STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

Internet: ct.gov/csc

Daniel F. Caruso

Chairman

March 14, 2011

Thomas J. Regan, Esq.
Brown Rudnick LLP
CityPlace I, 185 Asylum Street
Hartford, CT 06103

RE: **EM-SPRINT-NEXTEL-014-110204** – Sprint Nextel Corporation notice of intent to modify an existing telecommunications facility located at 850 West Main Street, Branford, Connecticut.

Dear Attorney Regan:

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

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

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated February 10, 2011. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Anthony "Unk" DaRos, First Selectman, Town of Branford
Diana Ross, Inland Wetland Enforcement Officer, Town of Branford
Justine K. Gillen, Zoning Enforcement Officer, Town of Branford
Crown Castle USA, Inc.

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

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Daniel F. Caruso
Chairman

February 22, 2011

The Honorable Anthony "Unk" DaRos
First Selectman
Town of Branford
Town Hall
1019 Main Street
P. O. Box 150
Branford, CT 06405-0150

RE: **EM-SPRINT-NEXTEL-014-110204** – Sprint Nextel Corporation notice of intent to modify an existing telecommunications facility located at 850 West Main Street, Branford, Connecticut.

Dear First Selectman DaRos:

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

If you have any questions or comments regarding this proposal, please call me or inform the Council by March 8, 2011.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Diana Ross, Inland Wetland Enforcement Officer, Town of Branford
Justine K. Gillen, Zoning Enforcement Officer, Town of Branford

BROWNRUDNICK

CityPlace I
185 Asylum
Street
Hartford
Connecticut
06103
tel 860.509.6500
fax 860.509.6501

THOMAS J. REGAN
Direct Dial: (860) 509-6522
tregan@brownrudnick.com

Via Hand Delivery

February 4, 2011

Daniel F. Caruso, Chairman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification /Branford @ 850 West Main Street

Dear Mr. Caruso:

On behalf of Sprint Nextel Corporation ("Sprint"), enclosed for filing are an original and five (5) copies of Sprint's Notice of Exempt Modification for a Facility located at the above-referenced site.

I also enclose herewith a check in the amount of $625.00 representing the filing fee.

I would appreciate it if you would date-stamp the enclosed copy of this transmittal letter and return it to the courier delivering this package.

If you have any questions, please feel free to contact me.

Very truly yours,

BROWN RUDNICK LLP

By: Thomas J. Regan
Thomas J. Regan

Enclosures

cc w/ encl. via 1st Class Mail – First Selectman Anthony DaRos

40281130 v1 - REGANTJ - 025064/0018

EM-SPRINT-NEXTEL-014-110204

CON

In re:

Sprint Nextel Corporation's Notice to Make an	:	**EXEMPT MODIFICATION NO. _____**
Exempt Modification to an Existing Facility at	:	
850 West Main Street, Branford, Connecticut.	:	February 2, 2011

NOTICE OF EXEMPT MODIFICATION

Pursuant to Conn. Agencies Regs. §§ 16-50j-73 and 16-50j-72(b), Sprint Nextel Corporation ("Sprint") hereby gives notice to the Connecticut Siting Council ("Council") and the Town of Branford of Sprint's intent to make an exempt modification to an existing monopole tower (the "Tower") located at 850 West Main Street in Branford, Connecticut. Specifically, Sprint plans to remove and replace existing antennas and install Tower Mounted Amplifiers ("TMA"). Under the Council's regulations (Conn. Agencies Regs. § 16-50j-72(b)), Sprint's plans do not constitute a modification subject to the Council's review because Sprint 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.

Sprint is currently upgrading its existing installations throughout Connecticut. This upgrade is designed to enhance the performance of Sprint's network. Upon completion of the upgrades to Sprint's network, it will offer improved voice and data communications to residents and travelers in Connecticut. In order to accomplish the upgrade at this site, Sprint plans to remove and replace antennas, install TMA and install related electronic equipment at the base of the Tower.

BROWN RUDNICK LLP
CITYPLACE I
185 ASYLUM STREET
HARTFORD, CT 06103
(860) 509-6500

The Tower is a 130-foot monopole tower located at 850 West Main Street in Branford, Connecticut (latitude 41° 16' 40" N, longitude 72° 50' 12.7" W). The Tower is owned by

Crown Castle. Multiple carriers are currently located on the Tower. Presently, Sprint has 9 antennas and 3 Samsung RRH's spread over three sectors with a centerline at 120 feet. Sprint's base station equipment is located adjacent to the base of the Tower. A site plan with the Tower specifications is attached.

Sprint's plans to remove and replace 3 of its existing antennas with 3 upgraded antennas (one per sector) and install 2 TMA. The TMA will be installed in the beta and gamma sectors. The new antennas and TMA will have the same centerline as the existing antennas – 120 feet. Sprint will continue to utilize its existing coax cables. To confirm that the Tower can support these changes, Sprint commissioned Crown Castle to perform a structural analysis of the Tower (attached). According to the structural analysis dated September 14, 2010, "...the structure and foundation .... [have] sufficient capacity" taking into account the existing and proposed loading (Page 1, Structural Analysis Report).

Within the existing compound Sprint will install one MCPA cabinet on its proposed 3-foot by 3-foot (approximately) concrete pad. The proposed concrete pad will be located within the existing fenced area; hence no increase in the size of the compound is necessary. Excluding brief, minor, construction-related noise during the addition of the antennas and dishes and the installation of the equipment cabinets, the proposed changes to the Tower will not increase noise levels at the site.

The addition of the new antennas and the TMA 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 Tower will be below the National Council on Radiation Protection and Measurements' ("NCRP") standard adopted by the Federal Communications

BROWN RUDNICK LLP
CITYPLACE I
185 ASYLUM STREET
HARTFORD, CT 06103
(860) 509-6500

Commission ("FCC"). A cumulative power density analysis indicates that together, all of the antennas on the Tower will emit 31.35% of the NCRP's standard for maximum permissible exposure. Therefore, the power density levels will be below the FCC mandated radio frequency exposure limits in all locations around the Tower, even with extremely conservative assumptions. The power density analysis is attached.

In conclusion, Sprint's proposed plan to remove and replace antennas, install 2 TMA and associated base station equipment does not constitute a modification subject to the Council's jurisdiction because Sprint will not increase the height of the Tower, will not extend the boundaries of the site, will not increase the noise levels at the site, and the total radio frequency electromagnetic radiation power density will stay within all applicable standards. *See* Conn. Agencies Regs. § 16-50j-72.

SPRINT NEXTEL CORPORATION

By: _____

Thomas J. Regan
Brown Rudnick LLP
185 Asylum Street, CityPlace I
Hartford, CT 06103-3402
Email - tregan@brownrudnick.com
Phone - 860.509.6522
Fax - 860.509.6501

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(860) 509-6500

Certificate of Service

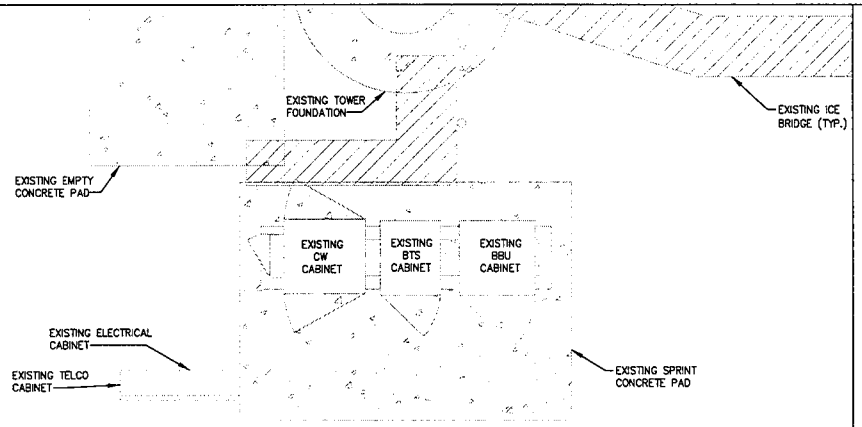
This is to certify that on this 4th day of February, 2011, the foregoing Notice of Exempt Modification was sent, via first class mail, to the following:

Town of Branford
First Selectman Anthony DaRos
1019 Main Street
Branford, CT 06405

By: _____
Thomas J. Regan

40281119 v1 - 025064/0018

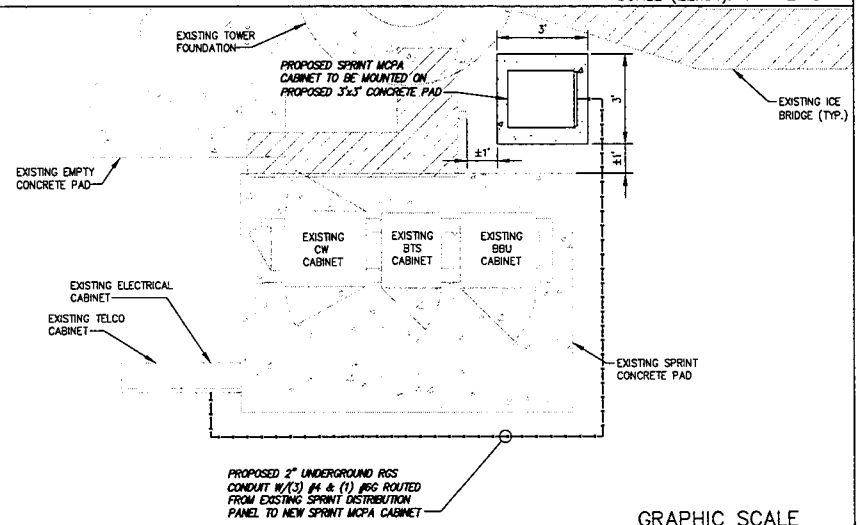
BROWN RUDNICK LLP
CITYPLACE I
185 ASYLUM STREET
HARTFORD, CT 06103
(860) 509-6500



1 -- ENLARGED SITE PLAN (EXISTING CONDITIONS)
SCALE:

APPROXIMATE NORTH

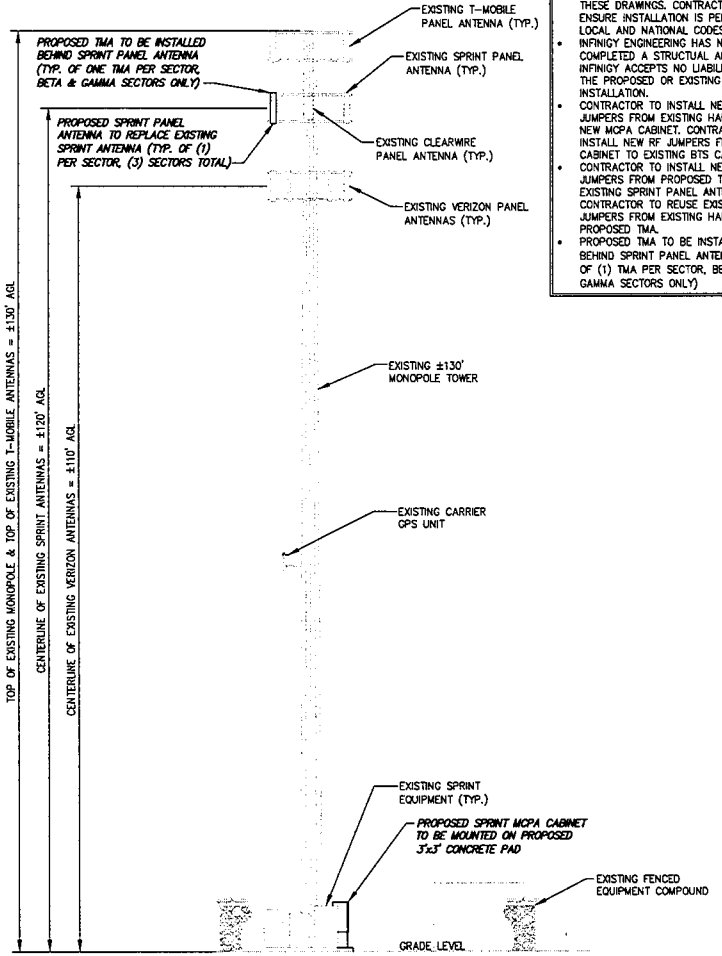
GRAPHIC SCALE
4' 2' 0 2' 4'
SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"



2 -- ENLARGED SITE PLAN (PROPOSED CONDITIONS)
SCALE:

APPROXIMATE NORTH

GRAPHIC SCALE
4' 2' 0 2' 4'
SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"



3 -- TOWER ELEVATION
NO SCALE

NOTES:
- BASEMAPPING BASED ON INFORMATION PROVIDED TO INFINIGY ENGINEERING AND A FIELD VISIT COMPLETED BY INFINIGY ENGINEERING.
- NO ELECTRIC LOAD STUDY WAS COMPLETED AT TIME OF ISSUANCE OF THESE DRAWINGS. CONTRACTOR TO ENSURE INSTALLATION IS PER ALL LOCAL AND NATIONAL CODES.
- INFINIGY ENGINEERING HAS NOT COMPLETED A STRUCTUAL ANALYSIS. INFINIGY ACCEPTS NO LIABILITY FOR THE PROPOSED OR EXISTING INSTALLATION.
- CONTRACTOR TO INSTALL NEW RF JUMPERS FROM EXISTING HARDLINE TO NEW MCPA CABINET. CONTRACTOR TO INSTALL NEW RF JUMPERS FROM MCPA CABINET TO EXISTING BTS CABINET.
- CONTRACTOR TO INSTALL NEW RF JUMPERS FROM PROPOSED TMA TO EXISTING SPRINT PANEL ANTENNAS. CONTRACTOR TO REUSE EXISTING RF JUMPERS FROM EXISTING HARDLINE TO PROPOSED TMA.
- PROPOSED TMA TO BE INSTALLED BEHIND SPRINT PANEL ANTENNA (TYP. OF (1) TMA PER SECTOR, BETA & GAMMA SECTORS ONLY)

infinigy engineering & surveying
11 HERBERT DRIVE
LATHAM, NY 12110
OFFICE: (518) 690-0790
FAX: (518) 690-0793

No.	Submittal / Revision	Appvd.	Date
1	REVISED PER CLIENT	BKB	9/27/10
0	ISSUED FOR REVIEW	BPM	9/7/10

Drawn: BPM Date: 9/7/10
Designed: MR Date: 9/7/10
Checked: MR Date: 9/7/10

Project Number: 159-006

Project Title:
CT03XC048
TARTAGLIA PROPERTY
850 WEST MAIN STREET
BRANFORD, CT 06405

Prepared For:
Sprint
Together with Nextel.
6 AIRLINE DRIVE, SUITE 105
ALBANY, NY 12205

Drawing Scale: AS NOTED
Date: 9/27/10

Drawing Title:
EQUIPMENT PLAN & TOWER ELEVATION

Drawing Number:
LE

Date: **September 14, 2010**

Veronica Harris
Crown Castle
1200 McArthur Blvd
Mahwah, NJ 07430

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

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	
	Carrier Site Number:	CT03XC048
	Carrier Site Name:	Tartaglia Property
Crown Castle Designation:	**Crown Castle BU Number:**	876322
	Crown Castle Site Name:	TARTAGLIA PROPERTY
	Crown Castle JDE Job Number:	141991
	Crown Castle Work Order Number:	357808
Engineering Firm Designation:	**Crown Castle Project Number:**	357808
Site Data:	**850 West Main Street, BRANFORD, New Haven County, CT**	
	Latitude *41° 16' 40.188"*, Longitude *-72° 50' 12.696"*	
	130 Foot - Monopole Tower	

Dear Veronica Harris,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 357808, in accordance with application 106890, 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 85 mph fastest mile.

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

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

Structural analysis prepared by: Jeffrey Fesko, E.I.T. / RJ

Respectfully submitted by:

Aaron C. Poot, P.E.
Engineering Supervisor

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

RISA Tower Report - version 5.4.2.0

9/14/10

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 130 ft Monopole tower designed by PJF/SUMMIT in July of 1998. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F, and an overall height of 120'. The tower was extended per modifications designed by Global Signal in December 2006.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
118	122	6	andrew	HBX-9014DS-R2M w/ Mount Pipe	-	-	-
		2	communication components inc.	TMA-CE-1819-200MC			

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
128	130	12	generic	tma	12	1-5/8	2
		6	rfs celwave	APX16PV-16PVL-E w/ Mount Pipe			
		6	generic	tma	6	1-5/8	1
		6	rfs celwave	APXV18-206516L-C w/ Mount Pipe			
	128	1	tower mounts	Platform Mount [LP 305-1]			
118	124	2	andrew	VHLP2-11	2	1/2	1
	122	6	decibel	DB980H90E-M w/ Mount Pipe	-	-	3
	120	3	argus technologies	LLPX310R w/ Mount Pipe	6 6	5/16 1-5/8	1
		3	samsung telecommunications	FDD_R6_RRH			
	118	1	tower mounts	Platform Mount [LP 712-1]			
110	114	1	kathrein	OG-860/1920/GPS-A	1 12	½ 1-5/8	1
	111	6	decibel	DB844H90E-XY w/ Mount Pipe			
		6	decibel	DB948H90E-M w/ Mount Pipe			
	110	1	tower mounts	Platform Mount [LP 712-1]			
50	52	1	kathrein	OG-860/1920/GPS-A	1	5/16	1
	50	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) SLA Equipment Controlling
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)
130	130	6	RFS	APX16PV-16PVL-E	-	-
		12	Remec	TMA		
120	120	9	Decibel	DB980H90	-	-
110	110	12	Swedcom	ALP901	-	-
100	100	12	Allgon	7250	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Goodkind & O'Dea, Inc.	1614542	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit Manufacturing Inc.	1613605	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit Manufacturing Inc.	1529811	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Tower Engineering Professionals	2483868	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	1956410	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	130 - 120.5	Pole	TP18.5x18.5x0.375	1	-2.16	597.73	12.2	Pass
L2	120.5 - 120	Pole	TP22x18.5x0.375	2	-2.16	597.73	12.2	Pass
L3	120 - 77	Pole	TP29.742x22x0.25	3	-9.07	1205.97	66.2	Pass
L4	77 - 37.75	Pole	TP36.308x28.5668x0.3125	4	-15.26	1840.62	81.9	Pass
L5	37.75 - 0	Pole	TP42.48x34.8729x0.375	5	-24.34	2643.11	84.8	Pass
							Summary	
						Pole (L5)	84.8	Pass
						Rating =	84.8	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	52.4	Pass
1	Base Plate	0	61.8	Pass
1	Base Foundation Soil Interaction	0	40.1	Pass
1	Flange Bolts & Plate	120	19.6 & 12.8	Pass
Structure Rating (max from all components) =				**84.8%**

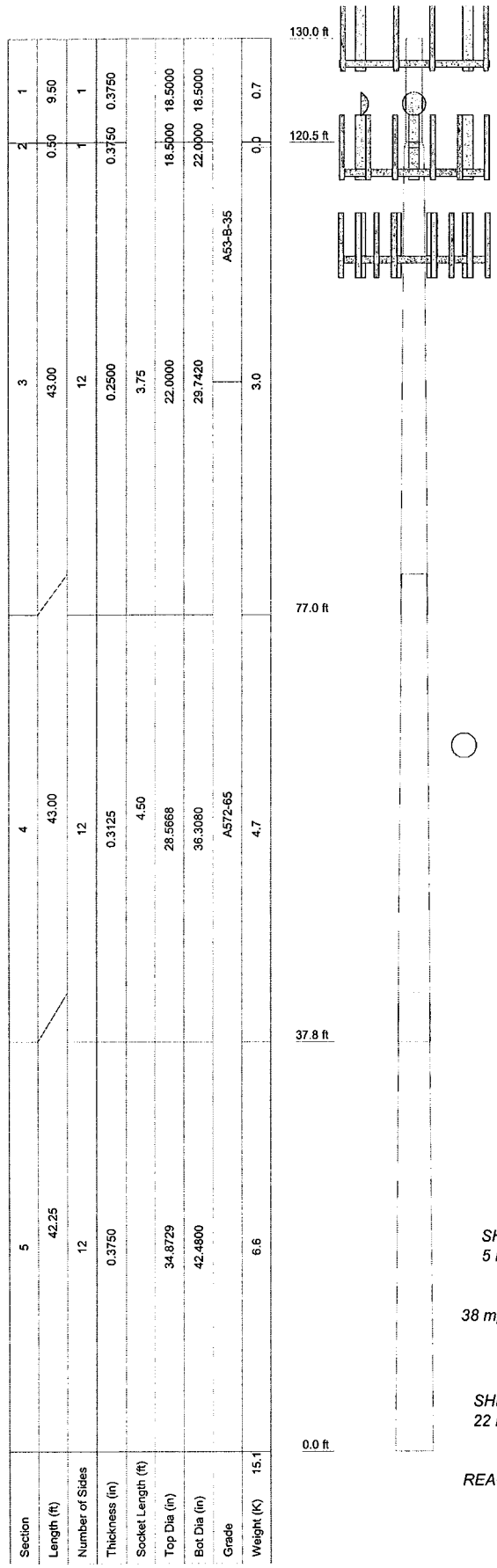
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

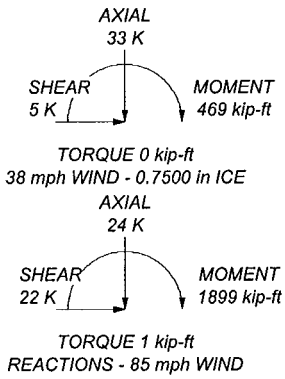
4.1) Recommendations

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

APPENDIX A

RISA TOWER OUTPUT





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) APX16PV-16PVL-E w/ Mount Pipe	128	LLPX310R w/ Mount Pipe	118
(4) TMA	128	FDD_R6_RRH	118
(2) APX16PV-16PVL-E w/ Mount Pipe	128	(2) HBX-9014DS-R2M w/ Mount Pipe	118
(4) TMA	128	TMA-CE-1819-200MC	118
(2) APX16PV-16PVL-E w/ Mount Pipe	128	Platform Mount [LP 712-1]	118
(4) TMA	128	VHLP2-11	118
6' x 2" Mount Pipe	128	VHLP2-11	118
6' x 2" Mount Pipe	128	(2) DB844H90E-XY w/ Mount Pipe	110
6' x 2" Mount Pipe	128	(2) DB948H90E-M w/ Mount Pipe	110
Platform Mount [LP 305-1]	128	(2) DB844H90E-XY w/ Mount Pipe	110
LLPX310R w/ Mount Pipe	118	(2) DB948H90E-M w/ Mount Pipe	110
FDD_R6_RRH	118	OG-860/1920/GPS-A	110
(2) HBX-9014DS-R2M w/ Mount Pipe	118	Platform Mount [LP 712-1]	110
LLPX310R w/ Mount Pipe	118	(2) DB844H90E-XY w/ Mount Pipe	110
FDD_R6_RRH	118	(2) DB948H90E-M w/ Mount Pipe	110
(2) HBX-9014DS-R2M w/ Mount Pipe	118	OG-860/1920/GPS-A	50
TMA-CE-1819-200MC	118	Side Arm Mount [SO 701-1]	50

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A572-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 84.8%

CROWN CASTLE
Shaping The Wireless World
Crown Castle
2000 Corporate Drive
Canonsburgh, PA 15317
Phone: (724) 416-2000
FAX: (724) 416-2254

Job: **BU# 876322**			
Project:			
Client: Crown Castle	Drawn by: RJenabzadeh		App'd:
Code: TIA/EIA-222-F	Date: 09/14/10		Scale: NTS
Path: R:\SA Models - Letters\Work Area\JFesko\876322\876322.eri			Dwg No. E-1

RISATower	Job	Page
	BU# 876322	1 of 14
Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: 724-416-2000 FAX:	Project	Date 08:37:12 09/14/10
	Client Crown Castle	Designed by JFesko

Tower Input Data

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

Tower is located in New Haven County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	130.00-120.50	9.50	0.00	Round	18.5000	18.5000	0.3750		A53-B-35 (35 ksi)
L2	120.50-120.00	0.50	0.00	Round	18.5000	22.0000	0.3750		A53-B-35 (35 ksi)
L3	120.00-77.00	43.00	3.75	12	22.0000	29.7420	0.2500	1.0000	A572-65 (65 ksi)
L4	77.00-37.75	43.00	4.50	12	28.5668	36.3080	0.3125	1.2500	A572-65 (65 ksi)
L5	37.75-0.00	42.25		12	34.8729	42.4800	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	18.5000	21.3530	877.5217	6.4162	9.2500	94.8672	1752.6528	10.6701	0.0000	0
	18.5000	21.3530	877.5217	6.4162	9.2500	94.8672	1752.6528	10.6701	0.0000	0
L2	18.5000	21.3530	877.5217	6.4162	9.2500	94.8672	1752.6528	10.6701	0.0000	0
	22.0000	25.4764	1490.3634	7.6552	11.0000	135.4876	2976.6666	12.7306	0.0000	0
L3	22.7761	17.5087	1057.2060	7.7865	11.3960	92.7699	2142.1860	8.6173	5.2260	20.904
	30.7912	23.7411	2635.6911	10.5581	15.4064	171.0782	5340.6247	11.6846	7.3009	29.203
L4	30.2735	28.4309	2896.9879	10.1150	14.7976	195.7740	5870.0829	13.9928	6.8184	21.819
	37.5888	36.2205	5990.1331	12.8864	18.8075	318.4963	12137.6337	17.8266	8.8930	28.458
L5	36.9419	41.6562	6327.7630	12.3502	18.0642	350.2940	12821.7633	20.5019	8.3409	22.242
	43.9785	50.8418	11504.6684	15.0736	22.0046	522.8292	23311.5772	25.0228	10.3796	27.679

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 130.00-120.50				1	1	1		
L2 120.50-120.00				1	1	1		
L3 120.00-77.00				1	1	1		
L4 77.00-37.75				1	1	1		
L5 37.75-0.00				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 ft^2/ft	Weight plf
LDF7-50A(1-5/8")	A	No	Inside Pole	128.00 - 5.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
***								
7983A(1/2")	C	No	Inside Pole	118.00 - 5.00	2	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
						2" Ice	0.00	0.08
						4" Ice	0.00	0.08
9207(5/16")	C	No	Inside Pole	118.00 - 5.00	6	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60
						2" Ice	0.00	0.60
						4" Ice	0.00	0.60
FLC 158-50J(1-5/8")	C	No	Inside Pole	118.00 - 5.00	6	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
						2" Ice	0.00	0.92

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						4" Ice	0.00	0.92
2" Rigid Conduit	C	No	Inside Pole	118.00 - 5.00	2	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
						2" Ice	0.00	2.80
						4" Ice	0.00	2.80
***								
LDF4-50A(1/2")	B	No	Inside Pole	110.00 - 5.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
LDF7-50A(1-5/8")	B	No	Inside Pole	110.00 - 5.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
***								
860 10000(5/16")	B	No	Inside Pole	50.00 - 5.00	1	No Ice	0.00	0.04
						1/2" Ice	0.00	0.04
						1" Ice	0.00	0.04
						2" Ice	0.00	0.04
						4" Ice	0.00	0.04
***								
Safety Line 3/8	C	No	CaAa (Out Of Face)	130.00 - 0.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	130.00-120.50	A	0.000	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.356	0.00
L2	120.50-120.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.019	0.00
L3	120.00-77.00	A	0.000	0.000	0.000	0.000	0.42
		B	0.000	0.000	0.000	0.000	0.33
		C	0.000	0.000	0.000	1.613	0.62
L4	77.00-37.75	A	0.000	0.000	0.000	0.000	0.39
		B	0.000	0.000	0.000	0.000	0.39
		C	0.000	0.000	0.000	1.472	0.59
L5	37.75-0.00	A	0.000	0.000	0.000	0.000	0.32
		B	0.000	0.000	0.000	0.000	0.33
		C	0.000	0.000	0.000	1.416	0.50

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	130.00-120.50	A	0.880	0.000	0.000	0.000	0.000	0.07
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.029	0.01
L2	120.50-120.00	A	0.876	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.106	0.00
L3	120.00-77.00	A	0.854	0.000	0.000	0.000	0.000	0.42
		B		0.000	0.000	0.000	0.000	0.33
		C		0.000	0.000	0.000	8.960	0.66
L4	77.00-37.75	A	0.801	0.000	0.000	0.000	0.000	0.39
		B		0.000	0.000	0.000	0.000	0.39
		C		0.000	0.000	0.000	8.179	0.63
L5	37.75-0.00	A	0.750	0.000	0.000	0.000	0.000	0.32
		B		0.000	0.000	0.000	0.000	0.33
		C		0.000	0.000	0.000	7.464	0.53

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	130.00-120.50	-0.0476	0.0275	-0.2249	0.1298
L2	120.50-120.00	-0.0477	0.0275	-0.2279	0.1315
L3	120.00-77.00	-0.0479	0.0276	-0.2328	0.1344
L4	77.00-37.75	-0.0481	0.0277	-0.2399	0.1385
L5	37.75-0.00	-0.0482	0.0278	-0.2331	0.1346

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight K
(2) APX16PV-16PVL-E w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.94 7.44 7.94 8.98 11.17	3.29 4.00 4.66 6.04 9.02	0.06 0.10 0.16 0.28 0.65
(4) TMA	A	From Leg	0.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.68 0.80 0.93 1.22 1.90	0.45 0.56 0.68 0.94 1.57	0.01 0.02 0.03 0.04 0.11
(2) APX16PV-16PVL-E w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.94 7.44 7.94 8.98 11.17	3.29 4.00 4.66 6.04 9.02	0.06 0.10 0.16 0.28 0.65
(4) TMA	B	From Leg	0.00	0.0000	128.00	No Ice	0.68	0.45	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	0.80	0.56	0.02
			2.00			1" Ice	0.93	0.68	0.03
						2" Ice	1.22	0.94	0.04
						4" Ice	1.90	1.57	0.11
(2) APX16PV-16PVL-E w/ Mount Pipe	C	From Leg	4.00	0.0000	128.00	No Ice	6.94	3.29	0.06
			0.00			1/2" Ice	7.44	4.00	0.10
			2.00			1" Ice	7.94	4.66	0.16
						2" Ice	8.98	6.04	0.28
						4" Ice	11.17	9.02	0.65
(4) TMA	C	From Leg	0.00	0.0000	128.00	No Ice	0.68	0.45	0.01
			0.00			1/2" Ice	0.80	0.56	0.02
			2.00			1" Ice	0.93	0.68	0.03
						2" Ice	1.22	0.94	0.04
						4" Ice	1.90	1.57	0.11
6' x 2" Mount Pipe	A	From Leg	4.00	0.0000	128.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
6' x 2" Mount Pipe	B	From Leg	4.00	0.0000	128.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
6' x 2" Mount Pipe	C	From Leg	4.00	0.0000	128.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
Platform Mount [LP 305-1]	C	None		0.0000	128.00	No Ice	18.01	18.01	1.12
						1/2" Ice	23.33	23.33	1.35
						1" Ice	28.65	28.65	1.58
						2" Ice	39.29	39.29	2.05
						4" Ice	60.57	60.57	2.97
***									
LLPX310R w/ Mount Pipe	A	From Leg	4.00	0.0000	118.00	No Ice	5.07	2.98	0.05
			0.00			1/2" Ice	5.48	3.53	0.08
			2.00			1" Ice	5.91	4.09	0.13
						2" Ice	6.79	5.31	0.23
						4" Ice	8.70	8.13	0.54
FDD_R6_RRH	A	From Leg	4.00	0.0000	118.00	No Ice	1.79	0.78	0.03
			0.00			1/2" Ice	1.97	0.92	0.04
			2.00			1" Ice	2.16	1.07	0.06
						2" Ice	2.57	1.39	0.09
						4" Ice	3.49	2.14	0.20
(2) HBX-9014DS-R2M w/ Mount Pipe	A	From Leg	4.00	0.0000	118.00	No Ice	3.59	3.37	0.03
			0.00			1/2" Ice	4.00	4.02	0.06
			4.00			1" Ice	4.45	4.66	0.10
						2" Ice	5.37	5.99	0.20
						4" Ice	7.34	8.99	0.51
LLPX310R w/ Mount Pipe	B	From Leg	4.00	0.0000	118.00	No Ice	5.07	2.98	0.05
			0.00			1/2" Ice	5.48	3.53	0.08
			2.00			1" Ice	5.91	4.09	0.13
						2" Ice	6.79	5.31	0.23
						4" Ice	8.70	8.13	0.54
FDD_R6_RRH	B	From Leg	4.00	0.0000	118.00	No Ice	1.79	0.78	0.03
			0.00			1/2" Ice	1.97	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			1" Ice	2.16	1.07	0.06
						2" Ice	2.57	1.39	0.09
						4" Ice	3.49	2.14	0.20
(2) HBX-9014DS-R2M w/ Mount Pipe	B	From Leg	4.00 0.00 4.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.00 4.45 5.37 7.34	3.37 4.02 4.66 5.99 8.99	0.03 0.06 0.10 0.20 0.51
TMA-CE-1819-200MC	B	From Leg	4.00 0.00 4.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.17 1.32 1.48 1.83 2.62	0.44 0.56 0.69 0.97 1.63	0.01 0.02 0.03 0.05 0.13
LLPX310R w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.07 5.48 5.91 6.79 8.70	2.98 3.53 4.09 5.31 8.13	0.05 0.08 0.13 0.23 0.54
FDD_R6_RRH	C	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.79 1.97 2.16 2.57 3.49	0.78 0.92 1.07 1.39 2.14	0.03 0.04 0.06 0.09 0.20
(2) HBX-9014DS-R2M w/ Mount Pipe	C	From Leg	4.00 0.00 4.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.00 4.45 5.37 7.34	3.37 4.02 4.66 5.99 8.99	0.03 0.06 0.10 0.20 0.51
TMA-CE-1819-200MC	C	From Leg	4.00 0.00 4.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.17 1.32 1.48 1.83 2.62	0.44 0.56 0.69 0.97 1.63	0.01 0.02 0.03 0.05 0.13
Platform Mount [LP 712-1]	C	None		0.0000	118.00	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
***									
(2) DB844H90E-XY w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.30 3.69 4.12 5.01 6.92	4.92 5.60 6.28 7.71 10.83	0.03 0.07 0.12 0.23 0.56
(2) DB948H90E-M w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.03 2.39 2.76 3.51 5.23	3.67 4.28 4.90 6.23 9.28	0.03 0.05 0.09 0.18 0.45
(2) DB844H90E-XY w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.30 3.69 4.12 5.01 6.92	4.92 5.60 6.28 7.71 10.83	0.03 0.07 0.12 0.23 0.56
(2) DB948H90E-M w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	2.03 2.39 2.76	3.67 4.28 4.90	0.03 0.05 0.09

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" Ice	3.51	6.23	0.18
						4" Ice	5.23	9.28	0.45
(2) DB844H90E-XY w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.30 3.69 4.12 5.01 6.92	4.92 5.60 6.28 7.71 10.83	0.03 0.07 0.12 0.23 0.56
(2) DB948H90E-M w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.03 2.39 2.76 3.51 5.23	3.67 4.28 4.90 6.23 9.28	0.03 0.05 0.09 0.18 0.45
OG-860/1920/GPS-A	C	From Leg	4.00 0.00 4.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.33 0.43 0.55 0.80 1.41	0.40 0.51 0.63 0.89 1.52	0.00 0.01 0.01 0.03 0.08
Platform Mount [LP 712-1]	C	None		0.0000	110.00	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
***									
OG-860/1920/GPS-A	A	From Leg	2.00 0.00 2.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.33 0.43 0.55 0.80 1.41	0.40 0.51 0.63 0.89 1.52	0.00 0.01 0.01 0.03 0.08
Side Arm Mount [SO 701-1]	A	From Leg	1.00 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18

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
VHLP2-11	A	Paraboloid w/o Radome	From Leg	4.00 0.00 6.00	0.0000		118.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.19
VHLP2-11	C	Paraboloid w/o Radome	From Leg	4.00 0.00 6.00	0.0000		118.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.19

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	130 - 120.5	Pole	Max Tension	27	0.00	-0.00	-0.00
			Max. Compression	14	-3.91	0.28	0.15
			Max. Mx	5	-2.17	-28.34	0.54
			Max. My	2	-2.16	-0.69	28.78
			Max. Vy	5	3.66	-28.34	0.54
			Max. Vx	8	3.75	0.19	-28.69
			Max. Torque	8			-0.42
L2	120.5 - 120	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-3.96	0.28	0.15

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	5	-2.21	-30.18	0.61
			Max. My	2	-2.20	-0.80	30.66
			Max. Vy	5	3.69	-30.18	0.61
			Max. Vx	8	3.78	0.21	-30.58
			Max. Torque	8			-0.42
L3	120 - 77	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-15.09	0.36	-0.04
			Max. Mx	5	-9.08	-459.44	6.22
			Max. My	8	-9.07	1.37	-462.04
			Max. Vy	5	13.66	-459.44	6.22
			Max. Vx	8	13.71	1.37	-462.04
			Max. Torque	7			-0.51
L4	77 - 37.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-22.44	0.41	0.18
			Max. Mx	5	-15.27	-1061.36	11.92
			Max. My	8	-15.26	2.48	-1065.72
			Max. Vy	5	17.61	-1061.36	11.92
			Max. Vx	8	17.63	2.48	-1065.72
			Max. Torque	7			-0.53
L5	37.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32.71	0.47	0.14
			Max. Mx	5	-24.34	-1889.07	17.84
			Max. My	8	-24.34	3.66	-1894.43
			Max. Vy	5	21.58	-1889.07	17.84
			Max. Vx	8	21.60	3.66	-1894.43
			Max. Torque	8			-0.54

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	21	32.71	0.01	-5.06
	Max. H_x	11	24.36	21.48	-0.00
	Max. H_z	2	24.36	-0.22	21.57
	Max. M_x	2	1892.88	-0.22	21.57
	Max. M_z	5	1889.07	-21.56	0.14
	Max. Torsion	4	0.49	-18.73	10.81
	Min. Vert	1	24.36	0.00	0.00
	Min. H_x	5	24.36	-21.56	0.14
	Min. H_z	8	24.36	0.03	-21.58
	Min. M_x	8	-1894.43	0.03	-21.58
	Min. M_z	11	-1879.28	21.48	-0.00
	Min. Torsion	8	-0.54	0.03	-21.58

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	24.36	0.00	0.00	-0.16	0.17	0.00
Dead+Wind 0 deg - No Ice	24.36	0.22	-21.57	-1892.88	-28.21	-0.30
Dead+Wind 30 deg - No Ice	24.36	10.93	-18.63	-1632.98	-964.29	-0.43

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 60 deg - No Ice	24.36	18.73	-10.81	-950.48	-1643.49	-0.49
Dead+Wind 90 deg - No Ice	24.36	21.56	-0.14	-17.84	-1889.07	-0.38
Dead+Wind 120 deg - No Ice	24.36	18.73	10.78	946.10	-1643.47	0.04
Dead+Wind 150 deg - No Ice	24.36	10.66	18.69	1640.15	-929.15	0.45
Dead+Wind 180 deg - No Ice	24.36	-0.03	21.58	1894.43	3.66	0.54
Dead+Wind 210 deg - No Ice	24.36	-10.71	18.76	1649.17	936.02	0.44
Dead+Wind 240 deg - No Ice	24.36	-18.62	10.97	970.77	1629.76	0.26
Dead+Wind 270 deg - No Ice	24.36	-21.48	0.00	0.46	1879.28	-0.01
Dead+Wind 300 deg - No Ice	24.36	-18.61	-10.71	-937.52	1628.36	-0.05
Dead+Wind 330 deg - No Ice	24.36	-10.74	-18.55	-1623.19	939.19	-0.07
Dead+Ice+Temp	32.71	0.00	0.00	-0.14	0.47	0.00
Dead+Wind 0 deg+Ice+Temp	32.71	0.05	-5.06	-467.33	-5.94	-0.11
Dead+Wind 30 deg+Ice+Temp	32.71	2.56	-4.37	-403.30	-237.26	-0.13
Dead+Wind 60 deg+Ice+Temp	32.71	4.39	-2.54	-234.64	-405.21	-0.12
Dead+Wind 90 deg+Ice+Temp	32.71	5.06	-0.03	-4.17	-465.99	-0.07
Dead+Wind 120 deg+Ice+Temp	32.71	4.39	2.53	233.42	-405.20	0.05
Dead+Wind 150 deg+Ice+Temp	32.71	2.50	4.38	404.71	-229.26	0.15
Dead+Wind 180 deg+Ice+Temp	32.71	-0.01	5.06	467.46	1.31	0.17
Dead+Wind 210 deg+Ice+Temp	32.71	-2.51	4.40	406.77	231.78	0.13
Dead+Wind 240 deg+Ice+Temp	32.71	-4.37	2.57	239.04	403.04	0.06
Dead+Wind 270 deg+Ice+Temp	32.71	-5.04	0.00	-0.00	464.71	-0.02
Dead+Wind 300 deg+Ice+Temp	32.71	-4.37	-2.51	-231.68	402.71	-0.05
Dead+Wind 330 deg+Ice+Temp	32.71	-2.52	-4.35	-401.06	232.49	-0.07
Dead+Wind 0 deg - Service	24.36	0.08	-7.46	-655.84	-9.66	-0.10
Dead+Wind 30 deg - Service	24.36	3.78	-6.45	-565.81	-333.93	-0.15
Dead+Wind 60 deg - Service	24.36	6.48	-3.74	-329.38	-569.22	-0.17
Dead+Wind 90 deg - Service	24.36	7.46	-0.05	-6.29	-654.28	-0.13
Dead+Wind 120 deg - Service	24.36	6.48	3.73	327.64	-569.21	0.02
Dead+Wind 150 deg - Service	24.36	3.69	6.47	568.06	-321.75	0.16
Dead+Wind 180 deg - Service	24.36	-0.01	7.47	656.15	1.39	0.19
Dead+Wind 210 deg - Service	24.36	-3.71	6.49	571.19	324.37	0.15
Dead+Wind 240 deg - Service	24.36	-6.44	3.80	336.18	564.70	0.09
Dead+Wind 270 deg - Service	24.36	-7.43	0.00	0.05	651.12	-0.00
Dead+Wind 300 deg - Service	24.36	-6.44	-3.71	-324.88	564.20	-0.02
Dead+Wind 330 deg - Service	24.36	-3.71	-6.42	-562.40	325.46	-0.02

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-24.36	0.00	0.00	24.36	0.00	0.000%
2	0.22	-24.36	-21.57	-0.22	24.36	21.57	0.000%
3	10.93	-24.36	-18.63	-10.93	24.36	18.63	0.000%
4	18.73	-24.36	-10.81	-18.73	24.36	10.81	0.000%
5	21.56	-24.36	-0.14	-21.56	24.36	0.14	0.000%
6	18.73	-24.36	10.78	-18.73	24.36	-10.78	0.000%
7	10.66	-24.36	18.69	-10.66	24.36	-18.69	0.000%
8	-0.03	-24.36	21.58	0.03	24.36	-21.58	0.000%
9	-10.71	-24.36	18.76	10.71	24.36	-18.76	0.000%
10	-18.62	-24.36	10.97	18.62	24.36	-10.97	0.000%
11	-21.48	-24.36	0.00	21.48	24.36	-0.00	0.000%
12	-18.61	-24.36	-10.71	18.61	24.36	10.71	0.000%
13	-10.74	-24.36	-18.55	10.74	24.36	18.55	0.000%
14	0.00	-32.71	0.00	0.00	32.71	0.00	0.000%
15	0.05	-32.71	-5.06	-0.05	32.71	5.06	0.000%
16	2.56	-32.71	-4.37	-2.56	32.71	4.37	0.000%
17	4.39	-32.71	-2.54	-4.39	32.71	2.54	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
18	5.06	-32.71	-0.03	-5.06	32.71	0.03	0.000%
19	4.39	-32.71	2.53	-4.39	32.71	-2.53	0.000%
20	2.50	-32.71	4.38	-2.50	32.71	-4.38	0.000%
21	-0.01	-32.71	5.06	0.01	32.71	-5.06	0.000%
22	-2.51	-32.71	4.40	2.51	32.71	-4.40	0.000%
23	-4.37	-32.71	2.57	4.37	32.71	-2.57	0.000%
24	-5.04	-32.71	0.00	5.04	32.71	-0.00	0.000%
25	-4.37	-32.71	-2.51	4.37	32.71	2.51	0.000%
26	-2.52	-32.71	-4.35	2.52	32.71	4.35	0.000%
27	0.08	-24.36	-7.46	-0.08	24.36	7.46	0.000%
28	3.78	-24.36	-6.45	-3.78	24.36	6.45	0.000%
29	6.48	-24.36	-3.74	-6.48	24.36	3.74	0.000%
30	7.46	-24.36	-0.05	-7.46	24.36	0.05	0.000%
31	6.48	-24.36	3.73	-6.48	24.36	-3.73	0.000%
32	3.69	-24.36	6.47	-3.69	24.36	-6.47	0.000%
33	-0.01	-24.36	7.47	0.01	24.36	-7.47	0.000%
34	-3.71	-24.36	6.49	3.71	24.36	-6.49	0.000%
35	-6.44	-24.36	3.80	6.44	24.36	-3.80	0.000%
36	-7.43	-24.36	0.00	7.43	24.36	-0.00	0.000%
37	-6.44	-24.36	-3.71	6.44	24.36	3.71	0.000%
38	-3.71	-24.36	-6.42	3.71	24.36	6.42	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00005042
3	Yes	6	0.00000001	0.00007477
4	Yes	6	0.00000001	0.00007687
5	Yes	5	0.00000001	0.00009301
6	Yes	6	0.00000001	0.00007572
7	Yes	6	0.00000001	0.00007225
8	Yes	5	0.00000001	0.00008642
9	Yes	6	0.00000001	0.00007626
10	Yes	6	0.00000001	0.00007571
11	Yes	5	0.00000001	0.00002288
12	Yes	6	0.00000001	0.00007340
13	Yes	6	0.00000001	0.00007409
14	Yes	4	0.00000001	0.00000001
15	Yes	6	0.00000001	0.00001594
16	Yes	6	0.00000001	0.00002482
17	Yes	6	0.00000001	0.00002504
18	Yes	6	0.00000001	0.00001587
19	Yes	6	0.00000001	0.00002489
20	Yes	6	0.00000001	0.00002410
21	Yes	6	0.00000001	0.00001600
22	Yes	6	0.00000001	0.00002500
23	Yes	6	0.00000001	0.00002516
24	Yes	6	0.00000001	0.00001583
25	Yes	6	0.00000001	0.00002437
26	Yes	6	0.00000001	0.00002454
27	Yes	4	0.00000001	0.00006848
28	Yes	6	0.00000001	0.00000647
29	Yes	6	0.00000001	0.00000687
30	Yes	5	0.00000001	0.00001160

31	Yes	6	0.00000001	0.00000665
32	Yes	6	0.00000001	0.00000606
33	Yes	5	0.00000001	0.00001589
34	Yes	6	0.00000001	0.00000677
35	Yes	6	0.00000001	0.00000664
36	Yes	5	0.00000001	0.00000001
37	Yes	6	0.00000001	0.00000628
38	Yes	6	0.00000001	0.00000641

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	130 - 120.5	28.229	29	1.8012	0.0026
L2	120.5 - 120	24.655	29	1.7880	0.0024
L3	120 - 77	24.468	29	1.7870	0.0023
L4	80.75 - 37.75	11.257	29	1.3211	0.0009
L5	42.25 - 0	3.071	29	0.6655	0.0003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
128.00	(2) APX16PV-16PVL-E w/ Mount Pipe	29	27.475	1.7989	0.0025	38392
124.00	VHLP2-11	29	25.968	1.7938	0.0025	30695
118.00	LLPX310R w/ Mount Pipe	29	23.722	1.7813	0.0023	10056
110.00	(2) DB844H90E-XY w/ Mount Pipe	29	20.795	1.7322	0.0020	6926
50.00	OG-860/1920/GPS-A	29	4.243	0.7949	0.0004	2865

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	130 - 120.5	81.339	4	5.1951	0.0073
L2	120.5 - 120	71.049	4	5.1572	0.0067
L3	120 - 77	70.510	4	5.1544	0.0066
L4	80.75 - 37.75	32.465	4	3.8114	0.0026
L5	42.25 - 0	8.863	4	1.9207	0.0009

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
128.00	(2) APX16PV-16PVL-E w/ Mount Pipe	4	79.167	5.1885	0.0072	13580
124.00	VHLP2-11	4	74.830	5.1737	0.0070	10858
118.00	LLPX310R w/ Mount Pipe	4	68.364	5.1382	0.0064	3559
110.00	(2) DB844H90E-XY w/ Mount Pipe	4	59.937	4.9969	0.0056	2444
50.00	OG-860/1920/GPS-A	4	12.244	2.2940	0.0011	996

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	130 - 120.5 (1)	TP18.5x18.5x0.375	9.50	0.00	0.0	21.000	21.3530	-2.16	448.41	0.005
L2	120.5 - 120 (2)	TP22x18.5x0.375	0.50	0.00	0.0	21.000	21.3530	-2.16	448.41	0.005
L3	120 - 77 (3)	TP29.742x22x0.25	43.00	0.00	0.0	39.000	23.1975	-9.07	904.70	0.010
L4	77 - 37.75 (4)	TP36.308x28.5668x0.3125	43.00	0.00	0.0	39.000	35.4053	-15.26	1380.81	0.011
L5	37.75 - 0 (5)	TP42.48x34.8729x0.375	42.25	0.00	0.0	39.000	50.8418	-24.34	1982.83	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	130 - 120.5 (1)	TP18.5x18.5x0.375	28.80	3.643	23.100	0.158	0.00	0.000	23.100	0.000
L2	120.5 - 120 (2)	TP22x18.5x0.375	28.80	3.643	23.100	0.158	0.00	0.000	23.100	0.000
L3	120 - 77 (3)	TP29.742x22x0.25	462.90	34.016	39.000	0.872	0.00	0.000	39.000	0.000
L4	77 - 37.75 (4)	TP36.308x28.5668x0.3125	1067.90	42.118	39.000	1.080	0.00	0.000	39.000	0.000
L5	37.75 - 0 (5)	TP42.48x34.8729x0.375	1898.54	43.575	39.000	1.117	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	130 - 120.5 (1)	TP18.5x18.5x0.375	3.74	0.175	14.000	0.025	0.16	0.010	14.000	0.001
L2	120.5 - 120 (2)	TP22x18.5x0.375	3.77	0.176	14.000	0.021	0.16	0.010	14.000	0.001
L3	120 - 77 (3)	TP29.742x22x0.25	13.74	0.592	26.000	0.046	0.32	0.011	26.000	0.000
L4	77 - 37.75 (4)	TP36.308x28.5668x0.3125	17.68	0.499	26.000	0.039	0.49	0.009	26.000	0.000
L5	37.75 - 0 (5)	TP42.48x34.8729x0.375	21.65	0.426	26.000	0.033	0.49	0.005	26.000	0.000

RISATower	Job: BU# 876322	Page: 14 of 14
Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: 724-416-2000 FAX:	Project:	Date: 08:37:12 09/14/10
	Client: Crown Castle	Designed by: JFesko

Pole Interaction Design Data

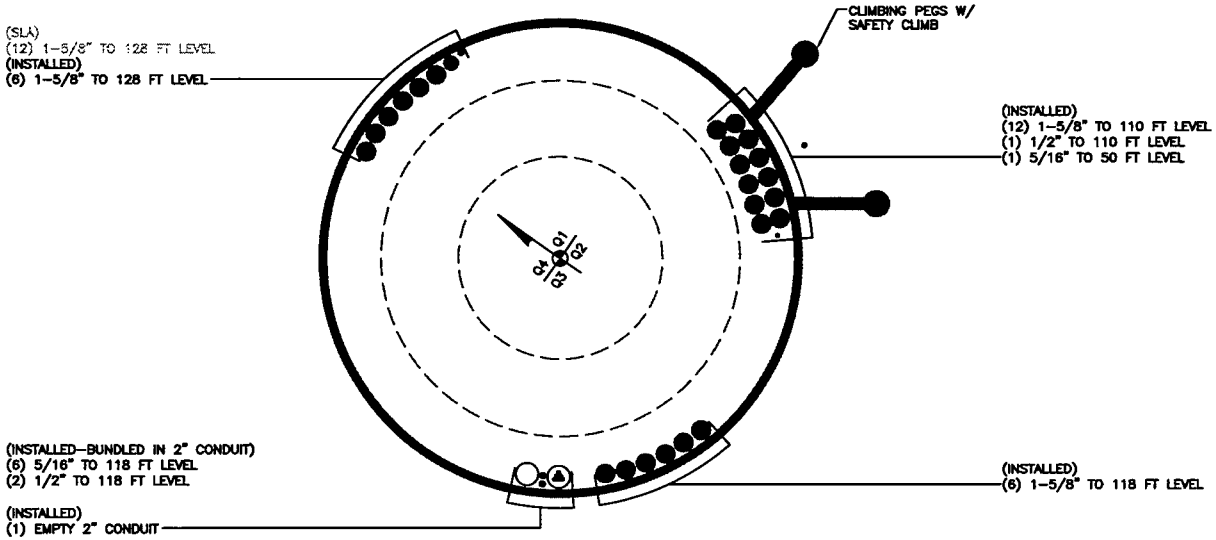
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	130 - 120.5 (1)	0.005	0.158	0.000	0.025	0.001	0.163 ✓	1.333	H1-3+VT ✓
L2	120.5 - 120 (2)	0.005	0.158	0.000	0.021	0.001	0.163 ✓	1.333	H1-3+VT ✓
L3	120 - 77 (3)	0.010	0.872	0.000	0.046	0.000	0.883 ✓	1.333	H1-3+VT ✓
L4	77 - 37.75 (4)	0.011	1.080	0.000	0.039	0.000	1.091 ✓	1.333	H1-3+VT ✓
L5	37.75 - 0 (5)	0.012	1.117	0.000	0.033	0.000	1.130 ✓	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	130 - 120.5	Pole	TP18.5x18.5x0.375	1	-2.16	597.73	12.2	Pass
L2	120.5 - 120	Pole	TP22x18.5x0.375	2	-2.16	597.73	12.2	Pass
L3	120 - 77	Pole	TP29.742x22x0.25	3	-9.07	1205.97	66.2	Pass
L4	77 - 37.75	Pole	TP36.308x28.5668x0.3125	4	-15.26	1840.62	81.9	Pass
L5	37.75 - 0	Pole	TP42.48x34.8729x0.375	5	-24.34	2643.11	84.8	Pass
							Summary	
						Pole (L5)	84.8	Pass
						RATING =	**84.8**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



0 1 2 3FT

: SCALE :

BUSINESS UNIT: 876322 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: *876322*
Site Name: *TARTAGLIA PROPERTY*
App #: *106891, rev.3*

Maximum Shaft Superimposed Forces		
TIA Revision:	F	
Max. Service Shaft M:	2048.074	ft-kips (* Note)
Max. Service Shaft P:	24	kips
Max Axial Force Type:	Comp.	

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

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

Load Factor	Shaft Factored Loads		
1.30	Mu:	2662.496	ft-kips
1.30	Pu:	31.2	kips

Pier Properties

Concrete:

Pier Diameter =	7.0	ft
Concrete Area =	5541.8	in^2

Reinforcement:

Clear Cover to **Tie**=	4.00	in
Horiz. **Tie** Bar Size=	5	
Vert. Cage Diameter =	6.11	ft
Vert. Cage Diameter =	73.34	in
Vertical Bar Size =	11	
Bar Diameter =	1.41	in
Bar Area =	1.56	in^2
Number of Bars =	32	
As Total=	49.92	in^2
A s/ Aconc, Rho:	0.0090	0.90%

Material Properties

Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	

ACI 318 Code

Select Analysis ACI Code= 2002

Seismic Properties

Seismic Design Category = B
Seismic Risk = **Low**

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

ACI 10.5 , ACI 21.10.4, and IBC 1810.

Min As for Flexural, Tesnion Controlled, Shafts:

(3)*(Sqrt(f'c)/Fy:	0.0027	
200 / Fy:	0.0033	
IBC 1810.1.2:	None	SDC A or B
Governing:	0.0033	**0.33%**

ACI 10.8 and 10.9

Min As for Columns, Comp. Controlled, Shafts:

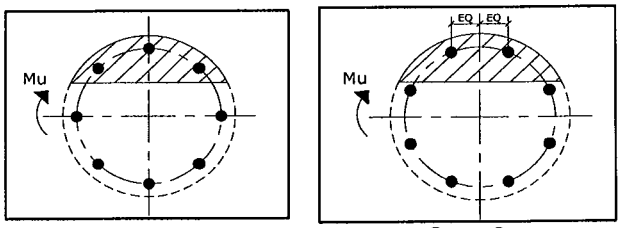
Min As:	0.0050	**0.50%**

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.90%	**OK**

Results:

Governing Orientation Case: **2**



Case 1 Case 2

Dist. From Edge to Neutral Axis: **16.78** in
Extreme Steel Strain, εt: **0.0110**
εt > 0.0050, Tension Controlled
Reduction Factor,φ: **0.900**

<-- Comment Box

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	8839.70	kips
at Mu=(ϕ=0.65)Mn=	5309.39	ft-kips
Max Tu, (φ=0.9) Tn =	2695.68	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	31.20	kips
Drilled Shaft Moment Capacity, φMn:	**7432.61**	ft-kips
Drilled Shaft Superimposed Mu:	**2662.50**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**35.82%**

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

Site Data

BU#: *876322*
Site Name: *TARTAGLIA PROPERTY*
App #: *106890, rev.3*

Connection Type:	*Butt*
Pole Manufacturer:	Other

Reactions		
Moment:	28.8	ft-kips
Axial:	2.16	kips
Shear:	3.77	kips
Elevation:	120	feet

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

Bolt Data			
Qty:	8		
Diameter (in.):	0.875	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	75	<-- Disregard	Bolt Fty:
N/A:	55	<-- Disregard	44.00
Circle (in.):	24		

Plate Data		
Diam:	26.25	in
Thick, t:	1.25	in
Grade (Fy):	50	ksi
Strength, Fu:	65	ksi
Single-Rod B-eff:	7.26	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.25	in
Fillet V. Weld:	0.25	in
Width:	3	in
Height:	8	in
Thick:	0.5	in
Notch:	0.375	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	18.5	in
Thick:	0.375	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

			Rigid
Bolt Tension Capacity, **B**:	35.27 kips		Service, ASD
Max Bolt directly applied T:	6.93 Kips		Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.161 in		
Min PL "treq" for actual **T w/ Pry**:	0.376 in		
Min PL "t1" for actual **T w/o Pry**:	0.515 in		
T allowable w/o Prying:	35.27 kips	α'<0 case	
Prying Force, Q:	0.00 kips		
Total Bolt Tension=T+Q:	6.93 kips		
Non-Prying Bolt Stress Ratio, T/B:	19.6% **Pass**		

Exterior Flange Plate Results Flexural Check

		Rigid
Compression Side Plate Stress:	6.4 ksi	Service ASD
Allowable Plate Stress:	50.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	12.8% **Pass**	Comp. Y.L. Length:
No Prying		15.29
Tension Side Stress Ratio, (treq/t)^2:	9.1% **Pass**	

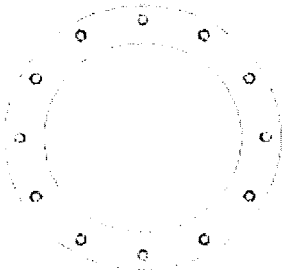
n/a

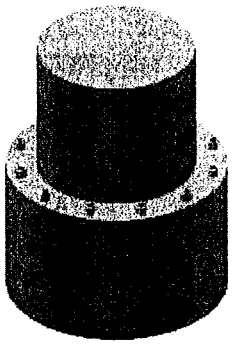
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a





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

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

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#:	*876322*
Site Name:	*TARTAGLIA PROPEI*
App #:	*106890, rev.3*

Reactions		
Moment:	1899	ft-kips
Axial:	24	kips
Shear:	22	kips

Connection Type:	*Butt*

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Grade(Fy):	75	ksi
Bolt Circle:	55	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	55	in
Thick:	3.5	in
Grade:	50	ksi
B effective	35.30	in

Pole Data		
Diam:	42.48	in
Thick:	0.375	in
Grade:	65	ksi

Stress Increase Factor		
ASIF:	1.333	

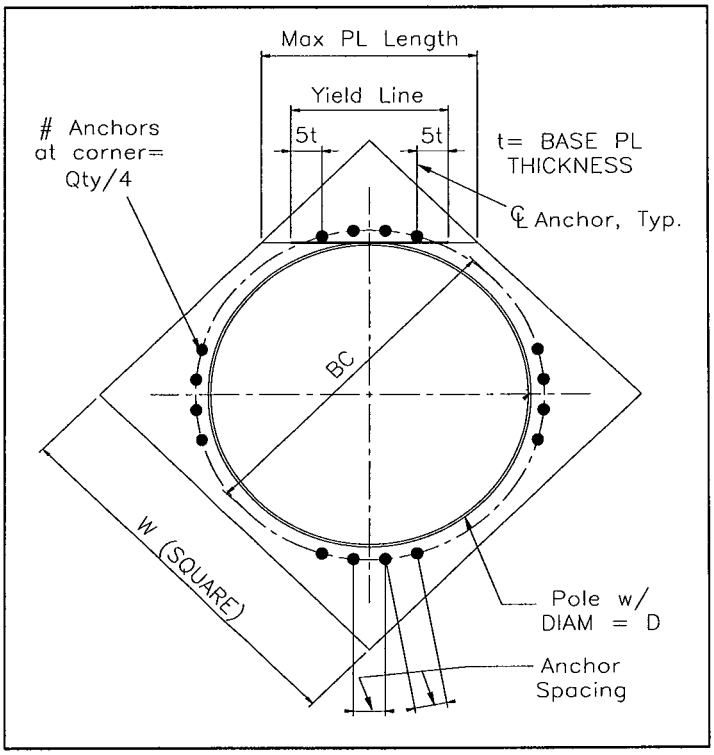
Anchor Rod Results

Maximum Rod Tension:	102.1	Kips
Allowable Tension:	195.0	Kips
Anchor Rod Stress Ratio:	52.4%	**Pass**

Base Plate Results

Base Plate Stress:	30.9	ksi
Allowable Plate Stress:	50.0	ksi
Base Plate Stress Ratio:	61.8%	**Pass**

PL Ref. Data
Yield Line (in):
35.30
Max PL Length:
35.30



Monopole Drilled Pier

Checks capacity of a single drilled shaft foundation for a monopole

BU#: 876322
Site Name: *TARTAGLIA PROPERTY*
App Number: *106891, rev.3*

CROWN CASTLE

ACI 318 Version:	2002

Design Reactions		
Shear, **S**:	22.00	kips
Moment, **Mt**:	1899.00	ft-kips
Tower Weight, **Wt**:	24.00	kips
Tower Height, **H**:	130	ft
Base Diameter, **BD**:	42.5	in

Foundation Dimensions		
Caisson Diameter, **CD**:	7.0	ft
Ext. Above Grade, **E**:	0.5	ft
Depth Below Grade, **L**:	24.0	ft
Neglected Depth, **N**:	5.0	ft
Rebar Size, **Sp**:	11	
Rebar Quantity, **mp**:	32	
Tie Size, **tp**:	5	

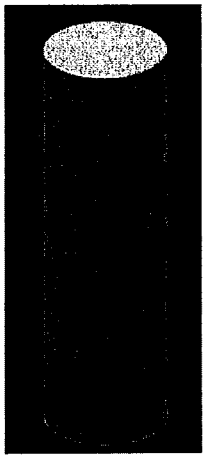
Material Properties		
Rebar Tensile, **Fy**:	60	ksi
Concrete Strength, **F'c**:	3000	psi
Concrete Density, **δx**:	150	pcf
Clear Cover, **cc**:	4	in

Soil Properties		
Soil Unit Weight, **γ**:	120	pcf
Allowable Bearing, **Bc**:	10.000	ksf
Seismic Design Cat, **z**:	B	

Caisson Analysis		
Depth to Zero Shear	5.0	ft
Max Factored Moment	2662.50	ft-kips
Overturning FOS	4.99	

Depth		Shear		Moment	
2.45	ft	22.1	kips	2010.3	ft-kips
4.9	ft	1.6	kips	2046.5	ft-kips
7.35	ft	-35.2	kips	2007.6	ft-kips

Design Checks	*Capacity/ Availability*	*Demand/ Limits*	*Check*
Minimum Req'd Dia. 1 (ft):	7.00	1.75	OK
Minimum Req'd Dia. 2 (ft):	7.00	5.04	OK
Bearing (ksf):	10.00	0.62	OK
Rebar Area (in²):	49.92	18.47	OK
Pier moment capacity (k-ft):	7432.61	2662.50	OK
Rebar spacing (in):	6.05	2 < Bs <18	OK
Development Length (in)	223.92	12.00	OK
Soil moment capacity(FOS):	4.99	2.00	OK



Bearing: 6.2%

Steel: 35.8%

Soil: 40.1%

CAISSON Version 10.40 10:15:26 AM Tuesday, September 14, 2010
Crown Castle USA

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*************************************************************************************************
*                                                                                               *
* CAISSON - Pier Foundations Analysis and Design -  Copyright Power Line Systems, Inc. 1993-2010 *
*                                                                                               *
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Project Title: BU#876322
Project Notes:

Calculation Method: Full 8CD

******* I N P U T D A T A

Pier Properties

Diameter (ft)	Distance of Top of Pier above Ground (ft)	Concrete Strength (ksi)	Steel Yield Strength (ksi)
7.00	0.50	3.00	60.00

Soil Properties

Layer	Type	Thickness (ft)	Depth at Top of Layer (ft)	Density (lbs/ft^3)	CU (psf)	KP	PHI (deg)
1	Clay	5.00	0.00	120.0			
2	Sand	5.00	5.00	120.0		3.690	35.00
3	Sand	10.00	10.00	60.0		4.599	40.00
4	Sand	4.00	20.00	63.0		5.289	43.00

Design (Factored) Loads at Top of Pier

Moment (ft-k)	Axial Load (kips)	Shear Load (kips)	Additional Safety Factor Against Soil Failure
1899.0	24.0	22.00	4.99

******* R E S U L T S

Calculated Pier Properties

Length (ft)	Weight (kips)	End Bearing Pressure (psf)
24.500	141.431	623.6

Ultimate Resisting Forces Along Pier

Type	Distance of Top of Layer to Top of Pier (ft)	Thickness (ft)	Density (lbs/ft^3)	CU (psf)	KP	Force (kips)	Arm (ft)
Clay	0.50	5.00	120.0			0.00	3.00
Sand	5.50	5.00	120.0		3.690	348.70	8.28
Sand	10.50	7.50	60.0		4.599	1032.85	14.45
Sand	18.00	2.50	60.0		4.599	-415.84	19.27
Sand	20.50	4.00	63.0		5.289	-855.68	22.54

Shear and Moments Along Pier

Distance below Top of Pier (ft)	Shear (with Safety Factor) (kips)	Moment (with Safety Factor) (ft-k)	Shear (without Safety Factor) (kips)	Moment (without Safety Factor) (ft-k)
0.00	110.0	9492.4	22.1	1902.3
2.45	110.0	9762.0	22.1	1956.3
4.90	110.0	10031.6	22.1	2010.3
7.35	8.1	10211.9	1.6	2046.5
9.80	-175.8	10017.8	-35.2	2007.6
12.25	-450.4	9272.7	-90.3	1858.3
14.70	-776.5	7776.8	-155.6	1558.5
17.15	-1137.5	5439.3	-228.0	1090.0
19.60	-1009.8	2588.5	-202.4	518.7
22.05	-537.4	666.9	-107.7	133.6
24.50	-0.0	0.0	-0.0	0.0

GIANT SOLUTIONS LLC

Electomagnetic Exposure Analysis
Sprint
CT03XC048
December 14, 2010

Executive Summary:
A power density study has been performed utilizing the transmit power of all proposed transceiver equipment to be installed on the tower. This theoretical result has been combined with empirical data recorded during a field survey of the existing installed transmitters (see below). This report takes into consideration the cumulative effect of both the proposed Sprint transmitting elements and the existing transmitting elements currently located on the tower. This report assumes a worse case scenario of all new elements radiating from the same point in space simultaneously. Careful review of the data indicates that the site, as is and as proposed, is in compliance with applicable Federal standards for Maximum Permissible Exposure levels for RF power density.

Background:
FCC 96-326 is the standard FCC guideline for power density. The guidelines are given in terms of mW/cm^2 and the maximum limits are termed 'Maximum Permissible Exposure' (MPE) for both occupational (controlled) and general (uncontrolled) cases. Because these guidelines are based upon the same limits as those in the American National Standards Institute/Institute of Electrical and Electronics Engineering (ANSI/IEEE) guidelines, they also include the safety factors of 10 and 50 for occupational and general public scenarios respectively.

Additionally, FCC Bulletin OET 65 is the standard for evaluating compliance with FCC guidelines. GIANT Solutions has adopted these methods and procedures and others based on sound engineering practice to ensure that the theoretical calculations performed to complete this analysis will over-predict field strength levels at ground distances close to the transmitting elements. A more realistic approach to calculating power densities at areas near the base of the tower was utilized by taking advantage of the relative gain patterns of the directional antennas being proposed by Sprint. Directional antennas focus energy toward the horizon. This results in a pattern of losses and gains relative to the direction of propagation due to elevation angle changes. Equation 6 from OET 65 was utilized in conjunction with the antenna vertical gain patterns to predict the field strength levels at various points away from the base of the tower. This equation takes into consideration a four-fold increase in power density by assuming a 100% reflection of incoming radiation at the ground level.

$$S=\frac{1.65\times ERP\times G}{\Pi\times R^2}$$

Where:
S = Power density in microwatts per centimeter squared.
ERP = Effective Radiated Power in microwatts (uW).
R = Straight-line distance between antenna centerline and head level in centimeters (cm).
$\Pi = 3.14$
G = Relative numeric gain of the antenna at specified angle of declination such that

$$G=10^{(dB/10)}$$

and, ***dB*** = relative antenna gain in dB (available from the antenna manufacturer).

Sprint has provided to GIANT Solutions the following information for the proposed installation required for analysis of these transmitting elements. These parameters were utilized to calculate the maximum exposure levels in and around the compound for the proposed installation.

- PCS B-Band, 2 carriers, 16 W per carrier. On Beta and Gamma sectors, adding Cellextenders that will increase the signal's power by 6 dB.

With this information, the signal's power was calculated to increase by 48 W per carrier.

This site currently has several antennas installed. Applicable transmit parameters for all existing equipment was unavailable, thus a field study was conducted to determine existing exposure levels. The details and results of the field study are included at the end of this report.

Power density levels were calculated for the additional Sprint transmitting equipment utilizing the methods and procedures previously referenced at a transmitting height of 120' AGL. These values were then compared to the applicable Maximum Permissible Exposure limits for General Population /Uncontrolled and Occupation/Controlled exposure[1]. The ratio of the calculated value to the maximum permissible exposure value was then computed to analyze the results as a percentage of the maximum allowable levels. For example, an antenna operating in the frequency range of 1900 MHz with a calculated value of power density equal to 0.03 mW/cm^2 would be operating at 3% of the allowable General Public standard which is defined as $1mW/cm^2$. These values were then summed to analyze the combined effect of all proposed transmitting equipment.

[1] FCC Bulletin OET 65 Table 1

These calculated values were then added to the RF exposure measurements from the field survey to get the total combined field strength of the existing and proposed equipment.

Areas closest to the transmitting elements surrounding the site compound were considered for this report. Points further away from surveyed areas will see a decrease in power density due to the attenuation of radio waves traveling through free space.

Results of the cumulative total indicate that no area accessible to the general public will exceed 31.352% of the maximum permissible limit for General Public/Uncontrolled access. **This is 3.19 times less than the allowed maximum.** This is based on the highest measured level in the area as described below. As indicated previously, a conservative approach was taken in calculating the power density levels at the site since it is unlikely that all of the transmitters at the site will be transmitting simultaneously at maximum power. The actual levels experienced at the site will likely be lower.

RF Exposure Measurements

Site Name: CT03XC048
Date Collected: 12/2/2010
Time: 17:07 pm – 17:14 pm
Survey Meter: *Model #NARDA BN 2251/02*
Serial # L-0098
Date of Last Calibration: 1/2010
Calibration Due: 1/2013
Operator: David Renyak

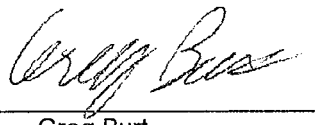
Measurements were made at this facility utilizing the above-referenced Narda Meter. This equipment is designed to measure cumulative RF fields over the 3MHz – 40 GHz spectrum band. Due to the wide band nature of the measuring device the minimum detectable level for occupational exposure is approximately 5% of the allowed threshold. Site data provided for this facility indicates a number of transmitters operating at the site and through visual inspection it was determined that there were no AM transmitters present. As a result, it was assumed that all existing elements were transmitting in the spectrum band measured. The weather was clear and the operating temperature was approximately 50 degrees F.

The test equipment was set to read percent of the total exposure limit as defined by the Federal Communications Commission Regulations ("FCC") for Exposure limits.

The unit was then carried around the tower site. The data was taken over a period of approximately 7 minutes. Measurements were taken in all accessible areas.

The largest signals to contribute to the 31% of the standard being displayed on the monitor were searched for. Logged data was collected around the tower as well as spatial averaging to provide an additional means of data comparison. Emitted signals fluctuated between 0% and 31% of the FCC general public/uncontrolled standard for human exposure in the areas accessible to the public.

Based upon these measurements, there were no instances when the measured data indicated that the site, as operating at the time of measurement, was not in full compliance with all applicable FCC RF exposure guidelines.



Greg Burt
RF Engineer

12/14/2010

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