



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

July 12, 2013

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

RE: **EM-VER -139-130618** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 44 Fyler Place, Suffield, 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 with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with the 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;
- Within 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 June 17, 2013. 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,

Melanie A. Bachman
Acting Executive Director

MAB/CDM/jb

c: The Honorable Edward G. McAnaney, First Selectman, Town of Suffield
William Hawkins, AICP, Town Planner, Town of Suffield
Crown Castle





STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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E-Mail: siting.council@ct.gov

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June 19, 2013

The Honorable Edward G. McAnaney
First Selectman
Town of Suffield
Town Hall
83 Mountain Road
Suffield, CT 06078

RE: **EM-VER -139-130618** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 44 Fyler Place, Suffield, Connecticut.

Dear First Selectman McAnaney:

The Connecticut Siting Council (Council) received a request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72, a copy of which has already been provided to you.

If you have any questions or comments regarding the proposal, please call me or inform the Council by July 3, 2013.

Thank you for your cooperation and consideration.

Very truly yours,

Melanie Bachman
Acting Executive Director

MB/jb

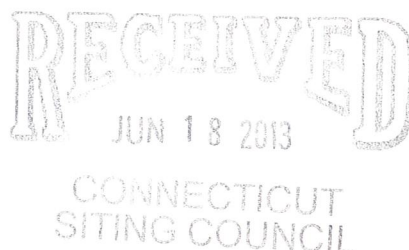
c: William Hawkins, AICP, Suffield Town Planner, Town of Suffield

EM-VER-139-130618

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

Also admitted in Massachusetts

June 17, 2013



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

Re: **Notice of Exempt Modification – Facility Modification
44 Fyler Place, Suffield, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains fifteen (15) antennas at the 91-foot level of the existing 110-foot tower at 44 Fyler Place in Suffield. The tower is owned by Crown Castle. The Council approved Cellco’s use of this tower in 2001. Cellco now intends to replace two (2) of its existing antennas with two (2) model BXA-70063-6CF LTE antennas at the same height on the tower. Attached behind Tab 1 are the specifications for the 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 Edward McAnaney, Suffield’s First Selectman. The Town of Suffield 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 an increase in the height of the existing tower. Cellco’s replacement antennas will be located at the 91-foot level of the existing 110-foot tower.



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Melanie A. Bachman
June 17, 2013
Page 2

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

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.


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

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

6. The tower and its foundation can support Cellco's proposed antenna modifications. (See Structural Analysis Report attached behind 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:

Edward McAnaney, Suffield First Selectman
Sandy M. Carter



BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

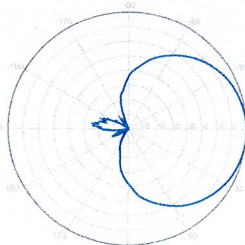
Replace "X" with desired electrical downtilt.

Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	696-900 MHz		
Frequency bands	696-806 MHz	806-900 MHz	
Polarization	±45°		
Horizontal beamwidth	65°	63°	
Vertical beamwidth	13°	11°	
Gain	14.0 dBd (16.1 dBi)	14.5 dBd (16.6 dBi)	
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10		
Impedance	50Ω		
VSWR	≤1.35:1		
Upper sidelobe suppression (0°)	-18.3 dB	-18.2 dB	
Front-to-back ratio (+/-30°)	-33.4 dB	-36.3 dB	
Null fill	5% (-26.02 dB)		
Isolation between ports	< -25 dB		
Input power with EDIN connectors	500 W		
Input power with NE connectors	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1804 x 285 x 132 mm	71.0 x 11.2 x 5.2 in	
Depth with z-brackets	172 mm	6.8 in	
Weight without mounting brackets	7.9 kg	17 lbs	
Survival wind speed	> 201 km/hr	> 125 mph	
Wind area	Front: 0.51 m ² Side: 0.24 m ²	Front: 5.5 ft ² Side: 2.6 ft ²	
Wind load @ 161 km/hr (100 mph)	Front: 759 N Side: 391 N	Front: 169 lbf Side: 89 lbf	
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs
Concealment Configurations	For concealment configurations, order BXA-70063-6CF-EDIN-X-FP		

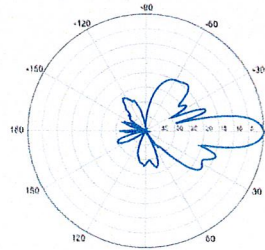


BXA-70063-6CF-EDIN-X



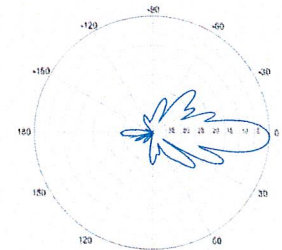
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

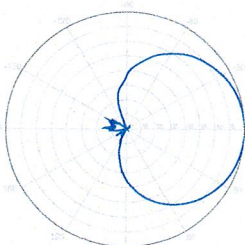


0° | Vertical | 750 MHz

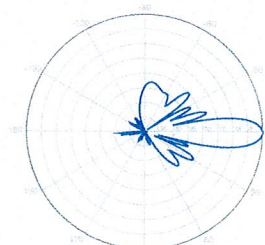
BXA-70063-6CF-EDIN-2



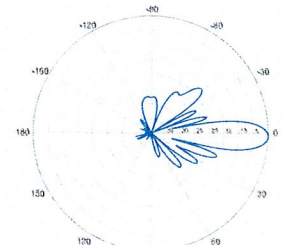
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



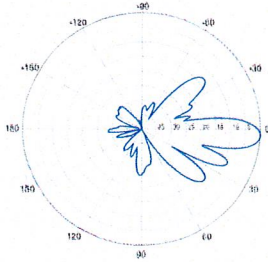
2° | Vertical | 850 MHz

Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.

BXA-70063-6CF-EDIN-X

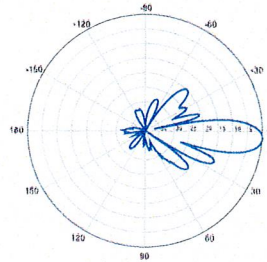
X-Pol | FET Panel | 63° | 14.5 dBd

BXA-70063-6CF-EDIN-3



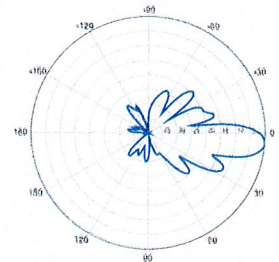
3° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-4

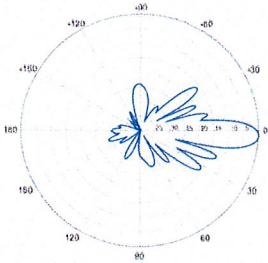


4° | Vertical | 750 MHz

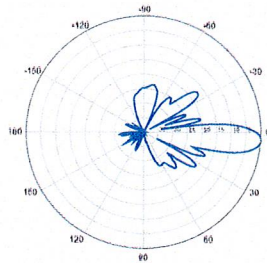
BXA-70063-6CF-EDIN-5



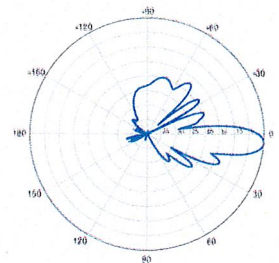
5° | Vertical | 750 MHz



3° | Vertical | 850 MHz

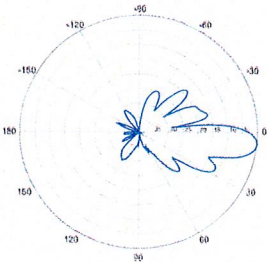


4° | Vertical | 850 MHz



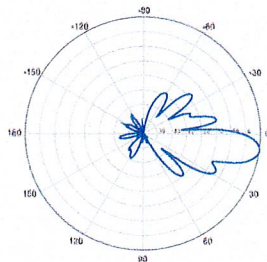
5° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-6



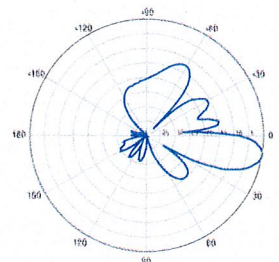
6° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-8

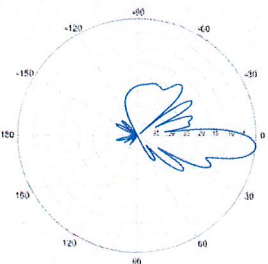


8° | Vertical | 750 MHz

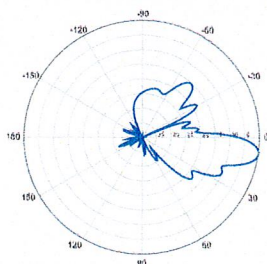
BXA-70063-6CF-EDIN-10



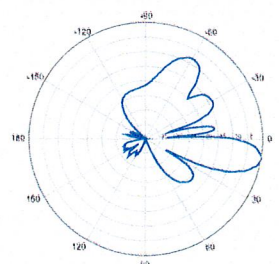
10° | Vertical | 750 MHz



6° | Vertical | 850 MHz



8° | Vertical | 850 MHz



10° | Vertical | 850 MHz

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Site Name: Suffield		General		Power		Density							
Tower Height: Verizon @ 91ft													
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total					
*AT&T UMTS	2	565	107	0.0355	880	0.5867	0.60%						
*AT&T UMTS	2	646	107	0.0406	1900	1.0000	0.41%						
*AT&T GSM	4	934	107	0.1173	1900	1.0000	1.17%						
*AT&T GSM	1	647	107	0.0203	880	0.5867	0.35%						
*AT&T LTE	1	1615	107	0.0507	734	0.4893	1.04%						
*Pocket (now MetroPCS)	3	631	62	0.1771	2130	1.0000	17.71%						
*Nextel	9	100	83	0.0470	851	0.5673	8.28%						
*Sprint CDMA/LTE	2	551	74	0.0724	1900	1.0000	7.24%						
*Sprint CDMA/LTE	1	276	74	0.0181	850	0.5667	3.20%						
Verizon PCS	11	284	91	0.1356	1970	1.0000	13.56%						
Verizon Cellular	9	278	91	0.1086	869	0.5793	18.75%						
Verizon AWS	1	1750	91	0.0760	2145	1.0000	7.60%						
Verizon 700	1	902	91	0.0392	698	0.4653	8.42%						
								88.32%					
* Source: Siting Council													

Date: **May 24, 2013**

Veronica Harris
Crown Castle
1200 McArthur Blvd
Mahwah, NJ 07430



Practical Solutions, Exceptional Service
Tectonic
1279 Route 300
Newburgh, NY
(845) 567-6656

Subject: Structural Analysis Report

Carrier Designation:	Verizon Wireless Co-Locate	
	Carrier Site Number:	N/A
	Carrier Site Name:	Suffield, CT
Crown Castle Designation:	Crown Castle BU Number:	801486
	Crown Castle Site Name:	CT SUFFIELD 2 CAC 801486
	Crown Castle JDE Job Number:	235179
	Crown Castle Work Order Number:	613206
	Crown Castle Application Number:	189370 Rev. 3
Engineering Firm Designation:	Tectonic Project Number:	6500.801486
Site Data:	44 Fyler Place, Suffield, Hartford County, CT Latitude 41° 58' 49.7", Longitude -72° 39' 26.2" 109 Foot - Monopole Tower	

Dear Veronica Harris,

Tectonic 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 548505, in accordance with application 189370, revision 3.

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:

LC7: 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 2005 Connecticut State Building Code with 2009 amendment based upon a wind speed of 80 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 Tectonic appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by Antonio A. Gualtieri

Respectfully submitted by:



Antonio A. Gualtieri, P.E.
Sr. VP-Telecommunications/Structural/Energy

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1) INTRODUCTION

This tower is a 109 ft Monopole tower designed by FWT INC. in February of 2002. The tower was originally designed for a wind speed of 80 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 80 mph with no ice, 37.6 mph with 1 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
90.0	91.0	2	antel	BXA-70063/6CF-EDIN-0 w/ Mount Pipe	-	-	-

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
107.0	109.0	4	andrew	SBNH-1D6565C w/ Mount Pipe	12 1 2	1-5/8 3/8 3/4	1
		3	communication components inc.	DTMABP7819VG12A			
		6	ericsson	RRUS-11			
		3	kathrein	800 10121 w/ Mount Pipe			
		6	kathrein	860 10025			
		3	powerwave technologies	7020.00			
		6	powerwave technologies	LGP13519			
		2	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe			
		6	powerwave technologies	TT19-08BP111-001			
		1	raycap	DC6-48-60-18-8F			
	107.0	1	tower mounts	Platform Mount [LP 712-1]			
90.0	91.0	2	antel	BXA-70063-4CF-EDIN-X w/ Mount Pipe	18	1-1/4	3
		1	antel	BXA-70063-4CF-EDIN-X w/ Mount Pipe			
		6	antel	LPA-171080/8CFx2 w/ Mount Pipe			
		2	antel	LPA-80080-4CF-EDIN-0 w/ Mount Pipe			
	4	swedcom	SC 9012 REV2 w/Mount Pipe				
	90.0	1	tower mounts	Platform Mount [LP 712-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
80.0	81.0	12	decibel	DB844H90-XY w/ Mount Pipe	12	7/8	1
	80.0	1	tower mounts	Platform Mount [LP 712-1]			
72.0	74.0	2	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe	3	1-1/4	2
		1	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
	72.0	1	tower mounts	Platform Mount [LP 712-1]	-	-	1
70.0	70.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-	2
		3	alcatel lucent	PCS 1900 MHz 4x45W-65MHz			
		1	tower mounts	Side Arm Mount [SO 102-3]			
62.0	62.0	3	rfs celwave	APX18-206516L w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 501-3]			
47.0	47.0	1	tower mounts	Side Arm Mount [SO 701-1]	1	1/2	1
		1	unknown	GPS			

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) 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)
110	110	12	swedcom	ALP-9212-N	-	-
102	102	12	swedcom	ALP-9212-N	-	-
92	92	12	swedcom	ALP-9212-N	-	-
82	82	12	swedcom	ALP-9212-N	-	-
72	72	12	swedcom	ALP-9212-N	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clough, Harbour & Associates, LLP	2294830	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	FWT, Inc.	821489	CCISITES
4-TOWER MANUFACTURER DRAWINGS	FWT, Inc.	823124	CCISITES

3.1) Analysis Method

tnxTower (version 6.0.4.0), 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.

This analysis may be affected if any assumptions are not valid or have been made in error. Tectonic 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	109 - 95	Pole	TP26.715x23.476x0.1875	1	-3.28	820.73	17.5	Pass	
L2	95 - 48.0833	Pole	TP37.573x26.715x0.3125	2	-14.80	1862.65	47.5	Pass	
L3	48.0833 - 0	Pole	TP48.075x35.8101x0.375	3	-26.70	2951.56	60.2	Pass	
							Summary:		
							Pole (L3)	60.2	Pass
							Rating =	60.2	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	47.2	Pass
1	Base Plate	0	28.3	Pass
1	Base Foundation	0	85.4	Pass
1	Flange Plate	95	4.8	Pass
1	Flange Bolts	95	11.8	Pass

Structure Rating (max from all components) =	85.4%
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Notes:

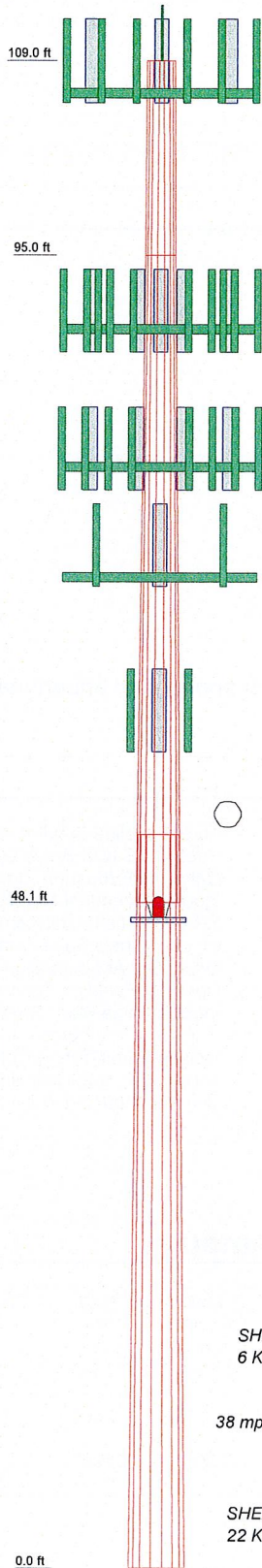
- 1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing, reserved and proposed loads. No modifications are required at this time.

APPENDIX A
TNXTOWER OUTPUT

Section	1	2	3
Length (ft)	14'	48'11-1/32"	53'
Number of Sides	18	18	18
Thickness (in)	0.1875	0.3125	0.3750
Socket Length (ft)		4'11-1/32"	
Top Dia (in)	23.4760	26.7150	35.8101
Bot Dia (in)	26.7150	37.5730	48.0750
Grade		A572-65	
Weight (K)	0.7	5.0	8.9



DESIGNED APPURTENANCE LOADING

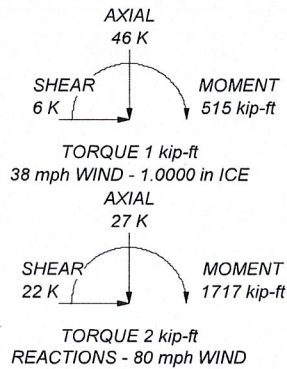
TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod 3/4" x 4'	111	BXA-70063/6CF w/ Mount Pipe	90
800 10121 w/ Mount Pipe	107	(2) LPA-171080/8CFx2 w/ Mount Pipe	90
(2) LGP13519	107	(2) SC 9012 REV2 w/ Mount Pipe	90
SBNH-1D6565C w/ Mount Pipe	107	BXA-70063/6CF w/ Mount Pipe	90
P65-17-XLH-RR w/ Mount Pipe	107	(2) LPA-171080/8CFx2 w/ Mount Pipe	90
(4) RRUS-11	107	(2) SC 9012 REV2 w/ Mount Pipe	90
(2) 860 10025	107	Platform Mount [LP 712-1]	90
7020.00	107	(4) DB844H90-XY w/ Mount Pipe	80
(2) TT19-08BP111-001	107	(4) DB844H90-XY w/ Mount Pipe	80
DC6-48-60-18-8F	107	(4) DB844H90-XY w/ Mount Pipe	80
800 10121 w/ Mount Pipe	107	Platform Mount [LP 712-1]	80
(2) LGP13519	107	APXV9ERR18-C-A20 w/ Mount Pipe	72
DTMABP7819VG12A	107	APXVSP18-C-A20 w/ Mount Pipe	72
(2) RRUS-11	107	APXV9ERR18-C-A20 w/ Mount Pipe	72
(2) 860 10025	107	Platform Mount [LP 712-1]	72
7020.00	107	(2) 5' x 2' Pipe Mount	72
(2) SBNH-1D6565C w/ Mount Pipe	107	(2) 5' x 2' Pipe Mount	72
(2) TT19-08BP111-001	107	(2) 5' x 2' Pipe Mount	72
800 10121 w/ Mount Pipe	107	800MHz 2X50W RRH W/FILTER	70
(2) LGP13519	107	PCS 1900MHz 4x45W-65MHz	70
SBNH-1D6565C w/ Mount Pipe	107	800MHz 2X50W RRH W/FILTER	70
(2) DTMABP7819VG12A	107	PCS 1900MHz 4x45W-65MHz	70
P65-17-XLH-RR w/ Mount Pipe	107	800MHz 2X50W RRH W/FILTER	70
(2) 860 10025	107	PCS 1900MHz 4x45W-65MHz	70
7020.00	107	Side Arm Mount [SO 102-3]	70
(2) TT19-08BP111-001	107	(2) 5x2 1/2" Pipe Mount	70
5' x 2' Pipe Mount	107	(2) 5x2 1/2" Pipe Mount	70
5' x 2' Pipe Mount	107	(2) 5x2 1/2" Pipe Mount	70
5' x 2' Pipe Mount	107	APX18-206516L w/ Mount Pipe	62
Platform Mount [LP 712-1]	107	APX18-206516L w/ Mount Pipe	62
BXA-70063-4CF-EDIN-X w/ Mount Pipe	90	APX18-206516L w/ Mount Pipe	62
(2) LPA-171080/8CFx2 w/ Mount Pipe	90	Pipe Mount [PM 501-3]	62
(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe	90	GPS	47
		Side Arm Mount [SO 701-1]	47

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

- Tower is located in Hartford County, Connecticut.
- Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
- Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
- Deflections are based upon a 50 mph wind.
- TOWER RATING: 60.2%



 Practical Solutions, Exceptional Service	Tectonic 1279 Route 300 Newburgh, NY Phone: (845) 567-6656 FAX:		Job: BU# 801486
	Project:	Client: Crown Castle	Drawn by: Cliff Gunther
	Code: TIA/EIA-222-F	Date: 05/22/13	App'd:
	Path:	Scale: NTS	Dwg No. E-1
	<small>©\Newburgh\Projects\6500 Crown SA\6500_801486\Structural\801486 Tower Model.dwg</small>		

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

- 4) Tower is located in Hartford County, Connecticut.
- 5) Basic wind speed of 80 mph.
- 6) Nominal ice thickness of 1.0000 in.
- 7) Ice thickness is considered to increase with height.
- 8) Ice density of 56 pcf.
- 9) A wind speed of 38 mph is used in combination with ice.
- 10) Temperature drop of 50 °F.
- 11) Deflections calculated using a wind speed of 50 mph.
- 12) A non-linear (P-delta) analysis was used.
- 13) Pressures are calculated at each section.
- 14) Stress ratio used in pole design is 1.333.
- 15) Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys ✓ Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas SR Members Have Cut Ends Sort Capacity Reports By Component Triangulate Diamond Inner Bracing	Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feedline Torque Include Angle Block Shear Check Poles ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
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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	109'-95'	14'	0'	18	23.4760	26.7150	0.1875	0.7500	A572-65 (65 ksi)
L2	95'-48'31/32"	46'11-1/32"	4'11-1/32"	18	26.7150	37.5730	0.3125	1.2500	A572-65 (65 ksi)
L3	48'31/32"-0'	53'		18	35.8101	48.0750	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	I/Q in ²	w in	w/t
L1	23.8382	13.8596	949.6645	8.2674	11.9258	79.6310	1900.5786	6.9311	3.8018	20.276
	27.1271	15.7872	1403.5717	9.4173	13.5712	103.4227	2808.9903	7.8951	4.3718	23.316
L2	27.1271	26.1880	2306.3730	9.3729	13.5712	169.9459	4615.7808	13.0965	4.1518	13.286

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
	38.1526	36.9578	6482.4687	13.2275	19.0871	339.6259	12973.467	18.4824	6.0628	19.401
L3	37.5179	42.1767	6690.7940	12.5795	18.1915	367.7969	13390.391	21.0923	5.6426	15.047
	48.8166	56.7749	16320.399	16.9335	24.4221	668.2635	32662.273	28.3929	7.8012	20.803

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft ²	in					in	in
L1 109'-95'				1	1	1		
L2 95'-48'31/32"				1	1	1		
L3 48'31/32"-0'				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		C _A A _A	Weight
				ft			ft ² /ft	plf
LDF7-50A(1-5/8")	A	No	Inside Pole	107' - 0'	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
FB-L98B-002-75000(3/8")	A	No	Inside Pole	107' - 0'	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	A	No	Inside Pole	107' - 0'	2	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
						2" Ice	0.00	0.58
						4" Ice	0.00	0.58

LDF6-50A(1-1/4")	A	No	Inside Pole	90' - 0'	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
						2" Ice	0.00	0.66
						4" Ice	0.00	0.66
LDF6-50A(1-1/4")	A	No	CaAa (Out Of Face)	90' - 0'	1	No Ice	0.16	0.66
						1/2" Ice	0.25	1.91
						1" Ice	0.35	3.78
						2" Ice	0.55	9.33
						4" Ice	0.95	27.78
LDF6-50A(1-1/4")	A	No	CaAa (Out Of Face)	90' - 0'	5	No Ice	0.00	0.66
						1/2" Ice	0.00	1.91
						1" Ice	0.00	3.78
						2" Ice	0.00	9.33
						4" Ice	0.00	27.78

LDF5-50A(7/8")	A	No	Inside Pole	80' - 0'	12	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33

HB114-1-08U4-M5J(1 1/4")	A	No	CaAa (Out Of Face)	72' - 0'	2	No Ice	0.00	1.08
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.18
						2" Ice	0.00	9.73
						4" Ice	0.00	28.15

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A		Weight plf
						In Face	Out Face	
HB114-1-08U4-M5J(1 1/4")	A	No	CaAa (Out Of Face)	72' - 0'	1	No Ice	0.15	1.08
						1/2" Ice	0.25	2.33
						1" Ice	0.35	4.18
						2" Ice	0.55	9.73
						4" Ice	0.95	28.15

CR 50 1873(1-5/8")	C	No	CaAa (Out Of Face)	62' - 0'	1	No Ice	0.20	0.83
						1/2" Ice	0.30	2.34
						1" Ice	0.40	4.47
						2" Ice	0.60	10.55
						4" Ice	1.00	30.05
CR 50 1873(1-5/8")	C	No	CaAa (Out Of Face)	62' - 0'	5	No Ice	0.00	0.83
						1/2" Ice	0.00	2.34
						1" Ice	0.00	4.47
						2" Ice	0.00	10.55
						4" Ice	0.00	30.05

LDF4-50A(1/2")	A	No	CaAa (Out Of Face)	47' - 0'	1	No Ice	0.06	0.15
						1/2" Ice	0.16	0.84
						1" Ice	0.26	2.14
						2" Ice	0.46	6.58
						4" Ice	0.86	22.78

Feed Line/Linear Appurtenances Section Areas

Tower Section n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	109'-95'	A	0.000	0.000	0.000	0.000	0.13
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	95'-48'31/32"	A	0.000	0.000	0.000	10.180	1.22
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.756	0.07
L3	48'31/32"-0'	A	0.000	0.000	0.000	17.819	1.46
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.521	0.24

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	109'-95'	A	1.145	0.000	0.000	0.000	0.000	0.13
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	95'-48'31/32"	A	1.096	0.000	0.000	0.000	24.609	2.40
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.806	0.42
L3	48'31/32"-0'	A	1.000	0.000	0.000	0.000	49.197	3.15
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	20.059	1.46

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	109'-95'	0.0000	0.0000	0.0000	0.0000

Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L2	95'-48'31/32"	-0.0774	-0.2627	-0.1373	-0.5462
L3	48'31/32"-0'	-0.2216	-0.3513	-0.3717	-0.8388

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight	
			Horz	Lateral						ft
Lighting Rod 3/4" x 4'	C	None			0.0000	111'	No Ice	0.30	0.30	0.03
							1/2" Ice	0.71	0.71	0.03
							Ice	1.00	1.00	0.04
							1" Ice	1.52	1.52	0.06
							2" Ice	2.72	2.72	0.14

800 10121 w/ Mount Pipe	A	From Leg	4.00	0'	0.0000	107'	No Ice	5.46	3.35	0.05
							1/2" Ice	5.88	3.74	0.08
							Ice	6.31	4.15	0.12
							1" Ice	7.21	5.06	0.22
							2" Ice	9.09	7.26	0.49
(2) LGP13519	A	From Leg	4.00	0'	0.0000	107'	No Ice	0.34	0.21	0.01
							1/2" Ice	0.42	0.28	0.01
							Ice	0.51	0.36	0.01
							1" Ice	0.73	0.55	0.02
							2" Ice	1.25	1.03	0.07
SBNH-1D6565C w/ Mount Pipe	A	From Leg	4.00	0'	0.0000	107'	No Ice	11.68	9.84	0.09
							1/2" Ice	12.40	11.37	0.18
							Ice	13.14	12.91	0.28
							1" Ice	14.60	15.27	0.52
							2" Ice	17.87	20.14	1.16
P65-17-XLH-RR w/ Mount Pipe	A	From Leg	4.00	0'	0.0000	107'	No Ice	11.70	8.94	0.09
							1/2" Ice	12.42	10.45	0.17
							Ice	13.15	11.99	0.27
							1" Ice	14.64	14.31	0.50
							2" Ice	17.91	19.14	1.13
(4) RRUS-11	A	From Leg	4.00	0'	0.0000	107'	No Ice	3.25	1.37	0.05
							1/2" Ice	3.49	1.55	0.07
							Ice	3.74	1.74	0.09
							1" Ice	4.27	2.14	0.15
							2" Ice	5.43	3.04	0.31
(2) 860 10025	A	From Leg	4.00	0'	0.0000	107'	No Ice	0.16	0.14	0.00
							1/2" Ice	0.23	0.20	0.00
							Ice	0.30	0.27	0.01
							1" Ice	0.48	0.44	0.01
							2" Ice	0.93	0.88	0.05
7020.00	A	From Leg	4.00	0'	0.0000	107'	No Ice	0.12	0.20	0.00
							1/2" Ice	0.17	0.28	0.01
							Ice	0.23	0.36	0.01
							1" Ice	0.38	0.56	0.02
							2" Ice	0.78	1.05	0.07
(2) TT19-08BP111-001	A	From Leg	4.00	0'	0.0000	107'	No Ice	0.64	0.52	0.02
							1/2" Ice	0.76	0.62	0.02
							Ice	0.88	0.74	0.03
							1" Ice	1.14	0.99	0.05
							2" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz	Vert					
			Lateral	ft		ft	ft ²	ft ²	K
			ft	ft					
			ft	ft					
DC6-48-60-18-8F	A	From Leg	4.00	0.0000	107'	2" Ice	1.78	1.59	0.12
						4" Ice			
						No Ice	1.47	1.47	0.02
						1/2"	1.67	1.67	0.04
						Ice	1.88	1.88	0.06
						1" Ice	2.33	2.33	0.11
800 10121 w/ Mount Pipe	B	From Leg	4.00	0.0000	107'	2" Ice	3.38	3.38	0.24
						4" Ice			
						No Ice	5.46	3.35	0.05
						1/2"	5.88	3.74	0.08
						Ice	6.31	4.15	0.12
						1" Ice	7.21	5.06	0.22
(2) LGP13519	B	From Leg	4.00	0.0000	107'	2" Ice	9.09	7.26	0.49
						4" Ice			
						No Ice	0.34	0.21	0.01
						1/2"	0.42	0.28	0.01
						Ice	0.51	0.36	0.01
						1" Ice	0.73	0.55	0.02
DTMABP7819VG12A	B	From Leg	4.00	0.0000	107'	2" Ice	1.25	1.03	0.07
						4" Ice			
						No Ice	1.14	0.39	0.02
						1/2"	1.28	0.49	0.03
						Ice	1.44	0.59	0.04
						1" Ice	1.77	0.83	0.06
(2) RRUS-11	B	From Leg	4.00	0.0000	107'	2" Ice	2.54	1.41	0.14
						4" Ice			
						No Ice	3.25	1.37	0.05
						1/2"	3.49	1.55	0.07
						Ice	3.74	1.74	0.09
						1" Ice	4.27	2.14	0.15
(2) 860 10025	B	From Leg	4.00	0.0000	107'	2" Ice	5.43	3.04	0.31
						4" Ice			
						No Ice	0.16	0.14	0.00
						1/2"	0.23	0.20	0.00
						Ice	0.30	0.27	0.01
						1" Ice	0.48	0.44	0.01
7020.00	B	From Leg	4.00	0.0000	107'	2" Ice	0.93	0.88	0.05
						4" Ice			
						No Ice	0.12	0.20	0.00
						1/2"	0.17	0.28	0.01
						Ice	0.23	0.36	0.01
						1" Ice	0.38	0.56	0.02
(2) SBNH-1D6565C w/ Mount Pipe	B	From Leg	4.00	0.0000	107'	2" Ice	0.78	1.05	0.07
						4" Ice			
						No Ice	11.68	9.84	0.09
						1/2"	12.40	11.37	0.18
						Ice	13.14	12.91	0.28
						1" Ice	14.60	15.27	0.52
(2) TT19-08BP111-001	B	From Leg	4.00	0.0000	107'	2" Ice	17.87	20.14	1.16
						4" Ice			
						No Ice	0.64	0.52	0.02
						1/2"	0.76	0.62	0.02
						Ice	0.88	0.74	0.03
						1" Ice	1.14	0.99	0.05
800 10121 w/ Mount Pipe	C	From Leg	4.00	0.0000	107'	2" Ice	1.78	1.59	0.12
						4" Ice			
						No Ice	5.46	3.35	0.05
						1/2"	5.88	3.74	0.08
						Ice	6.31	4.15	0.12
						1" Ice	7.21	5.06	0.22
(2) LGP13519	C	From Leg	4.00	0.0000	107'	2" Ice	9.09	7.26	0.49
						4" Ice			
						No Ice	0.34	0.21	0.01
						1/2"	0.42	0.28	0.01
						Ice	0.51	0.36	0.01

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz Lateral	Vert						
							ft ²	ft ²	K	
						1" Ice	0.73	0.55	0.02	
						2" Ice	1.25	1.03	0.07	
						4" Ice				
SBNH-1D6565C w/ Mount Pipe	C	From Leg	4.00	0' 2'	0.0000	107'	No Ice	11.68	9.84	0.09
						1/2" Ice	12.40	11.37	0.18	
						1" Ice	13.14	12.91	0.28	
						2" Ice	14.60	15.27	0.52	
						4" Ice	17.87	20.14	1.16	
(2) DTMABP7819VG12A	C	From Leg	4.00	0' 2'	0.0000	107'	No Ice	1.14	0.39	0.02
						1/2" Ice	1.28	0.49	0.03	
						1" Ice	1.44	0.59	0.04	
						2" Ice	1.77	0.83	0.06	
						4" Ice	2.54	1.41	0.14	
P65-17-XLH-RR w/ Mount Pipe	C	From Leg	4.00	0' 2'	0.0000	107'	No Ice	11.70	8.94	0.09
						1/2" Ice	12.42	10.45	0.17	
						1" Ice	13.15	11.99	0.27	
						2" Ice	14.64	14.31	0.50	
						4" Ice	17.91	19.14	1.13	
(2) 860 10025	C	From Leg	4.00	0' 2'	0.0000	107'	No Ice	0.16	0.14	0.00
						1/2" Ice	0.23	0.20	0.00	
						1" Ice	0.30	0.27	0.01	
						2" Ice	0.48	0.44	0.01	
						4" Ice	0.93	0.88	0.05	
7020.00	C	From Leg	4.00	0' 2'	0.0000	107'	No Ice	0.12	0.20	0.00
						1/2" Ice	0.17	0.28	0.01	
						1" Ice	0.23	0.36	0.01	
						2" Ice	0.38	0.56	0.02	
						4" Ice	0.78	1.05	0.07	
(2) TT19-08BP111-001	C	From Leg	4.00	0' 2'	0.0000	107'	No Ice	0.64	0.52	0.02
						1/2" Ice	0.76	0.62	0.02	
						1" Ice	0.88	0.74	0.03	
						2" Ice	1.14	0.99	0.05	
						4" Ice	1.78	1.59	0.12	
5' x 2' Pipe Mount	A	From Leg	4.00	0' 0'	0.0000	107'	No Ice	1.00	1.00	0.03
						1/2" Ice	1.39	1.39	0.04	
						1" Ice	1.70	1.70	0.05	
						2" Ice	2.35	2.35	0.08	
						4" Ice	3.78	3.78	0.20	
5' x 2' Pipe Mount	B	From Leg	4.00	0' 0'	0.0000	107'	No Ice	1.00	1.00	0.03
						1/2" Ice	1.39	1.39	0.04	
						1" Ice	1.70	1.70	0.05	
						2" Ice	2.35	2.35	0.08	
						4" Ice	3.78	3.78	0.20	
5' x 2' Pipe Mount	C	From Leg	4.00	0' 0'	0.0000	107'	No Ice	1.00	1.00	0.03
						1/2" Ice	1.39	1.39	0.04	
						1" Ice	1.70	1.70	0.05	
						2" Ice	2.35	2.35	0.08	
						4" Ice	3.78	3.78	0.20	
Platform Mount [LP 712-1]	C	None			0.0000	107'	No Ice	24.53	24.53	1.34
						1/2" Ice	29.94	29.94	1.65	
						1" Ice	35.35	35.35	1.96	
						2" Ice	46.17	46.17	2.58	
						4" Ice	67.81	67.81	3.82	

BXA-70063-4CF-EDIN-X	A	From Leg	4.00		0.0000	90'	No Ice	5.40	3.69	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} A _A Front ft ²	C _{AA} A _A Side ft ²	Weight K	
w/ Mount Pipe			0' 1'			1/2" Ice 1" Ice 2" Ice 4" Ice	5.84 6.30 7.24 9.26 9.29	4.29 4.91 6.26 7.15 9.29	0.07 0.12 0.23 0.58
(2) LPA-171080/8CFx2 w/ Mount Pipe	A	From Leg	4.00 0' 1'	0.0000	90'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.85 3.22 3.99 5.84	4.41 5.07 5.74 7.15 10.23	0.03 0.06 0.10 0.20 0.50
(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe	A	From Leg	4.00 0' 1'	0.0000	90'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.86 3.22 3.59 4.45 6.32	7.23 7.92 8.63 10.11 13.34	0.03 0.07 0.13 0.25 0.61
BXA-70063/6CF w/ Mount Pipe	B	From Leg	4.00 0' 1'	0.0000	90'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80
(2) LPA-171080/8CFx2 w/ Mount Pipe	B	From Leg	4.00 0' 1'	0.0000	90'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.85 3.22 3.99 5.84	4.41 5.07 5.74 7.15 10.23	0.03 0.06 0.10 0.20 0.50
(2) SC 9012 REV2 w/ Mount Pipe	B	From Leg	4.00 0' 1'	0.0000	90'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.95 3.33 3.73 4.55 6.35	4.40 5.01 5.64 6.96 9.90	0.03 0.06 0.10 0.21 0.51
BXA-70063/6CF w/ Mount Pipe	C	From Leg	4.00 0' 1'	0.0000	90'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80
(2) LPA-171080/8CFx2 w/ Mount Pipe	C	From Leg	4.00 0' 1'	0.0000	90'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.85 3.22 3.99 5.84	4.41 5.07 5.74 7.15 10.23	0.03 0.06 0.10 0.20 0.50
(2) SC 9012 REV2 w/ Mount Pipe	C	From Leg	4.00 0' 1'	0.0000	90'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.95 3.33 3.73 4.55 6.35	4.40 5.01 5.64 6.96 9.90	0.03 0.06 0.10 0.21 0.51
Platform Mount [LP 712-1]	C	None		0.0000	90'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.53 29.94 35.35 46.17 67.81	24.53 29.94 35.35 46.17 67.81	1.34 1.65 1.96 2.58 3.82

(4) DB844H90-XY w/ Mount Pipe	A	From Leg	4.00 0' 1'	0.0000	80'	No Ice 1/2" Ice 1" Ice 2" Ice	3.10 3.48 3.88 4.76 6.66	5.15 5.83 6.52 7.96 11.09	0.03 0.07 0.11 0.22 0.55

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz Lateral	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
(4) DB844H90-XY w/ Mount Pipe	B	From Leg	4.00	0'	0.0000	80'	4" Ice			
							No Ice	3.10	5.15	0.03
							1/2" Ice	3.48	5.83	0.07
							1" Ice	3.88	6.52	0.11
							2" Ice	4.76	7.96	0.22
4" Ice	6.66	11.09	0.55							
(4) DB844H90-XY w/ Mount Pipe	C	From Leg	4.00	0'	0.0000	80'	No Ice	3.10	5.15	0.03
							1/2" Ice	3.48	5.83	0.07
							1" Ice	3.88	6.52	0.11
							2" Ice	4.76	7.96	0.22
							4" Ice	6.66	11.09	0.55
Platform Mount [LP 712-1]	C	None			0.0000	80'	No Ice	24.53	24.53	1.34
							1/2" Ice	29.94	29.94	1.65
							1" Ice	35.35	35.35	1.96
							2" Ice	46.17	46.17	2.58
							4" Ice	67.81	67.81	3.82

APXV9ERR18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0'	0.0000	72'	No Ice	8.50	7.47	0.09
							1/2" Ice	9.15	8.66	0.16
							1" Ice	9.77	9.56	0.23
							2" Ice	11.03	11.39	0.42
							4" Ice	13.68	15.53	0.94
APXVSP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0'	0.0000	72'	No Ice	8.50	6.95	0.08
							1/2" Ice	9.15	8.13	0.15
							1" Ice	9.77	9.02	0.22
							2" Ice	11.03	10.84	0.41
							4" Ice	13.68	14.85	0.91
APXV9ERR18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0'	0.0000	72'	No Ice	8.50	7.47	0.09
							1/2" Ice	9.15	8.66	0.16
							1" Ice	9.77	9.56	0.23
							2" Ice	11.03	11.39	0.42
							4" Ice	13.68	15.53	0.94
Platform Mount [LP 712-1]	C	None			0.0000	72'	No Ice	24.53	24.53	1.34
							1/2" Ice	29.94	29.94	1.65
							1" Ice	35.35	35.35	1.96
							2" Ice	46.17	46.17	2.58
							4" Ice	67.81	67.81	3.82
(2) 5' x 2' Pipe Mount	A	From Leg	4.00	0'	0.0000	72'	No Ice	1.00	1.00	0.03
							1/2" Ice	1.39	1.39	0.04
							1" Ice	1.70	1.70	0.05
							2" Ice	2.35	2.35	0.08
							4" Ice	3.78	3.78	0.20
(2) 5' x 2' Pipe Mount	B	From Leg	4.00	0'	0.0000	72'	No Ice	1.00	1.00	0.03
							1/2" Ice	1.39	1.39	0.04
							1" Ice	1.70	1.70	0.05
							2" Ice	2.35	2.35	0.08
							4" Ice	3.78	3.78	0.20
(2) 5' x 2' Pipe Mount	C	From Leg	4.00	0'	0.0000	72'	No Ice	1.00	1.00	0.03
							1/2" Ice	1.39	1.39	0.04
							1" Ice	1.70	1.70	0.05
							2" Ice	2.35	2.35	0.08
							4" Ice	3.78	3.78	0.20

**										
800MHz 2X50W RRH	A	From Leg	2.00		0.0000	70'	No Ice	2.40	2.25	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
W/FILTER			0' 0'			1/2" Ice 1" Ice 2" Ice 4" Ice	2.61 2.83 3.13 4.15	0.09 0.11 0.17 0.34
PCS 1900MHz 4x45W-65MHz	A	From Leg	2.00 0' 0'	0.0000	70'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.61 4.74	0.06 0.08 0.11 0.17 0.35
800MHz 2X50W RRH W/FILTER	B	From Leg	2.00 0' 0'	0.0000	70'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.13 4.15	0.06 0.09 0.11 0.17 0.34
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.00 0' 0'	0.0000	70'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.61 4.74	0.06 0.08 0.11 0.17 0.35
800MHz 2X50W RRH W/FILTER	C	From Leg	2.00 0' 0'	0.0000	70'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.13 4.15	0.06 0.09 0.11 0.17 0.34
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.00 0' 0'	0.0000	70'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.61 4.74	0.06 0.08 0.11 0.17 0.35
Side Arm Mount [SO 102-3]	C	None		0.0000	70'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.48 3.96 4.92 6.84	0.08 0.11 0.14 0.20 0.32
(2) 5'x2 1/2" Pipe Mount	A	From Leg	2.00 0' 0'	0.0000	70'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.33 1.63 1.95 2.60 4.11	0.03 0.04 0.05 0.09 0.22
(2) 5'x2 1/2" Pipe Mount	B	From Leg	2.00 0' 0'	0.0000	70'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.33 1.63 1.95 2.60 4.11	0.03 0.04 0.05 0.09 0.22
(2) 5'x2 1/2" Pipe Mount	C	From Leg	2.00 0' 0'	0.0000	70'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.33 1.63 1.95 2.60 4.11	0.03 0.04 0.05 0.09 0.22
** APX18-206516L w/ Mount Pipe	A	From Leg	1.00 0' 0'	0.0000	62'	No Ice 1/2" Ice 1" Ice 2" Ice	3.74 4.16 4.59 6.04 9.02	0.04 0.07 0.11 0.21 0.52

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz Lateral	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
APX18-206516L w/ Mount Pipe	B	From Leg	1.00	0'	0.0000	62'	4" Ice			
							No Ice	3.74	3.29	0.04
							1/2" Ice	4.16	4.00	0.07
							Ice	4.59	4.66	0.11
							1" Ice	5.54	6.04	0.21
							2" Ice	7.57	9.02	0.52
APX18-206516L w/ Mount Pipe	C	From Leg	1.00	0'	0.0000	62'	4" Ice			
							No Ice	3.74	3.29	0.04
							1/2" Ice	4.16	4.00	0.07
							Ice	4.59	4.66	0.11
							1" Ice	5.54	6.04	0.21
							2" Ice	7.57	9.02	0.52
Pipe Mount [PM 501-3]	C	None			0.0000	62'	4" Ice			
							No Ice	5.78	5.78	0.16
							1/2" Ice	7.37	7.37	0.18
							Ice	8.96	8.96	0.20
							1" Ice	12.14	12.14	0.24
							2" Ice	18.50	18.50	0.32
*** GPS	A	From Leg	4.00	0'	0.0000	47'	4" Ice			
							No Ice	0.17	0.17	0.00
							1/2" Ice	0.24	0.24	0.00
							Ice	0.31	0.31	0.00
							1" Ice	0.48	0.48	0.01
							2" Ice	0.92	0.92	0.05
Side Arm Mount [SO 701-1]	A	From Leg	2.00	0'	0.0000	47'	4" Ice			
							No Ice	0.85	1.67	0.07
							1/2" Ice	1.14	2.34	0.08
							Ice	1.43	3.01	0.09
							1" Ice	2.01	4.35	0.12
							2" Ice	3.17	7.03	0.18

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

Comb. No.	Description
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	109 - 95	Pole	Max Tension	15	0.00	0.00	-0.00
			Max. Compression	14	-7.03	-0.75	1.53
			Max. Mx	5	-3.29	-73.64	0.18
			Max. My	2	-3.28	0.17	76.71
			Max. Vy	5	5.79	-73.64	0.18
			Max. Vx	2	-5.98	0.17	76.71
			Max. Torque	12			-1.08
L2	95 - 48.0833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.19	-0.21	3.15
			Max. Mx	5	-14.80	-641.39	-1.23
			Max. My	2	-14.80	1.96	643.92
			Max. Vy	5	18.27	-641.39	-1.23
			Max. Vx	2	-18.22	1.96	643.92
			Max. Torque	12			-1.71
L3	48.0833 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-45.79	2.09	6.03
			Max. Mx	11	-26.70	1712.94	6.14
			Max. My	2	-26.70	4.65	1712.46
			Max. Vy	11	-22.17	1712.94	6.14
			Max. Vx	2	-22.10	4.65	1712.46
			Max. Torque	11			-2.03

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	45.79	3.26	5.61
	Max. H _x	11	26.72	22.16	0.04
	Max. H _z	2	26.72	0.04	22.08
	Max. M _x	2	1712.46	0.04	22.08
	Max. M _z	5	1712.63	-22.16	-0.04
	Max. Torsion	5	2.03	-22.16	-0.04
	Min. Vert	1	26.72	0.00	0.00
	Min. H _x	5	26.72	-22.16	-0.04
	Min. H _z	8	26.72	-0.04	-22.08
	Min. M _x	8	-1709.17	-0.04	-22.08
	Min. M _z	11	-1712.94	22.16	0.04
	Min. Torsion	11	-2.03	22.16	0.04

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	26.72	0.00	0.00	-1.61	0.16	0.00
Dead+Wind 0 deg - No Ice	26.72	-0.04	-22.08	-1712.46	4.65	0.39
Dead+Wind 30 deg - No Ice	26.72	11.04	-19.10	-1481.01	-852.35	-0.69
Dead+Wind 60 deg - No Ice	26.72	19.17	-11.00	-853.16	-1480.92	-1.57
Dead+Wind 90 deg - No Ice	26.72	22.16	0.04	2.85	-1712.63	-2.03
Dead+Wind 120 deg - No Ice	26.72	19.21	11.08	857.66	-1485.41	-1.94
Dead+Wind 150 deg - No Ice	26.72	11.12	19.14	1482.21	-860.13	-1.34
Dead+Wind 180 deg - No Ice	26.72	0.04	22.08	1709.17	-4.34	-0.39
Dead+Wind 210 deg - No Ice	26.72	-11.04	19.10	1477.72	852.65	0.67
Dead+Wind 240 deg - No Ice	26.72	-19.17	11.00	849.87	1481.22	1.56
Dead+Wind 270 deg - No Ice	26.72	-22.16	-0.04	-6.14	1712.94	2.03
Dead+Wind 300 deg - No Ice	26.72	-19.21	-11.08	-860.94	1485.72	1.96
Dead+Wind 330 deg - No Ice	26.72	-11.12	-19.14	-1485.50	860.44	1.36
Dead+Ice+Temp	45.79	-0.00	-0.00	-6.03	2.09	0.00
Dead+Wind 0 deg+Ice+Temp	45.79	-0.01	-6.48	-514.15	3.19	0.09
Dead+Wind 30 deg+Ice+Temp	45.79	3.24	-5.60	-445.55	-251.17	-0.23
Dead+Wind 60 deg+Ice+Temp	45.79	5.62	-3.23	-259.19	-437.66	-0.49
Dead+Wind 90 deg+Ice+Temp	45.79	6.50	0.01	-5.03	-506.32	-0.62
Dead+Wind 120 deg+Ice+Temp	45.79	5.63	3.25	248.85	-438.74	-0.58
Dead+Wind 150 deg+Ice+Temp	45.79	3.26	5.61	434.40	-253.04	-0.39
Dead+Wind 180 deg+Ice+Temp	45.79	0.01	6.48	501.93	1.03	-0.09
Dead+Wind 210 deg+Ice+Temp	45.79	-3.24	5.60	433.32	255.39	0.23
Dead+Wind 240 deg+Ice+Temp	45.79	-5.62	3.23	246.97	441.89	0.49
Dead+Wind 270 deg+Ice+Temp	45.79	-6.50	-0.01	-7.19	510.54	0.62
Dead+Wind 300 deg+Ice+Temp	45.79	-5.63	-3.25	-261.07	442.97	0.58
Dead+Wind 330 deg+Ice+Temp	45.79	-3.26	-5.61	-446.63	257.26	0.39
Dead+Wind 0 deg - Service	26.72	-0.02	-8.63	-670.11	1.91	0.15
Dead+Wind 30 deg - Service	26.72	4.31	-7.46	-579.67	-332.94	-0.27
Dead+Wind 60 deg - Service	26.72	7.49	-4.30	-334.36	-578.54	-0.61
Dead+Wind 90 deg - Service	26.72	8.65	0.02	0.11	-669.08	-0.79
Dead+Wind 120 deg - Service	26.72	7.50	4.33	334.11	-580.30	-0.76
Dead+Wind 150 deg - Service	26.72	4.34	7.48	578.14	-335.98	-0.53
Dead+Wind 180 deg - Service	26.72	0.02	8.63	666.82	-1.60	-0.15
Dead+Wind 210 deg - Service	26.72	-4.31	7.46	576.38	333.25	0.26
Dead+Wind 240 deg - Service	26.72	-7.49	4.30	331.07	578.85	0.61
Dead+Wind 270 deg - Service	26.72	-8.65	-0.02	-3.40	669.39	0.80
Dead+Wind 300 deg - Service	26.72	-7.50	-4.33	-337.40	580.61	0.77
Dead+Wind 330 deg - Service	26.72	-4.34	-7.48	-581.43	336.29	0.53

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-26.72	0.00	0.00	26.72	0.00	0.000%
2	-0.04	-26.72	-22.08	0.04	26.72	22.08	0.000%
3	11.04	-26.72	-19.10	-11.04	26.72	19.10	0.000%
4	19.17	-26.72	-11.00	-19.17	26.72	11.00	0.000%
5	22.16	-26.72	0.04	-22.16	26.72	-0.04	0.000%
6	19.21	-26.72	11.08	-19.21	26.72	-11.08	0.000%
7	11.12	-26.72	19.14	-11.12	26.72	-19.14	0.000%
8	0.04	-26.72	22.08	-0.04	26.72	-22.08	0.000%
9	-11.04	-26.72	19.10	11.04	26.72	-19.10	0.000%
10	-19.17	-26.72	11.00	19.17	26.72	-11.00	0.000%
11	-22.16	-26.72	-0.04	22.16	26.72	0.04	0.000%
12	-19.21	-26.72	-11.08	19.21	26.72	11.08	0.000%
13	-11.12	-26.72	-19.14	11.12	26.72	19.14	0.000%
14	0.00	-45.79	0.00	0.00	45.79	0.00	0.000%
15	-0.01	-45.79	-6.48	0.01	45.79	6.48	0.000%
16	3.24	-45.79	-5.60	-3.24	45.79	5.60	0.000%
17	5.62	-45.79	-3.23	-5.62	45.79	3.23	0.000%
18	6.50	-45.79	0.01	-6.50	45.79	-0.01	0.000%
19	5.63	-45.79	3.25	-5.63	45.79	-3.25	0.000%
20	3.26	-45.79	5.61	-3.26	45.79	-5.61	0.000%
21	0.01	-45.79	6.48	-0.01	45.79	-6.48	0.000%
22	-3.24	-45.79	5.60	3.24	45.79	-5.60	0.000%
23	-5.62	-45.79	3.23	5.62	45.79	-3.23	0.000%
24	-6.50	-45.79	-0.01	6.50	45.79	0.01	0.000%
25	-5.63	-45.79	-3.25	5.63	45.79	3.25	0.000%
26	-3.26	-45.79	-5.61	3.26	45.79	5.61	0.000%
27	-0.02	-26.72	-8.63	0.02	26.72	8.63	0.000%
28	4.31	-26.72	-7.46	-4.31	26.72	7.46	0.000%
29	7.49	-26.72	-4.30	-7.49	26.72	4.30	0.000%
30	8.65	-26.72	0.02	-8.65	26.72	-0.02	0.000%
31	7.50	-26.72	4.33	-7.50	26.72	-4.33	0.000%
32	4.34	-26.72	7.48	-4.34	26.72	-7.48	0.000%
33	0.02	-26.72	8.63	-0.02	26.72	-8.63	0.000%
34	-4.31	-26.72	7.46	4.31	26.72	-7.46	0.000%
35	-7.49	-26.72	4.30	7.49	26.72	-4.30	0.000%
36	-8.65	-26.72	-0.02	8.65	26.72	0.02	0.000%
37	-7.50	-26.72	-4.33	7.50	26.72	4.33	0.000%
38	-4.34	-26.72	-7.48	4.34	26.72	7.48	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	0.00009354
3	Yes	5	0.00000001	0.00002338
4	Yes	5	0.00000001	0.00002650
5	Yes	4	0.00000001	0.00028831
6	Yes	5	0.00000001	0.00002164
7	Yes	5	0.00000001	0.00002717
8	Yes	4	0.00000001	0.00011024
9	Yes	5	0.00000001	0.00002452
10	Yes	5	0.00000001	0.00002182
11	Yes	4	0.00000001	0.00030537
12	Yes	5	0.00000001	0.00002821
13	Yes	5	0.00000001	0.00002226
14	Yes	4	0.00000001	0.00001020
15	Yes	4	0.00000001	0.00050366
16	Yes	4	0.00000001	0.00057633
17	Yes	4	0.00000001	0.00058196
18	Yes	4	0.00000001	0.00049928
19	Yes	4	0.00000001	0.00056173
20	Yes	4	0.00000001	0.00056928
21	Yes	4	0.00000001	0.00048810
22	Yes	4	0.00000001	0.00056089

23	Yes	4	0.00000001	0.00055832
24	Yes	4	0.00000001	0.00050064
25	Yes	4	0.00000001	0.00059029
26	Yes	4	0.00000001	0.00057939
27	Yes	4	0.00000001	0.00002169
28	Yes	4	0.00000001	0.00009759
29	Yes	4	0.00000001	0.00012923
30	Yes	4	0.00000001	0.00006241
31	Yes	4	0.00000001	0.00009172
32	Yes	4	0.00000001	0.00013380
33	Yes	4	0.00000001	0.00002288
34	Yes	4	0.00000001	0.00010751
35	Yes	4	0.00000001	0.00008805
36	Yes	4	0.00000001	0.00006376
37	Yes	4	0.00000001	0.00014625
38	Yes	4	0.00000001	0.00009194

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	109 - 95	13.347	38	0.9876	0.0054
L2	95 - 48.0833	10.497	38	0.9418	0.0039
L3	53 - 0	3.466	38	0.5945	0.0013

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
111'	Lighting Rod 3/4" x 4'	38	13.347	0.9876	0.0054	41573
107'	800 10121 w/ Mount Pipe	38	12.937	0.9821	0.0052	41573
90'	BXA-70063-4CF-EDIN-X w/ Mount Pipe	38	9.509	0.9164	0.0034	11175
80'	(4) DB844H90-XY w/ Mount Pipe	38	7.619	0.8493	0.0027	7477
72'	APXV9ERR18-C-A20 w/ Mount Pipe	38	6.219	0.7827	0.0022	5911
70'	800MHz 2X50W RRH W/FILTER	38	5.888	0.7646	0.0021	5617
62'	APX18-206516L w/ Mount Pipe	38	4.655	0.6875	0.0017	4681
47'	GPS	38	2.803	0.5305	0.0011	4443

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	109 - 95	34.080	13	2.5193	0.0137
L2	95 - 48.0833	26.809	13	2.4046	0.0098
L3	53 - 0	8.854	13	1.5189	0.0034

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
-----------------	--------------	-----------------	------------------	-----------	------------	---------------------------

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
111'	Lighting Rod 3/4" x 4'	13	34.080	2.5193	0.0140	16627
107'	800 10121 w/ Mount Pipe	13	33.032	2.5059	0.0134	16627
90'	BXA-70063-4CF-EDIN-X w/ Mount Pipe	13	24.287	2.3404	0.0089	4440
80'	(4) DB844H90-XY w/ Mount Pipe	13	19.461	2.1696	0.0069	2951
72'	APXV9ERR18-C-A20 w/ Mount Pipe	13	15.887	1.9995	0.0057	2326
70'	800MHz 2X50W RRH W/FILTER	13	15.043	1.9532	0.0054	2209
62'	APX18-206516L w/ Mount Pipe	13	11.893	1.7564	0.0044	1837
47'	GPS	13	7.162	1.3553	0.0029	1740

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
L1	109 - 95 (1)	TP26.715x23.476x0.1875	14'	0'	0.0	39.000	15.7872	-3.28	615.70	0.005
L2	95 - 48.0833 (2)	TP37.573x26.715x0.3125	46'11- 1/32"	0'	0.0	39.000	35.8291	-14.80	1397.34	0.011
L3	48.0833 - 0 (3)	TP48.075x35.8101x0.375	53'	0'	0.0	39.000	56.7749	-26.70	2214.22	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 f _{bx} F _{bx}	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio f _{by} F _{by}
L1	109 - 95 (1)	TP26.715x23.476x0.1875	76.71	8.901	39.000	0.228	0.00	0.000	39.000	0.000
L2	95 - 48.0833 (2)	TP37.573x26.715x0.3125	645.12	24.259	39.000	0.622	0.00	0.000	39.000	0.000
L3	48.0833 - 0 (3)	TP48.075x35.8101x0.375	1717.1 4	30.835	39.000	0.791	0.00	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 f _v F _v	Actual T kip-ft	Actual f _{vt} ksi	Allow. F _{vt} ksi	Ratio f _{vt} F _{vt}
L1	109 - 95 (1)	TP26.715x23.476x0.1875	5.98	0.379	26.000	0.029	0.56	0.032	26.000	0.001
L2	95 - 48.0833 (2)	TP37.573x26.715x0.3125	18.27	0.510	26.000	0.039	1.26	0.023	26.000	0.001
L3	48.0833 - 0 (3)	TP48.075x35.8101x0.375	22.19	0.391	26.000	0.030	1.96	0.017	26.000	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	109 - 95 (1)	0.005	0.228	0.000	0.029	0.001	0.234	1.333	H1-3+VT ✓
L2	95 - 48.0833 (2)	0.011	0.622	0.000	0.039	0.001	0.633	1.333	H1-3+VT ✓
L3	48.0833 - 0 (3)	0.012	0.791	0.000	0.030	0.001	0.803	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	109 - 95	Pole	TP26.715x23.476x0.1875	1	-3.28	820.73	17.5	Pass
L2	95 - 48.0833	Pole	TP37.573x26.715x0.3125	2	-14.80	1862.65	47.5	Pass
L3	48.0833 - 0	Pole	TP48.075x35.8101x0.375	3	-26.70	2951.56	60.2	Pass
Summary								
Pole (L3)							60.2	Pass
RATING =							60.2	Pass

APPENDIX B
BASE LEVEL DRAWING



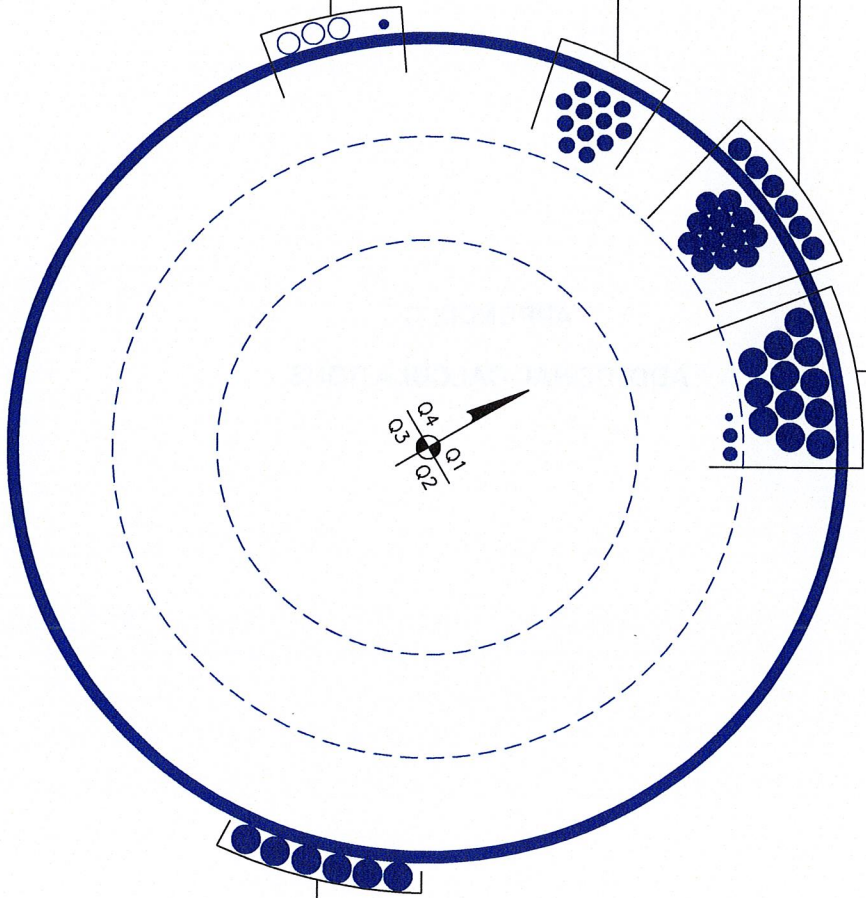
(INSTALLED)
(1) 3/8" TO 107 FT LEVEL
(2) 3/4" TO 107 FT LEVEL
(12) 1-5/8" TO 107 FT LEVEL

(INSTALLED)
(18) 1-1/4" TO 90 FT LEVEL

(INSTALLED)
(12) 7/8" TO 80 FT LEVEL

(RESERVED)
(3) 1-1/4" TO 72 FT LEVEL
(INSTALLED)
(1) 1/2" TO 47 FT LEVEL

(INSTALLED)
(6) 1-5/8" TO 62 FT LEVEL



APPENDIX C
ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#: 801486
Site Name: CT Suffield 2 CAC
App #: 189370
Pole Manufacturer: <i>Other</i>

Reactions		
Moment:	1717	ft-kips
Axial:	27	kips
Shear:	22	kips

Anchor Rod Data

Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	55	in

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

Anchor Rod Results

Maximum Rod Tension: 92.0 Kips
 Allowable Tension: 195.0 Kips
 Anchor Rod Stress Ratio: 47.2% **Pass**

Rigid
Service ASD
Fty*ASIF

Plate Data

Diam:	61	in
Thick:	2.75	in
Grade:	60	ksi
Single-Rod B-eff:	9.54	in

Base Plate Results

Base Plate Stress: 17.0 ksi
 Allowable Plate Stress: 60.0 ksi
 Base Plate Stress Ratio: 28.3% **Pass**

Flexural Check

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length:
26.72

Stiffener Data (Welding at both sides)

Config:	0	*
Weld Type:	Both	
Groove Depth:	0.25	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	5	in
Height:	18	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	50	ksi
Weld str.:	70	ksi

n/a

Stiffener Results

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

Pole Results

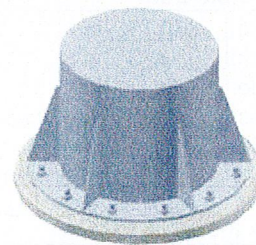
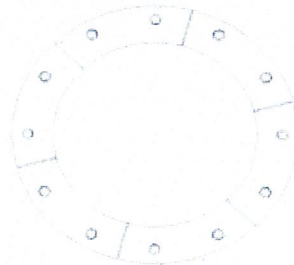
Pole Punching Shear Check: n/a

Pole Data

Diam:	48.075	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
-------	-------



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

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

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

Site Data

BU#: 801486
 Site Name: CT Suffield 2 CAC 801486
 App #: 189370

Reactions		
Moment:	76.71	ft-kips
Axial:	3.28	kips
Shear:	5.98	kips
Elevation:	95	feet

Pole Manufacturer:	Other
--------------------	-------

Bolt Data				
Qty:	20			
Diameter (in.):	1	Bolt Fu:	120	
Bolt Material:	A325	Bolt Fy:	92	
N/A:	75	<-- Disregard	Bolt Fty:	44.00
N/A:	55	<-- Disregard		
Circle (in.):	33			

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

Flange Bolt Results	
Bolt Tension Capacity, B:	46.07 kips
Max Bolt directly applied T:	5.41 Kips
Min. PL "tc" for B cap. w/o Pry:	1.703 in
Min PL "treq" for actual T w/ Pry:	0.442 in
Min PL "t1" for actual T w/o Pry:	0.584 in
T allowable w/o Prying:	46.07 kips
Prying Force, Q:	0.00 kips
Total Bolt Tension=T+Q:	5.41 kips
Non-Prying Bolt Stress Ratio, T/B:	11.8% Pass

Rigid
Service ASD
Fty*ASIF

Plate Data		
Diam:	36	in
Thick, t:	2.25	in
Grade (Fy):	60	ksi
Strength, Fu:	70	ksi
Single-Rod B-eff:	4.24	in

Exterior Flange Plate Results	
Flexural Check	
Compression Side Plate Stress:	2.9 ksi
Allowable Plate Stress:	60.0 ksi
Compression Plate Stress Ratio:	4.8% Pass
No Prying	
Tension Side Stress Ratio, (treq/t)^2:	3.9% Pass

Rigid
Service ASD
0.75*Fy*ASIF
Comp. Y.L. Length:
19.37

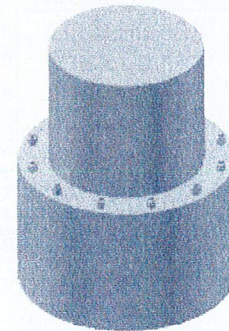
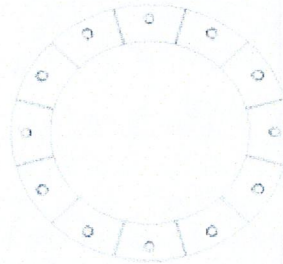
Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

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 Data		
Diam:	26.715	in
Thick:	0.1875	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Pole Results	
Pole Punching Shear Check:	n/a

Stress Increase Factor	
ASIF:	1.333



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

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

(Bearing and Stability Checks) Tool for TIA Rev F or G - Application (MP, SST with unitbase)

Site Data

BU#: 801486
Site Name: CT Suffield 2 CAC 801486
App #: 189370

Enter Load Factors Below:

For P (DL)	1.3	<---- Enter Factor
For P,V, and M (WL)	1.3	<---- Enter Factor

Pad & Pier Data

Base PL Dist. Above Pier:	6	in
Pier Dist. Above Grade:	6	in
Pad Bearing Depth, D:	6.5	ft
Pad Thickness, T:	2.5	ft
Pad Width=Length, L:	26	ft
Pier Cross Section Shape:	Round	<--Pull Down
Enter Pier Diameter:	6.5	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	33.18	ft^2
Pier Height:	4.50	ft
Soil (above pad) Height:	4.00	ft

Soil Parameters

Unit Weight, γ :	120.0	pcf
Ultimate Bearing Capacity, q_n :	8.00	ksf
Strength Reduct. factor, ϕ :	0.75	
Angle of Friction, Φ :	0.0	degrees
Undrained Shear Strength, C_u :	1.15	ksf
Allowable Bearing: $\phi * q_n$:	6.00	ksf
Passive Pres. Coeff., K_p :	1.00	

Forces/Moments due to Wind and Lateral Soil

Minimum of ($\phi * \text{Ultimate Pad Passive Force, } V_u$):	28.6	kips
Pad Force Location Above D: $\phi(\text{Passive Pressure Moment})$:	1.23	ft
Factored O.T. M(WL), "1.6W":	2446.6	ft-kips
Factored OT (MW-Msoil), M1	2411.46	ft-kips

Resistance due to Foundation Gravity

Soil Wedge Projection grade, a:	0.00	ft
Sum of Soil Wedges Wt:	0.00	kips
Soil Wedges ecc, K1:	0.00	ft
Ftg+Soil above Pad wt:	584.5	kips
Unfactored (Total ftg-soil Wt):	584.45	kips
1.2D. No Soil Wedges	736.44	kips
0.9D. With Soil Wedges	550.31	kips

Resistance due to Cohesion (Vertical)

$\phi * (1/2 * C_u)(\text{Total Vert. Planes})$	66.13	kips
Cohesion Force Eccentricity, K2	12.01	ft

Monopole Base Reaction Forces

TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	27	kips
Unfactored WL Axial, PW:	0	kips
Unfactored WL Shear, V:	22	kips
Unfactored WL Moment, M:	1717	ft-kips

Load Factor Shaft Factored Loads

1.30	1.2D+1.6W, Pu:	35.1	kips
0.90	0.9D+1.6W, Pu:	24.3	kips
1.30	Vu:	28.6	kips
	Mu:	2232.1	ft-kips

1.2D+1.6W Load Combination. Bearing Results:

(No Soil Wedges) [Reaction+Conc+Soil]	736.44	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	2411.46	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 = 3.27 ft
 Orthogonal qu = 1.64 ksf
 qu/ $\phi * q_n$ Ratio = **27.30%** Pass

Diagonal Direction:

ecc2 = (0.707M1)/P1 = 2.32 ft
 Diagonal qu = 1.61 ksf
 qu/ $\phi * q_n$ Ratio = **26.88%** Pass

<-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination. Bearing Results:

(w/ Soil Wedges) [Reaction+Conc+Soil]	550.31	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	1696.83	ft-kips

Orthogonal ecc3 = M2/P2 = 3.08 ft
 Ortho Non Bearing Length, NBL = 6.17 ft
 Orthogonal qu = 1.20 ksf
 Diagonal qu = 1.18 ksf

Max Reaction Moment (ft-kips) so that qu= $\phi * q_n$ = 100% Capacity Rating

Actual M:	1717.00		
M Orthogonal:	5116.77	33.56%	Pass
M Diagonal:	5116.77	33.56%	Pass

Spread Footing Reinforcement Design

Concrete Parameters			
Unit weight (γ):	0.150	pcf	
Comp. strength (f_c'):	3	ksi (assumed)	
Phi:	0.90	Moment	
Phi:	0.75	Shear	

Steel Parameters		
Yield strength (f_y):	60	ksi
Bar Size:	9	
Bar Spacing:	14	in OC
Concrete Cover:	3	in
As:	0.86	in ² /ft

Foundation Dimensions	
Pier Size	6.5 ft
Footing Depth	26 ft
Footing Width	26 ft
Footing Thickness	2.5 ft
Bearing Depth	6.5 ft
Edge of footing to face of pier	9.75 ft

One Way Shear	
Critical Section Distance	7.25 ft
Shear at Critical Section	12.83 kips
Shear Stress at Critical Section	5.13 ksf
Allowable Shear Stress	15.77 ksf
FS	2.30 O.K.

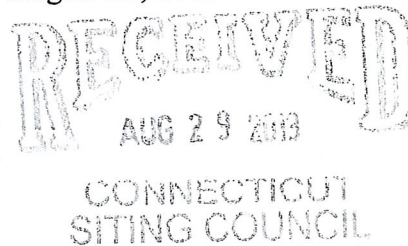
Moment Capacity of Footing	
T	51.4 kips/ft
d	26.4 in
a	1.681 in
Mn	2852.1 kip-ft
Phi*Mn	2566.9 kip-ft

Calculation of Applied Moment		
q_{max} (conservative):	1.77	ksf
Mu at pier:	2187.39	kip-ft
FS	1.17	O.K.

280 Trumbull Street
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Direct (860) 275-8345

Also admitted in Massachusetts

August 28, 2013



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

Re: **EM-VER-083-130627 – 1969 Saybrook Road, Middletown, Connecticut**
EM-VER-115-130524 – 54 Waterbury Road, Prospect, Connecticut
EM-VER-119-130618 – 2 West Street, Rocky Hill, Connecticut
EM-VER-049-130726 – 37 Bacon Road, Enfield, Connecticut
EM-VER-129-130425 – 400 Main Street, Somers, Connecticut
EM-VER-134-130604 – Brendan Street, Stafford, Connecticut
EM-VER-139-130618 – 44 Fyler Place, Suffield, Connecticut

Completion of Construction Activity

Dear Ms. Bachman:

The purpose of this letter is to notify the Siting Council that construction activity associated with the above-referenced Cellco Partnership d/b/a Verizon Wireless telecommunications facilities has been completed.

If you have any questions or need any additional information regarding this facility please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "K. Baldwin".

Kenneth C. Baldwin



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