



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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

E-Mail: siting.council@ct.gov

www.ct.gov/csc

July 15, 2011

Douglas L. Culp, Real Estate Consultant
New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, CT 06067-3900

RE: **EM-CING-107-110629** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 800 Ogg Meadow Road, Orange, Connecticut.

Dear Mr. Culp:

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 June 29, 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
Executive Director

LR/CDM/laf

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





STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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

E-Mail: siting.council@ct.gov

www.ct.gov/csc

June 30, 2011

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

RE: **EM-CING-107-110629** - New Cingular Wireless PCS, LLC notice of intent to install a temporary cellular telecommunications facility located at 800 Ogg Meadow Road, Orange, Connecticut.

Dear First Selectman Zeoli:

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

If you have any questions or comments regarding this proposal, please call me or inform the Council by July 15, 2011.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

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



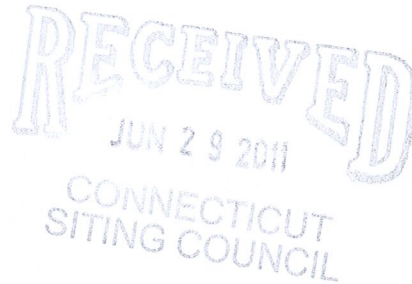
New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 463-5511
Fax: (860) 513-7190

Douglas L. Culp
Real Estate Consultant

HAND DELIVERED

June 29, 2011

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



Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 800 Ogg Meadow Road Orange, CT (Crown Castle).

Dear Ms. Roberts:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and/or Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the chief elected official of the municipality in which the affected cell site is located.

UMTS technology offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile ("GSM") communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the Internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

LTE is a new high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

The changes to the facility do not constitute modifications as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will be unaffected.
2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound other than some enlarged equipment pads as may be noted in the attachments.
3. The proposed changes will not increase the noise level at the existing facility by six decibels or more.
4. Radio frequency power density may increase due to use of one or more GSM channel for UMTS transmissions. Moreover, LTE will utilize additional radio frequencies newly-licensed by the FCC for cellular mobile communications. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons, New Cingular Wireless respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (860) 463-5511 with questions concerning this matter. Thank you for your consideration.

Sincerely,



Douglas L. Culp
Real Estate Consultant

Attachments

NEW CINGULAR WIRELESS PCS, LLC
Equipment Modification

800 Ogg Meadow Road Orange, CT
Site Number CT2159
Exempt Mod

Tower Owner/Manager: Crown Castle

Equipment configuration: Monopole

Current and/or approved: Six CSS antennas @ 152 ft
Three Kathrein 800-10121 antennas @ 152 ft
Six ADC TMA's and six Diplexers @ 152 ft
Twelve runs 1 1/4 inch coax @ 152 ft
Equipment Shelter

Planned Modifications: Remove CSS antennas, TMA's and Diplexers
Install six PowerWave P65-16 antennas or equivalent @ 152 ft
Install six remote radio heads Ericsson RRUS-11 @ 152 ft
Install six twin PowerWave Twin BP TMA's TT19-08BP111-001 or equivalent @ 152 ft
Install one RayCap DC/Fiber Connector DC6-48-60-18-8F @ 152 ft
Install one fiber and two DC power cables to @ 152 ft
Install one new cabinet and surge suppressor equipment in shelter

Power Density:

Worst-case calculations for existing wireless operations at the site, using standard parameters for other carriers, indicate a radio frequency electromagnetic radiation power density, measured at ground level beside the Tower, of approximately 44.8% of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density following proposed modifications would be approximately 46.4% of the standard.

Existing

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm ²)	Standard Limits (mW/cm ²)	Percent of Limit
Other Users							30.05
AT&T UMTS	152	1900 Band	1	500	0.0078	1.0000	0.78
AT&T UMTS	152	800 Band	1	500	0.0078	0.5867	1.33
AT&T GSM	152	800Band	11	296	0.0507	0.5867	8.64
AT&T GSM	152	1900 Band	6	427	0.0399	1.0000	3.99
Total							44.8%

* Data for other users are from Siting Council records.

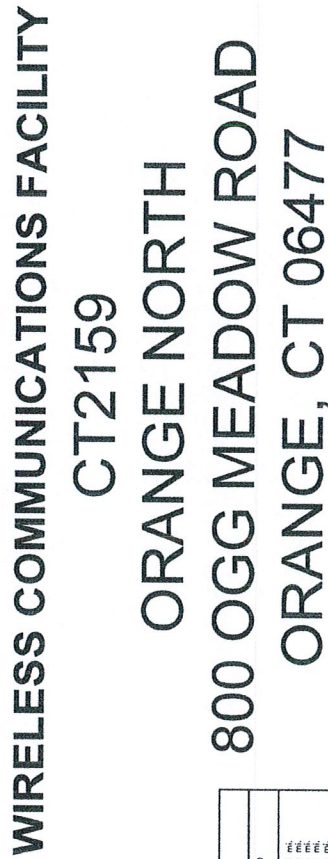
Proposed

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm ²)	Standard Limits (mW/cm ²)	Percent of Limit
Other Users							30.05
AT&T UMTS	152	800 Band	1	500	0.0078	0.5867	1.33
AT&T UMTS	152	1900 Band	1	500	0.0078	1.0000	0.78
AT&T GSM	152	880 - 894	11	296	0.0507	0.5867	8.64
AT&T GSM	152	1900 Band	6	427	0.0399	1.0000	3.99
AT&T LTE	152	740 - 746	1	500	0.0078	0.4933	1.58
Total							46.4%

* Data for other users are from Siting Council records.

Structural information:

The attached structural analysis demonstrates that the structure and foundation have adequate structural capacity to accommodate the proposed modifications. (Crown Castle dated 6-24-11).

GENERAL NOTES

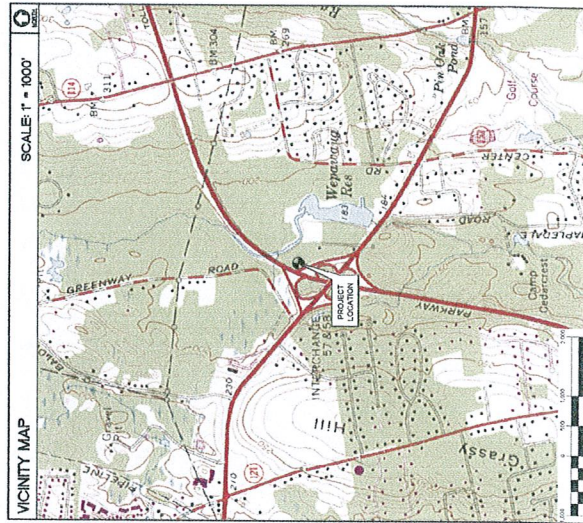
- ## PROJECT SUMMARY

PROJECT INFORMATION

T&T SITE NUMBER:	CT2159
T&T SITE NAME:	ORANGE NORTH
SITE ADDRESS:	800 DSG MEADOW ROAD ORANGE, CT 06477
LESSOR/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
ENGINEER:	CULITY ENGINEERING, INC. 63-1/2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-18'-28.30" N LONGITUDE: 72°-36'-19.10" W GRID: NAD 83, FTM 82, NAD 83

HEET INDEX

REV.	NO.	DESCRIPTION
1	E-1	TITLE SHEET
1	E-2	NOTES AND SPECIFICATIONS
1	E-3	PLANS AND ELEVATION
1	E-4	LIFE SYSTEM EQUIPMENT PLANS & DETAILS
1	E-5	ELECTRICAL DETAILS AND NOTES
1	E-6	ELECTRICAL DETAILS



AT&T MOBILITY		WIRELESS COMMUNICATIONS FACILITY		SITE NUMBER: CT12150		SITE NAME: ORANGE NORTH	
003 003 MCDON ROAD DUNWOODY, CT 06037							
DATE: 3/7/11		SCALE: AS NOTED		JOB NO. 11001.00054		TITLE SHEET	
DESIGNED BY: CHD		DRAWN BY: CHD		CHECKED BY: CHD		DATE: 3/7/11	
CONSTRUCTION - CLIENT REVIEW		CONSTRUCTION - CLIENT REVIEW		CONSTRUCTION - CLIENT REVIEW		CONSTRUCTION - CLIENT REVIEW	

DESIGN BASIS

1. DESIGN CRITERIA:

- ## GENERAL NOTES

SITE NOTES

- EARTHWORK NOTES

5. SELECT BACKFILL FOR FOUNDATION WALLS SHALL BE FREE OF ORGANIC MATERIAL, TOPSOIL, DEBRIS AND BOULDERS LARGER THAN 6".
6. GRAVEL AND GRANULAR FILL SHALL BE INSTALLED IN 8" MAX. LIFTS. COMPACTED TO 95% MIN. AT MAX. DRY DENSITY.
7. NON WOVEN GEOTEXTILE FOR SEPARATION PURPOSES SHALL BE MIRAFI 140N, OR ENGINEER APPROVED, EQUAL.

CONCRETE CONSTRUCTION NOTES

- ## GENERAL NOTES (REFERENCE)

CONTRACTOR TO REFER TO THE GENERAL NOTES ON SHEET T-1 FOR ADDITIONAL INFORMATION.

DATE: 3/7/11		NOTES		N-1 SPECIFICATIONS
DATE: 3/7/11		NOTES		
AT&T MOBILITY WIRELESS COMMUNICATIONS FACILITY SITE NAME: ORANGE NORTH 800 ORANGE NORTH ORANGE, CT 06477				
0201 48-0200 0202 48-0207 0203 48-0207 0204 48-0207 0205 48-0207 0206 48-0207 0207 48-0207 0208 48-0207 0209 48-0207 0210 48-0207 0211 48-0207 0212 48-0207 0213 48-0207 0214 48-0207 0215 48-0207 0216 48-0207 0217 48-0207 0218 48-0207 0219 48-0207 0220 48-0207 0221 48-0207 0222 48-0207 0223 48-0207 0224 48-0207 0225 48-0207 0226 48-0207 0227 48-0207 0228 48-0207 0229 48-0207 0230 48-0207 0231 48-0207 0232 48-0207 0233 48-0207 0234 48-0207 0235 48-0207 0236 48-0207 0237 48-0207 0238 48-0207 0239 48-0207 0240 48-0207 0241 48-0207 0242 48-0207 0243 48-0207 0244 48-0207 0245 48-0207 0246 48-0207 0247 48-0207 0248 48-0207 0249 48-0207 0250 48-0207 0251 48-0207 0252 48-0207 0253 48-0207 0254 48-0207 0255 48-0207 0256 48-0207 0257 48-0207 0258 48-0207 0259 48-0207 0260 48-0207 0261 48-0207 0262 48-0207 0263 48-0207 0264 48-0207 0265 48-0207 0266 48-0207 0267 48-0207 0268 48-0207 0269 48-0207 0270 48-0207 0271 48-0207 0272 48-0207 0273 48-0207 0274 48-0207 0275 48-0207 0276 48-0207 0277 48-0207 0278 48-0207 0279 48-0207 0280 48-0207 0281 48-0207 0282 48-0207 0283 48-0207 0284 48-0207 0285 48-0207 0286 48-0207 0287 48-0207 0288 48-0207 0289 48-0207 0290 48-0207 0291 48-0207 0292 48-0207 0293 48-0207 0294 48-0207 0295 48-0207 0296 48-0207 0297 48-0207 0298 48-0207 0299 48-0207 0300 48-0207				
0301 48-0207 0302 48-0207 0303 48-0207 0304 48-0207 0305 48-0207 0306 48-0207 0307 48-0207 0308 48-0207 0309 48-0207 0310 48-0207 0311 48-0207 0312 48-0207 0313 48-0207 0314 48-0207 0315 48-0207 0316 48-0207 0317 48-0207 0318 48-0207 0319 48-0207 0320 48-0207 0321 48-0207 0322 48-0207 0323 48-0207 0324 48-0207 0325 48-0207 0326 48-0207 0327 48-0207 0328 48-0207 0329 48-0207 0330 48-0207 0331 48-0207 0332 48-0207 0333 48-0207 0334 48-0207 0335 48-0207 0336 48-0207 0337 48-0207 0338 48-0207 0339 48-0207 0340 48-0207 0341 48-0207 0342 48-0207 0343 48-0207 0344 48-0207 0345 48-0207 0346 48-0207 0347 48-0207 0348 48-0207 0349 48-0207 0350 48-0207 0351 48-0207 0352 48-0207 0353 48-0207 0354 48-0207 0355 48-0207 0356 48-0207 0357 48-0207 0358 48-0207 0359 48-0207 0360 48-0207 0361 48-0207 0362 48-0207 0363 48-0207 0364 48-0207 0365 48-0207 0366 48-0207 0367 48-0207 0368 48-0207 0369 48-0207 0370 48-0207 0371 48-0207 0372 48-0207 0373 48-0207 0374 48-0207 0375 48-0207 0376 48-0207 0377 48-0207 0378 48-0207 0379 48-0207 0380 48-0207 0381 48-0207 0382 48-0207 0383 48-0207 0384 48-0207 0385 48-0207 0386 48-0207 0387 48-0207 0388 48-0207 0389 48-0207 0390 48-0207 0391 48-0207 0392 48-0207 0393 48-0207 0394 48-0207 0395 48-0207 0396 48-0207 0397 48-0207 0398 48-0207 0399 48-0207 0400 48-0207				
0401 48-0207 0402 48-0207 0403 48-0207 0404 48-0207 0405 48-0207 0406 48-0207 0407 48-0207 0408 48-0207 0409 48-0207 0410 48-0207 0411 48-0207 0412 48-0207 0413 48-0207 0414 48-0207 0415 48-0207 0416 48-0207 0417 48-0207 0418 48-0207 0419 48-0207 0420 48-0207				

1 EXISTING ANTENNA PLAN
SCALE: 3/16" = 1'-0"

2 EXISTING ANTENNA SECTOR ELEVATION
SCALE: 3/16" = 1'-0"

3 PROPOSED ANTENNA PLAN
SCALE: 3/16" = 1'-0"

4 PROPOSED ANTENNA SECTOR ELEVATION
SCALE: 3/16" = 1'-0"

5 RRU AND SURGE ARRESTOR MOUNTING PLAN
SCALE: 1/2" = 1'-0"

6 RRU MOUNTING DETAIL
SCALE: 1/2" = 1'-0"

7 RRU AND SURGE ARRESTOR MOUNTING DETAIL
SCALE: 1/2" = 1'-0"

8 RRU DETAIL
SCALE: NOT TO SCALE

9 SURGE ARRESTOR DETAIL
SCALE: NOT TO SCALE

NOTES:

- CONTRACTOR TO COORDINATE FINAL SURGE ARRESTOR MODEL SELECTION(S) WITH MANUFACTURERS.
- CONTRACTOR TO INSTALL ARRESTOR IN CONFORMANCE WITH MANUFACTURERS' RECOMMENDATIONS.

Date: June 24, 2011

Steve Tuttle
Crown Castle
The Piano Works 349 West Commercial Street
East Rochester, NY 14445



Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2191

Subject: Structural Analysis Report

Carrier Designation: AT&T Mobility Co-locate
Carrier Site Number: 2159
Carrier Site Name: Orange-Ogg Meadow Road

Crown Castle Designation: Crown Castle BU Number: 806939
Crown Castle Site Name: NHV 2071 143137
Crown Castle JDE Job Number: 154918
Crown Castle Work Order Number: 416148

Engineering Firm Designation: Crown Castle Project Number: 416148

Site Data: OFF OGG MEADOW ROAD, ORANGE, New Haven County, CT
Latitude 41° 18' 28.36", Longitude -73° 1' 56.22"
160 Foot - Monopole Tower

Dear Steve Tuttle,

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 416148, in accordance with application 121278, revision 0.

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

LC1: Existing + Reserved + Proposed Equipment

Sufficient Capacity

Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

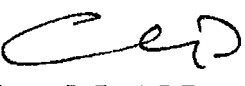
The analysis has been performed in accordance with the TIA/EIA-222-F standard and local code requirements based upon a wind speed of 85 mph fastest mile.

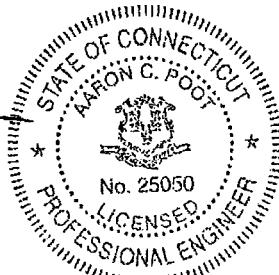
All equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

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

Structural analysis prepared by: Brad Gruszecki, Engineer I / MFB

Respectfully submitted by:


Aaron C. Poot, P.E.
Engineering Supervisor



RISA Tower Report - version 5.4.2.0

6/24/11

TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA

Table 1 - Proposed Antenna and Cable Information

Table 2 - Existing and Reserved Antenna and Cable Information

Table 3 - Design Antenna and Cable Information

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

4) ANALYSIS RESULTS

Table 5 – Section Capacity (Summary)

Table 6 - Tower Component Stresses vs. Capacity – LC1

4.1) Recommendations

5) APPENDIX A

RISATower Output

6) APPENDIX B

Base Level Drawing

7) APPENDIX C

Additional Calculations

1) INTRODUCTION

This tower is a 160 ft Monopole tower designed by VALMONT in September of 1999. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
147	152	6	ericsson	RRUS-11	2 1	3/8 5/8	-
		3	kathrein	800 10121 w/Mount Pipe			
		6	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe			
		6	powerwave technologies	TT19-08BP111-001			
		1	raycap	DC6-48-60-18-8F			

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
157	157	6	decibel	DB844H90 w/ Mount Pipe	12 1	1-5/8 1/2	1
		6	decibel	DB948F85T2E-M			
		1	tower mounts	Platform Mount [LP 713-1]			
156	170 156	1	unknown	GPS	6	1-5/8	3
		3	ems wireless	RR90-17-00DP w/ Mount Pipe			
		1	tower mounts	Pipe Mount [PM 601-1]			
147	152	6	css	DUO1417-8686 w/ Mount Pipe	-	-	4
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP13519			
137	147 140	1	tower mounts	Platform Mount [LP 713-1]	12	1-1/4	1
		1	andrew	VHLP2-11			
		6	decibel	DB980H90E-M w/ Mount Pipe			
127	137 129	1	dragonwave	Horizon DUO	6 12 6	1-5/8 1-1/4 1-5/8	1
		1	tower mounts	Platform Mount [LP 713-1]			
		3	ems wireless	RR90-17-02DP w/ Mount Pipe			
127	127 118	3	rfs celwave	APXV18-206516S-C-A20 w/ Mount Pipe	-	-	2
		6	rfs celwave	ATMAA1412D-1A20			
		1	tower mounts	Platform Mount [LP 713-1]			
	118	12	decibel	DB844H90-XY w/ Mount Pipe	-	-	1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
107	107	1	andrew	PX2F-52	6 3	1/2 5/8	1
		1	andrew	VHLP2-11			
		3	argus technologies	LLPX310R w/ Mount Pipe			
		2	dragonwave	HORIZON COMPACT			
		3	samsung telecommunications	WIMAX DAP HEAD			
100	100	1	tower mounts	Side Arm Mount [SO 101-3]	6	1-5/8	1
		3	rfs celwave	APXV18-206517S-C			
80	81	1	lucent	KS24019-L112A	1	1/2	1
	80	2	tower mounts	Side Arm Mount [SO 701-1]			
25	25	1	gps	GPS_A	1	1/2	1
		1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) Abandoned Equipment, Considered in Analysis
- 4) Equipment to be Removed, Not Considered in Analysis

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)
166.5	166.5	3	ems wireless	RV90-17-XXDP	-	-
157	157	12	swedcom	ALP 9011	-	-
147	147	12	swedcom	ALP 110 11-N	-	-
137	137	12	decibel	DB980H	-	-
127	127	12	swedcom	ALP 9011	-	-
117	117	12	swedcom	ALP 9011	-	-
100	100	2	generic	GPS	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering	1257473	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Valmont	1060127	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont	822032	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	160 - 121.333	Pole	TP29.774x21.65x0.25	1	-8.89	1185.74	55.6	Pass
L2	121.333 - 81.3333	Pole	TP37.67x28.2935x0.375	2	-18.11	2266.50	84.8	Pass
L3	81.3333 - 41.4167	Pole	TP45.297x35.7304x0.5	3	-30.17	3633.82	84.4	Pass
L4	41.4167 - 0	Pole	TP53x42.9154x0.5625	4	-49.45	4937.59	86.9	Pass
							Summary	
							Pole (L4)	86.9 Pass
							Rating =	86.9 Pass

Table 6 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	74.5	Pass
1	Base Plate	0	86.6	Pass
1	Base Foundation	0	70.9	Pass

Structure Rating (max from all components) =	86.9%
---	--------------

Notes:

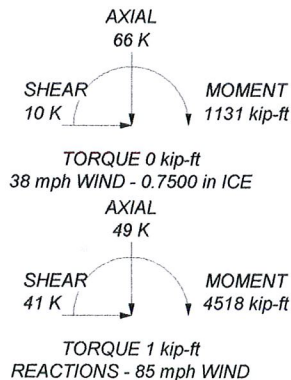
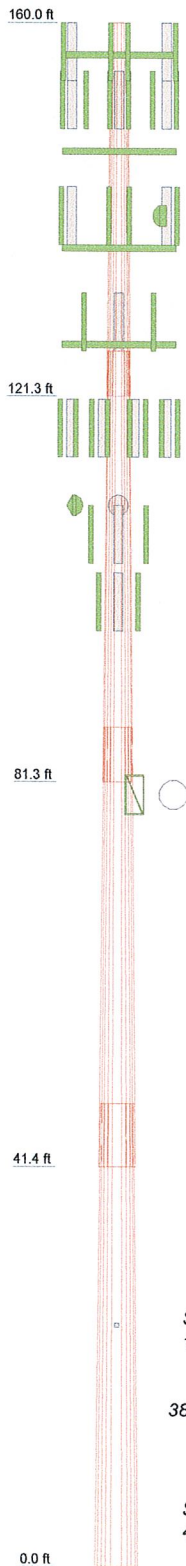
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

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

APPENDIX A
RISA TOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	388'-1/32"	12	0.2500	4'-8-1/32"	21.6500	29.7740	A572-65	2.7
2	44'-8-1/32"	12	0.3750	5'-8-1/32"	28.2935	37.6700	A572-65	6.0
3	45'-6-31/32"	12	0.5000	6'-6-31/32"	35.7304	45.2870	A572-65	10.0
4	48'	12	0.5625	42.9154	53.0000			14.0
								32.7



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) DB948F85T2E-M	157	(4) DB844H90-XY w/ Mount Pipe	127
(2) DB948F85T2E-M	157	(4) DB844H90-XY w/ Mount Pipe	127
(2) DB948F85T2E-M	157	APXV18-206516S-C-A20 w/ Mount Pipe	127
(2) DB844H90 w/ Mount Pipe	157	APXV18-206516S-C-A20 w/ Mount Pipe	127
(2) DB844H90 w/ Mount Pipe	157	APXV18-206516S-C-A20 w/ Mount Pipe	127
(2) DB844H90 w/ Mount Pipe	157	APXV18-206516S-C-A20 w/ Mount Pipe	127
GPS	157	APXV18-206516S-C-A20 w/ Mount Pipe	127
Platform Mount [LP 713-1]	157	(2) ATMAA1412D-1A20	127
(3) RR90-17-00DP w/ Mount Pipe	156	(2) ATMAA1412D-1A20	127
Pipe Mount [PM 601-1]	156	(2) ATMAA1412D-1A20	127
800 10121 w/ Mount Pipe	147	Platform Mount [LP 713-1]	127
800 10121 w/ Mount Pipe	147	RR90-17-02DP w/ Mount Pipe	127
800 10121 w/ Mount Pipe	147	LLPX310R w/ Mount Pipe	107
(2) P65-16-XLH-RR w/ Mount Pipe	147	LLPX310R w/ Mount Pipe	107
(2) P65-16-XLH-RR w/ Mount Pipe	147	WIMAX DAP HEAD	107
(2) P65-16-XLH-RR w/ Mount Pipe	147	WIMAX DAP HEAD	107
(2) TT19-08BP111-001	147	WIMAX DAP HEAD	107
(2) TT19-08BP111-001	147	HORIZON COMPACT	107
(2) TT19-08BP111-001	147	HORIZON COMPACT	107
(2) RRUS-11	147	(2) 8"x2" Antenna Mount Pipe	107
(2) RRUS-11	147	(2) 8"x2" Antenna Mount Pipe	107
(2) RRUS-11	147	(2) 8"x2" Antenna Mount Pipe	107
DC6-48-60-18-8F	147	Side Arm Mount [SO 101-3]	107
4' x 2" Pipe Mount	147	LLPX310R w/ Mount Pipe	107
4' x 2" Pipe Mount	147	VHLP2-11	107
4' x 2" Pipe Mount	147	PX2F-52	107
Platform Mount [LP 713-1]	147	6' x 2" Mount Pipe	100
(2) DB980H90E-M w/ Mount Pipe	137	6' x 2" Mount Pipe	100
(2) DB980H90E-M w/ Mount Pipe	137	6' x 2" Mount Pipe	100
(2) DB980H90E-M w/ Mount Pipe	137	APXV18-206517S-C	100
Horizon DUO	137	APXV18-206517S-C	100
(2) 4' x 2" Pipe Mount	137	APXV18-206517S-C	100
(2) 4' x 2" Pipe Mount	137	KS24019-L112A	80
(2) 4' x 2" Pipe Mount	137	Side Arm Mount [SO 701-1]	80
Platform Mount [LP 713-1]	137	Side Arm Mount [SO 701-1]	80
VHLP2-11	137	Side Arm Mount [SO 701-1]	25
RR90-17-02DP w/ Mount Pipe	127	GPS_A	25
RR90-17-02DP w/ Mount Pipe	127		
(4) DB844H90-XY w/ Mount Pipe	127		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 86.9%

Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191		Job: BU# 806939 Project: Client: Crown Castle Code: TIA/EIA-222-F Path: R:\SA Models - Letters\Work Area\BGruszecki\806939 - 416146\806939.dwg		Drawn by: bgruszecki Date: 06/15/11 App'd: Scale: NTS Dwg No. E-1	
---	--	---	--	---	--

RISATower Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	Page
	BU# 806939	1 of 19
	Project	Date
		15:18:39 06/15/11
	Client	Designed by
	Crown Castle	bgruszecki

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 56.00 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	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	160'-121'3-31/32"	38'8-1/32"	4'8-1/32"	12	21.6500	29.7740	0.2500	1.0000	A572-65 (65 ksi)
L2	121'3-31/32"-81'3-31/32"	44'8-1/32"	5'8-1/32"	12	28.2935	37.6700	0.3750	1.5000	A572-65 (65 ksi)
L3	81'3-31/32"-41'5-1/32"	45'6-31/32"	6'6-31/32"	12	35.7304	45.2970	0.5000	2.0000	A572-65 (65 ksi)
L4	41'5-1/32"-0'	48'		12	42.9154	53.0000	0.5625	2.2500	A572-65 (65 ksi)

RISATower Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	BU# 806939	Page	2 of 19
	Project		Date	15:18:39 06/15/11
	Client	Crown Castle	Designed by	bgruszecki

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	22.4137	17.2270	1006.9853	7.6612	11.2147	89.7916	2040.4253	8.4786	5.1322	20.529
	30.8243	23.7668	2644.2799	10.5696	15.4229	171.4512	5358.0279	11.6973	7.3094	29.238
L2	30.3058	33.7116	3353.9001	9.9948	14.6560	228.8408	6795.9109	16.5918	6.5777	17.54
	38.9989	45.0337	7995.1189	13.3516	19.5131	409.7317	16200.2784	22.1642	9.0906	24.241
L3	38.2221	56.7210	8985.9966	12.6125	18.5084	485.5099	18208.0653	27.9164	8.2358	16.472
	46.8949	72.1232	18473.9013	16.0373	23.4638	787.3347	37433.1325	35.4968	10.7996	21.599
L4	45.8612	76.7116	17563.5599	15.1623	22.2302	790.0781	35588.5340	37.7551	9.9938	17.767
	54.8696	94.9774	33334.2189	18.7726	27.4540	1214.1844	67544.1649	46.7450	12.6965	22.572

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft ²	in					in	in
L1				1	1	1		
160'-121'3-31/ 32"								
L2				1	1	1		
121'3-31/32"-8 1'3-31/32"								
L3				1	1	1		
81'3-31/32"-41' 5-1/32"								
L4				1	1	1		
41'5-1/32"-0'								

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
*										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight klf
LDF4-50A(1/2")	A	No	Inside Pole	157' - 0'	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
LDF7-50A(1-5/8")	A	No	Inside Pole	157' - 0'	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00

*

<i>RISATower</i> <i>Crown Castle</i> 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	BU# 806939	Page	3 of 19
	Project		Date	15:18:39 06/15/11
	Client	Crown Castle	Designed by	bgruszecki

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight klf
LDF7-50A(1-5/8")	A	No	Inside Pole	156' - 0'	6	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
*								
LDF6-50A(1-1/4")	C	No	Inside Pole	147' - 0'	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
FB-L98B-002-75000(3/8")	C	No	CaAa (Out Of Face)	147' - 0'	2	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.01
						4" Ice	0.00	0.02
WR-VG82ST-BRDA(5/8")	C	No	CaAa (Out Of Face)	147' - 0'	1	No Ice	0.06	0.00
						1/2" Ice	0.16	0.00
						1" Ice	0.26	0.00
						2" Ice	0.46	0.01
						4" Ice	0.86	0.02
*								
LDF7-50A(1-5/8")	C	No	Inside Pole	137' - 0'	6	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
EC4-50(1/2")	C	No	Inside Pole	137' - 0'	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
*								
LDF6-50A(1-1/4")	A	No	Inside Pole	127' - 0'	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
FLC 158-50J(1-5/8")	C	No	Inside Pole	127' - 0'	6	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
*								
FSJ4-50B(1/2")	B	No	CaAa (Out Of Face)	107' - 0'	3	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.01
						4" Ice	0.00	0.02
HJ4.5-50(5/8")	B	No	Inside Pole	107' - 0'	3	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
EC4-50(1/2")	B	No	CaAa (Out Of Face)	107' - 0'	3	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.01
						4" Ice	0.00	0.02
2" Rigid Conduit	B	No	CaAa (Out Of Face)	107' - 0'	1	No Ice	0.20	0.00
						1/2" Ice	0.30	0.00

RISATower Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	BU# 806939	Page 4 of 19
	Project		Date 15:18:39 06/15/11
	Client	Crown Castle	Designed by bgruszecki

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		$C_A A_A$ ft ² /ft	Weight klf
						1" Ice	0.40	0.01
						2" Ice	0.60	0.01
						4" Ice	1.00	0.03
* CR 50 1873(1-5/8")	A	No	Inside Pole	100' - 0'	6	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
* LDF4-50A(1/2")	C	No	Inside Pole	80' - 0'	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
* LDF4-50A(1/2")	C	No	Inside Pole	25' - 0'	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
*								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight K
L1	160'-121'3-31/32"	A	0.000	0.000	0.000	0.000	0.57
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.656	0.33
L2	121'3-31/32"-81'3-31/32"	A	0.000	0.000	0.000	0.000	1.01
		B	0.000	0.000	0.000	5.133	0.13
		C	0.000	0.000	0.000	2.580	0.76
L3	81'3-31/32"-41'5-1/32"	A	0.000	0.000	0.000	0.000	1.11
		B	0.000	0.000	0.000	7.983	0.20
		C	0.000	0.000	0.000	2.575	0.76
L4	41'5-1/32"-0'	A	0.000	0.000	0.000	0.000	1.15
		B	0.000	0.000	0.000	8.283	0.20
		C	0.000	0.000	0.000	2.671	0.79

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	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight K
L1	160'-121'3-31/32"	A	0.892	0.000	0.000	0.000	0.000	0.57
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	6.234	0.44
L2	121'3-31/32"-81'3-31/32"	A	0.858	0.000	0.000	0.000	0.000	1.01
		B		0.000	0.000	0.000	9.712	0.46
		C		0.000	0.000	0.000	9.715	0.94
L3	81'3-31/32"-41'5-1/32"	A	0.808	0.000	0.000	0.000	0.000	1.11
		B		0.000	0.000	0.000	14.829	0.69
		C		0.000	0.000	0.000	9.421	0.94

RISATower Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	BU# 806939	Page	5 of 19
	Project		Date	15:18:39 06/15/11
	Client	Crown Castle	Designed by	bgruszecki

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L4	41'5-1/32"-0'	A	0.750	0.000	0.000	0.000	0.000	1.15
		B		0.000	0.000	0.000	14.973	0.68
		C		0.000	0.000	0.000	9.361	0.96

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
L1	160'-121'3-31/32"	-0.0574	0.0332	-0.1927	0.1113
L2	121'3-31/32"-81'3-31/32"	0.0846	0.1393	0.0115	0.3034
L3	81'3-31/32"-41'5-1/32"	0.1634	0.1842	0.1444	0.3738
L4	41'5-1/32"-0'	0.1652	0.1862	0.1494	0.3740

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
(2) DB948F85T2E-M	A	From Leg	3.00	0.0000	157'	No Ice	1.92	0.01
			0'			1/2" Ice	2.22	0.03
			0'			1" Ice	2.53	0.05
			0'			2" Ice	3.16	0.11
			0'			4" Ice	4.62	0.28
(2) DB948F85T2E-M	B	From Leg	3.00	0.0000	157'	No Ice	1.92	0.01
			0'			1/2" Ice	2.22	0.03
			0'			1" Ice	2.53	0.05
			0'			2" Ice	3.16	0.11
			0'			4" Ice	4.62	0.28
(2) DB948F85T2E-M	C	From Leg	3.00	0.0000	157'	No Ice	1.92	0.01
			0'			1/2" Ice	2.22	0.03
			0'			1" Ice	2.53	0.05
			0'			2" Ice	3.16	0.11
			0'			4" Ice	4.62	0.28
(2) DB844H90 w/ Mount Pipe	A	From Leg	3.00	0.0000	157'	No Ice	3.30	0.03
			0'			1/2" Ice	3.69	0.07
			0'			1" Ice	4.12	0.11
			0'			2" Ice	5.01	0.22
			0'			4" Ice	6.92	0.55
(2) DB844H90 w/ Mount Pipe	B	From Leg	3.00	0.0000	157'	No Ice	3.30	0.03
			0'			1/2" Ice	3.69	0.07
			0'			1" Ice	4.12	0.11
			0'			2" Ice	5.01	0.22
			0'			4" Ice	6.92	0.55
(2) DB844H90 w/ Mount Pipe	C	From Leg	3.00	0.0000	157'	No Ice	3.30	0.03
			0'			1/2" Ice	3.69	0.07

RISATower Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	BU# 806939	Page 6 of 19
	Project		Date 15:18:39 06/15/11
	Client	Crown Castle	Designed by bgruszecki

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			0'			1" Ice	4.12	6.28	0.11
						2" Ice	5.01	7.71	0.22
						4" Ice	6.92	10.83	0.55
GPS	A	From Leg	3.00	0.0000	157'	No Ice	0.17	0.17	0.00
			0'			1/2" Ice	0.24	0.24	0.00
			0'			1" Ice	0.31	0.31	0.00
						2" Ice	0.48	0.48	0.01
						4" Ice	0.92	0.92	0.05
Platform Mount [LP 713-1]	C	None		0.0000	157'	No Ice	31.27	31.27	1.51
						1/2" Ice	39.68	39.68	1.93
						1" Ice	48.09	48.09	2.35
						2" Ice	64.91	64.91	3.19
						4" Ice	98.55	98.55	4.86
*									
(3) RR90-17-00DP w/ Mount Pipe	A	From Leg	1.00	0.0000	156'	No Ice	4.59	3.32	0.03
			0'			1/2" Ice	5.09	4.09	0.07
			14'			1" Ice	5.58	4.78	0.11
						2" Ice	6.59	6.23	0.22
						4" Ice	8.73	9.31	0.56
Pipe Mount [PM 601-1]	A	From Leg	0.50	0.0000	156'	No Ice	3.00	0.90	0.07
			0'			1/2" Ice	3.74	1.12	0.08
			0'			1" Ice	4.48	1.34	0.09
						2" Ice	5.96	1.78	0.12
						4" Ice	8.92	2.66	0.18
*									
800 10121 w/Mount Pipe	A	From Leg	3.00	0.0000	147'	No Ice	5.49	4.38	0.06
			0'			1/2" Ice	5.92	5.01	0.11
			5'			1" Ice	6.36	5.65	0.16
						2" Ice	7.28	7.04	0.28
						4" Ice	9.21	10.24	0.65
800 10121 w/Mount Pipe	B	From Leg	3.00	0.0000	147'	No Ice	5.49	4.38	0.06
			0'			1/2" Ice	5.92	5.01	0.11
			5'			1" Ice	6.36	5.65	0.16
						2" Ice	7.28	7.04	0.28
						4" Ice	9.21	10.24	0.65
800 10121 w/Mount Pipe	C	From Leg	3.00	0.0000	147'	No Ice	5.49	4.38	0.06
			0'			1/2" Ice	5.92	5.01	0.11
			5'			1" Ice	6.36	5.65	0.16
						2" Ice	7.28	7.04	0.28
						4" Ice	9.21	10.24	0.65
(2) P65-16-XLH-RR w/ Mount Pipe	A	From Leg	3.00	0.0000	147'	No Ice	8.64	6.36	0.08
			0'			1/2" Ice	9.29	7.54	0.14
			5'			1" Ice	9.91	8.43	0.22
						2" Ice	11.18	10.24	0.39
						4" Ice	13.83	14.10	0.89
(2) P65-16-XLH-RR w/ Mount Pipe	B	From Leg	3.00	0.0000	147'	No Ice	8.64	6.36	0.08
			0'			1/2" Ice	9.29	7.54	0.14
			5'			1" Ice	9.91	8.43	0.22
						2" Ice	11.18	10.24	0.39
						4" Ice	13.83	14.10	0.89
(2) P65-16-XLH-RR w/ Mount Pipe	C	From Leg	3.00	0.0000	147'	No Ice	8.64	6.36	0.08
			0'			1/2" Ice	9.29	7.54	0.14
			5'			1" Ice	9.91	8.43	0.22
						2" Ice	11.18	10.24	0.39
						4" Ice	13.83	14.10	0.89
(2) TT19-08BP111-001	A	From Leg	3.00	0.0000	147'	No Ice	0.64	0.52	0.02
			0'			1/2" Ice	0.75	0.62	0.02

<i>RISATower</i> <i>Crown Castle</i> 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	BU# 806939	Page
	Project		Date
	Client	Crown Castle	15:18:39 06/15/11 Designed by bgruszecki

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			5'			1" Ice 0.87	0.73	0.03
						2" Ice 1.13	0.98	0.05
						4" Ice 1.77	1.58	0.12
(2) TT19-08BP111-001	B	From Leg	3.00	0.0000	147'	No Ice 0.64	0.52	0.02
			0'			1/2" Ice 0.75	0.62	0.02
			5'			1" Ice 0.87	0.73	0.03
						2" Ice 1.13	0.98	0.05
						4" Ice 1.77	1.58	0.12
(2) TT19-08BP111-001	C	From Leg	3.00	0.0000	147'	No Ice 0.64	0.52	0.02
			0'			1/2" Ice 0.75	0.62	0.02
			5'			1" Ice 0.87	0.73	0.03
						2" Ice 1.13	0.98	0.05
						4" Ice 1.77	1.58	0.12
(2) RRUS-11	A	From Leg	3.00	0.0000	147'	No Ice 4.42	1.19	0.06
			0'			1/2" Ice 4.71	1.35	0.08
			5'			1" Ice 5.00	1.53	0.11
						2" Ice 5.61	1.90	0.18
						4" Ice 6.94	2.75	0.37
(2) RRUS-11	B	From Leg	3.00	0.0000	147'	No Ice 4.42	1.19	0.06
			0'			1/2" Ice 4.71	1.35	0.08
			5'			1" Ice 5.00	1.53	0.11
						2" Ice 5.61	1.90	0.18
						4" Ice 6.94	2.75	0.37
(2) RRUS-11	C	From Leg	3.00	0.0000	147'	No Ice 4.42	1.19	0.06
			0'			1/2" Ice 4.71	1.35	0.08
			5'			1" Ice 5.00	1.53	0.11
						2" Ice 5.61	1.90	0.18
						4" Ice 6.94	2.75	0.37
DC6-48-60-18-8F	C	From Leg	3.00	0.0000	147'	No Ice 1.27	1.27	0.02
			0'			1/2" Ice 1.46	1.46	0.04
			5'			1" Ice 1.66	1.66	0.05
						2" Ice 2.09	2.09	0.10
						4" Ice 3.10	3.10	0.21
4' x 2" Pipe Mount	A	From Leg	3.00	0.0000	147'	No Ice 0.79	0.79	0.03
			0'			1/2" Ice 1.03	1.03	0.04
			5'			1" Ice 1.28	1.28	0.04
						2" Ice 1.81	1.81	0.07
						4" Ice 3.11	3.11	0.17
4' x 2" Pipe Mount	B	From Leg	3.00	0.0000	147'	No Ice 0.79	0.79	0.03
			0'			1/2" Ice 1.03	1.03	0.04
			5'			1" Ice 1.28	1.28	0.04
						2" Ice 1.81	1.81	0.07
						4" Ice 3.11	3.11	0.17
4' x 2" Pipe Mount	C	From Leg	3.00	0.0000	147'	No Ice 0.79	0.79	0.03
			0'			1/2" Ice 1.03	1.03	0.04
			5'			1" Ice 1.28	1.28	0.04
						2" Ice 1.81	1.81	0.07
						4" Ice 3.11	3.11	0.17
Platform Mount [LP 713-1]	C	None		0.0000	147'	No Ice 31.27	31.27	1.51
						1/2" Ice 39.68	39.68	1.93
						1" Ice 48.09	48.09	2.35
						2" Ice 64.91	64.91	3.19
						4" Ice 98.55	98.55	4.86
*								
(2) DB980H90E-M w/ Mount Pipe	A	From Leg	3.00	0.0000	137'	No Ice 4.04	3.62	0.03
			0'			1/2" Ice 4.50	4.48	0.06
			3'			1" Ice 4.95	5.22	0.11

<i>RISATower</i> <i>Crown Castle</i> 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	BU# 806939	Page	8 of 19
	Project		Date	15:18:39 06/15/11
	Client	Crown Castle	Designed by	bgruszecki

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A ₁ Front ft ²	C _A A ₁ Side ft ²	Weight K
(2) DB980H90E-M w/ Mount Pipe	B	From Leg	3.00 0' 3'	0.0000	137'	2" Ice	5.87	0.22
						4" Ice	8.05	0.55
						No Ice	4.04	0.03
						1/2" Ice	4.50	0.06
						1" Ice	4.95	0.11
(2) DB980H90E-M w/ Mount Pipe	C	From Leg	3.00 0' 3'	0.0000	137'	2" Ice	5.87	0.22
						4" Ice	8.05	0.55
						No Ice	4.04	0.03
						1/2" Ice	4.50	0.06
						1" Ice	4.95	0.11
Horizon DUO	C	From Leg	3.00 0' 3'	0.0000	137'	2" Ice	5.87	0.22
						4" Ice	8.05	0.55
						No Ice	0.55	0.01
						1/2" Ice	0.65	0.01
						1" Ice	0.76	0.02
(2) 4' x 2" Pipe Mount	A	From Leg	3.00 0' 3'	0.0000	137'	2" Ice	1.00	0.04
						4" Ice	1.60	0.10
						No Ice	0.79	0.03
						1/2" Ice	1.03	0.04
						1" Ice	1.28	0.04
(2) 4' x 2" Pipe Mount	B	From Leg	3.00 0' 3'	0.0000	137'	2" Ice	1.81	0.07
						4" Ice	3.11	0.17
						No Ice	0.79	0.03
						1/2" Ice	1.03	0.04
						1" Ice	1.28	0.04
(2) 4' x 2" Pipe Mount	C	From Leg	3.00 0' 3'	0.0000	137'	2" Ice	1.81	0.07
						4" Ice	3.11	0.17
						No Ice	0.79	0.03
						1/2" Ice	1.03	0.04
						1" Ice	1.28	0.04
Platform Mount [LP 713-1]	C	None		0.0000	137'	2" Ice	1.81	0.07
						4" Ice	3.11	0.17
						No Ice	31.27	1.51
						1/2" Ice	39.68	1.93
						1" Ice	48.09	2.35
* RR90-17-02DP w/ Mount Pipe	A	From Leg	3.00 0' 2'	0.0000	127'	2" Ice	64.91	3.19
						4" Ice	98.55	4.86
						No Ice	4.59	0.03
						1/2" Ice	5.09	0.07
						1" Ice	5.58	0.11
RR90-17-02DP w/ Mount Pipe	B	From Leg	3.00 0' 2'	0.0000	127'	2" Ice	6.59	0.22
						4" Ice	8.73	0.56
						No Ice	4.59	0.03
						1/2" Ice	5.09	0.07
						1" Ice	5.58	0.11
RR90-17-02DP w/ Mount Pipe	C	From Leg	3.00 0' 2'	0.0000	127'	2" Ice	6.59	0.22
						4" Ice	8.73	0.56
						No Ice	4.59	0.03
						1/2" Ice	5.09	0.07
						1" Ice	5.58	0.11
(4) DB844H90-XY w/ Mount Pipe	A	From Leg	3.00 0' -9'	0.0000	127'	2" Ice	6.59	0.22
						4" Ice	8.73	0.56
						No Ice	3.10	0.03
						1/2" Ice	3.48	0.07
						1" Ice	3.88	0.11
						2" Ice	4.76	0.22

RISATower Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	BU# 806939	Page
	Project		Date
	Client	Crown Castle	15:18:39 06/15/11 Designed by bgruszecki

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A ₁ Front ft ²	C _A A ₁ Side ft ²	Weight K
(4) DB844H90-XY w/ Mount Pipe	B	From Leg	3.00 0' -9'	0.0000	127'	4" Ice 6.66 No Ice 3.10 1/2" Ice 3.48 1" Ice 3.88 2" Ice 4.76 4" Ice 6.66	11.09 5.15 5.83 6.52 7.96 11.09	0.55 0.03 0.07 0.11 0.22 0.55
(4) DB844H90-XY w/ Mount Pipe	C	From Leg	3.00 0' -9'	0.0000	127'	No Ice 3.10 1/2" Ice 3.48 1" Ice 3.88 2" Ice 4.76 4" Ice 6.66	5.15 5.83 6.52 7.96 11.09	0.03 0.07 0.11 0.22 0.55
APXV18-206516S-C-A20 w/ Mount Pipe	A	From Leg	3.00 0' 2'	0.0000	127'	No Ice 3.86 1/2" Ice 4.27 1" Ice 4.73 2" Ice 5.69 4" Ice 7.73	3.30 4.00 4.67 6.06 9.04	0.04 0.07 0.11 0.21 0.53
APXV18-206516S-C-A20 w/ Mount Pipe	B	From Leg	3.00 0' 2'	0.0000	127'	No Ice 3.86 1/2" Ice 4.27 1" Ice 4.73 2" Ice 5.69 4" Ice 7.73	3.30 4.00 4.67 6.06 9.04	0.04 0.07 0.11 0.21 0.53
APXV18-206516S-C-A20 w/ Mount Pipe	C	From Leg	3.00 0' 2'	0.0000	127'	No Ice 3.86 1/2" Ice 4.27 1" Ice 4.73 2" Ice 5.69 4" Ice 7.73	3.30 4.00 4.67 6.06 9.04	0.04 0.07 0.11 0.21 0.53
(2) ATMAA1412D-1A20	A	From Leg	3.00 0' 2'	0.0000	127'	No Ice 1.17 1/2" Ice 1.31 1" Ice 1.47 2" Ice 1.81 4" Ice 2.58	0.47 0.57 0.69 0.95 1.57	0.01 0.02 0.03 0.06 0.14
(2) ATMAA1412D-1A20	B	From Leg	3.00 0' 2'	0.0000	127'	No Ice 1.17 1/2" Ice 1.31 1" Ice 1.47 2" Ice 1.81 4" Ice 2.58	0.47 0.57 0.69 0.95 1.57	0.01 0.02 0.03 0.06 0.14
(2) ATMAA1412D-1A20	C	From Leg	3.00 0' 2'	0.0000	127'	No Ice 1.17 1/2" Ice 1.31 1" Ice 1.47 2" Ice 1.81 4" Ice 2.58	0.47 0.57 0.69 0.95 1.57	0.01 0.02 0.03 0.06 0.14
Platform Mount [LP 713-1]	C	None		0.0000	127'	No Ice 31.27 1/2" Ice 39.68 1" Ice 48.09 2" Ice 64.91 4" Ice 98.55	31.27 39.68 48.09 64.91 98.55	1.51 1.93 2.35 3.19 4.86
*								
LLPX310R w/ Mount Pipe	A	From Leg	2.00 0' 0'	0.0000	107'	No Ice 5.07 1/2" Ice 5.48 1" Ice 5.91 2" Ice 6.79 4" Ice 8.70	2.98 3.53 4.09 5.31 8.13	0.05 0.08 0.13 0.23 0.54
LLPX310R w/ Mount Pipe	B	From Leg	2.00 0' 0'	0.0000	107'	No Ice 5.07 1/2" Ice 5.48 1" Ice 5.91 2" Ice 6.79 4" Ice 8.70	2.98 3.53 4.09 5.31 8.13	0.05 0.08 0.13 0.23 0.54

<i>RISATower</i> <i>Crown Castle</i> 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	Page
	BU# 806939	10 of 19
	Project	Date
	Client	15:18:39 06/15/11
	Crown Castle	Designed by bgruszecki

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{A,A} Front ft ²	C _{A,A} Side ft ²	Weight K
LLPX310R w/ Mount Pipe	C	From Leg	2.00 0' 0'	0.0000	107'	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
WIMAX DAP HEAD	A	From Leg	2.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.80 1.99 2.18 2.59 3.51	0.78 0.92 1.07 1.39 2.14	0.03 0.04 0.06 0.09 0.20
WIMAX DAP HEAD	B	From Leg	2.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.80 1.99 2.18 2.59 3.51	0.78 0.92 1.07 1.39 2.14	0.03 0.04 0.06 0.09 0.20
WIMAX DAP HEAD	C	From Leg	2.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.80 1.99 2.18 2.59 3.51	0.78 0.92 1.07 1.39 2.14	0.03 0.04 0.06 0.09 0.20
HORIZON COMPACT	A	From Leg	2.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.84 0.97 1.10 1.39 2.08	0.43 0.52 0.63 0.86 1.43	0.01 0.02 0.03 0.05 0.12
HORIZON COMPACT	B	From Leg	2.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.84 0.97 1.10 1.39 2.08	0.43 0.52 0.63 0.86 1.43	0.01 0.02 0.03 0.05 0.12
(2) 8'x2" Antenna Mount Pipe	A	From Leg	2.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.90 2.73 3.40 4.40 6.50	1.90 2.73 3.40 4.40 6.50	0.03 0.04 0.06 0.12 0.30
(2) 8'x2" Antenna Mount Pipe	B	From Leg	2.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.90 2.73 3.40 4.40 6.50	1.90 2.73 3.40 4.40 6.50	0.03 0.04 0.06 0.12 0.30
(2) 8'x2" Antenna Mount Pipe	C	From Leg	2.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.90 2.73 3.40 4.40 6.50	1.90 2.73 3.40 4.40 6.50	0.03 0.04 0.06 0.12 0.30
Side Arm Mount [SO 101-3]	C	None		0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.50 8.90 10.30 13.10 18.70	7.50 8.90 10.30 13.10 18.70	0.25 0.33 0.41 0.58 0.90
*									
APXV18-206517S-C	A	From Leg	1.00 0' 0'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.17 5.62 6.08 7.02 9.12	3.04 3.47 3.91 4.81 6.70	0.03 0.05 0.09 0.17 0.40
APXV18-206517S-C	B	From Leg	1.00	0.0000	100'	No Ice	5.17	3.04	0.03

RISATower Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	BU# 806939	Page 11 of 19
	Project		Date 15:18:39 06/15/11
	Client	Crown Castle	Designed by bgruszecki

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			0'			1/2" Ice 5.62	3.47	0.05
			0'			1" Ice 6.08	3.91	0.09
						2" Ice 7.02	4.81	0.17
						4" Ice 9.12	6.70	0.40
APXV18-206517S-C	C	From Leg	1.00	0.0000	100'	No Ice 5.17	3.04	0.03
			0'			1/2" Ice 5.62	3.47	0.05
			0'			1" Ice 6.08	3.91	0.09
						2" Ice 7.02	4.81	0.17
						4" Ice 9.12	6.70	0.40
6' x 2" Mount Pipe	A	From Leg	1.00	0.0000	100'	No Ice 1.43	1.43	0.02
			0'			1/2" Ice 1.92	1.92	0.03
			0'			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	1.00	0.0000	100'	No Ice 1.43	1.43	0.02
			0'			1/2" Ice 1.92	1.92	0.03
			0'			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	1.00	0.0000	100'	No Ice 1.43	1.43	0.02
			0'			1/2" Ice 1.92	1.92	0.03
			0'			1" Ice 2.29	2.29	0.05
						2" Ice 3.06	3.06	0.09
						4" Ice 4.70	4.70	0.23
*								
KS24019-L112A	B	From Leg	2.00	0.0000	80'	No Ice 0.10	0.10	0.01
			0'			1/2" Ice 0.18	0.18	0.01
			1'			1" Ice 0.26	0.26	0.01
						2" Ice 0.42	0.42	0.01
						4" Ice 0.74	0.74	0.02
Side Arm Mount [SO 701-1]	A	From Leg	0.50	0.0000	80'	No Ice 0.85	1.67	0.07
			0'			1/2" Ice 1.14	2.34	0.08
			0'			1" Ice 1.43	3.01	0.09
						2" Ice 2.01	4.35	0.12
						4" Ice 3.17	7.03	0.18
Side Arm Mount [SO 701-1]	B	From Leg	0.50	0.0000	80'	No Ice 0.85	1.67	0.07
			0'			1/2" Ice 1.14	2.34	0.08
			0'			1" Ice 1.43	3.01	0.09
						2" Ice 2.01	4.35	0.12
						4" Ice 3.17	7.03	0.18
*								
GPS_A	A	From Leg	1.00	0.0000	25'	No Ice 0.30	0.30	0.00
			0'			1/2" Ice 0.37	0.37	0.00
			0'			1" Ice 0.46	0.46	0.01
						2" Ice 0.65	0.65	0.02
						4" Ice 1.15	1.15	0.08
Side Arm Mount [SO 701-1]	A	From Leg	0.50	0.0000	25'	No Ice 0.85	1.67	0.07
			0'			1/2" Ice 1.14	2.34	0.08
			0'			1" Ice 1.43	3.01	0.09
						2" Ice 2.01	4.35	0.12
						4" Ice 3.17	7.03	0.18
*								

RISATower Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	Page
	BU# 806939	12 of 19
	Project	Date
	Client	Designed by
	Crown Castle	bgruszecki

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				ft	°	°	ft	ft	ft ²	K
VHLP2-11	B	Paraboloid w/Shroud (HP)	From Leg	3.00 0' 3'	0.0000		137'	2.17	No Ice 3.72 1/2" Ice 4.01 1" Ice 4.30 2" Ice 4.88 4" Ice 6.04	0.03 0.05 0.07 0.11 0.19
*										
VHLP2-11	A	Paraboloid w/Shroud (HP)	From Leg	3.00 0' 3'	0.0000		107'	2.17	No Ice 3.72 1/2" Ice 4.01 1" Ice 4.30 2" Ice 4.88 4" Ice 6.04	0.03 0.05 0.07 0.11 0.19
PX2F-52	C	Paraboloid w/Radome	From Leg	3.00 0' 3'	0.0000		107'	2.09	No Ice 3.44 1/2" Ice 3.72 1" Ice 3.99 2" Ice 4.55 4" Ice 5.67	0.01 0.02 0.02 0.05 0.17
*										

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

<i>RISATower</i> <i>Crown Castle</i> 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	BU# 806939	Page 13 of 19
	Project		Date 15:18:39 06/15/11
	Client	Crown Castle	Designed by bgruszecki

Comb. No.	Description
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	160 - 121.333	Pole	Max Tension	8	0.00	0.00	0.00
			Max. Compression	14	-20.11	0.11	0.43
			Max. Mx	11	-9.86	368.18	1.08
			Max. My	2	-9.81	1.56	379.00
			Max. Vy	11	-22.06	368.18	1.08
			Max. Vx	2	-22.29	1.56	379.00
			Max. Torque	11			-1.05
L2	121.333 - 81.3333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-31.11	-0.13	0.30
			Max. Mx	11	-18.15	1373.99	4.37
			Max. My	2	-18.11	5.58	1395.99
			Max. Vy	11	-29.73	1373.99	4.37
			Max. Vx	2	-30.05	5.58	1395.99
			Max. Torque	11			-1.03
L3	81.3333 - 41.4167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-45.05	-0.91	-0.28
			Max. Mx	11	-30.19	2642.31	7.44
			Max. My	2	-30.17	8.80	2676.38
			Max. Vy	11	-35.14	2642.31	7.44
			Max. Vx	2	-35.44	8.80	2676.38
			Max. Torque	11			-1.04
L4	41.4167 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-66.50	-1.80	-0.99
			Max. Mx	11	-49.45	4470.49	11.06
			Max. My	2	-49.45	12.65	4518.28
			Max. Vy	11	-40.94	4470.49	11.06
			Max. Vx	2	-41.21	12.65	4518.28
			Max. Torque	11			-1.08

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	21	66.50	-0.01	-9.85
	Max. H _x	11	49.48	40.91	0.07
	Max. H _z	2	49.48	0.08	41.17
	Max. M _x	2	4518.28	0.08	41.17

RISATower Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	Page
	BU# 806939	14 of 19
	Project	Date
		15:18:39 06/15/11
	Client	Designed by
	Crown Castle	bgruszecki

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. M _z	5	4470.27	-40.91	-0.02
	Max. Torsion	5	0.99	-40.91	-0.02
	Min. Vert	1	49.48	0.00	0.00
	Min. H _x	5	49.48	-40.91	-0.02
	Min. H _z	8	49.48	-0.06	-41.16
	Min. M _x	8	-4516.77	-0.06	-41.16
	Min. M _z	11	-4470.49	40.91	0.07
	Min. Torsion	11	-1.03	40.91	0.07

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	49.48	0.00	0.00	-0.10	-0.65	0.00
Dead+Wind 0 deg - No Ice	49.48	-0.08	-41.17	-4518.28	12.65	0.02
Dead+Wind 30 deg - No Ice	49.48	20.43	-35.67	-3912.96	-2232.75	-0.26
Dead+Wind 60 deg - No Ice	49.48	35.42	-20.58	-2256.27	-3870.98	-0.72
Dead+Wind 90 deg - No Ice	49.48	40.91	0.02	4.82	-4470.27	-0.99
Dead+Wind 120 deg - No Ice	49.48	35.39	20.65	2267.58	-3867.56	-0.76
Dead+Wind 150 deg - No Ice	49.48	20.46	35.65	3912.47	-2238.39	-0.52
Dead+Wind 180 deg - No Ice	49.48	0.06	41.16	4516.77	-10.40	-0.16
Dead+Wind 210 deg - No Ice	49.48	-20.39	35.69	3916.13	2225.24	0.25
Dead+Wind 240 deg - No Ice	49.48	-35.42	20.57	2254.41	3870.04	0.74
Dead+Wind 270 deg - No Ice	49.48	-40.91	-0.07	-11.06	4470.49	1.03
Dead+Wind 300 deg - No Ice	49.48	-35.39	-20.64	-2266.48	3867.86	0.87
Dead+Wind 330 deg - No Ice	49.48	-20.45	-35.66	-3914.76	2236.86	0.49
Dead+Ice+Temp	66.50	0.00	0.00	0.99	-1.80	0.00
Dead+Wind 0 deg+Ice+Temp	66.50	-0.02	-9.86	-1129.29	1.02	-0.01
Dead+Wind 30 deg+Ice+Temp	66.50	4.90	-8.54	-977.91	-562.22	-0.08
Dead+Wind 60 deg+Ice+Temp	66.50	8.50	-4.93	-563.58	-973.21	-0.18
Dead+Wind 90 deg+Ice+Temp	66.50	9.81	0.00	1.97	-1123.51	-0.23
Dead+Wind 120 deg+Ice+Temp	66.50	8.49	4.94	567.93	-972.30	-0.17
Dead+Wind 150 deg+Ice+Temp	66.50	4.91	8.53	979.69	-563.25	-0.11
Dead+Wind 180 deg+Ice+Temp	66.50	0.01	9.85	1130.97	-3.94	-0.02
Dead+Wind 210 deg+Ice+Temp	66.50	-4.89	8.54	980.67	557.08	0.07
Dead+Wind 240 deg+Ice+Temp	66.50	-8.50	4.93	565.19	969.57	0.18
Dead+Wind 270 deg+Ice+Temp	66.50	-9.82	-0.01	-1.35	1120.14	0.24
Dead+Wind 300 deg+Ice+Temp	66.50	-8.49	-4.94	-565.66	968.93	0.20
Dead+Wind 330 deg+Ice+Temp	66.50	-4.91	-8.54	-978.19	559.47	0.11
Dead+Wind 0 deg - Service	49.48	-0.03	-14.25	-1565.58	3.94	0.01
Dead+Wind 30 deg - Service	49.48	7.07	-12.34	-1355.83	-774.03	-0.09
Dead+Wind 60 deg - Service	49.48	12.26	-7.12	-781.80	-1341.61	-0.25
Dead+Wind 90 deg - Service	49.48	14.15	0.01	1.60	-1549.24	-0.35
Dead+Wind 120 deg - Service	49.48	12.24	7.15	785.58	-1340.44	-0.26
Dead+Wind 150 deg - Service	49.48	7.08	12.34	1355.52	-775.99	-0.18
Dead+Wind 180 deg - Service	49.48	0.02	14.24	1564.91	-4.05	-0.06
Dead+Wind 210 deg - Service	49.48	-7.06	12.35	1356.78	770.55	0.08
Dead+Wind 240 deg - Service	49.48	-12.26	7.12	781.01	1340.41	0.26
Dead+Wind 270 deg - Service	49.48	-14.16	-0.03	-3.91	1548.44	0.36
Dead+Wind 300 deg - Service	49.48	-12.25	-7.14	-785.35	1339.66	0.31
Dead+Wind 330 deg - Service	49.48	-7.08	-12.34	-1356.46	774.58	0.17

Solution Summary

RISATower Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	Page
	BU# 806939	15 of 19
	Project	Date
	Client	15:18:39 06/15/11
	Crown Castle	Designed by bgruszecki

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-49.48	0.00	0.00	49.48	0.00	0.000%
2	-0.08	-49.48	-41.17	0.08	49.48	41.17	0.000%
3	20.43	-49.48	-35.67	-20.43	49.48	35.67	0.000%
4	35.42	-49.48	-20.58	-35.42	49.48	20.58	0.000%
5	40.91	-49.48	0.02	-40.91	49.48	-0.02	0.000%
6	35.39	-49.48	20.65	-35.39	49.48	-20.65	0.000%
7	20.46	-49.48	35.65	-20.46	49.48	-35.65	0.000%
8	0.06	-49.48	41.16	-0.06	49.48	-41.16	0.000%
9	-20.39	-49.48	35.69	20.39	49.48	-35.69	0.000%
10	-35.42	-49.48	20.57	35.42	49.48	-20.57	0.000%
11	-40.91	-49.48	-0.07	40.91	49.48	0.07	0.000%
12	-35.39	-49.48	-20.64	35.39	49.48	20.64	0.000%
13	-20.45	-49.48	-35.66	20.45	49.48	35.66	0.000%
14	0.00	-66.50	0.00	0.00	66.50	0.00	0.000%
15	-0.02	-66.50	-9.86	0.02	66.50	9.86	0.000%
16	4.90	-66.50	-8.54	-4.90	66.50	8.54	0.000%
17	8.50	-66.50	-4.93	-8.50	66.50	4.93	0.000%
18	9.81	-66.50	0.00	-9.81	66.50	-0.00	0.000%
19	8.49	-66.50	4.94	-8.49	66.50	-4.94	0.000%
20	4.91	-66.50	8.53	-4.91	66.50	-8.53	0.000%
21	0.01	-66.50	9.85	-0.01	66.50	-9.85	0.000%
22	-4.89	-66.50	8.54	4.89	66.50	-8.54	0.000%
23	-8.50	-66.50	4.93	8.50	66.50	-4.93	0.000%
24	-9.82	-66.50	-0.01	9.82	66.50	0.01	0.000%
25	-8.49	-66.50	-4.94	8.49	66.50	4.94	0.000%
26	-4.91	-66.50	-8.54	4.91	66.50	8.54	0.000%
27	-0.03	-49.48	-14.25	0.03	49.48	14.25	0.000%
28	7.07	-49.48	-12.34	-7.07	49.48	12.34	0.000%
29	12.26	-49.48	-7.12	-12.26	49.48	7.12	0.000%
30	14.15	-49.48	0.01	-14.15	49.48	-0.01	0.000%
31	12.24	-49.48	7.15	-12.24	49.48	-7.15	0.000%
32	7.08	-49.48	12.34	-7.08	49.48	-12.34	0.000%
33	0.02	-49.48	14.24	-0.02	49.48	-14.24	0.000%
34	-7.06	-49.48	12.35	7.06	49.48	-12.35	0.000%
35	-12.26	-49.48	7.12	12.26	49.48	-7.12	0.000%
36	-14.16	-49.48	-0.03	14.16	49.48	0.03	0.000%
37	-12.25	-49.48	-7.14	12.25	49.48	7.14	0.000%
38	-7.08	-49.48	-12.34	7.08	49.48	12.34	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	0.00021369
3	Yes	5	0.00000001	0.00052844
4	Yes	5	0.00000001	0.00053492
5	Yes	4	0.00000001	0.00033794
6	Yes	5	0.00000001	0.00052589
7	Yes	5	0.00000001	0.00053575
8	Yes	4	0.00000001	0.00016296
9	Yes	5	0.00000001	0.00053323
10	Yes	5	0.00000001	0.00052244
11	Yes	4	0.00000001	0.00048832
12	Yes	5	0.00000001	0.00053720

RISATower Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	Page
	BU# 806939	16 of 19
	Project	Date
	Client	15:18:39 06/15/11
	Crown Castle	Designed by
		bgruszecki

13	Yes	5	0.00000001	0.00053041
14	Yes	4	0.00000001	0.00000001
15	Yes	5	0.00000001	0.00013905
16	Yes	5	0.00000001	0.00017704
17	Yes	5	0.00000001	0.00017719
18	Yes	5	0.00000001	0.00013789
19	Yes	5	0.00000001	0.00017659
20	Yes	5	0.00000001	0.00017775
21	Yes	5	0.00000001	0.00013897
22	Yes	5	0.00000001	0.00017697
23	Yes	5	0.00000001	0.00017566
24	Yes	5	0.00000001	0.00013769
25	Yes	5	0.00000001	0.00017724
26	Yes	5	0.00000001	0.00017711
27	Yes	4	0.00000001	0.00005755
28	Yes	5	0.00000001	0.00004428
29	Yes	5	0.00000001	0.00004554
30	Yes	4	0.00000001	0.00008468
31	Yes	5	0.00000001	0.00004375
32	Yes	5	0.00000001	0.00004550
33	Yes	4	0.00000001	0.00005565
34	Yes	5	0.00000001	0.00004513
35	Yes	5	0.00000001	0.00004323
36	Yes	4	0.00000001	0.00009386
37	Yes	5	0.00000001	0.00004580
38	Yes	5	0.00000001	0.00004451

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 121.333	37.883	27	2.0779	0.0035
L2	126 - 81.3333	23.668	27	1.8139	0.0014
L3	87 - 41.4167	11.029	27	1.2116	0.0006
L4	48 - 0	3.338	27	0.6360	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
157'	(2) DB948F85T2E-M	27	36.578	2.0604	0.0033	27200
156'	(3) RR90-17-00DP w/ Mount Pipe	27	36.143	2.0545	0.0032	27200
147'	800 10121 w/Mount Pipe	27	32.259	1.9986	0.0026	10461
140'	VHLP2-11	27	29.299	1.9481	0.0022	6799
137'	(2) DB980H90E-M w/ Mount Pipe	27	28.055	1.9236	0.0020	5912
127'	RR90-17-02DP w/ Mount Pipe	27	24.054	1.8254	0.0015	4170
110'	VHLP2-11	27	17.912	1.5912	0.0009	3889
107'	LLPX310R w/ Mount Pipe	27	16.920	1.5435	0.0009	3870
100'	APXV18-206517S-C	27	14.715	1.4283	0.0008	3824
80'	KS24019-L112A	27	9.268	1.0999	0.0005	3646
25'	GPS_A	27	1.202	0.3271	0.0001	6257

RISATower Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	BU# 806939	Page 17 of 19
	Project		Date 15:18:39 06/15/11
	Client	Crown Castle	Designed by bgruszecki

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 121.333	109.094	2	5.9846	0.0101
L2	126 - 81.3333	68.204	2	5.2274	0.0040
L3	87 - 41.4167	31.804	2	3.4937	0.0017
L4	48 - 0	9.631	2	1.8347	0.0007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
157'	(2) DB948F85T2E-M	2	105.341	5.9346	0.0095	9638
156'	(3) RR90-17-00DP w/ Mount Pipe	2	104.091	5.9177	0.0093	9638
147'	800 10121 w/Mount Pipe	2	92.919	5.7575	0.0075	3705
140'	VHLP2-11	2	84.403	5.6127	0.0062	2407
137'	(2) DB980H90E-M w/ Mount Pipe	2	80.825	5.5425	0.0057	2092
127'	RR90-17-02DP w/ Mount Pipe	2	69.313	5.2604	0.0042	1473
110'	VHLP2-11	2	51.634	4.5868	0.0026	1368
107'	LLPX310R w/ Mount Pipe	2	48.777	4.4495	0.0025	1360
100'	APXV18-206517S-C	2	42.425	4.1178	0.0021	1341
80'	KS24019-L112A	2	26.730	3.1719	0.0015	1273
25'	GPS A	2	3.469	0.9438	0.0003	2171

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
L1	160 - 121.333 (1)	TP29.774x21.65x0.25	38'8-1/32'	0'	0.0	39.000	22.8084	-8.89	889.53	0.010
L2	121.333 - 81.3333 (2)	TP37.67x28.2935x0.375	44'8-1/32'	0'	0.0	39.000	43.5973	-18.11	1700.30	0.011
L3	81.3333 - 41.4167 (3)	TP45.297x35.7304x0.5	45'6-31/32"	0'	0.0	39.000	69.8987	-30.17	2726.05	0.011
L4	41.4167 - 0 (4)	TP53x42.9154x0.5625	48'	0'	0.0	39.000	94.9774	-49.45	3704.12	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 f _{bx} F _{bx}	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio f _{by} F _{by}
-------------	-----------------	------	------------------------------------	----------------------------------	----------------------------------	---	------------------------------------	----------------------------------	----------------------------------	---

RISATower Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	BU# 806939	Page 18 of 19
	Project		Date 15:18:39 06/15/11
	Client	Crown Castle	Designed by bgruszecki

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	160 - 121.333 (1)	TP29.774x21.65x0.25	374.29	28.455	39.000	0.730	0.00	0.000	39.000	0.000
L2	121.333 - 81.3333 (2)	TP37.67x28.2935x0.375	1396.00	43.638	39.000	1.119	0.00	0.000	39.000	0.000
L3	81.3333 - 41.4167 (3)	TP45.297x35.7304x0.5	2676.39	43.445	39.000	1.114	0.00	0.000	39.000	0.000
L4	41.4167 - 0 (4)	TP53x42.9154x0.5625	4518.30	44.655	39.000	1.145	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	160 - 121.333 (1)	TP29.774x21.65x0.25	22.29	0.977	26.000	0.076	0.02	0.001	26.000	0.000
L2	121.333 - 81.3333 (2)	TP37.67x28.2935x0.375	30.05	0.689	26.000	0.054	0.27	0.004	26.000	0.000
L3	81.3333 - 41.4167 (3)	TP45.297x35.7304x0.5	35.44	0.507	26.000	0.040	0.07	0.001	26.000	0.000
L4	41.4167 - 0 (4)	TP53x42.9154x0.5625	41.21	0.434	26.000	0.034	0.02	0.000	26.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P P_a	Ratio f_{bx} F_{bx}	Ratio f_{by} F_{by}	Ratio f_v F_v	Ratio f_{vt} F_{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	160 - 121.333 (1)	0.010	0.730	0.000	0.076	0.000	0.741	1.333	H1-3+VT ✓
L2	121.333 - 81.3333 (2)	0.011	1.119	0.000	0.054	0.000	1.130	1.333	H1-3+VT ✓
L3	81.3333 - 41.4167 (3)	0.011	1.114	0.000	0.040	0.000	1.125	1.333	H1-3+VT ✓
L4	41.4167 - 0 (4)	0.013	1.145	0.000	0.034	0.000	1.159	1.333	H1-3+VT ✓

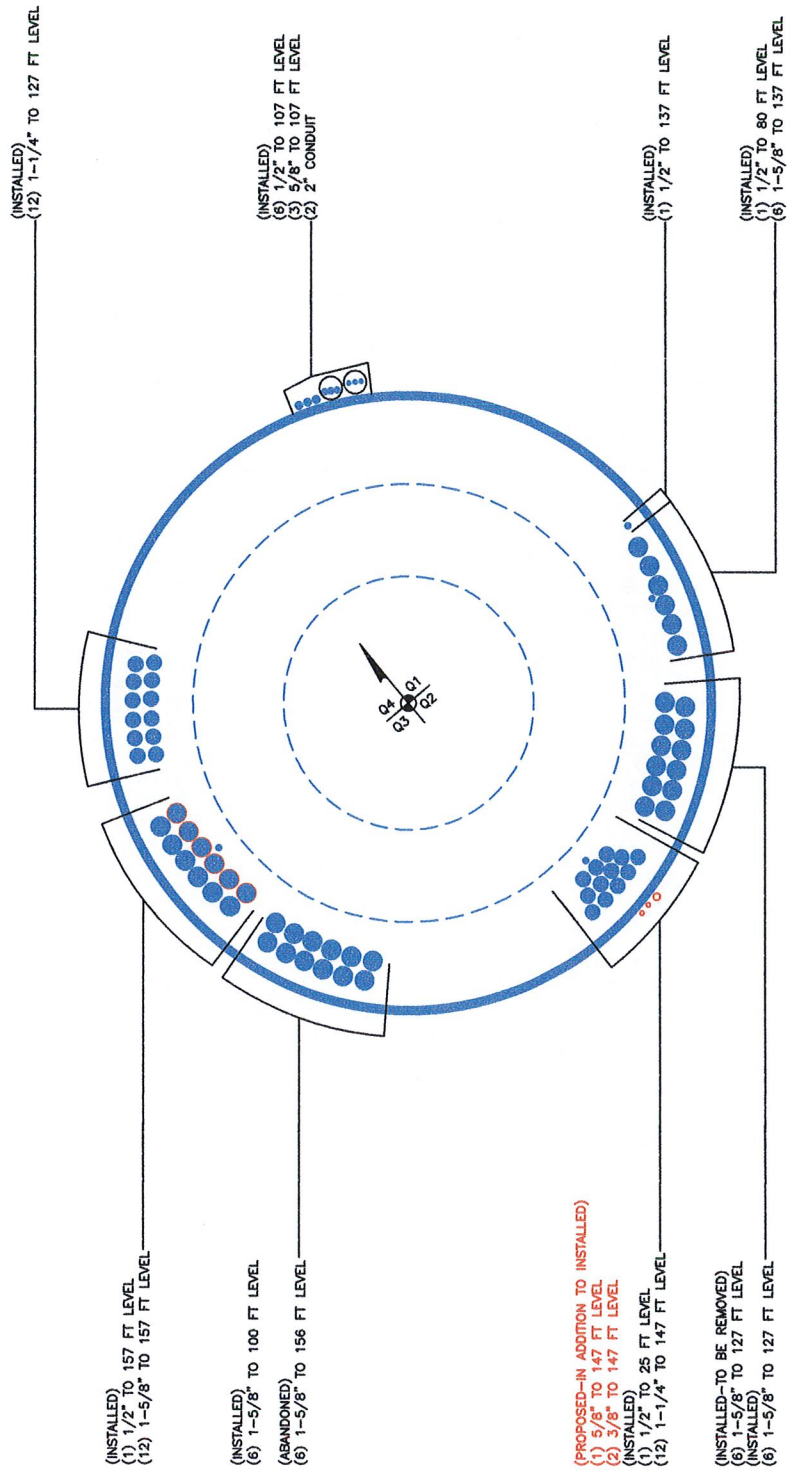
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF * P_{allow}$ K	% Capacity	Pass Fail
L1	160 - 121.333	Pole	TP29.774x21.65x0.25	1	-8.89	1185.74	55.6	Pass
L2	121.333 - 81.3333	Pole	TP37.67x28.2935x0.375	2	-18.11	2266.50	84.8	Pass
L3	81.3333 - 41.4167	Pole	TP45.297x35.7304x0.5	3	-30.17	3633.82	84.4	Pass

<i>RISATower</i> <i>Crown Castle</i> 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2191 FAX: (724) 416-4191	Job	BU# 806939	Page 19 of 19
	Project		Date 15:18:39 06/15/11
	Client	Crown Castle	Designed by bgruszecki

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
L4	41.4167 - 0	Pole	TP53x42.9154x0.5625	4	-49.45	4937.59	86.9	Pass
							Summary	
							Pole (L4)	Pass
							RATING =	86.9 Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

Terzaghi's Equation for Bearing Capacity

BU #: 806939

Site Name: NHV 2071 143137

App. Name: 121278, Rev. 0



Allowable Gross Bearing Capacity = 7.06 ksf

Footing Parameters		
Depth, D:	9.5	ft
Width, W:	7.0	ft
*Foundation Type, T:	S	
**Type, J (0, 1, 2):	1	

*Note: S= Shallow, D= Deep

**Note: 0 = Strip, 1 = Round, 2 = Square

Soil Parameters		
Unit Weight, γ :	0.1150	kcf
Cohesion, C_o :	0.00	ksf
Phi Angle, Φ :	31.0	deg
Blows per foot @ Subgrade, N:	13	

Factors	
Nc:	32.7
Nq:	20.7
Ny:	18.6

Modifiers	
Sc:	1.3
Sy:	0.6

Monopole Pier and Pad Foundation

BU #: 806939
 Site Name: NHV 2071 143137
 App. Number: 121278, Rev. 0



Design Reactions	
Shear, S:	41 kips
Moment, M:	4518 ft-kips
Tower Height, H:	160 ft
Tower Weight, Wt:	49 kips
Base Diameter, BD:	4.417 ft

Foundation Dimensions	
Depth, D:	9.5 ft
Pad Width, W:	30 ft
Neglected Depth, N:	2.5 ft
Thickness, T:	3.50 ft
Pier Diameter, Pd:	7.00 ft
Ext. Above Grade, E:	0.50 ft
Clear Cover, Cc:	3.0 in

Soil Properties	
Soil Unit Weight, γ	0.115 kcf
Bearing Capacity, Bc:	7.1 ksf
Angle of Friction, Φ :	31 deg
Cohesion, Co:	0.000 ksf
Passive Pressure, Pp:	0.000 kcf
Base Friction, μ :	0.20

Material Properties	
Rebar Yield Strength, Fy:	60000 psi
Concrete Strength, F'c:	4000 psi
Concrete Unit Weight, δ_c :	0.147 kcf
Seismic Zone, z:	1

Rebar Properties	
Pier Rebar Size, Sp:	11
Pier Rebar Quantity, mp:	36
Pad Rebar Size, Spad:	11
Pad Rebar Quantity, mpad:	28
Pier Tie Size, St:	5
Tie Quantity, mt:	12
	7

Design Checks			
	Capacity/ Availability	Demand/ Limits	Check
Req'd Pier Diam. (ft)	7	5.917	OK
Overturning (ft-kips)	13289.58	4928.00	OK
Shear Capacity (kips)	130.61	41.00	OK
Bearing (ksf)	7.06	2.55	OK
Pad Shear - 1-way (kips)	1743.83	1125.25	OK
Pad Shear - 2-way (kips)	3722.12	1861.06	OK
Pier Rebar Area (in^2)	56.16	27.71	OK
Pad Rebar Area (in^2)	43.68	34.76	OK
Pier Moment Capacity (k-ft)	6745.62	4784.50	OK
Pier Bar Spacing (in)	5.40	18 > s > 2	OK
Pad Bar Spacing (in)	11.65	18 > s > 2	OK
Pier Development Length (in)	75	25.74	OK
Pad Development Length (in)	39	25.74	OK
Hook Development Length (in)	177.00	18.73	OK
Rebar Hook Length (in)	138.00	23.97	OK

Modification Checks			
	Capacity/ Availability	Demand/ Limits	Check
Sleeve Rebar Area (in2):	15.8	0.00	Not Used
Sleeve Moment Capacity (k-ft):	6745.62	4784.50	Not Used
Sleeve Rebar Spacing (in):	N/A	18 > s > 2	Not Used
Sleeve Tie Spacing (in):	N/A	9 > s > 4.5	Not Used
Minimum Extra Thickness (in):	0	0	Not Used
Pad Rebar Area-short (in2):	0.44	0.00	Not Used
Pad Rebar Area-long (in2):	0.44	0.00	Not Used
Pad Rebar Spacing-short (in):	117.5	18 > s > 2	Not Used
Pad Rebar Spacing-long (in):	117.5	18 > s > 2	Not Used
End Cap Width (in):	0	0	Not Used
End Cap Rebar Area (in2):	3.16	0	Not Used
Rebar Spacing (in):	-3.00	18 > s > 2	Not Used
Tie Spacing (in):	24.79	354 > s > 4.5	Not Used
Dowel Area (in2):	2.2	0.00	Not Used
Dowel Embedment (in):	9	6	Not Used
Cone Shear Strength (kips):	25.15	23.78	Not Used
Dowel Edge Dist (in):	12.00	4.78	Not Used
Dowel Spacing (in):	84.00	18.00	Not Used
Dowel Edge Dist (vert) (in):	21.00	4.78	Not Used
Dowel Devel. Length (in):	-3.00	13.32	Not Used

Modifications			
	Pier Sleeve, ds:	End Cap Width, Wc:	
Revised Pier Diameter, dx:	7	Revised Width, Wx:	0 ft
PS Rebar Size, Ss:	8	EC Rebar Size, Sec:	30 ft
Rebar Quantity, ms:	20	Rebar Quantity, mec:	8 per side, top & bottom
Tie Size, Sst:	3	EC Tie Size, Sect:	4 per side
Tie Quantity, mst:	9	Tie Quantity, mect:	15
Pad Thickness, Te:	0	EC Dowel Size, Secd:	6 per side
Revised Pier Thickness, Tx:	3.50	Dowel Quantity, mecd:	5
Rebar Size, Se:	3	Rows of Dowels, Nd:	1
Rebar Quantity (long), me:	4	Dowel Depth, decd:	9 in
Rebar Quantity (short), mex:	4	Edge Distance, eecd:	12 in
Dowel Size, Sed:	3		
Dowel Quantity, med:	0		

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

TIA Rev F

Site Data

BU#: 806939
Site Name: NHV 2071 143137
App #: 121278, Rev. 0

Pole Manufacturer: Other

Reactions

Moment:	4518	ft-kips
Axial:	49	kips
Shear:	41	kips

Anchor Rod Data

Qty:	24	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	61.38	in

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

Anchor Rod Results

Maximum Rod Tension: 145.2 Kips
Allowable Tension: 195.0 Kips
Anchor Rod Stress Ratio: 74.5% **Pass**

Rigid

Service, ASD
Fty*ASIF

Plate Data

Diam:	67.38	in
Thick:	2.5	in
Grade:	60	ksi
Single-Rod B-eff:	7.10	in

Base Plate Results

Base Plate Stress: 51.9 ksi
Allowable Plate Stress: 60.0 ksi
Base Plate Stress Ratio: 86.6% **Pass**

Flexural Check

Rigid

Service ASD
0.75*Fy*ASIF
Y.L. Length:
30.96

Stiffener Data (Welding at both sides)

Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

Stiffener Results

Horizontal Weld : n/a
Vertical Weld: n/a
Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$: n/a
Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$: n/a
Plate Comp. (AISC Bracket): n/a

Pole Results

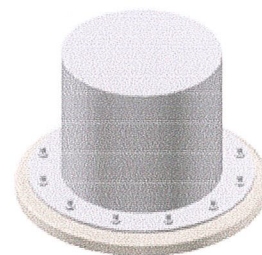
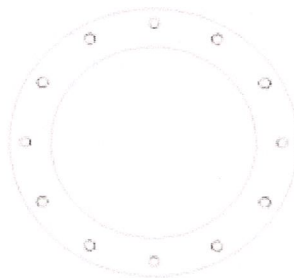
Pole Punching Shear Check: n/a

Pole Data

Diam:	53	in
Thick:	0.5625	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF: 1.333



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

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

P65-16-XLH-RR Dual Broadband Antennas

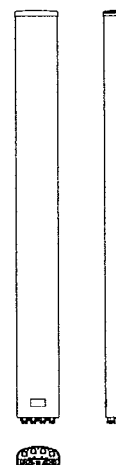
POLARIZATION: Dual linear $\pm 45^\circ$
 FREQUENCY (MHz): 698-894, 1710-2170
 HORIZONTAL BEAM WIDTH ($^\circ$): 65, 65
 GAIN (dBi/dBd): 15.5/13.4 17.5/15.4
 TILT: 1-12, 0-8
 LENGTH: 72"

ELECTRICAL SPECIFICATIONS*

	698-894			1710-2170	
Frequency range (MHz)	698-806	806-894		1710-1880	1850-1990
Frequency band (MHz)	14.8/12.7	15.5/13.4		16.9/14.8	17.2/15.1
Gain (dBi/dBd)					17.5/15.4
Polarization	Dual Linear +/- 45			Dual Linear +/- 45	
Nominal Impedance (Ω)	50			50	
VSWR	< 1.5:1			< 1.5:1	
Horizontal beam width, -3 dB ($^\circ$)	66	65		60	63
Vertical beam width, -3 dB ($^\circ$)	14.7	12.5		6.8	5.7
Electrical down tilt ($^\circ$)	1 to 12			0 to 8	
Side lobe suppression, vertical 1st upper (dB)	> 16	> 16		> 16	
	> 16	> 16			
Isolation between inputs (dB)	> 30	> 30		> 30	> 30
Inter band Isolation (dB)	> 40			> 40	
Tracking, horizontal plane $\pm 60^\circ$ (dB)	< 2			< 2	< 2
First null fill (dB)				> -20	> -20
Vertical beam squint ($^\circ$)	< 0.8	< 0.8		< 0.5	< 0.5
Front to back ratio (dB) $180^\circ \pm 30^\circ$ copolar	> 24	> 24		> 30	> 28
Front to back ratio (dB) $180^\circ \pm 30^\circ$ total power					
Cross polar discrimination (XPD) 0° (dB)	> 15	> 15		> 15	> 15
Cross polar discrimination (XPD) $\pm 60^\circ$ (dB)	> 10	> 10		> 10	> 10
Far field coupling					
IM3, 2xTx@43dBm (dBc)	< -153			< -153	
IM7, 2xTx@43dBm (dBc)					
Power handling, average per input (W)	500			250	
Power handling, average total (W)	1000			500	

MECHANICAL SPECIFICATIONS*

Connector	4 X 7/16 DIN Female, IP67
Connector position	Bottom
Dimensions, HxWxD, mm (ft)	72" x 12" x 6" (1829 x 305 x 152)
Mounting	Pre-mounted Tilt Brackets
Weight, with brackets, kg (lbs)	29 (64)
Weight, without brackets, kg (lbs)	24 (53)
Wind load, frontal/lateral/rear side 42 m/s Cd=1.6 (N)	1380
Maximum operational wind speed, m/s (mph)	100 (45)
Survival wind speed, m/s (mph)	150 (67)
Lightning protection	DC Ground
Operating Temperature	-40C to +60C
Radome material	PVC, IP55
Packet size, HxWxD, mm (ft)	87" x 16" x 10" (2225 x 400 x 225)
Radome colour	Light Grey
Shipping weight, kg (lbs)	34 (75)
RET	IRET AISGv1.1, MET and AISGv2.0
Brackets	7256.00, 7454.00



*All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data.

ANTENNA PATTERNS*

For detailed patterns visit <http://www.powerwave.com/rpa/>.

POWER

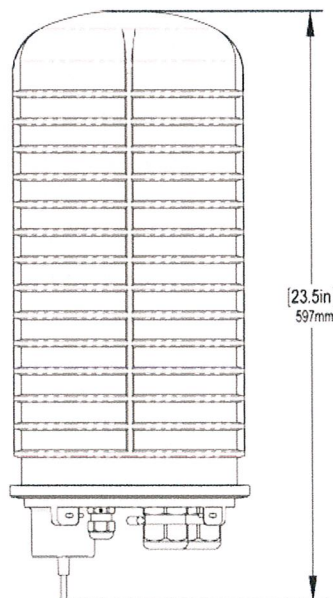
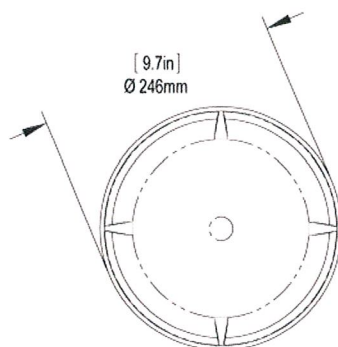
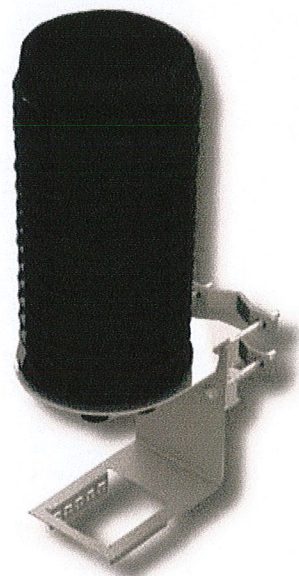
DC6-48-60-18-8F

DC Surge Suppression Solution

The DC6-48-60-18 is a dual chambered, DC surge suppression system for use in multi-circuit, Distributed Antenna Systems. The system will protect up to 6 Remote Radio Heads from voltage surges and lightning, and connect up to 18 fiber pairs. The system is enclosed in a NEMA 4 rated, waterproof enclosure.

FEATURES

- Protects up to 6 Remote Radio Heads, each with its own protection circuit.
- Flexible design allows for installation at the top of a tower for Remote Radio Head protection.
- Includes fiber connections for up to 18 pairs of fiber.
- LED indicators on individual circuits provide visual indication of suppressor status.
- Form 'C' relays allow for remote monitoring of the suppressor status.
- Patented Strikesorb technology provides over 60 kA of surge current capacity per circuit.
- Strikesorb suppression modules are fully recognized to UL 1449-3rd Edition Safety Standard, meeting all intermediate and high current fault requirements to facilitate use in OEM applications.
- Raycap recommends that DC protection system be installed within 2 meters or 6 feet of the radio.
- Dome design is lightweight and aerodynamic providing maximum flexibility for installation on top of towers.



Raycap

DC6-48-60-18-8F

DC Power Surge Protection

Electrical Specifications	
Model Number	DC6-48-60-18-8F
Nominal Operating Voltage	48 VDC
Nominal Discharge Current (I_n)	20 kA 8/20 μ s
Maximum Discharge Current (I_{max}) per NEMA LS-1	60 kA 8/20 μ s
Maximum Continuous Operating Voltage (U_c)	75 VDC
Voltage Protection Rating	400 V

Mechanical Specifications	
Suppression Connection Method	Compression lug, #2-#14 AWG Copper, #2-#12 Aluminum
Fiber Connection Method	LC-LC Single mode duplex
Environmental Rating	IP 68, 7m 72hrs
Operating Temperature	-40° C to + 80° C
Storage Temperature	-70° C to + 80° C
Cold Temperature Cycling	IEC 61300-2-22e -30° C to + 60° C 200 hrs @ 5 psi
Resistance to Aggressive Materials	CEI IEC 61073-2 including acids and bases
UV Protection	ISO 4892-2 Method A Xenon-Arc 2160 hrs
Weight	20 lbs without Mounting Bracket

STANDARDS

Strikesorb modules are compliant to the following Surge Protection Device (SPD) Standards:

- ANSI/UL 1449 - 3rd Edition
- IEEE C62.41
- NEMA LS-1, IEC 61643-1:2005 2nd Edition:2005
- IEC 61643-12
- EN 61643-11:2002 (including A11:2007)



Raycap

G02-00-068 REV 050610



GS-07F-0435V



Certified to
ISO 9001:2000



TÜV Rheinland
of North America

Raycap, Inc. 806 W. Clearwater Loop • Post Falls • Idaho • 83854 • USA
Phone 208.777.1166 • Toll Free 800.890.2569 • Fax 208.777.4466 • www.raycapsurgeprotection.com

RRUS 11 – Dual PA RRU.

Technical Data

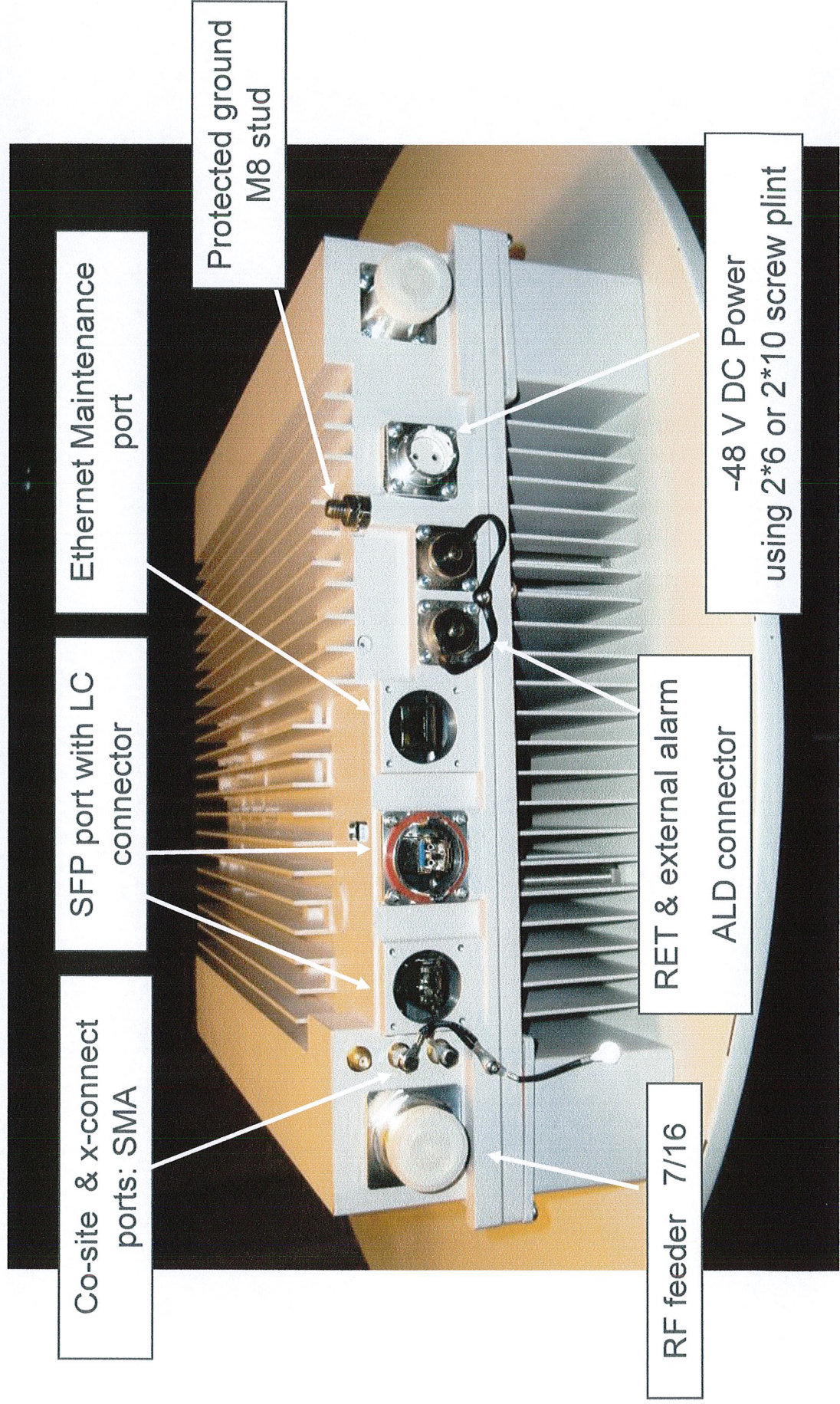
- > Multi standard
- > RF: 2x30 Watts
- > Carrier BW: 1.4 – 20 MHz
- > Alarms: 2
- > Dimensions (with sunshield):
 - Width: 17.0 in
 - Height: 17.8 in
 - Depth: 7.2 in
 - Weight: 55 lbs (Band 12)
 - Weight: 50 lbs (Band 4)
- > Temperature: -40 to +131 F
- > Cooling: Self convection
- > Power: -48 VDC
- > Rec. fuse size 20 Amp
 - Rec. DC cable:
 - > 6 mm² up to 60 meters
 - > 10 mm² over 60 meters
 - > Shielded
- > Power Cons: 200 Watts typ.



RRUS-11 I/F



RBS6000



TT19-08BP111-001

TMA Twin 1900 with 850 Bypass 12 dB AISG 1.1

ELECTRICAL SPECIFICATIONS

UL Frequency Range (MHz)	1850-1910 with 824-894 bypass
UL Rejection	>77 dB
UL Gain(dB)	12
UL Return Loss	>18
UL Noise Figure	<1.7 dB, Typical
UL Output 3rd Order Intercept Point(dBm)	>+23
UL Bypass Loss(dB)	2.5, Typical
UL Max Input Power (dBm)	+14 dBm
DL Frequency Range (MHz)	1930-1990 with 824-894 bypass
DL Return Loss	>18
DL Insertion Loss (dB)	850 MHz, <0.3; 1900 MHz, <0.5
Intermodulation	@ 2 x +43 dBm TX carriers, In receive band, <160 dBc, referred to antenna port
Input Voltage (V)	AISG Mode: 10-30; Current alarm mode: 8 -17
Alarm Functionality	AISG compatible or in case of no AISG command received, current alarm mode 170-190 mA
Power Consumption	<1.1W @12V
Power Handling, RMS	850: >57 dBm; 1900: >55 dBm
AISG Compatibility	AISG 1.1 fully upgradable to AISG 2.0 (AISG version only dependent on loaded SW version) TT19-08BP112-001 has AISG 2.0 loaded from factory

MECHANICAL SPECIFICATIONS

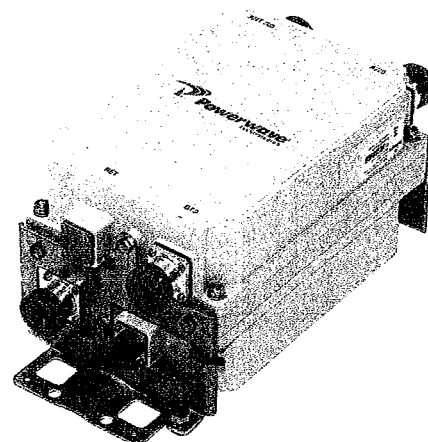
Dimension HxWxD mm(ft)	250x169x137 mm (9.9"x6.7"x5.4")
Weight(lbs)	<16
Colors	Off white (NCS 1502-R)
RF Connectors	DIN 7/16 female, long neck
Mounting Kit	Mounting kit for pole and wall is included

ENVIRONMENTAL SPECIFICATIONS

Temperature Range	-40° C to +65° C (-40° F to +149° F)
Operational	ETS 300 019-1-4
Transportation	ETS 300 019-1-2
Storage	ETS 300 019-1-1
Lightning Protection	3 kA 10/350 µs; 20 kA (Shield)
Housing	Aluminum
MTBF	>1 million hours per TMA
Ingress Protection	IP65 and IP68

APPROVAL AND TESTS

Safety	EN60950
EMC	3GPP: TS 25.113



*All specifications subject to change without notice. Contact your Powerwave representative for complete performance data.



New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 463-5511
Fax: (860) 513-7190

Douglas L. Culp
Real Estate Consultant

June 29, 2011

Honorable James Zeoli
1st Selectman, Town of Orange
Orange Town Hall
617 Orange Center Road
Orange, CT 06477

Re: Telecommunications Facility – 800 Ogg Meadow Road Orange, CT

Dear First Selectman Zeoli:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System (“UMTS”) and Long Term Evolution (“LTE”) capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC (“AT&T”) will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies (“R.C.S.A.”) Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review AT&T’s proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter to the Siting Council fully describes Cingular’s proposal for the referenced cell site. However, if you have any questions or require any further information on our plans or the Siting Council’s procedures; please call me at (860) 463-5511 or Ms. Linda Roberts, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Douglas L. Culp
Real Estate Consultant

Enclosure