

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

RECEIVED
JUN 28 2012
CONNECTICUT
SITING COUNCIL

June 27, 2012

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

Re: **EM-VER-119-120514 – 699 Old Main Street, Rocky Hill, Connecticut**
EM-VER-011-120123 – 785 Park Avenue, Bloomfield, Connecticut
EM-VER-014-120110 – 405 Brushy Hill Road, Branford, Connecticut
EM-VER-014-120106 – 180 North Main Street, Branford, Connecticut
EM-VER-030-120106 – 330 Middletown Road, Columbia, Connecticut
EM-VER-054-111108 – 374 Three Mile Road, Glastonbury, Connecticut

Completion of Construction Activity

Dear Ms. Roberts:

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

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

Sincerely,



Kenneth C. Baldwin

Copy to:
Sandy M. Carter



Law Offices

BOSTON

PROVIDENCE

HARTFORD

NEW LONDON

STAMFORD

WHITE PLAINS

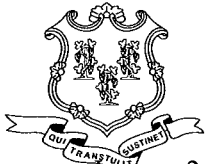
NEW YORK CITY

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11754237-v1



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

January 24, 2012

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

RE: **EM-VER-014-120106**- Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 180 & 184 North Main Street Branford, Connecticut.

Dear Attorney Baldwin:

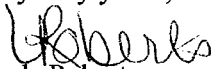
The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with 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 January 4, 2012. 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.

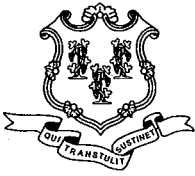
This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies 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 Anthony "Unk" DaRos, First Selectman, Town of Branford
Diana Ross, Inland Wetland Enforcement Officer, Town of Branford
Laura Magaraci, Zoning Enforcement Officer, Town of Branford
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

January 9, 2012

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

RE: **EM-VER-014-120106**- Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 180 & 184 North Main Street Branford, Connecticut.

Dear First Selectman DaRos:

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

If you have any questions or comments regarding this proposal, please call me or inform the Council by January 24, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Diana Ross, Inland Wetland Enforcement Officer, Town of Branford
Laura Magaraci, Zoning Enforcement Officer, Town of Branford

280 Trumbull Street
Hartford, CT 06103-3597
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January 4, 2012
RECEIVED
JAN - 6 2012

**CONNECTICUT
SITING COUNCIL**

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

Re: **Notice of Exempt Modification – Antenna Swap
180 & 184 North Main Street, Branford, Connecticut**

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains wireless telecommunications antennas, six (6) at the 105-foot level and six (6) at the 96-foot level on the existing 110-foot tower at the above-referenced address. The tower is owned by Crown Castle. The Council approved Cellco’s shared use of the existing tower in 1990. Cellco now intends to modify its installation by replacing nine (9) of its existing antennas with four (4) model LPA-171063/8CF PCS antennas and two (2) model LPA-171063/12CF PCS antennas at the 105-foot level; and two (2) model BXA-70062/4CF LTE antennas and one (1) model BXA-70063/6CF LTE antenna at the 96-foot level. Attached behind Tab 1 are the specifications for the proposed replacement antennas.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Anthony DaRos, First Selectman of the Town of Branford. A copy of this letter is also being sent to Three M&M Limited Partnership, the owner of the property on which the tower is located.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the overall height of the existing tower. Cellco’s replacement antennas will be located at the 105-foot and 96-foot levels on the existing 110-foot tower.



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Linda Roberts
January 4, 2012
Page 2

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

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

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

Also attached is a Structural Analysis confirming that the tower and foundation can support Cellco's proposed modifications. (See Tab 3).

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,



Kenneth C. Baldwin

Enclosures

Copy to:

Anthony DaRos, Branford First Selectman
Three M&M Limited Partnership
Sandy M. Carter

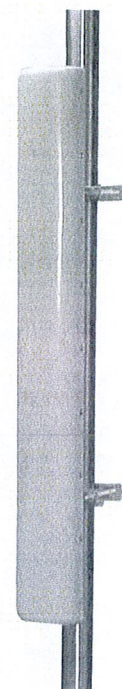


BXA-171063-8CF-EDIN-X

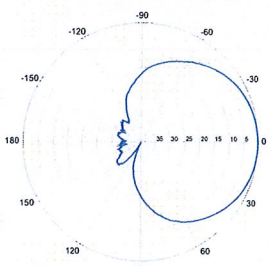
Replace "X" with desired electrical downtilt.

X-Pol | FET Panel | 63° | 17.4 dBi

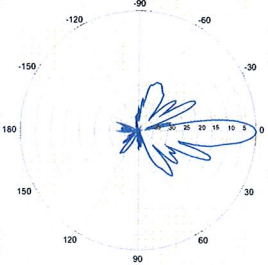
Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	68°	65°	60°
Vertical beamwidth	7°	7°	7°
Gain	14.5 dBd / 16.6 dBi	14.9 dBd / 17.0 dBi	15.3 dBd / 17.4 dBi
Electrical downtilt (X)	0, 2, 4, 8		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back isolation	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Center (Back)		
Operating temperature	-40° to +60° C / -40° to +140° F		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1232 x 154 x 105 mm		48.5 x 6.1 x 4.1 in
Depth with t-brackets	133 mm		5.2 in
Weight without mounting brackets	4.8 kg		10.5 lbs
Survival wind speed	296 km/hr		184 mph
Wind area	Front: 0.19 m ² Side: 0.14 m ²	Front: 2.0 ft ² Side: 1.5 ft ²	
Wind load @ 161 km/hr (100 mph)	Front: 281 N Side: 223 N	Front: 63 lbf Side: 50 lbf	
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-8CF-EDIN-X-FP		



BXA-171063-8CF-EDIN-X

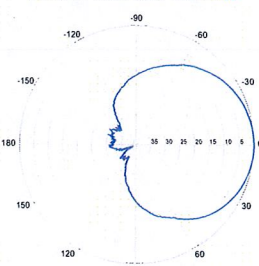


Horizontal | 1710-1880 MHz
BXA-171063-8CF-EDIN-0

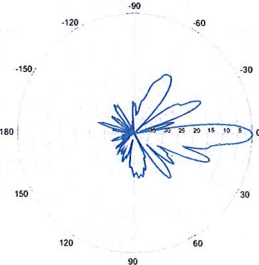


0° | Vertical | 1710-1880 MHz

BXA-171063-8CF-EDIN-X

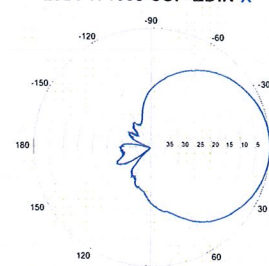


Horizontal | 1850-1990 MHz
BXA-171063-8CF-EDIN-0

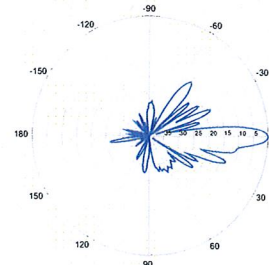


0° | Vertical | 1850-1990 MHz

BXA-171063-8CF-EDIN-X



Horizontal | 1920-2170 MHz
BXA-171063-8CF-EDIN-0



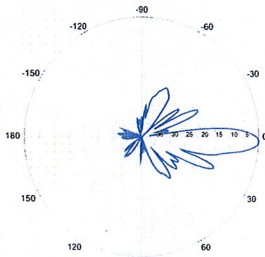
0° | Vertical | 1920-2170 MHz

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

BXA-171063-8CF-EDIN-X

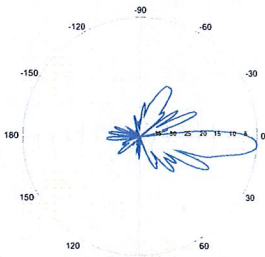
X-Pol | FET Panel | 63° | 17.4 dBi

BXA-171063-8CF-EDIN-2



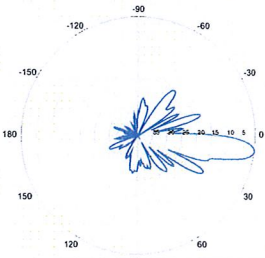
2° | Vertical | 1710-1880 MHz

BXA-171063-8CF-EDIN-4



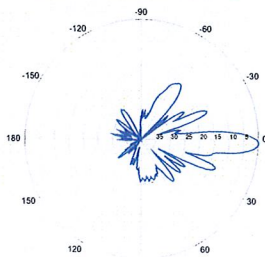
4° | Vertical | 1710-1880 MHz

BXA-171063-8CF-EDIN-8



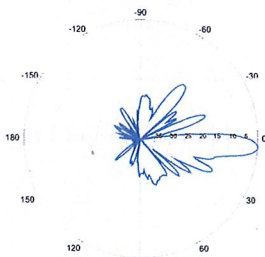
8° | Vertical | 1710-1880 MHz

BXA-171063-8CF-EDIN-2



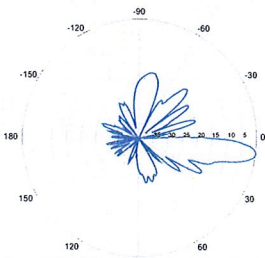
2° | Vertical | 1850-1990 MHz

BXA-171063-8CF-EDIN-4



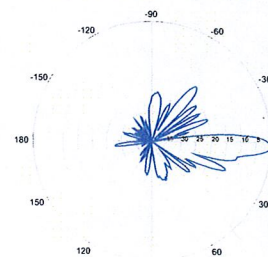
4° | Vertical | 1850-1990 MHz

BXA-171063-8CF-EDIN-8



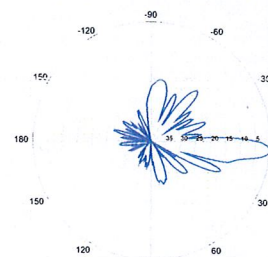
8° | Vertical | 1850-1990 MHz

BXA-171063-8CF-EDIN-2



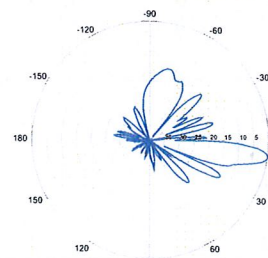
2° | Vertical | 1920-2170 MHz

BXA-171063-8CF-EDIN-4



4° | Vertical | 1920-2170 MHz

BXA-171063-8CF-EDIN-8



8° | Vertical | 1920-2170 MHz

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

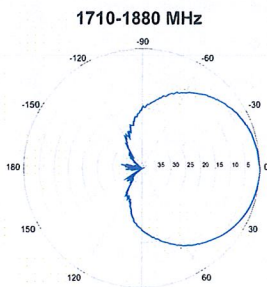
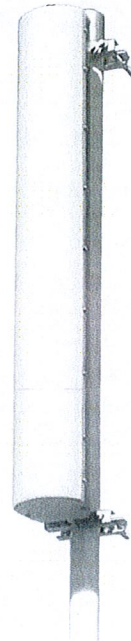
LPA-171063-12CF-EDIN-X

V-Pol | Log Periodic | 63° | 18.5-19.0 dBi

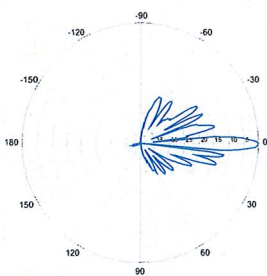
Replace "X" with desired electrical downtilt.

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

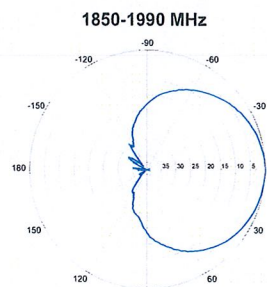
Electrical Characteristics		1710-2170 MHz					
Frequency bands	1710-1755 MHz	1850-1990 MHz	1920-2170 MHz				
Polarization	Vertical						
Horizontal beamwidth	60°	63°	65°				
Vertical beamwidth	3°	4°	3°				
Gain	16.4 dBd (18.5 dBi)	16.9 dBd (19.0 dBi)	16.4 dBd (18.5 dBi)				
Electrical downtilt (X)	0, 2						
Impedance	50Ω						
VSWR	≤ 1.5:1						
Null fill	5-10% (-26.02 to -20.0dB)						
Input power	250 W						
Lightning protection	Direct Ground						
Connector(s)	1 Port / EDIN or NE / Female / Center (Back)						
Mechanical Characteristics							
Dimensions Length x Width x Depth	1876 x 200 x 202 mm		73.9 x 7.9 x 8.0 in				
Weight without mounting brackets	5.2 kg		11.5 lbs				
Survival wind speed	>201 km/hr		>125 mph				
Wind area	Front: 0.31 m ² Side: 0.38 m ²		Front: 4.0 ft ² Side: 4.1 ft ²				
Wind load @ 161 km/hr (100 mph)	Front: 182 N Side: 586 N		Front: 41 lbf Side: 132 lbf				
Mounting Options		Part Number		Fits Pipe Diameter		Weight	
2-Point Mounting Bracket Kit		26799997		50-102 mm 2.0-4.0 in		2.3 kg 5.0 lbs	
2-Point Mounting and Downtilt Bracket Kit		26799999		50-102 mm 2.0-4.0 in		2.3 kg 5.0 lbs	



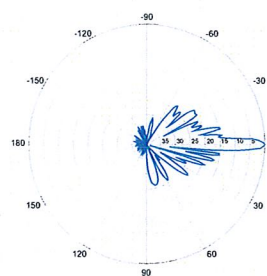
Horizontal



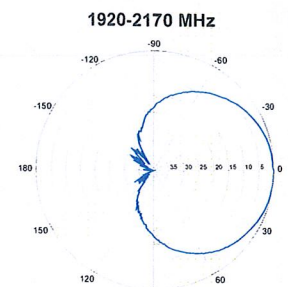
0° | Vertical



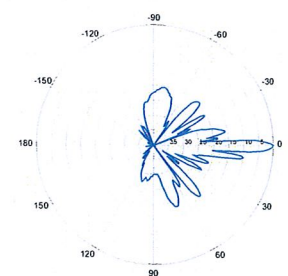
Horizontal



0° | Vertical



Horizontal

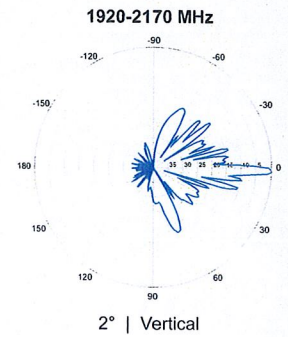
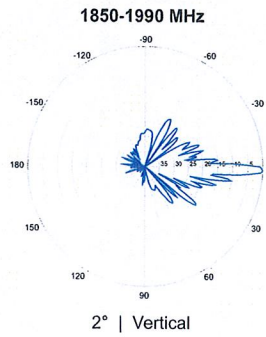
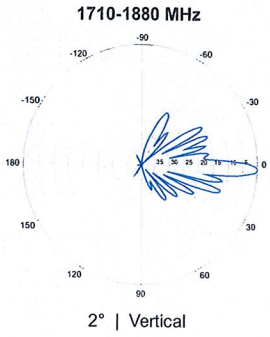


0° | Vertical

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

LPA-171063-12CF-EDIN-X

V-Pol | Log Periodic | 63° | 18.5-19.0 dBi



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

Mechanical specifications

Length	1205 mm	47.4 in
Width	285 mm	11.2 in
Depth	126 mm	5.0 in
Depth with z-bracket	166 mm	6.5 in
Weight ⁴⁾	4.5 kg	9.9 lbs
Wind Area Fore/Aft	0.36 m ²	3.9 ft ²
Wind Area Side	0.15 m ²	1.7 ft ²
Max Wind Survivability	>201 km/hr	>125 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	522 N	117 lbf
Side	244 N	55 lbf

Antenna consisting of aluminum alloy with brass feedlines covered by a UV safe fiberglass radome. RoHS compliant.

Mounting & Downtilting

Mounting hardware attaches to pipe diameter Ø50-160 mm; Ø2.0-6.3 in.

Mounting Bracket Kit	36210002
Downtilt Bracket Kit	36114003

Electrical specifications

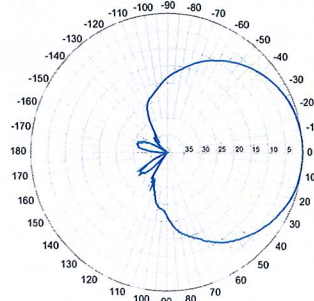
Frequency Range	696-900 MHz
Impedance	50Ω
Connector ³⁾	NE or E-DIN Female 2 ports / Center
VSWR ¹⁾	≤ 1.4:1
Polarization	Slant $\pm 45^\circ$
Isolation Between Ports ¹⁾	< -30 dB
Gain ¹⁾	13.0 dBd 15.0 dBi
Power Rating ²⁾	500 W
Half Power Angle ¹⁾	
Horizontal Beamwidth	63°
Vertical Beamwidth	15°
Electrical downtilt ⁵⁾	0°
Null fill ¹⁾	5%
Lightning protection	Direct ground

Patented Dipole Design: U.S. Patent No. 6,608,600 B2

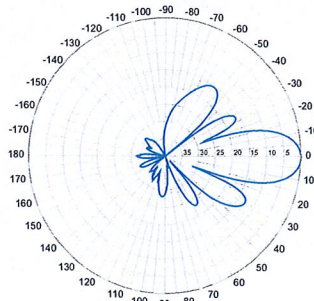
- 1) Typical values.
- 2) Power rating limited by connector only.
- 3) NE indicates an elongated N connector. E-DIN indicates an elongated DIN connector.
- 4) Antenna weight does not include brackets.
- 5) Add'l downtilts may be available. Check website for details.

Improvements to mechanical and/or electrical performance of the antenna may be made without notice.

Radiation-pattern¹⁾
750 MHz

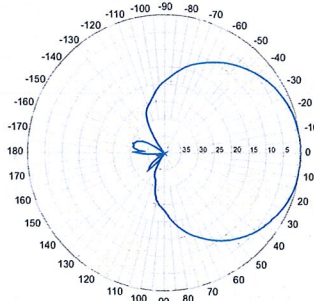


Horizontal

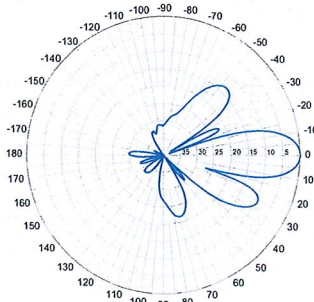


Vertical

850 MHz



Horizontal

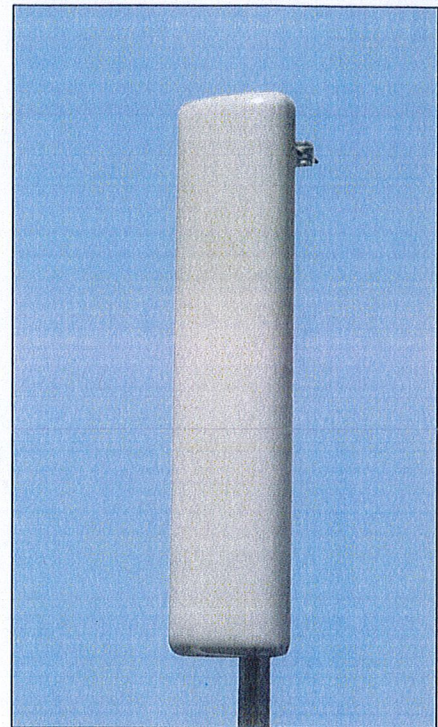


Vertical

696-900 MHz

BXA-70063/4CF

When ordering replace " _ " with connector type.



Featuring our Exclusive
3T Technology™
Antenna Design:

- Watercut brass feedline assembly for consistent performance.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad bandwidth and superior performance.
- Air as insulation for virtually no internal signal loss.

Warranty:

This antenna is under a five-year limited warranty for repair or replacement.

Revision Date: 10/27/08

BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

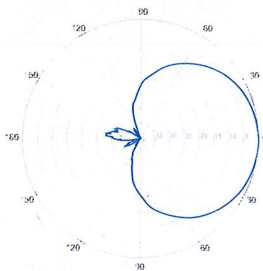
Replace "X" with desired electrical downtilt.

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

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

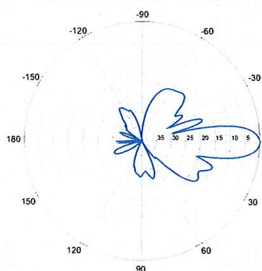


BXA-70063-6CF-EDIN-X



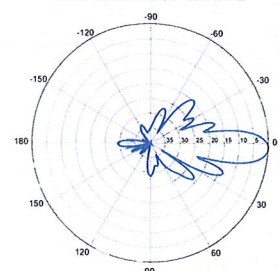
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

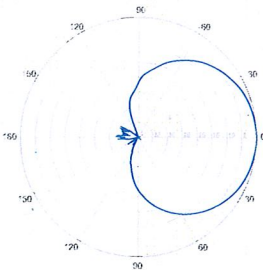


0° | Vertical | 750 MHz

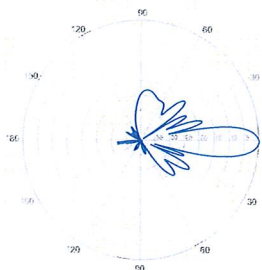
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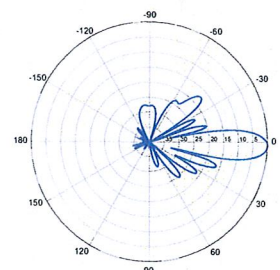
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



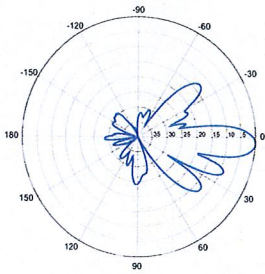
2° | Vertical | 850 MHz

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

BXA-70063-6CF-EDIN-X

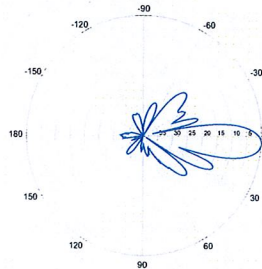
X-Pol | FET Panel | 63° | 14.5 dBd

BXA-70063-6CF-EDIN-3



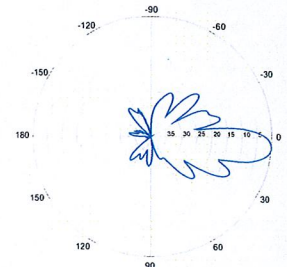
3° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-4

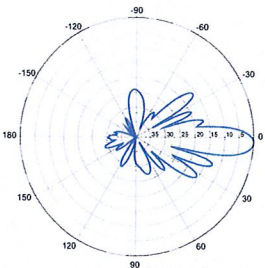


4° | Vertical | 750 MHz

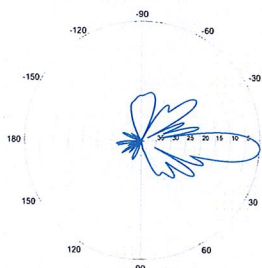
BXA-70063-6CF-EDIN-5



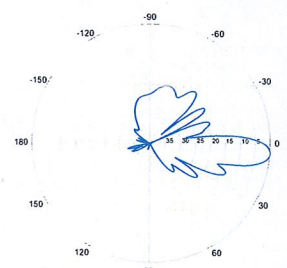
5° | Vertical | 750 MHz



3° | Vertical | 850 MHz

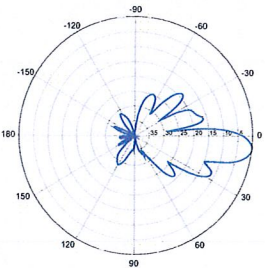


4° | Vertical | 850 MHz



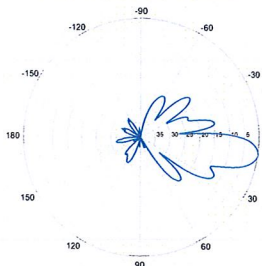
5° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-6



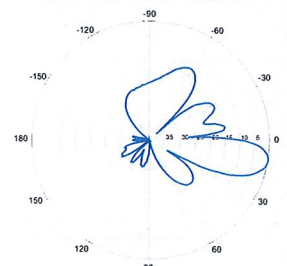
6° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-8

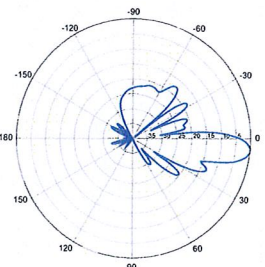


8° | Vertical | 750 MHz

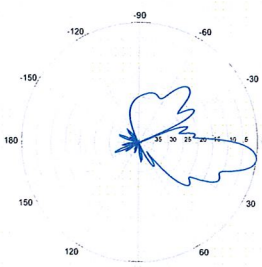
BXA-70063-6CF-EDIN-10



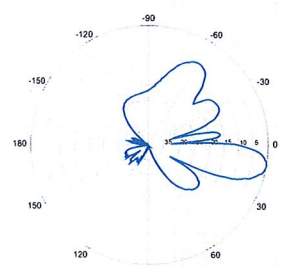
10° | Vertical | 750 MHz



6° | Vertical | 850 MHz



8° | Vertical | 850 MHz



10° | Vertical | 850 MHz

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

General Power Density

Site Name: BRANFORD, CT
 Cumulative Power Density

Operator	Operating Frequency (MHz)	Number of Trans.	ERP Per Trans. (watts)	Total ERP (watts)	Distance to Target (feet)	Calculated Power Density (mW/cm ²)	Maximum Permissible Exposure* (mW/cm ²)	Fraction of MPE (%)
VZW PCS	1970	7	301	2107	98	0.0789	1.0	7.89%
VZW Cellular	869	9	402	3618	98	0.1355	0.5793333333	23.38%
VZW AWS	2145	1	702	670	98	0.0251	1.0	2.51%
VZW 700	698	2	832	1664	98	0.0623	0.4653333333	13.39%

Total Percentage of Maximum Permissible Exposure

47.17%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz

mW/cm² = milliwatts per square centimeter

ERP = Effective Radiated Power

Absolute worst case maximum values used.



ENGINEERING • CONSTRUCTION

PSG Engineering, Ltd.
1006 Thompson Highway
Richmond, TX 77471
Telephone: 281-239-8490
Facsimile: 281-239-8515
opedraza@psgeng.com

Date: December 06, 2011

Veronica Harris
Crown Castle USA Inc.
1200 McArthur Blvd
Mahwah, NJ 07430

Subject: Structural Analysis Report

Carrier Designation:	Verizon Co-Locate	
	Carrier Site Number:	NVH113
	Carrier Site Name:	Branford, CT
Crown Castle Designation:	Crown Castle BU Number:	806360
	Crown Castle Site Name:	NHV 113 943126
	Crown Castle JDE Job Number:	172289
	Crown Castle Work Order Number:	453860
Engineering Firm Designation:	PSG Engineering, Ltd. Project Number:	1101H154-A040110
Site Data:	180 & 184 North Main Street, Branford, CT, New Haven	
	Latitude 41° 17' 22.77", Longitude -72° 48' 42.22"	
	110 Foot - Monopole Tower	

Dear Veronica Harris,

PSG Engineering, Ltd. 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 440049, in accordance with application 134877, revision 2.

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 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 PSG Engineering, Ltd. 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:

DEC 06 2011

Oscar Pedraza
President, P.E.

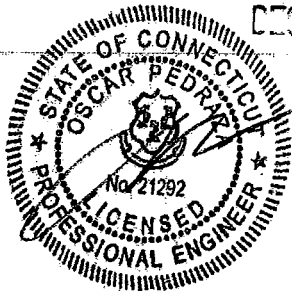


TABLE OF CONTENTS

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 - Tower Component Stresses vs. Capacity

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 110 ft Monopole tower designed by Valmont in May of 1990.

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, 73.6 mph with 0.5 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
101	105	2	Antel	LPA-171063-12CF-EDIN-2			
		4		LPA-171063/8CFx2			
	96	2		BXA-70063-4CF-EDIN-X			
		1		BXA-70063-6CF-2			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
107	107	1		Platform Mount [LP 712-1]			
	108	1		GPS_RESERVED			
	105	3	Decibel	932DG65T2E-M			
101	101	1		Pipe Mount [PM 601-1]	12	1-5/8	
		1		Platform Mount [LP 712-1]	6	7/8	1
	96	3		Sector Mount [SM 201-1]	1	1/2	
		6	Decibel	DB846F65ZAXY			
83	83	6	Swedcom	ALP 9212-N			
		1	Decibel	DB225-A	1	1/4	
	1		Pipe Mount [PM 501-1]				
64	64	1	Decibel	DB225-A	1	1-5/8	
		1		Pipe Mount [PM 501-1]			

Notes:

- 1) Proposed loads to replace Swedcom and Decibel 932DG65T2E-M antennas.

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Report	Applied Earth Technologies	262228	
Tower Foundation Drawings	Valmont	217660	CCI Sites
Tower Manufacturer Drawings		971913	
CAD Level Drawings	101', 83', 64' Level Drawings	-	Crown CAD Department

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. PSG Engineering, Ltd. 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	110 - 67.3333	Pole	TP30.45x21.91x0.2188	1	-6533.20	1013903.75	49.3	Pass	
L2	67.3333 - 29.4167	Pole	TP37.6x29.0784x0.3125	2	-11809.80	1892126.77	58.7	Pass	
L3	29.4167 - 0	Pole	TP42.85x35.8577x0.4063	3	-19265.70	2886411.43	58.0	Pass	
							Summary:		
							Pole (L2)	58.7	Pass
							Rating =	58.7	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
	Anchor Rods		57.8	Pass
	Base Plate		31.3	Pass
	Base Foundation		32.0	Pass
	Base Foundation Soil Interaction		46.2	Pass
Structure Rating (max from all components) =				58.7%

4.1) Recommendations

No modifications needed.

APPENDIX A
RISA TOWER OUTPUT

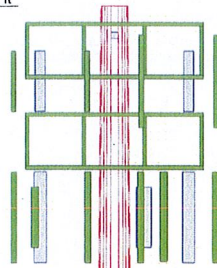
110.0 ft

Section	1	2	3
Length (ft)	42.67	42.58	35.00
Number of Sides	12	12	12
Thickness (in)	0.2188	0.3125	0.4063
Socket Length (ft)	4.67	5.68	35.8577
Top Dia (in)	21.9100	29.0784	42.8500
Bot Dia (in)	30.4500	37.6000	42.8500
Grade		A572-55	
Weight (K)	2.7	4.8	6.1

67.3 ft

29.4 ft

0.0 ft



DESIGNED APPURTENANCE LOADING

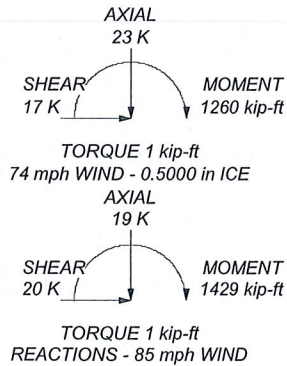
TYPE	ELEVATION	TYPE	ELEVATION
Platform Mount [LP 712-1]	107	(2) LPA-171063/8CFx2	101
Platform Mount [LP 712-1]	101	(2) LPA-171063-12CF-EDIN-2	101
Pipe Mount [PM 601-1]	101	(2) LPA-171063/8CFx2	101
Sector Mount [SM 201-1]	101	BXA-70063-4CF-EDIN-X	101
Sector Mount [SM 201-1]	101	BXA-70063-6CF-2	101
Sector Mount [SM 201-1]	101	BXA-70063-4CF-EDIN-X	101
(2) DB846F65ZAXY w/Mount Pipe	101	Pipe Mount [PM 501-1]	83
(2) DB846F65ZAXY w/Mount Pipe	101	DB225-A	83
(2) DB846F65ZAXY w/Mount Pipe	101	Pipe Mount [PM 501-1]	64
GPS_RESERVED	101	DB225-A	64

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 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 58.7%



PSG Engineering, Ltd.		Job: PSG Engineering Project Number: 1101H154-A04017	
1006 Thompson Highway		Project: (806360) (NHV 113 943126)	
Richmond, TX 77471		Client: Crown Castle International	Drawn by: edonahue
Phone: Telephone: 281-239-8490		Code: TIA/EIA-222-F	Date: 12/02/11
FAX: Facsimile: 281-239-8515		Path: J:\Projects\2011\Projects\1101H154\Documents\806360-453960.eri	Scale: NTS
			Dwg No. E-1

RISATower PSG Engineering, Ltd. 1006 Thompson Highway Richmond, TX 77471 Phone: Telephone: 281-239-8490 FAX: Facsimile: 281-239-8515	Job PSG Engineering Project Number: 1101H154-A040110	Page 1 of 8
	Project (806360) (NHV 113 943126)	Date 10:57:08 12/02/11
	Client Crown Castle International	Designed by edonahue

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 0.5000 in.

Ice density of 56 pcf.

A wind speed of 74 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

<ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile √ Include Bolts In Member Capacity √ Leg Bolts Are At Top Of Section √ Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination 	<ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area √ Use Clear Spans For KL/r Retension Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. √ Autocalc Torque Arm Areas SR Members Have Cut Ends Sort Capacity Reports By Component √ Triangulate Diamond Inner Bracing 	<ul style="list-style-type: none"> Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules √ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression √ All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feedline Torque Include Angle Block Shear Check <li style="padding-left: 20px;">Poles Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
--	--	---

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	110.00-67.33	42.67	4.67	12	21.9100	30.4500	0.2188	0.8750	A572-65 (65 ksi)
L2	67.33-29.42	42.58	5.58	12	29.0784	37.6000	0.3125	1.2500	A572-65 (65 ksi)
L3	29.42-0.00	35.00		12	35.8577	42.8500	0.4063	1.6250	A572-65 (65 ksi)

RISATower PSG Engineering, Ltd. 1006 Thompson Highway Richmond, TX 77471 Phone: Telephone: 281-239-8490 FAX: Facsimile: 281-239-8515	Job PSG Engineering Project Number: 1101H154-A040110	Page 2 of 8
	Project (806360) (NHV 113 943126)	Date 10:57:08 12/02/11
	Client Crown Castle International	Designed by edonahue

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	22.6829	15.2788	917.5793	7.7655	11.3494	80.8484	1859.2645	7.5197	5.2856	24.163
	31.5242	21.2941	2484.0378	10.8228	15.7731	157.4857	5033.3340	10.4803	7.5743	34.626
L2	31.0710	28.9457	3057.2251	10.2982	15.0626	202.9675	6194.7669	14.2462	6.9555	22.258
	38.9264	37.5205	6658.5803	13.3489	19.4768	341.8724	13492.0890	18.4665	9.2393	29.566
L3	38.2774	46.3749	7439.3822	12.6916	18.5743	400.5205	15074.2053	22.8243	8.5211	20.975
	44.3616	55.5217	12766.6349	15.1949	22.1963	575.1695	25868.6636	27.3261	10.3950	25.588

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 110.00-67.33				1	1	1		
L2 67.33-29.42				1	1	1		
L3 29.42-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement	Total Number	Number Per Row	Start/End Position	Width or Diameter	Perimeter	Weight
			ft				in	in	klf
MISCELLANEOUS									
Peg Ladder Rungs	A	Surface Ar (CaAa)	110.00 - 10.00	1	1	0.000 0.000	1.5000		0.00
Safety Line 3/8	A	Surface Ar (CaAa)	110.00 - 10.00	1	1	0.000 0.000	0.3750		0.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		C _A A _A	Weight
				ft			ft ² /ft	klf
EL. 101' LEVEL								
LDF7-50A(1-5/8")	A	No	Inside Pole	101.00 - 10.00	12	No Ice 1/2" Ice	0.00 0.00	0.00 0.00
LDF5-50A(7/8")	A	No	Inside Pole	101.00 - 10.00	6	No Ice 1/2" Ice	0.00 0.00	0.00 0.00
LDF4-50A(1/2")	A	No	Inside Pole	101.00 - 10.00	1	No Ice 1/2" Ice	0.00 0.00	0.00 0.00
EL. 83' LEVEL								
CAT5E (1/4")	B	No	Inside Pole	83.00 - 10.00	1	No Ice 1/2" Ice	0.00 0.00	0.00 0.00
EL. 64' LEVEL								
LDF7-50A(1-5/8")	B	No	Inside Pole	64.00 - 10.00	1	No Ice 1/2" Ice	0.00 0.00	0.00 0.00

RISATower PSG Engineering, Ltd. 1006 Thompson Highway Richmond, TX 77471 Phone: Telephone: 281-239-8490 FAX: Facsimile: 281-239-8515	Job PSG Engineering Project Number: 1101H154-A040110	Page 3 of 8
	Project (806360) (NHV 113 943126)	Date 10:57:08 12/02/11
	Client Crown Castle International	Designed by edonahue

Description	Face or Leg	Allow or Shield	Component Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight klf
-------------	-------------	-----------------	----------------	--------------	--------------	---	------------

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	110.00-67.33	A	0.000	0.000	8.000	0.000	0.54
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	67.33-29.42	A	0.000	0.000	7.109	0.000	0.58
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.00
L3	29.42-0.00	A	0.000	0.000	3.641	0.000	0.29
		B	0.000	0.000	0.000	0.000	0.02
		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 K
L1	110.00-67.33	A	0.500	0.000	0.000	16.533	0.000	0.62
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	67.33-29.42	A	0.500	0.000	0.000	14.693	0.000	0.64
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.00
L3	29.42-0.00	A	0.500	0.000	0.000	7.524	0.000	0.33
		B		0.000	0.000	0.000	0.000	0.02
		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	110.00-67.33	-0.2352	-0.1358	-0.4314	-0.2491
L2	67.33-29.42	-0.2370	-0.1368	-0.4453	-0.2571
L3	29.42-0.00	-0.1561	-0.0901	-0.3023	-0.1745

Discrete Tower Loads

RISATower PSG Engineering, Ltd. 1006 Thompson Highway Richmond, TX 77471 Phone: Telephone: 281-239-8490 FAX: Facsimile: 281-239-8515	Job PSG Engineering Project Number: 1101H154-A040110	Page 4 of 8
	Project (806360) (NHV 113 943126)	Date 10:57:08 12/02/11
	Client Crown Castle International	Designed by edonahue

Description	Face or Leg	Offset Type	Offsets: Horiz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
EL. 101' LEVEL								
Platform Mount [LP 712-1]	C	None		0.0000	107.00	No Ice 24.53 1/2" Ice 29.94	24.53 29.94	1.34 1.65
Platform Mount [LP 712-1]	C	None		0.0000	101.00	No Ice 24.53 1/2" Ice 29.94	24.53 29.94	1.34 1.65
Pipe Mount [PM 601-1]	A	From Leg	4.00 0.00 0.00	30.0000	101.00	No Ice 3.00 1/2" Ice 3.74	0.90 1.12	0.07 0.08
Sector Mount [SM 201-1]	A	From Leg	4.00 0.00 0.00	30.0000	101.00	No Ice 17.89 1/2" Ice 24.35	5.84 9.07	0.36 0.50
Sector Mount [SM 201-1]	B	From Leg	4.00 0.00 0.00	30.0000	101.00	No Ice 17.89 1/2" Ice 24.35	5.84 9.07	0.36 0.50
Sector Mount [SM 201-1]	C	From Leg	4.00 0.00 0.00	30.0000	101.00	No Ice 17.89 1/2" Ice 24.35	5.84 9.07	0.36 0.50
(2) DB846F65ZAXY w/Mount Pipe	A	From Leg	4.00 0.00 -5.00	30.0000	101.00	No Ice 7.27 1/2" Ice 7.88	7.82 9.01	0.05 0.11
(2) DB846F65ZAXY w/Mount Pipe	B	From Leg	4.00 0.00 -5.00	30.0000	101.00	No Ice 7.27 1/2" Ice 7.88	7.82 9.01	0.05 0.11
(2) DB846F65ZAXY w/Mount Pipe	C	From Leg	4.00 0.00 -5.00	30.0000	101.00	No Ice 7.27 1/2" Ice 7.88	7.82 9.01	0.05 0.11
GPS_RESERVED	A	From Leg	4.00 0.00 7.00	30.0000	101.00	No Ice 0.17 1/2" Ice 0.24	0.17 0.24	0.00 0.00
(2) LPA-171063/8CFx2	A	From Leg	4.00 0.00 4.00	30.0000	101.00	No Ice 3.69 1/2" Ice 4.06	3.69 4.06	0.00 0.03
(2) LPA-171063-12CF-EDIN-2	B	From Leg	4.00 0.00 4.00	30.0000	101.00	No Ice 5.99 1/2" Ice 6.46	6.05 6.52	0.00 0.04
(2) LPA-171063/8CFx2	C	From Leg	4.00 0.00 4.00	30.0000	101.00	No Ice 3.69 1/2" Ice 4.06	3.69 4.06	0.00 0.03
BXA-70063-4CF-EDIN-X	A	From Leg	4.00 2.00 -5.00	30.0000	101.00	No Ice 5.16 1/2" Ice 5.55	2.52 2.82	0.00 0.03
BXA-70063-6CF-2	B	From Leg	4.00 2.00 -5.00	30.0000	101.00	No Ice 7.73 1/2" Ice 8.27	4.16 4.60	0.00 0.04
BXA-70063-4CF-EDIN-X	C	From Leg	4.00 2.00 -5.00	30.0000	101.00	No Ice 5.16 1/2" Ice 5.55	2.52 2.82	0.00 0.03
*								
EL. 83' LEVEL								
Pipe Mount [PM 501-1]	B	From Leg	0.00 0.00 0.00	20.0000	83.00	No Ice 3.47 1/2" Ice 4.45	1.67 2.10	0.05 0.06
DB225-A	B	From Leg	3.00 0.00 0.00	20.0000	83.00	No Ice 3.21 1/2" Ice 5.78	3.21 5.78	0.04 0.05
*								
EL. 64' LEVEL								

RISATower PSG Engineering, Ltd. 1006 Thompson Highway Richmond, TX 77471 Phone: Telephone: 281-239-8490 FAX: Facsimile: 281-239-8515	Job PSG Engineering Project Number: 1101H154-A040110	Page 5 of 8
	Project (806360) (NHV 113 943126)	Date 10:57:08 12/02/11
	Client Crown Castle International	Designed by edonahue

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
			Horz Lateral ft	Vert ft					
Pipe Mount [PM 501-1]	A	None			0.0000	64.00	No Ice 3.47 1/2" Ice 4.45	1.67 2.10	0.05 0.06
DB225-A	A	From Leg	3.00 0.00 0.00		0.0000	64.00	No Ice 3.21 1/2" Ice 5.78	3.21 5.78	0.04 0.05

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

RISATower PSG Engineering, Ltd. 1006 Thompson Highway Richmond, TX 77471 Phone: Telephone: 281-239-8490 FAX: Facsimile: 281-239-8515	Job PSG Engineering Project Number: 1101H154-A040110	Page 6 of 8
	Project (806360) (NHV 113 943126)	Date 10:57:08 12/02/11
	Client Crown Castle International	Designed by edonahue

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	15	23.49	0.01	16.80
	Max. H _x	11	19.29	19.46	0.01
	Max. H _z	2	19.29	0.01	19.54
	Max. M _x	2	1429.00	0.01	19.54
	Max. M _z	5	1420.82	-19.46	-0.01
	Max. Torsion	8	1.28	-0.01	-19.54
	Min. Vert	1	19.29	0.00	0.00
	Min. H _x	5	19.29	-19.46	-0.01
	Min. H _z	8	19.29	-0.01	-19.54
	Min. M _x	8	-1427.77	-0.01	-19.54
	Min. M _z	11	-1421.23	19.46	0.01
	Min. Torsion	2	-1.28	0.01	19.54

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	19.29	0.00	0.00	-0.60	0.20	0.00
Dead+Wind 0 deg - No Ice	19.29	-0.01	-19.54	-1429.00	0.64	1.28
Dead+Wind 30 deg - No Ice	19.29	9.72	-16.92	-1237.42	-709.93	1.16
Dead+Wind 60 deg - No Ice	19.29	16.85	-9.76	-714.43	-1230.22	0.74
Dead+Wind 90 deg - No Ice	19.29	19.46	0.01	-0.18	-1420.82	0.11
Dead+Wind 120 deg - No Ice	19.29	16.86	9.78	713.96	-1230.66	-0.54
Dead+Wind 150 deg - No Ice	19.29	9.74	16.93	1236.62	-710.69	-1.05
Dead+Wind 180 deg - No Ice	19.29	0.01	19.54	1427.77	-0.24	-1.28
Dead+Wind 210 deg - No Ice	19.29	-9.72	16.92	1236.18	710.33	-1.17
Dead+Wind 240 deg - No Ice	19.29	-16.85	9.76	713.19	1230.63	-0.74
Dead+Wind 270 deg - No Ice	19.29	-19.46	-0.01	-1.06	1421.23	-0.11
Dead+Wind 300 deg - No Ice	19.29	-16.86	-9.78	-715.19	1231.06	0.55
Dead+Wind 330 deg - No Ice	19.29	-9.74	-16.93	-1237.85	711.09	1.05
Dead+Ice+Temp	23.49	0.00	0.00	-0.70	0.19	0.00
Dead+Wind 0 deg+Ice+Temp	23.49	-0.01	-16.80	-1259.86	0.49	1.10
Dead+Wind 30 deg+Ice+Temp	23.49	8.36	-14.54	-1091.02	-625.77	0.85
Dead+Wind 60 deg+Ice+Temp	23.49	14.48	-8.39	-630.04	-1084.31	0.39
Dead+Wind 90 deg+Ice+Temp	23.49	16.73	0.01	-0.42	-1252.25	-0.19
Dead+Wind 120 deg+Ice+Temp	23.49	14.49	8.41	629.11	-1084.61	-0.71
Dead+Wind 150 deg+Ice+Temp	23.49	8.37	14.55	1089.88	-626.29	-1.05
Dead+Wind 180 deg+Ice+Temp	23.49	0.01	16.80	1258.42	-0.11	-1.10
Dead+Wind 210 deg+Ice+Temp	23.49	-8.36	14.54	1089.57	626.16	-0.86
Dead+Wind 240 deg+Ice+Temp	23.49	-14.48	8.39	628.59	1084.69	-0.38
Dead+Wind 270 deg+Ice+Temp	23.49	-16.73	-0.01	-1.02	1252.64	0.19
Dead+Wind 300 deg+Ice+Temp	23.49	-14.49	-8.41	-630.55	1084.99	0.71
Dead+Wind 330 deg+Ice+Temp	23.49	-8.37	-14.55	-1091.32	626.67	1.05
Dead+Wind 0 deg - Service	19.29	-0.00	-6.76	-495.04	0.35	0.44
Dead+Wind 30 deg - Service	19.29	3.36	-5.85	-428.73	-245.60	0.40
Dead+Wind 60 deg - Service	19.29	5.83	-3.38	-247.70	-425.70	0.26
Dead+Wind 90 deg - Service	19.29	6.74	0.00	-0.47	-491.67	0.04
Dead+Wind 120 deg - Service	19.29	5.83	3.38	246.73	-425.85	-0.19
Dead+Wind 150 deg - Service	19.29	3.37	5.86	427.64	-245.87	-0.37
Dead+Wind 180 deg - Service	19.29	0.00	6.76	493.81	0.05	-0.44
Dead+Wind 210 deg - Service	19.29	-3.36	5.85	427.49	246.01	-0.40
Dead+Wind 240 deg - Service	19.29	-5.83	3.38	246.46	426.10	-0.26
Dead+Wind 270 deg - Service	19.29	-6.74	-0.00	-0.77	492.08	-0.04

RISATower PSG Engineering, Ltd. 1006 Thompson Highway Richmond, TX 77471 Phone: Telephone: 281-239-8490 FAX: Facsimile: 281-239-8515	Job PSG Engineering Project Number: 1101H154-A040110	Page 7 of 8
	Project (806360) (NHV 113 943126)	Date 10:57:08 12/02/11
	Client Crown Castle International	Designed by edonahue

Load Combination	Vertical	Shear _x	Shear _y	Overtuning Moment, M _x	Overtuning Moment, M _y	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 300 deg - Service	19.29	-5.83	-3.38	-247.96	426.25	0.19
Dead+Wind 330 deg - Service	19.29	-3.37	-5.86	-428.88	246.27	0.37

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-19.29	0.00	0.00	19.29	0.00	0.000%
2	-0.01	-19.29	-19.54	0.01	19.29	19.54	0.000%
3	9.72	-19.29	-16.92	-9.72	19.29	16.92	0.000%
4	16.85	-19.29	-9.76	-16.85	19.29	9.76	0.000%
5	19.46	-19.29	0.01	-19.46	19.29	-0.01	0.000%
6	16.86	-19.29	9.78	-16.86	19.29	-9.78	0.000%
7	9.74	-19.29	16.93	-9.74	19.29	-16.93	0.000%
8	0.01	-19.29	19.54	-0.01	19.29	-19.54	0.000%
9	-9.72	-19.29	16.92	9.72	19.29	-16.92	0.000%
10	-16.85	-19.29	9.76	16.85	19.29	-9.76	0.000%
11	-19.46	-19.29	-0.01	19.46	19.29	0.01	0.000%
12	-16.86	-19.29	-9.78	16.86	19.29	9.78	0.000%
13	-9.74	-19.29	-16.93	9.74	19.29	16.93	0.000%
14	0.00	-23.49	0.00	0.00	23.49	0.00	0.000%
15	-0.01	-23.49	-16.80	0.01	23.49	16.80	0.000%
16	8.36	-23.49	-14.54	-8.36	23.49	14.54	0.000%
17	14.48	-23.49	-8.39	-14.48	23.49	8.39	0.000%
18	16.73	-23.49	0.01	-16.73	23.49	-0.01	0.000%
19	14.49	-23.49	8.41	-14.49	23.49	-8.41	0.000%
20	8.37	-23.49	14.55	-8.37	23.49	-14.55	0.000%
21	0.01	-23.49	16.80	-0.01	23.49	-16.80	0.000%
22	-8.36	-23.49	14.54	8.36	23.49	-14.54	0.000%
23	-14.48	-23.49	8.39	14.48	23.49	-8.39	0.000%
24	-16.73	-23.49	-0.01	16.73	23.49	0.01	0.000%
25	-14.49	-23.49	-8.41	14.49	23.49	8.41	0.000%
26	-8.37	-23.49	-14.55	8.37	23.49	14.55	0.000%
27	-0.00	-19.29	-6.76	0.00	19.29	6.76	0.000%
28	3.36	-19.29	-5.85	-3.36	19.29	5.85	0.000%
29	5.83	-19.29	-3.38	-5.83	19.29	3.38	0.000%
30	6.74	-19.29	0.00	-6.74	19.29	-0.00	0.000%
31	5.83	-19.29	3.38	-5.83	19.29	-3.38	0.000%
32	3.37	-19.29	5.86	-3.37	19.29	-5.86	0.000%
33	0.00	-19.29	6.76	-0.00	19.29	-6.76	0.000%
34	-3.36	-19.29	5.85	3.36	19.29	-5.85	0.000%
35	-5.83	-19.29	3.38	5.83	19.29	-3.38	0.000%
36	-6.74	-19.29	-0.00	6.74	19.29	0.00	0.000%
37	-5.83	-19.29	-3.38	5.83	19.29	3.38	0.000%
38	-3.37	-19.29	-5.86	3.37	19.29	5.86	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	0.00013365

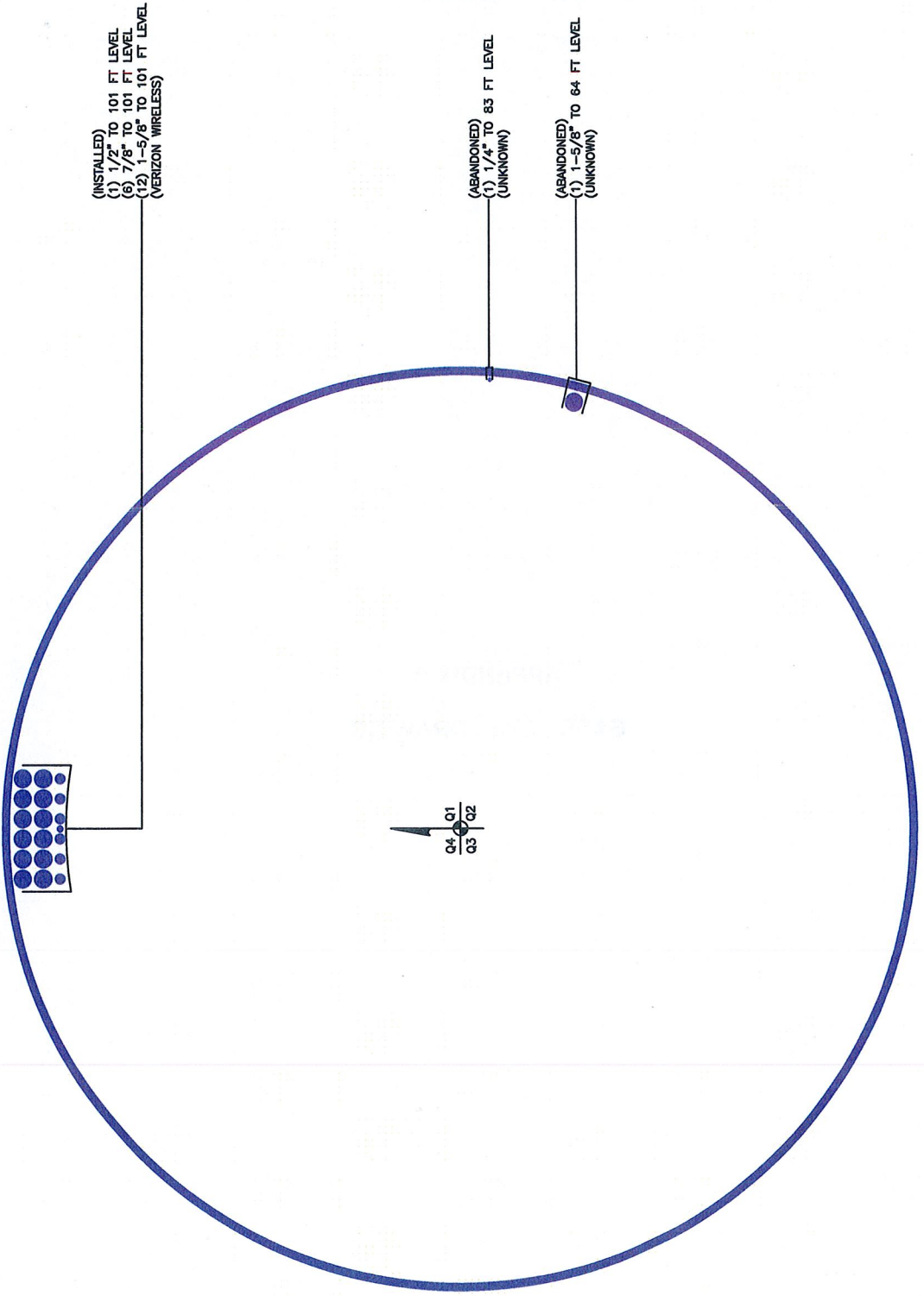
RISATower PSG Engineering, Ltd. 1006 Thompson Highway Richmond, TX 77471 Phone: Telephone: 281-239-8490 FAX: Facsimile: 281-239-8515	Job	PSG Engineering Project Number: 1101H154-A040110	Page	8 of 8
	Project	(806360) (NHV 113 943126)	Date	10:57:08 12/02/11
	Client	Crown Castle International	Designed by	edonahue

3	Yes	4	0.0000001	0.00084408
4	Yes	4	0.0000001	0.00072456
5	Yes	4	0.0000001	0.00003715
6	Yes	4	0.0000001	0.00074381
7	Yes	4	0.0000001	0.00082030
8	Yes	4	0.0000001	0.00013414
9	Yes	4	0.0000001	0.00070845
10	Yes	4	0.0000001	0.00081678
11	Yes	4	0.0000001	0.00003673
12	Yes	4	0.0000001	0.00078626
13	Yes	4	0.0000001	0.00072085
14	Yes	4	0.0000001	0.00000001
15	Yes	4	0.0000001	0.00087414
16	Yes	5	0.0000001	0.00004671
17	Yes	5	0.0000001	0.00004451
18	Yes	4	0.0000001	0.00085330
19	Yes	5	0.0000001	0.00004445
20	Yes	5	0.0000001	0.00004639
21	Yes	4	0.0000001	0.00087275
22	Yes	5	0.0000001	0.00004405
23	Yes	5	0.0000001	0.00004594
24	Yes	4	0.0000001	0.00085320
25	Yes	5	0.0000001	0.00004577
26	Yes	5	0.0000001	0.00004414
27	Yes	4	0.0000001	0.00002556
28	Yes	4	0.0000001	0.00006898
29	Yes	4	0.0000001	0.00004883
30	Yes	4	0.0000001	0.00000938
31	Yes	4	0.0000001	0.00005050
32	Yes	4	0.0000001	0.00006414
33	Yes	4	0.0000001	0.00002549
34	Yes	4	0.0000001	0.00004773
35	Yes	4	0.0000001	0.00006349
36	Yes	4	0.0000001	0.00000937
37	Yes	4	0.0000001	0.00005765
38	Yes	4	0.0000001	0.00004830

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
L1	110 - 67.3333	Pole	TP30.45x21.91x0.2188	1	-6.55	1013.90	49.3	Pass
L2	67.3333 - 29.4167	Pole	TP37.6x29.0784x0.3125	2	-11.83	1892.13	58.7	Pass
L3	29.4167 - 0	Pole	TP42.85x35.8577x0.4063	3	-19.29	2886.41	58.0	Pass
Summary								
Pole (L2)							58.7	Pass
RATING =							58.7	Pass

APPENDIX B
BASE LEVEL DRAWING



(INSTALLED)
(1) 1/2" TO 101 FT LEVEL
(6) 7/8" TO 101 FT LEVEL
(12) 1-5/8" TO 101 FT LEVEL
(VERIZON WIRELESS)

(ABANDONED)
(1) 1/4" TO 83 FT LEVEL
(UNKNOWN)

(ABANDONED)
(1) 1-5/8" TO 64 FT LEVEL
(UNKNOWN)

Q4 Q1
Q3 Q2

BUSINESS UNIT: 806360 TOWER ID: C_BASELEVEL

APPENDIX C
ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#:	806360
Site Name:	NHV 113 943126
App #:	134877 Rev. 2
Pole Manufacturer:	Other

Reactions		
Moment:	1429	ft-kips
Axial:	19	kips
Shear:	20	kips

Anchor Rod Data

Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	50	in

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

Anchor Rod Results

Maximum Rod Tension: 112.7 Kips
 Allowable Tension: 195.0 Kips
 Anchor Rod Stress Ratio: 57.8% **Pass**

Rigid
Service, ASD
Ft*ASIF

Plate Data

Diam:	56.86	in
Thick:	2.75	in
Grade:	60	ksi
Single-Rod B-eff:	11.48	in

Base Plate Results

Base Plate Stress: 18.8 ksi
 Allowable Plate Stress: 60.0 ksi
 Base Plate Stress Ratio: 31.3% **Pass**

Flexural Check

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length:
25.77

Stiffener Data (Welding at both sides)

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

n/a

Stiffener Results

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

Pole Results

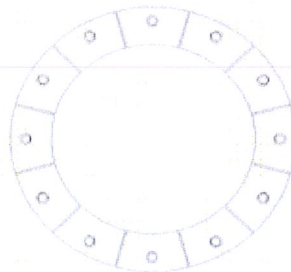
Pole Punching Shear Check: n/a

Pole Data

Diam:	42.85	in
Thick:	0.406	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
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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

PROJECT INFORMATION

Project Number: 806360

TAKEN FROM RISATOWER

Design Vertical Load (kips)	19.0
Design Shear Load (kips)	20.0
Design Moment Load (kip-ft.)	1429.0
TIA/EIA 222 Revision	F

TAKEN FROM FOUNDATION DESIGN

Overall Pier Length (ft.)	32.5
Pier Diameter (ft.)	6.0
Vertical Rebar Size	11.0
Number of Vertical Rebar	32.0
Rebar Cover (in.)	3.0
F'c (ksi)	3.0
Fy (ksi)	60.0

FOR CAISSON INPUT

Soil Design Vertical Load (kips)	19.0
Soil Design Shear Load (kips)	20.0
Soil Design Moment Load (kip-ft.)	1429.0
Structural Design Vertical Load (kips)	17.1
Structural Design Shear Load (kips)	26.0
Structural Design Moment Load (kip-ft.)	1857.7

TAKEN FROM CAISSON

Required Pier Length from Soil Check (ft.)	15.0
Maximum Moment in Pier from Steel Check (kip-ft)	1913.1
Distance Below Top of Pier where Maximum Moment Occurs (ft.)	1.2

FOR DT COLUMN INPUT

Gross Diameter (in.)	72.0
Area of Steel (in ²)	47.5
X distance (in.)	3.7
F'c (ksi)	3.0
Fy (ksi)	60.0
Phi Factor	0.9
Ultimate Concrete Strain	0.003
Factored Total Vertical Load (kips)	21.7

TAKEN FROM DT COLUMN

Interaction Diagram High Load (kips)	40.0
Interaction Diagram Low Load (kips)	20.0
Interaction Diagram High Moment (k-ft)	6002.0
Interaction Diagram Low Moment (k-ft)	5967.0
Factored Moment Capacity (k-ft)	5969.9

FINAL RESULTS

Structural Capacity (%)	32.0
Soil Capacity (%)	46.2

PSG Eng. Ltd.

 * PIER FOUNDATIONS ANALYSIS AND DESIGN - (C) 1995,2002 POWER LINE SYSTEMS, INC.*

*** ANALYSIS IDENTIFICATION : (806360) (NHV 113 943126)
 NOTES : Soil Analysis

*** PIER PROPERTIES CONCRETE STRENGTH (ksi) = 3.00 STEEL
 STRENGTH (ksi) = 60.00
 DIAMETER (ft) = 6.000 DISTANCE FROM TOP OF PIER TO GROUND
 LEVEL (ft) = 0.50

*** SOIL PROPERTIES	LAYER	TYPE	THICKNESS	DEPTH AT TOP OF LAYER	DENSITY
CU KP PHI			(ft)	(ft)	(pcf)
(psf)		(degrees)			
1300.0	1	C	7.00	0.00	155.0
1300.0	2	C	25.00	7.00	92.6

*** DESIGN (FACTORED) LOADS AT TOP OF PIER MOMENT (ft-k) = 1429.0 VERTICAL (k) = 19.0
 SHEAR (k) = 20.0
 ADDITIONAL SAFETY FACTOR AGAINST SOIL FAILURE = 2.00

*** CALCULATED PIER LENGTH (ft) = 15.000

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

TYPE	TOP OF LAYER	BELOW TOP OF PIER	THICKNESS	DENSITY	CU	KP
FORCE	ARM	(ft)	(ft)	(pcf)	(psf)	
(k)	(ft)					
436.80	C	0.50	7.00	155.0	1300.0	
35.83	C	7.50	0.57	92.6	1300.0	
-432.17	C	8.07	6.93	92.6	1300.0	

*** SHEAR AND MOMENTS ALONG PIER

ADDITIONAL SAFETY FACTOR	DISTANCE BELOW TOP OF PIER (ft)	WITH THE ADDITIONAL SAFETY FACTOR		WITHOUT
		SHEAR (k)	MOMENT (ft-k)	SHEAR
(k)	MOMENT (ft-k)			
	0.00	40.5	2959.8	
20.2	1479.9			
	1.50	-21.9	2989.2	-
11.0	1494.6			
	3.00	-115.5	2886.1	-
57.8	1443.1			
	4.50	-209.1	2642.6	-
104.6	1321.3			
	6.00	-302.7	2258.7	-
151.4	1129.4			
	7.50	-396.3	1734.4	-
198.2	867.2			
	9.00	-374.4	1123.2	-
187.2	561.6			

140.4	315.9	10.50	-280.8	631.8	-
93.6	140.4	12.00	-187.2	280.8	-
46.8	35.1	13.50	-93.6	70.2	-
0.0	-0.0	15.00	0.0	-0.0	

*** TOTAL REINFORCEMENT PCT = 0.30 REINFORCEMENT AREA (in^2) = 12.21
 *** USABLE AXIAL CAP. (k) = 19.0 USABLE MOMENT CAP. (ft-k) = 1656.4

- *** US Standard Re-Bars (Select one of the following):
- 62 BARS #4 (AREA = 0.20 in^2 DIA = 0.500 in) AT SPACING (in) = 3.14
 - 40 BARS #5 (AREA = 0.31 in^2 DIA = 0.625 in) AT SPACING (in) = 4.87
 - 28 BARS #6 (AREA = 0.44 in^2 DIA = 0.750 in) AT SPACING (in) = 6.96
 - 21 BARS #7 (AREA = 0.60 in^2 DIA = 0.875 in) AT SPACING (in) = 9.28
 - 16 BARS #8 (AREA = 0.79 in^2 DIA = 1.000 in) AT SPACING (in) = 12.17
 - 13 BARS #9 (AREA = 1.00 in^2 DIA = 1.128 in) AT SPACING (in) = 14.98
 - 10 BARS #10 (AREA = 1.27 in^2 DIA = 1.270 in) AT SPACING (in) = 19.48
 - 8 BARS #11 (AREA = 1.56 in^2 DIA = 1.410 in) AT SPACING (in) = 24.35
 - 6 BARS #14 (AREA = 2.25 in^2 DIA = 1.693 in) AT SPACING (in) = 32.46

*** WEIGHT OF CAISSON (kips) = 63.617
 *** PRESSURE UNDER CAISSON DUE TO INPUT DESIGN AXIAL LOAD (psf) = 672.0

PSG Eng. Ltd.

 * PIER FOUNDATIONS ANALYSIS AND DESIGN - (C) 1995,2002 POWER LINE SYSTEMS, INC.*

*** ANALYSIS IDENTIFICATION : (806360) (NHV 113 943126)
 NOTES : Concrete Analysis

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

DIAMETER (ft) = 6.000 DISTANCE FROM TOP OF PIER TO GROUND
 LEVEL (ft) = 0.50

*** SOIL PROPERTIES	LAYER	TYPE	THICKNESS	DEPTH AT TOP OF LAYER	DENSITY
CU KP PHI			(ft)	(ft)	(pcf)
(psf) (degrees)					
1300.0	1	C	7.00	0.00	155.0
1300.0	2	C	25.00	7.00	92.6

*** DESIGN (FACTORED) LOADS AT TOP OF PIER MOMENT (ft-k) = 1857.7 VERTICAL (k) = 17.1
 SHEAR (k) = 26.0
 = 1.00 ADDITIONAL SAFETY FACTOR AGAINST SOIL FAILURE

*** CALCULATED PIER LENGTH (ft) = 12.000

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

TYPE	TOP OF LAYER BELOW TOP OF PIER	THICKNESS	DENSITY	CU	KP
FORCE	ARM	(ft)	(pcf)	(psf)	
(k)	(ft)				
371.86	3.48	0.50	155.0	1300.0	
-64.93	6.98	6.46	155.0	1300.0	
-280.80	9.75	7.50	92.6	1300.0	

*** SHEAR AND MOMENTS ALONG PIER

ADDITIONAL SAFETY FACTOR		WITH THE ADDITIONAL SAFETY FACTOR		WITHOUT
(k)	DISTANCE BELOW TOP OF PIER (ft)	SHEAR (k)	MOMENT (ft-k)	SHEAR
	MOMENT (ft-k)			
	0.00	26.1	1897.0	
26.1	1897.0			
	1.20	-17.5	1913.1	-
17.5	1913.1			
	2.40	-92.4	1847.1	-
92.4	1847.1			
	3.60	-167.3	1691.3	-
167.3	1691.3			
	4.80	-242.2	1445.6	-
242.2	1445.6			
	6.00	-317.1	1110.0	-
317.1	1110.0			
	7.20	-299.5	718.8	-
299.5	718.8			

224.6	404.4	8.40	-224.6	404.4	-
149.8	179.7	9.60	-149.8	179.7	-
74.9	44.9	10.80	-74.9	44.9	-
0.0	-0.0	12.00	-0.0	-0.0	-

*** TOTAL REINFORCEMENT PCT = 0.36 REINFORCEMENT AREA (in²) = 14.66
 *** USABLE AXIAL CAP. (k) = 17.1 USABLE MOMENT CAP. (ft-k) = 1943.3

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

74	BARS #4	(AREA = 0.20 in ²)	DIA = 0.500 in)	AT SPACING (in) = 2.63
48	BARS #5	(AREA = 0.31 in ²)	DIA = 0.625 in)	AT SPACING (in) = 4.06
34	BARS #6	(AREA = 0.44 in ²)	DIA = 0.750 in)	AT SPACING (in) = 5.73
25	BARS #7	(AREA = 0.60 in ²)	DIA = 0.875 in)	AT SPACING (in) = 7.79
19	BARS #8	(AREA = 0.79 in ²)	DIA = 1.000 in)	AT SPACING (in) = 10.25
15	BARS #9	(AREA = 1.00 in ²)	DIA = 1.128 in)	AT SPACING (in) = 12.99
12	BARS #10	(AREA = 1.27 in ²)	DIA = 1.270 in)	AT SPACING (in) = 16.23
10	BARS #11	(AREA = 1.56 in ²)	DIA = 1.410 in)	AT SPACING (in) = 19.48
7	BARS #14	(AREA = 2.25 in ²)	DIA = 1.693 in)	AT SPACING (in) = 27.83

*** WEIGHT OF CAISSON (kips) = 50.894

*** PRESSURE UNDER CAISSON DUE TO INPUT DESIGN AXIAL LOAD (psf) = 604.8

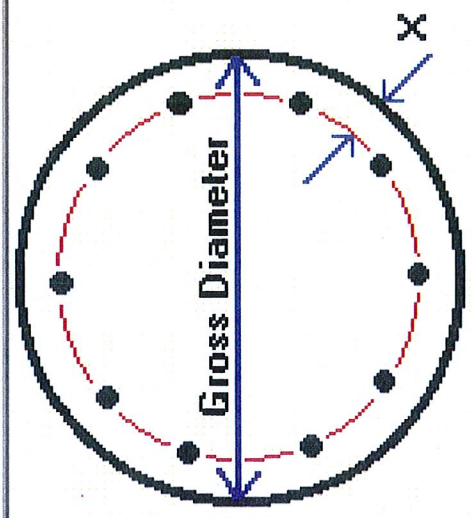
Units

English

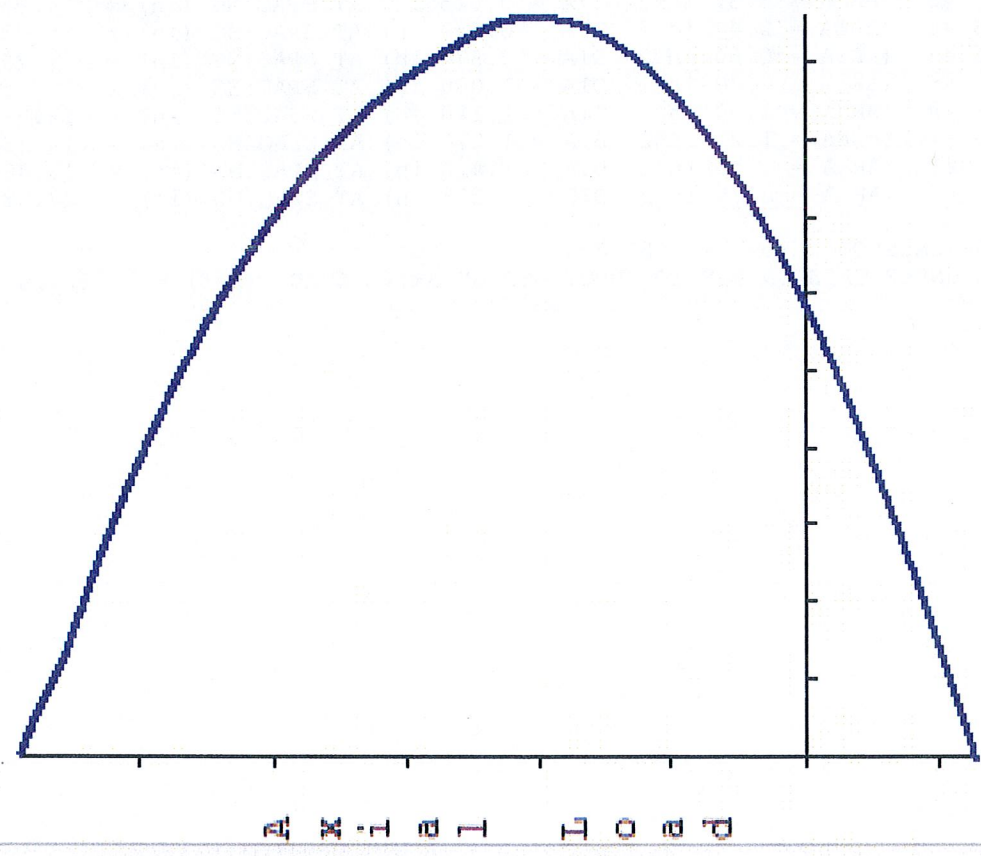
Metric

Column Description

Gross diameter	72.00 in
Area of Steel	47.50 in ²
X distance	3.70 in
F'c	3.00 ksi
Fy	60.00 ksi
Phi Factor	.90
Ult Concrete Strain	.003



2D Interaction Curve



460.	6703.
440.	6671.
420.	6640.
400.	6608.
380.	6576.
360.	6544.
340.	6512.
320.	6479.
300.	6446.
280.	6412.
260.	6378.
240.	6345.
220.	6311.
200.	6277.
180.	6243.
160.	6209.
140.	6176.
120.	6142.
100.	6108.
80.	6073.
60.	6038.
40.	6002.
20.	5967.
0.	5931.
-20.	5895.
-40.	5859.
-60.	5823.
-80.	5787.
-100.	5750.

ANALYZE

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