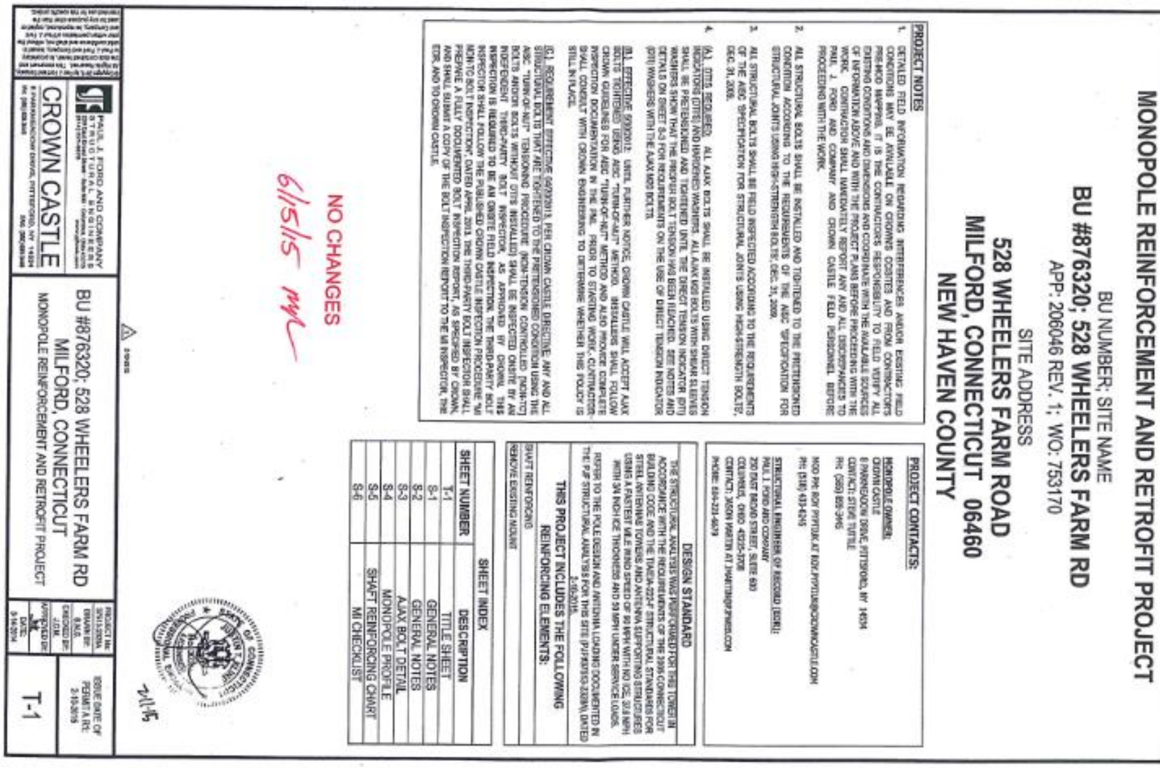
This letter verifies that Robert Foss Electric used ZRC cold-galvanization for all on-site cold galvanizing per industry standards in accordance with Crown Castle document ENG-BUL-10149 on the work performed at site BU876320 Wheelers Farm Rd.

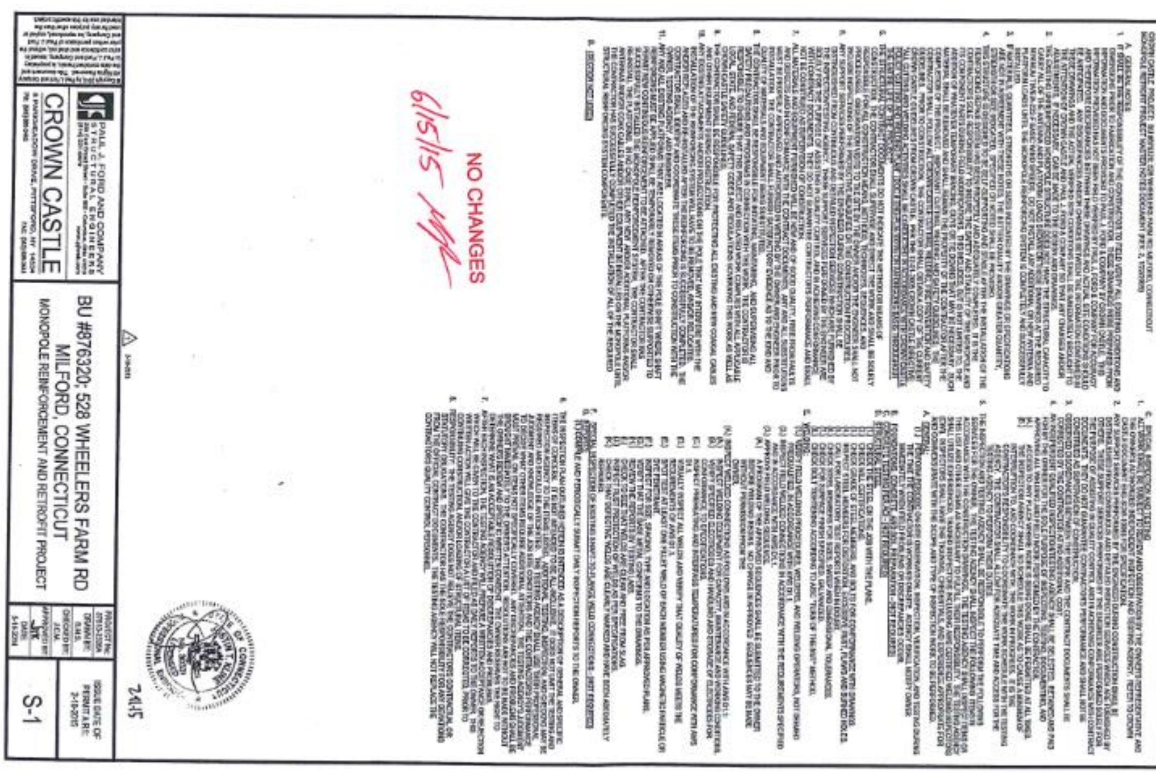
Regards,

Jeremy Norris
Construction Manager
Foss Electric

jnorris@fossllc.com

6.2.3 GC AS-BUILT DOCUMENTS





D. STRUCTURAL STEEL
1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCED 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 TO 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 GRINDING, SAW CUTTING, AND BORING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURAL STEEL DURING THE CUTTING WORK. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURAL STEEL 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. STICK GREATED REINFORCING ANCHOR RODS - (NOT REQUIRED)

I. TOUCH UP OF GALVANIZING
1. THE CONTRACTOR SHALL TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE, OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZINC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE WET 3.6 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-521-3373 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 ANSI/SSPC-PA 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 ZINC 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. NOT EXPLICITLY INDICATED ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR FOR ASTM A153, AS APPROPRIATE.
2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING.
3. DRILL OR PUNCH VENT 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 THIS 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 ZINC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD-CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS SUBSTANTIALLY 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."

NO CHANGES
6/15/15 mjk

STATE OF CONNECTICUT JUSTIN T. KUNZ No. 30261 LICENSED PROFESSIONAL ENGINEER
7-11-15

PAUL J. FORD AND COMPANY STRUCTURAL ENGINEERS	BU #876320; 528 WHEELERS FARM RD MILFORD, CONNECTICUT MONOPOLE REINFORCEMENT AND RETROFIT PROJECT	PROJECT No: 2013-2328A DRAWN BY: B.M.S. CHECKED BY: J.C.M. APPROVED BY: mjk DATE: 5-14-2014	ISSUE DATE OF PERMIT ART: 2-10-2015
CROWN CASTLE 6 FAIRMEADOW DRIVE, PITTSFORD, NY 14534			S-2

AJAX BOLT NOTE SHEET: REV. 1.4, 5-28-2013

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

NO CHANGES
6/15/15 mjk

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

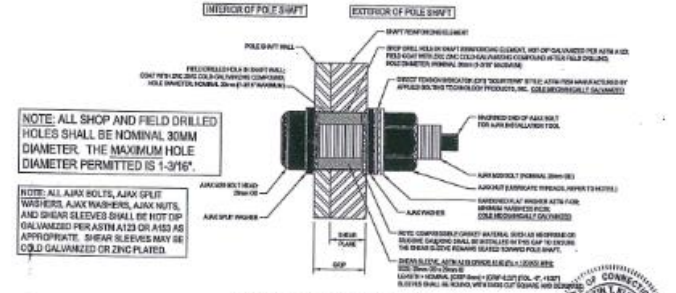
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY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

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

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

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

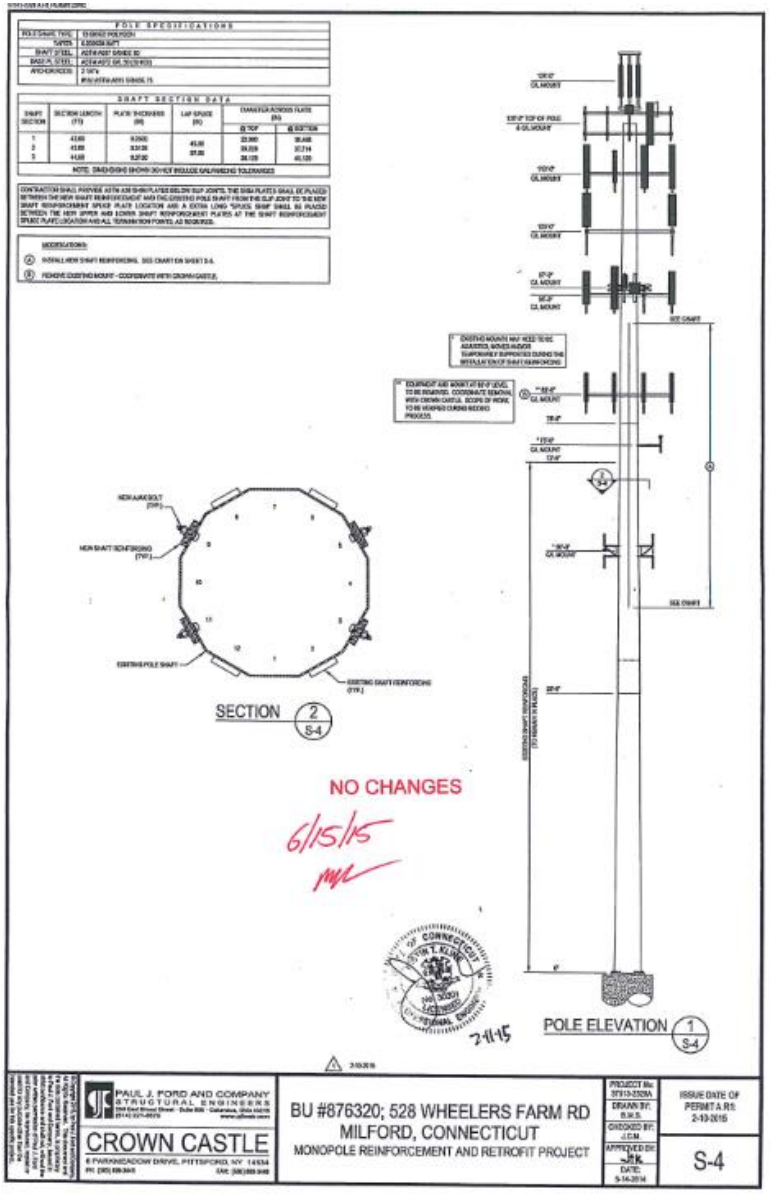
INSPECTION REQUIRED: ALL AJAX BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS", DEC. 31, 2009, BY A QUALIFIED BOLT INSPECTOR. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP-DRILLED AND FIELD-DRILLED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

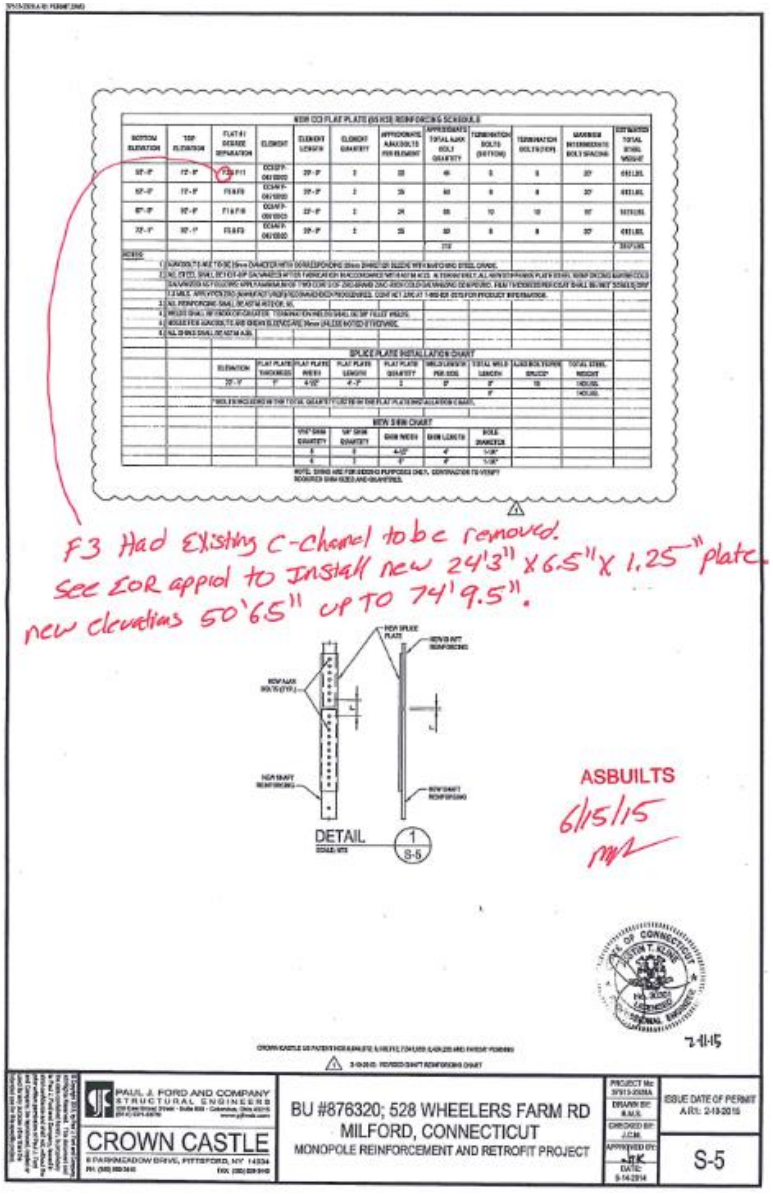


TYPICAL AJAX BOLT DETAIL 1 S-3

STATE OF CONNECTICUT JUSTIN T. KUNZ No. 30261 LICENSED PROFESSIONAL ENGINEER
7-11-15

PAUL J. FORD AND COMPANY STRUCTURAL ENGINEERS	BU #876320; 528 WHEELERS FARM RD MILFORD, CONNECTICUT MONOPOLE REINFORCEMENT AND RETROFIT PROJECT	PROJECT No: 2013-2328A DRAWN BY: B.M.S. CHECKED BY: J.C.M. APPROVED BY: mjk DATE: 5-14-2014	ISSUE DATE OF PERMIT ART: 2-10-2015
CROWN CASTLE 6 FAIRMEADOW DRIVE, PITTSFORD, NY 14534			S-3


POLE SPECIFICATIONS
SHAFT SECTION DATA
SECTION 2 S-4
POLE ELEVATION 1 S-4
NO CHANGES
6/15/15
2-11-15
PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
CROWN CASTLE
6 PARKMEADOW DRIVE, PITTSFORD, NY 14534
BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT
PROJECT No. 37913-2326A
DRAWN BY: B.M.S.
CHECKED BY: J.E.M.
APPROVED BY: M.K.
DATE: 5-14-2014
ISSUE DATE OF PERMIT A R1: 2-10-2015
S-4


F3 Had Existing C-channel to be removed.
See EOR appvl to Install new 24'3" X 6.5" X 1.25" plate.
new elevations 50'6.5" up TO 74'9.5".
DETAIL 1 S-5
ASBUILTS
6/15/15
2-11-15
PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
CROWN CASTLE
6 PARKMEADOW DRIVE, PITTSFORD, NY 14534
BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
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DRAWN BY: B.M.S.
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APPROVED BY: M.K.
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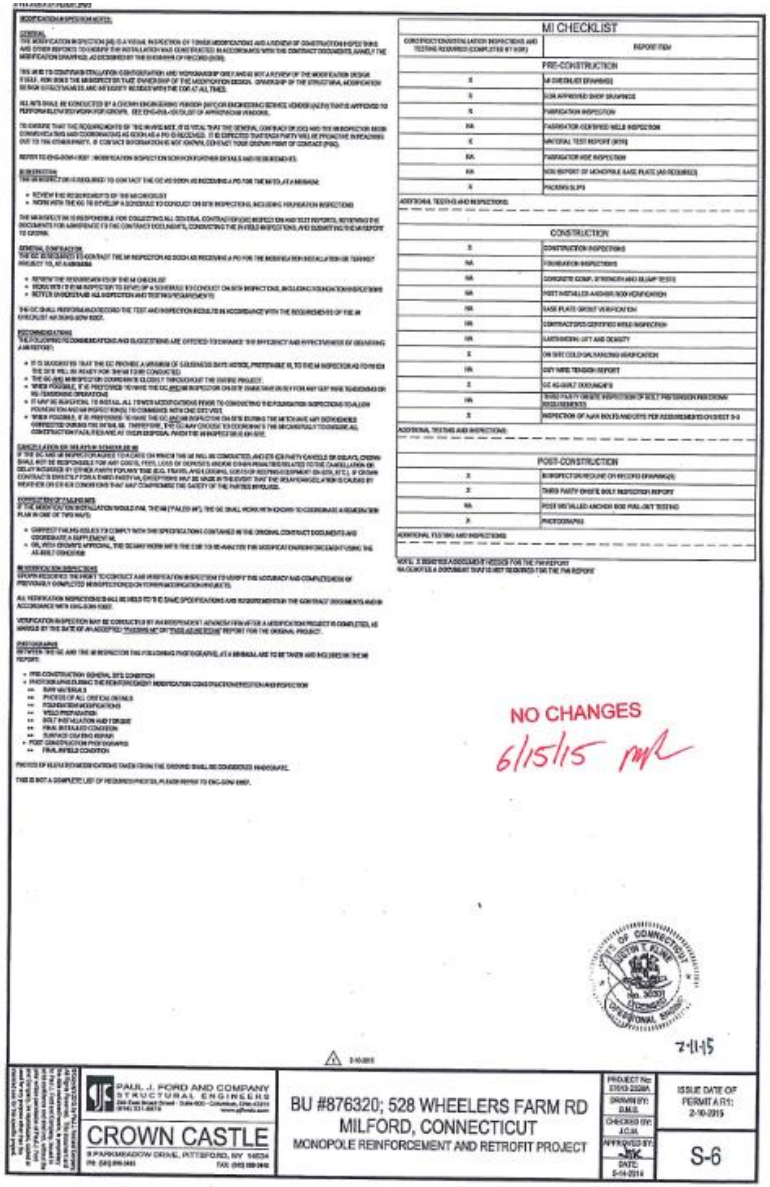
S-5



MODIFICATION INSPECTION NOTES:

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

THIS 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 IS RETAINED BY, AND WE ASSIST RESIDES WITH THE EOR AT ALL TIMES.

ALL INFO SHALL BE CONDUCTED BY A CROWN ENGINEERING PERSON (MP) OR ENGINEERING SERVICE VENDOR (AVE) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-STR-I-001-170 SET OF APPROVED VENDORS.

TO ENSURE THAT THE REQUIREMENTS OF THIS MI CHECKLIST, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR MAKE COMMUNICATIONS 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-I-0001 - MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND TO BE REVIEWED.

MI INSPECTOR
THE MI INSPECTOR IS RESPONSIBLE 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 COMPLIANCE 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 TOWER 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
- NOTIFY CROWN PRIOR TO ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND SOW-I-0001.

RECOMMENDATIONS
THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF OBSERVING CONSTRUCTION:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF SEVENTY-TWO (72) HOURS, 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, IF GC PREFERRED TO HAVE THE GC AND MI INSPECTOR ON SITE SIMULTANEOUSLY FOR ANY KEY PRE-TENSIONING OR RE-TENSIONING OPERATIONS.
- IT MAY BE SUGGESTED 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, IF GC 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 CHECKLIST TO ENSURE ALL CONSTRUCTION FAILURES ARE AT THEIR DISPOSAL PRIOR THE MI INSPECTOR IS ON SITE.

CANCELLATION OR RELATED SCHEDULE DELAY
IF THE GC AND MI INSPECTOR ARRIVE TO A SITE OR PREPARE THE MI TO BE CONDUCTED, AND SITE IS NOT IN CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF RENTING EQUIPMENT, ETC.), IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE MI APPROVED AS A NON-SCHEDULE BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

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

- CORRECT THE MI ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENTAL MI.
- OR, WITH CROWN'S APPROVAL, THE SCOPE WORK MAY'S THE GC TO RE-ANALYZE THE MODIFICATION PER EXISTING CONDITIONS USING THE AS-BUILT CONDITION.

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

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND/OR ACCORDANCE WITH ENG-SOW-I-0001.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT ATHENS FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS AWARDED BY THE SOLE OF AN ACCEPTED "FOLLOWING MI" OR "FINAL MI INSPECTION" 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 REPORTS:

- PRE-CONSTRUCTION (GENERAL SITE CONDITION)
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/EXECUTION AND INSPECTION
  - BAR MARKINGS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INSTALLED CONDITION

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

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-I-0001.

MI CHECKLIST

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

NOTE: X INDICATES A REQUIREMENT PRIOR TO THE FINAL REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE FINAL REPORT

NO CHANGES
6/15/15 mk

STATE OF CONNECTICUT
KRISTIN E. KLINE
No. 30091
LICENSED PROFESSIONAL ENGINEER

7-11-15

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS

CROWN CASTLE
2 PARKMEADOW DRIVE, PITTSFORD, NY 14534

BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

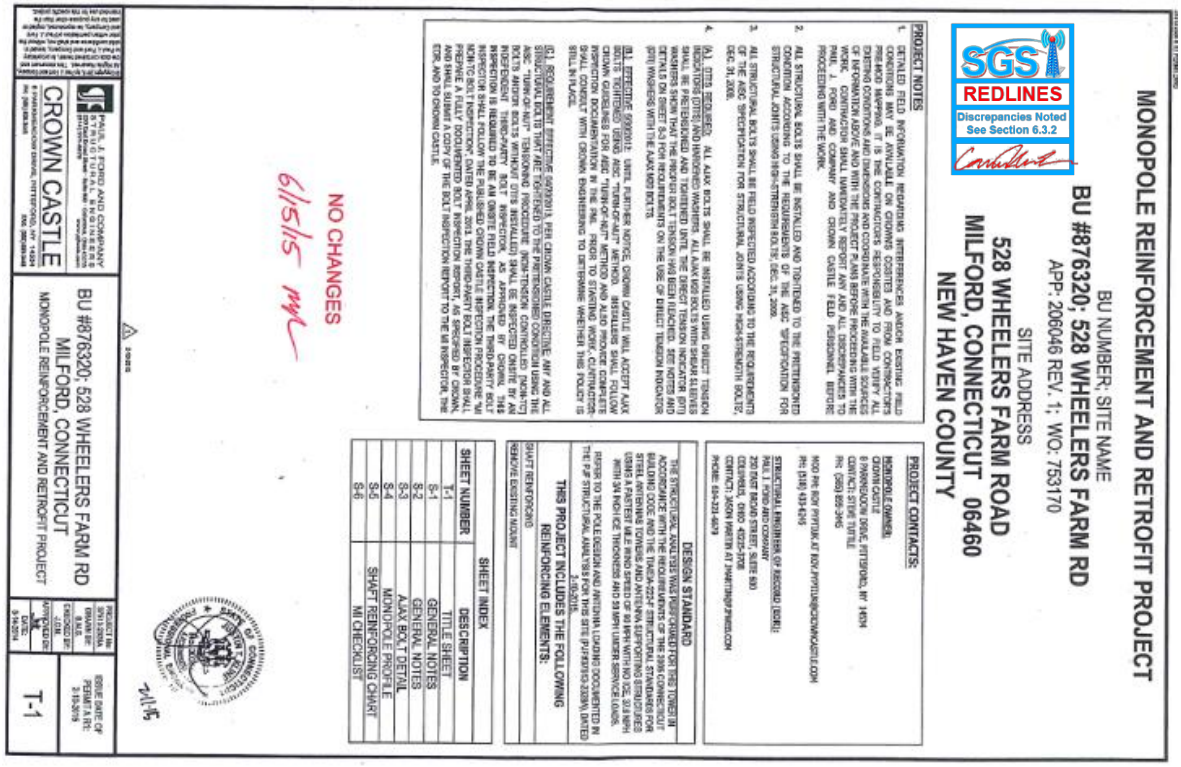
PROJECT No: 37513-2328A
DRAWN BY: DMD
CHECKED BY: JCJK
APPROVED BY: KEK
DATE: 5-14-2014

ISSUE DATE OF PERMIT A R1: 2-10-2015

S-6

POST-CONSTRUCTION

6.3.1 MI INSPECTOR REDLINE OR RECORD DRAWING(S)



MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER: SITE NAME

BU #876320; 528 WHEELERS FARM RD

APP: 206046 REV. 1; WO: 753170

SITE ADDRESS

528 WHEELERS FARM ROAD

MILFORD, CONNECTICUT 06460

NEW HAVEN COUNTY

SGS REDLINES Discrepancies Noted See Section 6.3.2

PROJECT NOTES

PROJECT CONTACTS:

DESIGN STANDARD

THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:

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	SHAFT REINFORCING CHART
S-6	MI CHECKLIST

NO CHANGES 6/15/15

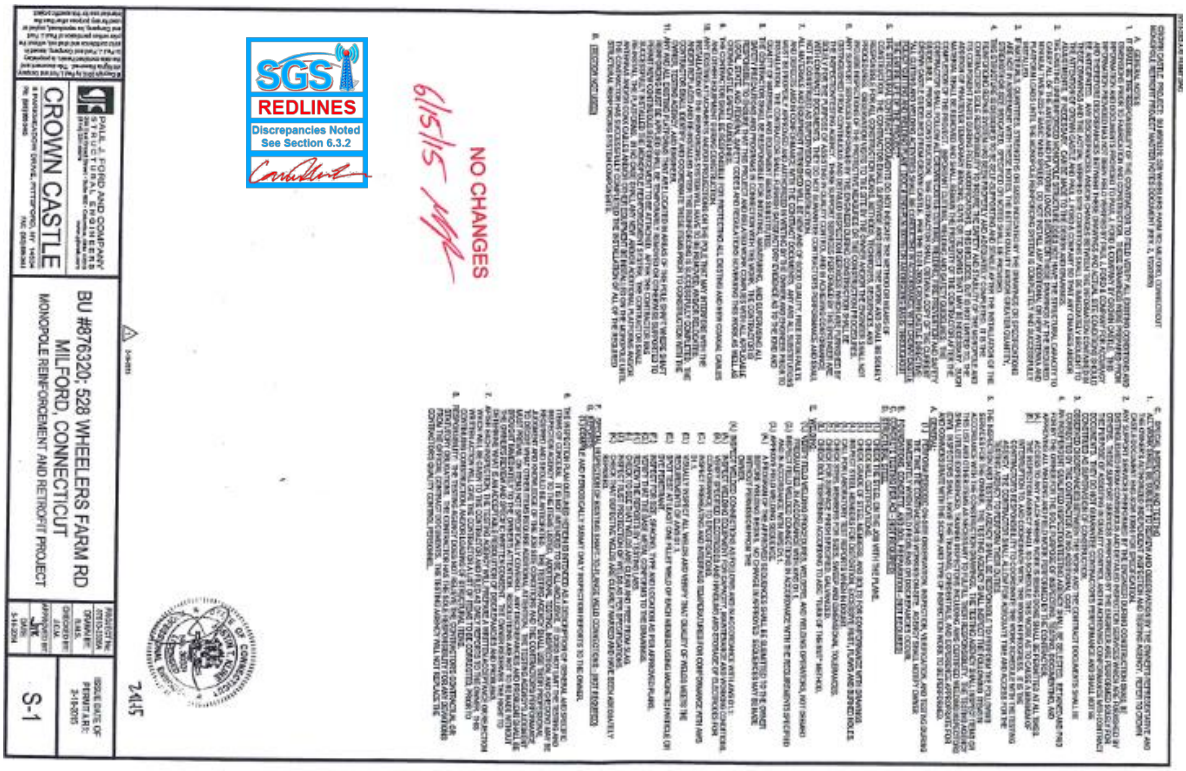
CROWN CASTLE

BU #876320; 528 WHEELERS FARM RD

MILFORD, CONNECTICUT

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

T-1



MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

SGS REDLINES Discrepancies Noted See Section 6.3.2

NO CHANGES 6/15/15

CROWN CASTLE

BU #876320; 528 WHEELERS FARM RD

MILFORD, CONNECTICUT

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

S-1

B. STRUCTURAL STEEL
C. 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".
(A.) "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"
(A.) "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 TO "SNUG TIGHT" TO CAUSE 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 E8XXX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' QUALIFICATION 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 F_Y = 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 ON 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 ARE 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, RESULTING FROM THE CONTRACTOR'S ACTIVITIES. SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTOR/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
(C.) ALL RECQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

E. BASE PLATE GROUT - (NOT REQUIRED)
F. FOUNDATION WORK - (NOT REQUIRED)

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

I. TOUCH UP OF GALVANIZING
1. THE CONTRACTOR SHALL "TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ARE AFFECTED 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 ZINC-RICH ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.6 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-631-3373 FOR PRODUCT INFORMATION.
2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS OR GALVANIZED AND PRE-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. NOT OF DISCERNED, ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
2. PREPARLY PREPARE STEEL ITEMS FOR GALVANIZING.
3. DRILL OR PUNCH WEEP HOLES AS SHOWN ON DRAWINGS AND AS REQUIRED.
4. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

K. PERIODIC 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 PERIODICAL 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 SIGNIFICANT UPON THE INSTALLED SIZE AND QUALITY. MAINTAINED SOUND CONDITION AND STRENGTH OF 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 FACTUAL 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 14.3, ASTIP 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".

SGS REDLINES Discrepancies Noted See Section 6.3.2

NO CHANGES
6/15/15

2-11-15

PAUL J. FORD AND COMPANY STRUCTURAL ENGINEERS
CROWN CASTLE
3 PARKMEADOW DRIVE, PITTSFORD, NY 14534
BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT
PROJECT No: 37513-239A
DRAWN BY: B.M.S.
CHECKED BY: J.C.M.
APPROVED BY: J.C.M.
DATE: 8-14-2014
ISSUE DATE OF PERMIT A'R1: 2-10-2015
S-2

AJAX BOLT NOTE SHEET: REV. 1.4, 9-26-2013

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 THEIM, 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

NO CHANGES
6/15/15

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.

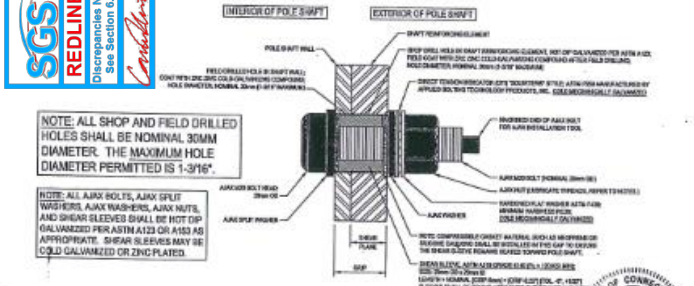
CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

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.

SGS REDLINES Discrepancies Noted See Section 6.3.2

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

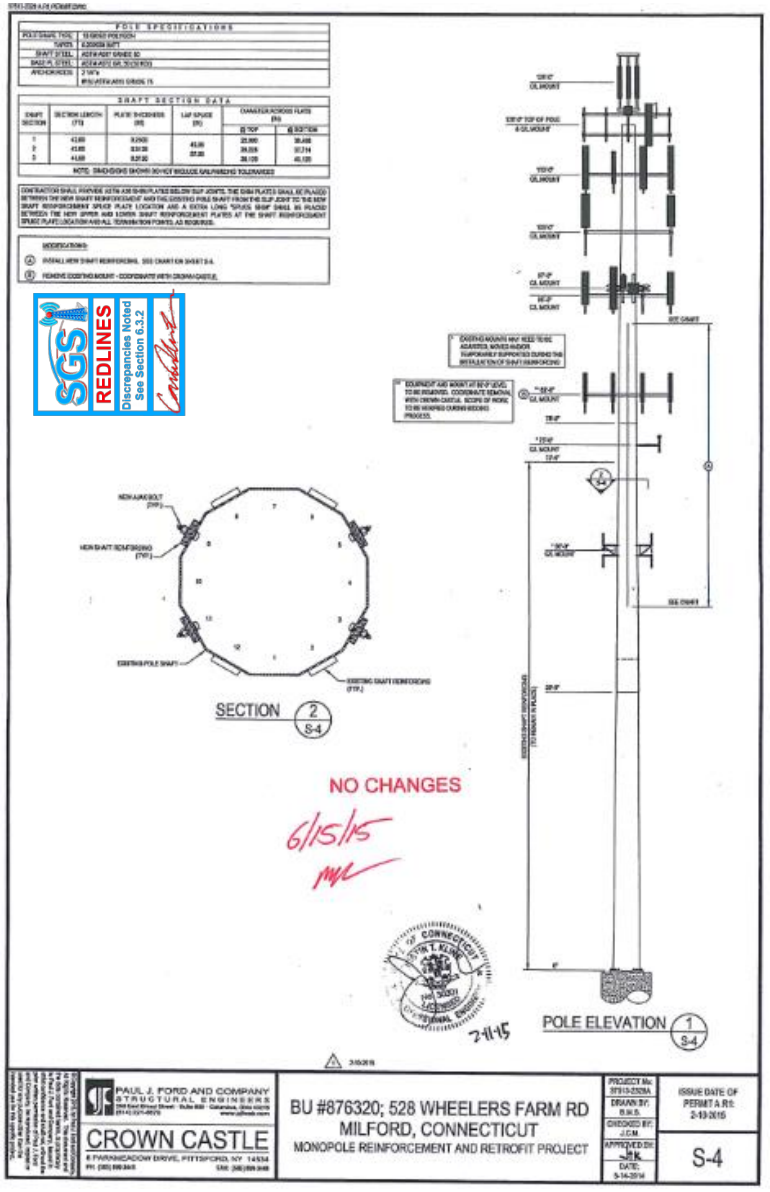
NOTE: ALL AJAX BOLTS, AJAX SPLIT WASHERS, AJAX WASHERS, AJAX NUTS, AND SHEAR SLEEVES SHALL BE HOT DIP GALVANIZED PER ASTM A123 OR A153 AS APPROPRIATE. SHEAR SLEEVES MAY BE COLD GALVANIZED OR ZINC PLATED.

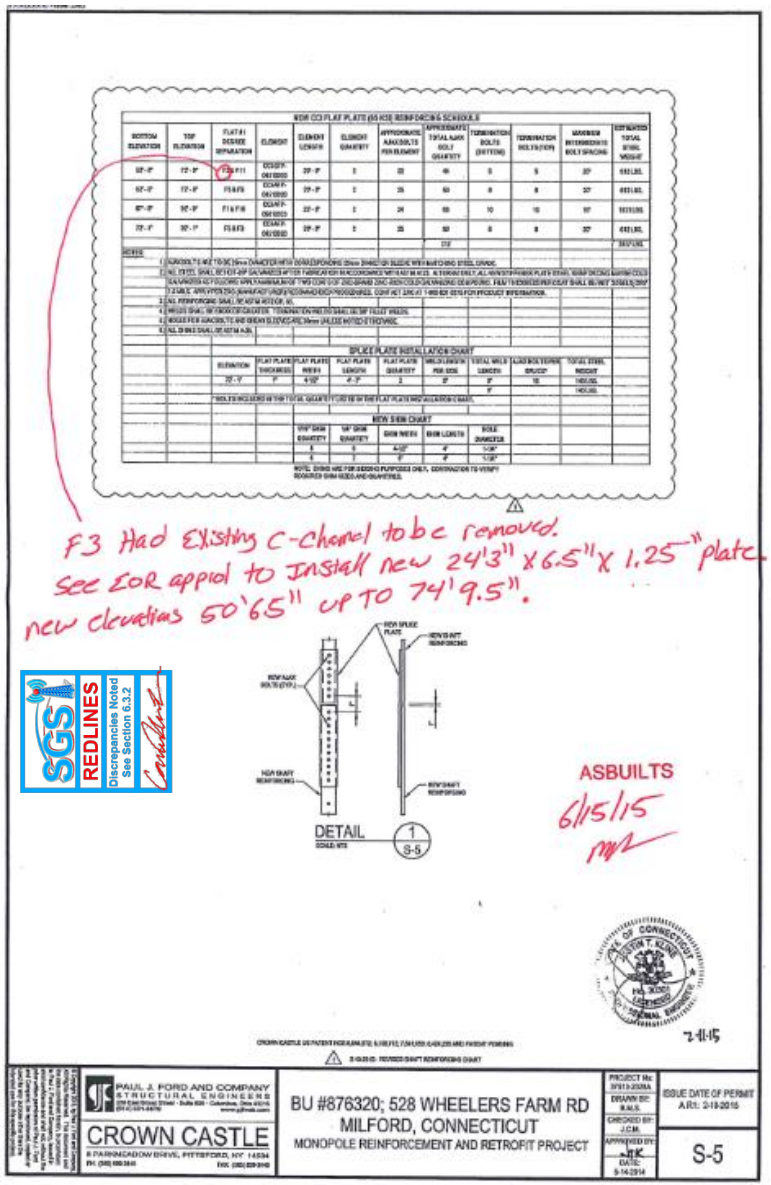


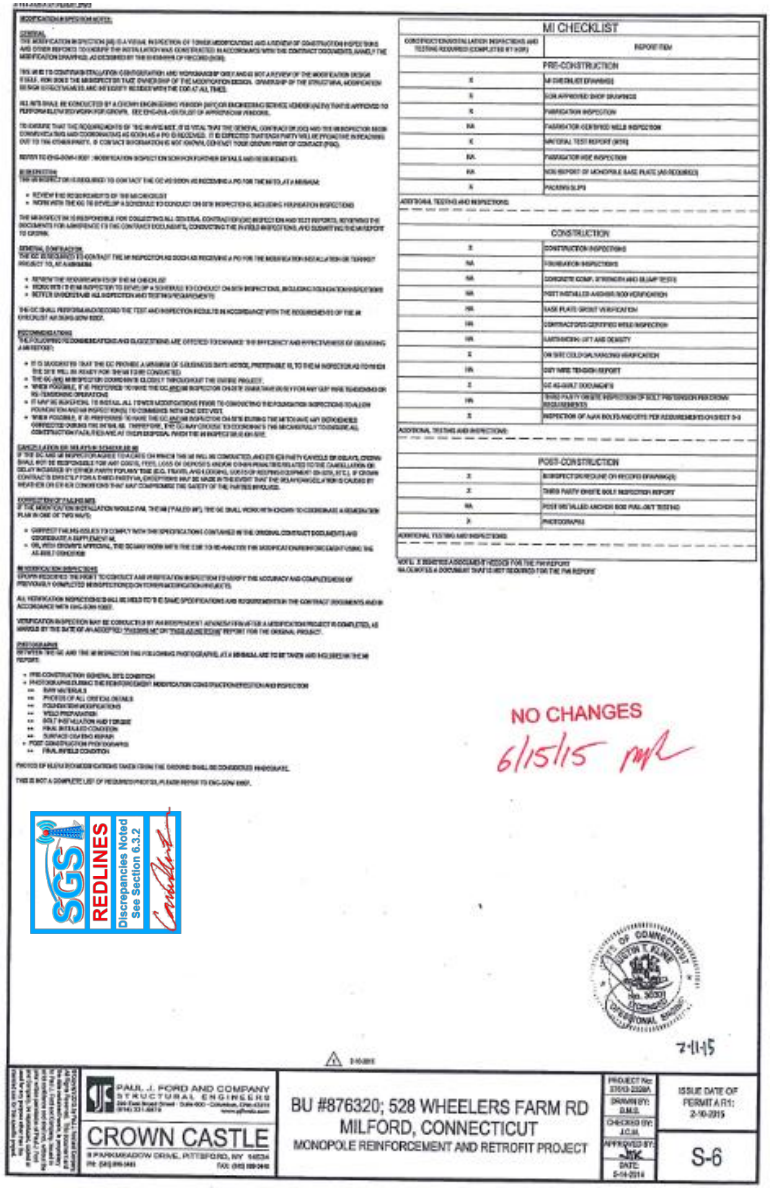
TYPICAL AJAX BOLT DETAIL 1 S-3

2-11-15

PAUL J. FORD AND COMPANY STRUCTURAL ENGINEERS
CROWN CASTLE
3 PARKMEADOW DRIVE, PITTSFORD, NY 14534
BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT
PROJECT No: 37513-239A
DRAWN BY: B.M.S.
CHECKED BY: J.C.M.
APPROVED BY: J.C.M.
DATE: 8-14-2014
ISSUE DATE OF PERMIT A'R1: 2-10-2015
S-3


POLE SPECIFICATIONS
SHAFT SECTION DATA
SGS
REDLINES
Discrepancies Noted
See Section 6.3.2
SECTION 2 S-4
POLE ELEVATION 1 S-4
NO CHANGES
6/15/15
2-11-15
PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
CROWN CASTLE
BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT
S-4


SPLICE PLATE INSTALLATION CHART
NEW SIGN CHART
F3 Had Existing C-channel to be removed.
See EOR appiol to Install new 24'3" X 6.5" X 1.25" plate
new elevations 50'6.5" up to 74'9.5".
SGS
REDLINES
Discrepancies Noted
See Section 6.3.2
DETAIL 1 S-5
ASBUILTS
6/15/15
2-11-15
PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
CROWN CASTLE
BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT
S-5



MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY MIR)	REPORT ITEM
	PRE-CONSTRUCTION
X	MI CHECKLIST (DRAWING)
X	SDR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	PAINTING INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
	CONSTRUCTION
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
NA	CONTRACTORS CERTIFIED WELD INSPECTION
NA	EARTHWORK: CUT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	DOT WIRE TEN-SION REPORT
X	GC AS-BUILT DOCUMENTS
NA	THIRD PARTY ON SITE INSPECTION OF BOLT PRETENSION PER DOWA REQUIREMENTS
X	INSPECTION OF NAVA BOLTS AND DITE PER ASSIGNMENT SHEET S-3
ADDITIONAL TESTING AND INSPECTIONS:	
	POST-CONSTRUCTION
X	INSPECTOR TO SIGN OFF ON RECORD DRAWINGS
X	THIRD PARTY ON SITE BOLT INSPECTION REPORT
NA	POST INSTALLED ANCHOR ROD PAIL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X INDICATES A REQUIREMENT NEEDED FOR THE FMI REPORT
NA OR NOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE FMI REPORT

NO CHANGES
6/15/15

REDLINES
Discrepancies Noted
See Section 6.3.2

7-11-15

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS

CROWN CASTLE

BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-230BA
DRAWN BY: D.M.S.
CHECKED BY: J.C.H.
APPROVED BY: [illegible]
DATE: 5-14-2014

ISSUE DATE OF PERMIT A R1: 2-10-2015

S-6

6.3.2 ENGINEER OF RECORD EMAIL

From: Jason Martin <jmartin@pjfweb.com>
Sent: Wednesday, June 10, 2015 1:41 PM
To: Matt Hague
Cc: pjfmod; McGee John; EnriqueCastro (ecastro1909@icloud.com)
Subject: RE: Emailing: 876320 Wheelers Farm existing conditions, New folder (2), New folder

Matt,

After looking at the new elevations of this plate this is acceptable. The overall capacity of the pole is unaffected as this plate is not part of the controlling cross sections.

Per Plan: 1" x 4" plate (6 Term. Bolts) from 52'-0" to 72'-0" on Flat 3 (Remove existing Channel)
Adjustment Due to existing bolt holes not lining up: 1.25" x 6.5" plate (11 Term. Bolts) from 50'-6.5" to 74'-6.5" (Contractor has this plate readily available)

This email can be used for the PMI if needed. If you have any further questions, please let us know. Thanks!

Jason C. Martin, E.I.
Main: 614.221-6679 ext 4175
Direct: 614.448-4175
E-Mail: jmartin@pjfweb.com
www.pauljford.com
PJF PAUL J. FORD & COMPANY

From: McGee, John <John.McGee@crowncastle.com>
Sent: Friday, June 19, 2015 3:27 PM
To: Matt Hague; Sgs_PMI@sgstowers.com
Subject: RE: Wheelers Farm RD. 876320 145190 Punch List

OK by me as long as no rust was present.

Best Regards

John McGee
Project Manager ETA – Structural Modifications
T: (980) 209-8253 | M: (704) 877-8397 | F:(724) 416-4716
john.mcgee@crowncastle.com

CROWN CASTLE
3530 Toringdon Way Suite 300, Charlotte NC, 28277
CrownCastle.com

From: Jason Martin <jmartin@pjfweb.com>
Date: June 19, 2015 at 3:16:57 PM EDT
To: Matt Hague <MHague@fossllc.com>
Cc: pjfmod <pjfmod@pjfweb.com>
Subject: Re: Fwd: Wheelers Farm RD. 876320 145190 Punch List

Matt,

Consider this noted. With this being an existing condition it does not fall within the scope of our modification. This should approved by Crown. This will not affect the structural capacity of our modification.

Jason C. Martin, E.I.
Main: 614.221-6679 ext 4175
Direct: 614.448-4175
E-Mail: jmartin@pjfweb.com
www.pauliford.com

From: Matt Hague <MHague@fossllc.com>
To: Jason Martin <jmartin@pjfweb.com>
CC: pjfmod <pjfmod@pjfweb.com>
Date: 6/19/2015 3:14 PM
Subject: Fwd: Wheelers Farm RD. 876320 145190 Punch List

Jason could you please give me approval for the punch item attached? This was an existing condition.

Thank you,

Matt Hague
Project Manager
RF Telecom
Foss Electric

Mobile – 215.307.0981
Office – 267-419-8190
Fax – 866.886.4841
Email – MHague@Fossllc.com
Web Site – www.Fossllc.com

PUNCH ITEM 1

HEIGHT	FLAT/ARC	PLATE #	PLATE HT START/STOP	DRAWING PG #
52' – 62'	12	N/A	52' – 62'	N/A

DISCREPANCY:

Extra unused holes were observed in the above location.

ACTIONS NEEDED BY GC:

Provide EOR approval for existing conditions.

PHOTOGRAPHS

SGS_PMI@Sgstowers.com

From: McGee, John <John.McGee@crowncastle.com>
Sent: Friday, June 19, 2015 3:32 PM
To: SGS PMI; 'Matt Hague'
Subject: RE: Wheelers Farm RD. 876320 145190 Punch List

Please include the Decom verification photos.

Best Regards

John McGee
Project Manager ETA – Structural Modifications
T: (980) 209-8253 | M: (704) 877-8397 | F:(724) 416-4716
john.mcgee@crowncastle.com

CROWN CASTLE
3530 Toringdon Way Suite 300, Charlotte NC, 28277
CrownCastle.com

6.3.3 PHOTOGRAPHS

PAUL J. FORD & COMPANY

Date: **May 15, 2015**

Jay Patton
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

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

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT2083
	Carrier Site Name:	Milford-Wheeler's Farm Road
Crown Castle Designation:	**Crown Castle BU Number:**	876320
	Crown Castle Site Name:	528 WHEELERS FARM RD
	Crown Castle JDE Job Number:	333360
	Crown Castle Work Order Number:	1060499
	Crown Castle Application Number:	293227 Rev. 1
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37515-1743.002.7805
Site Data:	**528 Wheelers Farm Road, MILFORD, New Haven County, CT** **Latitude *41° 14' 54.35"*, Longitude *-73° 4' 44.67"*** **120 Foot - Monopole Tower**	

Dear Jay Patton,

Paul J Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 786847, in accordance with application 293227, revision 1.

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

LC4.7: Existing + Reserved + Proposed Equipment + Proposed Modifications **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 the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 90 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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

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

Respectfully submitted by:

Corey McCartney, EI
Structural Designer

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER
5-15-15

tnxTower Report - version 6.1.4.1

Date: **May 15, 2015**

Jay Patton
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

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

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT2083
	Carrier Site Name:	Milford-Wheeler's Farm Road
Crown Castle Designation:	**Crown Castle BU Number:**	876320
	Crown Castle Site Name:	528 WHEELERS FARM RD
	Crown Castle JDE Job Number:	333360
	Crown Castle Work Order Number:	1060499
	Crown Castle Application Number:	293227 Rev. 1
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37515-1743.002.7805
Site Data:	**528 Wheelers Farm Road, MILFORD, New Haven County, CT**	
	Latitude *41° 14' 54.35"*, Longitude *-73° 4' 44.67"*	
	120 Foot - Monopole Tower	

Dear Jay Patton,

Paul J Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 786847, in accordance with application 293227, revision 1.

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

LC4.7: Existing + Reserved + Proposed Equipment + Proposed Modifications **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 the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 90 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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

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

Respectfully submitted by:

Corey McCartney, EI
Structural Designer

tnxTower Report - version 6.1.4.1

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7) APPENDIX C
Additional Calculations

1) INTRODUCTION

This tower is a 120-ft Monopole tower designed by SUMMIT in February of 1997. 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 the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 90 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
97.0	97.0	3	ericsson	TME-RRUS-32 B30	1 2	3/8 5/8	-
		1	raycap	DC6-48-60-18-8F			
96.0	97.0	3	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe	-	-	-

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
127.0	128.0	3	rfs celwave	APXV18-206516S-C-A20 w/ Mount Pipe	6	1-5/8	3
	127.0	1	tower mounts	Pipe Mount (PM 701-1)			
122.0	125.0	2	andrew	VHLP2-11	6 4 3	5/16 1/2 1-1/4	1
	123.0	1	andrew	PX2F-52			
		1	mti wireless edge	MT-485025			
	122.0	3	argus technologies	LLPX310R w/ Mount Pipe			
		3	samsung	FDD_R6_RRH			
		1	tower mounts	Platform Mount [LP 713-1]			
	121.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		3	alcatel lucent	800MHZ RRH			
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		9	rfs celwave	ACU-A20-N			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	alcatel lucent	TD-RRH8x20-25	1	1-1/4	2
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
113.0	116.0	1	trimble	ACUTIME 2000	1 13	1/2 1-5/8	1
	114.0	3	alcatel lucent	RRH2x40-AWS			
		3	antel	BXA-171063-8BF-EDIN-0 w/ Mount Pipe			
		1	antel	BXA-70040/6CFx2 w/ Mount Pipe			
		1	antel	BXA-70040/6CFx4 w/ Mount Pipe			
		1	antel	BXA-70063/6CF w/ Mount Pipe			
		4	antel	LPA-80063/4CF w/ Mount Pipe			
		2	decibel	DB846F65ZAXY w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		6	rfs celwave	FD9R6004/2C-3L			
		3	rymsa wireless	MG D3-800Tx w/ Mount Pipe			
	113.0	1	tower mounts	Platform Mount [LP 303-1]			
105.0	107.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	6 7	1-1/4 1-5/8	1
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
	105.0	1	tower mounts	Platform Mount [LP 712-1]			
97.0	97.0	6	ericsson	RRUS 11	-	-	1
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Side Arm Mount [SO 102-3]			
96.0	97.0	6	powerwave	7770.00 w/ Mount Pipe	1 2 12	3/8 5/8 1-1/4	1
		3	powerwave	P65-16-XLH-RR w/ Mount Pipe			
	96.0	12	powerwave	LGP2140X			
		1	tower mounts	Platform Mount [LP 601-1]			
82.0	83.0	12	decibel	DB844H90-XY w/ Mount Pipe	12	7/8	3
	82.0	1	tower mounts	Platform Mount [LP 712-1]			
75.0	76.0	1	trimble	ACUTIME 2000	1	1/2	1
	75.0	1	tower mounts	Side Arm Mount [SO 701-1]			

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

Table 3 - Design Antenna and Cable Information

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

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 08-10145E G1, 10/22/2008	1613534	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit, 2249, 02/27/1997	1614583	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit, 2249, 02/27/1997	1614557	CCISITES
4-POST-MODIFICATION INSPECTION	Semaan, CT03XC038, 05/17/2004	3350209	CCISITES
4-POST-MODIFICATION INSPECTION	B&T, 80214, 07/15/2009	2460628	CCISITES
4-POST-MODIFICATION INSPECTION	B&T, 80214.003, 04/04/2012	3349204	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 1210009, 04/01/2013	3753892	CCISITES
4-PROPOSED TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37513-2328A, 2/10/2015	4961357	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 was reinforced in conformance with the referenced modification drawings.
5) Monopole will be reinforced in conformance with the referenced modification drawings.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	120 - 90.0833	Pole	TP28.0446x22x0.25	1	-11.04	1073.72	86.5	Pass
L2	90.0833 - 89.5	Pole	TP28.1625x28.0446x0.2893	2	-11.14	1092.90	87.5	Pass
L3	89.5 - 78	Pole	TP30.486x28.1625x0.4419	3	-12.61	1600.96	80.5	Pass
L4	78 - 72	Pole	TP31.1982x28.8446x0.4965	4	-15.29	1894.87	89.9	Pass
L5	72 - 70.5	Pole	TP31.5013x31.1982x0.4944	5	-15.62	1905.80	92.4	Pass
L6	70.5 - 69.75	Pole	TP31.6528x31.5013x0.5312	6	-15.81	2176.95	82.4	Pass
L7	69.75 - 54	Pole	TP34.8349x31.6528x0.685	7	-20.54	2930.68	81.4	Pass
L8	54 - 53.5	Pole	TP34.9359x34.8349x0.687	8	-20.70	3089.95	77.8	Pass
L9	53.5 - 39.75	Pole	TP37.714x34.9359x0.5346	9	-23.15	2759.23	97.3	Pass
L10	39.75 - 35	Pole	TP38.0487x35.6851x0.7536	10	-27.54	4011.97	76.8	Pass
L11	35 - 25	Pole	TP40.069x38.0487x0.7309	11	-31.26	4117.49	82.4	Pass
L12	25 - 14.5	Pole	TP42.1905x40.069x0.7714	12	-35.52	4590.76	81.0	Pass
L13	14.5 - 4.75	Pole	TP44.1603x42.1905x0.797	13	-39.77	4985.98	80.3	Pass
L14	4.75 - 0	Pole	TP45.12x44.1603x0.6706	14	-41.64	4303.94	95.7	Pass
							Summary	
						Pole (L9)	97.3	Pass
						RATING =	**97.3**	**Pass**

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	79.2	Pass
1	Base Plate	0	46.4	Pass
1	Base Foundation Steel	0	66.4	Pass
1, 2	Base Foundation Soil Interaction	0	88.3	Pass

Structure Rating (max from all components) =	**97.3%**

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

4.1) Recommendations

- Install the modifications as per the proposed modification drawings referenced in Table 4.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

1) Tower is located in New Haven County, Connecticut.
2) Basic wind speed of 90 mph.
3) Nominal ice thickness of 0.7500 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56 pcf.
6) A wind speed of 38 mph is used in combination with ice.
7) Temperature drop of 50 °F.
8) Deflections calculated using a wind speed of 50 mph.
9) A non-linear (P-delta) analysis was used.
10) Pressures are calculated at each section.
11) Stress ratio used in pole design is 1.333.
12) Local bending stresses due to climbing loads, 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*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*	*Sides*	*in*	*in*	*in*	*in*	
L1	120.00-90.08	29.92	0.00	12	22.0000	28.0446	0.2500	1.0000	A607-60 (60 ksi)
L2	90.08-89.50	0.58	0.00	12	28.0446	28.1625	0.2893	1.1574	Reinf 52.62 ksi (53 ksi)
L3	89.50-78.00	11.50	3.75	12	28.1625	30.4860	0.4419	1.7674	Reinf 48.04 ksi (48 ksi)
L4	78.00-72.00	9.75	0.00	12	28.8446	31.1982	0.4965	1.9859	Reinf 48.27 ksi (48 ksi)
L5	72.00-70.50	1.50	0.00	12	31.1982	31.5013	0.4944	1.9777	Reinf 48.27 ksi (48 ksi)
L6	70.50-69.75	0.75	0.00	12	31.5013	31.6528	0.5312	2.1249	Reinf 51.13 ksi (51 ksi)
L7	69.75-54.00	15.75	0.00	12	31.6528	34.8349	0.6849	2.7398	Reinf 48.65 ksi (49 ksi)
L8	54.00-53.50	0.50	0.00	12	34.8349	34.9359	0.6870	2.7482	Reinf 50.99 ksi (51 ksi)
L9	53.50-39.75	13.75	4.75	12	34.9359	37.7140	0.5346	2.1385	Reinf 55.33 ksi

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
									(55 ksi)
L10	39.75-35.00	9.50	0.00	12	35.6851	38.0487	0.7536	3.0143	Reinf 55.43 ksi (55 ksi)
L11	35.00-25.00	10.00	0.00	12	38.0487	40.0690	0.7309	2.9234	Reinf 55.61 ksi (56 ksi)
L12	25.00-14.50	10.50	0.00	12	40.0690	42.1904	0.7714	3.0857	Reinf 55.79 ksi (56 ksi)
L13	14.50-4.75	9.75	0.00	12	42.1904	44.1603	0.7970	3.1879	Reinf 56.02 ksi (56 ksi)
L14	4.75-0.00	4.75		12	44.1603	45.1200	0.6705	2.6822	Reinf 56.07 ksi (56 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.7761	17.5087	1057.2060	7.7865	11.3960	92.7699	2142.1860	8.6173	5.2260	20.904
	29.0339	22.3747	2206.2926	9.9505	14.5271	151.8742	4470.5470	11.0121	6.8460	27.384
L2	29.0339	25.8589	2542.6478	9.9364	14.5271	175.0279	5152.0937	12.7270	6.7405	23.296
	29.1559	25.9687	2575.1740	9.9786	14.5881	176.5251	5218.0008	12.7810	6.7721	23.405
L3	29.1559	39.4397	3868.3393	9.9240	14.5881	265.1700	7838.3042	19.4110	6.3634	14.402
	31.5614	42.7455	4924.8890	10.7558	15.7917	311.8647	9979.1603	21.0380	6.9861	15.811
L4	30.7993	45.3192	4648.5476	10.1486	14.9415	311.1163	9419.2178	22.3047	6.3998	12.89
	32.2987	49.0818	5905.1546	10.9912	16.1607	365.4030	11965.4443	24.1566	7.0305	14.161
L5	32.2987	48.8824	5881.9499	10.9919	16.1607	363.9671	11918.4253	24.0584	7.0360	14.231
	32.6125	49.3649	6057.8531	11.1004	16.3177	371.2454	12274.8528	24.2959	7.1173	14.395
L6	32.6125	52.9751	6485.4712	11.0873	16.3177	397.4512	13141.3230	26.0727	7.0187	13.212
	32.7694	53.2343	6581.1340	11.1415	16.3961	401.3830	13335.1617	26.2003	7.0593	13.289
L7	32.7694	68.3008	8360.5228	11.0865	16.3961	509.9078	16940.6858	33.6156	6.6473	9.705
	36.0638	75.3191	11211.7052	12.2257	18.0445	621.3368	22717.9545	37.0698	7.5001	10.95
L8	36.0638	75.5443	11243.8511	12.2249	18.0445	623.1183	22783.0906	37.1806	7.4945	10.908
	36.1683	75.7678	11343.9349	12.2611	18.0968	626.8470	22985.8877	37.2906	7.5216	10.948
L9	36.1683	59.2211	8945.6591	12.3157	18.0968	494.3222	18126.3306	29.1468	7.9301	14.833
	39.0444	64.0034	11292.5872	13.3102	19.5359	578.0443	22881.8433	31.5005	8.6746	16.226
L10	38.1674	84.7611	13201.3243	12.5055	18.4849	714.1691	26749.4622	41.7169	7.5440	10.011
	39.3909	90.4964	16066.4675	13.3516	19.7092	815.1758	32555.0191	44.5396	8.1775	10.852
L11	39.3909	87.8214	15610.5614	13.3598	19.7092	792.0442	31631.2296	43.2230	8.2384	11.272
	41.4825	92.5760	18285.7675	14.0831	20.7558	880.9971	37051.9225	45.5631	8.7798	12.013
L12	41.4825	97.6142	19241.1694	14.0685	20.7558	927.0278	38987.8257	48.0427	8.6711	11.24
	43.6788	102.8837	22528.5110	14.8280	21.8547	1030.8336	45648.8710	50.6362	9.2396	11.977
L13	43.6788	106.2271	23231.9010	14.8189	21.8547	1063.0185	47074.1300	52.2817	9.1711	11.507
	45.7181	111.2823	26708.9873	15.5241	22.8750	1167.6037	54119.6495	54.7698	9.6991	12.17
L14	45.7181	93.9019	22669.1022	15.5693	22.8750	990.9970	45933.7471	46.2156	10.0379	14.97
	46.7117	95.9740	24203.1651	15.9129	23.3722	1035.5553	49042.1743	47.2355	10.2951	15.353

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 120.00-90.08				1	1	1		
L2 90.08-89.50				1	1	1		
L3 89.50-78.00				1	1	1		
L4 78.00-72.00				1	1	1		
L5 72.00-70.50				1	1	1		
L6 70.50-69.75				1	1	1		
L7 69.75-54.00				1	1	1		
L8 54.00-53.50				1	1	1		
L9 53.50-39.75				1	1	1		
L10 39.75-35.00				1	1	1		
L11 35.00-25.00				1	1	1		
L12 25.00-14.50				1	1	1		
L13 14.50-4.75				1	1	1		
L14 4.75-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
***										

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
***								
9207(5/16")	C	No	CaAa (Out Of Face)	120.00 - 0.00	6	No Ice	0.00	0.60
						1/2" Ice	0.00	1.11
						1" Ice	0.00	2.22
						2" Ice	0.00	6.29
						4" Ice	0.00	21.76
7983A(1/2")	C	No	CaAa (Out Of Face)	120.00 - 0.00	4	No Ice	0.00	0.08
						1/2" Ice	0.00	0.74
						1" Ice	0.00	2.01
						2" Ice	0.00	6.39
						4" Ice	0.00	22.47
2" Conduit	C	No	CaAa (Out Of Face)	120.00 - 0.00	1	No Ice	0.00	1.16
						1/2" Ice	0.00	2.53
						1" Ice	0.00	4.51
						2" Ice	0.00	10.30
						4" Ice	0.00	29.21
2" Conduit	C	No	CaAa (Out Of Face)	120.00 - 0.00	1	No Ice	0.17	1.16
						1/2" Ice	0.27	2.53
						1" Ice	0.37	4.51
						2" Ice	0.57	10.30
						4" Ice	0.97	29.21
HB114-13U3M12-XXXF(1-1/4")	C	No	Inside Pole	120.00 - 0.00	1	No Ice	0.00	0.99
						1/2" Ice	0.00	0.99

Description	*Face or Leg*	*Allow Shield*	*Component Type*	*Placement* *ft*	*Total Number*		*C_AA_A* *ft^2/ft*	*Weight* *plf*
						1" Ice	0.00	0.99
						2" Ice	0.00	0.99
						4" Ice	0.00	0.99
HB114-1-0813U4-M5J(1 1/4")	C	No	Inside Pole	120.00 - 0.00	3	No Ice	0.00	1.20
						1/2" Ice	0.00	1.20
						1" Ice	0.00	1.20
						2" Ice	0.00	1.20
						4" Ice	0.00	1.20
***								
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	113.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.84
						1" Ice	0.00	2.14
						2" Ice	0.00	6.58
						4" Ice	0.00	22.78
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	113.00 - 0.00	2	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
						1" Ice	0.40	4.46
						2" Ice	0.60	10.54
						4" Ice	1.00	30.04
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	113.00 - 0.00	11	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
***								
LDF6-50A(1-1/4")	C	No	Inside Pole	105.00 - 0.00	6	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
						2" Ice	0.00	0.66
						4" Ice	0.00	0.66
LDF7-50A(1-5/8")	C	No	Inside Pole	105.00 - 0.00	1	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	105.00 - 0.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
***								
FB-L98B-002-50000(3/8)	C	No	CaAa (Out Of Face)	97.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.61
						1" Ice	0.00	1.76
						2" Ice	0.00	5.91
						4" Ice	0.00	21.53
WR-VG82ST-BRDA(5/8")	C	No	CaAa (Out Of Face)	97.00 - 0.00	2	No Ice	0.00	0.31
						1/2" Ice	0.00	1.01
						1" Ice	0.00	2.32
						2" Ice	0.00	6.77
						4" Ice	0.00	23.01
***								
FB-L98B-002-50000(3/8)	C	No	Inside Pole	96.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
WR-VG82ST-BRDA(5/8")	C	No	Inside Pole	96.00 - 0.00	2	No Ice	0.00	0.31
						1/2" Ice	0.00	0.31
						1" Ice	0.00	0.31
						2" Ice	0.00	0.31
						4" Ice	0.00	0.31
LDF6-50A(1-1/4")	C	No	Inside Pole	96.00 - 0.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
						2" Ice	0.00	0.66
						4" Ice	0.00	0.66
***								
***								

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF4-50A(1/2")	C	No	Inside Pole	75.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
***								
C6 x 10.5	C	No	CaAa (Out Of Face)	56.00 - 0.00	2	No Ice	0.34	0.00
						1/2" Ice	0.42	0.00
						1" Ice	0.51	0.00
						2" Ice	0.67	0.00
						4" Ice	1.01	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	92.00 - 56.00	2	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00
						2" Ice	0.61	0.00
						4" Ice	1.06	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	120.00-90.08	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	14.919	0.77
L2	90.08-89.50	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	0.527	0.02
L3	89.50-78.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	10.388	0.47
L4	78.00-72.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	5.420	0.24
L5	72.00-70.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.355	0.06
L6	70.50-69.75	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	0.678	0.03
L7	69.75-54.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	14.917	0.64
L8	54.00-53.50	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	0.624	0.02
L9	53.50-39.75	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	17.160	0.56
L10	39.75-35.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	5.928	0.19
L11	35.00-25.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	12.480	0.41
L12	25.00-14.50	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	13.104	0.43
L13	14.50-4.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	12.168	0.40
L14	4.75-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	5.928	0.19

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	120.00-90.08	A	0.861	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	28.700	2.62
L2	90.08-89.50	A	0.846	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.042	0.07
L3	89.50-78.00	A	0.839	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	20.461	1.40
L4	78.00-72.00	A	0.828	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	10.675	0.73
L5	72.00-70.50	A	0.823	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.644	0.18
L6	70.50-69.75	A	0.821	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.321	0.09
L7	69.75-54.00	A	0.809	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	28.038	1.86
L8	54.00-53.50	A	0.795	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	0.995	0.06
L9	53.50-39.75	A	0.782	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	27.190	1.58
L10	39.75-35.00	A	0.761	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	9.393	0.55
L11	35.00-25.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	19.480	1.11
L12	25.00-14.50	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	20.454	1.17
L13	14.50-4.75	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	18.993	1.08
L14	4.75-0.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	9.253	0.53

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	120.00-90.08	-0.5343	0.3085	-0.8331	0.4810
L2	90.08-89.50	-0.8468	0.4889	-1.2731	0.7350
L3	89.50-78.00	-0.8568	0.4946	-1.2946	0.7474
L4	78.00-72.00	-0.8656	0.4997	-1.3165	0.7601
L5	72.00-70.50	-0.8720	0.5034	-1.3256	0.7654
L6	70.50-69.75	-0.8736	0.5044	-1.3290	0.7673
L7	69.75-54.00	-0.9186	0.5304	-1.3684	0.7900
L8	54.00-53.50	-1.1343	0.6549	-1.4943	0.8627
L9	53.50-39.75	-1.1479	0.6628	-1.5144	0.8743
L10	39.75-35.00	-1.1582	0.6687	-1.5334	0.8853
L11	35.00-25.00	-1.1719	0.6766	-1.5459	0.8925
L12	25.00-14.50	-1.1885	0.6862	-1.5768	0.9104
L13	14.50-4.75	-1.2037	0.6949	-1.6055	0.9269
L14	4.75-0.00	-1.2139	0.7009	-1.6250	0.9382

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***									
LLPX310R w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.96 5.35 5.75 6.58 8.37	2.85 3.37 3.90 5.08 7.84	0.04 0.08 0.12 0.23 0.53
LLPX310R w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.96 5.35 5.75 6.58 8.37	2.85 3.37 3.90 5.08 7.84	0.04 0.08 0.12 0.23 0.53
LLPX310R w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.96 5.35 5.75 6.58 8.37	2.85 3.37 3.90 5.08 7.84	0.04 0.08 0.12 0.23 0.53
MT-485025	C	From Leg	4.00 0.00 1.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.08 2.27 2.47 2.90 3.87	0.24 0.33 0.45 0.71 1.34	0.01 0.01 0.03 0.06 0.15
FDD_R6_RRH	A	From Leg	4.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.79 1.97 2.16 2.57 3.49	0.78 0.92 1.07 1.39 2.14	0.03 0.04 0.06 0.09 0.20
FDD_R6_RRH	B	From Leg	4.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.79 1.97 2.16 2.57 3.49	0.78 0.92 1.07 1.39 2.14	0.03 0.04 0.06 0.09 0.20
FDD_R6_RRH	C	From Leg	4.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.79 1.97 2.16 2.57 3.49	0.78 0.92 1.07 1.39 2.14	0.03 0.04 0.06 0.09 0.20
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 0.00 -1.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.08 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 -1.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.08 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 -1.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.08 0.13 0.19 0.34 0.75
TD-RRH8x20-25	A	From Leg	4.00	0.0000	122.00	No Ice	4.72	1.70	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"	5.01	1.92	0.10
			-1.00			Ice	5.32	2.15	0.13
						1" Ice	5.95	2.62	0.20
						2" Ice	7.31	3.68	0.40
						4" Ice			
TD-RRH8x20-25	B	From Leg	4.00	0.0000	122.00	No Ice	4.72	1.70	0.07
			0.00			1/2"	5.01	1.92	0.10
			-1.00			Ice	5.32	2.15	0.13
						1" Ice	5.95	2.62	0.20
						2" Ice	7.31	3.68	0.40
						4" Ice			
TD-RRH8x20-25	C	From Leg	4.00	0.0000	122.00	No Ice	4.72	1.70	0.07
			0.00			1/2"	5.01	1.92	0.10
			-1.00			Ice	5.32	2.15	0.13
						1" Ice	5.95	2.62	0.20
						2" Ice	7.31	3.68	0.40
						4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.0000	122.00	No Ice	8.50	6.95	0.08
			0.00			1/2"	9.15	8.13	0.15
			-1.00			Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
						4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.0000	122.00	No Ice	8.50	6.95	0.08
			0.00			1/2"	9.15	8.13	0.15
			-1.00			Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
						4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.0000	122.00	No Ice	8.50	6.95	0.08
			0.00			1/2"	9.15	8.13	0.15
			-1.00			Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
						4" Ice			
PCS 1900MHz 4x45W-65MHz	A	From Leg	4.00	0.0000	122.00	No Ice	2.71	2.61	0.06
			0.00			1/2"	2.95	2.85	0.08
			-1.00			Ice	3.20	3.09	0.11
						1" Ice	3.72	3.61	0.17
						2" Ice	4.86	4.74	0.35
						4" Ice			
PCS 1900MHz 4x45W-65MHz	B	From Leg	4.00	0.0000	122.00	No Ice	2.71	2.61	0.06
			0.00			1/2"	2.95	2.85	0.08
			-1.00			Ice	3.20	3.09	0.11
						1" Ice	3.72	3.61	0.17
						2" Ice	4.86	4.74	0.35
						4" Ice			
PCS 1900MHz 4x45W-65MHz	C	From Leg	4.00	0.0000	122.00	No Ice	2.71	2.61	0.06
			0.00			1/2"	2.95	2.85	0.08
			-1.00			Ice	3.20	3.09	0.11
						1" Ice	3.72	3.61	0.17
						2" Ice	4.86	4.74	0.35
						4" Ice			
(3) ACU-A20-N	A	From Leg	4.00	0.0000	122.00	No Ice	0.08	0.14	0.00
			0.00			1/2"	0.12	0.19	0.00
			-1.00			Ice	0.17	0.25	0.00
						1" Ice	0.30	0.40	0.01
						2" Ice	0.67	0.80	0.04
						4" Ice			
(3) ACU-A20-N	B	From Leg	4.00	0.0000	122.00	No Ice	0.08	0.14	0.00
			0.00			1/2"	0.12	0.19	0.00
			-1.00			Ice	0.17	0.25	0.00
						1" Ice	0.30	0.40	0.01
						2" Ice	0.67	0.80	0.04
						4" Ice			

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		*C_AA_A Front* ft^2	*C_AA_A Side* ft^2	*Weight* K
(3) ACU-A20-N	C	From Leg	4.00 0.00 -1.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
800 EXTERNAL NOTCH FILTER	A	From Leg	4.00 0.00 -1.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00 0.00 -1.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
800 EXTERNAL NOTCH FILTER	C	From Leg	4.00 0.00 -1.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
800MHZ RRH	A	From Leg	4.00 0.00 -1.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
800MHZ RRH	B	From Leg	4.00 0.00 -1.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
800MHZ RRH	C	From Leg	4.00 0.00 -1.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
Platform Mount [LP 713-1]	C	None		0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	31.27 39.68 48.09 64.91 98.55	31.27 39.68 48.09 64.91 98.55	1.51 1.93 2.35 3.19 4.86
***									
(2) DB846F65ZAXY w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.27 7.88 8.48 9.72 12.33	7.82 9.01 9.91 11.81 15.98	0.05 0.11 0.19 0.37 0.87
(2) LPA-80063/4CF w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.25 7.72 8.20 9.19 11.32	7.26 7.96 8.67 10.16 13.39	0.04 0.10 0.18 0.34 0.80
(2) LPA-80063/4CF w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	7.25 7.72 8.20 9.19	7.26 7.96 8.67 10.16	0.04 0.10 0.18 0.34

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" Ice	11.32	13.39	0.80
						4" Ice			
MG D3-800Tx w/ Mount Pipe	A	From Leg	4.00	0.0000	113.00	No Ice	3.57	3.42	0.03
			0.00			1/2"	3.98	4.12	0.07
			1.00			Ice	4.39	4.78	0.11
						1" Ice	5.33	6.16	0.21
						2" Ice	7.34	9.18	0.52
						4" Ice			
MG D3-800Tx w/ Mount Pipe	B	From Leg	4.00	0.0000	113.00	No Ice	3.57	3.42	0.03
			0.00			1/2"	3.98	4.12	0.07
			1.00			Ice	4.39	4.78	0.11
						1" Ice	5.33	6.16	0.21
						2" Ice	7.34	9.18	0.52
						4" Ice			
MG D3-800Tx w/ Mount Pipe	C	From Leg	4.00	0.0000	113.00	No Ice	3.57	3.42	0.03
			0.00			1/2"	3.98	4.12	0.07
			1.00			Ice	4.39	4.78	0.11
						1" Ice	5.33	6.16	0.21
						2" Ice	7.34	9.18	0.52
						4" Ice			
(2) FD9R6004/2C-3L	A	From Leg	4.00	0.0000	113.00	No Ice	0.37	0.08	0.00
			0.00			1/2"	0.45	0.14	0.01
			1.00			Ice	0.54	0.20	0.01
						1" Ice	0.75	0.34	0.02
						2" Ice	1.28	0.74	0.06
						4" Ice			
(2) FD9R6004/2C-3L	B	From Leg	4.00	0.0000	113.00	No Ice	0.37	0.08	0.00
			0.00			1/2"	0.45	0.14	0.01
			1.00			Ice	0.54	0.20	0.01
						1" Ice	0.75	0.34	0.02
						2" Ice	1.28	0.74	0.06
						4" Ice			
(2) FD9R6004/2C-3L	C	From Leg	4.00	0.0000	113.00	No Ice	0.37	0.08	0.00
			0.00			1/2"	0.45	0.14	0.01
			1.00			Ice	0.54	0.20	0.01
						1" Ice	0.75	0.34	0.02
						2" Ice	1.28	0.74	0.06
						4" Ice			
ACUTIME 2000	A	From Leg	4.00	0.0000	113.00	No Ice	0.30	0.30	0.00
			0.00			1/2"	0.37	0.37	0.00
			3.00			Ice	0.46	0.46	0.01
						1" Ice	0.65	0.65	0.02
						2" Ice	1.15	1.15	0.08
						4" Ice			
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	A	From Leg	4.00	0.0000	113.00	No Ice	3.18	3.35	0.03
			0.00			1/2"	3.56	3.97	0.06
			1.00			Ice	3.96	4.60	0.10
						1" Ice	4.85	5.89	0.19
						2" Ice	6.77	8.89	0.49
						4" Ice			
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	B	From Leg	4.00	0.0000	113.00	No Ice	3.18	3.35	0.03
			0.00			1/2"	3.56	3.97	0.06
			1.00			Ice	3.96	4.60	0.10
						1" Ice	4.85	5.89	0.19
						2" Ice	6.77	8.89	0.49
						4" Ice			
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	C	From Leg	4.00	0.0000	113.00	No Ice	3.18	3.35	0.03
			0.00			1/2"	3.56	3.97	0.06
			1.00			Ice	3.96	4.60	0.10
						1" Ice	4.85	5.89	0.19
						2" Ice	6.77	8.89	0.49
						4" Ice			
BXA-70063/6CF w/ Mount Pipe	A	From Leg	4.00	0.0000	113.00	No Ice	7.98	5.41	0.04
			0.00			1/2"	8.62	6.56	0.10
			1.00			Ice	9.23	7.42	0.17

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	10.47	9.20	0.33
						2" Ice	13.08	12.95	0.79
						4" Ice			
BXA-70040/6CFx4 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	16.55 17.27 17.96 19.37 22.30	7.37 8.54 9.42 11.23 15.34	0.06 0.16 0.27 0.52 1.17
BXA-70040/6CFx2 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	16.55 17.27 17.96 19.37 22.30	7.37 8.54 9.42 11.23 15.34	0.06 0.16 0.27 0.52 1.17
RRH2x40-AWS	A	From Leg	4.00 0.00 1.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
RRH2x40-AWS	B	From Leg	4.00 0.00 1.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
RRH2x40-AWS	C	From Leg	4.00 0.00 1.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
DB-T1-6Z-8AB-0Z	A	From Leg	4.00 0.00 1.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45
Platform Mount [LP 303-1]	C	None		0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	14.66 18.87 23.08 31.50 48.34	14.66 18.87 23.08 31.50 48.34	1.25 1.48 1.71 2.18 3.10
***									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A	A	From Leg	4.00	0.0000	105.00	No Ice	6.82	5.63	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
B2P w/ Mount Pipe			0.00				1/2" Ice	7.34	6.47	0.17
			2.00				1" Ice	7.85	7.25	0.23
							2" Ice	8.92	8.85	0.38
							4" Ice	11.17	12.28	0.81
ERICSSON AIR 21 B4A	B	From Leg	4.00		0.0000	105.00	No Ice	6.82	5.63	0.11
B2P w/ Mount Pipe			0.00				1/2" Ice	7.34	6.47	0.17
			2.00				1" Ice	7.85	7.25	0.23
							2" Ice	8.92	8.85	0.38
							4" Ice	11.17	12.28	0.81
ERICSSON AIR 21 B4A	C	From Leg	4.00		0.0000	105.00	No Ice	6.82	5.63	0.11
B2P w/ Mount Pipe			0.00				1/2" Ice	7.34	6.47	0.17
			2.00				1" Ice	7.85	7.25	0.23
							2" Ice	8.92	8.85	0.38
							4" Ice	11.17	12.28	0.81
KRY 112 144/1	A	From Leg	4.00		0.0000	105.00	No Ice	0.41	0.20	0.01
			0.00				1/2" Ice	0.50	0.27	0.01
			2.00				1" Ice	0.59	0.35	0.02
							2" Ice	0.81	0.53	0.03
							4" Ice	1.36	1.00	0.08
KRY 112 144/1	B	From Leg	4.00		0.0000	105.00	No Ice	0.41	0.20	0.01
			0.00				1/2" Ice	0.50	0.27	0.01
			2.00				1" Ice	0.59	0.35	0.02
							2" Ice	0.81	0.53	0.03
							4" Ice	1.36	1.00	0.08
KRY 112 144/1	C	From Leg	4.00		0.0000	105.00	No Ice	0.41	0.20	0.01
			0.00				1/2" Ice	0.50	0.27	0.01
			2.00				1" Ice	0.59	0.35	0.02
							2" Ice	0.81	0.53	0.03
							4" Ice	1.36	1.00	0.08
Platform Mount [LP 712-1]	C	None			0.0000	105.00	No Ice	24.53	24.53	1.34
							1/2" Ice	29.94	29.94	1.65
							1" Ice	35.35	35.35	1.96
							2" Ice	46.17	46.17	2.58
							4" Ice	67.81	67.81	3.82
***										
RRUS-32 B30	A	From Leg	2.00		0.0000	97.00	No Ice	3.87	2.76	0.08
			0.00				1/2" Ice	4.15	3.02	0.10
			0.00				1" Ice	4.44	3.29	0.14
							2" Ice	5.06	3.85	0.21
							4" Ice	6.38	5.08	0.41
RRUS-32 B30	B	From Leg	2.00		0.0000	97.00	No Ice	3.87	2.76	0.08
			0.00				1/2" Ice	4.15	3.02	0.10
			0.00				1" Ice	4.44	3.29	0.14
							2" Ice	5.06	3.85	0.21
							4" Ice	6.38	5.08	0.41
RRUS-32 B30	C	From Leg	2.00		0.0000	97.00	No Ice	3.87	2.76	0.08
			0.00				1/2" Ice	4.15	3.02	0.10
			0.00				1" Ice	4.44	3.29	0.14
							2" Ice	5.06	3.85	0.21
							4" Ice	6.38	5.08	0.41
DC6-48-60-18-8F	B	From Leg	2.00		0.0000	97.00	No Ice	1.47	1.47	0.02
			0.00				1/2" Ice	1.67	1.67	0.04
			0.00				1" Ice	1.88	1.88	0.06
							2" Ice	2.33	2.33	0.11
								3.38	3.38	0.24

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
						4" Ice			
DC6-48-60-18-8F	A	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.47 1.67 1.88 2.33 3.38	1.47 1.67 1.88 2.33 3.38	0.02 0.04 0.06 0.11 0.24
RRUS 11	A	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.26 3.50 3.75 4.28 5.44	1.38 1.56 1.74 2.15 3.05	0.05 0.07 0.10 0.15 0.31
RRUS 11	B	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.26 3.50 3.75 4.28 5.44	1.38 1.56 1.74 2.15 3.05	0.05 0.07 0.10 0.15 0.31
RRUS 11	C	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.26 3.50 3.75 4.28 5.44	1.38 1.56 1.74 2.15 3.05	0.05 0.07 0.10 0.15 0.31
RRUS 11	A	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.26 3.50 3.75 4.28 5.44	1.38 1.56 1.74 2.15 3.05	0.05 0.07 0.10 0.15 0.31
RRUS 11	B	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.26 3.50 3.75 4.28 5.44	1.38 1.56 1.74 2.15 3.05	0.05 0.07 0.10 0.15 0.31
RRUS 11	C	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.26 3.50 3.75 4.28 5.44	1.38 1.56 1.74 2.15 3.05	0.05 0.07 0.10 0.15 0.31
(2) 2.375" OD x 5' Mount Pipe	A	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.19 1.50 1.81 2.46 3.92	1.19 1.50 1.81 2.46 3.92	0.02 0.03 0.04 0.08 0.20
(2) 2.375" OD x 5' Mount Pipe	B	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.19 1.50 1.81 2.46 3.92	1.19 1.50 1.81 2.46 3.92	0.02 0.03 0.04 0.08 0.20
(2) 2.375" OD x 5' Mount Pipe	C	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.19 1.50 1.81 2.46 3.92	1.19 1.50 1.81 2.46 3.92	0.02 0.03 0.04 0.08 0.20
Side Arm Mount [SO 102-3]	C	None		0.0000	97.00	No Ice 1/2" Ice 1" Ice	3.00 3.48 3.96 4.92	3.00 3.48 3.96 4.92	0.08 0.11 0.14 0.20

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
						2" Ice 4" Ice	6.84	6.84	0.32
***									
OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.60 11.27 11.91 13.21 15.93	7.18 8.36 9.26 11.09 15.15	0.10 0.18 0.26 0.46 1.00
OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.60 11.27 11.91 13.21 15.93	7.18 8.36 9.26 11.09 15.15	0.10 0.18 0.26 0.46 1.00
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.60 11.27 11.91 13.21 15.93	7.18 8.36 9.26 11.09 15.15	0.10 0.18 0.26 0.46 1.00
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.22 6.71 7.22 8.26 10.48	4.82 5.51 6.21 7.67 11.06	0.09 0.14 0.21 0.36 0.76
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.22 6.71 7.22 8.26 10.48	4.82 5.51 6.21 7.67 11.06	0.09 0.14 0.21 0.36 0.76
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.22 6.71 7.22 8.26 10.48	4.82 5.51 6.21 7.67 11.06	0.09 0.14 0.21 0.36 0.76
P65-16-XLH-RR w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	6.36 7.54 8.43 10.24 14.10	0.08 0.14 0.22 0.39 0.89
P65-16-XLH-RR w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	6.36 7.54 8.43 10.24 14.10	0.08 0.14 0.22 0.39 0.89
P65-16-XLH-RR w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	6.36 7.54 8.43 10.24 14.10	0.08 0.14 0.22 0.39 0.89
(4) LGP2140X	A	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.26 1.42 1.58 1.94 2.75	0.38 0.49 0.62 0.89 1.54	0.01 0.02 0.03 0.05 0.13
(4) LGP2140X	B	From Leg	4.00 0.00	0.0000	96.00	No Ice 1/2"	1.26 1.42	0.38 0.49	0.01 0.02

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	1.58	0.62	0.03
						1" Ice	1.94	0.89	0.05
						2" Ice	2.75	1.54	0.13
						4" Ice			
(4) LGP2140X	C	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	1.26 1.42 1.58 1.94 2.75	0.38 0.49 0.62 0.89 1.54	0.01 0.02 0.03 0.05 0.13
Platform Mount [LP 601-1]	C	None		0.0000	96.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	28.47 33.59 38.71 48.95 69.43	28.47 33.59 38.71 48.95 69.43	1.12 1.51 1.91 2.69 4.26
***									
***									
ACUTIME 2000	A	From Leg	3.00 0.00 1.00	0.0000	75.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	0.30 0.37 0.46 0.65 1.15	0.30 0.37 0.46 0.65 1.15	0.00 0.00 0.01 0.02 0.08
Side Arm Mount [SO 701-1]	A	None		0.0000	75.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
***									

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
PX2F-52	A	Paraboloid w/Radome	From Leg	4.00 0.00 1.00	0.0000		122.00	2.09	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.44 3.72 3.99 4.55 5.67	0.02 0.04 0.06 0.09 0.17
VHLP2-11	A	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 3.00	0.0000		122.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.19
VHLP2-11	B	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 3.00	0.0000		122.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.19

Tower Pressures - No Ice

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 120.00-90.08	104.44	1.39	28.82	62.382	A	0.000	62.382	62.382	100.00	0.000	0.000
					B	0.000	62.382		100.00	0.000	0.000
					C	0.000	62.382		100.00	0.000	14.919
L2 90.08-89.50	89.79	1.331	27.60	1.366	A	0.000	1.366	1.366	100.00	0.000	0.000
					B	0.000	1.366		100.00	0.000	0.000
					C	0.000	1.366		100.00	0.000	0.527
L3 89.50-78.00	83.67	1.305	27.05	28.102	A	0.000	28.102	28.102	100.00	0.000	0.000
					B	0.000	28.102		100.00	0.000	0.000
					C	0.000	28.102		100.00	0.000	10.388
L4 78.00-72.00	74.98	1.264	26.22	15.237	A	0.000	15.237	15.237	100.00	0.000	0.000
					B	0.000	15.237		100.00	0.000	0.000
					C	0.000	15.237		100.00	0.000	5.420
L5 72.00-70.50	71.25	1.246	25.84	3.919	A	0.000	3.919	3.919	100.00	0.000	0.000
					B	0.000	3.919		100.00	0.000	0.000
					C	0.000	3.919		100.00	0.000	1.355
L6 70.50-69.75	70.12	1.24	25.72	1.974	A	0.000	1.974	1.974	100.00	0.000	0.000
					B	0.000	1.974		100.00	0.000	0.000
					C	0.000	1.974		100.00	0.000	0.678
L7 69.75-54.00	61.75	1.196	24.80	43.633	A	0.000	43.633	43.633	100.00	0.000	0.000
					B	0.000	43.633		100.00	0.000	0.000
					C	0.000	43.633		100.00	0.000	14.917
L8 54.00-53.50	53.75	1.15	23.84	1.454	A	0.000	1.454	1.454	100.00	0.000	0.000
					B	0.000	1.454		100.00	0.000	0.000
					C	0.000	1.454		100.00	0.000	0.624
L9 53.50-39.75	46.54	1.103	22.88	41.622	A	0.000	41.622	41.622	100.00	0.000	0.000
					B	0.000	41.622		100.00	0.000	0.000
					C	0.000	41.622		100.00	0.000	17.160
L10 39.75-35.00	37.36	1.036	21.48	14.827	A	0.000	14.827	14.827	100.00	0.000	0.000
					B	0.000	14.827		100.00	0.000	0.000
					C	0.000	14.827		100.00	0.000	5.928
L11 35.00-25.00	29.96	1	20.74	32.549	A	0.000	32.549	32.549	100.00	0.000	0.000
					B	0.000	32.549		100.00	0.000	0.000
					C	0.000	32.549		100.00	0.000	12.480
L12 25.00-14.50	19.70	1	20.74	35.989	A	0.000	35.989	35.989	100.00	0.000	0.000
					B	0.000	35.989		100.00	0.000	0.000
					C	0.000	35.989		100.00	0.000	13.104
L13 14.50-4.75	9.59	1	20.74	35.080	A	0.000	35.080	35.080	100.00	0.000	0.000
					B	0.000	35.080		100.00	0.000	0.000
					C	0.000	35.080		100.00	0.000	12.168
L14 4.75-0.00	2.37	1	20.74	17.670	A	0.000	17.670	17.670	100.00	0.000	0.000
					B	0.000	17.670		100.00	0.000	0.000
					C	0.000	17.670		100.00	0.000	5.928

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 120.00-90.08	104.44	1.39	5.03	0.8612	66.676	A	0.000	66.676	66.676	100.00	0.000	0.000
						B	0.000	66.676		100.00	0.000	0.000
						C	0.000	66.676		100.00	0.000	28.700
L2 90.08-89.50	89.79	1.331	4.82	0.8457	1.448	A	0.000	1.448	1.448	100.00	0.000	0.000
						B	0.000	1.448		100.00	0.000	0.000
						C	0.000	1.448		100.00	0.000	1.042
L3 89.50-78.00	83.67	1.305	4.72	0.8386	29.710	A	0.000	29.710	29.710	100.00	0.000	0.000
						B	0.000	29.710		100.00	0.000	0.000
						C	0.000	29.710		100.00	0.000	20.461

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
L4 78.00-72.00	74.98	1.264	4.58	0.8276	16.076	A	0.000	16.076	16.076	100.00	0.000	0.000
						B	0.000	16.076		100.00	0.000	0.000
						C	0.000	16.076		100.00	0.000	10.675
L5 72.00-70.50	71.25	1.246	4.51	0.8226	4.124	A	0.000	4.124	4.124	100.00	0.000	0.000
						B	0.000	4.124		100.00	0.000	0.000
						C	0.000	4.124		100.00	0.000	2.644
L6 70.50-69.75	70.12	1.24	4.49	0.8210	2.076	A	0.000	2.076	2.076	100.00	0.000	0.000
						B	0.000	2.076		100.00	0.000	0.000
						C	0.000	2.076		100.00	0.000	1.321
L7 69.75-54.00	61.75	1.196	4.33	0.8086	45.755	A	0.000	45.755	45.755	100.00	0.000	0.000
						B	0.000	45.755		100.00	0.000	0.000
						C	0.000	45.755		100.00	0.000	28.038
L8 54.00-53.50	53.75	1.15	4.16	0.7952	1.520	A	0.000	1.520	1.520	100.00	0.000	0.000
						B	0.000	1.520		100.00	0.000	0.000
						C	0.000	1.520		100.00	0.000	0.995
L9 53.50-39.75	46.54	1.103	3.99	0.7816	43.413	A	0.000	43.413	43.413	100.00	0.000	0.000
						B	0.000	43.413		100.00	0.000	0.000
						C	0.000	43.413		100.00	0.000	27.190
L10 39.75-35.00	37.36	1.036	3.75	0.7613	15.446	A	0.000	15.446	15.446	100.00	0.000	0.000
						B	0.000	15.446		100.00	0.000	0.000
						C	0.000	15.446		100.00	0.000	9.393
L11 35.00-25.00	29.96	1	3.62	0.7500	33.799	A	0.000	33.799	33.799	100.00	0.000	0.000
						B	0.000	33.799		100.00	0.000	0.000
						C	0.000	33.799		100.00	0.000	19.480
L12 25.00-14.50	19.70	1	3.62	0.7500	37.301	A	0.000	37.301	37.301	100.00	0.000	0.000
						B	0.000	37.301		100.00	0.000	0.000
						C	0.000	37.301		100.00	0.000	20.454
L13 14.50-4.75	9.59	1	3.62	0.7500	36.299	A	0.000	36.299	36.299	100.00	0.000	0.000
						B	0.000	36.299		100.00	0.000	0.000
						C	0.000	36.299		100.00	0.000	18.993
L14 4.75-0.00	2.37	1	3.62	0.7500	18.264	A	0.000	18.264	18.264	100.00	0.000	0.000
						B	0.000	18.264		100.00	0.000	0.000
						C	0.000	18.264		100.00	0.000	9.253

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 120.00-90.08	104.44	1.39	8.89	62.382	A	0.000	62.382	62.382	100.00	0.000	0.000
					B	0.000	62.382		100.00	0.000	0.000
					C	0.000	62.382		100.00	0.000	14.919
L2 90.08-89.50	89.79	1.331	8.52	1.366	A	0.000	1.366	1.366	100.00	0.000	0.000
					B	0.000	1.366		100.00	0.000	0.000
					C	0.000	1.366		100.00	0.000	0.527
L3 89.50-78.00	83.67	1.305	8.35	28.102	A	0.000	28.102	28.102	100.00	0.000	0.000
					B	0.000	28.102		100.00	0.000	0.000
					C	0.000	28.102		100.00	0.000	10.388
L4 78.00-72.00	74.98	1.264	8.09	15.237	A	0.000	15.237	15.237	100.00	0.000	0.000
					B	0.000	15.237		100.00	0.000	0.000
					C	0.000	15.237		100.00	0.000	5.420
L5 72.00-70.50	71.25	1.246	7.97	3.919	A	0.000	3.919	3.919	100.00	0.000	0.000
					B	0.000	3.919		100.00	0.000	0.000
					C	0.000	3.919		100.00	0.000	1.355
L6 70.50-69.75	70.12	1.24	7.94	1.974	A	0.000	1.974	1.974	100.00	0.000	0.000
					B	0.000	1.974		100.00	0.000	0.000
					C	0.000	1.974		100.00	0.000	0.678
L7 69.75-54.00	61.75	1.196	7.65	43.633	A	0.000	43.633	43.633	100.00	0.000	0.000
					B	0.000	43.633		100.00	0.000	0.000
					C	0.000	43.633		100.00	0.000	14.917
L8 54.00-53.50	53.75	1.15	7.36	1.454	A	0.000	1.454	1.454	100.00	0.000	0.000
					B	0.000	1.454		100.00	0.000	0.000
					C	0.000	1.454		100.00	0.000	0.624

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
L9 53.50-39.75	46.54	1.103	7.06	41.622	A	0.000	41.622	41.622	100.00	0.000	0.000
					B	0.000	41.622		100.00	0.000	0.000
					C	0.000	41.622		100.00	0.000	17.160
L10 39.75-35.00	37.36	1.036	6.63	14.827	A	0.000	14.827	14.827	100.00	0.000	0.000
					B	0.000	14.827		100.00	0.000	0.000
					C	0.000	14.827		100.00	0.000	5.928
L11 35.00-25.00	29.96	1	6.40	32.549	A	0.000	32.549	32.549	100.00	0.000	0.000
					B	0.000	32.549		100.00	0.000	0.000
					C	0.000	32.549		100.00	0.000	12.480
L12 25.00-14.50	19.70	1	6.40	35.989	A	0.000	35.989	35.989	100.00	0.000	0.000
					B	0.000	35.989		100.00	0.000	0.000
					C	0.000	35.989		100.00	0.000	13.104
L13 14.50-4.75	9.59	1	6.40	35.080	A	0.000	35.080	35.080	100.00	0.000	0.000
					B	0.000	35.080		100.00	0.000	0.000
					C	0.000	35.080		100.00	0.000	12.168
L14 4.75-0.00	2.37	1	6.40	17.670	A	0.000	17.670	17.670	100.00	0.000	0.000
					B	0.000	17.670		100.00	0.000	0.000
					C	0.000	17.670		100.00	0.000	5.928

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	120 - 90.0833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-23.98	1.97	-0.60
			Max. Mx	11	-11.04	517.93	1.40
			Max. My	8	-11.06	-0.98	-514.60
			Max. Vy	11	-27.74	517.93	1.40
			Max. Vx	8	27.59	-0.98	-514.60
			Max. Torque	11			-1.31
L2	90.0833 - 89.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-24.12	2.04	-0.64
			Max. Mx	11	-11.14	534.14	1.41
			Max. My	8	-11.16	-0.99	-530.73
			Max. Vy	11	-27.83	534.14	1.41
			Max. Vx	8	27.68	-0.99	-530.73
			Max. Torque	11			-1.28
L3	89.5 - 78	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.38	2.92	-1.15
			Max. Mx	11	-12.61	754.61	1.58
			Max. My	8	-12.63	-1.08	-749.94
			Max. Vy	11	-29.04	754.61	1.58
			Max. Vx	8	28.88	-1.08	-749.94
			Max. Torque	11			-1.28
L4	78 - 72	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30.21	4.06	-1.77
			Max. Mx	11	-15.29	1046.08	1.79
			Max. My	8	-15.30	-1.19	-1039.82
			Max. Vy	11	-30.71	1046.08	1.79
			Max. Vx	8	30.55	-1.19	-1039.82
			Max. Torque	11			-1.24
L5	72 - 70.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30.69	4.24	-1.88
			Max. Mx	11	-15.62	1092.34	1.83
			Max. My	8	-15.64	-1.21	-1085.83
			Max. Vy	11	-30.94	1092.34	1.83
			Max. Vx	8	30.79	-1.21	-1085.83
			Max. Torque	11			-1.22
L6	70.5 - 69.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30.94	4.34	-1.93
			Max. Mx	11	-15.81	1115.60	1.84
			Max. My	8	-15.82	-1.22	-1108.97
			Max. Vy	11	-31.05	1115.60	1.84
			Max. Vx	8	30.90	-1.22	-1108.97
			Max. Torque	11			-1.21
L7	69.75 - 54	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-37.19	6.29	-3.05
			Max. Mx	11	-20.54	1624.53	2.15
			Max. My	8	-20.55	-1.35	-1615.32
			Max. Vy	11	-33.56	1624.53	2.15
			Max. Vx	8	33.41	-1.35	-1615.32
			Max. Torque	11			-1.21
L8	54 - 53.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-37.40	6.36	-3.09
			Max. Mx	11	-20.70	1641.34	2.16
			Max. My	8	-20.71	-1.36	-1632.04
			Max. Vy	11	-33.64	1641.34	2.16
			Max. Vx	8	33.49	-1.36	-1632.04
			Max. Torque	11			-1.10
L9	53.5 - 39.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-40.62	7.52	-3.77
			Max. Mx	11	-23.15	1950.54	2.32
			Max. My	8	-23.16	-1.41	-1939.76
			Max. Vy	11	-35.04	1950.54	2.32
			Max. Vx	8	34.88	-1.41	-1939.76
			Max. Torque	11			-1.09
L10	39.75 - 35	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	14	-46.09	8.77	-4.49
			Max. Mx	11	-27.54	2291.32	2.48
			Max. My	8	-27.55	-1.47	-2278.97
			Max. Vy	11	-36.61	2291.32	2.48
			Max. Vx	8	36.46	-1.47	-2278.97
			Max. Torque	11			-0.96
L11	35 - 25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-50.64	10.07	-5.24
			Max. Mx	11	-31.26	2664.91	2.65
			Max. My	8	-31.26	-1.50	-2650.92
			Max. Vy	11	-38.08	2664.91	2.65
			Max. Vx	8	37.93	-1.50	-2650.92
			Max. Torque	11			-0.92
L12	25 - 14.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-55.81	11.49	-6.06
			Max. Mx	11	-35.52	3073.18	2.80
			Max. My	8	-35.52	-1.52	-3057.45
			Max. Vy	11	-39.65	3073.18	2.80
			Max. Vx	8	39.50	-1.52	-3057.45
			Max. Torque	10			-0.85
L13	14.5 - 4.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-60.90	12.88	-6.87
			Max. Mx	11	-39.77	3467.19	2.93
			Max. My	8	-39.77	-1.52	-3449.86
			Max. Vy	11	-41.13	3467.19	2.93
			Max. Vx	8	40.98	-1.52	-3449.86
			Max. Torque	2			0.94
L14	4.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-63.17	13.58	-7.27
			Max. Mx	11	-41.64	3664.35	2.99
			Max. My	8	-41.64	-1.52	-3646.23
			Max. Vy	11	-41.84	3664.35	2.99
			Max. Vx	8	41.69	-1.52	-3646.23
			Max. Torque	2			1.03

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	24	63.17	8.98	0.01
	Max. H_x	11	41.66	41.82	0.03
	Max. H_z	2	41.66	0.08	41.61
	Max. M_x	2	3634.93	0.08	41.61
	Max. M_z	5	3652.17	-41.77	-0.02
	Max. Torsion	2	1.03	0.08	41.61
	Min. Vert	11	41.66	41.82	0.03
	Min. H_x	5	41.66	-41.77	-0.02
	Min. H_z	8	41.66	-0.04	-41.67
	Min. M_x	8	-3646.23	-0.04	-41.67
	Min. M_z	11	-3664.35	41.82	0.03
	Min. Torsion	9	-0.88	20.90	-36.13

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	41.66	-0.00	0.00	1.43	3.00	0.00
Dead+Wind 0 deg - No Ice	41.66	-0.08	-41.61	-3634.93	13.44	-1.03
Dead+Wind 30 deg - No Ice	41.66	20.90	-36.02	-3145.72	-1826.04	-0.85
Dead+Wind 60 deg - No Ice	41.66	36.19	-20.78	-1813.09	-3163.52	-0.79
Dead+Wind 90 deg - No Ice	41.66	41.77	0.02	4.56	-3652.17	-0.56
Dead+Wind 120 deg - No Ice	41.66	36.17	20.89	1830.28	-3161.14	0.18

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 150 deg - No Ice	41.66	20.93	36.09	3158.55	-1829.76	0.60
Dead+Wind 180 deg - No Ice	41.66	0.04	41.67	3646.23	-1.52	0.87
Dead+Wind 210 deg - No Ice	41.66	-20.90	36.13	3162.81	1831.96	0.88
Dead+Wind 240 deg - No Ice	41.66	-36.23	20.83	1822.96	3175.35	0.85
Dead+Wind 270 deg - No Ice	41.66	-41.82	-0.03	-2.99	3664.35	0.58
Dead+Wind 300 deg - No Ice	41.66	-36.19	-20.82	-1819.05	3170.80	-0.07
Dead+Wind 330 deg - No Ice	41.66	-20.93	-36.04	-3148.45	1836.08	-0.65
Dead+Ice+Temp	63.17	0.00	-0.00	7.27	13.58	0.00
Dead+Wind 0 deg+Ice+Temp	63.17	-0.02	-8.94	-792.75	16.02	-0.35
Dead+Wind 30 deg+Ice+Temp	63.17	4.49	-7.74	-685.09	-388.42	-0.29
Dead+Wind 60 deg+Ice+Temp	63.17	7.77	-4.46	-391.88	-682.65	-0.22
Dead+Wind 90 deg+Ice+Temp	63.17	8.97	0.01	8.09	-790.21	-0.10
Dead+Wind 120 deg+Ice+Temp	63.17	7.77	4.49	409.68	-682.22	0.11
Dead+Wind 150 deg+Ice+Temp	63.17	4.49	7.75	701.98	-389.26	0.25
Dead+Wind 180 deg+Ice+Temp	63.17	0.01	8.95	809.28	12.89	0.32
Dead+Wind 210 deg+Ice+Temp	63.17	-4.49	7.76	702.80	416.12	0.30
Dead+Wind 240 deg+Ice+Temp	63.17	-7.78	4.47	408.12	711.55	0.23
Dead+Wind 270 deg+Ice+Temp	63.17	-8.98	-0.01	6.47	819.18	0.10
Dead+Wind 300 deg+Ice+Temp	63.17	-7.77	-4.47	-393.16	710.67	-0.10
Dead+Wind 330 deg+Ice+Temp	63.17	-4.49	-7.74	-685.69	417.03	-0.26
Dead+Wind 0 deg - Service	41.66	-0.02	-12.84	-1121.68	6.27	-0.31
Dead+Wind 30 deg - Service	41.66	6.45	-11.12	-970.65	-561.91	-0.26
Dead+Wind 60 deg - Service	41.66	11.17	-6.41	-559.05	-975.07	-0.25
Dead+Wind 90 deg - Service	41.66	12.89	0.01	2.41	-1125.90	-0.18
Dead+Wind 120 deg - Service	41.66	11.16	6.45	566.34	-974.31	0.04
Dead+Wind 150 deg - Service	41.66	6.46	11.14	976.62	-563.07	0.18
Dead+Wind 180 deg - Service	41.66	0.01	12.86	1127.18	1.65	0.27
Dead+Wind 210 deg - Service	41.66	-6.45	11.15	977.97	568.00	0.28
Dead+Wind 240 deg - Service	41.66	-11.18	6.43	564.08	982.93	0.27
Dead+Wind 270 deg - Service	41.66	-12.91	-0.01	0.08	1133.90	0.18
Dead+Wind 300 deg - Service	41.66	-11.17	-6.43	-560.89	981.55	-0.03
Dead+Wind 330 deg - Service	41.66	-6.46	-11.12	-971.50	569.25	-0.20

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-41.66	0.00	0.00	41.66	-0.00	0.000%
2	-0.08	-41.66	-41.61	0.08	41.66	41.61	0.002%
3	20.90	-41.66	-36.02	-20.90	41.66	36.02	0.000%
4	36.19	-41.66	-20.78	-36.19	41.66	20.78	0.000%
5	41.78	-41.66	0.02	-41.77	41.66	-0.02	0.002%
6	36.17	-41.66	20.89	-36.17	41.66	-20.89	0.000%
7	20.93	-41.66	36.09	-20.93	41.66	-36.09	0.000%
8	0.04	-41.66	41.67	-0.04	41.66	-41.67	0.002%
9	-20.90	-41.66	36.13	20.90	41.66	-36.13	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
10	-36.23	-41.66	20.83	36.23	41.66	-20.83	0.000%
11	-41.82	-41.66	-0.03	41.82	41.66	0.03	0.002%
12	-36.19	-41.66	-20.82	36.19	41.66	20.82	0.000%
13	-20.93	-41.66	-36.04	20.93	41.66	36.04	0.000%
14	0.00	-63.17	0.00	-0.00	63.17	0.00	0.003%
15	-0.02	-63.17	-8.94	0.02	63.17	8.94	0.000%
16	4.49	-63.17	-7.74	-4.49	63.17	7.74	0.000%
17	7.77	-63.17	-4.46	-7.77	63.17	4.46	0.000%
18	8.97	-63.17	0.01	-8.97	63.17	-0.01	0.000%
19	7.77	-63.17	4.49	-7.77	63.17	-4.49	0.000%
20	4.49	-63.17	7.75	-4.49	63.17	-7.75	0.000%
21	0.01	-63.17	8.95	-0.01	63.17	-8.95	0.000%
22	-4.49	-63.17	7.76	4.49	63.17	-7.76	0.000%
23	-7.78	-63.17	4.47	7.78	63.17	-4.47	0.000%
24	-8.98	-63.17	-0.01	8.98	63.17	0.01	0.000%
25	-7.77	-63.17	-4.47	7.77	63.17	4.47	0.000%
26	-4.49	-63.17	-7.74	4.49	63.17	7.74	0.000%
27	-0.02	-41.66	-12.84	0.02	41.66	12.84	0.004%
28	6.45	-41.66	-11.12	-6.45	41.66	11.12	0.001%
29	11.17	-41.66	-6.41	-11.17	41.66	6.41	0.000%
30	12.89	-41.66	0.01	-12.89	41.66	-0.01	0.004%
31	11.16	-41.66	6.45	-11.16	41.66	-6.45	0.001%
32	6.46	-41.66	11.14	-6.46	41.66	-11.14	0.001%
33	0.01	-41.66	12.86	-0.01	41.66	-12.86	0.004%
34	-6.45	-41.66	11.15	6.45	41.66	-11.15	0.000%
35	-11.18	-41.66	6.43	11.18	41.66	-6.43	0.001%
36	-12.91	-41.66	-0.01	12.91	41.66	0.01	0.004%
37	-11.17	-41.66	-6.43	11.17	41.66	6.43	0.000%
38	-6.46	-41.66	-11.12	6.46	41.66	11.12	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	11	0.00000001	0.00008458
3	Yes	14	0.00000001	0.00007498
4	Yes	14	0.00000001	0.00007651
5	Yes	11	0.00000001	0.00010326
6	Yes	14	0.00000001	0.00007562
7	Yes	14	0.00000001	0.00007644
8	Yes	11	0.00000001	0.00005765
9	Yes	14	0.00000001	0.00007702
10	Yes	14	0.00000001	0.00007536
11	Yes	11	0.00000001	0.00012117
12	Yes	14	0.00000001	0.00007688
13	Yes	14	0.00000001	0.00007594
14	Yes	6	0.00000001	0.00005429
15	Yes	13	0.00000001	0.00006311
16	Yes	13	0.00000001	0.00006770
17	Yes	13	0.00000001	0.00006781
18	Yes	13	0.00000001	0.00006284
19	Yes	13	0.00000001	0.00006879
20	Yes	13	0.00000001	0.00006908
21	Yes	13	0.00000001	0.00006434
22	Yes	13	0.00000001	0.00007094
23	Yes	13	0.00000001	0.00007103
24	Yes	13	0.00000001	0.00006521
25	Yes	13	0.00000001	0.00007015
26	Yes	13	0.00000001	0.00006967
27	Yes	10	0.00000001	0.00009073
28	Yes	11	0.00000001	0.00014236
29	Yes	12	0.00000001	0.00004968
30	Yes	10	0.00000001	0.00009681
31	Yes	11	0.00000001	0.00014396
32	Yes	11	0.00000001	0.00014935
33	Yes	10	0.00000001	0.00008975

34	Yes	12	0.00000001	0.00005001
35	Yes	11	0.00000001	0.00014313
36	Yes	10	0.00000001	0.00009842
37	Yes	12	0.00000001	0.00004997
38	Yes	11	0.00000001	0.00014717

Maximum Tower Deflections - Service Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	120 - 90.0833	19.068	36	1.4506	0.0035
L2	90.0833 - 89.5	10.625	36	1.1432	0.0011
L3	89.5 - 78	10.486	36	1.1327	0.0010
L4	81.75 - 72	8.729	36	1.0285	0.0008
L5	72 - 70.5	6.732	36	0.9090	0.0006
L6	70.5 - 69.75	6.450	36	0.8856	0.0005
L7	69.75 - 54	6.312	36	0.8745	0.0005
L8	54 - 53.5	3.743	36	0.6802	0.0003
L9	53.5 - 39.75	3.672	36	0.6738	0.0003
L10	44.5 - 35	2.540	36	0.5269	0.0002
L11	35 - 25	1.573	36	0.4323	0.0002
L12	25 - 14.5	0.803	36	0.3033	0.0001
L13	14.5 - 4.75	0.276	36	0.1762	0.0001
L14	4.75 - 0	0.032	36	0.0636	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
125.00	VHLP2-11	36	19.068	1.4506	0.0035	16755
123.00	PX2F-52	36	19.068	1.4506	0.0035	16755
122.00	LLPX310R w/ Mount Pipe	36	19.068	1.4506	0.0035	16755
113.00	(2) DB846F65ZAXY w/ Mount Pipe	36	16.951	1.4043	0.0028	11968
105.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	36	14.595	1.3399	0.0021	5584
97.00	RRUS-32 B30	36	12.376	1.2507	0.0015	3642
96.00	OPA-65R-LCUU-H6 w/ Mount Pipe	36	12.112	1.2371	0.0014	3490
75.00	ACUTIME 2000	36	7.318	0.9510	0.0006	4032

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	120 - 90.0833	61.552	11	4.6841	0.0112
L2	90.0833 - 89.5	34.311	11	3.6922	0.0034
L3	89.5 - 78	33.862	11	3.6583	0.0033
L4	81.75 - 72	28.192	11	3.3219	0.0025
L5	72 - 70.5	21.744	11	2.9359	0.0018
L6	70.5 - 69.75	20.834	11	2.8606	0.0017
L7	69.75 - 54	20.387	11	2.8248	0.0017
L8	54 - 53.5	12.093	11	2.1972	0.0010
L9	53.5 - 39.75	11.864	11	2.1768	0.0010
L10	44.5 - 35	8.207	11	1.7021	0.0007
L11	35 - 25	5.083	11	1.3965	0.0005
L12	25 - 14.5	2.595	11	0.9801	0.0003
L13	14.5 - 4.75	0.892	11	0.5693	0.0002
L14	4.75 - 0	0.102	11	0.2057	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.00	VHLP2-11	11	61.552	4.6841	0.0113	5251
123.00	PX2F-52	11	61.552	4.6841	0.0113	5251
122.00	LLPX310R w/ Mount Pipe	11	61.552	4.6841	0.0113	5251
113.00	(2) DB846F65ZAXY w/ Mount Pipe	11	54.722	4.5347	0.0092	3750
105.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	11	47.120	4.3270	0.0069	1749
97.00	RRUS-32 B30	11	39.961	4.0390	0.0048	1139
96.00	OPA-65R-LCUU-H6 w/ Mount Pipe	11	39.109	3.9952	0.0046	1091
75.00	ACUTIME 2000	11	23.636	3.0716	0.0020	1255

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	120 - 90.0833 (1)	TP28.0446x22x0.25	29.92	0.00	0.0	36.000	22.3747	-11.04	805.49	0.014
L2	90.0833 - 89.5 (2)	TP28.1625x28.0446x0.2893	0.58	0.00	0.0	31.572	25.9687	-11.14	819.88	0.014
L3	89.5 - 78 (3)	TP30.486x28.1625x0.4419	11.50	0.00	0.0	28.824	41.6675	-12.61	1201.02	0.010
L4	78 - 72 (4)	TP31.1982x28.8446x0.4965	9.75	0.00	0.0	28.962	49.0818	-15.29	1421.51	0.011
L5	72 - 70.5 (5)	TP31.5013x31.1982x0.4944	1.50	0.00	0.0	28.962	49.3649	-15.62	1429.71	0.011
L6	70.5 - 69.75 (6)	TP31.6528x31.5013x0.5312	0.75	0.00	0.0	30.678	53.2343	-15.81	1633.12	0.010
L7	69.75 - 54 (7)	TP34.8349x31.6528x0.685	15.75	0.00	0.0	29.190	75.3191	-20.54	2198.56	0.009
L8	54 - 53.5 (8)	TP34.9359x34.8349x0.687	0.50	0.00	0.0	30.594	75.7678	-20.70	2318.04	0.009
L9	53.5 - 39.75 (9)	TP37.714x34.9359x0.5346	13.75	0.00	0.0	33.198	62.3513	-23.15	2069.94	0.011
L10	39.75 - 35 (10)	TP38.0487x35.6851x0.7536	9.50	0.00	0.0	33.258	90.4964	-27.54	3009.73	0.009
L11	35 - 25 (11)	TP40.069x38.0487x0.7309	10.00	0.00	0.0	33.366	92.5760	-31.26	3088.89	0.010
L12	25 - 14.5 (12)	TP42.1905x40.069x0.7714	10.50	0.00	0.0	33.474	102.8840	-35.52	3443.93	0.010
L13	14.5 - 4.75 (13)	TP44.1603x42.1905x0.797	9.75	0.00	0.0	33.612	111.2820	-39.77	3740.42	0.011
L14	4.75 - 0 (14)	TP45.12x44.1603x0.6706	4.75	0.00	0.0	33.642	95.9740	-41.64	3228.76	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	120 - 90.0833 (1)	TP28.0446x22x0.25	517.93	40.923	36.000	1.137	0.00	0.000	36.000	0.000
L2	90.0833 - 89.5 (2)	TP28.1625x28.0446x0.2893	534.14	36.311	31.572	1.150	0.00	0.000	31.572	0.000
L3	89.5 - 78 (3)	TP30.486x28.1625x0.4419	754.61	30.569	28.824	1.061	0.00	0.000	28.824	0.000
L4	78 - 72 (4)	TP31.1982x28.8446x0.4965	1046.08	34.354	28.962	1.186	0.00	0.000	28.962	0.000
L5	72 - 70.5 (5)	TP31.5013x31.1982x0.4944	1092.34	35.309	28.962	1.219	0.00	0.000	28.962	0.000
L6	70.5 - 69.75 (6)	TP31.6528x31.5013x0.5312	1115.61	33.353	30.678	1.087	0.00	0.000	30.678	0.000

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 $\frac{f_{by}}{F_{by}}$
L7	69.75 - 54 (7)	TP34.8349x31.6528x0.685	1624.53	31.375	29.190	1.075	0.00	0.000	29.190	0.000
L8	54 - 53.5 (8)	TP34.9359x34.8349x0.687	1641.34	31.421	30.594	1.027	0.00	0.000	30.594	0.000
L9	53.5 - 39.75 (9)	TP37.714x34.9359x0.5346	1950.54	42.683	33.198	1.286	0.00	0.000	33.198	0.000
L10	39.75 - 35 (10)	TP38.0487x35.6851x0.7536	2291.32	33.730	33.258	1.014	0.00	0.000	33.258	0.000
L11	35 - 25 (11)	TP40.069x38.0487x0.7309	2664.92	36.299	33.366	1.088	0.00	0.000	33.366	0.000
L12	25 - 14.5 (12)	TP42.1905x40.069x0.7714	3073.18	35.775	33.474	1.069	0.00	0.000	33.474	0.000
L13	14.5 - 4.75 (13)	TP44.1603x42.1905x0.797	3467.19	35.634	33.612	1.060	0.00	0.000	33.612	0.000
L14	4.75 - 0 (14)	TP45.12x44.1603x0.6706	3664.35	42.462	33.642	1.262	0.00	0.000	33.642	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	120 - 90.0833 (1)	TP28.0446x22x0.25	27.74	1.240	24.000	0.105	1.29	0.048	24.000	0.002
L2	90.0833 - 89.5 (2)	TP28.1625x28.0446x0.2893	27.83	1.072	21.048	0.103	1.28	0.041	21.048	0.002
L3	89.5 - 78 (3)	TP30.486x28.1625x0.4419	29.04	0.697	19.216	0.074	1.24	0.024	19.216	0.001
L4	78 - 72 (4)	TP31.1982x28.8446x0.4965	30.71	0.626	19.308	0.066	1.23	0.019	19.308	0.001
L5	72 - 70.5 (5)	TP31.5013x31.1982x0.4944	30.94	0.627	19.308	0.066	1.22	0.019	19.308	0.001
L6	70.5 - 69.75 (6)	TP31.6528x31.5013x0.5312	31.05	0.583	20.452	0.058	1.21	0.017	20.452	0.001
L7	69.75 - 54 (7)	TP34.8349x31.6528x0.685	33.56	0.446	19.460	0.047	1.10	0.010	19.460	0.001
L8	54 - 53.5 (8)	TP34.9359x34.8349x0.687	33.64	0.444	20.396	0.044	1.10	0.010	20.396	0.000
L9	53.5 - 39.75 (9)	TP37.714x34.9359x0.5346	35.04	0.562	22.132	0.052	1.02	0.010	22.132	0.000
L10	39.75 - 35 (10)	TP38.0487x35.6851x0.7536	36.61	0.405	22.172	0.037	0.93	0.006	22.172	0.000
L11	35 - 25 (11)	TP40.069x38.0487x0.7309	38.08	0.411	22.244	0.038	0.84	0.005	22.244	0.000
L12	25 - 14.5 (12)	TP42.1905x40.069x0.7714	39.65	0.385	22.316	0.035	0.74	0.004	22.316	0.000
L13	14.5 - 4.75 (13)	TP44.1603x42.1905x0.797	41.13	0.370	22.408	0.034	0.64	0.003	22.408	0.000
L14	4.75 - 0 (14)	TP45.12x44.1603x0.6706	41.84	0.436	22.428	0.039	0.59	0.003	22.428	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	120 - 90.0833 (1)	0.014	1.137	0.000	0.105	0.002	1.153 ✔	1.333	H1-3+VT ✔
L2	90.0833 - 89.5 (2)	0.014	1.150	0.000	0.103	0.002	1.166 ✔	1.333	H1-3+VT ✔
L3	89.5 - 78 (3)	0.010	1.061	0.000	0.074	0.001	1.072 ✔	1.333	H1-3+VT ✔
L4	78 - 72 (4)	0.011	1.186	0.000	0.066	0.001	1.198	1.333	H1-3+VT ✔

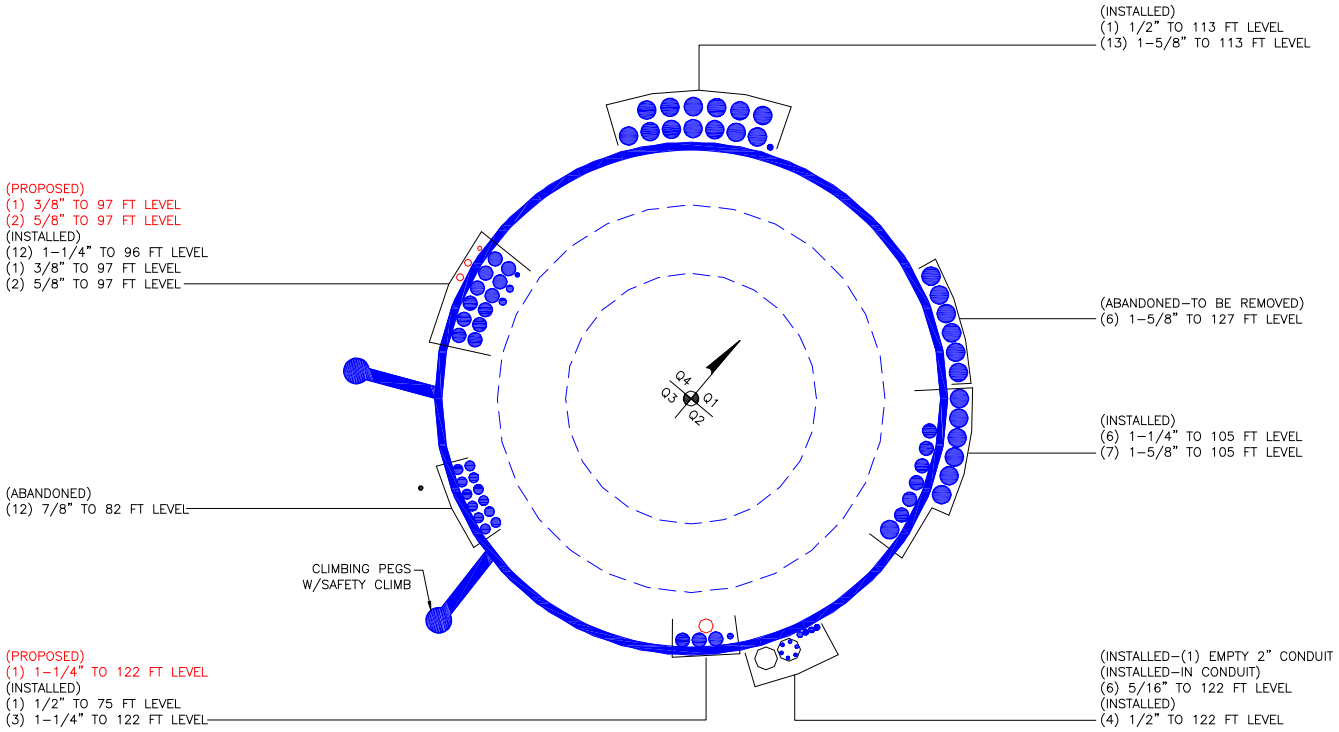
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L5	72 - 70.5 (5)	0.011	1.219	0.000	0.066	0.001	1.231 ✔	1.333	H1-3+VT ✔
L6	70.5 - 69.75 (6)	0.010	1.087	0.000	0.058	0.001	1.098 ✔	1.333	H1-3+VT ✔
L7	69.75 - 54 (7)	0.009	1.075	0.000	0.047	0.001	1.085 ✔	1.333	H1-3+VT ✔
L8	54 - 53.5 (8)	0.009	1.027	0.000	0.044	0.000	1.036 ✔	1.333	H1-3+VT ✔
L9	53.5 - 39.75 (9)	0.011	1.286	0.000	0.052	0.000	1.298 ✔	1.333	H1-3+VT ✔
L10	39.75 - 35 (10)	0.009	1.014	0.000	0.037	0.000	1.024 ✔	1.333	H1-3+VT ✔
L11	35 - 25 (11)	0.010	1.088	0.000	0.038	0.000	1.098 ✔	1.333	H1-3+VT ✔
L12	25 - 14.5 (12)	0.010	1.069	0.000	0.035	0.000	1.079 ✔	1.333	H1-3+VT ✔
L13	14.5 - 4.75 (13)	0.011	1.060	0.000	0.034	0.000	1.071 ✔	1.333	H1-3+VT ✔
L14	4.75 - 0 (14)	0.013	1.262	0.000	0.039	0.000	1.275 ✔	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	120 - 90.0833	Pole	TP28.0446x22x0.25	1	-11.04	1073.72	86.5	Pass
L2	90.0833 - 89.5	Pole	TP28.1625x28.0446x0.2893	2	-11.14	1092.90	87.5	Pass
L3	89.5 - 78	Pole	TP30.486x28.1625x0.4419	3	-12.61	1600.96	80.5	Pass
L4	78 - 72	Pole	TP31.1982x28.8446x0.4965	4	-15.29	1894.87	89.9	Pass
L5	72 - 70.5	Pole	TP31.5013x31.1982x0.4944	5	-15.62	1905.80	92.4	Pass
L6	70.5 - 69.75	Pole	TP31.6528x31.5013x0.5312	6	-15.81	2176.95	82.4	Pass
L7	69.75 - 54	Pole	TP34.8349x31.6528x0.685	7	-20.54	2930.68	81.4	Pass
L8	54 - 53.5	Pole	TP34.9359x34.8349x0.687	8	-20.70	3089.95	77.8	Pass
L9	53.5 - 39.75	Pole	TP37.714x34.9359x0.5346	9	-23.15	2759.23	97.3	Pass
L10	39.75 - 35	Pole	TP38.0487x35.6851x0.7536	10	-27.54	4011.97	76.8	Pass
L11	35 - 25	Pole	TP40.069x38.0487x0.7309	11	-31.26	4117.49	82.4	Pass
L12	25 - 14.5	Pole	TP42.1905x40.069x0.7714	12	-35.52	4590.76	81.0	Pass
L13	14.5 - 4.75	Pole	TP44.1603x42.1905x0.797	13	-39.77	4985.98	80.3	Pass
L14	4.75 - 0	Pole	TP45.12x44.1603x0.6706	14	-41.64	4303.94	95.7	Pass
							Summary	
						Pole (L9)	97.3	Pass
						RATING =	**97.3**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

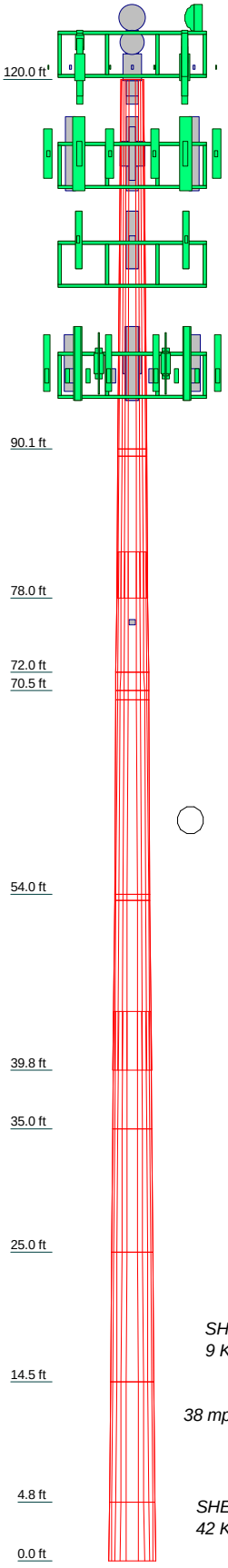


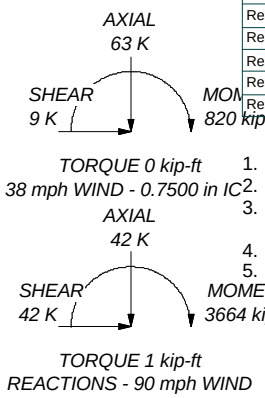
APPENDIX C

ADDITIONAL CALCULATIONS

Program Version 6.1.4.1 - 12/17/2013 File:G:/TOWER/375_Crown_Castle/2015/37515-1743_876320_528 WHEELERS FARM RD/37515-1743.002.7805_SA_1057328/Upload/37515-1743.002 Reinforced.eri

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Length (ft)	29.92	0.58	11.50	9.75	0.75	0.75	15.75	0.50	13.75	9.50	10.00	10.50	9.75	4.75
Number of Sides	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Thickness (in)	0.2500	0.2893	0.4419	0.4965	0.5444	0.5444	0.6849	0.6870	0.5346	0.7536	0.7309	0.7714	0.7970	0.6705
Socket Length (ft)			3.75						4.75					
Top Dia (in)	22.0000	28.0446	28.1625	28.8446	31.0198	31.0198	31.6528	34.8349	34.9359	35.6851	38.0487	40.0690	42.1904	44.1603
Bot Dia (in)	28.0446	28.1625	30.4860	31.1982	31.3581	31.3581	34.8349	34.9359	37.7140	38.0487	40.0690	42.1904	44.1603	45.1200
Grade	A607-60	Reinf 52.62 ksi	Reinf 48.04 ksi	Reinf 48.27 ksi	Reinf 51.13 ksi	Reinf 51.13 ksi	Reinf 48.65 ksi	Reinf 48.65 ksi	Reinf 50.99 ksi	Reinf 55.43 ksi	Reinf 55.61 ksi	Reinf 55.79 ksi	Reinf 56.02 ksi	Reinf 56.07 ksi
Weight (K)	2.0	0.1	1.6	1.6	0.3	0.3	3.8	0.1	2.9	2.8	3.1	3.6	3.6	1.5





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
LLPX310R w/ Mount Pipe	122	DB-T1-6Z-8AB-0Z	113
LLPX310R w/ Mount Pipe	122	Platform Mount [LP 303-1]	113
LLPX310R w/ Mount Pipe	122	(2) DB846F65ZAXY w/ Mount Pipe	113
MT-485025	122	(2) LPA-80063/4CF w/ Mount Pipe	113
FDD_R6_RRH	122	(2) LPA-80063/4CF w/ Mount Pipe	113
FDD_R6_RRH	122	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	105
FDD_R6_RRH	122	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	105
APXVTM14-C-120 w/ Mount Pipe	122	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	105
APXVTM14-C-120 w/ Mount Pipe	122	KRY 112 144/1	105
APXVTM14-C-120 w/ Mount Pipe	122	KRY 112 144/1	105
TD-RRH8x20-25	122	KRY 112 144/1	105
TD-RRH8x20-25	122	Platform Mount [LP 712-1]	105
TD-RRH8x20-25	122	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
APXVSPP18-C-A20 w/ Mount Pipe	122	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
APXVSPP18-C-A20 w/ Mount Pipe	122	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
APXVSPP18-C-A20 w/ Mount Pipe	122	DC6-48-60-18-8F	97
PCS 1900MHz 4x45W-65MHz	122	DC6-48-60-18-8F	97
PCS 1900MHz 4x45W-65MHz	122	RRUS 11	97
PCS 1900MHz 4x45W-65MHz	122	RRUS 11	97
(3) ACU-A20-N	122	RRUS 11	97
(3) ACU-A20-N	122	RRUS 11	97
(3) ACU-A20-N	122	RRUS 11	97
800 EXTERNAL NOTCH FILTER	122	RRUS 11	97
800 EXTERNAL NOTCH FILTER	122	(2) 2.375" OD x 5' Mount Pipe	97
800 EXTERNAL NOTCH FILTER	122	(2) 2.375" OD x 5' Mount Pipe	97
800MHZ RRH	122	(2) 2.375" OD x 5' Mount Pipe	97
800MHZ RRH	122	Side Arm Mount [SO 102-3]	97
800MHZ RRH	122	RRUS-32 B30	97
Platform Mount [LP 713-1]	122	RRUS-32 B30	97
PX2F-52	122	RRUS-32 B30	97
VHLP2-11	122	(2) 7770.00 w/ Mount Pipe	96
VHLP2-11	122	(2) 7770.00 w/ Mount Pipe	96
MG D3-800Tx w/ Mount Pipe	113	(2) 7770.00 w/ Mount Pipe	96
MG D3-800Tx w/ Mount Pipe	113	P65-16-XLH-RR w/ Mount Pipe	96
MG D3-800Tx w/ Mount Pipe	113	P65-16-XLH-RR w/ Mount Pipe	96
(2) FD9R6004/2C-3L	113	P65-16-XLH-RR w/ Mount Pipe	96
(2) FD9R6004/2C-3L	113	(4) LGP2140X	96
(2) FD9R6004/2C-3L	113	(4) LGP2140X	96
ACUTIME 2000	113	(4) LGP2140X	96
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	113	Platform Mount [LP 601-1]	96
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	113	OPA-65R-LCUU-H6 w/ Mount Pipe	96
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	113	OPA-65R-LCUU-H6 w/ Mount Pipe	96
BXA-70063/6CF w/ Mount Pipe	113	OPA-65R-LCUU-H6 w/ Mount Pipe	96
BXA-70040/6CFx4 w/ Mount Pipe	113	Side Arm Mount [SO 701-1]	75
BXA-70040/6CFx2 w/ Mount Pipe	113	ACUTIME 2000	75
RRH2x40-AWS	113		
RRH2x40-AWS	113		
RRH2x40-AWS	113		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	Reinf 55.33 ksi	55 ksi	70 ksi
Reinf 52.62 ksi	53 ksi	66 ksi	Reinf 55.43 ksi	55 ksi	70 ksi
Reinf 48.04 ksi	48 ksi	61 ksi	Reinf 55.61 ksi	56 ksi	70 ksi
Reinf 48.27 ksi	48 ksi	61 ksi	Reinf 55.79 ksi	56 ksi	70 ksi
Reinf 51.13 ksi	51 ksi	64 ksi	Reinf 56.02 ksi	56 ksi	71 ksi
Reinf 48.65 ksi	49 ksi	61 ksi	Reinf 56.07 ksi	56 ksi	71 ksi
Reinf 50.99 ksi	51 ksi	64 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 97.3%

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

Job: **Ex 120 ft Monopole / 528 Wheelers Farm Rd**			
Project: **PJF 37515-1743.002.7805 / BU 876320**			
Client: CCI	Drawn by: Corey McCartney	App'd:	
Code: TIA/EIA-222-F	Date: 05/15/15	Scale: NTS	
Path:		Dwg No. E-1	

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

Job Number: 37515-1743.002.7805
Site Number: 876320
Site Name: 528 Wheelers Farm Rd

By: CMM
Date: 5/15/2015

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

Unfactored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, M =	3664.0		k-ft
Shear, V =	42.0		kips
Axial Load, P =	42.0		kips
OTM =	3685.0	0.0	k-ft @ Ground

Safety Factors / Load Factors / Φ Factors

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

Drilled Pier Parameters

Diameter =	7	ft
Height Above Grade =	0.5	ft
Depth Below Grade =	19	ft
fc' =	3	ksi
εc =	0.003	in/in
Mat Ftdn. Cap Width =		ft
Mat Ftdn. Cap Length =		ft
Depth Below Grade =		ft

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

Load Combinations Checked per TIA/EIA-222-F

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

Steel Parameters

Number of Bars =	32	
Rebar Size =	#11	
Rebar Fy =	60	ksi
Rebar MOE =	29000	ksi
Tie Size =	#5	
Side Clear Cover to Ties =	4	in

Soil Parameters

Water Table Depth =	7.00	ft
Depth to Ignore Soil =	3.50	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?	Ground	

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

Direct Embed Pole Shaft Parameters

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

Maximum Capacity Ratios

Maximum Soil Ratio =	110.0%
Maximum Steel Ratio =	105.0%

Define Soil Layers

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

Layer	Thickness ft	Unit Weight pcf	Cohesion psf	Friction Angle degrees	Soil Type	Ultimate End Bearing psf	Comp. Ult. Skin Friction psf	Tension Ult. Skin Friction psf	Depth ft
1	2	100	0	28	Sand				2
2	5	135	0	42	Sand				7
3	6.5	135	0	42	Sand	20000			13.5
4	8.5	140	8000	0	Clay	20000			22
5									
6									
7									
8									
9									
10									
11									
12									

Soil Results: Overturning

Depth to COR =	15.24	ft, from Grade	Shear, V =	42.00	kips
Bending Moment, M =	4325.00	k-ft, from COR	Resisting Shear, Va =	47.59	kips
Resisting Moment, Ma =	4900.53	k-ft, from COR			
MOMENT RATIO =	**88.3%**	**OK**	**SHEAR RATIO =**	**88.3%**	**OK**

Soil Results: Uplift

Uplift, T =	0.00	kips
Allowable Uplift Cap., Ta =	67.00	kips
UPLIFT RATIO =	**0.0%**	**OK**

Soil Results: Compression

Compression, C =	42.00	kips
Allowable Comp. Cap., Ca =	369.36	kips
COMPRESSION RATIO =	**11.4%**	**OK**

Steel Results (ACI 318-02):

Minimum Steel Area =	18.47	sq in	Axial Load, P =	73.75	kips @ 5.00 ft Below Grade
Actual Steel Area =	49.92	sq in	Moment, M =	3870.28	k-ft @ 5.00 ft Below Grade
			Allowable Moment, Ma =	5828.48	k-ft
Allowable Min Axial, Pa =	-2073.60	kips, Where Ma = 0 k-ft	**MOMENT RATIO =**	**66.4%**	**OK**
Allowable Max Axial, Pa =	6799.77	kips, Where Ma = 0 k-ft			

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: *876320*
Site Name: *528 Wheelers Farm Rd*
App #:

Enter Load Factors Below:		
For M (WL)	1.3	<---- Enter Factor
For P (DL)	1.3	<---- Enter Factor

Pier Properties

Concrete:

Pier Diameter =	7.0	ft
Concrete Area =	5541.8	in^2

Reinforcement:

Clear Cover to **Tie**=	4.00	in
Horiz. **Tie** Bar Size=	5	
Vert. Cage Diameter =	6.11	ft
Vert. Cage Diameter =	73.34	in
Vertical Bar Size =	11	
Bar Diameter =	1.41	in
Bar Area =	1.56	in^2
Number of Bars =	32	
As Total=	49.92	in^2
A s/ Aconc, Rho:	0.0090	0.90%

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:
(3)*(Sqrt(f'c)/Fy: 0.0027
200 / Fy: 0.0033

Minimum Rho Check:
Actual Req'd Min. Rho: 0.33% Flexural
Provided Rho: 0.90% **OK**

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	8839.70	kips
at Mu=(ϕ=0.65)Mn=	5309.39	ft-kips
Max Tu, (φ=0.9) Tn =	2695.68	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces

TIA Revision:	F	
Max. Service Shaft M:	3870.28	ft-kips **(* Note)**
Max. Service Shaft P:	73.75	kips
Max Axial Force Type:	Comp.	

(*) Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

Load Factor	**Shaft Factored Loads**		
1.30	Mu:	5031.364	ft-kips
1.30	Pu:	95.875	kips

Material Properties

Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	

ACI 318 Code

Select Analysis ACI Code= 2002

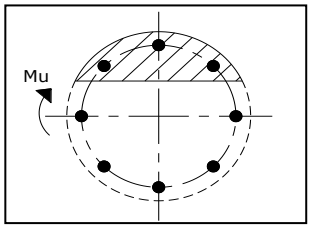
Seismic Properties

Seismic Design Category = D
Seismic Risk = **High**

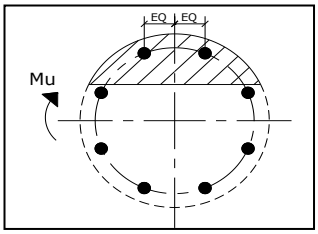
Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **2**



Case 1



Case 2

Dist. From Edge to Neutral Axis: **17.12** in
Extreme Steel Strain, ϵt: **0.0108**
ϵt > 0.0050, Tension Controlled
Reduction Factor,φ: **0.900**

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	95.88	kips
Drilled Shaft Moment Capacity, φMn:	**7577.02**	ft-kips
Drilled Shaft Superimposed Mu:	**5031.36**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**66.4%**

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

v4.4 - Effective 7-12-13

Date: 5/15/2015
PJF Project: 37515-1743.002.7805
Client Ref. # 876320
Site Name: 528 Wheelers Farm Rd
Description: 120' Pole
Owner: CCI
Engineer: CMM

Asymmetric Anchor Rod Analysis

Moment =	3664	k-ft	TIA Ref.	F	Location =	Base Plate		
Axial =	42.0	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	42.0	kips	Max Ratio =	105.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	24							

**** 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	27.3	58.00	0.00	3.98	158.69	154.35	154.35	0.00	195.00	79.2%
2	2.250	#18J A615 Gr 75	75	100	39.1	58.00	0.00	3.98	158.69	154.35	154.35	0.00	195.00	79.2%
3	2.250	#18J A615 Gr 75	75	100	50.9	58.00	0.00	3.98	158.69	154.35	154.35	0.00	195.00	79.2%
4	2.250	#18J A615 Gr 75	75	100	62.7	58.00	0.00	3.98	158.69	154.35	154.35	0.00	195.00	79.2%
5	2.250	#18J A615 Gr 75	75	100	117.3	58.00	0.00	3.98	158.69	154.35	154.35	0.00	195.00	79.2%
6	2.250	#18J A615 Gr 75	75	100	129.1	58.00	0.00	3.98	158.69	154.35	154.35	0.00	195.00	79.2%
7	2.250	#18J A615 Gr 75	75	100	140.9	58.00	0.00	3.98	158.69	154.35	154.35	0.00	195.00	79.2%
8	2.250	#18J A615 Gr 75	75	100	152.7	58.00	0.00	3.98	158.69	154.35	154.35	0.00	195.00	79.2%
9	2.250	#18J A615 Gr 75	75	100	207.3	58.00	0.00	3.98	158.69	154.35	154.35	0.00	195.00	79.2%
10	2.250	#18J A615 Gr 75	75	100	219.1	58.00	0.00	3.98	158.69	154.35	154.35	0.00	195.00	79.2%
11	2.250	#18J A615 Gr 75	75	100	230.9	58.00	0.00	3.98	158.69	154.35	154.35	0.00	195.00	79.2%
12	2.250	#18J A615 Gr 75	75	100	242.7	58.00	0.00	3.98	158.69	154.35	154.35	0.00	195.00	79.2%
13	2.250	#18J A615 Gr 75	75	100	297.3	58.00	0.00	3.98	158.69	154.35	154.35	0.00	195.00	79.2%
14	2.250	#18J A615 Gr 75	75	100	309.1	58.00	0.00	3.98	158.69	154.35	154.35	0.00	195.00	79.2%
15	2.250	#18J A615 Gr 75	75	100	320.9	58.00	0.00	3.98	158.69	154.35	154.35	0.00	195.00	79.2%
16	2.250	#18J A615 Gr 75	75	100	332.7	58.00	0.00	3.98	158.69	154.35	154.35	0.00	195.00	79.2%
17	1.375	Williams R71	127.7	150	352.1	58.00	0.00	1.68	66.90	65.08	65.08	0.00	110.75	58.8%
18	1.375	Williams R71	127.7	150	7.9	58.00	0.00	1.68	66.90	65.08	65.08	0.00	110.75	58.8%
19	1.375	Williams R71	127.7	150	82.1	58.00	0.00	1.68	66.90	65.08	65.08	0.00	110.75	58.8%
20	1.375	Williams R71	127.7	150	97.9	58.00	0.00	1.68	66.90	65.08	65.08	0.00	110.75	58.8%
21	1.375	Williams R71	127.7	150	172.1	58.00	0.00	1.68	66.90	65.08	65.08	0.00	110.75	58.8%
22	1.375	Williams R71	127.7	150	187.9	58.00	0.00	1.68	66.90	65.08	65.08	0.00	110.75	58.8%
23	1.375	Williams R71	127.7	150	262.1	58.00	0.00	1.68	66.90	65.08	65.08	0.00	110.75	58.8%
24	1.375	Williams R71	127.7	150	277.9	58.00	0.00	1.68	66.90	65.08	65.08	0.00	110.75	58.8%
								77.10						

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#: *876320*
Site Name: *528 Wheelers Farm Rd*
App #:

Base Reactions			
TIA Revision:	F		**Reactions adjusted to account for additional anchor rods.**
Unfactored Moment, M:	3026.1	ft-kips	
Unfactored Axial, P:	34.7	kips	
Unfactored Shear, V:	34.7	kips	

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	58	in
Anchor Spacing:	6	in

Anchor Rod Results

TIA F --> Maximum Rod Tension	154.4	Kips
Allowable Tension:	195.0	Kips
Anchor Rod Stress Ratio:	79.2%	**Pass**

Plate Data		
W=Side:	57	in
Thick:	3.25	in
Grade:	50	ksi
Clip Distance:	16	in

Base Plate Results Shear Check Only

Base Plate Stress:	3.8	ksi
Allowable PL Bending Stress:	26.7	ksi
Base Plate Stress Ratio:	14.2%	**Pass**

PL Ref. Data
Yield Line (in):
N/A, Roark
Max PL Length:
35.49

Stiffener Data (Welding at both sides)		
Configuration:	Stiffened	
Weld Type:	Both	**
Groove Depth:	0.5	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.5	in
Fillet V. Weld:	0.375	in
Width:	9	in
Height:	18	in
Thick:	1	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	80	ksi

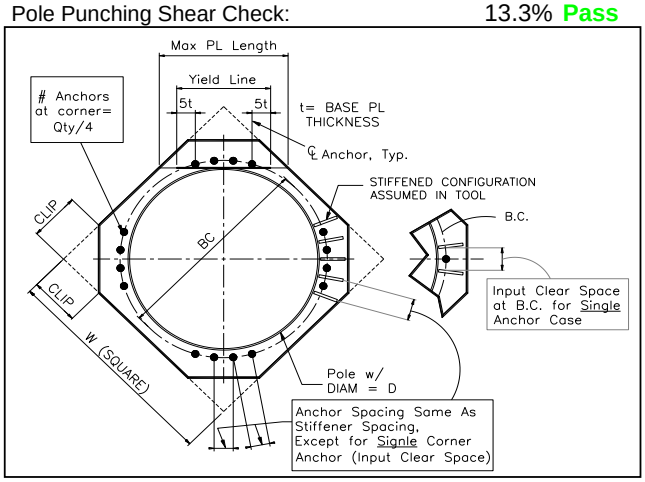
Stiffener Results

Horizontal Weld :	44.9%	**Pass**
Vertical Weld:	37.9%	**Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	12.4%	**Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	46.0%	**Pass**
Plate Comp. (AISC Bracket):	46.4%	**Pass**

Pole Results

Pole Punching Shear Check:	13.3%	**Pass**

Pole Data		
Diam:	45.12	in
Thick:	0.375	in
Grade:	60	ksi
# of Sides:	12	"0" IF Round



Stress Increase Factor		
ASD ASIF:	1.333	

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