PJF PAUL J. FORD & COMPANY

Date: **August 26, 2015**

Andrew Bazinet
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Paul J. Ford and Company
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Columbus, OH 43215
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Subject: **Structural Modification Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5748
	Carrier Site Name:	AWE - STONNINGTON EAST
Crown Castle Designation:	**Crown Castle BU Number:**	828257
	Crown Castle Site Name:	STONINGTON
	Crown Castle JDE Job Number:	334188
	Crown Castle Work Order Number:	1107669
	Crown Castle Application Number:	262048 Rev. 2
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37515-2530.001.7700
Site Data:	**82 Mechanic Street, Pawcatuck, New London County, CT**	
	Latitude *41° 22' 18.91"*, Longitude *-71° 49' 58.01"*	
	150 Foot - Monopole Tower	

Dear Andrew Bazinet,

Paul J. Ford and Company is pleased to submit this **"Structural Modification Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 817241, in accordance with application 262048, revision 2.

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

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

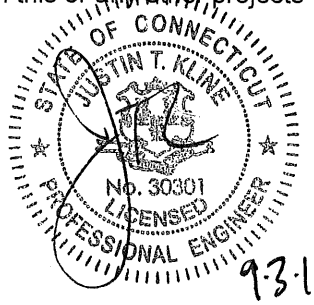
The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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

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

Respectfully submitted by:

Joey Meinerding, E.I. KJS
Structural Designer



9-3-15

tnxTower Report - version 6.1.4.1

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tnxTower Report - version 6.1.4.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft. monopole tower designed by Pirod in October of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of 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 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
133.0	135.0	3	cci antennas	OPA-65R-LCUU-H6	8	1-1/4	--
	129.0	6	cci antennas	TMABPDB7823VG12A			

Table 2 - Existing 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
145.0	148.0	6	ericsson	KRY 112 89/5	12	1-5/8	1
		3	rfs celwave	APX18-209014-CT2			
	143.0	3	rfs celwave	APXV18-206516S-C			
		6	rfs celwave	ATMAA1412D-1A20			
133.0	135.0	1	ericsson	KRY 112 144/1	1	5/16	2
		1	powerwave technologies	7770.00			
		2	powerwave technologies	LGP21401			
	131.0	1	ericsson	KRY 112 144/1			
		1	powerwave technologies	7770.00			
		2	powerwave technologies	LGP21401			
		--	--	--	4	1-1/4	1

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

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, 09/14/2000	3487586	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Pirod, A-117709, 10/12/2000	3946752	CCISITES
4-TOWER MANUFACTURER DRAWINGS	TEP, 61185_32839, 06/29/2015	3487587	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD, 2010296.48, 11/24/2010	3946736	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) For existing modifications: monopole was modified in conformance with the referenced modification drawings.
5) For proposed modifications: monopole will be modified in conformance with the attached proposed modification drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 138	Pole	HSS10.75x0.465	1	-1.34	504.71	10.7	Pass
L2	138 - 126	Pole	HSS10.75x0.465	2	-2.86	504.71	32.9	Pass
L3	126 - 110	Pole	P24x0.375	3	-5.32	934.94	18.0	Pass
L4	110 - 90	Pole	P24x0.375	4	-7.53	934.94	34.9	Pass
L5	90 - 60	Pole	P24x0.375	5	-10.93	934.94	67.9	Pass
L6	60 - 30	Pole	RPS 24" x 0.63107"	6	-16.29	1556.32	67.3	Pass
L7	30 - 2	Pole	RPS 30" x 0.57017"	7	-21.93	1601.75	73.8	Pass
L8	2 - 0	Pole	RPS 30" x 0.6927"	8	-22.41	1937.34	62.9	Pass
							Summary	
						Pole (L7)	73.8	Pass
						Rating =	73.8	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	74.1	Pass
1	Base Plate	0	80.8	Pass
1	Base Foundation Structural Steel	0	24.7	Pass
1	Base Foundation Soil Interaction	0	89.5	Pass
1	Flange Connection	30	85.8	Pass
1	Flange Connection	60	63.7	Pass
1	Flange Connection	90	73.1	Pass
1	Flange Connection	110	37.6	Pass
1	Flange Connection	126	70.6	Pass

Structure Rating (max from all components) =	**89.5%**

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

4.1) Recommendations

Install the proposed modifications per the attached drawings.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

1) Tower is located in New London County, Connecticut.
2) Basic wind speed of 85 mph.
3) Nominal ice thickness of 0.7500 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56 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		

Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L1	150.00-138.00	12.00	HSS10.75x0.465	A500-42 (42 ksi)	5.00
L2	133.00-121.00	12.00	HSS10.75x0.465	A500-42 (42 ksi)	5.00
L3	121.00-105.00	16.00	P24x0.375	A53-B-42 (42 ksi)	5.00
L4	105.00-85.00	20.00	P24x0.375	A53-B-42 (42 ksi)	5.00
L5	85.00-55.00	30.00	P24x0.375	A53-B-42 (42 ksi)	5.00
L6	55.00-25.00	30.00	RPS 24" x 0.63107"	Reinf 42.00 ksi (42 ksi)	5.00
L7	25.00-3.00	28.00	RPS 30" x 0.57017"	Reinf 37.99 ksi (38 ksi)	5.00
L8	3.00-1.00	2.00	RPS 30" x	Reinf 37.98	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
			0.6927"	ksi (38 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 150.00-138.00				1	0	1		
L2 138.00-126.00				1	0	1		
L3 126.00-110.00				1	1	1		
L4 110.00-90.00				1	1	1		
L5 90.00-60.00				1	1	1		
L6 60.00-30.00				1	1	1		
L7 30.00-2.00				1	1	1		
L8 2.00-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8")	C	No	Inside Pole	145.00 - 0.00	12	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
***								
LDF6-50A(1-1/4")	C	No	Inside Pole	133.00 - 0.00	4	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
LDF6-50A(1-1/4")	C	No	Inside Pole	133.00 - 0.00	8	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
***								
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	62.00 - 0.00	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	150.00-138.00	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	0.000	0.07
L2	138.00-126.00	A	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.17
L3	126.00-110.00	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	0.000	0.28
L4	110.00-90.00	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	0.000	0.36
L5	90.00-60.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.667	0.53
L6	60.00-30.00	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	10.000	0.53
L7	30.00-2.00	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	9.333	0.50
L8	2.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.667	0.04

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-138.00	A	0.895	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	0.000	0.07
L2	138.00-126.00	A	0.886	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	0.000	0.17
L3	126.00-110.00	A	0.874	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	0.000	0.28
L4	110.00-90.00	A	0.857	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	0.000	0.36
L5	90.00-60.00	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	1.402	0.53
L6	60.00-30.00	A	0.778	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	20.379	0.53
L7	30.00-2.00	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	18.666	0.50
L8	2.00-0.00	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	1.333	0.04

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.00-138.00	0.0000	0.0000	0.0000	0.0000
L2	138.00-126.00	0.0000	0.0000	0.0000	0.0000
L3	126.00-110.00	0.0000	0.0000	0.0000	0.0000
L4	110.00-90.00	0.0000	0.0000	0.0000	0.0000
L5	90.00-60.00	-0.0286	0.0165	-0.0556	0.0321
L6	60.00-30.00	-0.3712	0.2143	-0.6283	0.3627

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L7	30.00-2.00	-0.3821	0.2206	-0.6577	0.3797
L8	2.00-0.00	-0.3821	0.2206	-0.6577	0.3797

User Defined Loads

Description	Elevation	Offset From Centroid	Azimuth Angle		Weight	F_x	F_z	Wind Force	C_AA_C
	ft	ft	°		K	K	K	K	ft^2
Flag	150.00	0.00	0.0000	No Ice	0.29	0.00	0.00	0.34	**7.04**
				Ice	0.46	0.00	0.00	0.09	**9.11**
				Service	0.29	0.00	0.00	0.14	**8.11**

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft		ft^2	ft^2	K
*** ********** *******									
APXV18-206516S-C	A	From Leg	1.00 0.00 -2.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.02 0.04 0.06 0.13 0.31
APXV18-206516S-C	B	From Leg	1.00 0.00 -2.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.02 0.04 0.06 0.13 0.31
APXV18-206516S-C	C	From Leg	1.00 0.00 -2.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.02 0.04 0.06 0.13 0.31
APX18-209014-CT2	A	From Leg	1.00 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.01 0.03 0.05 0.11 0.28
APX18-209014-CT2	B	From Leg	1.00 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.01 0.03 0.05 0.11 0.28
APX18-209014-CT2	C	From Leg	1.00 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.01 0.03 0.05 0.11 0.28

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
(2) ATMAA1412D-1A20	A	From Leg	1.00 0.00 -2.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.01 0.02 0.03 0.06 0.14
(2) ATMAA1412D-1A20	B	From Leg	1.00 0.00 -2.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.01 0.02 0.03 0.06 0.14
(2) ATMAA1412D-1A20	C	From Leg	1.00 0.00 -2.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.01 0.02 0.03 0.06 0.14
(2) KRY 112 89/5	A	From Leg	1.00 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.02 0.02 0.03 0.05 0.11
(2) KRY 112 89/5	B	From Leg	1.00 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.02 0.02 0.03 0.05 0.11
(2) KRY 112 89/5	C	From Leg	1.00 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.02 0.02 0.03 0.05 0.11
***									
OPA-65R-LCUU-H6	A	From Leg	1.00 0.00 2.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.07 0.13 0.20 0.36 0.76
OPA-65R-LCUU-H6	B	From Leg	1.00 0.00 2.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.07 0.13 0.20 0.36 0.76
OPA-65R-LCUU-H6	C	From Leg	1.00 0.00 2.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.07 0.13 0.20 0.36 0.76
(2) TMABPDB7823VG12A	A	From Leg	1.00 0.00 -4.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.02 0.03 0.04 0.06 0.14
(2) TMABPDB7823VG12A	B	From Leg	1.00 0.00 -4.00	0.0000	133.00	No Ice 1/2" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.02 0.03 0.04

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	0.00	0.00	0.06
						2" Ice	0.00	0.00	0.14
						4" Ice			
(2) TMABPDB7823VG12A	C	From Leg	1.00 0.00 -4.00	0.0000	133.00	No Ice	0.00	0.00	0.02
						1/2" Ice	0.00	0.00	0.03
						1" Ice	0.00	0.00	0.04
						2" Ice	0.00	0.00	0.06
						4" Ice	0.00	0.00	0.14
***									
Canister Load1	C	None		0.0000	150.00	No Ice	10.62	10.62	0.11
						1/2" Ice	10.91	10.91	0.25
						1" Ice	11.21	11.21	0.38
						2" Ice	11.80	11.80	0.67
						4" Ice	12.98	12.98	1.29
Canister Load2	C	None		0.0000	138.00	No Ice	21.24	21.24	0.46
						1/2" Ice	21.83	21.83	0.73
						1" Ice	22.42	22.42	1.01
						2" Ice	23.60	23.60	1.58
						4" Ice	25.96	25.96	2.81
Canister Load3	C	None		0.0000	126.00	No Ice	10.62	10.62	0.75
						1/2" Ice	10.91	10.91	0.88
						1" Ice	11.21	11.21	1.02
						2" Ice	11.80	11.80	1.31
						4" Ice	12.98	12.98	1.92
Truck Ball	C	None		0.0000	150.75	No Ice	1.41	1.41	0.05
						1/2" Ice	1.58	1.58	0.07
						1" Ice	1.75	1.75	0.09
						2" Ice	2.11	2.11	0.13
						4" Ice	2.95	2.95	0.25

Tower Pressures - No Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % 	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 150.00-138.00	144.00	1.523	28	10.750	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000		0.00	0.000	0.000
					C	0.000	0.000		0.00	0.000	0.000
L2 138.00-126.00	132.00	1.486	27	10.750	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000		0.00	0.000	0.000
					C	0.000	0.000		0.00	0.000	0.000
L3 126.00-110.00	118.00	1.439	27	32.000	A	0.000	32.000	32.000	100.00	0.000	0.000
					B	0.000	32.000		100.00	0.000	0.000
					C	0.000	32.000		100.00	0.000	0.000
L4 110.00-90.00	100.00	1.373	25	40.000	A	0.000	40.000	40.000	100.00	0.000	0.000
					B	0.000	40.000		100.00	0.000	0.000
					C	0.000	40.000		100.00	0.000	0.000
L5 90.00-60.00	75.00	1.264	23	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000		100.00	0.000	0.000
					C	0.000	60.000		100.00	0.000	0.667
L6 60.00-	45.00	1.093	20	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
30.00					B	0.000	60.000		100.00	0.000	0.000
					C	0.000	60.000		100.00	0.000	10.000
L7 30.00-2.00	16.00	1	18	70.000	A	0.000	70.000	70.000	100.00	0.000	0.000
					B	0.000	70.000		100.00	0.000	0.000
					C	0.000	70.000		100.00	0.000	9.333
L8 2.00-0.00	1.00	1	18	5.000	A	0.000	5.000	5.000	100.00	0.000	0.000
					B	0.000	5.000		100.00	0.000	0.000
					C	0.000	5.000		100.00	0.000	0.667

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 150.00-138.00	144.00	1.523	6	0.8950	12.540	A	0.000	0.000	0.000	0.00	0.000	0.000
						B	0.000	0.000		0.00	0.000	0.000
						C	0.000	0.000		0.00	0.000	0.000
L2 138.00-126.00	132.00	1.486	5	0.8857	12.521	A	0.000	0.000	0.000	0.00	0.000	0.000
						B	0.000	0.000		0.00	0.000	0.000
						C	0.000	0.000		0.00	0.000	0.000
L3 126.00-110.00	118.00	1.439	5	0.8739	34.330	A	0.000	34.330	34.330	100.00	0.000	0.000
						B	0.000	34.330		100.00	0.000	0.000
						C	0.000	34.330		100.00	0.000	0.000
L4 110.00-90.00	100.00	1.373	5	0.8567	42.856	A	0.000	42.856	42.856	100.00	0.000	0.000
						B	0.000	42.856		100.00	0.000	0.000
						C	0.000	42.856		100.00	0.000	0.000
L5 90.00-60.00	75.00	1.264	5	0.8277	64.138	A	0.000	64.138	64.138	100.00	0.000	0.000
						B	0.000	64.138		100.00	0.000	0.000
						C	0.000	64.138		100.00	0.000	1.402
L6 60.00-30.00	45.00	1.093	4	0.7784	63.892	A	0.000	63.892	63.892	100.00	0.000	0.000
						B	0.000	63.892		100.00	0.000	0.000
						C	0.000	63.892		100.00	0.000	20.379
L7 30.00-2.00	16.00	1	4	0.7500	73.500	A	0.000	73.500	73.500	100.00	0.000	0.000
						B	0.000	73.500		100.00	0.000	0.000
						C	0.000	73.500		100.00	0.000	18.666
L8 2.00-0.00	1.00	1	4	0.7500	5.250	A	0.000	5.250	5.250	100.00	0.000	0.000
						B	0.000	5.250		100.00	0.000	0.000
						C	0.000	5.250		100.00	0.000	1.333

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 150.00-138.00	144.00	1.523	10	10.750	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000		0.00	0.000	0.000
					C	0.000	0.000		0.00	0.000	0.000
L2 138.00-126.00	132.00	1.486	10	10.750	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000		0.00	0.000	0.000
					C	0.000	0.000		0.00	0.000	0.000
L3 126.00-110.00	118.00	1.439	9	32.000	A	0.000	32.000	32.000	100.00	0.000	0.000
					B	0.000	32.000		100.00	0.000	0.000
					C	0.000	32.000		100.00	0.000	0.000
L4 110.00-	100.00	1.373	9	40.000	A	0.000	40.000	40.000	100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
90.00					B	0.000	40.000		100.00	0.000	0.000
					C	0.000	40.000		100.00	0.000	0.000
L5 90.00-60.00	75.00	1.264	8	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000		100.00	0.000	0.000
					C	0.000	60.000		100.00	0.000	0.667
L6 60.00-30.00	45.00	1.093	7	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000		100.00	0.000	0.000
					C	0.000	60.000		100.00	0.000	10.000
L7 30.00-2.00	16.00	1	6	70.000	A	0.000	70.000	70.000	100.00	0.000	0.000
					B	0.000	70.000		100.00	0.000	0.000
					C	0.000	70.000		100.00	0.000	9.333
L8 2.00-0.00	1.00	1	6	5.000	A	0.000	5.000	5.000	100.00	0.000	0.000
					B	0.000	5.000		100.00	0.000	0.000
					C	0.000	5.000		100.00	0.000	0.667

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 138	Pole	Max Tension	5	0.00	0.00	0.00
			Max. Compression	14	-2.38	0.00	0.00
			Max. Mx	5	-1.34	-11.88	-0.00
			Max. My	2	-1.34	0.00	11.88
			Max. Vy	5	1.02	-11.88	-0.00
			Max. Vx	2	-1.02	0.00	11.88
			Max. Torque	7			0.00
L2	138 - 126	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-5.03	0.00	0.00
			Max. Mx	5	-2.86	-36.87	-0.00
			Max. My	2	-2.86	0.00	36.87
			Max. Vy	5	2.11	-36.87	-0.00
			Max. Vx	2	-2.11	0.00	36.87
			Max. Torque	7			0.00
L3	126 - 110	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-8.24	0.00	0.00
			Max. Mx	5	-5.32	-86.76	-0.00
			Max. My	2	-5.32	0.00	86.76
			Max. Vy	5	3.59	-86.76	-0.00
			Max. Vx	2	-3.59	0.00	86.76
			Max. Torque	7			0.00
L4	110 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-11.01	0.00	0.00
			Max. Mx	5	-7.53	-169.73	-0.00
			Max. My	2	-7.53	0.00	169.73
			Max. Vy	5	4.70	-169.73	-0.00
			Max. Vx	2	-4.70	0.00	169.73
			Max. Torque	7			0.00
L5	90 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-15.14	0.00	0.00
			Max. Mx	5	-10.94	-332.27	-0.00
			Max. My	2	-10.94	0.00	332.27
			Max. Vy	5	6.11	-332.27	-0.00
			Max. Vx	2	-6.11	0.00	332.27
			Max. Torque	13			0.00
L6	60 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-21.11	0.00	0.00
			Max. Mx	5	-16.29	-537.40	-0.00
			Max. My	2	-16.29	0.00	537.40
			Max. Vy	5	7.53	-537.40	-0.00
			Max. Vx	2	-7.53	0.00	537.40
			Max. Torque	13			0.06
L7	30 - 2	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27.42	0.00	0.00
			Max. Mx	5	-21.93	-767.15	0.00
			Max. My	2	-21.93	-0.00	767.15
			Max. Vy	5	8.86	-767.15	0.00
			Max. Vx	2	-8.86	-0.00	767.15
			Max. Torque	13			0.12
L8	2 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27.94	0.00	0.00
			Max. Mx	5	-22.41	-784.94	-0.00
			Max. My	2	-22.41	0.00	784.94
			Max. Vy	5	8.94	-784.94	-0.00
			Max. Vx	2	-8.94	0.00	784.94
			Max. Torque	13			0.12

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	27.94	0.00	0.00
	Max. H_x	11	22.41	8.94	-0.00
	Max. H_z	2	22.41	0.00	8.94

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. M_x	2	784.94	0.00	8.94
	Max. M_z	5	784.94	-8.94	-0.00
	Max. Torsion	13	0.12	4.47	7.74
	Min. Vert	5	22.41	-8.94	-0.00
	Min. H_x	5	22.41	-8.94	-0.00
	Min. H_z	8	22.41	0.00	-8.94
	Min. M_x	8	-784.94	0.00	-8.94
	Min. M_z	11	-784.94	8.94	-0.00
	Min. Torsion	7	-0.12	-4.47	-7.74

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	22.41	0.00	0.00	0.00	0.00	0.00
Dead+Wind 0 deg - No Ice	22.41	-0.00	-8.94	-784.94	0.00	-0.11
Dead+Wind 30 deg - No Ice	22.41	4.47	-7.74	-680.07	-392.64	-0.06
Dead+Wind 60 deg - No Ice	22.41	7.74	-4.47	-392.64	-680.07	-0.00
Dead+Wind 90 deg - No Ice	22.41	8.94	0.00	0.00	-784.94	0.06
Dead+Wind 120 deg - No Ice	22.41	7.74	4.47	392.64	-680.07	0.11
Dead+Wind 150 deg - No Ice	22.41	4.47	7.74	680.07	-392.64	0.12
Dead+Wind 180 deg - No Ice	22.41	-0.00	8.94	784.94	0.00	0.11
Dead+Wind 210 deg - No Ice	22.41	-4.47	7.74	680.07	392.64	0.06
Dead+Wind 240 deg - No Ice	22.41	-7.74	4.47	392.64	680.07	-0.00
Dead+Wind 270 deg - No Ice	22.41	-8.94	0.00	0.00	784.94	-0.06
Dead+Wind 300 deg - No Ice	22.41	-7.74	-4.47	-392.64	680.07	-0.11
Dead+Wind 330 deg - No Ice	22.41	-4.47	-7.74	-680.07	392.64	-0.12
Dead+Ice+Temp	27.94	0.00	0.00	0.00	0.00	0.00
Dead+Wind 0 deg+Ice+Temp	27.94	-0.00	-2.00	-174.62	0.00	-0.04
Dead+Wind 30 deg+Ice+Temp	27.94	1.00	-1.73	-151.22	-87.31	-0.03
Dead+Wind 60 deg+Ice+Temp	27.94	1.73	-1.00	-87.31	-151.22	-0.00
Dead+Wind 90 deg+Ice+Temp	27.94	2.00	0.00	0.00	-174.62	0.03
Dead+Wind 120 deg+Ice+Temp	27.94	1.73	1.00	87.31	-151.22	0.04
Dead+Wind 150 deg+Ice+Temp	27.94	1.00	1.73	151.22	-87.31	0.05
Dead+Wind 180 deg+Ice+Temp	27.94	-0.00	2.00	174.62	0.00	0.04
Dead+Wind 210 deg+Ice+Temp	27.94	-1.00	1.73	151.22	87.31	0.03
Dead+Wind 240 deg+Ice+Temp	27.94	-1.73	1.00	87.31	151.22	-0.00
Dead+Wind 270 deg+Ice+Temp	27.94	-2.00	0.00	0.00	174.62	-0.03
Dead+Wind 300 deg+Ice+Temp	27.94	-1.73	-1.00	-87.31	151.22	-0.04
Dead+Wind 330 deg+Ice+Temp	27.94	-1.00	-1.73	-151.22	87.31	-0.05
Dead+Wind 0 deg - Service	22.41	-0.00	-3.11	-274.69	0.00	-0.04
Dead+Wind 30 deg - Service	22.41	1.55	-2.69	-237.89	-137.35	-0.02
Dead+Wind 60 deg - Service	22.41	2.69	-1.55	-137.35	-237.89	-0.00
Dead+Wind 90 deg - Service	22.41	3.11	0.00	0.00	-274.69	0.02
Dead+Wind 120 deg - Service	22.41	2.69	1.55	137.35	-237.89	0.04
Dead+Wind 150 deg - Service	22.41	1.55	2.69	237.89	-137.35	0.04
Dead+Wind 180 deg - Service	22.41	-0.00	3.11	274.69	0.00	0.04
Dead+Wind 210 deg - Service	22.41	-1.55	2.69	237.89	137.35	0.02

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 240 deg - Service	22.41	-2.69	1.55	137.35	237.89	-0.00
Dead+Wind 270 deg - Service	22.41	-3.11	0.00	0.00	274.69	-0.02
Dead+Wind 300 deg - Service	22.41	-2.69	-1.55	-137.35	237.89	-0.04
Dead+Wind 330 deg - Service	22.41	-1.55	-2.69	-237.89	137.35	-0.04

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-22.41	0.00	0.00	22.41	0.00	0.000%
2	0.00	-22.41	-8.94	0.00	22.41	8.94	0.015%
3	4.47	-22.41	-7.74	-4.47	22.41	7.74	0.002%
4	7.74	-22.41	-4.47	-7.74	22.41	4.47	0.002%
5	8.94	-22.41	0.00	-8.94	22.41	-0.00	0.013%
6	7.74	-22.41	4.47	-7.74	22.41	-4.47	0.002%
7	4.47	-22.41	7.74	-4.47	22.41	-7.74	0.002%
8	0.00	-22.41	8.94	0.00	22.41	-8.94	0.015%
9	-4.47	-22.41	7.74	4.47	22.41	-7.74	0.002%
10	-7.74	-22.41	4.47	7.74	22.41	-4.47	0.002%
11	-8.94	-22.41	0.00	8.94	22.41	-0.00	0.013%
12	-7.74	-22.41	-4.47	7.74	22.41	4.47	0.002%
13	-4.47	-22.41	-7.74	4.47	22.41	7.74	0.002%
14	0.00	-27.94	0.00	0.00	27.94	0.00	0.000%
15	0.00	-27.94	-2.00	0.00	27.94	2.00	0.003%
16	1.00	-27.94	-1.73	-1.00	27.94	1.73	0.002%
17	1.73	-27.94	-1.00	-1.73	27.94	1.00	0.002%
18	2.00	-27.94	0.00	-2.00	27.94	-0.00	0.002%
19	1.73	-27.94	1.00	-1.73	27.94	-1.00	0.002%
20	1.00	-27.94	1.73	-1.00	27.94	-1.73	0.002%
21	0.00	-27.94	2.00	0.00	27.94	-2.00	0.003%
22	-1.00	-27.94	1.73	1.00	27.94	-1.73	0.002%
23	-1.73	-27.94	1.00	1.73	27.94	-1.00	0.002%
24	-2.00	-27.94	0.00	2.00	27.94	-0.00	0.002%
25	-1.73	-27.94	-1.00	1.73	27.94	1.00	0.002%
26	-1.00	-27.94	-1.73	1.00	27.94	1.73	0.002%
27	0.00	-22.41	-3.11	0.00	22.41	3.11	0.005%
28	1.56	-22.41	-2.69	-1.55	22.41	2.69	0.005%
29	2.69	-22.41	-1.56	-2.69	22.41	1.55	0.005%
30	3.11	-22.41	0.00	-3.11	22.41	-0.00	0.005%
31	2.69	-22.41	1.56	-2.69	22.41	-1.55	0.005%
32	1.56	-22.41	2.69	-1.55	22.41	-2.69	0.005%
33	0.00	-22.41	3.11	0.00	22.41	-3.11	0.005%
34	-1.56	-22.41	2.69	1.55	22.41	-2.69	0.005%
35	-2.69	-22.41	1.56	2.69	22.41	-1.55	0.005%
36	-3.11	-22.41	0.00	3.11	22.41	-0.00	0.005%
37	-2.69	-22.41	-1.56	2.69	22.41	1.55	0.005%
38	-1.56	-22.41	-2.69	1.55	22.41	2.69	0.005%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	29	0.00012353	0.00014278
3	Yes	37	0.00000001	0.00013099
4	Yes	37	0.00000001	0.00013110
5	Yes	29	0.00012353	0.00013517

6	Yes	37	0.00000001	0.00013129
7	Yes	37	0.00000001	0.00013088
8	Yes	29	0.00012353	0.00014278
9	Yes	37	0.00000001	0.00013121
10	Yes	37	0.00000001	0.00013110
11	Yes	29	0.00012353	0.00013517
12	Yes	37	0.00000001	0.00013091
13	Yes	37	0.00000001	0.00013132
14	Yes	6	0.00000001	0.00000001
15	Yes	31	0.00013298	0.00005838
16	Yes	31	0.00013293	0.00004063
17	Yes	31	0.00013293	0.00004065
18	Yes	31	0.00013298	0.00009493
19	Yes	31	0.00013293	0.00004067
20	Yes	31	0.00013293	0.00004062
21	Yes	31	0.00013298	0.00005838
22	Yes	31	0.00013293	0.00004066
23	Yes	31	0.00013293	0.00004065
24	Yes	31	0.00013298	0.00009493
25	Yes	31	0.00013293	0.00004062
26	Yes	31	0.00013293	0.00004068
27	Yes	29	0.00012585	0.00007206
28	Yes	29	0.00012572	0.00004209
29	Yes	29	0.00012572	0.00004221
30	Yes	29	0.00012585	0.00008812
31	Yes	29	0.00012572	0.00004242
32	Yes	29	0.00012572	0.00004198
33	Yes	29	0.00012585	0.00007206
34	Yes	29	0.00012572	0.00004233
35	Yes	29	0.00012572	0.00004221
36	Yes	29	0.00012585	0.00008812
37	Yes	29	0.00012572	0.00004201
38	Yes	29	0.00012572	0.00004245

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load*	*Tilt*	*Twist*
	ft	*in*	*Comb.*	*°*	*°*
L1	150 - 138	27.315	30	1.5008	0.0001
L2	138 - 126	23.575	30	1.4639	0.0001
L3	126 - 110	20.053	30	1.3136	0.0001
L4	110 - 90	15.725	30	1.2630	0.0001
L5	90 - 60	10.680	30	1.1318	0.0001
L6	60 - 30	4.642	30	0.7484	0.0001
L7	30 - 2	1.122	30	0.3399	0.0001
L8	2 - 0	0.005	32	0.0226	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation	*Appurtenance*	*Gov. Load*	*Deflection*	*Tilt*	*Twist*	*Radius of Curvature*
ft		*Comb.*	*in*	*°*	*°*	*ft*
150.75	Truck Ball	30	27.315	1.5008	0.0001	16039
150.00	Canister Load1	30	27.315	1.5008	0.0001	16039
145.00	APXV18-206516S-C	30	25.742	1.4982	0.0001	16039
138.00	Canister Load2	30	23.575	1.4639	0.0001	7143
133.00	OPA-65R-LCUU-H6	30	22.075	1.4033	0.0001	6488
126.00	Canister Load3	30	20.053	1.3136	0.0001	6512

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 138	77.655	5	4.2529	0.0003
L2	138 - 126	67.064	13	4.1519	0.0003
L3	126 - 110	57.078	13	3.7349	0.0003
L4	110 - 90	44.782	13	3.5929	0.0003
L5	90 - 60	30.438	13	3.2224	0.0003
L6	60 - 30	13.247	13	2.1343	0.0003
L7	30 - 2	3.205	13	0.9707	0.0002
L8	2 - 0	0.014	7	0.0645	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.75	Truck Ball	5	77.655	4.2529	0.0003	5887
150.00	Canister Load1	5	77.655	4.2529	0.0003	5887
145.00	APXV18-206516S-C	5	73.201	4.2466	0.0003	5887
138.00	Canister Load2	13	67.064	4.1519	0.0003	2618
133.00	OPA-65R-LCUU-H6	13	62.813	3.9839	0.0003	2366
126.00	Canister Load3	13	57.078	3.7349	0.0003	2357

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	150 - 138 (1)	HSS10.75x0.465	12.00	0.00	0.0	25.200	15.0247	-1.34	378.62	0.004
L2	138 - 126 (2)	HSS10.75x0.465	12.00	0.00	0.0	25.200	15.0247	-2.86	378.62	0.008
L3	126 - 110 (3)	P24x0.375	16.00	0.00	0.0	25.200	27.8325	-5.32	701.38	0.008
L4	110 - 90 (4)	P24x0.375	20.00	0.00	0.0	25.200	27.8325	-7.53	701.38	0.011
L5	90 - 60 (5)	P24x0.375	30.00	0.00	0.0	25.200	27.8325	-10.93	701.38	0.016
L6	60 - 30 (6)	RPS 24" x 0.63107"	30.00	0.00	0.0	25.200	46.3304	-16.29	1167.53	0.014
L7	30 - 2 (7)	RPS 30" x 0.57017"	28.00	0.00	0.0	22.794	52.7159	-21.93	1201.61	0.018
L8	2 - 0 (8)	RPS 30" x 0.6927"	2.00	0.00	0.0	22.788	63.7780	-22.41	1453.37	0.015

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	150 - 138 (1)	HSS10.75x0.465	11.89	3.852	27.720	0.139	0.00	0.000	27.720	0.000
L2	138 - 126 (2)	HSS10.75x0.465	36.88	11.951	27.720	0.431	0.00	0.000	27.720	0.000
L3	126 - 110 (3)	P24x0.375	86.81	6.436	27.720	0.232	0.00	0.000	27.720	0.000
L4	110 - 90 (4)	P24x0.375	169.82	12.590	27.720	0.454	0.00	0.000	27.720	0.000
L5	90 - 60 (5)	P24x0.375	332.44	24.647	27.720	0.889	0.00	0.000	27.720	0.000
L6	60 - 30 (6)	RPS 24" x 0.63107"	537.65	24.462	27.720	0.882	0.00	0.000	27.720	0.000
L7	30 - 2 (7)	RPS 30" x 0.57017"	767.49	24.197	25.073	0.965	0.00	0.000	25.073	0.000
L8	2 - 0 (8)	RPS 30" x 0.6927"	785.28	20.631	25.067	0.823	0.00	0.000	25.067	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	150 - 138 (1)	HSS10.75x0.465	1.02	0.136	16.800	0.008	0.00	0.000	16.800	0.000
L2	138 - 126 (2)	HSS10.75x0.465	2.11	0.281	16.800	0.017	0.00	0.000	16.800	0.000
L3	126 - 110 (3)	P24x0.375	3.60	0.259	16.800	0.015	0.00	0.000	16.800	0.000
L4	110 - 90 (4)	P24x0.375	4.71	0.338	16.800	0.020	0.00	0.000	16.800	0.000
L5	90 - 60 (5)	P24x0.375	6.11	0.439	16.800	0.026	0.00	0.000	16.800	0.000
L6	60 - 30 (6)	RPS 24" x 0.63107"	7.53	0.325	16.800	0.019	0.06	0.001	16.800	0.000
L7	30 - 2 (7)	RPS 30" x 0.57017"	8.86	0.336	15.196	0.022	0.12	0.002	15.196	0.000
L8	2 - 0 (8)	RPS 30" x 0.6927"	8.94	0.280	15.192	0.018	0.12	0.002	15.192	0.000

Pole Interaction Design Data

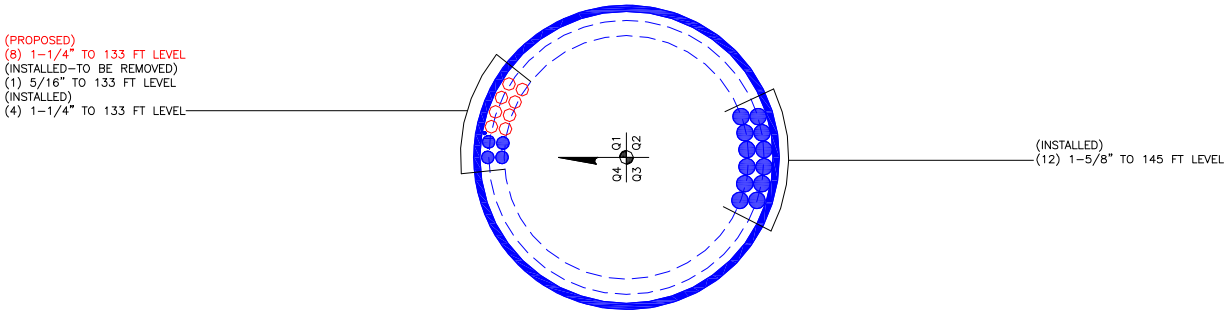
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 138 (1)	0.004	0.139	0.000	0.008	0.000	0.143 ✔	1.333	H1-3+VT ✔
L2	138 - 126 (2)	0.008	0.431	0.000	0.017	0.000	0.439 ✔	1.333	H1-3+VT ✔
L3	126 - 110 (3)	0.008	0.232	0.000	0.015	0.000	0.240 ✔	1.333	H1-3+VT ✔
L4	110 - 90 (4)	0.011	0.454	0.000	0.020	0.000	0.465 ✔	1.333	H1-3+VT ✔
L5	90 - 60 (5)	0.016	0.889	0.000	0.026	0.000	0.905 ✔	1.333	H1-3+VT ✔
L6	60 - 30 (6)	0.014	0.882	0.000	0.019	0.000	0.897 ✔	1.333	H1-3+VT ✔
L7	30 - 2 (7)	0.018	0.965	0.000	0.022	0.000	0.984 ✔	1.333	H1-3+VT ✔
L8	2 - 0 (8)	0.015	0.823	0.000	0.018	0.000	0.839 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	150 - 138	Pole	HSS10.75x0.465	1	-1.34	504.71	10.7	Pass
L2	138 - 126	Pole	HSS10.75x0.465	2	-2.86	504.71	32.9	Pass
L3	126 - 110	Pole	P24x0.375	3	-5.32	934.94	18.0	Pass
L4	110 - 90	Pole	P24x0.375	4	-7.53	934.94	34.9	Pass
L5	90 - 60	Pole	P24x0.375	5	-10.93	934.94	67.9	Pass
L6	60 - 30	Pole	RPS 24" x 0.63107"	6	-16.29	1556.32	67.3	Pass
L7	30 - 2	Pole	RPS 30" x 0.57017"	7	-21.93	1601.75	73.8	Pass
L8	2 - 0	Pole	RPS 30" x 0.6927"	8	-22.41	1937.34	62.9	Pass
							Summary	
						Pole (L7)	73.8	Pass
						RATING =	**73.8**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(PROPOSED)
(8) 1-1/4" TO 133 FT LEVEL
(INSTALLED-TO BE REMOVED)
(1) 5/16" TO 133 FT LEVEL
(INSTALLED)
(4) 1-1/4" TO 133 FT LEVEL
Q1
Q2
Q4
Q3
(INSTALLED)
(12) 1-5/8" TO 145 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Section	Size	Length (ft)	Socket Length (ft)	Grade	Weight (K)
1	HSS10.75x0.465	12.00	5.00	A500-42	0.6
2	HSS10.75x0.465	12.00	5.00		0.6
3	P24x0.375	16.00	5.00		1.5
4	P24x0.375	20.00	5.00	A53-B-42	1.9
5	P24x0.375	30.00	5.00		2.8
6	RPS 24" x 0.6310?"	30.00	5.00	Reinf 42.00 ksi	4.7
7	RPS 30" x 0.5701?"	28.00	5.00	Reinf 37.99 ksi	5.0
8	RPS 30" x 0.6927"	2.00		Reinf 37.98 ksi	0.4
					17.7

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Truck Ball	150.75	APXV18-206516S-C	145
Canister Load1	150	APXV18-206516S-C	145
Flag	150	APXV18-206516S-C	145
APX18-209014-CT2	145	Canister Load2	138
APX18-209014-CT2	145	(2) TMABPDB7823VG12A	133
APX18-209014-CT2	145	(2) TMABPDB7823VG12A	133
(2) ATMAA1412D-1A20	145	OPA-65R-LCUU-H6	133
(2) ATMAA1412D-1A20	145	(2) TMABPDB7823VG12A	133
(2) ATMAA1412D-1A20	145	OPA-65R-LCUU-H6	133
(2) KRY 112 89/5	145	OPA-65R-LCUU-H6	133
(2) KRY 112 89/5	145	Canister Load3	126
(2) KRY 112 89/5	145		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-42	42 ksi	58 ksi	Reinf 37.99 ksi	38 ksi	48 ksi
A53-B-42	42 ksi	63 ksi	Reinf 37.98 ksi	38 ksi	48 ksi
Reinf 42.00 ksi	42 ksi	53 ksi			

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 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: 73.8%

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

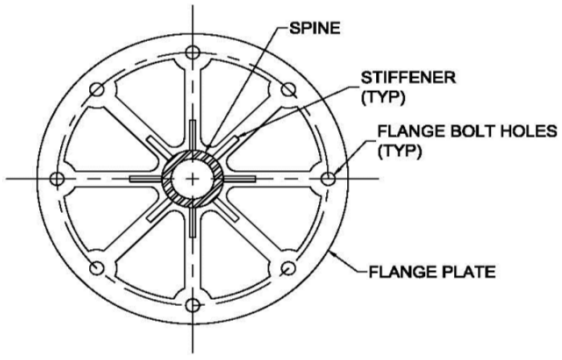
Job: 150 ft Monopole / Stonington		
Project: PJF 37515-2530 / BU 828257		
Client: Crown Castle	Drawn by: Joey Meinerding	App'd:
Code: TIA/EIA-222-F	Date: 08/26/15	Scale: NTS
Path: T:\375 Crown Castle\2015\37515-2530_828257_STONINGTON\37515-2530.001.7700_SDD_1\07669\37515-2530.001.7700_Reinforced.eri		Dwg No. E-1

CCI Flagpole Tool

Site Data	
BU#:	828257
Site Name:	Stonington
App #:	262048 Rev. 2

Code		
Code:	TIA/EIA 222-F	
Ice Thickness:	0.75	in
Windspeed (V):	85	mph
Ice Wind Speed (V):	37.6	mph

Tower Information		
Total Tower Height:	150	ft
Base Tower Height:	126	ft
Total Canister Length:	24	ft
Number of Canister Assembly Sections:	2	



FLANGE PLATE
(TYPE 4: SOLIDITY RATIO 0.55)

Canister Section Number *:	Canister Assembly Length (ft):	Canister Assembly Diameter (in):	Number of Sides Canister Section	Plate Type:	Mating Flange Plate Thickness (in)**:	Mating Flange Plate Diameter (in):	Solidity Ratio	Plate Weight (Kip):	Canister Weight (Kip)
1	12	36	Round	4	0.75	36	0.55	0.238	0.226
2	12	36	Round	4	2.00	36	0.55	0.635	0.226

* Sections are numbered from the top of the tower down ** Mating Flange Plate Thickness at the bottom of canister section

Flag on Tower:	Yes	
Flag Width:	20	ft
Flag Height:	12	ft
Flag Elevation(z):	150	ft

Truck Ball on Tower:	Yes	
Diameter of Ball:	18	in

Geometry : Base Tower + Spine

No Concealment.eri *(last saved 08/19 2:54 pm)*

Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material	Delete
150	12		0	10.75	10.75	0.465	n/a	A500-42	[x]
138	12		0	10.75	10.75	0.465	n/a	A500-42	[x]
126	16		0	24	24	0.375	n/a	A53-B-42	[x]
110	20		0	24	24	0.375	n/a	A53-B-42	[x]
90	30		0	24	24	0.375	n/a	A53-B-42	[x]
60	30		0	24	24	0.375	n/a	A53-B-42	[x]
30	30		0	30	30	0.375	n/a	A53-B-42	[x]

Discrete Loads: Truck Ball	Apply C_aA_A at Elevation(z) (ft)	C_aA_A No Ice (ft^2)	C_aA_A 1/2" Ice (ft^2)	C_aA_A 1" Ice (ft^2)	C_aA_A 2" Ice (ft^2)	C_aA_A 4" Ice (ft^2)	Weight No Ice (Kip)	Weight 1/2" Ice (Kip)
	150.75	1.414	1.575	1.745	2.112	2.950	0.05	0.067

Discrete Loads : C_FA_F for Canister Assembly								
Canister Loading	Apply C_FA_F at Elevation(z) (ft)	C_FA_F No Ice (ft^2)	C_FA_F 1/2" Ice (ft^2)	C_FA_F 1" Ice (ft^2)	C_FA_F 2" Ice (ft^2)	C_FA_F 4" Ice (ft^2)	Canister Assembly Weight No Ice (Kip)	Canister Assembly Weight 1/2" Ice (Kip)
Canister Load 1	150	10.620	10.915	11.210	11.800	12.980	0.113	0.247
Canister Load 2	138	21.240	21.830	22.420	23.600	25.960	0.464	0.732
Canister Load 3	126	10.620	10.915	11.210	11.800	12.980	0.748	0.882

User Forces: Flag Force Calculation Per ANSI/NAAMM FP 1001-07	
$Wind_{FORCE}$=	0.339 Kip
Weight=	0.291 Kip
$Wind_{FORCE, ICE}$=	0.086 Kip
Weight $_{ICE}$=	0.459 Kip
$W_{FORCE, SERVICE WIND}$=	0.135 Kip
Weight=	0.291 Kip

←Flag force should be included at the top of the flag attachment elevation. If the attachment of the flag to the halyard distributes forces equally to the pole, apply flag forces accordingly in tnx file.

Deflection Check Required:	**Yes**	Import Deflection Results
3% Spine Deflection Check		
Allowable (3%) Horizontal Spine Deflection (inches)	Actual Deflection ***(inches)	Sufficient/ Insufficient
8.640	7.262	Sufficient

*** Relative deflection under service level wind speed

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Job Number:	37515-2530.001.7700	**Page:**	1 / 1
By:	JWM	**Date:**	9/2/2015
Site Number:	828257	**Version:**	0.3
Site Name:	STONINGTON	**Effective:**	6/3/2015

CODE:	TIA-222-F
ASIF:	1.33

EEI FLANGE CONCEALMENT CALCULATIONS (126 Ft)

EEI Kit Number	Custom	
Flange Elevation	126.00	ft

STIFFENER INFORMATION

		Overrides
Stiffener Quantity	4	4
Width (in)	5.5	5.50
Height (in)	11	11.00
Thickness (in)	0.75	0.75
Horizontal Fillet Weld	0.375	0.375
Vertical Fillet Weld	0.375	0.375
Stiffener Grade (ksi)	36	36

RING PLATE INFORMATION

Thickness (in)	2	2.00
ID (in)	18.25	18.25
OD (in)	24	24.00
Ring Plate Grade (ksi)	36	36

BOLT INFORMATION

Bolt Quantity	8	8
Size (in)	1	1.00
Bolt Circle (in)	21	21.0
Bolt Specification	A325	A325

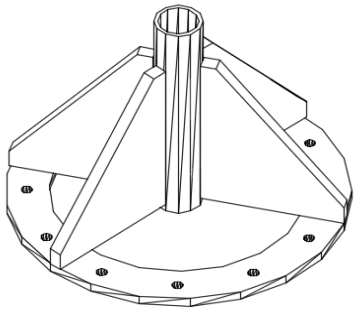
PIPE INFORMATION

Size	HSS10.75	HSS10.75
Pipe Grade	A500-42	A500-42
Fy (ksi)	42	42
Fu (ksi)	58	58
Pipe OD (in)	10.75	10.75
Pipe Thickness (in)	0.465	0.465

REACTIONS FROM TNX

Moment	36.88	kip*ft
Shear	2.11	kips
Axial	2.76	kips

Max Allowable Capacity	100%
Electrode (ksi)	E70



FLANGE CONNECTION RESULTS

Bolts	25.7% Passing
Ring Plate	70.6% Passing
Weld - Stiffener & Ring Plate	63.7% Passing
Weld - Spine & Stiffener	36.1% Passing
Spine Wall Tear Out	24.9% Passing
Max Tension In Stiffeners	23.6 kips
Max Compression in Stiffeners	25.0 kips
Stiffener Bending	25.3% Passing
Stiffener Shear	17.6% Passing
Stiffener Combined Shear & Bending	30.8% Passing

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

Site Data

BU#:	*828257*
Site Name:	*Stonington*
App #:	

Manufacturer:	Other

Reactions

Moment:	36.88	ft-kips
Axial:	2.86	kips
Shear:	2.11	kips
Exterior Flange Run, T+Q:	11.8	kips

Elevation: 126 feet

Bolt Data

Qty:	8		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle:	21	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	11.8	Kips, Ext. Flange T+Q
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	25.6%	**Pass**

Plate Data

Plate Outer Diam:	23.25	in
Plate Inner Diam:	18.25	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.50	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	11.8	Kips, Ext. Flange T+Q
Plate Stress:	9.3	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	25.8%	**Pass**

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

Stiffener Results

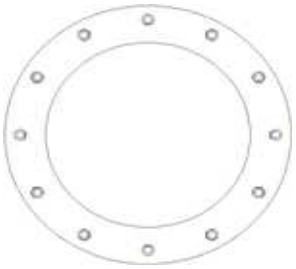
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check:	n/a

Pole Data

Pole OuterDiam:	24	in
Thick:	0.375	in
Pole Inner Diam:	23.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi



Stress Increase Factor

ASIF:	1.333	

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

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

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

Site Data	
BU#:	*828257*
Site Name:	*Stonington*
App #:	

Manufacturer:	Other

Bolt Data			
Qty:	16		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle:	20.75	in	

Plate Data		
Plate Outer Diam:	23.25	in
Plate Inner Diam:	18.25	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.57	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Pole OuterDiam:	24	in
Thick:	0.375	in
Pole Inner Diam:	23.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor	
ASIF:	1.3333333

Reactions		
Moment:	86.81	ft-kips
Axial:	5.32	kips
Shear:	3.6	kips
Exterior Flange Run, T+Q:		kips

Elevation: 110 feet

Interior Flange Bolt Results

Maximum Bolt Tension:	12.2	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	26.5%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	12.9	Kips, Ext. C= Interior C
Plate Stress:	13.5	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	37.6%	**Pass**

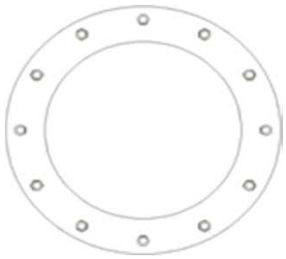
n/a

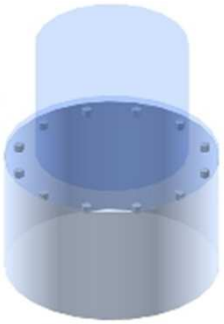
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a





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

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

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

Site Data

BU#: *828257*
Site Name: *Stonington*
App #:

Manufacturer:	Other

Reactions		
Moment:	86.81	ft-kips
Axial:	5.32	kips
Shear:	3.6	kips
Exterior Flange Run, T+Q:	0	kips

Elevation: 110 feet

Bolt Data			
Qty:	16		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle:	20.75	in	

Plate Data		
Plate Outer Diam:	23.25	in
Plate Inner Diam:	18.25	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.57	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Pole OuterDiam:	24	in
Thick:	0.375	in
Pole Inner Diam:	23.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.3333333	

Interior Flange Bolt Results

Maximum Bolt Tension:	12.2	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	26.5%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	12.9	Kips, Ext. C= Interior C
Plate Stress:	13.5	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	37.6%	**Pass**

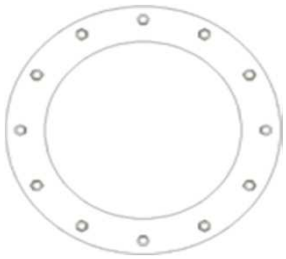
n/a

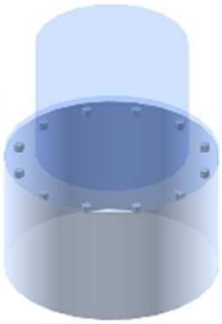
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a





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

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

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

Site Data

BU#: *828257*
Site Name: *Stonington*
App #:

Manufacturer:	Other

Reactions		
Moment:	169.82	ft-kips
Axial:	7.53	kips
Shear:	4.71	kips
Exterior Flange Run, T+Q:		kips

Elevation: 90 feet

Bolt Data			
Qty:	16		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle:	20.75	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	24.1	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	52.3%	**Pass**

Plate Data		
Plate Outer Diam:	23.25	in
Plate Inner Diam:	18.25	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.57	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	25.0	Kips, Ext. C= Interior C
Plate Stress:	26.3	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	73.1%	**Pass**

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

n/a

Stiffener Results

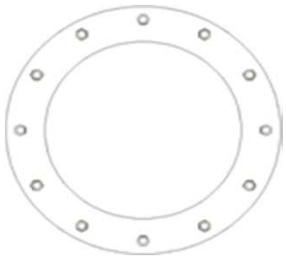
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

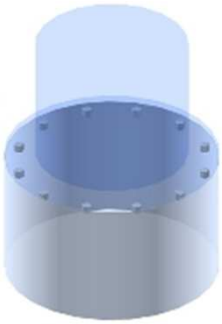
Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Pole OuterDiam:	24	in
Thick:	0.375	in
Pole Inner Diam:	23.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.3333333	





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

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

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

Site Data

BU#: *828257*
Site Name: *Stonington*
App #:

Manufacturer:	Other

Reactions		
Moment:	169.82	ft-kips
Axial:	7.53	kips
Shear:	4.71	kips
Exterior Flange Run, T+Q:	0	kips

Elevation: 90 feet

Bolt Data			
Qty:	16		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle:	20.75	in	

Plate Data		
Plate Outer Diam:	23.25	in
Plate Inner Diam:	18.25	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.57	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Pole OuterDiam:	24	in
Thick:	0.375	in
Pole Inner Diam:	23.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.3333333	

Interior Flange Bolt Results

Maximum Bolt Tension:	24.1	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	52.3%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	25.0	Kips, Ext. C= Interior C
Plate Stress:	26.3	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	73.1%	**Pass**

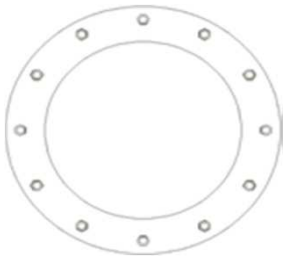
n/a

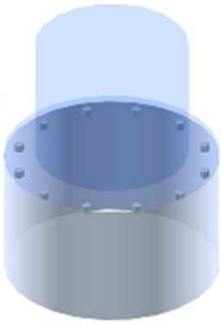
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a





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

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

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v4.4 - Effective 7-12-13

Date: 8/26/2015
PJF Project: 37515-2530.001.7700
Client Ref. # 828257
Site Name: Stonington
Description: 60'-0" Flange
Owner: Crown Castle
Engineer: JWM

Asymmetric Bolt Analysis

Moment =	332	k-ft	TIA Ref.	F	Location =	Flange Plate		
Axial =	10.9	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	6.1	kips	Max Ratio =	105.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	20							

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

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.000	A325	92	120	0.0	20.75	0.00	0.79	14.64	14.08	14.08	0.00	46.08	30.5%
2	1.000	A325	92	120	22.5	20.75	0.00	0.79	15.21	14.65	14.65	0.00	46.08	31.8%
3	1.000	A325	92	120	45.0	20.75	0.00	0.79	16.25	15.69	15.69	0.00	46.08	34.1%
4	1.000	A325	92	120	67.5	20.75	0.00	0.79	17.13	16.57	16.57	0.00	46.08	36.0%
5	1.000	A325	92	120	90.0	20.75	0.00	0.79	17.38	16.82	16.82	0.00	46.08	36.5%
6	1.000	A325	92	120	112.5	20.75	0.00	0.79	16.89	16.33	16.33	0.00	46.08	35.4%
7	1.000	A325	92	120	135.0	20.75	0.00	0.79	15.89	15.33	15.33	0.00	46.08	33.3%
8	1.000	A325	92	120	157.5	20.75	0.00	0.79	14.93	14.37	14.37	0.00	46.08	31.2%
9	1.000	A325	92	120	180.0	20.75	0.00	0.79	14.64	14.08	14.08	0.00	46.08	30.5%
10	1.000	A325	92	120	202.5	20.75	0.00	0.79	15.21	14.65	14.65	0.00	46.08	31.8%
11	1.000	A325	92	120	225.0	20.75	0.00	0.79	16.25	15.69	15.69	0.00	46.08	34.1%
12	1.000	A325	92	120	247.5	20.75	0.00	0.79	17.13	16.57	16.57	0.00	46.08	36.0%
13	1.000	A325	92	120	270.0	20.75	0.00	0.79	17.38	16.82	16.82	0.00	46.08	36.5%
14	1.000	A325	92	120	292.5	20.75	0.00	0.79	16.89	16.33	16.33	0.00	46.08	35.4%
15	1.000	A325	92	120	315.0	20.75	0.00	0.79	15.89	15.33	15.33	0.00	46.08	33.3%
16	1.000	A325	92	120	337.5	20.75	0.00	0.79	14.93	14.37	14.37	0.00	46.08	31.2%
17	0.000	CCI 4.5 x 1 (65 ksi)	65	80	37.5	25.00	4.50	4.50	109.35	106.14	109.35	171.67	171.67	63.7%
18	0.000	CCI 4.5 x 1 (65 ksi)	65	80	135.0	25.00	4.50	4.50	109.35	106.14	109.35	171.67	171.67	63.7%
19	0.000	CCI 4.5 x 1 (65 ksi)	65	80	217.5	25.00	4.50	4.50	109.35	106.14	109.35	171.67	171.67	63.7%
20	0.000	CCI 4.5 x 1 (65 ksi)	65	80	315.0	25.00	4.50	4.50	109.35	106.14	109.35	171.67	171.67	63.7%
								30.57						

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

Site Data	
BU#:	*828257*
Site Name:	*Stonington*
App #:	

Manufacturer:	Other

Bolt Data			
Qty:	16		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle:	20.75	in	

Plate Data		
Plate Outer Diam:	23.25	in
Plate Inner Diam:	18.25	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.57	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Pole OuterDiam:	24	in
Thick:	0.375	in
Pole Inner Diam:	23.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor	
ASIF:	1.3333333

Reactions		
Moment:	118.3	ft-kips
Axial:	4.5	kips
Shear:	2.5	kips
Exterior Flange Run, T+Q:		kips

Elevation: 60 feet

Interior Flange Bolt Results

Maximum Bolt Tension:	16.8	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	36.5%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	17.4	Kips, Ext. C= Interior C
Plate Stress:	18.3	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	50.8%	**Pass**

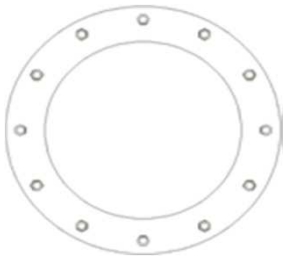
n/a

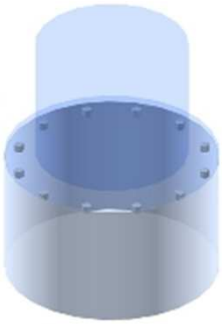
Stiffener Results

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

Pole Results

Pole Punching Shear Check:	n/a





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

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

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

Site Data	
BU#:	*828257*
Site Name:	*Stonington*
App #:	

Manufacturer:	Other

Bolt Data			
Qty:	16		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle:	20.75	in	

Plate Data		
Plate Outer Diam:	23.25	in
Plate Inner Diam:	18.25	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.57	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Pole OuterDiam:	24	in
Thick:	0.375	in
Pole Inner Diam:	23.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor	
ASIF:	1.3333333

Reactions		
Moment:	118.3	ft-kips
Axial:	4.5	kips
Shear:	2.5	kips
Exterior Flange Run, T+Q:	0	kips

Elevation: 60 feet

Interior Flange Bolt Results

Maximum Bolt Tension:	16.8	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	36.5%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	17.4	Kips, Ext. C= Interior C
Plate Stress:	18.3	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	50.8%	**Pass**

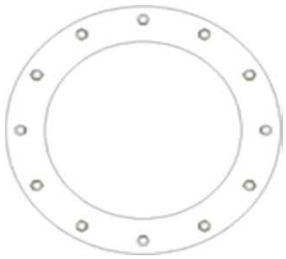
n/a

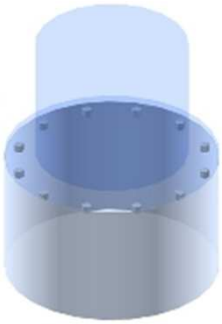
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a





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

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

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v4.4 - Effective 7-12-13

Date: 8/26/2015
PJF Project: 37515-2530.001.7700
Client Ref. # 828257
Site Name: Stonington
Description: 30'-0" Flange
Owner: Crown Castle
Engineer: JWM

Asymmetric Bolt Analysis

Moment =	538	k-ft	TIA Ref.	F	Location =	Flange Plate		
Axial =	16.3	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	7.5	kips	Max Ratio =	105.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	24							

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

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.000	A325	92	120	0.0	27.00	0.00	0.79	18.05	17.29	17.29	0.00	46.08	37.5%
2	1.000	A325	92	120	18.0	27.00	0.00	0.79	18.47	17.71	17.71	0.00	46.08	38.4%
3	1.000	A325	92	120	36.0	27.00	0.00	0.79	19.32	18.56	18.56	0.00	46.08	40.3%
4	1.000	A325	92	120	54.0	27.00	0.00	0.79	20.23	19.47	19.47	0.00	46.08	42.3%
5	1.000	A325	92	120	72.0	27.00	0.00	0.79	20.87	20.11	20.11	0.00	46.08	43.6%
6	1.000	A325	92	120	90.0	27.00	0.00	0.79	21.03	20.27	20.27	0.00	46.08	44.0%
7	1.000	A325	92	120	108.0	27.00	0.00	0.79	20.65	19.89	19.89	0.00	46.08	43.2%
8	1.000	A325	92	120	126.0	27.00	0.00	0.79	19.87	19.11	19.11	0.00	46.08	41.5%
9	1.000	A325	92	120	144.0	27.00	0.00	0.79	18.94	18.18	18.18	0.00	46.08	39.5%
10	1.000	A325	92	120	162.0	27.00	0.00	0.79	18.23	17.47	17.47	0.00	46.08	37.9%
11	1.000	A325	92	120	180.0	27.00	0.00	0.79	18.05	17.29	17.29	0.00	46.08	37.5%
12	1.000	A325	92	120	198.0	27.00	0.00	0.79	18.47	17.71	17.71	0.00	46.08	38.4%
13	1.000	A325	92	120	216.0	27.00	0.00	0.79	19.32	18.56	18.56	0.00	46.08	40.3%
14	1.000	A325	92	120	234.0	27.00	0.00	0.79	20.23	19.47	19.47	0.00	46.08	42.3%
15	1.000	A325	92	120	252.0	27.00	0.00	0.79	20.87	20.11	20.11	0.00	46.08	43.6%
16	1.000	A325	92	120	270.0	27.00	0.00	0.79	21.03	20.27	20.27	0.00	46.08	44.0%
17	1.000	A325	92	120	288.0	27.00	0.00	0.79	20.65	19.89	19.89	0.00	46.08	43.2%
18	1.000	A325	92	120	306.0	27.00	0.00	0.79	19.87	19.11	19.11	0.00	46.08	41.5%
19	1.000	A325	92	120	324.0	27.00	0.00	0.79	18.94	18.18	18.18	0.00	46.08	39.5%
20	1.000	A325	92	120	342.0	27.00	0.00	0.79	18.23	17.47	17.47	0.00	46.08	37.9%
21	0.000	CCI 4.5 x 1 (65 ksi)	65	80	37.5	31.00	4.50	4.50	127.28	122.93	127.28	171.67	171.67	74.1%
22	0.000	CCI 4.5 x 1 (65 ksi)	65	80	135.0	31.00	4.50	4.50	127.28	122.93	127.28	171.67	171.67	74.1%
23	0.000	CCI 4.5 x 1 (65 ksi)	65	80	217.5	31.00	4.50	4.50	127.28	122.93	127.28	171.67	171.67	74.1%
24	0.000	CCI 4.5 x 1 (65 ksi)	65	80	315.0	31.00	4.50	4.50	127.28	122.93	127.28	171.67	171.67	74.1%
								33.71						

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

Site Data

BU#: *828257*
Site Name: *Stonington*
App #:

Pole Manufacturer:	Other

Reactions		
Moment:	232.3	ft-kips
Axial:	7.6	kips
Shear:	3.5	kips
Elevation:	30	feet

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

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

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

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

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

Stress Increase Factor		
ASIF:	1.3333333	

Flange Bolt Results

			Rigid
Bolt Tension Capacity, **B**:	46.08	kips	Service, ASD
Max Bolt directly applied T:	20.27	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.427	in	
Min PL "treq" for actual **T w/ Pry**:	0.722	in	
Min PL "t1" for actual **T w/o Pry**:	0.947	in	
T allowable with Prying:	42.50	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	20.27	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	44.0%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	20.2	ksi	Service ASD
Allowable Plate Stress:	36.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	56.2%	**Pass**	Comp. Y.L. Length:
No Prying			12.37
Tension Side Stress Ratio, (treq/t)^2:	33.4%	**Pass**	

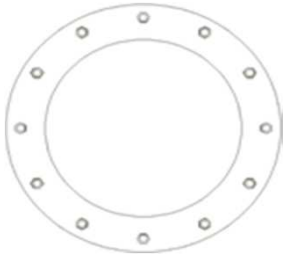
n/a

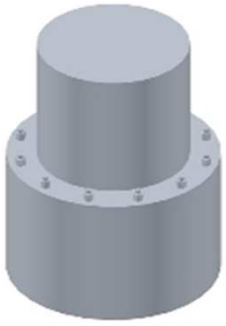
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a





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

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

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

Site Data	
BU#:	*828257*
Site Name:	*Stonington*
App #:	

Manufacturer:	Other

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

Plate Data		
Plate Outer Diam:	29.25	in
Plate Inner Diam:	24.5	in (Hole @ Ctr)
Thick:	1	in
Grade:	36	ksi
Effective Width:	4.59	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

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

Stress Increase Factor	
ASIF:	1.3333333

Reactions		
Moment:	232.3	ft-kips
Axial:	7.6	kips
Shear:	3.5	kips
Exterior Flange Run, T+Q:	20.27	kips

Elevation: 30 feet

Interior Flange Bolt Results

Maximum Bolt Tension:	20.3	Kips, Ext. Flange T+Q
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	44.0%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	21.0	Kips, Ext. C= Interior C
Plate Stress:	30.9	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	85.8%	**Pass**

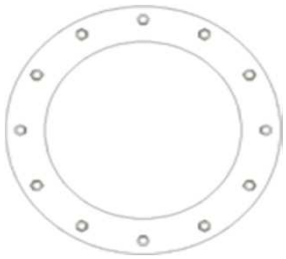
n/a

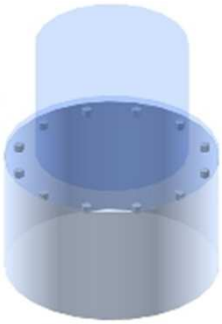
Stiffener Results

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

Pole Results

Pole Punching Shear Check:	n/a





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

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

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v4.4 - Effective 7-12-13

Date: 8/26/2015
PJF Project: 37515-2530.001.7700
Client Ref. # 828257
Site Name: Stonington
Description: 150' Pole
Owner: Crown Castle
Engineer: JWM

Asymmetric Anchor Rod Analysis

Moment =	785	k-ft	TIA Ref.	F	Location =	Base Plate		
Axial =	22.0	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	9.0	kips	Max Ratio =	105.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	28							

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

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.000	A687	105	150	0.0	33.00	0.00	0.79	25.54	24.32	24.32	0.00	51.84	46.9%
2	1.000	A687	105	150	15.0	33.00	0.00	0.79	25.08	23.87	23.87	0.00	51.84	46.0%
3	1.000	A687	105	150	30.0	33.00	0.00	0.79	25.54	24.32	24.32	0.00	51.84	46.9%
4	1.000	A687	105	150	45.0	33.00	0.00	0.79	26.74	25.53	25.53	0.00	51.84	49.2%
5	1.000	A687	105	150	60.0	33.00	0.00	0.79	28.30	27.09	27.09	0.00	51.84	52.3%
6	1.000	A687	105	150	75.0	33.00	0.00	0.79	29.78	28.57	28.57	0.00	51.84	55.1%
7	1.000	A687	105	150	90.0	33.00	0.00	0.79	30.82	29.60	29.60	0.00	51.84	57.1%
8	1.000	A687	105	150	105.0	33.00	0.00	0.79	31.19	29.97	29.97	0.00	51.84	57.8%
9	1.000	A687	105	150	120.0	33.00	0.00	0.79	30.82	29.60	29.60	0.00	51.84	57.1%
10	1.000	A687	105	150	135.0	33.00	0.00	0.79	29.78	28.57	28.57	0.00	51.84	55.1%
11	1.000	A687	105	150	150.0	33.00	0.00	0.79	28.30	27.09	27.09	0.00	51.84	52.3%
12	1.000	A687	105	150	165.0	33.00	0.00	0.79	26.74	25.53	25.53	0.00	51.84	49.2%
13	1.000	A687	105	150	180.0	33.00	0.00	0.79	25.54	24.32	24.32	0.00	51.84	46.9%
14	1.000	A687	105	150	195.0	33.00	0.00	0.79	25.08	23.87	23.87	0.00	51.84	46.0%
15	1.000	A687	105	150	210.0	33.00	0.00	0.79	25.54	24.32	24.32	0.00	51.84	46.9%
16	1.000	A687	105	150	225.0	33.00	0.00	0.79	26.74	25.53	25.53	0.00	51.84	49.2%
17	1.000	A687	105	150	240.0	33.00	0.00	0.79	28.30	27.09	27.09	0.00	51.84	52.3%
18	1.000	A687	105	150	255.0	33.00	0.00	0.79	29.78	28.57	28.57	0.00	51.84	55.1%
19	1.000	A687	105	150	270.0	33.00	0.00	0.79	30.82	29.60	29.60	0.00	51.84	57.1%
20	1.000	A687	105	150	285.0	33.00	0.00	0.79	31.19	29.97	29.97	0.00	51.84	57.8%
21	1.000	A687	105	150	300.0	33.00	0.00	0.79	30.82	29.60	29.60	0.00	51.84	57.1%
22	1.000	A687	105	150	315.0	33.00	0.00	0.79	29.78	28.57	28.57	0.00	51.84	55.1%
23	1.000	A687	105	150	330.0	33.00	0.00	0.79	28.30	27.09	27.09	0.00	51.84	52.3%
24	1.000	A687	105	150	345.0	33.00	0.00	0.79	26.74	25.53	25.53	0.00	51.84	49.2%
25	1.750	A193 Gr B7	105	125	52.5	40.00	0.00	2.41	101.71	97.99	97.99	0.00	132.29	74.1%
26	1.750	A193 Gr B7	105	125	157.5	40.00	0.00	2.41	101.71	97.99	97.99	0.00	132.29	74.1%
27	1.750	A193 Gr B7	105	125	232.5	40.00	0.00	2.41	101.71	97.99	97.99	0.00	132.29	74.1%
28	1.750	A193 Gr B7	105	125	337.5	40.00	0.00	2.41	101.71	97.99	97.99	0.00	132.29	74.1%
								28.47						

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

TIA Rev F

Site Data

BU#:	*828257*
Site Name:	*Stonington*
App #:	
Pole Manufacturer:	*Other*

Reactions		
Moment:	504.6	ft-kips
Axial:	14.6	kips
Shear:	6	kips

Reactions adjusted to account for additional anchor rods.

Anchor Rod Data		
Qty:	24	
Diam:	1	in
Rod Material:	Other	
Strength (Fu):	150	ksi
Yield (Fy):	105	ksi
Bolt Circle:	33	in

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

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Both	
Groove Depth:	0.25	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	50	ksi
Weld str.:	70	ksi

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

Stress Increase Factor		
ASIF:	1.333	

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

Anchor Rod Results

		Stiffened
Maximum Rod Tension:	30.0 Kips	Service, ASD
		Fty*ASIF

Base Plate Results

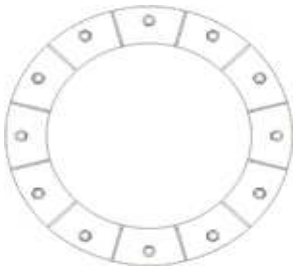
	Flexural Check	Stiffened
Base Plate Stress:	27.7 ksi	Service, ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	77.0% **Pass**	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	80.8% **Pass**
Vertical Weld:	43.8% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	20.5% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	33.3% **Pass**
Plate Comp. (AISC Bracket):	50.0% **Pass**

Pole Results

Pole Punching Shear Check:	22.2% **Pass**



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

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

foundation loads

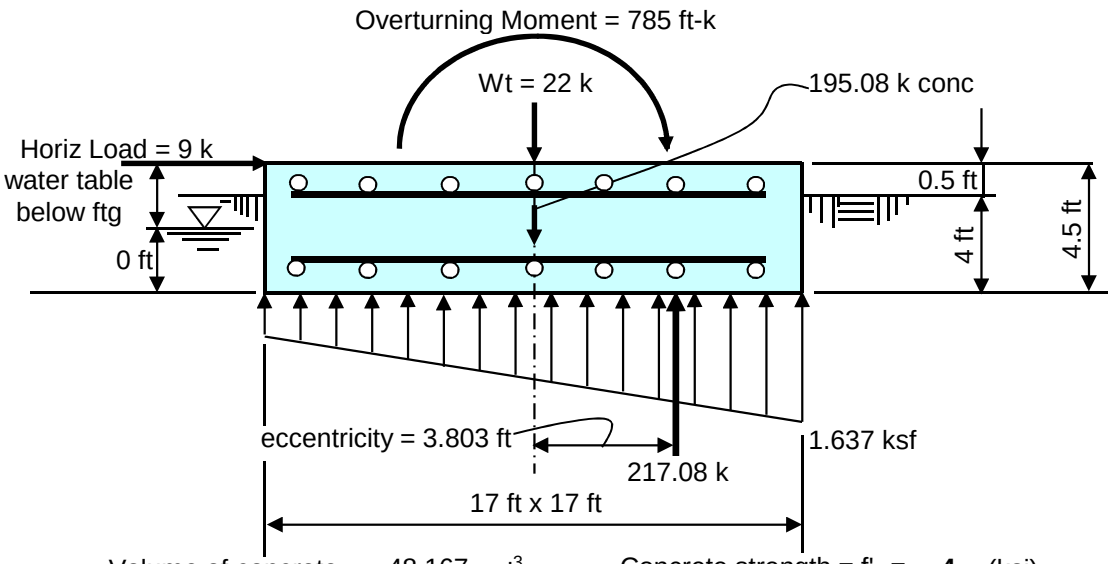
Tower or Pole Weight =	**22**	kips
Total Horizontal Force =	**9**	kips
Overturning Moment =	**785**	ft-kips

soil properties

Safety factor against overturning =	**2**	
Soil density =	**135**	pcf
Allowable soil bearing =	**4**	ksf
Depth to water table =	**7**	ft

mat dimensions

depth to bottom of footing =	**4**	ft
Footing thickness =	**4.5**	ft
Footing Width =	**17**	ft
Footing Length =	**17**	ft
Tower/Pole Center Offset =	**0**	ft



Volume of concrete = 48.167 yd^3 Concrete strength = f'_c = **4** (ksi)

Rebar = (88) #6 bars by 16.5 ft long

reinforcing steel = **(22) #6 @ 9.43 in o.c. ea way top and bottom**

Summary of analysis results

Overturning Moment: (Stress Ratio = 0.895) **< CONTROLLING CRITERIA**

Calculated Overturning Moment = 825.5 ft-kips

Resisting Moment = 1845.1 ft-kips

Factor of Safety against overturning = 2.235 **> 2 okay**

Rebar strength = F_y = **60** (ksi)

minimum cover over rebar = **3** inches

Soil Bearing (Stress Ratio = 0.409)

Net Soil Bearing Resistance = 4 ksf

Calculated Soil Bearing Pressure = 1.637 **ksf < 4 ksf okay**

Bending Moment (Stress Ratio = 0.247)

Ultimate Bending Moment Resistance = 2154 ft-kips

Calculated Ultimate Bending Moment = 532 **ft-kips < 2154 ft-kips okay**

Bending Shear (Stress Ratio = 0.1)

Ultimate Bending Shear Resistance = 965 kips

Calculated Ultimate Bending Shear = 97 **kips < 965 kips okay**

MODIFICATION OF AN EXISTING 150'-0" MONOPOLE

BU #828257; STONINGTON

82 MECHANIC STREET
PAWCATUCK, CONNETICUT 06379
NEW LONDON COUNTY
LAT: 41° 22' 18.91"; LONG: -71° 49' 58.01"
APP: 262048 REV. 2; WO: 1107669

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

CROWN CASTLE
3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065
PH: (585) 370-4766

PROJECT CONTACTS

STRUCTURE OWNER:
CROWN CASTLE
MOD PM: DAN VADNEY AT DAN.VADNEY@CROWNCASTLE.COM
PH: (578) 373-3510
MOD CM: JASON D'AMICO AT JASON.D'AMICO@CROWNCASTLE.COM
PH: (860) 209-0104

ENGINEER OF RECORD:
PJFMOD@PJFWEB.COM

WIND DESIGN DATA	
REFERENCE STANDARD	TIA/EIA-222-F
LOCAL CODE	2003 IBC
BASIC WIND SPEED (FASTEST-MILE)	85 MPH
ICE THICKNESS	0.75 IN
ICE WIND SPEED	37.6 MPH
SERVICE WIND SPEED	50 MPH

THIS PROJECT INCLUDES THE FOLLOWING ITEMS
REMOVAL OF EXISTING CONCEALMENT BULKHEADS & SHROUDS
INSTALLATION OF NEW CONCEALMENT SPINE
INSTALLATION OF NEW CONCEALMENT BULKHEADS & SHROUDS
INSTALLATION OF WELDED STIFFENERS
FLANGE BRIDGE STIFFENERS
SHAFT REINFORCING
FIELD WELDED ANCHOR BRACKETS
POST INSTALLED ANCHOR RODS
PAINT MODIFICATIONS TO MATCH EXISTING POLE
HIGH STRENGTH GROUT
CORRECT THE POLE OUT OF PLUMB
CLEAN CORROSION AND APPLY TWO COATS OF COLD GALVANIZING TO EXISTING BASE PLATE STIFFENERS AND INTERIOR WALL OF POLE SHAFT ADJACENT TO EXISTING STIFFENER PLATES. SEE SECTION 7 OF NOTES ON S-1

SHEET INDEX	
SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
S-1	GENERAL NOTES
S-2A	FORGBOLT™ DETAILS
S-2B	NEXGEN2™ BOLT DETAIL
S-3	MONOPOLE PROFILE
S-4	BASE PLATE DETAILS
S-5	CONCEALMENT ELEVATION DETAILS
S-6	CONCEALMENT FLANGE DETAILS
S-7	CONCEALMENT FLANGE DETAILS
S-8	BULKHEAD DETAILS
S-9	BRIDGE STIFFENER DETAILS
S-10	MI CHECKLIST

THE ASSOCIATED FAILING SA WO NUMBER FOR THIS PROJECT IS 1062894

ATTENTION ALL CONTRACTORS, ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT (800) 788-7011.

MODIFICATION OF AN EXISTING 150'-0" MONOPOLE
BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	
DATE:	08-26-2015

TITLE SHEET

T-1

37515-2530.001.DWG

MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 3, 02/05/2015)

1. GENERAL NOTES

1.1. THE MONOPOLE STRUCTURE IN ITS EXISTING CONDITION DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE PROPOSED AND EXISTING LOADS FROM THE ATTACHED STRUCTURAL MODIFICATION REPORT AT THE REQUIRED MINIMUM WIND SPEEDS. DO NOT INSTALL ANY NEW LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.

1.2. THESE DRAWINGS WERE PREPARED FROM INFORMATION PROVIDED BY CROWN CASTLE. THE INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY THE ENGINEER OF RECORD (EOR) FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT DRAWINGS AND THEIR FIELD VERIFIED CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO THE EOR AND CROWN CASTLE BEFORE PROCEEDING WITH THE WORK.

1.3. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.

1.4. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN SUCCESSFULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO ENSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.

1.5. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA-1019 (LATEST EDITION), OSHA AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

1.6. OBSERVATION VISITS TO THE SITE BY CROWN CASTLE AND/OR THE EOR SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES. ANY SUPPORT SERVICES PERFORMED BY THE EOR DURING CONSTRUCTION ARE SOLELY FOR THE PURPOSE OF ACHIEVING GENERAL CONFORMANCE WITH THE CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE THE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.

1.7. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY CROWN CASTLE AND EOR PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.

1.8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.

1.9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.

1.10. ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED AND RELOCATED, REPLACED, OR RE-INSTALLED AS REQUIRED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH CROWN CASTLE, TESTING AGENCY, AND EOR.

1.11. ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS.

1.12. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE EOR.

1.13. ALL SOLUTIONS FOR THE REPLACEMENT, RELOCATION OR MODIFICATION OF THE SAFETY CLIMB AND/OR ANY OF THE MONOPOLE CLIMBING FACILITIES SHALL BE COORDINATED WITH TUF-TUG PRODUCTS. CONTACT DETAILS:
3434 ENCRETE LANE, MORAINE, OHIO 45439
PHONE: 937-299-1213 EMAIL: TUFTUG@AOL.COM

2. STRUCTURAL STEEL

2.1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
2.1.1. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
2.1.1.1. "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS."
2.1.1.2. "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM HIGH STRENGTH BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS.
2.1.1.3. "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"
2.1.2. BY THE AMERICAN WELDING SOCIETY (AWS):
2.1.2.1. "STRUCTURAL WELDING CODE – STEEL D1.1."
2.1.2.2. "STANDARD SYMBOLS FOR WELDING, BRAZING, AND NONDESTRUCTIVE EXAMINATION"

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

2.3. 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.

2.4. 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.

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

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

2.7. 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.

2.8. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.

2.9. FIELD CUTTING OF STEEL:
2.9.1. IMPORTANT CUTTING AND WELDING SAFTEY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFTEY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY 'CUTTING AND WELDING SAFETY PLAN' (DOC # ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT", ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
2.9.2. 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. CONTRACTOR TO AVOID 90 DEGREE CORNERS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS.

3. BASE PLATE GROUT

3.1. NEW GROUT FOR THE POLE BASE SHALL BE NON-SHRINK, NON-METALLIC, GROUT (NS GROUT BY EUCLID, OR APPROVED EQUAL) WITH A 7500 PSI MINIMUM COMPRESSIVE STRENGTH. CONTRACTOR SHALL SUBMIT PROPOSED GROUT SPECIFICATION INFORMATION TO CROWN CASTLE FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. CONTRACTOR SHALL FOLLOW GROUT MANUFACTURER'S SPECIFICATIONS FOR COLD WEATHER GROUTING PROCEDURES (IF NECESSARY) AND THE TESTING AGENCY SHALL PREPARE GROUT SAMPLE SPECIMENS FOR COMPRESSIVE STRENGTH TESTING AND VERIFICATION.

3.2. GROUT SHALL BE INSTALLED TIGHT UNDER THE BASE PLATE AND BEARING PLATE REGION WITH NO VOIDS REMAINING BETWEEN THE TOP OF THE EXISTING CONCRETE AND THE UNDERSIDE OF THE EXISTING BASE PLATE AND BEARING PLATE.

3.3. CAULK AROUND ANCHOR RODS WHEN GROUTING.

4. FOUNDATION WORK - (NOT REQUIRED)

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

6. EPOXY GROUTED REINFORCING ANCHOR RODS

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

6.2. ALL REINFORCING ANCHOR RODS SHALL BE HOT DIP GALVANIZED PER ASTM A123.

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

6.4. HILTI HIT RE-500 SD OR ITW RED HEAD EPCON G5 EPOXY SHALL BE USED TO ANCHOR THE BAR IN THE DRILL HOLES. IF THE DESIGNED EMBEDMENT IS GREATER THAN 12 FT, CONTRACTOR HAS THE OPTION TO USE PILE ANCHOR GROUT BY E-CHEM AS AN ALTERNATE. IF CONTRACTOR WISHES TO USE A DIFFERENT EPOXY, A REQUEST INCLUDING THE EPOXY TECHNICAL DATA SHEET(S) SHALL BE SUBMITTED TO THE EOR FOR REVIEW PRIOR TO CONSTRUCTION.

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

6.6. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED THE CONTRACTOR SHALL TIGHTEN ALL HEAVY HEX ANCHOR NUTS TO SNUG TIGHT PLUS 1/8 TURN OF NUT.

7. TOUCH UP OF GALVANIZING

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

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

7.3. CROWN CASTLE'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 ADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

8. HOT-DIP GALVANIZING

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

8.2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES WITH EOR APPROVAL OF LOCATIONS.

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

9. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER

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

9.2. ANY FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE EXISTING GALVANIZED STEEL POLE STRUCTURE AND THE WELDED 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 CROWN CASTLE REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.

9.3. CROWN CASTLE 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 CROWN CASTLE BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. THE EOR 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".

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

CROWN CASTLE
3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065
PH: (585) 370-4766

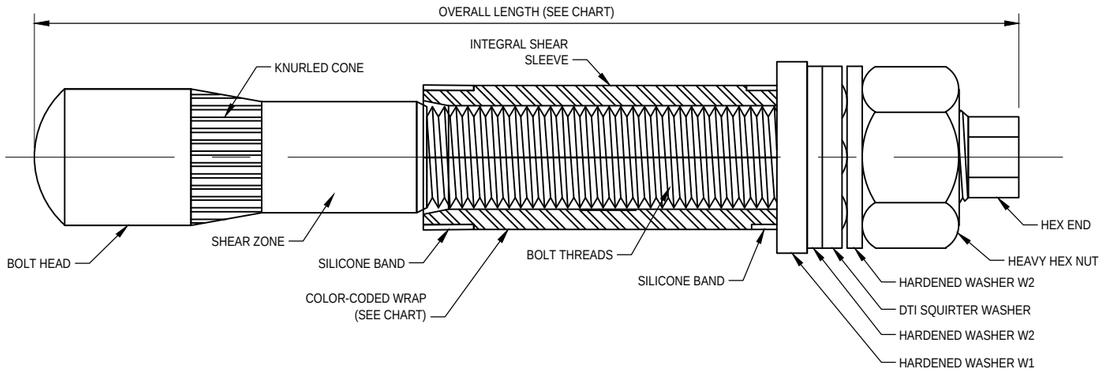
MODIFICATION OF AN EXISTING
150'-0" MONOPOLE
BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	
DATE:	08-26-2015

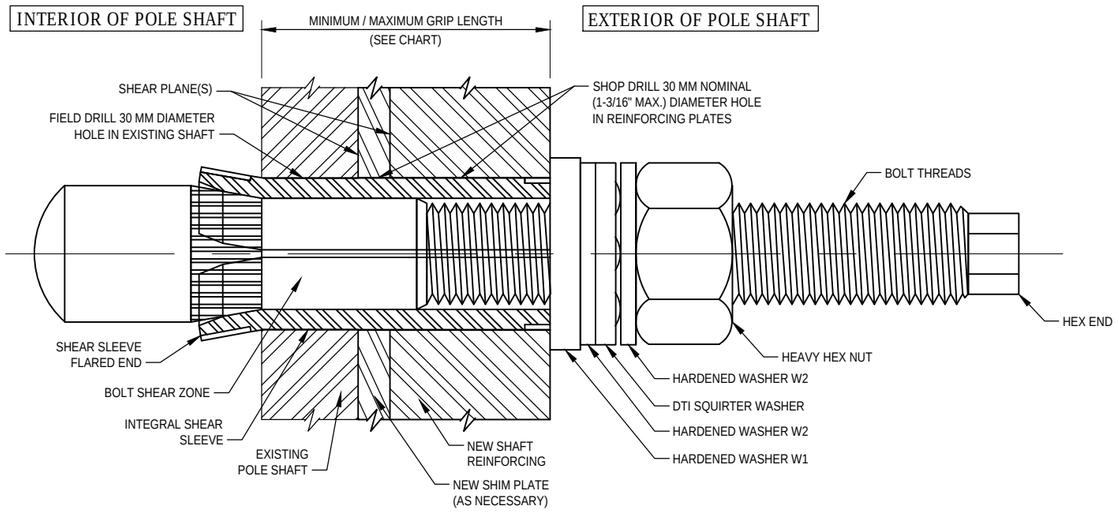
GENERAL NOTES

S-1

37515-2530.001.DWG



PRE-INSTALLED FORGBolt™ ASSEMBLY DETAIL 1 / S-2A



INSTALLED FORGBolt™ ASSEMBLY DETAIL 2 / S-2A

FORGBolt™		AISC Group A Material: ASTM A325 and PC8.8 (Tensile Stress, Fu = 120 ksi minimum)				
GROUP A		FORGBolt™ Size (mm)	Overall Length (inches)	Estimated Weight Each (lbs)	Grip Range (inch)	Comment	Color Code
FORGBolt™ A325 - PC8.8	1	135	5.31	1.3	3/8" to 1"	--	RED
	2	160	6.30	1.6	3/4" to 1-1/2"	--	GREEN
	3	195	7.68	1.9	1-1/4" to 2-1/4"	--	BLUE
	4	260	10.24	2.6	2" to 3-1/2"	Splice Bolt	YELLOW
	5	365	14.37	3.6	3-1/2" to 5-1/2"	Flange Jump Bolt	ORANGE
	6	440	17.32	4.3	5-1/2" to 8-1/2"	Flange Jump Bolt	BLACK
DTI Note		Each Group A (A325/PC8.8) FORGBolt™ assembly shall have a 'Squirter' DTI that is compatible with a M20-PC8.8 bolt.					

FOLLOW ALL MANUFACTURER / DISTRIBUTOR RECOMMENDATIONS FOR INSTALLATION, TIGHTENING, AND INSPECTION

INSTALLATION NOTES:
1. FIELD DRILL HOLES TO 30 MM DIAMETER.
2. SELECT CORRECT BOLT SIZE FOR INSTALLATION GRIP (REFER TO PLANS).
3. INSERT BOLT ASSEMBLY THROUGH HOLES IN SHAFT REINFORCING PLATES AND SEAT THE HARDENED WASHER W1 FLUSH AGAINST OUTSIDE OF PLATE.
4. HAND TIGHTEN NUT TO FINGER TIGHT.
5. TIGHTEN NUT TO PRETENSIONED CONDITION AND UNTIL DTI SHOWS PROPER INDICATION.
6. PROPERLY DOCUMENT AND INSPECT BOLT TIGHTENING PER PLAN REQUIREMENTS.

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

BOLT TIGHTENING AND INSPECTION 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.

AISC GROUP A MATERIAL: ASTM A325 AND PC8.8
(Fu = 120 KSI MIN. TENSILE STRESS)

CONTAINS PROPRIETARY INFORMATION PATENT PENDING

DISTRIBUTOR CONTACT:
PRECISION TOWER PRODUCTS
PHONE: 888-926-4857
EMAIL: info@precisiontowerproducts.com
WEB: www.precisiontowerproducts.com

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

CROWN CASTLE
3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065
PH: (585) 370-4766

MODIFICATION OF AN EXISTING
150'-0" MONOPOLE
BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	
DATE:	08-26-2015

FORGBolt™ DETAILS

S-2A

37515-2530.001.DWG

NEXGEN2™ BOLT NOTE SHEET: REV. 1.01, 04-15-2015

FOLLOW ALL MANUFACTURER / DISTRIBUTOR RECOMMENDATIONS FOR INSTALLATION, TIGHTENING, AND INSPECTION

BOLT HOLE NOTES:

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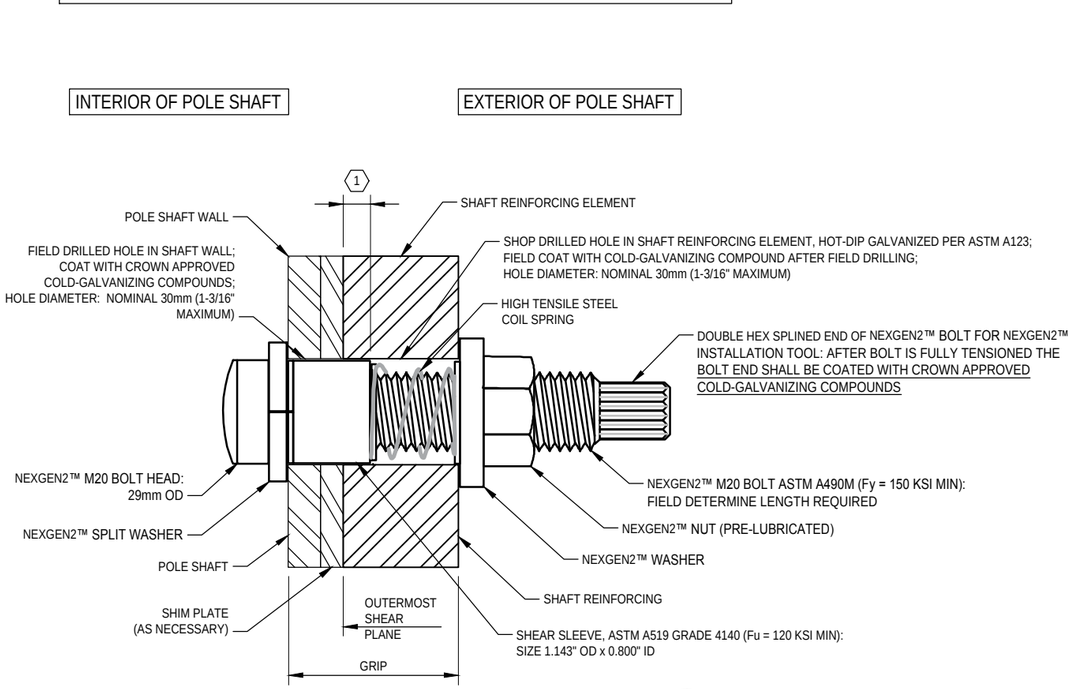
2. ALL FIELD-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM FIELD-DRILLED HOLE DIAMETER PERMITTED IS 30 MM.

BOLT TIGHTENING AND INSPECTION NOTES:

1. ALL NEXGEN2™ BOLT ASSEMBLIES SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF SECTION 8.2.3 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. PER SECTION 8.2.3: ALL FASTENER ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS IN AISC SECTION 8.1 WITHOUT SEVERING THE SPLINED END AND WITH WASHERS POSITIONED AS REQUIRED IN AISC SECTION 6.2. PER REQUIREMENTS IN SECTION 8.1: PRIOR TO BOLT PRETENSIONING, THE JOINT SHALL FIRST BE COMPACTED TO THE SNUG-TIGHT CONDITION. SNUG TIGHT IS THE CONDITION THAT EXISTS WHEN ALL OF THE PLIES IN THE CONNECTION HAVE BEEN PULLED INTO FIRM CONTACT BY THE BOLTS AND THE BOLTS HAVE BEEN TIGHTENED SUFFICIENTLY TO PREVENT THE REMOVAL OF THE NUTS WITHOUT THE USE OF A WRENCH. ONCE THE SNUG TIGHT CONDITION IS ACHIEVED, THEN THE BOLT ASSEMBLY CAN BE TIGHTENED TO THE PRETENSIONED CONDITION.
2. ALL NEXGEN2™ BOLT ASSEMBLIES SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF SECTION 9.2.3 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. NOTE THAT COMPLETE INSPECTION OF ALL NEXGEN2™ BOLT ASSEMBLIES IS REQUIRED IN ADDITION TO ROUTINE OBSERVATION.
3. ALL NEXGEN2™ BOLTS SHALL BE INSPECTED BY A QUALIFIED BOLT INSPECTOR PER NOTES 1 AND 2, ABOVE. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE NEXGEN2™ BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TENSIONING PROCEDURE. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THAT THE DOUBLE HEX SPLINED END OF THE BOLTS HAVE BEEN TWISTED OFF AND COATED WITH CROWN APPROVED COLD-GALVANIZING COMPOUND..

(1) NOTE: SHEAR SLEEVE LENGTH: THE SHEAR SLEEVE SHALL PROJECT A MINIMUM OF 3/8" BEYOND THE OUTERMOST SHEAR PLANE. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS SHOWING NEXGEN2™ BOLT LENGTHS AND SHEAR SLEEVE LENGTHS TO THE EOR FOR REVIEW AND APPROVAL.



TYPICAL NEXGEN2™ BOLT DETAIL 1 / S-2B

NOTE: NEXGEN2™ BOLT ASSEMBLY SHALL BE MAGNI 565 COATED PER ASTM F2833 AND MANUFACTURER SPECIFICATIONS.

NOTE: INSTALL NEXGEN2™ BOLT ASSEMBLY PER MANUFACTURER'S INSTRUCTIONS.

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

PJF PAUL J. FORD & COMPANY
250 E Broad St. Ste 600- Columbus, OH 43215
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CROWN CASTLE
3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065
PH: (585) 370-4766

MODIFICATION OF AN EXISTING 150'-0" MONOPOLE
BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	
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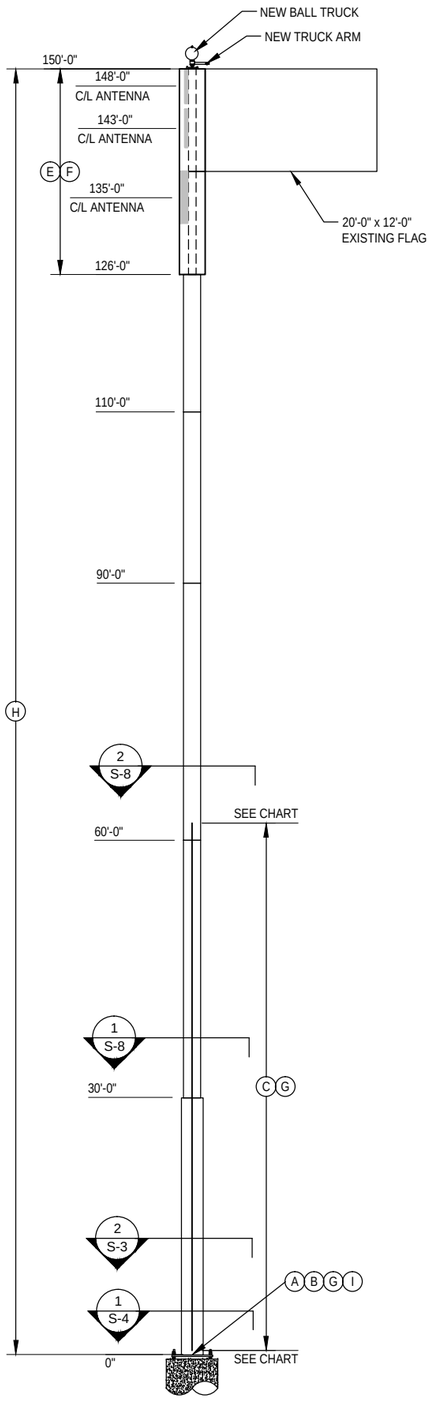
NEXGEN2™ BOLT DETAIL

S-2B

37515-2530.001.DWG

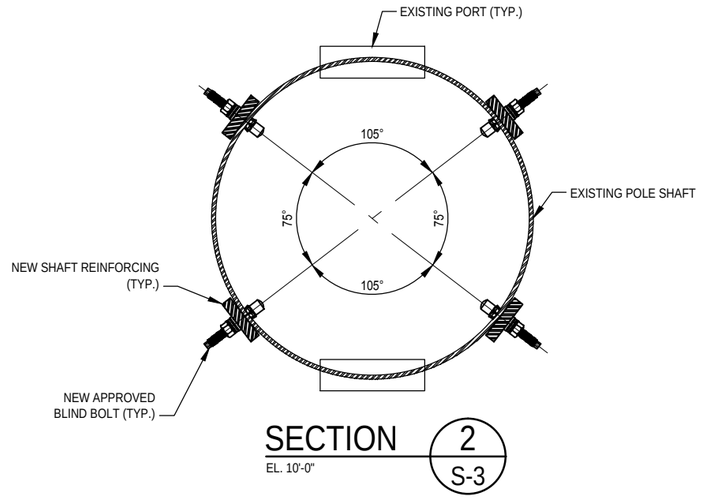


POLE ELEVATION 1 / S-3

NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE											
BOTTOM ELEVATION	TOP ELEVATION	FLAT # / DEGREE SEPARATION	ELEMENT	ELEMENT LENGTH	ELEMENT QUANTITY	APPROXIMATE BOLTS PER ELEMENT	APPROXIMATE TOTAL BOLT QUANTITY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	ESTIMATED TOTAL STEEL WEIGHT
0' - 6"	33' - 3"	37.5, 135, 217.5 & 315	1" x 4-1/2" CFP #1	32' - 9"	4	33	132	6	10	20"	2006 LBS.
30' - 6"	62' - 0"	37.5, 135, 217.5 & 315	1" x 4-1/2" CFP #2	31' - 6"	4	33	132	10	6	20"	1929 LBS.
							264				3935 LBS.

NOTES:

1.) ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
2.) ALL REINFORCING SHALL BE ASTM A572 GR. 65.
3.) WELDS SHALL BE E80XX OR GREATER. TERMINATION WELDS SHALL BE 3/8" FILLET WELDS.
4.) HOLES FOR BOLTS ARE 30mm UNLESS NOTED OTHERWISE.
5.) ALL SHIMS SHALL BE ASTM A-36.



SECTION 2 / S-3
EL. 10'-0"

SHAFT SECTION DATA							
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN) @ TOP	DIAMETER ACROSS FLATS (IN) @ BOTTOM	POLE GRADE (ksi)	POLE SHAPE
1	12.00	0.4650		10.750	10.750	A500-42	ROUND
2	12.00	0.4650		10.750	10.750	A500-42	ROUND
3	16.00	0.3750		24.000	24.000	A53-B-42	ROUND
4	20.00	0.3750		24.000	24.000	A53-B-42	ROUND
5	30.00	0.3750		24.000	24.000	A53-B-42	ROUND
6	30.00	0.3750		24.000	24.000	A53-B-42	ROUND
7	30.00	0.3750		30.000	30.000	A53-B-42	ROUND

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

ASTM A36 SHIMS FOR MONOPOLE REINFORCEMENT MEMBERS SHALL BE REQUIRED WHERE GAPS BETWEEN THE POLE SHAFT AND REINFORCING MEMBER EXIST AT FASTENER LOCATIONS. FOR INTERMEDIATE CONNECTIONS, THE MINIMUM SHIM LENGTH AND WIDTH SHALL BE THE WIDTH OF THE REINFORCING MEMBER. FOR TERMINATION CONNECTIONS, A CONTINUOUS SHIM PLATE (PREFERRED) OR EQUIVALENT INDIVIDUAL SHIM PLATES THE WIDTH OF THE REINFORCING MEMBER MAY BE USED. SHIM THICKNESSES SHALL BE NO LESS THAN 1/16". STACKING OF SHIMS IS PERMITTED.

MODIFICATIONS:

- (A) INSTALL NEW ANCHOR RODS AND BRACKETS AT BASE PLATE. SEE SHEET S-4.
- (B) INSTALL NEW TRANSITION STIFFENERS AT BASE PLATE. SEE SHEET S-4.
- (C) INSTALL NEW SHAFT REINFORCING. SEE CHART ON THIS SHEET.
- (D) INSTALL FILLER PLATES AT ELEVATION 30'-0".
- (E) REMOVE EXISTING CONCEALMENT BULKHEADS AND SHROUDS.
- (F) INSTALL NEW CONCEALMENT BULKHEADS AND SHROUDS.
- (G) PAINT MODIFICATIONS TO MATCH EXISTING POLE.
- (H) BRING POLE WITHIN DEFLECTION TOLERANCE PER TIA-222-G REGARDING PLUMBNESS. CONTRACTOR TO COORDINATE ADDRESSING THE PLUMBNESS WITH EOR.
- (I) CLEAN CORROSION AND APPLY TWO COATS OF COLD GALVANIZING COMPOUND TO EXISTING BASE PLATE STIFFENERS AND INTERIOR WALL OF POLE SHAFT ADJACENT TO EXISTING STIFFENER PLATES. SEE SHEET S-1 & S-4.

1. EXISTING CONCEALMENT TO BE REMOVED AND REPLACED WITH THE NEW CONCEALMENT.
2. NEW CONCEALMENT IS TO BE BOLTED TO TOP FLANGE OF EXISTING BASE POLE. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO FABRICATION AND INSTALLATION.
3. NEW CONCEALMENT BULKHEADS ARE TO BE BOLTED TO EXISTING CONCEALMENT SPINE. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO FABRICATION AND INSTALLATION.
4. CONTRACTOR SHALL SEND PAUL J. FORD & COMPANY THE FABRICATION DRAWINGS FOR APPROVAL PRIOR TO MANUFACTURING.
5. ALL EXISTING COAX SHALL BE REMOVED PRIOR TO INSTALLATION OF THE NEW NEW CONCEALMENT AND SHAFT REINFORCING. UPON COMPLETION COAX SHALL BE REINSTALLED. NEW COAX MAY BE REQUIRED. COORDINATE COAX INSTALLATION WITH PROJECT PM.

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

PAUL J. FORD & COMPANY
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BU #828257; STONINGTON
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CHECKED BY:	
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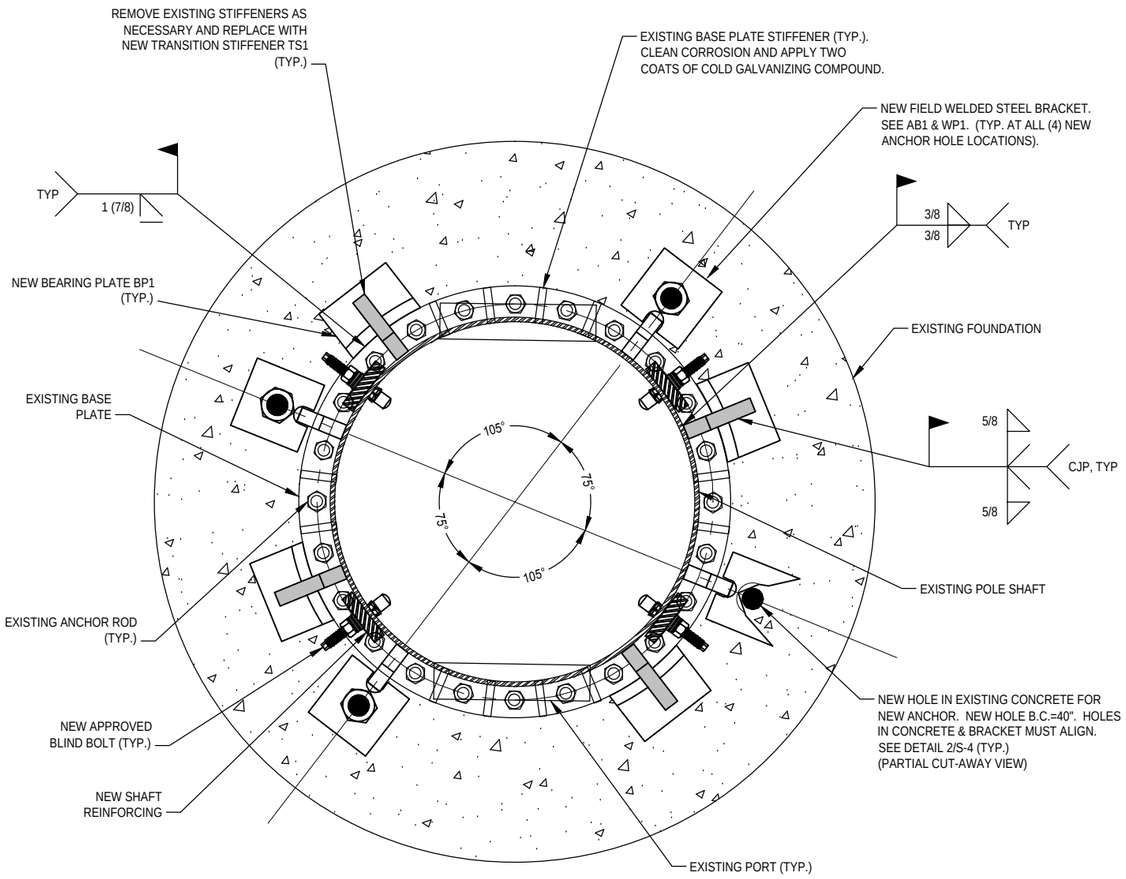
MONOPOLE PROFILE

S-3

37515-2530.001.DWG

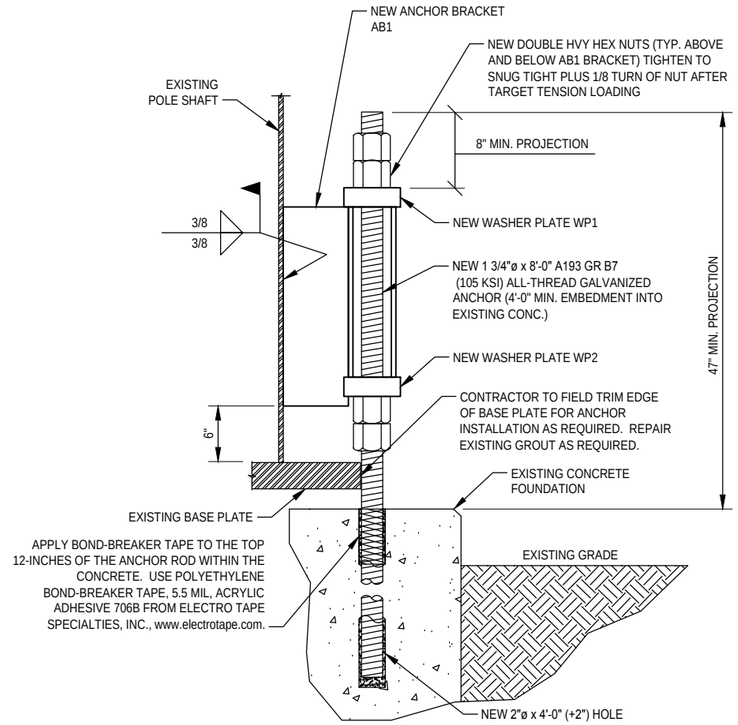
BASE SPECIFICATIONS	
BASE PLATE:	36" ROUND; 1 1/4" THK.; Fy=36 KSI
ANCHOR RODS:	(24) 1"ø; A687 GRADE 105; 33" B.C.

PROVIDE NON-SHRINK GROUT (NS GROUT BY EUCLID OR APPROVED. EQUAL; 7500 PSI MIN.) BELOW NEW BEARING PLATES. GROUT SHALL BE INSTALLED TIGHT UNDER NEW BEARING PLATES WITH NO VOIDS REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF NEW BEARING PLATES.



BASE PLATE 1 / S-4

NDE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. SEE CCI DOCUMENTS ENG-SOW-10033 'TOWER BASE PLATE NDE' AND ENG BUL-10051 'NDE REQUIREMENTS FOR MONOPOLE BASE PLATE TO PREVENT CONNECTION FAILURE.' NOTIFY THE EOR AND CROWN CASTLE ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING REINFORCEMENTS THAT HAVE BEEN WELDED TO THE BASE PLATE. ANY FULL PENETRATION WELDING TO THE BASE PLATE REQUIRED AS PART OF THIS ACTIVE REINFORCEMENT DESIGN SHALL BE INCLUDED IN THE NDE SCOPE OF WORK.



NEW ANCHOR & BRACKET DETAIL 2 / S-4

NEW ANCHOR ROD REINFORCING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ONCE ALL RESIN HAS CURED, ALL NEW ANCHOR ROD REINFORCING SHALL BE TESTED TO A TARGET TENSION LOAD OF 120 KIPS. ONCE THE TENSION LOAD HAS BEEN RELEASED, TIGHTEN HEAVY HEX NUT TO SNUG TIGHT PLUS 1/8 TURN OF NUT. REFER TO SHEET S-1, SECTION 6 FOR ADDITIONAL INFORMATION.

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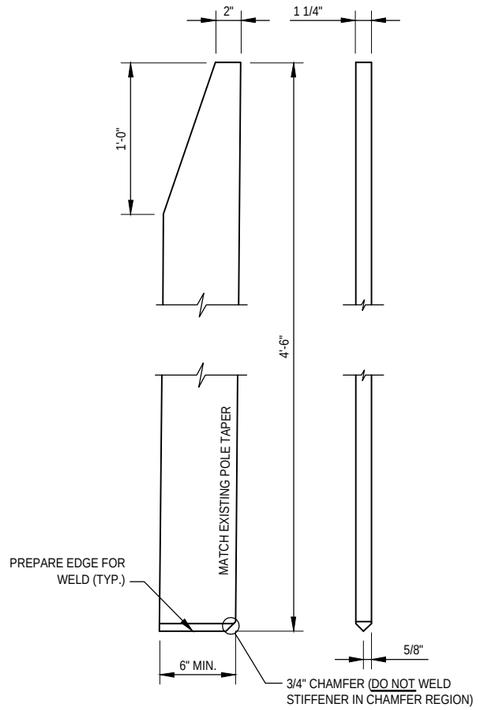
BASE PLATE DETAILS

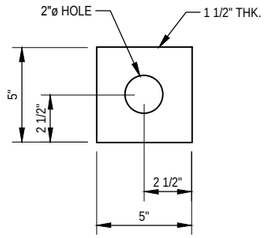
S-4

37515-2530.001.DWG



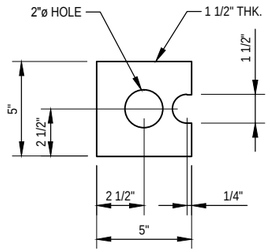
TRANSITION STIFFENER MK~TS1

(4 REQUIRED) (Fy = 65 KSI)



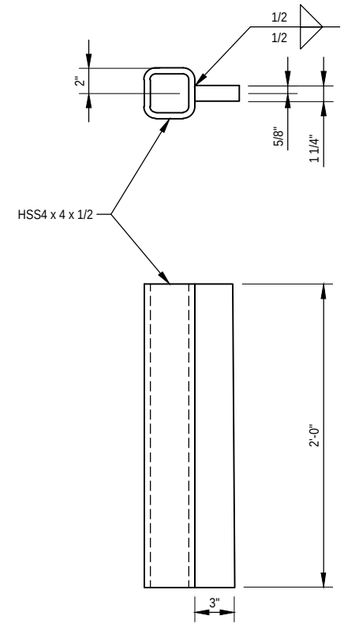
WASHER PLATE MK~WP1

(4 REQUIRED) (Fy = 50 KSI)



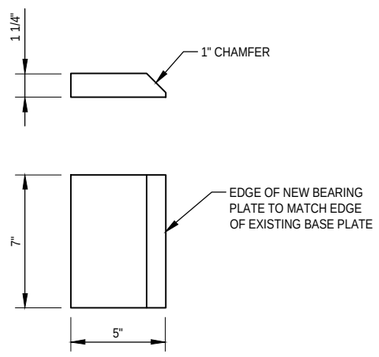
WASHER PLATE MK~WP2

(4 REQUIRED) (Fy = 50 KSI)



ANCHOR BRACKET MK~AB1

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



BEARING PLATE MK~P1

(4 REQUIRED) (Fy = 50 KSI)

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CROWN CASTLE

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DESIGNED BY:	J.W.M.
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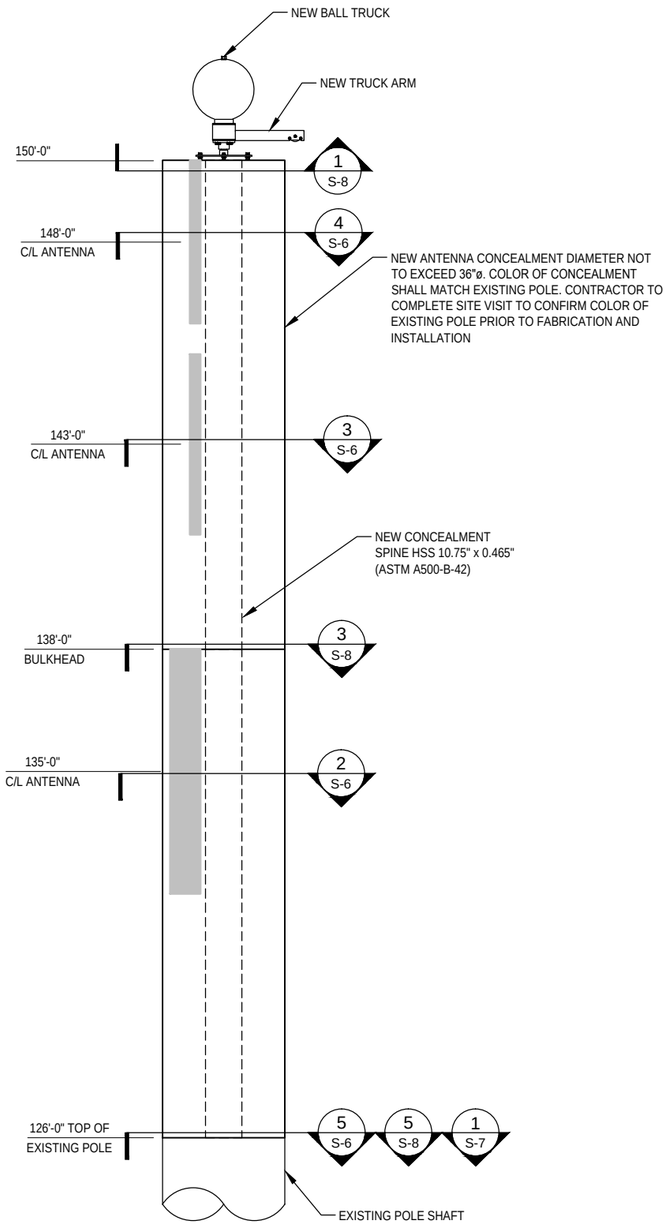
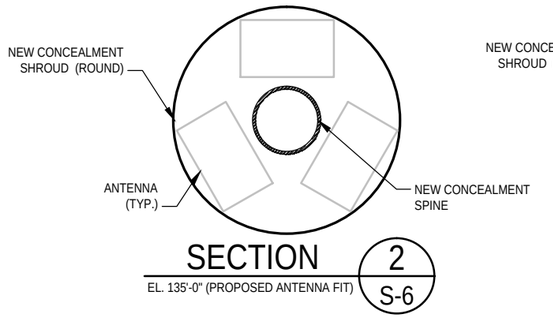
DRILLED IN REBAR DETAILS

S-5

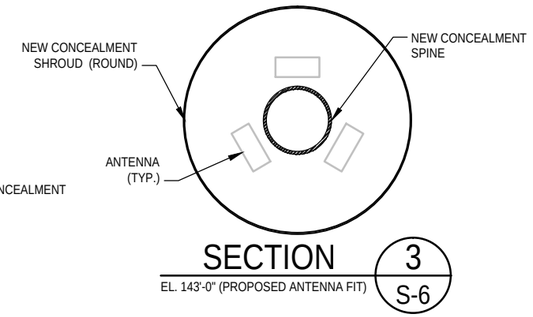
37515-2530.001.DWG



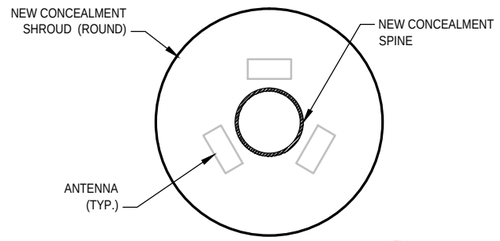
PARTIAL ELEVATION 1 / S-6



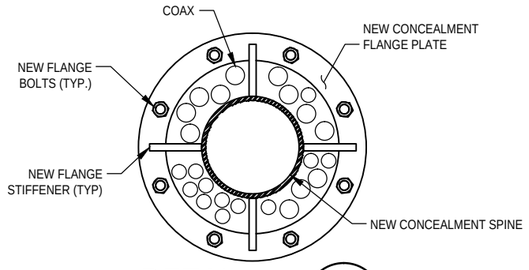
SECTION 2 / S-6
EL. 135'-0" (PROPOSED ANTENNA FIT)



SECTION 3 / S-6
EL. 143'-0" (PROPOSED ANTENNA FIT)



SECTION 4 / S-6
EL. 148'-0" (PROPOSED ANTENNA FIT)



DETAIL 5 / S-6
EL 126'-0" (COAX LAYOUT)

Antenna Model	Antenna Centerline Elevation, ft	Height, in	Depth, in	Width, in
APX18-209014-CT2	148	48.03	3.15	6.8
APXV18-206516S-C	143	53.1	3.15	6.9
OPA-65R-LCUU-H6	135	72	9	14.8

NOTE: ALL ANTENNA DIMENSIONS HAVE BEEN PROVIDED BY CROWN CASTLE. A 1-1/2" SPACING BETWEEN THE SPINE AND ANTENNA HAS BEEN ASSUMED.

Coax Model	QUANTITY	Elevation, ft	Nominal Diameter, in	Actual Diameter, in
LDF7-50A	12	145	1 5/8	1.98
LDF6-50A	12	133	1 1/4	1.55

NOTE: COAX LAYOUT AND FIT IS THEORETICAL. ACTUAL LAYOUT AND FIT MAY VARY PENDING EXISTING CONDITIONS.

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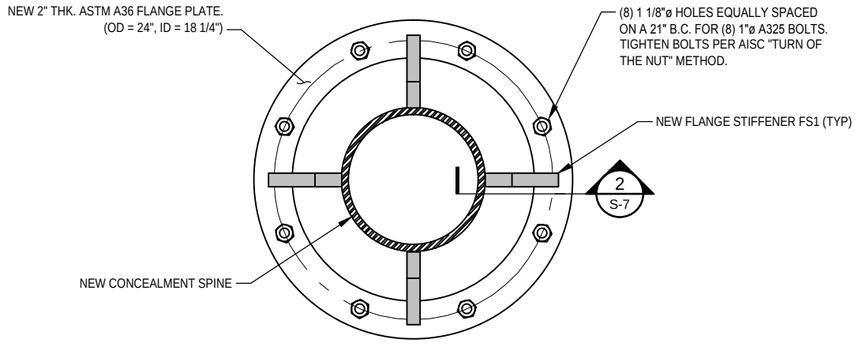
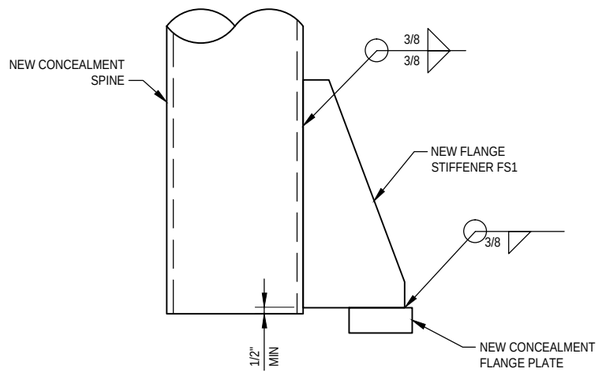
BRIDGE STIFFENER DETAILS

S-6

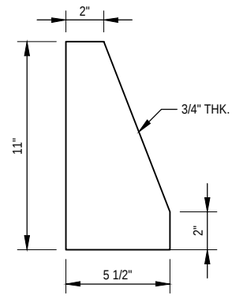
37515-2530.001.DWG



SECTION 1 / S-7
BOTTOM FLANGE PLATE



FLANGE CONNECTION 2 / S-7
1/4" RING PLATE NOT SHOWN FOR CLARITY



FLANGE STIFFENER MK~FS1
(4 REQUIRED) (Fy = 36 KSI)

PAUL J. FORD & COMPANY
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Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065
PH: (585) 370-4766

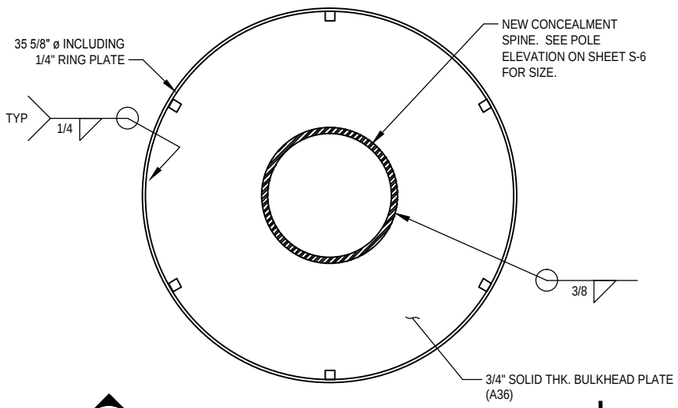
MODIFICATION OF AN EXISTING
150'-0" MONOPOLE
BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	
DATE:	08-26-2015

BRIDGE STIFFENER DETAILS

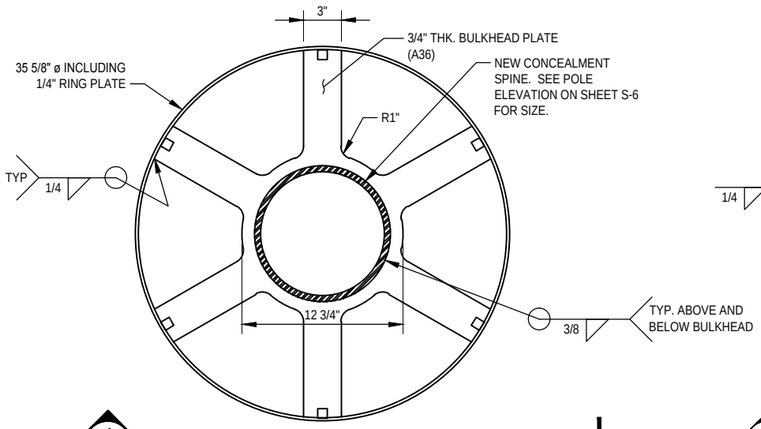
S-7

37515-2530.001.DWG



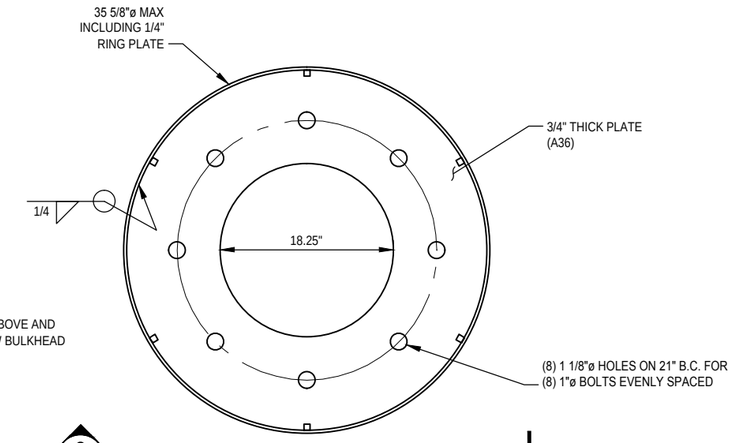
2 S-8

SECTION 1 S-8
TOP BULKHEAD



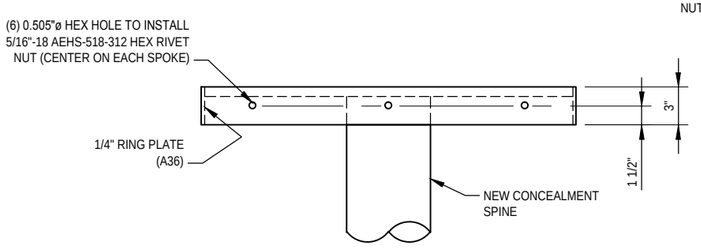
4 S-8

SECTION 3 S-8
138'-0" INTERMEDIATE BULKHEAD

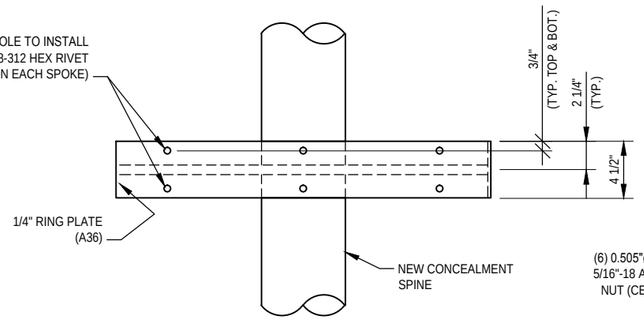


2 S-8

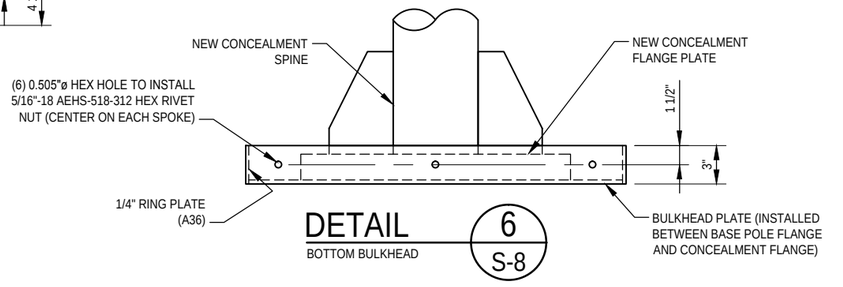
SECTION 5 S-8
126'-0" BOTTOM BULKHEAD



SECTION 2 S-8



SECTION 4 S-8



DETAIL 6 S-8
BOTTOM BULKHEAD

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MODIFICATION OF AN EXISTING 150'-0" MONOPOLE
BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
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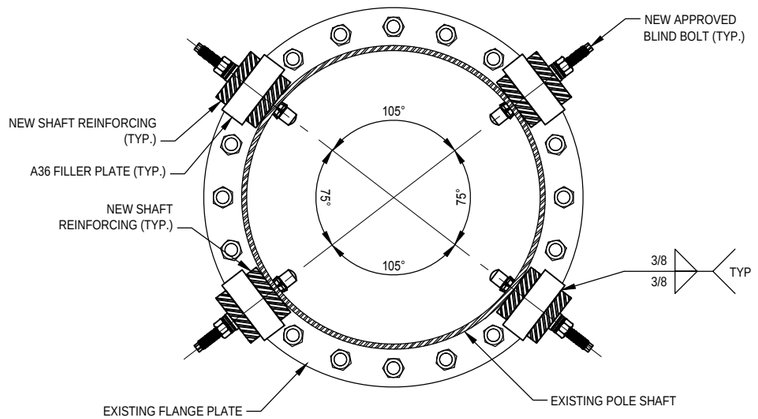
DATE:	08-26-2015

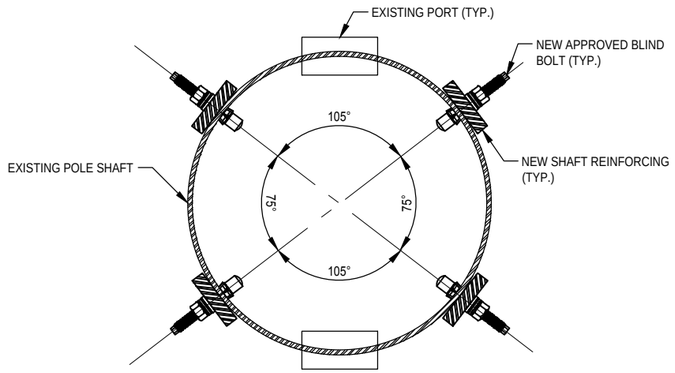
BULKHEAD DETAILS

S-8

37515-2530.001.DWG



SECTION 1 / S-9
EL. 30'-0"



SECTION 2 / S-9
EL. 60'-0"

REMOVE EXISTING BRIDGE STIFFENERS AS NECESSARY.

		TOP FILLER PLATE SIZE (in)			BOTTOM FILLER PLATE SIZE (in)					UNBRACED LENGTH (in)	
FLANGE EL (ft)	QTY	WIDTH	THK	LENGTH	WIDTH	THK	LENGTH	FILLER WEIGHT (lbs)	WELD LENGTH (in)	MAXIMUM BOLT SPACING AT FLANGE (LMAX)	JUMP WEIGHT (lbs)
30.00	4	5.50"	2.00"	33.00"				412	264.0"	3.00"	322

Total Jump Wt.	322	lbs
Total Steel Weight	734	lbs
Total Weld Length	264	in

NOTES:

1 ALL NEW FLANGE JUMP STEEL REINFORCING SHALL BE COLD GALVANIZED AS FOLLOWS:
APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC -RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.

2 ALL FILLER BARS SHALL BE ASTM A36 GR. 36

3 ALL FLANGE JUMP BARS SHALL BE ASTM A572 (GRADE 65 OR AS SPECIFIED ON THE DESIGN DRAWINGS) (MIN. Fy = 65 ksi, MIN. Fu = 80ksi).

4 HOLES FOR THE BOLTS ARE 30mm UNLESS NOTED OTHERWISE.

5 IF THE TOP OR BOTTOM BOLTS ARE NOT LISTED, THE QUANTITIES ARE INCLUDED IN THE SHAFT REINFORCING CHART.

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MODIFICATION OF AN EXISTING 150'-0" MONOPOLE

BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	
DATE:	08-26-2015

BRIDGE STIFFENER DETAILS

S-9

37515-2530.001.DWG

MODIFICATION INSPECTION NOTES:

1. GENERAL

1.1. 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 EOR.

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

1.3. ALL MI'S SHALL BE CONDUCTED BY A CROWN CASTLE ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN CASTLE.

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

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

2. MI INSPECTOR

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

2.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.

2.1.2. WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.

2.1.3. THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL 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 CASTLE.

3. GENERAL CONTRACTOR

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

3.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.

3.1.2. WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.

3.1.3. BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS.

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

4. RECOMMENDATIONS

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

4.1.1. IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.

4.1.2. THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.

4.1.3. WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.

4.1.4. IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.

4.1.5. WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

5. CANCELLATION OR DELAYS IN SCHEDULED MI

5.1. IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN CASTLE 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 CASTLE 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.

6. CORRECTION OF FAILING MI'S

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

6.1.1. CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.

6.1.2. OR, WITH CROWN CASTLE'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

7. MI VERIFICATION INSPECTIONS

7.1. CROWN CASTLE 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.

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

7.3. VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

8. PHOTOGRAPHS

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

8.1.1. PRECONSTRUCTION GENERAL SITE CONDITION

8.1.2. PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION

8.1.3. RAW MATERIALS

8.1.4. PHOTOS OF ALL CRITICAL DETAILS

8.1.5. FOUNDATION MODIFICATIONS

8.1.6. WELD PREPARATION

8.1.7. BOLT INSTALLATION AND TORQUE

8.1.8. FINAL INSTALLED CONDITION

8.1.9. SURFACE COATING REPAIR

8.1.10. POST CONSTRUCTION PHOTOGRAPHS

8.1.11. FINAL INFIELD CONDITION

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

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

9. INSPECTION AND TESTING

9.1. ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY CROWN CASTLE'S REPRESENTATIVE AND CROWN CASTLE'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY.

9.2. INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS ARE STILL REQUIRED WHEN THE EOR PERFORMS SUPPORT SERVICES DURING CONSTRUCTION.

9.3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.

9.4. AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY CROWN CASTLE FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.

9.4.1. ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.

9.4.2. THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.

9.5. THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES AND INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.

9.6. GENERAL

9.6.1. PERFORM PERIODIC ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY CROWN CASTLE AND THE EOR IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.

9.7. FOUNDATIONS AND SOIL PREPARATION - (NOT REQUIRED)

9.8. CONCRETE TESTING PER ACI - (NOT REQUIRED)

9.9. STRUCTURAL STEEL

9.9.1. CHECK STEEL ON THE JOB WITH THE PLANS.

9.9.2. CHECK MILL CERTIFICATIONS. CALL FOR LABORATORY TEST REPORTS WHEN MILL CERTIFICATION IS IN QUESTION.

9.9.3. CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.

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

9.9.5. INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.

9.9.6. CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.

9.9.7. CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.

9.9.8. CHECK THAT BOLTS HAVE BEEN TIGHTENED PROPERLY.

9.9.9. PRIOR TO ANY FIELD CUTTING THE CONTRACTOR SHALL MARK THE CUTOUT LINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

9.10. WELDING:

9.10.1. VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.

9.10.2. INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND WITH AWS D1.1.

9.10.3. APPROVE FIELD WELDING SEQUENCE.

9.10.4. A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO CROWN CASTLE BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM CROWN CASTLE.

9.10.5. INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:

9.10.5.1. INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE, AND WORKING CONDITIONS.

9.10.5.2. VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.

9.10.5.3. INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.

9.10.5.4. VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT.

9.10.5.5. SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE.

9.10.5.6. INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED DRAWINGS.

9.10.5.7. VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.

9.10.5.8. REVIEW THE REPORTS BY TESTING LABS.

9.10.5.9. CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.

9.10.5.10. INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.

9.10.5.11. CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.

9.10.5.12. FULL PENETRATION WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D1.1.

9.10.5.13. PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MP IN ACCORDANCE WITH AWS D1.1.

9.11. REPORTS:

9.11.1. COMPILE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO CROWN CASTLE.

9.11.2. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES OR PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO CROWN CASTLE'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT CROWN CASTLE'S REVIEW AND SPECIFIC WRITTEN CONSENT. CROWN CASTLE RESERVES THE RIGHT TO DETERMINE WHETHER OR NOT A RESOLUTION IS ACCEPTABLE.

9.11.3. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO CROWN CASTLE. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.

9.11.4. THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWINGS
X	EOR REVIEW
X	FABRICATION INSPECTION
X	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
X	FABRICATOR NDE 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
X	POST INSTALLED ANCHOR ROD VERIFICATION
X	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: PROVIDE PHOTO DOCUMENTATION OF EXCAVATION QUALITY AND COMPACTION
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
NA	MICROPILE/ROCK ANCHOR INSTALLER'S DRILLING AND INSTALLATION LOGS AND QA/QC DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	POST INSTALLED ANCHOR ROD TARGET TENSION LOAD TESTING
NA	REFER TO MICROPILE/ROCK ANCHOR NOTES FOR SPECIAL INSPECTION AND TESTING REQUIREMENTS.
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

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

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MODIFICATION OF AN EXISTING 150'-0" MONOPOLE

BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	
DATE:	08-26-2015

MI CHECKLIST

S-10

37515-2530.001.DWG

MODIFICATION OF AN EXISTING 150'-0" MONOPOLE

BU #828257; STONINGTON

82 MECHANIC STREET
PAWCATUCK, CONNETICUT 06379
NEW LONDON COUNTY
LAT: 41° 22' 18.91"; LONG: -71° 49' 58.01"
APP: 262048 REV. 2; WO: 1107669

PROJECT CONTACTS

STRUCTURE OWNER:
CROWN CASTLE
MOD PM: DAN VADNEY AT DAN.VADNEY@CROWNCASTLE.COM
PH: (578) 373-3510
MOD CM: JASON D'AMICO AT JASON.D'AMICO@CROWNCASTLE.COM
PH: (860) 209-0104

ENGINEER OF RECORD:
PJFMOD@PJFWEB.COM

WIND DESIGN DATA	
REFERENCE STANDARD	TIA/EIA-222-F
LOCAL CODE	2003 IBC
BASIC WIND SPEED (FASTEST-MILE)	85 MPH
ICE THICKNESS	0.75 IN
ICE WIND SPEED	37.6 MPH
SERVICE WIND SPEED	50 MPH

THIS PROJECT INCLUDES THE FOLLOWING ITEMS
REMOVAL OF EXISTING CONCEALMENT BULKHEADS & SHROUDS
INSTALLATION OF NEW CONCEALMENT SPINE
INSTALLATION OF NEW CONCEALMENT BULKHEADS & SHROUDS
INSTALLATION OF WELDED STIFFENERS
FLANGE BRIDGE STIFFENERS
SHAFT REINFORCING
FIELD WELDED ANCHOR BRACKETS
POST INSTALLED ANCHOR RODS
PAINT MODIFICATIONS TO MATCH EXISTING POLE
HIGH STRENGTH GROUT
CORRECT THE POLE OUT OF PLUMB
CLEAN CORROSION AND APPLY TWO COATS OF COLD GALVANIZING TO EXISTING BASE PLATE STIFFENERS AND INTERIOR WALL OF POLE SHAFT ADJACENT TO EXISTING STIFFENER PLATES. SEE SECTION 7 OF NOTES ON S-1

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THE ASSOCIATED FAILING SA WO NUMBER FOR THIS PROJECT IS 1062894

ATTENTION ALL CONTRACTORS, ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT (800) 788-7011.

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER
9.3.15

PJF PAUL J. FORD & COMPANY
250 E Broad St, Ste 600- Columbus, OH 43215
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CROWN CASTLE
3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065
PH: (585) 370-4766

MODIFICATION OF AN EXISTING
150'-0" MONOPOLE
BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	KJS
DATE:	08-26-2015

TITLE SHEET

T-1

37515-2530.001.DWG

MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 3, 02/05/2015)

1. GENERAL NOTES

1.1. THE MONOPOLE STRUCTURE IN ITS EXISTING CONDITION DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE PROPOSED AND EXISTING LOADS FROM THE ATTACHED STRUCTURAL MODIFICATION REPORT AT THE REQUIRED MINIMUM WIND SPEEDS. DO NOT INSTALL ANY NEW LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.

1.2. THESE DRAWINGS WERE PREPARED FROM INFORMATION PROVIDED BY CROWN CASTLE. THE INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY THE ENGINEER OF RECORD (EOR) FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT DRAWINGS AND THEIR FIELD VERIFIED CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO THE EOR AND CROWN CASTLE BEFORE PROCEEDING WITH THE WORK.

1.3. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.

1.4. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN SUCCESSFULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO ENSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.

1.5. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA-1019 (LATEST EDITION), OSHA AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

1.6. OBSERVATION VISITS TO THE SITE BY CROWN CASTLE AND/OR THE EOR SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES. ANY SUPPORT SERVICES PERFORMED BY THE EOR DURING CONSTRUCTION ARE SOLELY FOR THE PURPOSE OF ACHIEVING GENERAL CONFORMANCE WITH THE CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE THE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.

1.7. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY CROWN CASTLE AND EOR PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.

1.8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.

1.9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.

1.10. ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED AND RELOCATED, REPLACED, OR RE-INSTALLED AS REQUIRED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH CROWN CASTLE, TESTING AGENCY, AND EOR.

1.11. ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS.

1.12. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE EOR.

1.13. ALL SOLUTIONS FOR THE REPLACEMENT, RELOCATION OR MODIFICATION OF THE SAFETY CLIMB AND/OR ANY OF THE MONOPOLE CLIMBING FACILITIES SHALL BE COORDINATED WITH TUF-TUG PRODUCTS. CONTACT DETAILS:
3434 ENCRETE LANE, MORAINE, OHIO 45439
PHONE: 937-299-1213 EMAIL: TUFTUG@AOL.COM

2. STRUCTURAL STEEL

2.1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
2.1.1. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
2.1.1.1. "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS."
2.1.1.2. "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM HIGH STRENGTH BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS.
2.1.1.3. "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"
2.1.2. BY THE AMERICAN WELDING SOCIETY (AWS):
2.1.2.1. "STRUCTURAL WELDING CODE – STEEL D1.1."
2.1.2.2. "STANDARD SYMBOLS FOR WELDING, BRAZING, AND NONDESTRUCTIVE EXAMINATION"

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

2.3. 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.

2.4. 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.

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

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

2.7. 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.

2.8. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.

2.9. FIELD CUTTING OF STEEL:
2.9.1. IMPORTANT CUTTING AND WELDING SAFTEY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFTEY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY 'CUTTING AND WELDING SAFETY PLAN' (DOC # ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT". ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
2.9.2. 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. CONTRACTOR TO AVOID 90 DEGREE CORNERS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS.

3. BASE PLATE GROUT

3.1. NEW GROUT FOR THE POLE BASE SHALL BE NON-SHRINK, NON-METALLIC, GROUT (NS GROUT BY EUCLID, OR APPROVED EQUAL) WITH A 7500 PSI MINIMUM COMPRESSIVE STRENGTH. CONTRACTOR SHALL SUBMIT PROPOSED GROUT SPECIFICATION INFORMATION TO CROWN CASTLE FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. CONTRACTOR SHALL FOLLOW GROUT MANUFACTURER'S SPECIFICATIONS FOR COLD WEATHER GROUTING PROCEDURES (IF NECESSARY) AND THE TESTING AGENCY SHALL PREPARE GROUT SAMPLE SPECIMENS FOR COMPRESSIVE STRENGTH TESTING AND VERIFICATION.

3.2. GROUT SHALL BE INSTALLED TIGHT UNDER THE BASE PLATE AND BEARING PLATE REGION WITH NO VOIDS REMAINING BETWEEN THE TOP OF THE EXISTING CONCRETE AND THE UNDERSIDE OF THE EXISTING BASE PLATE AND BEARING PLATE.

3.3. CAULK AROUND ANCHOR RODS WHEN GROUTING.

4. FOUNDATION WORK - (NOT REQUIRED)

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

6. EPOXY GROUTED REINFORCING ANCHOR RODS

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

6.2. ALL REINFORCING ANCHOR RODS SHALL BE HOT DIP GALVANIZED PER ASTM A123.

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

6.4. HILTI HIT RE-500 SD OR ITW RED HEAD EPCON G5 EPOXY SHALL BE USED TO ANCHOR THE BAR IN THE DRILL HOLES. IF THE DESIGNED EMBEDMENT IS GREATER THAN 12 FT, CONTRACTOR HAS THE OPTION TO USE PILE ANCHOR GROUT BY E-CHEM AS AN ALTERNATE. IF CONTRACTOR WISHES TO USE A DIFFERENT EPOXY, A REQUEST INCLUDING THE EPOXY TECHNICAL DATA SHEET(S) SHALL BE SUBMITTED TO THE EOR FOR REVIEW PRIOR TO CONSTRUCTION.

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

6.6. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED THE CONTRACTOR SHALL TIGHTEN ALL HEAVY HEX ANCHOR NUTS TO SNUG TIGHT PLUS 1/8 TURN OF NUT.

7. TOUCH UP OF GALVANIZING

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

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

7.3. CROWN CASTLE'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 ADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

8. HOT-DIP GALVANIZING

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

8.2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES WITH EOR APPROVAL OF LOCATIONS.

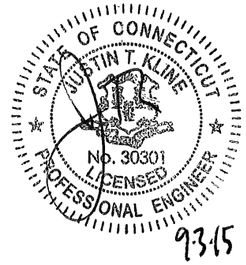
8.3. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

9. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER

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

9.2. ANY FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE EXISTING GALVANIZED STEEL POLE STRUCTURE AND THE WELDED 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 CROWN CASTLE REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.

9.3. CROWN CASTLE 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 CROWN CASTLE BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. THE EOR RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT. ACCORDING TO TIA/EIA-222-F-1996 SECTION 14.1, NOTE 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".



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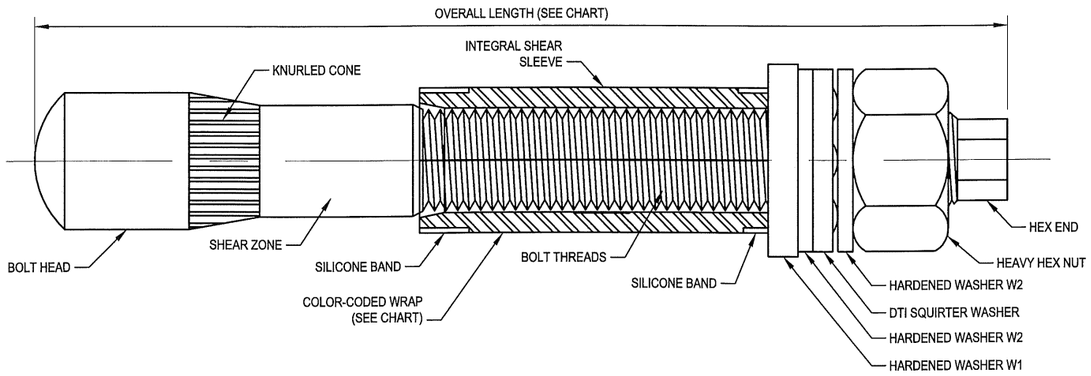
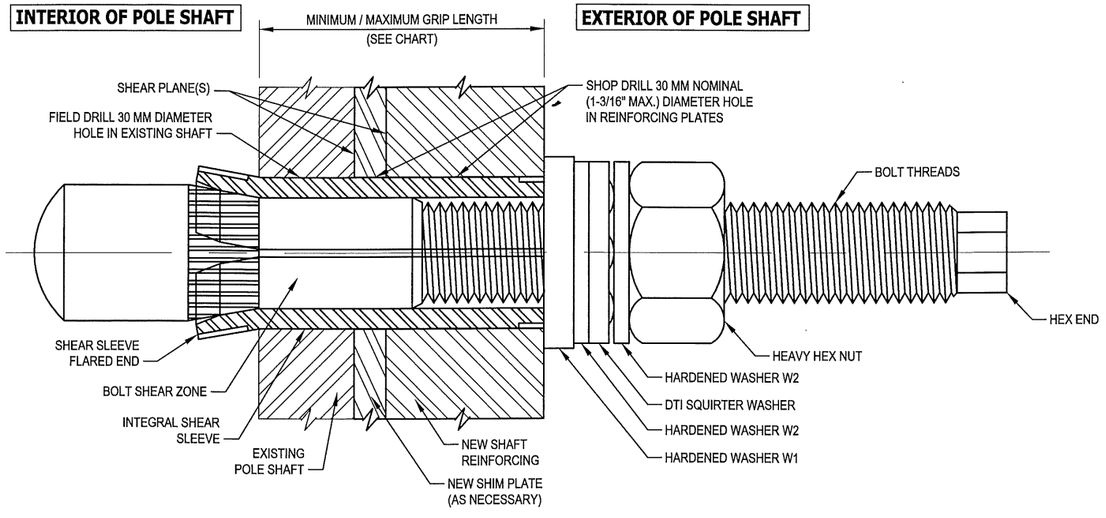
GENERAL NOTES

S-1

37515-2530.001.DWG



PRE-INSTALLED FORGBolt™ ASSEMBLY DETAIL 1 / S-2A



INSTALLED FORGBolt™ ASSEMBLY DETAIL 2 / S-2A

FORGBolt™		AISC Group A Material: ASTM A325 and PC8.8 (Tensile Stress, Fu = 120 ksi minimum)				
GROUP A		FORGBolt™ Size (mm)	Overall Length (inches)	Estimated Weight Each (lbs)	Grip Range (inch)	Comment	Color Code
FORGBolt™ A325 - PC8.8	1	135	5.31	1.3	3/8" to 1"	--	RED
	2	160	6.30	1.6	3/4" to 1-1/2"	--	GREEN
	3	195	7.68	1.9	1-1/4" to 2-1/4"	--	BLUE
	4	260	10.24	2.6	2" to 3-1/2"	Splice Bolt	YELLOW
	5	365	14.37	3.6	3-1/2" to 5-1/2"	Flange Jump Bolt	ORANGE
	6	440	17.32	4.3	5-1/2" to 8-1/2"	Flange Jump Bolt	BLACK
DTI Note		Each Group A (A325/PC8.8) FORGBolt™ assembly shall have a 'Squirter' DTI that is compatible with a M20-PC8.8 bolt.					

FOLLOW ALL MANUFACTURER / DISTRIBUTOR RECOMMENDATIONS FOR INSTALLATION, TIGHTENING, AND INSPECTION

INSTALLATION NOTES:
1. FIELD DRILL HOLES TO 30 MM DIAMETER.
2. SELECT CORRECT BOLT SIZE FOR INSTALLATION GRIP (REFER TO PLANS).
3. INSERT BOLT ASSEMBLY THROUGH HOLES IN SHAFT REINFORCING PLATES AND SEAT THE HARDENED WASHER W1 FLUSH AGAINST OUTSIDE OF PLATE.
4. HAND TIGHTEN NUT TO FINGER TIGHT.
5. TIGHTEN NUT TO PRETENSIONED CONDITION AND UNTIL DTI SHOWS PROPER INDICATION.
6. PROPERLY DOCUMENT AND INSPECT BOLT TIGHTENING PER PLAN REQUIREMENTS.

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

BOLT TIGHTENING AND INSPECTION 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.

AISC GROUP A MATERIAL: ASTM A325 AND PC8.8
(Fu = 120 KSI MIN. TENSILE STRESS)

CONTAINS PROPRIETARY INFORMATION PATENT PENDING

DISTRIBUTOR CONTACT:
PRECISION TOWER PRODUCTS
PHONE: 888-926-4857
EMAIL: info@precisiontowerproducts.com
WEB: www.precisiontowerproducts.com

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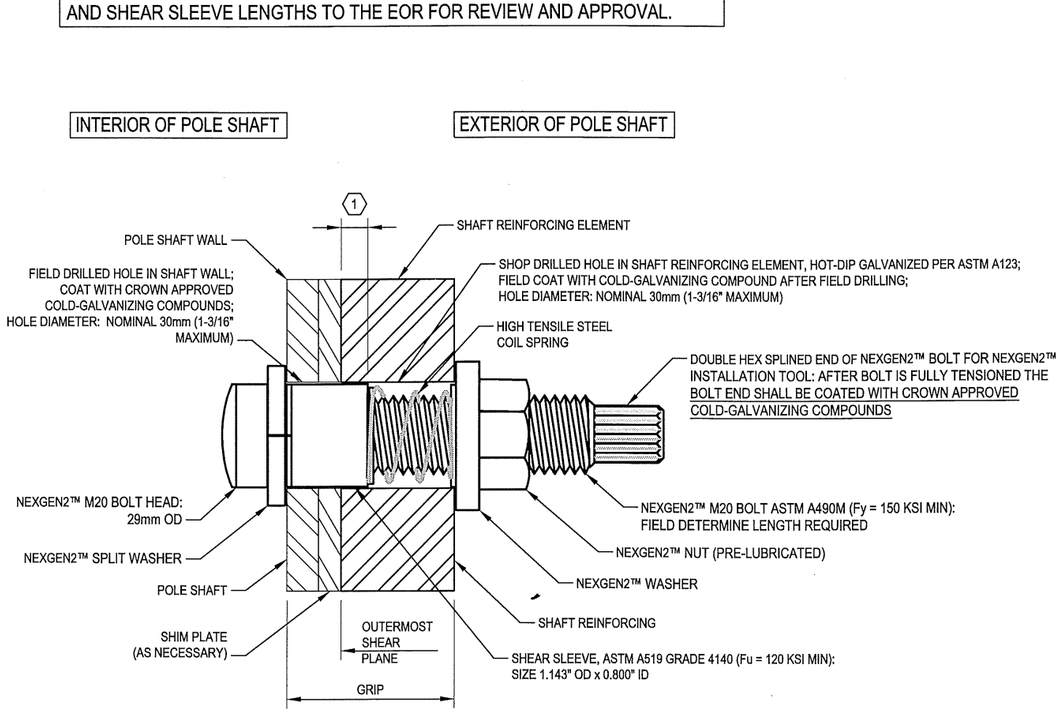
FORGBolt™ DETAILS

S-2A

37515-2530.001.DWG

NEXGEN2™ BOLT NOTE SHEET: REV. 1.01, 04-15-2015

<1> NOTE: SHEAR SLEEVE LENGTH: THE SHEAR SLEEVE SHALL PROJECT A MINIMUM OF 3/8" BEYOND THE OUTERMOST SHEAR PLANE. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS SHOWING NEXGEN2™ BOLT LENGTHS AND SHEAR SLEEVE LENGTHS TO THE EOR FOR REVIEW AND APPROVAL.



TYPICAL NEXGEN2™ BOLT DETAIL 1 / S-2B

FOLLOW ALL MANUFACTURER / DISTRIBUTOR RECOMMENDATIONS FOR INSTALLATION, TIGHTENING, AND INSPECTION

BOLT HOLE NOTES:

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

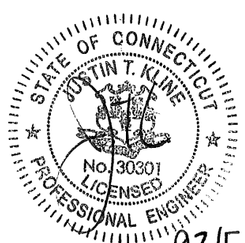
BOLT TIGHTENING AND INSPECTION NOTES:

1. ALL NEXGEN2™ BOLT ASSEMBLIES SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF SECTION 8.2.3 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. PER SECTION 8.2.3: ALL FASTENER ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS IN AISC SECTION 8.1 WITHOUT SEVERING THE SPLINED END AND WITH WASHERS POSITIONED AS REQUIRED IN AISC SECTION 6.2. PER REQUIREMENTS IN SECTION 8.1: PRIOR TO BOLT PRETENSIONING, THE JOINT SHALL FIRST BE COMPACTED TO THE SNUG-TIGHT CONDITION. SNUG TIGHT IS THE CONDITION THAT EXISTS WHEN ALL OF THE PLIES IN THE CONNECTION HAVE BEEN PULLED INTO FIRM CONTACT BY THE BOLTS AND THE BOLTS HAVE BEEN TIGHTENED SUFFICIENTLY TO PREVENT THE REMOVAL OF THE NUTS WITHOUT THE USE OF A WRENCH. ONCE THE SNUG TIGHT CONDITION IS ACHIEVED, THEN THE BOLT ASSEMBLY CAN BE TIGHTENED TO THE PRETENSIONED CONDITION.
2. ALL NEXGEN2™ BOLT ASSEMBLIES SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF SECTION 9.2.3 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. NOTE THAT COMPLETE INSPECTION OF ALL NEXGEN2™ BOLT ASSEMBLIES IS REQUIRED IN ADDITION TO ROUTINE OBSERVATION.
3. ALL NEXGEN2™ BOLTS SHALL BE INSPECTED BY A QUALIFIED BOLT INSPECTOR PER NOTES 1 AND 2, ABOVE. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE NEXGEN2™ BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TENSIONING PROCEDURE. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THAT THE DOUBLE HEX SPLINED END OF THE BOLTS HAVE BEEN TWISTED OFF AND COATED WITH CROWN APPROVED COLD-GALVANIZING COMPOUND..

NOTE: NEXGEN2™ BOLT ASSEMBLY SHALL BE MAGNI 565 COATED PER ASTM F2833 AND MANUFACTURER SPECIFICATIONS.

NOTE: INSTALL NEXGEN2™ BOLT ASSEMBLY PER MANUFACTURER'S INSTRUCTIONS.

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



9.3.15

PJF PAUL J. FORD & COMPANY
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CROWN CASTLE
3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065
PH: (585) 370-4766

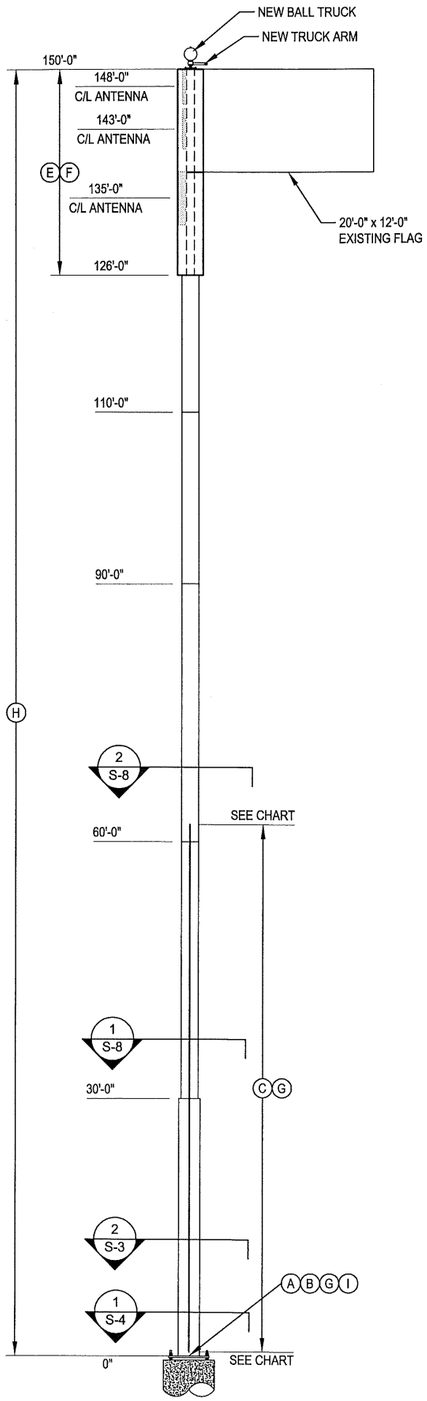
MODIFICATION OF AN EXISTING
150'-0" MONOPOLE
BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	KJS
DATE:	08-26-2015

NEXGEN2™ BOLT DETAIL

S-2B

37515-2530.001.DWG



POLE ELEVATION 1 / S-3

NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE

BOTTOM ELEVATION	TOP ELEVATION	FLAT # / DEGREE SEPARATION	ELEMENT	ELEMENT LENGTH	ELEMENT QUANTITY	APPROXIMATE BOLTS PER ELEMENT	APPROXIMATE TOTAL BOLT QUANTITY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	ESTIMATED TOTAL STEEL WEIGHT
0' - 6"	33' - 3"	37.5, 135, 217.5 & 315	1" x 4-1/2" CFP #1	32' - 9"	4	33	132	6	10	20"	2006 LBS.
30' - 6"	62' - 0"	37.5, 135, 217.5 & 315	1" x 4-1/2" CFP #2	31' - 6"	4	33	132	10	6	20"	1929 LBS.
							264				3935 LBS.

NOTES:

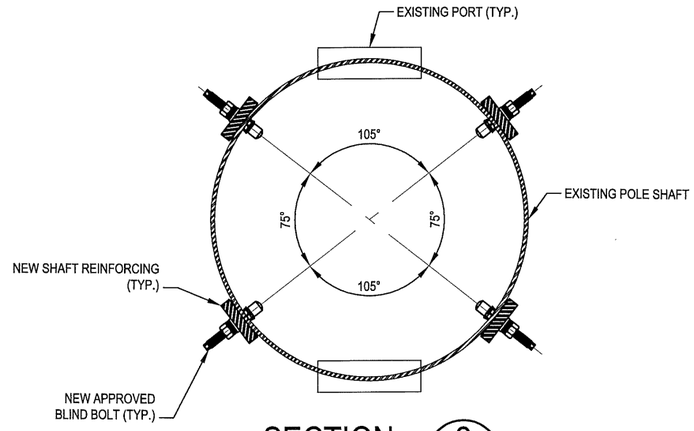
1.) ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0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

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

3.) WELDS SHALL BE E80XX OR GREATER. TERMINATION WELDS SHALL BE 3/8" FILLET WELDS.

4.) HOLES FOR BOLTS ARE 30mm UNLESS NOTED OTHERWISE.

5.) ALL SHIMS SHALL BE ASTM A-36.



SECTION 2 / S-3
EL. 10'-0"

SHAFT SECTION DATA

SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN) @ TOP	DIAMETER ACROSS FLATS (IN) @ BOTTOM	POLE GRADE (ksi)	POLE SHAPE
1	12.00	0.4650		10.750	10.750	A500-42	ROUND
2	12.00	0.4650		10.750	10.750	A500-42	ROUND
3	16.00	0.3750		24.000	24.000	A53-B-42	ROUND
4	20.00	0.3750		24.000	24.000	A53-B-42	ROUND
5	30.00	0.3750		24.000	24.000	A53-B-42	ROUND
6	30.00	0.3750		24.000	24.000	A53-B-42	ROUND
7	30.00	0.3750		30.000	30.000	A53-B-42	ROUND

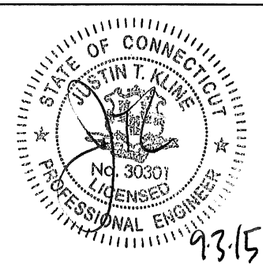
NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

ASTM A36 SHIMS FOR MONOPOLE REINFORCEMENT MEMBERS SHALL BE REQUIRED WHERE GAPS BETWEEN THE POLE SHAFT AND REINFORCING MEMBER EXIST AT FASTENER LOCATIONS. FOR INTERMEDIATE CONNECTIONS, THE MINIMUM SHIM LENGTH AND WIDTH SHALL BE THE WIDTH OF THE REINFORCING MEMBER. FOR TERMINATION CONNECTIONS, A CONTINUOUS SHIM PLATE (PREFERRED) OR EQUIVALENT INDIVIDUAL SHIM PLATES THE WIDTH OF THE REINFORCING MEMBER MAY BE USED. SHIM THICKNESSES SHALL BE NO LESS THAN 1/16". STACKING OF SHIMS IS PERMITTED.

MODIFICATIONS:

- (A) INSTALL NEW ANCHOR RODS AND BRACKETS AT BASE PLATE. SEE SHEET S-4.
- (B) INSTALL NEW TRANSITION STIFFENERS AT BASE PLATE. SEE SHEET S-4.
- (C) INSTALL NEW SHAFT REINFORCING. SEE CHART ON THIS SHEET.
- (D) INSTALL FILLER PLATES AT ELEVATION 30'-0".
- (E) REMOVE EXISTING CONCEALMENT BULKHEADS AND SHROUDS.
- (F) INSTALL NEW CONCEALMENT BULKHEADS AND SHROUDS.
- (G) PAINT MODIFICATIONS TO MATCH EXISTING POLE.
- (H) BRING POLE WITHIN DEFLECTION TOLERANCE PER TIA-222-G REGARDING PLUMBNESS. CONTRACTOR TO COORDINATE ADDRESSING THE PLUMBNESS WITH EOR.
- (I) CLEAN CORROSION AND APPLY TWO COATS OF COLD GALVANIZING COMPOUND TO EXISTING BASE PLATE STIFFENERS AND INTERIOR WALL OF POLE SHAFT ADJACENT TO EXISTING STIFFENER PLATES. SEE SHEET S-1 & S-4.

1. EXISTING CONCEALMENT TO BE REMOVED AND REPLACED WITH THE NEW CONCEALMENT.
2. NEW CONCEALMENT IS TO BE BOLTED TO TOP FLANGE OF EXISTING BASE POLE. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO FABRICATION AND INSTALLATION.
3. NEW CONCEALMENT BULKHEADS ARE TO BE BOLTED TO EXISTING CONCEALMENT SPINE. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO FABRICATION AND INSTALLATION.
4. CONTRACTOR SHALL SEND PAUL J. FORD & COMPANY THE FABRICATION DRAWINGS FOR APPROVAL PRIOR TO MANUFACTURING.
5. ALL EXISTING COAX SHALL BE REMOVED PRIOR TO INSTALLATION OF THE NEW NEW CONCEALMENT AND SHAFT REINFORCING. UPON COMPLETION COAX SHALL BE REINSTALLED. NEW COAX MAY BE REQUIRED. COORDINATE COAX INSTALLATION WITH PROJECT PM.



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CROWN CASTLE
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PH: (595) 370-4766

MODIFICATION OF AN EXISTING 150'-0" MONOPOLE

BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	KJS
DATE:	08-26-2015

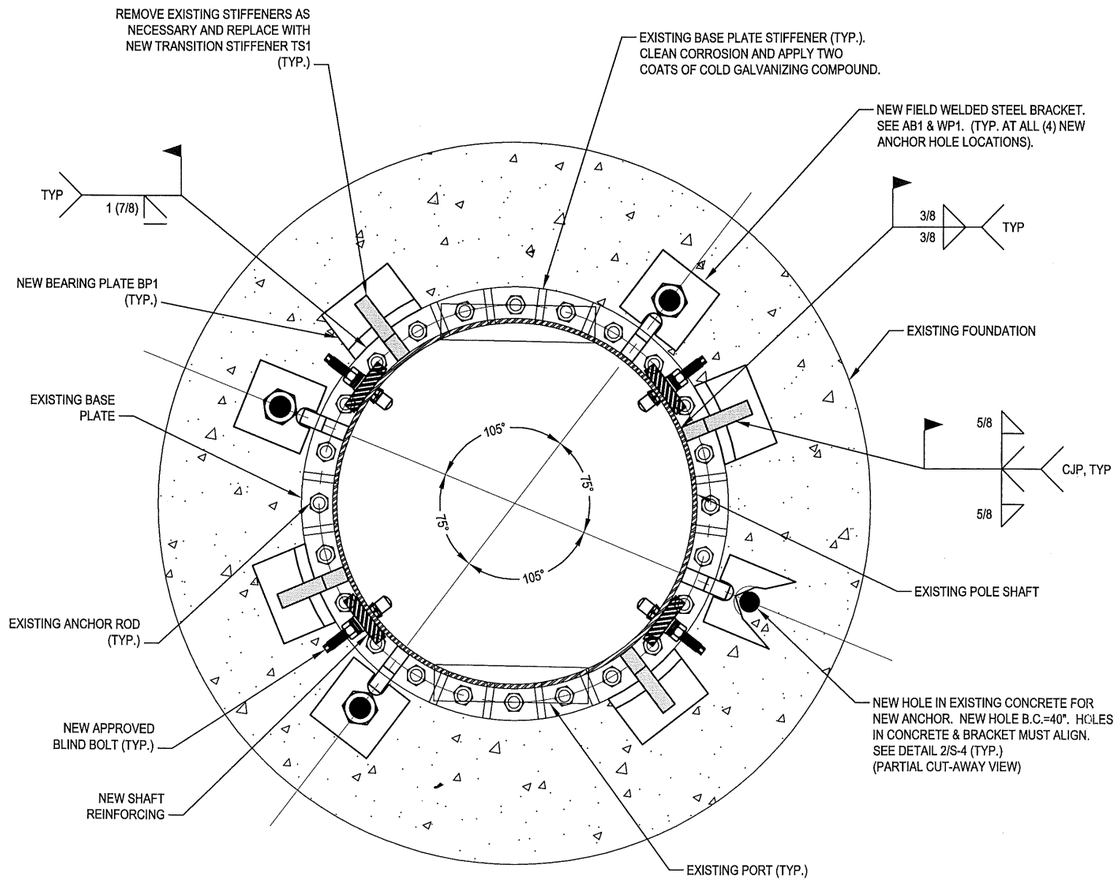
MONOPOLE PROFILE

S-3

37515-2530.001.DWG

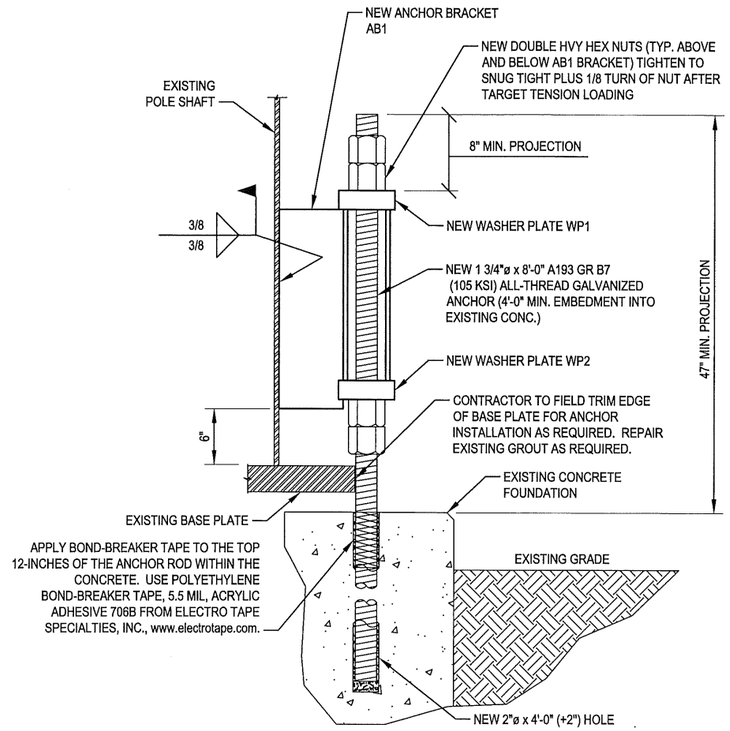
BASE SPECIFICATIONS	
BASE PLATE:	36" ROUND; 1 1/4" THK.; Fy=36 KSI
ANCHOR RODS:	(24) 1"ø; A687 GRADE 105; 33" B.C.

PROVIDE NON-SHRINK GROUT (NS GROUT BY EUCLID OR APPROVED. EQUAL; 7500 PSI MIN.) BELOW NEW BEARING PLATES. GROUT SHALL BE INSTALLED TIGHT UNDER NEW BEARING PLATES WITH NO VOIDS REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF NEW BEARING PLATES.



BASE PLATE 1 / S-4

NDE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. SEE CCI DOCUMENTS ENG-SOW-10033 'TOWER BASE PLATE NDE' AND ENG BUL-10051 'NDE REQUIREMENTS FOR MONOPOLE BASE PLATE TO PREVENT CONNECTION FAILURE.' NOTIFY THE EOR AND CROWN CASTLE ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING REINFORCEMENTS THAT HAVE BEEN WELDED TO THE BASE PLATE. ANY FULL PENETRATION WELDING TO THE BASE PLATE REQUIRED AS PART OF THIS ACTIVE REINFORCEMENT DESIGN SHALL BE INCLUDED IN THE NDE SCOPE OF WORK.



NEW ANCHOR & BRACKET DETAIL 2 / S-4

NEW ANCHOR ROD REINFORCING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ONCE ALL RESIN HAS CURED, ALL NEW ANCHOR ROD REINFORCING SHALL BE TESTED TO A TARGET TENSION LOAD OF 120 KIPS. ONCE THE TENSION LOAD HAS BEEN RELEASED, TIGHTEN HEAVY HEX NUT TO SNUG TIGHT PLUS 1/8 TURN OF NUT. REFER TO SHEET S-1, SECTION 6 FOR ADDITIONAL INFORMATION.

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PH: (585) 370-4766

MODIFICATION OF AN EXISTING 150'-0" MONOPOLE

BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	
DATE:	08-26-2015

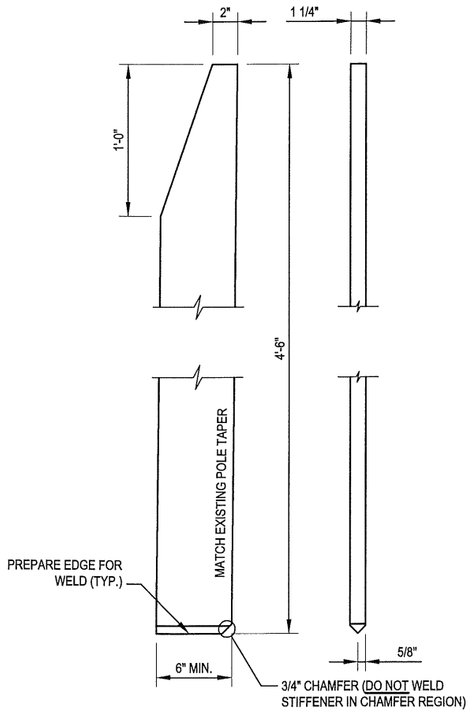
BASE PLATE DETAILS

S-4

STATE OF CONNECTICUT · JUSTIN T. KLINE · No. 30301 · LICENSED PROFESSIONAL ENGINEER

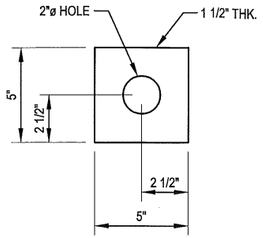
9315

37515-2530.001.DWG



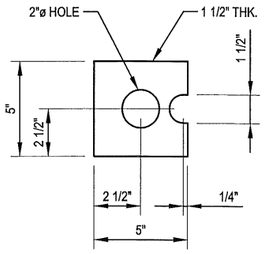
TRANSITION STIFFENER MK~TS1

(4 REQUIRED) (Fy = 65 KSI)



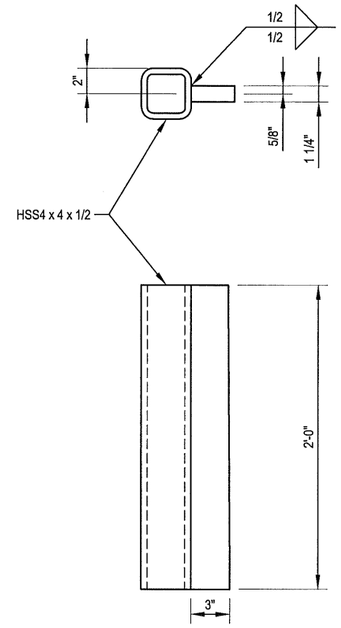
WASHER PLATE MK~WP1

(4 REQUIRED) (Fy = 50 KSI)



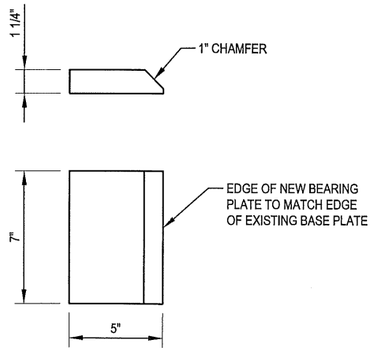
WASHER PLATE MK~WP2

(4 REQUIRED) (Fy = 50 KSI)



ANCHOR BRACKET MK~AB1

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



BEARING PLATE MK~P1

(4 REQUIRED) (Fy = 50 KSI)

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MODIFICATION OF AN EXISTING 150'-0" MONOPOLE

BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

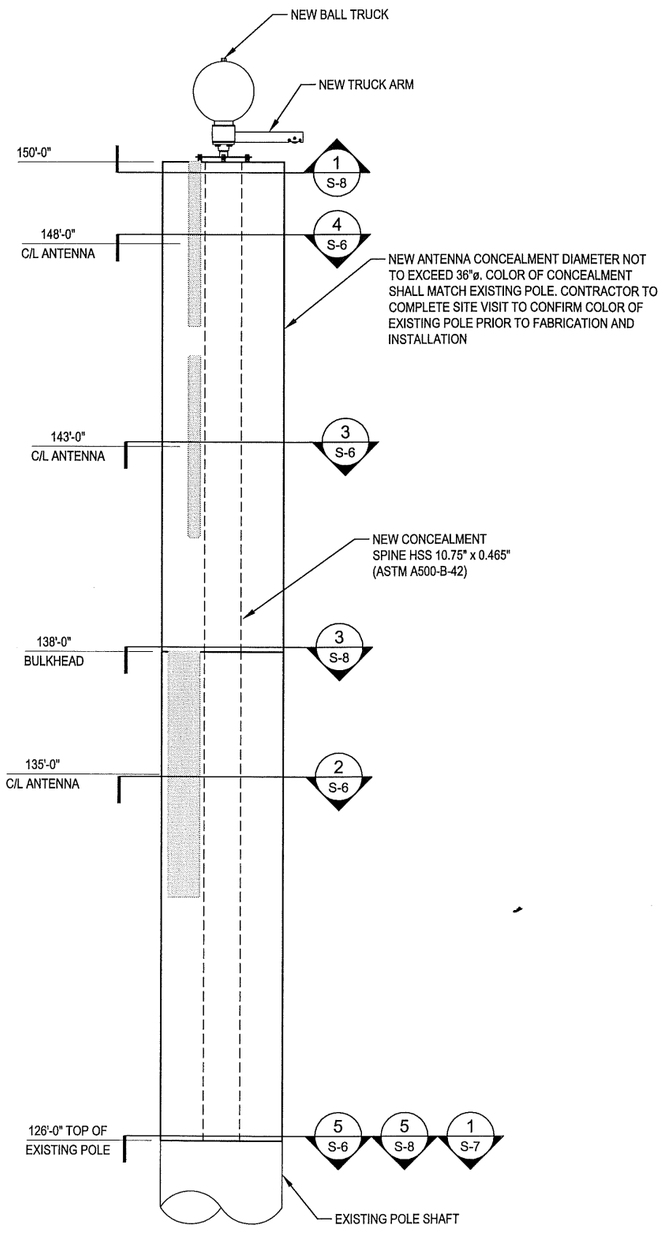
PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	KJS
DATE:	08-26-2015

DRILLED IN REBAR DETAILS

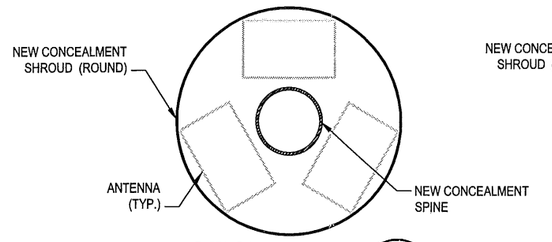
S-5

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER
9.7.15

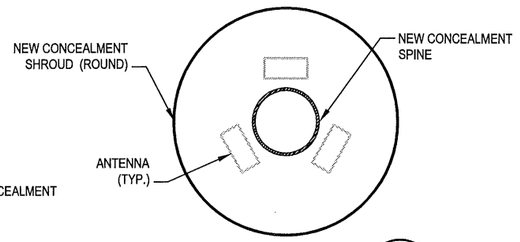
37515-2530.001.DWG



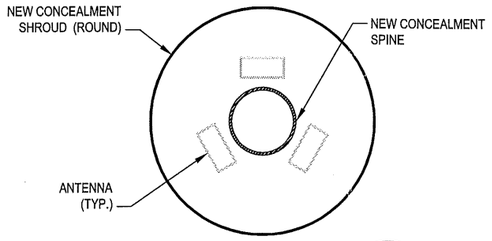
PARTIAL ELEVATION 1 / S-6



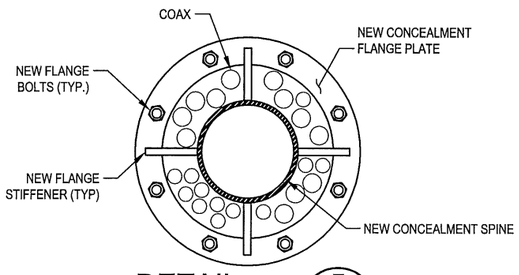
SECTION 2 / S-6
EL. 135'-0" (PROPOSED ANTENNA FIT)



SECTION 3 / S-6
EL. 143'-0" (PROPOSED ANTENNA FIT)



SECTION 4 / S-6
EL. 148'-0" (PROPOSED ANTENNA FIT)



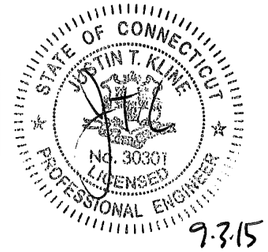
DETAIL 5 / S-6
EL 126'-0" (COAX LAYOUT)

Antenna Model	Antenna Centerline Elevation, ft	Height, in	Depth, in	Width, in
APX18-209014-CT2	148	48.03	3.15	6.8
APXV18-206516S-C	143	53.1	3.15	6.9
OPA-65R-LCUU-H6	135	72	9	14.8

NOTE: ALL ANTENNA DIMENSIONS HAVE BEEN PROVIDED BY CROWN CASTLE. A 1-1/2" SPACING BETWEEN THE SPINE AND ANTENNA HAS BEEN ASSUMED.

Coax Model	QUANTITY	Elevation, ft	Nominal Diameter, in	Actual Diameter, in
LDF7-50A	12	145	1 5/8	1.98
LDF6-50A	12	133	1 1/4	1.55

NOTE: COAX LAYOUT AND FIT IS THEORETICAL. ACTUAL LAYOUT AND FIT MAY VARY PENDING EXISTING CONDITIONS.



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PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
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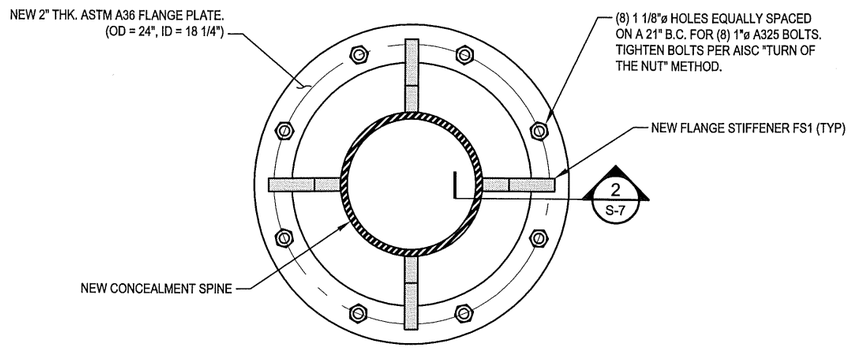
DESIGNED BY:	J.W.M.
CHECKED BY:	
DATE:	08-26-2015

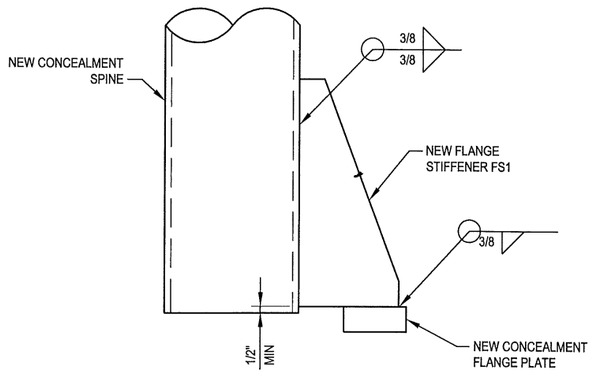
BRIDGE STIFFENER DETAILS

S-6

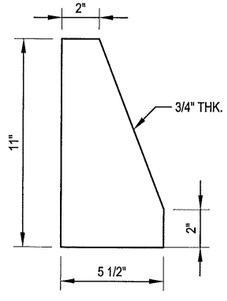
37515-2530.001.DWG



SECTION 1 / S-7
BOTTOM FLANGE PLATE



FLANGE CONNECTION 2 / S-7
1/4" RING PLATE NOT SHOWN FOR CLARITY



FLANGE STIFFENER MK~FS1
(4 REQUIRED) (Fy = 36 KSI)

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BRIDGE STIFFENER DETAILS

S-7

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
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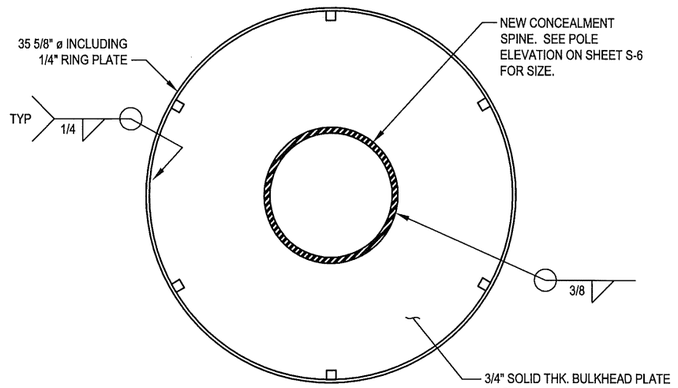
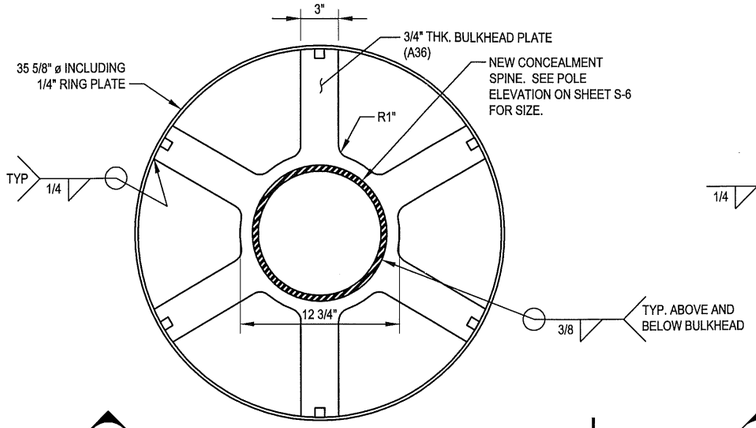
9.3.15

37515-2530.001.DWG



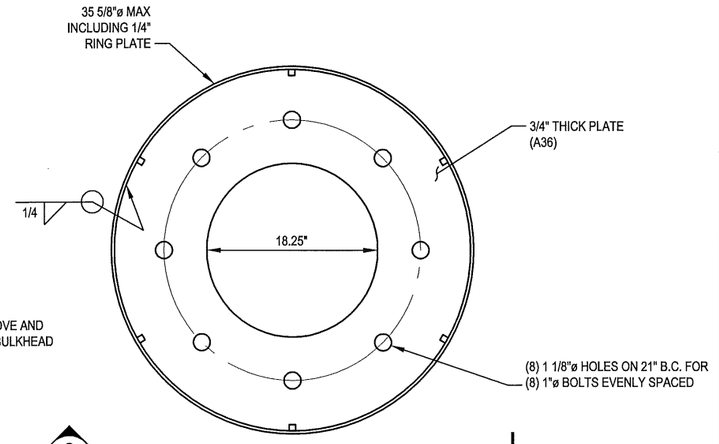
2 S-8

SECTION 1 S-8
TOP BULKHEAD



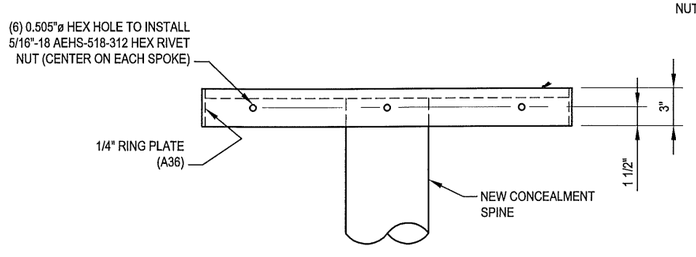
4 S-8

SECTION 3 S-8
138'-0" INTERMEDIATE BULKHEAD

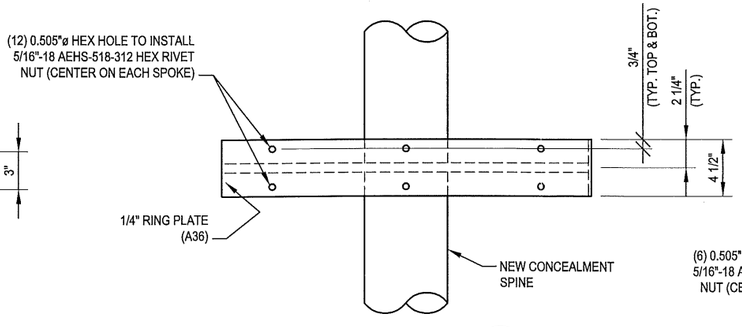


2 S-8

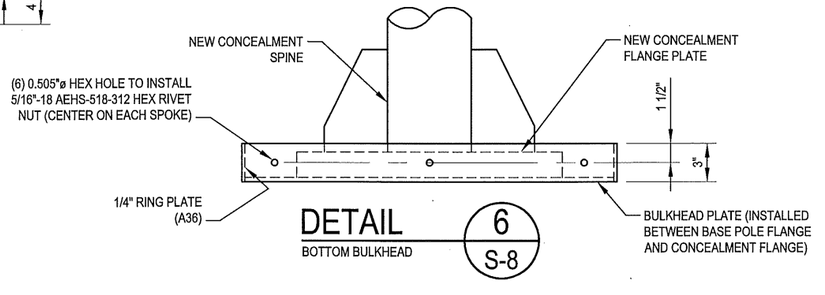
SECTION 5 S-8
126'-0" BOTTOM BULKHEAD



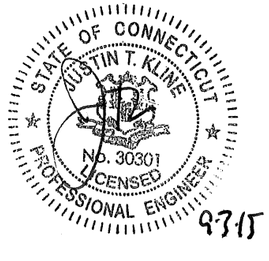
SECTION 2 S-8



SECTION 4 S-8



DETAIL 6 S-8
BOTTOM BULKHEAD



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

CROWN CASTLE
3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065
PH: (585) 370-4766

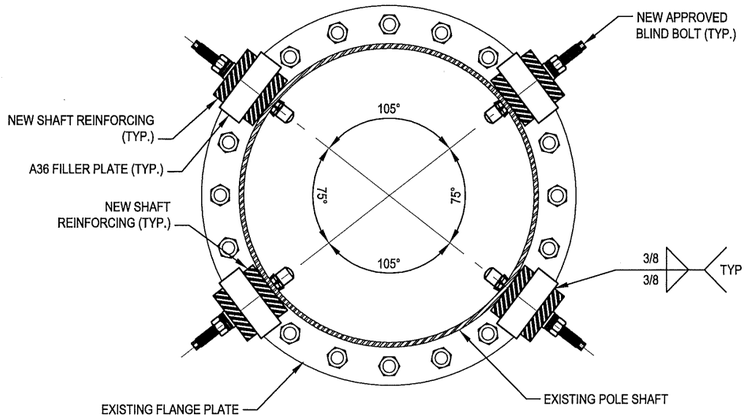
MODIFICATION OF AN EXISTING 150'-0" MONOPOLE
BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	KJS
DATE:	08-26-2015

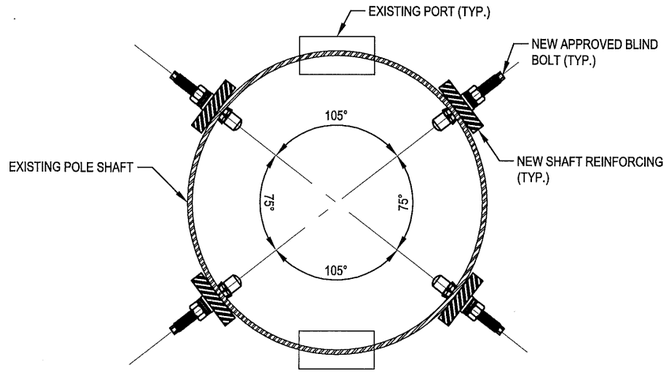
BULKHEAD DETAILS

S-8

37515-2530.001.DWG



SECTION 1 / S-9
EL. 30'-0"



SECTION 2 / S-9
EL. 60'-0"

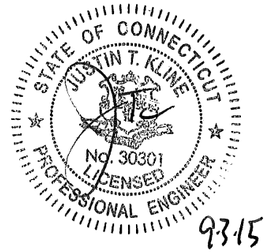
REMOVE EXISTING BRIDGE STIFFENERS AS NECESSARY.

		TOP FILLER PLATE SIZE (in)			BOTTOM FILLER PLATE SIZE (in)					UNBRACED LENGTH (in)	
FLANGE EL (ft)	QTY	WIDTH	THK	LENGTH	WIDTH	THK	LENGTH	FILLER WEIGHT (lbs)	WELD LENGTH (in)	MAXIMUM BOLT SPACING AT FLANGE (LMAX)	JUMP WEIGHT (lbs)
30.00	4	5.50"	2.00"	33.00"				412	264.0"	3.00"	322

Total Jump Wt.	322	lbs
Total Steel Weight	734	lbs
Total Weld Length	264	in

NOTES:

1 ALL NEW FLANGE JUMP STEEL REINFORCING SHALL BE COLD GALVANIZED AS FOLLOWS:
APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
2 ALL FILLER BARS SHALL BE ASTM A36 GR. 36
3 ALL FLANGE JUMP BARS SHALL BE ASTM A572 (GRADE 65 OR AS SPECIFIED ON THE DESIGN DRAWINGS) (MIN. Fy = 65 ksi, MIN. Fu = 80ksi).
4 HOLES FOR THE BOLTS ARE 30mm UNLESS NOTED OTHERWISE.
5 IF THE TOP OR BOTTOM BOLTS ARE NOT LISTED, THE QUANTITIES ARE INCLUDED IN THE SHAFT REINFORCING CHART.



9.15

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BRIDGE STIFFENER DETAILS

S-9

37515-2530.001.DWG

MODIFICATION INSPECTION NOTES:

1. **GENERAL**
   - 1.1. 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 EOR.
   - 1.2. THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.
   - 1.3. ALL MI'S SHALL BE CONDUCTED BY A CROWN CASTLE ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN CASTLE.
   - 1.4. TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN CASTLE POINT OF CONTACT (POC).
   - 1.5. REFER TO ENG-SOW-10007: MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

2. **MI INSPECTOR**
   - 2.1. THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:
     - 2.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
     - 2.1.2. WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
     - 2.1.3. THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL 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 CASTLE.

3. **GENERAL CONTRACTOR**
   - 3.1. THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:
     - 3.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
     - 3.1.2. WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
     - 3.1.3. BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS.
     - 3.1.4. THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.

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

5. **CANCELLATION OR DELAYS IN SCHEDULED MI**
   - 5.1. IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN CASTLE 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 CASTLE 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.

6. **CORRECTION OF FAILING MI'S**
   - 6.1. IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN CASTLE TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:
     - 6.1.1. CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
     - 6.1.2. OR, WITH CROWN CASTLE'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

7. **MI VERIFICATION INSPECTIONS**
   - 7.1. CROWN CASTLE 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.
   - 7.2. ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.
   - 7.3. VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

8. **PHOTOGRAPHS**
   - 8.1. BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:
     - 8.1.1. PRECONSTRUCTION GENERAL SITE CONDITION
     - 8.1.2. PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
     - 8.1.3. RAW MATERIALS
     - 8.1.4. PHOTOS OF ALL CRITICAL DETAILS
     - 8.1.5. FOUNDATION MODIFICATIONS
     - 8.1.6. WELD PREPARATION
     - 8.1.7. BOLT INSTALLATION AND TORQUE
     - 8.1.8. FINAL INSTALLED CONDITION
     - 8.1.9. SURFACE COATING REPAIR
     - 8.1.10. POST CONSTRUCTION PHOTOGRAPHS
     - 8.1.11. FINAL INFIELD CONDITION
     - 8.1.12. PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.
     - 8.1.13. THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

9. **INSPECTION AND TESTING**
   - 9.1. ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY CROWN CASTLE'S REPRESENTATIVE AND CROWN CASTLE'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY.
   - 9.2. INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS ARE STILL REQUIRED WHEN THE EOR PERFORMS SUPPORT SERVICES DURING CONSTRUCTION.
   - 9.3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
   - 9.4. AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY CROWN CASTLE FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
     - 9.4.1. ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
     - 9.4.2. THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
   - 9.5. THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES AND INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.
   - 9.6. GENERAL
     - 9.6.1. PERFORM PERIODIC ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY CROWN CASTLE AND THE EOR IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
   - 9.7. FOUNDATIONS AND SOIL PREPARATION - (NOT REQUIRED)
   - 9.8. CONCRETE TESTING PER ACI - (NOT REQUIRED)
   - 9.9. STRUCTURAL STEEL
     - 9.9.1. CHECK STEEL ON THE JOB WITH THE PLANS.
     - 9.9.2. CHECK MILL CERTIFICATIONS. CALL FOR LABORATORY TEST REPORTS WHEN MILL CERTIFICATION IS IN QUESTION.
     - 9.9.3. CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
     - 9.9.4. INSPECT ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
     - 9.9.5. INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
     - 9.9.6. CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
     - 9.9.7. CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
     - 9.9.8. CHECK THAT BOLTS HAVE BEEN TIGHTENED PROPERLY.
     - 9.9.9. PRIOR TO ANY FIELD CUTTING THE CONTRACTOR SHALL MARK THE CUTOUT LINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
   - 9.10. WELDING:
     - 9.10.1. VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
     - 9.10.2. INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND WITH AWS D1.1.
     - 9.10.3. APPROVE FIELD WELDING SEQUENCE.
     - 9.10.4. A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO CROWN CASTLE BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM CROWN CASTLE.
     - 9.10.5. INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
       - 9.10.5.1. INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE, AND WORKING CONDITIONS.
       - 9.10.5.2. VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
       - 9.10.5.3. INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
       - 9.10.5.4. VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT.
       - 9.10.5.5. SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE.
       - 9.10.5.6. INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED DRAWINGS.
       - 9.10.5.7. VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
       - 9.10.5.8. REVIEW THE REPORTS BY TESTING LABS.
       - 9.10.5.9. CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
       - 9.10.5.10. INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
       - 9.10.5.11. CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
       - 9.10.5.12. FULL PENETRATION WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D1.1.
       - 9.10.5.13. PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MP IN ACCORDANCE WITH AWS D1.1.
   - 9.11. REPORTS:
     - 9.11.1. COMPILE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO CROWN CASTLE.
     - 9.11.2. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES OR PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO CROWN CASTLE'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT CROWN CASTLE'S REVIEW AND SPECIFIC WRITTEN CONSENT. CROWN CASTLE RESERVES THE RIGHT TO DETERMINE WHETHER OR NOT A RESOLUTION IS ACCEPTABLE.
     - 9.11.3. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO CROWN CASTLE. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
     - 9.11.4. THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWINGS
X	EOR REVIEW
X	FABRICATION INSPECTION
X	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
X	FABRICATOR NDE 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
X	POST INSTALLED ANCHOR ROD VERIFICATION
X	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: PROVIDE PHOTO DOCUMENTATION OF EXCAVATION QUALITY AND COMPACTION
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
NA	MICROPILE/ROCK ANCHOR INSTALLER'S DRILLING AND INSTALLATION LOGS AND QA/QC DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	POST INSTALLED ANCHOR ROD TARGET TENSION LOAD TESTING
NA	REFER TO MICROPILE/ROCK ANCHOR NOTES FOR SPECIAL INSPECTION AND TESTING REQUIREMENTS.
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

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

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CHECKED BY:	KJS
DATE:	08-26-2015

MI CHECKLIST

S-10

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER
9.3.15

37515-2530.001.DWG

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

December 18, 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 82 Mechanic Street, Stonington

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.

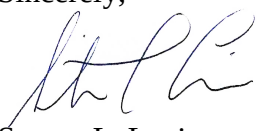
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The structure and its foundation can support the proposed antennas and equipment with certain modifications.

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: Town CEO – Honorable Robert R. Simmons, 1st Selectman, Town of Stonington
Land Owner of Record – Whittaker Technical Products Inc.
Tower Owner / Operator – Crown Castle

Attachments

NEW CINGULAR WIRELESS PCS, LLC
Equipment Modification

82 Mechanic Street, Stonington
Geographic Coordinates: N 41-22-18.89 W 71-49-57.98
Site Number 5748
Prior Decisions: Exempt Mods 11/02, 7/07, and 11/15 (denied)

Tower Owner/Manager: Crown Castle

Land Owner of Record: Whittaker Technical Products Inc.

Equipment configuration: Stealth Flagpole

Current and/or Approved:
One Powerwave 7770 panel antenna @ 135 ft agl c.l.
One Powerwave 7770 panel antenna @ 129 ft agl c.l.
Two TMA's and two diplexers @ 135 ft
Two TMA's and two diplexers @ 129 ft
Four lines 1 ¼ inch coax
Radio equipment on concrete pads

Planned Modifications:
Remove all existing antennas, TMA's, diplexers, etc.
Install recommended structural modifications.
Install one CCI OPA-65R-LCUU-H6 antenna @ 135 ft c.l.
Install two CCI OPA-65R-LCUU-H6 antennas @ 129 ft c.l.
Install six CCI BPDB7823VG12ATMA's @ 129 ft.
Install 8 additional lines 1 ¼ inch coax (total of twelve).
Replace existing 22-7/8 inch radome with 36 inch enclosure from 126 to 150 ft agl.
Install two unistrut frames at grade for RRU's & A-2 modules.

Original Permitting:
AT&T submits that the proposed modifications, including the plan to widen the top 25 feet of the structure, do not violate original permitting conditions. The 82 Mechanic Street facility was initially approved by local Planning & Zoning authorities on June 22, 2000 as a stealth flag pole within a 40 ft x 40 ft fenced enclosure, with the condition that the structure be "similar to the flag pole at Valenti's Auto Mall without the cross arm" (see the attached approval letter). Due to Siting Council concern that AT&T's proposal to widen the top of the tower might violate this condition, Town Planner Keith Brynes was asked for an opinion. By email dated 12/15/15 (attached) Mr. Brynes stated, "The Town has no issues with the proposal to widen the top of the flagpole at 82 Mechanic Street to 36"."

Lease Area:

The Council approved colocation by AT&T with a 7 ft x 16 ft lease area and outdoor cabinets in EM-AT&T-137-021030. (See attached site plan excerpt from the 2002 notice of exempt modification.) Pursuant to this Notice, AT&T proposes a 39 square foot increase of its respective lease area that will lie wholly within the existing fenced enclosure to accommodate proposed remote radio heads on two new Unistrut frames. Comparison of the 2002 site plan with the attached construction drawings demonstrates that the proposed equipment modifications will not increase the overall limits of the facility or the fenced enclosure.

Power Density:

Worst-case calculations with 10 dB reduction for existing wireless operations at the site indicate a radio frequency electromagnetic radiation power density, measured at six feet above ground level beside the tower, of approximately 0.84 % 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 0.91 % of the standard.

Existing

Carrier & Technology	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 *							0.42
AT&T UMTS	127	880 - 894	1	500	0.0123	0.5867	0.21
AT&T GSM	127	1900 Band	2	427	0.0210	1.0000	0.21
Total							**0.84%**

* Per CSC Records

Proposed – (Worst-Case Sector)

Carrier & Technology	Frequency (MHz)	Antenna (Total for all sectors)	Centerline Ht (feet)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users *								0.42
AT&T LTE	700 Band	CCI 3 ants.	129	1	500	0.0119	0.4667	0.25
AT&T UMTS	1900 Band	CCI 2 ants.	129	2	500	0.0238	1.0000	0.24
Total								**0.91%**

* Per CSC Records

Structural information: The attached structural analysis demonstrates that the tower will have adequate structural capacity to accommodate the proposed equipment modifications upon completion of the recommended structural modifications. (Paul J. Ford & Company, 8/26/15)

The Planning and Zoning Commission
152 Elm Street, P.O. Box 352
Stonington, Connecticut 06378
(860) 535-5095

June 22, 2000

Omnipoint Communications, Inc.
100 Filley St.
Bloomfield, CT 06002

Dear Sir:

The Planning and Zoning Commission at their meeting of June 20, 2000 voted to APPROVE your application - **#PZ0028SPA OMNIPOINT COMMUNICATIONS, INC.** - Application for Site Plan Approval to construct a 150' flag pole telecommunications tower. Property located at 82 Mechanics St., Pawcatuck. Assessor's Map 4 Block 7 Lot 15 Zone M-1. Your application was approved with the following stipulations:

1) The flag pole shall be similar to the flag pole at Valenti's Auto Mall without the cross arm.
2) The flag be raised and lowered at the appropriate time each day so no lighting will be required (no lighting is permitted).
3) The flag should be of the appropriate size for the flag pole.

Please bring to the Planning and Zoning Office for the Chairman's signature one (1) set of bluelines. If you require a signed copy of the site plan for your files, please provide the Planning office with the additional copy.

If you have any questions, please feel free to contact the Planning Office.

Sincerely,

Edward C. Donnelly

Edward Donnelly, AICP
Planning Director

Email from Stonington Town Planner Keith Brynes

Approval of Plan to Widen Top of Flagpole

From: Keith Brynes <kbrynes@stonington-ct.gov>
Date: Tuesday, December 15, 2015 1:19 PM
To: Brian Allen <brian@kjkwireless.com>
Subject: 82 Mechanic Street Pawcatuck

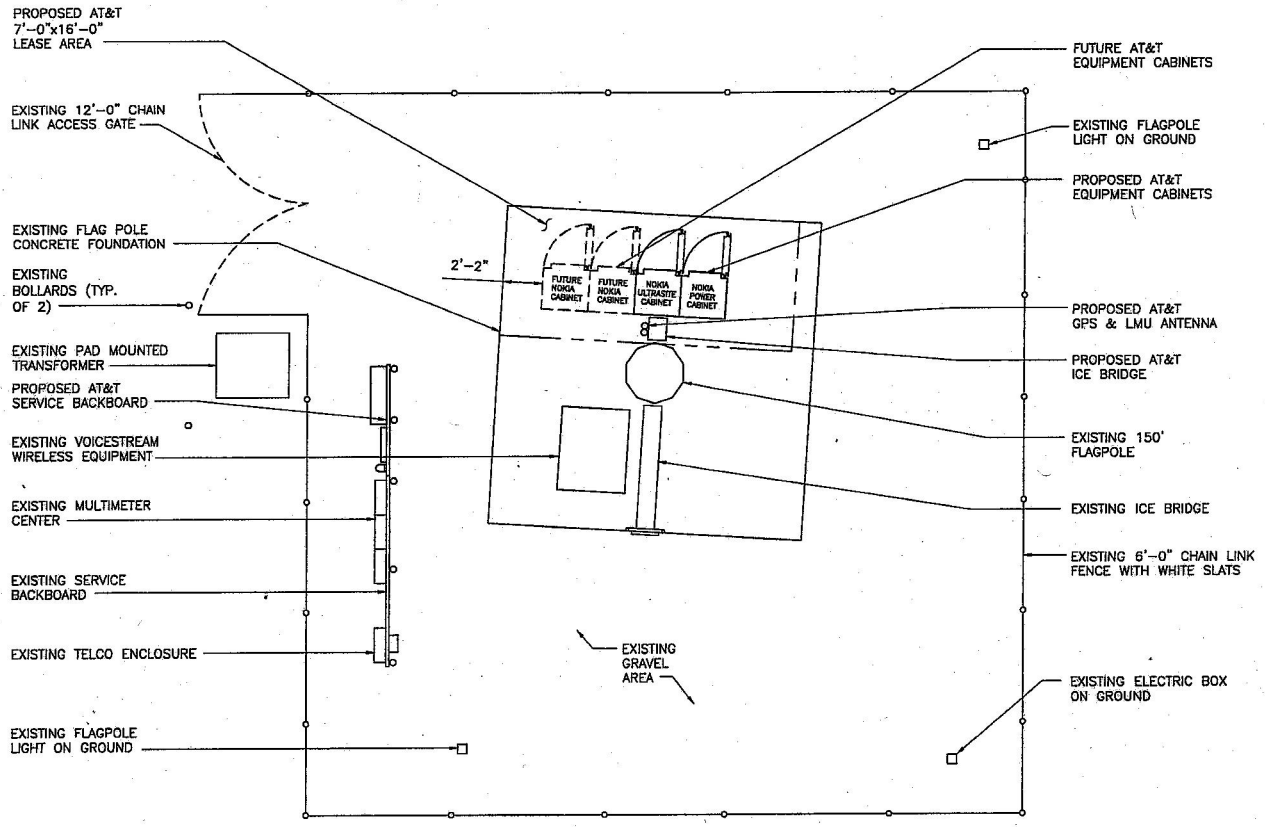
Brian,

Per our conversation, the Town has no issues with the proposal to widen the top of the flagpole at 82 Mechanic Street to 36". If the Siting Council were to approve the proposal a Zoning Permit could be submitted to our office followed by a Building Permit from the Building Office. Their 11/4/15 letter is enclosed is which they deemed New Cingular Wireless' proposal incomplete due to the Town's 2000 approval. It may be that the Siting Council wants our Planning and Zoning Commission itself to OK the change. Our Zoning Permit application form is also enclosed.

Keith A. Brynes, AICP

Town Planner
152 Elm Street
Stonington, CT 06378
860-535-5095
kbrynes@stonington-ct.gov

Site Plan Excerpt from AT&T's 2002 Exempt Mod Notice



1 / SC-1 COMPOUND PLAN
SCALE: 1" = 10'-0"

0 5 10 20

ISSUED FOR SITING COUNCIL

LATITUDE:	41.3772 (NAD 83)
LONGITUDE:	71.8377 (NAD 83)

URS
URS CORPORATION-AES
795 BROOK STREET, BLDG 5
ROCKY HILL, CT. 06067
1-(860)-529-8882
1-(860)-529-5566 (FAX)

AT&T
AT&T WIRELESS PCS LLC
12 OMEGA DRIVE
STAMFORD, CONNECTICUT 06902

DRAWING TITLE: COMPOUND PLAN

PROJECT INFORMATION: PAWCATUCK
CT-748
82 MECHANIC STREET
PAWCATUCK, CT

PROPERTY OWNER: WHITTAKER TECHNICAL PRODUCTS INC.
82 MECHANIC STREET
PAWCATUCK, CT

DRAWING TITLE: 907-009-748A-SC1

REVISION NO. 1	DRAWN BY: VJB
DATE ISSUED: 10/21/02	CHECKED BY: JCF
SCALE: AS NOTED	APPROVED BY:
	SHEET NO. 1 OF 2
URS JOB NO.: F302224.44	

PROJECT INFORMATION

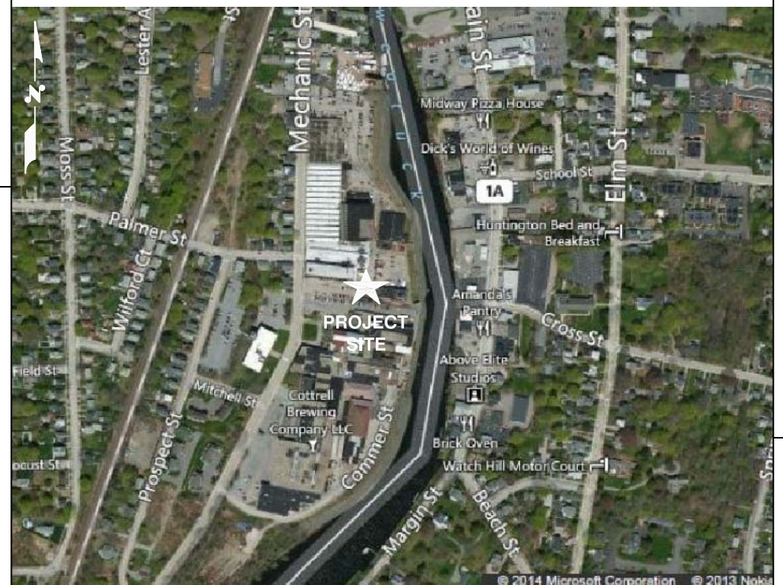
SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS
SITE ADDRESS:	82 MECHANIC STREET STONINGTON, CT 06379
LATITUDE:	41.37191 N 41° 22' 18.9" N
LONGITUDE:	71.83277 W 71° 49' 58.0" W
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
NOC#	866-915-5600

SITE NUMBER: CT5748
SITE NAME: STONINGTON EAST

DRAWING INDEX

VICINITY MAP

DIRECTIONS TO SITE:
START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. TURN LEFT ON CAPITOL BLVD. TURN LEFT ON WEST ST. TURN LEFT ON NEW HAVEN/I-91 S. MERGE ONTO I-9S TOWARD MIDDLETOWN / OLD SAYBROOK. MERGE ONTO I-95 N TOWARD NEW LONDON / PROVIDENCE. TAKE EXIT 91 AND MERGE ONTO CT-234 TOWARD NO. MAIN STREET / STONINGTON BOROUGH. TURN LEFT AT W BROAD ST. TURN SHARP RIGHT ONTO MEHCANIC STREET.



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.

3 WORKING DAYS

BEFORE YOU DIG

CALL TOLL FREE 800-922-4455 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: CT5748
SITE NAME: STONINGTON EAST
CROWN CASTLE ID: 828257
CROWN CASTLE NAME: STONINGTON

82 MECHANIC STREET
STONINGTON, CT 06379
NEW LONDON COUNTY

at&t
500 ENTERPRISE DRIVE
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	09/16/15	ISSUED FOR CONSTRUCTION	SG	AT	DPH
0	03/18/14	ISSUED FOR REVIEW	MJS	AT	DPH

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

STATE OF CONNECTICUT · REGISTERED · LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET (LTE)

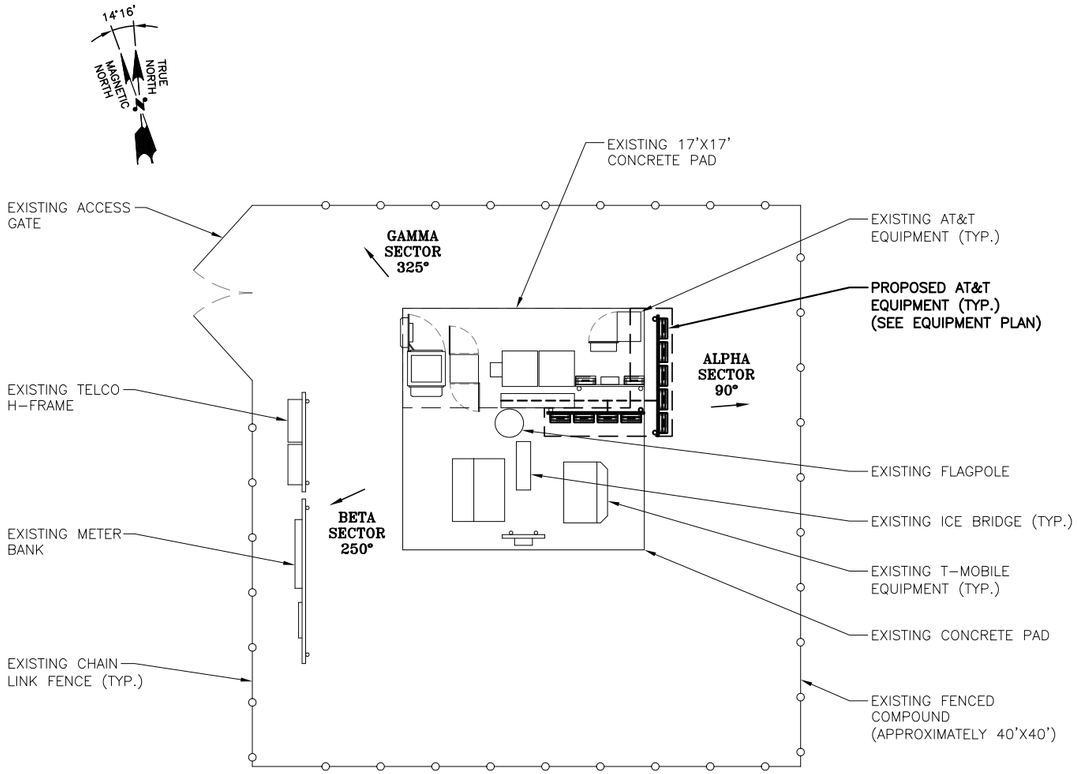
JOB NUMBER	DRAWING NUMBER	REV
5748.01	T-1	1

NOTE:

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

NOTE:

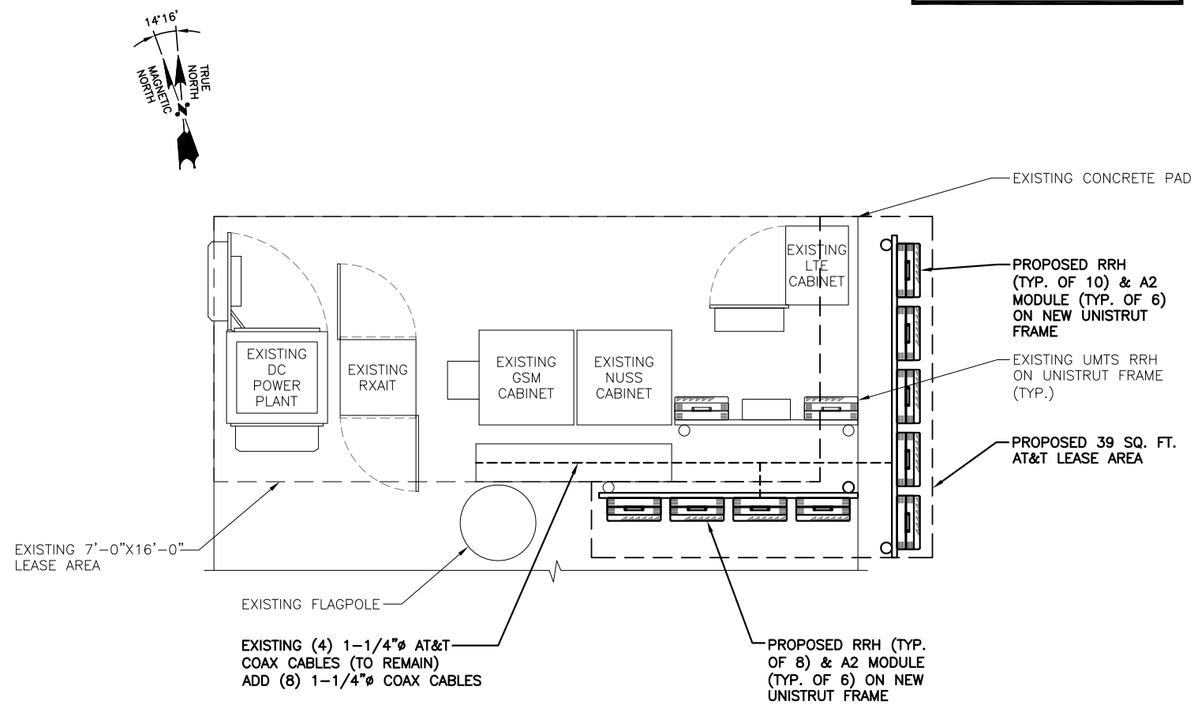
ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.



COMPOUND PLAN

SCALE: 3/16"= 1'-0"

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



EQUIPMENT PLAN

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

0 1'-0" 2'-0" 4'-0" 6'-0"

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: CT5748
SITE NAME: STONINGTON EAST
CROWN CASTLE ID: 828257
CROWN CASTLE NAME: STONINGTON

82 MECHANIC STREET
STONINGTON, CT 06379
NEW LONDON COUNTY

at&t
500 ENTERPRISE DRIVE
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
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0	03/18/14	ISSUED FOR REVIEW	MJS	AT	DPH

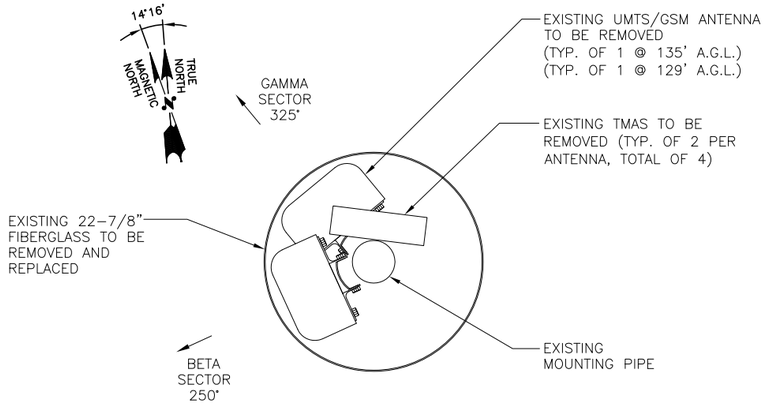
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: MJS

STATE OF CONNECTICUT
DEREK J. CREASER
No. 25057
LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND & EQUIPMENT PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
5748.01	A-1	1



EXISTING ANTENNA LAYOUT

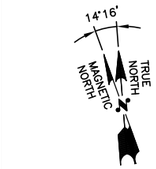
SCALE: N.T.S.

NOTE:

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

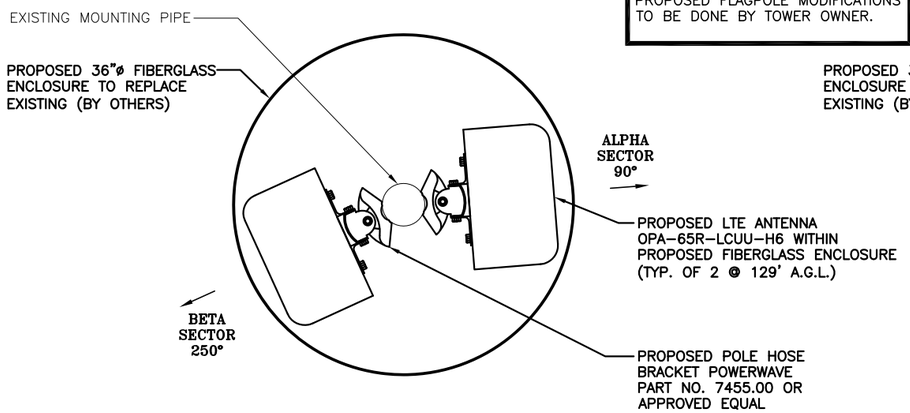
NOTE:

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



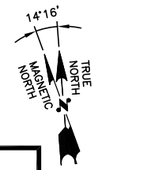
NOTE:

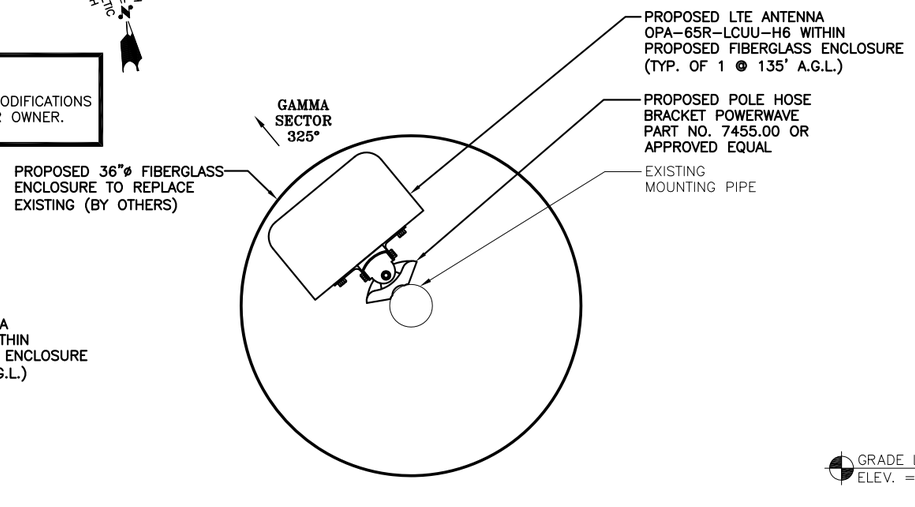
PROPOSED FLAGPOLE MODIFICATIONS TO BE DONE BY TOWER OWNER.



PROPOSED ANTENNA LAYOUT
129' ELEVATION

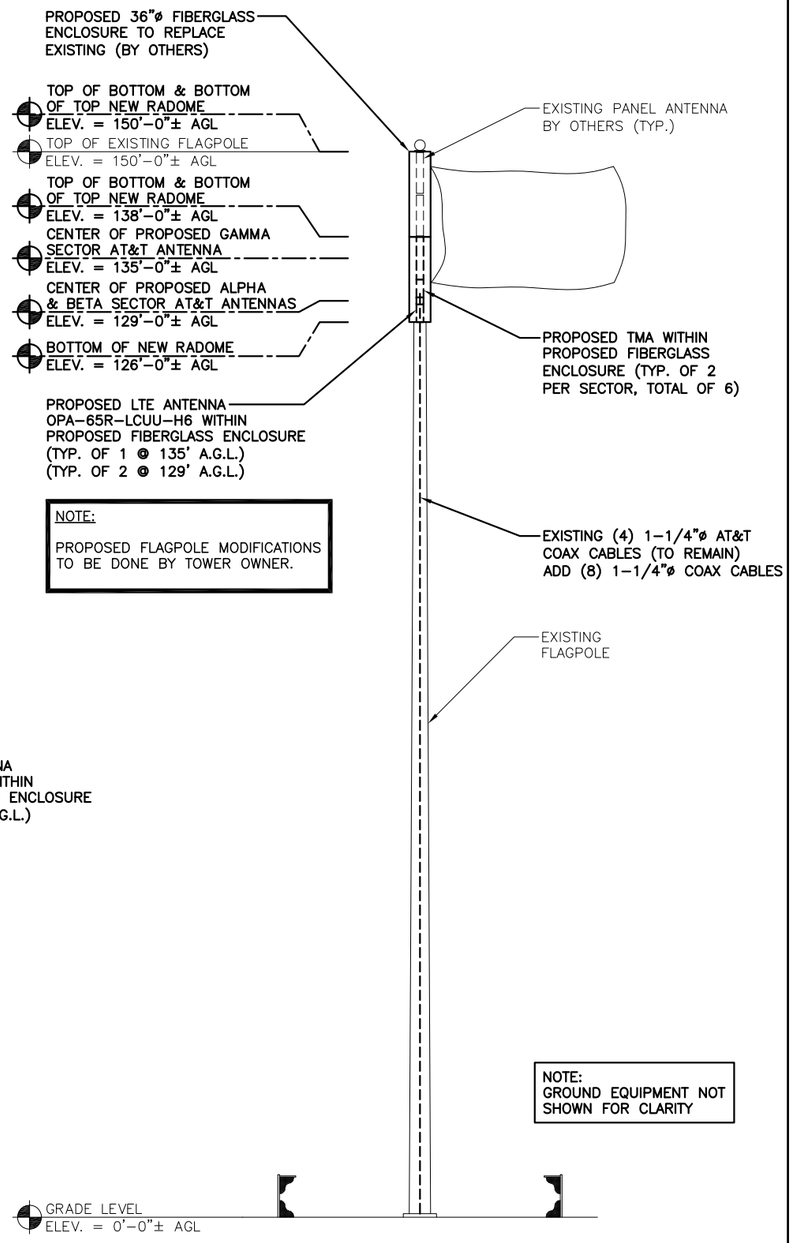
SCALE: N.T.S.





PROPOSED ANTENNA LAYOUT
135' ELEVATION

SCALE: N.T.S.



NOTE:

PROPOSED FLAGPOLE MODIFICATIONS TO BE DONE BY TOWER OWNER.

NOTE:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY

EAST ELEVATION

SCALE: 3/32"=1'-0"

0 5'-4" 10'-8" 21'-4" 32'-0"

Hudson Design Group LLC
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0	03/18/14	ISSUED FOR REVIEW	MJS	AT	DPH

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

STATE OF CONNECTICUT · DEREK J. CREASER · No. 28351 · LICENSED PROFESSIONAL ENGINEER

AT&T

ANTENNA LAYOUT AND ELEVATION (LTE)

JOB NUMBER	DRAWING NUMBER	REV
5748.01	A-2	1

PJF PAUL J. FORD & COMPANY

Date: **August 26, 2015**

Andrew Bazinet
Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
585.370.4766

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

Subject: **Structural Modification Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5748
	Carrier Site Name:	AWE - STONNINGTON EAST
Crown Castle Designation:	**Crown Castle BU Number:**	828257
	Crown Castle Site Name:	STONINGTON
	Crown Castle JDE Job Number:	334188
	Crown Castle Work Order Number:	1107669
	Crown Castle Application Number:	262048 Rev. 2
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37515-2530.001.7700
Site Data:	**82 Mechanic Street, Pawcatuck, New London County, CT**	
	Latitude *41° 22' 18.91"*, Longitude *-71° 49' 58.01"*	
	150 Foot - Monopole Tower	

Dear Andrew Bazinet,

Paul J. Ford and Company is pleased to submit this **"Structural Modification Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 817241, in accordance with application 262048, revision 2.

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

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

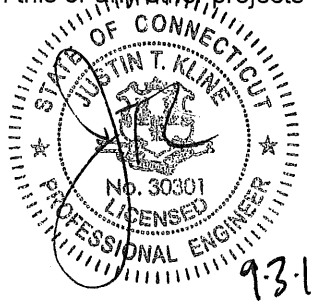
The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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

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

Respectfully submitted by:

Joey Meinerding, E.I. KJS
Structural Designer



9-3-15

tnxTower Report - version 6.1.4.1

1) INTRODUCTION

This tower is a 150 ft. monopole tower designed by Pirod in October of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of 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 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
133.0	135.0	3	cci antennas	OPA-65R-LCUU-H6	8	1-1/4	--
	129.0	6	cci antennas	TMABPDB7823VG12A			

Table 2 - Existing 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
145.0	148.0	6	ericsson	KRY 112 89/5	12	1-5/8	1
		3	rfs celwave	APX18-209014-CT2			
	143.0	3	rfs celwave	APXV18-206516S-C			
		6	rfs celwave	ATMAA1412D-1A20			
133.0	135.0	1	ericsson	KRY 112 144/1	1	5/16	2
		1	powerwave technologies	7770.00			
		2	powerwave technologies	LGP21401			
	131.0	1	ericsson	KRY 112 144/1			
		1	powerwave technologies	7770.00			
		2	powerwave technologies	LGP21401			
		--	--	--	4	1-1/4	1

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

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, 09/14/2000	3487586	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Pirod, A-117709, 10/12/2000	3946752	CCISITES
4-TOWER MANUFACTURER DRAWINGS	TEP, 61185_32839, 06/29/2015	3487587	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD, 2010296.48, 11/24/2010	3946736	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) For existing modifications: monopole was modified in conformance with the referenced modification drawings.
5) For proposed modifications: monopole will be modified in conformance with the attached proposed modification drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 138	Pole	HSS10.75x0.465	1	-1.34	504.71	10.7	Pass
L2	138 - 126	Pole	HSS10.75x0.465	2	-2.86	504.71	32.9	Pass
L3	126 - 110	Pole	P24x0.375	3	-5.32	934.94	18.0	Pass
L4	110 - 90	Pole	P24x0.375	4	-7.53	934.94	34.9	Pass
L5	90 - 60	Pole	P24x0.375	5	-10.93	934.94	67.9	Pass
L6	60 - 30	Pole	RPS 24" x 0.63107"	6	-16.29	1556.32	67.3	Pass
L7	30 - 2	Pole	RPS 30" x 0.57017"	7	-21.93	1601.75	73.8	Pass
L8	2 - 0	Pole	RPS 30" x 0.6927"	8	-22.41	1937.34	62.9	Pass
							Summary	
						Pole (L7)	73.8	Pass
						Rating =	73.8	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	74.1	Pass
1	Base Plate	0	80.8	Pass
1	Base Foundation Structural Steel	0	24.7	Pass
1	Base Foundation Soil Interaction	0	89.5	Pass
1	Flange Connection	30	85.8	Pass
1	Flange Connection	60	63.7	Pass
1	Flange Connection	90	73.1	Pass
1	Flange Connection	110	37.6	Pass
1	Flange Connection	126	70.6	Pass

Structure Rating (max from all components) =	**89.5%**

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

4.1) Recommendations

Install the proposed modifications per the attached drawings.

MODIFICATION OF AN EXISTING 150'-0" MONOPOLE

BU #828257; STONINGTON

82 MECHANIC STREET
PAWCATUCK, CONNETICUT 06379
NEW LONDON COUNTY
LAT: 41° 22' 18.91"; LONG: -71° 49' 58.01"
APP: 262048 REV. 2; WO: 1107669

PROJECT CONTACTS

STRUCTURE OWNER:
CROWN CASTLE
MOD PM: DAN VADNEY AT DAN.VADNEY@CROWNCASTLE.COM
PH: (578) 373-3510
MOD CM: JASON D'AMICO AT JASON.D'AMICO@CROWNCASTLE.COM
PH: (860) 209-0104

ENGINEER OF RECORD:
PJFMOD@PJFWEB.COM

WIND DESIGN DATA	
REFERENCE STANDARD	TIA/EIA-222-F
LOCAL CODE	2003 IBC
BASIC WIND SPEED (FASTEST-MILE)	85 MPH
ICE THICKNESS	0.75 IN
ICE WIND SPEED	37.6 MPH
SERVICE WIND SPEED	50 MPH

THIS PROJECT INCLUDES THE FOLLOWING ITEMS
REMOVAL OF EXISTING CONCEALMENT BULKHEADS & SHROUDS
INSTALLATION OF NEW CONCEALMENT SPINE
INSTALLATION OF NEW CONCEALMENT BULKHEADS & SHROUDS
INSTALLATION OF WELDED STIFFENERS
FLANGE BRIDGE STIFFENERS
SHAFT REINFORCING
FIELD WELDED ANCHOR BRACKETS
POST INSTALLED ANCHOR RODS
PAINT MODIFICATIONS TO MATCH EXISTING POLE
HIGH STRENGTH GROUT
CORRECT THE POLE OUT OF PLUMB
CLEAN CORROSION AND APPLY TWO COATS OF COLD GALVANIZING TO EXISTING BASE PLATE STIFFENERS AND INTERIOR WALL OF POLE SHAFT ADJACENT TO EXISTING STIFFENER PLATES. SEE SECTION 7 OF NOTES ON S-1

SHEET INDEX	
SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
S-1	GENERAL NOTES
S-2A	FORGBOLT™ DETAILS
S-2B	NEXGEN2™ BOLT DETAIL
S-3	MONOPOLE PROFILE
S-4	BASE PLATE DETAILS
S-5	CONCEALMENT ELEVATION DETAILS
S-6	CONCEALMENT FLANGE DETAILS
S-7	CONCEALMENT FLANGE DETAILS
S-8	BULKHEAD DETAILS
S-9	BRIDGE STIFFENER DETAILS
S-10	MI CHECKLIST

THE ASSOCIATED FAILING SA WO NUMBER FOR THIS PROJECT IS 1062894

ATTENTION ALL CONTRACTORS, ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT (800) 788-7011.

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER
9.3.15

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

CROWN CASTLE
3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065
PH: (585) 370-4766

MODIFICATION OF AN EXISTING
150'-0" MONOPOLE
BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	KJS
DATE:	08-26-2015

TITLE SHEET

T-1

37515-2530.001.DWG

MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 3, 02/05/2015)

1. GENERAL NOTES

1.1. THE MONOPOLE STRUCTURE IN ITS EXISTING CONDITION DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE PROPOSED AND EXISTING LOADS FROM THE ATTACHED STRUCTURAL MODIFICATION REPORT AT THE REQUIRED MINIMUM WIND SPEEDS. DO NOT INSTALL ANY NEW LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.

1.2. THESE DRAWINGS WERE PREPARED FROM INFORMATION PROVIDED BY CROWN CASTLE. THE INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY THE ENGINEER OF RECORD (EOR) FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT DRAWINGS AND THEIR FIELD VERIFIED CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO THE EOR AND CROWN CASTLE BEFORE PROCEEDING WITH THE WORK.

1.3. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.

1.4. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN SUCCESSFULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO ENSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.

1.5. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA-1019 (LATEST EDITION), OSHA AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

1.6. OBSERVATION VISITS TO THE SITE BY CROWN CASTLE AND/OR THE EOR SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES. ANY SUPPORT SERVICES PERFORMED BY THE EOR DURING CONSTRUCTION ARE SOLELY FOR THE PURPOSE OF ACHIEVING GENERAL CONFORMANCE WITH THE CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE THE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.

1.7. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY CROWN CASTLE AND EOR PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.

1.8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.

1.9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.

1.10. ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED AND RELOCATED, REPLACED, OR RE-INSTALLED AS REQUIRED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH CROWN CASTLE, TESTING AGENCY, AND EOR.

1.11. ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS.

1.12. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE EOR.

1.13. ALL SOLUTIONS FOR THE REPLACEMENT, RELOCATION OR MODIFICATION OF THE SAFETY CLIMB AND/OR ANY OF THE MONOPOLE CLIMBING FACILITIES SHALL BE COORDINATED WITH TUF-TUG PRODUCTS. CONTACT DETAILS:
3434 ENCRETE LANE, MORAINE, OHIO 45439
PHONE: 937-299-1213 EMAIL: TUFTUG@AOL.COM

2. STRUCTURAL STEEL

2.1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
2.1.1. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
2.1.1.1. "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS."
2.1.1.2. "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM HIGH STRENGTH BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS.
2.1.1.3. "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"
2.1.2. BY THE AMERICAN WELDING SOCIETY (AWS):
2.1.2.1. "STRUCTURAL WELDING CODE – STEEL D1.1."
2.1.2.2. "STANDARD SYMBOLS FOR WELDING, BRAZING, AND NONDESTRUCTIVE EXAMINATION"

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

2.3. 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.

2.4. 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.

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

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

2.7. 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.

2.8. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.

2.9. FIELD CUTTING OF STEEL:
2.9.1. IMPORTANT CUTTING AND WELDING SAFTEY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFTEY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY 'CUTTING AND WELDING SAFETY PLAN' (DOC # ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT". ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
2.9.2. 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. CONTRACTOR TO AVOID 90 DEGREE CORNERS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS.

3. BASE PLATE GROUT

3.1. NEW GROUT FOR THE POLE BASE SHALL BE NON-SHRINK, NON-METALLIC, GROUT (NS GROUT BY EUCLID, OR APPROVED EQUAL) WITH A 7500 PSI MINIMUM COMPRESSIVE STRENGTH. CONTRACTOR SHALL SUBMIT PROPOSED GROUT SPECIFICATION INFORMATION TO CROWN CASTLE FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. CONTRACTOR SHALL FOLLOW GROUT MANUFACTURER'S SPECIFICATIONS FOR COLD WEATHER GROUTING PROCEDURES (IF NECESSARY) AND THE TESTING AGENCY SHALL PREPARE GROUT SAMPLE SPECIMENS FOR COMPRESSIVE STRENGTH TESTING AND VERIFICATION.

3.2. GROUT SHALL BE INSTALLED TIGHT UNDER THE BASE PLATE AND BEARING PLATE REGION WITH NO VOIDS REMAINING BETWEEN THE TOP OF THE EXISTING CONCRETE AND THE UNDERSIDE OF THE EXISTING BASE PLATE AND BEARING PLATE.

3.3. CAULK AROUND ANCHOR RODS WHEN GROUTING.

4. FOUNDATION WORK - (NOT REQUIRED)

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

6. EPOXY GROUTED REINFORCING ANCHOR RODS

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

6.2. ALL REINFORCING ANCHOR RODS SHALL BE HOT DIP GALVANIZED PER ASTM A123.

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

6.4. HILTI HIT RE-500 SD OR ITW RED HEAD EPCON G5 EPOXY SHALL BE USED TO ANCHOR THE BAR IN THE DRILL HOLES. IF THE DESIGNED EMBEDMENT IS GREATER THAN 12 FT, CONTRACTOR HAS THE OPTION TO USE PILE ANCHOR GROUT BY E-CHEM AS AN ALTERNATE. IF CONTRACTOR WISHES TO USE A DIFFERENT EPOXY, A REQUEST INCLUDING THE EPOXY TECHNICAL DATA SHEET(S) SHALL BE SUBMITTED TO THE EOR FOR REVIEW PRIOR TO CONSTRUCTION.

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

6.6. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED THE CONTRACTOR SHALL TIGHTEN ALL HEAVY HEX ANCHOR NUTS TO SNUG TIGHT PLUS 1/8 TURN OF NUT.

7. TOUCH UP OF GALVANIZING

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

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

7.3. CROWN CASTLE'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 ADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

8. HOT-DIP GALVANIZING

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

8.2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES WITH EOR APPROVAL OF LOCATIONS.

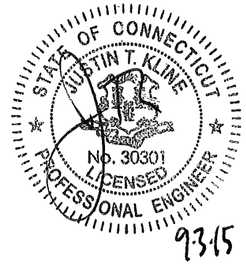
8.3. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

9. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER

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

9.2. ANY FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE EXISTING GALVANIZED STEEL POLE STRUCTURE AND THE WELDED 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 CROWN CASTLE REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.

9.3. CROWN CASTLE 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 CROWN CASTLE BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. THE EOR 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".



PJF PAUL J. FORD & COMPANY
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CROWN CASTLE
3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065
PH: (585) 370-4766

MODIFICATION OF AN EXISTING
150'-0" MONOPOLE
BU #828257; STONINGTON
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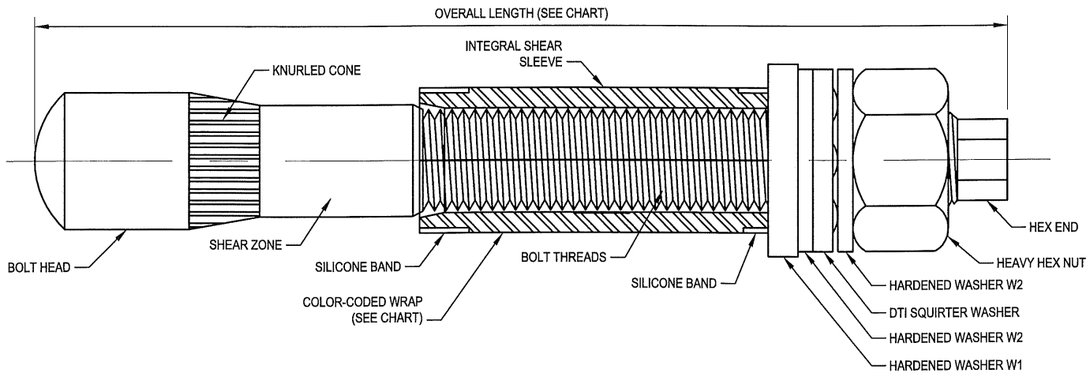
PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	KJS
DATE:	08-26-2015

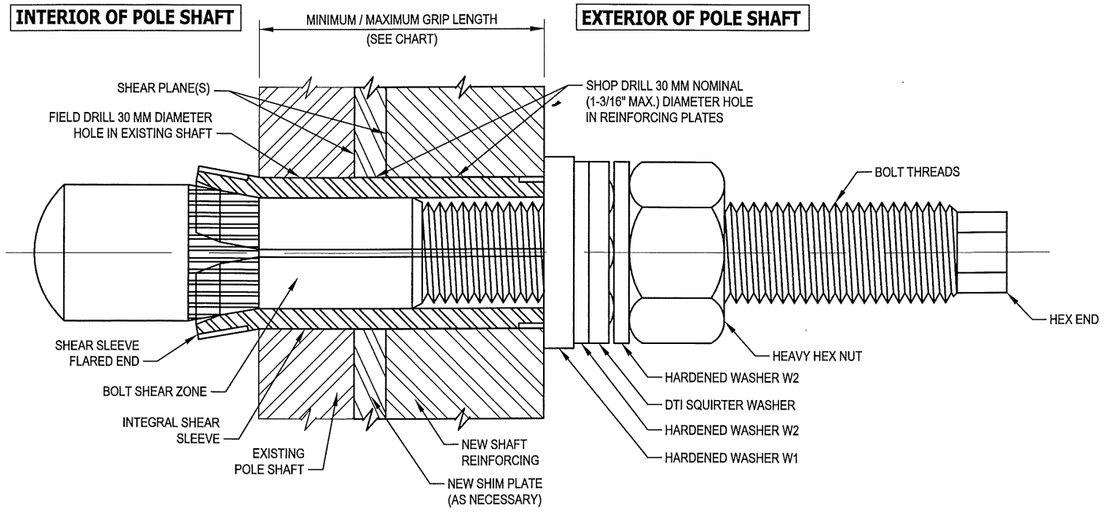
GENERAL NOTES

S-1

37515-2530.001.DWG



PRE-INSTALLED FORGBolt™ ASSEMBLY DETAIL 1 / S-2A



INSTALLED FORGBolt™ ASSEMBLY DETAIL 2 / S-2A

FORGBolt™		AISC Group A Material: ASTM A325 and PC8.8 (Tensile Stress, Fu = 120 ksi minimum)				
GROUP A		FORGBolt™ Size (mm)	Overall Length (inches)	Estimated Weight Each (lbs)	Grip Range (inch)	Comment	Color Code
FORGBolt™ A325 - PC8.8	1	135	5.31	1.3	3/8" to 1"	--	RED
	2	160	6.30	1.6	3/4" to 1-1/2"	--	GREEN
	3	195	7.68	1.9	1-1/4" to 2-1/4"	--	BLUE
	4	260	10.24	2.6	2" to 3-1/2"	Splice Bolt	YELLOW
	5	365	14.37	3.6	3-1/2" to 5-1/2"	Flange Jump Bolt	ORANGE
	6	440	17.32	4.3	5-1/2" to 8-1/2"	Flange Jump Bolt	BLACK
DTI Note		Each Group A (A325/PC8.8) FORGBolt™ assembly shall have a 'Squirter' DTI that is compatible with a M20-PC8.8 bolt.					

FOLLOW ALL MANUFACTURER / DISTRIBUTOR RECOMMENDATIONS FOR INSTALLATION, TIGHTENING, AND INSPECTION

INSTALLATION NOTES:
1. FIELD DRILL HOLES TO 30 MM DIAMETER.
2. SELECT CORRECT BOLT SIZE FOR INSTALLATION GRIP (REFER TO PLANS).
3. INSERT BOLT ASSEMBLY THROUGH HOLES IN SHAFT REINFORCING PLATES AND SEAT THE HARDENED WASHER W1 FLUSH AGAINST OUTSIDE OF PLATE.
4. HAND TIGHTEN NUT TO FINGER TIGHT.
5. TIGHTEN NUT TO PRETENSIONED CONDITION AND UNTIL DTI SHOWS PROPER INDICATION.
6. PROPERLY DOCUMENT AND INSPECT BOLT TIGHTENING PER PLAN REQUIREMENTS.

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

BOLT TIGHTENING AND INSPECTION 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.

AISC GROUP A MATERIAL: ASTM A325 AND PC8.8
(Fu = 120 KSI MIN. TENSILE STRESS)

CONTAINS PROPRIETARY INFORMATION PATENT PENDING

DISTRIBUTOR CONTACT:
PRECISION TOWER PRODUCTS
PHONE: 888-926-4857
EMAIL: info@precisiontowerproducts.com
WEB: www.precisiontowerproducts.com

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED PROFESSIONAL ENGINEER
9.3.15

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MODIFICATION OF AN EXISTING
150'-0" MONOPOLE
BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
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DATE:	08-26-2015

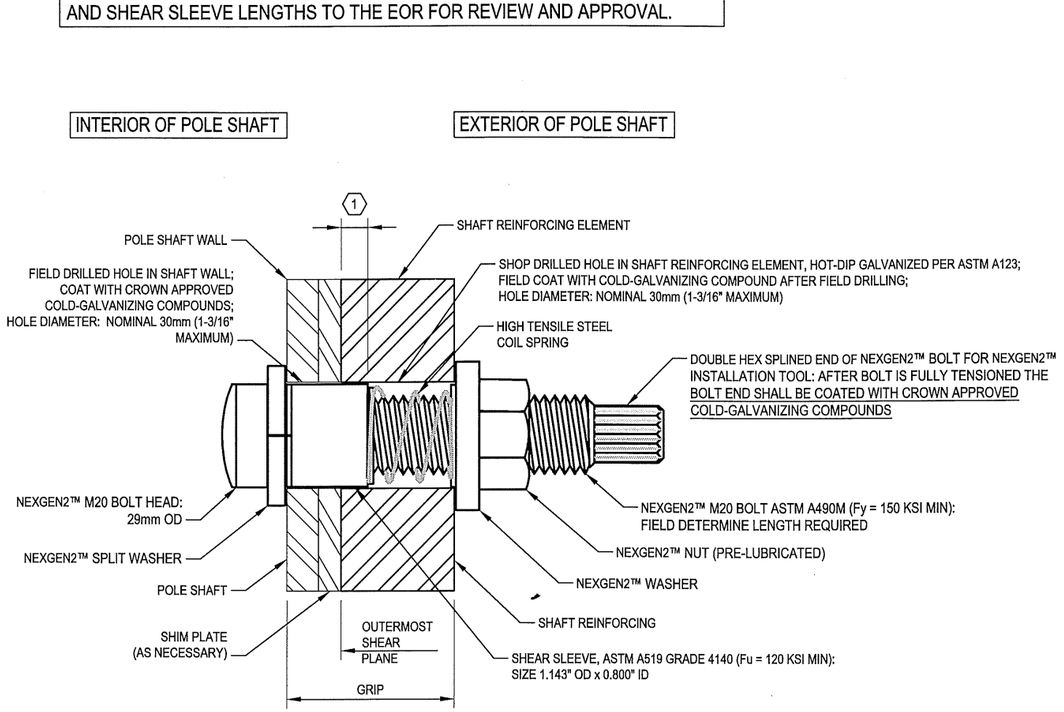
FORGBolt™ DETAILS

S-2A

37515-2530.001.DWG

NEXGEN2™ BOLT NOTE SHEET: REV. 1.01, 04-15-2015

<1> NOTE: SHEAR SLEEVE LENGTH: THE SHEAR SLEEVE SHALL PROJECT A MINIMUM OF 3/8" BEYOND THE OUTERMOST SHEAR PLANE. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS SHOWING NEXGEN2™ BOLT LENGTHS AND SHEAR SLEEVE LENGTHS TO THE EOR FOR REVIEW AND APPROVAL.



TYPICAL NEXGEN2™ BOLT DETAIL 1 / S-2B

FOLLOW ALL MANUFACTURER / DISTRIBUTOR RECOMMENDATIONS FOR INSTALLATION, TIGHTENING, AND INSPECTION

BOLT HOLE NOTES:

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

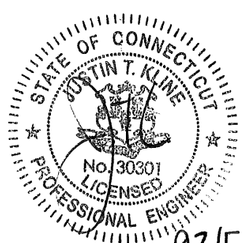
BOLT TIGHTENING AND INSPECTION NOTES:

1. ALL NEXGEN2™ BOLT ASSEMBLIES SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF SECTION 8.2.3 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. PER SECTION 8.2.3: ALL FASTENER ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS IN AISC SECTION 8.1 WITHOUT SEVERING THE SPLINED END AND WITH WASHERS POSITIONED AS REQUIRED IN AISC SECTION 6.2. PER REQUIREMENTS IN SECTION 8.1: PRIOR TO BOLT PRETENSIONING, THE JOINT SHALL FIRST BE COMPACTED TO THE SNUG-TIGHT CONDITION. SNUG TIGHT IS THE CONDITION THAT EXISTS WHEN ALL OF THE PLIES IN THE CONNECTION HAVE BEEN PULLED INTO FIRM CONTACT BY THE BOLTS AND THE BOLTS HAVE BEEN TIGHTENED SUFFICIENTLY TO PREVENT THE REMOVAL OF THE NUTS WITHOUT THE USE OF A WRENCH. ONCE THE SNUG TIGHT CONDITION IS ACHIEVED, THEN THE BOLT ASSEMBLY CAN BE TIGHTENED TO THE PRETENSIONED CONDITION.
2. ALL NEXGEN2™ BOLT ASSEMBLIES SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF SECTION 9.2.3 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. NOTE THAT COMPLETE INSPECTION OF ALL NEXGEN2™ BOLT ASSEMBLIES IS REQUIRED IN ADDITION TO ROUTINE OBSERVATION.
3. ALL NEXGEN2™ BOLTS SHALL BE INSPECTED BY A QUALIFIED BOLT INSPECTOR PER NOTES 1 AND 2, ABOVE. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE NEXGEN2™ BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TENSIONING PROCEDURE. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THAT THE DOUBLE HEX SPLINED END OF THE BOLTS HAVE BEEN TWISTED OFF AND COATED WITH CROWN APPROVED COLD-GALVANIZING COMPOUND..

NOTE: NEXGEN2™ BOLT ASSEMBLY SHALL BE MAGNI 565 COATED PER ASTM F2833 AND MANUFACTURER SPECIFICATIONS.

NOTE: INSTALL NEXGEN2™ BOLT ASSEMBLY PER MANUFACTURER'S INSTRUCTIONS.

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



9.3.15

PJF PAUL J. FORD & COMPANY
250 E Broad St, Ste 600- Columbus, OH 43215
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CROWN CASTLE
3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065
PH: (585) 370-4766

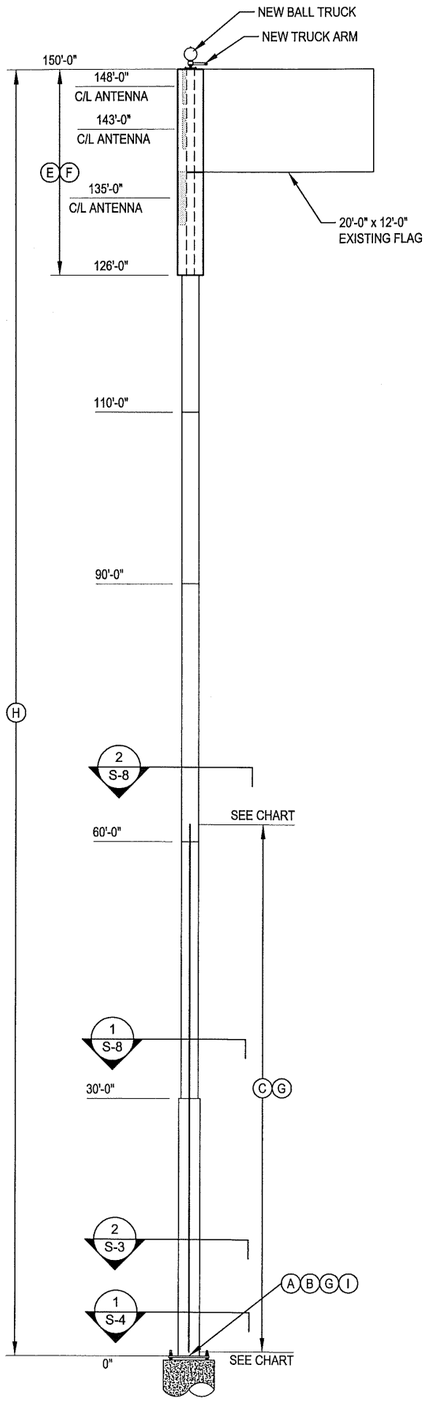
MODIFICATION OF AN EXISTING
150'-0" MONOPOLE
BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	KJS
DATE:	08-26-2015

NEXGEN2™ BOLT DETAIL

S-2B

37515-2530.001.DWG



POLE ELEVATION 1 / S-3

NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE

BOTTOM ELEVATION	TOP ELEVATION	FLAT # / DEGREE SEPARATION	ELEMENT	ELEMENT LENGTH	ELEMENT QUANTITY	APPROXIMATE BOLTS PER ELEMENT	APPROXIMATE TOTAL BOLT QUANTITY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	ESTIMATED TOTAL STEEL WEIGHT
0' - 6"	33' - 3"	37.5, 135, 217.5 & 315	1" x 4-1/2" CFP #1	32' - 9"	4	33	132	6	10	20"	2006 LBS.
30' - 6"	62' - 0"	37.5, 135, 217.5 & 315	1" x 4-1/2" CFP #2	31' - 6"	4	33	132	10	6	20"	1929 LBS.
							264				3935 LBS.

NOTES:

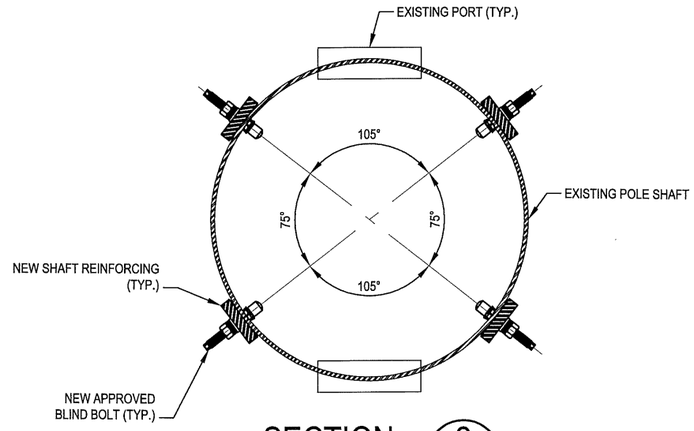
1.) ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0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

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

3.) WELDS SHALL BE E80XX OR GREATER. TERMINATION WELDS SHALL BE 3/8" FILLET WELDS.

4.) HOLES FOR BOLTS ARE 30mm UNLESS NOTED OTHERWISE.

5.) ALL SHIMS SHALL BE ASTM A-36.



SECTION 2 / S-3
EL. 10'-0"

SHAFT SECTION DATA

SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN) @ TOP	DIAMETER ACROSS FLATS (IN) @ BOTTOM	POLE GRADE (ksi)	POLE SHAPE
1	12.00	0.4650		10.750	10.750	A500-42	ROUND
2	12.00	0.4650		10.750	10.750	A500-42	ROUND
3	16.00	0.3750		24.000	24.000	A53-B-42	ROUND
4	20.00	0.3750		24.000	24.000	A53-B-42	ROUND
5	30.00	0.3750		24.000	24.000	A53-B-42	ROUND
6	30.00	0.3750		24.000	24.000	A53-B-42	ROUND
7	30.00	0.3750		30.000	30.000	A53-B-42	ROUND

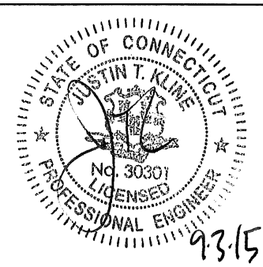
NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

ASTM A36 SHIMS FOR MONOPOLE REINFORCEMENT MEMBERS SHALL BE REQUIRED WHERE GAPS BETWEEN THE POLE SHAFT AND REINFORCING MEMBER EXIST AT FASTENER LOCATIONS. FOR INTERMEDIATE CONNECTIONS, THE MINIMUM SHIM LENGTH AND WIDTH SHALL BE THE WIDTH OF THE REINFORCING MEMBER. FOR TERMINATION CONNECTIONS, A CONTINUOUS SHIM PLATE (PREFERRED) OR EQUIVALENT INDIVIDUAL SHIM PLATES THE WIDTH OF THE REINFORCING MEMBER MAY BE USED. SHIM THICKNESSES SHALL BE NO LESS THAN 1/16". STACKING OF SHIMS IS PERMITTED.

MODIFICATIONS:

- (A) INSTALL NEW ANCHOR RODS AND BRACKETS AT BASE PLATE. SEE SHEET S-4.
- (B) INSTALL NEW TRANSITION STIFFENERS AT BASE PLATE. SEE SHEET S-4.
- (C) INSTALL NEW SHAFT REINFORCING. SEE CHART ON THIS SHEET.
- (D) INSTALL FILLER PLATES AT ELEVATION 30'-0".
- (E) REMOVE EXISTING CONCEALMENT BULKHEADS AND SHROUDS.
- (F) INSTALL NEW CONCEALMENT BULKHEADS AND SHROUDS.
- (G) PAINT MODIFICATIONS TO MATCH EXISTING POLE.
- (H) BRING POLE WITHIN DEFLECTION TOLERANCE PER TIA-222-G REGARDING PLUMBNESS. CONTRACTOR TO COORDINATE ADDRESSING THE PLUMBNESS WITH EOR.
- (I) CLEAN CORROSION AND APPLY TWO COATS OF COLD GALVANIZING COMPOUND TO EXISTING BASE PLATE STIFFENERS AND INTERIOR WALL OF POLE SHAFT ADJACENT TO EXISTING STIFFENER PLATES. SEE SHEET S-1 & S-4.

1. EXISTING CONCEALMENT TO BE REMOVED AND REPLACED WITH THE NEW CONCEALMENT.
2. NEW CONCEALMENT IS TO BE BOLTED TO TOP FLANGE OF EXISTING BASE POLE. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO FABRICATION AND INSTALLATION.
3. NEW CONCEALMENT BULKHEADS ARE TO BE BOLTED TO EXISTING CONCEALMENT SPINE. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO FABRICATION AND INSTALLATION.
4. CONTRACTOR SHALL SEND PAUL J. FORD & COMPANY THE FABRICATION DRAWINGS FOR APPROVAL PRIOR TO MANUFACTURING.
5. ALL EXISTING COAX SHALL BE REMOVED PRIOR TO INSTALLATION OF THE NEW NEW CONCEALMENT AND SHAFT REINFORCING. UPON COMPLETION COAX SHALL BE REINSTALLED. NEW COAX MAY BE REQUIRED. COORDINATE COAX INSTALLATION WITH PROJECT PM.



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CROWN CASTLE
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PH: (595) 370-4766

MODIFICATION OF AN EXISTING 150'-0" MONOPOLE

BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	KJS
DATE:	08-26-2015

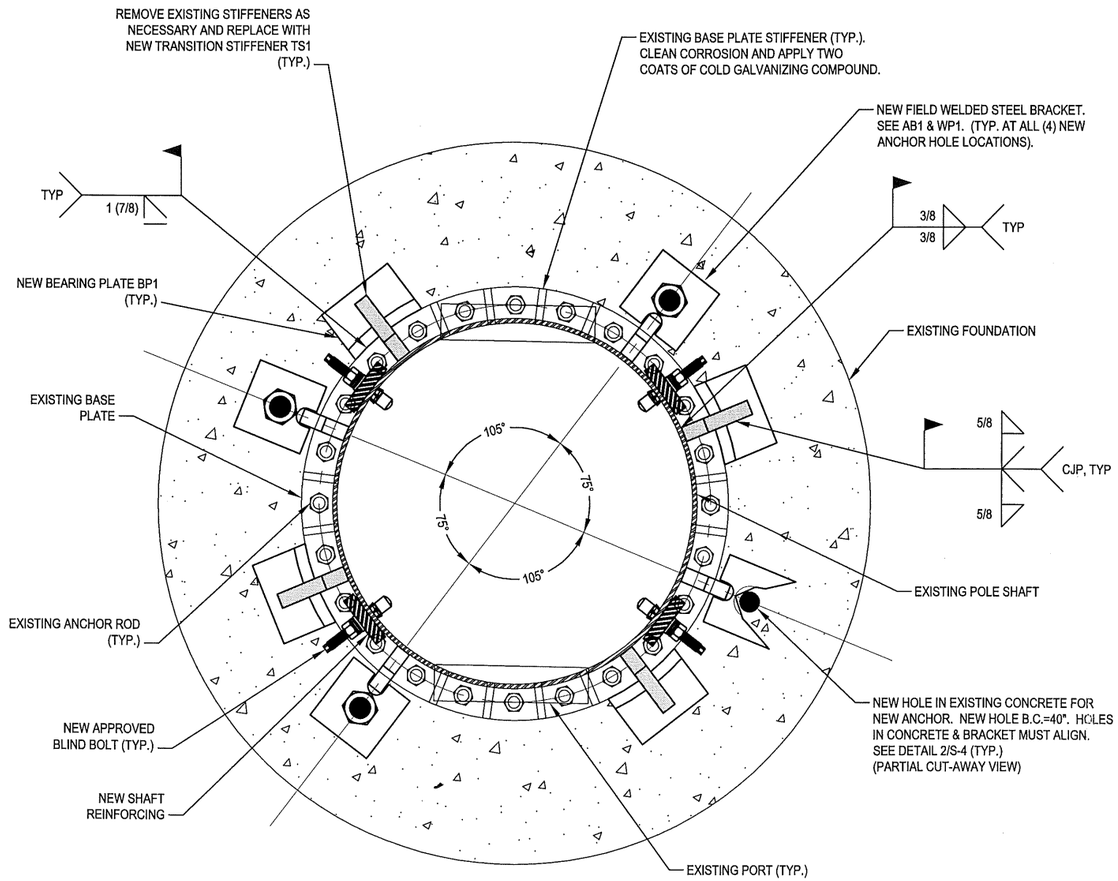
MONOPOLE PROFILE

S-3

37515-2530.001.DWG

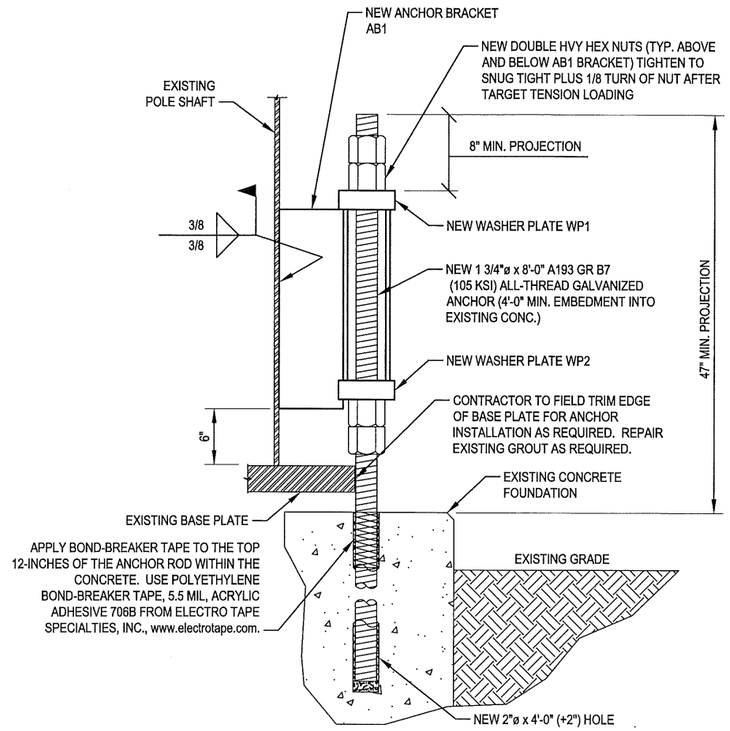
BASE SPECIFICATIONS	
BASE PLATE:	36" ROUND; 1 1/4" THK.; Fy=36 KSI
ANCHOR RODS:	(24) 1"ø; A687 GRADE 105; 33" B.C.

PROVIDE NON-SHRINK GROUT (NS GROUT BY EUCLID OR APPROVED. EQUAL; 7500 PSI MIN.) BELOW NEW BEARING PLATES. GROUT SHALL BE INSTALLED TIGHT UNDER NEW BEARING PLATES WITH NO VOIDS REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF NEW BEARING PLATES.



BASE PLATE 1 / S-4

NDE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. SEE CCI DOCUMENTS ENG-SOW-10033 'TOWER BASE PLATE NDE' AND ENG BUL-10051 'NDE REQUIREMENTS FOR MONOPOLE BASE PLATE TO PREVENT CONNECTION FAILURE.' NOTIFY THE EOR AND CROWN CASTLE ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING REINFORCEMENTS THAT HAVE BEEN WELDED TO THE BASE PLATE. ANY FULL PENETRATION WELDING TO THE BASE PLATE REQUIRED AS PART OF THIS ACTIVE REINFORCEMENT DESIGN SHALL BE INCLUDED IN THE NDE SCOPE OF WORK.



NEW ANCHOR & BRACKET DETAIL 2 / S-4

NEW ANCHOR ROD REINFORCING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ONCE ALL RESIN HAS CURED, ALL NEW ANCHOR ROD REINFORCING SHALL BE TESTED TO A TARGET TENSION LOAD OF 120 KIPS. ONCE THE TENSION LOAD HAS BEEN RELEASED, TIGHTEN HEAVY HEX NUT TO SNUG TIGHT PLUS 1/8 TURN OF NUT. REFER TO SHEET S-1, SECTION 6 FOR ADDITIONAL INFORMATION.

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DESIGNED BY:	J.W.M.
CHECKED BY:	
DATE:	08-26-2015

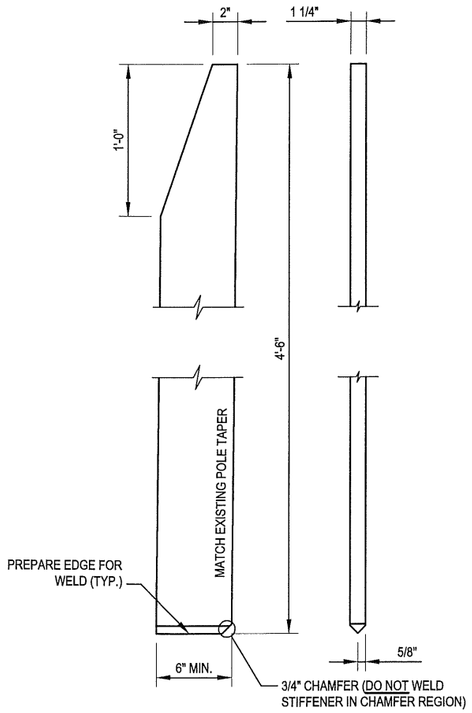
BASE PLATE DETAILS

S-4

STATE OF CONNECTICUT · JUSTIN T. KLINE · No. 30301 · LICENSED PROFESSIONAL ENGINEER

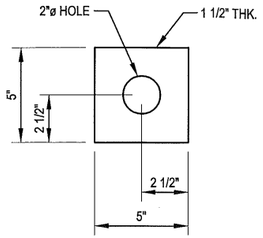
9315

37515-2530.001.DWG



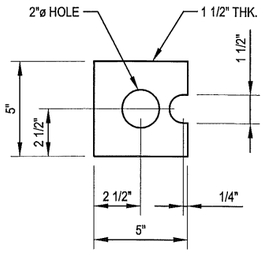
TRANSITION STIFFENER MK~TS1

(4 REQUIRED) (Fy = 65 KSI)



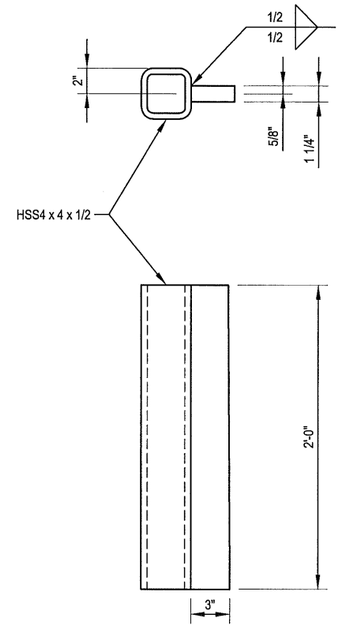
WASHER PLATE MK~WP1

(4 REQUIRED) (Fy = 50 KSI)



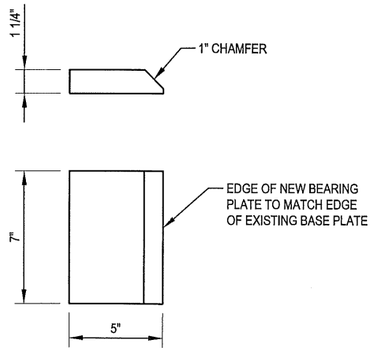
WASHER PLATE MK~WP2

(4 REQUIRED) (Fy = 50 KSI)



ANCHOR BRACKET MK~AB1

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



BEARING PLATE MK~P1

(4 REQUIRED) (Fy = 50 KSI)

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PH: (585) 370-4766

MODIFICATION OF AN EXISTING 150'-0" MONOPOLE

BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

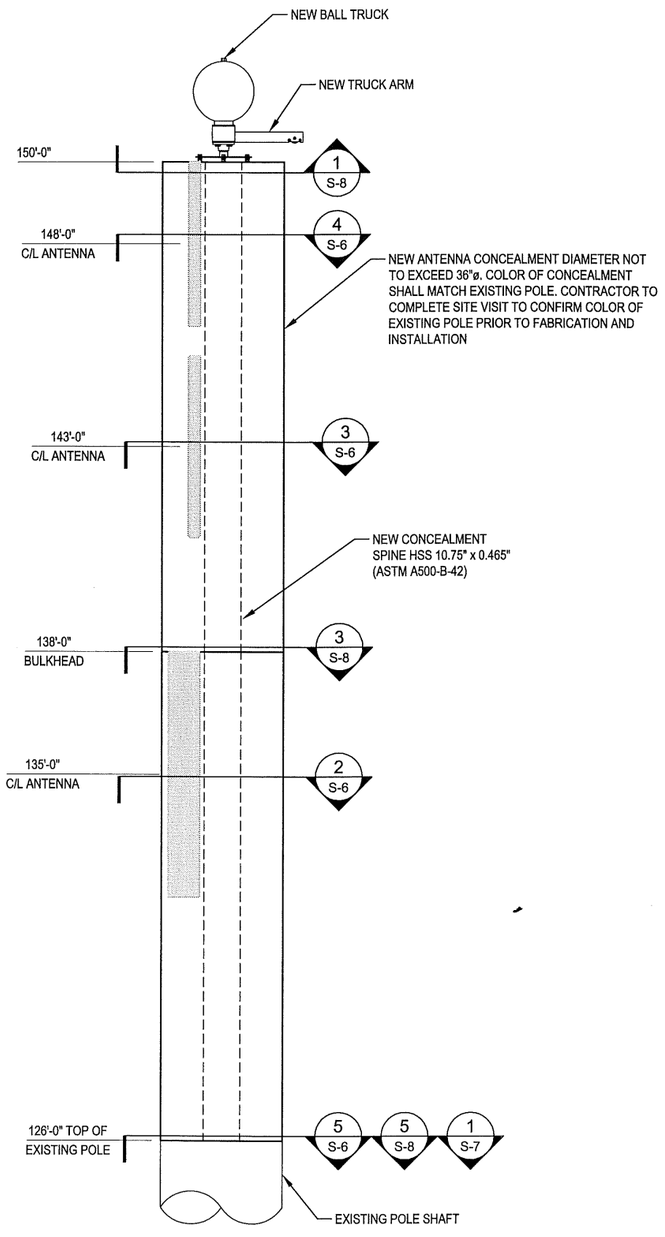
PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	KJS
DATE:	08-26-2015

DRILLED IN REBAR DETAILS

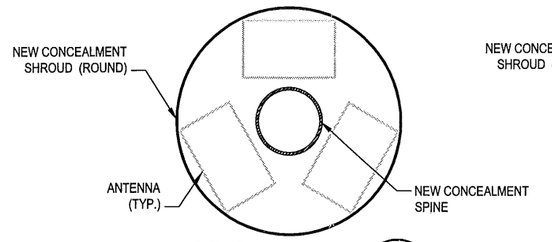
S-5

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER
9.7.15

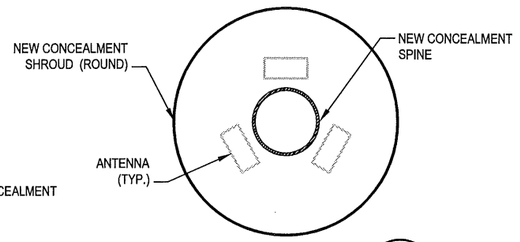
37515-2530.001.DWG



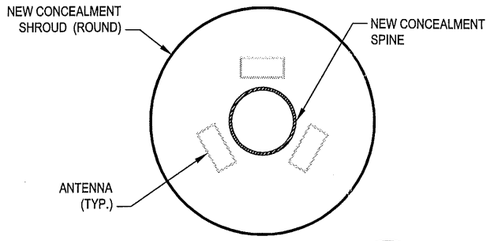
PARTIAL ELEVATION 1 / S-6



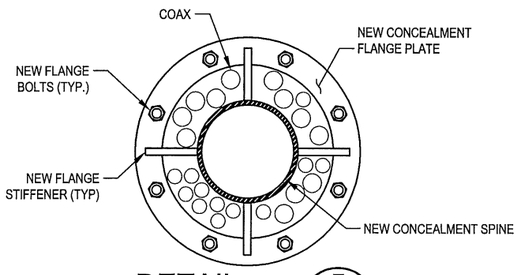
SECTION 2 / S-6
EL. 135'-0" (PROPOSED ANTENNA FIT)



SECTION 3 / S-6
EL. 143'-0" (PROPOSED ANTENNA FIT)



SECTION 4 / S-6
EL. 148'-0" (PROPOSED ANTENNA FIT)



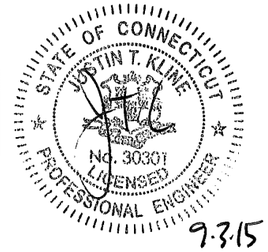
DETAIL 5 / S-6
EL 126'-0" (COAX LAYOUT)

Antenna Model	Antenna Centerline Elevation, ft	Height, in	Depth, in	Width, in
APX18-209014-CT2	148	48.03	3.15	6.8
APXV18-206516S-C	143	53.1	3.15	6.9
OPA-65R-LCUU-H6	135	72	9	14.8

NOTE: ALL ANTENNA DIMENSIONS HAVE BEEN PROVIDED BY CROWN CASTLE. A 1-1/2" SPACING BETWEEN THE SPINE AND ANTENNA HAS BEEN ASSUMED.

Coax Model	QUANTITY	Elevation, ft	Nominal Diameter, in	Actual Diameter, in
LDF7-50A	12	145	1 5/8	1.98
LDF6-50A	12	133	1 1/4	1.55

NOTE: COAX LAYOUT AND FIT IS THEORETICAL. ACTUAL LAYOUT AND FIT MAY VARY PENDING EXISTING CONDITIONS.



9.3.15

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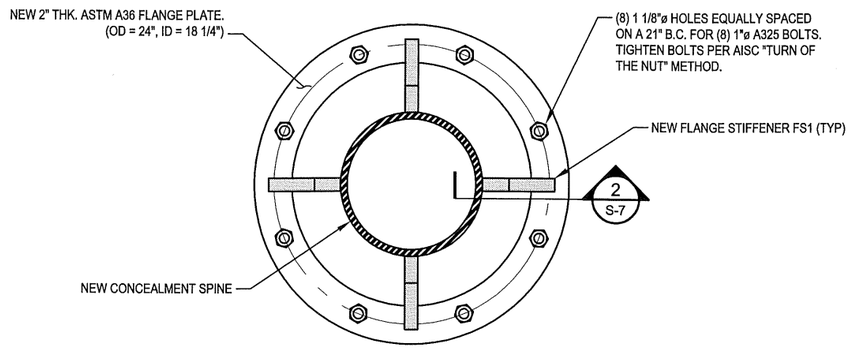
CHECKED BY:	
DATE:	08-26-2015

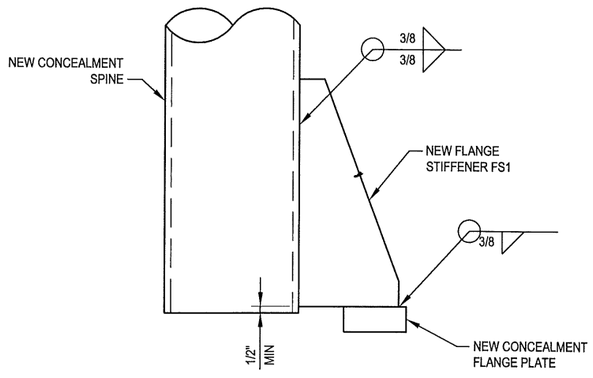
BRIDGE STIFFENER DETAILS

S-6

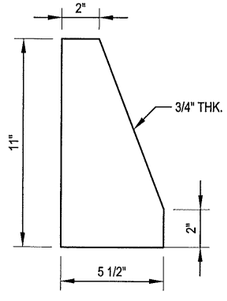
37515-2530.001.DWG



SECTION 1 / S-7
BOTTOM FLANGE PLATE



FLANGE CONNECTION 2 / S-7
1/4" RING PLATE NOT SHOWN FOR CLARITY



FLANGE STIFFENER MK~FS1
(4 REQUIRED) (Fy = 36 KSI)

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BRIDGE STIFFENER DETAILS

S-7

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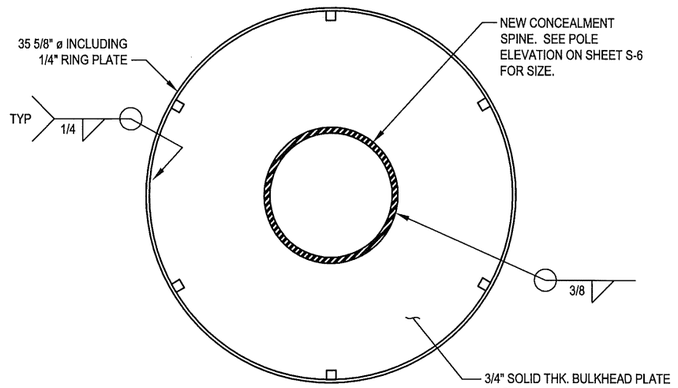
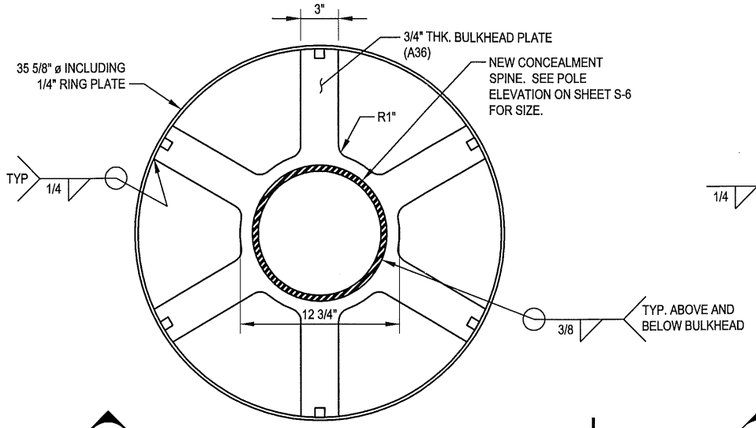
9.3.15

37515-2530.001.DWG



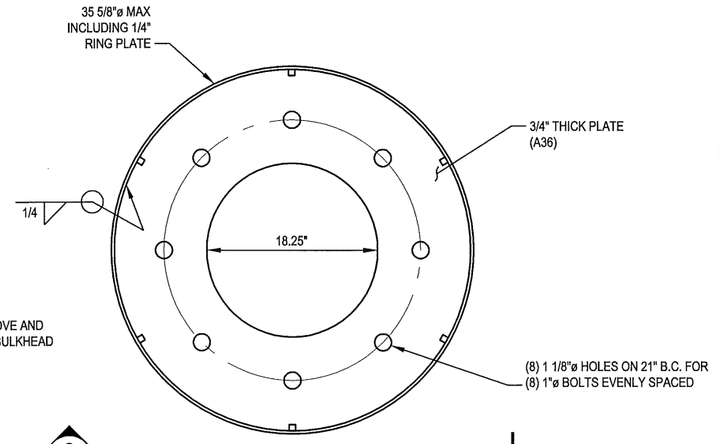
2 S-8

SECTION 1 S-8
TOP BULKHEAD



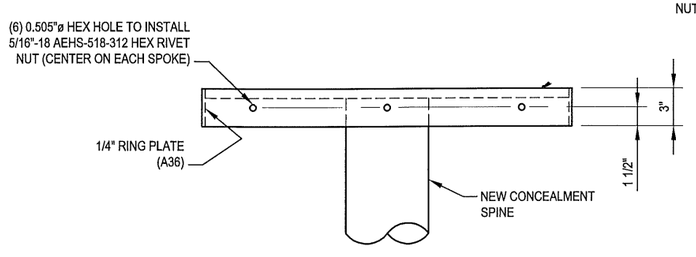
4 S-8

SECTION 3 S-8
138'-0" INTERMEDIATE BULKHEAD

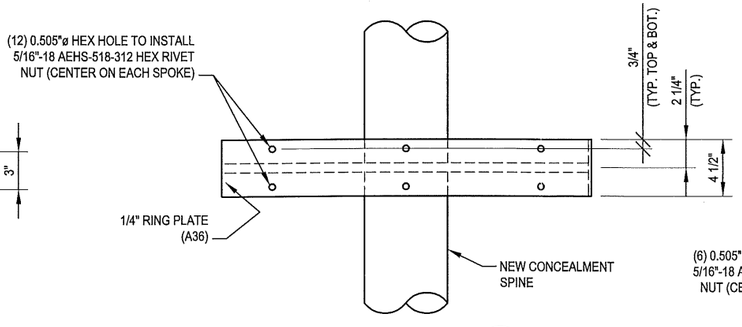


2 S-8

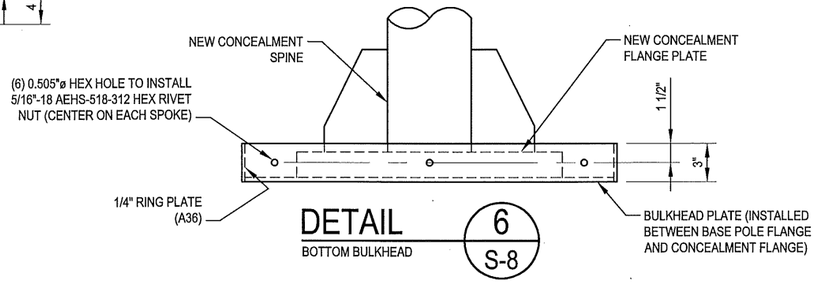
SECTION 5 S-8
126'-0" BOTTOM BULKHEAD



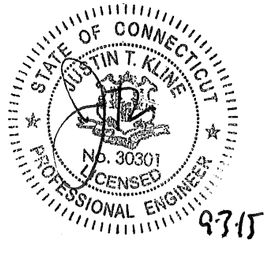
SECTION 2 S-8



SECTION 4 S-8



DETAIL 6 S-8
BOTTOM BULKHEAD



PJF PAUL J. FORD & COMPANY
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CROWN CASTLE
3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065
PH: (585) 370-4766

MODIFICATION OF AN EXISTING 150'-0" MONOPOLE
BU #828257; STONINGTON
PAWCATUCK, CONNETICUT

PROJECT No:	37515-2530.001.7700
DRAWN BY:	C.A.W.
DESIGNED BY:	J.W.M.
CHECKED BY:	KJS
DATE:	08-26-2015

BULKHEAD DETAILS

S-8

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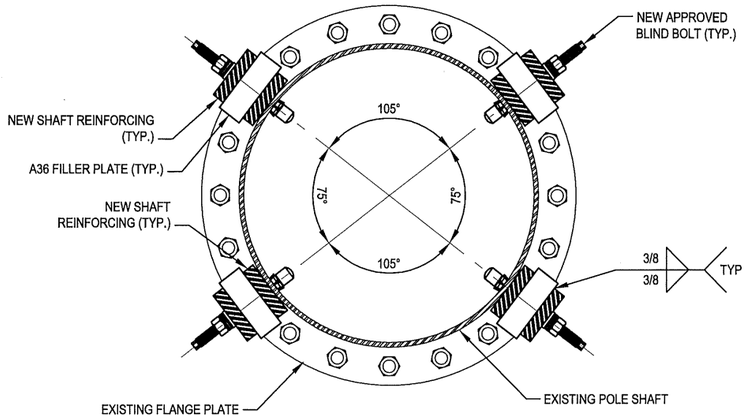
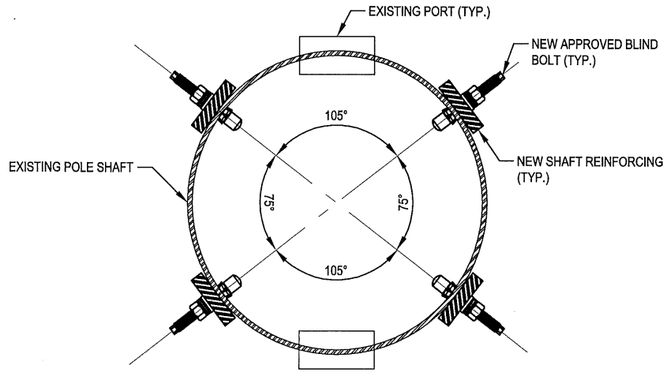


SECTION 1 / S-9
EL. 30'-0"



SECTION 2 / S-9
EL. 60'-0"

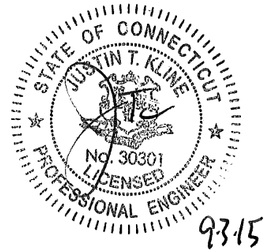
REMOVE EXISTING BRIDGE STIFFENERS AS NECESSARY.

		TOP FILLER PLATE SIZE (in)			BOTTOM FILLER PLATE SIZE (in)					UNBRACED LENGTH (in)	
FLANGE EL (ft)	QTY	WIDTH	THK	LENGTH	WIDTH	THK	LENGTH	FILLER WEIGHT (lbs)	WELD LENGTH (in)	MAXIMUM BOLT SPACING AT FLANGE (LMAX)	JUMP WEIGHT (lbs)
30.00	4	5.50"	2.00"	33.00"				412	264.0"	3.00"	322

Total Jump Wt.	322	lbs
Total Steel Weight	734	lbs
Total Weld Length	264	in

NOTES:

1 ALL NEW FLANGE JUMP STEEL REINFORCING SHALL BE COLD GALVANIZED AS FOLLOWS:
APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
2 ALL FILLER BARS SHALL BE ASTM A36 GR. 36
3 ALL FLANGE JUMP BARS SHALL BE ASTM A572 (GRADE 65 OR AS SPECIFIED ON THE DESIGN DRAWINGS) (MIN. Fy = 65 ksi, MIN. Fu = 80ksi).
4 HOLES FOR THE BOLTS ARE 30mm UNLESS NOTED OTHERWISE.
5 IF THE TOP OR BOTTOM BOLTS ARE NOT LISTED, THE QUANTITIES ARE INCLUDED IN THE SHAFT REINFORCING CHART.



9.15

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BRIDGE STIFFENER DETAILS

S-9

37515-2530.001.DWG

MODIFICATION INSPECTION NOTES:

1. **GENERAL**
   - 1.1. 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 EOR.
   - 1.2. THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.
   - 1.3. ALL MI'S SHALL BE CONDUCTED BY A CROWN CASTLE ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN CASTLE.
   - 1.4. TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN CASTLE POINT OF CONTACT (POC).
   - 1.5. REFER TO ENG-SOW-10007: MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

2. **MI INSPECTOR**
   - 2.1. THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:
     - 2.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
     - 2.1.2. WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
     - 2.1.3. THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL 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 CASTLE.

3. **GENERAL CONTRACTOR**
   - 3.1. THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:
     - 3.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
     - 3.1.2. WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
     - 3.1.3. BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS.
     - 3.1.4. THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.

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

5. **CANCELLATION OR DELAYS IN SCHEDULED MI**
   - 5.1. IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN CASTLE 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 CASTLE 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.

6. **CORRECTION OF FAILING MI'S**
   - 6.1. IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN CASTLE TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:
     - 6.1.1. CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
     - 6.1.2. OR, WITH CROWN CASTLE'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

7. **MI VERIFICATION INSPECTIONS**
   - 7.1. CROWN CASTLE 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.
   - 7.2. ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.
   - 7.3. VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

8. **PHOTOGRAPHS**
   - 8.1. BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:
     - 8.1.1. PRECONSTRUCTION GENERAL SITE CONDITION
     - 8.1.2. PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
     - 8.1.3. RAW MATERIALS
     - 8.1.4. PHOTOS OF ALL CRITICAL DETAILS
     - 8.1.5. FOUNDATION MODIFICATIONS
     - 8.1.6. WELD PREPARATION
     - 8.1.7. BOLT INSTALLATION AND TORQUE
     - 8.1.8. FINAL INSTALLED CONDITION
     - 8.1.9. SURFACE COATING REPAIR
     - 8.1.10. POST CONSTRUCTION PHOTOGRAPHS
     - 8.1.11. FINAL INFIELD CONDITION
     - 8.1.12. PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.
     - 8.1.13. THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

9. **INSPECTION AND TESTING**
   - 9.1. ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY CROWN CASTLE'S REPRESENTATIVE AND CROWN CASTLE'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY.
   - 9.2. INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS ARE STILL REQUIRED WHEN THE EOR PERFORMS SUPPORT SERVICES DURING CONSTRUCTION.
   - 9.3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
   - 9.4. AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY CROWN CASTLE FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
     - 9.4.1. ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
     - 9.4.2. THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
   - 9.5. THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES AND INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.
   - 9.6. GENERAL
     - 9.6.1. PERFORM PERIODIC ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY CROWN CASTLE AND THE EOR IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
   - 9.7. FOUNDATIONS AND SOIL PREPARATION - (NOT REQUIRED)
   - 9.8. CONCRETE TESTING PER ACI - (NOT REQUIRED)
   - 9.9. STRUCTURAL STEEL
     - 9.9.1. CHECK STEEL ON THE JOB WITH THE PLANS.
     - 9.9.2. CHECK MILL CERTIFICATIONS. CALL FOR LABORATORY TEST REPORTS WHEN MILL CERTIFICATION IS IN QUESTION.
     - 9.9.3. CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
     - 9.9.4. INSPECT ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
     - 9.9.5. INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
     - 9.9.6. CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
     - 9.9.7. CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
     - 9.9.8. CHECK THAT BOLTS HAVE BEEN TIGHTENED PROPERLY.
     - 9.9.9. PRIOR TO ANY FIELD CUTTING THE CONTRACTOR SHALL MARK THE CUTOUT LINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
   - 9.10. WELDING:
     - 9.10.1. VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
     - 9.10.2. INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND WITH AWS D1.1.
     - 9.10.3. APPROVE FIELD WELDING SEQUENCE.
     - 9.10.4. A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO CROWN CASTLE BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM CROWN CASTLE.
     - 9.10.5. INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
       - 9.10.5.1. INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE, AND WORKING CONDITIONS.
       - 9.10.5.2. VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
       - 9.10.5.3. INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
       - 9.10.5.4. VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT.
       - 9.10.5.5. SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE.
       - 9.10.5.6. INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED DRAWINGS.
       - 9.10.5.7. VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
       - 9.10.5.8. REVIEW THE REPORTS BY TESTING LABS.
       - 9.10.5.9. CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
       - 9.10.5.10. INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
       - 9.10.5.11. CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
       - 9.10.5.12. FULL PENETRATION WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D1.1.
       - 9.10.5.13. PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MP IN ACCORDANCE WITH AWS D1.1.
   - 9.11. REPORTS:
     - 9.11.1. COMPILE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO CROWN CASTLE.
     - 9.11.2. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES OR PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO CROWN CASTLE'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT CROWN CASTLE'S REVIEW AND SPECIFIC WRITTEN CONSENT. CROWN CASTLE RESERVES THE RIGHT TO DETERMINE WHETHER OR NOT A RESOLUTION IS ACCEPTABLE.
     - 9.11.3. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO CROWN CASTLE. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
     - 9.11.4. THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWINGS
X	EOR REVIEW
X	FABRICATION INSPECTION
X	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
X	FABRICATOR NDE 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
X	POST INSTALLED ANCHOR ROD VERIFICATION
X	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: PROVIDE PHOTO DOCUMENTATION OF EXCAVATION QUALITY AND COMPACTION
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
NA	MICROPILE/ROCK ANCHOR INSTALLER'S DRILLING AND INSTALLATION LOGS AND QA/QC DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	POST INSTALLED ANCHOR ROD TARGET TENSION LOAD TESTING
NA	REFER TO MICROPILE/ROCK ANCHOR NOTES FOR SPECIAL INSPECTION AND TESTING REQUIREMENTS.
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

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

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DESIGNED BY:	J.W.M.
CHECKED BY:	KJS
DATE:	08-26-2015

MI CHECKLIST

S-10

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER
9.3.15

37515-2530.001.DWG

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

December 18, 2015

Honorable Robert R. Simmons
1st Selectman, Town of Stonington
Town Hall 152 Elm St.
Stonington, CT 06378-0352

Re: Telecommunications Facility – 82 Mechanic Street

Dear Mr. Simmons:

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

December 18, 2015

Whittaker Technical Products Inc.
1955 N. Surveyor Avenue
Simi Valley, CA 93063

Re: Telecommunications Facility – 82 Mechanic Street, Stonington, CT

To Whom it May Concern:

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