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

April 15, 2011

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103

RE: **EM-VER-107-100107** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at Grassy Hill Road, Orange, Connecticut.

Dear Attorney Baldwin:

In addition to the Connecticut Siting Council (Council) acknowledgement dated February 19, 2010 (filing dated January 7, 2010), 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 March 14, 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

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable James M. Zeoli, First Selectman, Town of Orange
Paul Dinice, Zoning Enforcement Officer, Town of Orange
Crown Castle USA, Inc.

ROBINSON & COLE LLP

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
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kbaldwin@rc.com
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March 14, 2011

Michael Perrone
Siting Analyst
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Cellco Partnership d/b/a Verizon Wireless**
EM-VER-107-100107 – Grassy Hill Road, Orange, Connecticut

Dear Mr. Perrone:

On February 19, 2010, the Siting Council acknowledged receipt of Cellco's notice of intent to modify the above-referenced telecommunications facility This modification involved the removal of six (6) of Cellco's existing PCS antennas, replacing them with three (3) new PCS antennas and three (3) new LTE antennas.

In addition to the antenna modifications, Cellco now intends to install six (6) coax cable diplexers on its antenna mounting platform. Attached to this letter is an updated Structural Analysis Report for the previously approved antenna modifications including the coax diplexers and a copy of the diplexer specifications. This analysis confirms that the tower can support all of Cellco's proposed modifications.

If you have any questions regarding any of these materials, please do not hesitate to contact me or Rachel Mayo.

Sincerely,

Kenneth C. Baldwin

Attachment
Copy to:
Sandy M. Carter
Brian Ragozzine
Mark Gauger

10959209-v1

Date: **March 09, 2011**

Veronica Harris
Crown Castle USA Inc.
1200 McArthur Boulevard
Mahwah, NJ 07430
(201) 236-9094

Vertical Structures, Inc.
309 Spangler Drive, Suite E
Richmond, KY 40475
(859) 624-8360
amathis@verticalstructures.com

Subject: **Structural Analysis Report**

Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	N/A
	Carrier Site Name:	orange 3
Crown Castle Designation:	**Crown Castle BU Number:**	881541
	Crown Castle Site Name:	Rogers Property
	Crown Castle JDE Job Number:	150590
	Crown Castle Work Order Number:	391690
Engineering Firm Designation:	**Vertical Structures, Inc. Project Number:**	2011-004-012
Site Data:	**Grassy Hill Road, Orange, CT, New Haven County** **Latitude *41° 17' 7.75"*, Longitude *-73° 2' 33.27"*** **139.5 Foot - Monopole Tower**	

Dear Veronica Harris,

Vertical Structures, Inc. 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 406618, in accordance with application 118103, 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:

LC1: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and local code requirements based upon a wind speed of 85 mph fastest mile.

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 *Vertical Structures, Inc.* 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:

Andrew Mathis
Project Engineer

RISA Tower Report - version 5.4.2.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 139.5 ft Monopole tower designed by EEI in 2004. 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 85 mph with no ice and 50 mph under service loads. Also, per Crown Castle's direction and in accordance with ASCE-7-05 we have considered a fastest mile wind speed of 38 mph with an escalating 0.75 inch ice thickness.

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
118	118	6	celwave	FD9R6004/2C-3L Diplexer			

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
					6	1 5/8	1
136	136	3	powerwave technologies	7770.00 w/ mount pipe			2
		6	powerwave technologies	LGP21401 TMA			
		3	argus technologies	LLPX310R w/ Mount Pipe			
	132	2	dragonwave	A-ANT-23G-2-C	4	1/2	1
		3	samsung telecommunications	FDD_R6_RRH TMA	3	5/16	
130					6	1 5/8	4
		1		12' (4" Tube) T-Arm (3)			
	130	6	css	CSS-XS4-65-R w/ Mount Pipe	6	1 5/8	1
		9	ems wireless	FV65-14-00NA2 w/Mount Pipe	9	1 5/8	3
		1		T-Arm Mount [TA 602-3]			
		6	decibel	DB846F65ZAXY w/Mount Pipe			
118	118	3	powerwave technologies	P65.16.XL.2 w/ Mount Pipe	12	1 5/8	1
		3	rymsa	MG D3-800Tx w/ Mount Pipe			
		3	ems wireless	RR90-17-02DP w/ Mount Pipe			
	109	6	ericsson	KRY 112 71 TMA			
108		3	rfs	APXV18-206516S-C-A20 w/ Mount Pipe	12	1 5/8	1
		3	rfs	ATMAA1412D-1A20 TMA			
	108	1		T-Arm Mount [TA 602-3]			
100	100	3	kathrein	742 213 w/ Mount Pipe	6	1 5/8	1
	77	1	lucent	KS24019-L112A			
75	75	1		Side Arm Mount [SO 701-1]	1	1/2	1

Notes:
1) Existing Equipment
2) Reserved Equipment
3) MLA Equipment Controlling
4) Abandoned Equipment

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
140	140	1	eei	Low Profile Platform		
		12	dapa	48000		
130	130	1	eei	Low Profile Platform		
		12	dapa	48000		
120	120	1	eei	Low Profile Platform		
		12	dapa	48000		
110	110	1	eei	Low Profile Platform		
		12	dapa	48000		
100	100	1	eei	Low Profile Platform		
		12	dapa	48000		
75	75	1		GPS		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	Verizon Wireless Co-Locate Revision #1	118103	CCI iSite
Tower Drawing	EEI Drawing No. GS55077	2207700	CCI iSite
Foundation Drawing	EEI Drawing No. 12364-140	2208511	CCI iSite
Geotechnical Report	Clarence Welti Assoc., Inc. Report Dated 'February 16, 2004'	2245154	CCI iSite

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. Crown Castle's CCIplate 1.3 analysis tool was used to evaluate the anchor bolts, base plate, and any flange splices.

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. Vertical Structures, Inc. 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 (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
L1	139.5 - 93.04	Pole	TP26.99x15.5x0.25	1	-6872.26	1063078.12	70.2	Pass
L2	93.04 - 46.38	Pole	TP37.91x25.5205x0.375	2	-15505.10	2242999.02	72.9	Pass
L3	46.38 - 0	Pole	TP48.5x35.874x0.375	3	-26789.90	2867042.94	79.4	Pass
							Summary	
						Pole (L3)	79.4	Pass
						Rating =	79.4	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	61.5	Pass
1	Base Plate	0	83.4	Pass
	Base Foundation (Compared w/ Design Loads)	0	90.2	Pass

Structure Rating (max from all components) =	90.2%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity.
2) Capacities up to 105% are considered acceptable based on analysis methods used.

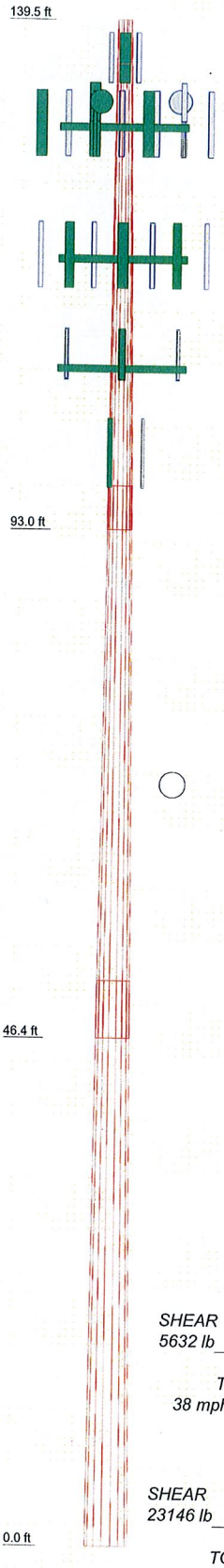
4.1) Recommendations

N/A

APPENDIX A

RISA TOWER OUTPUT

Section	1	2	3
Length (ft)	46.46	50.58	51.63
Number of Sides	18	18	18
Thickness (in)	0.2500	0.3750	0.3750
Socket Length (ft)	3.92	5.25	
Top Dia (in)	15.5000	25.5205	35.8740
Bot Dia (in)	26.9900	37.9100	48.5000
Grade		A572-65	
Weight (lb)	2633.8	6420.3	8743.3



DESIGNED APPURTENANCE LOADING

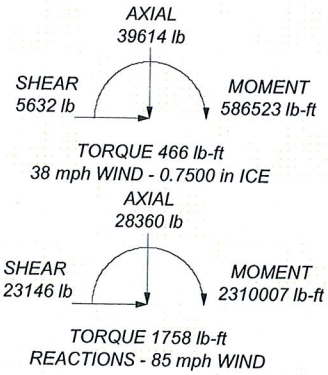
TYPE	ELEVATION	TYPE	ELEVATION
7770.00 w/ mount pipe	136	(2) FD9R6004/2C-3L Diplexer (Verizon Wireless)	118
7770.00 w/ mount pipe	136	(2) FD9R6004/2C-3L Diplexer (Verizon Wireless)	118
7770.00 w/ mount pipe	136	(2) FD9R6004/2C-3L Diplexer (Verizon Wireless)	118
(2) LGP21401 TMA (VSI)	136	T-Arm Mount [TA 602-3] (Verizon Wireless)	118
(2) LGP21401 TMA (VSI)	136	(2) DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	118
(2) LGP21401 TMA (VSI)	136	RR90-17-02DP w/ Mount Pipe	108
12' (4" Tube) T-Arm (3)	130	RR90-17-02DP w/ Mount Pipe	108
(3) FV65-14-00NA2 w/Mount Pipe	130	APXV18-206516S-C-A20 w/ Mount Pipe	108
(3) FV65-14-00NA2 w/Mount Pipe	130	APXV18-206516S-C-A20 w/ Mount Pipe	108
(3) FV65-14-00NA2 w/Mount Pipe	130	APXV18-206516S-C-A20 w/ Mount Pipe	108
LLPX310R w/ Mount Pipe	130	(2) KRY 112 71 TMA	108
LLPX310R w/ Mount Pipe	130	(2) KRY 112 71 TMA	108
LLPX310R w/ Mount Pipe	130	(2) KRY 112 71 TMA	108
FDD_R6_RRH TMA	130	ATMAA1412D-1A20 TMA	108
FDD_R6_RRH TMA	130	ATMAA1412D-1A20 TMA	108
FDD_R6_RRH TMA	130	ATMAA1412D-1A20 TMA	108
6'x4" Pipe Mount	130	(2) 7'x2" Antenna Mount Pipe	108
6'x4" Pipe Mount	130	(2) 7'x2" Antenna Mount Pipe	108
A-ANT-23G-2-C (VSI)	130	(2) 7'x2" Antenna Mount Pipe	108
A-ANT-23G-2-C (VSI)	130	T-Arm Mount [TA 602-3]	108
(2) DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	118	RR90-17-02DP w/ Mount Pipe	108
(2) DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	118	742 213 w/ Mount Pipe	100
MG D3-800Tx w/ Mount Pipe (Verizon Wireless)	118	742 213 w/ Mount Pipe	100
MG D3-800Tx w/ Mount Pipe (Verizon Wireless)	118	742 213 w/ Mount Pipe	100
MG D3-800Tx w/ Mount Pipe (Verizon Wireless)	118	Side Arm Mount [SO 701-1]	75
P65.16.XL.2 w/ Mount Pipe (Verizon Wireless)	118	KS24019-L112A	75
P65.16.XL.2 w/ Mount Pipe (Verizon Wireless)	118		
P65.16.XL.2 w/ Mount Pipe (Verizon Wireless)	118		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	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: 79.4%



Vertical Structures, Inc.
309 Spangler Drive, Suite E
Richmond, KY 40475
Phone: (859) 624-8360
FAX: (859) 624-8369

Job: Rogers Property, CT BU#881541			
Project: Vertical Structures Job No. 2011-004-012			
Client: Crown Castle	Drawn by: Andrew Mathis	App'd:	
Code: TIA/EIA-222-F	Date: 03/09/11	Scale: NTS	
Path: \\Nas1\amathis\Current Jobs\2011-004-012-Rogers Property, CT\RISA\881541.eri		Dwg No. E-1	

Tower Input Data

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

Tower is located in New Haven County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
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	139.50-93.04	46.46	3.92	18	15.5000	26.9900	0.2500	1.0000	A572-65 (65 ksi)
L2	93.04-46.38	50.58	5.25	18	25.5205	37.9100	0.3750	1.5000	A572-65 (65 ksi)
L3	46.38-0.00	51.63		18	35.8740	48.5000	0.3750	1.5000	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	15.7391	12.1009	355.5445	5.4138	7.8740	45.1542	711.5567	6.0516	2.2880	9.152
	27.4064	21.2182	1916.7638	9.4927	13.7109	139.7983	3836.0497	10.6111	4.3102	17.241
L2	26.8892	29.9295	2390.8862	8.9267	12.9644	184.4188	4784.9184	14.9676	3.8316	10.218
	38.4948	44.6760	7952.1562	13.3249	19.2583	412.9214	15914.7760	22.3423	6.0122	16.032
L3	37.7311	42.2527	6727.0540	12.6022	18.2240	369.1315	13462.9597	21.1304	5.6538	15.077
	49.2482	57.2808	16760.5346	17.0844	24.6380	680.2717	33543.1232	28.6458	7.8760	21.003

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 139.50-93.04				1	1	1		
L2 93.04-46.38				1	1	1		
L3 46.38-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	136.00 - 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
LDF4-50A (1/2 FOAM)	B	No	Inside Pole	132.00 - 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 FOAM)	B	No	CaAa (Out Of Face)	132.00 - 0.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.84
						1" Ice	0.00	2.14
						2" Ice	0.00	6.58
						4" Ice	0.00	22.78
9207(5/16")	B	No	Inside Pole	132.00 - 0.00	3	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
2" Rigid Conduit	B	No	CaAa (Out Of Face)	132.00 - 0.00	2	No Ice	0.10	2.80
						1/2" Ice	0.15	4.33
						1" Ice	0.20	6.47
						2" Ice	0.30	12.57
						4" Ice	0.50	32.12
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	130.00 - 0.00	9	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
561 (1-5/8 AIR) (Verizon Wireless)	B	No	Inside Pole	118.00 - 0.00	12	No Ice	0.00	1.35
						1/2" Ice	0.00	1.35

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.00	1.35
						2" Ice	0.00	1.35
						4" Ice	0.00	1.35
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	109.00 - 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
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	100.00 - 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
LDF4-50A (1/2 FOAM)	B	No	Inside Pole	77.00 - 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

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 lb
L1	139.50-93.04	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	7.792	1328.33
		C	0.000	0.000	0.000	0.000	0.00
L2	93.04-46.38	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	9.332	2320.80
		C	0.000	0.000	0.000	0.000	0.00
L3	46.38-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	9.276	2309.26
		C	0.000	0.000	0.000	0.000	0.00

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 lb
L1	139.50-93.04	A	0.871	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	14.577	1699.83
		C		0.000	0.000	0.000	0.000	0.00
L2	93.04-46.38	A	0.819	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	17.458	2765.71
		C		0.000	0.000	0.000	0.000	0.00
L3	46.38-0.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	16.876	2718.65
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	139.50-93.04	0.2077	0.1199	0.3378	0.1950
L2	93.04-46.38	0.2418	0.1396	0.4072	0.2351
L3	46.38-0.00	0.2460	0.1420	0.4145	0.2393

Discrete Tower Loads

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 lb
7770.00 w/ mount pipe	A	From Centroid-Face	1.50 0.00 0.00	10.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.22 6.77 7.30 8.38 10.69	4.35 5.20 5.92 7.41 10.76	56.90 102.99 159.01 293.01 679.74
7770.00 w/ mount pipe	B	From Centroid-Face	1.50 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.22 6.77 7.30 8.38 10.69	4.35 5.20 5.92 7.41 10.76	56.90 102.99 159.01 293.01 679.74
7770.00 w/ mount pipe	C	From Centroid-Face	1.50 0.00 0.00	-10.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.22 6.77 7.30 8.38 10.69	4.35 5.20 5.92 7.41 10.76	56.90 102.99 159.01 293.01 679.74
(2) LGP21401 TMA (VSI)	A	From Centroid-Face	1.50 0.00 0.00	10.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.36 0.48 0.60 0.87 1.52	14.10 21.26 30.32 54.89 135.29
(2) LGP21401 TMA (VSI)	B	From Centroid-Face	1.50 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.36 0.48 0.60 0.87 1.52	14.10 21.26 30.32 54.89 135.29
(2) LGP21401 TMA (VSI)	C	From Centroid-Face	1.50 0.00 0.00	-10.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.36 0.48 0.60 0.87 1.52	14.10 21.26 30.32 54.89 135.29
**									
12' (4" Tube) T-Arm (3)	C	None		0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	13.50 16.71 19.92 26.34 39.18	13.50 16.71 19.92 26.34 39.18	600.00 750.00 900.00 1200.00 1800.00
(3) FV65-14-00NA2 w/Mount Pipe	A	From Centroid-Face	4.75 2.75 0.00	30.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	6.95 8.13 9.02 10.84 14.85	55.55 121.25 198.95 381.03 886.36
(3) FV65-14-00NA2 w/Mount Pipe	B	From Centroid-	4.75 2.75	30.0000	130.00	No Ice 1/2" Ice	8.64 9.29	6.95 8.13	55.55 121.25

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 lb
		Face	0.00				1" Ice	9.91	9.02	198.95
							2" Ice	11.18	10.84	381.03
							4" Ice	13.83	14.85	886.36
(3) FV65-14-00NA2 w/Mount Pipe	C	From Centroid-Face	4.75	2.75	30.0000	130.00	No Ice	8.64	6.95	55.55
				0.00			1/2" Ice	9.29	8.13	121.25
							1" Ice	9.91	9.02	198.95
							2" Ice	11.18	10.84	381.03
							4" Ice	13.83	14.85	886.36
LLPX310R w/ Mount Pipe	A	From Centroid-Face	4.75	2.75	40.0000	130.00	No Ice	5.43	3.38	50.56
				2.00			1/2" Ice	5.99	4.15	89.99
							1" Ice	6.51	4.80	138.53
							2" Ice	7.57	6.19	255.15
							4" Ice	9.86	9.25	597.35
LLPX310R w/ Mount Pipe	B	From Centroid-Face	4.75	2.75	10.0000	130.00	No Ice	5.43	3.38	50.56
				2.00			1/2" Ice	5.99	4.15	89.99
							1" Ice	6.51	4.80	138.53
							2" Ice	7.57	6.19	255.15
							4" Ice	9.86	9.25	597.35
LLPX310R w/ Mount Pipe	C	From Centroid-Face	4.75	2.75	0.0000	130.00	No Ice	5.43	3.38	50.56
				2.00			1/2" Ice	5.99	4.15	89.99
							1" Ice	6.51	4.80	138.53
							2" Ice	7.57	6.19	255.15
							4" Ice	9.86	9.25	597.35
FDD_R6_RRH TMA	A	From Centroid-Face	4.75	2.75	40.0000	130.00	No Ice	1.79	0.78	33.00
				2.00			1/2" Ice	1.97	0.92	44.50
							1" Ice	2.16	1.07	58.31
							2" Ice	2.57	1.39	93.60
							4" Ice	3.49	2.14	200.35
FDD_R6_RRH TMA	B	From Centroid-Face	4.75	2.75	10.0000	130.00	No Ice	1.79	0.78	33.00
				2.00			1/2" Ice	1.97	0.92	44.50
							1" Ice	2.16	1.07	58.31
							2" Ice	2.57	1.39	93.60
							4" Ice	3.49	2.14	200.35
FDD_R6_RRH TMA	C	From Centroid-Face	4.75	2.75	0.0000	130.00	No Ice	1.79	0.78	33.00
				2.00			1/2" Ice	1.97	0.92	44.50
							1" Ice	2.16	1.07	58.31
							2" Ice	2.57	1.39	93.60
							4" Ice	3.49	2.14	200.35
6'x4" Pipe Mount	B	From Centroid-Face	4.75	2.75	0.0000	130.00	No Ice	2.25	2.25	65.00
				0.00			1/2" Ice	2.62	2.62	84.10
							1" Ice	3.00	3.00	107.47
							2" Ice	3.78	3.78	167.65
							4" Ice	5.56	5.56	346.05
6'x4" Pipe Mount	C	From Centroid-Face	4.75	2.75	0.0000	130.00	No Ice	2.25	2.25	65.00
				0.00			1/2" Ice	2.62	2.62	84.10
							1" Ice	3.00	3.00	107.47
							2" Ice	3.78	3.78	167.65
							4" Ice	5.56	5.56	346.05
**										
T-Arm Mount [TA 602-3] (Verizon Wireless)	C	None			0.0000	118.00	No Ice	11.59	11.59	774.30
							1/2" Ice	15.44	15.44	990.35
							1" Ice	19.29	19.29	1206.41
							2" Ice	26.99	26.99	1638.52
							4" Ice	42.39	42.39	2502.73
(2) DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	A	From Centroid-Face	6.00	0.00	-40.0000	118.00	No Ice	7.27	7.82	46.55
				0.00			1/2" Ice	7.88	9.01	111.10
							1" Ice	8.48	9.91	187.61

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 lb
						2" Ice	9.72	11.81	367.24
						4" Ice	12.33	15.98	867.25
(2) DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	B	From Centroid-Face	6.00 0.00 0.00	-20.0000	118.00	No Ice	7.27	7.82	46.55
						1/2" Ice	7.88	9.01	111.10
						1" Ice	8.48	9.91	187.61
						2" Ice	9.72	11.81	367.24
						4" Ice	12.33	15.98	867.25
(2) DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	C	From Centroid-Face	6.00 0.00 0.00	0.0000	118.00	No Ice	7.27	7.82	46.55
						1/2" Ice	7.88	9.01	111.10
						1" Ice	8.48	9.91	187.61
						2" Ice	9.72	11.81	367.24
						4" Ice	12.33	15.98	867.25
MG D3-800Tx w/ Mount Pipe (Verizon Wireless)	A	From Centroid-Face	6.00 0.00 0.00	-20.0000	118.00	No Ice	3.71	3.56	36.90
						1/2" Ice	4.19	4.39	69.87
						1" Ice	4.63	5.09	112.21
						2" Ice	5.65	6.54	217.21
						4" Ice	7.82	9.69	539.32
MG D3-800Tx w/ Mount Pipe (Verizon Wireless)	B	From Centroid-Face	6.00 0.00 0.00	-20.0000	118.00	No Ice	3.71	3.56	36.90
						1/2" Ice	4.19	4.39	69.87
						1" Ice	4.63	5.09	112.21
						2" Ice	5.65	6.54	217.21
						4" Ice	7.82	9.69	539.32
MG D3-800Tx w/ Mount Pipe (Verizon Wireless)	C	From Centroid-Face	6.00 0.00 0.00	-10.0000	118.00	No Ice	3.71	3.56	36.90
						1/2" Ice	4.19	4.39	69.87
						1" Ice	4.63	5.09	112.21
						2" Ice	5.65	6.54	217.21
						4" Ice	7.82	9.69	539.32
P65.16.XL.2 w/ Mount Pipe (Verizon Wireless)	A	From Centroid-Face	6.00 0.00 0.00	-20.0000	118.00	No Ice	8.88	6.02	62.20
						1/2" Ice	9.63	7.29	124.60
						1" Ice	10.36	8.41	199.63
						2" Ice	11.75	10.32	376.85
						4" Ice	14.66	14.36	877.75
P65.16.XL.2 w/ Mount Pipe (Verizon Wireless)	B	From Centroid-Face	6.00 0.00 0.00	-20.0000	118.00	No Ice	8.88	6.02	62.20
						1/2" Ice	9.63	7.29	124.60
						1" Ice	10.36	8.41	199.63
						2" Ice	11.75	10.32	376.85
						4" Ice	14.66	14.36	877.75
P65.16.XL.2 w/ Mount Pipe (Verizon Wireless)	C	From Centroid-Face	6.00 0.00 0.00	-20.0000	118.00	No Ice	8.88	6.02	62.20
						1/2" Ice	9.63	7.29	124.60
						1" Ice	10.36	8.41	199.63
						2" Ice	11.75	10.32	376.85
						4" Ice	14.66	14.36	877.75
(2) FD9R6004/2C-3L Diplexer (Verizon Wireless)	A	From Centroid-Face	6.00 0.00 0.00	-40.0000	118.00	No Ice	0.37	0.08	3.10
						1/2" Ice	0.45	0.14	5.40
						1" Ice	0.54	0.20	8.79
						2" Ice	0.75	0.34	19.61
						4" Ice	1.28	0.74	62.87
(2) FD9R6004/2C-3L Diplexer (Verizon Wireless)	B	From Centroid-Face	6.00 0.00 0.00	-20.0000	118.00	No Ice	0.37	0.08	3.10
						1/2" Ice	0.45	0.14	5.40
						1" Ice	0.54	0.20	8.79
						2" Ice	0.75	0.34	19.61
						4" Ice	1.28	0.74	62.87
(2) FD9R6004/2C-3L Diplexer (Verizon Wireless)	C	From Centroid-Face	6.00 0.00 0.00	0.0000	118.00	No Ice	0.37	0.08	3.10
						1/2" Ice	0.45	0.14	5.40
						1" Ice	0.54	0.20	8.79
						2" Ice	0.75	0.34	19.61
						4" Ice	1.28	0.74	62.87

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 lb
**									
T-Arm Mount [TA 602-3]	C	None		0.0000	108.00	No Ice	11.59	11.59	774.30
						1/2" Ice	15.44	15.44	990.35
						1" Ice	19.29	19.29	1206.41
						2" Ice	26.99	26.99	1638.52
						4" Ice	42.39	42.39	2502.73
RR90-17-02DP w/ Mount Pipe	A	From Centroid-Face	6.00 0.00 1.00	0.0000	108.00	No Ice	4.59	3.32	34.18
						1/2" Ice	5.09	4.09	69.33
						1" Ice	5.58	4.78	113.86
						2" Ice	6.59	6.23	223.79
						4" Ice	8.73	9.31	556.77
RR90-17-02DP w/ Mount Pipe	B	From Centroid-Face	6.00 0.00 1.00	0.0000	108.00	No Ice	4.59	3.32	34.18
						1/2" Ice	5.09	4.09	69.33
						1" Ice	5.58	4.78	113.86
						2" Ice	6.59	6.23	223.79
						4" Ice	8.73	9.31	556.77
RR90-17-02DP w/ Mount Pipe	C	From Centroid-Face	6.00 0.00 1.00	0.0000	108.00	No Ice	4.59	3.32	34.18
						1/2" Ice	5.09	4.09	69.33
						1" Ice	5.58	4.78	113.86
						2" Ice	6.59	6.23	223.79
						4" Ice	8.73	9.31	556.77
APXV18-206516S-C-A20 w/ Mount Pipe	A	From Centroid-Face	6.00 0.00 1.00	0.0000	108.00	No Ice	3.76	3.20	36.95
						1/2" Ice	4.14	3.83	68.28
						1" Ice	4.57	4.47	108.25
						2" Ice	5.47	5.81	207.80
						4" Ice	7.40	8.74	512.65
APXV18-206516S-C-A20 w/ Mount Pipe	B	From Centroid-Face	6.00 0.00 1.00	0.0000	108.00	No Ice	3.76	3.20	36.95
						1/2" Ice	4.14	3.83	68.28
						1" Ice	4.57	4.47	108.25
						2" Ice	5.47	5.81	207.80
						4" Ice	7.40	8.74	512.65
APXV18-206516S-C-A20 w/ Mount Pipe	C	From Centroid-Face	6.00 0.00 1.00	0.0000	108.00	No Ice	3.76	3.20	36.95
						1/2" Ice	4.14	3.83	68.28
						1" Ice	4.57	4.47	108.25
						2" Ice	5.47	5.81	207.80
						4" Ice	7.40	8.74	512.65
(2) KRY 112 71 TMA	A	From Centroid-Face	6.00 0.00 1.00	0.0000	108.00	No Ice	0.68	0.45	13.20
						1/2" Ice	0.80	0.56	18.38
						1" Ice	0.93	0.68	25.16
						2" Ice	1.22	0.94	44.33
						4" Ice	1.90	1.57	110.52
(2) KRY 112 71 TMA	B	From Centroid-Face	6.00 0.00 1.00	0.0000	108.00	No Ice	0.68	0.45	13.20
						1/2" Ice	0.80	0.56	18.38
						1" Ice	0.93	0.68	25.16
						2" Ice	1.22	0.94	44.33
						4" Ice	1.90	1.57	110.52
(2) KRY 112 71 TMA	C	From Centroid-Face	6.00 0.00 1.00	0.0000	108.00	No Ice	0.68	0.45	13.20
						1/2" Ice	0.80	0.56	18.38
						1" Ice	0.93	0.68	25.16
						2" Ice	1.22	0.94	44.33
						4" Ice	1.90	1.57	110.52
ATMAA1412D-1A20 TMA	A	From Centroid-Face	6.00 0.00 1.00	0.0000	108.00	No Ice	1.17	0.47	13.00
						1/2" Ice	1.31	0.57	20.62
						1" Ice	1.47	0.69	30.11
						2" Ice	1.81	0.95	55.52
						4" Ice	2.58	1.57	137.44
ATMAA1412D-1A20 TMA	B	From	6.00	0.0000	108.00	No Ice	1.17	0.47	13.00

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 lb
		Centroid-Face	0.00 1.00			1/2" Ice	1.31	0.57	20.62
						1" Ice	1.47	0.69	30.11
						2" Ice	1.81	0.95	55.52
						4" Ice	2.58	1.57	137.44
ATMAA1412D-1A20 TMA	C	From Centroid-Face	6.00 0.00 1.00	0.0000	108.00	No Ice	1.17	0.47	13.00
						1/2" Ice	1.31	0.57	20.62
						1" Ice	1.47	0.69	30.11
						2" Ice	1.81	0.95	55.52
						4" Ice	2.58	1.57	137.44
(2) 7'x2" Antenna Mount Pipe	A	From Centroid-Face	6.00 0.00 0.00	0.0000	108.00	No Ice	1.66	1.66	26.00
						1/2" Ice	2.39	2.39	38.58
						1" Ice	2.83	2.83	55.84
						2" Ice	3.71	3.71	104.97
						4" Ice	5.58	5.58	266.00
(2) 7'x2" Antenna Mount Pipe	B	From Centroid-Face	6.00 0.00 0.00	0.0000	108.00	No Ice	1.66	1.66	26.00
						1/2" Ice	2.39	2.39	38.58
						1" Ice	2.83	2.83	55.84
						2" Ice	3.71	3.71	104.97
						4" Ice	5.58	5.58	266.00
(2) 7'x2" Antenna Mount Pipe	C	From Centroid-Face	6.00 0.00 0.00	0.0000	108.00	No Ice	1.66	1.66	26.00
						1/2" Ice	2.39	2.39	38.58
						1" Ice	2.83	2.83	55.84
						2" Ice	3.71	3.71	104.97
						4" Ice	5.58	5.58	266.00
**									
742 213 w/ Mount Pipe	A	From Centroid-Face	1.75 1.00 0.00	30.0000	100.00	No Ice	5.28	4.53	47.55
						1/2" Ice	5.82	5.87	88.36
						1" Ice	6.34	6.77	140.80
						2" Ice	7.40	8.60	271.26
						4" Ice	9.63	12.45	668.89
742 213 w/ Mount Pipe	B	From Centroid-Face	1.75 1.00 0.00	30.0000	100.00	No Ice	5.28	4.53	47.55
						1/2" Ice	5.82	5.87	88.36
						1" Ice	6.34	6.77	140.80
						2" Ice	7.40	8.60	271.26
						4" Ice	9.63	12.45	668.89
742 213 w/ Mount Pipe	C	From Centroid-Face	1.75 1.00 0.00	30.0000	100.00	No Ice	5.28	4.53	47.55
						1/2" Ice	5.82	5.87	88.36
						1" Ice	6.34	6.77	140.80
						2" Ice	7.40	8.60	271.26
						4" Ice	9.63	12.45	668.89
**									
Side Arm Mount [SO 701-1]	C	From Centroid-Leg	2.75 0.00 0.00	0.0000	75.00	No Ice	0.85	1.67	65.00
						1/2" Ice	1.14	2.34	79.00
						1" Ice	1.43	3.01	93.00
						2" Ice	2.01	4.35	121.00
						4" Ice	3.17	7.03	177.00
KS24019-L112A	C	From Centroid-Leg	4.25 0.00 2.00	0.0000	75.00	No Ice	0.10	0.10	5.00
						1/2" Ice	0.18	0.18	6.50
						1" Ice	0.26	0.26	8.00
						2" Ice	0.42	0.42	11.00
						4" Ice	0.74	0.74	17.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert (ft)	Azimuth Adjustment (°)	3 dB Beam Width (°)	Elevation (ft)	Outside Diameter (ft)		Aperture Area (ft^2)	Weight (lb)
A-ANT-23G-2-C (VSI)	B	Paraboloid w/Shroud (HP)	From Centroid -Face	4.75 2.25 2.00	10.0000		130.00	2.17	No Ice	3.72	12.30
									1/2" Ice	4.01	32.88
									1" Ice	4.30	53.46
									2" Ice	4.88	94.62
									4" Ice	6.04	176.94
A-ANT-23G-2-C (VSI)	C	Paraboloid w/Shroud (HP)	From Centroid -Face	4.75 2.25 2.00	0.0000		130.00	2.17	No Ice	3.72	12.30
									1/2" Ice	4.01	32.88
									1" Ice	4.30	53.46
									2" Ice	4.88	94.62
									4" Ice	6.04	176.94

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 (lb)	Allow. P_a (lb)	Ratio $\frac{P}{P_a}$
L1	139.5 - 93.04 (1)	TP26.99x15.5x0.25	46.46	0.00	0.0	39.000	20.4489	-6872.26	797508.00	0.009
L2	93.04 - 46.38 (2)	TP37.91x25.5205x0.375	50.58	0.00	0.0	39.000	43.1454	-15505.10	1682670.00	0.009
L3	46.38 - 0 (3)	TP48.5x35.874x0.375	51.63	0.00	0.0	39.000	55.1492	-26789.90	2150820.00	0.012

Pole Bending Design Data

Section No.	Elevation (ft)	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	139.5 - 93.04 (1)	TP26.99x15.5x0.25	391294.17	-36.175	39.000	0.928	0.00	0.000	39.000	0.000
L2	93.04 - 46.38 (2)	TP37.91x25.5205x0.375	1204308.33	-37.539	39.000	0.963	0.00	0.000	39.000	0.000
L3	46.38 - 0 (3)	TP48.5x35.874x0.375	2142400.00	-40.782	39.000	1.046	0.00	0.000	39.000	0.000

Pole Interaction Design Data

Section No.	Elevation (ft)	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	139.5 - 93.04 (1)	TP26.99x15.5x0.25	0.009	0.928	0.000	0.936 ✔	1.333	H1-3 ✔
L2	93.04 - 46.38	TP37.91x25.5205x0.375	0.009	0.963	0.000	0.972 ✔	1.333	H1-3 ✔

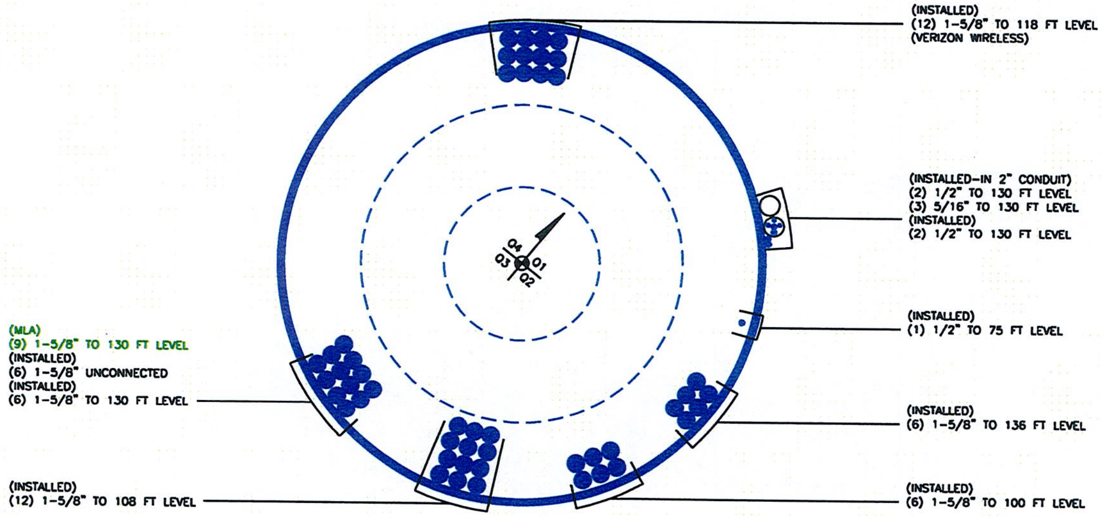
Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L3	(2) 46.38 - 0 (3)	TP48.5x35.874x0.375	0.012	1.046	0.000	1.058 ✔	1.333	H1-3 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	139.5 - 93.04	Pole	TP26.99x15.5x0.25	1	-6872.26	1063078.12	70.2	Pass
L2	93.04 - 46.38	Pole	TP37.91x25.5205x0.375	2	-15505.10	2242999.02	72.9	Pass
L3	46.38 - 0	Pole	TP48.5x35.874x0.375	3	-26789.90	2867042.94	79.4	Pass
							Summary	
						Pole (L3)	79.4	Pass
						RATING =	**79.4**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



0 1 2 3FT

: SCALE :

BUSINESS UNIT: 881541 TOWER ID: C_BASELEVEL

12/03/08	APPLICATION ADDED PER WORK ORDER # 210209	ADC
03/08/08	UPDATED PER WORK ORDER # 224252	JEE
08/08/08	AS-BUILT INFORMATION ADDED PER WORK ORDER # 224468	JEE
30/08/08	APPLICATION ADDED PER WORK ORDER # 229434	ADC
24/04/09	AS-BUILT INFORMATION ADDED PER WORK ORDER # 256862	ZBB
27/07/09	AS-BUILT INFORMATION ADDED PER WORK ORDER # 283600	SAC
31/07/09	UPDATED PER WORK ORDER # 288083	LWN
28/09/09	APPLICATION ADDED PER WORK ORDER # 291173	ADC
02/03/11	AS-BUILT INFORMATION ADDED PER WORK ORDER # 383418	ADC

DRAWN BY: VSG
CHECKED BY: GPK
DRAWING DATE: 25/02/08

PORT INFORMATION			
ELEV.	SIZE	LOCATION	STATUS
10'-0"	10"x30"	E & W	.
7'-0"	10"x30"	S	.
3'-3"	10"x30"	E & W	.

LEGEND: FEEDLINES
- ● SOLID BLUE CIRCLE DENOTES EXISTING FEEDLINE
- O OPEN RED CIRCLE DENOTES PROPOSED FEEDLINE
- X BLUE "X" DENOTES LOCATION NOT GIVEN

NOTE: ASSUME FEEDLINE ATTACHMENT HEIGHT TO TOWER STEEL AT 8-FEET ABOVE FINISHED GRADE UNLESS OTHERWISE SPECIFIED

SITE NUMBER:
SITE NAME:

SITE NAME
ROGERS PROPERTY

BUSINESS UNIT NUMBER
881541

SITE ADDRESS
NEW HAVEN, CT 06477
NEW HAVEN
UNITED STATES COUNTY
USA

SHEET TITLE
BASE LEVEL

SHEET NUMBER
A1-0

SCALE: 1" = 1'-0"   1

BASE LEVEL DRAWING

PLOT DATE: 3/2/2011   FILE NAME: 881541_BASELEVEL.DWG
Xref R:\TEMPLATES\TYPICAL BLOCKS FOR TEMPLATES\TITLE BLOCK STD-VER 3.1.dwg

APPENDIX C

ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#: *881541*
Site Name: *Rogers Property, CT*
App #: *118103, Rev. #1*

Pole Manufacturer:	*Other*

Reactions		
Moment:	2310.007	ft-kips
Axial:	28.36	kips
Shear:	23.146	kips

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	57	in

Plate Data		
Diam:	63	in
Thick:	2	in
Grade:	60	ksi
Single-Rod B-eff:	9.62	in

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

Pole Data		
Diam:	48.5	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	

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

Anchor Rod Results

Maximum Rod Tension:	119.8 Kips	Rigid
Allowable Tension:	195.0 Kips	Service, ASD
Anchor Rod Stress Ratio:	61.5% **Pass**	Fty*ASIF

Base Plate Results

	Flexural Check	Rigid
Base Plate Stress:	50.0 ksi	Service ASD
Allowable Plate Stress:	60.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	83.4% **Pass**	Y.L. Length: 29.95

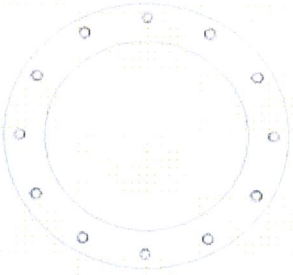
n/a

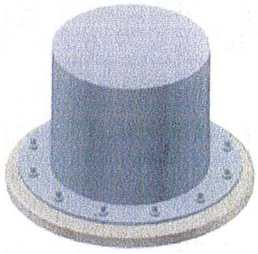
Stiffener Results

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

Pole Results

Pole Punching Shear Check:	n/a





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

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

Product Data Sheet **FD9R6004/2C-3L**

ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

Product Description

The ShareLite FD9R6004 Series of diplexers are designed to enable feeder sharing between systems in the 698-960 MHz range and in the 1710-2200 MHz range. The diplexer is equipped with in-line connector placement so it can be installed in the BTS cabinet or at the tower top. This is especially valuable in crowded sites or when the feeders are not easily accessible. Due to its wideband design, the FD9R6004 Series can accommodate many combining solutions between 698-960 MHz and 1710-2200 MHz systems such as LTE 700 MHz, Cellular 800 MHz with PCS, GSM900 with GSM1800, or GSM900 with UMTS. This diplexer features a highly selective filter. It provides a high level of isolation between ports, while keeping the insertion loss on both paths at an extremely low level. The FD9R6004 diplexers are available with various DC pass options, helpful in configurations with or without the Tower Mount Amplifiers installed.

Features/Benefits

- **LTE ready design**
- **Extremely Low Insertion Loss**
- **High level of Rejection between bands – Protection against interferences**
- **Extremely High Power Handling Capability**
- **Integrated DC block/bypass versions available**
- **Very compact & small size design – Easy installation and reduced tower load**
- **In-line long-neck connectors for easy connection & waterproofing**
- **Exceptional reliability & environmental protection (IP 67)**
- **Equipped with 1 * Breathable Vent – Prevent any humidity inside the product**
- **Mounting hardware for Wall and Pole mount provided (P/N SEM2-1A)**
- **Grounding already provided through the mounting bracket**
- **Kit available for easy dual mount**

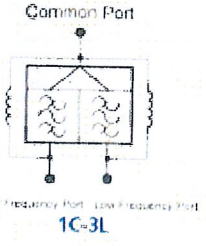
Technical Specifications

Product Type	Diplexer/Cross Band Coupler
Frequency Band, MHz	698-2200
Configuration	Sharelite Single diplexer, outdoor, DC pass in the 1710-2170MHz path, with mounting hardware SEM2-1A
Mounting	Wall Mounting: With 4 screws (maximum 6mm diameter); Pole Mounting: With included clamp set 40-110mm (1.57-4.33)
Frequency Range Low Frequency Path, MHz	698-960
Frequency Range High Frequency Path, MHz	1710-2200
Return Loss All Ports Min/Typ, dB	19/23
Power Handling Continuous, Max, W	1250 at common port; 750 in low frequency path & 500 in high frequency path
Power Handling Peak, Max, W	15000 in low frequency path & 8000 in high frequency path
Impedance, Ohms	50
Insertion Loss 698-960 MHz Path, Typ, dB	0.07
Insertion Loss 1710-2200MHz path, Typ, dB	0.13
Rejection Between Bands Min/Typ, dB	58/64@698-960MHz; 60/70@1710-2200MHz
IMP Level at the COM Port, Typ, dBm	-112 @ 2x43
DC Pass in Low Frequency Path	No
DC Pass in High Frequency Path	Yes
Temperature Range, °C (°F)	-40 to +60 (-40 to +140)
Environmental	ETSI 300-019-2-4 Class 4.1E
Ingress Protection	IP 67
Lightning Protection	EN/IEC61000-4-5 Level 4
Connectors	In-line long-neck 7-16-Female
Weight, kg (lb)	1.2 (2.6)
Shipping Weight, kg (lb)	3.2 (7) for 2 * single units in 1 * box, 9.8 (21.6) for 6 * units = 3 * Boxes in 1 * overwrap
Application	LTE 700MHz, GSM900/3G/UMTS, GSM900/GSM1800, Cellular 800/PCS
Dimensions, H x W x D, mm (in)	147 x 164 x 37 (5.8 x 6.5 x 1.5)
Shipping Dimensions, H x W x D, mm (in)	254 x 406 x 82 (10 x 16 x 3.2) for 2 * Single Units in 1 * box, 280 x 406 x 241 (11 x 16 x 9.5) for 6 * units = 3 * Boxes in 1 * overwrap
Volume, L	0.43
Housing	Aluminum

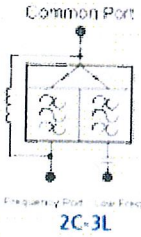
Notes

ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

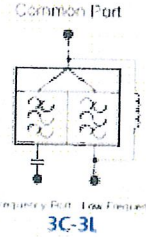
Selection Guide Diplexer 698-960 / 1710-2200MHz					
	Model Number	Full DC Pass	DC Pass High Band	DC Pass Low Band	Mounting Hardware Included
Single	FD9R6004/1C-3L				X
	FD9R6004/2C-3L				X
	FD9R6004/3C-3L				X
Dual	KIT-FD9R6004/1C-DL				X
	KIT-FD9R6004/2C-DL				X
	KIT-FD9R6004/3C-DL				X



1C-3L

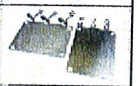


2C-3L



3C-3L

The FD9R6004 Series is upgradeable to a Dual Diplexer kit by means of 2 diplexers and mounting hardware kits SEM2-1A and SEM2-3

Mounting Hardware and Ground Cable Ordering Information		
Model Number	**Description**	
SEM2-1A	Mounting Hardware, Pole mount ø40-110mm (Included with the Single and Dual Diplexer) Wall Screws M6 (Not included with the product)	
SEM2-3	Assembly kit for 2 pcs of FT9DW/xC-3L (Can be ordered separately but included with the Dual Diplexer Kit)	
CA020-2	Ground Cable, 2m, includes lugs (Optional)	
CA030-2	Ground Cable, 2m, includes lugs (Optional)	
SEM6	Mounting Hardware for 6 Diplexers, Tower Base (Optional)	

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
Internet: ct.gov/csc

Daniel F. Caruso
Chairman

February 19, 2010

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: **EM-VER-107-100107** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at Grassy Hill Road, Orange, Connecticut.

Dear Attorney Baldwin:

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.

The proposed modifications are to be implemented as specified here and in your notice dated January 7, 2010, including the placement of all necessary equipment and shelters within the tower compound. 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. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/MP/laf

c: The Honorable James M. Zeoli, First Selectman, Town of Orange
Paul Dinice, Zoning Enforcement Officer, Town of Orange
Crown Castle USA, Inc.

G:\EM\BAM-VERIZON\ORANGE\dc021710GrassyHillRd.DOC

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

January 19, 2010

The Honorable James M. Zeoli
First Selectman
Town of Orange
Town Hall
617 Orange Center Road
Orange, CT 06477-2423

RE: **EM-VER-107-100107** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at Grassy Hill Road, Orange, Connecticut.

Dear First Selectman Zeoli:

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 February 2, 2010.

Thank you for your cooperation and consideration.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/jbw

Enclosure: Notice of Intent

c: Paul Dinice, Zoning Enforcement Officer, Town of Orange

ROBINSON & COLE LLP

EM-VER-107-100107

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

ORIGINAL

January 7, 2010

Via Hand Delivery

S. Derek Phelps
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Antenna Swap**
Grassy Hill Road, Orange, Connecticut

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains wireless telecommunications antennas at the 118-foot level on the existing 140-foot tower at the above-referenced address. The tower is owned by Crown Castle. The Council approved Cellco's use of the existing tower in 2004 in Docket No. 262. Cellco now intends to modify its installation by replacing six of its PCS antennas with three (3) model MG D3-800T0 PCS antennas and three (3) model P65-16-XL-2 LTE (700 MHz) antennas, all at the same 118-foot level on the tower. Attached behind Tab 1 are the specifications for the proposed replacement antennas.

Please accept this letter 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 James Zeoli, First Selectman for the Town of Orange. The Town of Orange is the owner of the property on which the tower is located.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in any increase in the overall height of the existing tower. Cellco's antennas will be located at the same 118-foot level on the existing 140-foot tower.

2. The proposed modifications will not involve any modifications to ground-mounted equipment and, therefore, will not require the extension of the site boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) power density levels at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative power density table for Cellco's modified facility is included behind Tab 2.

Also attached is a Structural Analysis Report confirming that the tower and foundation can support Cellco's proposed antennas modification. (See Tab 3).

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
James Zeoli, Orange First Selectman
Sandy M. Carter

RYMSA WIRELESS

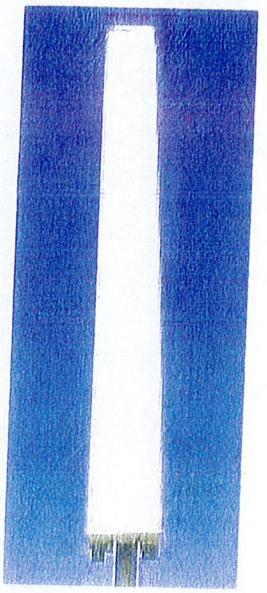
1710-2170 MHz

Model # MG D3-800TX

XPol GSM1800+PCS & UMTS Panel Antenna

Beamwidth: H 65°/V 6.5°
Gain: 16.15 dBd/18.25 dBi
Length: 52.7 in

Electrical Specifications			
Antenna model	MG D3-800TX		
Frequency range (MHz)	1710-1880	1850-1990	1920-2170
Impedance	50 ohms		
VSWR	1.4		
Polarization	±45°		
Isolation between ports (dB)	30		
Average gain (dBd/dBi)	15.7/17.8	15.9/18	16.15/18.25
Horizontal beamwidth (deg)	65°±5°		
Vertical beamwidth (deg)	6.5°±0.5°	6.3°±0.5°	6.3°±0.5°
Electrical tilt (deg)	Fixed 0°-14°		
Upper sidelobe suppression (dB)	18		
Front-to-back ratio (db) @180°±30°	30		
Polarization isolation (dB) @3 dB beamwidth	20		
Maximum power per input (w)	250		
Intermodulation products (dBc)	-150		
Connectors	2 X 7/16 female		
Connector position	Antenna bottom		



Mechanical & Environmental Specifications	
Dimensions in (mm)	52.7 x 6.3 x 3.5 (1380 x 160 x 90)
Survival wind speed mph (kph)	124 (200)
Front windload lbs (N) @100 mph/160 kph	74 (335)
Lateral windload lbs (N) @100 mph/160 kph	42 (188)
Antenna weight lbs (kg)	15 (7)
Clamps weight lbs (kg)	7.7 (3.5)
Mast mounting in (cm)	2.0 to 5.3 (50 to 135)
Radome color	Gray
Grounding	All metallic parts DC grounded
Temperature range F (°C)	-67° to 140° (-55 to +60°)
Humidity	100%

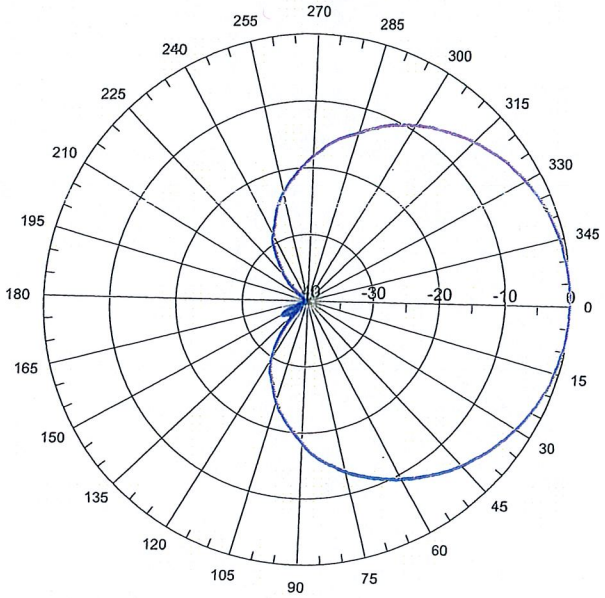
Shipping Specifications	
Dimensions in (mm)	64 x 8.8 x 6.9 (1630 x 225 x 175)
Weight lbs (kg)	27 (12.5)
Material	Cardboard and foam

1710-2170 MHz

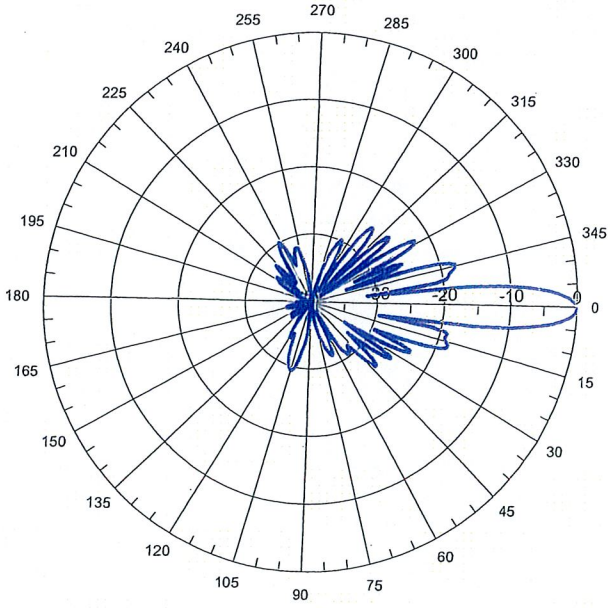
Model # MG D3-800TX

XPol GSM1800+PCS & UMTS Panel Antenna

H plane



E plane



P65-16-XL-2 Very Low Broadband Antennas

POLARIZATION: Dual linear ±45°
FREQUENCY (MHz): 698-894
HORIZONTAL BEAM WIDTH (°): 65
GAIN (dBi/dBd): 16.0/13.9
TILT: 2
LENGTH: 72"

ELECTRICAL SPECIFICATIONS*

Frequency range (MHz)		698-894	
Frequency band (MHz)	698-806		806-894
Gain (dBi/dBd)	15.5/13.4		16.0/13.9
Polarization			
Nominal Impedance (Ω)			
VSWR			
Horizontal beam width, -3 dB (°)	68		65
Vertical beam width, -3 dB (°)	10.5		9.5
Electrical down tilt (°)			
Side lobe suppression, vertical 1st upper (dB)	> 15		> 15
Isolation between inputs (dB)	> 30		> 30
Tracking, horizontal plane ±60° (dB)	< 2		< 2
First null fill (dB)	-		-
Vertical beam squint (°)	< 0.5		< 0.5
Front to back ratio (dB)	> 30		> 30
Front to back ratio, total power (dB)	> 25		> 25
Cross polar discrimination (XPD) 0° (dB)	> 15	> 15	
Cross polar discrimination (XPD) ±60° (dB)	> 10		> 10
Far field coupling			
IM3, 2xTx@43dBm (dBc)	-153		
IM7, 2xTx@43dBm (dBc)			
Power handling, average per input (W)			
Power handling, average total (W)			

MECHANICAL SPECIFICATIONS*

Connector	2 X 7/16 DIN Female
Connector position	Bottom
Dimensions, HxWxD, mm (ft)	72" x 12" x 5" (1829 x 305 x 125)
Mounting	Pre-mounted Tilt Brackets
Weight, with brackets, kg (lbs)	44 (20)
Weight, without brackets, kg (lbs)	33 (15)
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)	125 (55)
Lightning protection	DC Ground
Radome material	PVC
Radome colour	Light Grey
Package size, HxWxD, mm (ft)	82" x 16" x 10" (2082 x 400 x 255)
Shipping weight, kg (lbs)	55 (25)
RET	N/A
Brackets	7256.00, 7454.00, 2210.00

*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/.

Site Name: Orange 3	General	Power	Density					
Tower Height: Verizon @ 118'								
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total
*Sprint CDMA	11	266.07	130	0.0623	1962.5	1.0000	6.23%	
*Pocket	3	631	100	0.0681	2130	1.0000	6.81%	
*Sprint WiMAX	3	562	130	0.0359	2657	1.0000	3.59%	
*Clearwire	2	153	128	0.0067	2496	1.0000	0.67%	
*Clearwire	1	211	128	0.0046	11 GHz	1.0000	0.46%	
*Cingular GSM	2	427	140	0.0157	1900	1.0000	1.57%	
*Cingular UMTS	1	500	140	0.0092	880	0.5867	1.56%	
*T-Mobile UMTS	2	633	110	0.0376	2100	1.0000	3.76%	
*T-Mobile GSM	8	123	110	0.0292	1945	1.0000	2.92%	
Verizon	**3**	**438**	**118**	**0.0339**	**1970**	**1.0000**	**3.39%**	
Verizon	**9**	**403**	**118**	**0.0937**	**869**	**0.5793**	**16.17%**	
Verizon	**1**	**647**	**118**	**0.0167**	**757**	**0.4973**	**3.36%**	
								50.5%
* Source: Siting Council								

Date: **December 15, 2009**

Dawn Greene
Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317

Crown Castle
2000 Corporate Drive
Canonsburg, PA
(724) 416-2000

Subject: **Structural Analysis Report**

Carrier Designation:	***Verizon Wireless* LTE Upgrade**	
	Carrier Site Number:	N/A
	Carrier Site Name:	orange 3
Crown Castle Designation:	**Crown Castle BU Number:**	881541
	Crown Castle Site Name:	ROGERS PROPERTY
	Crown Castle JDE Job Number:	128300
	Crown Castle Work Order Number:	309136
Engineering Firm Designation:	**Crown Castle Project Number:**	309136
Site Data:	**Grassy Hill Road, Orange, New Haven County, CT**	
	Latitude *41° 17' 7.75"*, Longitude *-73° 2' 33.27"*	
	139.5 Foot - Monopole Tower	

Dear Dawn Greene,

Crown Castle 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 309136, in accordance with application 91611, revision 0.

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

LC1: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and local code requirements based upon a wind speed of 85 mph fastest mile.

All 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 *Crown Castle* 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.

Structural analysis prepared by: Firas Abdelahad, Engineer

Respectfully submitted by:

Kenton C. Weber, P.E.
Engineering Supervisor

STATE OF CONNECTICUT
KENTON C. WEBER
No. 27283
LICENSED PROFESSIONAL ENGINEER
12/15/09

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 139.5 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in March of 2004. 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 85 mph with no ice, 73.6 mph with 0.5 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
118	118	3	powerwave technologies	P65.16.XL.2 w/ Mount Pipe	-	-	-
		3	rymsa wireless	MG D3-900TX			

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
136	136	3	powerwave technologies	7770.00	-	-	2
		6	powerwave technologies	LGP21401			
130	132	1	tower mounts	Pipe Mount [PM 601-3]	6	1-5/8	1
		3	dragonwave	A-ANT-23G-2-C	3	1/2	2
	130	6	css	CSS-XS4-65-R w/ Mount Pipe	6	1-5/8	1
		9	mla	MLA_ANTENNA w/ Mount Pipe	9	1-5/8	3
		1	tower mounts	T-Arm Mount [TA 602-3]	-	-	1
	128	3	argus technologies	LLPX310R w/ Mount Pipe	6	5/16	2
		3	samsung telecommunications	FDD_R6_RRH			
118	118	6	decibel	DB844H90 w/ Mount Pipe	-	-	4
		6	decibel	DB846F65ZAXY w/Mount Pipe	12	1-5/8	1
		1	tower mounts	T-Arm Mount [TA 602-3]			
108	109	3	ems wireless	RR90-17-02DP w/Mount Pipe	12	1-5/8	1
		6	ericsson	KRY 112 71			
		3	rfs celwave	APXV18-206516S-C-A20 w/ Mount Pipe			2
		3	rfs celwave	ATMAA1412D-1A20			
	108	1	tower mounts	T-Arm Mount [TA 602-3]			1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
100	100	3	kathrein	742 213	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
75	77	1	lucent	KS24019-L112A	1	1/2	1
	75	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) MLA Equipment controlling, was considered in the analysis.
4) Equipment to be removed.

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
140	140	12	dapa	48000	12	-
130	130	12	dapa	48000	12	-
120	120	12	dapa	48000	12	-
110	110	12	dapa	48000	12	-
100	100	12	dapa	48000	12	-
75	75	1	-	GPS	1	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti Assoc, Inc	2245154	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	EEI	2208511	CCISITES
4-TOWER MANUFACTURER DRAWINGS	EEI	2207700	CCISITES
4-APPLICATION	Verizon, Rev 0	91611	CCISITES

3.1) Analysis Method

RISATower (version 5.3.1.0), 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. Crown Castle 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	139.5 - 93.04	Pole	TP26.99x15.5x0.25	1	-7.049	1063.078	68.8	Pass
L2	93.04 - 46.38	Pole	TP37.91x25.521x0.375	2	-15.399	2242.999	71.6	Pass
L3	46.38 - 0	Pole	TP48.5x35.874x0.375	3	-26.709	2903.980	78.1	Pass
							Summary	
						Pole (L3)	78.1	Pass
						Rating =	78.1	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	60.5	Pass
1	Base Plate	0	82.1	Pass
1	Base Foundation (Compared w/ Design Loads)	0	88.8	Pass

Structure Rating (max from all components) =	88.8%

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

4.1) Recommendations

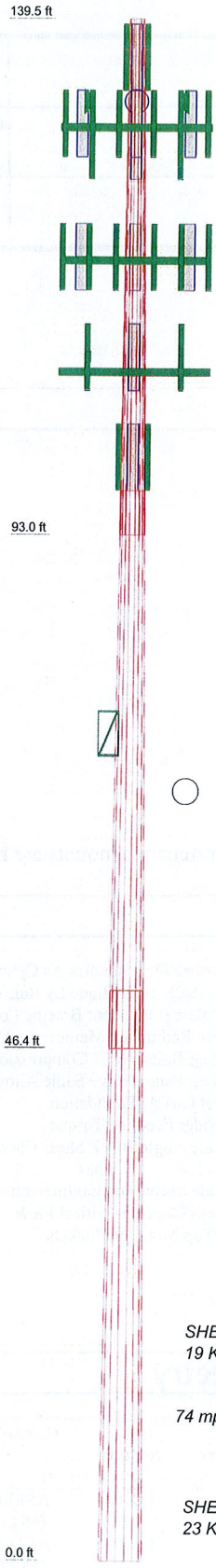
Based on our analysis, we have determined that the existing monopole and its foundation have sufficient capacity to adequately support the existing, reserved and proposed loading. No modifications are required at this time.

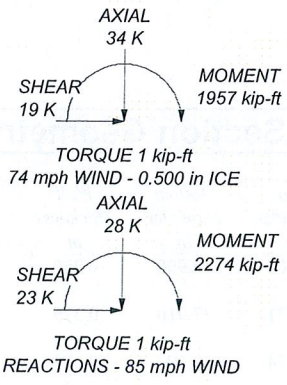
APPENDIX A

RISA TOWER OUTPUT

Section	1	2	3
Length (ft)	46.460	50.580	51.630
Number of Sides	18	18	18
Thickness (in)	0.250	0.375	0.375
Lap Splice (ft)	3.920	5.250	
Top Dia (in)	15.500	25.521	35.874
Bot Dia (in)	26.990	37.910	48.500
Grade	A572-65	A572-65	A572-65
Weight (K)	2.6	6.4	8.7

17.8





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
7770.00	136	P65.16.XL.2 w/ Mount Pipe	118
7770.00	136	MG D3-900TX	118
7770.00	136	(2) KRY 112 71	108
(2) LGP21401	136	RR90-17-02DP w/Mount Pipe	108
(2) LGP21401	136	(2) KRY 112 71	108
(2) LGP21401	136	APXV18-206516S-C-A20 w/ Mount Pipe	108
Pipe Mount [PM 601-3]	136	ATMAA1412D-1A20	108
(3) MLA_ANTENNA w/ Mount Pipe	130	APXV18-206516S-C-A20 w/ Mount Pipe	108
(3) MLA_ANTENNA w/ Mount Pipe	130	ATMAA1412D-1A20	108
(3) MLA_ANTENNA w/ Mount Pipe	130	APXV18-206516S-C-A20 w/ Mount Pipe	108
LLPX310R w/ Mount Pipe	130	ATMAA1412D-1A20	108
LLPX310R w/ Mount Pipe	130	(2) 4' x 2" Pipe Mount	108
LLPX310R w/ Mount Pipe	130	(2) 4' x 2" Pipe Mount	108
FDD_R6_RRH	130	(2) 4' x 2" Pipe Mount	108
FDD_R6_RRH	130	T-Arm Mount [TA 602-3]	108
FDD_R6_RRH	130	RR90-17-02DP w/Mount Pipe	108
T-Arm Mount [TA 602-3]	130	(2) KRY 112 71	108
A-ANT-23G-2-C	130	RR90-17-02DP w/Mount Pipe	108
A-ANT-23G-2-C	130	742 213	100
A-ANT-23G-2-C	130	742 213	100
(2) DB846F65ZAXY w/Mount Pipe	118	Pipe Mount [PM 601-3]	100
P65.16.XL.2 w/ Mount Pipe	118	742 213	100
MG D3-900TX	118	Side Arm Mount [SO 701-1]	75
(2) DB846F65ZAXY w/Mount Pipe	118	KS24019-L112A	75
P65.16.XL.2 w/ Mount Pipe	118		
MG D3-900TX	118		
T-Arm Mount [TA 602-3]	118		
(2) DB846F65ZAXY w/Mount Pipe	118		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	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 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 78.1%

CROWN CASTLE
Shaping the wireless world
Crown Castle
2000 Corporate Drive
Canonsburg, PA
Phone: (724) 416-2000
FAX:

Job: BU # 881541			
Project:			
Client: Crown Castle	Drawn by: Firas Abdelahad	App'd:	
Code: TIA/EIA-222-F	Date: 12/14/09	Scale: NTS	
Path: R:\SA Models - Letters\Work Area\FAbdelahad\881541\881541.eri		Dwg No. E-1	

RISATower	Job	Page
	BU # 881541	1 of 13
Crown Castle 2000 Corporate Drive Canonsburg, PA Phone: (724) 416-2000 FAX:	Project	Date 13:20:48 12/14/09
	Client Crown Castle	Designed by Firas Abdelahad

Tower Input Data

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

Tower is located in New Haven County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.500 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
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	139.500-93.040	46.460	3.920	18	15.500	26.990	0.250	1.000	A572-65 (65 ksi)
L2	93.040-46.380	50.580	5.250	18	25.521	37.910	0.375	1.500	A572-65 (65 ksi)
L3	46.380-0.000	51.630		18	35.874	48.500	0.375	1.500	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	15.739	12.101	355.544	5.414	7.874	45.154	711.557	6.052	2.288	9.152
	27.406	21.218	1916.764	9.493	13.711	139.798	3836.050	10.611	4.310	17.241
L2	26.889	29.929	2390.886	8.927	12.964	184.419	4784.918	14.968	3.832	10.218
	38.495	44.676	7952.156	13.325	19.258	412.921	15914.776	22.342	6.012	16.032
L3	37.731	42.253	6727.054	12.602	18.224	369.131	13462.959	21.130	5.654	15.077
	49.248	57.281	16760.535	17.084	24.638	680.272	33543.123	28.646	7.876	21.003

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 139.500-93.040				1	1	1		
L2 93.040-46.380				1	1	1		
L3 46.380-0.000				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
LDF7-50A(1-5/8")	B	No	Inside Pole	136.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
LDF7-50A(1-5/8")	C	No	Inside Pole	130.000 - 0.000	9	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
7983A (1/2")	A	No	CaAa (Out Of Face)	130.000 - 0.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
9207(5/16")	A	No	CaAa (Out Of Face)	130.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
LDF7-50A(1-5/8")	A	No	Inside Pole	118.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
LDF7-50A(1-5/8")	B	No	Inside Pole	108.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
CR 50 1873(1-5/8")	B	No	Inside Pole	100.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
LDF4-50A(1/2")	B	No	Inside Pole	75.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
**								
2" Rigid Conduit	A	No	CaAa (Out Of Face)	130.000 - 0.000	1	No Ice	0.200	0.003
						1/2" Ice	0.300	0.004

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	139.500-93.040	A	0.000	0.000	0.000	7.392	0.491

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	0.393
		C	0.000	0.000	0.000	0.000	0.273
L2	93.040-46.380	A	0.000	0.000	0.000	9.332	0.770
		B	0.000	0.000	0.000	0.000	0.925
		C	0.000	0.000	0.000	0.000	0.344
L3	46.380-0.000	A	0.000	0.000	0.000	9.276	0.765
		B	0.000	0.000	0.000	0.000	0.922
		C	0.000	0.000	0.000	0.000	0.342

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	139.500-93.040	A	0.500	0.000	0.000	0.000	11.088	0.734
		B		0.000	0.000	0.000	0.000	0.393
		C		0.000	0.000	0.000	0.000	0.273
L2	93.040-46.380	A	0.500	0.000	0.000	0.000	13.998	1.075
		B		0.000	0.000	0.000	0.000	0.925
		C		0.000	0.000	0.000	0.000	0.344
L3	46.380-0.000	A	0.500	0.000	0.000	0.000	13.914	1.069
		B		0.000	0.000	0.000	0.000	0.922
		C		0.000	0.000	0.000	0.000	0.342

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	139.500-93.040	0.000	-0.231	0.000	-0.320
L2	93.040-46.380	0.000	-0.279	0.000	-0.394
L3	46.380-0.000	0.000	-0.284	0.000	-0.406

Discrete Tower Loads

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
7770.00	A	From Leg	0.500 0.000 0.000	0.000	136.000	No Ice 1/2" Ice	5.882 6.314	2.928 3.273	0.035 0.068
7770.00	B	From Leg	0.500 0.000 0.000	0.000	136.000	No Ice 1/2" Ice	5.882 6.314	2.928 3.273	0.035 0.068
7770.00	C	From Leg	0.500	0.000	136.000	No Ice	5.882	2.928	0.035

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
			0.000			1/2" Ice	6.314	3.273	0.068
			0.000						
(2) LGP21401	A	From Leg	0.500	0.000	136.000	No Ice	1.288	0.233	0.014
			0.000			1/2" Ice	1.445	0.313	0.021
			0.000						
(2) LGP21401	B	From Leg	0.500	0.000	136.000	No Ice	1.288	0.233	0.014
			0.000			1/2" Ice	1.445	0.313	0.021
			0.000						
(2) LGP21401	C	From Leg	0.500	0.000	136.000	No Ice	1.288	0.233	0.014
			0.000			1/2" Ice	1.445	0.313	0.021
			0.000						
Pipe Mount [PM 601-3]	C	None		0.000	136.000	No Ice	4.390	4.390	0.195
						1/2" Ice	5.480	5.480	0.237
****									
(3) MLA_ANTENNA w/ Mount Pipe	A	From Leg	4.000	0.000	130.000	No Ice	8.637	6.946	0.066
			0.000			1/2" Ice	9.290	8.127	0.131
			0.000						
(3) MLA_ANTENNA w/ Mount Pipe	B	From Leg	4.000	0.000	130.000	No Ice	8.637	6.946	0.066
			0.000			1/2" Ice	9.290	8.127	0.131
			0.000						
(3) MLA_ANTENNA w/ Mount Pipe	C	From Leg	4.000	0.000	130.000	No Ice	8.637	6.946	0.066
			0.000			1/2" Ice	9.290	8.127	0.131
			0.000						
LLPX310R w/ Mount Pipe	A	From Leg	4.000	0.000	130.000	No Ice	5.065	2.985	0.045
			0.000			1/2" Ice	5.480	3.528	0.081
			-2.000						
LLPX310R w/ Mount Pipe	B	From Leg	4.000	0.000	130.000	No Ice	5.065	2.985	0.045
			0.000			1/2" Ice	5.480	3.528	0.081
			-2.000						
LLPX310R w/ Mount Pipe	C	From Leg	4.000	0.000	130.000	No Ice	5.065	2.985	0.045
			0.000			1/2" Ice	5.480	3.528	0.081
			-2.000						
FDD_R6_RRH	A	From Leg	4.000	0.000	130.000	No Ice	1.789	0.778	0.033
			0.000			1/2" Ice	1.971	0.918	0.045
			-2.000						
FDD_R6_RRH	B	From Leg	4.000	0.000	130.000	No Ice	1.789	0.778	0.033
			0.000			1/2" Ice	1.971	0.918	0.045
			-2.000						
FDD_R6_RRH	C	From Leg	4.000	0.000	130.000	No Ice	1.789	0.778	0.033
			0.000			1/2" Ice	1.971	0.918	0.045
			-2.000						
T-Arm Mount [TA 602-3]	C	None		0.000	130.000	No Ice	11.590	11.590	0.774
						1/2" Ice	15.440	15.440	0.990
**									
(2) DB846F65ZAXY w/Mount Pipe	A	From Leg	4.000	0.000	118.000	No Ice	7.271	7.821	0.047
			0.000			1/2" Ice	7.877	9.010	0.111
			0.000						
P65.16.XL.2 w/ Mount Pipe	A	From Leg	4.000	0.000	118.000	No Ice	8.637	5.779	0.059
			0.000			1/2" Ice	9.290	6.949	0.119
			0.000						
MG D3-900TX	A	From Leg	4.000	0.000	118.000	No Ice	4.977	3.316	0.024
			0.000			1/2" Ice	5.432	3.757	0.051
			0.000						
(2) DB846F65ZAXY w/Mount Pipe	B	From Leg	4.000	0.000	118.000	No Ice	7.271	7.821	0.047
			0.000			1/2" Ice	7.877	9.010	0.111
			0.000						
P65.16.XL.2 w/ Mount Pipe	B	From Leg	4.000	0.000	118.000	No Ice	8.637	5.779	0.059

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
			0.000 0.000			1/2" Ice	9.290	6.949	0.119
MG D3-900TX	B	From Leg	4.000 0.000 0.000	0.000	118.000	No Ice 1/2" Ice	4.977 5.432	3.316 3.757	0.024 0.051
(2) DB846F65ZAXY w/Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	118.000	No Ice 1/2" Ice	7.271 7.877	7.821 9.010	0.047 0.111
P65.16.XL.2 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	118.000	No Ice 1/2" Ice	8.637 9.290	5.779 6.949	0.059 0.119
MG D3-900TX	C	From Leg	4.000 0.000 0.000	0.000	118.000	No Ice 1/2" Ice	4.977 5.432	3.316 3.757	0.024 0.051
T-Arm Mount [TA 602-3]	C	None		0.000	118.000	No Ice 1/2" Ice	11.590 15.440	11.590 15.440	0.774 0.990
**									
RR90-17-02DP w/Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice	4.910 5.572	3.636 4.703	0.044 0.082
(2) KRY 112 71	A	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice	0.681 0.802	0.450 0.559	0.000 0.005
RR90-17-02DP w/Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice	4.910 5.572	3.636 4.703	0.044 0.082
(2) KRY 112 71	B	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice	0.681 0.802	0.450 0.559	0.000 0.005
RR90-17-02DP w/Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice	4.910 5.572	3.636 4.703	0.044 0.082
(2) KRY 112 71	C	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice	0.681 0.802	0.450 0.559	0.000 0.005
APXV18-206516S-C-A20 w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice	3.859 4.274	3.296 4.004	0.039 0.071
ATMAA1412D-1A20	A	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice	1.517 1.683	0.467 0.575	0.013 0.022
APXV18-206516S-C-A20 w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice	3.859 4.274	3.296 4.004	0.039 0.071
ATMAA1412D-1A20	B	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice	1.517 1.683	0.467 0.575	0.013 0.022
APXV18-206516S-C-A20 w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice	3.859 4.274	3.296 4.004	0.039 0.071
ATMAA1412D-1A20	C	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice	1.517 1.683	0.467 0.575	0.013 0.022
(2) 4' x 2" Pipe Mount	A	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice	0.785 1.028	0.785 1.028	0.029 0.035
(2) 4' x 2" Pipe Mount	B	From Leg	4.000	0.000	108.000	No Ice	0.785	0.785	0.029

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
			0.000 1.000			1/2" Ice	1.028	1.028	0.035
(2) 4' x 2" Pipe Mount	C	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice	0.785 1.028	0.785 1.028	0.029 0.035
T-Arm Mount [TA 602-3]	C	None		0.000	108.000	No Ice 1/2" Ice	11.590 15.440	11.590 15.440	0.774 0.990
****									
KS24019-L112A	C	From Leg	2.000 0.000 2.000	0.000	75.000	No Ice 1/2" Ice	0.100 0.180	0.100 0.180	0.005 0.006
Side Arm Mount [SO 701-1]	C	From Leg	1.000 0.000 0.000	0.000	75.000	No Ice 1/2" Ice	0.850 1.140	1.670 2.340	0.065 0.079
****									
742 213	A	From Leg	0.500 0.000 0.000	0.000	100.000	No Ice 1/2" Ice	5.135 5.609	2.869 3.483	0.022 0.047
742 213	B	From Leg	0.500 0.000 0.000	0.000	100.000	No Ice 1/2" Ice	5.135 5.609	2.869 3.483	0.022 0.047
742 213	C	From Leg	0.500 0.000 0.000	0.000	100.000	No Ice 1/2" Ice	5.135 5.609	2.869 3.483	0.022 0.047
Pipe Mount [PM 601-3]	C	None		0.000	100.000	No Ice 1/2" Ice	4.390 5.480	4.390 5.480	0.195 0.237
**									

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
A-ANT-23G-2-C	A	Paraboloid w/o Radome	From Leg	4.000 0.000 2.000	40.000		130.000	2.175	No Ice 1/2" Ice	3.720 4.010	0.012 0.030
A-ANT-23G-2-C	B	Paraboloid w/o Radome	From Leg	4.000 0.000 2.000	10.000		130.000	2.175	No Ice 1/2" Ice	3.720 4.010	0.012 0.030
A-ANT-23G-2-C	C	Paraboloid w/o Radome	From Leg	4.000 0.000 2.000	20.000		130.000	2.175	No Ice 1/2" Ice	3.720 4.010	0.012 0.030

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	139.5 - 93.04	Pole	Max Tension	5	0.000	0.000	-0.000
			Max. Compression	14	-11.705	0.001	0.425
			Max. Mx	11	-7.049	382.642	-1.187
			Max. My	2	-7.074	3.165	376.968
			Max. Vy	11	-15.964	382.642	-1.187
			Max. Vx	2	-15.794	3.165	376.968
			Max. Torque	11			-0.814
L2	93.04 - 46.38	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-20.787	0.176	1.095
			Max. Mx	11	-15.399	1183.087	-2.303
			Max. My	2	-15.412	7.762	1170.237
			Max. Vy	11	-19.363	1183.087	-2.303
			Max. Vx	2	-19.210	7.762	1170.237
			Max. Torque	7			-0.921
L3	46.38 - 0	Pole	Max Tension	1	0.000	0.000	0.000

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	-34.275	0.176	2.281
			Max. Mx	11	-27.900	2273.754	-2.975
			Max. My	2	-27.900	13.106	2253.681
			Max. Vy	11	-22.883	2273.754	-2.975
			Max. Vx	2	-22.735	13.106	2253.681
			Max. Torque	11			-0.900

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	24	34.275	19.255	-0.015
	Max. H_x	11	27.919	22.860	-0.024
	Max. H_z	2	27.919	0.101	22.712
	Max. M_x	2	2253.681	0.101	22.712
	Max. M_z	5	2263.452	-22.787	0.045
	Max. Torsion	13	0.303	11.460	19.650
	Min. Vert	1	27.919	0.000	0.000
	Min. H_x	5	27.919	-22.787	0.045
	Min. H_z	8	27.919	0.209	-22.706
	Min. M_x	8	-2250.532	0.209	-22.706
	Min. M_z	11	-2273.754	22.860	-0.024
	Min. Torsion	11	-0.900	22.860	-0.024

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	27.919	0.000	0.000	-1.114	0.143	0.000
Dead+Wind 0 deg - No Ice	27.919	-0.101	-22.712	-2253.681	13.106	0.062
Dead+Wind 30 deg - No Ice	27.919	11.439	-19.649	-1949.512	-1138.575	0.211
Dead+Wind 60 deg - No Ice	27.919	19.801	-11.263	-1115.412	-1969.704	-0.090
Dead+Wind 90 deg - No Ice	27.919	22.787	-0.045	-8.153	-2263.452	-0.007
Dead+Wind 120 deg - No Ice	27.919	19.816	11.192	1102.047	-1970.949	-0.065
Dead+Wind 150 deg - No Ice	27.919	11.393	19.725	1956.793	-1130.853	0.848
Dead+Wind 180 deg - No Ice	27.919	-0.209	22.706	2250.532	29.455	0.703
Dead+Wind 210 deg - No Ice	27.919	-11.363	19.695	1953.570	1128.584	0.885
Dead+Wind 240 deg - No Ice	27.919	-19.829	11.334	1122.827	1973.895	0.772
Dead+Wind 270 deg - No Ice	27.919	-22.860	0.024	2.975	2273.754	0.900
Dead+Wind 300 deg - No Ice	27.919	-19.752	-11.340	-1124.539	1962.567	0.434
Dead+Wind 330 deg - No Ice	27.919	-11.460	-19.650	-1948.893	1140.361	-0.303
Dead+Ice+Temp	34.275	0.000	-0.000	-2.281	0.176	-0.000
Dead+Wind 0 deg+Ice+Temp	34.275	-0.086	-19.140	-1942.372	11.099	0.012
Dead+Wind 30 deg+Ice+Temp	34.275	9.631	-16.557	-1680.355	-979.573	0.113
Dead+Wind 60 deg+Ice+Temp	34.275	16.676	-9.491	-962.280	-1695.093	-0.136
Dead+Wind 90 deg+Ice+Temp	34.275	19.196	-0.033	-7.791	-1948.538	-0.057
Dead+Wind 120 deg+Ice+Temp	34.275	16.692	9.441	949.023	-1696.419	-0.078
Dead+Wind 150 deg+Ice+Temp	34.275	9.601	16.623	1683.778	-973.789	0.695
Dead+Wind 180 deg+Ice+Temp	34.275	-0.165	19.135	1936.950	23.865	0.608
Dead+Wind 210 deg+Ice+Temp	34.275	-9.570	16.595	1680.832	971.522	0.776
Dead+Wind 240 deg+Ice+Temp	34.275	-16.699	9.549	965.505	1698.655	0.689

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 270 deg+Ice+Temp	34.275	-19.255	0.015	0.704	1957.103	0.780
Dead+Wind 300 deg+Ice+Temp	34.275	-16.641	-9.561	-970.283	1689.682	0.377
Dead+Wind 330 deg+Ice+Temp	34.275	-9.655	-16.563	-1680.155	981.693	-0.253
Dead+Wind 0 deg - Service	27.919	-0.035	-7.859	-781.479	4.639	0.022
Dead+Wind 30 deg - Service	27.919	3.958	-6.799	-676.111	-394.337	0.075
Dead+Wind 60 deg - Service	27.919	6.851	-3.897	-387.159	-682.268	-0.031
Dead+Wind 90 deg - Service	27.919	7.885	-0.016	-3.575	-784.030	-0.002
Dead+Wind 120 deg - Service	27.919	6.857	3.873	381.025	-682.694	-0.023
Dead+Wind 150 deg - Service	27.919	3.942	6.825	677.138	-391.660	0.297
Dead+Wind 180 deg - Service	27.919	-0.072	7.857	778.887	10.306	0.246
Dead+Wind 210 deg - Service	27.919	-3.932	6.815	676.017	391.070	0.309
Dead+Wind 240 deg - Service	27.919	-6.861	3.922	388.233	683.922	0.270
Dead+Wind 270 deg - Service	27.919	-7.910	0.008	0.281	787.805	0.314
Dead+Wind 300 deg - Service	27.919	-6.835	-3.924	-390.321	679.986	0.151
Dead+Wind 330 deg - Service	27.919	-3.965	-6.799	-675.895	395.149	-0.106

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	0.000	-27.919	0.000	0.000	27.919	0.000	0.000%
2	-0.101	-27.919	-22.712	0.101	27.919	22.712	0.000%
3	11.439	-27.919	-19.649	-11.439	27.919	19.649	0.000%
4	19.801	-27.919	-11.263	-19.801	27.919	11.263	0.000%
5	22.787	-27.919	-0.045	-22.787	27.919	0.045	0.000%
6	19.816	-27.919	11.192	-19.816	27.919	-11.192	0.000%
7	11.393	-27.919	19.725	-11.393	27.919	-19.725	0.000%
8	-0.209	-27.919	22.706	0.209	27.919	-22.706	0.000%
9	-11.363	-27.919	19.695	11.363	27.919	-19.695	0.000%
10	-19.829	-27.919	11.334	19.829	27.919	-11.334	0.000%
11	-22.860	-27.919	0.024	22.860	27.919	-0.024	0.000%
12	-19.752	-27.919	-11.340	19.752	27.919	11.340	0.000%
13	-11.460	-27.919	-19.650	11.460	27.919	19.650	0.000%
14	0.000	-34.275	0.000	0.000	34.275	0.000	0.000%
15	-0.086	-34.275	-19.140	0.086	34.275	19.140	0.000%
16	9.631	-34.275	-16.557	-9.631	34.275	16.557	0.000%
17	16.676	-34.275	-9.491	-16.676	34.275	9.491	0.000%
18	19.196	-34.275	-0.033	-19.196	34.275	0.033	0.000%
19	16.692	-34.275	9.441	-16.692	34.275	-9.441	0.000%
20	9.601	-34.275	16.623	-9.601	34.275	-16.623	0.000%
21	-0.165	-34.275	19.135	0.165	34.275	-19.135	0.000%
22	-9.570	-34.275	16.595	9.570	34.275	-16.595	0.000%
23	-16.699	-34.275	9.549	16.699	34.275	-9.549	0.000%
24	-19.255	-34.275	0.015	19.255	34.275	-0.015	0.000%
25	-16.641	-34.275	-9.561	16.641	34.275	9.561	0.000%
26	-9.655	-34.275	-16.563	9.655	34.275	16.563	0.000%
27	-0.035	-27.919	-7.859	0.035	27.919	7.859	0.000%
28	3.958	-27.919	-6.799	-3.958	27.919	6.799	0.000%
29	6.851	-27.919	-3.897	-6.851	27.919	3.897	0.000%
30	7.885	-27.919	-0.016	-7.885	27.919	0.016	0.000%
31	6.857	-27.919	3.873	-6.857	27.919	-3.873	0.000%
32	3.942	-27.919	6.825	-3.942	27.919	-6.825	0.000%
33	-0.072	-27.919	7.857	0.072	27.919	-7.857	0.000%
34	-3.932	-27.919	6.815	3.932	27.919	-6.815	0.000%
35	-6.861	-27.919	3.922	6.861	27.919	-3.922	0.000%
36	-7.910	-27.919	0.008	7.910	27.919	-0.008	0.000%
37	-6.835	-27.919	-3.924	6.835	27.919	3.924	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
38	-3.965	-27.919	-6.799	3.965	27.919	6.799	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	0.00007745
3	Yes	5	0.00000001	0.00015990
4	Yes	5	0.00000001	0.00015737
5	Yes	4	0.00000001	0.00006695
6	Yes	5	0.00000001	0.00015565
7	Yes	5	0.00000001	0.00015404
8	Yes	4	0.00000001	0.00036427
9	Yes	5	0.00000001	0.00016154
10	Yes	5	0.00000001	0.00015550
11	Yes	4	0.00000001	0.00020761
12	Yes	5	0.00000001	0.00015975
13	Yes	5	0.00000001	0.00015983
14	Yes	4	0.00000001	0.00000001
15	Yes	5	0.00000001	0.00008996
16	Yes	5	0.00000001	0.00036066
17	Yes	5	0.00000001	0.00035615
18	Yes	5	0.00000001	0.00009006
19	Yes	5	0.00000001	0.00035068
20	Yes	5	0.00000001	0.00035141
21	Yes	5	0.00000001	0.00009225
22	Yes	5	0.00000001	0.00036178
23	Yes	5	0.00000001	0.00035356
24	Yes	5	0.00000001	0.00009119
25	Yes	5	0.00000001	0.00036001
26	Yes	5	0.00000001	0.00036106
27	Yes	4	0.00000001	0.00001828
28	Yes	4	0.00000001	0.00037462
29	Yes	4	0.00000001	0.00036368
30	Yes	4	0.00000001	0.00001807
31	Yes	4	0.00000001	0.00035575
32	Yes	4	0.00000001	0.00034552
33	Yes	4	0.00000001	0.00004834
34	Yes	4	0.00000001	0.00038400
35	Yes	4	0.00000001	0.00035190
36	Yes	4	0.00000001	0.00004529
37	Yes	4	0.00000001	0.00037553
38	Yes	4	0.00000001	0.00037435

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	139.5 - 93.04	30.843	36	1.939	0.006
L2	96.96 - 46.38	14.773	36	1.486	0.002

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L3	51.63 - 0	4.067	36	0.745	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136.000	7770.00	36	29.427	1.910	0.005	26862
132.000	A-ANT-23G-2-C	36	27.813	1.877	0.005	17908
130.000	(3) MLA_ANTENNA w/ Mount Pipe	36	27.010	1.860	0.005	14138
118.000	(2) DB846F65ZAXY w/Mount Pipe	36	22.289	1.749	0.003	6246
108.000	RR90-17-02DP w/Mount Pipe	36	18.560	1.638	0.002	4262
100.000	742 213	36	15.775	1.532	0.002	3403
75.000	KS24019-L112A	36	8.588	1.097	0.001	3086

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	139.5 - 93.04	88.860	11	5.588	0.016
L2	96.96 - 46.38	42.594	11	4.284	0.005
L3	51.63 - 0	11.735	11	2.149	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136.000	7770.00	11	84.784	5.500	0.015	9473
132.000	A-ANT-23G-2-C	11	80.140	5.398	0.014	6314
130.000	(3) MLA_ANTENNA w/ Mount Pipe	11	77.829	5.346	0.013	4985
118.000	(2) DB846F65ZAXY w/Mount Pipe	11	64.237	5.016	0.010	2200
108.000	RR90-17-02DP w/Mount Pipe	11	53.498	4.700	0.007	1499
100.000	742 213	11	45.478	4.407	0.005	1195
75.000	KS24019-L112A	11	24.770	3.248	0.002	1077

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	139.5 - 93.04 (1)	TP26.99x15.5x0.25	46.460	0.000	0.0	39.000	20.449	-7.049	797.508	0.009
L2	93.04 - 46.38 (2)	TP37.91x25.521x0.375	50.580	0.000	0.0	39.000	43.145	-15.399	1682.670	0.009
L3	46.38 - 0 (3)	TP48.5x35.874x0.375	51.630	0.000	0.0	39.000	55.860	-26.709	2178.530	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	139.5 - 93.04 (1)	TP26.99x15.5x0.25	382.644	35.375	39.000	0.907	0.000	0.000	39.000	0.000
L2	93.04 - 46.38 (2)	TP37.91x25.521x0.375	1183.092	36.878	39.000	0.946	0.000	0.000	39.000	0.000
L3	46.38 - 0 (3)	TP48.5x35.874x0.375	2162.983	40.129	39.000	1.029	0.000	0.000	39.000	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 $\frac{f_{vt}}{F_{vt}}$
L1	139.5 - 93.04 (1)	TP26.99x15.5x0.25	15.964	0.781	26.000	0.060	0.814	0.037	26.000	0.001
L2	93.04 - 46.38 (2)	TP37.91x25.521x0.375	19.363	0.449	26.000	0.035	0.804	0.012	26.000	0.000
L3	46.38 - 0 (3)	TP48.5x35.874x0.375	22.712	0.407	26.000	0.031	0.895	0.008	26.000	0.000

Pole Interaction Design Data

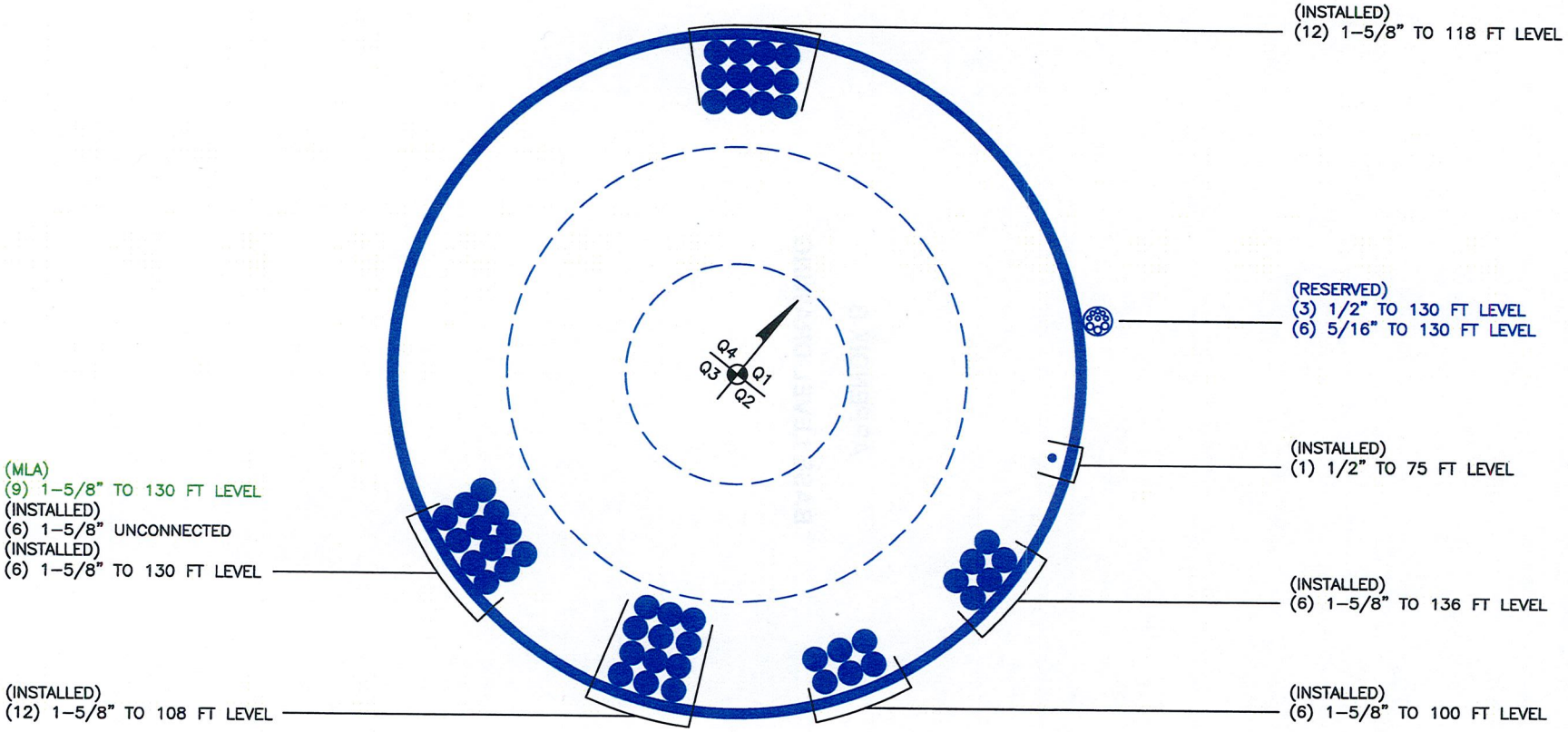
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	139.5 - 93.04 (1)	0.009	0.907	0.000	0.060	0.001	0.917 ✓	1.333	H1-3+VT ✓
L2	93.04 - 46.38 (2)	0.009	0.946	0.000	0.035	0.000	0.955 ✓	1.333	H1-3+VT ✓
L3	46.38 - 0 (3)	0.012	1.029	0.000	0.031	0.000	1.041 ✓	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	139.5 - 93.04	Pole	TP26.99x15.5x0.25	1	-7.049	1063.078	68.8	Pass
L2	93.04 - 46.38	Pole	TP37.91x25.521x0.375	2	-15.399	2242.999	71.6	Pass
L3	46.38 - 0	Pole	TP48.5x35.874x0.375	3	-26.709	2903.980	78.1	Pass
							Summary	
						Pole (L3)	78.1	Pass
						RATING =	**78.1**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 881541 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

FOUNDATION REACTION COMPARISON

BU # 881541
WO# 309136

REACTIONS	DESIGN REACTIONS	CURRENT REACTIONS	% CAPACITY
MOMENT (kip-ft)	2561.0	2274.0	88.8%
SHEAR (kips)	24.7	23.0	93.1%

Design loads from: CCIsites Doc #2208511 EEI, Project 12364

Although the shear capacity is at 93.1%, the moment reaction is the governing criteria for a monopole drilled pier foundation. Therefore, the overall capacity for this foundation is 88.8%.

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

Site Data

BU#: *881541*
Site Name: *ROGERS PROPERTY*
App #: *91611, Rev 0*

Pole Manufacturer:	*Other*

Reactions		
Moment:	2274	ft-kips
Axial:	28	kips
Shear:	23	kips

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

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	57	in

Plate Data		
Diam:	63	in
Thick:	2	in
Grade:	60	ksi
Single-Rod B-eff:	9.62	in

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:	Both	
Groove Depth:	0.25	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0	in
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	48.5	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

Maximum Rod Tension:	117.9 Kips	Rigid
Allowable Tension:	195.0 Kips	Service, ASD
Anchor Rod Stress Ratio:	60.5% **Pass**	Fty*ASIF

Base Plate Results

	Flexural Check	Rigid
Base Plate Stress:	49.3 ksi	Service ASD
Allowable Plate Stress:	60.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	82.1% **Pass**	Y.L. Length: 29.95

n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a

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

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

ROBINSON & COLE LLP

ORIGINAL

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Direct (860) 275-8345

December 13, 2010

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

Re: **Notice of Completion of Construction Activity**
EM-VER-167-100111 – 1116 Johnson Road, Woodbridge, Connecticut
EM-VER-089-100224A – 167 Lester Street, New Britain, Connecticut
EM-VER-052-100201 – 130 Birdseye Road, Farmington, Connecticut
EM-VER-084-100111 – 528 Wheelers Farm Road, Milford, Connecticut
EM-VER-084-100115 – 18 Research Parkway, Milford, Connecticut
EM-VER-107-100107 – Grassy Hill Road, Orange, Connecticut

Dear Ms. Roberts:

The purpose of this letter is to notify you that construction activity associated with the above-referenced facility modifications has been completed.

If you have any questions or need any additional information regarding any of these facilities, please do not hesitate to contact me.

Sincerely,

Kenneth C. Baldwin

KCB/kmd
Copy to:
Sandy M. Carter