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April 7, 2015

Melanie A. Bachman
Executive Director
Connecticut Siting Council
10 Franklin Street
New Britain, CT 06051

Regarding:	Notice of Exempt Modification – Addition of 3 radio heads previously approved
Property Address:	515 Boston Post Road, Westport CT (the "Property")
Applicant:	AT&T Mobility ("AT&T")

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 148 foot monopole ("tower") location on the Property. AT&T's facility consists of nine (9) wireless telecommunications antennas at 120 feet. The tower is controlled by Crown Castle. The Council approved the previous application on June 1, 2012 reference number EM-CING-158-110504. This application (attached) granted AT&T the use of 6 radio heads at this location. The approval expired one year from the issue date. During that time AT&T made the changes to the site per the approval but only installed three (3) of the six (6) radio heads that they received approval. AT&T would now like to install the additional three (3) radio heads that were originally approved under EM-CING-158-110504.

Please accept this application as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72 (b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Mayor, and the Town Planner for the Town of Westport. A copy of this letter is also being sent to Crown Castle, the owner of the structure that AT&T is located.

The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The planned modifications will not result in an increase in the height of the existing structure. AT&T's additional, previously approved 3 radio heads will be installed at 120' foot level of the 148 ' foot Monopole
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore will not require an extension of the site boundary.
3. The proposed modification will not increase the noise level at the facility by six decibel or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety

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standard. An RF emissions calculation (attached) for AT&T's modified facility was provided in the application which led to the July 15,2011 Decision.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (Please see attached Structural analysis completed by Paul J. Ford And Company July 7, 2014).

For the foregoing reasons AT&T respectfully requests that the proposed addition of 3 radio heads previously approved be allowed within the exempt modifications under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

David P. Cooper
Director of Site Acquisition
Empire Telecom

CC: James Marpe, First Selectman, town of Westport CT
Laurence Bradley, Town Planner, Westport CT
Town of Westport – property owner
Crown Castle

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

Date: **July 07, 2014**

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

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

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	**Scenario 2.5A**
	Carrier Site Number:	CT03XC355
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	876354
	Crown Castle Site Name:	WESTPORT FIRE DEPARTMENT
	Crown Castle JDE Job Number:	288080
	Crown Castle Work Order Number:	794876
	Crown Castle Application Number:	245839 Rev. 1
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37513-1197.003.7805
Site Data:	**515 Boston Post Road, WESTPORT, Fairfield County, CT** **Latitude *41° 8' 24.26"*, Longitude *-73° 20' 51.61"*** **148 Foot - Monopole Tower**	

Dear Adam Winters,

Paul J Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 664936, in accordance with application 245839, revision 1.

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

LC11: 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 the 2005 Connecticut State Building Code of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice (with a 1.15 importance factor), 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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

Respectfully submitted by:

John J. Woolley, E.I.
Structural Designer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 148 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 the 2005 Connecticut State Building Code of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice (with a 1.15 importance factor), 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
148.0	148.0	3	alcatel lucent	TD-RRH8x20-25	1	1-1/4	-
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
148.0	160.0	1	decibel	DB420	3 2 6	1-1/4 1/2 5/16	1
	152.0	2	andrew	VHLP800-11			
	151.0	3	argus technologies	LLPX310R w/ Mount Pipe			
		3	samsung telecommunications	FDD_R6_RRH			
	148.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		3	alcatel lucent	800MHZ RRH			
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		9	rfs celwave	ACU-A20-N			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		1	tower mounts	Miscellaneous [NA 507-1]			
		1	tower mounts	Platform Mount [LP 712-1]			
144.0	144.0	1	andrew	VHLP2.5-10W	1	EW90	1
		1	tower mounts	Pipe Mount [PM 601-1]			
134.0	134.0	12	decibel	DB844H90E-XY w/ Mount Pipe	12	1-1/4	3
		1	tower mounts	Platform Mount [LP 303-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
120.0	120.0	6	ericsson	RRUS-11	2 1	3/8 5/8	2
		3	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
		6	powerwave technologies	7770.00 w/ Mount Pipe	12	1-5/8	1
		6	powerwave technologies	LGP13519			
		6	powerwave technologies	LGP2140X			
		1	tower mounts	Platform Mount [LP 712-1]			
96.0	110.0	1	rfs celwave	PD220	7 5	7/8 1/2	1
	108.0	1	decibel	DB205-A			
	107.0	1	decibel	DB224			
		1	decibel	DB420-B			
	105.0	1	andrew	DB806E-XT			
		2	rfs celwave	PD1110			
		2	rfs celwave	PD201-1			
	96.0	1	tower mounts	Platform Mount [LP 712-1]			
	90.0	3	rfs celwave	PD83-1			
82.0	82.0	6	andrew	ETW190VS12UB	18 6	7/8 1-1/4	1
		9	ems wireless	RR90-17-00DPL2 w/ Mount Pipe			
		3	rfs celwave	APXV18-206516S-C-A20 w/ Mount Pipe			
		3	rfs celwave	ATMAA1412D-1A20			
		1	tower mounts	Platform Mount [LP 712-1]			
72.0	72.0	3	kathrein	800 10504 w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
53.0	56.0	1	radiall larsen	BSA150B	2	1/2	1
	53.0	1	tower mounts	Side Arm Mount [SO 702-1]			
	50.0	1	radiall larsen	BSA150B			
50.0	50.0	1	trimble	BULLET III	1	1/2	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	Sea Consultants	1531886	CCISITES
4-POST-MODIFICATION INSPECTION	PJF	2485808	CCISITES
4-POST-MODIFICATION INSPECTION	TEP	2971197	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PJF/Summit	1448194	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit	1446984	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 has been reinforced in conformance with the referenced modification drawings.
5) Per Town of Westport, pole analysis shall use an importance factor of 1.15. TIA-F wind speed has been adjusted accordingly (TIA-F default, I=1.0).

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	148 - 100.5	Pole	TP31.643x22x0.25	1	-7.66	1181.35	78.2	Pass
L2	100.5 - 70.667	Pole	TP37.1993x30.331x0.375	2	-17.24	2133.80	91.0	Pass
L3	70.667 - 63.75	Pole	TP38.6035x37.1993x0.4947	3	-18.97	2316.39	93.9	Pass
L4	63.75 - 63.25	Pole	TP38.705x38.6035x0.375	4	-19.08	2221.04	98.0	Pass
L5	63.25 - 53.229	Pole	TP39.9894x38.705x0.4375	5	-21.47	2673.84	94.8	Pass
L6	53.229 - 28.75	Pole	TP44.959x39.9894x0.5776	6	-27.34	3392.34	91.9	Pass
L7	28.75 - 25.75	Pole	TP44.6929x42.6364x0.6898	7	-32.16	4186.82	82.4	Pass
L8	25.75 - 0	Pole	TP49.92x44.6929x0.7194	8	-42.98	4787.50	86.8	Pass
							Summary	
						Pole (L4)	98.0	Pass
						Rating =	98.0	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	85.8	Pass
1	Base Plate	0	51.7	Pass
1	Base Foundation Structural Steel	0	61.2	Pass
1, 2	Base Foundation Soil Interaction	0	97.0	Pass

Structure Rating (max from all components) =	98.0%

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.

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 Fairfield County, Connecticut.
2) Basic wind speed of 91.20 mph.
3) Nominal ice thickness of 0.7500 in.
4) Ice density of 56.00 pcf.
5) A wind speed of 28.10 mph is used in combination with ice.
6) Temperature drop of 50.00 °F.
7) Deflections calculated using a wind speed of 50.00 mph.
8) A non-linear (P-delta) analysis was used.
9) Pressures are calculated at each section.
10) Stress ratio used in pole design is 1.333.
11) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation 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	148.0000-100.5000	47.5000	4.00	12	22.0000	31.6430	0.2500	1.0000	A607-60 (60 ksi)
L2	100.5000-70.6670	33.8330	0.00	12	30.3310	37.1993	0.3750	1.5000	A607-60 (60 ksi)
L3	70.6670-63.7500	6.9170	0.00	12	37.1993	38.6035	0.4947	1.9788	Reinf 47.71 ksi (48 ksi)
L4	63.7500-63.2500	0.5000	0.00	12	38.6035	38.7050	0.3750	1.5000	A607-60 (60 ksi)
L5	63.2500-53.2290	10.0210	0.00	12	38.7050	39.9894	0.4375	1.7500	A607-60 (60 ksi)
L6	53.2290-28.7500	24.4790	5.75	12	39.9894	44.9590	0.5776	2.3105	Reinf 52.77 ksi (53 ksi)
L7	28.7500-25.7500	8.7500	0.00	12	42.6364	44.6929	0.6898	2.7592	Reinf 53.56 ksi (54 ksi)
L8	25.7500-0.0000	25.7500		12	44.6929	49.9200	0.7194	2.8776	Reinf 52.52 ksi (53 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
	32.7592	25.2714	3178.9251	11.2387	16.3911	193.9425	6441.3640	12.4378	7.8103	31.241
L2	32.2416	36.1718	4143.0744	10.7242	15.7114	263.6980	8394.9919	17.8027	7.1237	18.997
	38.5115	44.4653	7696.1918	13.1831	19.2692	399.4032	15594.571 1	21.8845	8.9644	23.905
L3	38.5115	58.4680	10054.130 3	13.1402	19.2692	521.7713	20372.393 8	28.7762	8.6436	17.472
	39.9653	60.7048	11252.746 3	13.6429	19.9966	562.7331	22801.114 6	29.8770	9.0199	18.233
L4	39.9653	46.1609	8610.6084	13.6858	19.9966	430.6037	17447.427 1	22.7190	9.3407	24.909
	40.0703	46.2834	8679.3765	13.7221	20.0492	432.9044	17586.769 9	22.7793	9.3679	24.981
L5	40.0703	53.9093	10076.486 6	13.6998	20.0492	502.5886	20417.693 7	26.5325	9.2004	21.03
	41.4001	55.7188	11125.569 8	14.1596	20.7145	537.0905	22543.420 7	27.4231	9.5447	21.816
L6	41.4001	73.3047	14533.483 2	14.1094	20.7145	701.6087	29448.777 1	36.0783	9.1691	15.874
	46.5450	82.5480	20753.611 2	15.8885	23.2888	891.1427	42052.442 8	40.6276	10.5010	18.179
L7	45.5395	93.1700	20924.520 9	15.0169	22.0857	947.4257	42398.752 3	45.8554	9.5779	13.885
	46.2695	97.7377	24155.433 3	15.7531	23.1509	1043.3897	48945.456 7	48.1035	10.1290	14.684
L8	46.2695	101.8646	25141.494 9	15.7425	23.1509	1085.9824	50943.485 0	50.1347	10.0497	13.969
	51.6810	113.9732	35215.124 2	17.6138	25.8586	1361.8362	71355.388 9	56.0941	11.4505	15.917

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 148.0000-100.5000				1	1	1		
L2 100.5000-70.6670				1	1	1		
L3 70.6670-63.7500				1	1	1		
L4 63.7500-63.2500				1	1	1		
L5 63.2500-53.2290				1	1	1		
L6 53.2290-28.7500				1	1	1		
L7 28.7500-25.7500				1	1	1		
L8 25.7500-0.0000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
MLE Hybrid 3Power/6Fiber RL 2(1 1/4")	C	No	Inside Pole	148.0000 - 0.0000	3	No Ice	0.0000	0.68
						1/2" Ice	0.0000	0.68
						1" Ice	0.0000	0.68
HB114-21U3M12-	C	No	Inside Pole	148.0000 - 0.0000	1	No Ice	0.0000	1.22

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
XXXF(1-1/4")						1/2" Ice	0.0000	1.22
						1" Ice	0.0000	1.22
7983A(1/2")	C	No	Inside Pole	148.0000 - 0.0000	2	No Ice	0.0000	0.08
						1/2" Ice	0.0000	0.08
						1" Ice	0.0000	0.08
9207(5/16")	C	No	Inside Pole	148.0000 - 0.0000	6	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
2" Conduit	C	No	Inside Pole	148.0000 - 0.0000	2	No Ice	0.0000	0.95
						1/2" Ice	0.0000	0.95
						1" Ice	0.0000	0.95
LDF7-50A(1-5/8")	C	No	Inside Pole	120.0000 - 0.0000	12	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
FB-L98-002-XXX(3/8)	C	No	Inside Pole	120.0000 - 0.0000	2	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
WR-VG82ST-BRDA(5/8")	C	No	Inside Pole	120.0000 - 0.0000	1	No Ice	0.0000	0.31
						1/2" Ice	0.0000	0.31
						1" Ice	0.0000	0.31
LDF4-50A(1/2")	C	No	Inside Pole	96.0000 - 0.0000	5	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.15
						1" Ice	0.0000	0.15
LDF5-50A(7/8")	C	No	Inside Pole	96.0000 - 0.0000	7	No Ice	0.0000	0.33
						1/2" Ice	0.0000	0.33
						1" Ice	0.0000	0.33
LDF5-50A(7/8")	C	No	Inside Pole	82.0000 - 0.0000	12	No Ice	0.0000	0.33
						1/2" Ice	0.0000	0.33
						1" Ice	0.0000	0.33
HJ7-50A(1-5/8")	C	No	Inside Pole	72.0000 - 0.0000	6	No Ice	0.0000	1.04
						1/2" Ice	0.0000	1.04
						1" Ice	0.0000	1.04
LDF4-50A(1/2")	C	No	Inside Pole	53.0000 - 0.0000	2	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.15
						1" Ice	0.0000	0.15
LDF4-50A(1/2")	C	No	Inside Pole	50.0000 - 0.0000	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.15
						1" Ice	0.0000	0.15
EW90(ELLIPTICAL)	C	No	Inside Pole	144.0000 - 0.0000	1	No Ice	0.0000	0.32
						1/2" Ice	0.0000	0.32
						1" Ice	0.0000	0.32
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	35.5000 - 0.0000	1	No Ice	0.2083	0.00
						1/2" Ice	0.3194	0.00
						1" Ice	0.4306	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	55.5000 - 35.5000	1	No Ice	0.1667	0.00
						1/2" Ice	0.2778	0.00
						1" Ice	0.3889	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	72.2500 - 62.2500	1	No Ice	0.1667	0.00
						1/2" Ice	0.2778	0.00
						1" Ice	0.3889	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	148.0000-100.5000	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	0.000	0.49
L2	100.5000-70.6670	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	0.264	0.62
L3	70.6670-63.7500	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	1.153	0.20
L4	63.7500-63.2500	A	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.083	0.01
L5	63.2500-53.2290	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	0.545	0.30
L6	53.2290-28.7500	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	4.361	0.73
L7	28.7500-25.7500	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	0.625	0.09
L8	25.7500-0.0000	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	5.365	0.77

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	148.0000-100.5000	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	0.000	0.49
L2	100.5000-70.6670	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	0.528	0.62
L3	70.6670-63.7500	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	2.306	0.20
L4	63.7500-63.2500	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.167	0.01
L5	63.2500-53.2290	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	1.090	0.30
L6	53.2290-28.7500	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	8.441	0.73
L7	28.7500-25.7500	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	1.125	0.09
L8	25.7500-0.0000	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	9.656	0.77

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	148.0000-100.5000	0.0000	0.0000	0.0000	0.0000
L2	100.5000-70.6670	-0.0124	0.0072	-0.0237	0.0137
L3	70.6670-63.7500	-0.2057	0.1187	-0.3781	0.2183
L4	63.7500-63.2500	-0.2059	0.1189	-0.3791	0.2189
L5	63.2500-53.2290	-0.0698	0.0403	-0.1325	0.0765
L6	53.2290-28.7500	-0.2209	0.1276	-0.3960	0.2286
L7	28.7500-25.7500	-0.2562	0.1479	-0.4291	0.2477
L8	25.7500-0.0000	-0.2570	0.1484	-0.4323	0.2496

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
TD-RRH8x20-25	A	From Leg	4.0000 0.00 0.00	0.0000	148.0000	No Ice 1/2" Ice 1" Ice	4.7198 5.0138 5.3165	1.7027 1.9196 2.1453	0.07 0.10 0.13
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	148.0000	No Ice 1/2" Ice 1" Ice	7.1342 7.6618 8.1830	4.9591 5.7544 6.4723	0.08 0.13 0.19
TD-RRH8x20-25	B	From Leg	4.0000 0.00 0.00	0.0000	148.0000	No Ice 1/2" Ice 1" Ice	4.7198 5.0138 5.3165	1.7027 1.9196 2.1453	0.07 0.10 0.13
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	148.0000	No Ice 1/2" Ice 1" Ice	7.1342 7.6618 8.1830	4.9591 5.7544 6.4723	0.08 0.13 0.19
TD-RRH8x20-25	C	From Leg	4.0000 0.00 0.00	0.0000	148.0000	No Ice 1/2" Ice 1" Ice	4.7198 5.0138 5.3165	1.7027 1.9196 2.1453	0.07 0.10 0.13
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.0000	148.0000	No Ice 1/2" Ice 1" Ice	7.1342 7.6618 8.1830	4.9591 5.7544 6.4723	0.08 0.13 0.19
LLPX310R w/ Mount Pipe	A	From Leg	4.0000 0.00 3.00	0.0000	148.0000	No Ice 1/2" Ice 1" Ice	4.9623 5.3512 5.7501	2.8484 3.3668 3.9019	0.04 0.08 0.12
LLPX310R w/ Mount Pipe	B	From Leg	4.0000 0.00 3.00	0.0000	148.0000	No Ice 1/2" Ice 1" Ice	4.9623 5.3512 5.7501	2.8484 3.3668 3.9019	0.04 0.08 0.12
LLPX310R w/ Mount Pipe	C	From Leg	4.0000 0.00 3.00	0.0000	148.0000	No Ice 1/2" Ice 1" Ice	4.9623 5.3512 5.7501	2.8484 3.3668 3.9019	0.04 0.08 0.12
DB420	A	From Leg	4.0000 0.00 12.00	0.0000	148.0000	No Ice 1/2" Ice 1" Ice	3.3300 5.9940 8.6580	3.3300 5.9940 8.6580	0.03 0.04 0.05
FDD_R6_RRH	A	From Leg	4.0000 0.00 3.00	0.0000	148.0000	No Ice 1/2" Ice 1" Ice	1.7889 1.9715 2.1627	0.7778 0.9182 1.0673	0.03 0.04 0.06
FDD_R6_RRH	B	From Leg	4.0000 0.00 3.00	0.0000	148.0000	No Ice 1/2" Ice 1" Ice	1.7889 1.9715 2.1627	0.7778 0.9182 1.0673	0.03 0.04 0.06
FDD_R6_RRH	C	From Leg	4.0000 0.00 3.00	0.0000	148.0000	No Ice 1/2" Ice 1" Ice	1.7889 1.9715 2.1627	0.7778 0.9182 1.0673	0.03 0.04 0.06
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	148.0000	No Ice 1/2" Ice 1" Ice	8.4975 9.1490 9.7672	6.9458 8.1266 9.0212	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	148.0000	No Ice 1/2" Ice 1" Ice	8.4975 9.1490 9.7672	6.9458 8.1266 9.0212	0.08 0.15 0.23
APXVSPP18-C-A20 w/	C	From Leg	4.0000	0.0000	148.0000	No Ice	8.4975	6.9458	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Mount Pipe			0.00				1/2" Ice	9.1490	8.1266	0.15
			0.00				1" Ice	9.7672	9.0212	0.23
PCS 1900MHz 4x45W-65MHz	A	From Leg	4.0000		0.0000	148.0000	No Ice	2.7087	2.6111	0.06
			0.00				1/2" Ice	2.9477	2.8475	0.08
			0.00				1" Ice	3.1953	3.0925	0.11
PCS 1900MHz 4x45W-65MHz	B	From Leg	4.0000		0.0000	148.0000	No Ice	2.7087	2.6111	0.06
			0.00				1/2" Ice	2.9477	2.8475	0.08
			0.00				1" Ice	3.1953	3.0925	0.11
PCS 1900MHz 4x45W-65MHz	C	From Leg	4.0000		0.0000	148.0000	No Ice	2.7087	2.6111	0.06
			0.00				1/2" Ice	2.9477	2.8475	0.08
			0.00				1" Ice	3.1953	3.0925	0.11
800MHZ RRH	A	From Leg	4.0000		0.0000	148.0000	No Ice	2.4899	2.0685	0.05
			0.00				1/2" Ice	2.7061	2.2705	0.07
			0.00				1" Ice	2.9310	2.4812	0.10
800MHZ RRH	B	From Leg	4.0000		0.0000	148.0000	No Ice	2.4899	2.0685	0.05
			0.00				1/2" Ice	2.7061	2.2705	0.07
			0.00				1" Ice	2.9310	2.4812	0.10
800MHZ RRH	C	From Leg	4.0000		0.0000	148.0000	No Ice	2.4899	2.0685	0.05
			0.00				1/2" Ice	2.7061	2.2705	0.07
			0.00				1" Ice	2.9310	2.4812	0.10
800 EXTERNAL NOTCH FILTER	A	From Leg	4.0000		0.0000	148.0000	No Ice	0.7701	0.3747	0.01
			0.00				1/2" Ice	0.8898	0.4647	0.02
			0.00				1" Ice	1.0181	0.5634	0.02
800 EXTERNAL NOTCH FILTER	B	From Leg	4.0000		0.0000	148.0000	No Ice	0.7701	0.3747	0.01
			0.00				1/2" Ice	0.8898	0.4647	0.02
			0.00				1" Ice	1.0181	0.5634	0.02
800 EXTERNAL NOTCH FILTER	C	From Leg	4.0000		0.0000	148.0000	No Ice	0.7701	0.3747	0.01
			0.00				1/2" Ice	0.8898	0.4647	0.02
			0.00				1" Ice	1.0181	0.5634	0.02
(3) ACU-A20-N	A	From Leg	4.0000		0.0000	148.0000	No Ice	0.0778	0.1361	0.00
			0.00				1/2" Ice	0.1210	0.1890	0.00
			0.00				1" Ice	0.1728	0.2506	0.00
(3) ACU-A20-N	B	From Leg	4.0000		0.0000	148.0000	No Ice	0.0778	0.1361	0.00
			0.00				1/2" Ice	0.1210	0.1890	0.00
			0.00				1" Ice	0.1728	0.2506	0.00
(3) ACU-A20-N	C	From Leg	4.0000		0.0000	148.0000	No Ice	0.0778	0.1361	0.00
			0.00				1/2" Ice	0.1210	0.1890	0.00
			0.00				1" Ice	0.1728	0.2506	0.00
Platform Mount [LP 712-1]	C	None			0.0000	148.0000	No Ice	24.5300	24.5300	1.34
							1/2" Ice	29.9400	29.9400	1.65
							1" Ice	35.3500	35.3500	1.96
Miscellaneous [NA 507-1]	C	None			0.0000	148.0000	No Ice	4.8000	4.8000	0.25
							1/2" Ice	6.7000	6.7000	0.29
							1" Ice	8.6000	8.6000	0.34
6' x 2" Mount Pipe	A	From Leg	4.0000		0.0000	148.0000	No Ice	1.4250	1.4250	0.02
			0.00				1/2" Ice	1.9250	1.9250	0.03
			0.00				1" Ice	2.2939	2.2939	0.05
6' x 2" Mount Pipe	B	From Leg	4.0000		0.0000	148.0000	No Ice	1.4250	1.4250	0.02
			0.00				1/2"	1.9250	1.9250	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			Ice	2.2939	2.2939	0.05
						1" Ice			
6' x 2" Mount Pipe	C	From Leg	4.0000	0.0000	148.0000	No Ice	1.4250	1.4250	0.02
			0.00			1/2"	1.9250	1.9250	0.03
			0.00			Ice	2.2939	2.2939	0.05
						1" Ice			
***									
Pipe Mount [PM 601-1]	C	None		0.0000	144.0000	No Ice	3.0000	0.9000	0.07
						1/2"	3.7400	1.1200	0.08
						Ice	4.4800	1.3400	0.09
						1" Ice			
***									
***									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.0000	0.0000	120.0000	No Ice	6.1194	4.2543	0.06
			0.00			1/2"	6.6258	5.0137	0.10
			0.00			Ice	7.1283	5.7109	0.16
						1" Ice			
(2) LGP13519	A	From Leg	4.0000	0.0000	120.0000	No Ice	0.3379	0.2074	0.01
			0.00			1/2"	0.4220	0.2804	0.01
			0.00			Ice	0.5147	0.3621	0.01
						1" Ice			
(2) LGP2140X	A	From Leg	4.0000	0.0000	120.0000	No Ice	1.2600	0.3780	0.01
			0.00			1/2"	1.4160	0.4932	0.02
			0.00			Ice	1.5806	0.6170	0.03
						1" Ice			
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.0000	0.0000	120.0000	No Ice	6.1194	4.2543	0.06
			0.00			1/2"	6.6258	5.0137	0.10
			0.00			Ice	7.1283	5.7109	0.16
						1" Ice			
(2) LGP2140X	B	From Leg	4.0000	0.0000	120.0000	No Ice	1.2600	0.3780	0.01
			0.00			1/2"	1.4160	0.4932	0.02
			0.00			Ice	1.5806	0.6170	0.03
						1" Ice			
(2) LGP13519	B	From Leg	4.0000	0.0000	120.0000	No Ice	0.3379	0.2074	0.01
			0.00			1/2"	0.4220	0.2804	0.01
			0.00			Ice	0.5147	0.3621	0.01
						1" Ice			
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.0000	0.0000	120.0000	No Ice	6.1194	4.2543	0.06
			0.00			1/2"	6.6258	5.0137	0.10
			0.00			Ice	7.1283	5.7109	0.16
						1" Ice			
(2) LGP2140X	C	From Leg	4.0000	0.0000	120.0000	No Ice	1.2600	0.3780	0.01
			0.00			1/2"	1.4160	0.4932	0.02
			0.00			Ice	1.5806	0.6170	0.03
						1" Ice			
(2) LGP13519	C	From Leg	4.0000	0.0000	120.0000	No Ice	0.3379	0.2074	0.01
			0.00			1/2"	0.4220	0.2804	0.01
			0.00			Ice	0.5147	0.3621	0.01
						1" Ice			
(2) RRUS-11	A	From Leg	4.0000	0.0000	120.0000	No Ice	3.2486	1.3726	0.05
			0.00			1/2"	3.4905	1.5510	0.07
			0.00			Ice	3.7411	1.7380	0.09
						1" Ice			
P65-16-XLH-RR w/ Mount Pipe	A	From Leg	4.0000	0.0000	120.0000	No Ice	8.6375	6.3625	0.08
			0.00			1/2"	9.2903	7.5378	0.14
			0.00			Ice	9.9098	8.4270	0.22
						1" Ice			
DC6-48-60-18-8F	A	From Leg	4.0000	0.0000	120.0000	No Ice	2.5667	2.5667	0.02
			0.00			1/2"	2.7978	2.7978	0.04
			0.00			Ice	3.0377	3.0377	0.07
						1" Ice			
(2) RRUS-11	B	From Leg	4.0000	0.0000	120.0000	No Ice	3.2486	1.3726	0.05
			0.00			1/2"	3.4905	1.5510	0.07
			0.00			Ice	3.7411	1.7380	0.09
						1" Ice			

Description	Face or Leg	Offset Type	Ofisets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
P65-16-XLH-RR w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	120.0000	No Ice 1/2" Ice 1" Ice	8.6375 9.2903 9.9098	6.3625 7.5378 8.4270	0.08 0.14 0.22
(2) RRUS-11	C	From Leg	4.0000 0.00 0.00	0.0000	120.0000	No Ice 1/2" Ice 1" Ice	3.2486 3.4905 3.7411	1.3726 1.5510 1.7380	0.05 0.07 0.09
P65-16-XLH-RR w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.0000	120.0000	No Ice 1/2" Ice 1" Ice	8.6375 9.2903 9.9098	6.3625 7.5378 8.4270	0.08 0.14 0.22
Platform Mount [LP 712-1]	C	None		0.0000	120.0000	No Ice 1/2" Ice 1" Ice	24.5300 29.9400 35.3500	24.5300 29.9400 35.3500	1.34 1.65 1.96
6' x 2" Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	120.0000	No Ice 1/2" Ice 1" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.02 0.03 0.05
6' x 2" Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	120.0000	No Ice 1/2" Ice 1" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.02 0.03 0.05
6' x 2" Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.0000	120.0000	No Ice 1/2" Ice 1" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.02 0.03 0.05
DB420-B	A	From Leg	4.0000 0.00 11.00	0.0000	96.0000	No Ice 1/2" Ice 1" Ice	3.3300 5.9940 8.6580	3.3300 5.9940 8.6580	0.03 0.04 0.05
(2) PD1110	A	From Leg	4.0000 0.00 9.00	0.0000	96.0000	No Ice 1/2" Ice 1" Ice	2.5023 3.8435 5.2013	2.5023 3.8435 5.2013	0.02 0.04 0.07
PD201-1	A	From Leg	4.0000 0.00 9.00	0.0000	96.0000	No Ice 1/2" Ice 1" Ice	0.6279 1.5391 2.4669	0.6279 1.5391 2.4669	0.00 0.01 0.02
(2) PD83-1	A	From Leg	4.0000 0.00 -6.00	0.0000	96.0000	No Ice 1/2" Ice 1" Ice	3.7000 5.5750 7.4667	3.7000 5.5750 7.4667	0.02 0.05 0.09
DB205-A	B	From Leg	4.0000 0.00 12.00	0.0000	96.0000	No Ice 1/2" Ice 1" Ice	1.8083 3.6333 5.4750	1.8083 3.6333 5.4750	0.04 0.05 0.08
PD201-1	B	From Leg	4.0000 0.00 9.00	0.0000	96.0000	No Ice 1/2" Ice 1" Ice	0.6279 1.5391 2.4669	0.6279 1.5391 2.4669	0.00 0.01 0.02
PD83-1	B	From Leg	4.0000 0.00 -6.00	0.0000	96.0000	No Ice 1/2" Ice 1" Ice	3.7000 5.5750 7.4667	3.7000 5.5750 7.4667	0.02 0.05 0.09
DB806E-XT	C	From Leg	4.0000 0.00 9.00	0.0000	96.0000	No Ice 1/2" Ice 1" Ice	2.0000 2.8292 3.4557	2.0000 2.8292 3.4557	0.02 0.03 0.05
DB224	C	From Leg	4.0000 0.00 11.00	0.0000	96.0000	No Ice 1/2" Ice 1" Ice	6.1979 8.5814 10.9772	0.0000 2.3673 4.7469	0.03 0.05 0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
PD220	C	From Leg	4.0000 0.00 14.00	0.0000	96.0000	No Ice 1/2" Ice 1" Ice	3.0800 5.3000 7.5367	3.0800 5.3000 7.5367	0.02 0.05 0.09
(4) 6' x 2" Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	96.0000	No Ice 1/2" Ice 1" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.02 0.03 0.05
(3) 6' x 2" Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	96.0000	No Ice 1/2" Ice 1" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.02 0.03 0.05
(3) 6' x 2" Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.0000	96.0000	No Ice 1/2" Ice 1" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.02 0.03 0.05
Platform Mount [LP 712-1]	C	None		0.0000	96.0000	No Ice 1/2" Ice 1" Ice	24.5300 29.9400 35.3500	24.5300 29.9400 35.3500	1.34 1.65 1.96
***									
(3) RR90-17-00DPL2 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	82.0000	No Ice 1/2" Ice 1" Ice	4.5931 5.0883 5.5778	3.3194 4.0888 4.7844	0.04 0.08 0.12
(3) RR90-17-00DPL2 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	82.0000	No Ice 1/2" Ice 1" Ice	4.5931 5.0883 5.5778	3.3194 4.0888 4.7844	0.04 0.08 0.12
(3) RR90-17-00DPL2 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.0000	82.0000	No Ice 1/2" Ice 1" Ice	4.5931 5.0883 5.5778	3.3194 4.0888 4.7844	0.04 0.08 0.12
(2) ETW190VS12UB	A	From Leg	4.0000 0.00 0.00	0.0000	82.0000	No Ice 1/2" Ice 1" Ice	0.6644 0.7783 0.9008	0.3669 0.4613 0.5644	0.01 0.02 0.03
(2) ETW190VS12UB	B	From Leg	4.0000 0.00 0.00	0.0000	82.0000	No Ice 1/2" Ice 1" Ice	0.6644 0.7783 0.9008	0.3669 0.4613 0.5644	0.01 0.02 0.03
(2) ETW190VS12UB	C	From Leg	4.0000 0.00 0.00	0.0000	82.0000	No Ice 1/2" Ice 1" Ice	0.6644 0.7783 0.9008	0.3669 0.4613 0.5644	0.01 0.02 0.03
APXV18-206516S-C-A20 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	82.0000	No Ice 1/2" Ice 1" Ice	3.8586 4.2736 4.7274	3.2963 4.0044 4.6717	0.04 0.07 0.11
APXV18-206516S-C-A20 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	82.0000	No Ice 1/2" Ice 1" Ice	3.8586 4.2736 4.7274	3.2963 4.0044 4.6717	0.04 0.07 0.11
APXV18-206516S-C-A20 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.0000	82.0000	No Ice 1/2" Ice 1" Ice	3.8586 4.2736 4.7274	3.2963 4.0044 4.6717	0.04 0.07 0.11
ATMAA1412D-1A20	A	From Leg	4.0000 0.00 0.00	0.0000	82.0000	No Ice 1/2" Ice 1" Ice	1.1667 1.3136 1.4691	0.4667 0.5747 0.6914	0.01 0.02 0.03
ATMAA1412D-1A20	B	From Leg	4.0000 0.00 0.00	0.0000	82.0000	No Ice 1/2" Ice 1" Ice	1.1667 1.3136 1.4691	0.4667 0.5747 0.6914	0.01 0.02 0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
ATMAA1412D-1A20	C	From Leg	4.0000 0.00 0.00	0.0000	82.0000	No Ice 1/2" Ice 1" Ice	1.1667 1.3136 1.4691	0.4667 0.5747 0.6914	0.01 0.02 0.03
Platform Mount [LP 712-1]	C	None		0.0000	82.0000	No Ice 1/2" Ice 1" Ice	24.5300 29.9400 35.3500	24.5300 29.9400 35.3500	1.34 1.65 1.96
***									
800 10504 w/ Mount Pipe	A	From Leg	1.0000 0.00 0.00	0.0000	72.0000	No Ice 1/2" Ice 1" Ice	3.5887 4.0069 4.4217	3.1779 3.9053 4.5808	0.04 0.07 0.11
800 10504 w/ Mount Pipe	B	From Leg	1.0000 0.00 0.00	0.0000	72.0000	No Ice 1/2" Ice 1" Ice	3.5887 4.0069 4.4217	3.1779 3.9053 4.5808	0.04 0.07 0.11
800 10504 w/ Mount Pipe	C	From Leg	1.0000 0.00 0.00	0.0000	72.0000	No Ice 1/2" Ice 1" Ice	3.5887 4.0069 4.4217	3.1779 3.9053 4.5808	0.04 0.07 0.11
Pipe Mount [PM 601-3]	C	None		0.0000	72.0000	No Ice 1/2" Ice 1" Ice	4.3900 5.4800 6.5700	4.3900 5.4800 6.5700	0.20 0.24 0.28
****									
BSA150B	A	From Leg	4.0000 0.00 -3.00	0.0000	53.0000	No Ice 1/2" Ice 1" Ice	11.7778 12.3000 12.8333	11.7778 12.3000 12.8333	0.00 0.15 0.31
BSA150B	A	From Leg	4.0000 0.00 3.00	0.0000	53.0000	No Ice 1/2" Ice 1" Ice	11.7778 12.3000 12.8333	11.7778 12.3000 12.8333	0.00 0.15 0.31
BULLET III	C	From Leg	4.0000 0.00 0.00	0.0000	50.0000	No Ice 1/2" Ice 1" Ice	0.0774 0.1184 0.1680	0.0774 0.1184 0.1680	0.00 0.00 0.00
Side Arm Mount [SO 702-1]	A	None		0.0000	53.0000	No Ice 1/2" Ice 1" Ice	1.0000 1.0000 1.0000	1.4300 2.0500 2.6700	0.03 0.04 0.05
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP800-11	B	Paraboloid w/Shroud (HP)	From Leg	1.0000 0.00 4.00	40.0000		148.0000	2.9167	No Ice 1/2" Ice 1" Ice	6.6800 7.0700 7.4600	0.02 0.06 0.09
VHLP800-11	C	Paraboloid w/Shroud (HP)	From Leg	1.0000 0.00 4.00	-20.0000		148.0000	2.9167	No Ice 1/2" Ice 1" Ice	6.6800 7.0700 7.4600	0.02 0.06 0.09
VHLP2.5-10W	A	Paraboloid w/Shroud (HP)	From Leg	1.0000 0.00	0.0000		144.0000	2.9167	No Ice 1/2" Ice	6.6813 7.0686	0.05 0.08

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter		Aperture Area	Weight
				ft	°	°	ft	ft		ft^2	K
				0.00					1" Ice	7.4558	0.12

Tower Pressures - No Ice

G_H = 1.690

Section Elevation	z	K_z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
L1 148.0000-100.5000	123.1494	1.457	30.97	106.168	A	0.000	106.168	106.168	100.00	0.000	0.000
					B	0.000	106.168		100.00	0.000	0.000
					C	0.000	106.168		100.00	0.000	0.000
L2 100.5000-70.6670	85.1429	1.311	27.92	84.952	A	0.000	84.952	84.952	100.00	0.000	0.000
					B	0.000	84.952		100.00	0.000	0.000
					C	0.000	84.952		100.00	0.000	0.264
L3 70.6670-63.7500	67.1871	1.225	26.09	21.847	A	0.000	21.847	21.847	100.00	0.000	0.000
					B	0.000	21.847		100.00	0.000	0.000
					C	0.000	21.847		100.00	0.000	1.153
L4 63.7500-63.2500	63.4999	1.206	25.67	1.611	A	0.000	1.611	1.611	100.00	0.000	0.000
					B	0.000	1.611		100.00	0.000	0.000
					C	0.000	1.611		100.00	0.000	0.083
L5 63.2500-53.2290	58.2122	1.176	25.04	32.858	A	0.000	32.858	32.858	100.00	0.000	0.000
					B	0.000	32.858		100.00	0.000	0.000
					C	0.000	32.858		100.00	0.000	0.545
L6 53.2290-28.7500	40.7508	1.062	22.62	86.644	A	0.000	86.644	86.644	100.00	0.000	0.000
					B	0.000	86.644		100.00	0.000	0.000
					C	0.000	86.644		100.00	0.000	4.361
L7 28.7500-25.7500	27.2460	1	21.29	11.085	A	0.000	11.085	11.085	100.00	0.000	0.000
					B	0.000	11.085		100.00	0.000	0.000
					C	0.000	11.085		100.00	0.000	0.625
L8 25.7500-0.0000	12.6379	1	21.29	101.512	A	0.000	101.512	101.512	100.00	0.000	0.000
					B	0.000	101.512		100.00	0.000	0.000
					C	0.000	101.512		100.00	0.000	5.365

Tower Pressure - With Ice

G_H = 1.690

Section Elevation	z	K_z	q_z	t_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	in	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
L1 148.0000-100.5000	123.1494	1.457	2.94	0.7500	112.106	A	0.000	112.106	112.106	100.00	0.000	0.000
						B	0.000	112.106		100.00	0.000	0.000
						C	0.000	112.106		100.00	0.000	0.000
L2 100.5000-70.6670	85.1429	1.311	2.65	0.7500	88.681	A	0.000	88.681	88.681	100.00	0.000	0.000
						B	0.000	88.681		100.00	0.000	0.000
						C	0.000	88.681		100.00	0.000	0.528
L3 70.6670-63.7500	67.1871	1.225	2.48	0.7500	22.712	A	0.000	22.712	22.712	100.00	0.000	0.000
						B	0.000	22.712		100.00	0.000	0.000
						C	0.000	22.712		100.00	0.000	2.306
L4 63.7500-63.2500	63.4999	1.206	2.44	0.7500	1.673	A	0.000	1.673	1.673	100.00	0.000	0.000
						B	0.000	1.673		100.00	0.000	0.000
						C	0.000	1.673		100.00	0.000	0.167
L5 63.2500-53.2290	58.2122	1.176	2.38	0.7500	34.111	A	0.000	34.111	34.111	100.00	0.000	0.000
						B	0.000	34.111		100.00	0.000	0.000
						C	0.000	34.111		100.00	0.000	1.090
L6 53.2290-28.7500	40.7508	1.062	2.15	0.7500	89.704	A	0.000	89.704	89.704	100.00	0.000	0.000
						B	0.000	89.704		100.00	0.000	0.000

Section Elevation ft	z ft	K_z	q_z psf	t_z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	0.000	89.704		100.00	0.000	8.441
L7 28.7500-25.7500	27.2460	1	2.02	0.7500	11.460	A	0.000	11.460	11.460	100.00	0.000	0.000
						B	0.000	11.460		100.00	0.000	0.000
						C	0.000	11.460		100.00	0.000	1.125
L8 25.7500-0.0000	12.6379	1	2.02	0.7500	104.731	A	0.000	104.731	104.731	100.00	0.000	0.000
						B	0.000	104.731		100.00	0.000	0.000
						C	0.000	104.731		100.00	0.000	9.656

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 148.0000-100.5000	123.1494	1.457	9.31	106.168	A	0.000	106.168	106.168	100.00	0.000	0.000
					B	0.000	106.168		100.00	0.000	0.000
					C	0.000	106.168		100.00	0.000	0.000
L2 100.5000-70.6670	85.1429	1.311	8.39	84.952	A	0.000	84.952	84.952	100.00	0.000	0.000
					B	0.000	84.952		100.00	0.000	0.000
					C	0.000	84.952		100.00	0.000	0.264
L3 70.6670-63.7500	67.1871	1.225	7.84	21.847	A	0.000	21.847	21.847	100.00	0.000	0.000
					B	0.000	21.847		100.00	0.000	0.000
					C	0.000	21.847		100.00	0.000	1.153
L4 63.7500-63.2500	63.4999	1.206	7.72	1.611	A	0.000	1.611	1.611	100.00	0.000	0.000
					B	0.000	1.611		100.00	0.000	0.000
					C	0.000	1.611		100.00	0.000	0.083
L5 63.2500-53.2290	58.2122	1.176	7.53	32.858	A	0.000	32.858	32.858	100.00	0.000	0.000
					B	0.000	32.858		100.00	0.000	0.000
					C	0.000	32.858		100.00	0.000	0.545
L6 53.2290-28.7500	40.7508	1.062	6.80	86.644	A	0.000	86.644	86.644	100.00	0.000	0.000
					B	0.000	86.644		100.00	0.000	0.000
					C	0.000	86.644		100.00	0.000	4.361
L7 28.7500-25.7500	27.2460	1	6.40	11.085	A	0.000	11.085	11.085	100.00	0.000	0.000
					B	0.000	11.085		100.00	0.000	0.000
					C	0.000	11.085		100.00	0.000	0.625
L8 25.7500-0.0000	12.6379	1	6.40	101.512	A	0.000	101.512	101.512	100.00	0.000	0.000
					B	0.000	101.512		100.00	0.000	0.000
					C	0.000	101.512		100.00	0.000	5.365

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

Comb. No.	Description
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	148 - 100.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-13.78	0.00	0.61
			Max. Mx	5	-7.72	-551.42	7.69
			Max. My	2	-7.66	-4.85	569.79
			Max. Vy	5	18.96	-551.42	7.69
			Max. Vx	2	-19.36	-4.85	569.79
			Max. Torque	5			2.13
L2	100.5 - 70.667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27.06	0.15	1.55
			Max. Mx	5	-17.27	-1413.22	18.54
			Max. My	2	-17.24	-13.29	1440.14
			Max. Vy	5	31.57	-1413.22	18.54
			Max. Vx	2	-31.83	-13.29	1440.14
			Max. Torque	5			5.33
L3	70.667 - 63.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.92	0.15	1.55
			Max. Mx	5	-19.00	-1635.05	20.65
			Max. My	2	-18.97	-14.96	1663.71
			Max. Vy	5	32.59	-1635.05	20.65
			Max. Vx	2	-32.84	-14.96	1663.71
			Max. Torque	5			5.32
L4	63.75 - 63.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-29.03	0.15	1.55
			Max. Mx	5	-19.11	-1651.36	20.81
			Max. My	2	-19.08	-15.08	1680.15
			Max. Vy	5	32.66	-1651.36	20.81
			Max. Vx	2	-32.91	-15.08	1680.15
			Max. Torque	5			5.30
L5	63.25 - 53.229	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-31.58	0.15	1.54
			Max. Mx	5	-21.50	-1985.40	23.85
			Max. My	2	-21.48	-17.49	2016.70
			Max. Vy	5	34.02	-1985.40	23.85
			Max. Vx	2	-34.27	-17.49	2016.70
			Max. Torque	5			5.30

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L6	53.229 - 28.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-38.30	0.17	4.18
			Max. Mx	5	-27.36	-2665.02	29.30
			Max. My	2	-27.34	-21.96	2700.99
			Max. Vy	5	37.58	-2665.02	29.30
			Max. Vx	2	-37.83	-21.96	2700.99
			Max. Torque	5			10.79
L7	28.75 - 25.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-43.37	0.17	4.18
			Max. Mx	5	-32.18	-2999.53	31.91
			Max. My	2	-32.17	-24.04	3037.66
			Max. Vy	5	38.86	-2999.53	31.91
			Max. Vx	2	-39.10	-24.04	3037.66
			Max. Torque	5			10.73
L8	25.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-54.76	0.17	4.17
			Max. Mx	5	-42.98	-4044.14	39.45
			Max. My	2	-42.98	-30.12	4088.55
			Max. Vy	5	42.33	-4044.14	39.45
			Max. Vx	2	-42.57	-30.12	4088.55
			Max. Torque	5			10.73

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	54.76	-0.00	-0.00
	Max. H_x	11	43.00	42.26	-0.09
	Max. H_z	2	43.00	-0.23	42.56
	Max. M_x	2	4088.55	-0.23	42.56
	Max. M_z	5	4044.14	-42.31	0.29
	Max. Torsion	5	10.68	-42.31	0.29
	Min. Vert	2	43.00	-0.23	42.56
	Min. H_x	5	43.00	-42.31	0.29
	Min. H_z	8	43.00	0.22	-42.47
	Min. M_x	8	-4072.94	0.22	-42.47
	Min. M_z	11	-4035.78	42.26	-0.09
	Min. Torsion	11	-10.58	42.26	-0.09

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	43.00	0.00	-0.00	-0.73	0.03	0.00
Dead+Wind 0 deg - No Ice	43.00	0.23	-42.56	-4088.55	-30.12	0.25
Dead+Wind 30 deg - No Ice	43.00	21.17	-37.01	-3561.94	-2018.29	-5.01
Dead+Wind 60 deg - No Ice	43.00	36.67	-21.53	-2077.22	-3503.63	-8.97
Dead+Wind 90 deg - No Ice	43.00	42.31	-0.29	-39.45	-4044.14	-10.68
Dead+Wind 120 deg - No Ice	43.00	36.42	21.25	2043.35	-3471.56	-8.85
Dead+Wind 150 deg - No Ice	43.00	20.89	36.78	3530.68	-1986.77	-4.89
Dead+Wind 180 deg - No Ice	43.00	-0.22	42.47	4072.94	28.15	-0.04
Dead+Wind 210 deg - No Ice	43.00	-21.16	36.95	3550.19	2016.53	4.84
Dead+Wind 240 deg - No Ice	43.00	-36.57	21.57	2081.35	3488.00	8.47
Dead+Wind 270 deg - No Ice	43.00	-42.26	0.09	7.47	4035.78	10.58
Dead+Wind 300 deg - No Ice	43.00	-36.52	-21.22	-2040.87	3486.10	9.19
Dead+Wind 330 deg - No Ice	43.00	-20.86	-36.81	-3536.79	1981.57	5.37
Dead+Ice+Temp	54.76	0.00	0.00	-4.17	0.17	-0.00

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead+Wind 0 deg+Ice+Temp	54.76	0.02	-4.79	-478.49	-2.86	-0.02
Dead+Wind 30 deg+Ice+Temp	54.76	2.38	-4.16	-417.09	-234.04	-0.69
Dead+Wind 60 deg+Ice+Temp	54.76	4.13	-2.42	-244.70	-406.43	-1.17
Dead+Wind 90 deg+Ice+Temp	54.76	4.76	-0.03	-8.26	-469.24	-1.36
Dead+Wind 120 deg+Ice+Temp	54.76	4.10	2.39	232.85	-403.19	-1.12
Dead+Wind 150 deg+Ice+Temp	54.76	2.35	4.14	405.42	-230.95	-0.60
Dead+Wind 180 deg+Ice+Temp	54.76	-0.02	4.78	468.34	2.99	0.04
Dead+Wind 210 deg+Ice+Temp	54.76	-2.38	4.16	407.35	234.19	0.67
Dead+Wind 240 deg+Ice+Temp	54.76	-4.12	2.42	236.62	405.13	1.13
Dead+Wind 270 deg+Ice+Temp	54.76	-4.76	0.01	-3.60	468.70	1.36
Dead+Wind 300 deg+Ice+Temp	54.76	-4.11	-2.39	-241.11	405.05	1.15
Dead+Wind 330 deg+Ice+Temp	54.76	-2.35	-4.14	-414.57	230.74	0.64
Dead+Wind 0 deg - Service	43.00	0.07	-12.79	-1230.54	-9.04	0.06
Dead+Wind 30 deg - Service	43.00	6.36	-11.12	-1072.18	-607.19	-1.51
Dead+Wind 60 deg - Service	43.00	11.02	-6.47	-625.48	-1054.05	-2.70
Dead+Wind 90 deg - Service	43.00	12.72	-0.09	-12.41	-1216.65	-3.21
Dead+Wind 120 deg - Service	43.00	10.95	6.39	614.20	-1044.38	-2.67
Dead+Wind 150 deg - Service	43.00	6.28	11.06	1061.68	-597.70	-1.49
Dead+Wind 180 deg - Service	43.00	-0.07	12.76	1224.77	8.49	-0.03
Dead+Wind 210 deg - Service	43.00	-6.36	11.11	1067.57	606.70	1.47
Dead+Wind 240 deg - Service	43.00	-10.99	6.48	625.65	1049.38	2.57
Dead+Wind 270 deg - Service	43.00	-12.70	0.03	1.71	1214.17	3.20
Dead+Wind 300 deg - Service	43.00	-10.98	-6.38	-614.53	1048.80	2.77
Dead+Wind 330 deg - Service	43.00	-6.27	-11.06	-1064.59	596.17	1.61

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-43.00	0.00	0.00	43.00	0.00	0.000%
2	0.23	-43.00	-42.56	-0.23	43.00	42.56	0.002%
3	21.17	-43.00	-37.01	-21.17	43.00	37.01	0.000%
4	36.67	-43.00	-21.53	-36.67	43.00	21.53	0.000%
5	42.31	-43.00	-0.29	-42.31	43.00	0.29	0.000%
6	36.42	-43.00	21.25	-36.42	43.00	-21.25	0.000%
7	20.89	-43.00	36.78	-20.89	43.00	-36.78	0.000%
8	-0.22	-43.00	42.47	0.22	43.00	-42.47	0.002%
9	-21.16	-43.00	36.95	21.16	43.00	-36.95	0.000%
10	-36.57	-43.00	21.57	36.57	43.00	-21.57	0.000%
11	-42.26	-43.00	0.09	42.26	43.00	-0.09	0.000%
12	-36.52	-43.00	-21.22	36.52	43.00	21.22	0.000%
13	-20.86	-43.00	-36.81	20.86	43.00	36.81	0.000%
14	0.00	-54.76	0.00	-0.00	54.76	-0.00	0.001%
15	0.02	-54.76	-4.79	-0.02	54.76	4.79	0.000%
16	2.38	-54.76	-4.16	-2.38	54.76	4.16	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
17	4.13	-54.76	-2.42	-4.13	54.76	2.42	0.000%
18	4.76	-54.76	-0.03	-4.76	54.76	0.03	0.000%
19	4.10	-54.76	2.39	-4.10	54.76	-2.39	0.000%
20	2.35	-54.76	4.14	-2.35	54.76	-4.14	0.000%
21	-0.02	-54.76	4.78	0.02	54.76	-4.78	0.000%
22	-2.38	-54.76	4.16	2.38	54.76	-4.16	0.000%
23	-4.12	-54.76	2.42	4.12	54.76	-2.42	0.000%
24	-4.76	-54.76	0.01	4.76	54.76	-0.01	0.000%
25	-4.11	-54.76	-2.39	4.11	54.76	2.39	0.000%
26	-2.35	-54.76	-4.14	2.35	54.76	4.14	0.000%
27	0.07	-43.00	-12.79	-0.07	43.00	12.79	0.003%
28	6.36	-43.00	-11.12	-6.36	43.00	11.12	0.001%
29	11.02	-43.00	-6.47	-11.02	43.00	6.47	0.001%
30	12.72	-43.00	-0.09	-12.72	43.00	0.09	0.001%
31	10.95	-43.00	6.39	-10.95	43.00	-6.39	0.001%
32	6.28	-43.00	11.06	-6.28	43.00	-11.06	0.001%
33	-0.07	-43.00	12.77	0.07	43.00	-12.76	0.003%
34	-6.36	-43.00	11.11	6.36	43.00	-11.11	0.001%
35	-10.99	-43.00	6.48	10.99	43.00	-6.48	0.001%
36	-12.70	-43.00	0.03	12.70	43.00	-0.03	0.001%
37	-10.98	-43.00	-6.38	10.98	43.00	6.38	0.001%
38	-6.27	-43.00	-11.06	6.27	43.00	11.06	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	12	0.00000001	0.00007816
3	Yes	15	0.00000001	0.00006892
4	Yes	15	0.00000001	0.00008219
5	Yes	14	0.00000001	0.00006657
6	Yes	15	0.00000001	0.00006535
7	Yes	15	0.00000001	0.00007580
8	Yes	12	0.00000001	0.00005541
9	Yes	15	0.00000001	0.00007701
10	Yes	15	0.00000001	0.00006766
11	Yes	14	0.00000001	0.00005930
12	Yes	15	0.00000001	0.00008099
13	Yes	15	0.00000001	0.00006619
14	Yes	6	0.00000001	0.00001502
15	Yes	13	0.00000001	0.00009026
16	Yes	13	0.00000001	0.00009183
17	Yes	13	0.00000001	0.00009109
18	Yes	13	0.00000001	0.00008802
19	Yes	13	0.00000001	0.00008876
20	Yes	13	0.00000001	0.00008910
21	Yes	13	0.00000001	0.00008777
22	Yes	13	0.00000001	0.00008979
23	Yes	13	0.00000001	0.00008954
24	Yes	13	0.00000001	0.00008788
25	Yes	13	0.00000001	0.00009049
26	Yes	13	0.00000001	0.00009102
27	Yes	11	0.00000001	0.00007227
28	Yes	12	0.00000001	0.00007386
29	Yes	12	0.00000001	0.00012756
30	Yes	12	0.00000001	0.00007950
31	Yes	12	0.00000001	0.00007538
32	Yes	12	0.00000001	0.00010505
33	Yes	11	0.00000001	0.00007085
34	Yes	12	0.00000001	0.00010543
35	Yes	12	0.00000001	0.00007731
36	Yes	12	0.00000001	0.00007675
37	Yes	12	0.00000001	0.00012787
38	Yes	12	0.00000001	0.00007004

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	148 - 100.5	26.733	27	1.6765	0.0103
L2	104.5 - 70.667	12.887	28	1.2549	0.0063
L3	70.667 - 63.75	5.468	28	0.7976	0.0036
L4	63.75 - 63.25	4.375	28	0.7111	0.0032
L5	63.25 - 53.229	4.301	28	0.7029	0.0032
L6	53.229 - 28.75	2.980	28	0.5531	0.0026
L7	34.5 - 25.75	1.252	28	0.3277	0.0013
L8	25.75 - 0	0.702	28	0.2621	0.0010

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.0000	VHLP800-11	27	26.733	1.6765	0.0104	32690
148.0000	TD-RRH8x20-25	27	26.733	1.6765	0.0104	32690
144.0000	VHLP2.5-10W	27	25.367	1.6440	0.0100	32690
120.0000	(2) 7770.00 w/ Mount Pipe	27	17.437	1.4311	0.0078	5836
96.0000	DB420-B	28	10.690	1.1393	0.0055	3823
82.0000	(3) RR90-17-00DPL2 w/ Mount Pipe	28	7.562	0.9406	0.0043	3939
72.0000	800 10504 w/ Mount Pipe	28	5.694	0.8127	0.0037	4050
53.0000	BSA150B	28	2.954	0.5499	0.0026	4073
50.0000	BULLET III	28	2.620	0.5083	0.0024	4319

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	148 - 100.5	88.606	2	5.5559	0.0336
L2	104.5 - 70.667	42.746	3	4.1625	0.0206
L3	70.667 - 63.75	18.153	3	2.6477	0.0118
L4	63.75 - 63.25	14.526	3	2.3610	0.0106
L5	63.25 - 53.229	14.280	3	2.3336	0.0105
L6	53.229 - 28.75	9.898	3	1.8367	0.0087
L7	34.5 - 25.75	4.158	3	1.0883	0.0044
L8	25.75 - 0	2.332	3	0.8706	0.0033

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.0000	VHLP800-11	2	88.606	5.5559	0.0341	10029
148.0000	TD-RRH8x20-25	2	88.606	5.5559	0.0341	10029
144.0000	VHLP2.5-10W	2	84.084	5.4487	0.0329	10029
120.0000	(2) 7770.00 w/ Mount Pipe	2	57.826	4.7455	0.0256	1787
96.0000	DB420-B	3	35.469	3.7797	0.0182	1165
82.0000	(3) RR90-17-00DPL2 w/ Mount	3	25.100	3.1218	0.0143	1196

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
	Pipe					
72.0000	800 10504 w/ Mount Pipe	3	18.904	2.6979	0.0121	1227
53.0000	BSA150B	3	9.810	1.8260	0.0087	1230
50.0000	BULLET III	3	8.701	1.6880	0.0080	1304

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	148 - 100.5 (1)	TP31.643x22x0.25	47.5000	0.0000	0.0	36.000	24.6177	-7.66	886.24	0.009
L2	100.5 - 70.667 (2)	TP37.1993x30.331x0.375	33.8330	0.0000	0.0	36.000	44.4653	-17.24	1600.75	0.011
L3	70.667 - 63.75 (3)	TP38.6035x37.1993x0.4947	6.9170	0.0000	0.0	28.626	60.7048	-18.97	1737.73	0.011
L4	63.75 - 63.25 (4)	TP38.705x38.6035x0.375	0.5000	0.0000	0.0	36.000	46.2834	-19.08	1666.20	0.011
L5	63.25 - 53.229 (5)	TP39.9894x38.705x0.4375	10.0210	0.0000	0.0	36.000	55.7188	-21.47	2005.88	0.011
L6	53.229 - 28.75 (6)	TP44.959x39.9894x0.5776	24.4790	0.0000	0.0	31.662	80.3768	-27.34	2544.89	0.011
L7	28.75 - 25.75 (7)	TP44.6929x42.6364x0.6898	8.7500	0.0000	0.0	32.136	97.7377	-32.16	3140.90	0.010
L8	25.75 - 0 (8)	TP49.92x44.6929x0.7194	25.7500	0.0000	0.0	31.512	113.9730	-42.98	3591.52	0.012

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	148 - 100.5 (1)	TP31.643x22x0.25	569.81	37.161	36.000	1.032	0.00	0.000	36.000	0.000
L2	100.5 - 70.667 (2)	TP37.1993x30.331x0.375	1440.20	43.271	36.000	1.202	0.00	0.000	36.000	0.000
L3	70.667 - 63.75 (3)	TP38.6035x37.1993x0.4947	1664.03	35.485	28.626	1.240	0.00	0.000	28.626	0.000
L4	63.75 - 63.25 (4)	TP38.705x38.6035x0.375	1680.51	46.583	36.000	1.294	0.00	0.000	36.000	0.000
L5	63.25 - 53.229 (5)	TP39.9894x38.705x0.4375	2017.87	45.084	36.000	1.252	0.00	0.000	36.000	0.000
L6	53.229 - 28.75 (6)	TP44.959x39.9894x0.5776	2703.66	38.414	31.662	1.213	0.00	0.000	31.662	0.000
L7	28.75 - 25.75 (7)	TP44.6929x42.6364x0.6898	3041.04	34.975	32.136	1.088	0.00	0.000	32.136	0.000
L8	25.75 - 0 (8)	TP49.92x44.6929x0.7194	4094.02	36.075	31.512	1.145	0.00	0.000	31.512	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	148 - 100.5 (1)	TP31.643x22x0.25	19.36	0.787	24.000	0.067	0.23	0.007	24.000	0.000
L2	100.5 - 70.667 (2)	TP37.1993x30.331x0.375	31.83	0.716	24.000	0.061	0.46	0.006	24.000	0.000
L3	70.667 - 63.75 (3)	TP38.6035x37.1993x0.4947	32.93	0.542	19.084	0.058	2.16	0.022	19.084	0.001
L4	63.75 - 63.25 (4)	TP38.705x38.6035x0.375	33.00	0.713	24.000	0.060	2.16	0.028	24.000	0.001
L5	63.25 - 53.229 (5)	TP39.9894x38.705x0.4375	34.35	0.617	24.000	0.052	2.17	0.023	24.000	0.001
L6	53.229 - 28.75 (6)	TP44.959x39.9894x0.5776	37.91	0.472	21.108	0.045	4.95	0.033	21.108	0.002
L7	28.75 - 25.75 (7)	TP44.6929x42.6364x0.6898	39.18	0.401	21.424	0.038	4.96	0.027	21.424	0.001
L8	25.75 - 0 (8)	TP49.92x44.6929x0.7194	42.65	0.374	21.008	0.036	5.01	0.021	21.008	0.001

Pole Interaction Design Data

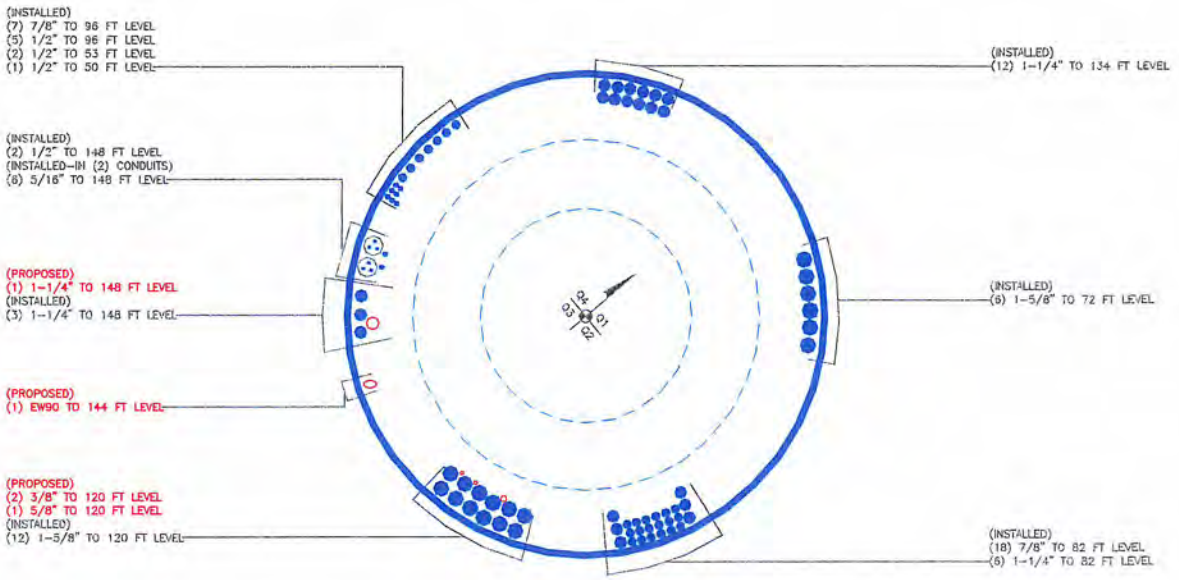
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	148 - 100.5 (1)	0.009	1.032	0.000	0.067	0.000	1.042 ✔	1.333	H1-3+VT ✔
L2	100.5 - 70.667 (2)	0.011	1.202	0.000	0.061	0.000	1.214 ✔	1.333	H1-3+VT ✔
L3	70.667 - 63.75 (3)	0.011	1.240	0.000	0.058	0.001	1.251 ✔	1.333	H1-3+VT ✔
L4	63.75 - 63.25 (4)	0.011	1.294	0.000	0.060	0.001	1.306 ✔	1.333	H1-3+VT ✔
L5	63.25 - 53.229 (5)	0.011	1.252	0.000	0.052	0.001	1.264 ✔	1.333	H1-3+VT ✔
L6	53.229 - 28.75 (6)	0.011	1.213	0.000	0.045	0.002	1.225 ✔	1.333	H1-3+VT ✔
L7	28.75 - 25.75 (7)	0.010	1.088	0.000	0.038	0.001	1.099 ✔	1.333	H1-3+VT ✔
L8	25.75 - 0 (8)	0.012	1.145	0.000	0.036	0.001	1.157 ✔	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	148 - 100.5	Pole	TP31.643x22x0.25	1	-7.66	1181.35	78.2	Pass
L2	100.5 - 70.667	Pole	TP37.1993x30.331x0.375	2	-17.24	2133.80	91.0	Pass
L3	70.667 - 63.75	Pole	TP38.6035x37.1993x0.4947	3	-18.97	2316.39	93.9	Pass
L4	63.75 - 63.25	Pole	TP38.705x38.6035x0.375	4	-19.08	2221.04	98.0	Pass
L5	63.25 - 53.229	Pole	TP39.9894x38.705x0.4375	5	-21.47	2673.84	94.8	Pass
L6	53.229 - 28.75	Pole	TP44.959x39.9894x0.5776	6	-27.34	3392.34	91.9	Pass
L7	28.75 - 25.75	Pole	TP44.6929x42.6364x0.6898	7	-32.16	4186.82	82.4	Pass
L8	25.75 - 0	Pole	TP49.92x44.6929x0.7194	8	-42.98	4787.50	86.8	Pass
							Summary	
						Pole (L4)	98.0	Pass
						RATING =	**98.0**	**Pass**

APPENDIX B

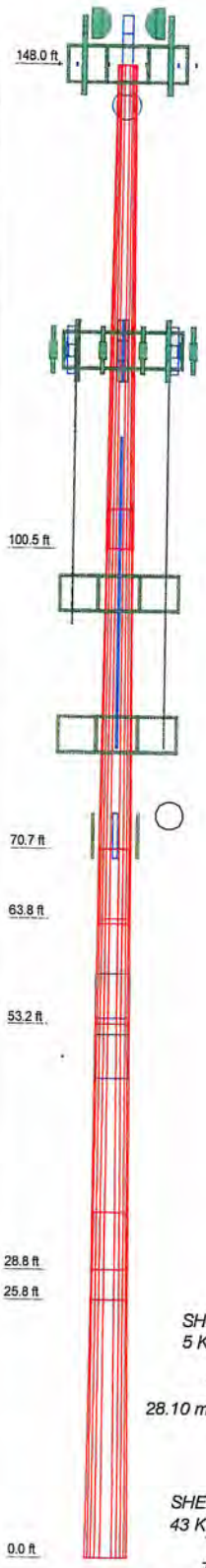
BASE LEVEL DRAWING

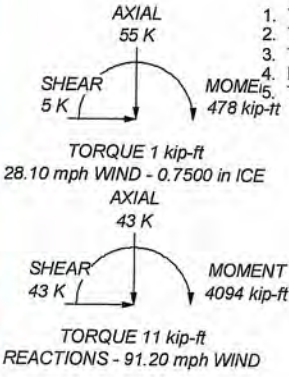

(INSTALLED)
(7) 7/8" TO 96 FT LEVEL
(5) 1/2" TO 96 FT LEVEL
(2) 1/2" TO 53 FT LEVEL
(1) 1/2" TO 50 FT LEVEL
(INSTALLED)
(2) 1/2" TO 148 FT LEVEL
(INSTALLED-IN (2) CONDUITS)
(6) 5/16" TO 148 FT LEVEL
(PROPOSED)
(1) 1-1/4" TO 148 FT LEVEL
(INSTALLED)
(3) 1-1/4" TO 148 FT LEVEL
(PROPOSED)
(1) EW90 TO 144 FT LEVEL
(PROPOSED)
(2) 3/8" TO 120 FT LEVEL
(1) 5/8" TO 120 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 120 FT LEVEL
(INSTALLED)
(12) 1-1/4" TO 134 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 72 FT LEVEL
(INSTALLED)
(18) 7/8" TO 82 FT LEVEL
(6) 1-1/4" TO 82 FT LEVEL
A1
A2
A3
B1
B2
B3
C1
C2
C3

APPENDIX C

ADDITIONAL CALCULATIONS

Section	1	2	3	4	5	6	7	8
Length (ft)	47.5000	33.8330	6.9170	0.5000	10.0210	24.4790	8.7500	25.7500
Number of Sides	12	12	12	12	12	12	12	12
Thickness (in)	0.2500	0.3750	0.4947	0.3750	0.4375	0.5776	0.6898	0.7194
Socket Length (ft)						5.7500		
Top Dia (in)	4.0000	30.3310	37.1993	38.6035	38.7050	39.9894	42.6364	44.6929
Bot Dia (in)	22.0000	37.1993	38.6035	38.7050	39.9894	44.9590	44.6929	49.9200
Grade	31.6430	A607-60	Reinf 47.71 ksi	A607-60	A607-60	Reinf 52.77 ksi	Reinf 52.77 ksi	Reinf 52.52 Reinf 53.56 ksi
Weight (K)	3.5	4.6	1.4	0.1	1.9	6.5	2.8	9.5





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
TD-RRH8x20-25	148	(2) RRUS-11	120
APXVTM14-C-120 w/ Mount Pipe	148	P65-16-XLH-RR w/ Mount Pipe	120
TD-RRH8x20-25	148	Platform Mount [LP 712-1]	120
APXVTM14-C-120 w/ Mount Pipe	148	6' x 2" Mount Pipe	120
TD-RRH8x20-25	148	6' x 2" Mount Pipe	120
APXVTM14-C-120 w/ Mount Pipe	148	6' x 2" Mount Pipe	120
LLPX310R w/ Mount Pipe	148	(2) LGP13519	120
LLPX310R w/ Mount Pipe	148	(2) 7770.00 w/ Mount Pipe	120
LLPX310R w/ Mount Pipe	148	(2) LGP2140X	120
DB420	148	(2) PD83-1	96
FDD_R6_RRH	148	DB205-A	96
FDD_R6_RRH	148	PD201-1	96
FDD_R6_RRH	148	PD83-1	96
APXVSPP18-C-A20 w/ Mount Pipe	148	DB806E-XT	96
APXVSPP18-C-A20 w/ Mount Pipe	148	DB224	96
APXVSPP18-C-A20 w/ Mount Pipe	148	PD220	96
PCS 1900MHz 4x45W-65MHz	148	(4) 6' x 2" Mount Pipe	96
PCS 1900MHz 4x45W-65MHz	148	(3) 6' x 2" Mount Pipe	96
PCS 1900MHz 4x45W-65MHz	148	(3) 6' x 2" Mount Pipe	96
800MHZ RRH	148	Platform Mount [LP 712-1]	96
800MHZ RRH	148	DB420-B	96
800MHZ RRH	148	(2) PD1110	96
800 EXTERNAL NOTCH FILTER	148	PD201-1	96
800 EXTERNAL NOTCH FILTER	148	(2) ETW190VS12UB	82
800 EXTERNAL NOTCH FILTER	148	(2) ETW190VS12UB	82
(3) ACU-A20-N	148	(2) ETW190VS12UB	82
(3) ACU-A20-N	148	APXV18-206516S-C-A20 w/ Mount Pipe	82
(3) ACU-A20-N	148	APXV18-206516S-C-A20 w/ Mount Pipe	82
Platform Mount [LP 712-1]	148	APXV18-206516S-C-A20 w/ Mount Pipe	82
Miscellaneous [NA 507-1]	148	ATMAA1412D-1A20	82
6' x 2" Mount Pipe	148	ATMAA1412D-1A20	82
6' x 2" Mount Pipe	148	ATMAA1412D-1A20	82
6' x 2" Mount Pipe	148	Platform Mount [LP 712-1]	82
VHLP800-11	148	(3) RR90-17-00DPL2 w/ Mount Pipe	82
VHLP800-11	148	(3) RR90-17-00DPL2 w/ Mount Pipe	82
Pipe Mount [PM 601-1]	144	(3) RR90-17-00DPL2 w/ Mount Pipe	82
VHLP2.5-10W	144	Pipe Mount [PM 601-3]	72
(2) 7770.00 w/ Mount Pipe	120	800 10504 w/ Mount Pipe	72
(2) LGP2140X	120	800 10504 w/ Mount Pipe	72
(2) LGP13519	120	800 10504 w/ Mount Pipe	72
(2) 7770.00 w/ Mount Pipe	120	Side Arm Mount [SO 702-1]	53
(2) LGP2140X	120	BSA150B	53
(2) LGP13519	120	BSA150B	53
(2) RRUS-11	120	BULLET III	50
P65-16-XLH-RR w/ Mount Pipe	120		
DC6-48-60-18-8F	120		
(2) RRUS-11	120		
P65-16-XLH-RR w/ Mount Pipe	120		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	Reinf 53.56 ksi	54 ksi	67 ksi
Reinf 47.71 ksi	48 ksi	60 ksi	Reinf 52.52 ksi	53 ksi	66 ksi
Reinf 52.77 ksi	53 ksi	66 ksi			

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 91.20 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28.10 mph basic wind with 0.75 in ice.
4. Deflections are based upon a 50.00 mph wind.
5. TOWER RATING: 98%

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

Job: *148' Monopole / Westport Fire Department*		
Project: *PJF 37512-1197 / BU 876354*		
Client: CCI	Drawn by: John J Woolley	App'd:
Code: TIA/EIA-222-F	Date: 07/08/14	Scale: NTS
Path:		Dwg No. E-1

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:	20	
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:	60	in
Thick:	2.75	in
Grade:	50	ksi
Clip Distance:	0	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:	6	in
Height:	18	in
Thick:	1	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	49.92	in
Thick:	0.5	in
Grade:	60	ksi
# of Sides:	12	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	4094	ft-kips
Unfactored Axial, P:	43	kips
Unfactored Shear, V:	43	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	167.3 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	85.8% Pass

Base Plate Results Shear Check Only

Base Plate Stress:	5.2 ksi
Allowable PL Bending Stress:	26.7 ksi
Base Plate Stress Ratio:	19.5% Pass

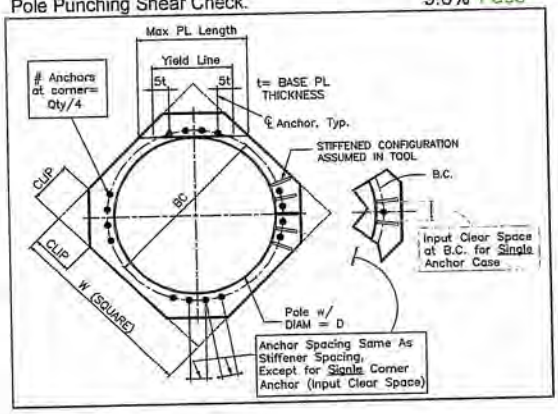
PL Ref. Data
Yield Line (in): N/A, Roark
Max PL Length: 34.93

Stiffener Results

Horizontal Weld :	50.1% Pass
Vertical Weld:	43.4% Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	12.2% Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	50.4% Pass
Plate Comp. (AISC Bracket):	51.7% Pass

Pole Results

Pole Punching Shear Check: 9.6% Pass



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

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

Job Number: 37513-1197.003.7805
Site Number: 876354
Site Name: Site Name

Page: 1
By: JJW
Date: 7/8/2014

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

Unfactored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, M =	4094.0		k-ft
Shear, V =	43.0		kips
Axial Load, P =	43.0		kips
OTM =	4115.5	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 =	22.5	ft
fc' =	3	ksi
εc =	0.003	in/in
Mat Ftdn. Cap Width =		ft
Mat Ftdn. Cap Length =		ft
Depth Below Grade =		ft

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

Load Combinations Checked per TIA/EIA-222-F

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

Steel Parameters

Number of Bars =	40	
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 =	99.00	ft
Depth to Ignore Soil =	3.50	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?	Ground	

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

Direct Embed Pole Shaft Parameters

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

Maximum Capacity Ratios

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

Define Soil Layers

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

Layer	Thickness ft	Unit Weight pcf	Cohesion psf	Friction Angle degrees	Soil Type	Ultimate End Bearing psf	Comp. Ult. Skin Friction psf	Tension Ult. Skin Friction psf	Depth ft
1	6.5	100		30	Sand	0			6.5
2	20	135		38	Sand	10000			26.5
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

Soil Results: Overturning

Depth to COR =	16.78	ft, from Grade
Bending Moment, M =	4836.87	k-ft, from COR
Resisting Moment, Ma =	4987.43	k-ft, from COR

MOMENT RATIO = 97.0% OK

Shear, V =	43.00	kips
Resisting Shear, Va =	44.34	kips

SHEAR RATIO = 97.0% OK

Soil Results: Uplift

Uplift, T =	0.00	kips
Allowable Uplift Cap., Ta =	106.22	kips

UPLIFT RATIO = 0.0% OK

Soil Results: Compression

Compression, C =	43.00	kips
Allowable Comp. Cap., Ca =	167.79	kips

COMPRESSION RATIO = 25.6% OK

Steel Results (ACI 318-02):

Minimum Steel Area =	18.47	sq in
Actual Steel Area =	62.40	sq in
Allowable Min Axial, Pa =	-2592.00	kips, Where Ma = 0 k-ft
Allowable Max Axial, Pa =	7086.56	kips, Where Ma = 0 k-ft

Axial Load, P =	80.52	kips @ 6.00 ft Below Grade
Moment, M =	4332.13	k-ft @ 6.00 ft Below Grade
Allowable Moment, Ma =	7073.59	k-ft

MOMENT RATIO = 61.2% 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#: *876354*
Site Name: *Site Name*
App #:

Maximum Shaft Superimposed Forces		
TIA Revision:	F	
Max. Service Shaft M:	4332.13	ft-kips (* Note)
Max. Service Shaft P:	80.52	kips
Max Axial Force Type:	Comp.	

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

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

Load Factor	Shaft Factored Loads		
1.30	Mu:	5631.769	ft-kips
1.30	Pu:	104.676	kips

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 = 40
As Total= 62.4 in^2
A s/ Aconc, Rho: 0.0113 1.13%

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

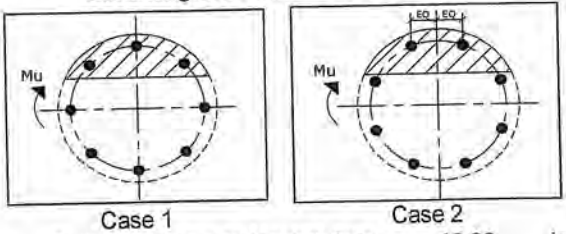
Seismic Design Category = D
Seismic Risk = **High**

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

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

Results:

Governing Orientation Case: **2**



Case 1 Case 2

Dist. From Edge to Neutral Axis: **18.83** in
Extreme Steel Strain, εt: **0.0095**
εt > 0.0050, Tension Controlled
Reduction Factor,φ: **0.900**

Minimum Rho Check:
Actual Req'd Min. Rho: 0.33% Flexural
Provided Rho: 1.13% OK

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	9212.52	kips
at Mu=(ϕ=0.65)Mn=	5501.91	ft-kips
Max Tu, (φ=0.9) Tn =	3369.6	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	104.68	kips
Drilled Shaft Moment Capacity, φMn:	**9195.66**	ft-kips
Drilled Shaft Superimposed Mu:	**5631.77**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR: 61.2%

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

CT2153

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

May 31, 2011

Douglas L. Culp, Real Estate Consultant
New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, CT 06067-3900

RE: **EM-CING-158-110504** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 515 Boston Post Road, Westport, Connecticut.

Dear Mr. Culp:

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

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated May 4, 2011. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

Very truly yours,

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Gordon F. Joseloff, First Selectman, Town of Westport
Laurence Bradley, Director, Planning & Zoning, Town of Westport
Crown Castle USA, Inc.

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

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

May 9, 2011

The Honorable Gordon F. Joseloff
First Selectman
Town of Westport
Town Hall
110 Myrtle Avenue
Westport, CT 06880

RE: **EM-CING-158-110504** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 515 Boston Post Road, Westport, Connecticut.

Dear First Selectman Joseloff:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

If you have any questions or comments regarding this proposal, please call me or inform the Council by May 23, 2011.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Laurence Bradley, Director, Planning & Zoning, Town of Westport

EM-CING-158-110504

at&t
Your world. Delivered.

gular Wireless PCS, LLC
Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 463-5511
Fax: (860) 513-7190

Douglas L. Culp
Real Estate Consultant

ORIGINAL

HAND DELIVERED

May 4, 2011

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

Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 515 Boston Post Road Westport, CT (owner Crown Castle)

Dear Ms. Roberts:

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

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

LTE is a new high-performance air interface for cellular mobile communications. It is the last step toward the 4th generation (4G) of radio technologies, designed to increase the capacity and speed of mobile telephone networks.

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

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

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

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

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

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

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

Please feel free to call me at (860) 463-5511 with questions concerning this matter. Thank you for your consideration.

Sincerely,

Douglas L. Culp
Real Estate Consultant

Attachments

NEW CINGULAR WIRELESS PCS, LLC
Equipment Modification

515 Boston Post Road East Westport, CT
Site Number 2153
Exempt Mod 08/07 and 05/08

Tower Owner/Manager: Crown Castle

Equipment configuration: Monopole

Current and/or approved: Six PowerWave antennas @ 120 ft
Six PowerWave TMA's and Six PowerWave Diplexers @ 120 ft
Twelve runs 1 5/8 inch coax to 120 ft
Equipment Shelter

Planned Modifications: Retain existing PowerWave Antenna's, Diplexers and TMA's at 105 ft
Retain all Coax Cabling
Install three PowerWave P65-16 antennas or equivalent @ 120 ft
Install six remote radio heads and surge arrestor @ 120 ft
Install one fiber and two DC power cables to 120 ft
Install one new cabinet and surge suppressor equipment in shelter

Power Density:

Worst-case calculations for existing wireless operations at the site, using standard parameters for other carriers, indicate a radio frequency electromagnetic radiation power density, measured at ground level beside the Tower, of 91.3% of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density following proposed modifications would be approximately 93.8 % of the standard.

Existing

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users							70.85
AT&T UMTS	120	1900 Band	2	500	0.0250	1.0000	2.50
AT&T UMTS	120	800 Band	1	500	0.0125	0.5867	2.13
AT&T GSM	120	800Band	10	296	0.0739	0.5867	12.60
AT&T GSM	120	1900 Band	3	427	0.0320	1.0000	3.20
Total							**91.3%**

* Data for other users are from Siting Council records.

Proposed

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users							70.85
AT&T UMTS	120	800 Band	1	500	0.0125	0.5867	2.13
AT&T UMTS	120	1900 Band	2	500	0.0250	1.0000	2.50
AT&T GSM	120	1900 Band	3	427	0.0320	1.0000	3.20
AT&T GSM	120	880 - 894	10	296	0.0739	0.5867	12.60
AT&T LTE	120	740 - 746	1	500	0.0125	0.4933	2.53
Total							**93.8%**

* Data for other users are from Siting Council records.

Structural information:

The attached structural analysis demonstrates that the monopole and foundation have adequate structural capacity to accommodate the proposed modifications. (Paul J. Ford and Co., dated 4-13-11).

PROJECT INFORMATION

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS
SITE ADDRESS:	515 BOSTON POST ROAD EAST WESTPORT, CT 06880
LATITUDE:	41.1401° N 41° 8' 24.59" N
LONGITUDE:	-73.3472° W -73° 20' 50" W
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
NOC#	866-915-5600

at&t

SITE NUMBER: CT2153
SITE NAME: WESTPORT FD

DRAWING INDEX

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

VICINITY MAP

DIRECTIONS TO SITE:
HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD. 0.3 MILES. TURN LEFT AT CAPITAL BLVD. 0.3 MILES. TURN LEFT AT WEST ST. 0.3 MILES. TURN LEFT TO MERGE ONTO I-91 S TOWARD NEW HAVEN. 9.6 MILES. TAKE EXIT 17 FOR CT-15 S/W CROSS PKWY. 0.4 MILES. MERGE ONTO CT-15 S. 29.8 MILES. TAKE EXIT 52 FOR STATE ROUTE 108 S/STATE ROUTE 8 S TOWARD BRIDGEPORT. 0.7 MILES. FOLLOW SIGNS FOR CT-8 S/BRIDGEPORT AND MERGE ONTO CT-8 S/STATE ROUTE 8 S. 5.3 MILES. KEEP RIGHT AT THE FORK, FOLLOW SIGNS FOR I-95 S/N.Y. CITY AND MERGE ONTO I-95 S. 5.6 MILES. TAKE EXIT 19 TOWARD US-1/S PORT. 0.2 MILES. MERGE ONTO PEASE AVE. 0.1 MILES. SLIGHT RIGHT AT US-1 S/POST RD DESTINATION WILL BE ON THE RIGHT. 3.1 MILES.

GENERAL NOTES

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

72 HOURS

BEFORE YOU DIG

CALL TOLL FREE 800-922-4455

UNDERGROUND SERVICE ALERT

Hudson Design Group

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SITE NAME: WESTPORT FD
515 BOSTON POST ROAD EAST
WESTPORT, CT 06880
FAIRFIELD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

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SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: AL

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TITLE SHEET (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2153.01	T-1	2

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR – SAI
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
OWNER – AT&T MOBILITY

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. APPLICABLE BUILDING CODES:
SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT & 2009 CT AMENDMENTS
ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS		
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	PROPOSED	NEW	TBR	TO BE REMOVED
EXISTING	EXISTING	N.T.S.	NOT TO SCALE	TBRR	TO BE REMOVED AND REPLACED
EG	EQUIPMENT GROUND	REF	REFERENCE		
EGR	EQUIPMENT GROUND RING	REQ'D	REQUIRED	TYP	TYPICAL

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SITE NAME: WESTPORT FD
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FAIRFIELD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
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1	03/09/11	ISSUED FOR CONSTRUCTION		DC	DPH
0	02/14/11	ISSUED FOR REVIEW	AL	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: AL

JOB NUMBER: 2153.01

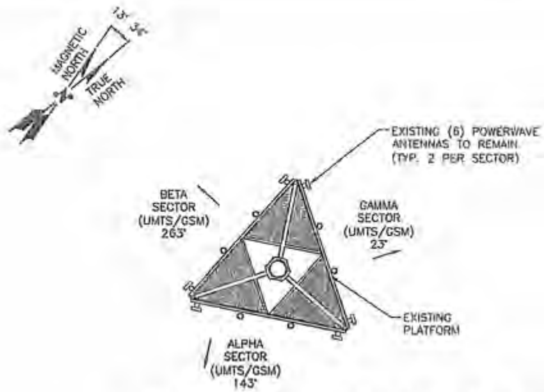
AT&T
GENERAL NOTES (LTE)
DRAWING NUMBER: GN-1
REV: 2

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

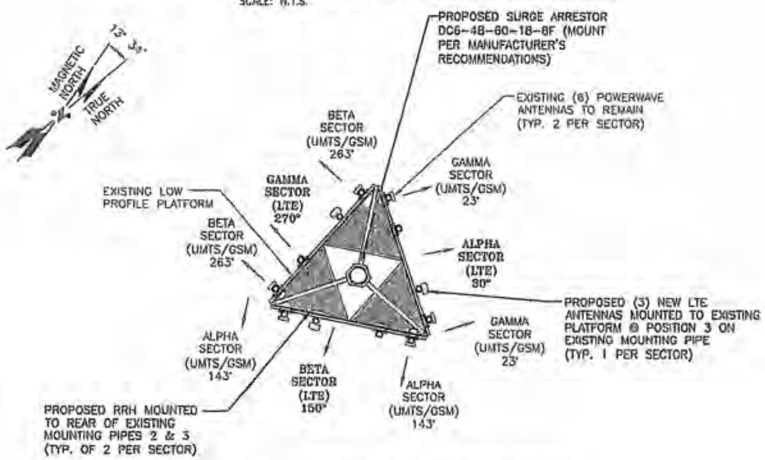
NOTE:

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



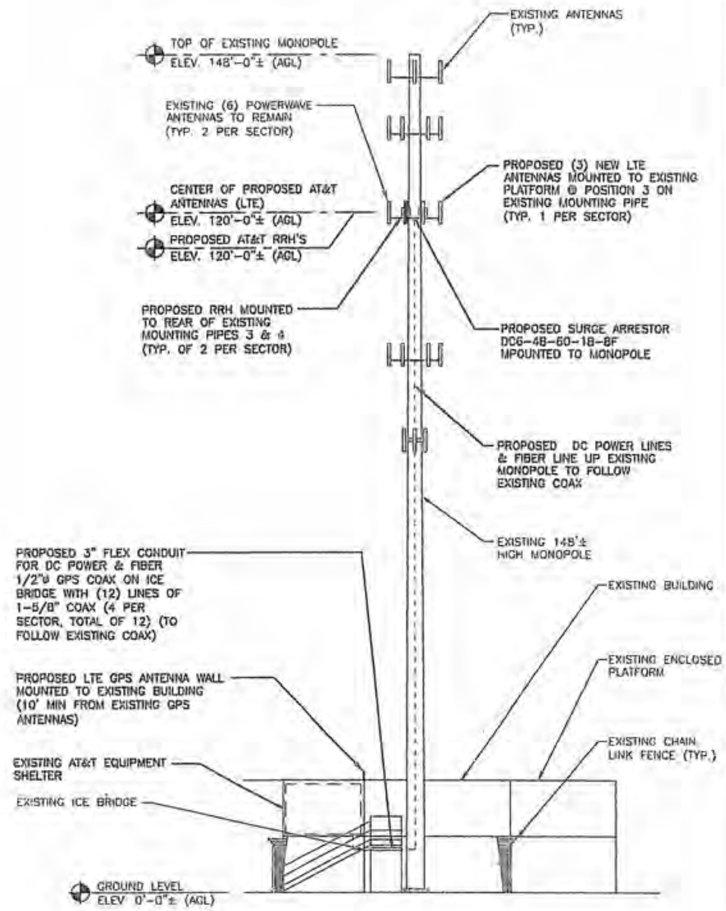
EXISTING GSM/UMTS ANTENNA PLAN

SCALE: N.T.S.



PROPOSED LTE ANTENNA PLAN

SCALE: N.T.S.



SOUTHEAST ELEVATION

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

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

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FAIRFIELD COUNTY

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ANTENNA LAYOUT AND ELEVATION (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2153.01	A-2	2

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

NOTE:

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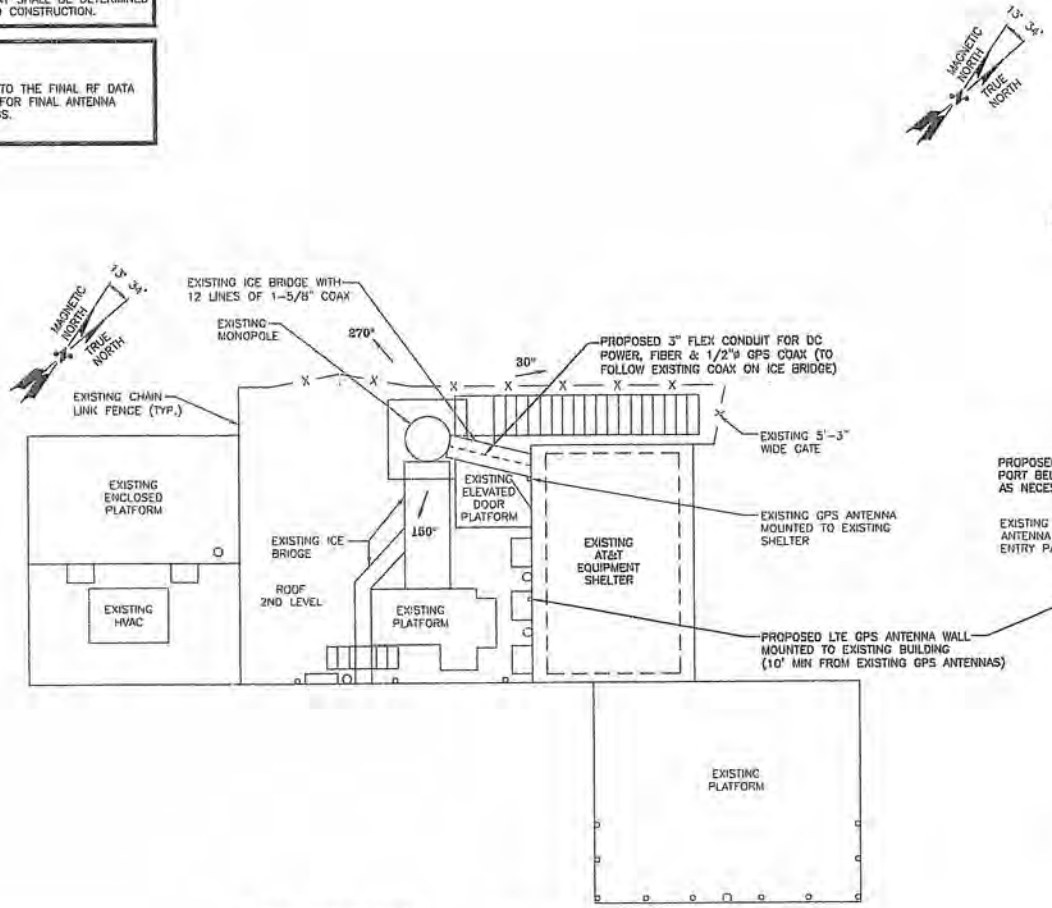
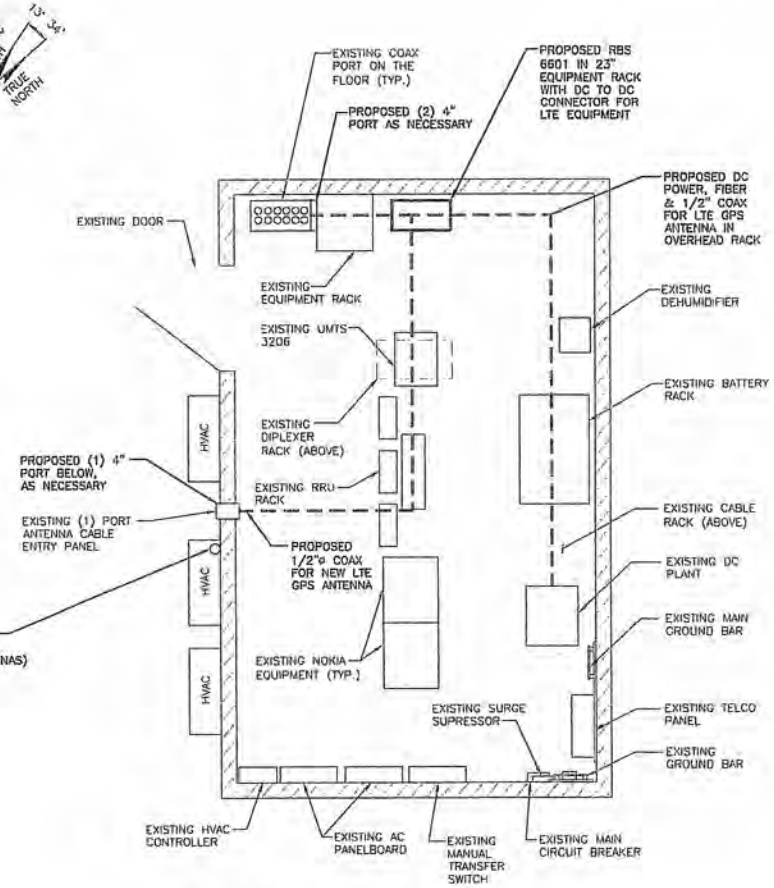


COMPOUND PLAN

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

0 2'-8" 5'-4" 10'-7" 16'-0"



EQUIPMENT PLAN

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

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

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COMPOUND & EQUIPMENT PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
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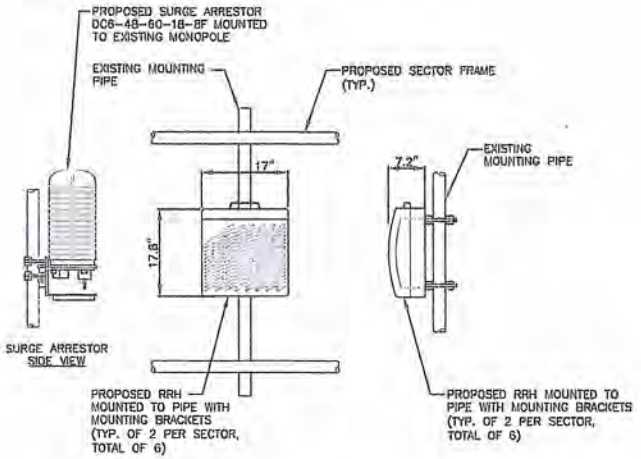
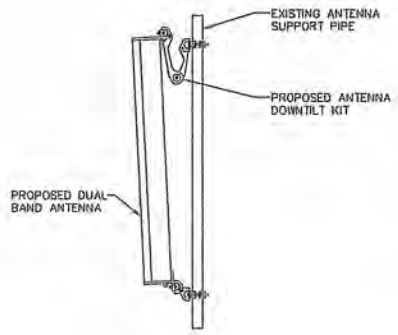


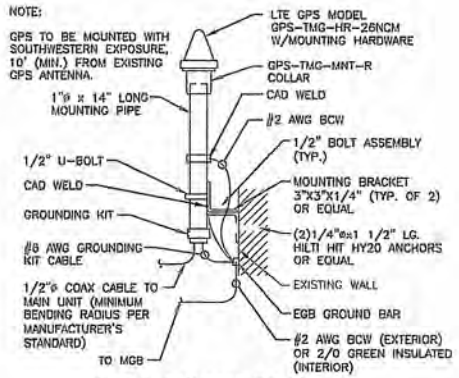
PROPOSED RRH & SURGE ARRESTOR MOUNTING DETAIL

SCALE: N.T.S.



PROPOSED LTE ANTENNA DETAIL

SCALE: N.T.S.



GPS MOUNTED TO WALL

SCALE: N.T.S.

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

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DETAILS
(LTE)

JOB NUMBER	DRAWING NUMBER	REV
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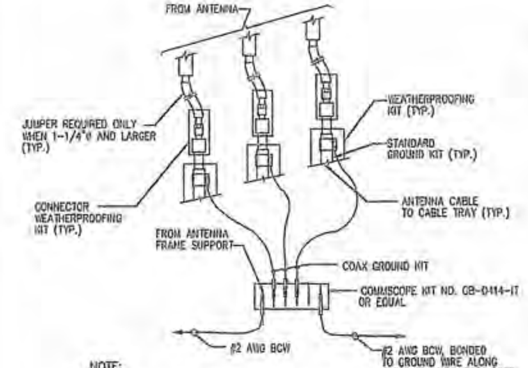
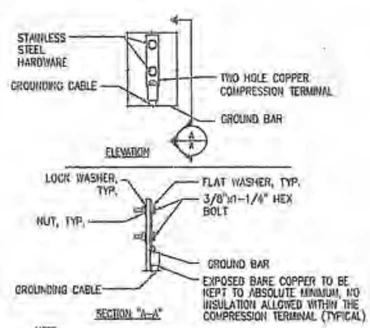


NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

1 GROUND WIRE TO GROUND BAR CONNECTION DETAIL

N.T.S.

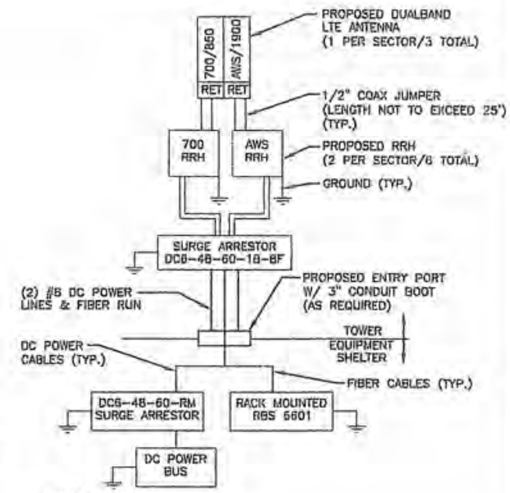


NOTE:

1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

2 TYPICAL GROUND BAR CONNECTION DETAIL

N.T.S.



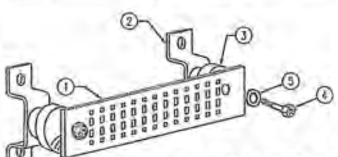
NOTES:

1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.

3 PLUMBING DIAGRAM

N.T.S.

WIRELESS SOLUTIONS INC.			
NO.	REQ.	PART NO.	DESCRIPTION
①	1	HLCB-0420-IS	SOLID GND. BAR (20"x4"x1/4")
②	2	———	WALL MTG. BRKT.
③	2	———	INSULATORS
④	4	———	5/8"-11x1" H.H.C.S.
⑤	4	———	5/8 LOCKWASHER



4 GROUND BAR - DETAIL

N.T.S.

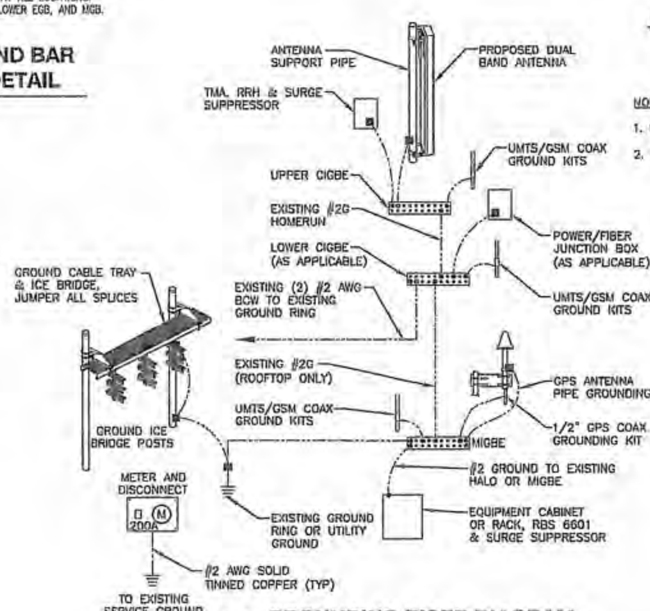
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
-48V POWER SUPPLY RETURN BAR (#2)
RECTIFIER FRAMES.

SECTION "A" – SURGE ABSORBERS

INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)



5 GROUNDING RISER DIAGRAM

N.T.S.

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

AT&T
PLUMBING DIAGRAM & DETAILS (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2153.01	G-1	2

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

Date: **April 13, 2011**

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Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	2153
	Carrier Site Name:	Westport-Boston Post Road
Crown Castle Designation:	**Crown Castle BU Number:**	876354
	Crown Castle Site Name:	Westport Fire Department
	Crown Castle JDE Job Number:	152026
	Crown Castle Work Order Number:	395576
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	32910-0089 Final R1 (Corrected Proposed Loading)
Site Data:	**515 Boston Post Road, Westport, Fairfield County, CT** **Latitude *41° 8' 24.26"*, Longitude *-73° 20' 51.61"*** **148 Foot - Monopole Tower**	

Dear Joshua Mostow,

Paul J Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and in accordance with application 119145, revision 1.

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

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

Please note that per TIA/EIA-222-F Standard, the minimum design wind speed for Fairfield County, CT is 85 MPH. In our analysis, we used 91.2 MPH design wind speed to compensate for the importance factor of 1.15.

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

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

Respectfully submitted by:

Allen R Bonham, EI
Structural Engineer

RISA Tower Report - version 5.4.2.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 148 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 TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 91.2 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
120	120	6	Ericsson	RRUS-11	2 (I) 1 (I)	3/8 5/8	1
		3	Powerwave Technologies	P65-16-XLH-RR w/ Mount Pipe			
		1	Raycap	DC6-48-60-18-8F			

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
148	150	9	-	MLA_ANTENNA w/Mount Pipe	9	1-5/8	3
		6	Decibel	DB980H90E-M w/Mount Pipe	6 (I)	1-5/8	1
	160	1		DB420	2 (I)	7/8	1
	152	1	Andrew	P2F-52	5 (E)* 6 (E)*	1/2 5/16	2
		1		VHLP2-11			
		1		VHLP2-23			
		2		VHLP800-11			
	148	3	Argus Technologies	LLPX310R w/ Mount Pipe			
		3	Samsung Telecommunications	FDD_R6_RRH			
		1	-	Platform Mount [LP 712-1]			1
144	144	1	Andrew	VHLP2.5-10W	1 (I)	EW90	2
		1	-	Pipe Mount [PM 601-1]			
134	134	12	Decibel	DB844H90E-XY w/ Mount Pipe	12 (I)	1-1/4	1
		1	-	Platform Mount [LP 303-1]			
120	120	6	Powerwave Technologies	7770.00 w/ Mount Pipe	12 (I)	1-5/8	1
		6		LGP13519			
		6		LGP2140X			
		1	-	Platform Mount [LP 712-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
96	110	1	RFS/Celwave	PD220	7 (I) 5 (I)	7/8 1/2	1
	108	1	Decibel	DB205-A			
	107	1		DB224			
		1		DB420-B			
	105	1	Andrew	DB806E-XT			
		2	RFS/Celwave	PD1110			
		2		PD201-1			
	96	1	-	Platform Mount [LP 712-1]			
	90	3	RFS/Celwave	PD83-1			
82	82	3	RFS/Celwave	ATMAA1412D-1A20	18 (I) 6 (I)	7/8 1-1/4	1
		3		APXV18-206516S-C-A20 w/ Mount Pipe			
		9	EMS Wireless	RR90-17-00DPL2 w/ Mount Pipe			
		1	-	Platform Mount [LP 712-1]			
72	72	3	Kathrein	800 10504	6 (I)	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
53	56	1	Radiall/Larsen	BSA150B	2 (I)	1/2	1
	53	1	tower mounts	Side Arm Mount [SO 701-1]			
	50	1	Radiall/Larsen	BSA150B			
50	50	1	Trimble	BULLET III	1 (I)	1/2	1

Notes:
1) Existing equipment
2) Reserved equipment
3) MLA equipment; not considered in analysis

(E) Coax to be mounted externally and exposed to the wind. See coax layout in Appendix B.
(I) Coax to be mounted internally and shielded from the wind. See coax layout in Appendix B.
* Coax are to be mounted externally inside a 2" diameter conduit.

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Sea Consultants Inc., 97013.01, 12/18/1996	1531886	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit Manufacturing, Inc., A29297-62, 2/24/1997	1448194	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit Manufacturing, Inc., A29297-62, 2/24/1997	1446984	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37508-0047, 3/4/2009	2350855	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 32910-0089 R1, 4/7/2011		PJF

3.1) Analysis Method

RISATower (version 5.4.2.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	148 - 100.5	Pole	TP31.643x22x0.25	1	-8.38	1181.35	80.8	Pass
L2	100.5 - 69	Pole	TP37.5377x30.331x0.375	2	-18.56	2153.41	96.8	Pass
L3	69 - 58.25	Pole	TP39.72x37.5377x0.3897	3	-19.92	2307.05	98.4	Pass
L4	58.25 - 52.83	Pole	TP40.0697x37.9256x0.4375	4	-23.44	2679.26	99.0	Pass
L5	52.83 - 28.75	Pole	TP44.959x40.0697x0.5055	5	-29.04	3380.90	95.0	Pass
L6	28.75 - 12	Pole	TP47.4841x42.7806x0.5412	6	-38.10	3925.40	99.7	Pass
L7	12 - 0	Pole	TP49.92x47.4841x0.5591	7	-42.62	4264.28	99.3	Pass
							Summary	
						Pole (L6)	99.7	Pass
						Rating =	99.7	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	88.1	Pass
1	Base Plate	0	48.6	Pass
1, 2	Foundation (Soil) - PLS Caisson Methodology	0	90.3	Pass
1	Foundation (Structural)	0	62.4	Pass

Structure Rating (max from all components) =	99.7%

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

1.) See attached modification drawings.

APPENDIX A

RISA TOWER 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:

4) Tower is located in Fairfield County, Connecticut.
5) Basic wind speed of 91 mph.
6) Nominal ice thickness of 0.7500 in.
7) Ice thickness is considered to increase with height.
8) Ice density of 56 pcf.
9) A wind speed of 38 mph is used in combination with ice.
10) Temperature drop of 50 °F.
11) Deflections calculated using a wind speed of 50 mph.
12) A non-linear (P-delta) analysis was used.
13) Pressures are calculated at each section.
14) Stress ratio used in pole design is 1.333.
15) Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	148.00-100.50	47.50	4.00	12	22.0000	31.6430	0.2500	1.0000	A607-60 (60 ksi)
L2	100.50-69.00	35.50	0.00	12	30.3310	37.5377	0.3750	1.5000	A607-60 (60 ksi)
L3	69.00-58.25	10.75	5.00	12	37.5377	39.7200	0.3897	1.5587	A607-60 (60 ksi)
L4	58.25-52.83	10.42	0.00	12	37.9256	40.0697	0.4375	1.7500	A607-60

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
L5	52.83-28.75	24.08	5.75	12	40.0697	44.9590	0.5055	2.0219	(60 ksi) A607-60 (60 ksi)
L6	28.75-12.00	22.50	0.00	12	42.7806	47.4841	0.5412	2.1646	A607-60 (60 ksi)
L7	12.00-0.00	12.00		12	47.4841	49.9200	0.5591	2.2363	A607-60 (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
	32.7592	25.2714	3178.9251	11.2387	16.3911	193.9425	6441.3640	12.4378	7.8103	31.241
L2	32.2416	36.1718	4143.0744	10.7242	15.7114	263.6980	8394.9919	17.8027	7.1237	18.997
	38.8619	44.8739	7910.3285	13.3042	19.4445	406.8152	16028.4701	22.0856	9.0551	24.147
L3	38.8619	46.6110	8210.0501	13.2990	19.4445	422.2294	16635.7873	22.9405	9.0158	23.137
	41.1212	49.3492	9743.6475	14.0803	20.5750	473.5682	19743.2715	24.2882	9.6006	24.638
L4	40.3286	52.8114	9473.2998	13.4208	19.6455	482.2128	19195.4737	25.9922	8.9916	20.552
	41.4832	55.8319	11193.4957	14.1883	20.7561	539.2864	22681.0570	27.4788	9.5662	21.866
L5	41.4832	64.3953	12866.0927	14.1640	20.7561	619.8697	26070.1921	31.6934	9.3840	18.565
	46.5450	72.3532	18249.7100	15.9144	23.2888	783.6273	36978.8602	35.6100	10.6944	21.157
L6	45.5341	73.6037	16761.8101	15.1217	22.1603	756.3880	33963.9717	36.2255	10.0149	18.506
	49.1591	81.7997	23007.9293	16.8056	24.5967	935.4053	46620.3025	40.2593	11.2754	20.836
L7	49.1591	84.4761	23742.6038	16.7991	24.5967	965.2741	48108.9522	41.5766	11.2274	20.082
	51.6810	88.8614	27635.3847	17.6712	25.8586	1068.7132	55996.7818	43.7349	11.8802	21.25

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 148.00-100.50				1	1	1		
L2 100.50-69.00				1	1	1		
L3 69.00-58.25				1	1	1		
L4 58.25-52.83				1	1	1		
L5 52.83-28.75				1	1	1		
L6 28.75-12.00				1	1	1		
L7 12.00-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight plf
EW90(EW90)	C	No	Inside Pole	144.00 - 0.00	1	No Ice	0.00	0.32
						1/2" Ice	0.00	0.32
						1" Ice	0.00	0.32
						2" Ice	0.00	0.32
						4" Ice	0.00	0.32
***								
LDF5-50A(7/8")	C	No	Inside Pole	148.00 - 0.00	2	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
LDF7-50A(1-5/8")	C	No	Inside Pole	148.00 - 0.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
***								
7983A(1/2")	A	No	CaAa (Out Of Face)	148.00 - 0.00	5	No Ice	0.00	0.08
						1/2" Ice	0.00	0.74
						1" Ice	0.00	2.01
						2" Ice	0.00	6.39
						4" Ice	0.00	22.47
9207(5/16")	A	No	CaAa (Out Of Face)	148.00 - 0.00	6	No Ice	0.00	0.60
						1/2" Ice	0.00	1.11
						1" Ice	0.00	2.22
						2" Ice	0.00	6.29
						4" Ice	0.00	21.76
2" Rigid Conduit	A	No	CaAa (Out Of Face)	148.00 - 0.00	1	No Ice	0.20	2.80
						1/2" Ice	0.30	4.33
						1" Ice	0.40	6.47
						2" Ice	0.60	12.57
						4" Ice	1.00	32.12
***								
LDF6-50A(1-1/4")	A	No	Inside Pole	134.00 - 0.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
						2" Ice	0.00	0.66
						4" Ice	0.00	0.66
***								
LDF7-50A(1-5/8")	C	No	Inside Pole	120.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
FB-L98B-002-50000(3/8)	C	No	Inside Pole	120.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
LDF4.5-50 (5/8" foam)	C	No	Inside Pole	120.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
***								
LDF4-50A(1/2")	A	No	Inside Pole	96.00 - 0.00	5	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
LDF5-50A(7/8")	A	No	Inside Pole	96.00 - 0.00	7	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
LDF4-50A(1/2")	A	No	Inside Pole	53.00 - 0.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
LDF4-50A(1/2")	A	No	Inside Pole	50.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
***								
LDF5-50A(7/8")	B	No	Inside Pole	82.00 - 0.00	18	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
LCF114-50J(1-1/4")	B	No	Inside Pole	82.00 - 0.00	6	No Ice	0.00	0.70
						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
						2" Ice	0.00	0.70
						4" Ice	0.00	0.70
***								
HJ7-50A(1-5/8")	B	No	Inside Pole	72.00 - 0.00	6	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04
						2" Ice	0.00	1.04
						4" Ice	0.00	1.04
***								
***								
***								
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	35.00 - 0.00	1	No Ice	0.21	0.00
						1/2" Ice	0.32	0.00
						1" Ice	0.43	0.00
						2" Ice	0.65	0.00
						4" Ice	1.10	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	52.00 - 35.00	1	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00
						2" Ice	0.61	0.00
						4" Ice	1.06	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	67.00 - 60.00	1	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00
						2" Ice	0.61	0.00
						4" Ice	1.06	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	148.00-100.50	A	0.000	0.000	0.000	9.500	0.59
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.47
L2	100.50-69.00	A	0.000	0.000	0.000	6.300	0.55
		B	0.000	0.000	0.000	0.000	0.15
		C	0.000	0.000	0.000	0.000	0.50
L3	69.00-58.25	A	0.000	0.000	0.000	2.150	0.19
		B	0.000	0.000	0.000	0.000	0.18

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.000	1.167	0.17
L4	58.25-52.83	A	0.000	0.000	0.000	1.084	0.10
		B	0.000	0.000	0.000	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.09
L5	52.83-28.75	A	0.000	0.000	0.000	4.816	0.44
		B	0.000	0.000	0.000	0.000	0.39
		C	0.000	0.000	0.000	4.135	0.38
L6	28.75-12.00	A	0.000	0.000	0.000	3.350	0.31
		B	0.000	0.000	0.000	0.000	0.27
		C	0.000	0.000	0.000	3.490	0.27
L7	12.00-0.00	A	0.000	0.000	0.000	2.400	0.22
		B	0.000	0.000	0.000	0.000	0.20
		C	0.000	0.000	0.000	2.500	0.19

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	148.00-100.50	A	0.878	0.000	0.000	0.000	17.845	1.51
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.47
L2	100.50-69.00	A	0.840	0.000	0.000	0.000	11.834	1.16
		B		0.000	0.000	0.000	0.000	0.15
		C		0.000	0.000	0.000	0.000	0.50
L3	69.00-58.25	A	0.811	0.000	0.000	0.000	3.894	0.38
		B		0.000	0.000	0.000	0.000	0.18
		C		0.000	0.000	0.000	2.429	0.17
L4	58.25-52.83	A	0.798	0.000	0.000	0.000	1.964	0.19
		B		0.000	0.000	0.000	0.000	0.09
		C		0.000	0.000	0.000	0.000	0.09
L5	52.83-28.75	A	0.769	0.000	0.000	0.000	8.518	0.83
		B		0.000	0.000	0.000	0.000	0.39
		C		0.000	0.000	0.000	8.107	0.38
L6	28.75-12.00	A	0.750	0.000	0.000	0.000	5.925	0.57
		B		0.000	0.000	0.000	0.000	0.27
		C		0.000	0.000	0.000	6.351	0.27
L7	12.00-0.00	A	0.750	0.000	0.000	0.000	4.200	0.40
		B		0.000	0.000	0.000	0.000	0.20
		C		0.000	0.000	0.000	4.500	0.19

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	148.00-100.50	0.0000	-0.2754	0.0000	-0.4568
L2	100.50-69.00	0.0000	-0.2804	0.0000	-0.4766
L3	69.00-58.25	-0.1287	-0.1994	-0.2398	-0.3053
L4	58.25-52.83	0.0000	-0.2828	0.0000	-0.4721
L5	52.83-28.75	-0.2028	-0.1544	-0.3565	-0.2252
L6	28.75-12.00	-0.2444	-0.1298	-0.4018	-0.2009
L7	12.00-0.00	-0.2459	-0.1306	-0.4028	-0.2015

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
DB420	C	From Leg	0.00	0.00	0.0000	148.00	No Ice	3.33	3.33	0.03
							1/2" Ice	5.99	5.99	0.04
				12.00			1" Ice	8.66	8.66	0.05
							2" Ice	13.99	13.99	0.07
							4" Ice	24.64	24.64	0.12
(2) DB980H90E-M w/Mount Pipe	A	From Leg	4.00	0.00	0.0000	148.00	No Ice	4.27	3.86	0.03
							1/2" Ice	4.86	4.95	0.07
				2.00			1" Ice	5.37	5.75	0.12
							2" Ice	6.42	7.39	0.23
							4" Ice	8.86	10.87	0.59
LLPX310R w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	148.00	No Ice	4.96	2.85	0.04
							1/2" Ice	5.35	3.37	0.08
				0.00			1" Ice	5.75	3.90	0.12
							2" Ice	6.58	5.08	0.23
							4" Ice	8.37	7.84	0.53
FDD_R6_RRH	A	From Leg	4.00	0.00	0.0000	148.00	No Ice	1.79	0.78	0.03
							1/2" Ice	1.97	0.92	0.04
				0.00			1" Ice	2.16	1.07	0.06
							2" Ice	2.57	1.39	0.09
							4" Ice	3.49	2.14	0.20
(2) DB980H90E-M w/Mount Pipe	B	From Leg	4.00	0.00	0.0000	150.00	No Ice	4.27	3.86	0.03
							1/2" Ice	4.86	4.95	0.07
				2.00			1" Ice	5.37	5.75	0.12
							2" Ice	6.42	7.39	0.23
							4" Ice	8.86	10.87	0.59
LLPX310R w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	148.00	No Ice	4.96	2.85	0.04
							1/2" Ice	5.35	3.37	0.08
				0.00			1" Ice	5.75	3.90	0.12
							2" Ice	6.58	5.08	0.23
							4" Ice	8.37	7.84	0.53
FDD_R6_RRH	B	From Leg	4.00	0.00	0.0000	148.00	No Ice	1.79	0.78	0.03
							1/2" Ice	1.97	0.92	0.04
				0.00			1" Ice	2.16	1.07	0.06
							2" Ice	2.57	1.39	0.09
							4" Ice	3.49	2.14	0.20
(2) DB980H90E-M w/Mount Pipe	C	From Leg	4.00	0.00	0.0000	150.00	No Ice	4.27	3.86	0.03
							1/2" Ice	4.86	4.95	0.07
				2.00			1" Ice	5.37	5.75	0.12
							2" Ice	6.42	7.39	0.23
							4" Ice	8.86	10.87	0.59
LLPX310R w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	148.00	No Ice	4.96	2.85	0.04
							1/2" Ice	5.35	3.37	0.08
				0.00			1" Ice	5.75	3.90	0.12
							2" Ice	6.58	5.08	0.23
							4" Ice	8.37	7.84	0.53
FDD_R6_RRH	C	From Leg	4.00	0.00	0.0000	148.00	No Ice	1.79	0.78	0.03
							1/2" Ice	1.97	0.92	0.04
				0.00			1" Ice	2.16	1.07	0.06
							2" Ice	2.57	1.39	0.09
							4" Ice	3.49	2.14	0.20
Platform Mount [LP 712-1]	C	None			0.0000	148.00	No Ice	24.53	24.53	1.34
							1/2" Ice	29.94	29.94	1.65
							1" Ice	35.35	35.35	1.96
							2" Ice	46.17	46.17	2.58
							4" Ice	67.81	67.81	3.82

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
***									
Pipe Mount [PM 601-1]	A	From Leg	0.50 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.74 4.48 5.96 8.92	0.90 1.12 1.34 1.78 2.66	0.07 0.08 0.09 0.12 0.18
***									
(4) DB844H90E-XY w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.30 3.69 4.12 5.01 6.92	4.92 5.60 6.28 7.71 10.83	0.03 0.07 0.12 0.23 0.56
(4) DB844H90E-XY w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.30 3.69 4.12 5.01 6.92	4.92 5.60 6.28 7.71 10.83	0.03 0.07 0.12 0.23 0.56
(4) DB844H90E-XY w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.30 3.69 4.12 5.01 6.92	4.92 5.60 6.28 7.71 10.83	0.03 0.07 0.12 0.23 0.56
Platform Mount [LP 303-1]	C	None		0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	14.66 18.87 23.08 31.50 48.34	14.66 18.87 23.08 31.50 48.34	1.25 1.48 1.71 2.18 3.10
***									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
(2) LGP2140X	A	From Leg	4.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.26 1.42 1.58 1.94 2.75	0.38 0.49 0.62 0.89 1.54	0.01 0.02 0.03 0.05 0.13
(2) LGP13519	A	From Leg	4.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.34 0.42 0.51 0.73 1.25	0.21 0.28 0.36 0.55 1.03	0.01 0.01 0.01 0.02 0.07
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
(2) LGP2140X	B	From Leg	4.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.26 1.42 1.58 1.94 2.75	0.38 0.49 0.62 0.89 1.54	0.01 0.02 0.03 0.05 0.13
(2) LGP13519	B	From Leg	4.00	0.0000	120.00	No Ice	0.34	0.21	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				1/2" Ice	0.42	0.28	0.01
			0.00				1" Ice	0.51	0.36	0.01
							2" Ice	0.73	0.55	0.02
							4" Ice	1.25	1.03	0.07
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00		0.0000	120.00	No Ice	6.12	4.25	0.06
			0.00				1/2" Ice	6.63	5.01	0.10
			0.00				1" Ice	7.13	5.71	0.16
							2" Ice	8.16	7.16	0.29
							4" Ice	10.36	10.41	0.66
(2) LGP2140X	C	From Leg	4.00		0.0000	120.00	No Ice	1.26	0.38	0.01
			0.00				1/2" Ice	1.42	0.49	0.02
			0.00				1" Ice	1.58	0.62	0.03
							2" Ice	1.94	0.89	0.05
							4" Ice	2.75	1.54	0.13
(2) LGP13519	C	From Leg	4.00		0.0000	120.00	No Ice	0.34	0.21	0.01
			0.00				1/2" Ice	0.42	0.28	0.01
			0.00				1" Ice	0.51	0.36	0.01
							2" Ice	0.73	0.55	0.02
							4" Ice	1.25	1.03	0.07
Platform Mount [LP 712-1]	C	None			0.0000	120.00	No Ice	24.53	24.53	1.34
							1/2" Ice	29.94	29.94	1.65
							1" Ice	35.35	35.35	1.96
							2" Ice	46.17	46.17	2.58
							4" Ice	67.81	67.81	3.82
P65-16-XLH-RR w/ Mount Pipe	A	From Leg	4.00		0.0000	120.00	No Ice	8.64	6.36	0.08
			0.00				1/2" Ice	9.29	7.54	0.14
			0.00				1" Ice	9.91	8.43	0.22
							2" Ice	11.18	10.24	0.39
							4" Ice	13.83	14.10	0.89
P65-16-XLH-RR w/ Mount Pipe	B	From Leg	4.00		0.0000	120.00	No Ice	8.64	6.36	0.08
			0.00				1/2" Ice	9.29	7.54	0.14
			0.00				1" Ice	9.91	8.43	0.22
							2" Ice	11.18	10.24	0.39
							4" Ice	13.83	14.10	0.89
P65-16-XLH-RR w/ Mount Pipe	C	From Leg	4.00		0.0000	120.00	No Ice	8.64	6.36	0.08
			0.00				1/2" Ice	9.29	7.54	0.14
			0.00				1" Ice	9.91	8.43	0.22
							2" Ice	11.18	10.24	0.39
							4" Ice	13.83	14.10	0.89
(2) RRUS-11	A	From Leg	4.00		0.0000	120.00	No Ice	4.42	1.19	0.06
			0.00				1/2" Ice	4.71	1.35	0.08
			0.00				1" Ice	5.00	1.53	0.11
							2" Ice	5.61	1.90	0.18
							4" Ice	6.94	2.75	0.37
(2) RRUS-11	B	From Leg	4.00		0.0000	120.00	No Ice	4.42	1.19	0.06
			0.00				1/2" Ice	4.71	1.35	0.08
			0.00				1" Ice	5.00	1.53	0.11
							2" Ice	5.61	1.90	0.18
							4" Ice	6.94	2.75	0.37
(2) RRUS-11	C	From Leg	4.00		0.0000	120.00	No Ice	4.42	1.19	0.06
			0.00				1/2" Ice	4.71	1.35	0.08
			0.00				1" Ice	5.00	1.53	0.11
							2" Ice	5.61	1.90	0.18
							4" Ice	6.94	2.75	0.37

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
DC6-48-60-18-8F	C	From Leg	4.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.27 1.46 1.66 2.09 3.10	1.27 1.46 1.66 2.09 3.10	0.02 0.04 0.05 0.10 0.21
***									
DB420-B	A	From Leg	4.00 0.00 11.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.33 5.99 8.66 13.99 24.64	3.33 5.99 8.66 13.99 24.64	0.03 0.04 0.05 0.07 0.12
(2) PD83-1	A	From Leg	4.00 0.00 -6.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.70 5.58 7.47 11.30 18.46	3.70 5.58 7.47 11.30 18.46	0.02 0.05 0.09 0.20 0.58
(2) PD1110	A	From Leg	4.00 0.00 9.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.50 3.84 5.20 7.97 11.61	2.50 3.84 5.20 7.97 11.61	0.02 0.04 0.07 0.15 0.42
PD201-1	A	From Leg	4.00 0.00 9.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.63 1.54 2.47 4.27 6.57	0.63 1.54 2.47 4.27 6.57	0.00 0.01 0.02 0.07 0.23
DB205-A	B	From Leg	4.00 0.00 12.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 2.16 3.12 5.04 8.88	1.20 2.16 3.12 5.04 8.88	0.04 0.05 0.06 0.08 0.13
PD201-1	B	From Leg	4.00 0.00 9.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.63 1.54 2.47 4.27 6.57	0.63 1.54 2.47 4.27 6.57	0.00 0.01 0.02 0.07 0.23
PD83-1	B	From Leg	4.00 0.00 -6.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.70 5.58 7.47 11.30 18.46	3.70 5.58 7.47 11.30 18.46	0.02 0.05 0.09 0.20 0.58
DB806E-XT	C	From Leg	4.00 0.00 9.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.00 2.83 3.46 4.45 6.56	2.00 2.83 3.46 4.45 6.56	0.02 0.03 0.05 0.11 0.29
PD220	C	From Leg	4.00 0.00 14.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.08 5.30 7.54 12.06 21.31	3.08 5.30 7.54 12.06 21.31	0.02 0.05 0.09 0.21 0.62
DB224	C	From Leg	4.00 0.00 11.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice	3.15 5.67 8.19 13.23	3.15 5.67 8.19 13.23	0.03 0.04 0.05 0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	23.31	23.31	0.11
						4" Ice			
Platform Mount [LP 712-1]	C	None		0.0000	96.00	No Ice	24.53	24.53	1.34
						1/2" Ice	29.94	29.94	1.65
						1" Ice	35.35	35.35	1.96
						2" Ice	46.17	46.17	2.58
						4" Ice	67.81	67.81	3.82
***									
(3) RR90-17-00DPL2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	82.00	No Ice	4.59	3.32	0.04
						1/2" Ice	5.09	4.09	0.07
						1" Ice	5.58	4.78	0.12
						2" Ice	6.59	6.23	0.23
						4" Ice	8.73	9.31	0.56
APXV18-206516S-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	82.00	No Ice	3.86	3.30	0.04
						1/2" Ice	4.27	4.00	0.07
						1" Ice	4.73	4.67	0.11
						2" Ice	5.69	6.06	0.21
						4" Ice	7.73	9.04	0.53
ATMAA1412D-1A20	A	From Leg	4.00 0.00 0.00	0.0000	82.00	No Ice	0.00	0.47	0.01
						1/2" Ice	0.00	0.57	0.02
						1" Ice	0.00	0.69	0.03
						2" Ice	0.00	0.95	0.06
						4" Ice	0.00	1.57	0.16
(3) RR90-17-00DPL2 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	82.00	No Ice	4.59	3.32	0.04
						1/2" Ice	5.09	4.09	0.07
						1" Ice	5.58	4.78	0.12
						2" Ice	6.59	6.23	0.23
						4" Ice	8.73	9.31	0.56
APXV18-206516S-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	82.00	No Ice	3.86	3.30	0.04
						1/2" Ice	4.27	4.00	0.07
						1" Ice	4.73	4.67	0.11
						2" Ice	5.69	6.06	0.21
						4" Ice	7.73	9.04	0.53
ATMAA1412D-1A20	B	From Leg	4.00 0.00 0.00	0.0000	82.00	No Ice	0.00	0.47	0.01
						1/2" Ice	0.00	0.57	0.02
						1" Ice	0.00	0.69	0.03
						2" Ice	0.00	0.95	0.06
						4" Ice	0.00	1.57	0.16
(3) RR90-17-00DPL2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	82.00	No Ice	4.59	3.32	0.04
						1/2" Ice	5.09	4.09	0.07
						1" Ice	5.58	4.78	0.12
						2" Ice	6.59	6.23	0.23
						4" Ice	8.73	9.31	0.56
APXV18-206516S-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	82.00	No Ice	3.86	3.30	0.04
						1/2" Ice	4.27	4.00	0.07
						1" Ice	4.73	4.67	0.11
						2" Ice	5.69	6.06	0.21
						4" Ice	7.73	9.04	0.53
ATMAA1412D-1A20	C	From Leg	4.00 0.00 0.00	0.0000	82.00	No Ice	0.00	0.47	0.01
						1/2" Ice	0.00	0.57	0.02
						1" Ice	0.00	0.69	0.03
						2" Ice	0.00	0.95	0.06
						4" Ice	0.00	1.57	0.16
Platform Mount [LP 712-1]	C	None		0.0000	82.00	No Ice	24.53	24.53	1.34
						1/2" Ice	29.94	29.94	1.65

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						Ice	35.35	35.35	1.96
						1" Ice	46.17	46.17	2.58
						2" Ice	67.81	67.81	3.82
						4" Ice			
***									
800 10504	A	From Leg	1.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.35 3.70 4.05 4.84 6.61	1.87 2.20 2.53 3.22 4.70	0.02 0.04 0.06 0.12 0.29
800 10504	B	From Leg	1.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.35 3.70 4.05 4.84 6.61	1.87 2.20 2.53 3.22 4.70	0.02 0.04 0.06 0.12 0.29
800 10504	C	From Leg	1.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.35 3.70 4.05 4.84 6.61	1.87 2.20 2.53 3.22 4.70	0.02 0.04 0.06 0.12 0.29
Pipe Mount [PM 601-3]	C	None		0.0000	72.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.39 5.48 6.57 8.75 13.11	4.39 5.48 6.57 8.75 13.11	0.20 0.24 0.28 0.36 0.53
***									
BSA150B	B	From Leg	1.00 0.00 3.00	0.0000	53.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.33 3.13 3.93 5.53 8.73	2.33 3.13 3.93 5.53 8.73	0.00 0.15 0.31 0.65 1.42
BSA150B	B	From Leg	1.00 0.00 -3.00	0.0000	53.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.33 3.13 3.93 5.53 8.73	2.33 3.13 3.93 5.53 8.73	0.00 0.15 0.31 0.65 1.42
Side Arm Mount [SO 701-1]	B	From Leg	0.50 0.00 0.00	0.0000	53.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
***									
BULLET III	C	From Leg	1.00 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.29 0.65	0.08 0.12 0.17 0.29 0.65	0.00 0.00 0.00 0.01 0.04

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight K
P2F-52	B	Paraboloid w/o Radome	From Leg	4.00 0.00 4.00	0.0000		148.00	2.09	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.44 3.72 3.99 4.55 5.67	0.02 0.03 0.05 0.09 0.17
VHLP2-11	B	Paraboloid w/o Radome	From Leg	4.00 0.00 4.00	0.0000		148.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.19
VHLP2-23	C	Paraboloid w/o Radome	From Leg	4.00 0.00 4.00	0.0000		148.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.20
(2) VHLP800-11	C	Paraboloid w/o Radome	From Leg	4.00 0.00 4.00	0.0000		148.00	2.92	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.68 7.07 7.46 8.23 9.78	0.02 0.06 0.09 0.17 0.31
VHLP2.5-10W	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	0.0000		144.00	2.92	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.68 7.07 7.46 8.23 9.78	0.05 0.09 0.12 0.20 0.34

Tower Pressures - No Ice

G_H = 1.690

Section Elevation ft	z ft	K_z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 148.00-100.50	123.15	1.457	31	106.168	A	0.000	106.168	106.168	100.00	0.000	9.500
					B	0.000	106.168		100.00	0.000	0.000
					C	0.000	106.168		100.00	0.000	0.000
L2 100.50-69.00	84.47	1.308	28	90.143	A	0.000	90.143	90.143	100.00	0.000	6.300
					B	0.000	90.143		100.00	0.000	0.000
					C	0.000	90.143		100.00	0.000	0.000
L3 69.00-58.25	63.57	1.206	26	34.605	A	0.000	34.605	34.605	100.00	0.000	2.150
					B	0.000	34.605		100.00	0.000	0.000
					C	0.000	34.605		100.00	0.000	1.167
L4 58.25-52.83	55.53	1.16	25	17.846	A	0.000	17.846	17.846	100.00	0.000	1.084
					B	0.000	17.846		100.00	0.000	0.000
					C	0.000	17.846		100.00	0.000	0.000
L5 52.83-28.75	40.56	1.061	23	85.312	A	0.000	85.312	85.312	100.00	0.000	4.816
					B	0.000	85.312		100.00	0.000	0.000
					C	0.000	85.312		100.00	0.000	4.135
L6 28.75-12.00	20.27	1	21	63.836	A	0.000	63.836	63.836	100.00	0.000	3.350
					B	0.000	63.836		100.00	0.000	0.000
					C	0.000	63.836		100.00	0.000	3.490
L7 12.00-0.00	5.95	1	21	48.702	A	0.000	48.702	48.702	100.00	0.000	2.400
					B	0.000	48.702		100.00	0.000	0.000
					C	0.000	48.702		100.00	0.000	2.500

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_z	q_z psf	t_z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 148.00-100.50	123.15	1.457	5	0.8784	113.122	A	0.000	113.122	113.122	100.00	0.000	17.845
						B	0.000	113.122		100.00	0.000	0.000
						C	0.000	113.122		100.00	0.000	0.000
L2 100.50-69.00	84.47	1.308	5	0.8395	94.755	A	0.000	94.755	94.755	100.00	0.000	11.834
						B	0.000	94.755		100.00	0.000	0.000
						C	0.000	94.755		100.00	0.000	0.000
L3 69.00-58.25	63.57	1.206	4	0.8114	36.059	A	0.000	36.059	36.059	100.00	0.000	3.894
						B	0.000	36.059		100.00	0.000	0.000
						C	0.000	36.059		100.00	0.000	2.429
L4 58.25-52.83	55.53	1.16	4	0.7983	18.579	A	0.000	18.579	18.579	100.00	0.000	1.964
						B	0.000	18.579		100.00	0.000	0.000
						C	0.000	18.579		100.00	0.000	0.000
L5 52.83-28.75	40.56	1.061	4	0.7688	88.398	A	0.000	88.398	88.398	100.00	0.000	8.518
						B	0.000	88.398		100.00	0.000	0.000
						C	0.000	88.398		100.00	0.000	8.107
L6 28.75-12.00	20.27	1	4	0.7500	65.982	A	0.000	65.982	65.982	100.00	0.000	5.925
						B	0.000	65.982		100.00	0.000	0.000
						C	0.000	65.982		100.00	0.000	6.351
L7 12.00-0.00	5.95	1	4	0.7500	50.202	A	0.000	50.202	50.202	100.00	0.000	4.200
						B	0.000	50.202		100.00	0.000	0.000
						C	0.000	50.202		100.00	0.000	4.500

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 148.00-100.50	123.15	1.457	9	106.168	A	0.000	106.168	106.168	100.00	0.000	9.500
					B	0.000	106.168		100.00	0.000	0.000
					C	0.000	106.168		100.00	0.000	0.000
L2 100.50-69.00	84.47	1.308	8	90.143	A	0.000	90.143	90.143	100.00	0.000	6.300
					B	0.000	90.143		100.00	0.000	0.000
					C	0.000	90.143		100.00	0.000	0.000
L3 69.00-58.25	63.57	1.206	8	34.605	A	0.000	34.605	34.605	100.00	0.000	2.150
					B	0.000	34.605		100.00	0.000	0.000
					C	0.000	34.605		100.00	0.000	1.167
L4 58.25-52.83	55.53	1.16	7	17.846	A	0.000	17.846	17.846	100.00	0.000	1.084
					B	0.000	17.846		100.00	0.000	0.000
					C	0.000	17.846		100.00	0.000	0.000
L5 52.83-28.75	40.56	1.061	7	85.312	A	0.000	85.312	85.312	100.00	0.000	4.816
					B	0.000	85.312		100.00	0.000	0.000
					C	0.000	85.312		100.00	0.000	4.135
L6 28.75-12.00	20.27	1	6	63.836	A	0.000	63.836	63.836	100.00	0.000	3.350
					B	0.000	63.836		100.00	0.000	0.000
					C	0.000	63.836		100.00	0.000	3.490
L7 12.00-0.00	5.95	1	6	48.702	A	0.000	48.702	48.702	100.00	0.000	2.400
					B	0.000	48.702		100.00	0.000	0.000
					C	0.000	48.702		100.00	0.000	2.500

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	148 - 100.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-17.05	0.80	0.69
			Max. Mx	5	-8.41	-580.56	38.20
			Max. My	2	-8.40	-34.98	580.83
			Max. Vy	5	20.83	-580.56	38.20
			Max. Vx	2	-20.87	-34.98	580.83
			Max. Torque	12			2.75
L2	100.5 - 69	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-31.81	0.90	2.98
			Max. Mx	5	-18.58	-1543.33	67.90
			Max. My	2	-18.57	-61.76	1545.83
			Max. Vy	5	32.93	-1543.33	67.90
			Max. Vx	2	-32.97	-61.76	1545.83
			Max. Torque	9			-3.65
L3	69 - 58.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-33.35	0.90	3.21
			Max. Mx	5	-19.94	-1735.02	72.69
			Max. My	2	-19.93	-66.09	1737.83
			Max. Vy	5	33.77	-1735.02	72.69
			Max. Vx	2	-33.82	-66.09	1737.83
			Max. Torque	9			-3.67
L4	58.25 - 52.83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-38.01	-0.41	2.86
			Max. Mx	5	-23.46	-2095.68	81.30
			Max. My	2	-23.45	-74.04	2098.87

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	5	35.60	-2095.68	81.30
			Max. Vx	2	-35.67	-74.04	2098.87
			Max. Torque	9			-3.69
L5	52.83 - 28.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-44.21	-0.40	3.60
			Max. Mx	5	-29.05	-2771.32	96.72
			Max. My	2	-29.05	-88.01	2775.85
			Max. Vy	5	38.15	-2771.32	96.72
			Max. Vx	2	-38.22	-88.01	2775.85
			Max. Torque	9			-3.08
L6	28.75 - 12	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-54.27	-0.40	4.56
			Max. Mx	5	-38.10	-3666.14	115.44
			Max. My	2	-38.10	-104.96	3672.34
			Max. Vy	5	41.30	-3666.14	115.44
			Max. Vx	2	-41.36	-104.96	3672.34
			Max. Torque	9			-3.16
L7	12 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-59.16	-0.40	5.11
			Max. Mx	5	-42.62	-4171.36	125.27
			Max. My	2	-42.62	-113.86	4178.45
			Max. Vy	5	42.94	-4171.36	125.27
			Max. Vx	2	-43.00	-113.86	4178.45
			Max. Torque	9			-3.21

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	59.16	0.00	0.00
	Max. H_x	11	42.64	42.66	0.30
	Max. H_z	2	42.64	-0.74	42.98
	Max. M_x	2	4178.45	-0.74	42.98
	Max. M_z	5	4171.36	-42.92	0.80
	Max. Torsion	5	2.48	-42.92	0.80
	Min. Vert	1	42.64	0.00	0.00
	Min. H_x	5	42.64	-42.92	0.80
	Min. H_z	8	42.64	0.11	-42.52
	Min. M_x	8	-4102.22	0.11	-42.52
	Min. M_z	11	-4131.43	42.66	0.30
	Min. Torsion	9	-3.21	21.15	-36.95

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	42.64	0.00	0.00	-1.55	0.12	0.00
Dead+Wind 0 deg - No Ice	42.64	0.74	-42.98	-4178.45	-113.86	-0.97
Dead+Wind 30 deg - No Ice	42.64	21.99	-36.88	-3564.09	-2167.13	-0.65
Dead+Wind 60 deg - No Ice	42.64	37.27	-21.68	-2118.37	-3627.77	-1.71
Dead+Wind 90 deg - No Ice	42.64	42.92	-0.80	-125.27	-4171.36	-2.48
Dead+Wind 120 deg - No Ice	42.64	37.54	20.57	1941.86	-3672.07	-1.41
Dead+Wind 150 deg - No Ice	42.64	20.96	36.71	3534.72	-2008.39	0.45
Dead+Wind 180 deg - No Ice	42.64	-0.11	42.52	4102.22	15.39	2.23
Dead+Wind 210 deg - No Ice	42.64	-21.15	36.95	3571.89	2037.00	3.21
Dead+Wind 240 deg - No Ice	42.64	-37.21	21.22	2042.15	3618.06	2.38
Dead+Wind 270 deg - No Ice	42.64	-42.66	-0.30	-49.83	4131.43	0.92
Dead+Wind 300 deg - No Ice	42.64	-36.86	-21.32	-2064.50	3565.23	-0.52

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead+Wind 330 deg - No Ice	42.64	-21.31	-36.61	-3523.88	2063.95	-1.45
Dead+Ice+Temp	59.16	-0.00	-0.00	-5.11	-0.40	-0.00
Dead+Wind 0 deg+Ice+Temp	59.16	0.14	-8.99	-913.84	-22.13	-0.36
Dead+Wind 30 deg+Ice+Temp	59.16	4.58	-7.72	-781.35	-469.40	-0.45
Dead+Wind 60 deg+Ice+Temp	59.16	7.79	-4.53	-464.98	-788.38	-0.69
Dead+Wind 90 deg+Ice+Temp	59.16	8.97	-0.15	-29.23	-906.83	-0.77
Dead+Wind 120 deg+Ice+Temp	59.16	7.84	4.32	420.89	-796.94	-0.43
Dead+Wind 150 deg+Ice+Temp	59.16	4.39	7.69	765.77	-438.59	0.03
Dead+Wind 180 deg+Ice+Temp	59.16	-0.02	8.90	889.02	2.57	0.56
Dead+Wind 210 deg+Ice+Temp	59.16	-4.43	7.73	772.94	443.32	0.90
Dead+Wind 240 deg+Ice+Temp	59.16	-7.78	4.44	440.07	785.91	0.79
Dead+Wind 270 deg+Ice+Temp	59.16	-8.92	-0.06	-14.74	898.36	0.50
Dead+Wind 300 deg+Ice+Temp	59.16	-7.71	-4.46	-454.57	775.51	0.14
Dead+Wind 330 deg+Ice+Temp	59.16	-4.46	-7.67	-773.58	448.77	-0.21
Dead+Wind 0 deg - Service	42.64	0.22	-12.92	-1258.68	-34.20	-0.35
Dead+Wind 30 deg - Service	42.64	6.61	-11.08	-1073.76	-652.15	-0.25
Dead+Wind 60 deg - Service	42.64	11.20	-6.52	-638.69	-1091.77	-0.53
Dead+Wind 90 deg - Service	42.64	12.90	-0.24	-38.84	-1255.34	-0.70
Dead+Wind 120 deg - Service	42.64	11.28	6.18	583.27	-1105.07	-0.33
Dead+Wind 150 deg - Service	42.64	6.30	11.03	1062.59	-604.29	0.14
Dead+Wind 180 deg - Service	42.64	-0.03	12.78	1233.41	4.73	0.67
Dead+Wind 210 deg - Service	42.64	-6.36	11.11	1073.82	613.11	0.97
Dead+Wind 240 deg - Service	42.64	-11.18	6.38	613.48	1088.98	0.68
Dead+Wind 270 deg - Service	42.64	-12.82	-0.09	-16.12	1243.45	0.26
Dead+Wind 300 deg - Service	42.64	-11.08	-6.41	-622.42	1073.04	-0.15
Dead+Wind 330 deg - Service	42.64	-6.40	-11.00	-1061.58	621.21	-0.41

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-42.64	0.00	0.00	42.64	0.00	0.000%
2	0.74	-42.64	-42.98	-0.74	42.64	42.98	0.000%
3	21.99	-42.64	-36.88	-21.99	42.64	36.88	0.000%
4	37.27	-42.64	-21.68	-37.27	42.64	21.68	0.000%
5	42.92	-42.64	-0.80	-42.92	42.64	0.80	0.000%
6	37.54	-42.64	20.57	-37.54	42.64	-20.57	0.000%
7	20.96	-42.64	36.71	-20.96	42.64	-36.71	0.000%
8	-0.11	-42.64	42.52	0.11	42.64	-42.52	0.000%
9	-21.15	-42.64	36.95	21.15	42.64	-36.95	0.000%
10	-37.21	-42.64	21.22	37.21	42.64	-21.22	0.000%
11	-42.66	-42.64	-0.30	42.66	42.64	0.30	0.000%
12	-36.86	-42.64	-21.32	36.86	42.64	21.32	0.000%
13	-21.31	-42.64	-36.61	21.31	42.64	36.61	0.000%
14	0.00	-59.16	0.00	0.00	59.16	0.00	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
15	0.14	-59.16	-8.99	-0.14	59.16	8.99	0.000%
16	4.58	-59.16	-7.72	-4.58	59.16	7.72	0.000%
17	7.79	-59.16	-4.53	-7.79	59.16	4.53	0.000%
18	8.97	-59.16	-0.15	-8.97	59.16	0.15	0.000%
19	7.84	-59.16	4.32	-7.84	59.16	-4.32	0.000%
20	4.39	-59.16	7.69	-4.39	59.16	-7.69	0.000%
21	-0.02	-59.16	8.90	0.02	59.16	-8.90	0.000%
22	-4.43	-59.16	7.73	4.43	59.16	-7.73	0.000%
23	-7.78	-59.16	4.44	7.78	59.16	-4.44	0.000%
24	-8.92	-59.16	-0.06	8.92	59.16	0.06	0.000%
25	-7.71	-59.16	-4.46	7.71	59.16	4.46	0.000%
26	-4.46	-59.16	-7.67	4.46	59.16	7.67	0.000%
27	0.22	-42.64	-12.92	-0.22	42.64	12.92	0.000%
28	6.61	-42.64	-11.08	-6.61	42.64	11.08	0.000%
29	11.20	-42.64	-6.52	-11.20	42.64	6.52	0.000%
30	12.90	-42.64	-0.24	-12.90	42.64	0.24	0.000%
31	11.28	-42.64	6.18	-11.28	42.64	-6.18	0.000%
32	6.30	-42.64	11.03	-6.30	42.64	-11.03	0.000%
33	-0.03	-42.64	12.78	0.03	42.64	-12.78	0.000%
34	-6.36	-42.64	11.11	6.36	42.64	-11.11	0.000%
35	-11.18	-42.64	6.38	11.18	42.64	-6.38	0.000%
36	-12.82	-42.64	-0.09	12.82	42.64	0.09	0.000%
37	-11.08	-42.64	-6.41	11.08	42.64	6.41	0.000%
38	-6.40	-42.64	-11.00	6.40	42.64	11.00	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00056367
3	Yes	5	0.00000001	0.00029381
4	Yes	5	0.00000001	0.00030338
5	Yes	5	0.00000001	0.00004414
6	Yes	5	0.00000001	0.00027235
7	Yes	5	0.00000001	0.00027190
8	Yes	4	0.00000001	0.00071411
9	Yes	5	0.00000001	0.00029640
10	Yes	5	0.00000001	0.00027638
11	Yes	4	0.00000001	0.00057736
12	Yes	5	0.00000001	0.00028158
13	Yes	5	0.00000001	0.00028727
14	Yes	4	0.00000001	0.00001648
15	Yes	5	0.00000001	0.00017609
16	Yes	5	0.00000001	0.00018950
17	Yes	5	0.00000001	0.00019099
18	Yes	5	0.00000001	0.00017463
19	Yes	5	0.00000001	0.00018454
20	Yes	5	0.00000001	0.00018025
21	Yes	5	0.00000001	0.00017001
22	Yes	5	0.00000001	0.00018388
23	Yes	5	0.00000001	0.00018573
24	Yes	5	0.00000001	0.00017280
25	Yes	5	0.00000001	0.00018611
26	Yes	5	0.00000001	0.00018443
27	Yes	4	0.00000001	0.00009495
28	Yes	4	0.00000001	0.00057214
29	Yes	4	0.00000001	0.00061854
30	Yes	4	0.00000001	0.00016018
31	Yes	4	0.00000001	0.00051095
32	Yes	4	0.00000001	0.00050370
33	Yes	4	0.00000001	0.00013113
34	Yes	4	0.00000001	0.00060384
35	Yes	4	0.00000001	0.00051672
36	Yes	4	0.00000001	0.00010327

37	Yes	4	0.00000001	0.00053629
38	Yes	4	0.00000001	0.00056149

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	148 - 100.5	30.746	29	1.8261	0.0079
L2	104.5 - 69	15.410	29	1.4225	0.0035
L3	69 - 58.25	6.544	29	0.9164	0.0015
L4	63.25 - 52.83	5.497	29	0.8216	0.0012
L5	52.83 - 28.75	3.821	29	0.6933	0.0009
L6	34.5 - 12	1.659	29	0.4331	0.0005
L7	12 - 0	0.198	29	0.1581	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.00	P2F-52	29	30.746	1.8261	0.0079	33341
150.00	(2) DB980H90E-M w/Mount Pipe	29	30.746	1.8261	0.0079	33341
148.00	DB420	29	30.746	1.8261	0.0079	33341
144.00	VHLP2.5-10W	29	29.246	1.7934	0.0075	33341
134.00	(4) DB844H90E-XY w/ Mount Pipe	29	25.525	1.7101	0.0064	11907
120.00	(2) 7770.00 w/ Mount Pipe	29	20.502	1.5844	0.0049	5953
96.00	DB420-B	29	12.914	1.3193	0.0029	3749
82.00	(3) RR90-17-00DPL2 w/ Mount Pipe	29	9.310	1.1249	0.0021	3622
72.00	800 10504	29	7.132	0.9670	0.0016	3548
53.00	BSA150B	29	3.846	0.6953	0.0009	3726
50.00	BULLET III	29	3.424	0.6568	0.0009	3781

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	148 - 100.5	101.845	4	6.0587	0.0269
L2	104.5 - 69	51.099	4	4.7194	0.0119
L3	69 - 58.25	21.718	4	3.0417	0.0050
L4	63.25 - 52.83	18.246	4	2.7272	0.0041
L5	52.83 - 28.75	12.686	4	2.3014	0.0031
L6	34.5 - 12	5.507	4	1.4382	0.0017
L7	12 - 0	0.658	4	0.5252	0.0005

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.00	P2F-52	4	101.845	6.0587	0.0269	10270
150.00	(2) DB980H90E-M w/Mount Pipe	4	101.845	6.0587	0.0269	10270
148.00	DB420	4	101.845	6.0587	0.0269	10270

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
144.00	VHLP2.5-10W	4	96.882	5.9500	0.0254	10270
134.00	(4) DB844H90E-XY w/ Mount Pipe	4	84.573	5.6734	0.0216	3666
120.00	(2) 7770.00 w/ Mount Pipe	4	67.953	5.2564	0.0166	1830
96.00	DB420-B	4	42.832	4.3774	0.0099	1146
82.00	(3) RR90-17-00DPL2 w/ Mount Pipe	4	30.888	3.7330	0.0072	1102
72.00	800 10504	4	23.666	3.2093	0.0055	1077
53.00	BSA150B	4	12.768	2.3083	0.0031	1127
50.00	BULLET III	4	11.366	2.1805	0.0028	1143

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	148 - 100.5 (1)	TP31.643x22x0.25	47.50	0.00	0.0	36.000	24.6177	-8.38	886.24	0.009
L2	100.5 - 69 (2)	TP37.5377x30.331x0.375	35.50	0.00	0.0	36.000	44.8739	-18.56	1615.46	0.011
L3	69 - 58.25 (3)	TP39.72x37.5377x0.3897	10.75	0.00	0.0	36.000	48.0756	-19.92	1730.72	0.012
L4	58.25 - 52.83 (4)	TP40.0697x37.9256x0.4375	10.42	0.00	0.0	36.000	55.8319	-23.44	2009.95	0.012
L5	52.83 - 28.75 (5)	TP44.959x40.0697x0.5055	24.08	0.00	0.0	36.000	70.4529	-29.04	2536.31	0.011
L6	28.75 - 12 (6)	TP47.4841x42.7806x0.5412	22.50	0.00	0.0	36.000	81.7997	-38.10	2944.79	0.013
L7	12 - 0 (7)	TP49.92x47.4841x0.5591	12.00	0.00	0.0	36.000	88.8614	-42.62	3199.01	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	148 - 100.5 (1)	TP31.643x22x0.25	588.93	38.408	36.000	1.067	0.00	0.000	36.000	0.000
L2	100.5 - 69 (2)	TP37.5377x30.331x0.375	1558.75	45.979	36.000	1.277	0.00	0.000	36.000	0.000
L3	69 - 58.25 (3)	TP39.72x37.5377x0.3897	1751.56	46.779	36.000	1.299	0.00	0.000	36.000	0.000
L4	58.25 - 52.83 (4)	TP40.0697x37.9256x0.4375	2114.20	47.044	36.000	1.307	0.00	0.000	36.000	0.000
L5	52.83 - 28.75 (5)	TP44.959x40.0697x0.5055	2793.72	45.134	36.000	1.254	0.00	0.000	36.000	0.000
L6	28.75 - 12 (6)	TP47.4841x42.7806x0.5412	3693.27	47.380	36.000	1.316	0.00	0.000	36.000	0.000
L7	12 - 0 (7)	TP49.92x47.4841x0.5591	4200.98	47.170	36.000	1.310	0.00	0.000	36.000	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 $\frac{f_{vt}}{F_{vt}}$

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	148 - 100.5 (1)	TP31.643x22x0.25	21.02	0.854	24.000	0.072	0.49	0.015	24.000	0.001
L2	100.5 - 69 (2)	TP37.5377x30.331x0.375	33.12	0.738	24.000	0.062	2.08	0.029	24.000	0.001
L3	69 - 58.25 (3)	TP39.72x37.5377x0.3897	33.96	0.706	24.000	0.060	2.09	0.026	24.000	0.001
L4	58.25 - 52.83 (4)	TP40.0697x37.9256x0.4375	35.81	0.641	24.000	0.054	2.12	0.022	24.000	0.001
L5	52.83 - 28.75 (5)	TP44.959x40.0697x0.5055	38.36	0.544	24.000	0.046	1.60	0.012	24.000	0.001
L6	28.75 - 12 (6)	TP47.4841x42.7806x0.5412	41.51	0.507	24.000	0.043	1.67	0.010	24.000	0.000
L7	12 - 0 (7)	TP49.92x47.4841x0.5591	43.14	0.485	24.000	0.041	1.71	0.009	24.000	0.000

Pole Interaction Design Data

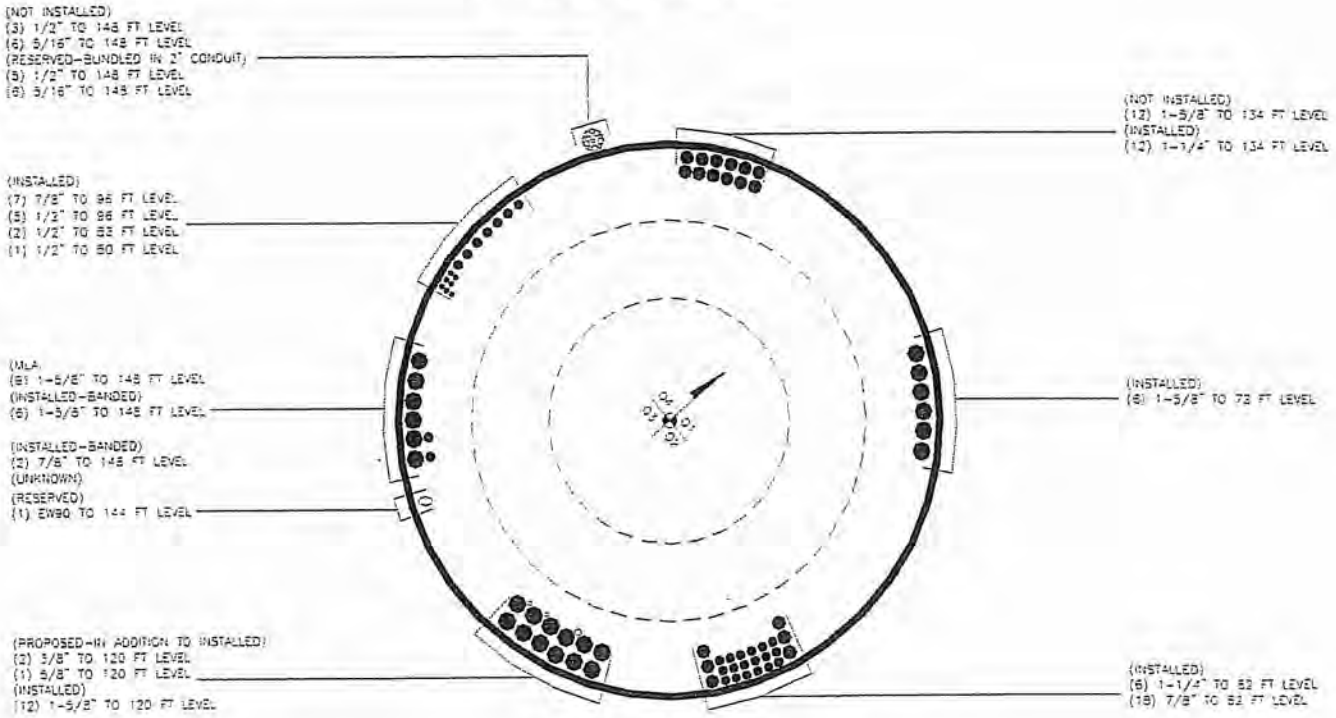
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	148 - 100.5 (1)	0.009	1.067	0.000	0.072	0.001	1.078 ✓	1.333	H1-3+VT ✓
L2	100.5 - 69 (2)	0.011	1.277	0.000	0.062	0.001	1.290 ✓	1.333	H1-3+VT ✓
L3	69 - 58.25 (3)	0.012	1.299	0.000	0.060	0.001	1.312 ✓	1.333	H1-3+VT ✓
L4	58.25 - 52.83 (4)	0.012	1.307	0.000	0.054	0.001	1.319 ✓	1.333	H1-3+VT ✓
L5	52.83 - 28.75 (5)	0.011	1.254	0.000	0.046	0.001	1.266 ✓	1.333	H1-3+VT ✓
L6	28.75 - 12 (6)	0.013	1.316	0.000	0.043	0.000	1.329 ✓	1.333	H1-3+VT ✓
L7	12 - 0 (7)	0.013	1.310	0.000	0.041	0.000	1.324 ✓	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	148 - 100.5	Pole	TP31.643x22x0.25	1	-8.38	1181.35	80.8	Pass
L2	100.5 - 69	Pole	TP37.5377x30.331x0.375	2	-18.56	2153.41	96.8	Pass
L3	69 - 58.25	Pole	TP39.72x37.5377x0.3897	3	-19.92	2307.05	98.4	Pass
L4	58.25 - 52.83	Pole	TP40.0697x37.9256x0.4375	4	-23.44	2679.26	99.0	Pass
L5	52.83 - 28.75	Pole	TP44.959x40.0697x0.5055	5	-29.04	3380.90	95.0	Pass
L6	28.75 - 12	Pole	TP47.4841x42.7806x0.5412	6	-38.10	3925.40	99.7	Pass
L7	12 - 0	Pole	TP49.92x47.4841x0.5591	7	-42.62	4264.28	99.3	Pass
							Summary	
						Pole (L6)	99.7	Pass
						RATING =	99.7	Pass

APPENDIX B

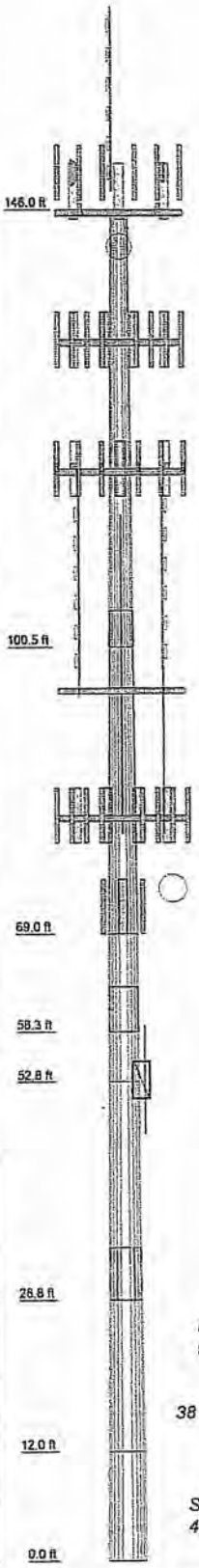
BASE LEVEL DRAWING



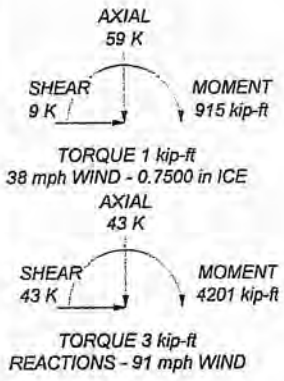
APPENDIX C

ADDITIONAL CALCULATIONS

Program Version 5.4.2.0 - 6/17/2010 File:T:/329_Sabre Communications/_2010_SABRE/32910-0089_876354/Final Rev 1/32910-0089 Final R1.eri



Section	1	2	3	4	5	6	7	8
Length (ft)	47.50	35.50	10.75	10.42	24.08	22.50	12.00	3.5
Number of Sides	12	12	12	12	12	12	12	3.5
Thickness (in)	0.2500	0.3750	0.3867	0.4375	0.5055	0.5412	0.5591	1.8
Socket Length (ft)	4.00		5.00		5.75			1.9
Top Dia (in)	22.0000	30.3310	37.5377	37.9256	40.0697	42.7806	47.4841	5.6
Bot Dia (in)	31.6430	37.5377	39.7200	40.0697	44.5590	47.4841	49.9200	5.9
Grade	A607-60							27.1
Weight (K)	3.5	4.9	1.8	1.9	5.6	5.9	3.5	



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) DB980H90E-M w/Mount Pipe	150	(2) 7770.00 w/ Mount Pipe	120
(2) DB980H90E-M w/Mount Pipe	150	(2) LGP2140X	120
LLPX310R w/ Mount Pipe	148	(2) 7770.00 w/ Mount Pipe	120
FDD_R6_RRH	148	PD201-1	96
DB420	148	PD83-1	96
LLPX310R w/ Mount Pipe	148	DB806E-XT	96
FDD_R6_RRH	148	PD220	96
(2) DB980H90E-M w/Mount Pipe	148	DB224	96
LLPX310R w/ Mount Pipe	148	Platform Mount [LP 712-1]	96
FDD_R6_RRH	148	DB420-B	96
Platform Mount [LP 712-1]	148	(2) PD83-1	96
P2F-52	148	(2) PD1110	96
VHLP2-11	148	PD201-1	96
VHLP2-23	148	DB205-A	96
(2) VHLP600-11	148	ATMAA1412D-1A20	82
Pipe Mount [PM 601-1]	144	(3) RR90-17-00DPL2 w/ Mount Pipe	82
VHLP2.5-10W	144	APXV18-206516S-C-A20 w/ Mount Pipe	82
Platform Mount [LP 303-1]	134		
(4) DB844H90E-XY w/ Mount Pipe	134	ATMAA1412D-1A20	82
(4) DB844H90E-XY w/ Mount Pipe	134	Platform Mount [LP 712-1]	82
(4) DB844H90E-XY w/ Mount Pipe	134	(3) RR90-17-00DPL2 w/ Mount Pipe	82
(2) LGP13519	120	APXV18-206516S-C-A20 w/ Mount Pipe	82
(2) 7770.00 w/ Mount Pipe	120		
(2) LGP2140X	120	ATMAA1412D-1A20	82
(2) LGP13519	120	(3) RR90-17-00DPL2 w/ Mount Pipe	82
Platform Mount [LP 712-1]	120	APXV18-206516S-C-A20 w/ Mount Pipe	82
P65-16-XLH-RR w/ Mount Pipe	120		
P65-16-XLH-RR w/ Mount Pipe	120	800 10504	72
P65-16-XLH-RR w/ Mount Pipe	120	800 10504	72
(2) RRUS-11	120	800 10504	72
(2) RRUS-11	120	Pipe Mount [PM 601-3]	72
(2) RRUS-11	120	Side Arm Mount [SO 701-1]	53
DC6-48-60-18-8F	120	BSA150B	53
(2) LGP2140X	120	BSA150B	53
(2) LGP13519	120	BULLET III	50

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi			

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 91 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 99.7%

Paul J Ford and Company
250 E. Broad Street Suite 1500
Columbus, OH 43215
Phone: 614.221.6679
FAX: 614.448.4105

Job: *Westport Fire Department / Westport, CT*			
Project: *32910-0089 Final R1/ BU# 876354*			
Client: Crown Castle	Drawn by: Allen Bonham	App'd:	
Code: TIA/EIA-222-F	Date: 04/13/11	Scale: NTS	
Path: T:\32910 Sales Documentation\2010 SALES\32910-0089 876354\Final Rev 1\32910-0089 Final R1.eri		Dwg No. E-1	

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#: *876354*
Site Name: *Westport Fire Department*
App #:

Anchor Rod Data		
Qty:	20	
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:	60	in
Thick:	2.75	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:	6	in
Height:	18	in
Thick:	1	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	49.92	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	4201	ft-kips
Unfactored Axial, P:	43	kips
Unfactored Shear, V:	43	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	171.7 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	88.1% **Pass**

Base Plate Results — Shear Check Only

Base Plate Stress:	5.3 ksi
Allowable PL Bending Stress:	26.7 ksi
Base Plate Stress Ratio:	20.0% **Pass**

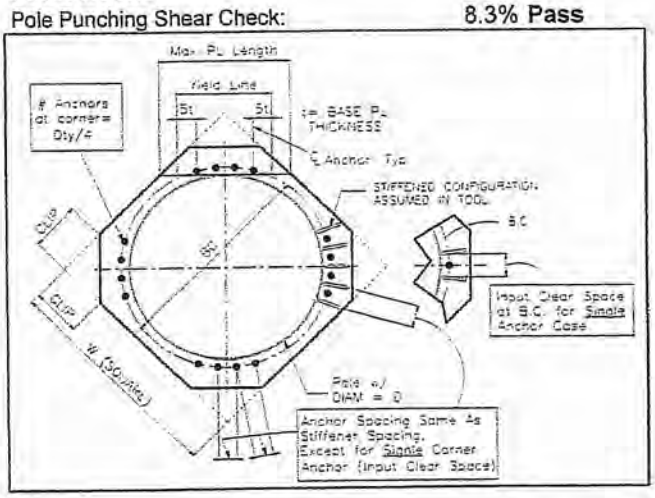
PL Ref. Data	
Yield Line (in):	N/A, Roark
Max PL Length:	34.93

Stiffener Results

Horizontal Weld :	46.9% **Pass**
Vertical Weld:	40.8% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	11.2% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	47.2% **Pass**
Plate Comp. (AISC Bracket):	48.6% **Pass**

Pole Results

Pole Punching Shear Check:	8.3% **Pass**



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

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Job Number: 32910-0089
Site Number: 876354
Site Name: Westport Fire Department

Page: 1
By: ARB
Date: 4/13/2011

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

Unfactored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, M =	4201.0		k-ft
Shear, V =	43.0		kips
Axial Load, P =	43.0		kips
OTM =	4222.5	0.0	k-ft @ Ground

Safety Factors / Load Factors / Φ Factors

Tower Type =	Monopole
ACI Code =	ACI 318-05
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 =	22.5	ft
fc' =	3	ksi
εc =	0.003	in/in
Mat Ftdn. Cap Width =		ft
Mat Ftdn. Cap Length =		ft
Depth Below Grade =		ft

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

Load Combinations Checked per TIA/EIA-222-F

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

Steel Parameters

Number of Bars =	40	
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 =	99.00	ft
Depth to Ignore Soil =	3.50	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?	Ground	

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

Maximum Capacity Ratios

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

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	6	100	1000		Clay				6
2	18	135		38	Sand	10000			24
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

Soil Results: Overturning

Depth to COR =	16.57	ft, from Grade	Shear, V =	43.00	kips
Bending Moment, M =	4935.05	k-ft, from COR	Resisting Shear, Va =	47.63	kips
Resisting Moment, Ma =	5466.97	k-ft, from COR			
MOMENT RATIO =	90.3%	OK	SHEAR RATIO =	90.3%	OK

Soil Results: Uplift

Uplift, T =	0.00	kips
Allowable Uplift Cap., Ta =	106.22	kips
UPLIFT RATIO =	0.0%	OK

Soil Results: Compression

Compression, C =	43.00	kips
Allowable Comp. Cap., Ca =	168.47	kips
COMPRESSION RATIO =	25.5%	OK

Steel Results (ACI 318-05):

Minimum Steel Area =	27.71	sq in
Actual Steel Area =	62.40	sq in
Allowable Min Axial, Pa =	-2592.00	kips, Where Ma = 0 k-ft
Allowable Max Axial, Pa =	7086.56	kips, Where Ma = 0 k-ft
Axial Load, P =	74.75	kips @ 5.00 ft Below Grade
Moment, M =	4409.06	k-ft @ 5.00 ft Below Grade
Allowable Moment, Ma =	7061.61	k-ft
MOMENT RATIO =	62.4%	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#: *876354*
Site Name: *Westport Fire Department*
App #:

Maximum Shaft Superimposed Forces		
TIA Revision:	F	
Max. Service Shaft M:	4409.06	ft-kips (* Note)
Max. Service Shaft P:	74.75	kips
Max Axial Force Type:	Comp.	

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

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

Load Factor	Shaft Factored Loads		
1.30	Mu:	5731.778	ft-kips
1.30	Pu:	97.175	kips

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 = 40
As Total= 62.4 in^2
A s/ Aconc, Rho: 0.0113 1.13%

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= 2005

Seismic Properties

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

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

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tesnion Controlled, Shafts:

(3)*(Sqrt(f'c)/Fy: 0.0027
200 / Fy: 0.0033
IBC 1810.1.2: 0.0050 SDC D, E, or F
Governing: 0.0050 **0.50%**

ACI 10.8 and 10.9
Min As for Columns, Comp. Controlled, Shafts:

Min As: 0.0100 **1.00%**

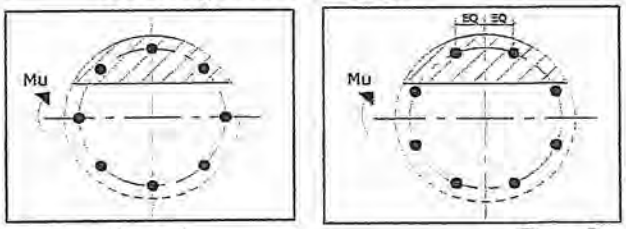
Minimum Rho Check:

Actual Req'd Min. Rho: 0.50% Flexural Member
Provided Rho: 1.13% **OK**

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	9212.52	kips
at Mu=(ϕ=0.65)Mn=	5501.91	ft-kips
Max Tu, (φ=0.9) Tn =	3369.6	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Results:

Governing Orientation Case: **2**



Case 1 Case 2

Extreme Steel Strain, εt: **0.0095**
εt > 0.0050, Tension Controlled
Reduction Factor,φ: **0.900**

Dist. From Edge to Neutral Axis: **18.79** in

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu = 97.18 kips
Drilled Shaft Moment Capacity, φMn: **9180.09** ft-kips
Drilled Shaft Superimposed Mu: **5731.78** ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR: 62.44%

CROWN CASTLE USA PROJECT: WESTPORT FIRE DEPARTMENT; WESTPORT, CT; BU #876354
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

UPON THE SUCCESSFUL AND COMPLETE INSTALLATION OF THE REINFORCING SYSTEM SPECIFIED IN THESE PLANS, THE REINFORCED POLE MEETS THE WIND DESIGN RECOMMENDATIONS OF THE TIA/EIA-222-F-1996 STANDARD FOR WIND SPEEDS OF 91.2 MPH AND 19 MPH + 1/2" RADIAL ICE

A. GENERAL NOTES

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

B. "LOW HEAT" WELDING PROCEDURES:

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

C. SPECIAL INSPECTION AND TESTING

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

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

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

C. CONCRETE TESTING PER ACI - (NOT REQUIRED)

D. STRUCTURAL STEEL
   (1.) CHECK THE STEEL ON THE JOB WITH THE PLANS.
   (2.) CHECK MILL CERTIFICATIONS.
   (3.) CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
   (4.) INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
   (5.) CALL FOR LABORATORY TEST REPORTS WHEN IN DOUBT.
   (6.) CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
   (7.) CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
   (8.) CHECK BOLT TIGHTENING ACCORDING TO AISC "TURN OF THE NUT" METHOD.

E. WELDING:
   (1.) VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
   (2.) INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND IN ACCORDANCE WITH AWS D1.1.
   (3.) APPROVE FIELD WELDING SEQUENCE.
      (A.) A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO THE OWNER BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM THE OWNER.
   (4.) INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
      (A.) INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE AND WORKING CONDITIONS.
      (B.) VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
      (C.) INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
      (D.) VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1.
      (E.) SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE OR DYE PENETRANT.
      (F.) INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED PLANS.
      (G.) VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
      (H.) REVIEW THE REPORTS BY TESTING LABS.
      (I.) CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
      (J.) INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
      (K.) CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.

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

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

APR 1 0 2011

ISSUE DATE FOR PERMIT: 4-7-2011

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT
BU #876354; WESTPORT FIRE DEPARTMENT; WESTPORT, CT

Revisions:		
	SABRE COMMUNICATIONS Sabre Towers & Poles 2101 MURRAY STREET, P.O. BOX 658, SIOUX CITY, IA 51111 PH: (712) 258-6690 FAX: (712) 258-1000	Job No. 32910-0089 Date: 4-7-2011 Scale: N.T.S. Designed By: A.R.B. Drawn By: B.M.S. Checked By: H.K.
	PAUL J. FORD AND COMPANY STRUCTURAL ENGINEERS 250 East Broad Street · Suite 1500 · Columbus, Ohio 43215 (614) 221-6679 www.pjford.com	SHEET NO: S-1

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C. **SPECIAL INSPECTION AND TESTING - CONTINUED**

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

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

D. **STRUCTURAL STEEL**
1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
A. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
(A.) "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
(B.) "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
(C.) "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (PARAGRAPH 4.2.1 SPECIFICALLY EXCLUDED).
B. BY THE AMERICAN WELDING SOCIETY (AWS):
(A.) "STRUCTURAL WELDING CODE - STEEL D1.1."
(B.) "SYMBOLS FOR WELDING AND NON-DESTRUCTIVE TESTING"
2. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
3. TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AJAX M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC "TURN OF THE NUT" METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.
4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E70XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO THE OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH-UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
8. UNLESS OTHERWISE NOTED, ALL STEEL MEMBERS SHALL BE HOT-DIP GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH ASTM A123. SEE SECTION J FOR FURTHER NOTES AND FOR EXCEPTIONS (IF ANY).
9. ALL WELDS SHALL BE VISUALLY INSPECTED BY THE OWNER'S APPROVED TESTING AGENCY. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY IN THEIR TESTING EFFORTS.
10. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
11. FIELD CUTTING OF STEEL:
(A.) PRIOR TO ANY FIELD CUTTING, THE CONTRACTOR SHALL MARK THE CUT OUTLINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS.
(B.) ANY REQUIRED CUTS IN THE STEEL SHALL BE CAREFULLY CUT BY MECHANICAL METHODS SUCH AS DRILLING, SAW CUTTING, AND GRINDING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, DURING THE CUTTING WORK. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
(C.) ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

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

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

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

H. **EPOXY GROUTED REINFORCING ANCHOR RODS - (NOT REQUIRED)**

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

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

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

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

ISSUE DATE FOR PERMIT: 4-7-2011

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT
BU #876354; WESTPORT FIRE DEPARTMENT; WESTPORT, CT

Revisions:		
	SABRE COMMUNICATIONS Sabre Towers & Poles PH: (712) 258-6690 FAX: (712) 224-1601	Job No. 32910-0089 Date: 4-7-2011 Scale: N.T.S. Designed By: A.R.B. Drawn By: B.M.S. Checked By:
	PAUL J. FORD AND COMPANY STRUCTURAL ENGINEERS 250 East Broad Street - Suite 1500 - Columbus, Ohio 43215 (614) 221-6679 www.pjfweb.com	SHEET NO: S-2

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

THIS POLE REINFORCEMENT DRAWING IS FOR THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF CO-LOCATION ANALYSIS FOR THIS SITE (PJF#32910-0089), DATED 4-7-2011.

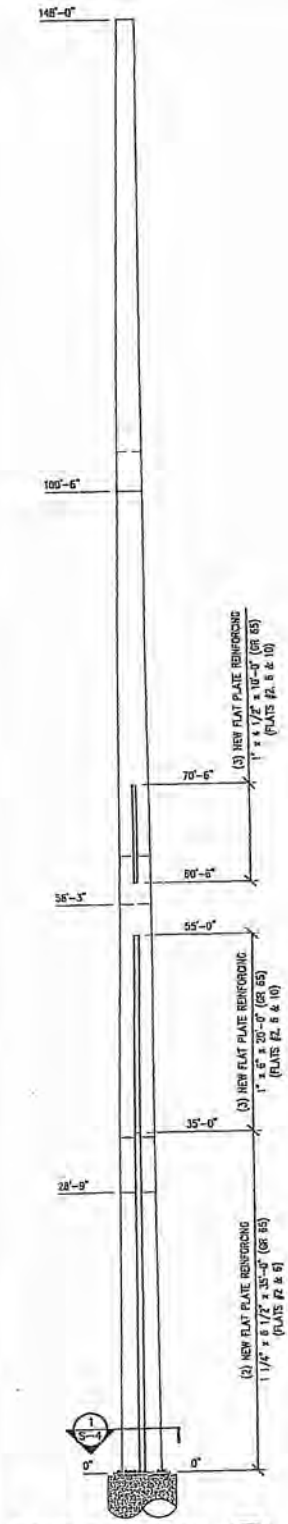
POLE SPECIFICATIONS	
Pole Shape Type:	12-SIDED POLYGON
Taper:	0.XXXXXX IN/FT
Shaft Steel:	ASTM A607 GRADE 60
Base PL Steel:	ASTM A572 50 KSI
Anchor Rods:	2 1/4"ø #18J ASTM A615 GRADE 75

SHAFT SECTION DATA					
Shaft Section	Section Length (feet)	Plate Thickness (in.)	Lap Splice (in.)	Diameter Across Flats (inches) @ Top	Diameter Across Flats (inches) @ Bottom
1	47.50	0.2500	48.00	22.000	31.643
2	46.25	0.3750	60.00	30.331	39.720
3	34.50	0.4375	69.00	34.955	44.959
4	34.50	0.5000		42.917	49.920

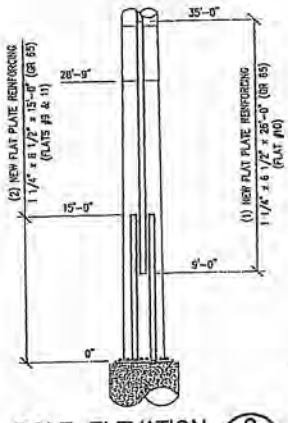
NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AJAX M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC "TURN OF THE NUT" METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.

PLEASE CONTACT SABRE COMMUNICATIONS FOR ALL MATERIAL AND INSTALLATION PRICING.



POLE ELEVATION 1 S-3



POLE ELEVATION 2 S-3

ISSUE DATE FOR PERMIT: 4-7-2011

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT
BU #876354; WESTPORT FIRE DEPARTMENT; WESTPORT, CT

Revisions:

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Drawn By:	B.M.S.
Checked By:	
SHEET NO:	S-3

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

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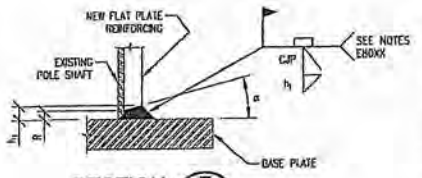


SECTION 3 / S-4

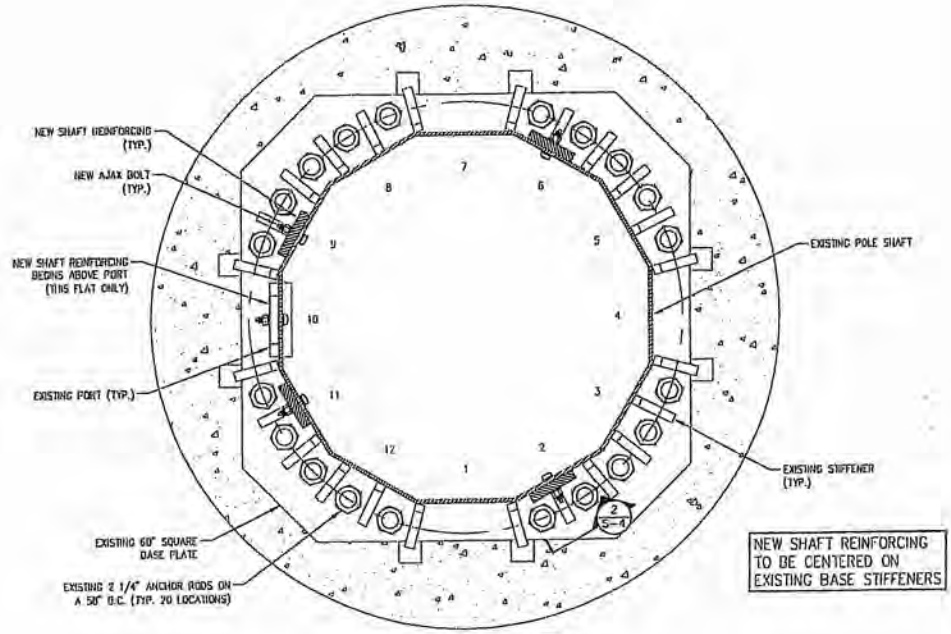
WELD DETAIL NOTES:

1. THE WELD DETAILS AND DIMENSIONS REGARDING THE ROOT OPENING (R), GROOVE ANGLE (α), AND REINFORCING FILLET WELD SIZE (h_2) SHALL BE IN ACCORDANCE WITH AN APPROVED SPECIFIC AWS-QUALIFIED WELDING PROCEDURE SPECIFICATION (WPS). THE WPS SHALL BE DEVELOPED IN COOPERATION WITH AND APPROVED BY AN AWS CERTIFIED WELD INSPECTOR (CWI). ALL WELDS SHALL BE IN ACCORDANCE WITH AWS D1.1, AND SHALL BE INSTALLED BY AWS-CERTIFIED WELDERS WHO HAVE BEEN CERTIFIED/QUALIFIED TO THIS SPECIFIC WPS. A COPY OF THE WPS SHALL BE SUPPLIED TO THE OWNER AND ENGINEER PRIOR TO CONSTRUCTION.

2. THE EXISTING SHAFT TO BASE PLATE WELD CONNECTION SERVES AS A BACKING ELEMENT FOR THE NEW CJP FIELD WELD AS SHOWN IN THE DETAIL. THIS EXISTING WELD SURFACE SHALL BE PROPERLY PREPARED FOR FIELD WELDING ACCORDING TO AWS D1.1.

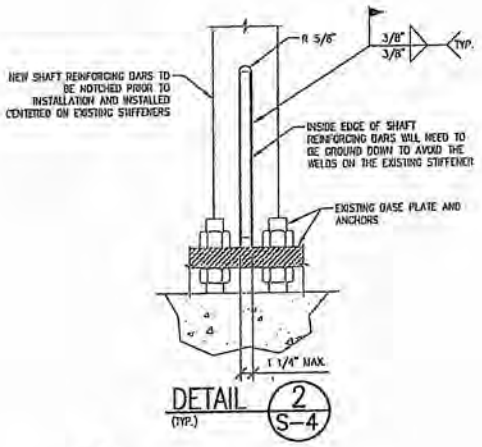
3. THE EXISTING SHAFT TO BASE PLATE WELD SHALL BE INSPECTED BY AN AWS CERTIFIED WELD INSPECTOR (CWI) FOR CRACK INDICATIONS OR OTHER SIGNS OF DISTRESS PRIOR TO CONSTRUCTION AND PRIOR TO ANY NEW FIELD WELDING. ANY CRACKS OR DISTRESS IDENTIFIED BY THE CWI SHALL BE REPORTED TO THE OWNER AND ENGINEER FOR EVALUATION OF REPAIR RECOMMENDATIONS. ALL REQUIRED WELD REPAIRS SHALL BE COMPLETED BY THE CONTRACTOR AND INSPECTED AND APPROVED BY THE CWI BEFORE ANY NEW FIELD WELDING PROCEEDS. THE CONTRACTOR SHALL REFER TO CROWN CASTLE DOCUMENTS ENG-SOW-10033 AND ENG-GUL-10051 FOR SPECIFICATIONS OF INSPECTION AND REPAIR REQUIREMENTS FOR THIS CONNECTION. ALSO READ NOTES ON SHEET S-1.

4. ALL FIELD WELDS SHALL BE INSPECTED BY A CERTIFIED WELD INSPECTOR (CWI) ACCORDING TO AWS D1.1.



NEW SHAFT REINFORCING TO BE CENTERED ON EXISTING BASE STIFFENERS

BASE PLAN 1 / S-4



DETAIL 2 / S-4 (TYP.)

STATE OF CONNECTICUT — JOSEPH MICHAEL SARAH JACOBS — No. PEN 22731 — LICENSED PROFESSIONAL ENGINEER

APR 1 0 2011

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MODIFICATION INSPECTION NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEWAESV 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.

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

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

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

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

MI CHECKLIST

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

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

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P65-16-XLH-RR | Dual Broadband Antennas

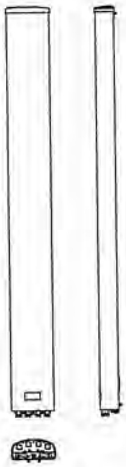
POLARIZATION: Dual linear ±45°
FREQUENCY (MHz): 698-894, 1710-2170
HORIZONTAL BEAM WIDTH (°): 65, 65
GAIN (dBi/dBd): 15.5/13.4 17.5/15.4
TILT: 1-12, 0-8
LENGTH: 72"

ELECTRICAL SPECIFICATIONS*

Frequency range (MHz)	698-894		1710-2170		
Frequency band (MHz)	698-806	806-894	1710-1880	1850-1990	1900-2170
Gain (dBi/dBd)	14.8/12.7	15.5/13.4	16.9/14.8	17.2/15.1	17.5/15.4
Polarization	Dual Linear +/- 45			Dual Linear +/- 45	
Nominal Impedance (Ω)	50			50	
VSWR	< 1.5:1			< 1.5:1	
Horizontal beam width, -3 dB (°)	66	65	60	63	63
Vertical beam width, -3 dB (°)	14.7	12.5	6.8	6.4	5.7
Electrical down tilt (°)	1 to 12			0 to 8	
Side lobe suppression, vertical 1st upper (dB)	> 16	>16	> 16		
	>16	>16			
Isolation between inputs (dB)	> 30	> 30	> 30	> 30	
Inter band Isolation (dB)	> 40			> 40	
Tracking, horizontal plane ±60° (dB)	< 2		< 2	< 2	< 2
First null fill (dB)			>-20	>-20	>-20
Vertical beam squint (°)	< 0.8	< 0.8	< 0.5	< 0.5	< 0.5
Front to back ratio (dB) 180°±30° copolar	>24	>24	> 30	>30	>28
Front to back ratio (dB) 180°±30° total power					
Cross polar discrimination (XPD) 0° (dB)	> 15	> 15	> 15	> 15	> 15
Cross polar discrimination (XPD) ±60° (dB)	> 10	> 10	> 10	> 10	> 10
Far field coupling					
IM3, 2xTx@43dBm (dBc)	<-153			<-153	
IM7, 2xTx@43dBm (dBc)					
Power handling, average per input (W)	500			250	
Power handling, average total (W)	1000			500	

MECHANICAL SPECIFICATIONS*

Connector	4 X 7/16 DIN Female, IP67
Connector position	Bottom
Dimensions, HxWxD, mm (ft)	72" x 12" x 6" (1829 x 305 x 152)
Mounting	Pre-mounted Tilt Brackets
Weight, with brackets, kg (lbs)	29 (64)
Weight, without brackets, kg (lbs)	24 (53)
Wind load, frontal/lateral/rear side 42 m/s Cd=1.6 (N)	1380
Maximum operational wind speed, m/s (mph)	100 (45)
Survival wind speed, m/s (mph)	150 (67)
Lightning protection	DC Ground
Operating Temperature	-40C to +60C
Radome material	PVC, IP55
Packet size, HxWxD, mm (ft)	87" x 16" x 10" (2225 x 400 x 225)
Radome colour	Light Grey
Shipping weight, kg (lbs)	34 (75)
RET	iRET AISGv1.1, MET and AISGv2.0
Brackets	7256.00, 7454.00A



*All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data.

ANTENNA PATTERNS*

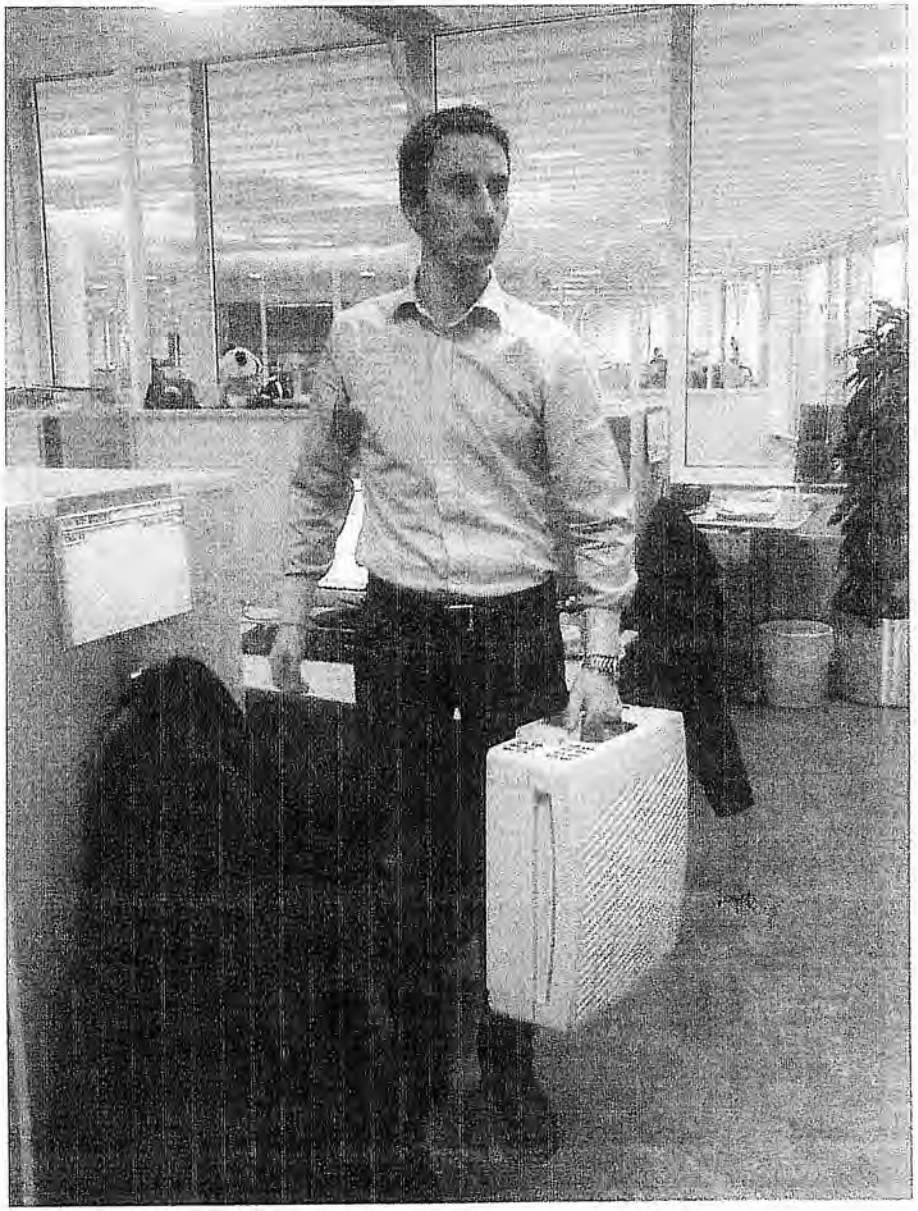
For detailed patterns visit http://www.powerwave.com/rpa/.

RRUS 11 – Dual PA RRU.

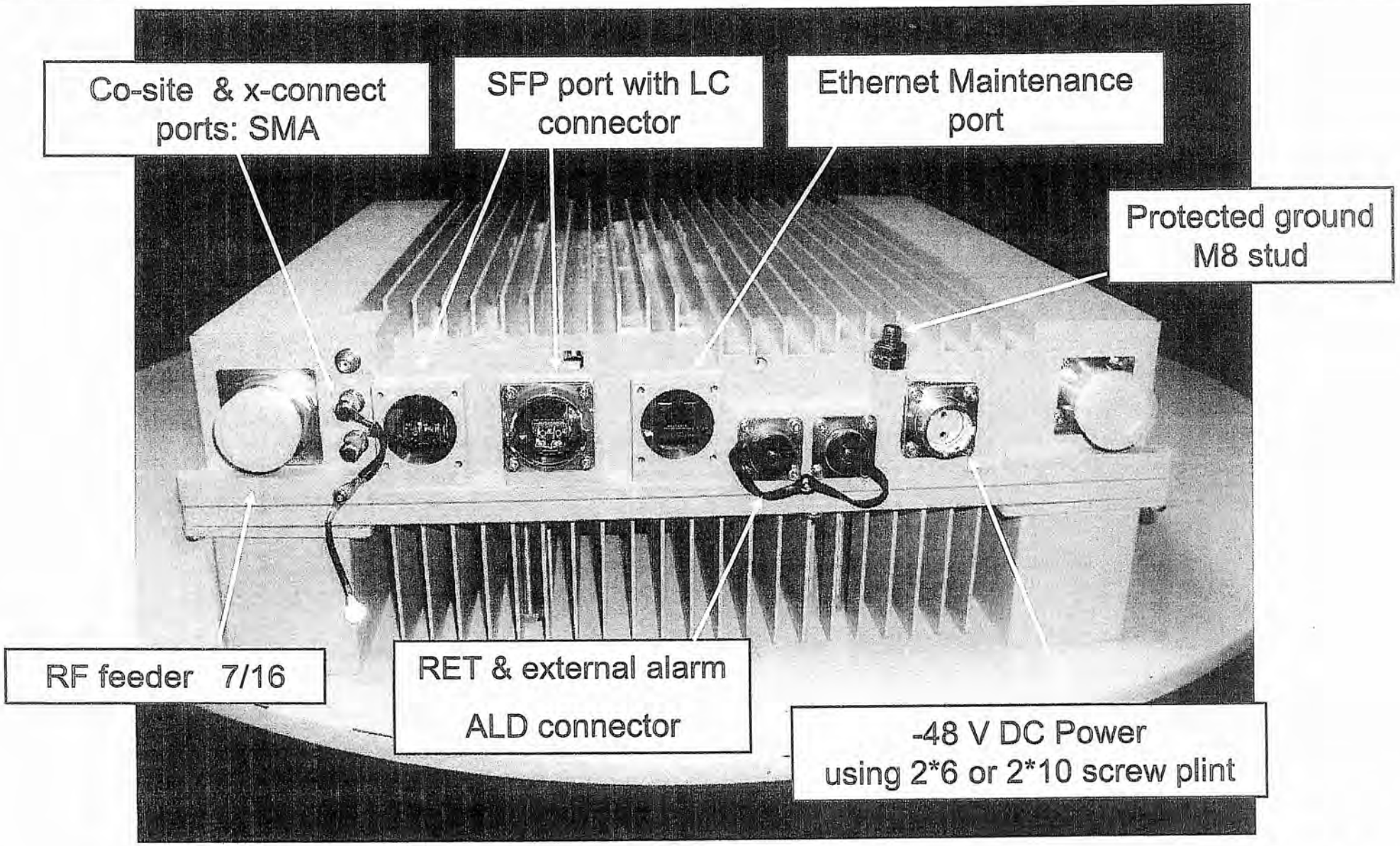
Technical Data

RBS6000

- Multi standard
- RF: 2x30 Watts
- Carrier BW: 1.4 – 20 MHz
- Alarms: 2
- Dimensions (with sunshield):
  - Width: 17.0 in
  - Height: 17.8 in
  - Depth: 7.2 in
  - Weight: 55 lbs (Band 12)
  - Weight: 50 lbs (Band 4)
- Temperature: -40 to +131 F
- Cooling: Self convection
- Power: -48 VDC
- Rec. fuse size 20 Amp
  - Rec. DC cable:
    6 mm^2 up to 60 meters
    10 mm^2 over 60 meters
    Shielded
- Power Cons: 200 Watts typ.



RRUS-11 I/F



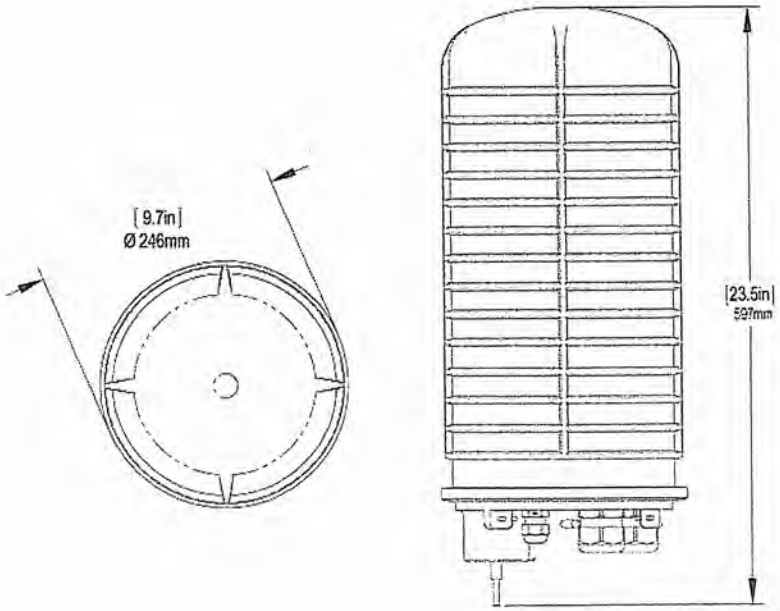
DC6-48-60-18-8F

DC Surge Suppression Solution

The DC6-48-60-18 is a dual chambered, DC surge suppression system for use in multi-circuit, Distributed Antenna Systems. The system will protect up to 6 Remote Radio Heads from voltage surges and lightning, and connect up to 18 fiber pairs. The system is enclosed in a NEMA 4 rated, waterproof enclosure.

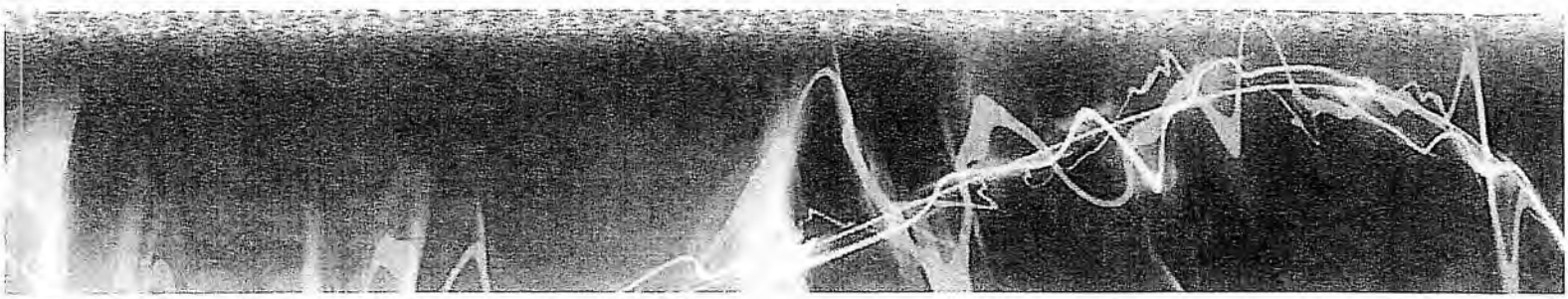
FEATURES

- Protects up to 6 Remote Radio Heads, each with its own protection circuit.
- Flexible design allows for installation at the top of a tower for Remote Radio Head protection.
- Includes fiber connections for up to 18 pairs of fiber.
- LED indicators on individual circuits provide visual indication of suppressor status.
- Form 'C' relays allow for remote monitoring of the suppressor status.
- Patented Strikesorb technology provides over 60 kA of surge current capacity per circuit.
- Strikesorb suppression modules are fully recognized to UL 1449-3rd Edition Safety Standard, meeting all intermediate and high current fault requirements to facilitate use in OEM applications.
- Raycap recommends that DC protection system be installed within 2 meters or 6 feet of the radio.
- Dome design is lightweight and aerodynamic providing maximum flexibility for installation on top of towers.



Raycap

Phone 208.777.1166 Toll Free 800.890.2569 Fax 208.777.4466 www.raycapsurgeprotection.com



DC6-48-60-18-8F

DC Power Surge Protection

Electrical Specifications	
Model Number	DC6-48-60-18-8F
Nominal Operating Voltage	48 VDC
Nominal Discharge Current (I_n)	20 kA 8/20 µs
Maximum Discharge Current (I_{max}) per NEMA LS-1	60 kA 8/20 µs
Maximum Continuous Operating Voltage (U_c)	75 VDC
Voltage Protection Rating	400 V

Mechanical Specifications	
Suppression Connection Method	Compression lug, #2-#14 AWG Copper, #2-#12 Aluminum
Fiber Connection Method	LC-LC Single mode duplex
Environmental Rating	IP 68, 7m 72hrs
Operating Temperature	-40° C to + 80° C
Storage Temperature	-70° C to + 80° C
Cold Temperature Cycling	IEC 61300-2-22e -30° C to + 60° C 200 hrs @ 5 psi
Resistance to Aggressive Materials	CEI IEC 61073-2 including acids and bases
UV Protection	ISO 4892-2 Method A Xenon-Arc 2160 hrs
Weight	20 lbs without Mounting Bracket

STANDARDS

Strikesorb modules are compliant to the following Surge Protection Device (SPD) Standards:

- ANSI/UL 1449 – 3rd Edition
- IEEE C62.41
- NEMA LS-1, IEC 61643-1:2005 2nd Edition:2005
- IEC 61643-12
- EN 61643-11:2002 (including A11:2007)

GS-07F-0435V

Certified to ISO 9001:2000

TÜV Rheinland of North America

Raycap, Inc. 806 W. Clearwater Loop • Post Falls • Idaho • 83854 • USA
Phone 208.777.1166 • Toll Free 800.890.2569 • Fax 208.777.4466 • www.raycapsurgeprotection.com

New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 463-5511
Fax: (860) 513-7190

Douglas L. Culp
Real Estate Consultant

May 4, 2011

Honorable Gordon F. Joseloff
1st Selectman, Town of Westport
Westport Town Hall
110 Myrtle Ave., Room 310
Westport, CT 06880

Re: Telecommunications Facility – 515 Boston Post Road Westport, CT

Dear Selectman Joseloff:

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

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

The accompanying letter to the Siting Council fully describes Cingular's proposal for the referenced cell site. However, if you have any questions or require any further information on our plans or the Siting Council's procedures; please call me at (860) 463-5511 or Ms. Linda Roberts, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Douglas L. Culp
Real Estate Consultant

Enclosure

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

Date: **July 07, 2014**

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

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

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	**Scenario 2.5A**
	Carrier Site Number:	CT03XC355
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	876354
	Crown Castle Site Name:	WESTPORT FIRE DEPARTMENT
	Crown Castle JDE Job Number:	288080
	Crown Castle Work Order Number:	794876
	Crown Castle Application Number:	245839 Rev. 1
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37513-1197.003.7805
Site Data:	**515 Boston Post Road, WESTPORT, Fairfield County, CT**	
	Latitude *41° 8' 24.26"*, Longitude *-73° 20' 51.61"*	
	148 Foot - Monopole Tower	

Dear Adam Winters,

Paul J Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 664936, in accordance with application 245839, revision 1.

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

LC11: 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 the 2005 Connecticut State Building Code of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice (with a 1.15 importance factor), 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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

Respectfully submitted by:

John J. Woolley, E.I.
Structural Designer