



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 20, 2011

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

RE: **EM-CING-107-110531** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 700 Grassy Hill 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 May 31, 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 6, 2011

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

RE: **EM-CING-107-110531** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 700 Grassy Hill Road, Orange, Connecticut.

Dear First Selectman Zeoli:

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

If you have any questions or comments regarding this proposal, please call me or inform the Council by June 20, 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

EM-CING-107-110531

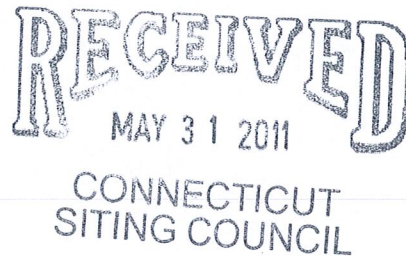


Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 463-5511
Fax: (860) 513-7190

Douglas L. Culp
Real Estate Consultant

HAND DELIVERED

May 31, 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 700 Grassy Hill Road Orange, CT (owner 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 the last step toward the 4th generation (4G) of radio technologies, 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.

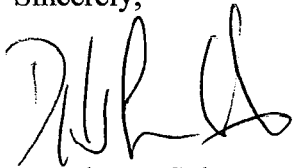
The changes to the facility do not constitute modifications as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within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

A handwritten signature in black ink, appearing to read 'D. Culp', with a stylized flourish at the end.

Douglas L. Culp
Real Estate Consultant

Attachments

NEW CINGULAR WIRELESS PCS, LLC
Equipment Modification

700 Grassy Hill Road Orange, CT
Site Number 3159
Exempt Mod

Tower Owner/Manager **Crown Castle**

Equipment configuration: Monopole

Current and/or approved: Six Kathrein antennas @ 140 ft
Six PowerWave TMA's @ 140 ft
Six runs 1 5/8 inch coax to 140 ft
Equipment Shelter

Planned Modifications: Retain existing Kathrein Antenna's and TMA's at 140 ft
Retain all Coax Cabling
Install three PowerWave P65-16 antennas or equivalent @ 140 ft
Install six remote radio heads and surge arrestor @ 140 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 60.0% 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 61.9 % of the standard.

Existing

Other Users							47.31
AT&T UMTS	140	1900 Band	1	500	0.0092	1.0000	0.92
AT&T UMTS	140	800 Band	1	500	0.0092	0.5867	1.56
AT&T GSM	140	800Band	6	296	0.0326	0.5867	5.55
AT&T GSM	140	1900 Band	6	427	0.0470	1.0000	4.70
Total							60.0%

* 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							47.31
AT&T UMTS	140	800 Band	1	500	0.0092	0.5867	1.56
AT&T UMTS	140	1900 Band	1	500	0.0092	1.0000	0.92
AT&T GSM	140	1900 Band	6	427	0.0470	1.0000	4.70
AT&T GSM	140	880 - 894	6	296	0.0326	0.5867	5.55
AT&T LTE	140	740 - 746	1	500	0.0092	0.4933	1.86
Total							61.9%

* Data for other users are from Siting Council records.

Structural information:

The attached structural analysis demonstrates that the monopole and foundation have adequate structural capacity to accommodate the proposed modifications. (Vertical Structures, Inc. dated 4-25-11).

GENERAL NOTES

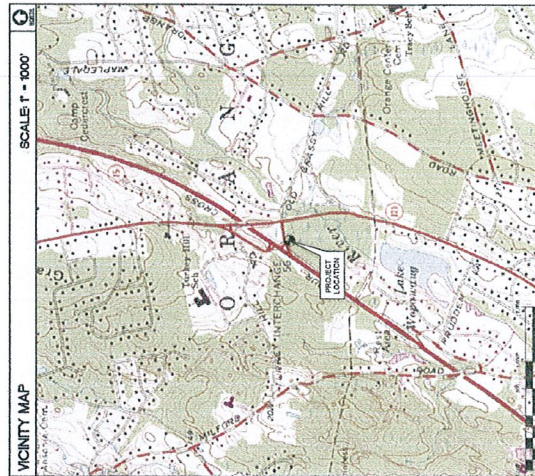
- ## PROJECT SUMMARY

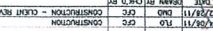
1. THE PROPOSED SCOPE OF WORK GENERALLY CONSISTS OF THE INSTALLATION OF ONE (1) LTE ANTENNA PER SITE FOR THE PROPOSED 4G LTE NETWORK. THE ANTENNA ARRAY IS A TRANSMITTING EQUIPMENT LAST (TREL) WHICH WILL BE INSTALLED AT GRADE AND ADJACENT TO THE EXISTING AT&T OUTDOOR EQUIPMENT CABINETS.
2. ADDITIONALLY, (2) REMOTE RADIO UNITS (RRU) PER SITE WILL BE INSTALLED IN PROXIMITY TO THE PROPOSED LTE ANTENNAS. SURGE ARRESTORS WILL BE INSTALLED AT BOTH AT&T RRU AND RRE EQUIPMENT LOCATIONS. REFER TO THESE ATTACHED DRAWINGS FOR THE PROPOSED EQUIPMENT LOCATIONS.

PROJECT INFORMATION

ART SITE NUMBER:	01519	ART LOCALITY:	INTERSTATE DRIVE, SUITE 1A ROCKY HILL, CT 06067	PROJECT COORDINATES:	LATITUDE 41-17'-27.5" N LONGITUDE 71-57'-34.5" W
TAX SITE NAME:	ORANGE - GRASSY HILL	OWNER:	CELESTY ENGINEERING, INC. 61-2 NORTH BRANSTED RD. BRANFORD, CT 06405		
TE ADDRESS:	700 GRASSY HILL ROAD ORANGE, CT 06477				

SHEET INDEX			REV.
SHEET NO.	DESCRIPTION		
1	TITLE SHEET	1	
N-1	NOTES AND SPECIFICATIONS	1	
C-1	PLANS AND ELEVATION	1	
C-2	LIFE SYSTEM EQUIPMENT PLANS & DETAILS	1	
E-1	ELECTRICAL DETAILS AND NOTES	1	
E-2	ELECTRICAL DETAILS	1	

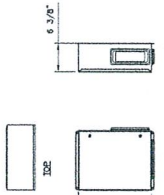


DATE: 02/07/11		SCALE: AS NOTED		JOB NO: 11021.0001	
SITE NAME: ORANGE - GRASSY HILL					
SITE NUMBER: CT159					
UNLESS OTHERWISE NOTED					
AT&T MOBILITY					
700 GRASSY HILL ROAD GRASSY CT 00477					
www.CentexRF.com					
 					
					
1. 02/08/11 2. 02/08/11 3. 02/08/11 4. 02/08/11 5. 02/08/11 6. 02/08/11 7. 02/08/11 8. 02/08/11 9. 02/08/11 10. 02/08/11 11. 02/08/11 12. 02/08/11 13. 02/08/11 14. 02/08/11 15. 02/08/11 16. 02/08/11 17. 02/08/11 18. 02/08/11 19. 02/08/11 20. 02/08/11 21. 02/08/11 22. 02/08/11 23. 02/08/11 24. 02/08/11 25. 02/08/11 26. 02/08/11 27. 02/08/11 28. 02/08/11 29. 02/08/11 30. 02/08/11 31. 02/08/11 32. 02/08/11 33. 02/08/11 34. 02/08/11 35. 02/08/11 36. 02/08/11 37. 02/08/11 38. 02/08/11 39. 02/08/11 40. 02/08/11 41. 02/08/11 42. 02/08/11 43. 02/08/11 44. 02/08/11 45. 02/08/11 46. 02/08/11 47. 02/08/11 48. 02/08/11 49. 02/08/11 50. 02/08/11 51. 02/08/11 52. 02/08/11 53. 02/08/11 54. 02/08/11 55. 02/08/11 56. 02/08/11 57. 02/08/11 58. 02/08/11 59. 02/08/11 60. 02/08/11 61. 02/08/11 62. 02/08/11 63. 02/08/11 64. 02/08/11 65. 02/08/11 66. 02/08/11 67. 02/08/11 68. 02/08/11 69. 02/08/11 70. 02/08/11 71. 02/08/11 72. 02/08/11 73. 02/08/11 74. 02/08/11 75. 02/08/11 76. 02/08/11 77. 02/08/11 78. 02/08/11 79. 02/08/11 80. 02/08/11 81. 02/08/11 82. 02/08/11 83. 02/08/11 84. 02/08/11 85. 02/08/11 86. 02/08/11 87. 02/08/11 88. 02/08/11 89. 02/08/11 90. 02/08/11 91. 02/08/11 92. 02/08/11 93. 02/08/11 94. 02/08/11 95. 02/08/11 96. 02/08/11 97. 02/08/11 98. 02/08/11 99. 02/08/11 100. 02/08/11 101. 02/08/11 102. 02/08/11 103. 02/08/11 104. 02/08/11 105. 02/08/11 106. 02/08/11 107. 02/08/11 108. 02/08/11 109. 02/08/11 110. 02/08/11 111. 02/08/11 112. 02/08/11 113. 02/08/11 114. 02/08/11 115. 02/08/11 116. 02/08/11 117. 02/08/11 118. 02/08/11 119. 02/08/11 120. 02/08/11 121. 02/08/11 122. 02/08/11 123. 02/08/11 124. 02/08/11 125. 02/08/11 126. 02/08/11 127. 02/08/11 128. 02/08/11 129. 02/08/11 130. 02/08/11 131. 02/08/11 132. 02/08/11 133. 02/08/11 134. 02/08/11 135. 02/08/11 136. 02/08/11 137. 02/08/11 138. 02/08/11 139. 02/08/11 140. 02/08/11 141. 02/08/11 142. 02/08/11 143. 02/08/11 144. 02/08/11 145. 02/08/11 146. 02/08/11 147. 02/08/11 148. 02/08/11 149. 02/08/11 150. 02/08/11 151. 02/08/11 152. 02/08/11 153. 02/08/11 154. 02/08/11 155. 02/08/11 156. 02/08/11 157. 02/08/11 158. 02/08/11 159. 02/08/11 160. 02/08/11 161. 02/08/11 162. 02/08/11 163. 02/08/11 164. 02/08/11 165. 02/08/11 166. 02/08/11 167. 02/08/11 168. 02/08/11 169. 02/08/11 170. 02/08/11 171. 02/08/11 172. 02/08/11 173. 02/08/11 174. 02/08/11 175. 02/08/11 176. 02/08/11 177. 02/08/11 178. 02/08/11 179. 02/08/11 180. 02/08/11 181. 02/08/11 182. 02/08/11 183. 02/08/11 184. 02/08/11 185. 02/08/11 186. 02/08/11 187. 02/08/11 188. 02/08/11 189. 02/08/11 190. 02/08/11 191. 02/08/11 192. 02/08/11 193. 02/08/11 194. 02/08/11 195. 02/08/11 196. 02/08/11 197. 02/08/11 198. 02/08/11 199. 02/08/11 200. 02/08/11 201. 02/08/11 202. 02/08/11 203. 02/08/11 204. 02/08/11 205. 02/08/11 206. 02/08/11 207. 02/08/11 208. 02/08/11 209. 02/08/11 210. 02/08/11 211. 02/08/11 212.					

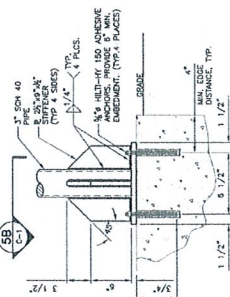
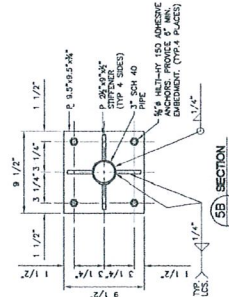
SURGE ARRESTOR		SUPPORT FRAME AT PERCELL RISE CABINET	
SITE TYPE	ARRESTOR MAKE/MODEL	CITY REQUIRED	ARRESTOR LOCATION
TOWER	RAYCAP	(1) PER SITE	
MODEL	DB-48-60-3-1B		

NOTES:

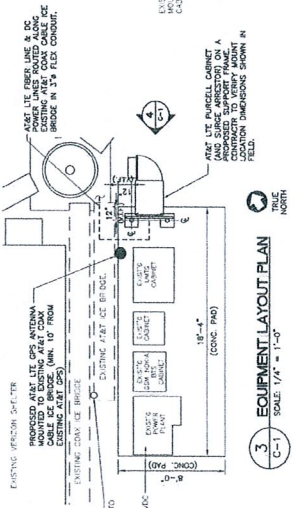
1. CONTRACTOR TO COORDINATE WITH SURGE ARRESTOR MANUFACTURER MODEL SELECTION(S) WITH CITY REQUIREMENTS.
2. CONTRACTOR TO INSTALL ARRESTOR IN CONFORMANCE WITH MANUFACTURER'S INSTRUCTIONS.



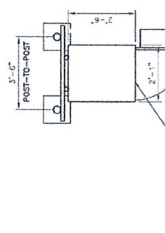
6 SURGE ARRESTOR DETAIL
C-1 NOT TO SCALE



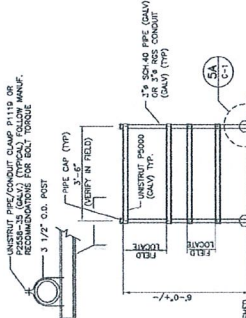
5A FRAME TO CONCRETE CONNECTION DETAIL
C-1 NOT TO SCALE



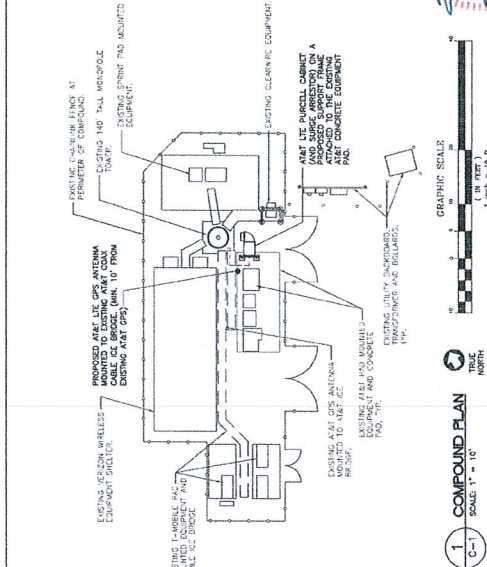
3 EQUIPMENT LAYOUT PLAN
C-1 SCALE 1/4" = 1'-0"



4 PERCELL CABINET MOUNTING DETAIL
C-1 NOT TO SCALE



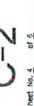
5 EQUIPMENT MOUNTING FRAME DETAIL
C-1 NOT TO SCALE

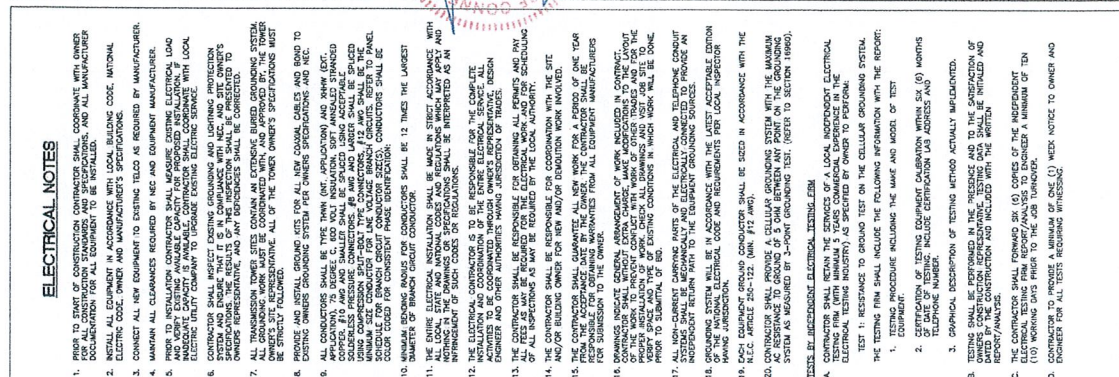


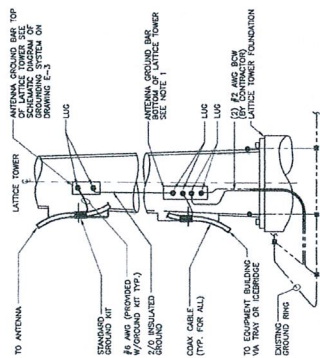
1 COMPOUND PLAN
C-1 SCALE 1" = 10'



2 TOWER ELEVATION
C-1 SCALE 1" = 10'

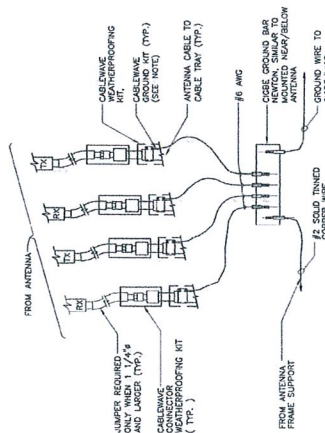


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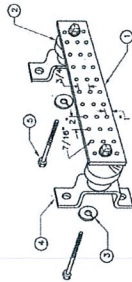
1 ANTENNA CABLE GROUNDING - MONOPOLE

E-2 / NOT TO SCALE



3 CONNECTION OF GROUND WIRES TO GROUND BAR

E-2 / NOT TO SCALE

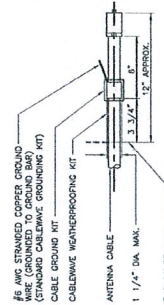


LEGEND

1. TINNED COPPER GROUND BAR, 1/4" x 4" x .063"
PHOTOGRAPHIC SUPPLY CO. HOLE CENTERS TO MATCH
NEWMA DOUBLE JUV.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 2,
3061-4.
3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO.
CAT. NO. 3055-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO.
CAT. NO. A-6056.
5. STAINLESS STEEL SECURITY SCREWS.

2 GROUND BAR DETAIL

E-2 / NOT TO SCALE



4 ANTENNA CABLE GROUNDING DETAIL

E-2 / NOT TO SCALE

[illegible]

Date: April 25, 2011



Greg Guzzie
Crown Castle USA Inc.
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2620

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

Subject: Structural Analysis Report

Carrier Designation:

AT&T Mobility Change-Out

Carrier Site Number:

3159

Carrier Site Name:

Orange-Grassy Hill
Road

Crown Castle Designation:

Crown Castle BU Number:

881541

Crown Castle Site Name:

Rogers Property

Crown Castle JDE Job Number:

154919

Crown Castle Work Order Number:

402290

Engineering Firm Designation:

Vertical Structures, Inc. Project Number:

2011-004-038

Site Data:

Grassy Hill Road, Orange, CT, New Haven County

Latitude 41° 17' 7.75", Longitude -73° 2' 33.27"

139.5 Foot - Monopole Tower

Dear Greg Guzzie,

Vertical Structures, Inc. is pleased to submit this "**Structural Analysis Report**" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 412563, in accordance with application 121356, 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

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

Sufficient Capacity

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

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

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

Respectfully submitted by:


Nathan Coomes, P.E.
Project Engineer

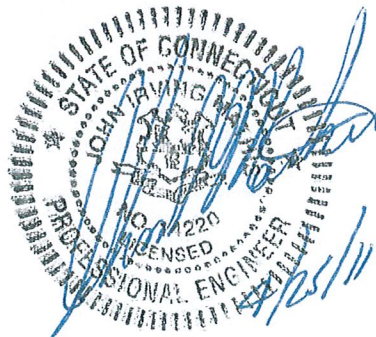


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Additional Calculations

1) INTRODUCTION

This tower is a 139.5 ft Monopole tower designed by EEI in 2004. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice and 50 mph under service loads. Also, per Crown Castle's direction and in accordance with ASCE-7-05 we have considered a fastest mile wind speed of 38 mph with an escalating 0.75 inch ice thickness.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
136	140	6	ericsson	RRUS-11 BTS	2 1	3/8 5/8	
		3	kathrein	800 10121 w/ mount pipe			
		3	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F Surge Arrestor			
	136	1		T-Arm Mount [TA 602-3]			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
136	136	3	powerwave technologies	7770.00 w/ mount pipe			4
		6	powerwave technologies	LGP21401 TMA	6	1 5/8	1
130	132	3	argus technologies	LLPX310R w/ Mount Pipe	4	1/2 5/16	1
		2	dragonwave	A-ANT-23G-2-C			
		3	samsung telecommunications	FDD_R6_RRH TMA			
	130				6	1 5/8	5
		1		12' (4" Tube) T-Arm (3)	6	1 5/8	1
		6	css	CSS-XS4-65-R w/ Mount Pipe			
118	118	9	ems wireless	FV65-14-00NA2 w/Mount Pipe	9	1 5/8	3
		1		T-Arm Mount [TA 602-3]	12	1 5/8	1
		6	celwave	FD9R6004/2C-3L Diplexer			2
		6	decibel	DB846F65ZAXY w/Mount Pipe			1
		3	powerwave technologies	P65.16.XL.2 w/ Mount Pipe			
		3	rymsa	MG D3-800Tx w/ Mount Pipe			
108	109	3	ems wireless	RR90-17-02DP w/ Mount Pipe	12	1 5/8	1
		6	ericsson	KRY 112 71 TMA			
		3	rfs	APXV18-206516S-C-A20 w/ Mount Pipe			
		3	rfs	ATMAA1412D-1A20 TMA			
100	108	1		T-Arm Mount [TA 602-3]	6	1 5/8	1
	100	3	kathrein	742 213 w/ Mount Pipe			
75	77	1	lucent	KS24019-L112A	1	1/2	1
	75	1		Side Arm Mount [SO 701-1]			

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) MLA Equipment Controlling
- 4) Equipment to be Removed
- 5) Abandoned Equipment

Table 3 - Design Antenna and Cable Information

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

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	AT&T Mobility Change-Out Revision #0	121356	CCI iSite
Tower Drawing	EEI Drawing No. GS55077	2207700	CCI iSite
Foundation Drawing	EEI Drawing No. 12364-140	2208511	CCI iSite
Geotechnical Report	Clarence Welti Assoc., Inc. Report Dated 'February 16, 2004'	2245154	CCI iSite

3.1) Analysis Method

RISATower (version 5.4.2.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. Crown Castle's CCIplate 1.4 analysis tool was used to evaluate the anchor bolts, base plate, and any flange splices.

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
L1	139.5 - 93.04	Pole	TP26.99x15.5x0.25	1	-7791.42	1063078.12	91.5	Pass
L2	93.04 - 46.38	Pole	TP37.91x25.5205x0.375	2	-16692.40	2242999.02	87.6	Pass
L3	46.38 - 0	Pole	TP48.5x35.874x0.375	3	-23665.60	2608480.94	93.1	Pass
							Summary	
						Pole (L3)	93.1	Pass
						Rating =	93.1	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	71.7	Pass
1	Base Plate	0	97.0	Pass
1	Base Foundation Soil Interaction	0	82.5	Pass
Structure Rating (max from all components) =				97%

Notes:

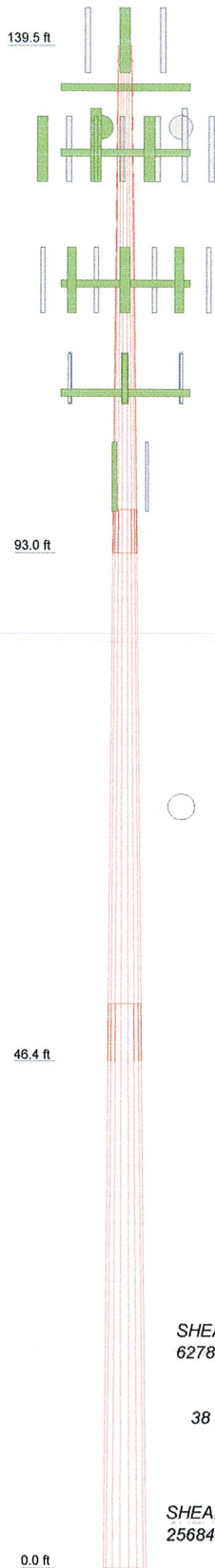
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity.
- 2) Capacities up to 105% are considered acceptable based on analysis methods used.

4.1) Recommendations

N/A

APPENDIX A
RISA TOWER OUTPUT

Section	1	2	3	
Length (ft)	46.46	50.58	51.63	
Number of Sides	18	18	18	
Thickness (in)	0.2500	0.3750	0.3750	
Socket Length (ft)	3.92	5.25		
Top Dia (in)	15.5000	25.5205	35.8740	
Bot Dia (in)	26.9900	37.9100	48.5000	
Grade		A572-65		
Weight (lb)	2633.8	6420.3	8743.3	17797.4



DESIGNED APPURTENANCE LOADING

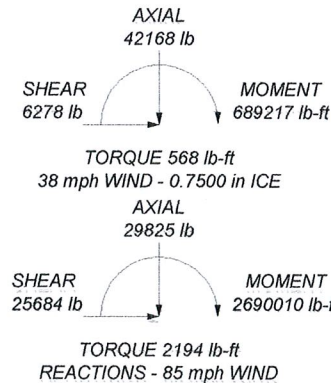
TYPE	ELEVATION	TYPE	ELEVATION
T-Arm Mount [TA 602-3] (ATT Mobility)	136	A-ANT-23G-2-C (VSI)	130
800 10121 w/ mount pipe (ATT Mobility)	136	(2) DB846F65ZAXY w/Mount Pipe	118
800 10121 w/ mount pipe (ATT Mobility)	136	(2) DB846F65ZAXY w/Mount Pipe	118
800 10121 w/ mount pipe (ATT Mobility)	136	MG D3-800Tx w/ Mount Pipe	118
800 10121 w/ mount pipe (ATT Mobility)	136	MG D3-800Tx w/ Mount Pipe	118
800 10121 w/ mount pipe (ATT Mobility)	136	MG D3-800Tx w/ Mount Pipe	118
P65-16-XLH-RR w/ Mount Pipe (ATT Mobility)	136	MG D3-800Tx w/ Mount Pipe	118
P65-16-XLH-RR w/ Mount Pipe (ATT Mobility)	136	P65.16.XL.2 w/ Mount Pipe	118
P65-16-XLH-RR w/ Mount Pipe (ATT Mobility)	136	P65.16.XL.2 w/ Mount Pipe	118
(2) RRUS-11 BTS (ATT Mobility)	136	(2) FD9R6004/2C-3L Diplexer	118
(2) RRUS-11 BTS (ATT Mobility)	136	(2) FD9R6004/2C-3L Diplexer	118
(2) RRUS-11 BTS (ATT Mobility)	136	(2) FD9R6004/2C-3L Diplexer	118
DC6-48-60-18-8F Surge Arrestor (ATT Mobility)	136	T-Arm Mount [TA 602-3]	118
(2) LGP21401 TMA (VSI) (ATT Mobility)	136	(2) DB846F65ZAXY w/Mount Pipe	118
(2) LGP21401 TMA (VSI) (ATT Mobility)	136	RR90-17-02DP w/ Mount Pipe	108
(2) LGP21401 TMA (VSI) (ATT Mobility)	136	RR90-17-02DP w/ Mount Pipe	108
12' (4" Tube) T-Arm (3)	130	RR90-17-02DP w/ Mount Pipe	108
(3) FV65-14-00NA2 w/Mount Pipe	130	APXV18-206516S-C-A20 w/ Mount Pipe	108
(3) FV65-14-00NA2 w/Mount Pipe	130	APXV18-206516S-C-A20 w/ Mount Pipe	108
(3) FV65-14-00NA2 w/Mount Pipe	130	APXV18-206516S-C-A20 w/ Mount Pipe	108
LLPX310R w/ Mount Pipe	130	(2) KRY 112 71 TMA	108
LLPX310R w/ Mount Pipe	130	(2) KRY 112 71 TMA	108
LLPX310R w/ Mount Pipe	130	(2) KRY 112 71 TMA	108
FDD_R6_RRH TMA	130	ATMAA1412D-1A20 TMA	108
FDD_R6_RRH TMA	130	ATMAA1412D-1A20 TMA	108
FDD_R6_RRH TMA	130	ATMAA1412D-1A20 TMA	108
6"x4" Pipe Mount	130	(2) 7"x2" Antenna Mount Pipe	108
6"x4" Pipe Mount	130	(2) 7"x2" Antenna Mount Pipe	108
A-ANT-23G-2-C (VSI)	130	(2) 7"x2" Antenna Mount Pipe	108
		T-Arm Mount [TA 602-3]	108
		RR90-17-02DP w/ Mount Pipe	108
		742 213 w/ Mount Pipe	100
		742 213 w/ Mount Pipe	100
		742 213 w/ Mount Pipe	100
		Side Arm Mount [SO 701-1]	75
		KS24019-L112A	75

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: 93.1%



 Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job: Rogers Property, CT BU#881541		
	Project: Vertical Structures Job No. 2011-004-038		
	Client: Crown Castle	Drawn by: ncoomes	App'd:
	Code: TIA/EIA-222-F	Date: 04/25/11	Scale: NTS
	Path: \\nas1\ncoomes\CPEN\2011-004-038 Rogers Property, CT\RSA\881541.dwg		

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	Client	Crown Castle	Designed by	ncoomes

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	Retention Guys To Initial Tension	√ All Leg Panels Have Same Allowable
√ Escalate Ice	√ Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Poles
√ Leg Bolts Are At Top Of Section	√ SR Members Have Cut Ends	Include Shear-Torsion Interaction
√ Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	√ Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination		

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	139.50-93.04	46.46	3.92	18	15.5000	26.9900	0.2500	1.0000	A572-65 (65 ksi)
L2	93.04-46.38	50.58	5.25	18	25.5205	37.9100	0.3750	1.5000	A572-65 (65 ksi)
L3	46.38-0.00	51.63		18	35.8740	48.5000	0.3750	1.5000	A572-65 (65 ksi)

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	Client	Crown Castle	Designed by	ncoomes

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	Iw/Q in ²	w in	w/t
L1	15.7391	12.1009	355.5445	5.4138	7.8740	45.1542	711.5567	6.0516	2.2880	9.152
	27.4064	21.2182	1916.7638	9.4927	13.7109	139.7983	3836.0497	10.6111	4.3102	17.241
L2	26.8892	29.9295	2390.8862	8.9267	12.9644	184.4188	4784.9184	14.9676	3.8316	10.218
	38.4948	44.6760	7952.1562	13.3249	19.2583	412.9214	15914.7760	22.3423	6.0122	16.032
L3	37.7311	42.2527	6727.0540	12.6022	18.2240	369.1315	13462.9597	21.1304	5.6538	15.077
	49.2482	57.2808	16760.5346	17.0844	24.6380	680.2717	33543.1232	28.6458	7.8760	21.003

Tower Elevation	Gusset Area (per face)	Gusset Thickness	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
ft	ft ²	in						
L1 139.50-93.04				1	1	1		
L2 93.04-46.38				1	1	1		
L3 46.38-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
LDF7-50A (1-5/8 FOAM) (AT&T Mobility)	B	No	Inside Pole	139.50 - 0.00	6	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.82 0.82 0.82 0.82 0.82
FB-L98-002-XXX (3/8") (AT&T Mobility)	B	No	Inside Pole	139.50 - 0.00	2	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.10 0.10 0.10 0.10 0.10
WR-VG86ST-BRD (Power Cable) (AT&T Mobility)	B	No	Inside Pole	139.50 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.15 0.15 0.15 0.15 0.15
LDF4-50A (1/2 FOAM)	B	No	Inside Pole	132.00 - 0.00	2	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.15 0.15 0.15 0.15 0.15
LDF4-50A (1/2 FOAM)	B	No	CaAa (Out Of Face)	132.00 - 0.00	2	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.15 0.84 2.14 6.58 22.78
9207(5/16")	B	No	Inside Pole	132.00 - 0.00	3	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.06 0.06 0.06 0.06 0.06
2" Rigid Conduit	B	No	CaAa (Out Of Face)	132.00 - 0.00	2	No Ice 1/2" Ice	0.10 0.15	2.80 4.33

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	Client	Crown Castle	Designed by	ncoomes

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	$C_A A_A$ ft^2/ft	Weight plf
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	130.00 - 0.00	9	1" Ice	6.47
						2" Ice	12.57
						4" Ice	32.12
						No Ice	0.82
						1/2" Ice	0.82
						1" Ice	0.82
						2" Ice	0.82
						4" Ice	0.82
						No Ice	1.35
561 (1-5/8 AIR)	B	No	Inside Pole	118.00 - 0.00	12	1/2" Ice	1.35
						1" Ice	1.35
						2" Ice	1.35
						4" Ice	1.35
						No Ice	0.82
						1/2" Ice	0.82
						1" Ice	0.82
						2" Ice	0.82
						4" Ice	0.82
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	109.00 - 0.00	12	No Ice	0.82
						1/2" Ice	0.82
						1" Ice	0.82
						2" Ice	0.82
						4" Ice	0.82
						No Ice	0.82
						1/2" Ice	0.82
						1" Ice	0.82
						2" Ice	0.82
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	100.00 - 0.00	6	4" Ice	0.82
						No Ice	0.82
						1/2" Ice	0.82
						1" Ice	0.82
						2" Ice	0.82
						4" Ice	0.82
						No Ice	0.15
						1/2" Ice	0.15
						1" Ice	0.15
LDF4-50A (1/2 FOAM)	B	No	Inside Pole	77.00 - 0.00	1	2" Ice	0.15
						4" Ice	0.15
						No Ice	0.00
						1/2" Ice	0.00
						1" Ice	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 lb
L1	139.50-93.04	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	7.792	1361.82
		C	0.000	0.000	0.000	0.000	0.00
L2	93.04-46.38	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	9.332	2337.13
		C	0.000	0.000	0.000	0.000	0.00
L3	46.38-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	9.276	2325.49
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	$C_A A_A$ In Face ft^2	$C_A A_A$ Out Face ft^2	Weight lb
L1	139.50-93.04	A	0.871	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	14.577	1733.31
		C		0.000	0.000	0.000	0.000	0.00
L2	93.04-46.38	A	0.819	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	17.458	2782.04
		C		0.000	0.000	0.000	0.000	0.00

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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 lb
L3	46.38-0.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	16.876	2734.88
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

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

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	$C_A A_A$ Front ft^2	$C_A A_A$ Side ft^2	Weight lb
T-Arm Mount [TA 602-3] (AT&T Mobility)	A	None		0.0000	136.00	No Ice	11.59	774.30
						1/2" Ice	15.44	990.35
						1" Ice	19.29	1206.41
						2" Ice	26.99	1638.52
						4" Ice	42.39	2502.73
800 10121 w/ mount pipe (AT&T Mobility)	A	From Centroid- Face	4.00 0.00 4.00	10.0000	136.00	No Ice	5.80	66.00
						1/2" Ice	6.34	112.31
						1" Ice	6.86	168.51
						2" Ice	7.94	302.82
						4" Ice	10.23	689.84
800 10121 w/ mount pipe (AT&T Mobility)	B	From Centroid- Face	4.00 0.00 4.00	0.0000	136.00	No Ice	5.80	66.00
						1/2" Ice	6.34	112.31
						1" Ice	6.86	168.51
						2" Ice	7.94	302.82
						4" Ice	10.23	689.84
800 10121 w/ mount pipe (AT&T Mobility)	C	From Centroid- Face	4.00 0.00 4.00	-10.0000	136.00	No Ice	5.80	66.00
						1/2" Ice	6.34	112.31
						1" Ice	6.86	168.51
						2" Ice	7.94	302.82
						4" Ice	10.23	689.84
P65-16-XLH-RR w/ Mount Pipe (AT&T Mobility)	A	From Centroid- Face	4.00 0.00 4.00	30.0000	136.00	No Ice	8.88	82.20
						1/2" Ice	9.63	147.36
						1" Ice	10.36	225.21
						2" Ice	11.75	408.26
						4" Ice	14.66	921.60
P65-16-XLH-RR w/ Mount Pipe (AT&T Mobility)	B	From Centroid- Face	4.00 0.00 4.00	30.0000	136.00	No Ice	8.88	82.20
						1/2" Ice	9.63	147.36
						1" Ice	10.36	225.21
						2" Ice	11.75	408.26
						4" Ice	14.66	921.60

RISATower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	Rogers Property, CT BU#881541	Page	5 of 11
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	Client	Crown Castle	Designed by	ncoomes

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 lb
P65-16-XLH-RR w/ Mount Pipe (AT&T Mobility)	C	From Centroid- Face	4.00 0.00 4.00	30.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.88 9.63 10.36 11.75 14.66	6.60 7.88 9.00 10.93 15.02	82.20 147.36 225.21 408.26 921.60
(2) RRUS-11 BTS (AT&T Mobility)	A	From Centroid- Face	4.00 0.00 4.00	30.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.42 4.71 5.00 5.61 6.94	1.19 1.35 1.53 1.90 2.75	55.00 80.77 109.98 179.45 368.09
(2) RRUS-11 BTS (AT&T Mobility)	B	From Centroid- Face	4.00 0.00 4.00	30.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.42 4.71 5.00 5.61 6.94	1.19 1.35 1.53 1.90 2.75	55.00 80.77 109.98 179.45 368.09
(2) RRUS-11 BTS (AT&T Mobility)	C	From Centroid- Face	4.00 0.00 4.00	30.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.42 4.71 5.00 5.61 6.94	1.19 1.35 1.53 1.90 2.75	55.00 80.77 109.98 179.45 368.09
DC6-48-60-18-8F Surge Arrestor (AT&T Mobility)	C	From Centroid- Face	4.00 0.00 4.00	30.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.22 2.44 2.66 3.15 4.21	2.22 2.44 2.66 3.15 4.21	20.00 39.25 61.47 115.61 268.16
(2) LGP21401 TMA (VSI) (AT&T Mobility)	A	From Centroid- Face	4.00 0.00 4.00	10.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.36 0.48 0.60 0.87 1.52	14.10 21.26 30.32 54.89 135.29
(2) LGP21401 TMA (VSI) (AT&T Mobility)	B	From Centroid- Face	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.36 0.48 0.60 0.87 1.52	14.10 21.26 30.32 54.89 135.29
(2) LGP21401 TMA (VSI) (AT&T Mobility)	C	From Centroid- Face	4.00 0.00 4.00	-10.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.36 0.48 0.60 0.87 1.52	14.10 21.26 30.32 54.89 135.29
**									
12' (4" Tube) T-Arm (3)	C	None		0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	13.50 16.71 19.92 26.34 39.18	13.50 16.71 19.92 26.34 39.18	600.00 750.00 900.00 1200.00 1800.00
(3) FV65-14-00NA2 w/Mount Pipe	A	From Centroid- Face	4.75 2.75 0.00	30.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	6.95 8.13 9.02 10.84 14.85	55.55 121.25 198.95 381.03 886.36
(3) FV65-14-00NA2 w/Mount Pipe	B	From Centroid- Face	4.75 2.75 0.00	30.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	6.95 8.13 9.02 10.84 14.85	55.55 121.25 198.95 381.03 886.36
(3) FV65-14-00NA2	C	From	4.75	30.0000	130.00	No Ice	8.64	6.95	55.55

<i>RISA</i>Tower <i>Vertical Structures, Inc.</i> 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	Rogers Property, CT BU#881541	Page	6 of 11
	Project	Vertical Structures Job No. 2011-004-038	Date	14:35:43 04/25/11
	Client	Crown Castle	Designed by	ncoomes

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_AA₁ Front ft²</i>	<i>C_AA₁ Side ft²</i>	<i>Weight lb</i>
w/Mount Pipe		Centroid- Face	2.75 0.00			1/2" Ice 9.29 1" Ice 9.91 2" Ice 11.18 4" Ice 13.83	8.13 9.02 10.84 14.85	121.25 198.95 381.03 886.36
LLPX310R w/ Mount Pipe	A	From Centroid- Face	4.75 2.75 2.00	40.0000	130.00	No Ice 5.43 1/2" Ice 5.99 1" Ice 6.51 2" Ice 7.57 4" Ice 9.86	3.38 4.15 4.80 6.19 9.25	50.56 89.99 138.53 255.15 597.35
LLPX310R w/ Mount Pipe	B	From Centroid- Face	4.75 2.75 2.00	10.0000	130.00	No Ice 5.43 1/2" Ice 5.99 1" Ice 6.51 2" Ice 7.57 4" Ice 9.86	3.38 4.15 4.80 6.19 9.25	50.56 89.99 138.53 255.15 597.35
LLPX310R w/ Mount Pipe	C	From Centroid- Face	4.75 2.75 2.00	0.0000	130.00	No Ice 5.43 1/2" Ice 5.99 1" Ice 6.51 2" Ice 7.57 4" Ice 9.86	3.38 4.15 4.80 6.19 9.25	50.56 89.99 138.53 255.15 597.35
FDD_R6_RRH TMA	A	From Centroid- Face	4.75 2.75 2.00	40.0000	130.00	No Ice 1.79 1/2" Ice 1.97 1" Ice 2.16 2" Ice 2.57 4" Ice 3.49	0.78 0.92 1.07 1.39 2.14	33.00 44.50 58.31 93.60 200.35
FDD_R6_RRH TMA	B	From Centroid- Face	4.75 2.75 2.00	10.0000	130.00	No Ice 1.79 1/2" Ice 1.97 1" Ice 2.16 2" Ice 2.57 4" Ice 3.49	0.78 0.92 1.07 1.39 2.14	33.00 44.50 58.31 93.60 200.35
FDD_R6_RRH TMA	C	From Centroid- Face	4.75 2.75 2.00	0.0000	130.00	No Ice 1.79 1/2" Ice 1.97 1" Ice 2.16 2" Ice 2.57 4" Ice 3.49	0.78 0.92 1.07 1.39 2.14	33.00 44.50 58.31 93.60 200.35
6'x4" Pipe Mount	B	From Centroid- Face	4.75 2.75 0.00	0.0000	130.00	No Ice 2.25 1/2" Ice 2.62 1" Ice 3.00 2" Ice 3.78 4" Ice 5.56	2.25 2.62 3.00 3.78 5.56	65.00 84.10 107.47 167.65 346.05
6'x4" Pipe Mount	C	From Centroid- Face	4.75 2.75 0.00	0.0000	130.00	No Ice 2.25 1/2" Ice 2.62 1" Ice 3.00 2" Ice 3.78 4" Ice 5.56	2.25 2.62 3.00 3.78 5.56	65.00 84.10 107.47 167.65 346.05
**								
T-Arm Mount [TA 602-3]	C	None		0.0000	118.00	No Ice 11.59 1/2" Ice 15.44 1" Ice 19.29 2" Ice 26.99 4" Ice 42.39	11.59 15.44 19.29 26.99 42.39	774.30 990.35 1206.41 1638.52 2502.73
(2) DB846F65ZAXY w/Mount Pipe	A	From Centroid- Face	6.00 0.00 0.00	-40.0000	118.00	No Ice 7.27 1/2" Ice 7.88 1" Ice 8.48 2" Ice 9.72 4" Ice 12.33	7.82 9.01 9.91 11.81 15.98	46.55 111.10 187.61 367.24 867.25
(2) DB846F65ZAXY w/Mount Pipe	B	From Centroid-	6.00 0.00	-20.0000	118.00	No Ice 7.27 1/2" Ice 7.88	7.82 9.01	46.55 111.10

RISATower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	Rogers Property, CT BU#881541	Page	7 of 11
	Project	Vertical Structures Job No. 2011-004-038	Date	14:35:43 04/25/11
	Client	Crown Castle	Designed by	ncoomes

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 lb
		Face	0.00			1" Ice 8.48	9.91	187.61
						2" Ice 9.72	11.81	367.24
						4" Ice 12.33	15.98	867.25
(2) DB846F65ZAXY w/Mount Pipe	C	From Centroid- Face	6.00 0.00 0.00	0.0000	118.00	No Ice 7.27	7.82	46.55
						1/2" Ice 7.88	9.01	111.10
						1" Ice 8.48	9.91	187.61
						2" Ice 9.72	11.81	367.24
						4" Ice 12.33	15.98	867.25
MG D3-800Tx w/ Mount Pipe	A	From Centroid- Face	6.00 0.00 0.00	-20.0000	118.00	No Ice 3.71	3.56	36.90
						1/2" Ice 4.19	4.39	69.87
						1" Ice 4.63	5.09	112.21
						2" Ice 5.65	6.54	217.21
						4" Ice 7.82	9.69	539.32
MG D3-800Tx w/ Mount Pipe	B	From Centroid- Face	6.00 0.00 0.00	-20.0000	118.00	No Ice 3.71	3.56	36.90
						1/2" Ice 4.19	4.39	69.87
						1" Ice 4.63	5.09	112.21
						2" Ice 5.65	6.54	217.21
						4" Ice 7.82	9.69	539.32
MG D3-800Tx w/ Mount Pipe	C	From Centroid- Face	6.00 0.00 0.00	-10.0000	118.00	No Ice 3.71	3.56	36.90
						1/2" Ice 4.19	4.39	69.87
						1" Ice 4.63	5.09	112.21
						2" Ice 5.65	6.54	217.21
						4" Ice 7.82	9.69	539.32
P65.16.XL.2 w/ Mount Pipe	A	From Centroid- Face	6.00 0.00 0.00	-20.0000	118.00	No Ice 8.88	6.02	62.20
						1/2" Ice 9.63	7.29	124.60
						1" Ice 10.36	8.41	199.63
						2" Ice 11.75	10.32	376.85
						4" Ice 14.66	14.36	877.75
P65.16.XL.2 w/ Mount Pipe	B	From Centroid- Face	6.00 0.00 0.00	-20.0000	118.00	No Ice 8.88	6.02	62.20
						1/2" Ice 9.63	7.29	124.60
						1" Ice 10.36	8.41	199.63
						2" Ice 11.75	10.32	376.85
						4" Ice 14.66	14.36	877.75
P65.16.XL.2 w/ Mount Pipe	C	From Centroid- Face	6.00 0.00 0.00	-20.0000	118.00	No Ice 8.88	6.02	62.20
						1/2" Ice 9.63	7.29	124.60
						1" Ice 10.36	8.41	199.63
						2" Ice 11.75	10.32	376.85
						4" Ice 14.66	14.36	877.75
(2) FD9R6004/2C-3L Diplexer	A	From Centroid- Face	6.00 0.00 0.00	-40.0000	118.00	No Ice 0.37	0.08	3.10
						1/2" Ice 0.45	0.14	5.40
						1" Ice 0.54	0.20	8.79
						2" Ice 0.75	0.34	19.61
						4" Ice 1.28	0.74	62.87
(2) FD9R6004/2C-3L Diplexer	B	From Centroid- Face	6.00 0.00 0.00	-20.0000	118.00	No Ice 0.37	0.08	3.10
						1/2" Ice 0.45	0.14	5.40
						1" Ice 0.54	0.20	8.79
						2" Ice 0.75	0.34	19.61
						4" Ice 1.28	0.74	62.87
(2) FD9R6004/2C-3L Diplexer	C	From Centroid- Face	6.00 0.00 0.00	0.0000	118.00	No Ice 0.37	0.08	3.10
						1/2" Ice 0.45	0.14	5.40
						1" Ice 0.54	0.20	8.79
						2" Ice 0.75	0.34	19.61
						4" Ice 1.28	0.74	62.87
**								
T-Arm Mount [TA 602-3]	C	None		0.0000	108.00	No Ice 11.59	11.59	774.30
						1/2" Ice 15.44	15.44	990.35
						1" Ice 19.29	19.29	1206.41

RISATower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	Rogers Property, CT BU#881541	Page	8 of 11
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	Client	Crown Castle	Designed by	ncoomes

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 lb
RR90-17-02DP w/ Mount Pipe	A	From Centroid- Face	6.00 0.00 1.00	0.0000	108.00	2" Ice	26.99	26.99	1638.52
						4" Ice	42.39	42.39	2502.73
						No Ice	4.59	3.32	34.18
						1/2" Ice	5.09	4.09	69.33
						1" Ice	5.58	4.78	113.86
						2" Ice	6.59	6.23	223.79
RR90-17-02DP w/ Mount Pipe	B	From Centroid- Face	6.00 0.00 1.00	0.0000	108.00	4" Ice	8.73	9.31	556.77
						No Ice	4.59	3.32	34.18
						1/2" Ice	5.09	4.09	69.33
						1" Ice	5.58	4.78	113.86
						2" Ice	6.59	6.23	223.79
						4" Ice	8.73	9.31	556.77
RR90-17-02DP w/ Mount Pipe	C	From Centroid- Face	6.00 0.00 1.00	0.0000	108.00	No Ice	4.59	3.32	34.18
						1/2" Ice	5.09	4.09	69.33
						1" Ice	5.58	4.78	113.86
						2" Ice	6.59	6.23	223.79
						4" Ice	8.73	9.31	556.77
						No Ice	3.76	3.20	36.95
APXV18-206516S-C-A20 w/ Mount Pipe	A	From Centroid- Face	6.00 0.00 1.00	0.0000	108.00	1/2" Ice	4.14	3.83	68.28
						1" Ice	4.57	4.47	108.25
						2" Ice	5.47	5.81	207.80
						4" Ice	7.40	8.74	512.65
						No Ice	3.76	3.20	36.95
						1/2" Ice	4.14	3.83	68.28
APXV18-206516S-C-A20 w/ Mount Pipe	B	From Centroid- Face	6.00 0.00 1.00	0.0000	108.00	1" Ice	4.57	4.47	108.25
						2" Ice	5.47	5.81	207.80
						4" Ice	7.40	8.74	512.65
						No Ice	3.76	3.20	36.95
						1/2" Ice	4.14	3.83	68.28
						1" Ice	4.57	4.47	108.25
APXV18-206516S-C-A20 w/ Mount Pipe	C	From Centroid- Face	6.00 0.00 1.00	0.0000	108.00	2" Ice	5.47	5.81	207.80
						4" Ice	7.40	8.74	512.65
						No Ice	0.68	0.45	13.20
						1/2" Ice	0.80	0.56	18.38
						1" Ice	0.93	0.68	25.16
						2" Ice	1.22	0.94	44.33
(2) KRY 112 71 TMA	A	From Centroid- Face	6.00 0.00 1.00	0.0000	108.00	4" Ice	1.90	1.57	110.52
						No Ice	0.68	0.45	13.20
						1/2" Ice	0.80	0.56	18.38
						1" Ice	0.93	0.68	25.16
						2" Ice	1.22	0.94	44.33
						4" Ice	1.90	1.57	110.52
(2) KRY 112 71 TMA	B	From Centroid- Face	6.00 0.00 1.00	0.0000	108.00	No Ice	0.68	0.45	13.20
						1/2" Ice	0.80	0.56	18.38
						1" Ice	0.93	0.68	25.16
						2" Ice	1.22	0.94	44.33
						4" Ice	1.90	1.57	110.52
						No Ice	0.68	0.45	13.20
(2) KRY 112 71 TMA	C	From Centroid- Face	6.00 0.00 1.00	0.0000	108.00	1/2" Ice	0.80	0.56	18.38
						1" Ice	0.93	0.68	25.16
						2" Ice	1.22	0.94	44.33
						4" Ice	1.90	1.57	110.52
						No Ice	1.17	0.47	13.00
						1/2" Ice	1.31	0.57	20.62
ATMAA1412D-1A20 TMA	A	From Centroid- Face	6.00 0.00 1.00	0.0000	108.00	1" Ice	1.47	0.69	30.11
						2" Ice	1.81	0.95	55.52
						4" Ice	2.58	1.57	137.44
						No Ice	1.17	0.47	13.00
						1/2" Ice	1.31	0.57	20.62
						1" Ice	1.47	0.69	30.11
ATMAA1412D-1A20 TMA	B	From Centroid- Face	6.00 0.00 1.00	0.0000	108.00	2" Ice	1.81	0.95	55.52
						4" Ice	2.58	1.57	137.44

RISATower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	Rogers Property, CT BU#881541	Page	9 of 11
	Project	Vertical Structures Job No. 2011-004-038	Date	14:35:43 04/25/11
	Client	Crown Castle	Designed by	ncoomes

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

Dishes

RISATower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	Rogers Property, CT BU#881541	Page	10 of 11
	Project	Vertical Structures Job No. 2011-004-038	Date	14:35:43 04/25/11
	Client	Crown Castle	Designed by	ncoomes

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

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P P _a
L1	139.5 - 93.04 (1)	TP26.99x15.5x0.25	46.46	0.00	0.0	39.000	20.4489	-7791.42	797508.00	0.010
L2	93.04 - 46.38 (2)	TP37.91x25.5205x0.375	50.58	0.00	0.0	39.000	43.1454	-16692.40	1682670.00	0.010
L3	46.38 - 0 (3)	TP48.5x35.874x0.375	51.63	0.00	0.0	39.000	50.1756	-23665.60	1956850.00	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x lb-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio f _{bx} F _{bx}	Actual M _y lb-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio f _{by} F _{by}
L1	139.5 - 93.04 (1)	TP26.99x15.5x0.25	510580. 00	-47.203	39.000	1.210	0.00	0.000	39.000	0.000
L2	93.04 - 46.38 (2)	TP37.91x25.5205x0.375	1448175. 00	-45.141	39.000	1.157	0.00	0.000	39.000	0.000
L3	46.38 - 0 (3)	TP48.5x35.874x0.375	2082250. 00	-47.923	39.000	1.229	0.00	0.000	39.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio P P _a	Ratio f _{bx} F _{bx}	Ratio f _{by} F _{by}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	139.5 - 93.04 (1)	TP26.99x15.5x0.25	0.010	1.210	0.000	1.220 ✓	1.333	H1-3 ✓
L2	93.04 - 46.38 (2)	TP37.91x25.5205x0.375	0.010	1.157	0.000	1.167 ✓	1.333	H1-3 ✓
L3	46.38 - 0 (3)	TP48.5x35.874x0.375	0.012	1.229	0.000	1.241 ✓	1.333	H1-3 ✓

RISA Tower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	Rogers Property, CT BU#881541	Page	11 of 11
	Project	Vertical Structures Job No. 2011-004-038	Date	14:35:43 04/25/11
	Client	Crown Castle	Designed by	ncoomes

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
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Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail
L1	139.5 - 93.04	Pole	TP26.99x15.5x0.25	1	-7791.42	1063078.12	91.5	Pass
L2	93.04 - 46.38	Pole	TP37.91x25.5205x0.375	2	-16692.40	2242999.02	87.6	Pass
L3	46.38 - 0	Pole	TP48.5x35.874x0.375	3	-23665.60	2608480.94	93.1	Pass
							Summary	
							Pole (L3)	93.1 Pass
							RATING =	93.1 Pass

APPENDIX B
BASE LEVEL DRAWING

APPENDIX C

ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#:	881541
Site Name:	Rogers Property, CT
App #:	121356, Rev. 0
Pole Manufacturer:	Other

Reactions		
Moment:	2690.01	ft-kips
Axial:	29.825	kips
Shear:	25.684	kips

Anchor Rod Data

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

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

Anchor Rod Results

Maximum Rod Tension: 139.7 Kips
 Allowable Tension: 195.0 Kips
 Anchor Rod Stress Ratio: 71.7% **Pass**

Rigid
Service, ASD
Fty*ASIF

Plate Data

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

Base Plate Results

Base Plate Stress: 58.2 ksi
 Allowable Plate Stress: 60.0 ksi
 Base Plate Stress Ratio: 97.0% **Pass**

Flexural Check

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length:
29.95

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

Pole Results

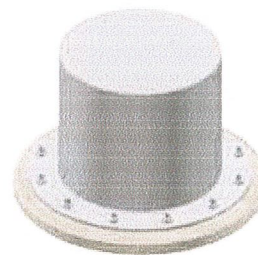
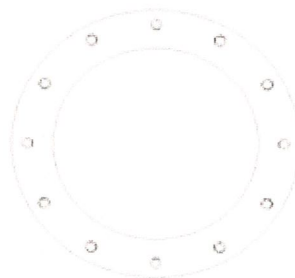
Pole Punching Shear Check: n/a

Pole Data

Diam:	48.5	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF:	1.333	
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* 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



Overturning Calculation for Rectangular Mat Foundations (Eccentrically Loaded)

Customer: Crown Castle
Site Name: Rogers Property, CT BU#881541
Job Number: 2011-004-038
Tower Model: 140' EEI Monopole
Date: 4/25/2011

Soil Ultimate Bearing	8	ksf
Unit wt soil	0.125	kcf
Unit wt concrete	0.15	kcf

Mat Length (long dimension)	23	ft
Mat Width (short dimension)	23	ft
Mat Thickness	3	ft
Depth of Soil Over Mat	4	ft
Has Pedestals? (Y or N)	Y	
Pedestal Round or Square? (R or S)	S	
Number of Pedestals	1	
Pedestal Height	5	ft
Pedestal Diameter or Width	7	ft

Applied Shear	25.684	kip
Applied Axial Force	29.825	kip
Applied Moment	2690.01	k-ft

Load Eccentricity on Pad

distance from long axis =	3.5	ft
distance from short axis =	3.5	ft

wt. Concrete =	274.800	kip	
wt. Soil =	240.000	kip	
Shear Moment =	205.472	k-ft	
P*e =	104.388	k-ft	104.388 k-ft

	(about long axis)		(about short axis)
Allowable Bearing =	4 ksf		
Mat Width / 6 =	3.83 ft	3.83	ft
e =	5.51 ft	5.51	ft
l =	17.98 ft	17.98	ft
Bearing =	1.47 ksf	2.63	ksf

BEARING ADEQUATE

x =	2.960	ft	2.960	ft
Resisting Moment =	5457.165	k-ft	5457.165	k-ft
SF =	1.819		1.819	

OVERTURNING ADEQUATE

JOB: 111259
 SHEET NUMBER: 2 OF 2
 CALCULATED BY: BRR DATE 5.18.2011
 CHECKED BY: DATE

CHECK ONE WAY SHEAR

$V_u =$ 271.2 k
 $V_c =$ 1096.8 k

Capacity: 24.73%

CHECK TWO WAY SHEAR: PUNCHING + UNBALANCED MOMENT

$V_u =$ 12.6 psi
 $\phi V_c =$ 164.3 psi

Capacity: 7.64%

CALCULATE REINFORCING REQUIRED

$F'_c = 3.0$ ksi $F'_y = 60.0$ ksi

Temp & Shrinkage reinforcing, $A_{s, temp} =$ 0.40 in²/ft (ACI 318 Sec. 10.5.4)

BOTTOM REINFORCING

Bar Size = 11
 Bar Spacing, c-c: 15.0
 d = 54.9 in.

$M_u =$ 781.2 in-k/ft

$$\phi M_n = 0.9 * A_s * F_y * d (1 - 0.59 * A_s * F_y / (b * d * F'_c))$$

Solution: $A_{s, req} =$ 0.26 in²/ft

Check, $A_s =$ 1.25 in²/ft

Capacity: 32.05%
 $A_{s, temp}$ controls

TOP REINFORCING

Bar Size = 11
 Bar Spacing, c-c: 15.0
 d = 54.9 in.

$M_u =$ 348.0 in-k/ft

$$\phi M_n = 0.9 * A_s * F_y * d (1 - 0.59 * A_s * F_y / (b * d * F'_c))$$

Solution: $A_{s, req} =$ 0.12 in²/ft

$A_{s, req} < A_{s, t}$, Use $A_{s, t}$

Bar Spacing, c-c:

Check, $A_s =$ 1.25 in²/ft

Top Reinforcing O.K.

Capacity: 32.05%
 $A_{s, temp}$ controls

JOB: 111259
 SHEET NUMBER: 1 OF 2
 CALCULATED BY: BRR DATE 5.18.2011
 CHECKED BY: DATE

Pad and Pier Foundation for Monopole - TIA-222-F

Q_a , ALLOWABLE SOIL PRESS. (ksf)	6
NET or GROSS	NET
SOIL DENSITY (pcf)	134

F'_c (ksi)	3
F'_y (ksi)	60

Base Reactions LC1: Maximum Wind

M , MOMENT (k-ft)	2129.0
P_t , TOTAL DOWNLOAD (k)	26.0
H , HORIZONTAL SHEAR (k)	28.0

Base Reaction LC 2: Ice Wind + Ice

M (k-ft)	558.0
P_t (k)	40.0
H (k)	7.0

Try:	L (ft.)	B (ft.)	t (ft.)	Soil depth to TOP of mat (ft.)	Soil depth to BOT. of mat (ft.)	Pier dia./width (ft.)	Pier Height, h (cu.ft.)	Pier Shape
	20	20	5	0	5	5.00	0.67	Round

W_m , WEIGHT OF PAD (k) =	300.0	CONCRETE VOL. (cu yd)	74.56
W_p , WEIGHT OF PIER (k) =	2.0		
W_{p2} , ADD. WEIGHT OF PIER (k) =	17.3		
W_s , WEIGHT OF SOIL (k) =	0.0		

CHECK DESIGN CRITERIA

CHECK STABILITY:

	LC1	LC2
$Mst = P * (L/2) + (Vf+s * L/2) =$	3452.7 k-ft	3592.7 k-ft
$Mot = M + H * (t+h) =$	2287.8 k-ft	598 k-ft
$SF = Mot/Mst =$	1.51 > 1.5	6.01 > 1.5

Capacity: 99.4%

CHECK BEARING PRESSURE

	LC1	LC2
$P = P_t + W_f + W_s =$	345.3 k	359.3 k
$e = M / P =$	6.63 ft	1.66 ft
$L/6 =$	3.33 ft	3.33 ft
Width of Wedge, $L' =$	10.12 ft	20.00 ft
0 Deg Wind: $Q_{max} =$	2.74 ksf	0.68 ksf
45 Deg Wind: $Q_{max} =$	3.94 ksf	0.86 ksf

Capacity: 65.6%

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

TIA Rev F

Site Data

BU#: 806352
 Site Name: BRG 302943052
 App #:
 Pole Manufacturer: Other

Reactions		
Moment:	2129	ft-kips
Axial:	26	kips
Shear:	28	kips

Anchor Rod Data

Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	48.22	in

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

Anchor Rod Results

Maximum Rod Tension: 174.4 Kips
 Allowable Tension: 195.0 Kips
 Anchor Rod Stress Ratio: 89.5% **Pass**

Rigid
Service, ASD
Fty*ASIF

Plate Data

Diam:	54.22	in
Thick:	2.5	in
Grade:	60	ksi
Single-Rod B-eff:	10.80	in

Base Plate Results

Base Plate Stress: 39.3 ksi
 Allowable Plate Stress: 60.0 ksi
 Base Plate Stress Ratio: 65.5% **Pass**

Flexural Check

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length:
26.48

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

Pole Results

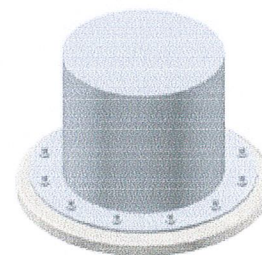
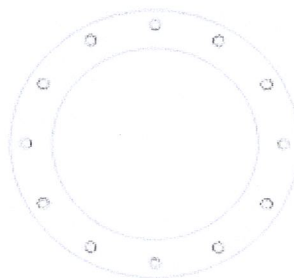
Pole Punching Shear Check: n/a

Pole Data

Diam:	40.3	in
Thick:	0.34375	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

12 - Sided Monopole Plate Modification:
Job #: 102000.39

TIA Code Revision: F

Section Elevation:

0
Feet Above Base of Pole

Quick Check:

PASS

99%

Loads:

"x" axis
Axial: 25.540 K
Moment: 2129.320 (K-FT)
Shear: 27.710 K
Torque: NA K

"y" axis
Axial: 0.000 (K-FT)
Moment: 0.000 (K-FT)
Shear: 0.000 K
Torque: 0.000 K

Resultant
Axial: 25.54 K
Moment: 2129.32 (K-FT)
Shear: 27.71 K
Torque: NA K

Pole % of Allowable w/o Mods: 115%
Pole % of Allowable w/ Mods: 81%

Stresses without Reinforcement:

Allowable Stress on the Pole
Total: 52.00 ksi

Stress on Pole
Pole, P/A: 0.58 ksi
Pole, M/S: 59.14 ksi
Total: 59.72 ksi
Pole % of Allowable: 114.85%

Stresses with Reinforcement:

Allowable Stress on the Plates
Compression (ksi) Tension (ksi)
Total: 41.73 52.00
Total: 0.00 0.00
Total: 0.00 0.00
Total: 0.00 0.00

Stress on Pole
Pole, P/A: 0.41 ksi
Pole, M/S: 41.48 ksi
Total: 41.89 ksi
Pole % of Allowable: 80.55%

Allowable Load on the Plates
Compression (kips) Tension (kips)
Total: 250.40 250.00
Total: 0.00 0.00
Total: 0.00 0.00
Total: 0.00 0.00

Stress on Plates
Compression (kips) Tension (kips)
Plate, P/A: 0.41 0.00
Plate, M/S: 41.06 41.06
Total: 41.47 41.06

Actual Load on the Plates
Compression (kips) Tension (kips)
Total: 248.80 246.34
Total: 0.00 0.00
Total: 0.00 0.00
Total: 0.00 0.00

Plate, P/A: 0.00 0.00
Plate, M/S: 0.00 0.00
Total: 0.00 0.00
Plate, P/A: 0.00 0.00
Plate, M/S: 0.00 0.00
Total: 0.00 0.00

Plate % of Allowable
Compression Tension
Total: 99% 99%
Total: 0% 0%
Total: 0% 0%
Total: 0% 0%

Plate, P/A: 0.00 0.00
Plate, M/S: 0.00 0.00
Total: 0.00 0.00
Plate, P/A: 0.00 0.00
Plate, M/S: 0.00 0.00
Total: 0.00 0.00

Stitch Bolt Connection
15%

12 - Sided Monopole Plate Modification:

TIA Code Revision: F

Job #: 102000.39

Section Elevation:

0 Feet Above Base of Pole

Quick Check:

PASS

99%

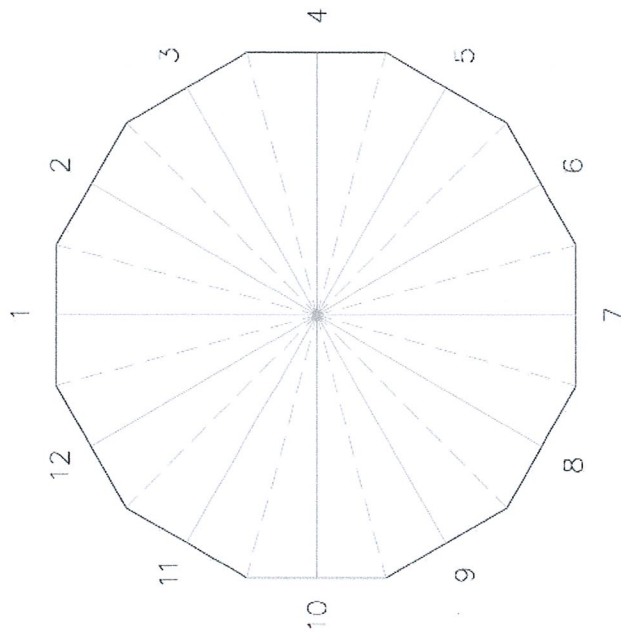
Section Properties:

Pole Type: 12
 No. of Sides Used: 12
 Diameter Across Flats: 40.30 in
 Thickness: 0.344 in
 Inside Bend Radius: 1.38 in
 Yield Stress: 65.00 ksi
 Moment of Inertia: 9012.36 in⁴
 Area: 44.16 in²
 J: 17597.92 in⁴
 C Flats: 20.15 in
 C Points: 20.86082 in
 W / T = 28.73
 D / T = 117.24
 Width of Flat: 9.88 in
 Allow. Stress Increase: 1.33
 Allow. Stress Factor: 0.60 TIA - F (Table 5)

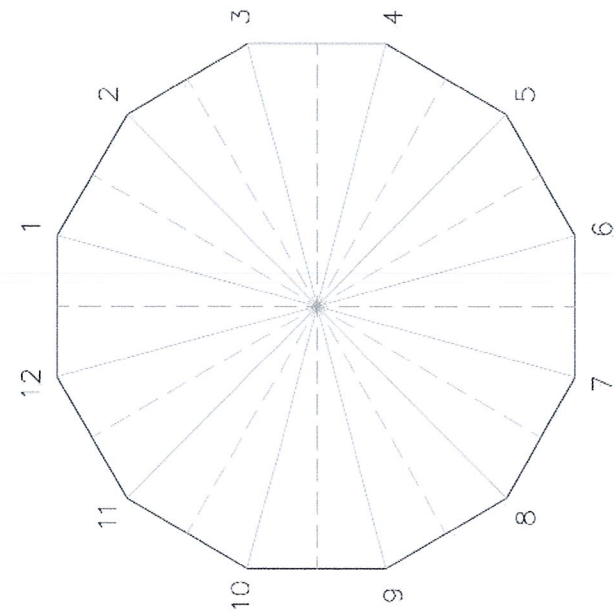
Modifications:

Modification 1: Sabre PLI x 6 on Flats
 Plate Fy: 65 ksi
 Drill Hole: 1.25 in
 Stitch Bolt Capacity: 30 kips
 Stitch Bolt Spacing (override):
 Modification 2:
 Plate Fy: 65 ksi
 Drill Hole: 1.25 in
 Stitch Bolt Capacity: 30 kips
 Stitch Bolt Spacing (override):
 Modification 3:
 Plate Fy: 65 ksi
 Drill Hole: 1.25 in
 Stitch Bolt Capacity: 30 kips
 Stitch Bolt Spacing (override):
 Modification 4:
 Plate Fy: 65 ksi
 Drill Hole: 1.25 in
 Stitch Bolt Capacity: 30 kips
 Stitch Bolt Spacing (override):

Pole % of Allowable w/o Mods: 115%
 Pole % of Allowable w/ Mods: 81%
 Area: 6.00 in²
 Plate Thickness: 1.00 in
 Net Area of Plate: 0.289 in²
 Mod % of Allowable: 99%
 Area: 6.00 in²
 Plate Thickness: 1.00 in
 Net Area of Plate: 0.289 in²
 Mod % of Allowable: 99%
 Area: 6.00 in²
 Plate Thickness: 1.00 in
 Net Area of Plate: 0.289 in²
 Mod % of Allowable: 99%
 Area: 6.00 in²
 Plate Thickness: 1.00 in
 Net Area of Plate: 0.289 in²
 Mod % of Allowable: 99%



Flats



Points

P65-15-XLH-RR

Dual Broadband Antennas

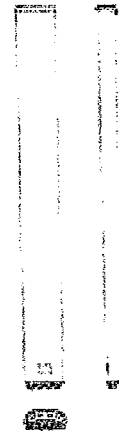
POLARIZATION: Dual Linear ±45°
 FREQUENCY (MHz): 550-550, 1710-1710
 HORIZONTAL BEAM WIDTH (°): 65-65
 GAIN (dBd): 14.7/12.6, 17.0/14.9
 TILT: 0-18, 0-0
 LENGTH: 51"

ELECTRICAL SPECIFICATIONS*

	550-550		1710-1710		
Frequency range (MHz)	550-550	550-550	1710-1710	1710-1710	1710-1710
Frequency band (MHz)	550-550	550-550	1710-1710	1710-1710	1710-1710
Gain (dBd)	14.7/12.6	14.7/12.6	17.0/14.9	17.0/14.9	17.0/14.9
Polarization	Dual Linear ±45		Dual Linear ±45		
Horizontal Impedance (Ω)	50		50		
VSWR	<1.5:1		<1.5:1		
Horizontal beam width, -3 dB (°)	73	65	65	61	60
Vertical beam width, -3 dB (°)	17		7.5		
Elevation down tilt (°)	0-13		0-9		
Side lobe suppression, vertical 1st upper (dB)	>14		>20		
Isolation between inputs (dB)	>30		>30		
Inter band isolation (dB)	>40		>40		
Tracking, horizontal plane ±60° (dB)	<2		<2		
Vertical beam squint (°)	<1.25		<0.5		
Front to back ratio (dB) 150°±30° copolar	>25		>38		
Front to back ratio (dB) 150°±30° total power	>25		>25		
Cross polar discrimination (XPD) 0° (dB)	>15		>15		
Cross polar discrimination (XPD) ±60° (dB)	>10		>10		
RAI, 2dBi/3dBi (dB)	<153		<153		
Power handling, average per input (W)	500		200		
Power handling, average total (W)	1000		600		

MECHANICAL SPECIFICATIONS*

Connector	4 X 7/16 DIN Female, IP67
Connector position	Bottom
Dimensions, HxWxD, in (mm)	51" x 12" x 6" (1285 x 305 x 152)
Mounting	Pre-mounted Tin Brackets
Weight, with brackets, lbs (kg)	41 (19)
Weight, without brackets, lbs (kg)	39 (18)
Wind load, instantaneous (per sec 3 sec) (ft=1.00)	520
Maximum operational wind speed, mph (m/s)	100 (45)
Survival wind speed, mph (m/s)	150 (67)
Lightning protection	DC Ground
Operating Temperature	-40°C to +60°C
Roaming material	PVC, IP55
Packet size, HxWxD, in (mm)	65" x 16" x 10" (1651 x 406 x 254)
Package colour	Light Grey
Shipping weight, lbs (kg)	52 (24)
RET	(RET A) 80v1 1, MET and AISGv2.0
Brackets	7255.00, 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/pa>.

POWER

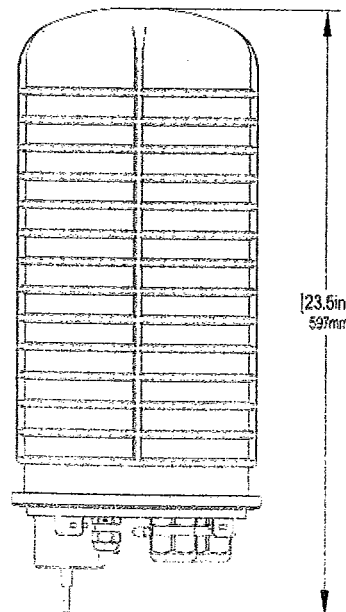
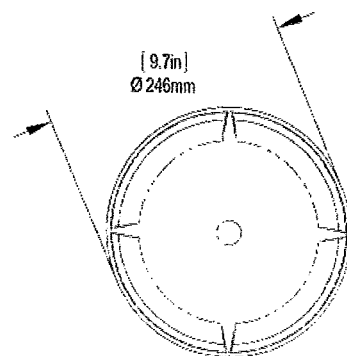
DC6-48-60-18-8F

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.



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

RBS6000

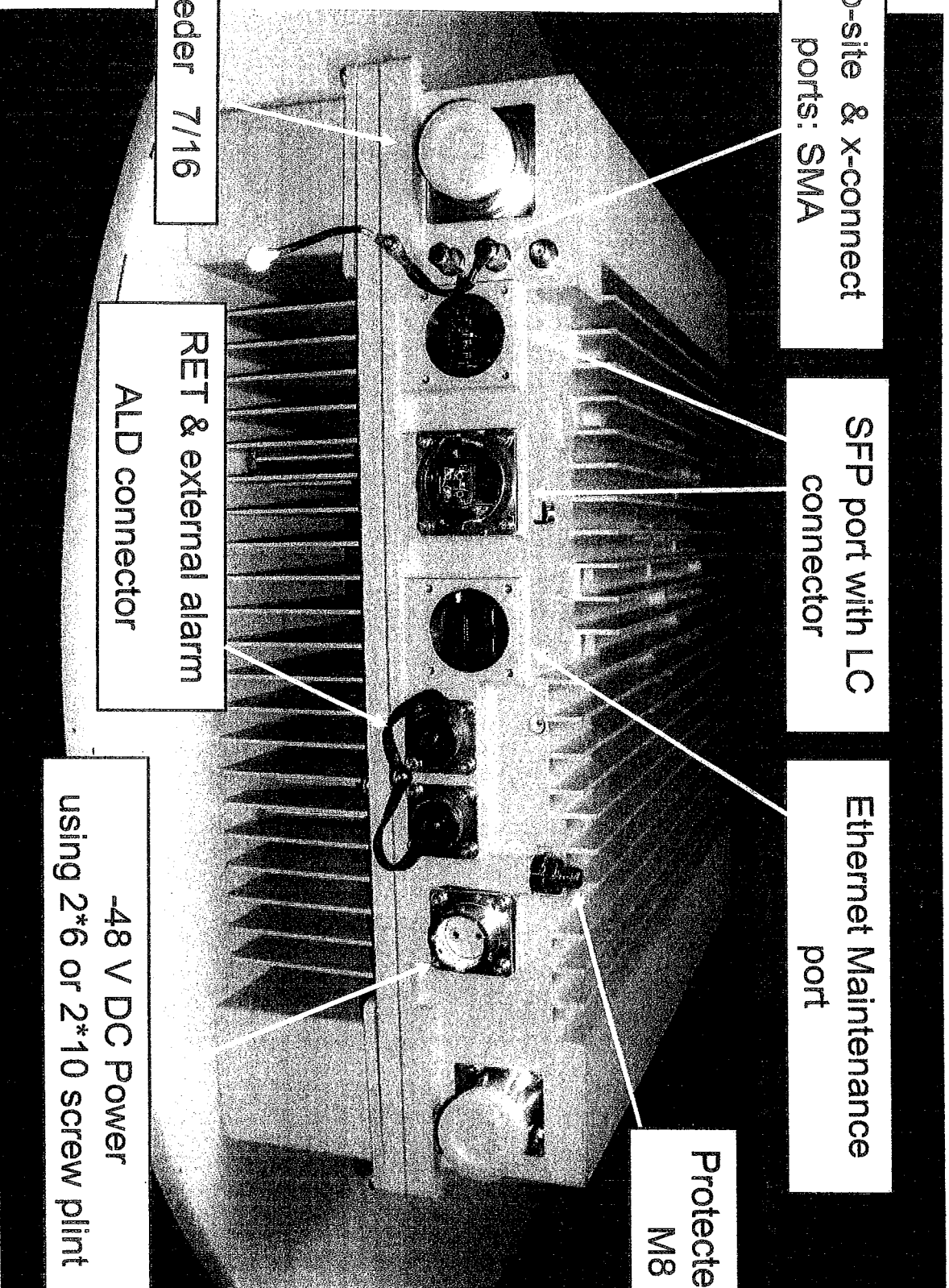
- > Multi standard
- > RF: 2x30 Watts
- > Carrier BW: 1.4 – 20 MHz
- > Alarms: 2
- > Dimensions (with sunshield):
 - Width: 17.0 in
 - Height: 17.8 in
 - Depth: 7.2 in
 - Weight: 55 lbs (Band 12)
 - Weight: 50 lbs (Band 4)
- > Temperature: -40 to +131 F
- > Cooling: Self convection
- > Power: -48 VDC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





RRUS-11 I/F

RBS6000





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

May 31, 2011

Honorable James Zeoli
1st Selectman, Town of Orange
Orange Town Hall
617 Orange Center Road
Orange, CT 06830

Re: Telecommunications Facility – 700 Grassy Hill 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