



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

October 19, 2015

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

RE: T-Mobile - Exempt Modification - Crown Site BU: 876320
T-Mobile Site ID: CT11082E
Located at: 528 Wheelers Farm Road, Milford, CT 06460

Dear Ms. Bachman:

This letter and exhibits are submitted on behalf of T-Mobile. T-Mobile is making modifications to certain existing sites in its Connecticut system in order to implement their 700MHz technology. Please accept this letter and exhibits as notification, pursuant to § 16-50j-73 of the Regulations of Connecticut State Agencies (“R.C.S.A.”), of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In compliance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to The Honorable Benjamin G. Blake, Mayor, City of Milford and Roseanne Condon, Boys Village Youth and Family Services as Property Owner..

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at **528 Wheelers Farm Road, Milford, CT**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to T-Mobile’s operations at the site (Exhibit-3).

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

1. The proposed modifications will not result in an increase in the height of the existing tower. T-Mobile’s additional antennas will be located at the same elevation on the existing tower.
2. There will be no proposed modifications to the ground and no extension of boundaries.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

Melanie A. Bachman

October 19, 2015

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4. A Structural Modification Report confirming that the tower and foundation can support T-Mobile's proposed modifications is included as Exhibit-2.
5. The operation of the additional antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table report for T-Mobile's modified facility is included as Exhibit-3.

For the foregoing reasons, T-Mobile respectfully submits the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Kimberly Myl.

Sincerely,



Kimberly Myl
Real Estate Specialist

Enclosures

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes

Tab 2: Exhibit-2: Structural Modification Report

Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

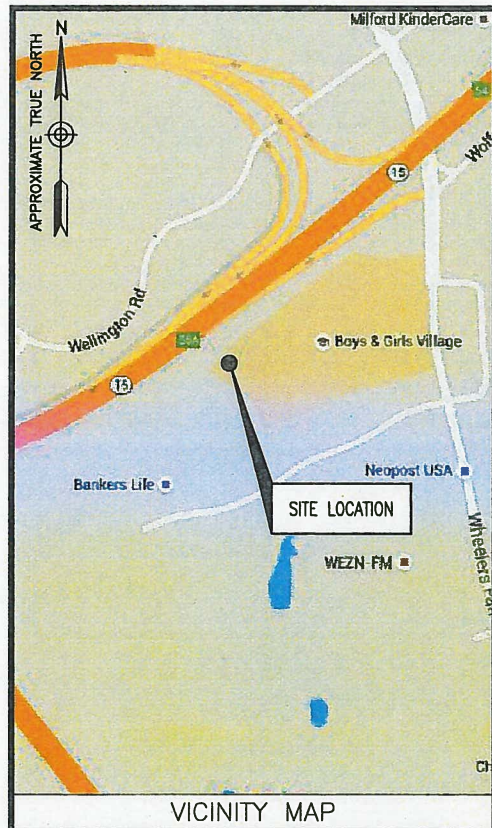
cc: The Honorable Benjamin G. Blake, Mayor
City of Milford
70 West River Street
Milford, CT 06460

Boys Village Youth and Family Services
Attn: Roseanne Condon
528 Wheelers Farm Road
Milford, CT 06460

T-Mobile

T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11082E
CROWN CASTLE BU #: 876320
SITE NAME: 528 WHEELERS FARM RD
528 WHEELERS FARMS ROAD
MILFORD, CT 06460
NEW HAVEN COUNTY



VICINITY MAP

FROM PARSIPPANY, NJ:

DEPART SYLVAN WAY AND TAKE I-287 N TOWARD ALBANY. USE THE RIGHT 2 LANES TO MERGE ONTO I-287 E/I-87 S TOWARD TAPPAN ZEE BR. STAY ON I-287 E AND FOLLOW SIGNS FOR WHITE PLAINS. TAKE EXIT 9N-9S FOR HUTCHINSON PKWY TOWARD WHITE STONE BRIDGE/MERRITT PKWY. MERGE ONTO HUTCHINSON RIVER PKWY N. CONTINUE ONTO CT-15 N. USE THE MIDDLE LANE TO STAY ON CT-15 N. TAKE EXIT 55A FOR WHEELERS FARMS RD. SITE WILL BE ON THE RIGHT.

ENGINEER
 DEWBERRY ENGINEERS INC.
 600 PARSIPPANY ROAD
 SUITE 301
 PARSIPPANY, NJ 07054
 CONTACT: BRYAN HUFF
 PHONE #: (973) 576-0147

CONSTRUCTION
 CROWN CASTLE
 3 CORPORATE PARK DRIVE, SUITE 101
 CLIFTON PARK, NY 12065
 CONTACT: PATRICIA PELON
 PHONE #: (518) 373-3507

CONSULTANT TEAM

SITE NAME:
 528 WHEELERS FARM RD

SITE NUMBER:
 CT11082E

TOWER OWNER:
 CROWN CASTLE
 3 CORPORATE PARK DRIVE, SUITE 101
 CLIFTON PARK, NY 12065

APPLICANT/DEVELOPER:
 T-MOBILE NORTHEAST LLC
 4 SYLVAN WAY
 PARSIPPANY, NJ 07054

COORDINATES:
 LATITUDE: 41°-14'-54.35" N (NAD83)
 LONGITUDE: 73°-04'-44.67" W (NAD83)
 (PER CROWN CASTLE)

CONFIGURATION
702Cu

PROJECT SUMMARY

SITE ADDRESS:
 528 WHEELERS FARMS ROAD
 MILFORD, CT 06460
 NEW HAVEN COUNTY

PROJECT DIRECTORY

- INSTALL (3) NEW ANTENNAS.
- INSTALL (3) NEW RRU'S.
- REMOVE (6) EXISTING LINES OF COAX.
- REMOVE EXISTING ANTENNAS, MOUNTS & CABLES
 @ 82'-0"± CENTERLINE ELEVATION.
- REMOVE EXISTING ANTENNAS, MOUNTS & CABLES
 @ 128'-0"± CENTERLINE ELEVATION.

SCOPE OF WORK

THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.

A.D.A. COMPLIANCE:
 FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.

SCOPE OF WORK

SHT. NO.	DESCRIPTION
T-1	TITLE SHEET
G-1	GENERAL NOTES
C-1	COMPOUND PLAN & EQUIPMENT PLANS
C-2	ANTENNA LAYOUTS & ELEVATIONS
C-3	CONSTRUCTION DETAILS
E-1	GROUNDING NOTES & DETAILS

SHEET INDEX

T-Mobile

T-MOBILE NORTHEAST LLC
 4 SYLVAN WAY
 PARSIPPANY, NJ 07054



CROWN CASTLE
 3 CORPORATE PARK DRIVE, SUITE 101
 CLIFTON PARK, NY 12065

CT11082E
528 WHEELERS FARM RD

CONSTRUCTION DRAWINGS

REV	DATE	DESCRIPTION
0	10/19/15	ISSUED AS FINAL
A	10/07/15	ISSUED FOR REVIEW



Dewberry Engineers Inc.
 600 PARSIPPANY ROAD
 SUITE 301
 PARSIPPANY, NJ 07054
 PHONE: 973.739.9400
 FAX: 973.739.9710



DRAWN BY: RA

REVIEWED BY: BSH

CHECKED BY: GHN

PROJECT NUMBER: 50066258

JOB NUMBER: 50074608

SITE ADDRESS:

528 WHEELERS FARMS ROAD
 MILFORD, CT 06460
 NEW HAVEN COUNTY

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1



Date: September 1, 2015

Danielle Gardner
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
704.405.6615

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

Subject: Structural Modification Report

Carrier Designation:	T-Mobile Co-Locate	
	Carrier Site Number:	CT11082E
	Carrier Site Name:	Stratford/ MP X 53/Main
Crown Castle Designation:	Crown Castle BU Number:	876320
	Crown Castle Site Name:	528 Wheelers Farm Rd
	Crown Castle JDE Job Number:	340889
	Crown Castle Work Order Number:	1101579
	Crown Castle Application Number:	303773 Rev. 0

Engineering Firm Designation: Paul J Ford and Company Project Number: 37515-1743.006.7700
(Revised Wording)

Site Data: 528 Wheelers Farm Road, MILFORD, New Haven County, CT
Latitude 41° 14' 54.35", Longitude -73° 4' 44.67"
120 Foot - Monopole Tower

Dear Danielle Gardner,

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 813423, in accordance with application 303773, revision 0.

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

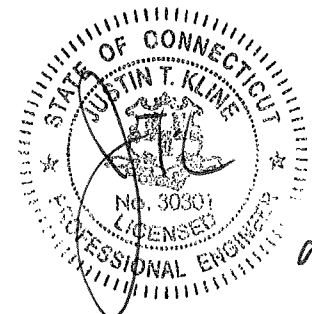
LC4.7: Modified Structure w/ Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 110 mph converted to a fastest mile wind speed of 90 mph with no ice, 37.6 mph with 1.25 inch ice thickness and 50 mph under service loads.

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

Respectfully submitted by:


Bob Koors, E.I.
Structural Designer



9-6-15

Date: **September 1, 2015**

Danielle Gardner
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
704.405.6615

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

Subject: Structural Modification Report

Carrier Designation: *T-Mobile Co-Locate*
Carrier Site Number: CT11082E
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Bob Koors, E.I.
Structural Designer

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1) INTRODUCTION

This tower is a 120 ft Monopole tower designed by SUMMIT in February of 1997. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 110 mph converted to a fastest mile wind speed of 90 mph with no ice, 37.6 mph with 1.25 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
105.0	107.0	3	commscope	LNx-6515DS-VTM w/ Mount Pipe	-	-	-
		3	ericsson	RRUS 11 B12			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note	
127.0	128.0	3	rfs celwave	APXV18-206516S-C-A20 w/ Mount Pipe	6	1-5/8	3	
	127.0	1	miscl	12' x 8" Cylinder				
		1	tower mounts	Pipe Mount (PM 701-1)				
122.0	125.0	2	andrew	VHLP2-11	6 3 4	5/16 1-1/4 1/2	1	
	123.0	1	andrew	PX2F-52				
		1	mti wireless edge	MT-485025				
	122.0	122.0	3	argus technologies				LLPX310R w/ Mount Pipe
			3	samsung telecommunications				FDD_R6_RRH
			1	tower mounts				Platform Mount [LP 713-1]
	121.0	121.0	3	alcatel lucent				800 EXTERNAL NOTCH FILTER
			3	alcatel lucent				800MHZ RRH
			3	alcatel lucent				PCS 1900MHz 4x45W-65MHz
			9	rfs celwave				ACU-A20-N
			3	rfs celwave				APXVSP18-C-A20 w/ Mount Pipe
			3	alcatel lucent				TD-RRH8x20-25
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe	1	1-1/4	2	

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
113.0	113.0	1	tower mounts	Platform Mount [LP 305-1]	11 1	1-5/8 1/2	1
	114.0	4	antel	LPA-80063/4CF w/ Mount Pipe			
		2	decibel	DB846F65ZAXY w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
	116.0	1	trimble	ACUTIME 2000	1	1-5/8	2
	114.0	3	alcatel lucent	RRH2X60-1900			
		3	alcatel lucent	RRH2x60-700			
		3	alcatel lucent	RRH2x60-AWS			
		9	commscope	SBNHH-1D65B w/ Mount Pipe			
	1	rfs celwave	DB-T1-6Z-8AB-0Z				
105.0	107.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	7	1-5/8	1
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		1	ericsson	KRY 112 144/1			
	105.0	2	ericsson	KRY 112 144/1			
		1	tower mounts	Platform Mount [LP 712-1]			
97.0	97.0	3	ericsson	RRUS-32 B30	-	-	2
		1	raycap	DC6-48-60-18-8F	-	-	1
		6	ericsson	RRUS 11			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Side Arm Mount [SO 102-3]			
96.0	97.0	3	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe	1 2	3/8 5/8	2
		6	powerwave technologies	7770.00 w/ Mount Pipe	1 2 12	3/8 5/8 1-1/4	1
		12	powerwave technologies	LGP2140X			
		3	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe			
	96.0	1	tower mounts	Platform Mount [LP 601-1]			
82.0	82.0	12	decibel	DB844H90-XY w/ Mount Pipe	12	7/8	3
		1	tower mounts (cci)	Platform Mount [LP 712-1]			
75.0	76.0	1	trimble	ACUTIME 2000	1	1/2	1
	75.0	1	tower mounts	Side Arm Mount [SO 701-1]			

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

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 08-10145E G1, 10/22/2008	1613534	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit, 2249, 02/27/1997	1614583	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit, 2249, 02/27/1997	1614557	CCISITES
4-POST-MODIFICATION INSPECTION	Semaan, CT03XC038, 05/17/2004	3350209	CCISITES
4-POST-MODIFICATION INSPECTION	B&T, 80214, 07/15/2009	2460628	CCISITES
4-POST-MODIFICATION INSPECTION	B&T, 80214.003, 04/04/2012	3349204	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 1210009, 04/01/2013	3753892	CCISITES
4-POST-MODIFICATION INSPECTION	SGS, 145190, 06/23/15	5760332	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) Monopole was reinforced in conformance with the referenced modification drawings.
- 5) Monopole will be reinforced in conformance with the attached 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	120 - 96.75	Pole	TP26.6976x22x0.25	1	-8.80	1021.68	74.2	Pass
L2	96.75 - 90.0833	Pole	TP28.0446x26.6976x0.3741	2	-11.77	1348.70	82.2	Pass
L3	90.0833 - 89.5	Pole	TP28.1625x28.0446x0.4881	3	-11.90	1600.67	71.6	Pass
L4	89.5 - 78	Pole	TP30.486x28.1625x0.6246	4	-13.75	2187.51	70.1	Pass
L5	78 - 76.75	Pole	TP30.2385x28.4792x0.6844	5	-15.78	2425.97	74.3	Pass
L6	76.75 - 72	Pole	TP31.1982x30.2385x0.7684	6	-17.28	2511.59	80.8	Pass
L7	72 - 70.5	Pole	TP31.5013x31.1982x0.7596	7	-17.73	2512.69	83.3	Pass
L8	70.5 - 69.75	Pole	TP31.6528x31.5013x0.8415	8	-17.99	2972.20	71.9	Pass
L9	69.75 - 56	Pole	TP34.4308x31.6528x0.6901	9	-22.13	2916.86	92.3	Pass
L10	56 - 54	Pole	TP34.8349x34.4308x0.7794	10	-22.82	3465.72	80.4	Pass
L11	54 - 53.5	Pole	TP34.9359x34.8349x0.7812	11	-23.01	3582.14	78.4	Pass
L12	53.5 - 39.75	Pole	TP37.714x34.9359x0.621	12	-25.74	3199.04	97.8	Pass
L13	39.75 - 35	Pole	TP38.0487x35.5123x0.7536	13	-30.29	4011.97	88.7	Pass
L14	35 - 25	Pole	TP40.069x38.0487x0.7306	14	-34.03	4117.70	94.9	Pass
L15	25 - 14.5	Pole	TP42.1905x40.069x0.7714	15	-38.32	4590.76	93.0	Pass
L16	14.5 - 12.5	Pole	TP42.5945x42.1905x0.8155	16	-39.20	4901.57	88.6	Pass
L17	12.5 - 5.5	Pole	TP44.0088x42.5945x0.7987	17	-42.29	4977.25	91.7	Pass
L18	5.5 - 4.75	Pole	TP44.1603x44.0088x0.7413	18	-42.61	4752.05	96.3	Pass
L19	4.75 - 0	Pole	TP45.12x44.1603x0.7716	19	-44.70	5292.28	89.4	Pass
							Summary	
						Pole (L12)	97.8	Pass
						RATING =	97.8	Pass

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	90.7	Pass
1	Base Plate	0	53.2	Pass
1	Base Foundation Steel	0	75.7	Pass
1,2	Base Foundation Soil Interaction	0	99.8	Pass

Structure Rating (max from all components) =	99.8%
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Notes:

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

4.1) Recommendations

The monopole and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads once the proposed modifications are installed.

- 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 Haven County, Connecticut.
- 2) Basic wind speed of 90 mph.
- 3) Nominal ice thickness of 1.2500 in.
- 4) Ice thickness is considered to increase with height.
- 5) Ice density of 56.00 pcf.
- 6) A wind speed of 38 mph is used in combination with ice.
- 7) Temperature drop of 50 °F.
- 8) Deflections calculated using a wind speed of 50 mph.
- 9) A non-linear (P-delta) analysis was used.
- 10) Pressures are calculated at each section.
- 11) Stress ratio used in pole design is 1.333.
- 12) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	120.0000-96.7500	23.2500	0.00	12	22.0000	26.6976	0.2500	1.0000	A607-60 (60 ksi)
L2	96.7500-90.0833	6.6667	0.00	12	26.6976	28.0446	0.3741	1.4964	Reinf 50.59 ksi (51 ksi)
L3	90.0833-89.5000	0.5833	0.00	12	28.0446	28.1625	0.4881	1.9525	Reinf 46.01 ksi (46 ksi)
L4	89.5000-78.0000	11.5000	3.75	12	28.1625	30.4860	0.6246	2.4982	Reinf 46.73 ksi (47 ksi)
L5	78.0000-76.7500	5.0000	0.00	12	28.4792	30.2385	0.6844	2.7377	Reinf 46.57 ksi (47 ksi)
L6	76.7500-72.0000	4.7500	0.00	12	30.2385	31.1982	0.7684	3.0735	Reinf 41.71 ksi (42 ksi)
L7	72.0000-70.5000	1.5000	0.00	12	31.1982	31.5013	0.7596	3.0386	Reinf 41.78 ksi (42 ksi)
L8	70.5000-69.7500	0.7500	0.00	12	31.5013	31.6528	0.8415	3.3662	Reinf 44.51 ksi (45 ksi)
L9	69.7500-56.0000	13.7500	0.00	12	31.6528	34.4308	0.6901	2.7605	Reinf 48.64 ksi (49 ksi)
L10	56.0000-54.0000	2.0000	0.00	12	34.4308	34.8349	0.7794	3.1176	Reinf 50.70 ksi (51 ksi)
L11	54.0000-53.5000	0.5000	0.00	12	34.8349	34.9359	0.7812	3.1248	Reinf 52.13 ksi (52 ksi)
L12	53.5000-39.7500	13.7500	4.75	12	34.9359	37.7140	0.6210	2.4839	Reinf 55.36 ksi (55 ksi)
L13	39.7500-35.0000	9.5000	0.00	12	35.5123	38.0487	0.7536	3.0143	Reinf 55.43 ksi (55 ksi)
L14	35.0000-25.0000	10.0000	0.00	12	38.0487	40.0690	0.7306	2.9225	Reinf 55.63 ksi (56 ksi)
L15	25.0000-14.5000	10.5000	0.00	12	40.0690	42.1904	0.7714	3.0857	Reinf 55.79 ksi (56 ksi)
L16	14.5000-12.5000	2.0000	0.00	12	42.1904	42.5945	0.8155	3.2621	Reinf 55.86 ksi (56 ksi)
L17	12.5000-5.5000	7.0000	0.00	12	42.5945	44.0088	0.7987	3.1948	Reinf 56.00 ksi (56 ksi)
L18	5.5000-4.7500	0.7500	0.00	12	44.0088	44.1603	0.7413	2.9651	Reinf 57.33 ksi (57 ksi)
L19	4.7500-0.0000	4.7500		12	44.1603	45.1200	0.7716	3.0866	Reinf 60.05 ksi (60 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	22.7761	17.5087	1057.2060	7.7865	11.3960	92.7699	2142.1860	8.6173	5.2260	20.904
	27.6394	21.2903	1900.8206	9.4682	13.8294	137.4482	3851.5778	10.4785	6.4850	25.94
L2	27.6394	31.7102	2804.6072	9.4238	13.8294	202.8009	5682.8945	15.6068	6.1523	16.445
	29.0339	33.3328	3257.5545	9.9060	14.5271	224.2398	6600.6886	16.4054	6.5133	17.41
L3	29.0339	43.3127	4198.0545	9.8652	14.5271	288.9808	8506.3966	21.3172	6.2078	12.717
	29.1559	43.4979	4252.1463	9.9074	14.5881	291.4795	8616.0012	21.4083	6.2393	12.782
L4	29.1559	55.3801	5360.4530	9.8586	14.5881	367.4526	10861.7310	27.2564	5.8737	9.405
	31.5614	60.0529	6835.0502	10.6904	15.7917	432.8242	13849.6649	29.5562	6.4965	10.402
L5	30.8499	61.2551	6040.2543	9.9505	14.7522	409.4467	12239.1927	30.1479	5.7982	8.472
	31.3052	65.1322	7261.3413	10.5804	15.6635	463.5823	14713.4460	32.0561	6.2697	9.161
L6	31.3052	72.9136	8082.7357	10.5503	15.6635	516.0222	16377.8138	35.8858	6.0447	7.867
	32.2987	75.2880	8898.3682	10.8939	16.1607	550.6190	18030.5064	37.0545	6.3019	8.202
L7	32.2987	74.4539	8804.8412	10.8970	16.1607	544.8317	17840.9954	36.6440	6.3253	8.327
	32.6125	75.1953	9070.4722	11.0055	16.3177	555.8687	18379.2358	37.0088	6.4065	8.434
L8	32.6125	83.0804	9968.3009	10.9762	16.3177	610.8906	20198.4801	40.8897	6.1870	7.352
	32.7694	83.4911	10116.8320	11.0304	16.3961	617.0250	20499.4445	41.0918	6.2276	7.4
L9	32.7694	68.8058	8419.5236	11.0846	16.3961	513.5063	17060.2375	33.8641	6.6334	9.612
	35.6454	74.9792	10895.2043	12.0792	17.8352	610.8829	22076.6378	36.9025	7.3779	10.691
L10	35.6454	84.4539	12207.1191	12.0472	17.8352	684.4407	24734.9329	41.5657	7.1387	9.159
	36.0638	85.4680	12652.1628	12.1919	18.0445	701.1649	25636.7120	42.0648	7.2470	9.298
L11	36.0638	85.6620	12679.5230	12.1912	18.0445	702.6812	25692.1512	42.1602	7.2421	9.27
	36.1683	85.9161	12792.6991	12.2274	18.0968	706.9033	25921.4767	42.2853	7.2692	9.305
L12	36.1683	68.6147	10312.6416	12.2848	18.0968	569.8594	20896.2078	33.7701	7.6986	12.398
	39.0444	74.1696	13025.5484	13.2793	19.5359	666.7510	26393.2924	36.5040	8.4431	13.596
L13	38.0780	84.3420	13006.4532	12.4436	18.3954	707.0494	26354.6005	41.5106	7.4977	9.95
	39.3909	90.4964	16066.4675	13.3516	19.7092	815.1758	32555.0191	44.5396	8.1775	10.852
L14	39.3909	87.7943	15605.9372	13.3599	19.7092	791.8095	31621.8598	43.2097	8.2390	11.277
	41.4825	92.5474	18280.3336	14.0832	20.7558	880.7353	37040.9119	45.5490	8.7804	12.018
L15	41.4825	97.6142	19241.1694	14.0685	20.7558	927.0278	38987.8257	48.0427	8.6711	11.24
	43.6788	102.8837	22528.5110	14.8280	21.8547	1030.8336	45648.8710	50.6362	9.2396	11.977
L16	43.6788	108.6508	23740.6860	14.8122	21.8547	1086.2989	48105.0663	53.4746	9.1214	11.185
	44.0971	109.7119	24443.0600	14.9569	22.0640	1107.8274	49528.2664	53.9969	9.2297	11.317
L17	44.0971	107.4898	23967.2900	14.9629	22.0640	1086.2641	48564.2274	52.9032	9.2748	11.613
	45.5613	111.1269	26483.5307	15.4692	22.7966	1161.7340	53662.8132	54.6933	9.6539	12.087
L18	45.5613	103.2762	24677.9916	15.4898	22.7966	1082.5317	50004.3016	50.8294	9.8077	13.231
	45.7181	103.6378	24938.1806	15.5440	22.8750	1090.1915	50531.5136	51.0074	9.8483	13.286

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L19	45.7181	107.8070	25905.135	15.5331	22.8750	1132.4627	52490.827	53.0593	9.7670	12.657
			5				7			
	46.7117	110.1915	27662.361	15.8767	23.3722	1183.5603	56051.443	54.2329	10.0242	12.991
			2				3			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft ²	in					in	in
L1 120.0000-				1	1	1		
96.7500								
L2 96.7500-				1	1	1		
90.0833								
L3 90.0833-				1	1	1		
89.5000								
L4 89.5000-				1	1	1		
78.0000								
L5 78.0000-				1	1	1		
76.7500								
L6 76.7500-				1	1	1		
72.0000								
L7 72.0000-				1	1	1		
70.5000								
L8 70.5000-				1	1	1		
69.7500								
L9 69.7500-				1	1	1		
56.0000								
L10 56.0000-				1	1	1		
54.0000								
L11 54.0000-				1	1	1		
53.5000								
L12 53.5000-				1	1	1		
39.7500								
L13 39.7500-				1	1	1		
35.0000								
L14 35.0000-				1	1	1		
25.0000								
L15 25.0000-				1	1	1		
14.5000								
L16 14.5000-				1	1	1		
12.5000								
L17 12.5000-				1	1	1		
5.5000								
L18 5.5000-				1	1	1		
4.7500								
L19 4.7500-				1	1	1		
0.0000								

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number	C _A A _A	Weight
				ft		ft ² /ft	plf

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		CAAA ft ² /ft	Weight plf

9207(5/16")	C	No	CaAa (Out Of Face)	120.0000 - 0.0000	6	No Ice	0.0000	0.60
						1/2" Ice	0.0000	1.11
						1" Ice	0.0000	2.22
						2" Ice	0.0000	6.29
						4" Ice	0.0000	21.76
7983A(1/2")	C	No	CaAa (Out Of Face)	120.0000 - 0.0000	4	No Ice	0.0000	0.08
						1/2" Ice	0.0000	0.74
						1" Ice	0.0000	2.01
						2" Ice	0.0000	6.39
						4" Ice	0.0000	22.47
2" Conduit (1 1/2" EMT)	C	No	CaAa (Out Of Face)	120.0000 - 0.0000	1	No Ice	0.0000	1.16
						1/2" Ice	0.0000	2.53
						1" Ice	0.0000	4.51
						2" Ice	0.0000	10.30
						4" Ice	0.0000	29.21
2" Conduit (1 1/2" EMT)	C	No	CaAa (Out Of Face)	120.0000 - 0.0000	1	No Ice	0.1740	1.16
						1/2" Ice	0.2740	2.53
						1" Ice	0.3740	4.51
						2" Ice	0.5740	10.30
						4" Ice	0.9740	29.21
HB114-13U3M12-XXXF(1-1/4")	C	No	CaAa (Out Of Face)	120.0000 - 0.0000	1	No Ice	0.0000	0.99
						1/2" Ice	0.0000	2.24
						1" Ice	0.0000	4.10
						2" Ice	0.0000	9.64
						4" Ice	0.0000	28.07
HB114-1-0813U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	120.0000 - 0.0000	2	No Ice	0.0000	1.20
						1/2" Ice	0.0000	2.45
						1" Ice	0.0000	4.30
						2" Ice	0.0000	9.85
						4" Ice	0.0000	28.27
HB114-1-0813U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	120.0000 - 0.0000	1	No Ice	0.1540	1.20
						1/2" Ice	0.2540	2.45
						1" Ice	0.3540	4.30
						2" Ice	0.5540	9.85
						4" Ice	0.9540	28.27

LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	113.0000 - 0.0000	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.84
						1" Ice	0.0000	2.14
						2" Ice	0.0000	6.58
						4" Ice	0.0000	22.78
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	113.0000 - 0.0000	1	No Ice	0.0000	0.82
						1/2" Ice	0.0000	2.33
						1" Ice	0.0000	4.46
						2" Ice	0.0000	10.54
						4" Ice	0.0000	30.04
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	113.0000 - 0.0000	9	No Ice	0.0000	0.82
						1/2" Ice	0.0000	2.33
						1" Ice	0.0000	4.46
						2" Ice	0.0000	10.54
						4" Ice	0.0000	30.04
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	113.0000 - 0.0000	2	No Ice	0.1980	0.82
						1/2" Ice	0.2980	2.33
						1" Ice	0.3980	4.46
						2" Ice	0.5980	10.54
						4" Ice	0.9980	30.04

LDF7-50A(1-5/8")	C	No	Inside Pole	105.0000 - 0.0000	1	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
						2" Ice	0.0000	0.82
						4" Ice	0.0000	0.82
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	105.0000 - 0.0000	6	No Ice	0.0000	0.82
						1/2" Ice	0.0000	2.33
						1" Ice	0.0000	4.46
						2" Ice	0.0000	10.54
						4" Ice	0.0000	30.04

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A		Weight
							ft ² /ft	plf
FB-L98B-002-50000(3/8)	C	No	CaAa (Out Of Face)	97.0000 - 0.0000	1	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.61
						1" Ice	0.0000	1.76
						2" Ice	0.0000	5.91
						4" Ice	0.0000	21.53
WR-VG82ST-BRDA(5/8")	C	No	CaAa (Out Of Face)	97.0000 - 0.0000	2	No Ice	0.0000	0.31
						1/2" Ice	0.0000	1.01
						1" Ice	0.0000	2.32
						2" Ice	0.0000	6.77
						4" Ice	0.0000	23.01
FB-L98B-002-50000(3/8)	C	No	Inside Pole	97.0000 - 0.0000	1	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
						2" Ice	0.0000	0.06
						4" Ice	0.0000	0.06
WR-VG82ST-BRDA(5/8")	C	No	Inside Pole	97.0000 - 0.0000	2	No Ice	0.0000	0.31
						1/2" Ice	0.0000	0.31
						1" Ice	0.0000	0.31
						2" Ice	0.0000	0.31
						4" Ice	0.0000	0.31
LDF6-50A(1-1/4")	C	No	Inside Pole	96.0000 - 0.0000	12	No Ice	0.0000	0.66
						1/2" Ice	0.0000	0.66
						1" Ice	0.0000	0.66
						2" Ice	0.0000	0.66
						4" Ice	0.0000	0.66

LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	75.0000 - 0.0000	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.84
						1" Ice	0.0000	2.14
						2" Ice	0.0000	6.58
						4" Ice	0.0000	22.78

C6 x 10.5	C	No	CaAa (Out Of Face)	56.0000 - 0.0000	2	No Ice	0.3390	0.00
						1/2" Ice	0.4223	0.00
						1" Ice	0.5057	0.00
						2" Ice	0.6723	0.00
						4" Ice	1.0057	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	92.0000 - 56.0000	2	No Ice	0.1667	0.00
						1/2" Ice	0.2778	0.00
						1" Ice	0.3889	0.00
						2" Ice	0.6111	0.00
						4" Ice	1.0556	0.00
**								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	120.0000-96.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	14.061	0.46
L2	96.7500-90.0833	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	5.466	0.23
L3	90.0833-89.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.617	0.02
L4	89.5000-78.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	12.159	0.41
L5	78.0000-76.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.322	0.04
L6	76.7500-72.0000	A	0.000	0.000	0.000	0.000	0.00

Tower Sectio n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _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	5.022	0.17
L7	72.0000-70.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.586	0.05
L8	70.5000-69.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.793	0.03
L9	69.7500-56.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	14.538	0.50
L10	56.0000-54.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.804	0.07
L11	54.0000-53.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.701	0.02
L12	53.5000-39.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	19.277	0.50
L13	39.7500-35.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.659	0.17
L14	35.0000-25.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	14.020	0.36
L15	25.0000-14.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	14.721	0.38
L16	14.5000-12.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.804	0.07
L17	12.5000-5.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.814	0.25
L18	5.5000-4.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.051	0.03
L19	4.7500-0.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.659	0.17

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Sectio n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	120.0000-96.7500	A	0.865	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	27.723	1.94
L2	96.7500-90.0833	A	0.850	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	10.721	0.83
L3	90.0833-89.5000	A	0.846	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.231	0.07
L4	89.5000-78.0000	A	0.839	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	24.160	1.43
L5	78.0000-76.7500	A	0.831	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.626	0.16
L6	76.7500-72.0000	A	0.827	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	9.910	0.59
L7	72.0000-70.5000	A	0.823	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	A _R	A _F	C _A A _A In Face	C _A A _A Out Face	Weight
n	ft		in	ft ²	ft ²	ft ²	ft ²	K
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.121	0.19
L8	70.5000-69.7500	A	0.821	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.559	0.09
L9	69.7500-56.0000	A	0.810	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	28.401	1.68
L10	56.0000-54.0000	A	0.797	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	4.611	0.24
L11	54.0000-53.5000	A	0.795	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.152	0.06
L12	53.5000-39.7500	A	0.782	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	31.457	1.63
L13	39.7500-35.0000	A	0.761	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	10.867	0.56
L14	35.0000-25.0000	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	22.520	1.14
L15	25.0000-14.5000	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	23.646	1.20
L16	14.5000-12.5000	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	4.504	0.23
L17	12.5000-5.5000	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	15.764	0.80
L18	5.5000-4.7500	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.689	0.09
L19	4.7500-0.0000	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	10.697	0.54

Feed Line Center of Pressure

Section	Elevation	CP _x	CP _z	CP _x	CP _z
	ft	in	in	Ice in	Ice in
L1	120.0000-96.7500	-0.6133	0.3541	-0.9456	0.5460
L2	96.7500-90.0833	-0.7850	0.4532	-1.1848	0.6841
L3	90.0833-89.5000	-0.9463	0.5463	-1.3976	0.8069
L4	89.5000-78.0000	-0.9587	0.5535	-1.4237	0.8220
L5	78.0000-76.7500	-0.9654	0.5574	-1.4396	0.8312
L6	76.7500-72.0000	-0.9720	0.5612	-1.4502	0.8373
L7	72.0000-70.5000	-0.9778	0.5645	-1.4620	0.8441
L8	70.5000-69.7500	-0.9798	0.5657	-1.4661	0.8465
L9	69.7500-56.0000	-0.9924	0.5730	-1.4913	0.8610
L10	56.0000-54.0000	-1.2258	0.7077	-1.6235	0.9373
L11	54.0000-53.5000	-1.2287	0.7094	-1.6280	0.9399
L12	53.5000-39.7500	-1.2447	0.7187	-1.6522	0.9539
L13	39.7500-35.0000	-1.2563	0.7253	-1.6738	0.9664
L14	35.0000-25.0000	-1.2729	0.7349	-1.6907	0.9761
L15	25.0000-14.5000	-1.2925	0.7462	-1.7274	0.9973
L16	14.5000-12.5000	-1.3038	0.7528	-1.7488	1.0096
L17	12.5000-5.5000	-1.3116	0.7573	-1.7636	1.0182
L18	5.5000-4.7500	-1.3182	0.7611	-1.7762	1.0255
L19	4.7500-0.0000	-1.3227	0.7637	-1.7849	1.0305

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
**									
APXVSP18-C-A20 w/ Mount Pipe	A	From Leg	4.0000 0.00 -1.00	0.00	122.0000	No Ice	8.4975	6.9458	0.08
						1/2" Ice	9.1490	8.1266	0.15
						1" Ice	9.7672	9.0212	0.23
						2" Ice	11.0311	10.8440	0.41
						4" Ice	13.6786	14.8507	0.91
						No Ice	8.4975	6.9458	0.08
APXVSP18-C-A20 w/ Mount Pipe	B	From Leg	4.0000 0.00 -1.00	0.00	122.0000	No Ice	8.4975	6.9458	0.08
						1/2" Ice	9.1490	8.1266	0.15
						1" Ice	9.7672	9.0212	0.23
						2" Ice	11.0311	10.8440	0.41
						4" Ice	13.6786	14.8507	0.91
						No Ice	8.4975	6.9458	0.08
APXVSP18-C-A20 w/ Mount Pipe	C	From Leg	4.0000 0.00 -1.00	0.00	122.0000	No Ice	8.4975	6.9458	0.08
						1/2" Ice	9.1490	8.1266	0.15
						1" Ice	9.7672	9.0212	0.23
						2" Ice	11.0311	10.8440	0.41
						4" Ice	13.6786	14.8507	0.91
						No Ice	8.4975	6.9458	0.08
LLPX310R w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	122.0000	No Ice	4.9623	2.8484	0.04
						1/2" Ice	5.3512	3.3668	0.08
						1" Ice	5.7501	3.9019	0.12
						2" Ice	6.5777	5.0799	0.23
						4" Ice	8.3714	7.8368	0.53
						No Ice	4.9623	2.8484	0.04
LLPX310R w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	122.0000	No Ice	4.9623	2.8484	0.04
						1/2" Ice	5.3512	3.3668	0.08
						1" Ice	5.7501	3.9019	0.12
						2" Ice	6.5777	5.0799	0.23
						4" Ice	8.3714	7.8368	0.53
						No Ice	4.9623	2.8484	0.04
LLPX310R w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	122.0000	No Ice	4.9623	2.8484	0.04
						1/2" Ice	5.3512	3.3668	0.08
						1" Ice	5.7501	3.9019	0.12
						2" Ice	6.5777	5.0799	0.23
						4" Ice	8.3714	7.8368	0.53
						No Ice	4.9623	2.8484	0.04
MT-485025	C	From Leg	4.0000 0.00 1.00	0.00	122.0000	No Ice	2.0752	0.2358	0.01
						1/2" Ice	2.2689	0.3329	0.01
						1" Ice	2.4713	0.4508	0.03
						2" Ice	2.9019	0.7125	0.06
						4" Ice	3.8669	1.3395	0.15
						No Ice	2.0752	0.2358	0.01
800 EXTERNAL NOTCH FILTER	A	From Leg	4.0000 0.00 -1.00	0.00	122.0000	No Ice	0.7701	0.3747	0.01
						1/2" Ice	0.8898	0.4647	0.02
						1" Ice	1.0181	0.5634	0.02
						2" Ice	1.3007	0.7868	0.04
						4" Ice	1.9696	1.3372	0.11
						No Ice	0.7701	0.3747	0.01
800 EXTERNAL NOTCH FILTER	B	From Leg	4.0000 0.00 -1.00	0.00	122.0000	No Ice	0.7701	0.3747	0.01
						1/2" Ice	0.8898	0.4647	0.02
						1" Ice	1.0181	0.5634	0.02
						2" Ice	1.3007	0.7868	0.04
						4" Ice	1.9696	1.3372	0.11
						No Ice	0.7701	0.3747	0.01
800 EXTERNAL NOTCH FILTER	C	From Leg	4.0000 0.00 -1.00	0.00	122.0000	No Ice	0.7701	0.3747	0.01
						1/2" Ice	0.8898	0.4647	0.02
						1" Ice	1.0181	0.5634	0.02
						2" Ice	1.3007	0.7868	0.04
						4" Ice	1.9696	1.3372	0.11
						No Ice	0.7701	0.3747	0.01

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral	Vert						ft
(3) ACU-A20-N	A	From Leg	4.0000	0.00	-1.00	0.00	122.0000	2" Ice	1.9696	1.3372	0.11
								4" Ice			
								No Ice	0.0778	0.1361	0.00
								1/2" Ice	0.1210	0.1890	0.00
								1" Ice	0.1728	0.2506	0.00
(3) ACU-A20-N	B	From Leg	4.0000	0.00	-1.00	0.00	122.0000	2" Ice	0.6654	0.8015	0.04
								4" Ice			
								No Ice	0.0778	0.1361	0.00
								1/2" Ice	0.1210	0.1890	0.00
								1" Ice	0.1728	0.2506	0.00
(3) ACU-A20-N	C	From Leg	4.0000	0.00	-1.00	0.00	122.0000	2" Ice	0.6654	0.8015	0.04
								4" Ice			
								No Ice	0.0778	0.1361	0.00
								1/2" Ice	0.1210	0.1890	0.00
								1" Ice	0.1728	0.2506	0.00
PCS 1900MHz 4x45W-65MHz	A	From Leg	4.0000	0.00	-1.00	0.00	122.0000	2" Ice	4.8623	4.7439	0.35
								4" Ice			
								No Ice	2.7087	2.6111	0.06
								1/2" Ice	2.9477	2.8475	0.08
								1" Ice	3.1953	3.0925	0.11
PCS 1900MHz 4x45W-65MHz	B	From Leg	4.0000	0.00	-1.00	0.00	122.0000	2" Ice	4.8623	4.7439	0.35
								4" Ice			
								No Ice	2.7087	2.6111	0.06
								1/2" Ice	2.9477	2.8475	0.08
								1" Ice	3.1953	3.0925	0.11
PCS 1900MHz 4x45W-65MHz	C	From Leg	4.0000	0.00	-1.00	0.00	122.0000	2" Ice	4.8623	4.7439	0.35
								4" Ice			
								No Ice	2.7087	2.6111	0.06
								1/2" Ice	2.9477	2.8475	0.08
								1" Ice	3.1953	3.0925	0.11
800MHZ RRH	A	From Leg	4.0000	0.00	-1.00	0.00	122.0000	2" Ice	4.4620	3.9265	0.32
								4" Ice			
								No Ice	2.4899	2.0685	0.05
								1/2" Ice	2.7061	2.2705	0.07
								1" Ice	2.9310	2.4812	0.10
800MHZ RRH	B	From Leg	4.0000	0.00	-1.00	0.00	122.0000	2" Ice	4.4620	3.9265	0.32
								4" Ice			
								No Ice	2.4899	2.0685	0.05
								1/2" Ice	2.7061	2.2705	0.07
								1" Ice	2.9310	2.4812	0.10
800MHZ RRH	C	From Leg	4.0000	0.00	-1.00	0.00	122.0000	2" Ice	4.4620	3.9265	0.32
								4" Ice			
								No Ice	2.4899	2.0685	0.05
								1/2" Ice	2.7061	2.2705	0.07
								1" Ice	2.9310	2.4812	0.10
FDD_R6_RRH	A	From Leg	4.0000	0.00	0.00	0.00	122.0000	2" Ice	3.4914	2.1432	0.20
								4" Ice			
								No Ice	1.7889	0.7778	0.03
								1/2" Ice	1.9715	0.9182	0.04
								1" Ice	2.1627	1.0673	0.06
FDD_R6_RRH	B	From Leg	4.0000	0.00	0.00	0.00	122.0000	2" Ice	3.4914	2.1432	0.20
								4" Ice			
								No Ice	1.7889	0.7778	0.03
								1/2" Ice	1.9715	0.9182	0.04
								1" Ice	2.1627	1.0673	0.06

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight
			Horz	Lateral	Vert					
			ft	ft	ft	°	ft	ft ²	ft ²	K
FDD_R6_RRH	C	From Leg	4.0000 0.00 0.00	0.00	122.0000		1" Ice	2.5710	1.3914	0.09
							2" Ice	3.4914	2.1432	0.20
							4" Ice			
							No Ice	1.7889	0.7778	0.03
							1/2" Ice	1.9715	0.9182	0.04
							1" Ice	2.1627	1.0673	0.06
							2" Ice	2.5710	1.3914	0.09
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.0000 0.00 -1.00	0.00	122.0000		2" Ice	3.4914	2.1432	0.20
							4" Ice			
							No Ice	7.1342	4.9591	0.08
							1/2" Ice	7.6618	5.7544	0.13
							Ice	8.1830	6.4723	0.19
							1" Ice	9.2563	8.0099	0.34
							2" Ice	11.5262	11.4120	0.75
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.0000 0.00 -1.00	0.00	122.0000		4" Ice			
							No Ice	7.1342	4.9591	0.08
							1/2" Ice	7.6618	5.7544	0.13
							Ice	8.1830	6.4723	0.19
							1" Ice	9.2563	8.0099	0.34
							2" Ice	11.5262	11.4120	0.75
							APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.0000 0.00 -1.00
No Ice	7.1342	4.9591	0.08							
1/2" Ice	7.6618	5.7544	0.13							
Ice	8.1830	6.4723	0.19							
1" Ice	9.2563	8.0099	0.34							
2" Ice	11.5262	11.4120	0.75							
TD-RRH8x20-25	A	From Leg	4.0000 0.00 -1.00	0.00	122.0000					
							No Ice	4.7198	1.7027	0.07
							1/2" Ice	5.0138	1.9196	0.10
							Ice	5.3165	2.1453	0.13
							1" Ice	5.9478	2.6224	0.20
							2" Ice	7.3141	3.6805	0.40
							TD-RRH8x20-25	B	From Leg	4.0000 0.00 -1.00
No Ice	4.7198	1.7027	0.07							
1/2" Ice	5.0138	1.9196	0.10							
Ice	5.3165	2.1453	0.13							
1" Ice	5.9478	2.6224	0.20							
2" Ice	7.3141	3.6805	0.40							
TD-RRH8x20-25	C	From Leg	4.0000 0.00 -1.00	0.00	122.0000					
							No Ice	4.7198	1.7027	0.07
							1/2" Ice	5.0138	1.9196	0.10
							Ice	5.3165	2.1453	0.13
							1" Ice	5.9478	2.6224	0.20
							2" Ice	7.3141	3.6805	0.40
							Platform Mount [LP 713-1]	C	None	
No Ice	31.2700	31.2700	1.51							
1/2" Ice	39.6800	39.6800	1.93							
Ice	48.0900	48.0900	2.35							
1" Ice	64.9100	64.9100	3.19							
2" Ice	98.5500	98.5500	4.86							
2.375" OD x 5' Mount Pipe	A	From Face	4.0000 0.00 0.00	0.00	122.0000					
							No Ice	1.1875	1.1875	0.02
							1/2" Ice	1.4956	1.4956	0.03
							Ice	1.8071	1.8071	0.04
							1" Ice	2.4580	2.4580	0.08
							2" Ice	3.9194	3.9194	0.20
							2.375" OD x 5' Mount Pipe	B	From Face	4.0000 0.00 0.00
No Ice	1.1875	1.1875	0.02							
1/2" Ice	1.4956	1.4956	0.03							
Ice	1.8071	1.8071	0.04							
1" Ice	2.4580	2.4580	0.08							
2" Ice	3.9194	3.9194	0.20							
2.375" OD x 5' Mount Pipe	C	From Face	4.0000 0.00	0.00	122.0000					
							No Ice	1.1875	1.1875	0.02
							1/2" Ice	1.4956	1.4956	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			0.00			Ice	1.8071	1.8071	0.04
						1" Ice	2.4580	2.4580	0.08
						2" Ice	3.9194	3.9194	0.20
						4" Ice			
**									
(2) DB846F65ZAXY w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	113.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.2708 7.8773 8.4838 9.7244 12.3252	7.8208 9.0097 9.9124 11.8119 15.9785	0.05 0.11 0.19 0.37 0.87
(2) LPA-80063/4CF w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	113.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.2481 7.7190 8.2003 9.1945 11.3199	7.2599 7.9574 8.6723 10.1556 13.3910	0.04 0.10 0.18 0.34 0.80
(2) LPA-80063/4CF w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	113.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.2481 7.7190 8.2003 9.1945 11.3199	7.2599 7.9574 8.6723 10.1556 13.3910	0.04 0.10 0.18 0.34 0.80
ACUTIME 2000	A	From Leg	4.0000 0.00 3.00	0.00	113.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.2975 0.3739 0.4589 0.6549 1.1506	0.2975 0.3739 0.4589 0.6549 1.1506	0.00 0.00 0.01 0.02 0.08
DB-T1-6Z-8AB-0Z	A	From Leg	4.0000 0.00 1.00	0.00	113.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.6000 5.9154 6.2395 6.9136 8.3654	2.3333 2.5580 2.7914 3.2840 4.3728	0.04 0.08 0.12 0.21 0.45
(3) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	113.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.6393 9.2963 9.9210 11.1952 13.8631	7.0730 8.2637 9.1753 11.0130 15.0524	0.07 0.14 0.21 0.39 0.90
(3) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	113.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.6393 9.2963 9.9210 11.1952 13.8631	7.0730 8.2637 9.1753 11.0130 15.0524	0.07 0.14 0.21 0.39 0.90
(3) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	113.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.6393 9.2963 9.9210 11.1952 13.8631	7.0730 8.2637 9.1753 11.0130 15.0524	0.07 0.14 0.21 0.39 0.90
RRH2x60-700	A	From Leg	4.0000 0.00 1.00	0.00	113.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.9569 4.2724 4.5965 5.2705 6.7224	1.8157 2.0752 2.3603 2.9566 4.2529	0.06 0.08 0.11 0.17 0.35
RRH2x60-700	B	From Leg	4.0000 0.00 1.00	0.00	113.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.9569 4.2724 4.5965 5.2705 6.7224	1.8157 2.0752 2.3603 2.9566 4.2529	0.06 0.08 0.11 0.17 0.35

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
RRH2x60-700	C	From Leg	4.0000	0.00	0.00	113.0000	No Ice	3.9569	1.8157	0.06
			0.00				1/2"	4.2724	2.0752	0.08
			1.00				Ice	4.5965	2.3603	0.11
							1" Ice	5.2705	2.9566	0.17
							2" Ice	6.7224	4.2529	0.35
DB-T1-6Z-8AB-0Z	A	From Leg	4.0000	0.00	0.00	113.0000	No Ice	5.6000	2.3333	0.04
			0.00				1/2"	5.9154	2.5580	0.08
			1.00				Ice	6.2395	2.7914	0.12
							1" Ice	6.9136	3.2840	0.21
							2" Ice	8.3654	4.3728	0.45
RRH2X60-1900	A	From Leg	4.0000	0.00	0.00	113.0000	No Ice	2.1865	1.4056	0.04
			0.00				1/2"	2.3936	1.5867	0.06
			1.00				Ice	2.6093	1.7765	0.08
							1" Ice	3.0666	2.1820	0.12
							2" Ice	4.0850	3.0967	0.26
RRH2X60-1900	B	From Leg	4.0000	0.00	0.00	113.0000	No Ice	2.1865	1.4056	0.04
			0.00				1/2"	2.3936	1.5867	0.06
			1.00				Ice	2.6093	1.7765	0.08
							1" Ice	3.0666	2.1820	0.12
							2" Ice	4.0850	3.0967	0.26
RRH2X60-1900	C	From Leg	4.0000	0.00	0.00	113.0000	No Ice	2.1865	1.4056	0.04
			0.00				1/2"	2.3936	1.5867	0.06
			1.00				Ice	2.6093	1.7765	0.08
							1" Ice	3.0666	2.1820	0.12
							2" Ice	4.0850	3.0967	0.26
RRH2x60-AWS	A	From Leg	4.0000	0.00	0.00	113.0000	No Ice	2.1904	1.4290	0.04
			0.00				1/2"	2.3976	1.6109	0.06
			1.00				Ice	2.6134	1.8015	0.08
							1" Ice	3.0710	2.2085	0.13
							2" Ice	4.0899	3.1263	0.26
RRH2x60-AWS	B	From Leg	4.0000	0.00	0.00	113.0000	No Ice	2.1904	1.4290	0.04
			0.00				1/2"	2.3976	1.6109	0.06
			1.00				Ice	2.6134	1.8015	0.08
							1" Ice	3.0710	2.2085	0.13
							2" Ice	4.0899	3.1263	0.26
RRH2x60-AWS	C	From Leg	4.0000	0.00	0.00	113.0000	No Ice	2.1904	1.4290	0.04
			0.00				1/2"	2.3976	1.6109	0.06
			1.00				Ice	2.6134	1.8015	0.08
							1" Ice	3.0710	2.2085	0.13
							2" Ice	4.0899	3.1263	0.26
Platform Mount [LP 305-1]	C	None			0.00	113.0000	No Ice	18.0100	18.0100	1.12
							1/2"	23.3300	23.3300	1.35
							Ice	28.6500	28.6500	1.58
							1" Ice	39.2900	39.2900	2.05
							2" Ice	60.5700	60.5700	2.97
** ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.0000	0.00	0.00	105.0000	No Ice	6.8253	5.6424	0.11
			0.00				1/2"	7.3471	6.4800	0.17
			2.00				Ice	7.8631	7.2567	0.23
							1" Ice	8.9261	8.8640	0.38
							2" Ice	11.1755	12.2932	0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.0000	0.00	0.00	105.0000	No Ice	6.8253	5.6424	0.11
			0.00				1/2"	7.3471	6.4800	0.17
			2.00				Ice	7.8631	7.2567	0.23
							1" Ice	8.9261	8.8640	0.38

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.0000	0.00	0.00	105.0000	2" Ice	11.1755	12.2932	0.81
							4" Ice			
							No Ice	6.8253	5.6424	0.11
							1/2" Ice	7.3471	6.4800	0.17
							1" Ice	7.8631	7.2567	0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.0000	0.00	0.00	105.0000	1" Ice	8.9261	8.8640	0.38
							2" Ice	11.1755	12.2932	0.81
							4" Ice			
							No Ice	6.8155	5.6334	0.11
							1/2" Ice	7.3373	6.4717	0.17
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.0000	0.00	0.00	105.0000	Ice	7.8532	7.2478	0.23
							1" Ice	8.9160	8.8537	0.38
							2" Ice	11.1650	12.2804	0.81
							4" Ice			
							No Ice	6.8155	5.6334	0.11
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.0000	0.00	0.00	105.0000	1/2" Ice	7.3373	6.4717	0.17
							Ice	7.8532	7.2478	0.23
							1" Ice	8.9160	8.8537	0.38
							2" Ice	11.1650	12.2804	0.81
							4" Ice			
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.0000	0.00	0.00	105.0000	No Ice	6.8155	5.6334	0.11
							1/2" Ice	7.3373	6.4717	0.17
							Ice	7.8532	7.2478	0.23
							1" Ice	8.9160	8.8537	0.38
							2" Ice	11.1650	12.2804	0.81
KRY 112 144/1	A	From Leg	4.0000	0.00	0.00	105.0000	4" Ice			
							No Ice	0.4083	0.2042	0.01
							1/2" Ice	0.4969	0.2733	0.01
							Ice	0.5941	0.3511	0.02
							1" Ice	0.8145	0.5326	0.03
KRY 112 144/1	B	From Leg	4.0000	0.00	0.00	105.0000	2" Ice	1.3590	0.9992	0.08
							4" Ice			
							No Ice	0.4083	0.2042	0.01
							1/2" Ice	0.4969	0.2733	0.01
							Ice	0.5941	0.3511	0.02
KRY 112 144/1	C	From Leg	4.0000	0.00	0.00	105.0000	1" Ice	0.8145	0.5326	0.03
							2" Ice	1.3590	0.9992	0.08
							4" Ice			
							No Ice	0.4083	0.2042	0.01
							1/2" Ice	0.4969	0.2733	0.01
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.0000	0.00	0.00	105.0000	Ice	0.5941	0.3511	0.02
							1" Ice	0.8145	0.5326	0.03
							2" Ice	1.3590	0.9992	0.08
							4" Ice			
							No Ice	11.6828	9.8418	0.08
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.0000	0.00	0.00	105.0000	1/2" Ice	12.4043	11.3657	0.17
							Ice	13.1351	12.9138	0.27
							1" Ice	14.6007	15.2672	0.51
							2" Ice	17.8748	20.1392	1.15
							4" Ice			
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.0000	0.00	0.00	105.0000	No Ice	11.6828	9.8418	0.08
							1/2" Ice	12.4043	11.3657	0.17
							Ice	13.1351	12.9138	0.27
							1" Ice	14.6007	15.2672	0.51
							2" Ice	17.8748	20.1392	1.15
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.0000	0.00	0.00	105.0000	4" Ice			
							No Ice	11.6828	9.8418	0.08
							1/2" Ice	12.4043	11.3657	0.17
							Ice	13.1351	12.9138	0.27
							1" Ice	14.6007	15.2672	0.51
RRUS 11 B12	A	From Leg	4.0000	0.00	0.00	105.0000	2" Ice	17.8748	20.1392	1.15
							4" Ice			
							No Ice	3.3056	1.3611	0.05
							1/2" Ice	3.5497	1.5404	0.07
							Ice	3.8025	1.7284	0.10

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral	Vert						ft
			ft	ft	ft	°	ft	ft ²	ft ²	K	
RRUS 11 B12	B	From Leg	4.0000	0.00	2.00	0.00	105.0000	1" Ice	4.3340	2.1302	0.15
								2" Ice	5.5006	3.0377	0.31
								4" Ice			
								No Ice	3.3056	1.3611	0.05
								1/2" Ice	3.5497	1.5404	0.07
								Ice	3.8025	1.7284	0.10
								1" Ice	4.3340	2.1302	0.15
RRUS 11 B12	C	From Leg	4.0000	0.00	2.00	0.00	105.0000	2" Ice	5.5006	3.0377	0.31
								4" Ice			
								No Ice	3.3056	1.3611	0.05
								1/2" Ice	3.5497	1.5404	0.07
								Ice	3.8025	1.7284	0.10
								1" Ice	4.3340	2.1302	0.15
								2" Ice	5.5006	3.0377	0.31
Platform Mount [LP 712-1]	C	None				0.00	105.0000	4" Ice			
								No Ice	24.5300	24.5300	1.34
								1/2" Ice	29.9400	29.9400	1.65
								Ice	35.3500	35.3500	1.96
								1" Ice	46.1700	46.1700	2.58
(2) RRUS 11	A	From Leg	2.0000	0.00	0.00	0.00	97.0000	2" Ice	67.8100	67.8100	3.82
								4" Ice			
								No Ice	3.2560	1.3790	0.05
								1/2" Ice	3.4982	1.5577	0.07
								Ice	3.7490	1.7450	0.10
								1" Ice	4.2766	2.1455	0.15
								2" Ice	5.4355	3.0504	0.31
(2) RRUS 11	B	From Leg	2.0000	0.00	0.00	0.00	97.0000	4" Ice			
								No Ice	3.2560	1.3790	0.05
								1/2" Ice	3.4982	1.5577	0.07
								Ice	3.7490	1.7450	0.10
								1" Ice	4.2766	2.1455	0.15
								2" Ice	5.4355	3.0504	0.31
								4" Ice			
(2) RRUS 11	C	From Leg	2.0000	0.00	0.00	0.00	97.0000	No Ice	3.2560	1.3790	0.05
								1/2" Ice	3.4982	1.5577	0.07
								Ice	3.7490	1.7450	0.10
								1" Ice	4.2766	2.1455	0.15
								2" Ice	5.4355	3.0504	0.31
								4" Ice			
								No Ice	3.2560	1.3790	0.05
DC6-48-60-18-8F	A	From Leg	2.0000	0.00	0.00	0.00	97.0000	1" Ice	2.3333	2.3333	0.11
								2" Ice	3.3778	3.3778	0.24
								4" Ice			
								No Ice	1.4667	1.4667	0.02
								1/2" Ice	1.6667	1.6667	0.04
RRUS-32 B30	A	From Leg	2.0000	0.00	0.00	0.00	97.0000	Ice	1.8778	1.8778	0.06
								1" Ice	2.3333	2.3333	0.11
								2" Ice	3.3778	3.3778	0.24
								4" Ice			
								No Ice	3.8662	2.7616	0.08
RRUS-32 B30	B	From Leg	2.0000	0.00	0.00	0.00	97.0000	1/2" Ice	4.1506	3.0213	0.10
								Ice	4.4435	3.2896	0.14
								1" Ice	5.0554	3.8522	0.21
								2" Ice	6.3828	5.0811	0.41
								4" Ice			
RRUS-32 B30	C	From Leg	2.0000	0.00	0.00	0.00	97.0000	No Ice	3.8662	2.7616	0.08
								1/2" Ice	4.1506	3.0213	0.10
								Ice	4.4435	3.2896	0.14
								1" Ice	5.0554	3.8522	0.21
								2" Ice	6.3828	5.0811	0.41
DC6-48-60-18-8F	B	From Leg	2.0000	0.00	0.00	0.00	97.0000	4" Ice			
								No Ice	3.8662	2.7616	0.08
								1/2" Ice	4.1506	3.0213	0.10
								Ice	4.4435	3.2896	0.14
								1" Ice	5.0554	3.8522	0.21

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			0.00			1/2"	1.6667	1.6667	0.04
			0.00			Ice	1.8778	1.8778	0.06
						1" Ice	2.3333	2.3333	0.11
						2" Ice	3.3778	3.3778	0.24
						4" Ice			
Side Arm Mount [SO 102-3]	C	None		0.00	97.0000	No Ice	3.0000	3.0000	0.08
						1/2"	3.4800	3.4800	0.11
						Ice	3.9600	3.9600	0.14
						1" Ice	4.9200	4.9200	0.20
						2" Ice	6.8400	6.8400	0.32
						4" Ice			
(2) 2.375" OD x 4' Mount Pipe	A	From Leg	2.0000 0.00 0.00	0.00	97.0000	No Ice	0.8657	0.8657	0.02
						1/2"	1.1106	1.1106	0.03
						Ice	1.3648	1.3648	0.04
						1" Ice	1.9008	1.9008	0.06
						2" Ice	3.2278	3.2278	0.16
						4" Ice			
(2) 2.375" OD x 4' Mount Pipe	B	From Leg	2.0000 0.00 0.00	0.00	97.0000	No Ice	0.8657	0.8657	0.02
						1/2"	1.1106	1.1106	0.03
						Ice	1.3648	1.3648	0.04
						1" Ice	1.9008	1.9008	0.06
						2" Ice	3.2278	3.2278	0.16
						4" Ice			
(2) 2.375" OD x 4' Mount Pipe	C	From Leg	2.0000 0.00 0.00	0.00	97.0000	No Ice	0.8657	0.8657	0.02
						1/2"	1.1106	1.1106	0.03
						Ice	1.3648	1.3648	0.04
						1" Ice	1.9008	1.9008	0.06
						2" Ice	3.2278	3.2278	0.16
						4" Ice			
**									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	96.0000	No Ice	6.2208	4.8204	0.09
						1/2"	6.7144	5.5082	0.14
						Ice	7.2182	6.2127	0.21
						1" Ice	8.2568	7.6716	0.36
						2" Ice	10.4762	11.0613	0.76
						4" Ice			
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	96.0000	No Ice	6.2208	4.8204	0.09
						1/2"	6.7144	5.5082	0.14
						Ice	7.2182	6.2127	0.21
						1" Ice	8.2568	7.6716	0.36
						2" Ice	10.4762	11.0613	0.76
						4" Ice			
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	96.0000	No Ice	6.2208	4.8204	0.09
						1/2"	6.7144	5.5082	0.14
						Ice	7.2182	6.2127	0.21
						1" Ice	8.2568	7.6716	0.36
						2" Ice	10.4762	11.0613	0.76
						4" Ice			
P65-16-XLH-RR w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	96.0000	No Ice	8.6375	6.3625	0.08
						1/2"	9.2903	7.5378	0.14
						Ice	9.9098	8.4270	0.22
						1" Ice	11.1763	10.2390	0.39
						2" Ice	13.8289	14.0988	0.89
						4" Ice			
P65-16-XLH-RR w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	96.0000	No Ice	8.6375	6.3625	0.08
						1/2"	9.2903	7.5378	0.14
						Ice	9.9098	8.4270	0.22
						1" Ice	11.1763	10.2390	0.39
						2" Ice	13.8289	14.0988	0.89
						4" Ice			
P65-16-XLH-RR w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	96.0000	No Ice	8.6375	6.3625	0.08
						1/2"	9.2903	7.5378	0.14
						Ice	9.9098	8.4270	0.22
						1" Ice	11.1763	10.2390	0.39
						2" Ice	13.8289	14.0988	0.89
						4" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	CA _{AA} Front ft ²	CA _{AA} Side ft ²	Weight K	
(4) LGP2140X	A	From Leg	4.0000 0.00 1.00	0.00	96.0000	4" Ice			
						No Ice	1.2600	0.3780	0.01
						1/2"	1.4160	0.4932	0.02
						Ice	1.5806	0.6170	0.03
						1" Ice	1.9358	0.8905	0.05
(4) LGP2140X	B	From Leg	4.0000 0.00 1.00	0.00	96.0000	2" Ice	2.7499	1.5412	0.13
						4" Ice			
						No Ice	1.2600	0.3780	0.01
						1/2"	1.4160	0.4932	0.02
						Ice	1.5806	0.6170	0.03
(4) LGP2140X	C	From Leg	4.0000 0.00 1.00	0.00	96.0000	1" Ice	1.9358	0.8905	0.05
						2" Ice	2.7499	1.5412	0.13
						4" Ice			
						No Ice	1.2600	0.3780	0.01
						1/2"	1.4160	0.4932	0.02
OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	96.0000	Ice	1.5806	0.6170	0.03
						1" Ice	1.9358	0.8905	0.05
						2" Ice	2.7499	1.5412	0.13
						4" Ice			
						No Ice	10.5975	7.1792	0.10
OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	96.0000	1/2"	11.2684	8.3621	0.18
						Ice	11.9061	9.2588	0.26
						1" Ice	13.2089	11.0860	0.46
						2" Ice	15.9341	15.1514	1.00
						4" Ice			
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	96.0000	No Ice	10.5975	7.1792	0.10
						1/2"	11.2684	8.3621	0.18
						Ice	11.9061	9.2588	0.26
						1" Ice	13.2089	11.0860	0.46
						2" Ice	15.9341	15.1514	1.00
Platform Mount [LP 601-1]	C	None		0.00	96.0000	4" Ice			
						No Ice	28.4700	28.4700	1.12
						1/2"	33.5900	33.5900	1.51
						Ice	38.7100	38.7100	1.91
						1" Ice	48.9500	48.9500	2.69
ACUTIME 2000	A	From Leg	3.0000 0.00 1.00	0.00	75.0000	2" Ice	1.1506	1.1506	0.08
						4" Ice			
						No Ice	0.2975	0.2975	0.00
						1/2"	0.3739	0.3739	0.00
						Ice	0.4589	0.4589	0.01
Side Arm Mount [SO 701-1]	A	None		0.00	75.0000	1" Ice	0.6549	0.6549	0.02
						2" Ice	1.1506	1.1506	0.08
						4" Ice			
						No Ice	0.8500	1.6700	0.07
						1/2"	1.1400	2.3400	0.08
						Ice	1.4300	3.0100	0.09
						1" Ice	2.0100	4.3500	0.12
						2" Ice	3.1700	7.0300	0.18
						4" Ice			
						No Ice	0.8500	1.6700	0.07

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight	
				Horz Lateral	Vert							
				ft	°	°	ft	ft	ft ²	K		
PX2F-52	A	Paraboloid w/o Radome	From Leg	4.0000	25.00			122.0000	2.0917	No Ice	3.4400	0.02
				0.00						1/2" Ice	3.7200	0.04
				1.00						1" Ice	3.9900	0.06
										2" Ice	4.5500	0.09
										4" Ice	5.6700	0.17
VHLP2-11	A	Paraboloid w/o Radome	From Leg	4.0000	37.00			122.0000	2.1750	No Ice	3.7200	0.03
				0.00						1/2" Ice	4.0100	0.05
				3.00						1" Ice	4.3000	0.07
										2" Ice	4.8800	0.11
										4" Ice	6.0400	0.19
VHLP2-11	B	Paraboloid w/o Radome	From Leg	4.0000	10.00			122.0000	2.1750	No Ice	3.7200	0.03
				0.00						1/2" Ice	4.0100	0.05
				3.00						1" Ice	4.3000	0.07
										2" Ice	4.8800	0.11
										4" Ice	6.0400	0.19

**

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face	C _A A _A Out Face
ft	ft		psf	ft ²		ft ²	ft ²	ft ²	%	ft ²	ft ²
L1 120.0000-96.7500	108.0012	1.403	29.10	47.176	A	0.000	47.176	47.176	100.00	0.000	0.000
					B	0.000	47.176	100.00	0.000	0.000	
					C	0.000	47.176	100.00	0.000	14.061	
L2 96.7500-90.0833	93.3893	1.346	27.91	15.206	A	0.000	15.206	15.206	100.00	0.000	0.000
					B	0.000	15.206	100.00	0.000	0.000	
					C	0.000	15.206	100.00	0.000	5.466	
L3 90.0833-89.5000	89.7914	1.331	27.60	1.366	A	0.000	1.366	1.366	100.00	0.000	0.000
					B	0.000	1.366	100.00	0.000	0.000	
					C	0.000	1.366	100.00	0.000	0.617	
L4 89.5000-78.0000	83.6741	1.305	27.05	28.102	A	0.000	28.102	28.102	100.00	0.000	0.000
					B	0.000	28.102	100.00	0.000	0.000	
					C	0.000	28.102	100.00	0.000	12.159	
L5 78.0000-76.7500	77.3735	1.276	26.45	3.127	A	0.000	3.127	3.127	100.00	0.000	0.000
					B	0.000	3.127	100.00	0.000	0.000	
					C	0.000	3.127	100.00	0.000	1.322	
L6 76.7500-72.0000	74.3626	1.261	26.15	12.159	A	0.000	12.159	12.159	100.00	0.000	0.000
					B	0.000	12.159	100.00	0.000	0.000	
					C	0.000	12.159	100.00	0.000	5.022	
L7 72.0000-70.5000	71.2488	1.246	25.84	3.919	A	0.000	3.919	3.919	100.00	0.000	0.000
					B	0.000	3.919	100.00	0.000	0.000	
					C	0.000	3.919	100.00	0.000	1.586	
L8 70.5000-69.7500	70.1247	1.24	25.72	1.974	A	0.000	1.974	1.974	100.00	0.000	0.000
					B	0.000	1.974	100.00	0.000	0.000	
					C	0.000	1.974	100.00	0.000	0.793	
L9 69.7500-56.0000	62.7787	1.202	24.92	37.860	A	0.000	37.860	37.860	100.00	0.000	0.000
					B	0.000	37.860	100.00	0.000	0.000	
					C	0.000	37.860	100.00	0.000	14.538	
L10 56.0000-54.0000	54.9981	1.157	23.99	5.772	A	0.000	5.772	5.772	100.00	0.000	0.000
					B	0.000	5.772	100.00	0.000	0.000	
					C	0.000	5.772	100.00	0.000	2.804	
L11 54.0000-53.5000	53.7499	1.15	23.84	1.454	A	0.000	1.454	1.454	100.00	0.000	0.000
					B	0.000	1.454	100.00	0.000	0.000	
					C	0.000	1.454	100.00	0.000	0.701	
L12 53.5000-39.7500	46.5374	1.103	22.88	41.622	A	0.000	41.622	41.622	100.00	0.000	0.000
					B	0.000	41.622	100.00	0.000	0.000	

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L13 39.7500-35.0000	37.3616	1.036	21.48	14.810	C	0.000	41.622	14.810	100.00	0.000	19.277
					A	0.000	14.810		100.00	0.000	0.000
					B	0.000	14.810		100.00	0.000	0.000
L14 35.0000-25.0000	29.9569	1	20.74	32.549	C	0.000	14.810	32.549	100.00	0.000	6.659
					A	0.000	32.549		100.00	0.000	0.000
					B	0.000	32.549		100.00	0.000	0.000
L15 25.0000-14.5000	19.7049	1	20.74	35.989	C	0.000	32.549	35.989	100.00	0.000	14.020
					A	0.000	35.989		100.00	0.000	0.000
					B	0.000	35.989		100.00	0.000	0.000
L16 14.5000-12.5000	13.4984	1	20.74	7.065	C	0.000	35.989	7.065	100.00	0.000	14.721
					A	0.000	7.065		100.00	0.000	0.000
					B	0.000	7.065		100.00	0.000	0.000
L17 12.5000-5.5000	8.9809	1	20.74	25.259	C	0.000	7.065	25.259	100.00	0.000	2.804
					A	0.000	25.259		100.00	0.000	0.000
					B	0.000	25.259		100.00	0.000	0.000
L18 5.5000-4.7500	5.1248	1	20.74	2.755	C	0.000	25.259	2.755	100.00	0.000	9.814
					A	0.000	2.755		100.00	0.000	0.000
					B	0.000	2.755		100.00	0.000	0.000
L19 4.7500-0.0000	2.3665	1	20.74	17.670	C	0.000	2.755	17.670	100.00	0.000	1.051
					A	0.000	17.670		100.00	0.000	0.000
					B	0.000	17.670		100.00	0.000	0.000
					C	0.000	17.670		100.00	0.000	6.659

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K _Z	q _z psf	t _z in	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 120.0000-96.7500	108.0012	1.403	5.08	0.8647	50.526	A	0.000	50.526	50.526	100.00	0.000	0.000
						B	0.000	50.526		100.00	0.000	0.000
						C	0.000	50.526		100.00	0.000	27.723
L2 96.7500-90.0833	93.3893	1.346	4.87	0.8497	16.150	A	0.000	16.150	16.150	100.00	0.000	0.000
						B	0.000	16.150		100.00	0.000	0.000
						C	0.000	16.150		100.00	0.000	10.721
L3 90.0833-89.5000	89.7914	1.331	4.82	0.8457	1.448	A	0.000	1.448	1.448	100.00	0.000	0.000
						B	0.000	1.448		100.00	0.000	0.000
						C	0.000	1.448		100.00	0.000	1.231
L4 89.5000-78.0000	83.6741	1.305	4.72	0.8386	29.710	A	0.000	29.710	29.710	100.00	0.000	0.000
						B	0.000	29.710		100.00	0.000	0.000
						C	0.000	29.710		100.00	0.000	24.160
L5 78.0000-76.7500	77.3735	1.276	4.62	0.8308	3.302	A	0.000	3.302	3.302	100.00	0.000	0.000
						B	0.000	3.302		100.00	0.000	0.000
						C	0.000	3.302		100.00	0.000	2.626
L6 76.7500-72.0000	74.3626	1.261	4.56	0.8268	12.814	A	0.000	12.814	12.814	100.00	0.000	0.000
						B	0.000	12.814		100.00	0.000	0.000
						C	0.000	12.814		100.00	0.000	9.910
L7 72.0000-70.5000	71.2488	1.246	4.51	0.8226	4.124	A	0.000	4.124	4.124	100.00	0.000	0.000
						B	0.000	4.124		100.00	0.000	0.000
						C	0.000	4.124		100.00	0.000	3.121
L8 70.5000-69.7500	70.1247	1.24	4.49	0.8210	2.076	A	0.000	2.076	2.076	100.00	0.000	0.000
						B	0.000	2.076		100.00	0.000	0.000
						C	0.000	2.076		100.00	0.000	1.559
L9 69.7500-56.0000	62.7787	1.202	4.35	0.8102	39.717	A	0.000	39.717	39.717	100.00	0.000	0.000
						B	0.000	39.717		100.00	0.000	0.000
						C	0.000	39.717		100.00	0.000	28.401
L10 56.0000-54.0000	54.9981	1.157	4.19	0.7974	6.038	A	0.000	6.038	6.038	100.00	0.000	0.000
						B	0.000	6.038		100.00	0.000	0.000
						C	0.000	6.038		100.00	0.000	4.611
L11 54.0000-53.5000	53.7499	1.15	4.16	0.7952	1.520	A	0.000	1.520	1.520	100.00	0.000	0.000
						B	0.000	1.520		100.00	0.000	0.000
						C	0.000	1.520		100.00	0.000	1.152
L12 53.5000-	46.5374	1.103	3.99	0.7816	43.413	A	0.000	43.413	43.413	100.00	0.000	0.000

Section Elevation ft	z ft	K _Z	q _z psf	t _z in	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
39.7500						B	0.000	43.413		100.00	0.000	0.000
L13 39.7500-35.0000	37.3616	1.036	3.75	0.7613	15.429	C	0.000	43.413		100.00	0.000	31.457
						A	0.000	15.429	15.429	100.00	0.000	0.000
						B	0.000	15.429		100.00	0.000	0.000
						C	0.000	15.429		100.00	0.000	10.867
L14 35.0000-25.0000	29.9569	1	3.62	0.7500	33.799	A	0.000	33.799	33.799	100.00	0.000	0.000
						B	0.000	33.799		100.00	0.000	0.000
						C	0.000	33.799		100.00	0.000	22.520
L15 25.0000-14.5000	19.7049	1	3.62	0.7500	37.301	A	0.000	37.301	37.301	100.00	0.000	0.000
						B	0.000	37.301		100.00	0.000	0.000
						C	0.000	37.301		100.00	0.000	23.646
L16 14.5000-12.5000	13.4984	1	3.62	0.7500	7.315	A	0.000	7.315	7.315	100.00	0.000	0.000
						B	0.000	7.315		100.00	0.000	0.000
						C	0.000	7.315		100.00	0.000	4.504
L17 12.5000-5.5000	8.9809	1	3.62	0.7500	26.134	A	0.000	26.134	26.134	100.00	0.000	0.000
						B	0.000	26.134		100.00	0.000	0.000
						C	0.000	26.134		100.00	0.000	15.764
L18 5.5000-4.7500	5.1248	1	3.62	0.7500	2.849	A	0.000	2.849	2.849	100.00	0.000	0.000
						B	0.000	2.849		100.00	0.000	0.000
						C	0.000	2.849		100.00	0.000	1.689
L19 4.7500-0.0000	2.3665	1	3.62	0.7500	18.264	A	0.000	18.264	18.264	100.00	0.000	0.000
						B	0.000	18.264		100.00	0.000	0.000
						C	0.000	18.264		100.00	0.000	10.697

Tower Pressure - Service

$G_H = 1.690$

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 120.0000-96.7500	108.0012	1.403	8.98	47.176	A	0.000	47.176	47.176	100.00	0.000	0.000
					B	0.000	47.176		100.00	0.000	0.000
					C	0.000	47.176		100.00	0.000	14.061
L2 96.7500-90.0833	93.3893	1.346	8.62	15.206	A	0.000	15.206	15.206	100.00	0.000	0.000
					B	0.000	15.206		100.00	0.000	0.000
					C	0.000	15.206		100.00	0.000	5.466
L3 90.0833-89.5000	89.7914	1.331	8.52	1.366	A	0.000	1.366	1.366	100.00	0.000	0.000
					B	0.000	1.366		100.00	0.000	0.000
					C	0.000	1.366		100.00	0.000	0.617
L4 89.5000-78.0000	83.6741	1.305	8.35	28.102	A	0.000	28.102	28.102	100.00	0.000	0.000
					B	0.000	28.102		100.00	0.000	0.000
					C	0.000	28.102		100.00	0.000	12.159
L5 78.0000-76.7500	77.3735	1.276	8.16	3.127	A	0.000	3.127	3.127	100.00	0.000	0.000
					B	0.000	3.127		100.00	0.000	0.000
					C	0.000	3.127		100.00	0.000	1.322
L6 76.7500-72.0000	74.3626	1.261	8.07	12.159	A	0.000	12.159	12.159	100.00	0.000	0.000
					B	0.000	12.159		100.00	0.000	0.000
					C	0.000	12.159		100.00	0.000	5.022
L7 72.0000-70.5000	71.2488	1.246	7.97	3.919	A	0.000	3.919	3.919	100.00	0.000	0.000
					B	0.000	3.919		100.00	0.000	0.000
					C	0.000	3.919		100.00	0.000	1.586
L8 70.5000-69.7500	70.1247	1.24	7.94	1.974	A	0.000	1.974	1.974	100.00	0.000	0.000
					B	0.000	1.974		100.00	0.000	0.000
					C	0.000	1.974		100.00	0.000	0.793
L9 69.7500-56.0000	62.7787	1.202	7.69	37.860	A	0.000	37.860	37.860	100.00	0.000	0.000
					B	0.000	37.860		100.00	0.000	0.000
					C	0.000	37.860		100.00	0.000	14.538
L10 56.0000-54.0000	54.9981	1.157	7.41	5.772	A	0.000	5.772	5.772	100.00	0.000	0.000
					B	0.000	5.772		100.00	0.000	0.000
					C	0.000	5.772		100.00	0.000	2.804
L11 54.0000-	53.7499	1.15	7.36	1.454	A	0.000	1.454	1.454	100.00	0.000	0.000

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
53.5000					B	0.000	1.454		100.00	0.000	0.000
L12 53.5000-39.7500	46.5374	1.103	7.06	41.622	C	0.000	1.454		100.00	0.000	0.701
					A	0.000	41.622	41.622	100.00	0.000	0.000
					B	0.000	41.622		100.00	0.000	0.000
					C	0.000	41.622		100.00	0.000	19.277
L13 39.7500-35.0000	37.3616	1.036	6.63	14.810	A	0.000	14.810	14.810	100.00	0.000	0.000
					B	0.000	14.810		100.00	0.000	0.000
					C	0.000	14.810		100.00	0.000	6.659
L14 35.0000-25.0000	29.9569	1	6.40	32.549	A	0.000	32.549	32.549	100.00	0.000	0.000
					B	0.000	32.549		100.00	0.000	0.000
					C	0.000	32.549		100.00	0.000	14.020
L15 25.0000-14.5000	19.7049	1	6.40	35.989	A	0.000	35.989	35.989	100.00	0.000	0.000
					B	0.000	35.989		100.00	0.000	0.000
					C	0.000	35.989		100.00	0.000	14.721
L16 14.5000-12.5000	13.4984	1	6.40	7.065	A	0.000	7.065	7.065	100.00	0.000	0.000
					B	0.000	7.065		100.00	0.000	0.000
					C	0.000	7.065		100.00	0.000	2.804
L17 12.5000-5.5000	8.9809	1	6.40	25.259	A	0.000	25.259	25.259	100.00	0.000	0.000
					B	0.000	25.259		100.00	0.000	0.000
					C	0.000	25.259		100.00	0.000	9.814
L18 5.5000-4.7500	5.1248	1	6.40	2.755	A	0.000	2.755	2.755	100.00	0.000	0.000
					B	0.000	2.755		100.00	0.000	0.000
					C	0.000	2.755		100.00	0.000	1.051
L19 4.7500-0.0000	2.3665	1	6.40	17.670	A	0.000	17.670	17.670	100.00	0.000	0.000
					B	0.000	17.670		100.00	0.000	0.000
					C	0.000	17.670		100.00	0.000	6.659

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

Comb. No.	Description
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	120 - 96.75	Pole	Max Tension	27	0.00	-0.00	-0.00
			Max. Compression	14	-20.14	1.49	0.70
			Max. Mx	11	-8.83	398.18	-7.75
			Max. My	8	-8.80	9.46	-400.80
			Max. Vy	11	-25.07	398.18	-7.75
			Max. Vx	8	25.30	9.46	-400.80
			Max. Torque	11			-3.57
L2	96.75 - 90.0833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.46	2.29	0.24
			Max. Mx	11	-11.80	608.07	-9.87
			Max. My	8	-11.78	11.95	-612.14
			Max. Vy	11	-31.97	608.07	-9.87
			Max. Vx	8	32.20	11.95	-612.14
			Max. Torque	11			-3.57
L3	90.0833 - 89.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.63	2.37	0.20
			Max. Mx	11	-11.93	626.76	-10.05
			Max. My	8	-11.90	12.17	-630.95
			Max. Vy	11	-32.07	626.76	-10.05
			Max. Vx	8	32.29	12.17	-630.95
			Max. Torque	11			-3.53
L4	89.5 - 78	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-29.34	3.34	-0.36
			Max. Mx	11	-13.78	880.45	-12.53
			Max. My	8	-13.75	15.07	-886.33
			Max. Vy	11	-33.36	880.45	-12.53
			Max. Vx	8	33.59	15.07	-886.33
			Max. Torque	11			-3.52
L5	78 - 76.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32.08	3.98	-0.72
			Max. Mx	11	-15.81	1049.74	-14.13
			Max. My	8	-15.78	16.94	-1056.70
			Max. Vy	11	-34.29	1049.74	-14.13
			Max. Vx	8	34.51	16.94	-1056.70
			Max. Torque	11			-3.43
L6	76.75 - 72	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.11	4.61	-1.04
			Max. Mx	11	-17.30	1214.88	-15.66
			Max. My	8	-17.28	18.73	-1222.86
			Max. Vy	11	-35.18	1214.88	-15.66
			Max. Vx	8	35.41	18.73	-1222.86
			Max. Torque	11			-3.46
L7	72 - 70.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.73	4.81	-1.16
			Max. Mx	11	-17.76	1267.87	-16.15
			Max. My	8	-17.73	19.30	-1276.17
			Max. Vy	11	-35.43	1267.87	-16.15
			Max. Vx	8	35.66	19.30	-1276.17
			Max. Torque	11			-3.44
L8	70.5 - 69.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-35.06	4.91	-1.22
			Max. Mx	11	-18.02	1294.50	-16.39
			Max. My	8	-17.99	19.58	-1302.97
			Max. Vy	11	-35.55	1294.50	-16.39
			Max. Vx	8	35.78	19.58	-1302.97
			Max. Torque	11			

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L9	69.75 - 56	Pole	Max. Torque	11			-3.43
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-40.57	6.82	-2.31
			Max. Mx	11	-22.15	1798.87	-20.85
			Max. My	8	-22.13	24.78	-1810.31
			Max. Vy	11	-37.78	1798.87	-20.85
			Max. Vx	8	38.01	24.78	-1810.31
L10	56 - 54	Pole	Max. Torque	11			-3.42
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41.46	7.11	-2.47
			Max. Mx	11	-22.85	1874.82	-21.50
			Max. My	8	-22.83	25.54	-1886.69
			Max. Vy	11	-38.13	1874.82	-21.50
			Max. Vx	8	38.36	25.54	-1886.69
L11	54 - 53.5	Pole	Max. Torque	11			-3.31
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41.69	7.19	-2.52
			Max. Mx	11	-23.03	1893.92	-21.66
			Max. My	8	-23.01	25.73	-1905.90
			Max. Vy	11	-38.21	1893.92	-21.66
			Max. Vx	8	38.44	25.73	-1905.90
L12	53.5 - 39.75	Pole	Max. Torque	11			-3.29
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-45.24	8.49	-3.27
			Max. Mx	11	-25.76	2244.53	-24.59
			Max. My	8	-25.74	29.15	-2258.44
			Max. Vy	11	-39.66	2244.53	-24.59
			Max. Vx	8	39.89	29.15	-2258.44
L13	39.75 - 35	Pole	Max. Torque	11			-3.29
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-50.89	9.89	-4.08
			Max. Mx	11	-30.30	2629.51	-27.69
			Max. My	8	-30.29	32.75	-2645.45
			Max. Vy	11	-41.27	2629.51	-27.69
			Max. Vx	8	41.50	32.75	-2645.45
L14	35 - 25	Pole	Max. Torque	11			-3.14
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-55.47	11.35	-4.93
			Max. Mx	11	-34.04	3049.79	-30.95
			Max. My	8	-34.03	36.55	-3067.86
			Max. Vy	11	-42.75	3049.79	-30.95
			Max. Vx	8	42.97	36.55	-3067.86
L15	25 - 14.5	Pole	Max. Torque	11			-3.09
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-60.66	12.95	-5.86
			Max. Mx	11	-38.33	3507.15	-34.37
			Max. My	8	-38.32	40.53	-3527.42
			Max. Vy	11	-44.33	3507.15	-34.37
			Max. Vx	8	44.55	40.53	-3527.42
L16	14.5 - 12.5	Pole	Max. Torque	11			-2.99
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-61.71	13.26	-6.04
			Max. Mx	11	-39.21	3596.15	-35.02
			Max. My	8	-39.20	41.28	-3616.84
			Max. Vy	11	-44.63	3596.15	-35.02
			Max. Vx	8	44.85	41.28	-3616.84
L17	12.5 - 5.5	Pole	Max. Torque	11			-2.88
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-65.40	14.39	-6.69
			Max. Mx	11	-42.29	3912.45	-37.29
			Max. My	8	-42.29	43.93	-3934.60
			Max. Vy	11	-45.69	3912.45	-37.29
			Max. Vx	8	45.92	43.93	-3934.60
L18	5.5 - 4.75	Pole	Max. Torque	11			-2.85
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-65.78	14.51	-6.76
			Max. Mx	11	-42.61	3946.79	-37.53
			Max. My	8	-42.61	44.21	-3969.09
Max. Vy	11	-45.80	3946.79	-37.53			

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L19	4.75 - 0	Pole	Max. Vx	8	46.03	44.21	-3969.09
			Max. Torque	11			-2.77
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-68.29	15.29	-7.22
			Max. Mx	11	-44.70	4166.20	-39.07
			Max. My	8	-44.70	46.00	-4189.48
			Max. Vy	11	-46.53	4166.20	-39.07
			Max. Vx	8	46.75	46.00	-4189.48
			Max. Torque	11			-2.76

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	68.29	-0.00	0.00
	Max. H _x	11	44.72	46.51	-0.30
	Max. H _z	2	44.72	0.18	46.64
	Max. M _x	2	4175.00	0.18	46.64
	Max. M _z	5	4127.60	-46.26	0.09
	Max. Torsion	4	2.37	-40.15	23.27
	Min. Vert	27	44.72	0.05	14.39
	Min. H _x	5	44.72	-46.26	0.09
	Min. H _z	8	44.72	0.33	-46.73
	Min. M _x	8	-4189.48	0.33	-46.73
	Min. M _z	11	-4166.20	46.51	-0.30
	Min. Torsion	11	-2.71	46.51	-0.30

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overtuning Moment, M _x kip-ft	Overtuning Moment, M _z kip-ft	Torque kip-ft
Dead Only	44.72	-0.00	0.00	1.46	3.57	0.00
Dead+Wind 0 deg - No Ice	44.72	-0.18	-46.64	-4175.00	26.48	-1.29
Dead+Wind 30 deg - No Ice	44.72	23.10	-40.43	-3619.82	-2057.97	-2.11
Dead+Wind 60 deg - No Ice	44.72	40.15	-23.27	-2079.94	-3584.71	-2.37
Dead+Wind 90 deg - No Ice	44.72	46.26	-0.09	-10.32	-4127.60	-1.57
Dead+Wind 120 deg - No Ice	44.72	40.00	23.21	2075.24	-3566.32	-0.51
Dead+Wind 150 deg - No Ice	44.72	22.80	40.61	3646.59	-2019.98	1.71
Dead+Wind 180 deg - No Ice	44.72	-0.33	46.73	4189.48	46.00	2.60
Dead+Wind 210 deg - No Ice	44.72	-23.26	40.55	3638.01	2086.08	2.65
Dead+Wind 240 deg - No Ice	44.72	-40.31	23.49	2110.75	3612.61	2.55
Dead+Wind 270 deg - No Ice	44.72	-46.51	0.30	39.07	4166.20	2.71
Dead+Wind 300 deg - No Ice	44.72	-40.11	-23.24	-2077.00	3586.83	0.99
Dead+Wind 330 deg - No Ice	44.72	-23.20	-40.33	-3607.91	2077.75	-0.47
Dead+Ice+Temp	68.29	0.00	-0.00	7.22	15.29	0.00
Dead+Wind 0 deg+Ice+Temp	68.29	-0.04	-10.09	-915.19	20.31	-0.43
Dead+Wind 30 deg+Ice+Temp	68.29	5.01	-8.75	-792.44	-440.81	-0.56
Dead+Wind 60 deg+Ice+Temp	68.29	8.70	-5.04	-452.49	-778.54	-0.54
Dead+Wind 90 deg+Ice+Temp	68.29	10.03	-0.02	4.99	-898.95	-0.28
Dead+Wind 120 deg+Ice+Temp	68.29	8.67	5.02	465.70	-774.84	0.01
Dead+Wind 150 deg+Ice+Temp	68.29	4.95	8.79	812.02	-433.17	0.50
Dead+Wind 180 deg+Ice+Temp	68.29	-0.07	10.11	932.22	24.19	0.69

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 210 deg+lce+Temp	68.29	-5.04	8.77	810.25	476.31	0.68
Dead+Wind 240 deg+lce+Temp	68.29	-8.73	5.08	472.85	814.01	0.58
Dead+Wind 270 deg+lce+Temp	68.29	-10.08	0.06	14.94	936.59	0.53
Dead+Wind 300 deg+lce+Temp	68.29	-8.69	-5.03	-451.97	808.80	0.09
Dead+Wind 330 deg+lce+Temp	68.29	-5.03	-8.73	-790.07	474.68	-0.26
Dead+Wind 0 deg - Service	44.72	-0.05	-14.39	-1288.51	10.70	-0.38
Dead+Wind 30 deg - Service	44.72	7.13	-12.48	-1117.24	-633.24	-0.65
Dead+Wind 60 deg - Service	44.72	12.39	-7.18	-641.52	-1104.87	-0.74
Dead+Wind 90 deg - Service	44.72	14.28	-0.03	-2.17	-1272.53	-0.48
Dead+Wind 120 deg - Service	44.72	12.35	7.16	642.10	-1099.18	-0.16
Dead+Wind 150 deg - Service	44.72	7.04	12.54	1127.55	-621.50	0.50
Dead+Wind 180 deg - Service	44.72	-0.10	14.42	1295.22	16.73	0.79
Dead+Wind 210 deg - Service	44.72	-7.18	12.51	1124.91	646.97	0.83
Dead+Wind 240 deg - Service	44.72	-12.44	7.25	653.09	1118.56	0.79
Dead+Wind 270 deg - Service	44.72	-14.35	0.09	13.09	1289.52	0.86
Dead+Wind 300 deg - Service	44.72	-12.38	-7.17	-640.61	1110.57	0.31
Dead+Wind 330 deg - Service	44.72	-7.16	-12.45	-1113.55	644.39	-0.14

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-44.72	0.00	0.00	44.72	-0.00	0.000%
2	-0.18	-44.72	-46.64	0.18	44.72	46.64	0.001%
3	23.10	-44.72	-40.43	-23.10	44.72	40.43	0.000%
4	40.15	-44.72	-23.27	-40.15	44.72	23.27	0.000%
5	46.26	-44.72	-0.09	-46.26	44.72	0.09	0.001%
6	40.00	-44.72	23.21	-40.00	44.72	-23.21	0.000%
7	22.80	-44.72	40.61	-22.80	44.72	-40.61	0.000%
8	-0.33	-44.72	46.73	0.33	44.72	-46.73	0.000%
9	-23.26	-44.72	40.55	23.26	44.72	-40.55	0.000%
10	-40.31	-44.72	23.49	40.31	44.72	-23.49	0.000%
11	-46.51	-44.72	0.30	46.51	44.72	-0.30	0.001%
12	-40.11	-44.72	-23.24	40.11	44.72	23.24	0.000%
13	-23.20	-44.72	-40.33	23.20	44.72	40.33	0.000%
14	0.00	-68.29	0.00	-0.00	68.29	0.00	0.004%
15	-0.04	-68.29	-10.09	0.04	68.29	10.09	0.000%
16	5.01	-68.29	-8.75	-5.01	68.29	8.75	0.000%
17	8.70	-68.29	-5.04	-8.70	68.29	5.04	0.000%
18	10.03	-68.29	-0.02	-10.03	68.29	0.02	0.000%
19	8.67	-68.29	5.02	-8.67	68.29	-5.02	0.000%
20	4.95	-68.29	8.79	-4.95	68.29	-8.79	0.000%
21	-0.07	-68.29	10.11	0.07	68.29	-10.11	0.000%
22	-5.04	-68.29	8.77	5.04	68.29	-8.77	0.000%
23	-8.73	-68.29	5.08	8.73	68.29	-5.08	0.000%
24	-10.08	-68.29	0.06	10.08	68.29	-0.06	0.000%
25	-8.69	-68.29	-5.03	8.69	68.29	5.03	0.000%
26	-5.03	-68.29	-8.73	5.03	68.29	8.73	0.000%
27	-0.05	-44.72	-14.40	0.05	44.72	14.39	0.006%
28	7.13	-44.72	-12.48	-7.13	44.72	12.48	0.000%
29	12.39	-44.72	-7.18	-12.39	44.72	7.18	0.000%
30	14.28	-44.72	-0.03	-14.28	44.72	0.03	0.002%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
31	12.35	-44.72	7.16	-12.35	44.72	-7.16	0.000%
32	7.04	-44.72	12.54	-7.04	44.72	-12.54	0.000%
33	-0.10	-44.72	14.42	0.10	44.72	-14.42	0.002%
34	-7.18	-44.72	12.51	7.18	44.72	-12.51	0.000%
35	-12.44	-44.72	7.25	12.44	44.72	-7.25	0.000%
36	-14.35	-44.72	0.09	14.35	44.72	-0.09	0.002%
37	-12.38	-44.72	-7.17	12.38	44.72	7.17	0.000%
38	-7.16	-44.72	-12.45	7.16	44.72	12.45	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	12	0.00000001	0.00006176
3	Yes	15	0.00000001	0.00004577
4	Yes	15	0.00000001	0.00004824
5	Yes	12	0.00000001	0.00011999
6	Yes	15	0.00000001	0.00004539
7	Yes	15	0.00000001	0.00004574
8	Yes	13	0.00000001	0.00004672
9	Yes	15	0.00000001	0.00004932
10	Yes	15	0.00000001	0.00004660
11	Yes	12	0.00000001	0.00011890
12	Yes	15	0.00000001	0.00004783
13	Yes	15	0.00000001	0.00004679
14	Yes	6	0.00000001	0.00005692
15	Yes	13	0.00000001	0.00010585
16	Yes	13	0.00000001	0.00011569
17	Yes	13	0.00000001	0.00011563
18	Yes	13	0.00000001	0.00010359
19	Yes	13	0.00000001	0.00011566
20	Yes	13	0.00000001	0.00011688
21	Yes	13	0.00000001	0.00010753
22	Yes	13	0.00000001	0.00012176
23	Yes	13	0.00000001	0.00012132
24	Yes	13	0.00000001	0.00010819
25	Yes	13	0.00000001	0.00011908
26	Yes	13	0.00000001	0.00011907
27	Yes	10	0.00014740	0.00012927
28	Yes	12	0.00000001	0.00008872
29	Yes	12	0.00000001	0.00010504
30	Yes	11	0.00000001	0.00006025
31	Yes	12	0.00000001	0.00008853
32	Yes	12	0.00000001	0.00009089
33	Yes	11	0.00000001	0.00006170
34	Yes	12	0.00000001	0.00010847
35	Yes	12	0.00000001	0.00009035
36	Yes	11	0.00000001	0.00007716
37	Yes	12	0.00000001	0.00010298
38	Yes	12	0.00000001	0.00009435

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 96.75	20.33	34	1.50	0.01
L2	96.75 - 90.0833	13.36	34	1.29	0.00
L3	90.0833 - 89.5	11.63	34	1.19	0.00

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L4	89.5 - 78	11.48	34	1.18	0.00
L5	81.75 - 76.75	9.63	34	1.09	0.00
L6	76.75 - 72	8.50	34	1.05	0.00
L7	72 - 70.5	7.48	34	1.00	0.00
L8	70.5 - 69.75	7.17	34	0.98	0.00
L9	69.75 - 56	7.02	34	0.97	0.00
L10	56 - 54	4.50	34	0.78	0.00
L11	54 - 53.5	4.18	34	0.75	0.00
L12	53.5 - 39.75	4.10	34	0.74	0.00
L13	44.5 - 35	2.84	34	0.60	0.00
L14	35 - 25	1.74	34	0.49	0.00
L15	25 - 14.5	0.88	34	0.34	0.00
L16	14.5 - 12.5	0.29	34	0.19	0.00
L17	12.5 - 5.5	0.22	34	0.17	0.00
L18	5.5 - 4.75	0.04	34	0.07	0.00
L19	4.75 - 0	0.03	34	0.06	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.0000	VHLP2-11	34	20.33	1.50	0.01	15291
123.0000	PX2F-52	34	20.33	1.50	0.01	15291
122.0000	APXVSP18-C-A20 w/ Mount Pipe	34	20.33	1.50	0.01	15291
113.0000	(2) DB846F65ZAXY w/ Mount Pipe	34	18.14	1.45	0.01	10922
105.0000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	34	15.71	1.39	0.01	5097
97.0000	(2) RRUS 11	34	13.43	1.29	0.00	3503
96.0000	(2) 7770.00 w/ Mount Pipe	34	13.16	1.28	0.00	3487
75.0000	ACUTIME 2000	34	8.12	1.04	0.00	5126

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 96.75	65.62	9	4.85	0.03
L2	96.75 - 90.0833	43.13	9	4.16	0.01
L3	90.0833 - 89.5	37.54	9	3.85	0.01
L4	89.5 - 78	37.07	9	3.82	0.01
L5	81.75 - 76.75	31.10	9	3.54	0.01
L6	76.75 - 72	27.46	9	3.41	0.01
L7	72 - 70.5	24.16	9	3.23	0.01
L8	70.5 - 69.75	23.16	9	3.17	0.01
L9	69.75 - 56	22.66	9	3.14	0.01
L10	56 - 54	14.53	9	2.51	0.00
L11	54 - 53.5	13.50	9	2.42	0.00
L12	53.5 - 39.75	13.24	9	2.40	0.00
L13	44.5 - 35	9.17	9	1.92	0.00
L14	35 - 25	5.64	9	1.58	0.00
L15	25 - 14.5	2.84	9	1.10	0.00
L16	14.5 - 12.5	0.95	9	0.62	0.00
L17	12.5 - 5.5	0.71	9	0.54	0.00
L18	5.5 - 4.75	0.14	9	0.24	0.00
L19	4.75 - 0	0.10	9	0.21	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.0000	VHLP2-11	9	65.62	4.85	0.03	4792
123.0000	PX2F-52	9	65.62	4.85	0.03	4792
122.0000	APXVSP18-C-A20 w/ Mount Pipe	9	65.62	4.85	0.03	4792
113.0000	(2) DB846F65ZAXY w/ Mount Pipe	9	58.56	4.70	0.02	3422
105.0000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	9	50.71	4.48	0.02	1596
97.0000	(2) RRUS 11	9	43.35	4.18	0.01	1095
96.0000	(2) 7770.00 w/ Mount Pipe	9	42.48	4.13	0.01	1090
75.0000	ACUTIME 2000	9	26.22	3.35	0.01	1598

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 P P _a
L1	120 - 96.75 (1)	TP26.6976x22x0.25	23.2500	0.0000	0.0	36.00	21.2903	-8.80	766.45	0.011
L2	96.75 - 90.0833 (2)	TP28.0446x26.6976x0.374	6.6667	0.0000	0.0	30.35	33.3328	-11.77	1011.78	0.012
L3	90.0833 - 89.5 (3)	TP28.1625x28.0446x0.488	0.5833	0.0000	0.0	27.61	43.4979	-11.90	1200.80	0.010
L4	89.5 - 78 (4)	TP30.486x28.1625x0.6246	11.5000	0.0000	0.0	28.04	58.5292	-13.75	1641.04	0.008
L5	78 - 76.75 (5)	TP30.2385x28.4792x0.684	5.0000	0.0000	0.0	27.94	65.1322	-15.78	1819.93	0.009
L6	76.75 - 72 (6)	TP31.1982x30.2385x0.768	4.7500	0.0000	0.0	25.03	75.2880	-17.28	1884.16	0.009
L7	72 - 70.5 (7)	TP31.5013x31.1982x0.759	1.5000	0.0000	0.0	25.07	75.1953	-17.73	1884.99	0.009
L8	70.5 - 69.75 (8)	TP31.6528x31.5013x0.841	0.7500	0.0000	0.0	26.71	83.4911	-17.99	2229.71	0.008
L9	69.75 - 56 (9)	TP34.4308x31.6528x0.690	13.7500	0.0000	0.0	29.18	74.9792	-22.13	2188.19	0.010
L10	56 - 54 (10)	TP34.8349x34.4308x0.779	2.0000	0.0000	0.0	30.42	85.4680	-22.82	2599.94	0.009
L11	54 - 53.5 (11)	TP34.9359x34.8349x0.781	0.5000	0.0000	0.0	31.28	85.9161	-23.01	2687.28	0.009
L12	53.5 - 39.75 (12)	TP37.714x34.9359x0.621	13.7500	0.0000	0.0	33.22	72.2506	-25.74	2399.88	0.011
L13	39.75 - 35 (13)	TP38.0487x35.5123x0.753	9.5000	0.0000	0.0	33.26	90.4964	-30.29	3009.73	0.010
L14	35 - 25 (14)	TP40.069x38.0487x0.7306	10.0000	0.0000	0.0	33.38	92.5474	-34.03	3089.05	0.011
L15	25 - 14.5 (15)	TP42.1905x40.069x0.7714	10.5000	0.0000	0.0	33.47	102.884	-38.32	3443.93	0.011
L16	14.5 - 12.5 (16)	TP42.5945x42.1905x0.815	2.0000	0.0000	0.0	33.52	109.712	-39.20	3677.10	0.011
L17	12.5 - 5.5 (17)	TP44.0088x42.5945x0.798	7.0000	0.0000	0.0	33.60	111.127	-42.29	3733.87	0.011
L18	5.5 - 4.75 (18)	TP44.1603x44.0088x0.741	0.7500	0.0000	0.0	34.40	103.638	-42.61	3564.93	0.012
L19	4.75 - 0 (19)	TP45.12x44.1603x0.7716	4.7500	0.0000	0.0	36.03	110.192	-44.70	3970.20	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	120 - 96.75 (1)	TP26.6976x22x0.25	402.02	35.10	36.00	0.975	0.00	0.00	36.00	0.000
L2	96.75 - 90.0833 (2)	TP28.0446x26.6976x0.3741	613.54	32.83	30.35	1.082	0.00	0.00	30.35	0.000
L3	90.0833 - 89.5 (3)	TP28.1625x28.0446x0.4881	632.37	26.03	27.61	0.943	0.00	0.00	27.61	0.000
L4	89.5 - 78 (4)	TP30.486x28.1625x0.6246	887.97	25.93	28.04	0.925	0.00	0.00	28.04	0.000
L5	78 - 76.75 (5)	TP30.2385x28.4792x0.6844	1058.4	27.40	27.94	0.981	0.00	0.00	27.94	0.000
L6	76.75 - 72 (6)	TP31.1982x30.2385x0.7684	1224.7	26.69	25.03	1.067	0.00	0.00	25.03	0.000
L7	72 - 70.5 (7)	TP31.5013x31.1982x0.7596	1278.1	27.59	25.07	1.101	0.00	0.00	25.07	0.000
L8	70.5 - 69.75 (8)	TP31.6528x31.5013x0.8415	1304.9	25.38	26.71	0.950	0.00	0.00	26.71	0.000
L9	69.75 - 56 (9)	TP34.4308x31.6528x0.6901	1812.7	35.61	29.18	1.220	0.00	0.00	29.18	0.000
L10	56 - 54 (10)	TP34.8349x34.4308x0.7794	1889.1	32.33	30.42	1.063	0.00	0.00	30.42	0.000
L11	54 - 53.5 (11)	TP34.9359x34.8349x0.7812	1908.3	32.40	31.28	1.036	0.00	0.00	31.28	0.000
L12	53.5 - 39.75 (12)	TP37.714x34.9359x0.6219	2261.1	42.91	33.22	1.292	0.00	0.00	33.22	0.000
L13	39.75 - 35 (13)	TP38.0487x35.5123x0.7536	2648.4	38.99	33.26	1.172	0.00	0.00	33.26	0.000
L14	35 - 25 (14)	TP40.069x38.0487x0.7306	3071.2	41.85	33.38	1.254	0.00	0.00	33.38	0.000
L15	25 - 14.5 (15)	TP42.1905x40.069x0.7714	3531.1	41.11	33.47	1.228	0.00	0.00	33.47	0.000
L16	14.5 - 12.5 (16)	TP42.5945x42.1905x0.8155	3620.6	39.22	33.52	1.170	0.00	0.00	33.52	0.000
L17	12.5 - 5.5 (17)	TP44.0088x42.5945x0.7987	3938.6	40.68	33.60	1.211	0.00	0.00	33.60	0.000
L18	5.5 - 4.75 (18)	TP44.1603x44.0088x0.7413	3973.1	43.73	34.40	1.271	0.00	0.00	34.40	0.000
L19	4.75 - 0 (19)	TP45.12x44.1603x0.7716	4193.6	42.52	36.03	1.180	0.00	0.00	36.03	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	120 - 96.75 (1)	TP26.6976x22x0.25	25.32	1.19	24.00	0.101	1.84	0.08	24.00	0.003
L2	96.75 - 90.0833 (2)	TP28.0446x26.6976x0.3741	32.22	0.97	20.24	0.097	1.78	0.04	20.24	0.002
L3	90.0833 - 89.5 (3)	TP28.1625x28.0446x0.4881	32.31	0.74	18.40	0.082	1.78	0.03	18.40	0.002
L4	89.5 - 78 (4)	TP30.486x28.1625x0.6246	33.61	0.57	18.69	0.062	1.84	0.03	18.69	0.001
L5	78 - 76.75 (5)	TP30.2385x28.4792x0.6844	34.53	0.53	18.63	0.058	1.87	0.02	18.63	0.001
L6	76.75 - 72 (6)	TP31.1982x30.2385x0.7684	35.42	0.47	16.68	0.057	1.94	0.02	16.68	0.001
L7	72 - 70.5 (7)	TP31.5013x31.1982x0.7596	35.68	0.47	16.71	0.058	1.95	0.02	16.71	0.001
L8	70.5 - 69.75 (8)	TP31.6528x31.5013x0.8415	35.80	0.43	17.80	0.049	1.96	0.02	17.80	0.001
L9	69.75 - 56 (9)	TP34.4308x31.6528x0.6901	38.02	0.51	19.46	0.053	2.06	0.02	19.46	0.001

Section No.	Elevation ft	Size	Actual V K	Actual f _v ksi	Allow. F _v ksi	Ratio f _v F _v	Actual T kip-ft	Actual f _{vt} ksi	Allow. F _{vt} ksi	Ratio f _{vt} F _{vt}
L10	56 - 54 (10)	TP34.8349x34.4308x0.77 94	38.37	0.45	20.28	0.045	2.08	0.02	20.28	0.001
L11	54 - 53.5 (11)	TP34.9359x34.8349x0.78 12	38.46	0.45	20.85	0.044	2.09	0.02	20.85	0.001
L12	53.5 - 39.75 (12)	TP37.714x34.9359x0.621	39.90	0.55	22.14	0.051	2.18	0.02	22.14	0.001
L13	39.75 - 35 (13)	TP38.0487x35.5123x0.75 36	41.52	0.46	22.17	0.042	2.28	0.02	22.17	0.001
L14	35 - 25 (14)	TP40.069x38.0487x0.730 6	42.99	0.46	22.25	0.042	2.38	0.02	22.25	0.001
L15	25 - 14.5 (15)	TP42.1905x40.069x0.771 4	44.57	0.43	22.32	0.039	2.49	0.01	22.32	0.001
L16	14.5 - 12.5 (16)	TP42.5945x42.1905x0.81 55	44.87	0.41	22.34	0.037	2.51	0.01	22.34	0.001
L17	12.5 - 5.5 (17)	TP44.0088x42.5945x0.79 87	45.93	0.41	22.40	0.037	2.59	0.01	22.40	0.001
L18	5.5 - 4.75 (18)	TP44.1603x44.0088x0.74 13	46.04	0.44	22.93	0.039	2.60	0.01	22.93	0.001
L19	4.75 - 0 (19)	TP45.12x44.1603x0.7716	46.77	0.42	24.02	0.036	2.65	0.01	24.02	0.001

Pole Interaction Design Data

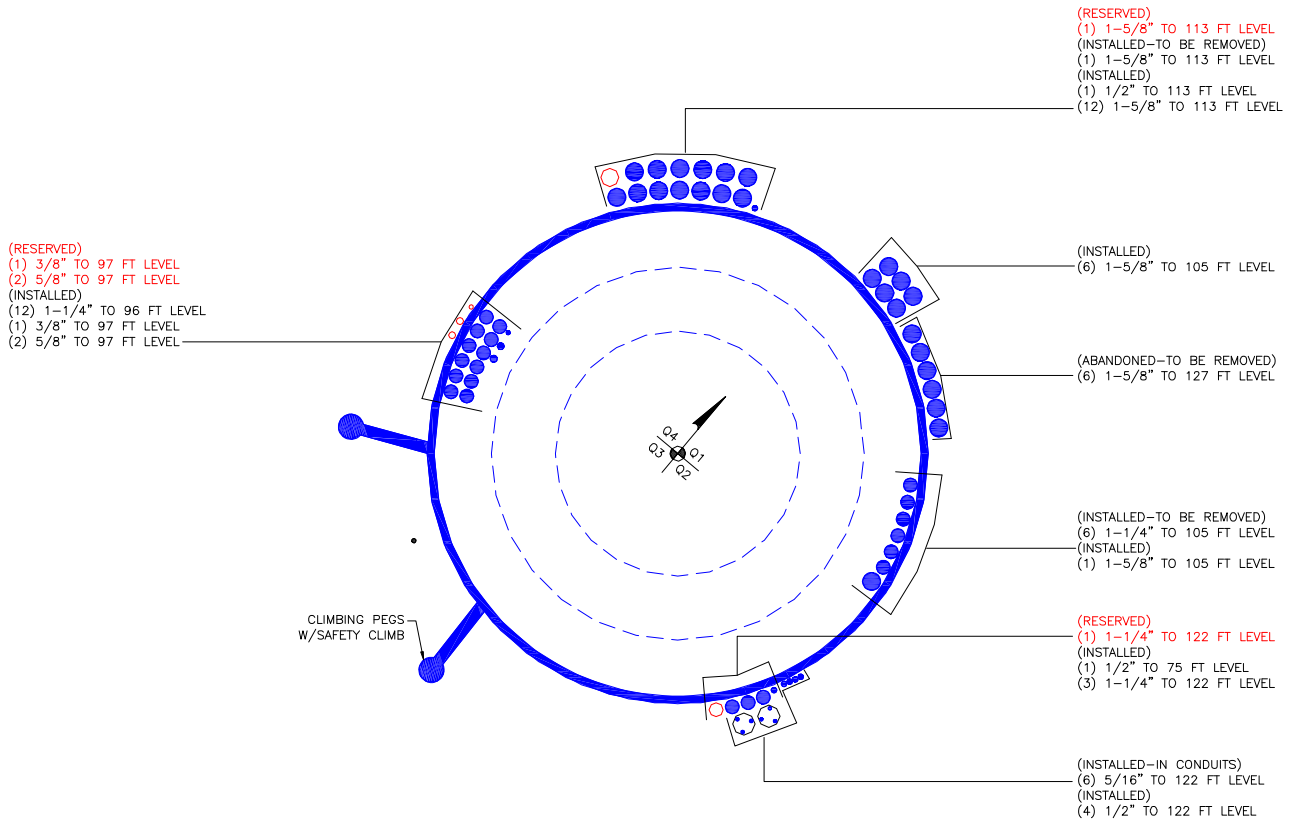
Section No.	Elevation ft	Ratio P P _a	Ratio f _{bx} F _{bx}	Ratio f _{by} F _{by}	Ratio f _v F _v	Ratio f _{vt} F _{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	120 - 96.75 (1)	0.011	0.975	0.000	0.101	0.003	0.989	1.333	H1-3+VT ✓
L2	96.75 - 90.0833 (2)	0.012	1.082	0.000	0.097	0.002	1.096	1.333	H1-3+VT ✓
L3	90.0833 - 89.5 (3)	0.010	0.943	0.000	0.082	0.002	0.955	1.333	H1-3+VT ✓
L4	89.5 - 78 (4)	0.008	0.925	0.000	0.062	0.001	0.934	1.333	H1-3+VT ✓
L5	78 - 76.75 (5)	0.009	0.981	0.000	0.058	0.001	0.990	1.333	H1-3+VT ✓
L6	76.75 - 72 (6)	0.009	1.067	0.000	0.057	0.001	1.077	1.333	H1-3+VT ✓
L7	72 - 70.5 (7)	0.009	1.101	0.000	0.058	0.001	1.111	1.333	H1-3+VT ✓
L8	70.5 - 69.75 (8)	0.008	0.950	0.000	0.049	0.001	0.959	1.333	H1-3+VT ✓
L9	69.75 - 56 (9)	0.010	1.220	0.000	0.053	0.001	1.231	1.333	H1-3+VT ✓
L10	56 - 54 (10)	0.009	1.063	0.000	0.045	0.001	1.072	1.333	H1-3+VT ✓
L11	54 - 53.5 (11)	0.009	1.036	0.000	0.044	0.001	1.045	1.333	H1-3+VT ✓
L12	53.5 - 39.75 (12)	0.011	1.292	0.000	0.051	0.001	1.303	1.333	H1-3+VT ✓
L13	39.75 - 35 (13)	0.010	1.172	0.000	0.042	0.001	1.183	1.333	H1-3+VT ✓
L14	35 - 25 (14)	0.011	1.254	0.000	0.042	0.001	1.265	1.333	H1-3+VT ✓
L15	25 - 14.5 (15)	0.011	1.228	0.000	0.039	0.001	1.240	1.333	H1-3+VT ✓
L16	14.5 - 12.5 (16)	0.011	1.170	0.000	0.037	0.001	1.181	1.333	H1-3+VT ✓
L17	12.5 - 5.5 (17)	0.011	1.211	0.000	0.037	0.001	1.222	1.333	H1-3+VT ✓

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L18	5.5 - 4.75 (18)	0.012	1.271	0.000	0.039	0.001	1.284	1.333	H1-3+VT ✓
L19	4.75 - 0 (19)	0.011	1.180	0.000	0.036	0.001	1.192	1.333	H1-3+VT ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail	
L1	120 - 96.75	Pole	TP26.6976x22x0.25	1	-8.80	1021.68	74.2	Pass	
L2	96.75 - 90.0833	Pole	TP28.0446x26.6976x0.3741	2	-11.77	1348.70	82.2	Pass	
L3	90.0833 - 89.5	Pole	TP28.1625x28.0446x0.4881	3	-11.90	1600.67	71.6	Pass	
L4	89.5 - 78	Pole	TP30.486x28.1625x0.6246	4	-13.75	2187.51	70.1	Pass	
L5	78 - 76.75	Pole	TP30.2385x28.4792x0.6844	5	-15.78	2425.97	74.3	Pass	
L6	76.75 - 72	Pole	TP31.1982x30.2385x0.7684	6	-17.28	2511.59	80.8	Pass	
L7	72 - 70.5	Pole	TP31.5013x31.1982x0.7596	7	-17.73	2512.69	83.3	Pass	
L8	70.5 - 69.75	Pole	TP31.6528x31.5013x0.8415	8	-17.99	2972.20	71.9	Pass	
L9	69.75 - 56	Pole	TP34.4308x31.6528x0.6901	9	-22.13	2916.86	92.3	Pass	
L10	56 - 54	Pole	TP34.8349x34.4308x0.7794	10	-22.82	3465.72	80.4	Pass	
L11	54 - 53.5	Pole	TP34.9359x34.8349x0.7812	11	-23.01	3582.14	78.4	Pass	
L12	53.5 - 39.75	Pole	TP37.714x34.9359x0.621	12	-25.74	3199.04	97.8	Pass	
L13	39.75 - 35	Pole	TP38.0487x35.5123x0.7536	13	-30.29	4011.97	88.7	Pass	
L14	35 - 25	Pole	TP40.069x38.0487x0.7306	14	-34.03	4117.70	94.9	Pass	
L15	25 - 14.5	Pole	TP42.1905x40.069x0.7714	15	-38.32	4590.76	93.0	Pass	
L16	14.5 - 12.5	Pole	TP42.5945x42.1905x0.8155	16	-39.20	4901.57	88.6	Pass	
L17	12.5 - 5.5	Pole	TP44.0088x42.5945x0.7987	17	-42.29	4977.25	91.7	Pass	
L18	5.5 - 4.75	Pole	TP44.1603x44.0088x0.7413	18	-42.61	4752.05	96.3	Pass	
L19	4.75 - 0	Pole	TP45.12x44.1603x0.7716	19	-44.70	5292.28	89.4	Pass	
							Summary		
							Pole (L12)	97.8	Pass
							RATING =	97.8	Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

DESIGNED APPURTENANCE LOADING

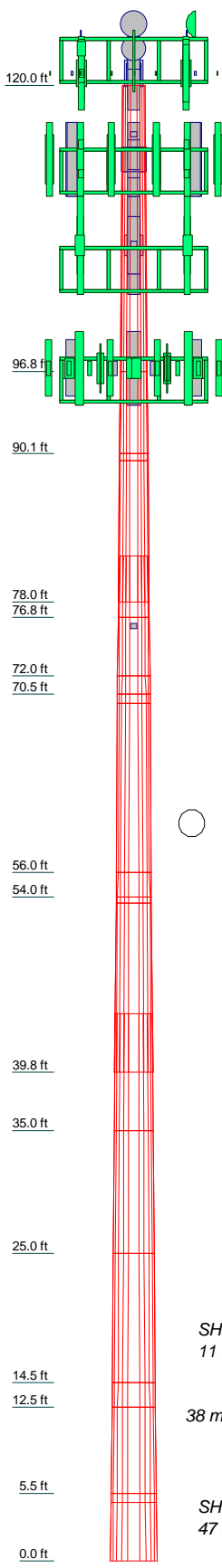
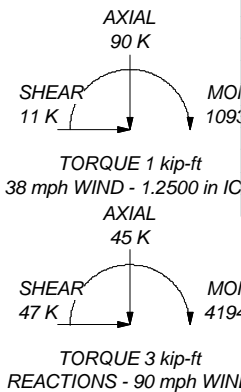
TYPE	ELEVATION	TYPE	ELEVATION
APXVSP18-C-A20 w/ Mount Pipe	122	(2) LPA-80063/4CF w/ Mount Pipe	113
APXVSP18-C-A20 w/ Mount Pipe	122	(2) LPA-80063/4CF w/ Mount Pipe	113
APXVSP18-C-A20 w/ Mount Pipe	122	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	105
LLPX310R w/ Mount Pipe	122	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	105
LLPX310R w/ Mount Pipe	122	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	105
LLPX310R w/ Mount Pipe	122	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	105
MT-485025	122	KRY 112 144/1	105
800 EXTERNAL NOTCH FILTER	122	KRY 112 144/1	105
800 EXTERNAL NOTCH FILTER	122	KRY 112 144/1	105
800 EXTERNAL NOTCH FILTER	122	LNx-6515DS-VTM w/ Mount Pipe	105
(3) ACU-A20-N	122	LNx-6515DS-VTM w/ Mount Pipe	105
(3) ACU-A20-N	122	LNx-6515DS-VTM w/ Mount Pipe	105
(3) ACU-A20-N	122	LNx-6515DS-VTM w/ Mount Pipe	105
PCS 1900MHz 4x45W-65MHz	122	RRUS 11 B12	105
PCS 1900MHz 4x45W-65MHz	122	RRUS 11 B12	105
PCS 1900MHz 4x45W-65MHz	122	RRUS 11 B12	105
800MHZ RRRH	122	Platform Mount [LP 712-1]	105
800MHZ RRRH	122	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
800MHZ RRRH	122	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
FDD_R6_RRH	122	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
FDD_R6_RRH	122	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
FDD_R6_RRH	122	DC6-48-60-18-8F	97
APXVTM14-C-120 w/ Mount Pipe	122	RRUS-32 B30	97
APXVTM14-C-120 w/ Mount Pipe	122	RRUS-32 B30	97
TD-RRH8x20-25	122	RRUS-32 B30	97
TD-RRH8x20-25	122	DC6-48-60-18-8F	97
TD-RRH8x20-25	122	DC6-48-60-18-8F	97
TD-RRH8x20-25	122	Side Arm Mount [SO 102-3]	97
Platform Mount [LP 713-1]	122	(2) 2.375" OD x 4" Mount Pipe	97
2.375" OD x 5" Mount Pipe	122	(2) 2.375" OD x 4" Mount Pipe	97
2.375" OD x 5" Mount Pipe	122	(2) 2.375" OD x 4" Mount Pipe	97
2.375" OD x 5" Mount Pipe	122	(2) RRRUS 11	97
PX2F-52	122	(2) RRRUS 11	97
VHLP2-11	122	(2) RRRUS 11	97
VHLP2-11	122	P65-16-XLH-RR w/ Mount Pipe	96
ACUTIME 2000	113	P65-16-XLH-RR w/ Mount Pipe	96
DB-T1-6Z-8AB-0Z	113	P65-16-XLH-RR w/ Mount Pipe	96
(3) SBNHH-1D65B w/ Mount Pipe	113	(4) LGP2140X	96
(3) SBNHH-1D65B w/ Mount Pipe	113	(4) LGP2140X	96
(3) SBNHH-1D65B w/ Mount Pipe	113	(4) LGP2140X	96
RRH2x60-700	113	OPA-65R-LCUU-H6 w/ Mount Pipe	96
RRH2x60-700	113	OPA-65R-LCUU-H6 w/ Mount Pipe	96
RRH2x60-700	113	OPA-65R-LCUU-H6 w/ Mount Pipe	96
DB-T1-6Z-8AB-0Z	113	Platform Mount [LP 601-1]	96
RRH2X60-1900	113	(2) 7770.00 w/ Mount Pipe	96
RRH2X60-1900	113	(2) 7770.00 w/ Mount Pipe	96
RRH2X60-1900	113	(2) 7770.00 w/ Mount Pipe	96
RRH2X60-AWS	113	(2) 7770.00 w/ Mount Pipe	96
RRH2X60-AWS	113	Side Arm Mount [SO 701-1]	75
RRH2X60-AWS	113	ACUTIME 2000	75
Platform Mount [LP 305-1]	113		
(2) DB846F65ZAXY w/ Mount Pipe	113		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	Reinf 52.13 ksi	52 ksi	66 ksi
Reinf 50.59 ksi	51 ksi	64 ksi	Reinf 55.36 ksi	55 ksi	70 ksi
Reinf 46.01 ksi	46 ksi	58 ksi	Reinf 55.43 ksi	55 ksi	70 ksi
Reinf 46.73 ksi	47 ksi	59 ksi	Reinf 55.63 ksi	56 ksi	70 ksi
Reinf 46.57 ksi	47 ksi	59 ksi	Reinf 55.79 ksi	56 ksi	70 ksi
Reinf 41.71 ksi	42 ksi	53 ksi	Reinf 55.86 ksi	56 ksi	70 ksi
Reinf 41.78 ksi	42 ksi	53 ksi	Reinf 56.00 ksi	56 ksi	70 ksi
Reinf 44.51 ksi	45 ksi	56 ksi	Reinf 57.33 ksi	57 ksi	72 ksi
Reinf 48.64 ksi	49 ksi	61 ksi	Reinf 60.05 ksi	60 ksi	76 ksi
Reinf 50.70 ksi	51 ksi	64 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.25 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 97.8%



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	23.2500	12	0.2500					
2		12						
3		12						
4		12						
5		12						
6		12						
7		12						
8		12						
9		12						
10		12						
11		12						
12		12						
13		12						
14		12						
15		12						
16		12						
17		12						
18		12						
19		12						

Paul J Ford and Company
 250 E. Broad Street Suite 600
 Columbus, OH 43215
 Phone: 614.221.6679
 FAX: 614.448.44105

Job: **120' MP; 528 Wheelers Farm RD; Milford, CT**
 Project: **PJF 37515-1743 / BU 876320**

Client: Crown Castle	Drawn by: Robert Koors	App'd:
Code: TIA/EIA-222-F	Date: 09/01/15	Scale: NTS
Path:		Dwg No. E-1

v4.4 - Effective 7-12-13

Asymmetric Anchor Rod Analysis

Moment =	4194	k-ft	TIA Ref.	F	Location =	Base Plate
Axial =	45.0	kips	ASIF =	1.3333	η =	N/A for BP, Rev. G Sect. 4.9.9
Shear =	47.0	kips	Max Ratio =	100.0%	Threads =	N/A for FP, Rev. G
Anchor Qty =	24					

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

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in ²	Area, in ²	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	2.250	#18J A615 Gr 75	75	100	27.3	58.00	0.00	3.98	181.49	176.84	176.84	0.00	195.00	90.7%
2	2.250	#18J A615 Gr 75	75	100	39.1	58.00	0.00	3.98	181.49	176.84	176.84	0.00	195.00	90.7%
3	2.250	#18J A615 Gr 75	75	100	50.9	58.00	0.00	3.98	181.49	176.84	176.84	0.00	195.00	90.7%
4	2.250	#18J A615 Gr 75	75	100	62.7	58.00	0.00	3.98	181.49	176.84	176.84	0.00	195.00	90.7%
5	2.250	#18J A615 Gr 75	75	100	117.3	58.00	0.00	3.98	181.49	176.84	176.84	0.00	195.00	90.7%
6	2.250	#18J A615 Gr 75	75	100	129.1	58.00	0.00	3.98	181.49	176.84	176.84	0.00	195.00	90.7%
7	2.250	#18J A615 Gr 75	75	100	140.9	58.00	0.00	3.98	181.49	176.84	176.84	0.00	195.00	90.7%
8	2.250	#18J A615 Gr 75	75	100	152.7	58.00	0.00	3.98	181.49	176.84	176.84	0.00	195.00	90.7%
9	2.250	#18J A615 Gr 75	75	100	207.3	58.00	0.00	3.98	181.49	176.84	176.84	0.00	195.00	90.7%
10	2.250	#18J A615 Gr 75	75	100	219.1	58.00	0.00	3.98	181.49	176.84	176.84	0.00	195.00	90.7%
11	2.250	#18J A615 Gr 75	75	100	230.9	58.00	0.00	3.98	181.49	176.84	176.84	0.00	195.00	90.7%
12	2.250	#18J A615 Gr 75	75	100	242.7	58.00	0.00	3.98	181.49	176.84	176.84	0.00	195.00	90.7%
13	2.250	#18J A615 Gr 75	75	100	297.3	58.00	0.00	3.98	181.49	176.84	176.84	0.00	195.00	90.7%
14	2.250	#18J A615 Gr 75	75	100	309.1	58.00	0.00	3.98	181.49	176.84	176.84	0.00	195.00	90.7%
15	2.250	#18J A615 Gr 75	75	100	320.9	58.00	0.00	3.98	181.49	176.84	176.84	0.00	195.00	90.7%
16	2.250	#18J A615 Gr 75	75	100	332.7	58.00	0.00	3.98	181.49	176.84	176.84	0.00	195.00	90.7%
17	1.375	Williams R71	127.7	150	352.1	58.00	0.00	1.68	76.52	74.56	74.56	0.00	110.75	67.3%
18	1.375	Williams R71	127.7	150	7.9	58.00	0.00	1.68	76.52	74.56	74.56	0.00	110.75	67.3%
19	1.375	Williams R71	127.7	150	82.1	58.00	0.00	1.68	76.52	74.56	74.56	0.00	110.75	67.3%
20	1.375	Williams R71	127.7	150	97.9	58.00	0.00	1.68	76.52	74.56	74.56	0.00	110.75	67.3%
21	1.375	Williams R71	127.7	150	172.1	58.00	0.00	1.68	76.52	74.56	74.56	0.00	110.75	67.3%
22	1.375	Williams R71	127.7	150	187.9	58.00	0.00	1.68	76.52	74.56	74.56	0.00	110.75	67.3%
23	1.375	Williams R71	127.7	150	262.1	58.00	0.00	1.68	76.52	74.56	74.56	0.00	110.75	67.3%
24	1.375	Williams R71	127.7	150	277.9	58.00	0.00	1.68	76.52	74.56	74.56	0.00	110.75	67.3%

77.10

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

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

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

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

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

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

Stress Increase Factor	
ASD ASIF:	1.333

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

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	3463.8	ft-kips
Unfactored Axial, P:	37.2	kips
Unfactored Shear, V:	38.8	kips

Reactions adjusted to account for additional anchor rods.

Anchor Rod Results

TIA F --> Maximum Rod Tension: 176.8 Kips
 Allowable Tension: 195.0 Kips
 Anchor Rod Stress Ratio: 90.7% Pass

Base Plate Results

Base Plate Stress: 4.3 ksi
 Allowable PL Bending Stress: 26.7 ksi
 Base Plate Stress Ratio: 16.3% Pass

Shear Check Only

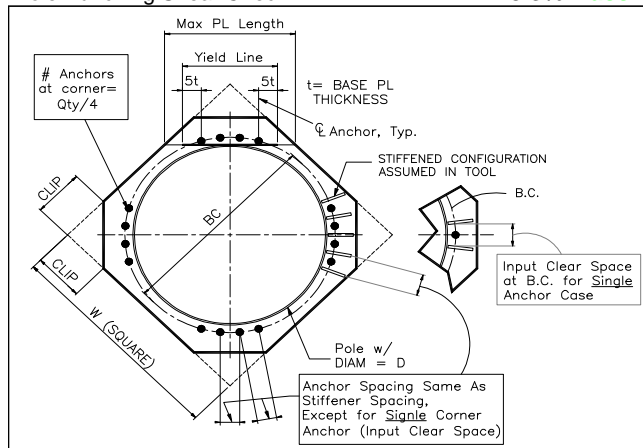
PL Ref. Data
Yield Line (in):
N/A, Roark
Max PL Length:
35.49

Stiffener Results

Horizontal Weld : 51.7% Pass
 Vertical Weld: 43.4% Pass
 Plate Flex+Shear, fb/Fb+(fv/Fv)^2: 14.9% Pass
 Plate Tension+Shear, ft/Ft+(fv/Fv)^2: 53.2% Pass
 Plate Comp. (AISC Bracket): 53.1% Pass

Pole Results

Pole Punching Shear Check: 15.3% Pass



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

Unfactored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, M =	4194.0		k-ft
Shear, V =	47.0		kips
Axial Load, P =	45.0		kips
OTM =	4217.5	0.0	k-ft @ Ground

Safety Factors / Load Factors / Φ Factors

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

Drilled Pier Parameters

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

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

Load Combinations Checked per TIA/EIA-222-F

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

Steel Parameters

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

Soil Parameters

Water Table Depth =	7.00	ft
Depth to Ignore Soil =	3.33	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?	Ground	
<i>Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)</i>		
<i>Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)</i>		

Direct Embed Pole Shaft Parameters

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

Maximum Capacity Ratios

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

Define Soil Layers

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

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

Soil Results: Overturning

Depth to COR =	15.23	ft, from Grade
Bending Moment, M =	4933.27	k-ft, from COR
Resisting Moment, Ma =	4941.72	k-ft, from COR

Shear, V =	47.00	kips
Resisting Shear, Va =	47.08	kips

MOMENT RATIO = 99.8% OK

SHEAR RATIO = 99.8% OK

Soil Results: Uplift

Uplift, T =	0.00	kips
Allowable Uplift Cap., Ta =	67.00	kips

UPLIFT RATIO = 0.0% OK

Soil Results: Compression

Compression, C =	45.00	kips
Allowable Comp. Cap., Ca =	369.36	kips

COMPRESSION RATIO = 12.2% OK

Steel Results (ACI 318-02):

Minimum Steel Area =	18.47	sq in
Actual Steel Area =	49.92	sq in

Axial Load, P =	75.31	kips @ 4.75 ft Below Grade
Moment, M =	4417.11	k-ft @ 4.75 ft Below Grade
Allowable Moment, Ma =	5831.94	k-ft

Allowable Min Axial, Pa =	-2073.60	kips, Where Ma = 0 k-ft
Allowable Max Axial, Pa =	6799.77	kips, Where Ma = 0 k-ft

MOMENT RATIO = 75.7% OK

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

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

Site Data

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

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

Pier Properties	
Concrete:	
Pier Diameter =	7.0 ft
Concrete Area =	5541.8 in ²
Reinforcement:	
Clear Cover to Tie=	4.00 in
Horiz. Tie Bar Size=	5
Vert. Cage Diameter =	6.11 ft
Vert. Cage Diameter =	73.34 in
Vertical Bar Size =	11
Bar Diameter =	1.41 in
Bar Area =	1.56 in ²
Number of Bars =	32
As Total=	49.92 in ²
A s/ Aconc, Rho:	0.0090 0.90%

ACI 10.5 , ACI 21.10.4, and IBC 1810.

Min As for Flexural, Tension Controlled, Shafts:

$$(3) * (\text{Sqrt}(f'c) / F_y) = 0.0027$$

$$200 / F_y = 0.0033$$

Minimum Rho Check:

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

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

Maximum Shaft Superimposed Forces		
TIA Revision:	F	
Max. Service Shaft M:	4417.11	ft-kips (* Note)
Max. Service Shaft P:	75.31	kips
Max Axial Force Type:	Comp.	

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

Load Factor	Shaft Factored Loads	
1.30	Mu:	5742.243 ft-kips
1.30	Pu:	97.903 kips

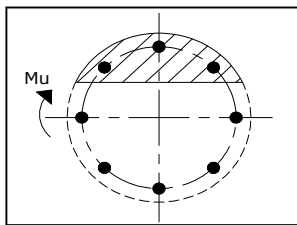
Material Properties		
Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	
ACI 318 Code		
Select Analysis ACI Code=	2002	
Seismic Properties		
Seismic Design Category =	D	
Seismic Risk =	High	

Solve (Run)

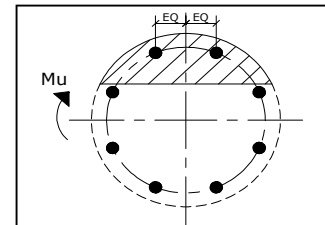
<-- Press Upon Completing All Input

Results:

Governing Orientation Case: 2



Case 1



Case 2

Dist. From Edge to Neutral Axis: 17.13 in

Extreme Steel Strain, ϵ_t : 0.0107

$\epsilon_t > 0.0050$, Tension Controlled

Reduction Factor, ϕ : 0.900

Output Note: Negative Pu=Tension
 For Axial Compression, ϕ Pn = Pu: 97.90 kips
 Drilled Shaft Moment Capacity, ϕ Mn: 7581.54 ft-kips
 Drilled Shaft Superimposed Mu: 5742.24 ft-kips

(Mu/ ϕ Mn, Drilled Shaft Flexure CSR: 75.7%

MODIFICATION OF AN EXISTING 120' MONOPOLE

BU #876320; 528 WHEELERS FARM RD

528 WHEELERS FARM ROAD
MILFORD, CONNECTICUT 06460

NEW HAVEN COUNTY

LAT: 41° 14' 54.35"; LONG: -73° 4' 44.67"

APP: 303773 REV. 0; WO: 1101579

PROJECT CONTACTS

STRUCTURE OWNER:

CROWN CASTLE
MOD PM: DAN VADNEY AT DAN.VADNEY@CROWNCastle.COM
PH: (518) 373-3510
MOD CM: JASON D'AMICO AT
JASON.D'AMICO.VENDOR@CROWNCastle.COM
PH: (860) 209-0104

ENGINEER OF RECORD:

PJFMOD@PJFWEB.COM

THIS PROJECT INCLUDES THE FOLLOWING ITEMS

SHAFT REINFORCING
FIELD WELDED STIFFENER EXTENSIONS
HIGH STRENGTH GROUT
MOUNT, ANTENNA & COAX REMOVAL

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	SHAFT REINF. CHART AND DETAILS
S-5	BASE PLATE DETAILS
S-6	MISC DETAILS
S-7	MI CHECKLIST

WIND DESIGN DATA

REFERENCE STANDARD	TIA/EIA-222-F
LOCAL CODE	2005 CTBC
BASIC WIND SPEED (3-SECOND GUST)	110 MPH
BASIC WIND SPEED (FASTEST-MILE)	90 MPH
ICE THICKNESS	1.25 IN
ICE WIND SPEED	37.6 MPH
SERVICE WIND SPEED	50 MPH



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.



9-1-2015 : REVISED WIND DESIGN DATA

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

CROWN CASTLE
3530 TORRINGDON WAY SUITE 300 CHARLOTTE, NC 28277
PH: (704) 405-6615

MODIFICATION OF AN EXISTING 120'
MONOPOLE
BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT

PROJECT No: 37515-1743.006.7700 R1
DRAWN BY: I.M.
DESIGNED BY: R.M.K.
CHECKED BY:
DATE: 8-18-2015

TITLE SHEET

T-1

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, MORAIN, 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 SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES. 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 - (NOT REQUIRED)

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 SEVER WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".

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250 E Broad St, Ste 600, Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

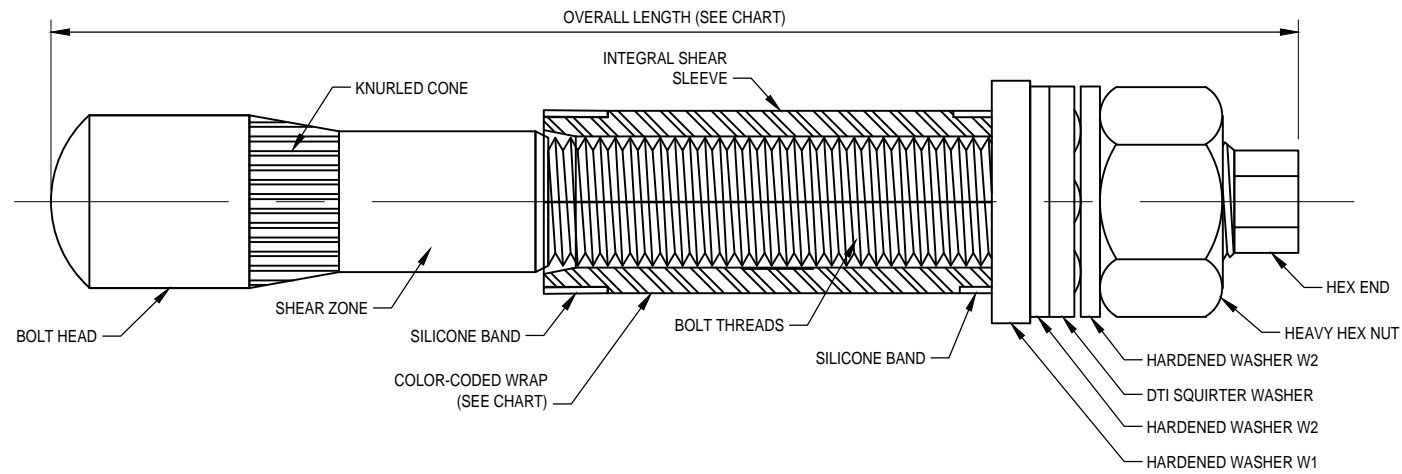
CROWN CASTLE
3530 TORRINGDON WAY SUITE 300 CHARLOTTE, NC 28277
PH: (704) 405-6615

MODIFICATION OF AN EXISTING 120' MONOPOLE
BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT

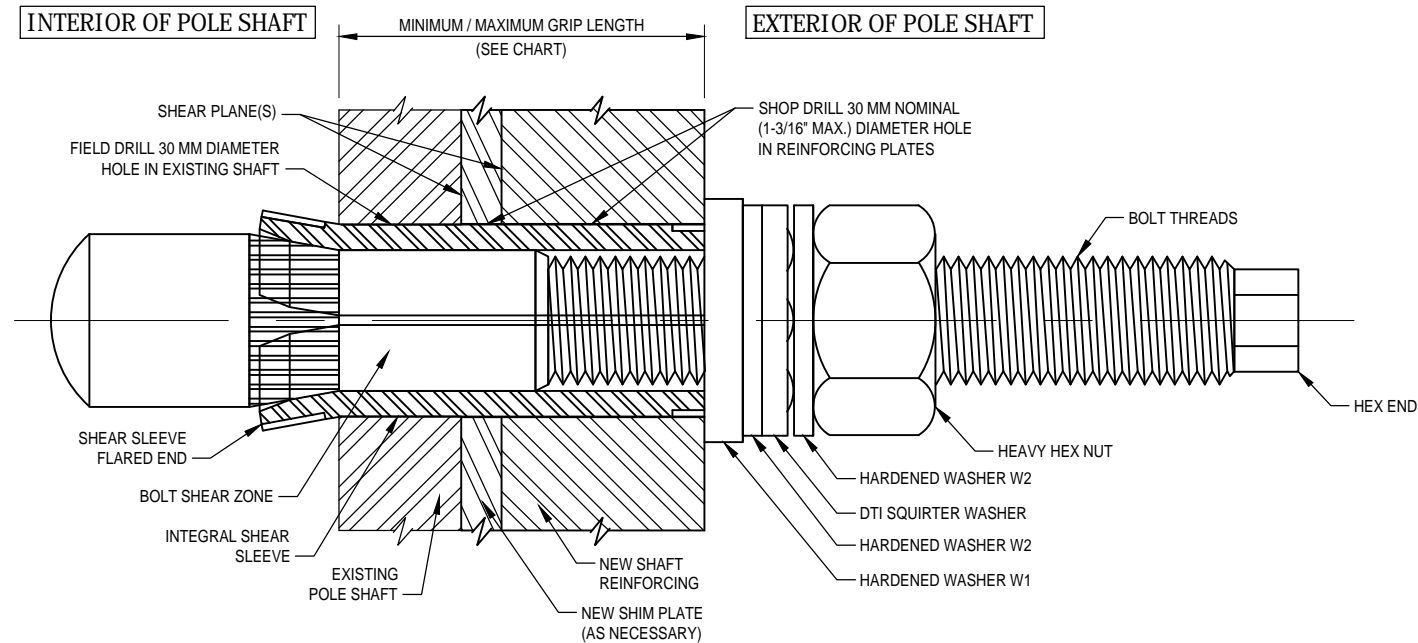
PROJECT No:	37515-1743.006.7700 R1
DRAWN BY:	I.M.
DESIGNED BY:	R.M.K.
CHECKED BY:	
DATE:	8-18-2015

GENERAL NOTES

S-1



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

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

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3530 TORRINGDON WAY SUITE 300 CHARLOTTE, NC 28277
PH: (704) 405-6615

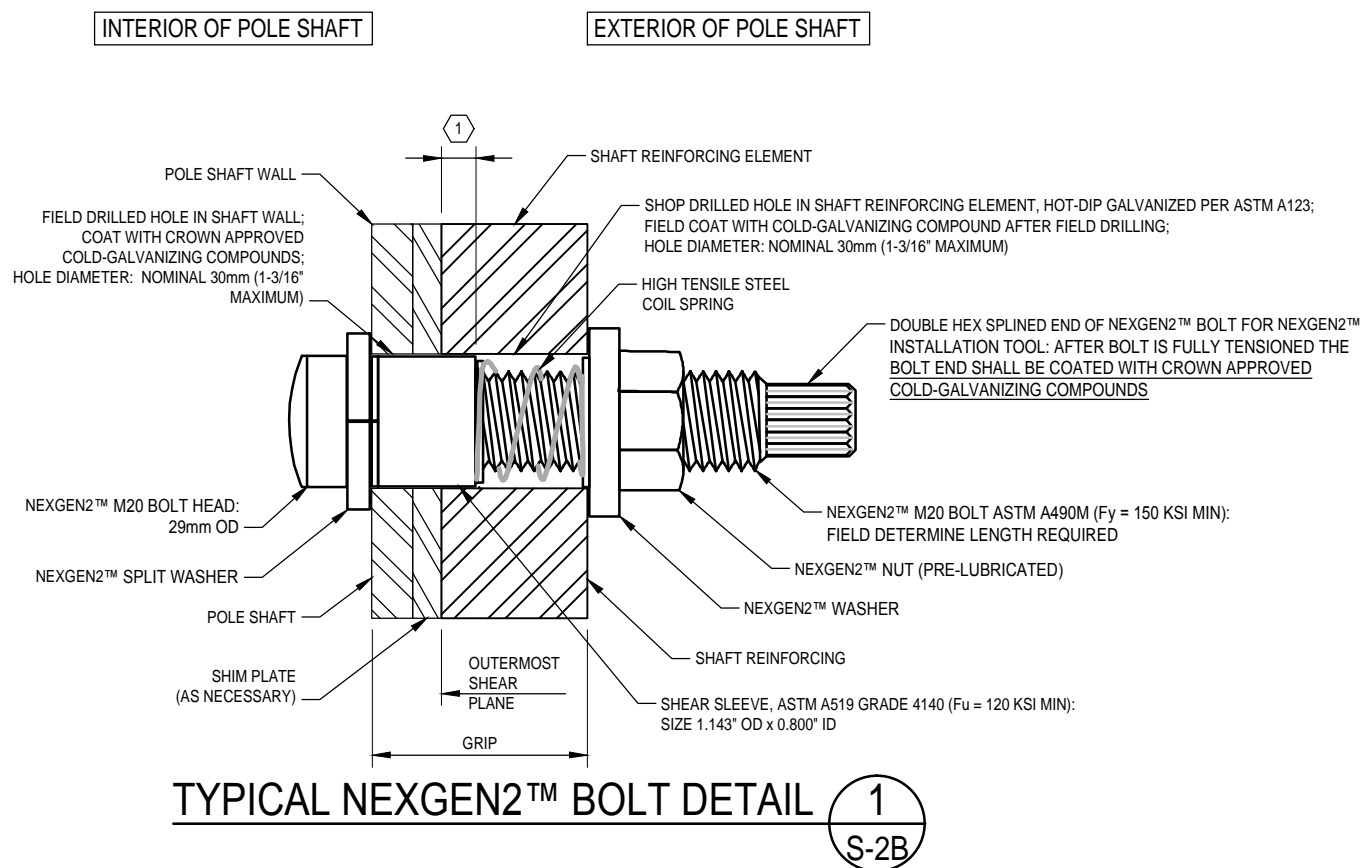
MODIFICATION OF AN EXISTING 120' MONOPOLE
BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT

PROJECT No:	37515-1743.006.7700 R1
DRAWN BY:	I.M.
DESIGNED BY:	R.M.K.
CHECKED BY:	
DATE:	8-18-2015

FORGBolt™ DETAILS

S-2A

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.



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

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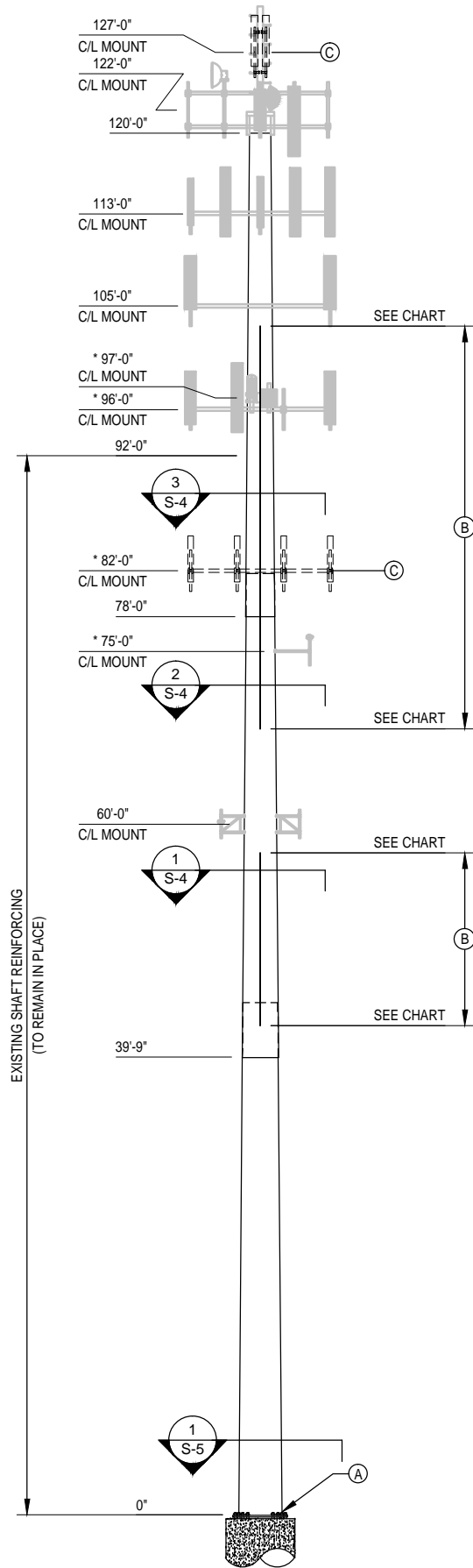
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MODIFICATION OF AN EXISTING 120' MONOPOLE
 BU #876320; 528 WHEELERS FARM RD
 MILFORD, CONNECTICUT

PROJECT No:	37515-1743.006.7700 R1
DRAWN BY:	I.M.
DESIGNED BY:	R.M.K.
CHECKED BY:	
DATE:	8-18-2015

NEXGEN2™ BOLT DETAIL

S-2B



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

SHAFT SECTION DATA							
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN)		POLE GRADE (ksi)	POLE SHAPE
				@ TOP	@ BOTTOM		
1	42.00	0.2500	45.00	22.000	30.486	60	12-SIDED
2	42.00	0.3125	57.00	29.228	37.714	60	12-SIDED
3	44.50	0.3750		36.129	45.120	60	12-SIDED

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 STIFFENER EXTENSIONS, BEARING PLATES, AND GROUT AT BASE PLATE. SEE SHEET S-5.
 - (B) INSTALL NEW SHAFT REINFORCING. SEE CHART ON SHEET S-4.
 - (C) REMOVE MOUNT, ANTENNAS & COAX.

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MONOPOLE PROFILE

S-3

37515-1743.006 R1.DWG

NOTE: SHAFT REINFORCING MAY NEED TO BE INSTALLED OFF CENTER OF FLAT FOR FIT UP.

NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE

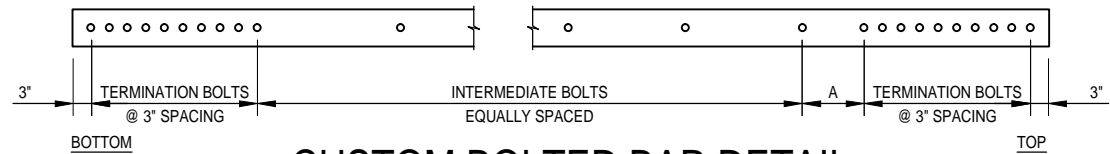
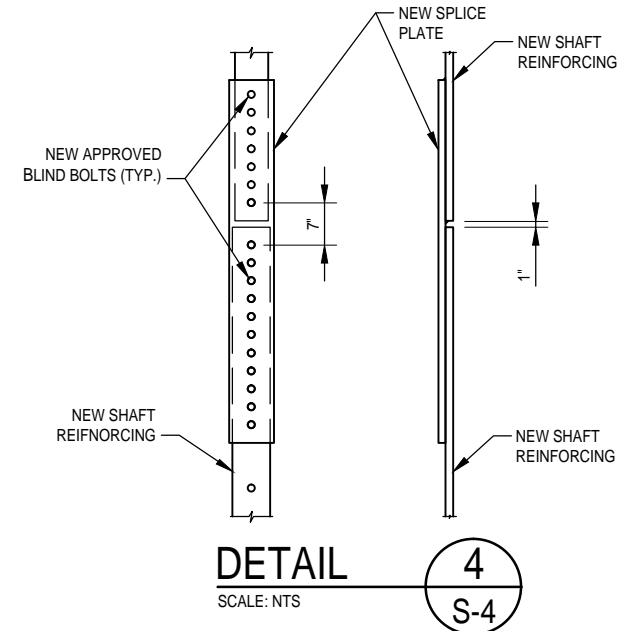
BOTTOM ELEVATION	TOP ELEVATION	FLAT # / DEGREE SEPARATION	ELEMENT	ELEMENT LENGTH	ELEMENT QUANTITY	APPROXIMATE BOLTS PER ELEMENT	APPROXIMATE TOTAL BOLT QUANTITY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	ESTIMATED TOTAL STEEL WEIGHT
42'-6"	57'-6"	F2, F6, F8 & F12	CCI-SFP-04510015	15'-0"	4	19	76	6	6	20"	919 LBS.
68'-3"	98'-3"	F4, F7 & F12	4" x 1-1/4" CFP#1	25'-0"	3	21	63	6	6	27"	766 LBS.
68'-3"	78'-3"	F8	4" x 1-1/4" CFP#2	10'-0"	1	15	15	6	6	27"	102 LBS.
154											1787 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.

NEW SHIM CHART

1/16" SHIM QUANTITY	1/4" SHIM QUANTITY	SHIM WIDTH	SHIM LENGTH	HOLE DIAMETER
18	0	4"	4"	1-1/4"

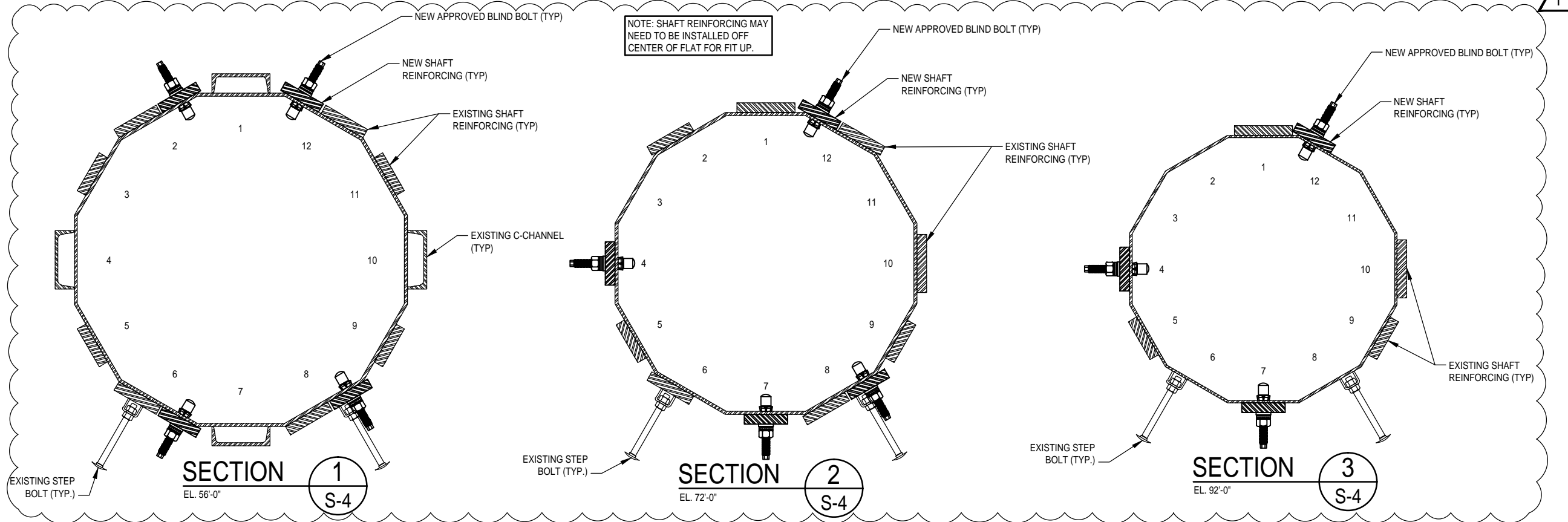
SHIMS ARE FOR BIDDING PURPOSES ONLY, FINAL SHIM REQUIREMENTS TO BE DETERMINED BY CONTRACTOR DURING FABRICATION.



CUSTOM BOLTED BAR DETAIL

NOTE: "A" DIMENSION MAY VARY, NOT TO EXCEED MAXIMUM INTERMEDIATE BOLT SPACING

NOTE: FLAT LOCATION OF THE EXISTING STEP BOLTS MAY DIFFER FROM SHOWN DEPENDING ON ELEVATION. CONTRACTOR SHALL REMOVE AND REPLACE STEP BOLTS AS REQUIRED FOR REINFORCING INSTALLATION



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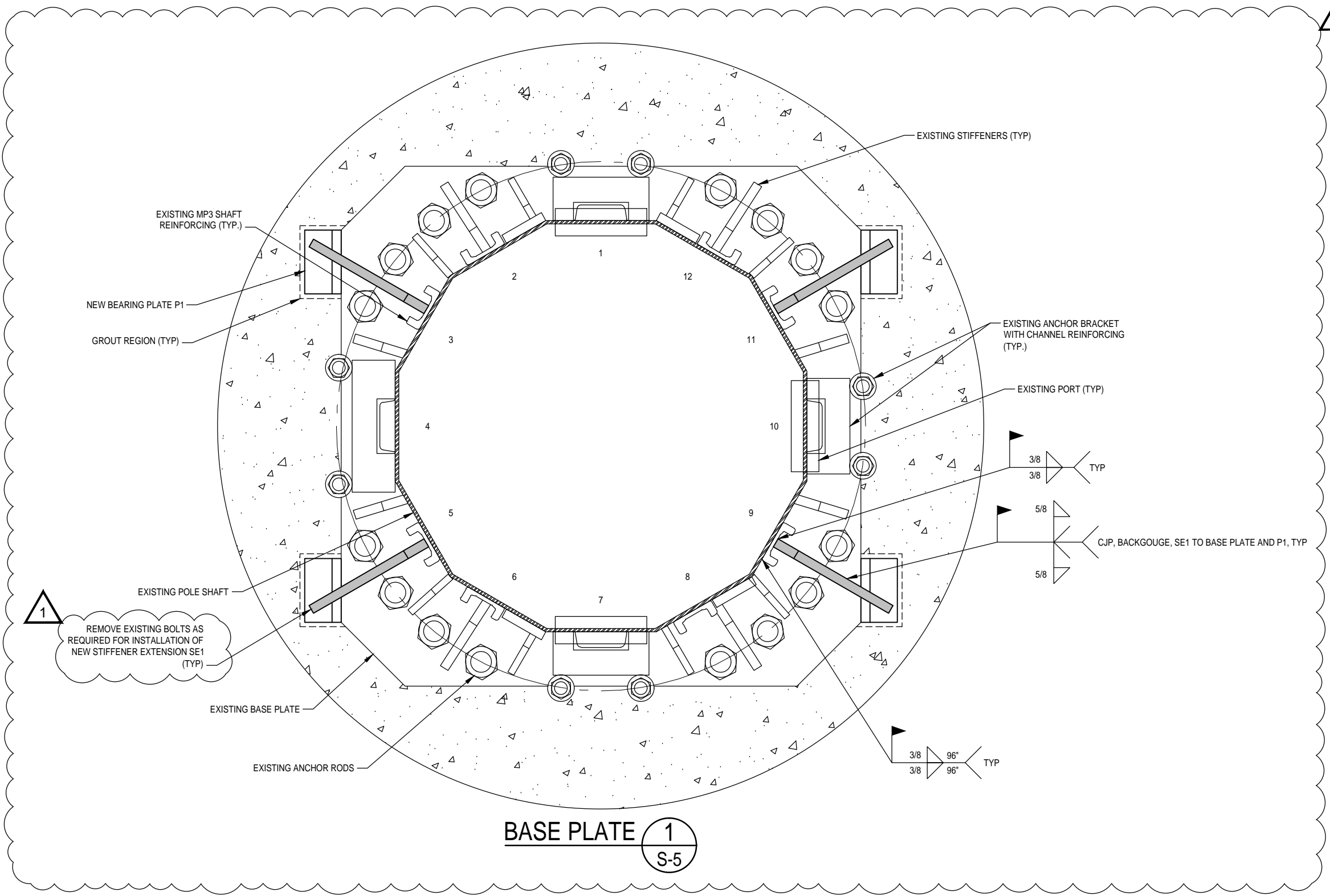
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SHAFT REINF. CHART AND DETAILS

S-4

BASE SPECIFICATIONS	
BASE PLATE:	57" SQUARE; 3 1/4" THK.; Fy=50 KSI
ANCHOR RODS:	(16) 2 1/4"ø; A615 GRADE 75; 58" 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.



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

CROWN CASTLE
 3530 TORRINGDON WAY SUITE 300 CHARLOTTE, NC 28277
 PH: (704) 405-6615

MODIFICATION OF AN EXISTING 120' MONOPOLE
 BU #876320; 528 WHEELERS FARM RD
 MILFORD, CONNECTICUT

PROJECT No:	37515-1743.006.7700 R1
DRAWN BY:	I.M.
DESIGNED BY:	R.M.K.
CHECKED BY:	
DATE:	8-18-2015

BASE PLATE DETAILS

S-5

37515-1743.006 R1.DWG

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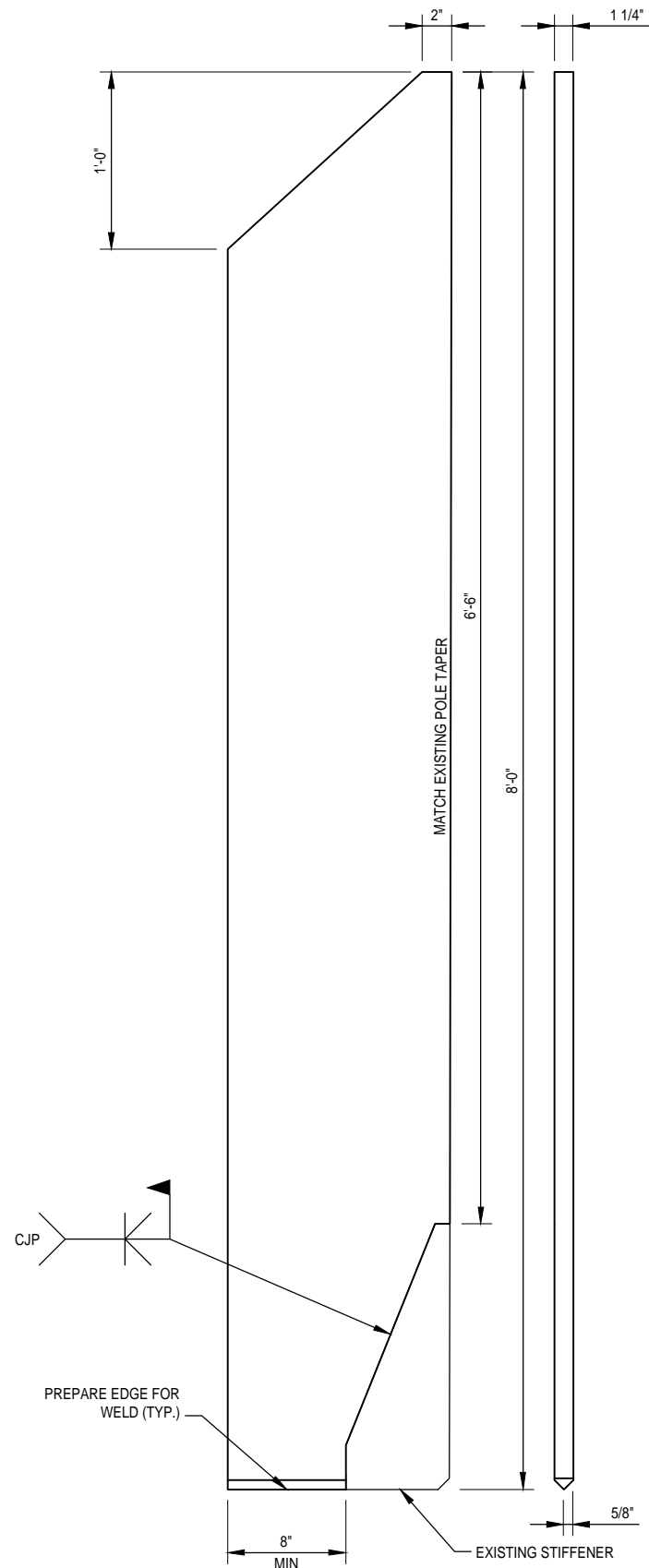
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MODIFICATION OF AN EXISTING 120' MONOPOLE
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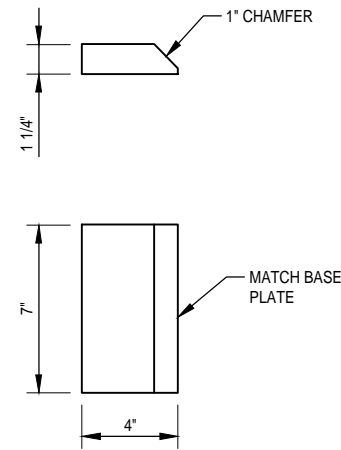
PROJECT No: 37515-1743.006.7700 R1
 DRAWN BY: I.M.
 DESIGNED BY: R.M.K.
 CHECKED BY:
 DATE: 8-18-2015

MISC DETAILS

S-6



STIFFENER EXTENSION MK~SE1
 (4 REQ.) (Fy = 65 KSI)



BEARING PLATE MK~P1
 (4 REQUIRED) (Fy = 50 KSI)

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 CUTOFF 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. COMPILER 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
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	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
NA	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)
NA	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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BU #876320; 528 WHEELERS FARM RD MILFORD, CONNECTICUT

PROJECT No:	37515-1743.006.7700 R1
DRAWN BY:	I.M.
DESIGNED BY:	R.M.K.
CHECKED BY:	
DATE:	8-18-2015

MI CHECKLIST

S-7

MODIFICATION OF AN EXISTING 120' MONOPOLE

BU #876320; 528 WHEELERS FARM RD

528 WHEELERS FARM ROAD
MILFORD, CONNECTICUT 06460
NEW HAVEN COUNTY

LAT: 41° 14' 54.35"; LONG: -73° 4' 44.67"
APP: 303773 REV. 0; WO: 1101579

PROJECT CONTACTS

STRUCTURE OWNER:
CROWN CASTLE
MOD PM: DAN VADNEY AT DAN.VADNEY@CROWNCastle.COM
PH: (518) 373-3510
MOD CM: JASON D'AMICO AT
JASON.D'AMICO.VENDOR@CROWNCastle.COM
PH: (860) 209-0104

ENGINEER OF RECORD:
PJFMOD@PJFWEB.COM

THIS PROJECT INCLUDES THE FOLLOWING ITEMS

SHAFT REINFORCING
FIELD WELDED STIFFENER EXTENSIONS
HIGH STRENGTH GROUT
MOUNT, ANTENNA & COAX REMOVAL

SHEET INDEX

SHEET NUMBER	DESCRIPTION
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S-1	GENERAL NOTES
S-2A	FORGBOLT™ DETAILS
S-2B	NEXGEN2™ BOLT DETAIL
S-3	MONOPOLE PROFILE
S-4	SHAFT REINF. CHART AND DETAILS
S-5	BASE PLATE DETAILS
S-6	MISC DETAILS
S-7	MI CHECKLIST

WIND DESIGN DATA

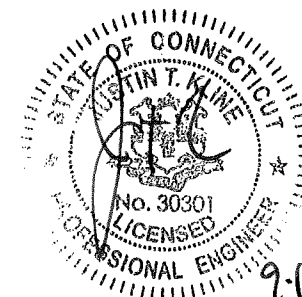
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LOCAL CODE	2005 CTBC
BASIC WIND SPEED (3-SECOND GUST)	110 MPH
BASIC WIND SPEED (FASTEST-MILE)	90 MPH
ICE THICKNESS	1.25 IN
ICE WIND SPEED	37.6 MPH
SERVICE WIND SPEED	50 MPH

1

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.

1

9-1-2015 : REVISED WIND DESIGN DATA



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PROJECT No: 37515-1743.006.7700 R1
DRAWN BY: I.M.
DESIGNED BY: R.M.K.
CHECKED BY:
DATE: 8-18-2015

TITLE SHEET

T-1

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 ANSII/TIA-1019 (LATEST EDITION), OSHA AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSII/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, MORAINNE, 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 SAFETY GUIDELINES:** THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES. 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 - (NOT REQUIRED)

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 SEVER WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".

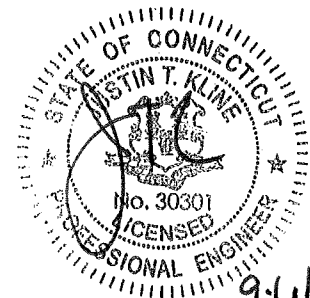
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PAUL J. FORD & COMPANY
250 E Broad St, Ste 600· Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
3550 TORRINGTON WAY SUITE 300 CHARLOTTE, NC 28277
PH: (704) 405-6615

MODIFICATION OF AN EXISTING 120' MONOPOLE
BU #876320; 528 WHEELERS FARM RD MILFORD, CONNECTICUT

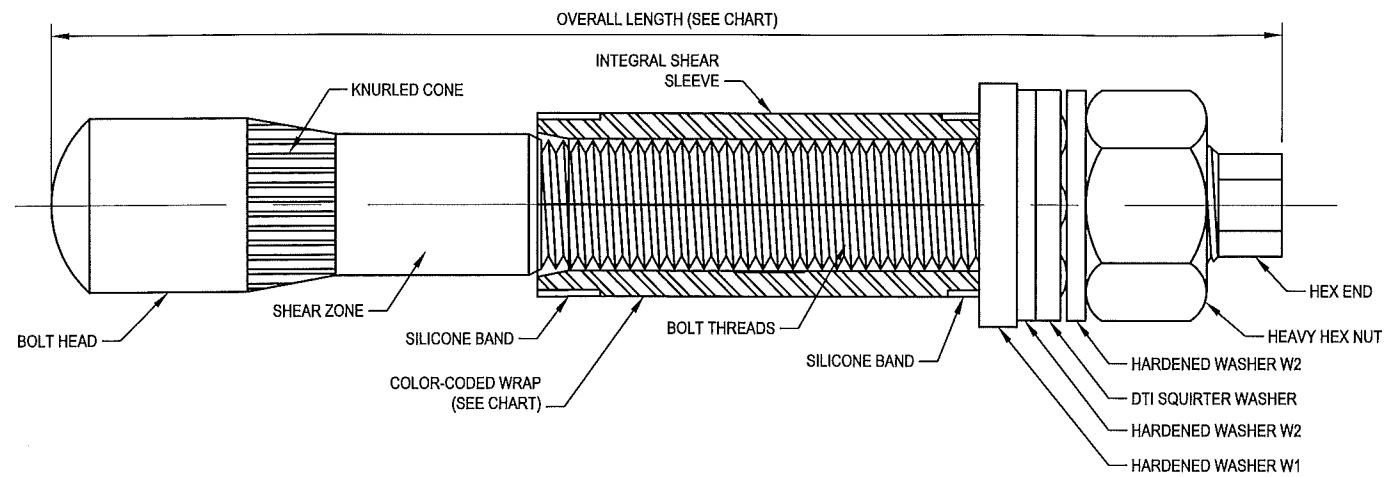
PROJECT No:	37515-1743.006.7700 R1
DRAWN BY:	I.M.
DESIGNED BY:	R.M.K.
CHECKED BY:	
DATE:	8-18-2015



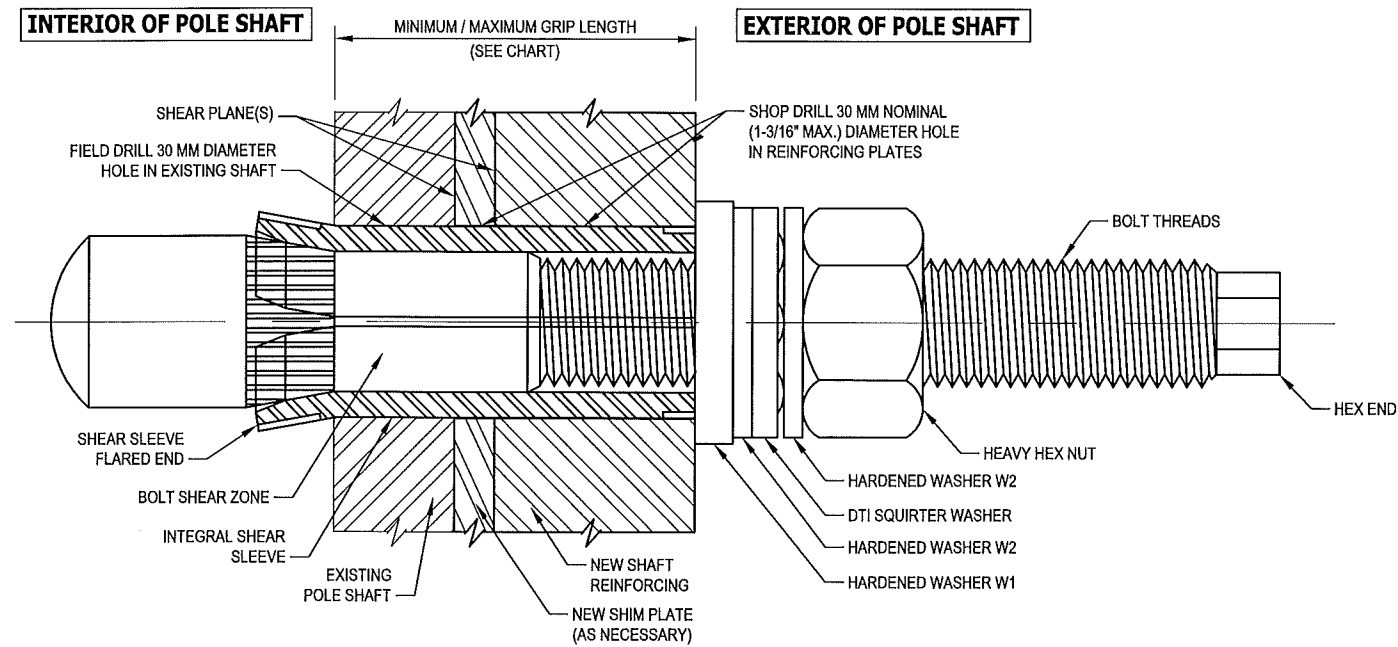
GENERAL NOTES

S-1

37515-1743.006 R1.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.

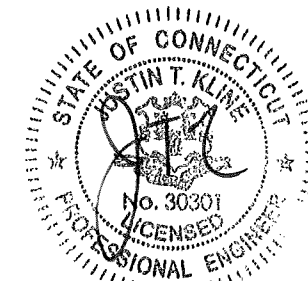
**AISC GROUP A MATERIAL: ASTM A325 AND PC8.8
(Fu = 120 KSI MIN. TENSILE STRESS)**

CONTAINS PROPRIETARY INFORMATION PATENT PENDING

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DISTRIBUTOR CONTACT:

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



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

CROWN CASTLE
 3530 TORRINGTON WAY SUITE 300 CHARLOTTE, NC 28277
 PH: (704) 405-6615

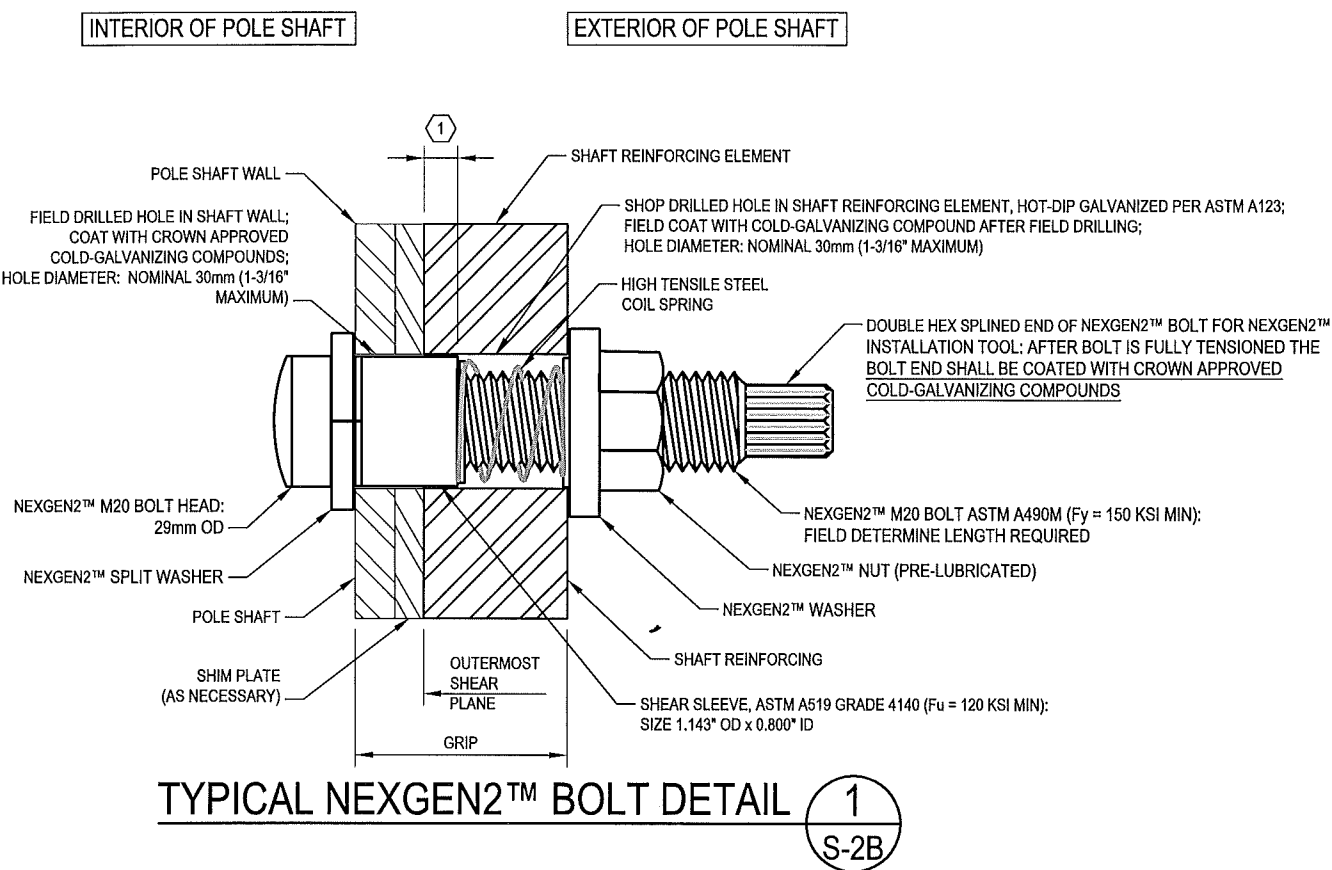
MODIFICATION OF AN EXISTING 120' MONOPOLE
 BU #876320; 528 WHEELERS FARM RD
 MILFORD, CONNECTICUT

PROJECT No: 37515-1743.006.7700 R1
 DRAWN BY: I.M.
 DESIGNED BY: R.M.K.
 CHECKED BY:
 DATE: 8-18-2015

FORGBolt™
 DETAILS

S-2A

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.



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.

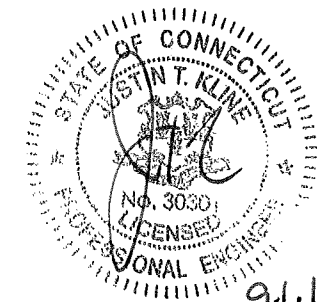
BOLT TIGHTENING AND INSPECTION NOTES:

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



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 250 E Broad St, Ste 600· Columbus, OH 43215
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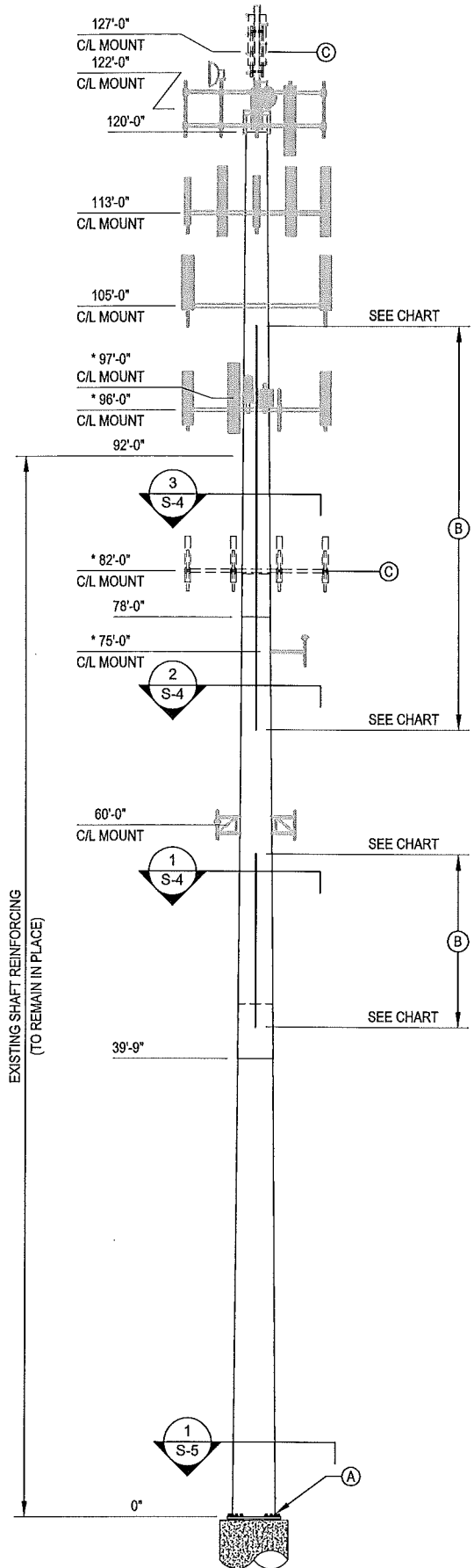
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MODIFICATION OF AN EXISTING 120' MONOPOLE
 BU #876320; 528 WHEELERS FARM RD
 MILFORD, CONNECTICUT

PROJECT No: 37515-1743.006.7700 R1
 DRAWN BY: I.M.
 DESIGNED BY: R.M.K.
 CHECKED BY:
 DATE: 8-18-2015

NEXGEN2™ BOLT
 DETAIL

S-2B



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

SHAFT SECTION DATA							
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN)		POLE GRADE (ksi)	POLE SHAPE
				@ TOP	@ BOTTOM		
1	42.00	0.2500	45.00	22.000	30.486	60	12-SIDED
2	42.00	0.3125	57.00	29.228	37.714	60	12-SIDED
3	44.50	0.3750		36.129	45.120	60	12-SIDED

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 STIFFENER EXTENSIONS, BEARING PLATES, AND GROUT AT BASE PLATE. SEE SHEET S-5.
 - (B) INSTALL NEW SHAFT REINFORCING. SEE CHART ON SHEET S-4.
 - (C) REMOVE MOUNT, ANTENNAS & COAX.

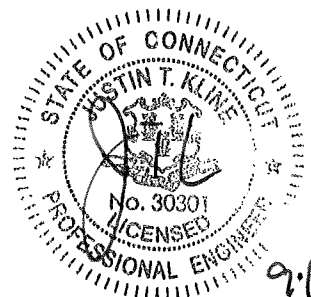
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RF PAUL J. FORD & COMPANY
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MONOPOLE PROFILE

S-3

NOTE: SHAFT REINFORCING MAY NEED TO BE INSTALLED OFF CENTER OF FLAT FOR FIT UP.

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
42'-6"	57'-6"	F2, F6, F8 & F12	CCI-SFP-04510015	15'-0"	4	19	76	6	6	20"	919 LBS.
68'-3"	98'-3"	F4, F7 & F12	4" x 1-1/4" CFP#1	25'-0"	3	21	63	6	6	27"	766 LBS.
68'-3"	78'-3"	F8	4" x 1-1/4" CFP#2	10'-0"	1	15	15	6	6	27"	102 LBS.
154											1787 LBS.

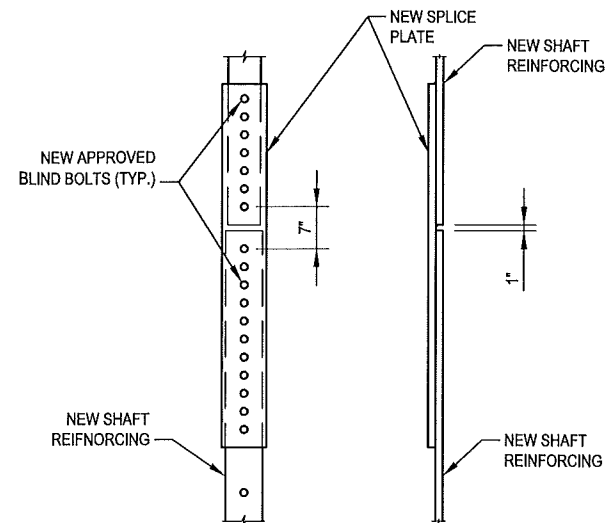
NOTES:

- 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.

NEW SHIM CHART

1/16" SHIM QUANTITY	1/4" SHIM QUANTITY	SHIM WIDTH	SHIM LENGTH	HOLE DIAMETER
18	0	4"	4"	1-1/4"

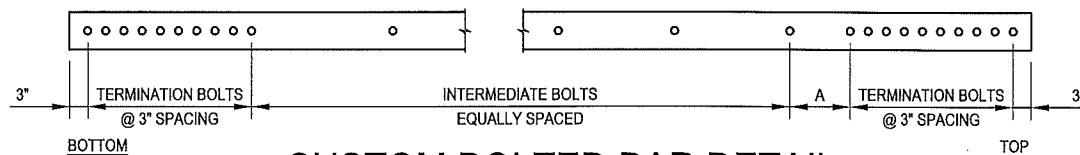
SHIMS ARE FOR BIDDING PURPOSES ONLY, FINAL SHIM REQUIREMENTS TO BE DETERMINED BY CONTRACTOR DURING FABRICATION.



DETAIL 4

SCALE: NTS

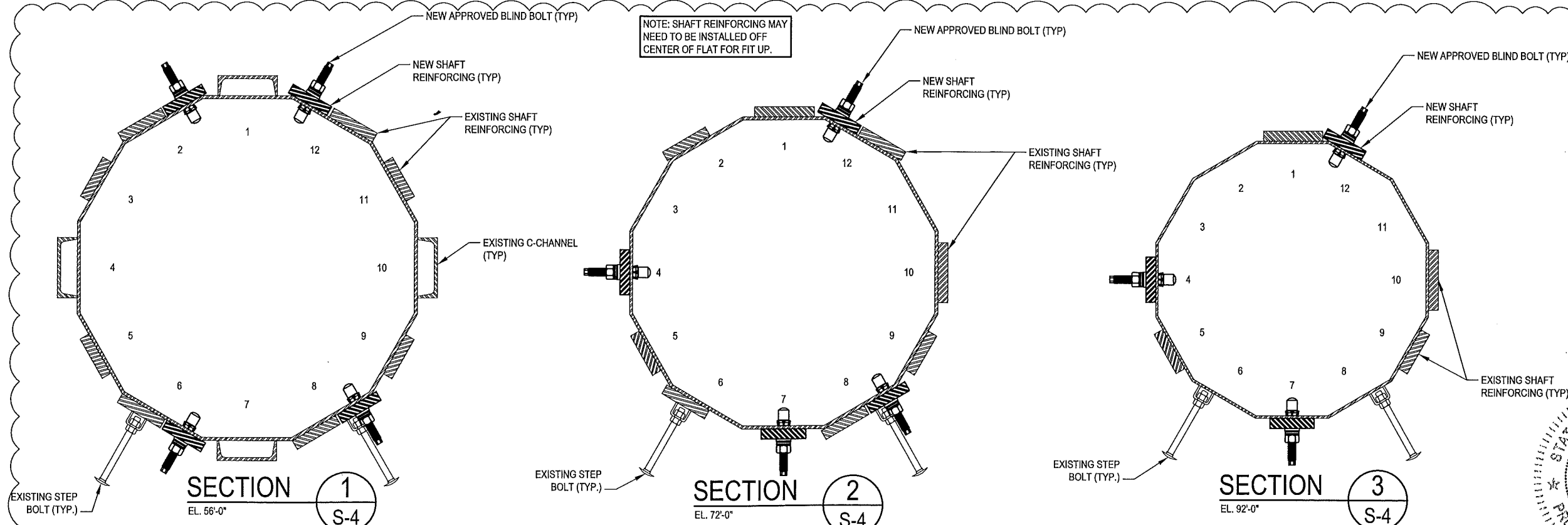
S-4



CUSTOM BOLTED BAR DETAIL

NOTE: "A" DIMENSION MAY VARY, NOT TO EXCEED MAXIMUM INTERMEDIATE BOLT SPACING

NOTE: FLAT LOCATION OF THE EXISTING STEP BOLTS MAY DIFFER FROM SHOWN DEPENDING ON ELEVATION. CONTRACTOR SHALL REMOVE AND REPLACE STEP BOLTS AS REQUIRED FOR REINFORCING INSTALLATION



SECTION 1

EL. 56'-0"

S-4

SECTION 2

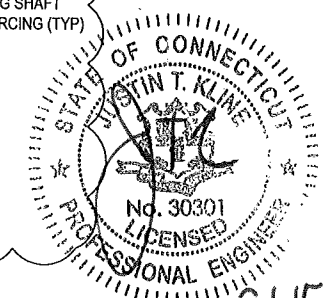
EL. 72'-0"

S-4

SECTION 3

EL. 92'-0"

S-4



MODIFICATION OF AN EXISTING 120' MONOPOLE

BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT

PROJECT No:	37515-1743.006.7700 R1
DRAWN BY:	I.M.
DESIGNED BY:	R.M.K.
CHECKED BY:	
DATE:	8-18-2015

SHAFT REINF. CHART AND DETAILS

S-4

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

CROWN CASTLE
3530 TORRINGTON WAY SUITE 300 CHARLOTTE, NC 28277
PH: (704) 405-6615

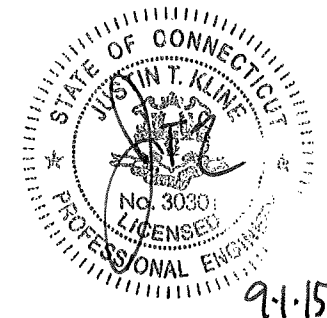
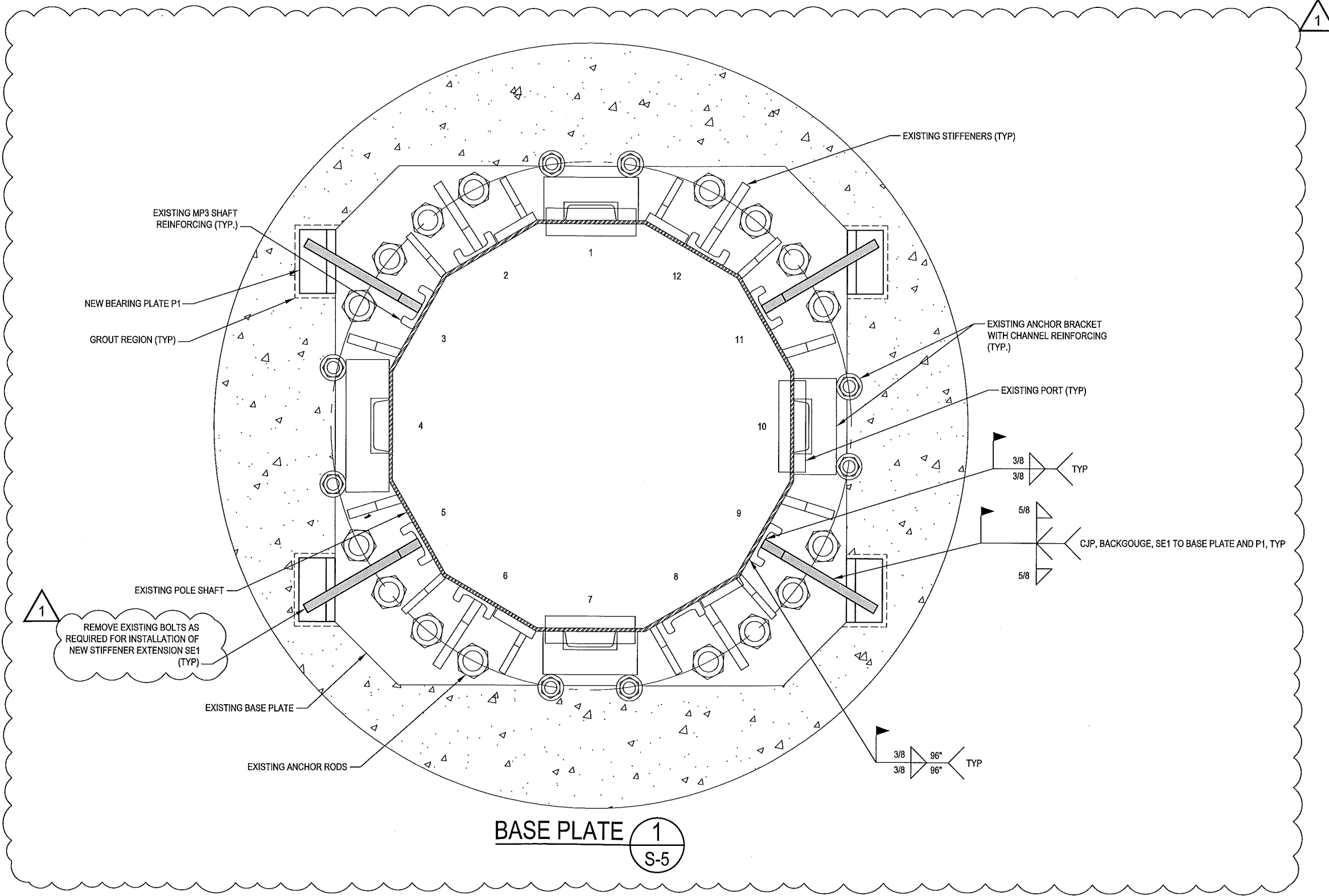
37515-1743.006 R1.DWG

9-1-15

BASE SPECIFICATIONS	
BASE PLATE:	57" SQUARE; 3 1/4" THK.; Fy=50 KSI
ANCHOR RODS:	(16) 2 1/4"Ø; A615 GRADE 75; 58" 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.

1



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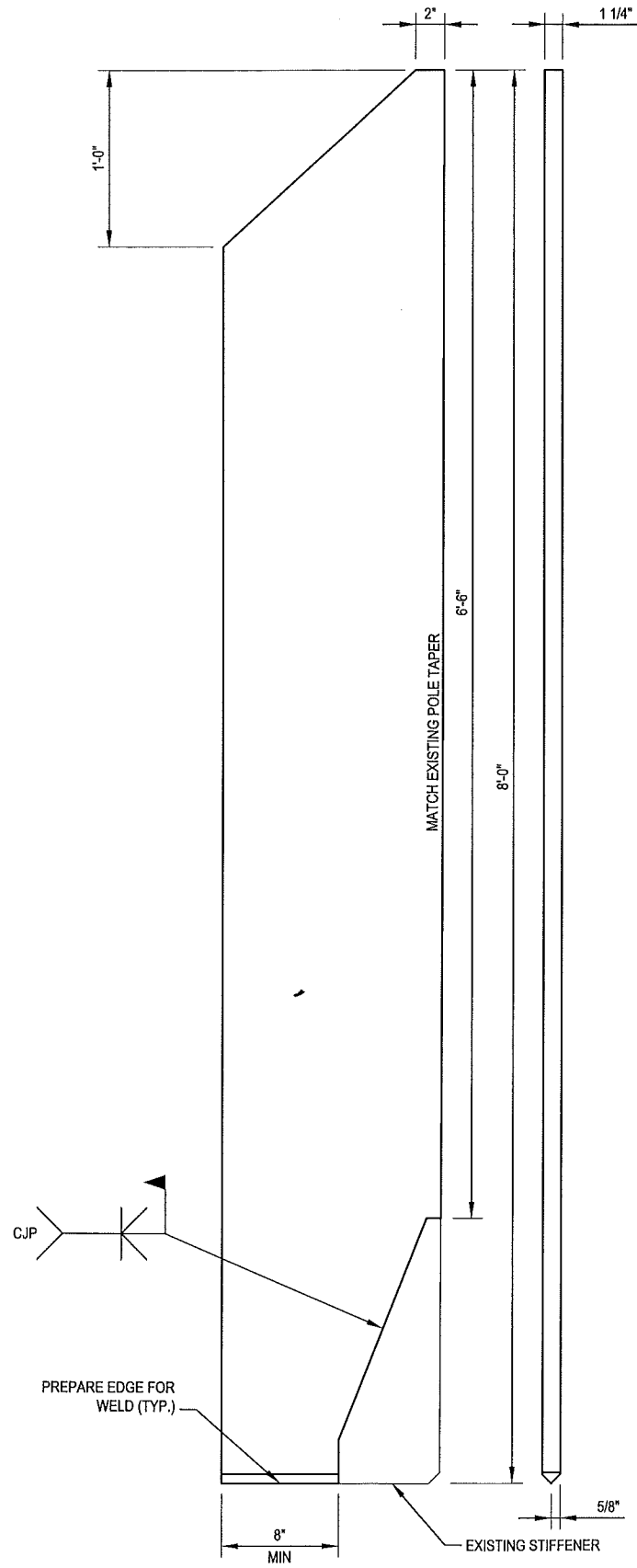
PROJECT No:	37515-1743.006.7700 R1
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DESIGNED BY:	R.M.K.
CHECKED BY:	
DATE:	8-18-2015

BASE PLATE DETAILS

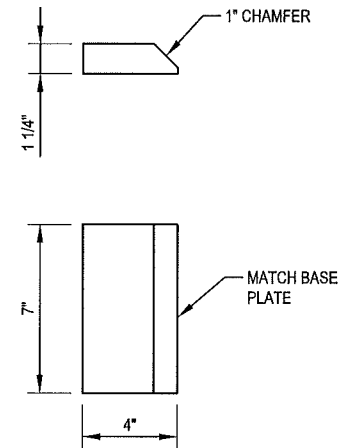
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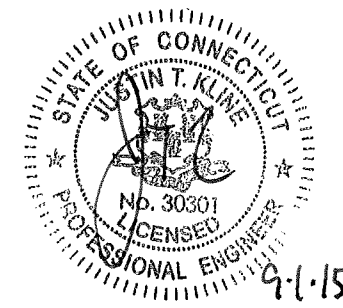
1 9-1-2015 : REVISED FLAT NUMBERS AND NOTES.



STIFFENER EXTENSION MK~SE1
 (4 REQ.) (Fy = 65 KSI)



BEARING PLATE MK~P1
 (4 REQUIRED) (Fy = 50 KSI)



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 DESIGNED BY: R.M.K.
 CHECKED BY:
 DATE: 8-18-2015

MISC DETAILS

S-6

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. 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.
 - 1.2. 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.
 - 1.3. 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).
 - 1.4. 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 CUTOFF 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. COMPILER 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	EOB REVIEW
X	FABRICATION INSPECTION
NA	FABRICATION CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATION 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
NA	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)
NA	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

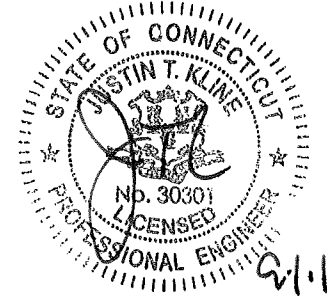
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PROJECT No: 37515-1743.006.7700 R1
 DRAWN BY: I.M.
 DESIGNED BY: R.M.K.
 CHECKED BY:
 DATE: 8-18-2015



MI CHECKLIST
 S-7

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL
TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11082E

Stratford/ MP X 53/ Main
528 Wheelers Farms Road
Milford, CT 06460

September 9, 2015

EBI Project Number: 6215004651

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	12.33 %

September 9, 2015

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11082E – Stratford/ MP X 53/ Main**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **528 Wheelers Farms Road, Milford, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limit for the 700 MHz Band is approximately 467 $\mu\text{W}/\text{cm}^2$, and the general population exposure limit for the PCS and AWS bands is 1000 $\mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **528 Wheelers Farms Road, Milford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

- 1) 2 GSM / UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel
- 2) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 4) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.
- 5) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

- 6) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 7) The antennas used in this modeling are the **Ericsson AIR21 (B4A/B2P & B2A/B4P)** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 (B4A/B2P & B2A/B4P)** have a maximum gain of **15.9 dBd** at their main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 8) The antenna mounting height centerline of the proposed antennas is **107 feet** above ground level (AGL).
- 9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculations were done with respect to uncontrolled / general public threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	107	Height (AGL):	107	Height (AGL):	107
Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	1.65	Antenna B1 MPE%	1.65	Antenna C1 MPE%	1.65
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	107	Height (AGL):	107	Height (AGL):	107
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	1.65	Antenna B2 MPE%	1.65	Antenna C2 MPE%	1.65
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	107	Height (AGL):	107	Height (AGL):	107
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.65	Antenna B3 MPE%	0.65	Antenna C3 MPE%	0.65

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	3.94 %
AT&T	2.18 %
XM Satellite Radio	0.18 %
MetroPCS	0.42 %
Clearwire	0.13 %
Sprint	0.62 %
Nextel	0.83 %
Metricom	0.56 %
Verizon Wireless	3.47 %
Site Total MPE %:	12.33 %

T-Mobile Sector 1 Total:	3.94 %
T-Mobile Sector 2 Total:	3.94 %
T-Mobile Sector 3 Total:	3.94 %
Site Total:	12.33 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile 2100 MHz (AWS) LTE	2	2,334.27	107	16.45	2100	1000	1.65 %
T-Mobile 700 MHz LTE	1	865.21	107	3.05	700	467	0.65 %
T-Mobile 1900 MHz (PCS) GSM/UMTS	2	1,167.14	107	8.23	1900	1000	0.82 %
T-Mobile 2100 MHz (AWS) UMTS	2	1,167.14	107	8.23	1900	1000	0.82 %
Total:						4.31 %	

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public exposure to RF Emissions.

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector 1:	3.94 %
Sector 2:	3.94 %
Sector 3 :	3.94 %
T-Mobile Per Sector Maximum:	3.94 %
Site Total:	12.33 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **12.33%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.



Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803