

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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

E-Mail: siting.council@ct.gov

www.ct.gov/csc

May 25, 2010

Kenneth C. Baldwin
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: **EM-VER-064-100405**- Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 439-455 Homestead Avenue, Hartford, Connecticut.

Dear Attorney Baldwin:

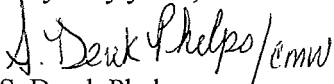
The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice dated April 5, 2010, including the placement of all necessary equipment and shelters within the tower compound. 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. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

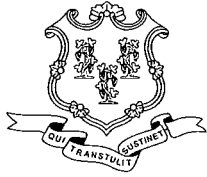
Very truly yours,


S. Derek Phelps

Executive Director

SDP/MP/laf

c: The Honorable Eddie A. Perez, Mayor, City of Hartford
David B. Panagore, Chief Operating Officer, City of Hartford
Roger J. O'Brien, Director of Planning, City of Hartford
Crown Castle



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E-Mail: siting.council@ct.gov

www.ct.gov/csc

April 16, 2010

The Honorable Eddie A. Perez
Mayor
City of Hartford
Municipal Building
550 Main Street
Hartford, CT 06103

RE: **EM-VER-064-100405-** Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 439-455 Homestead Avenue, Hartford, Connecticut.

Dear Mayor Perez:

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 April 30, 2010.

Thank you for your cooperation and consideration.

Very truly yours,

A handwritten signature in black ink that reads "S. Derek Phelps".

S. Derek Phelps
Executive Director

SDP/jbw

Enclosure: Notice of Intent

c: David B. Panagore, Chief Operating Officer, City of Hartford
Roger J. O'Brien, Director of Planning, City of Hartford

ORIGINAL

April 5, 2010

Via Hand Delivery

S. Derek Phelps
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RECEIVED
APR - 5 2010
CONNECTICUT
SITING COUNCIL

Re: **Notice of Exempt Modification – Antenna Swap
439-455 Homestead Avenue, Hartford, Connecticut**

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains wireless telecommunications antennas at the 137-foot level of the existing 140-foot tower at the above-referenced address. The tower is owned by Crown Castle. The Council approved Cellco’s use of the tower in 1990 through Docket No. 126. Cellco now intends to modify its installation by replacing all twelve (12) of its antennas with four (4) model LPA-80080/4CF cellular antennas; two (2) model LPA-80063/4CF cellular antennas; two (2) model BXA-185090/8CF PCS antennas; one (1) model BXA-185063/8CF PCS antenna; two (2) model BXA-70063/6CF_5 LTE antennas; and one (1) model BXA-70063/6CF_4 LTE antenna, all at the same 137-foot level on the tower. Attached behind Tab 1 are the specifications for the proposed replacement antennas.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Eddie A. Perez, Mayor for the City of Hartford. A copy of this letter is also being sent to Talar Properties 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).

1. The proposed modifications will not result in any increase in the height of the existing tower. Cellco’s antennas will be located at the same 137-foot level on the existing tower.



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ROBINSON & COLE_{LLP}

S. Derek Phelps
April 5, 2010
Page 2

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

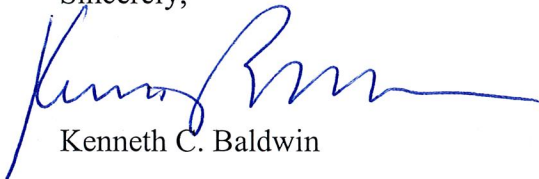
3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

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

Also attached is a Structural Analysis Report confirming that the tower and foundation can support Cellco's proposed antennas modification. (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:

Eddie A. Perez, Hartford Mayor
Talar Properties LLC
Sandy M. Carter



LPA-80080/4CF

When ordering replace "___" with connector type.

Mechanical specifications

Length	1200 mm	47.2 in
Width	140 mm	5.5 in
Depth	335 mm	13.2 in
Depth with z-bracket	375 mm	14.8 in
4) Weight	5.4 kg	12.0 lbs
Wind Area		
Fore/Aft	0.17 m ²	1.8 ft ²
Side	0.40 m ²	4.3 ft ²
Rated Wind Velocity (Safety factor 2.0)		
	>369 km/hr	>229 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	254 N	57.1 lbs
Side	574 N	129.0 lbs

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

Mounting and Downtilt

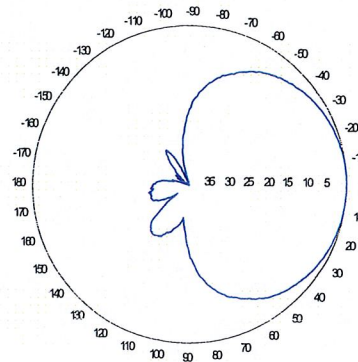
Mounting brackets attach to a pipe diameter of Ø50-102 mm (2.0-4.0 in). If the lock-down brace is used, the maximum diameter is Ø88.9 mm (3.5 in).

Mounting Bracket & Downtilt Bracket Kit
#21699999

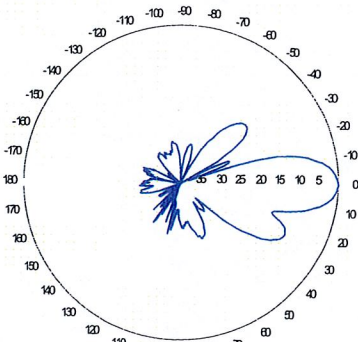
Electrical specifications

Frequency Range	806-960 MHz
Impedance	50Ω
3) Connector(s)	NE or E-DIN 1 port / center
1) VSWR	≤ 1.4:1
Polarization	Vertical
1) Gain	12.5 dBd
2) Power Rating	500 W
1) Half Power Angle	
H-Plane	80°
E-Plane	15°
1) Electrical Downtilt	0°
1) Null Fill	15%
Lightning Protection	Direct Ground

Radiation pattern¹⁾



Horizontal

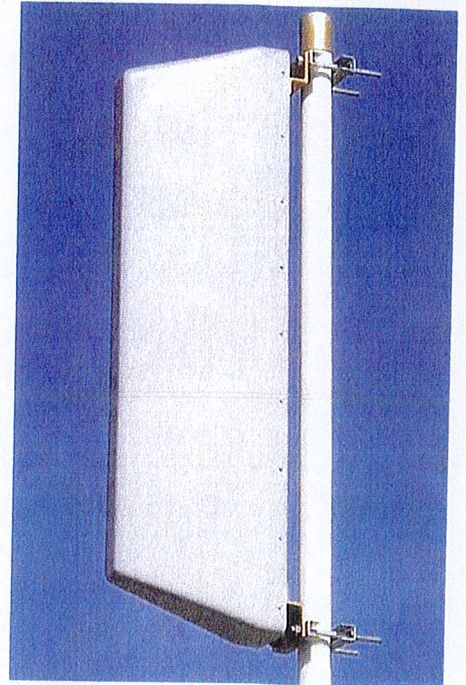


Vertical

Featuring upper side lobe suppression.

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the Front-to-Back ratio.



Amphenol Antel's Exclusive 3T (True Transmission Line Technology) Antenna Design:

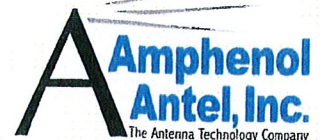
- True log-periodic design allows for superior front-to-side characteristics to minimize sector overlap.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad bandwidth and superior performance.
- Air as insulation for virtually no internal signal loss.

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

Antenna available with center-fed connector only.

CF Denotes a Center-Fed Connector.

806-960 MHz



Revision Date: 7/5/07

1) Typical values.
2) Power rating limited by connector only.
3) NE indicates an elongated N connector. E-DIN indicates an elongated DIN connector.
4) The antenna weight listed above does not include the bracket weight.

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

LPA-80063/4CF

When ordering replace "___" with connector type.

Mechanical specifications

Length	1205 mm	47.4 in
Width	386 mm	15.2 in
Depth	335 mm	13.2 in
Depth with z-bracket	375 mm	14.8 in
4) Weight	9.1 kg	20.0 lbs
Wind Area		
Fore/Aft	0.47 m ²	5.0 ft ²
Side	0.40 m ²	4.4 ft ²
Rated Wind Velocity (Safety factor 2.0)		
	>265 km/hr	>165 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	665 N	149.5 lbs
Side	577 N	129.6 lbs

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

Mounting and Downtilting

Mounting brackets attach to a pipe diameter of Ø50-102 mm (2.0-4.0 in). If the lock-down brace is used, the maximum diameter is Ø88.9 mm (3.5 in)

Mounting Bracket and Downtilt Bracket Kit #21699999

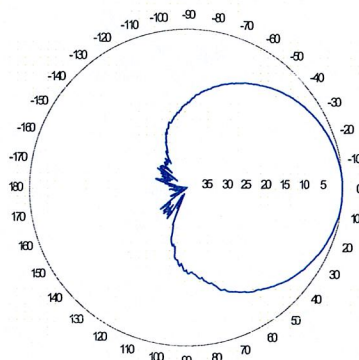
Electrical specifications

Frequency Range	806-960 MHz
Impedance	50Ω
3) Connector(s)	NE or E-DIN 1 port / center
1) VSWR	≤ 1.4:1
Polarization	Vertical
1) Gain	13 dBd
2) Power Rating	500 W
1) Half Power Angle	
H-Plane	63°
E-Plane	15°
1) Electrical Downtilt	0°
1) Null Fill	10%
Lightning Protection	Direct Ground

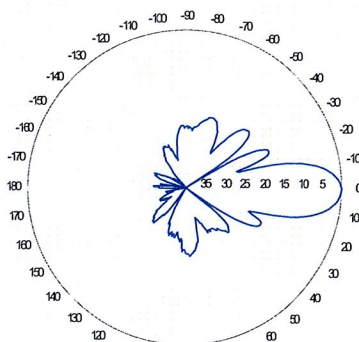
- 1) Typical values.
- 2) Power rating limited by connector only.
- 3) NE indicates an elongated N connector.
E-DIN indicates an elongated DIN connector.
- 4) The antenna weight listed above does not include the bracket weight.

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

Radiation pattern¹⁾



Horizontal

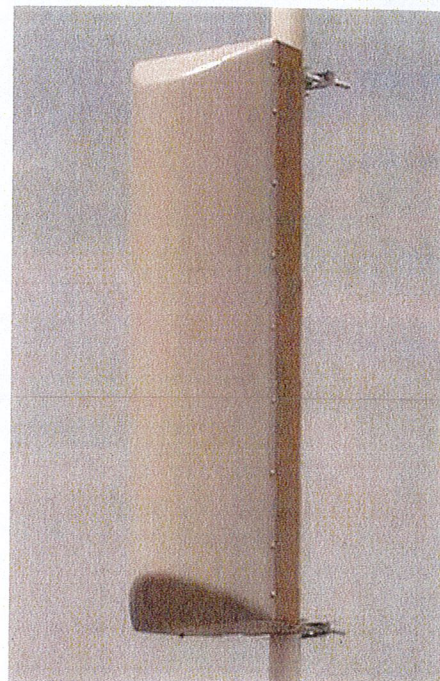


Vertical

Featuring upper side lobe suppression.

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the Front-to-Back ratio.



Amphenol Antel's Exclusive 3T (True Transmission Line Technology) Antenna Design:

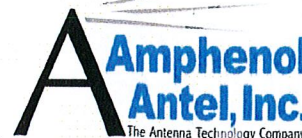
- True log-periodic design allows for superior front-to-side characteristics to minimize sector overlap.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad bandwidth and superior performance.
- Air as insulation for virtually no internal signal loss.

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

Antenna available with center-fed connector only.

CF Denotes a Center-Fed Connector.

806-960 MHz



Revision Date: 6/17/08

Slant +/- 45° Dual Polarized, Panel 90° / 16.5 dBi

BXA-185090/8CF

When ordering replace "___" with connector type.

Mechanical specifications

Length	1225 mm	48.2 in
Width	154 mm	6.1 in
Depth	105 mm	4.1 in
Depth with t-bracket	133 mm	5.2 in
4) Weight	5.0 kg	11.0 lbs
Wind Area		
Fore/Aft	0.19 m ²	2.0 ft ²
Side	0.13 m ²	1.4 ft ²
Rated Wind Velocity (Safety factor 2.0)	>322 km/hr	>200 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	283 N	64.0 lbs
Side	211 N	47.5 lbs

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

Mounting and Downtilting

Mounting brackets attach to a pipe diameter of Ø50-102 mm (2.0-4.0 in).

Mounting bracket kit #26799997

Downtilt bracket kit #26799999

The downtilt bracket kit includes the mounting bracket kit.

Electrical specifications

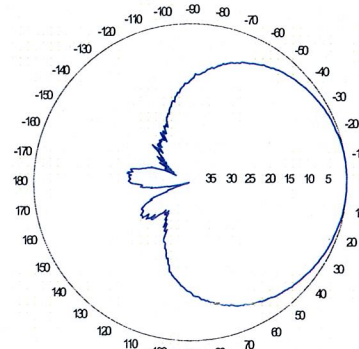
Frequency Range	1850-1990 MHz
Impedance	50Ω
3) Connector(s)	NE or E-DIN 2 ports / center
1) VSWR	≤ 1.4:1
Polarization	Slant ± 45°
1) Isolation Between Ports	< -30 dB
1) Gain	16.5 dBi
2) Power Rating	250 W
1) Half Power Angle	
H-Plane	90°
E-Plane	7°
1) Electrical Downtilt	0°
1) Null Fill	5%
Lightning Protection	Direct Ground

Patented Dipole Design: U.S. Patent No. 6,597,324 B2

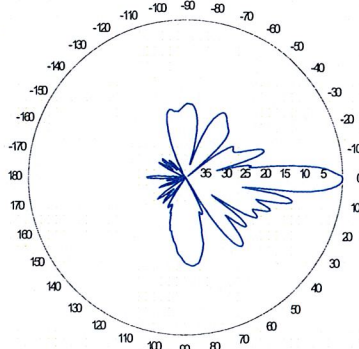
- 1) Typical values.
- 2) Power rating limited by connector only.
- 3) NE indicates an elongated N connector.
E-DIN indicates an elongated DIN connector.
- 4) The antenna weight listed above does not include the bracket weight.

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

Radiation pattern¹⁾



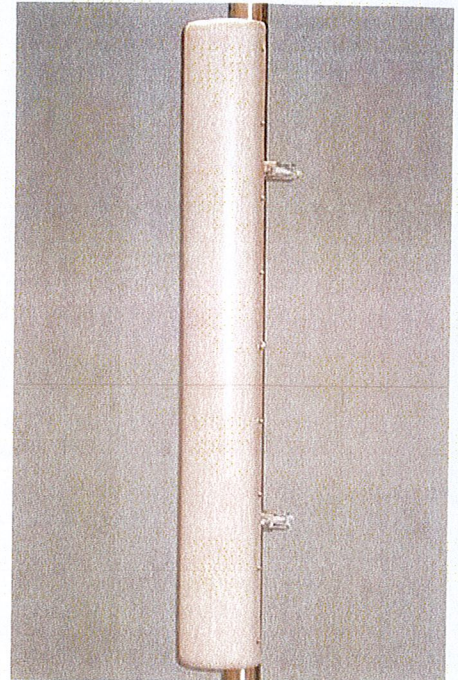
Horizontal



Vertical

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the Front-to-Back ratio.



Amphenol Antel's Exclusive 3T (True Transmission Line Technology) Antenna Design:

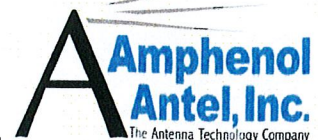
- Watercut brass feedline assembly for consistent performance.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad bandwidth and superior performance.
- Air as insulation for virtually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

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

Antenna available with center-fed connectors only.

CF Denotes a Center-Fed Connector.

1850-1990 MHz



Revision Date: 7/11/07

BXA-185063/8CF

When ordering replace "___" with connector type.

Mechanical specifications

Length	1238 mm	48.8 in
Width	154 mm	6.1 in
Depth	80 mm	3.2 in
Depth with t-bracket	108 mm	4.3 in
4) Weight	4.5 kg	10.0 lbs
Wind Area		
Fore/Aft	0.19 m ²	2.1 ft ²
Side	0.10 m ²	1.1 ft ²
Rated Wind Velocity (Safety factor 2.0)		
	>322 km/hr	>200 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	288 N	65 lbs
Side	170 N	38 lbs

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

Mounting and Downtilting

Mounting brackets attach to a pipe diameter of Ø50-102 mm (2.0-4.0 in).

Mounting bracket kit #26799997

Downtilt bracket kit #26799999

The downtilt bracket kit includes the mounting bracket kit.

Electrical specifications

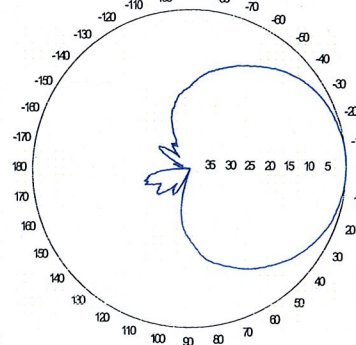
Frequency Range	1850-1990 MHz
Impedance	50Ω
3) Connector(s)	NE or E-DIN 2 ports / center or bottom
1) VSWR	≤ 1.4:1
Polarization	Slant ± 45°
1) Isolation Between Ports	< -30 dB
1) Gain	18.5 dBi
2) Power Rating	250 W
1) Half Power Angle	
H-Plane	63°
E-Plane	7°
1) Electrical Downtilt	0°
1) Null Fill	5%
Lightning Protection	Direct Ground

Patented Dipole Design: U.S. Patent No. 6,597,324 B2

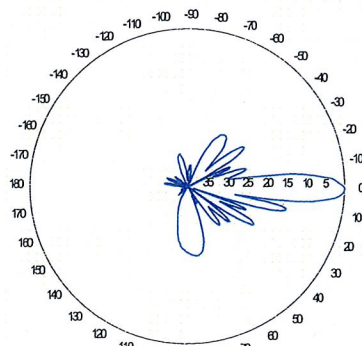
- 1) Typical values.
- 2) Power rating limited by connector only.
- 3) NE indicates an elongated N connector.
E-DIN indicates an elongated DIN connector.
- 4) The antenna weight listed above does not include the bracket weight.

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

Radiation pattern¹⁾



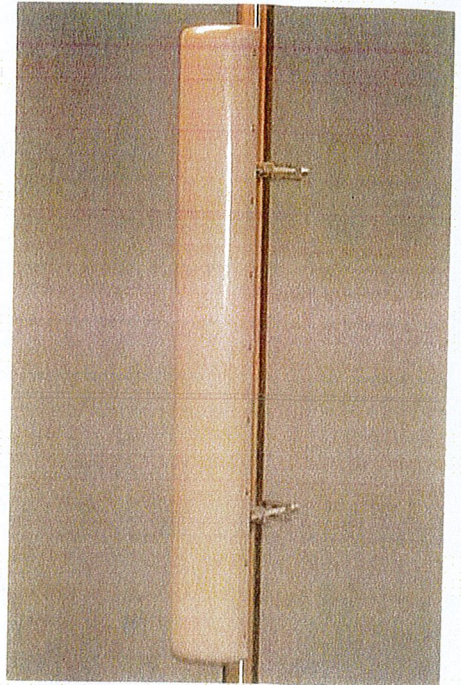
Horizontal



Vertical

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the Front-to-Back ratio.



Amphenol Antel's Exclusive 3T (True Transmission Line Technology) Antenna Design:

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

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

Antenna can be ordered with center-fed or bottom-fed connectors.

Center-fed: BXA-185063/8CF + (NE or E-DIN)
Bottom-fed: BXA-185063/8BF + (NE or E-DIN)

CF Denotes a Center-Fed Connector.

1850-1990 MHz



Revision Date: 7/11/07

Mechanical specifications

Length	1804 mm	71.0 in
Width	285 mm	11.2 in
Depth	114 mm	4.5 in
Depth with z-bracket	154 mm	6.1 in
Weight ⁴⁾	7.9 kg	17.0 lbs
Wind Area Fore/Aft	0.51 m ²	5.5 ft ²
Wind Area Side	0.21 m ²	2.2 ft ²
Max Wind Survivability	>201 km/hr	>125 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	753 N	169 lbf
Side	351 N	79 lbf

Antenna consisting of aluminum alloy with brass feedlines covered by a UV safe fiber-glass radome.

Mounting & Downtilting

Mounting hardware attaches to pipe diameter $\varnothing 50$ -160 mm; $\varnothing 2.0$ -6.3 in

Mounting Bracket Kit	36210003
Downtilt Bracket Kit	36210004
Mechanical Downtilt	0-14°

Electrical specifications

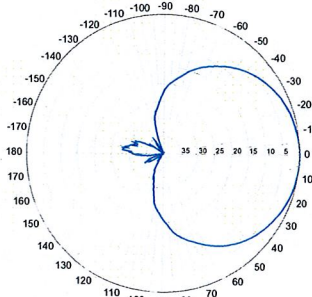
Frequency Range	696-900 MHz
Impedance	50 Ω
Connector ³⁾	NE or E-DIN Female 2 ports / Center
VSWR ¹⁾	$\leq 1.35:1$
Polarization	Slant $\pm 45^\circ$
Isolation Between Ports ¹⁾	< -25 dB
Gain ¹⁾	14.5 dBd 16.5 dBi
Power Rating ²⁾	500 W
Half Power Angle ¹⁾	
Horizontal Beamwidth	63°
Vertical Beamwidth	11°
Electrical downtilt ⁵⁾	5°
Null fill ¹⁾	5%
Lightning protection	Direct ground

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

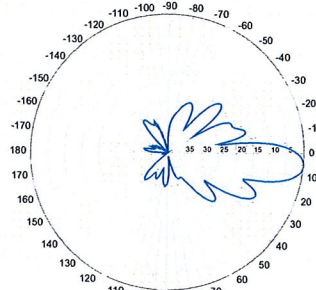
- 1) Typical values.
- 2) Power rating limited by connector only.
- 3) NE indicates an elongated N connector.
E-DIN indicates an elongated DIN connector.
- 4) Antenna weight does not include brackets.
- 5) Add'l downtilts may be available. Check website for details.

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

Radiation-pattern¹⁾
750 MHz

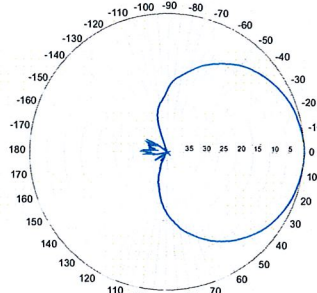


Horizontal

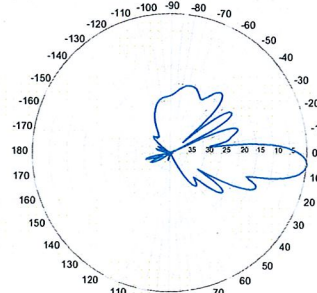


Vertical

850 MHz



Horizontal

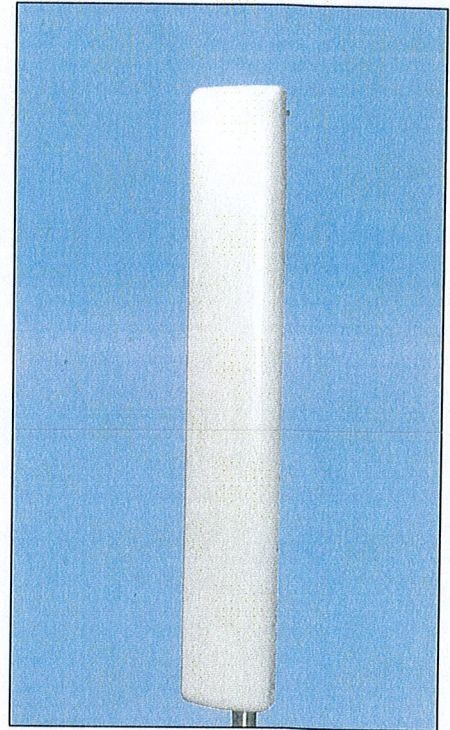


Vertical

696-900 MHz

BXA-70063/6CF __ 5°

When ordering replace "__" with connector type.



Featuring our Exclusive
3T Technology™
Antenna Design:

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

Warranty:

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

Revision Date 05/07/09

Mechanical specifications

Length	1804 mm	71.0 in
Width	285 mm	11.2 in
Depth	114 mm	4.5 in
Depth with z-bracket	154 mm	6.1 in
Weight ⁴⁾	7.9 kg	17.0 lbs
Wind Area Fore/Aft	0.51 m ²	5.5 ft ²
Wind Area Side	0.21 m ²	2.2 ft ²
Max Wind Survivability	>201 km/hr	>125 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	753 N	169 lbf
Side	351 N	79 lbf

Antenna consisting of aluminum alloy with brass feedlines covered by a UV safe fiber-glass radome.

Mounting & Downtilting

Mounting hardware attaches to pipe diameter $\varnothing 50$ -160 mm; $\varnothing 2.0$ -6.3 in

Mounting Bracket Kit	36210003
Downtilt Bracket Kit	36210004

Electrical specifications

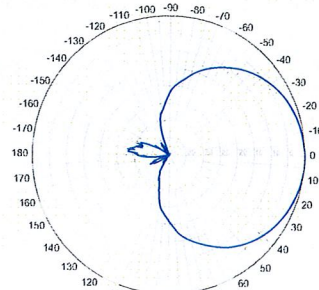
Frequency Range	696-900 MHz
Impedance	50 Ω
Connector ³⁾	NE or E-DIN Female 2 ports / Center
VSWR ¹⁾	$\leq 1.35:1$
Polarization	Slant $\pm 45^\circ$
Isolation Between Ports ¹⁾	< -25 dB
Gain ¹⁾	14.5 dBd 16.5 dBi
Power Rating ²⁾	500 W
Half Power Angle ¹⁾	
Horizontal Beamwidth	63°
Vertical Beamwidth	11°
Electrical downtilt ⁵⁾	4°
Null fill ¹⁾	5%
Lightning protection	Direct ground

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

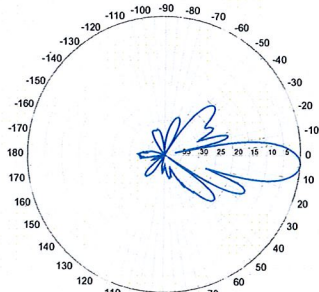
- 1) Typical values.
- 2) Power rating limited by connector only.
- 3) NE indicates an elongated N connector.
E-DIN indicates an elongated DIN connector.
- 4) Antenna weight does not include brackets.
- 5) Add'l downtilts may be available. Check website for details.

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

Radiation-pattern¹⁾
750 MHz

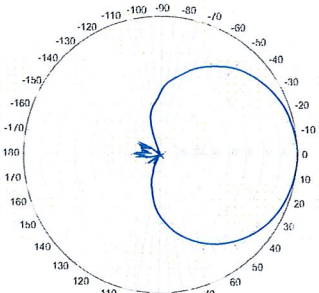


Horizontal

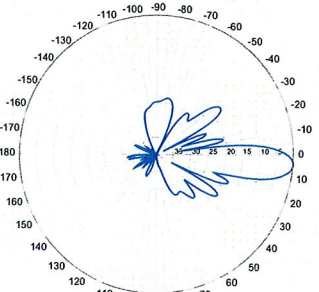


Vertical

850 MHz



Horizontal

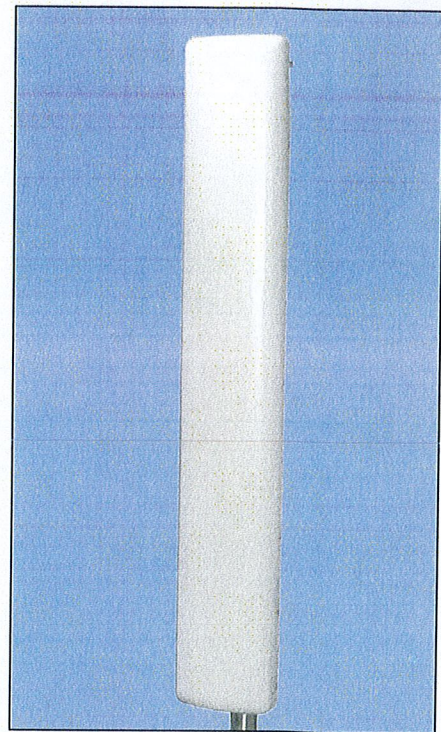


Vertical

696-900 MHz

BXA-70063/6CF __ 4°

When ordering replace "__" with connector type.



Featuring our Exclusive
3T Technology™
Antenna Design:

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

Warranty:

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

Revision Date 04/09/09

Site Name: Hartford NW		General		Power		Density							
Tower Height: Verizon @ 137Ft.													
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total					
*Sprint	11	609	104	0.2227	1962.5	1.0000	22.27%						
*Clearwire	2	153	104	0.0102	2496	1.0000	1.02%						
*Clearwire	1	211	108	0.0065	11 GHz	1.0000	0.65%						
*Sensus (CL&P)	1	200	74	0.0131	940.1125	0.6267	2.10%						
*Pocket	3	631	94	0.0770	2130	1.0000	7.70%						
*T-Mobile GSM	8	193	127	0.0344	1945	1.0000	3.44%						
*T-Mobile UMTS	2	770	127	0.0343	2100	1.0000	3.43%						
*Cingular UMTS	1	500	117	0.0131	1945	1.0000	1.31%						
*Cingular	20	250	117	0.1313	880	0.5867	22.39%						
*Cingular	3	427	117	0.0336	1945	1.0000	3.36%						
Verizon	3	325	137	0.0187	1970	1.0000	1.87%						
Verizon	9	269	137	0.0464	869	0.5793	8.01%						
Verizon	1	626	137	0.0120	757	0.4973	2.41%						
								79.96%					
* Source: Siting Council													

Date: March 15, 2010

Eva Morales
Crown Castle
46 Broadway
Albany, NY 12204


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

Subject: Structural Analysis Report

Carrier Designation: Verizon Wireless Co-Locate
Carrier Site Number: 2010441909
Carrier Site Name: Hartford NW

Crown Castle Designation: Crown Castle BU Number: 806369
Crown Castle Site Name: HRT 094 943225
Crown Castle JDE Job Number: 132236
Crown Castle Work Order Number: 323241

Engineering Firm Designation: Crown Castle Project Number: 323241

Site Data: 439-455 HOMESTEAD AVE, HARTFORD, Hartford County, CT
Latitude 41° 47' 1.61", Longitude -72° 42' 13.66"
140.12 Foot - Monopole Tower

Dear Eva Morales,

Crown Castle is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 323241, in accordance with application 93281, 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:

LC1: Existing + Reserved + Proposed Equipment

Sufficient Capacity

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

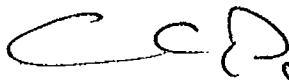
The analysis has been performed in accordance with the TIA/EIA-222-F standard and local code requirements based upon a wind speed of 80 mph fastest mile.

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

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

Structural analysis prepared by: Heather Norton, E.I.T./JCM

Respectfully submitted by:



Aaron C. Poot, P.E.
Engineering Supervisor

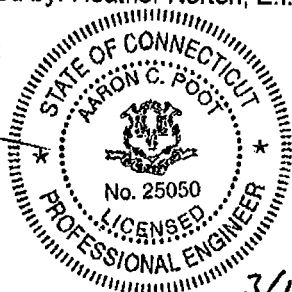


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1) INTRODUCTION

This tower is a 140.12 ft Monopole tower believed to have been designed by Valmont. The tower was mapped in July of 2008 and the original design wind speed and code is unknown.

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
137	137	1	antel	BXA-185063/8CF w/ Mount Pipe	-	-	-
		2	antel	BXA-185090/8CF w/ Mount Pipe			
		3	antel	BXA-70063/6CF w/ Mount Pipe			
		2	antel	LPA-80063/4CF w/ Mount Pipe			
		4	antel	LPA-80080/4CF w/ Mount Pipe			
		6	rfs celwave	FD9R6004/1C-3L			

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
137	141	6	allgon	7130.16 w/ Mount Pipe	-	-	2
		6	decibel	948F85T4E-M w/ Mount Pipe			
124	137	1	tower mounts	Platform Mount (LP 101-1)	12	7/8	1
	127	8	rfs celwave	APX16DWV-16DWV-S-E-A20	18	1 5/8	1
		5	siemens	DTMA GSM 1900			
117	124	1	tower mounts	Platform Mount [LP 301-1]	12	1 5/8	1
	119	6	powerwave technologies	7770.00 w/ Mount Pipe			
		12	powerwave technologies	LGP21401			
	117	1	tower mounts	Platform Mount [LP 712-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
102	108	2	andrew	VHLP2.5-11	6 3	5/16 1/2	3
		2	dragonwave	HORIZON COMPACT			
	104	3	samsung telecommunications	WIMAX DAP HEAD			
		3	kathrein	840 10054 w/ Mount Pipe			
		1	motorola	TIMING 2000			
		6	ems wireless	RV65-17-02DPL2 w/ Mount Pipe			
102	1	tower mounts	Platform Mount [LP 602-1]				
94	94	3	kathrein	742 213 w/ Mount Pipe	6	1 5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
		1	antel	BCD-87010			
74	74	1	tower mounts	Pipe Mount [PM 601-1]	1	7/8	1
49	50	1	lucent	KS24019-L112A	1	1/2	1
	49	1	tower mounts	Pipe Mount [PM 601-1]			

- Notes:
 1) Existing Equipment
 2) Equipment to be Removed
 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)
N/A						

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	TOWER ENGINEERING PROFESSIONALS	2294838	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	TOWER ENGINEERING PROFESSIONALS	2294380	CCISITES
4-TOWER MANUFACTURER DRAWINGS	TOWER ENGINEERING PROFESSIONALS	2294379	CCISITES

3.1) Analysis Method

RISATower (version 5.4.1.5), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
- 5) The shaft, base plate and anchor rod grade are standard for Valmont monopoles.
- 6) The base plate grout was not considered in this analysis.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	140.12 - 88.3596	Pole	TP39.1x26x0.31	1	-13.50	1942.46	36.2	Pass
L2	88.3596 - 39.4012	Pole	TP50.87x37.2422x0.42	2	-25.70	3433.85	48.6	Pass
L3	39.4012 - 0	Pole	TP60x48.4206x0.5	3	-42.87	4980.10	50.7	Pass
							Summary	
						Pole (L3)	50.7	Pass
						Rating =	50.7	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	57.2	Pass
1	Base Plate	0	16.6	Pass
1	Base Foundation	0	40.1	Pass

Structure Rating (max from all components) =	57.2%
---	--------------

Notes:

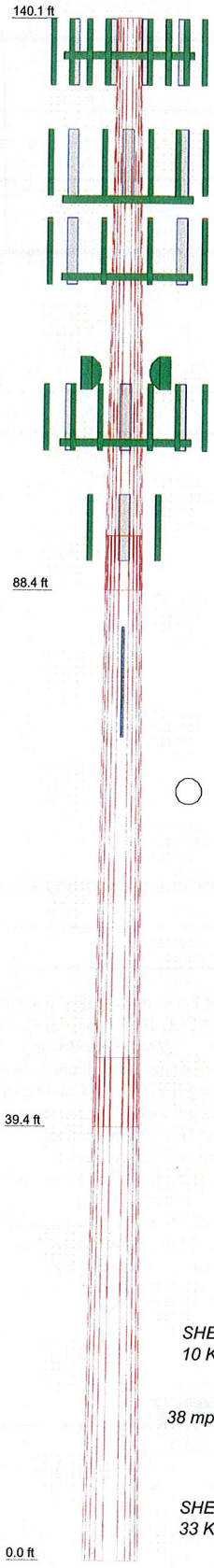
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

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

APPENDIX A
RISA TOWER OUTPUT

Section	1	2	3
Length (ft)	51.76	53.85	45.76
Number of Sides	12	12	12
Thickness (in)	0.3100	0.4200	0.5000
Socket Length (ft)	4.89	6.36	48.4206
Top Dia (in)	26.0000	37.2422	60.0000
Bot Dia (in)	39.1000	50.8700	13.5
Grade		A572-65	
Weight (K)		10.8	29.9



DESIGNED APPURTENANCE LOADING

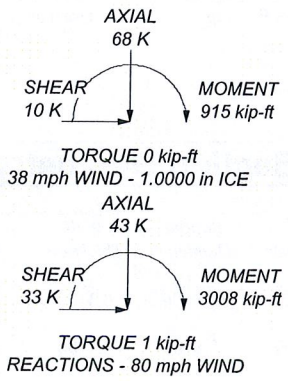
TYPE	ELEVATION	TYPE	ELEVATION
BXA-185063/8CF w/ Mount Pipe	137	8'x2" Antenna Mount Pipe	117
BXA-70063/6CF w/ Mount Pipe	137	8'x2" Antenna Mount Pipe	117
(2) LPA-80063/4CF w/ Mount Pipe	137	8'x2" Antenna Mount Pipe	117
(2) FD9R6004/1C-3L	137	(2) RV65-17-02DPL2 w/ Mount Pipe	102
BXA-185090/8CF w/ Mount Pipe	137	840 10054 w/ Mount Pipe	102
BXA-70063/6CF w/ Mount Pipe	137	TIMING 2000	102
(2) LPA-80080/4CF w/ Mount Pipe	137	WIMAX DAP HEAD	102
(2) FD9R6004/1C-3L	137	(2) RV65-17-02DPL2 w/ Mount Pipe	102
BXA-185090/8CF w/ Mount Pipe	137	HORIZON COMPACT	102
BXA-70063/6CF w/ Mount Pipe	137	840 10054 w/ Mount Pipe	102
(2) LPA-80080/4CF w/ Mount Pipe	137	WIMAX DAP HEAD	102
(2) FD9R6004/1C-3L	137	(2) RV65-17-02DPL2 w/ Mount Pipe	102
Platform Mount (LP 101-1)	137	840 10054 w/ Mount Pipe	102
(2) DTMA GSM 1900	124	HORIZON COMPACT	102
DTMA GSM 1900	124	WIMAX DAP HEAD	102
(2) DTMA GSM 1900	124	Platform Mount [LP 602-1]	102
(3) APX16DWV-16DWV-S-E-A20	124	VHLP2.5-11	102
(3) APX16DWV-16DWV-S-E-A20	124	VHLP2.5-11	102
(2) APX16DWV-16DWV-S-E-A20	124	742 213 w/ Mount Pipe	94
Platform Mount [LP 301-1]	124	Pipe Mount [PM 601-3]	94
(2) 7770.00 w/ Mount Pipe	117	742 213 w/ Mount Pipe	94
(4) LGP21401	117	742 213 w/ Mount Pipe	94
(2) 7770.00 w/ Mount Pipe	117	BCD-87010	74
(4) LGP21401	117	Pipe Mount [PM 601-1]	74
(2) 7770.00 w/ Mount Pipe	117	KS24019-L112A	49
(4) LGP21401	117	Pipe Mount [PM 601-1]	49
Platform Mount [LP 712-1]	117		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	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 1.000 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 50.7%



<p>Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Shaping the Wireless World Phone: (724) 416-2000 FAX:</p>	<p>Job: BU 806369</p>									
	<p>Project:</p>									
	<table border="1"> <tr> <td>Client: Crown Castle</td> <td>Drawn by: henorton</td> <td>App'd:</td> </tr> <tr> <td>Code: TIA/EIA-222-F</td> <td>Date: 03/12/10</td> <td>Scale: NTS</td> </tr> <tr> <td>Path: R:\SA Models - Letters\Work Area\HNorton\806369\806369.dwg</td> <td colspan="2">Dwg No. E-1</td> </tr> </table>	Client: Crown Castle	Drawn by: henorton	App'd:	Code: TIA/EIA-222-F	Date: 03/12/10	Scale: NTS	Path: R:\SA Models - Letters\Work Area\HNorton\806369\806369.dwg	Dwg No. E-1	
	Client: Crown Castle	Drawn by: henorton	App'd:							
	Code: TIA/EIA-222-F	Date: 03/12/10	Scale: NTS							
Path: R:\SA Models - Letters\Work Area\HNorton\806369\806369.dwg	Dwg No. E-1									

RISATower Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2000 FAX:	Job BU 806369	Page 1 of 15
	Project	Date 16:33:47 03/11/10
	Client Crown Castle	Designed by henorton

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

Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	140.12-88.36	51.76	4.89	12	26.0000	39.1000	0.3100	1.2400	A572-65 (65 ksi)
L2	88.36-39.40	53.85	6.36	12	37.2422	50.8700	0.4200	1.6800	A572-65 (65 ksi)
L3	39.40-0.00	45.76		12	48.4206	60.0000	0.5000	2.0000	A572-65 (65 ksi)

RISATower Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2000 FAX:	Job	BU 806369	Page	2 of 15
	Project		Date	16:33:47 03/11/10
	Client	Crown Castle	Designed by	henorton

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	<i>l</i> in ⁴	<i>r</i> in	<i>C</i> in	<i>I/C</i> in ³	<i>J</i> in ⁴	<i>I/Q</i> in ²	<i>w</i> in	<i>w/t</i>
L1	26.9172	25.6438	2160.2093	9.1970	13.4680	160.3957	4377.1697	12.6211	6.1372	19.797
	40.4793	38.7202	7436.4019	13.8868	20.2538	367.1608	15068.1664	19.0569	9.6480	31.123
L2	39.8374	49.7984	8618.2994	13.1824	19.2915	446.7413	17463.0112	24.5093	8.8553	21.084
	52.6645	68.2286	22165.3516	18.0611	26.3507	841.1687	44913.0116	33.5800	12.5076	29.78
L3	51.7947	77.1522	22614.0733	17.1556	25.0819	901.6102	45822.2434	37.9720	11.6367	23.273
	62.1166	95.7950	43287.5218	21.3010	31.0800	1392.7774	87712.2550	47.1474	14.7400	29.48

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor <i>A_f</i>	Adjust. Factor <i>A_r</i>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
<i>ft</i>	<i>ft</i> ²	in					in	in
L1 140.12-88.36				1	1	1		
L2 88.36-39.40				1	1	1		
L3 39.40-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement	Total Number	Number Per Row	Start/End Position	Width or Diameter	Perimeter	Weight
			<i>ft</i>				in	in	plf
LDF7-50A(1 5/8")	A	Surface Ar (CaAa)	124.00 - 0.00	6	1	0.000	1.9800		0.82
ATCB-B01-005(5/16)	C	Surface Ar (CaAa)	102.00 - 0.00	6	2	0.000	0.3150		0.07
FSJ4-50B(1/2")	C	Surface Ar (CaAa)	102.00 - 0.00	3	1	0.000	0.5200		0.14
* AVA7-50(1-5/8")	B	Surface Ar (CaAa)	94.00 - 0.00	6	1	0.000	1.0000		0.72
* LDF5-50A(7/8")	A	Surface Ar (CaAa)	74.00 - 0.00	1	1	0.000	1.0900		0.33

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number	<i>C_AA</i>	Weight	
				<i>ft</i>		<i>ft</i> ² / <i>ft</i>	plf	
LDF5-50A(7/8")	A	No	Inside Pole	137.00 - 0.00	12	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
* FLC 158-50J(1-5/8")	A	No	Inside Pole	124.00 - 0.00	12	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
						2" Ice	0.00	0.92
						4" Ice	0.00	0.92

RISATower Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2000 FAX:	Job BU 806369	Page 3 of 15
	Project	Date 16:33:47 03/11/10
	Client Crown Castle	Designed by henorton

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
*								
LDF7-50A(1-5/8")	B	No	Inside Pole	117.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
*								
LDF7-50A(1-5/8")	C	No	Inside Pole	102.00 - 0.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
*								
LDF4-50A(1/2")	B	No	Inside Pole	49.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	140.12-88.36	A	0.000	0.000	7.057	0.000	0.76
		B	0.000	0.000	0.564	0.000	0.31
		C	0.000	0.000	1.569	0.000	0.08
L2	88.36-39.40	A	0.000	0.000	13.465	0.000	0.99
		B	0.000	0.000	4.896	0.000	0.69
		C	0.000	0.000	5.630	0.000	0.28
L3	39.40-0.00	A	0.000	0.000	12.096	0.000	0.80
		B	0.000	0.000	3.940	0.000	0.56
		C	0.000	0.000	4.531	0.000	0.23

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	140.12-88.36	A	1.159	0.000	0.000	15.319	0.000	1.71
		B		0.000	0.000	1.872	0.000	0.41
		C		0.000	0.000	14.165	0.000	0.23
L2	88.36-39.40	A	1.082	0.000	0.000	32.835	0.000	2.40
		B		0.000	0.000	16.245	0.000	1.59
		C		0.000	0.000	50.843	0.000	0.81
L3	39.40-0.00	A	1.000	0.000	0.000	29.142	0.000	1.87
		B		0.000	0.000	12.463	0.000	1.21
		C		0.000	0.000	38.678	0.000	0.61

Feed Line Center of Pressure

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Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L1	140.12-88.36	-0.2427	-0.1110	-0.4146	-0.0123
L2	88.36-39.40	-0.2643	-0.1565	-0.3533	0.1771
L3	39.40-0.00	-0.2915	-0.1677	-0.4322	0.1435

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
BXA-185063/8CF w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	137.00	No Ice	3.18	3.00	0.03
						1/2" Ice	3.56	3.61	0.06
						1" Ice	3.96	4.24	0.09
						2" Ice	4.86	5.53	0.19
						4" Ice	6.77	8.42	0.47
BXA-70063/6CF w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	137.00	No Ice	7.98	5.70	0.04
						1/2" Ice	8.62	6.85	0.10
						1" Ice	9.23	7.71	0.17
						2" Ice	10.47	9.50	0.33
						4" Ice	13.08	13.26	0.80
(2) LPA-80063/4CF w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	137.00	No Ice	7.25	7.26	0.04
						1/2" Ice	7.72	7.96	0.10
						1" Ice	8.20	8.67	0.18
						2" Ice	9.19	10.16	0.34
						4" Ice	11.32	13.39	0.80
(2) FD9R6004/1C-3L	A	From Leg	4.00 0.00 0.00	0.0000	137.00	No Ice	0.37	0.08	0.00
						1/2" Ice	0.45	0.14	0.01
						1" Ice	0.54	0.20	0.01
						2" Ice	0.75	0.34	0.02
						4" Ice	1.28	0.74	0.06
BXA-185090/8CF w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	137.00	No Ice	3.16	3.33	0.03
						1/2" Ice	3.53	3.94	0.06
						1" Ice	3.94	4.56	0.10
						2" Ice	4.83	5.86	0.19
						4" Ice	6.73	8.84	0.49
BXA-70063/6CF w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	137.00	No Ice	7.98	5.70	0.04
						1/2" Ice	8.62	6.85	0.10
						1" Ice	9.23	7.71	0.17
						2" Ice	10.47	9.50	0.33
						4" Ice	13.08	13.26	0.80
(2) LPA-80080/4CF w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	137.00	No Ice	2.86	7.23	0.03
						1/2" Ice	3.22	7.92	0.07
						1" Ice	3.59	8.63	0.13
						2" Ice	4.45	10.11	0.25
						4" Ice	6.32	13.34	0.61
(2) FD9R6004/1C-3L	B	From Leg	4.00 0.00 0.00	0.0000	137.00	No Ice	0.37	0.08	0.00
						1/2" Ice	0.45	0.14	0.01
						1" Ice	0.54	0.20	0.01
						2" Ice	0.75	0.34	0.02
						4" Ice	1.28	0.74	0.06
BXA-185090/8CF w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	137.00	No Ice	3.16	3.33	0.03
						1/2" Ice	3.53	3.94	0.06
						1" Ice	3.94	4.56	0.10

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight				
			Horz	Lateral									
			ft	ft	°	ft	ft ²	ft ²	K				
BXA-70063/6CF w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	137.00	2" Ice	4.83	5.86	0.19			
							4" Ice	6.73	8.84	0.49			
							No Ice	7.98	5.70	0.04			
							1/2" Ice	8.62	6.85	0.10			
							1" Ice	9.23	7.71	0.17			
							2" Ice	10.47	9.50	0.33			
(2) LPA-80080/4CF w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	137.00	4" Ice	13.08	13.26	0.80			
							No Ice	2.86	7.23	0.03			
							1/2" Ice	3.22	7.92	0.07			
							1" Ice	3.59	8.63	0.13			
							2" Ice	4.45	10.11	0.25			
							4" Ice	6.32	13.34	0.61			
(2) FD9R6004/1C-3L	C	From Leg	4.00	0.00	0.0000	137.00	No Ice	0.37	0.08	0.00			
							1/2" Ice	0.45	0.14	0.01			
							1" Ice	0.54	0.20	0.01			
							2" Ice	0.75	0.34	0.02			
							4" Ice	1.28	0.74	0.06			
							No Ice	36.21	36.21	1.50			
Platform Mount (LP 101-1)	C	None	0.0000	137.00	1/2" Ice	42.82	42.82	2.30					
					1" Ice	49.43	49.43	3.10					
					2" Ice	62.65	62.65	4.70					
					4" Ice	89.09	89.09	7.89					
					* *								
					(2) DTMA GSM 1900	A	From Leg	4.00	0.00	0.0000	124.00	No Ice	0.79
1/2" Ice	0.92	0.65	0.03										
1" Ice	1.05	0.77	0.03										
2" Ice	1.35	1.04	0.06										
4" Ice	2.04	1.68	0.13										
No Ice	0.79	0.54	0.02										
DTMA GSM 1900	B	From Leg	4.00	0.00	0.0000	124.00	1/2" Ice	0.92	0.65	0.03			
							1" Ice	1.05	0.77	0.03			
							2" Ice	1.35	1.04	0.06			
							4" Ice	2.04	1.68	0.13			
							No Ice	0.79	0.54	0.02			
							1/2" Ice	0.92	0.65	0.03			
(2) DTMA GSM 1900	C	From Leg	4.00	0.00	0.0000	124.00	1" Ice	1.05	0.77	0.03			
							2" Ice	1.35	1.04	0.06			
							4" Ice	2.04	1.68	0.13			
							No Ice	0.79	0.54	0.02			
							1/2" Ice	0.92	0.65	0.03			
							1" Ice	1.05	0.77	0.03			
(3) APX16DWV-16DWV-S-E-A 20	A	From Leg	4.00	0.00	0.0000	124.00	2" Ice	1.35	1.04	0.06			
							4" Ice	2.04	1.68	0.13			
							No Ice	7.23	2.15	0.04			
							1/2" Ice	7.68	2.49	0.07			
							1" Ice	8.14	2.84	0.11			
							2" Ice	9.09	3.55	0.20			
(3) APX16DWV-16DWV-S-E-A 20	B	From Leg	4.00	0.00	0.0000	124.00	4" Ice	11.09	5.08	0.46			
							No Ice	7.23	2.15	0.04			
							1/2" Ice	7.68	2.49	0.07			
							1" Ice	8.14	2.84	0.11			
							2" Ice	9.09	3.55	0.20			
							4" Ice	11.09	5.08	0.46			
(2) APX16DWV-16DWV-S-E-A 20	C	From Leg	4.00	0.00	0.0000	124.00	No Ice	7.23	2.15	0.04			
							1/2" Ice	7.68	2.49	0.07			
							1" Ice	8.14	2.84	0.11			
							2" Ice	9.09	3.55	0.20			
							4" Ice	11.09	5.08	0.46			
							No Ice	30.10	30.10	1.59			
Platform Mount [LP 301-1]	C	None	0.0000	124.00	1/2" Ice	40.80	40.80	2.03					
					1" Ice	51.50	51.50	2.47					

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz Lateral	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
						2" Ice	72.90	72.90	3.35	
						4" Ice	115.70	115.70	5.11	
* (2) 7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00		0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
(4) LGP21401	A	From Leg	4.00 0.00 2.00		0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00		0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
(4) LGP21401	B	From Leg	4.00 0.00 2.00		0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00		0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
(4) LGP21401	C	From Leg	4.00 0.00 2.00		0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
Platform Mount [LP 712-1]	C	None			0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.53 29.94 35.35 46.17 67.81	24.53 29.94 35.35 46.17 67.81	1.34 1.65 1.96 2.58 3.82
8'x2" Antenna Mount Pipe	A	From Leg	4.00 0.00 2.00		0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.90 2.73 3.40 4.40 6.50	1.90 2.73 3.40 4.40 6.50	0.03 0.04 0.06 0.12 0.30
8'x2" Antenna Mount Pipe	B	From Leg	4.00 0.00 2.00		0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.90 2.73 3.40 4.40 6.50	1.90 2.73 3.40 4.40 6.50	0.03 0.04 0.06 0.12 0.30
8'x2" Antenna Mount Pipe	C	From Leg	4.00 0.00 2.00		0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.90 2.73 3.40 4.40 6.50	1.90 2.73 3.40 4.40 6.50	0.03 0.04 0.06 0.12 0.30
* (2) RV65-17-02DPL2 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00		0.0000	102.00	No Ice 1/2" Ice 1" Ice	3.10 3.48 3.88	2.89 3.49 4.10	0.03 0.06 0.09

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz	Lateral					
840 10054 w/ Mount Pipe	A	From Leg	4.00	0.0000	102.00	2" Ice	4.76	5.38	0.18
						4" Ice	6.66	8.24	0.46
						No Ice	5.41	2.39	0.05
						1/2" Ice	5.83	2.92	0.09
						1" Ice	6.26	3.47	0.13
						2" Ice	7.16	4.61	0.23
TIMING 2000	A	From Leg	4.00	0.0000	102.00	4" Ice	9.09	7.32	0.53
						No Ice	0.13	0.13	0.00
						1/2" Ice	0.18	0.18	0.00
						1" Ice	0.24	0.24	0.01
						2" Ice	0.38	0.38	0.01
						4" Ice	0.78	0.78	0.05
(2) WIMAX DAP HEAD	A	From Leg	4.00	0.0000	102.00	No Ice	1.80	0.78	0.03
						1/2" Ice	1.99	0.92	0.04
						1" Ice	2.18	1.07	0.06
						2" Ice	2.59	1.39	0.09
						4" Ice	3.51	2.14	0.20
						No Ice	3.10	2.89	0.03
(2) RV65-17-02DPL2 w/ Mount Pipe	B	From Leg	4.00	0.0000	102.00	1/2" Ice	3.48	3.49	0.06
						1" Ice	3.88	4.10	0.09
						2" Ice	4.76	5.38	0.18
						4" Ice	6.66	8.24	0.46
						No Ice	0.84	0.43	0.01
						1/2" Ice	0.97	0.52	0.02
HORIZON COMPACT	B	From Leg	4.00	0.0000	102.00	1" Ice	1.10	0.63	0.03
						2" Ice	1.39	0.86	0.05
						4" Ice	2.08	1.43	0.12
						No Ice	5.41	2.39	0.05
						1/2" Ice	5.83	2.92	0.09
						1" Ice	6.26	3.47	0.13
840 10054 w/ Mount Pipe	B	From Leg	4.00	0.0000	102.00	2" Ice	7.16	4.61	0.23
						4" Ice	9.09	7.32	0.53
						No Ice	1.80	0.78	0.03
						1/2" Ice	1.99	0.92	0.04
						1" Ice	2.18	1.07	0.06
						2" Ice	2.59	1.39	0.09
WIMAX DAP HEAD	B	From Leg	4.00	0.0000	102.00	4" Ice	3.51	2.14	0.20
						No Ice	3.10	2.89	0.03
						1/2" Ice	3.48	3.49	0.06
						1" Ice	3.88	4.10	0.09
						2" Ice	4.76	5.38	0.18
						4" Ice	6.66	8.24	0.46
(2) RV65-17-02DPL2 w/ Mount Pipe	C	From Leg	4.00	0.0000	102.00	No Ice	5.41	2.39	0.05
						1/2" Ice	5.83	2.92	0.09
						1" Ice	6.26	3.47	0.13
						2" Ice	7.16	4.61	0.23
						4" Ice	9.09	7.32	0.53
						No Ice	0.84	0.43	0.01
840 10054 w/ Mount Pipe	C	From Leg	4.00	0.0000	102.00	1/2" Ice	0.97	0.52	0.02
						1" Ice	1.10	0.63	0.03
						2" Ice	1.39	0.86	0.05
						4" Ice	2.08	1.43	0.12
						No Ice	1.80	0.78	0.03
						1/2" Ice	1.99	0.92	0.04
HORIZON COMPACT	C	From Leg	4.00	0.0000	102.00	1" Ice	2.18	1.07	0.06
						2" Ice	2.59	1.39	0.09
						4" Ice	3.51	2.14	0.20
						No Ice	1.80	0.78	0.03
						1/2" Ice	1.99	0.92	0.04
						1" Ice	2.18	1.07	0.06
WIMAX DAP HEAD	C	From Leg	4.00	0.0000	102.00	2" Ice	2.59	1.39	0.09
						4" Ice	3.51	2.14	0.20

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _{Front}	C _A A _{Side}	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	K
Platform Mount [LP 602-1]	C	None			0.0000	102.00	No Ice 32.03 1/2" Ice 38.71 1" Ice 45.39 2" Ice 58.75 4" Ice 85.47	32.03 38.71 45.39 58.75 85.47	1.34 1.80 2.26 3.17 5.00
* 742 213 w/ Mount Pipe	A	From Leg	2.00 0.00 0.00		0.0000	94.00	No Ice 5.37 1/2" Ice 5.95 1" Ice 6.50 2" Ice 7.61 4" Ice 9.93	4.62 6.00 6.98 8.85 12.79	0.05 0.09 0.14 0.28 0.68
742 213 w/ Mount Pipe	B	From Leg	2.00 0.00 0.00		0.0000	94.00	No Ice 5.37 1/2" Ice 5.95 1" Ice 6.50 2" Ice 7.61 4" Ice 9.93	4.62 6.00 6.98 8.85 12.79	0.05 0.09 0.14 0.28 0.68
742 213 w/ Mount Pipe	C	From Leg	2.00 0.00 0.00		0.0000	94.00	No Ice 5.37 1/2" Ice 5.95 1" Ice 6.50 2" Ice 7.61 4" Ice 9.93	4.62 6.00 6.98 8.85 12.79	0.05 0.09 0.14 0.28 0.68
Pipe Mount [PM 601-3]	C	None			0.0000	94.00	No Ice 4.39 1/2" Ice 5.48 1" Ice 6.57 2" Ice 8.75 4" Ice 13.11	4.39 5.48 6.57 8.75 13.11	0.20 0.24 0.28 0.36 0.53
* * BCD-87010	A	From Leg	4.00 0.00 6.00		0.0000	74.00	No Ice 2.90 1/2" Ice 4.05 1" Ice 5.21 2" Ice 7.01 4" Ice 9.85	2.90 4.05 5.21 7.01 9.85	0.03 0.05 0.08 0.16 0.41
Pipe Mount [PM 601-1]	A	None			0.0000	74.00	No Ice 3.00 1/2" Ice 3.74 1" Ice 4.48 2" Ice 5.96 4" Ice 8.92	0.90 1.12 1.34 1.78 2.66	0.07 0.08 0.09 0.12 0.18
* * KS24019-L112A	C	From Leg	4.00 0.00 1.00		0.0000	49.00	No Ice 0.10 1/2" Ice 0.18 1" Ice 0.26 2" Ice 0.42 4" Ice 0.74	0.10 0.18 0.26 0.42 0.74	0.01 0.01 0.01 0.01 0.02
Pipe Mount [PM 601-1]	C	None			0.0000	49.00	No Ice 3.00 1/2" Ice 3.74 1" Ice 4.48 2" Ice 5.96 4" Ice 8.92	0.90 1.12 1.34 1.78 2.66	0.07 0.08 0.09 0.12 0.18

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Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight		
				Lateral ft	Vert ft								
VHLP2.5-11	B	Paraboloid w/Shroud (HP)	From Leg	1.00	0.0000	°	°	ft	ft	ft ²	K		
				0.00									
				6.00									
					No Ice							6.68	0.03
					1/2" Ice							7.07	0.04
	1" Ice	7.46	0.05										
		2" Ice	8.23	0.07									
		4" Ice	9.78	0.11									
VHLP2.5-11	C	Paraboloid w/Shroud (HP)	From Leg	1.00	90.0000	°	°	ft	ft	ft ²	K		
				0.00									
				6.00									
					No Ice							6.68	0.03
					1/2" Ice							7.07	0.04
	1" Ice	7.46	0.05										
		2" Ice	8.23	0.07									
		4" Ice	9.78	0.11									

Load Combinations

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

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Comb. No.	Description
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	140.12 - 88.3596	Pole	Max Tension	18	0.00	0.00	-0.00
			Max. Compression	14	-27.11	1.32	2.14
			Max. Mx	11	-13.53	506.32	6.57
			Max. My	2	-13.50	6.88	526.49
			Max. Vy	11	-19.35	506.32	6.57
			Max. Vx	8	19.87	-5.91	-526.28
			Max. Torque	5			-0.50
L2	88.3596 - 39.4012	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-44.97	2.79	4.69
			Max. Mx	11	-25.72	1589.28	21.33
			Max. My	8	-25.70	-19.90	-1633.21
			Max. Vy	11	-26.32	1589.28	21.33
			Max. Vx	8	26.84	-19.90	-1633.21
			Max. Torque	4			0.68
L3	39.4012 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-67.81	4.26	6.99
			Max. Mx	11	-42.87	2937.36	35.38
			Max. My	8	-42.87	-33.28	-3004.21
			Max. Vy	11	-32.62	2937.36	35.38
			Max. Vx	8	33.13	-33.28	-3004.21
			Max. Torque	4			0.84

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	67.81	4.93	8.57
	Max. H _x	11	42.88	32.61	0.29
	Max. H _z	2	42.88	0.33	33.06
	Max. M _x	2	3001.96	0.33	33.06
	Max. M _z	5	2930.91	-32.55	-0.33
	Max. Torsion	4	0.84	-28.11	16.35
	Min. Vert	1	42.88	0.00	0.00
	Min. H _x	5	42.88	-32.55	-0.33
	Min. H _z	8	42.88	-0.29	-33.11
	Min. M _x	8	-3004.21	-0.29	-33.11
	Min. M _z	11	-2937.36	32.61	0.29
	Min. Torsion	10	-0.83	28.18	-16.25

Tower Mast Reaction Summary

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Load Combination	Vertical K	Shear _x K	Shear _y K	Overturning Moment, M _x kip-ft	Overturning Moment, M _y kip-ft	Torque kip-ft
Dead Only	42.88	0.00	0.00	-1.59	0.47	0.00
Dead+Wind 0 deg - No Ice	42.88	-0.33	-33.06	-3001.96	38.85	-0.56
Dead+Wind 30 deg - No Ice	42.88	16.09	-28.55	-2590.02	-1443.63	-0.74
Dead+Wind 60 deg - No Ice	42.88	28.11	-16.35	-1480.24	-2528.19	-0.84
Dead+Wind 90 deg - No Ice	42.88	32.55	0.33	36.75	-2930.91	-0.38
Dead+Wind 120 deg - No Ice	42.88	28.29	16.76	1524.76	-2549.62	-0.12
Dead+Wind 150 deg - No Ice	42.88	16.49	28.74	2609.22	-1489.47	0.19
Dead+Wind 180 deg - No Ice	42.88	0.29	33.11	3004.21	-33.28	0.51
Dead+Wind 210 deg - No Ice	42.88	-16.00	28.62	2594.67	1434.13	0.81
Dead+Wind 240 deg - No Ice	42.88	-28.18	16.25	1466.53	2537.04	0.83
Dead+Wind 270 deg - No Ice	42.88	-32.61	-0.29	-35.38	2937.36	0.66
Dead+Wind 300 deg - No Ice	42.88	-28.30	-16.74	-1526.08	2551.59	0.36
Dead+Wind 330 deg - No Ice	42.88	-16.50	-28.73	-2611.45	1492.36	-0.08
Dead+Ice+Temp	67.81	-0.00	-0.00	-6.99	4.26	-0.00
Dead+Wind 0 deg+Ice+Temp	67.81	-0.08	-9.87	-912.39	13.88	-0.21
Dead+Wind 30 deg+Ice+Temp	67.81	4.83	-8.52	-788.68	-434.85	-0.25
Dead+Wind 60 deg+Ice+Temp	67.81	8.42	-4.89	-454.46	-763.10	-0.26
Dead+Wind 90 deg+Ice+Temp	67.81	9.75	0.08	2.42	-884.64	-0.11
Dead+Wind 120 deg+Ice+Temp	67.81	8.47	4.99	451.99	-768.34	-0.00
Dead+Wind 150 deg+Ice+Temp	67.81	4.92	8.57	779.93	-446.14	0.10
Dead+Wind 180 deg+Ice+Temp	67.81	0.07	9.88	899.54	-4.03	0.20
Dead+Wind 210 deg+Ice+Temp	67.81	-4.81	8.54	776.43	440.87	0.27
Dead+Wind 240 deg+Ice+Temp	67.81	-8.44	4.86	437.55	773.79	0.25
Dead+Wind 270 deg+Ice+Temp	67.81	-9.76	-0.07	-15.50	894.71	0.18
Dead+Wind 300 deg+Ice+Temp	67.81	-8.47	-4.98	-465.75	777.28	0.06
Dead+Wind 330 deg+Ice+Temp	67.81	-4.93	-8.57	-793.92	455.31	-0.08
Dead+Wind 0 deg - Service	42.88	-0.13	-12.92	-1173.88	15.47	-0.22
Dead+Wind 30 deg - Service	42.88	6.29	-11.15	-1012.92	-563.74	-0.29
Dead+Wind 60 deg - Service	42.88	10.98	-6.39	-579.32	-987.48	-0.33
Dead+Wind 90 deg - Service	42.88	12.72	0.13	13.37	-1144.82	-0.15
Dead+Wind 120 deg - Service	42.88	11.05	6.55	594.75	-995.86	-0.05
Dead+Wind 150 deg - Service	42.88	6.44	11.23	1018.46	-581.66	0.07
Dead+Wind 180 deg - Service	42.88	0.11	12.94	1172.78	-12.71	0.20
Dead+Wind 210 deg - Service	42.88	-6.25	11.18	1012.77	560.61	0.32
Dead+Wind 240 deg - Service	42.88	-11.01	6.35	571.99	991.52	0.33
Dead+Wind 270 deg - Service	42.88	-12.74	-0.11	-14.81	1147.93	0.26
Dead+Wind 300 deg - Service	42.88	-11.05	-6.54	-597.24	997.21	0.14
Dead+Wind 330 deg - Service	42.88	-6.45	-11.22	-1021.30	583.37	-0.03

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	-42.88	0.00	0.00	42.88	0.00	0.000%
2	-0.33	-42.88	-33.06	0.33	42.88	33.06	0.000%
3	16.09	-42.88	-28.55	-16.09	42.88	28.55	0.000%
4	28.11	-42.88	-16.35	-28.11	42.88	16.35	0.000%
5	32.55	-42.88	0.33	-32.55	42.88	-0.33	0.000%
6	28.29	-42.88	16.76	-28.29	42.88	-16.76	0.000%
7	16.49	-42.88	28.74	-16.49	42.88	-28.74	0.000%
8	0.29	-42.88	33.11	-0.29	42.88	-33.11	0.000%
9	-16.00	-42.88	28.62	16.00	42.88	-28.62	0.000%
10	-28.18	-42.88	16.25	28.18	42.88	-16.25	0.000%
11	-32.61	-42.88	-0.29	32.61	42.88	0.29	0.000%
12	-28.30	-42.88	-16.74	28.30	42.88	16.74	0.000%
13	-16.50	-42.88	-28.73	16.50	42.88	28.73	0.000%
14	0.00	-67.81	0.00	0.00	67.81	0.00	0.000%

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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	
15	-0.08	-67.81	-9.87	0.08	67.81	9.87	0.000%
16	4.83	-67.81	-8.52	-4.83	67.81	8.52	0.000%
17	8.42	-67.81	-4.89	-8.42	67.81	4.89	0.000%
18	9.75	-67.81	0.08	-9.75	67.81	-0.08	0.000%
19	8.47	-67.81	4.99	-8.47	67.81	-4.99	0.000%
20	4.92	-67.81	8.57	-4.92	67.81	-8.57	0.000%
21	0.07	-67.81	9.88	-0.07	67.81	-9.88	0.000%
22	-4.81	-67.81	8.54	4.81	67.81	-8.54	0.000%
23	-8.44	-67.81	4.86	8.44	67.81	-4.86	0.000%
24	-9.76	-67.81	-0.07	9.76	67.81	0.07	0.000%
25	-8.47	-67.81	-4.98	8.47	67.81	4.98	0.000%
26	-4.93	-67.81	-8.57	4.93	67.81	8.57	0.000%
27	-0.13	-42.88	-12.92	0.13	42.88	12.92	0.000%
28	6.29	-42.88	-11.15	-6.29	42.88	11.15	0.000%
29	10.98	-42.88	-6.39	-10.98	42.88	6.39	0.000%
30	12.72	-42.88	0.13	-12.72	42.88	-0.13	0.000%
31	11.05	-42.88	6.55	-11.05	42.88	-6.55	0.000%
32	6.44	-42.88	11.23	-6.44	42.88	-11.23	0.000%
33	0.11	-42.88	12.94	-0.11	42.88	-12.94	0.000%
34	-6.25	-42.88	11.18	6.25	42.88	-11.18	0.000%
35	-11.01	-42.88	6.35	11.01	42.88	-6.35	0.000%
36	-12.74	-42.88	-0.11	12.74	42.88	0.11	0.000%
37	-11.05	-42.88	-6.54	11.05	42.88	6.54	0.000%
38	-6.45	-42.88	-11.22	6.45	42.88	11.22	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00002265
3	Yes	4	0.00000001	0.00032841
4	Yes	4	0.00000001	0.00033552
5	Yes	4	0.00000001	0.00001453
6	Yes	4	0.00000001	0.00034559
7	Yes	4	0.00000001	0.00034751
8	Yes	4	0.00000001	0.00001244
9	Yes	4	0.00000001	0.00033772
10	Yes	4	0.00000001	0.00032236
11	Yes	4	0.00000001	0.00002234
12	Yes	4	0.00000001	0.00034912
13	Yes	4	0.00000001	0.00035097
14	Yes	4	0.00000001	0.00000488
15	Yes	4	0.00000001	0.00035764
16	Yes	4	0.00000001	0.00036995
17	Yes	4	0.00000001	0.00036495
18	Yes	4	0.00000001	0.00034412
19	Yes	4	0.00000001	0.00036528
20	Yes	4	0.00000001	0.00036854
21	Yes	4	0.00000001	0.00035096
22	Yes	4	0.00000001	0.00036627
23	Yes	4	0.00000001	0.00036382
24	Yes	4	0.00000001	0.00034897
25	Yes	4	0.00000001	0.00037423
26	Yes	4	0.00000001	0.00037825
27	Yes	4	0.00000001	0.00000656

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28	Yes	4	0.0000001	0.00002904
29	Yes	4	0.0000001	0.00003063
30	Yes	4	0.0000001	0.00000591
31	Yes	4	0.0000001	0.00003095
32	Yes	4	0.0000001	0.00003102
33	Yes	4	0.0000001	0.00000606
34	Yes	4	0.0000001	0.00003083
35	Yes	4	0.0000001	0.00002835
36	Yes	4	0.0000001	0.00000649
37	Yes	4	0.0000001	0.00003169
38	Yes	4	0.0000001	0.00003167

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140.12 - 88.3596	15.538	38	0.9171	0.0004
L2	93.2502 - 39.4012	7.141	38	0.7203	0.0003
L3	45.7606 - 0	1.717	38	0.3399	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
137.00	BXA-185063/8CF w/ Mount Pipe	38	14.942	0.9072	0.0004	72689
124.00	(2) DTMA GSM 1900	38	12.479	0.8641	0.0004	22546
117.00	(2) 7770.00 w/ Mount Pipe	38	11.185	0.8383	0.0004	15719
108.00	VHLP2.5-11	38	9.578	0.8001	0.0003	11315
102.00	(2) RV65-17-02DPL2 w/ Mount Pipe	38	8.553	0.7706	0.0003	9533
94.00	742 213 w/ Mount Pipe	38	7.258	0.7250	0.0003	7938
74.00	BCD-87010	38	4.455	0.5789	0.0003	6820
49.00	KS24019-L112A	38	1.952	0.3669	0.0002	5892

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140.12 - 88.3596	39.708	13	2.3434	0.0011
L2	93.2502 - 39.4012	18.254	13	1.8414	0.0009
L3	45.7606 - 0	4.389	13	0.8692	0.0004

Critical Deflections and Radius of Curvature - Design Wind

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Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
137.00	BXA-185063/8CF w/ Mount Pipe	13	38.184	2.3182	0.0011	28541
124.00	(2) DTMA GSM 1900	13	31.892	2.2083	0.0010	8852
117.00	(2) 7770.00 w/ Mount Pipe	13	28.587	2.1424	0.0010	6171
108.00	VHLP2.5-11	13	24.482	2.0449	0.0009	4441
102.00	(2) RV65-17-02DPL2 w/ Mount Pipe	13	21.863	1.9697	0.0009	3741
94.00	742 213 w/ Mount Pipe	13	18.553	1.8533	0.0009	3115
74.00	BCD-87010	13	11.390	1.4799	0.0007	2672
49.00	KS24019-L112A	13	4.990	0.9380	0.0004	2306

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L _u	Kl/r	F _a	A	Actual P	Allow. P _a	Ratio P
	ft		ft	ft		ksi	in ²	K	K	P _a
L1	140.12 - 88.3596 (1)	TP39.1x26x0.31	51.76	0.00	0.0	38.875	37.4846	-13.50	1457.21	0.009
L2	88.3596 - 39.4012 (2)	TP50.87x37.2422x0.42	53.85	0.00	0.0	39.000	66.0520	-25.70	2576.03	0.010
L3	39.4012 - 0 (3)	TP60x48.4206x0.5	45.76	0.00	0.0	39.000	95.7950	-42.87	3736.01	0.011

Pole Bending Design Data

Section No.	Elevation	Size	Actual M _x	Actual f _{bx}	Allow. F _{bx}	Ratio f _{bx}	Actual M _y	Actual f _{by}	Allow. F _{by}	Ratio f _{by}
	ft		kip-ft	ksi	ksi	F _{bx}	kip-ft	ksi	ksi	F _{by}
L1	140.12 - 88.3596 (1)	TP39.1x26x0.31	526.53	18.367	38.875	0.472	0.00	0.000	38.875	0.000
L2	88.3596 - 39.4012 (2)	TP50.87x37.2422x0.42	1634.85	24.892	39.000	0.638	0.00	0.000	39.000	0.000
L3	39.4012 - 0 (3)	TP60x48.4206x0.5	3007.78	25.915	39.000	0.664	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V	Actual f _v	Allow. F _v	Ratio f _v	Actual T	Actual f _{vt}	Allow. F _{vt}	Ratio f _{vt}
	ft		K	ksi	ksi	F _v	kip-ft	ksi	ksi	F _{vt}
L1	140.12 - 88.3596 (1)	TP39.1x26x0.31	19.83	0.529	26.000	0.041	0.24	0.004	26.000	0.000
L2	88.3596 - 39.4012 (2)	TP50.87x37.2422x0.42	26.86	0.407	26.000	0.032	0.02	0.000	26.000	0.000
L3	39.4012 - 0 (3)	TP60x48.4206x0.5	33.15	0.346	26.000	0.027	0.08	0.000	26.000	0.000

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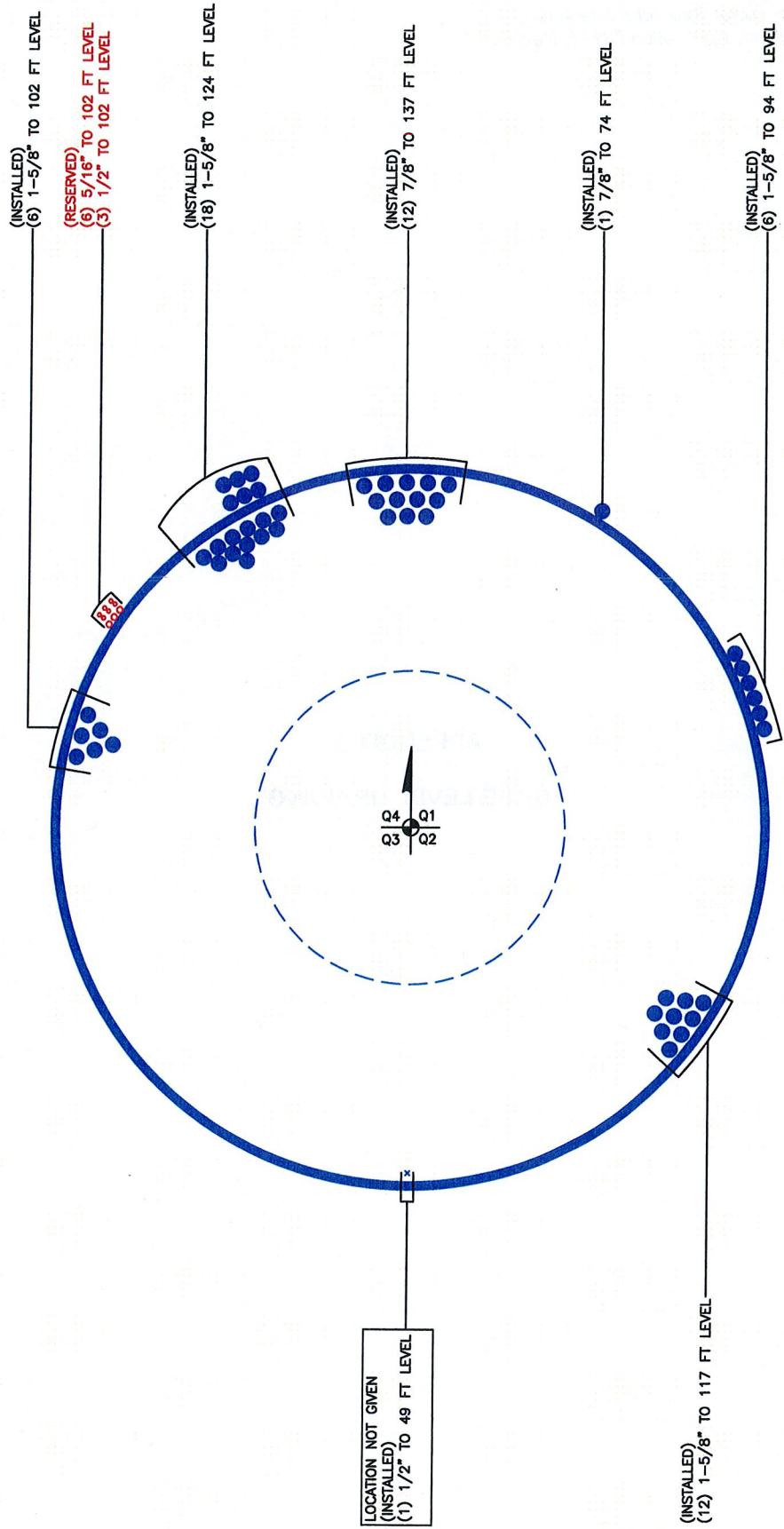
Pole Interaction Design Data

Section No.	Elevation <i>ft</i>	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_a	f_{bx}	f_{by}	f_v	f_{vt}			
L1	140.12 - 88.3596 (1)	0.009	0.472	0.000	0.041	0.000	0.482	1.333	H1-3+VT ✓
L2	88.3596 - 39.4012 (2)	0.010	0.638	0.000	0.032	0.000	0.648	1.333	H1-3+VT ✓
L3	39.4012 - 0 (3)	0.011	0.664	0.000	0.027	0.000	0.676	1.333	H1-3+VT ✓

Section Capacity Table

Section No.	Elevation <i>ft</i>	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail	
L1	140.12 - 88.3596	Pole	TP39.1x26x0.31	1	-13.50	1942.46	36.2	Pass	
L2	88.3596 - 39.4012	Pole	TP50.87x37.2422x0.42	2	-25.70	3433.85	48.6	Pass	
L3	39.4012 - 0	Pole	TP60x48.4206x0.5	3	-42.87	4980.10	50.7	Pass	
							Summary		
							Pole (L3)	50.7	Pass
							RATING =	50.7	Pass

APPENDIX B
BASE LEVEL DRAWING



BUSINESS UNIT: 808369 TOWER ID: C_BASELEVEL

APPENDIX C
ADDITIONAL CALCULATIONS

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

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

Site Data

BU#: 806369
 Site Name: HRT 094 943225
 App #: 93281 Rev. 1

Enter Load Factors Below:

For M (WL) 1.3 <---- Enter Factor
 For P (DL) 1.3 <---- Enter Factor

Pier Properties

Concrete:

Pier Diameter = 7.5 ft
 Concrete Area = 6361.7 in²

Reinforcement:

Clear Cover to Tie = 3.00 in
 Horiz. Tie Bar Size = 3
 Vert. Cage Diameter = 6.83 ft
 Vert. Cage Diameter = 81.98 in
Vertical Bar Size = 10
 Bar Diameter = 1.27 in
 Bar Area = 1.27 in²
 Number of Bars = 52
 As Total = 66.04 in²
 A s/ Aconc, Rho: 0.0104 1.04%

Maximum Shaft Superimposed Forces

TIA Revision:	F	
Max. Service Shaft M:	3286.158	ft-kips (* Note)
Max. Service Shaft P:	43	kips
Max Axial Force Type:	Comp.	

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

Load Factor Shaft Factored Loads

1.30	Mu:	4272.006	ft-kips
1.30	Pu:	55.9	kips

Material Properties

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

ACI 318 Code

Select Analysis ACI Code = 2002

Seismic Properties

Seismic Design Category = B
 Seismic Risk = Low

Solve
(Run)

<-- Press Upon Completing All Input

ACI 10.5, ACI 21.10.4, and IBC 1810.

Min As for Flexural, Tension Controlled, Shafts:

(3)*(Sqrt(f_c)/F_y): 0.0027
 200 / F_y: 0.0033
 IBC 1810.1.2: None SDC A or B
 Governing: 0.0033 0.33%

ACI 10.8 and 10.9

Min As for Columns, Comp. Controlled, Shafts:

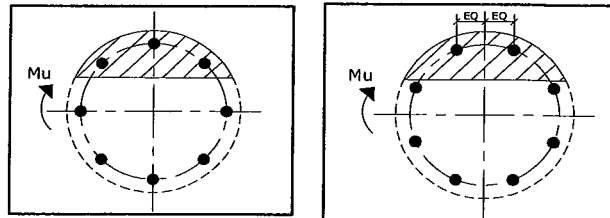
Min As: 0.0050 0.50%

Minimum Rho Check:

Actual Req'd Min. Rho: 0.33% Flexural
 Provided Rho: 1.04% OK

Results:

Governing Orientation Case: 1



Case 1

Case 2

Dist. From Edge to Neutral Axis: 18.71 in

Extreme Steel Strain, ε_t: 0.0108

ε_t > 0.0050, Tension Controlled

Reduction Factor, φ: 0.900

<-- Comment Box

Ref. Shaft Max Axial Capacities, φ Max(P_n or T_n):

Max P _n = (φ=0.65) P _n	
P _n per ACI 318 (10-2)	10408.53 kips
at Mu=(φ=0.65)M _n =	6794.66 ft-kips
Max T _n , (φ=0.9) T _n =	3566.16 kips
at Mu=φ=(0.90)M _n =	0.00 ft-kips

Output Note: Negative Pu=Tension

For Axial Compression, φ P_n = P_u: 55.90 kips
 Drilled Shaft Moment Capacity, φM_n: 10659.59 ft-kips
 Drilled Shaft Superimposed Mu: 4272.01 ft-kips

(Mu/φM_n, Drilled Shaft Flexure CSR: 40.08%

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

TIA Rev F

Site Data

BU#: 806369	
Site Name: HRT 094 943225	
App #: 93281 Rev. 1	
Pole Manufacturer:	Other

Reactions		
Moment:	3008	ft-kips
Axial:	43	kips
Shear:	33	kips

Anchor Rod Data

Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	63.5	in

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

Anchor Rod Results

Maximum Rod Tension: 111.5 Kips
 Allowable Tension: 195.0 Kips
 Anchor Rod Stress Ratio: 57.2% **Pass**

Rigid
Service ASD
Fty*ASIF

Plate Data

Diam:	74.64	in
Thick:	3	in
Grade:	60	ksi
Single-Rod B-eff:	9.25	in

Base Plate Results

Base Plate Stress: 10.0 ksi
 Allowable Plate Stress: 60.0 ksi
 Base Plate Stress Ratio: 16.6% **Pass**

Flexural Check

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length:
20.79

Stiffener Data (Welding at both sides)

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

n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a

Pole Data

Diam:	60	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF:	1.333
-------	-------

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

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

Monopole Drilled Pier

Checks capacity of a single drilled shaft foundation for a monopole

BU#: 806369

Site Name: HRT 094 943225

App Number: 93281 Rev. 1



ACI 318 Version: 2002

Design Reactions		
Shear, S:	33.00	kips
Moment, Mt:	3008.00	ft-kips
Tower Weight, Wt:	43.00	kips
Tower Height, H:	140	ft
Base Diameter, BD:	60.0	in

Foundation Dimensions		
Caisson Diameter, CD:	7.5	ft
Ext. Above Grade, E:	0.0	ft
Depth Below Grade, L:	47.0	ft
Neglected Depth, N:	5.0	ft
Rebar Size, Sp:	10	
Rebar Quantity, mp:	52	
Tie Size, tp:	3	

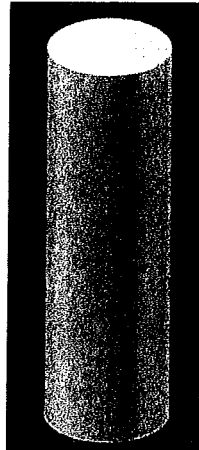
Material Properties		
Rebar Tensile, Fy:	60	ksi
Concrete Strength, F'c:	3000	psi
Concrete Density, δx:	150	pcf
Clear Cover, cc:	3	in

Soil Properties		
Soil Unit Weight, γ:	65	pcf
Allowable Bearing, Bc:	4,500	ksf
Seismic Design Cat, z:	B	

Caisson Analysis		
Depth to Zero Shear	8.3	ft
Max Factored Moment	4272.01	ft-kips
Overtuning FOS	8.23	

Depth	Shear	Moment
0 ft	33.1 kips	3010.4 ft-kips
4.7 ft	33.1 kips	3165.9 ft-kips
9.4 ft	-9.7 kips	3236.5 ft-kips

Design Checks			
	Capacity/Availability	Demand/Limits	Check
Minimum Req'd Dia. 1 (ft):	7.50	3.49	OK
Minimum Req'd Dia. 2 (ft):	7.50	7.00	OK
Bearing (ksf):	4.50	0.97	OK
Rebar Area (in ²):	66.04	21.21	OK
Pier moment capacity (k-ft):	10659.59	4272.01	OK
Rebar spacing (in):	3.80	2 < Bs < 18	OK
Development Length (in)	460.98	12.00	OK
Soil moment capacity(FOS):	8.23	2.00	OK



Bearing: 21.6%

Steel: 40.1%

Soil: 24.3%

 * CAISSON - Pier Foundations Analysis and Design - Copyright Power Line Systems, Inc. 1993-2010 *

Project Title: BU#806369
 Project Notes:

Calculation Method: Full 8CD

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

Pier Properties

Diameter (ft)	Distance of Top of Pier above Ground (ft)	Concrete Strength (ksi)	Steel Yield Strength (ksi)
7.50	0.00	3.00	60.00

Soil Properties

Layer	Type	Thickness (ft)	Depth at Top of Layer (ft)	Density (lbs/ft ³)	CU (psf)	KP	PHI (deg)
1	Clay	5.00	0.00	105.0			
2	Sand	5.00	5.00	100.0			
3	Sand	2.50	10.00	36.0		4.780	40.84
4	Sand	5.00	12.50	36.0		3.260	32.04
5	Sand	5.00	17.50	36.0		3.090	30.73
6	Sand	5.00	22.50	36.0		2.990	29.92
7	Sand	7.50	27.50	36.0		2.930	29.41
8	Clay	10.00	35.00	41.0	200.0	2.890	29.07
9	Sand	7.00	45.00	41.0		3.250	31.97

Design (Factored) Loads at Top of Pier

Moment (ft-k)	Axial Load (kips)	Shear Load (kips)	Additional Safety Factor Against Soil Failure
3008.0	43.0	33.00	8.23

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

Calculated Pier Properties

Length (ft)	Weight (kips)	End Bearing Pressure (psf)
47.000	311.459	973.3

Ultimate Resisting Forces Along Pier

Type	Distance of Top of Layer to Top of Pier (ft)	Thickness (ft)	Density (lbs/ft ³)	CU (psf)	KP	Force (kips)	Arm (ft)
Clay	0.00	5.00	105.0			0.00	2.50
Sand	5.00	5.00	100.0			416.76	7.77
Sand	10.00	2.50	36.0		4.780	196.21	11.27
Sand	12.50	5.00	36.0		3.260	418.89	15.06
Sand	17.50	5.00	36.0		3.090	465.88	20.05
Sand	22.50	3.13	36.0		2.990	315.47	24.08
Sand	25.63	1.87	36.0		2.930	-200.39	26.57
Sand	27.50	7.50	36.0		2.890	-872.96	31.34
Clay	35.00	10.00	41.0	200.0		-120.00	40.00
Sand	45.00	2.00	41.0		3.250	-347.49	46.01

Shear and Moments Along Pier

Moment Factor	Distance below Top of Pier (ft)	Shear (with Safety Factor) (kips)	Moment (with Safety Factor) (ft-k)	Shear (without Safety Factor) (kips)	Moment (without Safety Factor) (ft-k)
	0.00	272.4	24775.2	33.1	
3010.4	4.70	272.4	26055.4	33.1	
3165.9	9.40	-80.2	26636.2	-9.7	
3236.5	14.10	-467.8	25320.3	-56.8	
3076.6	18.80	-874.8	22180.2	-106.3	
2695.0	23.50	-1323.8	17030.8	-160.9	
2069.4	28.20	-1264.5	10374.6	-153.7	
1260.6	32.90	-725.2	5678.5	-88.1	
690.0	37.60	-436.3	3249.5	-53.0	
394.8	42.30	-379.9	1331.5	-46.2	
161.8	47.00	-323.5	-321.5	-39.3	
-39.1					

Reinforcement and Capacity

Total Reinforcement Percent	Reinforcement Area (in ²)	Usable Axial Capacity (kips)	Usable Moment Capacity (ft-k)
0.32	20.36	43.0	3493.7

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

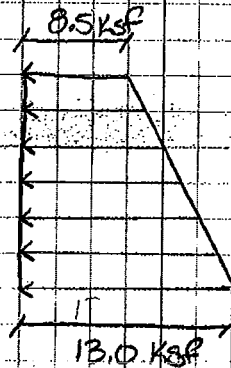
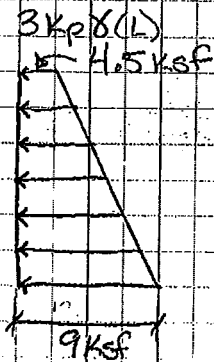
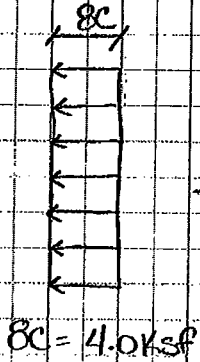
Quantity	Name	Area (in ²)	Diameter (in)	Spacing (in)
102	#4	0.20	0.500	2.46
66	#5	0.31	0.625	3.81
47	#6	0.44	0.750	5.35
34	#7	0.60	0.875	7.39
26	#8	0.79	1.000	9.67
21	#9	1.00	1.128	11.97
17	#10	1.27	1.270	14.78
14	#11	1.56	1.410	17.95
10	#14	2.25	1.693	25.13

Project

Cousson Soil Parameters

5 ft to 10 ft.

$C = 450 \text{ psf}$ $\phi = 30^\circ$ $\delta = 100 \text{ psf}$



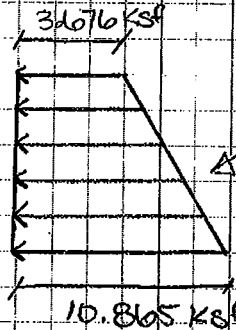
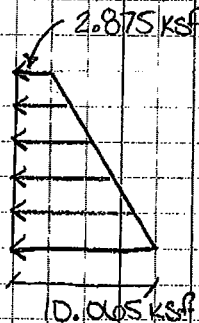
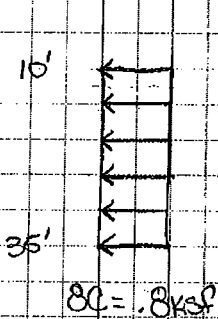
@ depth 7.5
 10.75 ksf

Parameters to use:

Depth	P (ksf)	Kp	ϕ	C (psf)
7.5'	10.75	4.78	40.8°	1344

10 ft to 35 ft

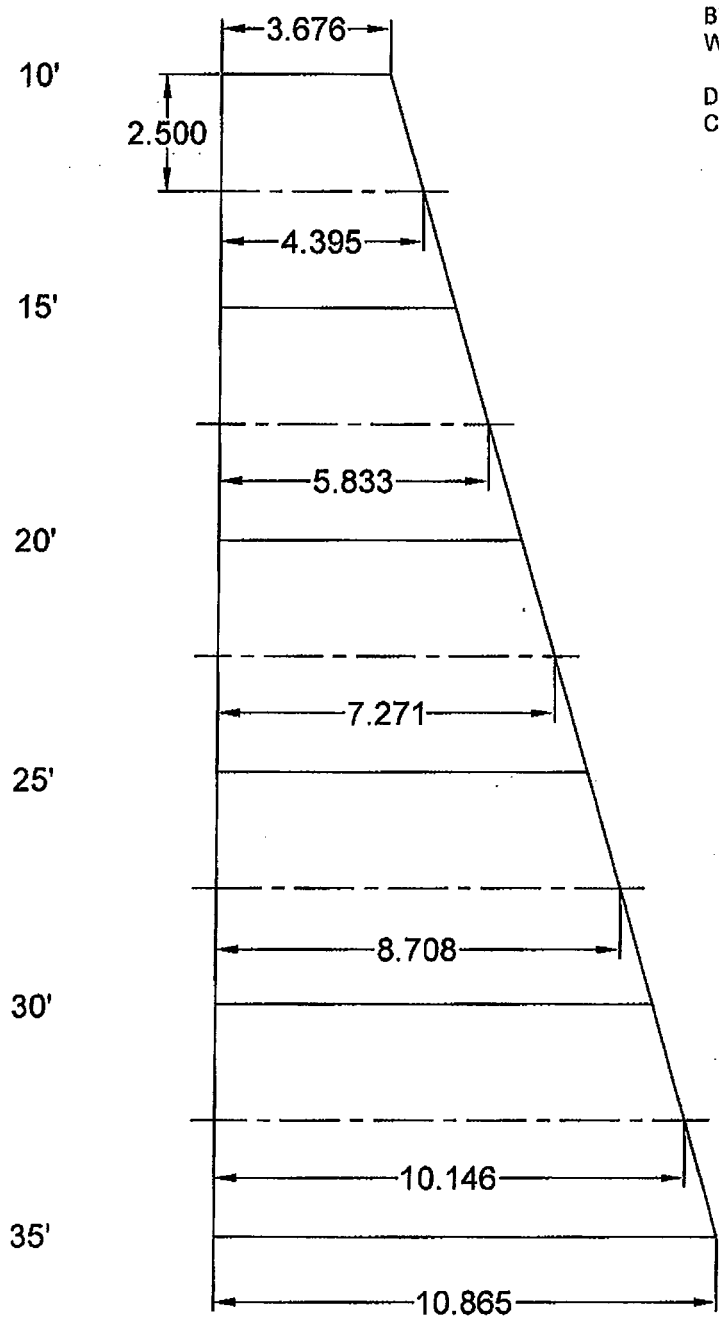
$C = 100 \text{ psf}$ $\phi = 27^\circ$ $\delta = 36 \text{ psf}$



(see attached drawing)

Parameters to use:

Depth	P (ksf)	Kp	ϕ	C (psf)
12.5	4.895	3.26	32.0°	549
17.5	5.833	3.09	30.7°	729
22.5	7.271	2.99	29.9°	909
27.5	8.708	2.93	29.4°	1089
32.5	10.146	2.89	29.1°	1268



BU 806369
 WO 323241

PAGE 2 OF 2

DONE BY: HNORTON
 CHECK BY: JCM

DATE: 3/12/10
 DATE: 03-15-10

SITE NAME	HARTFORD NW CT		ECP - CELL #	8	123
LATITUDE	41-47-01.36 N		LONGITUDE	72-42-13.64 W	
Additional Comments: Remove 1900 antenans and replace with 3 700 antennas and 3 1900 antennas. Diplex PCS with Cellular Cable.			SAVE BUTTON		
			STRUCTURE TYPE	MONOPOLE	
700 Mhz - LTE ANTENNA ADD	ALPHA		BETA		GAMMA
EQUIPMENT TYPE	eNodeB		eNodeB		eNodeB
ANTENNA TYPE	BXA-70063-6CF-4-750MHZ		BXA-70063-6CF-5-750MHZ		BXA-70063-6CF-5-750MHZ
QTY OF ANTENNAS PER FACE	1		1		1
ORIENTATION (DEG)	30		150		265
DOWN TILT (MECH/DEG)	3		3		3
RAD CTR (FT AGL)	137		137		137
TMA - QTY / MODEL					
DIPLEXER - QTY / MODEL					
MCPA BRICKS (QTY)					
850 Cellular - Current Config	ALPHA		BETA		GAMMA
EQUIPMENT TYPE	Modcell 4.0 HD		Modcell 4.0 HD		Modcell 4.0 HD
ANTENNA TYPE	7130.16		7130.16		7130.16
QTY OF ANTENNAS PER FACE	2		2		2
ORIENTATION (DEG)	30		150		270
DOWN TILT (MECH/DEG)	8		8		8
RAD CTR (FT AGL)	137		137		137
TMA - QTY / MODEL					
DIPLEXER - QTY / MODEL					
MCPA BRICKS (QTY)					
850 Cellular - Future Config	ALPHA		BETA		GAMMA
EQUIPMENT TYPE	Modcell 4.0 HD		Modcell 4.0 HD		Modcell 4.0 HD
ANTENNA TYPE	LPA-80063/4CF		LPA-80080/4CF		LPA-80080/4CF
QTY OF ANTENNAS PER FACE	2		2		2
ORIENTATION (DEG)	30		150		265
DOWN TILT (MECH/DEG)	8		8		8
RAD CTR (FT AGL)	137		137		137
TMA - QTY / MODEL					
DIPLEXER - QTY / MODEL	2	FD9R6004/2C-3L	2	FD9R6004/2C-3L	2
MCPA BRICKS (QTY)					
1900 Cellular - Current Config	ALPHA		BETA		GAMMA
EQUIPMENT TYPE	PCS Modcell 4.0		PCS Modcell 4.0		PCS Modcell 4.0
ANTENNA TYPE	948F85T2E-M_2		948F85T2E-M_2		948F85T2E-M_2
QTY OF ANTENNAS PER FACE	2		2		2
ORIENTATION (DEG)	30		150		270
DOWN TILT (MECH/DEG)	0		0		0
RAD CTR (FT AGL)	137		137		137
TMA - QTY / MODEL					
DIPLEXER - QTY / MODEL					
MCPA BRICKS (QTY)					
1900 Cellular - Future Config	ALPHA		BETA		GAMMA
EQUIPMENT TYPE	PCS Modcell 4.0		PCS Modcell 4.0		PCS Modcell 4.0
ANTENNA TYPE	BXA-185063/8CF		BXA-185090/8CF		BXA-185090/8CF
QTY OF ANTENNAS PER FACE	1		1		1
ORIENTATION (DEG)	30		150		265
DOWN TILT (MECH/DEG)	3		3		2
RAD CTR (FT AGL)	137		137		137
TMA - QTY / MODEL					

DIPLEXER - QTY / MODEL											
MCPA BRICKS (QTY)											
NUMBER OF CABLE'S NEEDED								ESTIMATED CABLE LENGTH			
MAINLINE SIZE		1 5/8"		TOTAL # OF MAINLINES		18		MAINLINE (FT)		170	
JUMPER SIZE		1/2 "		TOTAL # OF TOP JUMPERS		18		TOP JUMPER (FT)		10	
TX / RX FREQUENCIES								TX POWER OUTPUT			
Cellular A-Band				PCS F-Band		700 Mhz C - Bloc		Cellular (Watts)		20	
TX - 869-880,890-891.5 MHz				TX - 1970-1975		TX - 746-757		PCS (Watts)		16	
RX - 824-835,845-846.5 MHz				RX - 1890-1895		RX - 776-787		LTE (Watts)		40	
ALPHA				BETA				GAMMA			
Ant.	Freq.	Func.	Color Code	Ant.	Freq.	Func.	Color Code	Ant.	Freq.	Func.	Color Code
A1	800	Tx1/Rx0	RED	A7	800	Tx2/Rx0	BLUE	A13	800	Tx3/Rx0	GREEN
A2	1900	Tx1/Rx0	RED/ WHITE	A8	1900	Tx2/Rx0	BLUE/ WHITE	A14	1900	Tx3/Rx0	GREEN/ WHITE
A4	700	Tx1/Rx0	RED/ ORANGE	A10	700	Tx2/Rx0	BLUE/ ORANGE	A16	700	Tx3/Rx0	GREEN/ ORANGE
A5	700	Tx4/Rx1	RED/ RED/ ORANGE	A11	700	Tx5/Rx1	BLUE/ BLUE/ ORANGE	A17	700	Tx6/Rx1	GREEN/ GREEN/ ORANGE
A3	1900	Tx4/Rx1	RED/ RED/ WHITE	A9	1900	Tx5/Rx1	BLUE/ BLUE/ WHITE	A15	1900	Tx6/Rx1	GREEN/ GREEN/ WHITE
A6	800	Tx4/Rx1	RED/ RED	A12	800	Tx5/Rx1	BLUE/ BLUE	A18	800	Tx6/Rx1	GREEN/ GREEN
RF ENGINEER				RF MANAGER				INITIALS		DATE	
Prepared By : Alex Restrepo				Steve Weatherbee				AR		11/13/2009	

Site Configuration

