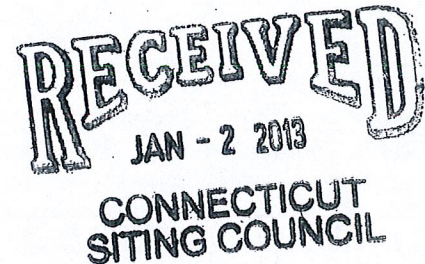


280 Trumbull Street  
Hartford, CT 06103-3597  
Main (860) 275-8200  
Fax (860) 275-8299  
kbaldwin@rc.com  
Direct (860) 275-8345

Also admitted in Massachusetts

December 28, 2012

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



Re: **EM-VER-064-120904 – 223 Brainard Road, Hartford, Connecticut**  
**EM-VER-049-120904 – Bright Meadow Boulevard, Enfield, Connecticut**  
**EM-VER-089-120813 – 35 Wildwood Street, New Britain, Connecticut**  
**EM-VER-107-120725 – 617 Orange Center Road, Orange, Connecticut**  
**EM-VER-148-120702 – 90 North Plains Industrial Road, Wallingford, Connecticut**  
**EM-VER-003-120906 – 20 Seles Road, Ashford, 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,

A handwritten signature in black ink, appearing to read "Ken Baldwin", written over a horizontal line.

Kenneth C. Baldwin

Copy to:  
Sandy M. Carter



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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](mailto:siting.council@ct.gov)

[www.ct.gov/csc](http://www.ct.gov/csc)

September 21, 2012

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

RE: **EM-VER-049-120904** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at Bright Meadow Road, Enfield, 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 August 31, 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.

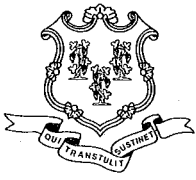
Very truly yours,

Linda Roberts  
Executive Director

LR/CDM/jbw

c: The Honorable Scott Kaupin, Mayor, Town of Enfield  
Matthew W. Coppler, Director of Planning and Community Development, Town of Enfield  
Jose Giner, Director of Planning and Community Development, Town of Enfield  
Crown Castle





STATE OF CONNECTICUT  
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

[www.ct.gov/csc](http://www.ct.gov/csc)

September 6, 2012

The Honorable Scott Kaupin  
Mayor  
Town of Enfield  
820 Enfield Street  
Enfield, CT 06082

RE: **EM-VER-049-120904** Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at Bright Meadow Road, Enfield, Connecticut.

Dear Mayor Kaupin:

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 September 20, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts  
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Matthew W. Coppler, Town Manager, Town of Enfield  
Jose Giner, Director of Planning and Community Development, Town of Enfield

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

Also admitted in Massachusetts

August 31, 2012

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

RECEIVED  
SEP - 4 2012  
CONNECTICUT  
SITING COUNCIL

Re: **Notice of Exempt Modification – Antenna Swap  
Bright Meadow Road, Enfield, Connecticut**

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the 134-foot level on an existing 150-foot tower at the above-referenced address. The tower is owned by Crown Castle. Cellco’s use of the tower was approved by the Council in 1999. Cellco now intends to replace all of its antennas with six (6) model LPA-80063-4CF cellular antennas; three (3) model BXA-171063-8BF PCS antennas; and three (3) model BXA-70063-6CF LTE antennas, all at the same 134-foot level. Cellco also intends to install six (6) additional coax cables inside the monopole. Attached behind Tab 1 are the specifications for the 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 Matthew W. Coppler, Town Manager of the Town of Enfield. A copy of this letter is also being sent to Welcome Enfield LLC, 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).



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# ROBINSON & COLE<sup>LLP</sup>


Linda Roberts  
August 31, 2012  
Page 2

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas will be located at the 134-foot level on the existing 150-foot tower.
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) emissions 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 Report 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:

Matthew W. Coppler, Enfield Town Manager  
Welcome Enfield LLC  
Sandy M. Carter

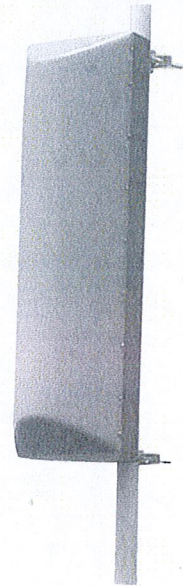


## LPA-80063-4CF-EDIN-X

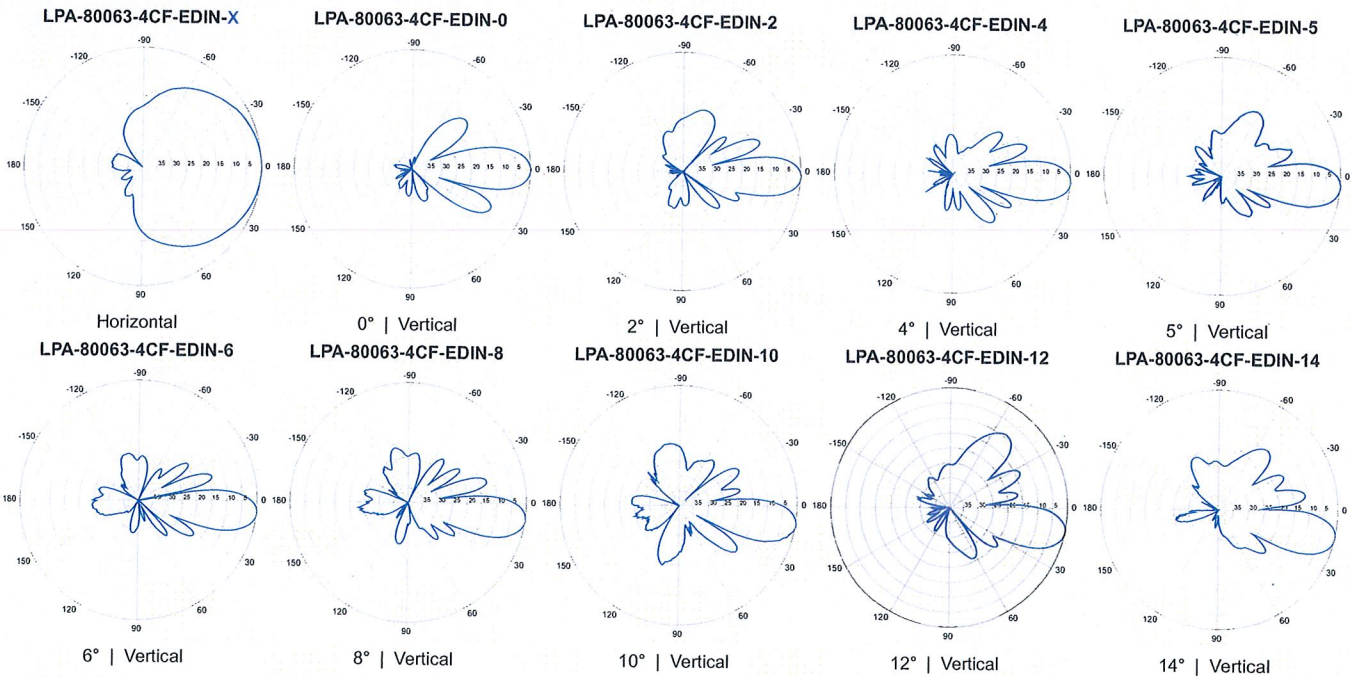
V-Pol | Log Periodic | 63° | 13.0 dBd

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		
Frequency bands	806-960 MHz	
Polarization	Vertical	
Horizontal beamwidth	63°	
Vertical beamwidth	15°	
Gain	13.0 dBd (15.1 dBi)	
Electrical downtilt (X)	0, 2, 4, 5, 6, 8, 10, 12, 14	
Impedance	50Ω	
VSWR	≤1.4:1	
Upper sidelobe suppression (0°)	-15.7 dB	
Front-to-back ratio (+/-30°)	-31.7 dB	
Null fill	5% (-26.02 dB)	
Input power	500 W	
Lightning protection	Direct Ground	
Connector(s)	1 Port / EDIN or NE / Female / Center (Back)	
Mechanical Characteristics		
Dimensions Length x Width x Depth	1205 x 385 x 332 mm      47.4 x 15.2 x 13.1 in	
Depth of antenna with z-bracket	372 mm      14.6 in	
Weight without mounting brackets	9.1 kg      20 lbs	
Survival wind speed	> 201 km/hr      > 125 mph	
Wind area	Front: 0.46 m <sup>2</sup> Side: 0.39 m <sup>2</sup> Front: 5.0 ft <sup>2</sup> Side: 4.2 ft <sup>2</sup>	
Wind load @ 161 km/hr (100 mph)	Front: 660 N    Side: 550 N      Front: 149 lbf    Side: 124 lbf	
Mounting Options		
Part Number	Fits Pipe Diameter	Weight
2-Point Mounting & Downtilt Bracket Kit (0-20°)	21699999      50-102 mm    2.0-4.0 in	5.4 kg    12 lbs
Lock-Down Brace	If the lock-down brace is used, the maximum diameter of the mounting pipe is 88.9 mm or 3.5 in.	



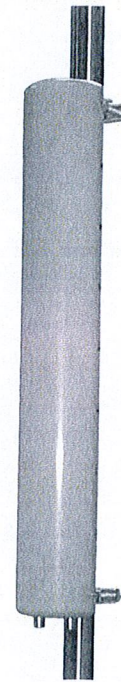
Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product.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

## BXA-171063-8BF-EDIN-X

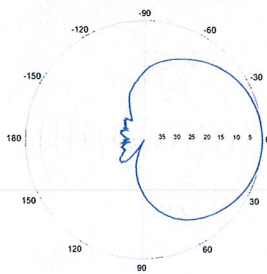
Replace 'X' with desired electrical downtilt.

X-Pol | FET Panel | 63° | 17.4 dBi

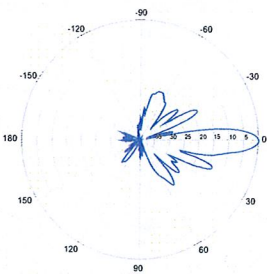
Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	68°	65°	60°
Vertical beamwidth	7°	7°	7°
Gain	14.5 dBd / 16.6 dBi	14.9 dBd / 17.0 dBi	15.3 dBd / 17.4 dBi
Electrical downtilt (X)	0, 2, 4, 8		
Impedance	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 / Bottom		
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 l-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 <sup>2</sup> Side: 0.14 m <sup>2</sup>	Front: 2.0 ft <sup>2</sup> Side: 1.5 ft <sup>2</sup>	
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-171063-8BF-EDIN-X-FP		



**BXA-171063-8BF-EDIN-X**

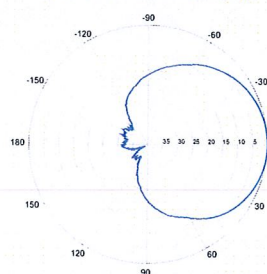


Horizontal | 1710-1880 MHz  
**BXA-171063-8BF-EDIN-0**

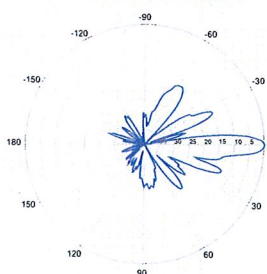


0° | Vertical | 1710-1880 MHz

**BXA-171063-8BF-EDIN-X**

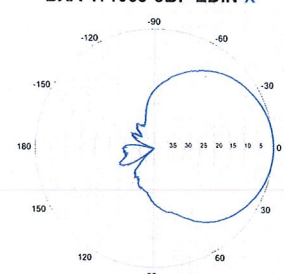


Horizontal | 1850-1990 MHz  
**BXA-171063-8BF-EDIN-0**

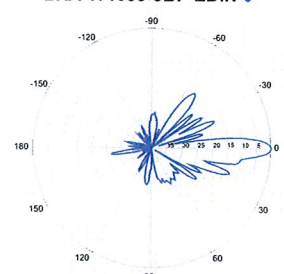


0° | Vertical | 1850-1990 MHz

**BXA-171063-8BF-EDIN-X**



Horizontal | 1920-2170 MHz  
**BXA-171063-8BF-EDIN-0**



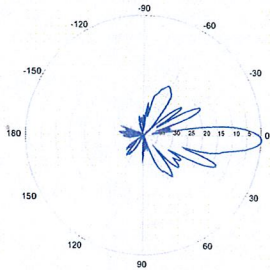
0° | Vertical | 1920-2170 MHz

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.

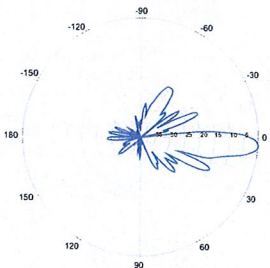
**BXA-171063-8BF-EDIN-X**

X-Pol | FET Panel | 63° | 17.4 dBi

**BXA-171063-8BF-EDIN-2**

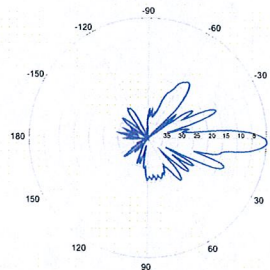


2° | Vertical | 1710-1880 MHz  
**BXA-171063-8BF-EDIN-4**



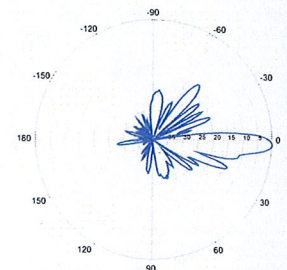
2° | Vertical | 1850-1990 MHz  
**BXA-171063-8BF-EDIN-4**

**BXA-171063-8BF-EDIN-2**

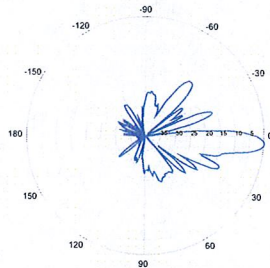


2° | Vertical | 1920-2170 MHz  
**BXA-171063-8BF-EDIN-4**

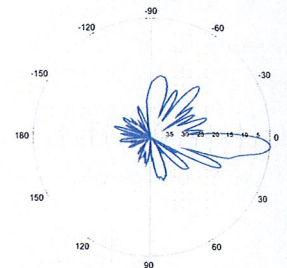
**BXA-171063-8BF-EDIN-2**



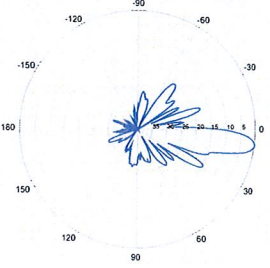
4° | Vertical | 1710-1880 MHz  
**BXA-171063-8BF-EDIN-8**



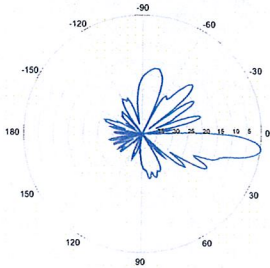
4° | Vertical | 1850-1990 MHz  
**BXA-171063-8BF-EDIN-8**



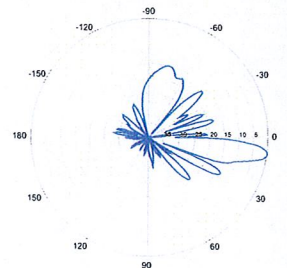
4° | Vertical | 1920-2170 MHz  
**BXA-171063-8BF-EDIN-8**



8° | Vertical | 1710-1880 MHz



8° | Vertical | 1850-1990 MHz



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.

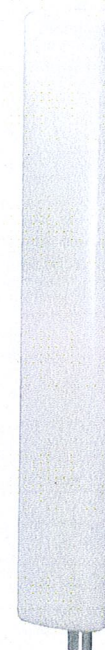


## BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

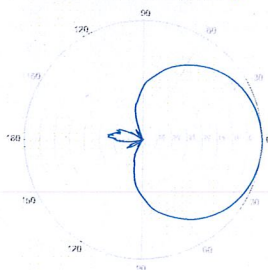
Replace "X" with desired electrical downtilt.

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



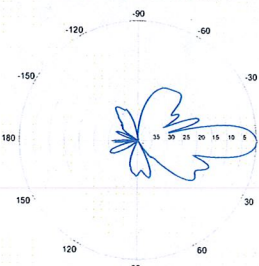
Electrical Characteristics	696-900 MHz		
	696-806 MHz	806-900 MHz	
Frequency bands	696-806 MHz	806-900 MHz	
Polarization	±45°		
Horizontal beamwidth	65°	63°	
Vertical beamwidth	13°	11°	
Gain	14.0 dBd (16.1 dBi)	14.5 dBd (16.6 dBi)	
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10		
Impedance	50Ω		
VSWR	≤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 <sup>2</sup> Side: 0.24 m <sup>2</sup>	Front: 5.5 ft <sup>2</sup> Side: 2.6 ft <sup>2</sup>	
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



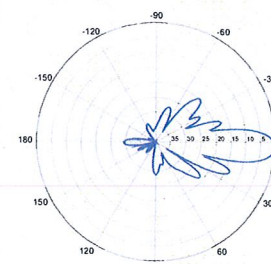
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

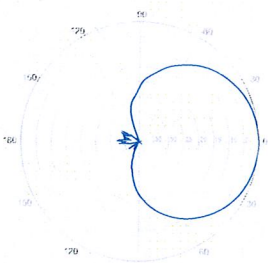


0° | Vertical | 750 MHz

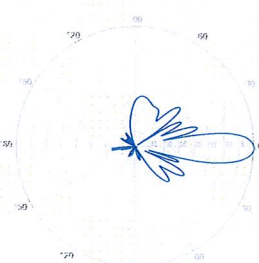
BXA-70063-6CF-EDIN-2



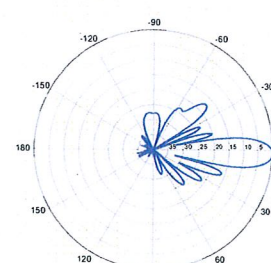
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



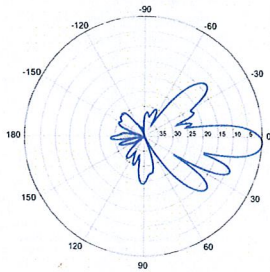
2° | Vertical | 850 MHz

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**BXA-70063-6CF-EDIN-X**

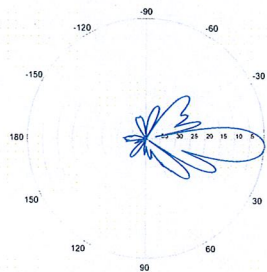
X-Pol | FET Panel | 63° | 14.5 dBd

**BXA-70063-6CF-EDIN-3**



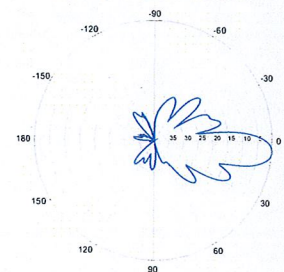
3° | Vertical | 750 MHz

**BXA-70063-6CF-EDIN-4**

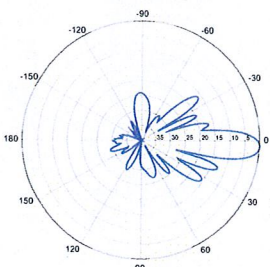


4° | Vertical | 750 MHz

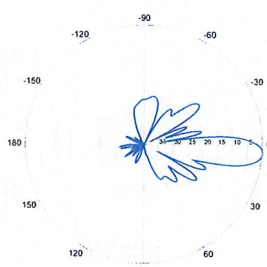
**BXA-70063-6CF-EDIN-5**



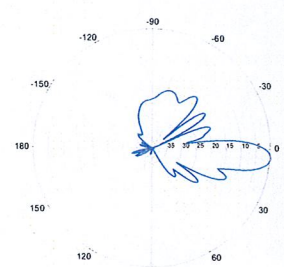
5° | Vertical | 750 MHz



3° | Vertical | 850 MHz

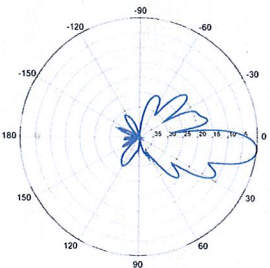


4° | Vertical | 850 MHz



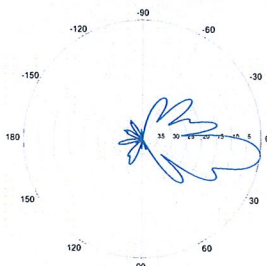
5° | Vertical | 850 MHz

**BXA-70063-6CF-EDIN-6**



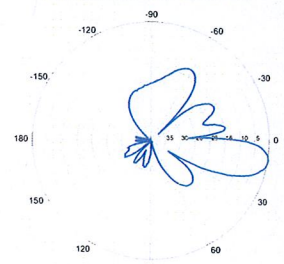
6° | Vertical | 750 MHz

**BXA-70063-6CF-EDIN-8**

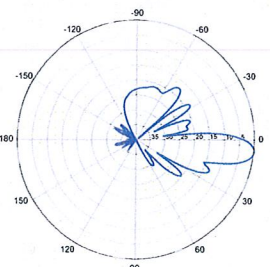


8° | Vertical | 750 MHz

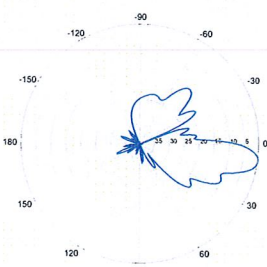
**BXA-70063-6CF-EDIN-10**



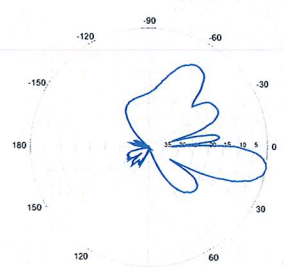
10° | Vertical | 750 MHz



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: North Thompsonville (Enfield)									
Tower Height: Verizon @ 134Ft.									
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total	
*AT&T UMTS	2	565	119	0.0287	880	0.5867	4.89%		
*AT&T UMTS	2	875	119	0.0444	1900	1.0000	4.44%		
*AT&T GSM	1	283	119	0.0072	880	0.5867	1.22%		
*AT&T GSM	4	525	119	0.0533	1900	1.0000	5.33%		
*AT&T LTE	1	1375	119	0.0349	734	0.4893	7.13%		
*Pocket	3	631	107	0.0595	2130	1.0000	5.95%		
*Clearwire	2	153	147	0.0051	2496	1.0000	0.51%		
*Clearwire	1	211	147	0.0035	11 GHz	1.0000	0.35%		
*Sprint PCS	11	122	147	0.0223	1957.5	1.0000	2.23%		
*Nextel	9	100	127	0.0201	851	0.5673	3.54%		
*XM Sat Radio	2	307	142	0.0109	2340	1.0000	1.09%		
Verizon PCS	11	246	134	0.0542	1970	1.0000	5.42%		
Verizon Cellular	9	254	134	0.0458	869	0.5793	7.90%		
Verizon AWS	1	596	134	0.0119	2145	1.0000	1.19%		
Verizon 700	1	834	134	0.0167	698	0.4653	3.59%		
								54.80%	
* Source: Siting Council									

Date: August 21, 2012

Veronica Harris  
Crown Castle  
1200 McArthur Blvd  
Mahwah, NJ 07430



FDH Engineering, Inc.  
6521 Meridien Drive  
Raleigh, NC 27616  
(919) 755-1012

**Subject: Structural Analysis Report**

**Carrier Designation:** Verizon Wireless Co-Locate  
**Carrier Site Number:** 119680  
**Carrier Site Name:** North Thompsonville CT

**Crown Castle Designation:** Crown Castle BU Number: 876348  
Crown Castle Site Name: ENFIELD  
Crown Castle JDE Job Number: 191333  
Crown Castle Work Order Number: 503576  
Crown Castle Application Number: 151081 Rev. 1

**Engineering Firm Designation:** FDH Engineering, Inc. Project Number: 12-04604E S3 (R1)

**Site Data:** Bright Meadow Blvd., ENFIELD, Hartford County, CT  
Latitude 42° 1' 14.91", Longitude -72° 35' 6.59"  
147.5 Foot - Monopole Tower

Dear Veronica Harris,

FDH Engineering, 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 471199, in accordance with application 151081, revision 1.

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:

LC7: 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 2005 CT State Building Code based upon a wind speed of 80 mph fastest mile.

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

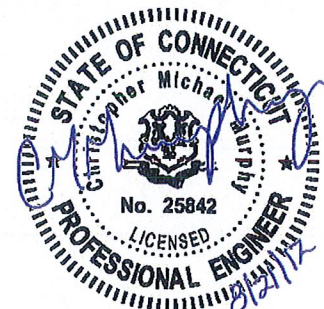
We at FDH Engineering, Inc. appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by:

Tyler Mora, EI  
Project Engineer

Reviewed by:

Christopher M. Murphy, PE  
President  
CT PE License No. 25842



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**1) INTRODUCTION**

This tower is a 147.5 ft Monopole tower designed by SUMMIT in September of 1998. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

**2) ANALYSIS CRITERIA**

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 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
		6	antel	LPA-80063/4CF w/ Mount Pipe			
132	134	3	antel	BXA-70063-6CF-EDIN-2 w/ Mount Pipe	6	1-5/8	---
		3	antel	BXA-171063-8BF-EDIN-2 w/ Mount Pipe			

**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
147.0	147.0	1	crown mounts	Platform Mount [LP 712-1]			
		6	decibel	DB980H90E-M w/ Mount Pipe	6	1-5/8	1
132.0	134.0	6	antel	WPA-80090/4CF w/Mount Pipe	---	---	2
	132.0	6	decibel	DB948F85T2E-M w/Mount Pipe			
127.0	129.0	1	crown mounts	Platform Mount [LP 712-1]	12	1-5/8	1
	127.0	12	decibel	DB844H90E-XY w/ Mount Pipe	12	7/8	1
	119.0	1	crown mounts	Platform Mount [LP 712-1]			
117.0	117.0	3	powerwave technologies	7770.00 w/ Mount Pipe			
		1	crown mounts	Platform Mount [LP 712-1]	9	1-5/8	1
		6	powerwave technologies	LGP21401			
		1	andrew	SBNH-1D6565C w/ Mount Pipe			
		6	ericsson	RRUS-11			
117.0	119.0	1	kmw communications	AM-X-CD-14-65-00T-RET w/Mount Pipe	2 1	3/4 3/8	3
		1	kmw communications	AM-X-CD-16-65-00T-RET w/Mount Pipe			
		1	raycap	DC6-48-60-18-8F			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
116.0	116.0	1	Crown mounts	Side Arm Mount [SO102-3]			
107.0	107.0	1	crown mounts	Side Arm Mount [SO 102-3]			
		3	rfs celwave	APXV18-206517S-C w/ Mount Pipe	6	1-5/8	1
49.0	50.0	1	symmetricom	58532A			
	49.0	1	crown mounts	Side Arm Mount [SO 701-1]	1	1/2	1

Notes:

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

**Table 3 - Design Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
147.5	147.5	1	---	14' Low Profile Platform	---	---
		12	decibel	DB980H PCS	---	---
132	132	1	---	14' Low Profile Platform	---	---
		12	---	Panel Antenna (CaAa = 3.9 SF each)	---	---
117	117	1	---	14' Low Profile Platform	---	---
		12	---	Panel Antenna (CaAa = 3.9 SF each)	---	---

**3) ANALYSIS PROCEDURE**

**Table 4 - Documents Provided**

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering, Inc.	Project No. 12-04604E G1	-
4-TOWER FOUNDATION MAPPING	FDH Engineering, Inc.	1613614	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit Manufacturing, Inc. (September 11, 1998)	1613591	CCISITES

**3.1) Analysis Method**

tnxTower (version 6.0.4.0), 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) Based on site photos, the Summit Manufacturing pad and pier foundation (Document 1613614) is assumed to be installed.
- 5) 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. FDH Engineering, 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 (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	147.5 - 108.5	Pole	TP29.4x22x0.25	1	-9.15	1082.89	46.9	Pass
L2	108.5 - 72.25	Pole	TP35.7x28.1885x0.25	2	-14.32	1427.51	93.0	Pass
L3	72.25 - 35.75	Pole	TP42.2x34.355x0.3125	3	-21.32	2108.11	95.6	Pass
L4	35.75 - 0	Pole	TP48.4x40.5705x0.375	4	-31.73	2971.67	90.5	Pass
Summary								
Pole (L3)							95.6	Pass
<b>RATING =</b>							<b>95.6</b>	<b>Pass</b>

**Table 6 - Tower Component Stresses vs. Capacity – LC7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	96.6	Pass
1	Base Plate	0	86.9	Pass
1	Base Foundation Soil Interaction	0	80.3	Pass

<b>Structure Rating (max from all components) =</b>	<b>96.6%</b>
---	--------------

Notes:

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

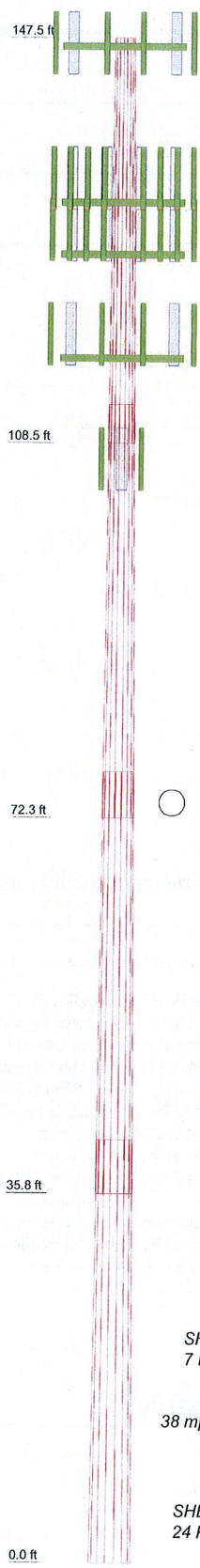
**4.1) Recommendations**

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



**APPENDIX A**  
**TNXTOWER OUTPUT**

Section	1	2	3	4
Length (ft)	39.00	40.00	41.00	41.00
Number of Sides	18	18	18	18
Thickness (in)	0.2500	0.2500	0.3125	0.3750
Socket Length (ft)	3.75	4.50	5.25	40.5705
Top Dia (in)	22.0000	28.1885	34.3550	40.5705
Bot Dia (in)	29.4000	35.7000	42.2000	48.4000
Grade	A607-60	A607-65	A607-65	A607-65
Weight (K)	2.7	3.4	5.3	7.3



**DESIGNED APPURTENANCE LOADING**

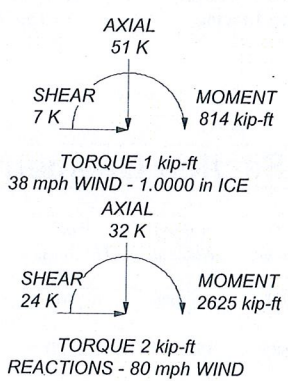
TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod	147.5	AM-X-CD-16-65-00T-RET w/ Mount Pipe	117
(2) DB980H90E-M w/ Mount Pipe	147	DC6-48-60-18-8F	117
(2) DB980H90E-M w/ Mount Pipe	147	(2) RRUS-11	117
Platform Mount [LP 712-1]	147	(2) RRUS-11	117
(2) Empty Pipe Mount	147	(2) RRUS-11	117
(2) Empty Pipe Mount	147	(2) LGP21401	117
(2) DB980H90E-M w/ Mount Pipe	147	(2) LGP21401	117
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	132	(2) LGP21401	117
(2) LPA-80063/4CF w/ Mount Pipe	132	7770.00 w/ Mount Pipe	117
BXA-70063-6CF-2 w/ Mount Pipe	132	7770.00 w/ Mount Pipe	117
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	132	SBNH-1D6565C w/ Mount Pipe	117
(2) LPA-80063/4CF w/ Mount Pipe	132	Platform Mount [LP 712-1]	117
BXA-70063-6CF-2 w/ Mount Pipe	132	(2) Empty Pipe Mount	117
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	132	(2) Empty Pipe Mount	117
(2) LPA-80063/4CF w/ Mount Pipe	132	(2) Empty Pipe Mount	117
Platform Mount [LP 712-1]	132	7770.00 w/ Mount Pipe	117
BXA-70063-6CF-2 w/ Mount Pipe	132	Side Arm Mount [SO 102-3]	116
(4) DB844H90E-XY w/ Mount Pipe	127	APXV18-206517S-C w/ Mount Pipe	107
(4) DB844H90E-XY w/ Mount Pipe	127	APXV18-206517S-C w/ Mount Pipe	107
(4) DB844H90E-XY w/ Mount Pipe	127	Side Arm Mount [SO 102-3]	107
Platform Mount [LP 712-1]	127	APXV18-206517S-C w/ Mount Pipe	107
AM-X-CD-14-65-00T-RET w/ Mount Pipe	117	Side Arm Mount [SO 701-1]	49
		58532A	49

**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	A607-65	65 ksi	80 ksi

**TOWER DESIGN NOTES**

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 95.6%



<p><b>FDH Engineering, Inc.</b> 6521 Meridian Drive Raleigh, NC 27616 Phone: (919) 755-1012 FAX: (919) 755-1031</p>	Job: <b>876348</b>
	Project: <b>12-04604E S3 (R1)</b>
	Client: <b>Crown Castle</b> Drawn by: <b>Tyler Mora, EI</b> App'd:
	Code: <b>TIA/EIA-222-F</b> Date: <b>08/21/12</b> Scale: <b>NTS</b>
Tower Analysis	Path: <small>12-11-12\Projects\12-04604E S3 (R1)\Drawings\12-04604E S3 (R1) E-1.dwg</small>
	Dwg No. <b>E-1</b>

<b>tnxTower</b>  <b>FDH Engineering, Inc.</b> 6521 Meridien Drive Raleigh, NC 27616 Phone: (919) 755-1012 FAX: (919) 755-1031	<b>Job</b> 876348	<b>Page</b> 1 of 25
	<b>Project</b> 12-04604E S3 (R1)	<b>Date</b> 14:40:22 08/21/12
	<b>Client</b> Crown Castle	<b>Designed by</b> Tyler Mora, EI

## Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

- Tower is located in Hartford County, Connecticut.
- Basic wind speed of 80 mph.
- Nominal ice thickness of 1.0000 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

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

## 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	147.50-108.50	39.00	3.75	18	22.0000	29.4000	0.2500	1.0000	A607-60 (60 ksi)
L2	108.50-72.25	40.00	4.50	18	28.1885	35.7000	0.2500	1.0000	A607-65 (65 ksi)
L3	72.25-35.75	41.00	5.25	18	34.3550	42.2000	0.3125	1.2500	A607-65 (65 ksi)
L4	35.75-0.00	41.00		18	40.5705	48.4000	0.3750	1.5000	A607-65 (65 ksi)

<b>tnxTower</b>  <b>FDH Engineering, Inc.</b> 6521 Meriden Drive Raleigh, NC 27616 Phone: (919) 755-1012 FAX: (919) 755-1031	<b>Job</b> 876348	<b>Page</b> 2 of 25
	<b>Project</b> 12-04604E S3 (R1)	<b>Date</b> 14:40:22 08/21/12
	<b>Client</b> Crown Castle	<b>Designed by</b> Tyler Mora, EI

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	<i>l</i> in <sup>4</sup>	<i>r</i> in	<i>C</i> in	<i>l/C</i> in <sup>2</sup>	<i>J</i> in <sup>4</sup>	<i>l/J</i> in <sup>2</sup>	<i>w</i> in	<i>w/t</i>
L1	22.3394	17.2586	1031.4832	7.7212	11.1760	92.2945	2064.3237	8.6310	3.4320	13.728
	29.8535	23.1305	2483.1334	10.3483	14.9352	166.2605	4969.5343	11.5675	4.7344	18.938
L2	29.3384	22.1692	2186.2099	9.9182	14.3197	152.6711	4375.2966	11.0867	4.5212	18.085
	36.2507	28.1296	4466.1479	12.5848	18.1356	246.2641	8938.1724	14.0675	5.8432	23.373
L3	35.7593	33.7659	4943.7545	12.0851	17.4523	283.2721	9894.0141	16.8861	5.4965	17.589
	42.8510	41.5472	9209.7474	14.8701	21.4376	429.6072	18431.6131	20.7775	6.8772	22.007
L4	42.2143	47.8426	9765.7670	14.2694	20.6098	473.8412	19544.3840	23.9259	6.4804	17.281
	49.1466	57.1618	16656.2703	17.0489	24.5872	677.4366	33334.4574	28.5863	7.8584	20.956

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor <i>A<sub>f</sub></i>	Adjust. Factor <i>A<sub>r</sub></i>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft <sup>2</sup>	in					in	in
L1 147.50-108.50				1	1	1		
L2 108.50-72.25				1	1	1		
L3 72.25-35.75				1	1	1		
L4 35.75-0.00				1	1	1		

### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	<i>C<sub>A</sub>A<sub>A</sub></i> ft <sup>2</sup> /ft	Weight plf
LDF7-50A(1-5/8")	C	No	Inside Pole	147.00 - 0.00	6	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")	C	No	Inside Pole	132.00 - 0.00	12	No Ice	0.82
						1/2" Ice	0.82
						1" Ice	0.82
						2" Ice	0.82
						4" Ice	0.82
LDF7-50A(1-5/8")	C	No	Inside Pole	132.00 - 0.00	12	No Ice	0.82
						1/2" Ice	0.82
						1" Ice	0.82
						2" Ice	0.82
						4" Ice	0.82
LDF5-50A(7/8")	C	No	Inside Pole	127.00 - 0.00	12	No Ice	0.33
						1/2" Ice	0.33
						1" Ice	0.33
						2" Ice	0.33
						4" Ice	0.33
LDF7-50A(1-5/8")	C	No	Inside Pole	117.00 - 0.00	9	No Ice	0.82
						1/2" Ice	0.82
						1" Ice	0.82
						2" Ice	0.82
						4" Ice	0.82
FB-L98B-002-75000(	C	No	Inside Pole	117.00 - 0.00	1	No Ice	0.06

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	Client	Crown Castle	Designed by	Tyler Mora, EI

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C <sub>AA</sub>	Weight plf
3/8")						1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.06 0.06 0.06
WR-VG86ST-BRD( 3/4)	C	No	Inside Pole	117.00 - 0.00	2	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.59 0.59 0.59 0.59
LCF158-50JL(1-5/8")	C	No	CaAa (Out Of Face)	107.00 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.20 2.03 4.16 10.24 29.74
LCF158-50JL(1-5/8")	C	No	CaAa (Out Of Face)	107.00 - 0.00	5	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.52 2.03 4.16 10.24 29.74
LDF4-50A(1/2")	C	No	Inside Pole	49.00 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.15 0.15 0.15 0.15 0.15
Safety Line 3/8	A	No	CaAa (Out Of Face)	147.50 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.22 0.75 1.28 2.34 4.46

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	147.50-108.50	A	0.000	0.000	0.000	1.462	0.01
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.80
L2	108.50-72.25	A	0.000	0.000	0.000	1.359	0.01
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.881	1.46
L3	72.25-35.75	A	0.000	0.000	0.000	1.369	0.01
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	7.227	1.47
L4	35.75-0.00	A	0.000	0.000	0.000	1.341	0.01
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	7.079	1.45

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	147.50-108.50	A	1.176	0.000	0.000	0.000	10.634	0.06
		B		0.000	0.000	0.000	0.000	0.00

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	<b>Project</b> 12-04604E S3 (R1)	<b>Date</b> 14:40:22 08/21/12
	<b>Client</b> Crown Castle	<b>Designed by</b> Tyler Mora, EI

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
		C		0.000	0.000	0.000	0.000	0.80
L2	108.50-72.25	A	1.128	0.000	0.000	0.000	9.884	0.05
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	15.053	2.44
L3	72.25-35.75	A	1.061	0.000	0.000	0.000	9.603	0.05
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	15.461	2.44
L4	35.75-0.00	A	1.000	0.000	0.000	0.000	8.924	0.05
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	14.662	2.31

### Feed Line Center of Pressure

Section	Elevation ft	$CP_x$ in	$CP_z$ in	$CP_x$ Ice in	$CP_z$ Ice in
L1	147.50-108.50	0.0000	-0.0553	0.0000	-0.3356
L2	108.50-72.25	-0.2284	0.0800	-0.4078	-0.0724
L3	72.25-35.75	-0.2397	0.0860	-0.4329	-0.0605
L4	35.75-0.00	-0.2420	0.0868	-0.4356	-0.0547

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	$C_{AA}$ Front ft <sup>2</sup>	$C_{AA}$ Side ft <sup>2</sup>	Weight K	
(2) DB980H90E-M w/ Mount Pipe	A	From Leg	4.00	0.0000	147.00	No Ice	4.04	3.62	0.03
			0.00			1/2" Ice	4.50	4.48	0.06
			0.00			1" Ice	4.95	5.22	0.11
						2" Ice	5.87	6.74	0.22
						4" Ice	8.05	10.00	0.55
(2) DB980H90E-M w/ Mount Pipe	B	From Leg	4.00	0.0000	147.00	No Ice	4.04	3.62	0.03
			0.00			1/2" Ice	4.50	4.48	0.06
			0.00			1" Ice	4.95	5.22	0.11
						2" Ice	5.87	6.74	0.22
						4" Ice	8.05	10.00	0.55
(2) DB980H90E-M w/ Mount Pipe	C	From Leg	4.00	0.0000	147.00	No Ice	4.04	3.62	0.03
			0.00			1/2" Ice	4.50	4.48	0.06
			0.00			1" Ice	4.95	5.22	0.11
						2" Ice	5.87	6.74	0.22
						4" Ice	8.05	10.00	0.55
*** (2) LPA-80063/4CF w/ Mount Pipe	A	From Leg	4.00	0.0000	132.00	No Ice	7.11	7.13	0.04
			0.00			1/2" Ice	7.58	7.83	0.10
			2.00			1" Ice	8.07	8.54	0.17
						2" Ice	9.06	10.02	0.34
						4" Ice	11.19	13.25	0.79
BXA-70063-6CF-2 w/ Mount	A	From Leg	4.00	0.0000	132.00	No Ice	7.97	5.80	0.04

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
Pipe			0.00			1/2" Ice	8.61	6.95
			2.00			1" Ice	9.22	7.82
						2" Ice	10.46	9.60
						4" Ice	13.07	13.37
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	A	From Leg	4.00	0.0000	132.00	No Ice	3.18	3.35
			0.00			1/2" Ice	3.56	3.97
			2.00			1" Ice	3.96	4.60
						2" Ice	4.85	5.89
						4" Ice	6.77	8.89
(2) LPA-80063/4CF w/ Mount Pipe	B	From Leg	4.00	0.0000	132.00	No Ice	7.11	7.13
			0.00			1/2" Ice	7.58	7.83
			2.00			1" Ice	8.07	8.54
						2" Ice	9.06	10.02
						4" Ice	11.19	13.25
BXA-70063-6CF-2 w/ Mount Pipe	B	From Leg	4.00	0.0000	132.00	No Ice	7.97	5.80
			0.00			1/2" Ice	8.61	6.95
			2.00			1" Ice	9.22	7.82
						2" Ice	10.46	9.60
						4" Ice	13.07	13.37
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	B	From Leg	4.00	0.0000	132.00	No Ice	3.18	3.35
			0.00			1/2" Ice	3.56	3.97
			2.00			1" Ice	3.96	4.60
						2" Ice	4.85	5.89
						4" Ice	6.77	8.89
(2) LPA-80063/4CF w/ Mount Pipe	C	From Leg	4.00	0.0000	132.00	No Ice	7.11	7.13
			0.00			1/2" Ice	7.58	7.83
			2.00			1" Ice	8.07	8.54
						2" Ice	9.06	10.02
						4" Ice	11.19	13.25
BXA-70063-6CF-2 w/ Mount Pipe	C	From Leg	4.00	0.0000	132.00	No Ice	7.97	5.80
			0.00			1/2" Ice	8.61	6.95
			2.00			1" Ice	9.22	7.82
						2" Ice	10.46	9.60
						4" Ice	13.07	13.37
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	C	From Leg	4.00	0.0000	132.00	No Ice	3.18	3.35
			0.00			1/2" Ice	3.56	3.97
			2.00			1" Ice	3.96	4.60
						2" Ice	4.85	5.89
						4" Ice	6.77	8.89
***								
(4) DB844H90E-XY w/ Mount Pipe	A	From Leg	4.00	0.0000	127.00	No Ice	3.30	4.92
			0.00			1/2" Ice	3.69	5.60
			2.00			1" Ice	4.12	6.28
						2" Ice	5.01	7.71
						4" Ice	6.92	10.83
(4) DB844H90E-XY w/ Mount Pipe	B	From Leg	4.00	0.0000	127.00	No Ice	3.30	4.92
			0.00			1/2" Ice	3.69	5.60
			2.00			1" Ice	4.12	6.28
						2" Ice	5.01	7.71
						4" Ice	6.92	10.83
(4) DB844H90E-XY w/ Mount Pipe	C	From Leg	4.00	0.0000	127.00	No Ice	3.30	4.92
			0.00			1/2" Ice	3.69	5.60
			2.00			1" Ice	4.12	6.28
						2" Ice	5.01	7.71
						4" Ice	6.92	10.83
***								
7770.00 w/ Mount Pipe	A	From Leg	4.00	0.0000	117.00	No Ice	6.12	4.25

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Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>Front</sub>	C <sub>A</sub> A <sub>Side</sub>	Weight
			Horz	Lateral	Vert					
					0.00					
					2.00		1/2" Ice	6.63	5.01	0.10
							1" Ice	7.13	5.71	0.16
							2" Ice	8.16	7.16	0.29
							4" Ice	10.36	10.41	0.66
7770.00 w/ Mount Pipe	C	From Leg	4.00	0.0000	117.00		No Ice	6.12	4.25	0.06
			0.00				1/2" Ice	6.63	5.01	0.10
			2.00				1" Ice	7.13	5.71	0.16
							2" Ice	8.16	7.16	0.29
							4" Ice	10.36	10.41	0.66
7770.00 w/ Mount Pipe	B	From Leg	4.00	0.0000	117.00		No Ice	6.12	4.25	0.06
			0.00				1/2" Ice	6.63	5.01	0.10
			2.00				1" Ice	7.13	5.71	0.16
							2" Ice	8.16	7.16	0.29
							4" Ice	10.36	10.41	0.66
(2) LGP21401	A	From Leg	4.00	0.0000	117.00		No Ice	1.29	0.23	0.01
			0.00				1/2" Ice	1.45	0.31	0.02
			0.00				1" Ice	1.61	0.40	0.03
							2" Ice	1.97	0.61	0.05
							4" Ice	2.79	1.12	0.14
(2) LGP21401	B	From Leg	4.00	0.0000	117.00		No Ice	1.29	0.23	0.01
			0.00				1/2" Ice	1.45	0.31	0.02
			0.00				1" Ice	1.61	0.40	0.03
							2" Ice	1.97	0.61	0.05
							4" Ice	2.79	1.12	0.14
(2) LGP21401	C	From Leg	4.00	0.0000	117.00		No Ice	1.29	0.23	0.01
			0.00				1/2" Ice	1.45	0.31	0.02
			0.00				1" Ice	1.61	0.40	0.03
							2" Ice	1.97	0.61	0.05
							4" Ice	2.79	1.12	0.14
SBNH-1D6565C w/ Mount Pipe	A	From Leg	4.00	0.0000	117.00		No Ice	11.68	9.84	0.10
			0.00				1/2" Ice	12.40	11.37	0.19
			2.00				1" Ice	13.14	12.91	0.29
							2" Ice	14.60	15.27	0.52
							4" Ice	17.87	20.14	1.17
AM-X-CD-14-65-00T-RET w/ Mount Pipe	B	From Leg	4.00	0.0000	117.00		No Ice	5.74	4.02	0.03
			0.00				1/2" Ice	6.20	4.63	0.08
			2.00				1" Ice	6.66	5.28	0.13
							2" Ice	7.62	6.68	0.25
							4" Ice	9.67	9.74	0.61
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.00	0.0000	117.00		No Ice	8.50	6.30	0.07
			0.00				1/2" Ice	9.15	7.48	0.14
			2.00				1" Ice	9.77	8.37	0.21
							2" Ice	11.03	10.18	0.38
							4" Ice	13.68	14.02	0.87
DC6-48-60-18-8F	A	From Leg	4.00	0.0000	117.00		No Ice	2.57	4.32	0.02
			0.00				1/2" Ice	2.80	4.60	0.05
			2.00				1" Ice	3.04	4.88	0.09
							2" Ice	3.54	5.49	0.17
							4" Ice	4.66	6.80	0.38
(2) RRUS-11	A	From Leg	4.00	0.0000	117.00		No Ice	2.94	1.52	0.05
			0.00				1/2" Ice	3.17	1.69	0.08
			2.00				1" Ice	3.41	1.88	0.10
							2" Ice	3.91	2.27	0.16
							4" Ice	5.02	3.16	0.32
(2) RRUS-11	B	From Leg	4.00	0.0000	117.00		No Ice	2.94	1.52	0.05
			0.00				1/2" Ice	3.17	1.69	0.08
			2.00				1" Ice	3.41	1.88	0.10



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	<b>Client</b>		Crown Castle		<b>Designed by</b>		Tyler Mora, EI	

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
(2) RRUS-11	C	From Leg	4.00 0.00 2.00	0.0000	117.00	2" Ice	3.91	2.27	0.16
						4" Ice	5.02	3.16	0.32
						No Ice	2.94	1.52	0.05
						1/2" Ice	3.17	1.69	0.08
						1" Ice	3.41	1.88	0.10
						2" Ice	3.91	2.27	0.16
***						4" Ice	5.02	3.16	0.32
APXV18-206517S-C w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	0.0000	107.00	No Ice	5.40	4.70	0.05
						1/2" Ice	5.96	5.86	0.09
						1" Ice	6.48	6.73	0.15
						2" Ice	7.55	8.51	0.28
						4" Ice	9.92	12.28	0.68
						No Ice	5.40	4.70	0.05
APXV18-206517S-C w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	0.0000	107.00	1/2" Ice	5.96	5.86	0.09
						1" Ice	6.48	6.73	0.15
						2" Ice	7.55	8.51	0.28
						4" Ice	9.92	12.28	0.68
						No Ice	5.40	4.70	0.05
						1/2" Ice	5.96	5.86	0.09
APXV18-206517S-C w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	0.0000	107.00	1" Ice	6.48	6.73	0.15
						2" Ice	7.55	8.51	0.28
						4" Ice	9.92	12.28	0.68
						No Ice	5.40	4.70	0.05
						1/2" Ice	5.96	5.86	0.09
						1" Ice	6.48	6.73	0.15
***						2" Ice	7.55	8.51	0.28
58532A	A	From Leg	4.00 0.00 1.00	0.0000	49.00	No Ice	0.22	0.22	0.00
						1/2" Ice	0.29	0.29	0.00
						1" Ice	0.37	0.37	0.01
						2" Ice	0.55	0.55	0.02
						4" Ice	1.01	1.01	0.06
***						No Ice	24.53	24.53	1.34
Platform Mount [LP 712-1]	C	None		0.0000	147.00	1/2" Ice	29.94	29.94	1.65
						1" Ice	35.35	35.35	1.96
						2" Ice	46.17	46.17	2.58
						4" Ice	67.81	67.81	3.82
						No Ice	24.53	24.53	1.34
(2) Empty Pipe Mount	A	From Leg	4.00 0.00 0.00	0.0000	147.00	1/2" Ice	1.63	1.63	0.04
						1" Ice	1.95	1.95	0.05
						2" Ice	2.60	2.60	0.09
						4" Ice	4.11	4.11	0.22
						No Ice	1.33	1.33	0.03
(2) Empty Pipe Mount	B	From Leg	4.00 0.00 0.00	0.0000	147.00	1/2" Ice	1.63	1.63	0.04
						1" Ice	1.95	1.95	0.05
						2" Ice	2.60	2.60	0.09
						4" Ice	4.11	4.11	0.22
						No Ice	1.33	1.33	0.03
(2) Empty Pipe Mount	C	From Leg	4.00 0.00 0.00	0.0000	147.00	1/2" Ice	1.63	1.63	0.04
						1" Ice	1.95	1.95	0.05
						2" Ice	2.60	2.60	0.09
						4" Ice	4.11	4.11	0.22
						No Ice	1.33	1.33	0.03
***						1" Ice	1.95	1.95	0.05
Platform Mount [LP 712-1]	C	None		0.0000	132.00	2" Ice	2.60	2.60	0.09
						4" Ice	4.11	4.11	0.22
						No Ice	24.53	24.53	1.34
						1/2" Ice	29.94	29.94	1.65
						1" Ice	35.35	35.35	1.96
Platform Mount [LP 712-1]	C	None		0.0000	127.00	2" Ice	46.17	46.17	2.58
						4" Ice	67.81	67.81	3.82
						No Ice	24.53	24.53	1.34
						1/2" Ice	29.94	29.94	1.65
						1" Ice	35.35	35.35	1.96

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	<b>Client</b> Crown Castle	<b>Designed by</b> Tyler Mora, EI

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Lateral	Vert					
			ft	ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
Platform Mount [LP 712-1]	C	None	0.0000	117.00	1/2" Ice	29.94	29.94	1.65		
					1" Ice	35.35	35.35	1.96		
					2" Ice	46.17	46.17	2.58		
					4" Ice	67.81	67.81	3.82		
					No Ice	24.53	24.53	1.34		
					1/2" Ice	29.94	29.94	1.65		
					1" Ice	35.35	35.35	1.96		
(2) Empty Pipe Mount	A	From Leg	4.00	0.0000	117.00	2" Ice	46.17	46.17	2.58	
						4" Ice	67.81	67.81	3.82	
						No Ice	1.33	1.33	0.03	
						1/2" Ice	1.63	1.63	0.04	
						1" Ice	1.95	1.95	0.05	
						2" Ice	2.60	2.60	0.09	
						4" Ice	4.11	4.11	0.22	
(2) Empty Pipe Mount	B	From Leg	4.00	0.0000	117.00	No Ice	1.33	1.33	0.03	
						1/2" Ice	1.63	1.63	0.04	
						1" Ice	1.95	1.95	0.05	
						2" Ice	2.60	2.60	0.09	
						4" Ice	4.11	4.11	0.22	
						No Ice	1.33	1.33	0.03	
						1/2" Ice	1.63	1.63	0.04	
(2) Empty Pipe Mount	C	From Leg	4.00	0.0000	117.00	1" Ice	1.95	1.95	0.05	
						2" Ice	2.60	2.60	0.09	
						4" Ice	4.11	4.11	0.22	
						No Ice	1.33	1.33	0.03	
						1/2" Ice	1.63	1.63	0.04	
						1" Ice	1.95	1.95	0.05	
						2" Ice	2.60	2.60	0.09	
Side Arm Mount [SO 102-3]	C	None	0.0000	107.00	4" Ice	4.11	4.11	0.22		
					No Ice	3.00	3.00	0.08		
					1/2" Ice	3.48	3.48	0.11		
					1" Ice	3.96	3.96	0.14		
					2" Ice	4.92	4.92	0.20		
					4" Ice	6.84	6.84	0.32		
					No Ice	0.85	1.67	0.07		
Side Arm Mount [SO 701-1]	A	From Leg	0.00	0.0000	49.00	1/2" Ice	1.14	2.34	0.08	
						1" Ice	1.43	3.01	0.09	
						2" Ice	2.01	4.35	0.12	
						4" Ice	3.17	7.03	0.18	
						No Ice	0.25	0.25	0.03	
						1/2" Ice	0.66	0.66	0.03	
						1" Ice	0.97	0.97	0.04	
Side Arm Mount [SO 102-3]	C	None	0.0000	116.00	2" Ice	1.49	1.49	0.06		
					4" Ice	2.68	2.68	0.14		
					No Ice	3.00	3.00	0.08		
					1/2" Ice	3.48	3.48	0.11		
					1" Ice	3.96	3.96	0.14		
					2" Ice	4.92	4.92	0.20		
					4" Ice	6.84	6.84	0.32		

### Load Combinations

Comb. No.	Description
1	Dead Only

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

### Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load	Force	Major Axis Moment	Minor Axis Moment
				Comb.	K	kip-ft	kip-ft
L1	147.5 - 108.5	Pole	Max Tension	36	0.00	-0.00	-0.00
			Max. Compression	14	-20.50	0.45	1.26
			Max. Mx	11	-9.15	290.91	0.20
			Max. My	2	-9.16	0.10	290.53
			Max. Vy	11	-16.24	290.91	0.20
			Max. Vx	2	-16.17	0.10	290.53
			Max. Torque	11			-1.84
			Max Tension	1	0.00	0.00	0.00
L2	108.5 - 72.25	Pole	Max. Compression	14	-28.51	1.67	0.70
			Max. Mx	11	-14.32	934.72	-0.07
			Max. My	2	-14.33	-0.06	931.36
			Max. Vy	11	-19.49	934.72	-0.07
			Max. Vx	2	-19.41	-0.06	931.36
			Max. Torque	11			-1.84
			Max Tension	1	0.00	0.00	0.00
L3	72.25 - 35.75	Pole	Max. Compression	14	-38.07	3.13	0.13
			Max Tension	1	0.00	0.00	0.00

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L4	35.75 - 0	Pole	Max. Mx	11	-21.32	1676.22	-0.31
			Max. My	2	-21.33	-0.20	1669.70
			Max. Vy	11	-21.93	1676.22	-0.31
			Max. Vx	2	-21.82	-0.20	1669.70
			Max. Torque	11			-1.92
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-51.44	4.89	-0.81
			Max. Mx	11	-31.73	2624.91	-0.74
			Max. My	2	-31.73	-0.32	2613.86
			Max. Vy	11	-24.29	2624.91	-0.74
			Max. Vx	2	-24.19	-0.32	2613.86
			Max. Torque	4			1.91

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	51.44	-0.00	-0.00
	Max. H <sub>x</sub>	11	31.74	24.26	-0.01
	Max. H <sub>z</sub>	2	31.74	-0.01	24.16
	Max. M <sub>x</sub>	2	2613.86	-0.01	24.16
	Max. M <sub>z</sub>	5	2623.57	-24.26	0.01
	Max. Torsion	4	1.91	-21.02	12.09
	Min. Vert	2	31.74	-0.01	24.16
	Min. H <sub>x</sub>	5	31.74	-24.26	0.01
	Min. H <sub>z</sub>	8	31.74	0.01	-24.16
	Min. M <sub>x</sub>	8	-2613.32	0.01	-24.16
	Min. M <sub>z</sub>	11	-2624.91	24.26	-0.01
	Min. Torsion	10	-1.91	21.02	-12.09

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturing Moment, M <sub>x</sub> kip-ft	Overturing Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	31.74	-0.00	-0.00	-0.25	0.65	0.00
Dead+Wind 0 deg - No Ice	31.74	0.01	-24.16	-2613.86	-0.32	-0.55
Dead+Wind 30 deg - No Ice	31.74	12.14	-20.93	-2264.44	-1312.39	-1.42
Dead+Wind 60 deg - No Ice	31.74	21.02	-12.09	-1308.04	-2272.60	-1.91
Dead+Wind 90 deg - No Ice	31.74	24.26	-0.01	-1.25	-2623.57	-1.89
Dead+Wind 120 deg - No Ice	31.74	21.01	12.08	1305.81	-2271.60	-1.36
Dead+Wind 150 deg - No Ice	31.74	12.13	20.92	2262.92	-1310.66	-0.46
Dead+Wind 180 deg - No Ice	31.74	-0.01	24.16	2613.32	1.66	0.55
Dead+Wind 210 deg - No Ice	31.74	-12.14	20.93	2263.91	1313.72	1.42
Dead+Wind 240 deg - No Ice	31.74	-21.02	12.09	1307.53	2273.93	1.91
Dead+Wind 270 deg - No Ice	31.74	-24.26	0.01	0.74	2624.91	1.89
Dead+Wind 300 deg - No Ice	31.74	-21.01	-12.08	-1306.32	2272.96	1.36
Dead+Wind 330 deg - No Ice	31.74	-12.13	-20.92	-2263.45	1312.01	0.47
Dead+Ice+Temp	51.44	0.00	0.00	0.81	4.89	-0.00
Dead+Wind 0 deg+Ice+Temp	51.44	-0.00	-7.04	-803.58	5.13	-0.20
Dead+Wind 30 deg+Ice+Temp	51.44	3.54	-6.10	-695.81	-399.10	-0.45
Dead+Wind 60 deg+Ice+Temp	51.44	6.13	-3.52	-401.42	-695.07	-0.59

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Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overturning		Torque
	K	K	K	Moment, M <sub>x</sub> kip-ft	Moment, M <sub>z</sub> kip-ft	kip-ft
Dead+Wind 90 deg+Ice+Temp	51.44	7.08	0.00	0.80	-803.32	-0.57
Dead+Wind 120 deg+Ice+Temp	51.44	6.13	3.52	402.99	-695.01	-0.39
Dead+Wind 150 deg+Ice+Temp	51.44	3.54	6.10	697.41	-399.10	-0.11
Dead+Wind 180 deg+Ice+Temp	51.44	0.00	7.04	805.17	5.13	0.20
Dead+Wind 210 deg+Ice+Temp	51.44	-3.54	6.10	697.46	409.39	0.45
Dead+Wind 240 deg+Ice+Temp	51.44	-6.13	3.52	402.98	705.26	0.59
Dead+Wind 270 deg+Ice+Temp	51.44	-7.08	-0.00	0.80	813.58	0.57
Dead+Wind 300 deg+Ice+Temp	51.44	-6.13	-3.52	-401.42	705.33	0.39
Dead+Wind 330 deg+Ice+Temp	51.44	-3.54	-6.10	-695.87	409.39	0.11
Dead+Wind 0 deg - Service	31.74	0.00	-9.44	-1022.65	0.29	-0.22
Dead+Wind 30 deg - Service	31.74	4.74	-8.18	-886.06	-513.02	-0.56
Dead+Wind 60 deg - Service	31.74	8.21	-4.72	-511.91	-888.68	-0.76
Dead+Wind 90 deg - Service	31.74	9.48	-0.00	-0.66	-1025.81	-0.75
Dead+Wind 120 deg - Service	31.74	8.21	4.72	510.69	-888.29	-0.54
Dead+Wind 150 deg - Service	31.74	4.74	8.17	885.13	-512.34	-0.18
Dead+Wind 180 deg - Service	31.74	-0.00	9.44	1022.10	1.06	0.22
Dead+Wind 210 deg - Service	31.74	-4.74	8.18	885.52	514.37	0.56
Dead+Wind 240 deg - Service	31.74	-8.21	4.72	511.36	890.03	0.75
Dead+Wind 270 deg - Service	31.74	-9.48	0.00	0.12	1027.16	0.75
Dead+Wind 300 deg - Service	31.74	-8.21	-4.72	-511.23	889.64	0.54
Dead+Wind 330 deg - Service	31.74	-4.74	-8.17	-885.67	513.70	0.19

## 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	-31.74	0.00	0.00	31.74	0.00	0.000%
2	0.01	-31.74	-24.16	-0.01	31.74	24.16	0.006%
3	12.14	-31.74	-20.93	-12.14	31.74	20.93	0.000%
4	21.02	-31.74	-12.09	-21.02	31.74	12.09	0.000%
5	24.26	-31.74	-0.01	-24.26	31.74	0.01	0.003%
6	21.01	-31.74	12.08	-21.01	31.74	-12.08	0.000%
7	12.13	-31.74	20.92	-12.13	31.74	-20.92	0.000%
8	-0.01	-31.74	24.16	0.01	31.74	-24.16	0.006%
9	-12.14	-31.74	20.93	12.14	31.74	-20.93	0.000%
10	-21.02	-31.74	12.09	21.02	31.74	-12.09	0.000%
11	-24.26	-31.74	0.01	24.26	31.74	-0.01	0.003%
12	-21.01	-31.74	-12.08	21.01	31.74	12.08	0.000%
13	-12.13	-31.74	-20.92	12.13	31.74	20.92	0.000%
14	0.00	-51.44	0.00	-0.00	51.44	-0.00	0.002%
15	-0.00	-51.44	-7.04	0.00	51.44	7.04	0.002%
16	3.54	-51.44	-6.10	-3.54	51.44	6.10	0.002%
17	6.13	-51.44	-3.52	-6.13	51.44	3.52	0.001%
18	7.08	-51.44	0.00	-7.08	51.44	-0.00	0.002%
19	6.13	-51.44	3.52	-6.13	51.44	-3.52	0.002%
20	3.54	-51.44	6.10	-3.54	51.44	-6.10	0.002%
21	0.00	-51.44	7.04	-0.00	51.44	-7.04	0.002%
22	-3.54	-51.44	6.10	3.54	51.44	-6.10	0.001%
23	-6.13	-51.44	3.52	6.13	51.44	-3.52	0.002%
24	-7.08	-51.44	-0.00	7.08	51.44	0.00	0.002%
25	-6.13	-51.44	-3.52	6.13	51.44	3.52	0.001%
26	-3.54	-51.44	-6.10	3.54	51.44	6.10	0.001%
27	0.00	-31.74	-9.44	-0.00	31.74	9.44	0.007%
28	4.74	-31.74	-8.18	-4.74	31.74	8.18	0.001%
29	8.21	-31.74	-4.72	-8.21	31.74	4.72	0.001%
30	9.48	-31.74	-0.00	-9.48	31.74	0.00	0.007%
31	8.21	-31.74	4.72	-8.21	31.74	-4.72	0.001%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
32	4.74	-31.74	8.17	-4.74	31.74	-8.17	0.001%
33	-0.00	-31.74	9.44	0.00	31.74	-9.44	0.007%
34	-4.74	-31.74	8.18	4.74	31.74	-8.18	0.001%
35	-8.21	-31.74	4.72	8.21	31.74	-4.72	0.001%
36	-9.48	-31.74	0.00	9.48	31.74	-0.00	0.007%
37	-8.21	-31.74	-4.72	8.21	31.74	4.72	0.001%
38	-4.74	-31.74	-8.17	4.74	31.74	8.17	0.001%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	15	0.00006480	0.00009217
3	Yes	19	0.00000001	0.00010467
4	Yes	19	0.00000001	0.00011035
5	Yes	16	0.00002899	0.00007777
6	Yes	19	0.00000001	0.00010431
7	Yes	19	0.00000001	0.00010751
8	Yes	15	0.00006481	0.00009378
9	Yes	19	0.00000001	0.00010931
10	Yes	19	0.00000001	0.00010390
11	Yes	16	0.00002899	0.00007600
12	Yes	19	0.00000001	0.00010940
13	Yes	19	0.00000001	0.00010592
14	Yes	8	0.00000001	0.00001577
15	Yes	16	0.00008598	0.00008925
16	Yes	16	0.00008579	0.00014716
17	Yes	17	0.00000001	0.00007613
18	Yes	16	0.00008596	0.00008968
19	Yes	16	0.00008576	0.00014722
20	Yes	16	0.00008575	0.00014934
21	Yes	16	0.00008593	0.00008906
22	Yes	17	0.00000001	0.00007659
23	Yes	16	0.00008573	0.00014877
24	Yes	16	0.00008594	0.00009075
25	Yes	17	0.00000001	0.00007679
26	Yes	17	0.00000001	0.00007534
27	Yes	14	0.00014997	0.00009893
28	Yes	16	0.00000001	0.00008358
29	Yes	16	0.00000001	0.00009727
30	Yes	14	0.00014995	0.00011395
31	Yes	16	0.00000001	0.00008302
32	Yes	16	0.00000001	0.00009044
33	Yes	14	0.00014996	0.00009890
34	Yes	16	0.00000001	0.00009459
35	Yes	16	0.00000001	0.00008195
36	Yes	14	0.00014995	0.00011376
37	Yes	16	0.00000001	0.00009517
38	Yes	16	0.00000001	0.00008667

### Maximum Tower Deflections - Service Wind

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147.5 - 108.5	42.151	36	2.3668	0.0056
L2	112.25 - 72.25	25.113	36	2.1653	0.0051
L3	76.75 - 35.75	11.381	36	1.4427	0.0022
L4	41 - 0	3.170	36	0.7084	0.0008

**Critical Deflections and Radius of Curvature - Service Wind**

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
147.50	Lighting Rod	36	42.151	2.3668	0.0056	29030
147.00	(2) DB980H90E-M w/ Mount Pipe	36	41.901	2.3659	0.0056	29030
132.00	(2) LPA-80063/4CF w/ Mount Pipe	36	34.444	2.3262	0.0056	9364
127.00	(4) DB844H90E-XY w/ Mount Pipe	36	32.009	2.3017	0.0056	7079
117.00	7770.00 w/ Mount Pipe	36	27.277	2.2219	0.0053	4757
116.00	Side Arm Mount [SO 102-3]	36	26.816	2.2111	0.0053	4607
107.00	APXV18-206517S-C w/ Mount Pipe	36	22.797	2.0865	0.0047	3781
49.00	58532A	36	4.476	0.8604	0.0010	2489

**Maximum Tower Deflections - Design Wind**

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147.5 - 108.5	107.473	11	6.0384	0.0143
L2	112.25 - 72.25	64.068	11	5.5251	0.0128
L3	76.75 - 35.75	29.056	11	3.6832	0.0055
L4	41 - 0	8.098	11	1.8095	0.0021

**Critical Deflections and Radius of Curvature - Design Wind**

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
147.50	Lighting Rod	11	107.473	6.0384	0.0143	11607
147.00	(2) DB980H90E-M w/ Mount Pipe	11	106.836	6.0361	0.0143	11607
132.00	(2) LPA-80063/4CF w/ Mount Pipe	11	87.843	5.9350	0.0143	3742
127.00	(4) DB844H90E-XY w/ Mount Pipe	11	81.640	5.8726	0.0142	2828
117.00	7770.00 w/ Mount Pipe	11	69.583	5.6693	0.0134	1898
116.00	Side Arm Mount [SO 102-3]	11	68.410	5.6418	0.0133	1838
107.00	APXV18-206517S-C w/ Mount Pipe	11	58.166	5.3243	0.0120	1505
49.00	58532A	11	11.433	2.1976	0.0025	977

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**Compression Checks**

**Pole Design Data**

Section No.	Elevation <i>ft</i>	Size	<i>L</i> <i>ft</i>	<i>L<sub>n</sub></i> <i>ft</i>	<i>Kl/r</i>	<i>F<sub>a</sub></i> <i>ksi</i>	<i>A</i> <i>in<sup>2</sup></i>	Actual <i>P</i> <i>K</i>	Allow. <i>P<sub>a</sub></i> <i>K</i>	Ratio <i>P</i> <i>P<sub>a</sub></i>
L1	147.5 - 145.645	TP29.4x22x0.25	39.00	0.00	0.0	36.000	17.5380	-1.60	631.37	0.003
	145.645 - 143.789					36.000	17.8173	-1.74	641.42	0.003
	143.789 - 141.934					36.000	18.0966	-1.88	651.48	0.003
	141.934 - 140.079					36.000	18.3759	-2.03	661.53	0.003
	140.079 - 138.224					36.000	18.6553	-2.17	671.59	0.003
	138.224 - 136.368					36.000	18.9346	-2.32	681.65	0.003
	136.368 - 134.513					36.000	19.2139	-2.46	691.70	0.004
	134.513 - 132.658					36.000	19.4933	-2.61	701.76	0.004
	132.658 - 130.803					36.000	19.7726	-4.12	711.81	0.006
	130.803 - 128.947					36.000	20.0519	-4.28	721.87	0.006
	128.947 - 127.092					36.000	20.3313	-4.43	731.93	0.006
	127.092 - 125.237					36.000	20.6106	-5.97	741.98	0.008
	125.237 - 123.382					36.000	20.8899	-6.14	752.04	0.008
	123.382 - 121.526					36.000	21.1693	-6.30	762.09	0.008
	121.526 - 119.671					36.000	21.4486	-6.47	772.15	0.008
	119.671 - 117.816					36.000	21.7279	-6.64	782.21	0.008
	117.816 - 115.961					36.000	22.0073	-8.79	792.26	0.011
	115.961 - 114.105					36.000	22.2866	-8.97	802.32	0.011
	114.105 - 112.25					36.000	22.5659	-9.15	812.37	0.011
	112.25 - 108.5					36.000	23.1305	-4.96	832.70	0.006
	L2					112.25 - 108.5	TP35.7x28.1885x0.25	40.00	0.00	0.0
108.5 - 106.736		39.000	22.9908	-10.18	896.64	0.011				
106.736 - 104.972		39.000	23.2536	-10.40	906.89	0.011				
104.972 - 103.208		39.000	23.5165	-10.63	917.14	0.012				
103.208 - 101.444		39.000	23.7793	-10.85	927.39	0.012				
101.444 - 99.6806		39.000	24.0421	-11.08	937.64	0.012				
99.6806 - 97.9167		39.000	24.3050	-11.32	947.89	0.012				
97.9167 - 96.1528		39.000	24.5678	-11.55	958.14	0.012				
96.1528 - 94.3889		39.000	24.8307	-11.79	968.40	0.012				
94.3889 - 92.6250		39.000	25.0935	-12.02	978.65	0.012				



<b>tnxTower</b>  <b>FDH Engineering, Inc.</b> 6521 Meridien Drive Raleigh, NC 27616 Phone: (919) 755-1012 FAX: (919) 755-1031	<b>Job</b> 876348	<b>Page</b> 15 of 25
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	<b>Client</b> Crown Castle	<b>Designed by</b> Tyler Mora, EI

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
	94.3889									
	94.3889 - 92.625					39.000	25.0935	-12.03	978.65	0.012
	92.625 - 90.8611					39.000	25.3563	-12.28	988.90	0.012
	90.8611 - 89.0972					39.000	25.6192	-12.52	999.15	0.013
	89.0972 - 87.3333					39.000	25.8820	-12.77	1009.40	0.013
	87.3333 - 85.5694					39.000	26.1448	-13.02	1019.65	0.013
	85.5694 - 83.8056					39.000	26.4077	-13.28	1029.90	0.013
	83.8056 - 82.0417					39.000	26.6705	-13.53	1040.15	0.013
	82.0417 - 80.2778					39.000	26.9334	-13.79	1050.40	0.013
	80.2778 - 78.5139					39.000	27.1962	-14.05	1060.65	0.013
	78.5139 - 76.75					39.000	27.4590	-14.32	1070.90	0.013
	76.75 - 72.25					39.000	28.1296	-6.98	1097.05	0.006
L3	76.75 - 72.25	TP42.2x34.355x0.3125	41.00	0.00	0.0	39.000	34.6199	-8.49	1350.18	0.006
	72.25 - 70.5139					39.000	34.9494	-15.77	1363.03	0.012
	70.5139 - 68.7778					39.000	35.2789	-16.08	1375.88	0.012
	68.7778 - 67.0417					39.000	35.6084	-16.38	1388.73	0.012
	67.0417 - 65.3056					39.000	35.9379	-16.69	1401.58	0.012
	65.3056 - 63.5694					39.000	36.2674	-17.00	1414.43	0.012
	63.5694 - 61.8333					39.000	36.5969	-17.31	1427.28	0.012
	61.8333 - 60.0972					39.000	36.9264	-17.63	1440.13	0.012
	60.0972 - 58.3611					39.000	37.2558	-17.95	1452.98	0.012
	58.3611 - 56.625					39.000	37.5853	-18.27	1465.83	0.012
	56.625 - 54.8889					39.000	37.9148	-18.59	1478.68	0.013
	54.8889 - 53.1528					39.000	38.2443	-18.92	1491.53	0.013
	53.1528 - 51.4167					39.000	38.5738	-19.24	1504.38	0.013
	51.4167 - 49.6806					39.000	38.9033	-19.57	1517.23	0.013
	49.6806 - 47.9444					39.000	39.2328	-19.97	1530.08	0.013
	47.9444 - 46.2083					39.000	39.5623	-20.30	1542.93	0.013
	46.2083 - 44.4722					39.000	39.8918	-20.64	1555.78	0.013
	44.4722 - 42.7361					39.000	40.2213	-20.98	1568.63	0.013
	42.7361 - 41					39.000	40.5508	-21.32	1581.48	0.013
	41 - 35.75					39.000	41.5472	-10.68	1620.34	0.007
L4	41 - 35.75	TP48.4x40.5705x0.375	41.00	0.00	0.0	39.000	49.0359	-12.48	1912.40	0.007
	35.75 - 33.8684					39.000	49.4636	-23.60	1929.08	0.012
	33.8684 -					39.000	49.8913	-24.02	1945.76	0.012



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	<b>Client</b> Crown Castle	<b>Designed by</b> Tyler Mora, EI

Section No.	Elevation ft	Size	Actual $M_x$ kip-ft	Actual $f_{bx}$ ksi	Allow. $F_{bx}$ ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual $M_y$ kip-ft	Actual $f_{by}$ ksi	Allow. $F_{by}$ ksi	Ratio $\frac{f_{by}}{F_{by}}$
	132.658 - 130.803		60.65	5.999	36.000	0.167	0.00	0.000	36.000	0.000
	130.803 - 128.947		75.19	7.231	36.000	0.201	0.00	0.000	36.000	0.000
	128.947 - 127.092		89.95	8.413	36.000	0.234	0.00	0.000	36.000	0.000
	127.092 - 125.237		114.56	10.425	36.000	0.290	0.00	0.000	36.000	0.000
	125.237 - 123.382		135.67	12.016	36.000	0.334	0.00	0.000	36.000	0.000
	123.382 - 121.526		157.00	13.539	36.000	0.376	0.00	0.000	36.000	0.000
	121.526 - 119.671		178.57	14.999	36.000	0.417	0.00	0.000	36.000	0.000
	119.671 - 117.816		200.36	16.397	36.000	0.455	0.00	0.000	36.000	0.000
	117.816 - 115.961		231.20	18.442	36.000	0.512	0.00	0.000	36.000	0.000
	115.961 - 114.105		260.94	20.293	36.000	0.564	0.00	0.000	36.000	0.000
	114.105 - 112.25		290.91	22.066	36.000	0.613	0.00	0.000	36.000	0.000
L2	112.25 - 108.5	TP35.7x28.1885x0.25	180.87	13.055	36.000	0.363	0.00	0.000	36.000	0.000
	112.25 - 108.5		171.48	12.821	39.000	0.329	0.00	0.000	39.000	0.000
	108.5 - 106.736		381.82	27.895	39.000	0.715	0.00	0.000	39.000	0.000
	106.736 - 104.972		412.58	29.463	39.000	0.755	0.00	0.000	39.000	0.000
	104.972 - 103.208		443.57	30.969	39.000	0.794	0.00	0.000	39.000	0.000
	103.208 - 101.444		474.79	32.416	39.000	0.831	0.00	0.000	39.000	0.000
	101.444 - 99.6806		506.22	33.808	39.000	0.867	0.00	0.000	39.000	0.000
	99.6806 - 97.9167		537.87	35.146	39.000	0.901	0.00	0.000	39.000	0.000
	97.9167 - 96.1528		569.75	36.433	39.000	0.934	0.00	0.000	39.000	0.000
	96.1528 - 94.3889		601.84	37.672	39.000	0.966	0.00	0.000	39.000	0.000
	94.3889 - 92.625		634.15	38.864	39.000	0.997	0.00	0.000	39.000	0.000
	92.625 - 90.8611		666.68	40.011	39.000	1.026	0.00	0.000	39.000	0.000
	90.8611 - 89.0972		699.43	41.117	39.000	1.054	0.00	0.000	39.000	0.000
	89.0972 - 87.3333		732.39	42.181	39.000	1.082	0.00	0.000	39.000	0.000
	87.3333 - 85.5694		765.58	43.207	39.000	1.108	0.00	0.000	39.000	0.000
	85.5694 - 83.8056		798.97	44.195	39.000	1.133	0.00	0.000	39.000	0.000
	83.8056 - 82.0417		832.59	45.148	39.000	1.158	0.00	0.000	39.000	0.000
	82.0417 - 80.2778		866.42	46.067	39.000	1.181	0.00	0.000	39.000	0.000
	80.2778 - 78.5139		900.46	46.953	39.000	1.204	0.00	0.000	39.000	0.000
	78.5139 - 76.75		934.72	47.807	39.000	1.226	0.00	0.000	39.000	0.000

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	<b>Client</b> Crown Castle	<b>Designed by</b> Tyler Mora, EI

Section No.	Elevation ft	Size	Actual $M_x$ kip-ft	Actual $f_{bx}$ ksi	Allow. $F_{bx}$ ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual $M_y$ kip-ft	Actual $f_{by}$ ksi	Allow. $F_{by}$ ksi	Ratio $\frac{f_{by}}{F_{by}}$
L3	76.75 - 72.25	TP42.2x34.355x0.3125	466.96	22.754	39.000	0.583	0.00	0.000	39.000	0.000
	76.75 - 72.25		556.28	22.412	39.000	0.575	0.00	0.000	39.000	0.000
	72.25 - 70.5139		1057.83	41.816	39.000	1.072	0.00	0.000	39.000	0.000
	70.5139 - 68.7778		1092.63	42.384	39.000	1.087	0.00	0.000	39.000	0.000
	68.7778 - 67.0417		1127.62	42.932	39.000	1.101	0.00	0.000	39.000	0.000
	67.0417 - 65.3056		1162.81	43.461	39.000	1.114	0.00	0.000	39.000	0.000
	65.3056 - 63.5694		1198.20	43.970	39.000	1.127	0.00	0.000	39.000	0.000
	63.5694 - 61.8333		1233.78	44.461	39.000	1.140	0.00	0.000	39.000	0.000
	61.8333 - 60.0972		1269.57	44.934	39.000	1.152	0.00	0.000	39.000	0.000
	60.0972 - 58.3611		1305.54	45.391	39.000	1.164	0.00	0.000	39.000	0.000
	58.3611 - 56.625		1341.72	45.831	39.000	1.175	0.00	0.000	39.000	0.000
	56.625 - 54.8889		1378.08	46.255	39.000	1.186	0.00	0.000	39.000	0.000
	54.8889 - 53.1528		1414.63	46.664	39.000	1.196	0.00	0.000	39.000	0.000
	53.1528 - 51.4167		1451.38	47.058	39.000	1.207	0.00	0.000	39.000	0.000
	51.4167 - 49.6806		1488.30	47.438	39.000	1.216	0.00	0.000	39.000	0.000
	49.6806 - 47.9444		1525.49	47.807	39.000	1.226	0.00	0.000	39.000	0.000
	47.9444 - 46.2083		1562.90	48.164	39.000	1.235	0.00	0.000	39.000	0.000
	46.2083 - 44.4722		1600.49	48.508	39.000	1.244	0.00	0.000	39.000	0.000
	44.4722 - 42.7361		1638.26	48.839	39.000	1.252	0.00	0.000	39.000	0.000
	L4		42.7361 - 41	TP48.4x40.5705x0.375	1676.22	49.159	39.000	1.260	0.00	0.000
41 - 35.75		837.18	23.385		39.000	0.600	0.00	0.000	39.000	0.000
41 - 35.75		955.13	23.020		39.000	0.590	0.00	0.000	39.000	0.000
35.75 - 33.8684		1834.38	43.448		39.000	1.114	0.00	0.000	39.000	0.000
33.8684 - 31.9868		1876.65	43.687		39.000	1.120	0.00	0.000	39.000	0.000
31.9868 - 30.1053		1919.12	43.916		39.000	1.126	0.00	0.000	39.000	0.000
30.1053 - 28.2237		1961.78	44.135		39.000	1.132	0.00	0.000	39.000	0.000
28.2237 - 26.3421		2004.63	44.345		39.000	1.137	0.00	0.000	39.000	0.000
26.3421 - 24.4605		2047.68	44.547		39.000	1.142	0.00	0.000	39.000	0.000
24.4605 - 22.5789		2090.91	44.739		39.000	1.147	0.00	0.000	39.000	0.000
22.5789 - 20.6974		2134.34	44.924		39.000	1.152	0.00	0.000	39.000	0.000
20.6974 - 18.8158		2177.97	45.101		39.000	1.156	0.00	0.000	39.000	0.000
18.8158 - 16.9342		2221.79	45.270		39.000	1.161	0.00	0.000	39.000	0.000
16.9342 -		2265.81	45.432		39.000	1.165	0.00	0.000	39.000	0.000

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Section No.	Elevation ft	Size	Actual $M_x$ kip-ft	Actual $f_{bx}$ ksi	Allow. $F_{bx}$ ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual $M_y$ kip-ft	Actual $f_{by}$ ksi	Allow. $F_{by}$ ksi	Ratio $\frac{f_{by}}{F_{by}}$
	15.0526									
	15.0526 - 13.1711		2310.02	45.587	39.000	1.169	0.00	0.000	39.000	0.000
	13.1711 - 11.2895		2354.42	45.735	39.000	1.173	0.00	0.000	39.000	0.000
	11.2895 - 9.40789		2399.02	45.877	39.000	1.176	0.00	0.000	39.000	0.000
	9.40789 - 7.52632		2443.81	46.012	39.000	1.180	0.00	0.000	39.000	0.000
	7.52632 - 5.64474		2488.79	46.142	39.000	1.183	0.00	0.000	39.000	0.000
	5.64474 - 3.76316		2533.97	46.266	39.000	1.186	0.00	0.000	39.000	0.000
	3.76316 - 1.88158		2579.34	46.384	39.000	1.189	0.00	0.000	39.000	0.000
	1.88158 - 0		2624.91	46.497	39.000	1.192	0.00	0.000	39.000	0.000

**Pole Shear Design Data**

Section No.	Elevation ft	Size	Actual $V$ K	Actual $f_v$ ksi	Allow. $F_v$ ksi	Ratio $\frac{f_v}{F_v}$	Actual $T$ kip-ft	Actual $f_{vt}$ ksi	Allow. $F_{vt}$ ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	147.5 - 145.645	TP29.4x22x0.25	2.65	0.151	24.000	0.013	0.00	0.000	24.000	0.000
	145.645 - 143.789		2.76	0.155	24.000	0.013	0.00	0.000	24.000	0.000
	143.789 - 141.934		2.87	0.159	24.000	0.013	0.00	0.000	24.000	0.000
	141.934 - 140.079		2.99	0.163	24.000	0.014	0.00	0.000	24.000	0.000
	140.079 - 138.224		3.10	0.166	24.000	0.014	0.00	0.000	24.000	0.000
	138.224 - 136.368		3.22	0.170	24.000	0.014	0.00	0.000	24.000	0.000
	136.368 - 134.513		3.34	0.174	24.000	0.014	0.00	0.000	24.000	0.000
	134.513 - 132.658		3.46	0.178	24.000	0.015	0.00	0.000	24.000	0.000
	132.658 - 130.803		7.78	0.393	24.000	0.033	0.00	0.000	24.000	0.000
	130.803 - 128.947		7.90	0.394	24.000	0.033	0.00	0.000	24.000	0.000
	128.947 - 127.092		8.02	0.395	24.000	0.033	0.00	0.000	24.000	0.000
	127.092 - 125.237		11.32	0.549	24.000	0.046	0.00	0.000	24.000	0.000
	125.237 - 123.382		11.44	0.548	24.000	0.046	0.01	0.000	24.000	0.000
	123.382 - 121.526		11.57	0.546	24.000	0.046	0.01	0.000	24.000	0.000
	121.526 - 119.671		11.69	0.545	24.000	0.045	0.01	0.000	24.000	0.000
	119.671 - 117.816		11.82	0.544	24.000	0.045	0.01	0.000	24.000	0.000
	117.816 - 115.961		15.97	0.726	24.000	0.060	1.39	0.054	24.000	0.002

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	Crown Castle	Tyler Mora, EI

Section No.	Elevation ft	Size	Actual V K	Actual f <sub>v</sub> ksi	Allow. F <sub>v</sub> ksi	Ratio f <sub>v</sub> F <sub>v</sub>	Actual T kip-ft	Actual f <sub>t</sub> ksi	Allow. F <sub>t</sub> ksi	Ratio f <sub>t</sub> F <sub>t</sub>
	115.961 - 114.105		16.10	0.722	24.000	0.060	1.39	0.053	24.000	0.002
	114.105 - 112.25		16.24	0.720	24.000	0.060	1.84	0.068	24.000	0.003
	112.25 - 108.5		8.55	0.369	24.000	0.031	0.94	0.033	24.000	0.001
L2	112.25 - 108.5	TP35.7x28.1885x0.25	7.99	0.351	26.000	0.027	0.89	0.033	26.000	0.001
	108.5 - 106.736		17.38	0.756	26.000	0.058	1.84	0.065	26.000	0.003
	106.736 - 104.972		17.51	0.753	26.000	0.058	1.84	0.064	26.000	0.002
	104.972 - 103.208		17.64	0.750	26.000	0.058	1.84	0.062	26.000	0.002
	103.208 - 101.444		17.76	0.747	26.000	0.057	1.83	0.061	26.000	0.002
	101.444 - 99.6806		17.89	0.744	26.000	0.057	1.83	0.060	26.000	0.002
	99.6806 - 97.9167		18.01	0.741	26.000	0.057	1.83	0.058	26.000	0.002
	97.9167 - 96.1528		18.14	0.738	26.000	0.057	1.83	0.057	26.000	0.002
	96.1528 - 94.3889		18.26	0.736	26.000	0.057	1.83	0.056	26.000	0.002
	94.3889 - 92.625		18.39	0.733	26.000	0.056	1.83	0.055	26.000	0.002
	92.625 - 90.8611		18.51	0.730	26.000	0.056	1.83	0.054	26.000	0.002
	90.8611 - 89.0972		18.64	0.727	26.000	0.056	1.83	0.052	26.000	0.002
	89.0972 - 87.3333		18.76	0.725	26.000	0.056	1.82	0.051	26.000	0.002
	87.3333 - 85.5694		18.88	0.722	26.000	0.056	1.82	0.050	26.000	0.002
	85.5694 - 83.8056		19.00	0.720	26.000	0.055	1.82	0.049	26.000	0.002
	83.8056 - 82.0417		19.13	0.717	26.000	0.055	1.82	0.048	26.000	0.002
	82.0417 - 80.2778		19.25	0.715	26.000	0.055	1.82	0.047	26.000	0.002
	80.2778 - 78.5139		19.37	0.712	26.000	0.055	1.82	0.046	26.000	0.002
	78.5139 - 76.75		19.49	0.710	26.000	0.055	1.82	0.045	26.000	0.002
	76.75 - 72.25		9.17	0.326	26.000	0.025	0.83	0.020	26.000	0.001
L3	76.75 - 72.25	TP42.2x34.355x0.3125	10.71	0.309	26.000	0.024	0.99	0.019	26.000	0.001
	72.25 - 70.5139		19.99	0.572	26.000	0.044	1.81	0.035	26.000	0.001
	70.5139 - 68.7778		20.11	0.570	26.000	0.044	1.81	0.034	26.000	0.001
	68.7778 - 67.0417		20.22	0.568	26.000	0.044	1.81	0.034	26.000	0.001
	67.0417 - 65.3056		20.34	0.566	26.000	0.044	1.81	0.033	26.000	0.001
	65.3056 - 63.5694		20.45	0.564	26.000	0.043	1.81	0.032	26.000	0.001
	63.5694 - 61.8333		20.57	0.562	26.000	0.043	1.81	0.032	26.000	0.001
	61.8333 - 60.0972		20.68	0.560	26.000	0.043	1.81	0.031	26.000	0.001
	60.0972 - 58.3611		20.79	0.558	26.000	0.043	1.80	0.031	26.000	0.001

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	<b>Client</b> Crown Castle	<b>Designed by</b> Tyler Mora, EI

Section No.	Elevation ft	Size	Actual V K	Actual f <sub>v</sub> ksi	Allow. F <sub>v</sub> ksi	Ratio f <sub>v</sub> F <sub>v</sub>	Actual T kip-ft	Actual f <sub>t</sub> ksi	Allow. F <sub>vt</sub> ksi	Ratio f <sub>t</sub> F <sub>vt</sub>
	58.3611 - 56.625		20.90	0.556	26.000	0.043	1.80	0.030	26.000	0.001
	56.625 - 54.8889		21.01	0.554	26.000	0.043	1.80	0.029	26.000	0.001
	54.8889 - 53.1528		21.12	0.552	26.000	0.042	1.80	0.029	26.000	0.001
	53.1528 - 51.4167		21.23	0.550	26.000	0.042	1.80	0.028	26.000	0.001
	51.4167 - 49.6806		21.34	0.548	26.000	0.042	1.80	0.028	26.000	0.001
	49.6806 - 47.9444		21.51	0.548	26.000	0.042	1.92	0.029	26.000	0.001
	47.9444 - 46.2083		21.61	0.546	26.000	0.042	1.92	0.029	26.000	0.001
	46.2083 - 44.4722		21.72	0.544	26.000	0.042	1.92	0.028	26.000	0.001
	44.4722 - 42.7361		21.82	0.543	26.000	0.042	1.92	0.028	26.000	0.001
	42.7361 - 41 - 35.75		21.93	0.541	26.000	0.042	1.91	0.027	26.000	0.001
	41 - 35.75		10.53	0.254	26.000	0.020	0.89	0.012	26.000	0.000
L4	41 - 35.75	TP48.4x40.5705x0.375	11.80	0.241	26.000	0.019	1.02	0.012	26.000	0.000
	35.75 - 33.8684		22.43	0.453	26.000	0.035	1.91	0.022	26.000	0.001
	33.8684 - 31.9868		22.53	0.452	26.000	0.035	1.91	0.022	26.000	0.001
	31.9868 - 30.1053		22.63	0.450	26.000	0.035	1.91	0.021	26.000	0.001
	30.1053 - 28.2237		22.74	0.448	26.000	0.034	1.91	0.021	26.000	0.001
	28.2237 - 26.3421		22.84	0.446	26.000	0.034	1.91	0.021	26.000	0.001
	26.3421 - 24.4605		22.94	0.445	26.000	0.034	1.90	0.020	26.000	0.001
	24.4605 - 22.5789		23.05	0.443	26.000	0.034	1.90	0.020	26.000	0.001
	22.5789 - 20.6974		23.15	0.441	26.000	0.034	1.90	0.020	26.000	0.001
	20.6974 - 18.8158		23.25	0.440	26.000	0.034	1.90	0.019	26.000	0.001
	18.8158 - 16.9342		23.36	0.438	26.000	0.034	1.90	0.019	26.000	0.001
	16.9342 - 15.0526		23.46	0.437	26.000	0.034	1.90	0.019	26.000	0.001
	15.0526 - 13.1711		23.56	0.435	26.000	0.033	1.90	0.018	26.000	0.001
	13.1711 - 11.2895		23.67	0.434	26.000	0.033	1.90	0.018	26.000	0.001
	11.2895 - 9.40789		23.77	0.432	26.000	0.033	1.90	0.018	26.000	0.001
	9.40789 - 7.52632		23.87	0.431	26.000	0.033	1.89	0.017	26.000	0.001
	7.52632 - 5.64474		23.98	0.429	26.000	0.033	1.89	0.017	26.000	0.001
	5.64474 - 3.76316		24.08	0.428	26.000	0.033	1.89	0.017	26.000	0.001
	3.76316 - 1.88158		24.18	0.426	26.000	0.033	1.89	0.017	26.000	0.001
	1.88158 - 0		24.29	0.425	26.000	0.033	1.89	0.016	26.000	0.001

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### Pole Interaction Design Data

Section No.	Elevation ft	Ratio P	Ratio $f_{bx}$	Ratio $f_{by}$	Ratio $f_v$	Ratio $f_{vt}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$P_a$	$F_{bx}$	$F_{by}$	$F_v$	$F_{vt}$			
L1	147.5 - 145.645	0.003	0.012	0.000	0.013	0.000	0.015	1.333	H1-3+VT ✓
	145.645 - 143.789	0.003	0.029	0.000	0.013	0.000	0.032	1.333	H1-3+VT ✓
	143.789 - 141.934	0.003	0.045	0.000	0.013	0.000	0.048	1.333	H1-3+VT ✓
	141.934 - 140.079	0.003	0.061	0.000	0.014	0.000	0.064	1.333	H1-3+VT ✓
	140.079 - 138.224	0.003	0.077	0.000	0.014	0.000	0.080	1.333	H1-3+VT ✓
	138.224 - 136.368	0.003	0.092	0.000	0.014	0.000	0.096	1.333	H1-3+VT ✓
	136.368 - 134.513	0.004	0.107	0.000	0.014	0.000	0.111	1.333	H1-3+VT ✓
	134.513 - 132.658	0.004	0.122	0.000	0.015	0.000	0.126	1.333	H1-3+VT ✓
	132.658 - 130.803	0.006	0.167	0.000	0.033	0.000	0.173	1.333	H1-3+VT ✓
	130.803 - 128.947	0.006	0.201	0.000	0.033	0.000	0.207	1.333	H1-3+VT ✓
	128.947 - 127.092	0.006	0.234	0.000	0.033	0.000	0.240	1.333	H1-3+VT ✓
	127.092 - 125.237	0.008	0.290	0.000	0.046	0.000	0.298	1.333	H1-3+VT ✓
	125.237 - 123.382	0.008	0.334	0.000	0.046	0.000	0.342	1.333	H1-3+VT ✓
	123.382 - 121.526	0.008	0.376	0.000	0.046	0.000	0.385	1.333	H1-3+VT ✓
	121.526 - 119.671	0.008	0.417	0.000	0.045	0.000	0.426	1.333	H1-3+VT ✓
	119.671 - 117.816	0.008	0.455	0.000	0.045	0.000	0.464	1.333	H1-3+VT ✓
	117.816 - 115.961	0.011	0.512	0.000	0.060	0.002	0.524	1.333	H1-3+VT ✓
	115.961 - 114.105	0.011	0.564	0.000	0.060	0.002	0.576	1.333	H1-3+VT ✓
	114.105 - 112.25	0.011	0.613	0.000	0.060	0.003	0.625	1.333	H1-3+VT ✓
	112.25 - 108.5	0.006	0.363	0.000	0.031	0.001	0.369	1.333	H1-3+VT ✓
L2	112.25 - 108.5	0.005	0.329	0.000	0.027	0.001	0.334	1.333	H1-3+VT ✓
	108.5 - 106.736	0.011	0.715	0.000	0.058	0.003	0.728	1.333	H1-3+VT ✓
	106.736 - 104.972	0.011	0.755	0.000	0.058	0.002	0.768	1.333	H1-3+VT ✓
	104.972 - 103.208	0.012	0.794	0.000	0.058	0.002	0.807	1.333	H1-3+VT ✓



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Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	103.208 - 101.444	0.012	0.831	0.000	0.057	0.002	0.844	1.333	H1-3+VT ✓
	101.444 - 99.6806	0.012	0.867	0.000	0.057	0.002	0.880	1.333	H1-3+VT ✓
	99.6806 - 97.9167	0.012	0.901	0.000	0.057	0.002	0.914	1.333	H1-3+VT ✓
	97.9167 - 96.1528	0.012	0.934	0.000	0.057	0.002	0.947	1.333	H1-3+VT ✓
	96.1528 - 94.3889	0.012	0.966	0.000	0.057	0.002	0.979	1.333	H1-3+VT ✓
	94.3889 - 92.625	0.012	0.997	0.000	0.056	0.002	1.010	1.333	H1-3+VT ✓
	92.625 - 90.8611	0.012	1.026	0.000	0.056	0.002	1.039	1.333	H1-3+VT ✓
	90.8611 - 89.0972	0.013	1.054	0.000	0.056	0.002	1.068	1.333	H1-3+VT ✓
	89.0972 - 87.3333	0.013	1.082	0.000	0.056	0.002	1.095	1.333	H1-3+VT ✓
	87.3333 - 85.5694	0.013	1.108	0.000	0.056	0.002	1.122	1.333	H1-3+VT ✓
	85.5694 - 83.8056	0.013	1.133	0.000	0.055	0.002	1.147	1.333	H1-3+VT ✓
	83.8056 - 82.0417	0.013	1.158	0.000	0.055	0.002	1.172	1.333	H1-3+VT ✓
	82.0417 - 80.2778	0.013	1.181	0.000	0.055	0.002	1.195	1.333	H1-3+VT ✓
	80.2778 - 78.5139	0.013	1.204	0.000	0.055	0.002	1.218	1.333	H1-3+VT ✓
	78.5139 - 76.75	0.013	1.226	0.000	0.055	0.002	1.240	1.333	H1-3+VT ✓
	76.75 - 72.25	0.006	0.583	0.000	0.025	0.001	0.590	1.333	H1-3+VT ✓
L3	76.75 - 72.25	0.006	0.575	0.000	0.024	0.001	0.581	1.333	H1-3+VT ✓
	72.25 - 70.5139	0.012	1.072	0.000	0.044	0.001	1.084	1.333	H1-3+VT ✓
	70.5139 - 68.7778	0.012	1.087	0.000	0.044	0.001	1.099	1.333	H1-3+VT ✓
	68.7778 - 67.0417	0.012	1.101	0.000	0.044	0.001	1.113	1.333	H1-3+VT ✓
	67.0417 - 65.3056	0.012	1.114	0.000	0.044	0.001	1.127	1.333	H1-3+VT ✓
	65.3056 - 63.5694	0.012	1.127	0.000	0.043	0.001	1.140	1.333	H1-3+VT ✓
	63.5694 - 61.8333	0.012	1.140	0.000	0.043	0.001	1.153	1.333	H1-3+VT ✓
	61.8333 - 60.0972	0.012	1.152	0.000	0.043	0.001	1.165	1.333	H1-3+VT ✓
	60.0972 - 58.3611	0.012	1.164	0.000	0.043	0.001	1.177	1.333	H1-3+VT ✓
	58.3611 - 56.625	0.012	1.175	0.000	0.043	0.001	1.188	1.333	H1-3+VT ✓

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Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$\frac{P}{P_a}$	$\frac{f_{bx}}{F_{bx}}$	$\frac{f_{by}}{F_{by}}$	$\frac{f_v}{F_v}$	$\frac{f_{vt}}{F_{vt}}$			
	56.625 - 54.8889	0.013	1.186	0.000	0.043	0.001	1.199	1.333	H1-3+VT ✓
	54.8889 - 53.1528	0.013	1.196	0.000	0.042	0.001	1.210	1.333	H1-3+VT ✓
	53.1528 - 51.4167	0.013	1.207	0.000	0.042	0.001	1.220	1.333	H1-3+VT ✓
	51.4167 - 49.6806	0.013	1.216	0.000	0.042	0.001	1.230	1.333	H1-3+VT ✓
	49.6806 - 47.9444	0.013	1.226	0.000	0.042	0.001	1.239	1.333	H1-3+VT ✓
	47.9444 - 46.2083	0.013	1.235	0.000	0.042	0.001	1.249	1.333	H1-3+VT ✓
	46.2083 - 44.4722	0.013	1.244	0.000	0.042	0.001	1.258	1.333	H1-3+VT ✓
	44.4722 - 42.7361	0.013	1.252	0.000	0.042	0.001	1.266	1.333	H1-3+VT ✓
	42.7361 - 41	0.013	1.260	0.000	0.042	0.001	1.274	1.333	H1-3+VT ✓
	41 - 35.75	0.007	0.600	0.000	0.020	0.000	0.606	1.333	H1-3+VT ✓
L4	41 - 35.75	0.007	0.590	0.000	0.019	0.000	0.597	1.333	H1-3+VT ✓
	35.75 - 33.8684	0.012	1.114	0.000	0.035	0.001	1.127	1.333	H1-3+VT ✓
	33.8684 - 31.9868	0.012	1.120	0.000	0.035	0.001	1.133	1.333	H1-3+VT ✓
	31.9868 - 30.1053	0.012	1.126	0.000	0.035	0.001	1.139	1.333	H1-3+VT ✓
	30.1053 - 28.2237	0.013	1.132	0.000	0.034	0.001	1.145	1.333	H1-3+VT ✓
	28.2237 - 26.3421	0.013	1.137	0.000	0.034	0.001	1.150	1.333	H1-3+VT ✓
	26.3421 - 24.4605	0.013	1.142	0.000	0.034	0.001	1.155	1.333	H1-3+VT ✓
	24.4605 - 22.5789	0.013	1.147	0.000	0.034	0.001	1.160	1.333	H1-3+VT ✓
	22.5789 - 20.6974	0.013	1.152	0.000	0.034	0.001	1.165	1.333	H1-3+VT ✓
	20.6974 - 18.8158	0.013	1.156	0.000	0.034	0.001	1.170	1.333	H1-3+VT ✓
	18.8158 - 16.9342	0.013	1.161	0.000	0.034	0.001	1.174	1.333	H1-3+VT ✓
	16.9342 - 15.0526	0.013	1.165	0.000	0.034	0.001	1.179	1.333	H1-3+VT ✓
	15.0526 - 13.1711	0.013	1.169	0.000	0.033	0.001	1.183	1.333	H1-3+VT ✓
	13.1711 - 11.2895	0.014	1.173	0.000	0.033	0.001	1.187	1.333	H1-3+VT ✓
	11.2895 - 9.40789	0.014	1.176	0.000	0.033	0.001	1.190	1.333	H1-3+VT ✓
	9.40789 - 7.52632	0.014	1.180	0.000	0.033	0.001	1.194	1.333	H1-3+VT ✓

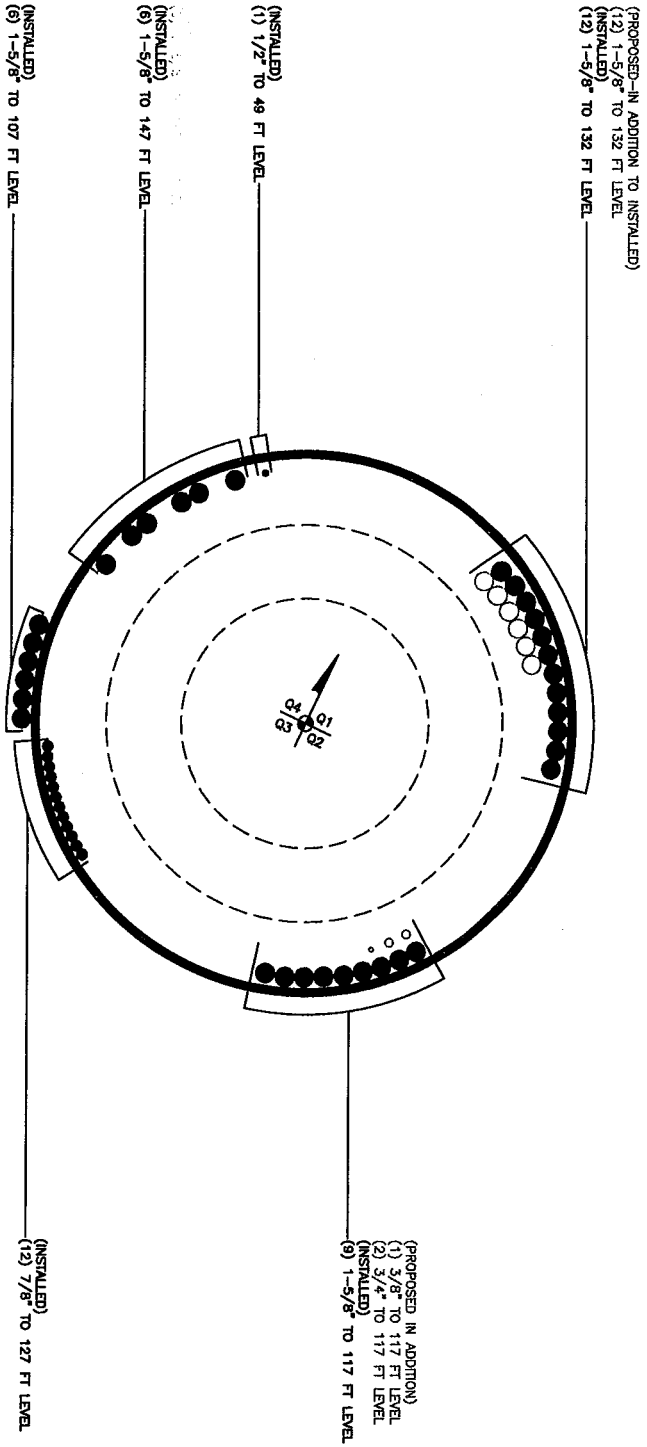
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	Client	Crown Castle	Designed by	Tyler Mora, EI

Section No.	Elevation ft	Ratio P	Ratio $J_{bx}$	Ratio $J_{by}$	Ratio $f_v$	Ratio $f_{vt}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$P_a$	$F_{bx}$	$F_{by}$	$F_v$	$F_{vt}$			
	7.52632 - 5.64474	0.014	1.183	0.000	0.033	0.001	✓ 1.197	1.333	H1-3+VT ✓
	5.64474 - 3.76316	0.014	1.186	0.000	0.033	0.001	✓ 1.201	1.333	H1-3+VT ✓
	3.76316 - 1.88158	0.014	1.189	0.000	0.033	0.001	✓ 1.204	1.333	H1-3+VT ✓
	1.88158 - 0	0.014	1.192	0.000	0.033	0.001	✓ 1.207	1.333	H1-3+VT ✓

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P <sub>allow</sub> K	% Capacity	Pass Fail
L1	147.5 - 108.5	Pole	TP29.4x22x0.25	1	-9.15	1082.89	46.9	Pass
L2	108.5 - 72.25	Pole	TP35.7x28.1885x0.25	2	-14.32	1427.51	93.0	Pass
L3	72.25 - 35.75	Pole	TP42.2x34.355x0.3125	3	-21.32	2108.11	95.6	Pass
L4	35.75 - 0	Pole	TP48.4x40.5705x0.375	4	-31.73	2971.67	90.5	Pass
Summary								
Pole (L3)							95.6	Pass
<b>RATING =</b>							<b>95.6</b>	<b>Pass</b>

**APPENDIX B**  
**BASE LEVEL DRAWING**



BUSINESS UNIT: 876348 TOWER ID: C.BASLEVEL

**APPENDIX C**  
**ADDITIONAL CALCULATIONS**

# Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

- Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).  
 2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)  
 3) Clear space between bottom of leveling nut and top of concrete **not** exceeding  $(1) \times (\text{Rod Diameter})$

## Site Data

BU#:	876348	
Site Name:	Enfield, CT	
App #:	145024 Rev1	
Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	55	in
Anchor Spacing:	6	in

## Base Reactions

TIA Revision:	F	
Unfactored Moment, M:	2625	ft-kips
Unfactored Axial, P:	32	kips
Unfactored Shear, V:	24	kips

## Anchor Rod Results

TIA F --> Maximum Rod Tension: 188.2 Kips  
 Allowable Tension: 195.0 Kips  
 Anchor Rod Stress Ratio: 96.6% **Pass**

## Plate Data

W=Side:	52	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	6	in

## Base Plate Results

Base Plate Stress: 43.5 ksi  
 Allowable PL Bending Stress: 50.0 ksi  
 Base Plate Stress Ratio: 86.9% **Pass**

## Flexural Check

PL Ref. Data	
Yield Line (in):	25.14
Max PL Length:	25.14

## Stiffener Data (Welding at both sides)

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

## N/A - Unstiffened

## Stiffener Results

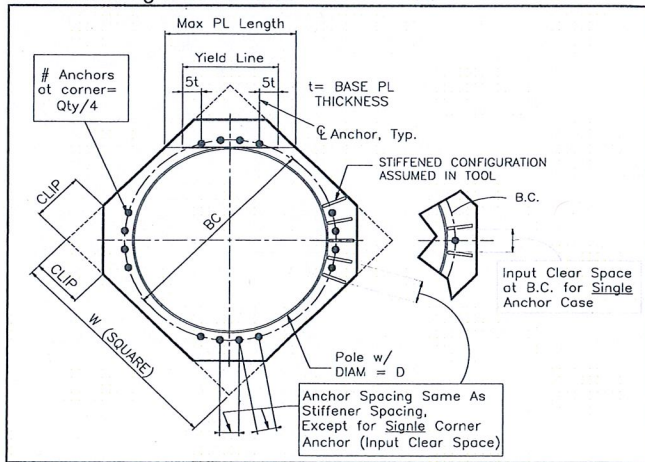
Horizontal Weld: N/A  
 Vertical Weld: N/A  
 Plate Flex+Shear,  $f_b/F_b + (f_v/F_v)^2$ : N/A  
 Plate Tension+Shear,  $f_t/F_t + (f_v/F_v)^2$ : N/A  
 Plate Comp. (AISC Bracket): N/A

## Pole Results

Pole Punching Shear Check: N/A

## Pole Data

Diam:	48.4	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round



## Stress Increase Factor

ASD ASIF:	1.333
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\*\* Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

**(Bearing and Stability Checks) Tool for TIA Rev F or G - Any application (MP, SST, GT)**

**Site Data**

BU#: 876348
Site Name: <i>Enfield, CT</i>
App #: 145024 Rev1

**Enter Load Factors Below:**

For P (DL)	1.2	<---- Enter Factor
For P,V, and M (WL)	1.35	<---- Enter Factor

**Pad & Pier Data**

Base PL Dist. Above Pier:	3	in
Pier Dist. Above Grade:	6	in
Pad Bearing Depth, D:	9.8	ft
Pad Thickness, T:	2.8	ft
Pad Width=Length, L:	23.8	ft
Pier Cross Section Shape:	Square	<--Pull Down
Enter Pier Side Width:	8	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	64.00	ft^2
Pier Height:	7.50	ft
Soil (above pad) Height:	7.00	ft

**Soil Parameters**

Unit Weight, $\gamma$ :	115.0	pcf
Ultimate Bearing Capacity, $q_n$ :	6.50	ksf
Strength Reduct. factor, $\phi$ :	0.75	
Angle of Friction, $\Phi$ :	32.0	degrees
Undrained Shear Strength, $C_u$ :	0.00	ksf
Allowable Bearing: $\phi * q_n$ :	4.88	ksf
Passive Pres. Coeff., $K_p$ :	3.25	

**Forces/Moments due to Wind and Lateral Soil**

Factored Pad Passive Force:	209.5	kips
Pad Force Location Above D:	1.32	ft
$\phi$ (Passive Pressure Moment):	207.77	ft-kips
Factored O.T. M(WL), "1.6W":	3885.6	ft-kips
Factored OT (MW-Msoil), M1	3677.80	ft-kips

**Resistance due to Foundation Gravity**

Soil Wedge Projection grade, a:	4.37	ft
Sum of Soil Wedges Wt:	109.87	kips
Soil Wedges ecc, K1:	8.31	ft
Ftg+Soil above Pad wt:	714.4	kips
Unfactored (Total ftg-soil Wt):	824.24	kips
1.2D. <b>No Soil Wedges.</b>	895.64	kips
0.9D. <b>With Soil Wedges</b>	770.61	kips

**Resistance due to Cohesion (Vertical)**

$\phi * (1/2 * C_u) * (\text{Total Vert. Planes})$	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

**Monopole Base Reaction Forces**

TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	32	kips
Unfactored WL Axial, PW:	0	kips
Unfactored WL Shear, V:	24	kips
Unfactored WL Moment, M:	2625	ft-kips

**Load Factor Shaft Factored Loads**

1.20	1.2D+1.6W, Pu:	38.4	kips
0.90	0.9D+1.6W, Pu:	28.8	kips
1.35	Vu:	32.4	kips
	Mu:	3543.75	ft-kips

**1.2D+1.6W Load Combination, Bearing Results:**

<b>(No Soil Wedges)</b> [Reaction+Conc+Soil]	895.64	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	3677.80	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 = 4.11 ft  
 Orthogonal qu = 2.67 ksf  
 qu/ $\phi * q_n$  Ratio = **54.82% Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 = 2.90 ft  
 Diagonal qu = 3.91 ksf  
 qu/ $\phi * q_n$  Ratio = **80.25% Pass**

<-- Press Upon Completing All Input

**Overturning Stability Check**

**0.9D+1.6W Load Combination, Bearing Results:**

<b>(w/ Soil Wedges)</b> [Reaction+Conc+Soil]	770.61	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	2856.44	ft-kips

Orthogonal ecc3 = M2/P2 = 3.71 ft  
 Ortho Non Bearing Length, NBL = **16.39 ft**  
 Orthogonal qu = 2.21 ksf  
 Diagonal qu = 3.16 ksf

**Max Reaction Moment (ft-kips) so that qu= $\phi * q_n$  = 100% Capacity Rating**

Actual M:	2625.00		
M Orthogonal:	5267.12	<b>49.84%</b>	<b>Pass</b>
M Diagonal:	4090.17	<b>64.18%</b>	<b>Pass</b>