npmi
NANEPASHEMET

July 20, 2011

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

Re: MetroPCS (NHC0246B) Tower Sharing Request
338 Oxford Road, Oxford, CT

Dear Ms. Roberts:

On behalf of our client, MetroPCS, enclosed please find a tower sharing request (1 Original and 25 Copies) for the existing tower facility referenced above along with a check in the amount of $625. The tower sharing request contains site plans, signed and sealed structural information and MPE calculations. The structural analysis was performed with the proposed coaxial cables being routed on the inside of the Monopole structure. I'll follow up with the council staff next week to discuss the request further.

Thank you in advance for your consideration of the enclosed.

Very truly yours,

Dick Man
Site Acquisition Specialist
Nanepashemet Project Management, Inc.
On behalf of MetroPCS, Inc.

Encs.
Exhibit A- Site Plan
Exhibit B- Structural Analysis

cc: Kellie Dunn, MetroPCS
Kate Rugman, MetroPCS
Crown Castle
Mary Ann Drayton-Rogers, First Selectman, Town of Oxford, Connecticut

831 Beacon St., #259, Newton, MA 02459
Phone (857) 891-2769

MetroPCS ID: NHC0246B
Facility ID: 338 Oxford Road, Oxford Facil **TS-METROPCS-108-110720MA**

METROPCS' TOWER SHARING REQUEST FOR AN EXISTING TELECOMMUNICATIONS FACILITY AT 338 OXFORD ROAD, OXFORD, CONNECTICUT

Pursuant to the Connecticut General Statues (C.G.S.) § 16-50aa, Metro PCS, Inc., by and through its agent MetroPCS Massachusetts, LLC ("MetroPCS") hereby requests an order from the Connecticut Siting Council (the "Council") to approve the proposed shared use of an existing communications tower, located at 338 Oxford Road in the Town of Oxford (the "338 Oxford Road Facility"), and owned by Crown Castle. MetroPCS and Crown Castle have agreed to the shared use of the 338 Oxford Road Facility as detailed below.

The 338 Oxford Road Facility

The 338 Oxford Road Facility is located on the East side of Oxford Road behind Cucina Rustica at 340 Oxford Road, on an approximate 2.1 acre parcel of land owned by William E. Jr. & Ellen S. Fritz. The 338 Oxford Road Facility consists of a one hundred fifty (150) foot high steel Monopole telecommunications tower (the "Tower") and wireless equipment currently being used by Sprint, AT&T and Verizon. Associated equipment is located immediately adjacent to the Tower. The current adjacent land uses are general commercial, industrial and residential. A chain link fence surrounds the Tower and equipment areas. The site coordinates are Latitude 41.42799° and Longitude -73.1085°.

MetroPCS' Wireless Facility

As shown on the enclosed plans (Exhibit A) prepared by Chappell Engineering Associates, LLC, including a site plan, compound plan, tower elevation and antenna/equipment detail of the 338 Oxford Road Facility, MetroPCS proposes shared use of the facility by placing antennas on the Tower and equipment cabinets within the existing fenced compound to provide personal communications services ("PCS"). MetroPCS will install up to six (6) Andrew Model HBX-6516DS-VTM panel antennas, or their functional equivalents, at the 117 foot level of the Tower. A GPS antenna and associated equipment including a battery cabinet, a PPC cabinet, a CDMA Modcell cabinet and space for a future battery cabinet and future CDMA modcell cabinet will be located on a 9 foot x 16 foot concrete pad within the existing fenced compound.

Connecticut General Statues § 16-50aa provides that, upon written request for shared use approval, an order approving such use shall be issued, "if the council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns." (C.G.S. § 16-50aa(c)(1)). Further, upon approval of such shared use, it is exclusive and no local zoning or land use approvals are required C.G.S. § 16-50x. Shared use of the 338 Oxford Road Facility satisfies the approval criteria set forth in C.G.S. § 16-50aa as follows:

A. Technical Feasibility MetroPCS has confirmed that the Tower is structurally capable of supporting the addition of MetroPCS' antennas as set forth in a letter from Paul J Ford

and Company, a structural engineering firm hired by Crown Castle. (Exhibit B). The proposed shared use of this Tower is therefore technically feasible.

B. Legal Feasibility Pursuant to C.G.S. § 16-50aa, the Council has been authorized to issue an order approving shared use of the existing Industrial Drive Facility. (C.G.S. § 16-50aa(c)(1)). Under the authority vested in the Council by C.G.S. § 16-50aa, an order by the Council approving the shared use of a tower would permit the Applicant to obtain a building permit for the proposed installation.

C. Environmental Feasibility The proposed shared use would have a minimal environmental effect, for the following reasons:

   a. The proposed installation would have a de minimis visual impact, and would not cause any significant change or alteration in the physical or environmental characteristics of the existing facility;

   b. The proposed installation by MetroPCS would not increase the height of the tower or extend the boundaries of the 338 Oxford Road Facility;

   c. The proposed installation would not increase the noise levels at the existing facility boundaries by six (6) decibels or more;

   d. Operation of MetroPCS antennas at this site would not exceed the total radio frequency electromagnetic radiation power density level adopted by the FCC and Connecticut Department of Health. The "worst case" exposure calculated for the operation of this facility for all carriers would be approximately 22.51% as prepared by Frantz Pierre, RF Engineer, MetroPCS and detailed in the Power Density Calculation section shown on the next page;

   e. The proposed shared use of the 338 Oxford Road Facility would not require any water or sanitary facilities, or generate air emissions or discharges to water bodies. Further, the installation will not generate any traffic other than for periodic maintenance visits.

D. Economic Feasibility The Applicant and the Tower owner have agreed to share use of the 338 Oxford Road Facility on terms agreeable to both parties. The proposed tower sharing is therefore economically feasible.

E. Public Safety As stated above and evidenced in the power density calculation shown on the next page, the operation of MetroPCS' facility will not increase the cumulative radio frequency electromagnetic radiation power density at the Tower site's boundary to or above the standard adopted by the Connecticut Department of Environmental Protection as set forth in Section 22a-162 of the Connecticut General Statutes and MPE limits established by the Federal Communications Commission. Further, the addition of MetroPCS' telecommunications service in the Oxford areas through shared use of the 338

Oxford Road Facility is expected to enhance the safety and welfare of local residents and travelers through the area resulting in an improvement to public safety in this area of Oxford.

Power Density Calculation

The tower currently has three (3) existing carriers: AT&T, Verizon and Sprint. The power density for existing conditions is fully documented in the last filing with the Connecticut Siting Council for the 338 Oxford Road Facility as 16.78% of the MPE limits.

Calculations for MetroPCS' proposed facility are as follows:

Carrier	Centerline Height	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density	Standard Limits	Percent of Limits
MetroPCS	117'	2140	3	727	0.0573	1.0000	5.73%

When combining the cumulative "worse case" power density levels for the existing facility with MetroPCS' proposed facility, it would result in a total power density of 22.51% which is well within applicable standards.

Conclusion

As delineated above, the proposed shared use of the 338 Oxford Road Facility satisfies the criteria set forth in C.G.S. § 16-50aa, and advances the General Assembly's and the Siting Council's goal of preventing the proliferation of towers in the State of Connecticut. MetroPCS therefore requests the Siting Council issue an order approving the proposed shared use of the 338 Oxford Road Facility.

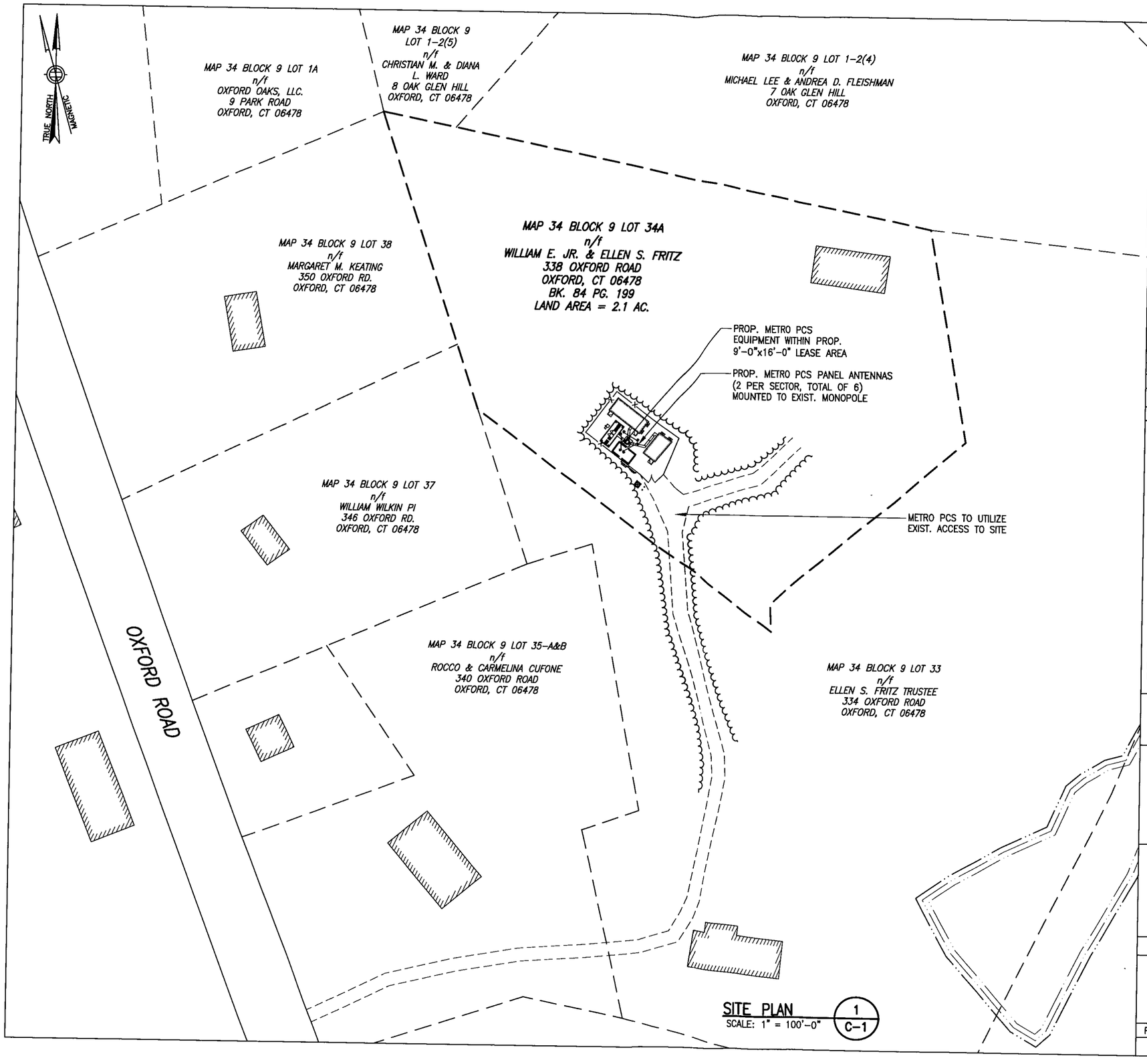
Respectfully submitted,

Dick Man
Site Acquisition Specialist
Nanepashemet Project Management, Inc.
On behalf of MetroPCS, Inc.

cc: Kellie Dunn, MetroPCS
Kate Rugman, MetroPCS
Crown Castle
Mary Ann Drayton-Rogers, First Selectman, Town of Oxford, Connecticut

Exhibit A

Site Plans



SITE PLAN (1 / C-1)
SCALE: 1" = 100'-0"

metroPCS
Unlimit Yourself.

285 BILLERICA ROAD
THIRD FLOOR
CHELMSFORD, MA 01824
TEL (978) 244-7200
FAX (978) 244-7240

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil · Structural · Land Surveying

R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST, SUITE 301
MARLBOROUGH, MA 01752
TEL (508) 481-7400
FAX (508) 481-7406

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	07/15/11	CSCP REVISED	CMC	JMT	JMT
1	07/08/11	CSCP FINAL	CMC	JMT	JMT
0	06/28/11	CONN. SITING COUNCIL PLAN	CMC	JMT	JMT

NOT TO SCALE | DESIGNED BY: JMT | DRAWN BY: CMC

APPROVALS

SITE OWNER _____ DATE _____

CONSTRUCTION MANAGER _____ DATE _____

RF ENGINEER _____ DATE _____

SITE ACQUISITION _____ DATE _____

THE ABOVE PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HERIN. ALL CONSTRUCTION DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND ANY CHANGES OR MODIFICATIONS THEY MAY IMPOSE.

SITE ID
NHC0246B

SITE NAME
CROWN OXFORD ROAD
OXFORD
(CROWN SITE #876362)

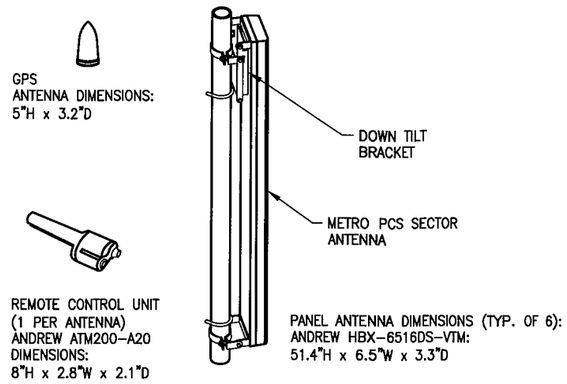
SITE ADDRESS
338 OXFORD ROAD
OXFORD, CT
06483

METRO PCS LEASE AREA

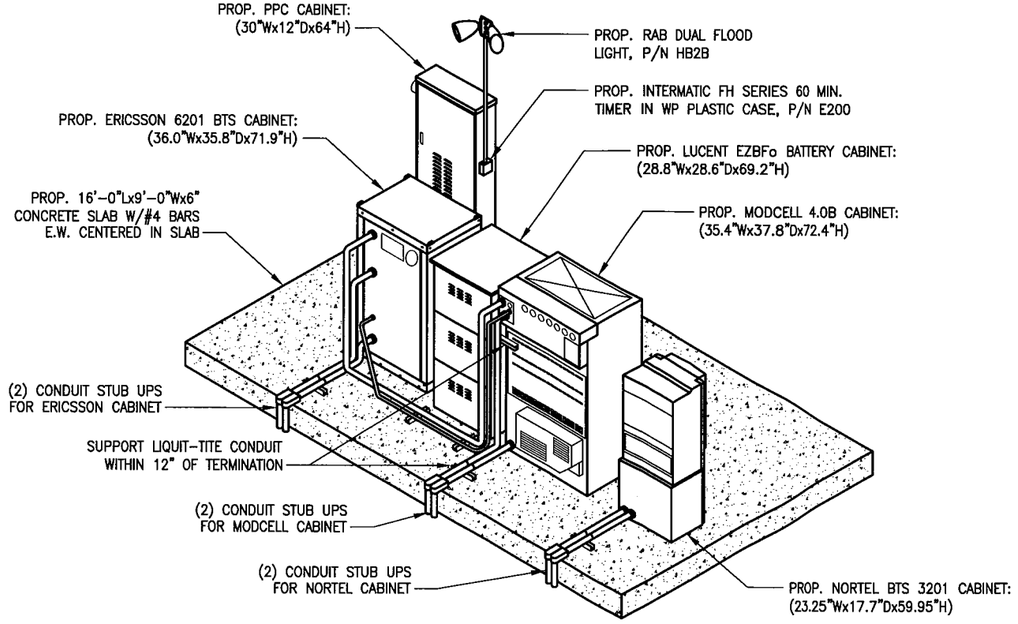
EQUIPMENT: 9'-0"x16'-0"=144.0 S.F.

TOTAL: = 144.0 S.F.

PROJECT NO.	DRAWING NAME	DATE	SHEET NO.	REV
736.400	C-1	07/15/11	1 OF 4	2



GPS & PANEL ANTENNA DETAIL — 1 / C-4
SCALE: NOT TO SCALE



EQUIPMENT DETAIL — 2 / C-4
SCALE: NOT TO SCALE

metroPCS
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TOTAL: = 144.0 S.F.

PROJECT NO.	DRAWING NAME	DATE	SHEET NO.	REV
736.400	C-4	07/15/11	4 OF 4	2

Exhibit B

Structural Analysis Report
Performed by:
Paul J. Ford and Company
On behalf of Crown Castle

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

Date: **July 1, 2011**

Eva Morales
Crown Castle USA Inc.
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Paul J Ford and Company
250 E. Broad Street, Suite 1500
Columbus, OH 43215
614.221.6679
cmccartney@pjfweb.com

Subject: Structural Analysis Report

Carrier Designation:	*Metro PCS Wireless Inc.* Co-Locate	
	Carrier Site Number:	NHC0246B
	Carrier Site Name:	Crown Oxford Road Oxford
Crown Castle Designation:	**Crown Castle BU Number:**	876362
	Crown Castle Site Name:	OXFORD/FRITZ PROPERTY
	Crown Castle JDE Job Number:	159021
	Crown Castle Work Order Number:	420669
Engineering Firm Designation:	**Paul J Ford and Company Project Number:** 37511-1194 R1	
Site Data:	**338 Oxford Rd., OXFORD, New Haven County, CT**	
	Latitude *41° 25' 40.77"*, Longitude *-73° 6' 30.75"*	
	150 Foot - Monopole Tower	

Dear Eva Morales,

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 421568, in accordance with application 124535, 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:

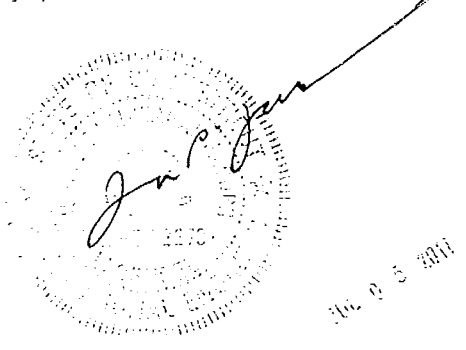
LC5: Existing + Current Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and local code requirements based upon a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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:

Corey McCartney, E.I.T.
Structural Engineer



RISA Tower Report - version 5.4.2.0

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

Date: **July 1, 2011**

Eva Morales
Crown Castle USA Inc.
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Paul J Ford and Company
250 E. Broad Street, Suite 1500
Columbus, OH 43215
614.221.6679
cmccartney@pjfweb.com

Subject: **Structural Analysis Report**

Carrier Designation:	***Metro PCS Wireless Inc.* Co-Locate**	
	Carrier Site Number:	NHC0246B
	Carrier Site Name:	Crown Oxford Road Oxford
Crown Castle Designation:	**Crown Castle BU Number:**	876362
	Crown Castle Site Name:	OXFORD/FRITZ PROPERTY
	Crown Castle JDE Job Number:	159021
	Crown Castle Work Order Number:	420669
Engineering Firm Designation:	**Paul J Ford and Company Project Number:** 37511-1194 R1	
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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:

Corey McCartney, E.I.T.
Structural Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by Engineered Endeavors, Inc. in September of 1999. The tower was originally designed for a wind speed of 89.25 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 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		6 *	andrew	ATM200-A20			
117	117	6	andrew	HBX-6516DS-VTM w/ Mount Pipe	6 (I) 12 (I)	3/8 1 5/8	-
		1	tower mounts	Sector Mount [SM 402-3]			

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
		9	sprint mla	SPRINT MLA_ANTENNA w/ Mount Pipe	9 (I)	1 5/8	2
150	152	6	decibel	DB980H90E-M w/ Mount Pipe			
	150	1	tower mounts	Platform Mount [LP 601-1]	6 (I)	1 5/8	1
		6 *	adc	DD1900 FULL BAND w/850 BY-PASS MASTHEAD			
137	138	6	css	DU04-8670 w/Mount Pipe			
		3	powerwave technologies	7770.00 w/ Mount Pipe	12 (I)	1 1/4	1
		6 *	powerwave technologies	LGP21901			
	137	1	tower mounts	Platform Mount [LP 401-1]			
	131	1	gps	GPS_A			
127	128	6	decibel	948F85T2E-M w/ Mount Pipe	12 (I)	1 5/8	
		6	decibel	DB844H90E-XY w/Mount Pipe	1 (I)	1/2	1
	127	1	tower mounts	Platform Mount [LP 712-1]			
	76	1	kathrein	OG-860/1920/GPS-A			
75	75	1	tower mounts	Side Arm Mount [SO 701-1]	1 (E)	1/2	1

Notes:
1) Existing Equipment
2) MLA Equipment (Not Considered)
(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.
* TMA modeled behind antennas

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	EEI, 5724,1/26/00	1440552	CCISITES
GEOTECHNICAL REPORTS	Clarence Welti Assoc., Sprint Site CT23xC508, 9/15/99	1531939	CCISITES
TOWER MANUFACTURER DRAWINGS	EEI, 99-1188, 9/21/99	1441271	CCISITES
POST-MODIFICATION INSPECTION	Vertical Solutions, 080876.07, 12/01/08	2364903	CCISITES

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.
5) Monopole was reinforced in conformance with the referenced modification drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 123.42	Pole	TP20.74x15x0.1875	1	-4.97	614.69	53.4	Pass
L2	123.42 - 105.25	Pole	TP24.2182x19.6804x0.25	2	-7.93	988.73	86.3	Pass
L3	105.25 - 101.9	Pole	TP24.9305x24.2182x0.2651	3	-8.33	1078.74	86.0	Pass
L4	101.9 - 85.96	Pole	TP28.32x24.9305x0.2917	4	-9.88	1307.14	89.7	Pass
L5	85.96 - 72.15	Pole	TP30.7639x26.8691x0.3198	5	-12.93	1606.41	94.7	Pass
L6	72.15 - 42.41	Pole	TP37.1x30.7639x0.3268	6	-17.12	1923.40	99.0	Pass
L7	42.41 - 0	Pole	TP45.5x35.345x0.375	7	-24.45	2585.87	91.5	Pass
							Summary	
						Pole (L6)	99.0	Pass
						RATING =	**99.0**	**Pass**

Table 5 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	87.6	Pass
1	Base Plate	0	72.7	Pass
1	Base Foundation Steel	0	97.6	Pass
1	Base Foundation Soil Interaction	0	75.0	Pass
	Structure Rating (max from all components) =			**99.0%**

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

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:

1) Tower is located in New Haven County, Connecticut.
2) Basic wind speed of 85 mph.
3) Nominal ice thickness of 0.7500 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56.00 pcf.
6) A wind speed of 38 mph is used in combination with ice.
7) Temperature drop of 50 °F.
8) Deflections calculated using a wind speed of 50 mph.
9) A non-linear (P-delta) analysis was used.
10) Pressures are calculated at each section.
11) Stress ratio used in pole design is 1.333.
12) Local bending stresses due to climbing loads, 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	150.00-123.42	26.58	3.17	18	15.0000	20.7400	0.1875	0.7500	A572-65 (65 ksi)
L2	123.42-105.25	21.34	0.00	18	19.6804	24.2182	0.2500	1.0000	A572-65 (65 ksi)
L3	105.25-101.90	3.35	0.00	18	24.2182	24.9305	0.2651	1.0602	65 ksi (w/ Reinf.) (65 ksi)
L4	101.90-85.96	15.94	4.08	18	24.9305	28.3200	0.2917	1.1666	65 ksi (w/ Reinf.) (65 ksi)
L5	85.96-72.15	17.89	0.00	18	26.8691	30.7639	0.3198	1.2791	65 ksi (w/ Reinf.) (65 ksi)
L6	72.15-42.41	29.74	5.17	18	30.7639	37.1000	0.3268	1.3071	65 ksi (w/ Reinf.) (65 ksi)
L7	42.41-0.00	47.58		18	35.3450	45.5000	0.3750	1.1666	A572-65 (65 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	15.2314	8.8153	244.3603	5.2584	7.6200	32.0683	489.0422	4.4085	2.3100	12.32
	21.0599	12.2313	652.7391	7.2961	10.5359	61.9537	1306.3371	6.1168	3.3202	17.708
L2	20.6685	15.4180	735.4138	6.8978	9.9977	73.5586	1471.7953	7.7105	3.0238	12.095
	24.5918	19.0187	1380.3476	8.5087	12.3028	112.1976	2762.5115	9.5112	3.8224	15.29
L3	24.5918	20.1510	1460.6895	8.5034	12.3028	118.7280	2923.3010	10.0774	3.7959	14.321
	25.3151	20.7503	1594.9215	8.7562	12.6647	125.9345	3191.9416	10.3771	3.9213	14.794
L4	25.3151	22.8089	1749.3714	8.7468	12.6647	138.1298	3501.0446	11.4066	3.8744	13.284
	28.7569	25.9466	2575.2143	9.9501	14.3866	179.0014	5153.8171	12.9758	4.4710	15.329
L5	28.1855	26.9471	2399.6952	9.4250	13.6495	175.8082	4802.5479	13.4761	4.1661	13.028
	31.2385	30.9002	3618.3043	10.8077	15.6281	231.5263	7241.3697	15.4530	4.8516	15.172
L6	31.2385	31.5684	3694.8498	10.8052	15.6281	236.4242	7394.5614	15.7872	4.8393	14.81
	37.6723	38.1400	6516.0121	13.0545	18.8468	345.7357	13040.598 2	19.0736	5.9545	18.222
L7	37.0107	41.6230	6430.7576	12.4143	17.9553	358.1546	12869.976 9	20.8155	5.6781	15.141
	46.2019	53.7100	13817.430 4	16.0194	23.1140	597.7949	27653.042 1	26.8601	7.4653	19.908

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 150.00-123.42				1	1	1		
L2 123.42-105.25				1	1	1		
L3 105.25-101.90				1	1	1		
L4 101.90-85.96				1	1	1		
L5 85.96-72.15				1	1	1		
L6 72.15-42.41				1	1	1		
L7 42.41-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
LDF4-50A (1/2" foam)	C	No	Inside Pole	60.00 - 0.00	2	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
***								
LDF4-50A (1/2" foam)	C	No	CaAa (Out Of Face)	75.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.01
***								
LDF2-50 (3/8" foam)	C	No	Inside Pole	117.00 - 0.00	6	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
LDF7-50A (1 5/8" foam)	C	No	Inside Pole	117.00 - 0.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
***						4" Ice	0.00	0.00
LDF7-50A (1 5/8" foam)	C	No	Inside Pole	127.00 - 0.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
LDF4-50A (1/2" foam)	C	No	Inside Pole	127.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
***								
LDF6-50 (1 1/4" foam)	C	No	Inside Pole	137.00 - 0.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
***								
LDF7-50A (1 5/8" foam)	C	No	Inside Pole	150.00 - 0.00	6	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
***								
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	106.50 - 42.40	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

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-123.42	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	0.00
L2	123.42-105.25	A	0.000	0.000	0.000	0.000	0.29
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L3	105.25-101.90	A	0.000	0.000	0.000	0.260	0.58
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L4	101.90-85.96	A	0.000	0.000	0.000	0.698	0.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L5	85.96-72.15	A	0.000	0.000	0.000	3.321	0.58
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L6	72.15-42.41	A	0.000	0.000	0.000	2.877	0.50
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L7	42.41-0.00	A	0.000	0.000	0.000	6.196	1.08
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.002	1.55

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	150.00-123.42	A	0.889	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	0.29
L2	123.42-105.25	A	0.870	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	0.507	0.58
L3	105.25-101.90	A	0.860	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	1.338	0.12
L4	101.90-85.96	A	0.850	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	6.332	0.58
L5	85.96-72.15	A	0.833	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	5.486	0.50
L6	72.15-42.41	A	0.801	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.486	1.13
L7	42.41-0.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.004	1.61

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.00-123.42	0.0000	0.0000	0.0000	0.0000
L2	123.42-105.25	-0.0200	0.0115	-0.0358	0.0207
L3	105.25-101.90	-0.2456	0.1418	-0.4102	0.2368
L4	101.90-85.96	-0.2474	0.1428	-0.4152	0.2397
L5	85.96-72.15	-0.2493	0.1440	-0.4226	0.2440
L6	72.15-42.41	-0.2521	0.1455	-0.4238	0.2447
L7	42.41-0.00	-0.0001	0.0000	-0.0001	0.0001

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight K
***										
Side Arm Mount [SO 701-1]	C	None			0.00	75.00	No Ice	0.85	1.67	0.07
							1/2" Ice	1.14	2.34	0.08
							1" Ice	1.43	3.01	0.09
							2" Ice	2.01	4.35	0.12
							4" Ice	3.17	7.03	0.18
OG-860/1920/GPS-A	B	From Face	2.00	0.00	0.00	75.00	No Ice	0.33	0.40	0.00
			0.00	1.00			1/2" Ice	0.43	0.51	0.01
			1.00				1" Ice	0.55	0.63	0.01
							2" Ice	0.80	0.89	0.02
							4" Ice	1.41	1.52	0.08
***										
Sector Mount [SM 402-3]	C	None			0.00	117.00	No Ice	18.91	18.91	0.85
							1/2" Ice	26.78	26.78	1.23
							1" Ice	34.65	34.65	1.62
							2" Ice	50.39	50.39	2.38
								81.87	81.87	3.91

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
(2) HBX-6516DS-VTM w/ Mount Pipe	A	From Face	4.00	0.00	0.00	117.00	4" Ice			
			0.00				No Ice	3.60	3.24	0.03
			0.00				1/2" Ice	4.00	3.91	0.06
							1" Ice	4.43	4.56	0.10
							2" Ice	5.37	5.91	0.20
							4" Ice	7.36	8.88	0.50
(2) HBX-6516DS-VTM w/ Mount Pipe	B	From Face	4.00	0.00	0.00	117.00	No Ice	3.60	3.24	0.03
			0.00				1/2" Ice	4.00	3.91	0.06
			0.00				1" Ice	4.43	4.56	0.10
							2" Ice	5.37	5.91	0.20
							4" Ice	7.36	8.88	0.50
(2) HBX-6516DS-VTM w/ Mount Pipe	C	From Face	4.00	0.00	0.00	117.00	No Ice	3.60	3.24	0.03
			0.00				1/2" Ice	4.00	3.91	0.06
			0.00				1" Ice	4.43	4.56	0.10
							2" Ice	5.37	5.91	0.20
							4" Ice	7.36	8.88	0.50
(2) ATM200-A20	A	From Face	4.00	0.00	0.00	117.00	No Ice	0.00	0.16	0.00
			0.00				1/2" Ice	0.00	0.23	0.00
			0.00				1" Ice	0.00	0.31	0.01
							2" Ice	0.00	0.49	0.02
							4" Ice		0.96	0.06
(2) ATM200-A20	B	From Face	4.00	0.00	0.00	117.00	No Ice	0.00	0.16	0.00
			0.00				1/2" Ice	0.00	0.23	0.00
			0.00				1" Ice	0.00	0.31	0.01
							2" Ice	0.00	0.49	0.02
							4" Ice		0.96	0.06
(2) ATM200-A20	C	From Face	4.00	0.00	0.00	117.00	No Ice	0.00	0.16	0.00
			0.00				1/2" Ice	0.00	0.23	0.00
			0.00				1" Ice	0.00	0.31	0.01
							2" Ice	0.00	0.49	0.02
							4" Ice		0.96	0.06
*** Platform Mount [LP 712-1]	C	None			0.00	127.00	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
(2) DB844H90E-XY w/Mount Pipe	A	From Face	4.00	0.00	0.00	127.00	No Ice	3.58	5.40	0.04
			0.00				1/2" Ice	4.20	6.49	0.08
			1.00				1" Ice	4.73	7.30	0.13
							2" Ice	5.86	8.96	0.25
							4" Ice	8.27	12.49	0.62
(2) DB844H90E-XY w/Mount Pipe	B	From Face	4.00	0.00	0.00	127.00	No Ice	3.58	5.40	0.04
			0.00				1/2" Ice	4.20	6.49	0.08
			1.00				1" Ice	4.73	7.30	0.13
							2" Ice	5.86	8.96	0.25
							4" Ice	8.27	12.49	0.62
(2) DB844H90E-XY w/Mount Pipe	C	From Face	4.00	0.00	0.00	127.00	No Ice	3.58	5.40	0.04
			0.00				1/2" Ice	4.20	6.49	0.08
			1.00				1" Ice	4.73	7.30	0.13
							2" Ice	5.86	8.96	0.25
							4" Ice	8.27	12.49	0.62
(2) 948F85T2E-M w/ Mount Pipe	A	From Face	4.00	0.00	0.00	127.00	No Ice	2.05	4.45	0.03
			0.00				1/2" Ice	2.41	5.12	0.06
			1.00				1" Ice	2.78	5.80	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) 948F85T2E-M w/ Mount Pipe	B	From Face	4.00	0.00	0.00	127.00	1" Ice	3.54	7.22	0.19
			0.00				2" Ice	5.26	10.31	0.48
			1.00				4" Ice			
							No Ice	2.05	4.45	0.03
							1/2" Ice	2.41	5.12	0.06
								2.78	5.80	0.09
							1" Ice	3.54	7.22	0.19
							2" Ice	5.26	10.31	0.48
							4" Ice			
(2) 948F85T2E-M w/ Mount Pipe	C	From Face	4.00	0.00	0.00	127.00	No Ice	2.05	4.45	0.03
			0.00				1/2" Ice	2.41	5.12	0.06
			1.00					2.78	5.80	0.09
							1" Ice	3.54	7.22	0.19
							2" Ice	5.26	10.31	0.48
							4" Ice			
GPS_A	B	From Face	4.00	0.00	0.00	127.00	No Ice	0.30	0.30	0.00
			0.00				1/2" Ice	0.37	0.37	0.00
			4.00					0.46	0.46	0.01
							1" Ice	0.65	0.65	0.02
							2" Ice	1.15	1.15	0.08
							4" Ice			
***										
(2) DU04-8670 w/Mount Pipe	A	From Face	4.00	0.00	0.00	137.00	No Ice	7.25	5.86	0.06
			0.00				1/2" Ice	7.96	6.96	0.11
			1.00					8.57	7.78	0.18
							1" Ice	9.80	9.45	0.34
							2" Ice	12.42	13.01	0.79
							4" Ice			
(2) DU04-8670 w/Mount Pipe	B	From Face	4.00	0.00	0.00	137.00	No Ice	7.25	5.86	0.06
			0.00				1/2" Ice	7.96	6.96	0.11
			1.00					8.57	7.78	0.18
							1" Ice	9.80	9.45	0.34
							2" Ice	12.42	13.01	0.79
							4" Ice			
(2) DU04-8670 w/Mount Pipe	C	From Face	4.00	0.00	0.00	137.00	No Ice	7.25	5.86	0.06
			0.00				1/2" Ice	7.96	6.96	0.11
			1.00					8.57	7.78	0.18
							1" Ice	9.80	9.45	0.34
							2" Ice	12.42	13.01	0.79
							4" Ice			
7770.00 w/ Mount Pipe	A	From Face	4.00	0.00	0.00	137.00	No Ice	6.12	4.25	0.06
			0.00				1/2" Ice	6.63	5.01	0.10
			1.00					7.13	5.71	0.16
							1" Ice	8.16	7.16	0.29
							2" Ice	10.36	10.41	0.66
							4" Ice			
7770.00 w/ Mount Pipe	B	From Face	4.00	0.00	0.00	137.00	No Ice	6.12	4.25	0.06
			0.00				1/2" Ice	6.63	5.01	0.10
			1.00					7.13	5.71	0.16
							1" Ice	8.16	7.16	0.29
							2" Ice	10.36	10.41	0.66
							4" Ice			
7770.00 w/ Mount Pipe	C	From Face	4.00	0.00	0.00	137.00	No Ice	6.12	4.25	0.06
			0.00				1/2" Ice	6.63	5.01	0.10
			1.00					7.13	5.71	0.16
							1" Ice	8.16	7.16	0.29
							2" Ice	10.36	10.41	0.66
							4" Ice			
(2) LGP21901	A	From Face	4.00	0.00	0.00	137.00	No Ice	0.00	0.18	0.01
			0.00				1/2" Ice	0.00	0.25	0.01
			1.00					0.00	0.32	0.01
							1" Ice	0.00	0.49	0.02
							2" Ice	0.00	0.94	0.07
							4" Ice			
(2) LGP21901	B	From Face	4.00	0.00	0.00	137.00	No Ice	0.00	0.18	0.01

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
			0.00							
			1.00				1/2" Ice	0.00	0.25	0.01
							1" Ice	0.00	0.32	0.01
							2" Ice	0.00	0.49	0.02
(2) LGP21901	C	From Face	4.00		0.00	137.00	4" Ice		0.94	0.07
			0.00				No Ice	0.00	0.18	0.01
			1.00				1/2" Ice	0.00	0.25	0.01
							1" Ice	0.00	0.32	0.01
							2" Ice	0.00	0.49	0.02
(2) DD1900 FULL BAND w/850 BY-PASS MASTHEAD	A	From Face	4.00		0.00	137.00	4" Ice		0.94	0.07
			0.00				No Ice	0.00	0.32	0.02
			1.00				1/2" Ice	0.00	0.42	0.02
							1" Ice	0.00	0.52	0.03
							2" Ice	0.00	0.76	0.06
(2) DD1900 FULL BAND w/850 BY-PASS MASTHEAD	B	From Face	4.00		0.00	137.00	4" Ice		1.35	0.14
			0.00				No Ice	0.00	0.32	0.02
			1.00				1/2" Ice	0.00	0.42	0.02
							1" Ice	0.00	0.52	0.03
							2" Ice	0.00	0.76	0.06
(2) DD1900 FULL BAND w/850 BY-PASS MASTHEAD	C	From Face	4.00		0.00	137.00	4" Ice		1.35	0.14
			0.00				No Ice	0.00	0.32	0.02
			1.00				1/2" Ice	0.00	0.42	0.02
							1" Ice	0.00	0.52	0.03
							2" Ice	0.00	0.76	0.06
Platform Mount [LP 401-1]	C	None			0.00	137.00	4" Ice		1.35	0.14
							No Ice	24.33	24.33	1.65
							1/2" Ice	30.22	30.22	2.03
							1" Ice	36.11	36.11	2.41
							2" Ice	47.89	47.89	3.18
***							4" Ice	71.45	71.45	4.72
(2) DB980H90E-M w/ Mount Pipe	A	From Face	4.00		0.00	150.00	No Ice	4.04	3.62	0.03
			0.00				1/2" Ice	4.50	4.48	0.06
			2.00				1" Ice	4.95	5.22	0.11
							2" Ice	5.87	6.74	0.22
(2) DB980H90E-M w/ Mount Pipe	B	From Face	4.00		0.00	150.00	4" Ice	8.05	10.00	0.55
			0.00				No Ice	4.04	3.62	0.03
			2.00				1/2" Ice	4.50	4.48	0.06
							1" Ice	4.95	5.22	0.11
							2" Ice	5.87	6.74	0.22
(2) DB980H90E-M w/ Mount Pipe	C	From Face	4.00		0.00	150.00	4" Ice	8.05	10.00	0.55
			0.00				No Ice	4.04	3.62	0.03
			2.00				1/2" Ice	4.50	4.48	0.06
							1" Ice	4.95	5.22	0.11
							2" Ice	5.87	6.74	0.22
6' x 2.375" Pipe Mount	A	From Face	4.00		0.00	150.00	4" Ice	8.05	10.00	0.55
			0.00				No Ice	1.43	1.43	0.02
			2.00				1/2" Ice	1.92	1.92	0.03
							1" Ice	2.29	2.29	0.05
							2" Ice	3.06	3.06	0.09
6' x 2.375" Pipe Mount	B	From Face	4.00		0.00	150.00	4" Ice	4.70	4.70	0.23
			0.00				No Ice	1.43	1.43	0.02
			2.00				1/2" Ice	1.92	1.92	0.03
							1" Ice	2.29	2.29	0.05
							2" Ice	3.06	3.06	0.09
								4.70	4.70	0.23

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
6' x 2.375" Pipe Mount	C	From Face	4.00 0.00 2.00	0.00	150.00	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
Platform Mount [LP 601-1]	C	None		0.00	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.47 33.59 38.71 48.95 69.43	28.47 33.59 38.71 48.95 69.43	1.12 1.51 1.91 2.69 4.26

Tower Pressures - No Ice

G_H = 1.690

Section Elevation ft	z ft	K_z	q_z ksf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 150.00-123.42	136.00	1.499	0.03	39.582	A	0.000	39.582	39.582	100.00	0.000	0.000
					B	0.000	39.582		100.00	0.000	0.000
					C	0.000	39.582		100.00	0.000	0.000
L2 123.42-105.25	114.07	1.425	0.03	33.745	A	0.000	33.745	33.745	100.00	0.000	0.000
					B	0.000	33.745		100.00	0.000	0.000
					C	0.000	33.745		100.00	0.000	0.000
L3 105.25-101.90	103.57	1.386	0.03	6.860	A	0.000	6.860	6.860	100.00	0.000	0.260
					B	0.000	6.860		100.00	0.000	0.000
					C	0.000	6.860		100.00	0.000	0.000
L4 101.90-85.96	93.76	1.348	0.02	35.367	A	0.000	35.367	35.367	100.00	0.000	0.698
					B	0.000	35.367		100.00	0.000	0.000
					C	0.000	35.367		100.00	0.000	0.000
L5 85.96-72.15	78.94	1.283	0.02	33.674	A	0.000	33.674	33.674	100.00	0.000	3.321
					B	0.000	33.674		100.00	0.000	0.000
					C	0.000	33.674		100.00	0.000	0.000
L6 72.15-42.41	56.82	1.168	0.02	84.095	A	0.000	84.095	84.095	100.00	0.000	2.877
					B	0.000	84.095		100.00	0.000	0.000
					C	0.000	84.095		100.00	0.000	0.000
L7 42.41-0.00	20.42	1	0.02	144.810	A	0.000	144.810	144.810	100.00	0.000	6.196
					B	0.000	144.810		100.00	0.000	0.000
					C	0.000	144.810		100.00	0.000	0.000
									100.00	0.000	0.002

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_z	q_z ksf	t_z in	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 150.00-123.42	136.00	1.499	0.01	0.8889	43.520	A	0.000	43.520	43.520	100.00	0.000	0.000
						B	0.000	43.520		100.00	0.000	0.000
						C	0.000	43.520		100.00	0.000	0.000
L2 123.42-105.25	114.07	1.425	0.01	0.8704	36.437	A	0.000	36.437	36.437	100.00	0.000	0.000
						B	0.000	36.437		100.00	0.000	0.000
						C	0.000	36.437		100.00	0.000	0.000
L3 105.25-101.90	103.57	1.386	0.01	0.8603	7.341	A	0.000	7.341	7.341	100.00	0.000	0.507
						B	0.000	7.341		100.00	0.000	0.000
						C	0.000	7.341		100.00	0.000	0.000
										100.00	0.000	1.338

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L4 101.90-85.96	93.76	1.348	0.00	0.8501	37.626	A	0.000	37.626	37.626	100.00	0.000	0.000
						B	0.000	37.626		100.00	0.000	0.000
						C	0.000	37.626		100.00	0.000	6.332
L5 85.96-72.15	78.94	1.283	0.00	0.8327	35.631	A	0.000	35.631	35.631	100.00	0.000	0.000
						B	0.000	35.631		100.00	0.000	0.000
						C	0.000	35.631		100.00	0.000	5.486
L6 72.15-42.41	56.82	1.168	0.00	0.8005	88.063	A	0.000	88.063	88.063	100.00	0.000	0.000
						B	0.000	88.063		100.00	0.000	0.000
						C	0.000	88.063		100.00	0.000	11.486
L7 42.41-0.00	20.42	1	0.00	0.7500	150.468	A	0.000	150.468	150.468	100.00	0.000	0.000
						B	0.000	150.468		100.00	0.000	0.000
						C	0.000	150.468		100.00	0.000	0.004

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 150.00-123.42	136.00	1.499	0.01	39.582	A	0.000	39.582	39.582	100.00	0.000	0.000
					B	0.000	39.582		100.00	0.000	0.000
					C	0.000	39.582		100.00	0.000	0.000
L2 123.42-105.25	114.07	1.425	0.01	33.745	A	0.000	33.745	33.745	100.00	0.000	0.000
					B	0.000	33.745		100.00	0.000	0.000
					C	0.000	33.745		100.00	0.000	0.260
L3 105.25-101.90	103.57	1.386	0.01	6.860	A	0.000	6.860	6.860	100.00	0.000	0.000
					B	0.000	6.860		100.00	0.000	0.000
					C	0.000	6.860		100.00	0.000	0.698
L4 101.90-85.96	93.76	1.348	0.01	35.367	A	0.000	35.367	35.367	100.00	0.000	0.000
					B	0.000	35.367		100.00	0.000	0.000
					C	0.000	35.367		100.00	0.000	3.321
L5 85.96-72.15	78.94	1.283	0.01	33.674	A	0.000	33.674	33.674	100.00	0.000	0.000
					B	0.000	33.674		100.00	0.000	0.000
					C	0.000	33.674		100.00	0.000	2.877
L6 72.15-42.41	56.82	1.168	0.01	84.095	A	0.000	84.095	84.095	100.00	0.000	0.000
					B	0.000	84.095		100.00	0.000	0.000
					C	0.000	84.095		100.00	0.000	6.196
L7 42.41-0.00	20.42	1	0.01	144.810	A	0.000	144.810	144.810	100.00	0.000	0.000
					B	0.000	144.810		100.00	0.000	0.000
					C	0.000	144.810		100.00	0.000	0.002

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 123.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-11.23	-0.04	0.02
			Max. Mx	5	-4.97	-131.65	-0.00
			Max. My	2	-4.97	0.00	131.65
			Max. Vy	5	11.61	-131.65	-0.00
			Max. Vx	2	-11.61	0.00	131.65
			Max. Torque	7			0.07
L2	123.42 - 105.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-15.91	-0.04	0.02
			Max. Mx	5	-7.93	-415.08	-0.00
			Max. My	2	-7.93	0.00	415.08
			Max. Vy	5	14.76	-415.08	-0.00
			Max. Vx	2	-14.76	0.00	415.08
			Max. Torque	7			0.07
L3	105.25 - 101.9	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-16.35	-0.04	0.02
			Max. Mx	5	-8.33	-464.86	-0.00
			Max. My	2	-8.33	0.00	464.86
			Max. Vy	5	14.98	-464.86	-0.00
			Max. Vx	2	-14.98	0.00	464.86
			Max. Torque	7			0.06
L4	101.9 - 85.96	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18.09	-0.04	0.02
			Max. Mx	5	-9.88	-647.15	0.00
			Max. My	2	-9.88	-0.00	647.15
			Max. Vy	5	15.78	-647.15	0.00
			Max. Vx	2	-15.78	-0.00	647.15
			Max. Torque	7			0.06
L5	85.96 - 72.15	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-21.62	-0.05	0.03
			Max. Mx	5	-12.93	-941.47	-0.00
			Max. My	2	-12.93	0.00	941.47
			Max. Vy	5	17.14	-941.47	-0.00
			Max. Vx	2	-17.14	0.00	941.47
			Max. Torque	7			0.06
L6	72.15 - 42.41	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	14	-26.27	-0.00	0.00
			Max. Mx	5	-17.12	-1381.51	-0.04
			Max. My	2	-17.12	0.04	1381.56
			Max. Vy	11	-18.72	1381.51	0.04
			Max. Vx	8	18.72	-0.04	-1381.55
			Max. Torque	7			0.06
L7	42.41 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-38.47	0.11	-0.06
			Max. Mx	11	-28.01	2336.54	0.10
			Max. My	8	-28.01	-0.09	-2336.66
			Max. Vy	11	-21.34	2336.54	0.10
			Max. Vx	8	21.35	-0.09	-2336.66
			Max. Torque	26			0.01

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	24	38.47	5.15	0.00
	Max. H_x	11	28.03	21.32	0.00
	Max. H_z	2	28.03	0.00	21.32
	Max. M_x	2	2336.65	0.00	21.32
	Max. M_z	5	2336.53	-21.32	-0.00
	Max. Torsion	26	0.01	2.58	4.46
	Min. Vert	1	28.03	0.00	0.00
	Min. H_x	5	28.03	-21.32	-0.00
	Min. H_z	8	28.03	-0.00	-21.32
	Min. M_x	8	-2336.66	-0.00	-21.32
	Min. M_z	11	-2336.54	21.32	0.00
	Min. Torsion	20	-0.01	-2.58	-4.46

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	28.03	0.00	0.00	0.00	0.01	0.00
Dead+Wind 0 deg - No Ice	28.03	-0.00	-21.32	-2336.65	0.11	0.01
Dead+Wind 30 deg - No Ice	28.03	10.66	-18.46	-2023.55	-1168.17	0.00
Dead+Wind 60 deg - No Ice	28.03	18.46	-10.66	-1168.24	-2023.44	-0.00
Dead+Wind 90 deg - No Ice	28.03	21.32	0.00	0.11	-2336.53	-0.00
Dead+Wind 120 deg - No Ice	28.03	18.46	10.66	1168.42	-2023.55	-0.01
Dead+Wind 150 deg - No Ice	28.03	10.66	18.46	2023.66	-1168.35	-0.01
Dead+Wind 180 deg - No Ice	28.03	0.00	21.32	2336.66	-0.09	-0.01
Dead+Wind 210 deg - No Ice	28.03	-10.66	18.46	2023.56	1168.19	-0.00
Dead+Wind 240 deg - No Ice	28.03	-18.46	10.66	1168.24	2023.46	-0.00
Dead+Wind 270 deg - No Ice	28.03	-21.32	-0.00	-0.10	2336.54	0.00
Dead+Wind 300 deg - No Ice	28.03	-18.46	-10.66	-1168.41	2023.56	0.01
Dead+Wind 330 deg - No Ice	28.03	-10.66	-18.46	-2023.65	1168.36	0.01
Dead+Ice+Temp	38.47	0.00	0.00	0.06	0.11	0.00
Dead+Wind 0 deg+Ice+Temp	38.47	-0.00	-5.15	-602.38	0.13	-0.01
Dead+Wind 30 deg+Ice+Temp	38.47	2.57	-4.46	-521.66	-301.08	-0.00
Dead+Wind 60 deg+Ice+Temp	38.47	4.46	-2.57	-301.14	-521.59	-0.00
Dead+Wind 90 deg+Ice+Temp	38.47	5.15	0.00	0.08	-602.31	0.00
Dead+Wind 120 deg+Ice+Temp	38.47	4.46	2.58	301.30	-521.61	0.01
Dead+Wind 150 deg+Ice+Temp	38.47	2.58	4.46	521.80	-301.12	0.01
Dead+Wind 180	38.47	0.00	5.15	602.50	0.08	0.01

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
deg+Ice+Temp						
Dead+Wind 210 deg+Ice+Temp	38.47	-2.57	4.46	521.78	301.30	0.00
Dead+Wind 240 deg+Ice+Temp	38.47	-4.46	2.57	301.26	521.80	-0.00
Dead+Wind 270 deg+Ice+Temp	38.47	-5.15	-0.00	0.04	602.52	-0.00
Dead+Wind 300 deg+Ice+Temp	38.47	-4.46	-2.58	-301.18	521.82	-0.01
Dead+Wind 330 deg+Ice+Temp	38.47	-2.58	-4.46	-521.68	301.33	-0.01
Dead+Wind 0 deg - Service	28.03	-0.00	-7.38	-810.74	0.04	0.00
Dead+Wind 30 deg - Service	28.03	3.69	-6.39	-702.11	-405.32	0.00
Dead+Wind 60 deg - Service	28.03	6.39	-3.69	-405.34	-702.07	-0.00
Dead+Wind 90 deg - Service	28.03	7.38	0.00	0.04	-810.70	-0.00
Dead+Wind 120 deg - Service	28.03	6.39	3.69	405.41	-702.11	-0.00
Dead+Wind 150 deg - Service	28.03	3.69	6.39	702.15	-405.38	-0.00
Dead+Wind 180 deg - Service	28.03	0.00	7.38	810.75	-0.03	-0.00
Dead+Wind 210 deg - Service	28.03	-3.69	6.39	702.12	405.33	-0.00
Dead+Wind 240 deg - Service	28.03	-6.39	3.69	405.35	702.09	-0.00
Dead+Wind 270 deg - Service	28.03	-7.38	-0.00	-0.03	810.71	0.00
Dead+Wind 300 deg - Service	28.03	-6.39	-3.69	-405.40	702.12	0.00
Dead+Wind 330 deg - Service	28.03	-3.69	-6.39	-702.15	405.39	0.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-28.03	0.00	0.00	28.03	0.00	0.000%
2	-0.00	-28.03	-21.32	0.00	28.03	21.32	0.000%
3	10.66	-28.03	-18.46	-10.66	28.03	18.46	0.000%
4	18.46	-28.03	-10.66	-18.46	28.03	10.66	0.000%
5	21.32	-28.03	0.00	-21.32	28.03	-0.00	0.000%
6	18.46	-28.03	10.66	-18.46	28.03	-10.66	0.000%
7	10.66	-28.03	18.46	-10.66	28.03	-18.46	0.000%
8	0.00	-28.03	21.32	-0.00	28.03	-21.32	0.000%
9	-10.66	-28.03	18.46	10.66	28.03	-18.46	0.000%
10	-18.46	-28.03	10.66	18.46	28.03	-10.66	0.000%
11	-21.32	-28.03	-0.00	21.32	28.03	0.00	0.000%
12	-18.46	-28.03	-10.66	18.46	28.03	10.66	0.000%
13	-10.66	-28.03	-18.46	10.66	28.03	18.46	0.000%
14	0.00	-38.47	0.00	0.00	38.47	0.00	0.000%
15	-0.00	-38.47	-5.15	0.00	38.47	5.15	0.000%
16	2.57	-38.47	-4.46	-2.57	38.47	4.46	0.000%
17	4.46	-38.47	-2.57	-4.46	38.47	2.57	0.000%
18	5.15	-38.47	0.00	-5.15	38.47	-0.00	0.000%
19	4.46	-38.47	2.58	-4.46	38.47	-2.58	0.000%
20	2.58	-38.47	4.46	-2.58	38.47	-4.46	0.000%
21	0.00	-38.47	5.15	-0.00	38.47	-5.15	0.000%
22	-2.57	-38.47	4.46	2.57	38.47	-4.46	0.000%
23	-4.46	-38.47	2.57	4.46	38.47	-2.57	0.000%
24	-5.15	-38.47	-0.00	5.15	38.47	0.00	0.000%
25	-4.46	-38.47	-2.58	4.46	38.47	2.58	0.000%
26	-2.58	-38.47	-4.46	2.58	38.47	4.46	0.000%
27	-0.00	-28.03	-7.38	0.00	28.03	7.38	0.000%
28	3.69	-28.03	-6.39	-3.69	28.03	6.39	0.000%
29	6.39	-28.03	-3.69	-6.39	28.03	3.69	0.000%
30	7.38	-28.03	0.00	-7.38	28.03	-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
31	6.39	-28.03	3.69	-6.39	28.03	-3.69	0.000%
32	3.69	-28.03	6.39	-3.69	28.03	-6.39	0.000%
33	0.00	-28.03	7.38	-0.00	28.03	-7.38	0.000%
34	-3.69	-28.03	6.39	3.69	28.03	-6.39	0.000%
35	-6.39	-28.03	3.69	6.39	28.03	-3.69	0.000%
36	-7.38	-28.03	-0.00	7.38	28.03	0.00	0.000%
37	-6.39	-28.03	-3.69	6.39	28.03	3.69	0.000%
38	-3.69	-28.03	-6.39	3.69	28.03	6.39	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	5	0.00000001	0.00003250
3	Yes	6	0.00000001	0.00048679
4	Yes	6	0.00000001	0.00048659
5	Yes	5	0.00000001	0.00003149
6	Yes	6	0.00000001	0.00048625
7	Yes	6	0.00000001	0.00048703
8	Yes	5	0.00000001	0.00003294
9	Yes	6	0.00000001	0.00048637
10	Yes	6	0.00000001	0.00048659
11	Yes	5	0.00000001	0.00003175
12	Yes	6	0.00000001	0.00048698
13	Yes	6	0.00000001	0.00048619
14	Yes	4	0.00000001	0.00000001
15	Yes	6	0.00000001	0.00013473
16	Yes	6	0.00000001	0.00023877
17	Yes	6	0.00000001	0.00023873
18	Yes	6	0.00000001	0.00013473
19	Yes	6	0.00000001	0.00023867
20	Yes	6	0.00000001	0.00023879
21	Yes	6	0.00000001	0.00013472
22	Yes	6	0.00000001	0.00023863
23	Yes	6	0.00000001	0.00023866
24	Yes	6	0.00000001	0.00013472
25	Yes	6	0.00000001	0.00023876
26	Yes	6	0.00000001	0.00023864
27	Yes	4	0.00000001	0.00048132
28	Yes	5	0.00000001	0.00089380
29	Yes	5	0.00000001	0.00089313
30	Yes	4	0.00000001	0.00048035
31	Yes	5	0.00000001	0.00089207
32	Yes	5	0.00000001	0.00089456
33	Yes	4	0.00000001	0.00048145
34	Yes	5	0.00000001	0.00089241
35	Yes	5	0.00000001	0.00089307
36	Yes	4	0.00000001	0.00048041
37	Yes	5	0.00000001	0.00089437
38	Yes	5	0.00000001	0.00089188

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 123.42	48.86	27	3.04	0.00
L2	126.59 - 105.25	34.40	27	2.78	0.00
L3	105.25 - 101.9	22.96	27	2.27	0.00
L4	101.9 - 85.96	21.40	27	2.18	0.00
L5	90.04 - 72.15	16.39	27	1.86	0.00
L6	72.15 - 42.41	10.13	33	1.44	0.00
L7	47.58 - 0	4.27	32	0.85	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
150.00	(2) DB980H90E-M w/ Mount Pipe	27	48.86	3.04	0.00	14193
137.00	(2) DU04-8670 w/Mount Pipe	27	40.69	2.92	0.00	5458
127.00	Platform Mount [LP 712-1]	27	34.64	2.79	0.00	3114
117.00	Sector Mount [SM 402-3]	27	28.97	2.58	0.00	2392
75.00	Side Arm Mount [SO 701-1]	33	11.02	1.51	0.00	2302

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	150 - 123.42	140.22	2	8.74	0.00
L2	126.59 - 105.25	98.82	2	7.98	0.00
L3	105.25 - 101.9	66.03	2	6.54	0.00
L4	101.9 - 85.96	61.55	2	6.26	0.00
L5	90.04 - 72.15	47.14	2	5.35	0.00
L6	72.15 - 42.41	29.17	8	4.15	0.00
L7	47.58 - 0	12.31	8	2.44	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
150.00	(2) DB980H90E-M w/ Mount Pipe	2	140.22	8.74	0.00	5153
137.00	(2) DU04-8670 w/Mount Pipe	2	116.83	8.40	0.00	1980
127.00	Platform Mount [LP 712-1]	2	99.51	8.00	0.00	1126
117.00	Sector Mount [SM 402-3]	2	83.26	7.42	0.00	860
75.00	Side Arm Mount [SO 701-1]	8	31.73	4.34	0.00	809

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
L1	150 - 123.42 (1)	TP20.74x15x0.1875	26.58	0.00	0.0	39.00	11.8239	-4.97	461.13	0.011
L2	123.42 - 105.25 (2)	TP24.2182x19.6804x0.25	21.34	0.00	0.0	39.00	19.0187	-7.93	741.73	0.011
L3	105.25 - 101.9 (3)	TP24.9305x24.2182x0.265 1	3.35	0.00	0.0	39.00	20.7503	-8.33	809.26	0.010
L4	101.9 - 85.96 (4)	TP28.32x24.9305x0.2917	15.94	0.00	0.0	39.00	25.1435	-9.88	980.60	0.010
L5	85.96 - 72.15 (5)	TP30.7639x26.8691x0.319 8	17.89	0.00	0.0	39.00	30.9002	-12.93	1205.11	0.011
L6	72.15 - 42.41 (6)	TP37.1x30.7639x0.3268	29.74	0.00	0.0	39.00	36.9976	-17.12	1442.91	0.012
L7	42.41 - 0 (7)	TP45.5x35.345x0.375	47.58	0.00	0.0	39.00	49.7408	-24.45	1939.89	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	150 - 123.42 (1)	TP20.74x15x0.1875	131.65	27.30	39.00	0.700	0.00	0.00	39.00	0.000
L2	123.42 - 105.25 (2)	TP24.2182x19.6804x0.25	415.08	44.39	39.00	1.138	0.00	0.00	39.00	0.000
L3	105.25 - 101.9 (3)	TP24.9305x24.2182x0.2651	464.86	44.30	39.00	1.136	0.00	0.00	39.00	0.000
L4	101.9 - 85.96 (4)	TP28.32x24.9305x0.2917	647.15	46.21	39.00	1.185	0.00	0.00	39.00	0.000
L5	85.96 - 72.15 (5)	TP30.7639x26.8691x0.3198	941.48	48.80	39.00	1.251	0.00	0.00	39.00	0.000
L6	72.15 - 42.41 (6)	TP37.1x30.7639x0.3268	1381.58	50.97	39.00	1.307	0.00	0.00	39.00	0.000
L7	42.41 - 0 (7)	TP45.5x35.345x0.375	2010.07	47.08	39.00	1.207	0.00	0.00	39.00	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	150 - 123.42 (1)	TP20.74x15x0.1875	11.61	0.98	26.00	0.076	0.03	0.00	26.00	0.000
L2	123.42 - 105.25 (2)	TP24.2182x19.6804x0.25	14.76	0.78	26.00	0.060	0.03	0.00	26.00	0.000
L3	105.25 - 101.9 (3)	TP24.9305x24.2182x0.2651	14.98	0.72	26.00	0.056	0.03	0.00	26.00	0.000
L4	101.9 - 85.96 (4)	TP28.32x24.9305x0.2917	15.78	0.63	26.00	0.048	0.02	0.00	26.00	0.000
L5	85.96 - 72.15 (5)	TP30.7639x26.8691x0.3198	17.15	0.55	26.00	0.043	0.05	0.00	26.00	0.000
L6	72.15 - 42.41 (6)	TP37.1x30.7639x0.3268	18.72	0.51	26.00	0.039	0.02	0.00	26.00	0.000
L7	42.41 - 0 (7)	TP45.5x35.345x0.375	20.64	0.41	26.00	0.032	0.01	0.00	26.00	0.000

Pole Interaction Design Data

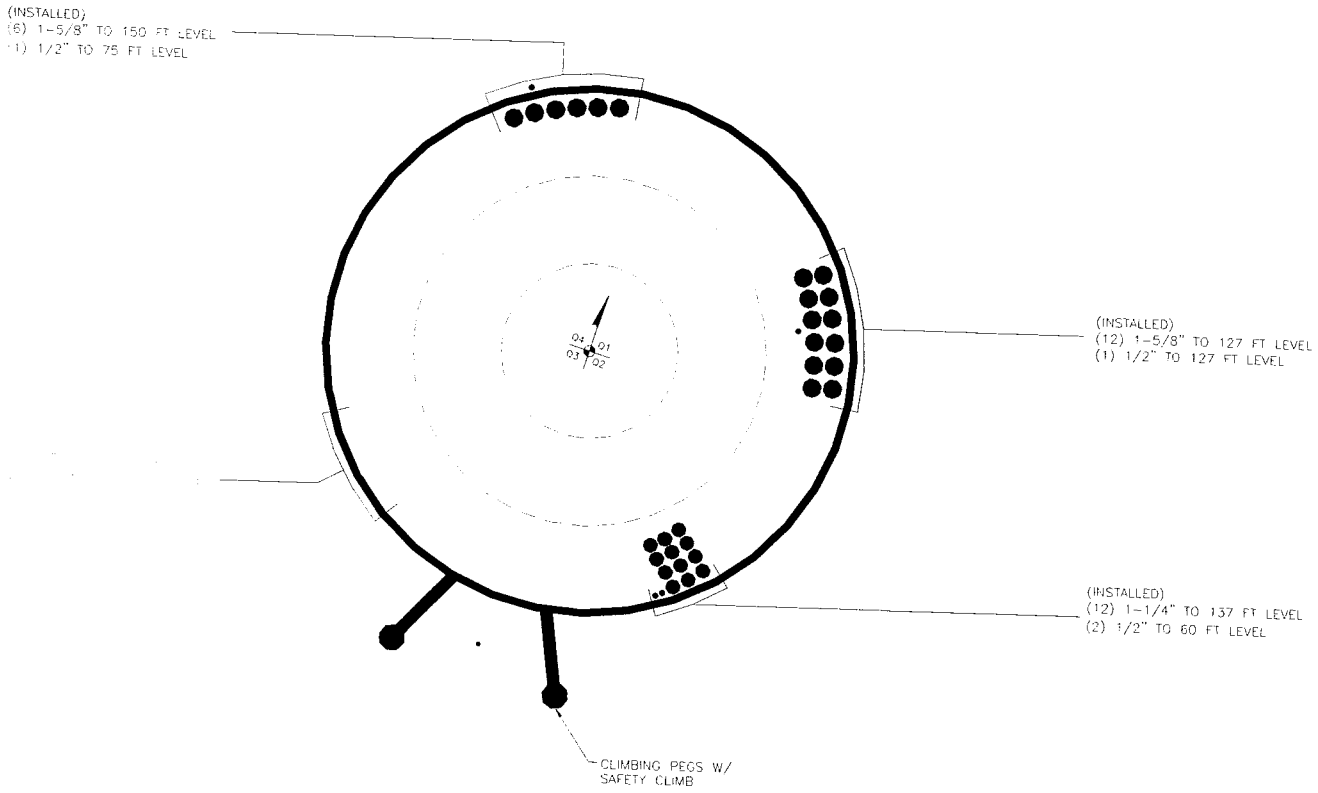
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 123.42 (1)	0.011	0.700	0.000	0.076	0.000	0.712 ✓	1.333	H1-3+VT ✓
L2	123.42 - 105.25 (2)	0.011	1.138	0.000	0.060	0.000	1.150 ✓	1.333	H1-3+VT ✓
L3	105.25 - 101.9 (3)	0.010	1.136	0.000	0.056	0.000	1.147 ✓	1.333	H1-3+VT ✓
L4	101.9 - 85.96 (4)	0.010	1.185	0.000	0.048	0.000	1.196 ✓	1.333	H1-3+VT ✓
L5	85.96 - 72.15 (5)	0.011	1.251	0.000	0.043	0.000	1.262 ✓	1.333	H1-3+VT ✓
L6	72.15 - 42.41 (6)	0.012	1.307	0.000	0.039	0.000	1.319 ✓	1.333	H1-3+VT ✓
L7	42.41 - 0 (7)	0.013	1.207	0.000	0.032	0.000	1.220 ✓	1.333	H1-3+VT ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	150 - 123.42	Pole	TP20.74x15x0.1875	1	-4.97	614.69	53.4	Pass
L2	123.42 - 105.25	Pole	TP24.2182x19.6804x0.25	2	-7.93	988.73	86.3	Pass
L3	105.25 - 101.9	Pole	TP24.9305x24.2182x0.2651	3	-8.33	1078.74	86.0	Pass
L4	101.9 - 85.96	Pole	TP28.32x24.9305x0.2917	4	-9.88	1307.14	89.7	Pass
L5	85.96 - 72.15	Pole	TP30.7639x26.8691x0.3198	5	-12.93	1606.41	94.7	Pass
L6	72.15 - 42.41	Pole	TP37.1x30.7639x0.3268	6	-17.12	1923.40	99.0	Pass
L7	42.41 - 0	Pole	TP45.5x35.345x0.375	7	-24.45	2585.87	91.5	Pass
							Summary	
						Pole (L6)	99.0	Pass
						RATING =	**99.0**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



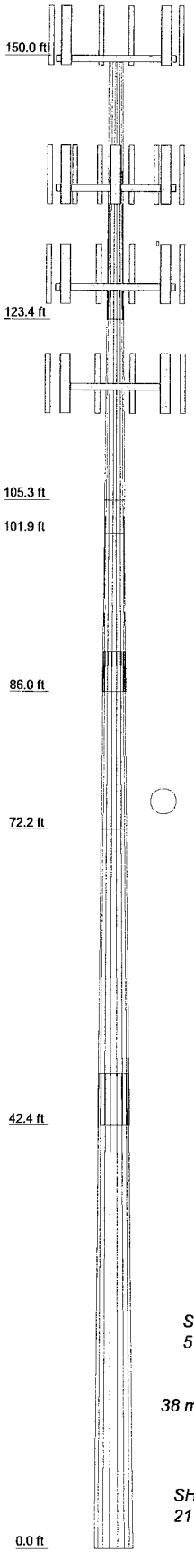
APPENDIX C

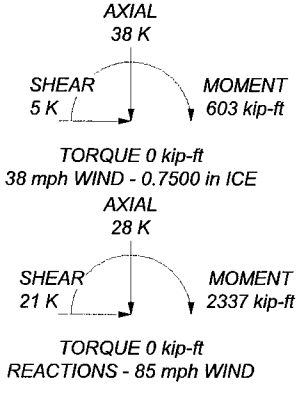
ADDITIONAL CALCULATIONS

Program Version 5.4.2.0 - 6/17/2010 File:G:/TOWER/375_Crown_Castle/2011/37511-1194 BU 876362/WO 420669 BU 876362/37511-1194_rev 1_LC5.eri

Section	1	2	3	4	5	6	7
Length (ft)	26.58	21.34	3.35	15.84	17.89	29.74	47.58
Number of Sides	18	18	18	18	18	18	18
Thickness (in)	0.1875	0.2500	0.2651	0.2917	0.3198	0.3268	0.3750
Socket Length (ft)	3.17			4.08		5.17	
Top Dia (in)	15.0000	19.6804	24.2182	24.9305	26.8691	30.7639	35.3450
Bot Dia (in)	20.7400	24.2182	24.9305	28.3200	30.7639	37.1000	45.5000
Grade	A572-65				65 ksi (w/ Reinf.)		A572-65
Weight (K)	1.0	1.3	0.2	1.3	1.8	3.5	7.7

16.6





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) DB980H90E-M w/ Mount Pipe	150	(2) DD1900 FULL BAND w/850 BY-PASS MASTHEAD	137
(2) DB980H90E-M w/ Mount Pipe	150	Platform Mount [LP 401-1]	137
(2) DB980H90E-M w/ Mount Pipe	150	(2) DB844H90E-XY w/Mount Pipe	127
6' x 2.375" Pipe Mount	150	(2) DB844H90E-XY w/Mount Pipe	127
6' x 2.375" Pipe Mount	150	(2) DB844H90E-XY w/Mount Pipe	127
6' x 2.375" Pipe Mount	150	(2) 948F85T2E-M w/ Mount Pipe	127
Platform Mount [LP 601-1]	150	(2) 948F85T2E-M w/ Mount Pipe	127
(2) DU04-8670 w/Mount Pipe	137	(2) 948F85T2E-M w/ Mount Pipe	127
(2) DU04-8670 w/Mount Pipe	137	GPS_A	127
(2) DU04-8670 w/Mount Pipe	137	Platform Mount [LP 712-1]	127
7770.00 w/ Mount Pipe	137	(2) ATM200-A20	117
7770.00 w/ Mount Pipe	137	(2) ATM200-A20	117
7770.00 w/ Mount Pipe	137	Sector Mount [SM 402-3]	117
(2) LGP21901	137	(2) HBX-6516DS-VTM w/ Mount Pipe	117
(2) LGP21901	137	(2) HBX-6516DS-VTM w/ Mount Pipe	117
(2) LGP21901	137	(2) HBX-6516DS-VTM w/ Mount Pipe	117
(2) DD1900 FULL BAND w/850 BY-PASS MASTHEAD	137	(2) ATM200-A20	117
(2) DD1900 FULL BAND w/850 BY-PASS MASTHEAD	137	OG-860/1920/GPS-A	75
		Side Arm Mount [SO 701-1]	75

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	65 ksi (w/ Reinf.)	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 99%

Paul J Ford and Company
250 E. Broad Street, Suite 1500
Columbus, OH 43215
Phone: 614.221.6679
FAX: 314.448.4105

Job: *150' MP; Oxford, CT; Oxford/ Fritz Propei*			
Project: *PJF 37511-1194 (BU 876362)*			
Client: Crown Castle	Drawn by: Corey McCartney	App'd:	
Code: TIA/EIA-222-F	Date: 07/05/11	Scale: NTS	
Path: G:\TOWERS\375_Crown_Castle\2011\37511-1194 BU 876362\WO 420688 BU 876362 37511-1194 rev 1 LCS.eri		Dwg No. E-	

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

TIA Rev F

Site Data

BU#: *876362*
Site Name: *Oxford / Fritz Property*
App #:

Pole Manufacturer:	*Other*

Reactions		
Moment:	2337	ft-kips
Axial:	28	kips
Shear:	21	kips

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

Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	54	in

Plate Data		
Diam:	60	in
Thick:	1.75	in
Grade:	60	ksi
Single-Rod B-eff:	12.03	in

Stiffener Data (Welding at both sides)		
Config:	3	*
Weld Type:	Both	
Groove Depth:	0.25	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	6.75	in
Height:	13.75	in
Thick:	0.5	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	80	ksi
Clear Space between Stiffeners (b):	5.5	in

Pole Data		
Diam:	45.5	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Anchor Rod Results

		Stiffened
Maximum Rod Tension:	170.8 Kips	Service, ASD
Allowable Tension:	195.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	87.6% Pass	

Base Plate Results

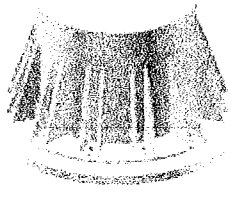
	Shear Check Only	Stiffened
Base Plate Stress:	7.4 ksi	Service, ASD
Allowable Plate Stress:	32.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	23.2% Pass	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	53.9% Pass
Vertical Weld:	33.0% Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	28.2% Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	56.6% Pass
Plate Comp. (AISC Bracket):	72.7% Pass

Pole Results

Pole Punching Shear Check:	13.2% Pass



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

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

PJF job no. **37511-1194** Project name **150' MP**

Foundation Loads:

Pole weight or tower leg compression =	**28**	(kips)
Horizontal load at top of pier =	**21**	(kips)
Overturning moment at top of pier=	**2337**	(ft-kips)

Design criteria:

Safety factor against overturning =	**1.5**	

Soil Properties:

Soil density =	**100**	(pcf)
Allowable soil bearing =	**8**	(ksf)
Depth to water table =	**99**	(ft)

Dimensions:

Pier shape (round or square)	**S**	("R" or "S")
Pier width =	**6**	(ft)
Pier height above grade =	**1**	(ft)
depth to bottom of footing =	**5**	(ft)
Footing thickness =	**4.5**	(ft)
Footing width =	**22.75**	(ft)
Footing length =	**22.75**	(ft)

Concrete:

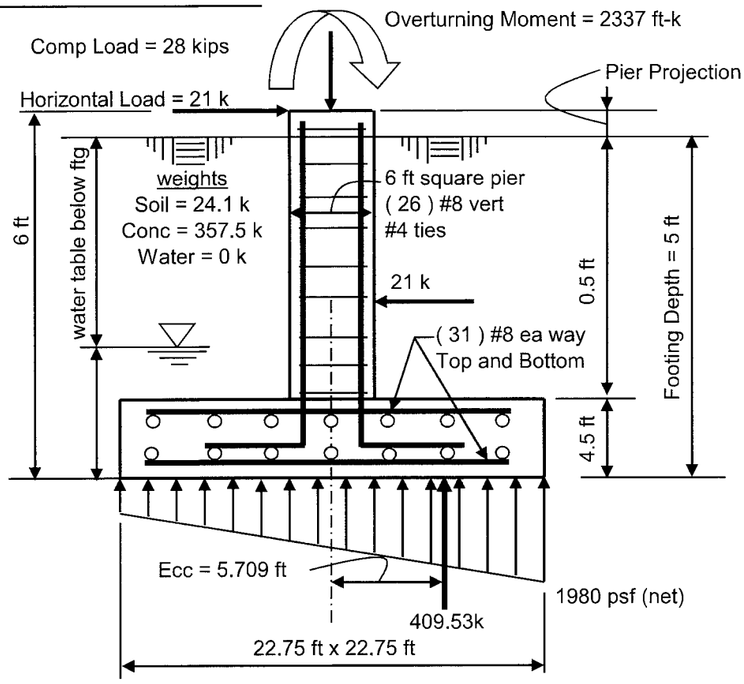
Concrete strength =	**4**	(ksi)
Rebar strength =	**60**	(ksi)
ultimate load factor =	**1.3**	

Reinforcing Steel:

	Pad	
minimum cover over rebar =	**3**	inches
size of pad rebar =	**#8**	bar
quantity of pad rebar =	**31**	(ea direction)

Reinforcing Steel:

	Pier	
size of vert rebar in pier=	**#8**	bar
vertical rebar quantity =	**26**	
size of pier ties =	**#4**	bar
minimum cover over rebar =	**4.5**	inches
Total volume of concrete =	88.3	cu yd



Summary of analysis results	
Maximum Net Soil Bearing = 1.98 ksf Allowable Net Soil Bearing = 8 ksf **Soil Bearing Stress Ratio = 0.25 Okay**	Ult Bending Shear Capacity = 126 psi Ult Bending Shear Stress = 16 psi **Bending Shear Stress Ratio = 0.13 Okay**
Ftg Overturning Resistance = 4658 ft-kips Overturning Moment = 2338 ft-kips Required Overturning Safety Factor = 1.5 Overturning Safety Factor = 1.992 **Ratio = 0.75 Okay**	Pad Bending Moment Capacity= 5368 ft-k Pad Bending Moment = 1084 ft-k **Bending Moment Stress Ratio = 0.2 OK**

General Information:
==========

File Name: G:\TOWER\375_Crown_Castle\2011\37511-1194 BU 876362\WO 420669 BU 876362\37511-1194.col
Project: 37511-1194
Column: Engineer: CMM
Code: ACI 318-08 Units: English

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

Material Properties:
==========

f'c = 4 ksi fy = 60 ksi
Ec = 3605 ksi Es = 29000 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.85

Section:
==========

Rectangular: Width = 72 in Depth = 72 in

Gross section area, Ag = 5184 in^2
Ix = 2.23949e+006 in^4 Iy = 2.23949e+006 in^4
rx = 20.7846 in ry = 20.7846 in
Xo = 0 in Yo = 0 in

Reinforcement:
==========

Bar Set: ASTM A615

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

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

Layout: Circular
Pattern: All Sides Equal (Cover to transverse reinforcement)
Total steel area: As = 20.54 in^2 at rho = 0.40% (Note: rho < 0.50%)
Minimum clear spacing = 6.35 in

26 #8 Cover = 4.5 in

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

No.	Pu kip	Mux k-ft	PhiMnx k-ft	PhiMn/Mu	NA depth in	Dt depth in	eps_t	Phi
1	28.00	3079.05	3154.93	1.025	5.47	66.50	0.03347	0.900

*** End of output ***

metroPCS
Communications, Inc.

January 23, 2012

Robert Stein, Chairman
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: MetroPCS Connecticut Siting Council ("CSC") Approved Sites Complete

Dear Mr. Stein:

The following is written confirmation as requested that certain MetroPCS Massachusetts, LLC ("MetroPCS") installations have been completed.

TS-METROPCS-033-110720MA-	160 West Street, Cromwell CT	(HFC0212A)
TS-METROPCS-078-110622-	1725 Strafford Road, Mansfield CT	(HFC1246A)
TS-METROPCS-003-110622-	33 Janowski Road, Ashford CT	(HFC1248A)
TS-METROPCS-043-110713MA-	148 Roberts Street, East Hartford CT	(HFC1287B)
TS-METROPCS-110-110713MA-	10 Sparks Street, Plainville, CT	(HFC1548A)
TS-METROPCS-049-110713MA-	4 Oliver Road, Enfield CT	(HFC1552A)
TS-METROPCS-131-110720MA-	1394 Rt 322, Southington CT	(NHC0027A)
TS-METROPCS-108-110720MA-	338 Oxford Road, Oxford CT	(NHC0246B)
EM-METROPCS-101-110801-	50 Devine Street, North Haven CT	(NHC0455B)

I have attached for your reference copies of the approvals.

Please feel free to contact me if you have any questions.

Thank you,

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