CLEAR

) Carillon Point
ınd, WA 98033

EM-CLEARWIRE-089-090925

September 24, 2009

ORIGINAL

RECEIVED
SEP 25 2009
CONNECTICUT
SITING COUNCIL

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

Re: Notice of Exempt Modification
Clearwire Corporation Notice to make an Exempt Modification to an Existing Facility at 188 Stanley Street, New Britain, CT
Clearwire Site Number CT-HFD0117A

Dear Mr. Phelps,

Pursuant to Conn. Agency Regulations Sections 16-50j-73 and 16-50j-72(b), Clearwire Corporation (Clearwire) hereby gives notice to the Connecticut Siting Council (Council) and the City of New Britain, CT. of Clearwire's intent to make an exempt modification to an existing monopole tower (tower) located at 188 Stanley Street, New Britain, CT. Specifically, Clearwire plans to add three (3) antennas to the tower, one (1) per sector and to add three (3) microwave dishes, one (1) per sector for backhaul. Pursuant to the Council's regulations, (Conn. Agency Regulations Section 16-50j-72(b)), Clearwire's plans do not constitute a modification subject to the Council's review because Clearwire will not change the height of the tower, will not extend the boundaries of the compound, will not increase the noise levels at the site and will not increase the total radio frequency electromagnetic radiation power density at the site to levels above applicable standards. A copy of this notice has been seen to Mayor Timothy T. Stewart, New Britain, CT.

Clearwire is currently developing a 4G wireless broadband network to provide high-speed wireless data and VoIP service within the State of Connecticut. Clearwire's 4G service leverages the WiMAX technology to enable enhanced wireless data communications. In order to accomplish the upgrade at this site, Clearwire plans to add three (3) WiMAX antennas, three (3) dishes and to install additional WiMAX related electronic equipment at the base of the tower.

The tower is a 195' monopole located at 188 Stanley Street, New Britain, Connecticut (Latitude 41-39-16.16 N Longitude 72-46-11.14 W). The tower is owned by Crown Castle USA Inc. and is located at 188 Stanley Street, New Britain, CT. AT&T/Cingular, Verizon and Pocket PCS are located on the tower. Presently, Clearwire is not located at the site. Clearwire will add three (3) antennas in three (3) sectors (one in each) and three microwave backhaul dishes. A site plan with the tower elevations and site plan specifications is attached.

Clearwire will add three (3) antennas, one (1) to each sector, centerline 175' AGL and mount three (3) microwave dishes, one(1) in between each of those antennas. The center line for the microwave dishes will be 175'. Nine coaxial cables will be added to the structure, 2 per antenna and one per microwave dish. These cables will be inside the tower so that there will be

CLEAR™
4400 Carillon Point
Kirkland, WA 98033

no additional wind loading. To confirm that the tower can support these changes, Clearwire commissioned Crown castle USA Inc. to perform a structural analysis of the tower and the proposed changes. According to that structural dated September 17, 2009 and attached hereto, the structural is sufficient to support the proposed loading. The tower, with the additions, is at 36.6 % of its capacity.

Within the existing compound, Clearwire will install one (1) WiMAX radio and power cabinet on a new concrete pad in its lease area at the site. Excluding brief, construction related noise during the addition of this equipment, the proposed changes to the tower will not increase noise levels at the site.

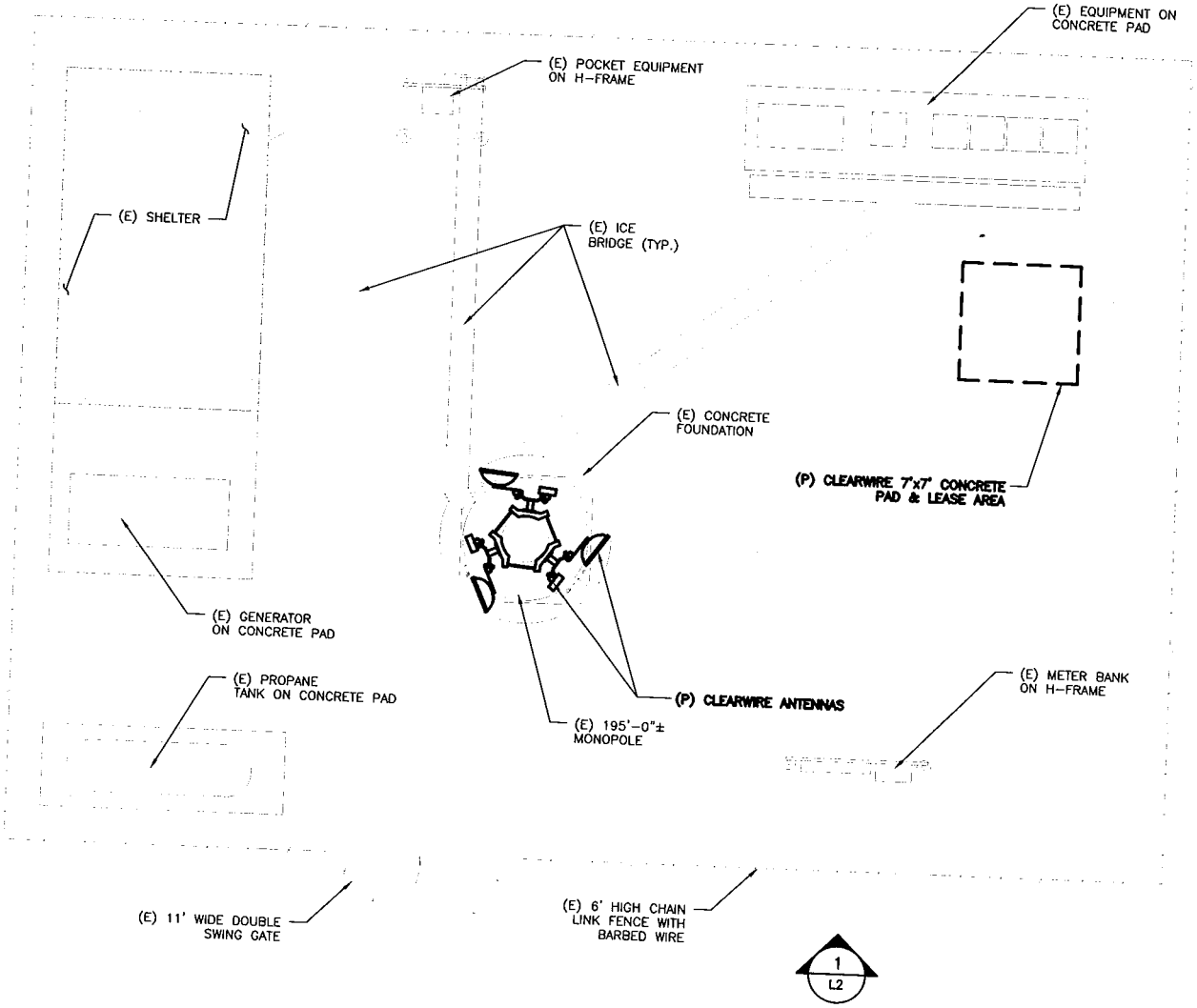
The addition of new WiMAX antennas and microwave dishes will not adversely impact the health and safety of the surrounding community or the people working on the tower. The total radio frequency exposure measured around the base of the tower will be well below the National Council on Radiation Protection and Measurements' (NCRP) standard adopted by the Federal Communications Commission (FCC). The worst case power density analysis for the WiMAX antennas and dishes, measured at the base of the tower, indicates that the WiMAX antennas and dishes will emit .009 % of the NCRP's standard for maximum permissible exposure. The cumulative power density analysis indicates that all the antennas on the structure will emit 18.95% of the NRCP's standard for maximum permissible exposure. Therefore, the power density levels will be well below the FCC mandated radio frequency exposure limits in all locations around the base of the tower. The power density analysis is attached.

In conclusion, Clearwire's proposed plan to add three (3) WiMAX antennas, three (3) microwave dishes and the associated base station equipment does not constitute a modification subject to the Council's jurisdiction because Clearwire will not increase the height of the tower, will not extend the boundaries of the compound at the site, will not increase the noise levels at the site and the radio frequency electromagnetic radiation power density will stay within all applicable standards.

Respectfully Submitted

Thomas F. Flynn III
Agent for Clearwire Corporation
Site Development Project Manager
Maxton Technology Inc
1296 Blue Hills Ave.
Bloomfield, CT 06002
508-821-6974
Tom.flynn@maxtontech.com

Cc: Mayor Timothy T. Stewart
City of New Britain



COMPOUND PLAN

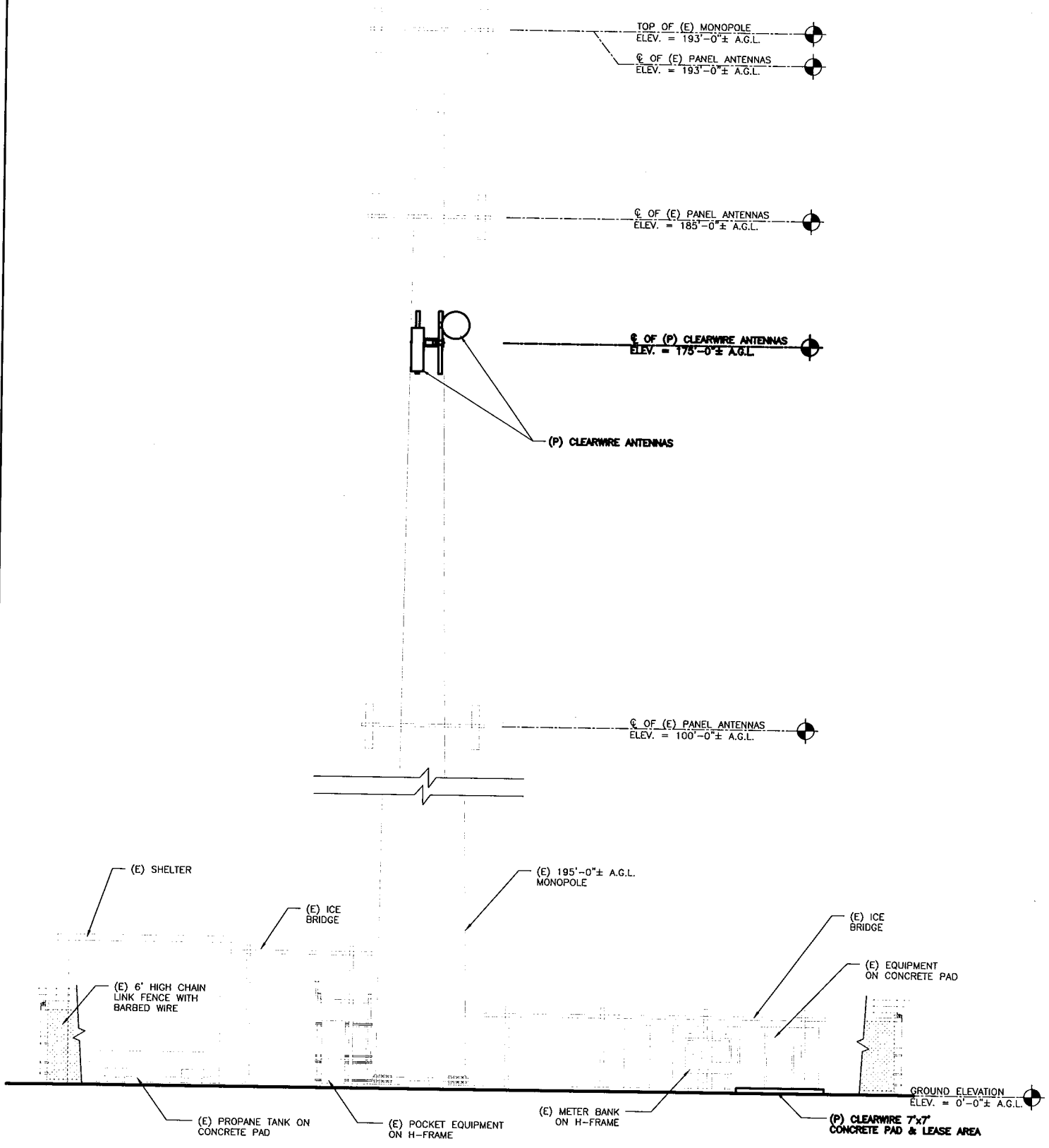
SCALE: N.T.S

1

MIXTON BAY STATE DESIGN
241 BOSTON POST RD WEST
MARLBOROUGH, MA. 01752
Phone: 508-229-4100
Fax: 508-485-5321
Bay State Design, Inc.
Architects • Engineers
241 BOSTON POST RD WEST
MARLBOROUGH, MA. 01752
Phone: 508-229-4100
Fax: 508-485-5321

clearwire
5808 LAKE WASHINGTON BLVD.
NE SUITE 300
KIRKLAND, WA 98033

PROJECT LOCATION: NEW BRITAIN CT-HFD0117-A 188 STANLEY ST NEW BRITAIN, CT 06051	SITE TYPE: MONOPOLE COLOCATION
APPROVED BY:	PROJECT MANAGER: JP / DRAWN BY: RS
	DATE: 09/18/09 / REVISION: 1
BSDA PROJ. #: 2908.109	SHEET: L1



ELEVATION 1

SCALE: N.T.S

MAXTON
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clearwire
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PROJECT LOCATION: NEW BRITAIN CT-HFD0117-A 188 STANLEY ST NEW BRITAIN, CT 06051	SITE TYPE: MONOPOLE COLOCATION		BSDA PROJ. #: 2908.109
APPROVED BY:	PROJECT MANAGER: JP	DRAWN BY: RS	SHEET: L2
	DATE: 09/18/09	REVISION: 1	

CLEAR

4400 Carillon Point
Kirkland, WA 98033

To: Connecticut Siting Council
From: Praveen Meesarapu – Radio Frequency Engineer
Cc: Cameron Syme
Subject: Power Density Report for CT-HFD0117
Date: September 24, 2009

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1. Introduction:

This report is the result of Electromagnetic Field Intensities (EMF – Power Densities) study for the Clearwire broadband antenna installation on a Self Support Tower at 200 Stanley Street, New Britain, CT, 06051. This study incorporates the most conservative consideration for determining the practical combined worst case power density levels that would be theoretically encountered from locations surrounding the transmitting location:

2: Discussion:

The following assumptions were used in the calculations:

1) The emissions from Clearwire transmitters are in the (2496 – 2960) Frequency Band
2) The emissions from the Clearwire Microwave dishes are in the 18 GHz Frequency Band
3) The model number for Clearwire Antenna is Argus LLPX310R
4) The model number for the Microwave dish is Andrew VHLP2-18 with 24" Diameter.
5) The Clearwire Panel antenna centerline is 175 feet.
6) The Clearwire Microwave dish centerline is 175 feet.
7) The Maximum Transmit power from any Clearwire panel antenna is 251 Watts Effective Isotropic Radiated Power (EiRP) assuming 2 channels per sector.
8) The Maximum Transmit power from any Clearwire Microwave Dish is 346 Watts Effective Isotropic Radiated Power (EiRP) assuming 1 channel per dish.
9) All antennas are simultaneously transmitting and receiving 24 hours per day.
10) The average ground level of the studied area does not change significantly with respect to the transmitting location.

Equations given in "FCC OET Bulletin 65, Edition 97-01" were used with the above information to perform the calculations.

3: Conclusion:

Based on the above worst case assumptions, the power density calculation from the Clearwire antenna installation on a Self Support Tower at 200 Stanley Street, New Britain, CT is 0.0000009 mW/cm^2. This value represents 0.009% of the Maximum Permissible Exposure (MPE) standard of 1 milliwatt per square centimeter (mW/cm^2) set forth in the FCC/ANSI/IEEE C95-1-1991. Furthermore, the proposed antenna location for Clearwire will not interfere with existing public safety communications, AM or FM radio broadcasts, TV, Police Communications, HAM Radio communications or any other signals in the area.

The combined Power Density from all other carriers is 18.95 %. The combined Power Density for this site is 18.96 % of the M.P.E. standard.

Date: **September 17, 2009**

Marianne Leech
Crown Castle USA Inc.
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

Crown Castle USA
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject: **Structural Analysis Report**

Carrier Designation:	***Clearwire Corp* Co-Locate Carrier Site Number:**	CT-HFD0117
Crown Castle Designation:	**Crown Castle BU Number:**	803843
	Crown Castle Site Name:	CT NEW BRITAIN 4 CAC 803843
	Crown Castle JDE Job Number:	124361
	Crown Castle Work Order Number:	291687
Engineering Firm Designation:	**Crown Castle USA Project Number:**	291687
Site Data:	**Stanley Street, New Britain, Hartford County, CT** **Latitude *41° 39' 16.4"*, Longitude *-72° 46' 9.59"*** **192 Foot - Monopole Tower**	

Dear Marianne Leech,

Crown Castle USA 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 291687, in accordance with application 87384, 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:

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 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 *Crown Castle USA* 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: Levi Marcus, E.I.T. / MFB

Respectfully submitted by:

Aaron C. Poot, P.E.
Engineering Supervisor

STATE OF CONNECTICUT
AARON C. POOT
No. 25050
LICENSED PROFESSIONAL ENGINEER

9/17/09

RISA Tower Report - version 5.3.1.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 192 ft Monopole tower designed by SUMMIT in April of 2001. 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, 69.3 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
175	177	2	dragonwave	A-ANT-18G-2-C	3 3 3 1	1/4 5/8 1/2 5/16	-
		2	dragonwave	HORIZON COMPACT			
	175	1	motorola	TIMING 2000			
		1	tower mounts	Side Arm Mount [SO 702-3]			
	173	3	argus technologies	LLPX310R w/ Mount Pipe			
		3	samsung telecommunications	WIMAX DAP HEAD			

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
193	195	9	dapa	58210 w/ Mount Pipe	6	1-5/8	2
		3	powerwave technologies	7770.00 w/ Mount Pipe	6	1-5/8	1
		6	powerwave technologies	LGP21401			
	193	1	tower mounts	Platform Mount [LP 401-1]			
185	185	3	rfs celwave	APXV18-206517S-C w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Platform Mount [LP 401-1]			
100	102	6	antel	WPA-80090/4CF w/ Mount Pipe	12	1-5/8	1
		6	decibel	DB948F85T2E-M w/ Mount Pipe			
	100	1	tower mounts	T-Arm Mount [TA 701-3]			

Notes:
1) Existing Equipment
2) Reserved 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)
192	192	-	-	Panel Antennas (CaAa = 75 ft. sq. total)	-	-
185	185	-	-	Panel Antennas (CaAa = 75 ft. sq. total)	-	-
175	175	-	-	Panel Antennas (CaAa = 75 ft. sq. total)	-	-
165	165	-	-	Microwave w/ Mount (CaAa = 110 ft. sq. total)	-	-
155	155	-	-	Panel Antennas (CaAa = 75 ft. sq. total)	-	-
145	145	-	-	Panel Antennas (CaAa = 75 ft. sq. total)	-	-
135	135	-	-	Microwave w/ Mount (CaAa = 110 ft. sq. total)	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, P.E.	2384583	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit	1118798	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit	925033	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 USA 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	192 - 151.25	Pole	TP39.245x26x0.3125	1	-8.77	1923.73	18.6	Pass
L2	151.25 - 111.25	Pole	TP51.621x36.9948x0.4375	2	-17.92	3542.45	20.5	Pass
L3	111.25 - 72.75	Pole	TP63.259x48.6333x0.5	3	-32.64	4963.31	22.7	Pass
L4	72.75 - 35.75	Pole	TP74.285x59.6589x0.5625	4	-50.47	6563.60	23.4	Pass
L5	35.75 - 0	Pole	TP84.78x70.1535x0.5625	5	-76.78	7816.75	26.0	Pass
							Summary	
						Pole (L5)	26.0	Pass
						RATING =	**26.0**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	35.7	Pass
1	Base Plate	0	31.5	Pass
1	Base Foundation	0	36.6	Pass

Structure Rating (max from all components) =	36.6%

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.

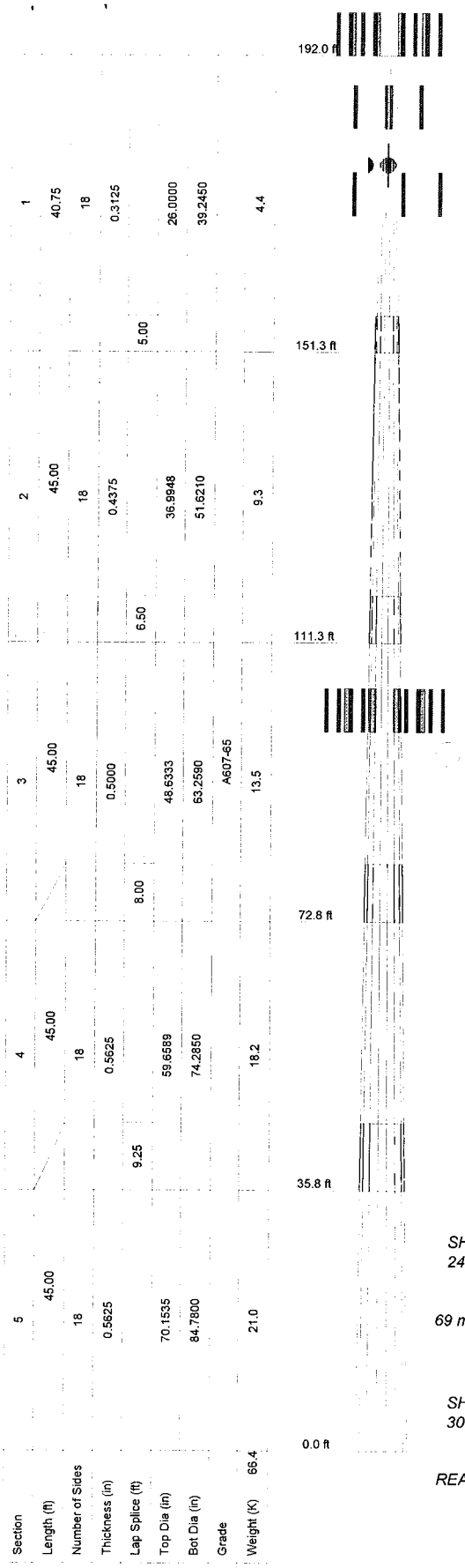
The twist and sway values for a 50 mph fastest-mile service wind speed are given below:

Critical Deflections and Radius of Curvature - Service Wind

Elevation	*Appurtenance*	*Gov. Load Comb.*	*Deflection*	*Tilt*	*Twist*	*Radius of Curvature*
ft			*in*	*°*	*°*	*ft*
177.00	A-ANT-18G-2-C	31	9.656	0.5356	0.0013	31610

APPENDIX A

RISA TOWER OUTPUT



AXIAL
86 K

SHEAR
24 K

MOMENT
2798 kip-ft

TORQUE 1 kip-ft
69 mph WIND - 0.5000 in ICE

AXIAL
77 K

MOMENT
3386 kip-ft

SHEAR
30 K

TORQUE 1 kip-ft
REACTIONS - 80 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
7770.00 w/ Mount Pipe	193	HORIZON COMPACT	175
(2) LGP21401	193	TIMING 2000	175
(3) 58210 w/ Mount Pipe	193	(2) LLPX310R w/ Mount Pipe	175
7770.00 w/ Mount Pipe	193	(2) WIMAX DAP HEAD	175
(2) LGP21401	193	LLPX310R w/ Mount Pipe	175
(3) 58210 w/ Mount Pipe	193	HORIZON COMPACT	175
7770.00 w/ Mount Pipe	193	WIMAX DAP HEAD	175
(2) LGP21401	193	Side Arm Mount [SO 702-3]	175
(3) 58210 w/ Mount Pipe	193	A-ANT-18G-2-C	175
Platform Mount [LP 401-1]	193	A-ANT-18G-2-C	175
APXV18-206517S-C w/ Mount Pipe	185	(2) WPA-80090/4CF w/ Mount Pipe	100
APXV18-206517S-C w/ Mount Pipe	185	(2) DB948F85T2E-M w/ Mount Pipe	100
APXV18-206517S-C w/ Mount Pipe	185	(2) WPA-80090/4CF w/ Mount Pipe	100
Platform Mount [LP 401-1]	185	(2) DB948F85T2E-M w/ Mount Pipe	100
(2) 3'4"x4" Pipe Mount	185	T-Arm Mount [TA 701-3]	100
(2) 3'4"x4" Pipe Mount	185	(2) WPA-80090/4CF w/ Mount Pipe	100
(2) 3'4"x4" Pipe Mount	185	(2) DB948F85T2E-M w/ Mount Pipe	100

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 26%

CROWN CASTLE
Shaping the Wirless World

Crown Castle USA, Inc.
2000 Corporate Drive
Canonsburg, PA
Phone: (724) 416-2866
FAX: (724) 416-4866

Job:	***BU # 803843***		
Project:			
Client:	Crown Castle, USA	Drawn by: Matt Branagan	App'd:
Code:	TIA/EIA-222-F	Date: 09/17/09	Scale: NTS
Path:	R:\SA Models - Letters\Work Area\LMarcus\803843\803843.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 Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 69 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.

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	192.00-151.25	40.75	5.00	18	26.0000	39.2450	0.3125	1.2500	A607-65 (65 ksi)
L2	151.25-111.25	45.00	6.50	18	36.9948	51.6210	0.4375	1.7500	A607-65 (65 ksi)
L3	111.25-72.75	45.00	8.00	18	48.6333	63.2590	0.5000	2.0000	A607-65 (65 ksi)
L4	72.75-35.75	45.00	9.25	18	59.6589	74.2850	0.5625	2.2500	A607-65 (65 ksi)
L5	35.75-0.00	45.00		18	70.1535	84.7800	0.5625	2.2500	A607-65 (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	26.4011	25.4788	2124.0264	9.1191	13.2080	160.8136	4250.8477	12.7418	4.0260	12.883
	39.8504	38.6162	7394.8824	13.8210	19.9365	370.9225	14799.4952	19.3118	6.3571	20.343
L2	39.2158	50.7644	8571.2947	12.9779	18.7934	456.0805	17153.8678	25.3870	5.7411	13.122
	52.4173	71.0747	23524.0650	18.1701	26.2235	897.0616	47079.0836	35.5441	8.3153	19.006
L3	51.5288	76.3876	22358.9907	17.0873	24.7057	905.0122	44747.4018	38.2011	7.6795	15.359
	64.2349	99.5985	49561.2695	22.2794	32.1356	1542.2557	99187.7529	49.8087	10.2536	20.507
L4	63.2195	105.5092	46553.2031	20.9792	30.3067	1536.0691	93167.6621	52.7646	9.5100	16.907
	75.4310	131.6223	90378.9022	26.1715	37.7368	2394.9818	180876.727 3	65.8237	12.0842	21.483
L5	74.2887	124.2461	76019.7623	24.7048	35.6380	2133.1104	152139.553 3	62.1348	11.3570	20.19
	86.0879	150.3598	134732.986 1	29.8972	43.0682	3128.3606	269643.257 3	75.1942	13.9313	24.767

Tower Elevation ft	Gusset Area (per face) ft²	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 192.00-151.25				1	1	1		
L2 151.25-111.25				1	1	1		
L3 111.25-72.75				1	1	1		
L4 72.75-35.75				1	1	1		
L5 35.75-0.00				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 ft²/ft	Weight plf
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	192.00 - 8.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	192.00 - 8.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	185.00 - 8.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	100.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
FSJ1-50A(1/4")	B	No	Inside Pole	175.00 - 0.00	3	No Ice	0.00	0.04
						1/2" Ice	0.00	0.04
FSJ4-50B(1/2")	B	No	Inside Pole	175.00 - 0.00	3	No Ice	0.00	0.14
						1/2" Ice	0.00	0.14
HJ4.5-50(5/8")	B	No	Inside Pole	175.00 - 0.00	3	No Ice	0.00	0.40
						1/2" Ice	0.00	0.40
9207(5/16")	B	No	Inside Pole	175.00 - 0.00	1	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
1" Rigid Conduit	B	No	Inside Pole	175.00 - 0.00	3	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	192.00-151.25	A	0.000	0.000	0.000	0.000	0.17
		B	0.000	0.000	0.000	0.000	0.10
		C	0.000	0.000	0.000	0.000	0.40
L2	151.25-111.25	A	0.000	0.000	0.000	0.000	0.20
		B	0.000	0.000	0.000	0.000	0.17
		C	0.000	0.000	0.000	0.000	0.39
L3	111.25-72.75	A	0.000	0.000	0.000	0.000	0.19
		B	0.000	0.000	0.000	0.000	0.16
		C	0.000	0.000	0.000	0.000	0.65
L4	72.75-35.75	A	0.000	0.000	0.000	0.000	0.18
		B	0.000	0.000	0.000	0.000	0.15
		C	0.000	0.000	0.000	0.000	0.73
L5	35.75-0.00	A	0.000	0.000	0.000	0.000	0.14

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	0.15
		C	0.000	0.000	0.000	0.000	0.55

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	192.00-151.25	A	0.500	0.000	0.000	0.000	0.000	0.17
		B		0.000	0.000	0.000	0.000	0.10
		C		0.000	0.000	0.000	0.000	0.40
L2	151.25-111.25	A	0.500	0.000	0.000	0.000	0.000	0.20
		B		0.000	0.000	0.000	0.000	0.17
		C		0.000	0.000	0.000	0.000	0.39
L3	111.25-72.75	A	0.500	0.000	0.000	0.000	0.000	0.19
		B		0.000	0.000	0.000	0.000	0.16
		C		0.000	0.000	0.000	0.000	0.65
L4	72.75-35.75	A	0.500	0.000	0.000	0.000	0.000	0.18
		B		0.000	0.000	0.000	0.000	0.15
		C		0.000	0.000	0.000	0.000	0.73
L5	35.75-0.00	A	0.500	0.000	0.000	0.000	0.000	0.14
		B		0.000	0.000	0.000	0.000	0.15
		C		0.000	0.000	0.000	0.000	0.55

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	192.00-151.25	0.0000	0.0000	0.0000	0.0000
L2	151.25-111.25	0.0000	0.0000	0.0000	0.0000
L3	111.25-72.75	0.0000	0.0000	0.0000	0.0000
L4	72.75-35.75	0.0000	0.0000	0.0000	0.0000
L5	35.75-0.00	0.0000	0.0000	0.0000	0.0000

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 K
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	193.00	No Ice 1/2" Ice	6.12 6.63	4.25 5.01	0.06 0.10
(2) LGP21401	A	From Leg	4.00 0.00	0.0000	193.00	No Ice 1/2" Ice	1.29 1.45	0.23 0.31	0.01 0.02

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
			2.00						
(3) 58210 w/ Mount Pipe	A	From Leg	4.00	0.0000	193.00	No Ice	3.62	3.12	0.03
			0.00			1/2" Ice	4.03	3.83	0.06
			2.00						
7770.00 w/ Mount Pipe	B	From Leg	4.00	0.0000	193.00	No Ice	6.12	4.25	0.06
			0.00			1/2" Ice	6.63	5.01	0.10
			2.00						
(2) LGP21401	B	From Leg	4.00	0.0000	193.00	No Ice	1.29	0.23	0.01
			0.00			1/2" Ice	1.45	0.31	0.02
			2.00						
(3) 58210 w/ Mount Pipe	B	From Leg	4.00	0.0000	193.00	No Ice	3.62	3.12	0.03
			0.00			1/2" Ice	4.03	3.83	0.06
			2.00						
7770.00 w/ Mount Pipe	C	From Leg	4.00	0.0000	193.00	No Ice	6.12	4.25	0.06
			0.00			1/2" Ice	6.63	5.01	0.10
			2.00						
(2) LGP21401	C	From Leg	4.00	0.0000	193.00	No Ice	1.29	0.23	0.01
			0.00			1/2" Ice	1.45	0.31	0.02
			2.00						
(3) 58210 w/ Mount Pipe	C	From Leg	4.00	0.0000	193.00	No Ice	3.62	3.12	0.03
			0.00			1/2" Ice	4.03	3.83	0.06
			2.00						
Platform Mount [LP 401-1]	C	None		0.0000	193.00	No Ice	24.33	24.33	1.65
						1/2" Ice	30.22	30.22	2.03
***									
APXV18-206517S-C w/ Mount Pipe	A	From Leg	4.00	0.0000	185.00	No Ice	5.40	4.70	0.05
			0.00			1/2" Ice	5.96	5.86	0.09
			0.00						
APXV18-206517S-C w/ Mount Pipe	B	From Leg	4.00	0.0000	185.00	No Ice	5.40	4.70	0.05
			0.00			1/2" Ice	5.96	5.86	0.09
			0.00						
APXV18-206517S-C w/ Mount Pipe	C	From Leg	4.00	0.0000	185.00	No Ice	5.40	4.70	0.05
			0.00			1/2" Ice	5.96	5.86	0.09
			0.00						
Platform Mount [LP 401-1]	C	None		0.0000	185.00	No Ice	24.33	24.33	1.65
						1/2" Ice	30.22	30.22	2.03
(2) 3'4"x4" Pipe Mount	A	From Leg	0.00	0.0000	185.00	No Ice	1.05	1.05	0.04
			0.00			1/2" Ice	1.27	1.27	0.05
			0.00						
(2) 3'4"x4" Pipe Mount	B	From Leg	0.00	0.0000	185.00	No Ice	1.05	1.05	0.04
			0.00			1/2" Ice	1.27	1.27	0.05
			0.00						
(2) 3'4"x4" Pipe Mount	C	From Leg	0.00	0.0000	185.00	No Ice	1.05	1.05	0.04
			0.00			1/2" Ice	1.27	1.27	0.05
			0.00						
***									
HORIZON COMPACT	A	From Leg	4.00	0.0000	175.00	No Ice	0.84	0.43	0.01
			0.00			1/2" Ice	0.97	0.52	0.02
			2.00						
TIMING 2000	A	From Leg	4.00	0.0000	175.00	No Ice	0.13	0.13	0.00
			0.00			1/2" Ice	0.18	0.18	0.00
			0.00						
(2) LLPX310R w/ Mount Pipe	B	From Leg	4.00	0.0000	175.00	No Ice	5.07	2.98	0.05
			0.00			1/2" Ice	5.48	3.53	0.08
			-2.00						
(2) WIMAX DAP HEAD	B	From Leg	4.00	0.0000	175.00	No Ice	1.80	0.78	0.03
			0.00			1/2" Ice	1.99	0.92	0.04

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
			-2.00						
LLPX310R w/ Mount Pipe	C	From Leg	4.00	0.0000	175.00	No Ice	5.07	2.98	0.05
			0.00			1/2" Ice	5.48	3.53	0.08
			-2.00						
HORIZON COMPACT	C	From Leg	4.00	0.0000	175.00	No Ice	0.84	0.43	0.01
			0.00			1/2" Ice	0.97	0.52	0.02
			2.00						
WIMAX DAP HEAD	C	From Leg	4.00	0.0000	175.00	No Ice	1.80	0.78	0.03
			0.00			1/2" Ice	1.99	0.92	0.04
			-2.00						
Side Arm Mount [SO 702-3]	C	None		0.0000	175.00	No Ice	3.22	3.22	0.08
						1/2" Ice	4.15	4.15	0.11
***									
(2) WPA-80090/4CF w/ Mount Pipe	A	From Leg	4.00	0.0000	100.00	No Ice	3.97	3.88	0.03
			0.00			1/2" Ice	4.39	4.49	0.07
			2.00						
(2) DB948F85T2E-M w/ Mount Pipe	A	From Leg	4.00	0.0000	100.00	No Ice	2.13	4.45	0.03
			0.00			1/2" Ice	2.49	5.12	0.06
			2.00						
(2) WPA-80090/4CF w/ Mount Pipe	B	From Leg	4.00	0.0000	100.00	No Ice	3.97	3.88	0.03
			0.00			1/2" Ice	4.39	4.49	0.07
			2.00						
(2) DB948F85T2E-M w/ Mount Pipe	B	From Leg	4.00	0.0000	100.00	No Ice	2.13	4.45	0.03
			0.00			1/2" Ice	2.49	5.12	0.06
			2.00						
(2) WPA-80090/4CF w/ Mount Pipe	C	From Leg	4.00	0.0000	100.00	No Ice	3.97	3.88	0.03
			0.00			1/2" Ice	4.39	4.49	0.07
			2.00						
(2) DB948F85T2E-M w/ Mount Pipe	C	From Leg	4.00	0.0000	100.00	No Ice	2.13	4.45	0.03
			0.00			1/2" Ice	2.49	5.12	0.06
			2.00						
T-Arm Mount [TA 701-3]	C	None		0.0000	100.00	No Ice	27.95	27.95	1.09
						1/2" Ice	37.26	37.26	1.41

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-18G-2-C	A	Paraboloid w/o Radome	From Leg	1.00	0.0000		175.00	2.17	No Ice	3.72	0.03
				0.00					1/2" Ice	4.01	0.03
				2.00							
A-ANT-18G-2-C	C	Paraboloid w/o Radome	From Leg	1.00	0.0000		175.00	2.17	No Ice	3.72	0.03
				0.00					1/2" Ice	4.01	0.03
				2.00							

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	192 - 151.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-11.29	-0.44	-0.91
			Max. Mx	5	-8.77	-265.36	1.45
			Max. My	8	-8.78	-0.52	-264.09
			Max. Vy	5	9.72	-265.36	1.45
			Max. Vx	8	9.61	-0.52	-264.09
			Max. Torque	10			1.35
L2	151.25 - 111.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-21.48	-0.44	-0.91
			Max. Mx	5	-17.92	-711.48	4.73
			Max. My	8	-17.92	-1.47	-705.73

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	5	13.55	-711.48	4.73
			Max. Vx	8	13.44	-1.47	-705.73
			Max. Torque	10			1.35
L3	111.25 - 72.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-38.16	-0.44	-0.91
			Max. Mx	5	-32.65	-1345.76	7.90
			Max. My	8	-32.65	-2.37	-1335.68
			Max. Vy	5	20.47	-1345.76	7.90
			Max. Vx	8	20.35	-2.37	-1335.68
			Max. Torque	10			1.35
L4	72.75 - 35.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-57.38	-0.44	-0.91
			Max. Mx	5	-50.47	-2152.83	10.95
			Max. My	8	-50.47	-3.25	-2138.59
			Max. Vy	5	24.63	-2152.83	10.95
			Max. Vx	8	24.51	-3.25	-2138.59
			Max. Torque	10			1.35
L5	35.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-85.73	-0.44	-0.91
			Max. Mx	5	-76.78	-3374.65	14.77
			Max. My	8	-76.78	-4.34	-3355.20
			Max. Vy	5	29.69	-3374.65	14.77
			Max. Vx	8	29.58	-4.34	-3355.20
			Max. Torque	10			1.35

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	85.73	0.00	0.00
	Max. H_x	11	76.78	29.61	0.05
	Max. H_z	2	76.78	-0.17	29.55
	Max. M_x	2	3351.43	-0.17	29.55
	Max. M_z	5	3374.65	-29.68	0.08
	Max. Torsion	10	1.35	25.63	-14.92
	Min. Vert	31	76.78	-10.07	-5.79
	Min. H_x	5	76.78	-29.68	0.08
	Min. H_z	8	76.78	-0.02	-29.57
	Min. M_x	8	-3355.20	-0.02	-29.57
	Min. M_z	11	-3360.16	29.61	0.05
	Min. Torsion	4	-1.25	-25.74	14.76

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	76.78	0.00	0.00	0.57	-0.26	0.00
Dead+Wind 0 deg - No Ice	76.78	0.17	-29.55	-3351.43	-30.31	0.60
Dead+Wind 30 deg - No Ice	76.78	14.95	-25.52	-2889.27	-1707.01	1.08
Dead+Wind 60 deg - No Ice	76.78	25.74	-14.76	-1673.19	-2928.50	1.25
Dead+Wind 90 deg - No Ice	76.78	29.68	-0.08	-14.77	-3374.65	1.11

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 120 deg - No Ice	76.78	25.79	14.82	1684.15	-2937.31	0.75
Dead+Wind 150 deg - No Ice	76.78	14.77	25.63	2909.54	-1674.16	0.19
Dead+Wind 180 deg - No Ice	76.78	0.02	29.57	3355.20	-4.34	-0.50
Dead+Wind 210 deg - No Ice	76.78	-14.73	25.65	2913.08	1667.26	-1.09
Dead+Wind 240 deg - No Ice	76.78	-25.63	14.92	1702.61	2908.66	-1.35
Dead+Wind 270 deg - No Ice	76.78	-29.61	-0.05	-7.39	3360.16	-1.28
Dead+Wind 300 deg - No Ice	76.78	-25.67	-14.75	-1670.70	2915.52	-0.75
Dead+Wind 330 deg - No Ice	76.78	-14.84	-25.50	-2884.62	1686.86	-0.01
Dead+Ice+Temp	85.73	0.00	0.00	0.91	-0.44	0.00
Dead+Wind 0 deg+Ice+Temp	85.73	0.14	-23.82	-2772.23	-25.64	0.54
Dead+Wind 30 deg+Ice+Temp	85.73	12.04	-20.57	-2390.50	-1411.23	0.97
Dead+Wind 60 deg+Ice+Temp	85.73	20.73	-11.90	-1384.55	-2420.52	1.12
Dead+Wind 90 deg+Ice+Temp	85.73	23.91	-0.07	-12.34	-2788.87	1.00
Dead+Wind 120 deg+Ice+Temp	85.73	20.77	11.94	1392.93	-2426.83	0.67
Dead+Wind 150 deg+Ice+Temp	85.73	11.89	20.65	2407.04	-1383.16	0.15
Dead+Wind 180 deg+Ice+Temp	85.73	0.01	23.83	2776.21	-2.93	-0.46
Dead+Wind 210 deg+Ice+Temp	85.73	-11.87	20.67	2410.74	1378.53	-0.97
Dead+Wind 240 deg+Ice+Temp	85.73	-20.65	12.03	1409.34	2403.97	-1.20
Dead+Wind 270 deg+Ice+Temp	85.73	-23.84	-0.03	-4.70	2776.66	-1.13
Dead+Wind 300 deg+Ice+Temp	85.73	-20.67	-11.89	-1381.10	2408.70	-0.66
Dead+Wind 330 deg+Ice+Temp	85.73	-11.95	-20.55	-2385.91	1392.99	-0.01
Dead+Wind 0 deg - Service	76.78	0.06	-11.54	-1308.86	-12.01	0.23
Dead+Wind 30 deg - Service	76.78	5.84	-9.97	-1128.32	-667.00	0.42
Dead+Wind 60 deg - Service	76.78	10.05	-5.77	-653.26	-1144.17	0.49
Dead+Wind 90 deg - Service	76.78	11.60	-0.03	-5.41	-1318.45	0.44
Dead+Wind 120 deg - Service	76.78	10.07	5.79	658.26	-1147.61	0.29
Dead+Wind 150 deg - Service	76.78	5.77	10.01	1136.96	-654.17	0.07
Dead+Wind 180 deg - Service	76.78	0.01	11.55	1311.05	-1.86	-0.20
Dead+Wind 210 deg - Service	76.78	-5.75	10.02	1138.34	651.14	-0.42
Dead+Wind 240 deg - Service	76.78	-10.01	5.83	665.48	1136.09	-0.53
Dead+Wind 270 deg - Service	76.78	-11.56	-0.02	-2.53	1312.47	-0.50
Dead+Wind 300 deg - Service	76.78	-10.03	-5.76	-652.29	1138.77	-0.29
Dead+Wind 330 deg - Service	76.78	-5.80	-9.96	-1126.50	658.80	-0.01

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-76.78	0.00	0.00	76.78	0.00	0.000%
2	0.17	-76.78	-29.55	-0.17	76.78	29.55	0.000%
3	14.95	-76.78	-25.52	-14.95	76.78	25.52	0.000%
4	25.74	-76.78	-14.76	-25.74	76.78	14.76	0.000%
5	29.68	-76.78	-0.08	-29.68	76.78	0.08	0.000%
6	25.79	-76.78	14.82	-25.79	76.78	-14.82	0.000%
7	14.77	-76.78	25.63	-14.77	76.78	-25.63	0.000%
8	0.02	-76.78	29.57	-0.02	76.78	-29.57	0.000%
9	-14.73	-76.78	25.65	14.73	76.78	-25.65	0.000%
10	-25.63	-76.78	14.92	25.63	76.78	-14.92	0.000%
11	-29.61	-76.78	-0.05	29.61	76.78	0.05	0.000%
12	-25.67	-76.78	-14.75	25.67	76.78	14.75	0.000%
13	-14.84	-76.78	-25.50	14.84	76.78	25.50	0.000%
14	0.00	-85.73	0.00	0.00	85.73	0.00	0.000%
15	0.14	-85.73	-23.82	-0.14	85.73	23.82	0.000%
16	12.04	-85.73	-20.57	-12.04	85.73	20.57	0.000%
17	20.73	-85.73	-11.90	-20.73	85.73	11.90	0.000%
18	23.91	-85.73	-0.07	-23.91	85.73	0.07	0.000%
19	20.77	-85.73	11.94	-20.77	85.73	-11.94	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
20	11.89	-85.73	20.65	-11.89	85.73	-20.65	0.000%
21	0.01	-85.73	23.83	-0.01	85.73	-23.83	0.000%
22	-11.87	-85.73	20.67	11.87	85.73	-20.67	0.000%
23	-20.65	-85.73	12.03	20.65	85.73	-12.03	0.000%
24	-23.84	-85.73	-0.03	23.84	85.73	0.03	0.000%
25	-20.67	-85.73	-11.89	20.67	85.73	11.89	0.000%
26	-11.95	-85.73	-20.55	11.95	85.73	20.55	0.000%
27	0.06	-76.78	-11.54	-0.06	76.78	11.54	0.000%
28	5.84	-76.78	-9.97	-5.84	76.78	9.97	0.000%
29	10.05	-76.78	-5.77	-10.05	76.78	5.77	0.000%
30	11.60	-76.78	-0.03	-11.60	76.78	0.03	0.000%
31	10.07	-76.78	5.79	-10.07	76.78	-5.79	0.000%
32	5.77	-76.78	10.01	-5.77	76.78	-10.01	0.000%
33	0.01	-76.78	11.55	-0.01	76.78	-11.55	0.000%
34	-5.75	-76.78	10.02	5.75	76.78	-10.02	0.000%
35	-10.01	-76.78	5.83	10.01	76.78	-5.83	0.000%
36	-11.56	-76.78	-0.02	11.56	76.78	0.02	0.000%
37	-10.03	-76.78	-5.76	10.03	76.78	5.76	0.000%
38	-5.80	-76.78	-9.96	5.80	76.78	9.96	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	0.00002400
3	Yes	4	0.00000001	0.00013752
4	Yes	4	0.00000001	0.00011939
5	Yes	4	0.00000001	0.00002712
6	Yes	4	0.00000001	0.00013656
7	Yes	4	0.00000001	0.00012504
8	Yes	4	0.00000001	0.00002199
9	Yes	4	0.00000001	0.00011857
10	Yes	4	0.00000001	0.00014159
11	Yes	4	0.00000001	0.00002963
12	Yes	4	0.00000001	0.00012098
13	Yes	4	0.00000001	0.00012569
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00064853
16	Yes	4	0.00000001	0.00071168
17	Yes	4	0.00000001	0.00071148
18	Yes	4	0.00000001	0.00065326
19	Yes	4	0.00000001	0.00071727
20	Yes	4	0.00000001	0.00070891
21	Yes	4	0.00000001	0.00065013
22	Yes	4	0.00000001	0.00070807
23	Yes	4	0.00000001	0.00071548
24	Yes	4	0.00000001	0.00064981
25	Yes	4	0.00000001	0.00070743
26	Yes	4	0.00000001	0.00070471
27	Yes	4	0.00000001	0.00000882
28	Yes	4	0.00000001	0.00001544
29	Yes	4	0.00000001	0.00001376
30	Yes	4	0.00000001	0.00000927
31	Yes	4	0.00000001	0.00001525
32	Yes	4	0.00000001	0.00001407

33	Yes	4	0.00000001	0.00000876
34	Yes	4	0.00000001	0.00001365
35	Yes	4	0.00000001	0.00001595
36	Yes	4	0.00000001	0.00000941
37	Yes	4	0.00000001	0.00001373
38	Yes	4	0.00000001	0.00001410

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	192 - 151.25	11.412	31	0.5756	0.0015
L2	156.25 - 111.25	7.386	31	0.4739	0.0008
L3	117.75 - 72.75	4.084	31	0.3365	0.0004
L4	80.75 - 35.75	1.900	31	0.2186	0.0002
L5	45 - 0	0.604	31	0.1191	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
193.00	7770.00 w/ Mount Pipe	31	11.412	0.5756	0.0016	94830
185.00	APXV18-206517S-C w/ Mount Pipe	31	10.587	0.5571	0.0015	67736
177.00	A-ANT-18G-2-C	31	9.656	0.5356	0.0013	31610
175.00	HORIZON COMPACT	31	9.427	0.5301	0.0013	27891
100.00	(2) WPA-80090/4CF w/ Mount Pipe	31	2.927	0.2788	0.0003	18741

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	192 - 151.25	29.186	6	1.4713	0.0038
L2	156.25 - 111.25	18.896	6	1.2121	0.0021
L3	117.75 - 72.75	10.449	6	0.8608	0.0009
L4	80.75 - 35.75	4.862	6	0.5593	0.0004
L5	45 - 0	1.546	6	0.3048	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
193.00	7770.00 w/ Mount Pipe	6	29.186	1.4713	0.0041	37218
185.00	APXV18-206517S-C w/ Mount Pipe	6	27.078	1.4242	0.0037	26584

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.00	A-ANT-18G-2-C	6	24.699	1.3693	0.0033	12406
175.00	HORIZON COMPACT	6	24.112	1.3552	0.0032	10946
100.00	(2) WPA-80090/4CF w/ Mount Pipe	6	7.489	0.7108	0.0007	7329

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	192 - 151.25 (1)	TP39.245x26x0.3125	40.75	0.00	0.0	39.000	37.0042	-8.77	1443.16	0.006
L2	151.25 - 111.25 (2)	TP51.621x36.9948x0.4375	45.00	0.00	0.0	39.000	68.1410	-17.92	2657.50	0.007
L3	111.25 - 72.75 (3)	TP63.259x48.6333x0.5	45.00	0.00	0.0	39.000	95.4721	-32.64	3723.41	0.009
L4	72.75 - 35.75 (4)	TP74.285x59.6589x0.5625	45.00	0.00	0.0	39.000	126.2550	-50.47	4923.93	0.010
L5	35.75 - 0 (5)	TP84.78x70.1535x0.5625	45.00	0.00	0.0	39.000	150.3600	-76.78	5864.03	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	192 - 151.25 (1)	TP39.245x26x0.3125	266.90	9.406	39.000	0.241	0.00	0.000	39.000	0.000
L2	151.25 - 111.25 (2)	TP51.621x36.9948x0.4375	715.40	10.416	39.000	0.267	0.00	0.000	39.000	0.000
L3	111.25 - 72.75 (3)	TP63.259x48.6333x0.5	1351.99	11.453	39.000	0.294	0.00	0.000	39.000	0.000
L4	72.75 - 35.75 (4)	TP74.285x59.6589x0.5625	2161.28	11.773	39.000	0.302	0.00	0.000	39.000	0.000
L5	35.75 - 0 (5)	TP84.78x70.1535x0.5625	3385.87	12.988	39.000	0.333	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 $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	192 - 151.25 (1)	TP39.245x26x0.3125	9.79	0.264	26.000	0.020	0.75	0.013	26.000	0.000
L2	151.25 - 111.25 (2)	TP51.621x36.9948x0.4375	13.62	0.200	26.000	0.015	0.75	0.005	26.000	0.000
L3	111.25 - 72.75 (3)	TP63.259x48.6333x0.5	20.53	0.215	26.000	0.017	0.75	0.003	26.000	0.000
L4	72.75 - 35.75	TP74.285x59.6589x0.5625	24.69	0.196	26.000	0.015	0.75	0.002	26.000	0.000

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 $\frac{f_{vt}}{F_{vt}}$
L5	(4) 35.75 - 0 (5)	TP84.78x70.1535x0.5625	29.75	0.198	26.000	0.015	0.75	0.001	26.000	0.000

Pole Interaction Design Data

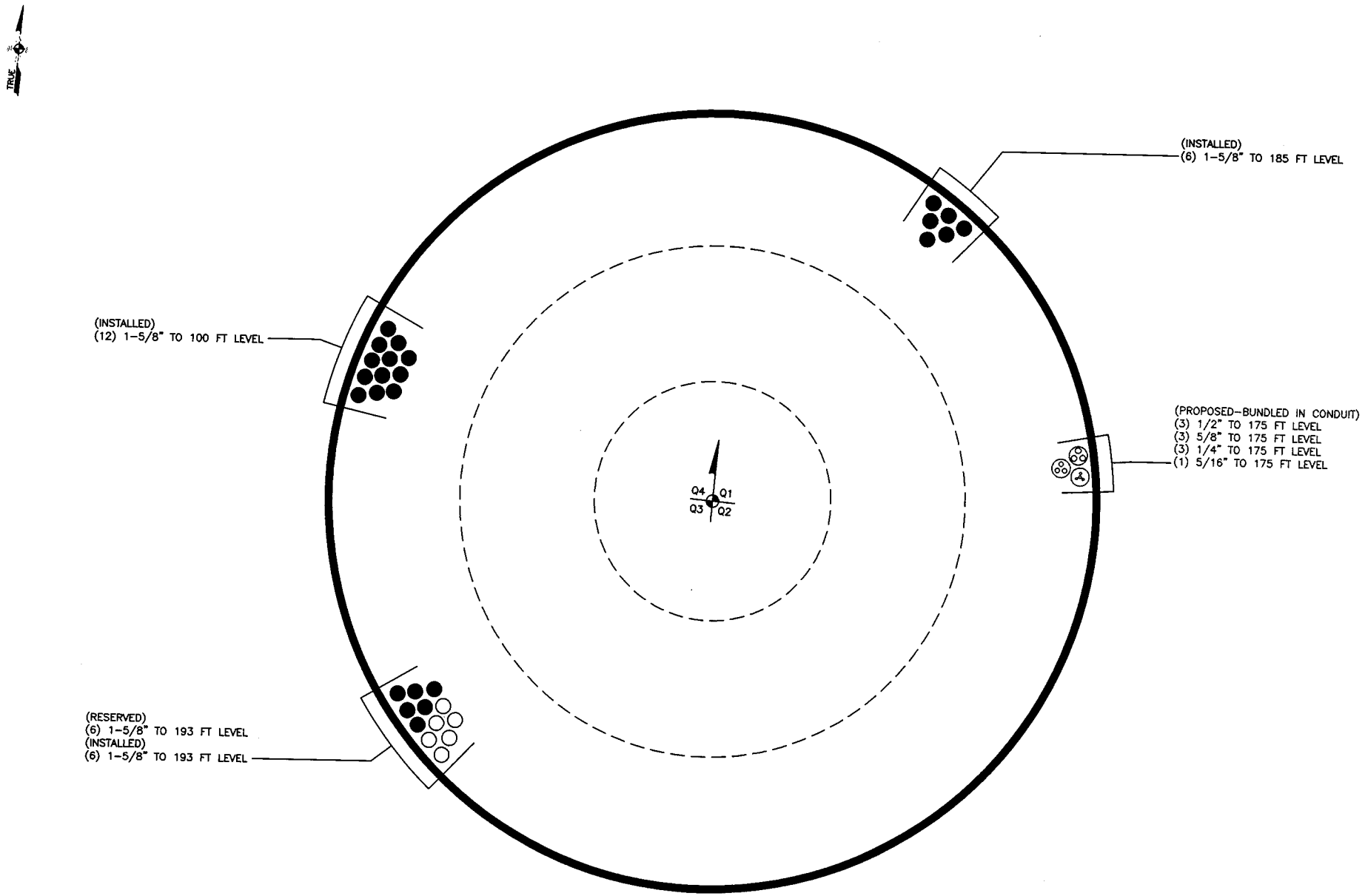
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	192 - 151.25 (1)	0.006	0.241	0.000	0.020	0.000	0.247 ✓	1.333	H1-3+VT ✓
L2	151.25 - 111.25 (2)	0.007	0.267	0.000	0.015	0.000	0.274 ✓	1.333	H1-3+VT ✓
L3	111.25 - 72.75 (3)	0.009	0.294	0.000	0.017	0.000	0.302 ✓	1.333	H1-3+VT ✓
L4	72.75 - 35.75 (4)	0.010	0.302	0.000	0.015	0.000	0.312 ✓	1.333	H1-3+VT ✓
L5	35.75 - 0 (5)	0.013	0.333	0.000	0.015	0.000	0.346 ✓	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	192 - 151.25	Pole	TP39.245x26x0.3125	1	-8.77	1923.73	18.6	Pass
L2	151.25 - 111.25	Pole	TP51.621x36.9948x0.4375	2	-17.92	3542.45	20.5	Pass
L3	111.25 - 72.75	Pole	TP63.259x48.6333x0.5	3	-32.64	4963.31	22.7	Pass
L4	72.75 - 35.75	Pole	TP74.285x59.6589x0.5625	4	-50.47	6563.60	23.4	Pass
L5	35.75 - 0	Pole	TP84.78x70.1535x0.5625	5	-76.78	7816.75	26.0	Pass
							Summary	
						Pole (L5)	26.0	Pass
						RATING =	**26.0**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 803843 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

Assumptions: Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48.
Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)

Site Data

BU#: *803843*
Site Name: *CT NEW BRITAIN 4 CAC 803843*
App #: *87384 R3*

Reactions		
Moment:	3386	ft-kips
Axial:	77	kips
Shear:	30	kips

Anchor Rod Data		
Qty:	24	
Diam:	2.25	in
Rod Material:	A615-J	
Grade(Fy):	75	ksi
Bolt Circle:	93	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	91	in
Thick:	3.25	in
Grade:	55	ksi
B effective	43.91	in

Pole Data		
Diam:	84.78	in
Thick:	0.5625	in
Grade:	65	ksi

Stress Increase Factor		
ASIF:	1.333	

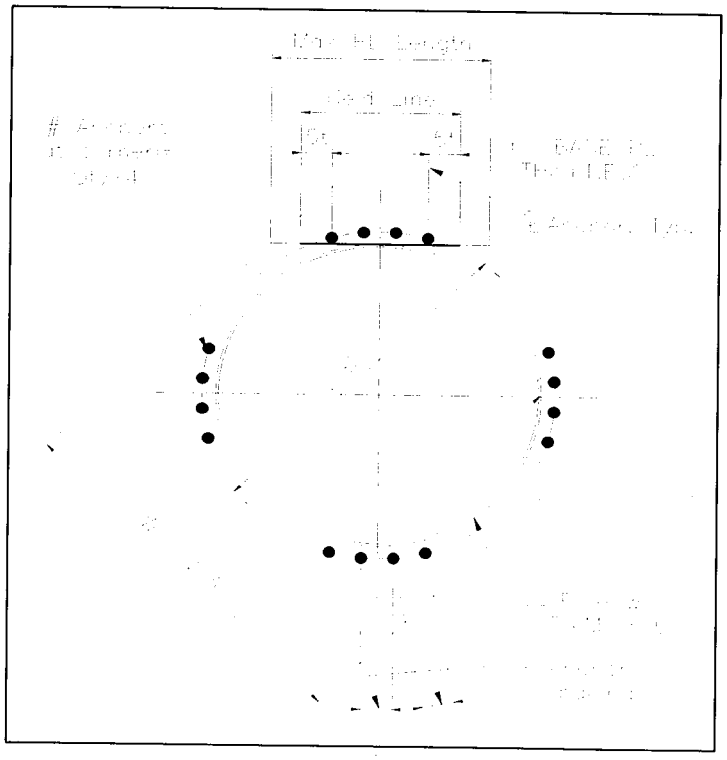
Anchor Rod Results

Maximum Rod Tension:	69.6 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	35.7% **Pass**

Base Plate Results

Base Plate Stress:	17.3 ksi
Allowable Plate Stress:	55.0 ksi
Base Plate Stress Ratio:	31.5% **Pass**

PL Ref. Data
Yield Line (in):
43.91
Max PL Length:
43.91



Monopole Drilled Pier

Checks capacity of a single drilled shaft foundation for a monopole

BU#: *803843*
Site Name: *CT NEW BRITAIN 4 CAC 803843*
App Number: *87384 R3*

Shear, **S**:	30.00	kips
Moment, **Mt**:	3386.00	ft-kips
Tower Weight, **Wt**:	77.00	kips
Tower Height, **H**:	192	ft
Base Diameter, **BD**:	84.8	in

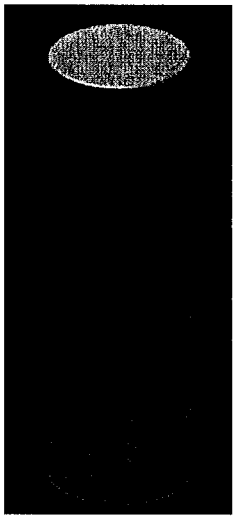
Caisson Diameter, **CD**:	10.0	ft
Ext. Above Grade, **E**:	0.5	ft
Depth Below Grade, **L**:	28.5	ft
Neglected Depth, **N**:	5.0	ft
Rebar Size, **Sp**:	11	
Rebar Quantity, **mp**:	40	

Rebar Tensile, **Fy**:	60000	psi
Concrete Strength, **F'c**:	3000	psi
Concrete Density, δ**x**:	122	pcf
Clear Cover, **cc**:	4	in

Soil Unit Weight, γ:	99	pcf
Allowable Bearing, **Bc**:	12.000	ksf
Seismic Zone, **z**:	1	

Depth to Zero Shear	6.5	ft
Max Moment	3742.37	ft-kips
Required Length	21.5	ft
Max Soil Moment	9256.8	ft-kips

	Capacity/ Availability	*Demand/ Limits*	*Check*
Minimum Req'd Dia. 1 (ft):	10.00	2.86	OK
Minimum Req'd Dia. 2 (ft):	10.00	9.07	OK
Bearing (ksf):	12.00	0.98	OK
Rebar Area (in^2):	62.40	56.55	OK
Pier moment capacity (k-ft):	11172.43	3742.37	OK
Rebar spacing (in):	7.39	2 < Bs <18	OK
Development Length (in)	259.45	54.68	OK
Required Length (ft):	29.00	21.50	OK
Soil moment capacity(k-ft):	9256.80	3386.00	OK



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Crown Castle USA

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*  PIER FOUNDATIONS ANALYSIS AND DESIGN - (C) 1995,2002 POWER LINE SYSTEMS, INC.*
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*** ANALYSIS IDENTIFICATION : BU# 803843
NOTES :

*** PIER PROPERTIES CONCRETE STRENGTH (ksi) = 3.00 STEEL STRENGTH (ksi) = 60.00

DIAMETER (ft) = 10.000 DISTANCE FROM TOP OF PIER TO GROUND LEVEL (ft) = 0.50

*** SOIL PROPERTIES

LAYER	TYPE	THICKNESS (ft)	DEPTH AT TOP OF LAYER (ft)	DENSITY (pcf)	CU (psf)	KP	PHI (degrees)
1	C	5.00	0.00	115.0	0.0		
2	S	10.00	5.00	115.0		3.000	30.00
3	S	10.00	15.00	70.0		3.540	34.02
4	S	3.50	25.00	70.0		4.500	39.52

*** DESIGN (FACTORED) LOADS AT TOP OF PIER MOMENT (ft-k) = 9256.8 VERTICAL (k) = 77.0 SHEAR (k) = 81.2
ADDITIONAL SAFETY FACTOR AGAINST SOIL FAILURE = 2.00

*** CALCULATED PIER LENGTH (ft) = 29.000

*** CHECK OF SOILS PROPERTIES AND ULTIMATE RESISTING FORCES ALONG PIER

TYPE	TOP OF LAYER BELOW TOP OF PIER (ft)	THICKNESS (ft)	DENSITY (pcf)	CU (psf)	KP	FORCE (k)	ARM (ft)
C	0.50	5.00	115.0	0.0		0.00	3.00
S	5.50	10.00	115.0		3.000	1035.00	11.33
S	15.50	6.15	70.0		3.540	1267.44	18.69
S	21.65	3.85	70.0		3.540	-936.21	23.61
S	25.50	3.50	70.0		4.500	-1203.69	27.28

*** SHEAR AND MOMENTS ALONG PIER

DISTANCE BELOW TOP OF PIER (ft)	WITH THE ADDITIONAL SAFETY FACTOR SHEAR (k)	WITH THE ADDITIONAL SAFETY FACTOR MOMENT (ft-k)	WITHOUT ADDITIONAL SAFETY FACTOR SHEAR (k)	WITHOUT ADDITIONAL SAFETY FACTOR MOMENT (ft-k)
0.00	162.5	19524.0	81.3	9762.0
2.90	162.5	19995.4	81.3	9997.7
5.80	146.5	20464.3	73.3	10232.2
8.70	-56.1	20616.6	-28.0	10308.3
11.60	-345.7	20055.0	-172.9	10027.5
14.50	-722.4	18527.3	-361.2	9263.7
17.40	-1234.0	15733.9	-617.0	7866.9
20.30	-1837.4	11295.5	-918.7	5647.7
23.20	-1776.4	5574.8	-888.2	2787.4
26.10	-1005.6	1477.3	-502.8	738.6
29.00	-0.0	0.0	-0.0	0.0

*** TOTAL REINFORCEMENT PCT = 0.42 REINFORCEMENT AREA (in^2) = 47.50
*** USABLE AXIAL CAP. (k) = 77.0 USABLE MOMENT CAP. (ft-k) = 10674.9

*** US Standard Re-Bars (Select one of the following):

238	BARS #4	(AREA = 0.20 in^2	DIA = 0.500 in) AT SPACING (in) =	1.45
154	BARS #5	(AREA = 0.31 in^2	DIA = 0.625 in) AT SPACING (in) =	2.24
108	BARS #6	(AREA = 0.44 in^2	DIA = 0.750 in) AT SPACING (in) =	3.20
80	BARS #7	(AREA = 0.60 in^2	DIA = 0.875 in) AT SPACING (in) =	4.32
61	BARS #8	(AREA = 0.79 in^2	DIA = 1.000 in) AT SPACING (in) =	5.67
48	BARS #9	(AREA = 1.00 in^2	DIA = 1.128 in) AT SPACING (in) =	7.20
38	BARS #10	(AREA = 1.27 in^2	DIA = 1.270 in) AT SPACING (in) =	9.09
31	BARS #11	(AREA = 1.56 in^2	DIA = 1.410 in) AT SPACING (in) =	11.15
22	BARS #14	(AREA = 2.25 in^2	DIA = 1.693 in) AT SPACING (in) =	15.71

*** WEIGHT OF CAISSON (kips) = 341.648
*** PRESSURE UNDER CAISSON DUE TO INPUT DESIGN AXIAL LOAD (psf) = 980.4

CAISSON Version 10.00 3:33:10 PM Thursday, September 17, 2009
Crown Castle USA

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*  PIER FOUNDATIONS ANALYSIS AND DESIGN - (C) 1995,2002 POWER LINE SYSTEMS, INC.*
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*** ANALYSIS IDENTIFICATION : BU# 803843
NOTES :

*** PIER PROPERTIES CONCRETE STRENGTH (ksi) = 3.00 STEEL STRENGTH (ksi) = 60.00

DIAMETER (ft) = 10.000 DISTANCE FROM TOP OF PIER TO GROUND LEVEL (ft) = 0.50

*** SOIL PROPERTIES

LAYER	TYPE	THICKNESS (ft)	DEPTH AT TOP OF LAYER (ft)	DENSITY (pcf)	CU (psf)	KP	PHI (degrees)
1	C	5.00	0.00	115.0	0.0		
2	S	10.00	5.00	115.0		3.000	30.00
3	S	10.00	15.00	70.0		3.540	34.02
4	S	3.50	25.00	70.0		4.500	39.52

*** DESIGN (FACTORED) LOADS AT TOP OF PIER MOMENT (ft-k) = 3386.0 VERTICAL (k) = 77.0 SHEAR (k) = 30.0
ADDITIONAL SAFETY FACTOR AGAINST SOIL FAILURE = 2.00

*** CALCULATED PIER LENGTH (ft) = 21.500

*** CHECK OF SOILS PROPERTIES AND ULTIMATE RESISTING FORCES ALONG PIER

TYPE	TOP OF LAYER BELOW TOP OF PIER (ft)	THICKNESS (ft)	DENSITY (pcf)	CU (psf)	KP	FORCE (k)	ARM (ft)
C	0.50	5.00	115.0	0.0		0.00	3.00
S	5.50	10.00	115.0		3.000	1035.00	11.33
S	15.50	0.70	70.0		3.540	129.38	15.85
S	16.20	5.30	70.0		3.540	-1103.60	18.93

*** SHEAR AND MOMENTS ALONG PIER

DISTANCE BELOW TOP OF PIER (ft)	WITH THE ADDITIONAL SAFETY FACTOR SHEAR (k)	MOMENT (ft-k)	WITHOUT ADDITIONAL SAFETY FACTOR SHEAR (k)	MOMENT (ft-k)
0.00	60.8	7112.8	30.4	3556.4
2.15	60.8	7243.4	30.4	3621.7
4.30	60.8	7374.1	30.4	3687.0
6.45	6.9	7479.9	3.5	3740.0
8.60	-149.4	7335.4	-74.7	3667.7
10.75	-353.6	6803.3	-176.8	3401.6
12.90	-605.6	5780.8	-302.8	2890.4
15.05	-905.4	4165.1	-452.7	2082.5
17.20	-910.8	2007.5	-455.4	1003.7
19.35	-472.6	514.2	-236.3	257.1
21.50	-0.0	0.0	-0.0	0.0

*** TOTAL REINFORCEMENT PCT = 0.34 REINFORCEMENT AREA (in^2) = 38.45
*** USABLE AXIAL CAP. (k) = 77.0 USABLE MOMENT CAP. (ft-k) = 8834.4

*** US Standard Re-Bars (Select one of the following):

193	BARS #4	(AREA = 0.20 in^2	DIA = 0.500 in) AT SPACING (in) =	1.79
125	BARS #5	(AREA = 0.31 in^2	DIA = 0.625 in) AT SPACING (in) =	2.76
88	BARS #6	(AREA = 0.44 in^2	DIA = 0.750 in) AT SPACING (in) =	3.93
65	BARS #7	(AREA = 0.60 in^2	DIA = 0.875 in) AT SPACING (in) =	5.32
49	BARS #8	(AREA = 0.79 in^2	DIA = 1.000 in) AT SPACING (in) =	7.05
39	BARS #9	(AREA = 1.00 in^2	DIA = 1.128 in) AT SPACING (in) =	8.86
31	BARS #10	(AREA = 1.27 in^2	DIA = 1.270 in) AT SPACING (in) =	11.15
25	BARS #11	(AREA = 1.56 in^2	DIA = 1.410 in) AT SPACING (in) =	13.82
18	BARS #14	(AREA = 2.25 in^2	DIA = 1.693 in) AT SPACING (in) =	19.20

*** WEIGHT OF CAISSON (kips) = 253.291
*** PRESSURE UNDER CAISSON DUE TO INPUT DESIGN AXIAL LOAD (psf) = 980.4