ROBINSON & COLE LLP

KENNETH C. BALDWIN

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

Also admitted in Massachusetts

ORIGINAL

February 14, 2013

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

Re: **Notice of Completion of Construction**
EM-VER-165-121115–1000 Old County Road, Windsor Locks, Connecticut
EM-VER-108-121023B–130 Vernon Road, Bolton, Connecticut
EM-VER-057-120621–1323 King Street, Greenwich, Connecticut
EM-VER-033-120620–201 Main Street, Cromwell, Connecticut
EM-VER-066-121004–159 Weingart Road, Harwinton, Connecticut
EM-VER-078-121101–497 Middle Turnpike, Mansfield, Connecticut
EM-VER-155-121011-139 North Main Street, West Hartford, Connecticut

Dear Ms. Roberts:

The purpose of this letter is to notify you that construction activity associated with each the above-referenced exempt modification filings has been completed and all sites have been activated.

If you have any questions or need any additional information regarding any of these facilities, please do not hesitate to contact me.

Sincerely,

Kenneth C. Baldwin

Copy to:
Sandy M. Carter

12085869-v1

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

November 16, 2012

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

RE: **EM-VER-078-121101** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 497 Middle Turnpike, Mansfield, 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 October 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 Elizabeth Patterson, Mayor, Town of Mansfield
Matthew W. Hart, Town Manager, Town of Mansfield
Linda M. Painter, Director of Planning and Development, Town of Mansfield
Christopher B. Fisher, Esq., AT&T

ROBINSON & CO

EM-VER-078-121101

KENNETH C. BALDWIN

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Also admitted in Massachusetts

October 31, 2012

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

Re: **Notice of Exempt Modification – Antenna Swap**
497 Middle Turnpike, Mansfield, Connecticut

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 109-foot level on an existing 120-foot tower at the above-referenced address. Cellco's use of the tower was approved by the Council in 2007. Cellco now intends to replace six (6) of its existing antennas with three (3) model BXA-171085-12BF PCS antennas; two (2) model BXA-70063-6CF LTE antennas; and one (1) model APX75-866514-CT0 LTE antenna; all at the same 109-foot level. Cellco also intends to attach six (6) additional coax cables to the outside of the monopole tower. 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. Hart, Town Manager of the Town of Mansfield. A copy of this letter is also being sent to Estate of Bernard R. Brodin, the owner of the property on which the tower is located.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas will be located at the 109-foot level on the existing 120-foot tower.

2. The proposed modifications do 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, or to levels that exceed state or local criteria.

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 table for Cellco's modified facility is included behind is included behind Tab 2.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The proposed modification will not impair the structural integrity of the existing tower. Attached is a Structural Analysis confirming that the tower and foundation can support Cellco's proposed modifications. (See Tab 3).

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Matthew W. Hart, Mansfield Town Manger
Estate of Bernard R. Brodin
Sandy M. Carter

BXA-171085-12BF-EDIN-X

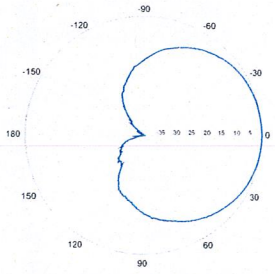
Replace "X" with desired electrical downtilt

X-Pol | FET Panel | 85° | 18.0 dBi

Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	88°	85°	80°
Vertical beamwidth	4.5°	4.5°	4.5°
Gain	15.1 dBd / 17.2 dBi	15.5 dBd / 17.6 dBi	15.9 dBd / 18.0 dBi
Electrical downtilt (X)	0, 2, 4		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back ratio	> 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	1820 x 154 x 105 mm	71.7 x 6.1 x 4.1 in	
Depth with z-brackets	133 mm	5.2 in	
Weight without mounting brackets	6.8 kg	15 lbs	
Survival wind speed	> 201 km/hr	> 125 mph	
Wind area	Front: 0.28 m^2 Side: 0.19 m^2	Front: 3.1 ft^2 Side: 2.1 ft^2	
Wind load @ 161 km/hr (100 mph)	Front: 460 N Side: 304 N	Front: 103 lbf Side: 68 lbf	

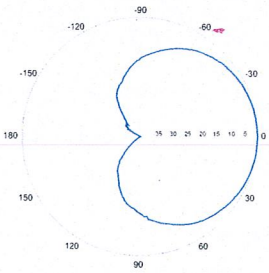
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171085-12BF-EDIN-X-FP		

BXA-171085-12BF-EDIN-X



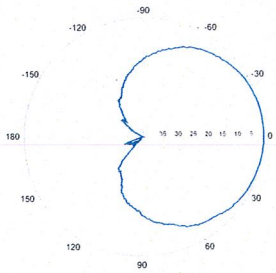
Horizontal | 1710-1880 MHz

BXA-171085-12BF-EDIN-X



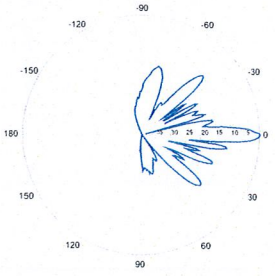
Horizontal | 1850-1990 MHz

BXA-171085-12BF-EDIN-X



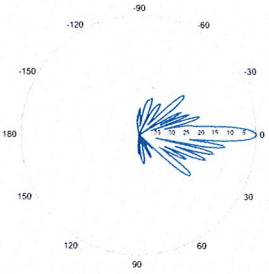
Horizontal | 1920-2170 MHz

BXA-171085-12BF-EDIN-0



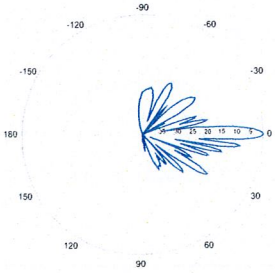
0° | Vertical | 1710-1880 MHz

BXA-171085-12BF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171085-12BF-EDIN-0

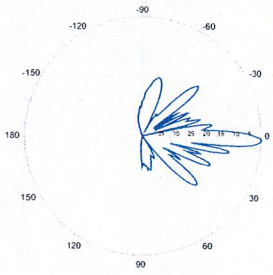


0° | Vertical | 1920-2170 MHz

BXA-171085-12BF-EDIN-X

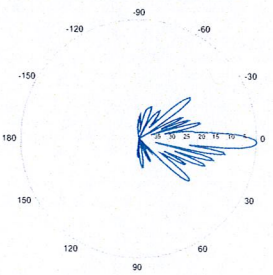
X-Pol | FET Panel | 85° | 18.0 dBi

BXA-171085-12BF-EDIN-2



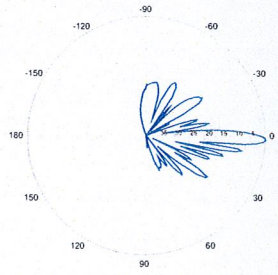
2° | Vertical | 1710-1880 MHz

BXA-171085-12BF-EDIN-2



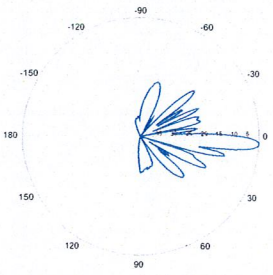
2° | Vertical | 1850-1990 MHz

BXA-171085-12BF-EDIN-2



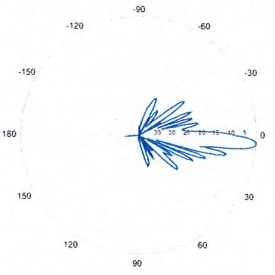
2° | Vertical | 1920-2170 MHz

BXA-171085-12BF-EDIN-4



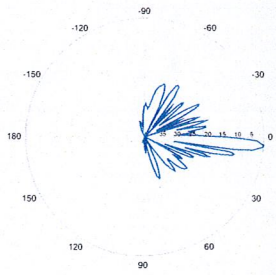
4° | Vertical | 1710-1880 MHz

BXA-171085-12BF-EDIN-4



4° | Vertical | 1850-1990 MHz

BXA-171085-12BF-EDIN-4



4° | Vertical | 1920-2170 MHz

BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

Replace "X" with desired electrical downtilt.

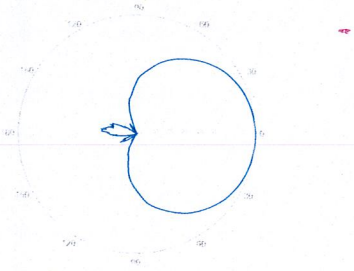
Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	696-900 MHz	
Frequency bands	696-806 MHz	806-900 MHz
Polarization	±45°	
Horizontal beamwidth	65°	63°
Vertical beamwidth	13°	11°
Gain	14.0 dBd (16.1 dBi)	14.5 dBd (16.6 dBi)
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10	
Impedance	50Ω	
VSWR	≤1.35:1	
Upper sidelobe suppression (0°)	-18.3 dB	-18.2 dB
Front-to-back ratio (+/-30°)	-33.4 dB	-36.3 dB
Null fill	5% (-26.02 dB)	
Isolation between ports	< -25 dB	
Input power with EDIN connectors	500 W	
Input power with NE connectors	300 W	
Lightning protection	Direct Ground	
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)	

Mechanical Characteristics		
Dimensions Length x Width x Depth	1804 x 285 x 132 mm	71.0 x 11.2 x 5.2 in
Depth with z-brackets	172 mm	6.8 in
Weight without mounting brackets	7.9 kg	17 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.51 m^2 Side: 0.24 m^2	Front: 5.5 ft^2 Side: 2.6 ft^2
Wind load @ 161 km/hr (100 mph)	Front: 759 N Side: 391 N	Front: 169 lbf Side: 89 lbf

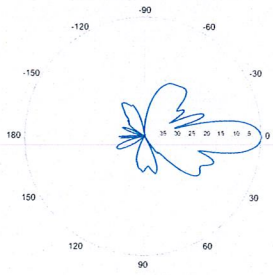
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs
Concealment Configurations	For concealment configurations, order BXA-70063-6CF-EDIN-X-FP		

BXA-70063-6CF-EDIN-X



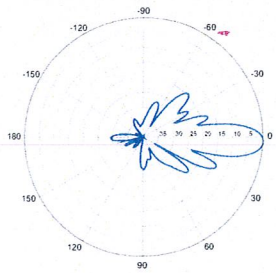
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

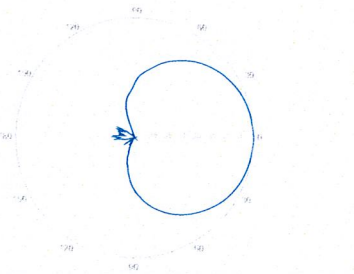


0° | Vertical | 750 MHz

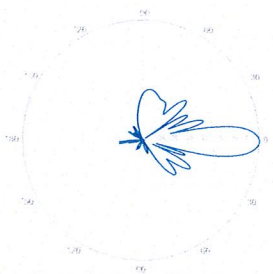
BXA-70063-6CF-EDIN-2



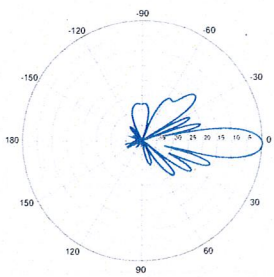
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



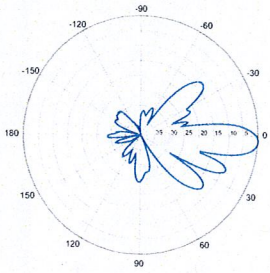
2° | Vertical | 850 MHz

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

BXA-70063-6CF-EDIN-X

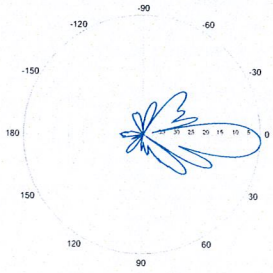
X-Pol | FET Panel | 63° | 14.5 dBd

BXA-70063-6CF-EDIN-3



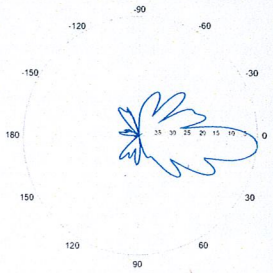
3° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-4

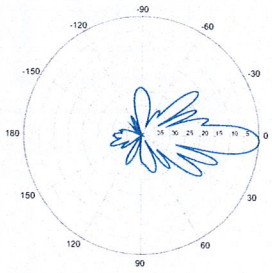


4° | Vertical | 750 MHz

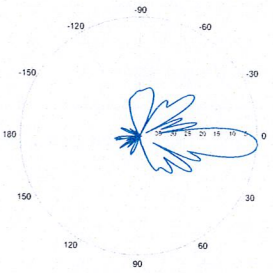
BXA-70063-6CF-EDIN-5



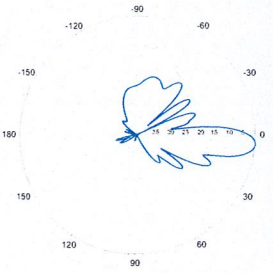
5° | Vertical | 750 MHz



3° | Vertical | 850 MHz

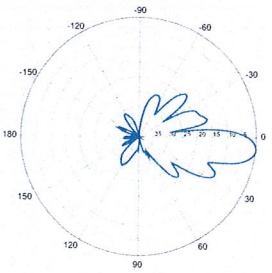


4° | Vertical | 850 MHz



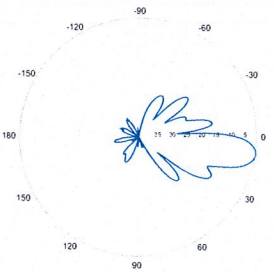
5° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-6



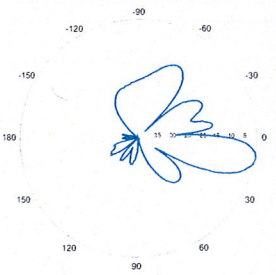
6° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-8

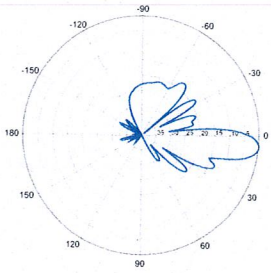


8° | Vertical | 750 MHz

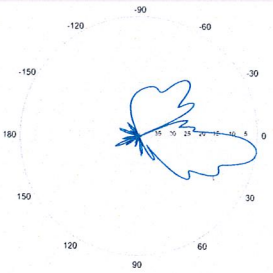
BXA-70063-6CF-EDIN-10



10° | Vertical | 750 MHz



6° | Vertical | 850 MHz



8° | Vertical | 850 MHz

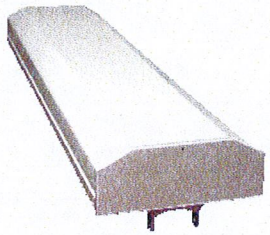
10° | Vertical | 850 MHz

Product Data Sheet APX75-866514-CT0

Optimizer® Dual Polarized Antenna, 698-896, 65deg, 16.1dBi, 2m, FET, 0deg

Product Description

Wideband antenna for dense networks where site aspect is essential.



Features/Benefits

- **Wideband performance 698-896 MHz**
- **High sidelobe suppression**
- **Null fill**
- **Dual polarization**
- **High front-to-back ratio**

Technical Specifications

Electrical Specifications

Frequency Range, MHz	698-896
Horizontal Beamwidth, deg	66 +/-5
Vertical Beamwidth, deg	9-12
Electrical Downtilt Range, deg	0
Gain, dBi (dBd)	16.1 (14)
1st Upper Sidelobe Suppression, dB	>18
Upper Sidelobe Suppression, dB	>18
Front-To-Back Ratio, dB	>30
Polarization	Slant +/-45 degrees
VSWR	1.40:1
Isolation between Ports, dB	>30
3rd Order IMP @ 2 x 43 dBm, dBc	>150
Impedance, Ohms	50
Maximum Power Input, W	500
Lightning Protection	Chassis Ground
Connector Type/Location	(2) 7-16 Long Neck DIN Female/Bottom

Mechanical Specifications

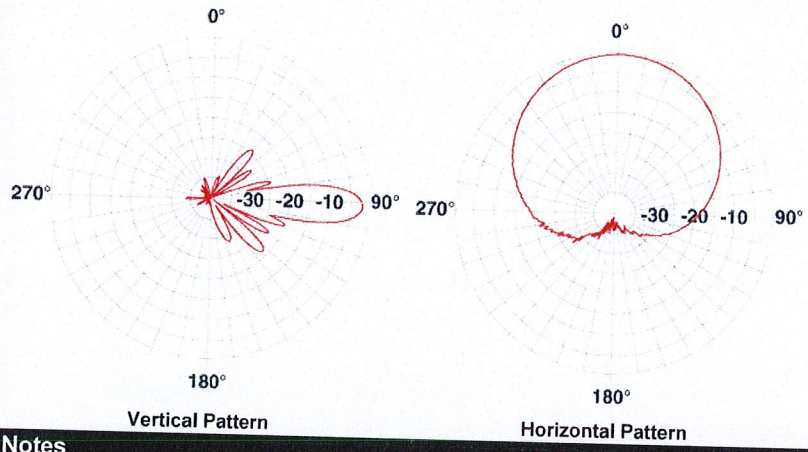
Dimensions - HxWxD, mm (in)	2082.8 x 311.2 x 120.7 (82 x 12.25 x 4.75)
Weight w/o Mtg Hardware, kg (lb)	14.0 (30.8)
Survival/Rated Wind Speed, km/h (mph)	200 (125) / 160 (100)
Operation temperature, °C (°F)	-40 to +60 (-40 to +140)
Radome Material/Color	ASA Plastic/Light Grey RAL7035
Mounting Hardware Material	Diecasted Aluminum
Radiating Element Material	Brass
Reflector Material	Aluminum

Ordering Information

Mounting Hardware	APM40-3
Mounting Pipe Diameter, mm (in)	60-120 (2.36-4.72)
Mounting Hardware Weight, kg (lb)	5.4 (11.9)

Product Data Sheet APX75-866514-CT0

Optimizer® Dual Polarized Antenna, 698-896, 65deg, 16.1dBi, 2m, FET, 0deg



Vertical Pattern

Horizontal Pattern

Notes

For additional mounting information please click "External Document Link" below.

External Document Links

APM40 Series Datasheet
APM40 Series Installation Instructions

	General	Power	Density					
Site Name: Mansfield								
Tower Height: Verizon @ 109Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T UMTS	2	565	123	0.0269	880	0.5867	4.58%	
*AT&T UMTS	2	875	123	0.0416	1900	1.0000	4.16%	
*AT&T GSM	1	283	123	0.0067	880	0.5867	1.15%	
*AT&T GSM	4	525	123	0.0499	1900	1.0000	4.99%	
*AT&T LTE	1	1375	123	0.0327	734	0.4893	6.68%	
Verizon PCS	**7**	**379**	**109**	**0.0803**	**1970**	**1.0000**	**8.03%**	
Verizon Cellular	**9**	**353**	**109**	**0.0961**	**869**	**0.5793**	**16.60%**	
Verizon AWS	**1**	**1432**	**109**	**0.0433**	**2145**	**1.0000**	**4.33%**	
Verizon 700	**1**	**821**	**109**	**0.0248**	**698**	**0.4653**	**5.34%**	
								55.85%
* Source: Siting Council								

AT&T Towers
5405 Windward Parkway
Alpharetta, GA 30004
770-708-6100

Ping Jiang
Black & Veatch Corp.
10950 Grandview Drive
Overland Park, KS 66210
(913) 458-7245
JiangP@bv.com

Monday, October 15, 2012

STRUCTURAL ANALYSIS
120' Monopole

AT&T DESIGNATION:	Site ID:	27067
	Site FA:	10071108
	Site Name:	Mansfield Four Corners
	Project Number:	176850 (27067VERCT-S (Rev 2))
ANALYSIS CRITERIA:	Codes:	TIA/EIA-222-F 2005 CT Building Code
SITE DATA:		497 Middle Turnpike, Storrs Mansfield, CT 06268, Tolland County Latitude 41.822692, Longitude -72.286299 Market: MA/RI/VT/NH/ME/CT 120' Monopole

Mrs. Charlotte Malone

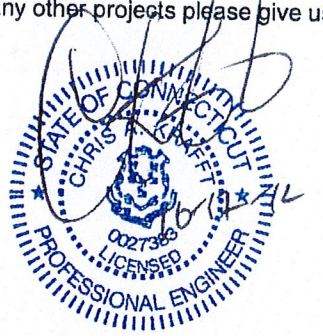
Black & Veatch Corp. is pleased to submit this Structural Analysis Report to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the existing and proposed loading configuration detailed in the analysis report.

Analysis Results

Tower Stress Level with Proposed Equipment:	84.40%	Pass
Base Plate Stress Level with Proposed Equipment:	44.60%	Pass
Foundation Ratio with Proposed Equipment:	93.40%	Pass

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

Respectfully Submitted by:	Black & Veatch Corp.
Analysis Prepared by:	Josh Riley
Analysis Reviewed by:	Chris A. Krafft, P.E.



This analysis was prepared by me or under my direct supervision and to the best of my knowledge and ability complies with the applicable provisions of the governing codes and ordinances.

Black & Veatch Corp.
10950 Grandview Drive
Overland Park, KS 66210
B&V: 176850 (27067VERCT-S (Rev 2))

Documents

Document	Description	Source
Structural Analysis by Black & Veatch Corp., dated 09/17/2012	Previous Structural Analysis	Black & Veatch Corp.
Tower and Foundation Drawings by PennSummit Tubular, LLC., dated 11/25/2003	Tower Geometry and Foundation Data	AT&T Siterra
Geotechnical Report by VN Engineering, Inc., dated 9/26/2003	Geotechnical Data	AT&T Siterra
Site Photos from 2009	Site Condition Data	AT&T Siterra
Carrier Co-Location Documents (Applications, Leases, Initial Co-Location Analyses, Modification Request for Information Form, etc.)	Tower Loading Data	AT&T Siterra

Black & Veatch Corp.
10950 Grandview Drive
Overland Park, KS 66210
B&V: 176850 (27067VERCT-S (Rev 2))

Assumptions, Disclaimers, and Notes

1. This analysis was performed under the assumption that all information provided to Black & Veatch is current and correct. This is to include site data, existing/proposed appurtenance loading, tower/foundation details, and geotechnical data. If this information is not current and correct, this report should be considered obsolete and further analysis will be required.
2. This analysis assumes that the tower structural components and mounts, including all steel sections and attachment hardware, are in good working order and in their original state, free of rust or other forms of corrosion. Furthermore, it is assumed that the tower and the tower foundation have been properly maintained and monitored since the time of construction. This report should be considered obsolete and further analysis will be required if the tower and/or foundation does not meet all of the above specifications.
3. This analysis assumes that all existing and/or proposed equipment mounts on the tower will have adequate capacity to support the existing and proposed equipment loading.
4. Capacity of the structural members is based on theoretical values as shown in the attached TAS form.
5. Reported foundation ratio is based on calculated reactions compared to the original design reactions for the foundation.
6. This analysis assumes that all existing and proposed port cuts are properly installed such that the overall structural capacity of the monopole is not reduced.
7. It should be noted that what is called out as the base plate stress ratio in this analysis is representative of not only the base plate, but also the anchor bolts and base plate stiffeners. The ratio reported is the controlling ratio when comparing these tower base components.
8. This analysis was revised due to changes in the proposed loading outlined in the attached TAS form as requested by the client.

Tower Analysis Summary Form

General Info

Site Name	Mansfield Four Corners
Site Number	27067VERCT-S (Rev 2)
FA Number	10071108
Date of Analysis	10/15/2012
Company Performing Analysis	Black & Veatch Corp.

The information contained in this summary report is not to be used independently from the PE stamped tower analysis.

Tower Info	Description	Date
Tower Type (G, SST, MP)	MP	N/A
Tower Height (top of steel AGL)	120 ft	N/A
Tower Manufacturer	PennSummit Tubular, LLC.	N/A
Tower Model	N/A	N/A
Tower Design	N/A	N/A
Foundation Design	Paul J. Ford and Company	10/1/2003
Geotech Report	VN Engineering, Inc.	9/26/2003
Tower Mapping	N/A	N/A
Previous Structural Analysis	Black & Veatch Corp.	9/17/2012
Foundation Mapping	N/A	N/A

Steel Yield Strength (ksi)

Pole	A607-65
Base Plate	A572-55
Anchor Rods	A615-75

Design Parameters

Design Code Used	TIA/EIA-222-F 2005 CT Building Code
Location of Tower (County, State)	Tolland County, CT
Basic Wind Speed (mph)	85
Ice Thickness (in)	0.5
Structure Classification (I, II, III)	
Exposure Category (B, C, D)	
Topographic Category (1 to 5)	

Analysis Results (% Maximum Usage)

Existing/Reserved + Future + Proposed Condition	
Tower (%)	84.40%
Base Plate (%)	44.60%
Foundation (%)	93.40%
Foundation Adequate?	Yes

Analysis Results (% Maximum Usage)

Existing/Reserved	REV G	REV F
Tower (%)		
Base Plate (%)		
Foundation (%)		
Foundation Adequate?		

Analysis Results (% Maximum Usage)

Existing/Reserved + Proposed Condition	
Tower (%)	
Base Plate (%)	
Foundation (%)	
Foundation Adequate?	

Existing/Reserved Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face
AT&T	120	123	6	Panel	Powerwave	7770	90, 210, 330	1		Low Profile Platform	12		1 1/4"	Inside
AT&T	120	123	2	Panel	KMW	AM-X-CD-16-65-00T	0, 120							
AT&T	120	123	1	Panel	Andrew	SBNH-1D6565C	240				1	Conduit	3"	Inside
AT&T	120	123	6	TMA	Powerwave	LGP 21401					2	DC cable	7/8"	Inside
AT&T	120	123	6	Diplexers	Powerwave	LGP 21903					1	Fiber cable	1/2"	Inside
AT&T	120	123	6	RRH	Ericsson	RRUS 11								
AT&T	120	123	1	S A	RayCap	DC6-48-60-18-8F								
Verizon	109	109	6	Panel	Antel	LPA-80080-6CF	30, 150, 270	1		Low Profile Platform	12		1 5/8"	Inside
Verizon	109	109	6*	Panel	Antel	LPA-185080-12CF	30, 150, 270							
Verizon	109	109	6	TMA	Andrew	PCS1900 Dual Duplex								

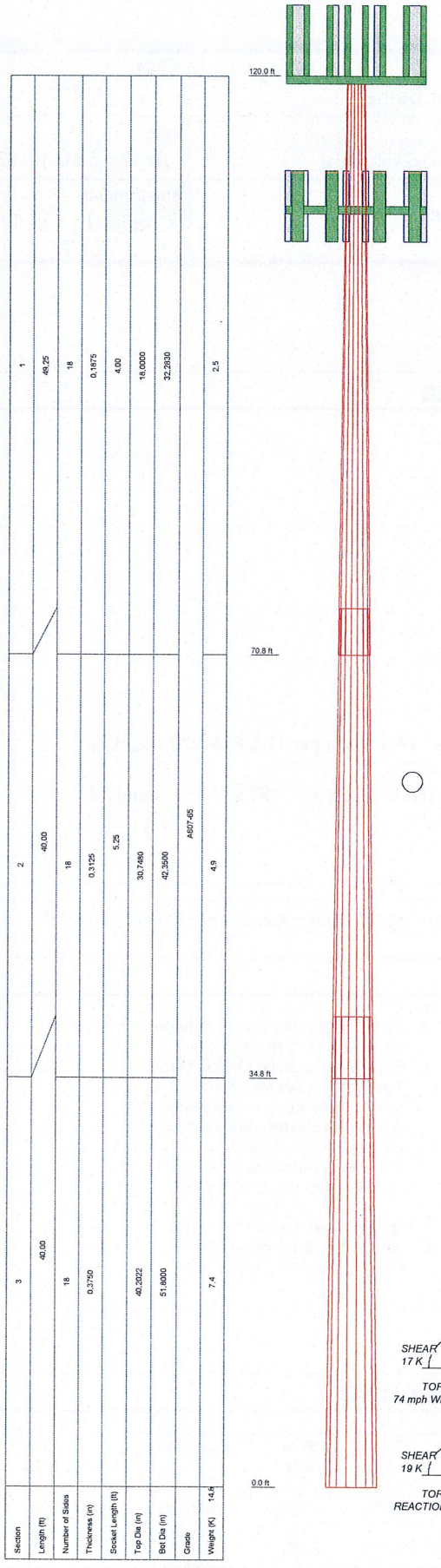
*** To Be Removed**

Proposed Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face
Verizon	109	109	1	Panel	RFS	APX75-866514T0	30				6		1 5/8"	Outside
Verizon	109	109	2	Panel	Antel	BXA-70063-6CF	150, 270							
Verizon	109	109	3	Panel	Antel	BXA-171085-12BF	30, 150, 270							

Future Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face
AT&T	120	123	3	Panel	Powerwave	7770.00	90, 210, 330				6		1 5/8"	Outside



Section	1	2	3	
Length (ft)	49.25	40.00	40.00	
Number of Sides	18	18	18	
Thickness (in)	0.1675	0.3125	0.3750	
Socket Length (ft)	4.00	5.25		
Top Dia (in)	18.0000	30.7480	40.2022	
Bot Dia (in)	32.2830	42.3500	51.8000	
Grade	A607-65			
Weight (K)	2.5	4.9	7.4	14.8

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
PIROD 13' Low Profile Platform (Monopole) (ATI-Existing)	120	(2) LPA-80080-6CF w/Mount Pipe (Verizon-Existing)	109
(2) Powerwave 7770 w/ Mount Pipe (ATI-Existing)	120	(2) LPA-80080-6CF w/Mount Pipe (Verizon-Existing)	109
(2) Powerwave 7770 w/ Mount Pipe (ATI-Existing)	120	(2) LPA-80080-6CF w/Mount Pipe (Verizon-Existing)	109
(2) Powerwave 7770 w/ Mount Pipe (ATI-Existing)	120	APX75-866514T0 w/Mount Pipe (Verizon-Proposed)	109
AM-X-CD-16-65-00T w/Mount Pipe (ATI-Existing)	120	BXA-70063-6CF w/ Mount Pipe (Verizon-Proposed)	109
AM-X-CD-16-65-00T w/Mount Pipe (ATI-Existing)	120		
SBNH-1D6565C w/ Mount Pipe (ATI-Existing)	120	BXA-70063-6CF w/ Mount Pipe (Verizon-Proposed)	109
Powerwave 7770 w/ Mount Pipe (ATI-Future)	120		
Powerwave 7770 w/ Mount Pipe (ATI-Future)	120	BXA-171085-12BF w/ Mount Pipe (Verizon-Proposed)	109
Powerwave 7770 w/ Mount Pipe (ATI-Future)	120		
(2) LGP 21401 (ATI-Existing)	120	BXA-171085-12BF w/ Mount Pipe (Verizon-Proposed)	109
(2) LGP 21401 (ATI-Existing)	120		
(2) LGP 21401 (ATI-Existing)	120	BXA-171085-12BF w/ Mount Pipe (Verizon-Proposed)	109
(2) LGP21903 (ATI-Existing)	120	(2) PCS1900 Dual Duplex (TMA) (Verizon-Existing)	109
(2) LGP21903 (ATI-Existing)	120		
(2) LGP21903 (ATI-Existing)	120	(2) PCS1900 Dual Duplex (TMA) (Verizon-Existing)	109
(2) Ericsson RRUS 11 (ATI-Existing)	120		
(2) Ericsson RRUS 11 (ATI-Existing)	120	(2) PCS1900 Dual Duplex (TMA) (Verizon-Existing)	109
(2) Ericsson RRUS 11 (ATI-Existing)	120		
Demarcation Box (DC6-48-60-18-8F) (ATI-Existing)	120		
PIROD 13' Low Profile Platform (Monopole) (Verizon-Existing)	109		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. Weld together tower sections have flange connections.
6. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
7. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
8. Welds are fabricated with ER-70S-6 electrodes.
9. TOWER RATING: 84.4%

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corp.
10950 Grandview Drive
Overland Park, KS 66210
Phone: (913) 458-2000
FAX: (913) 458-8136

Job: 27067 Mansfield Four Corners			
Project: 176850 (27067VERCT-S (Rev 2))			
Client: AT&T Towers	Drawn by: Charles E. Carrillo, E.I.T	App'd:	
Code: TIA/EIA-222-F	Date: 10/15/12	Scale: NTS	
Path:		Dwg No. E-1	

tnxTower	Job	Page
	27067 Mansfield Four Corners	1 of 9
Black & Veatch Corp. 10950 Grandview Drive Overland Park, KS 66210 Phone: (913) 458-2000 FAX: (913) 458-8136	**Project** 176850 (27067VERCT-S (Rev 2))	**Date** 15:17:35 10/15/12
	Client AT&T Towers	**Designed by** Charles E. Carrillo, E.I.T.

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 Tolland County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Treat Feedline Bundles As Cylinder
	Consider Moments - Horizontals		Assume Legs Pinned		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Diagonals		Assume Rigid Index Plate		Calculate Redundant Bracing Forces
	Use Moment Magnification	√	Use Clear Spans For Wind Area		Ignore Redundant Members in FEA
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r		SR Leg Bolts Resist Compression
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		All Leg Panels Have Same Allowable
	Escalate Ice		Bypass Mast Stability Checks		Offset Girt At Foundation
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Consider Feedline Torque
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Include Angle Block Shear Check
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Poles
	Leg Bolts Are At Top Of Section		SR Members Have Cut Ends		Include Shear-Torsion Interaction
	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component		Always Use Sub-Critical Flow
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Use Top Mounted Sockets
	Add IBC .6D+W Combination				

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	120.00-70.75	49.25	4.00	18	18.0000	32.2830	0.1875	0.7500	A607-65 (65 ksi)
L2	70.75-34.75	40.00	5.25	18	30.7480	42.3500	0.3125	1.2500	A607-65 (65 ksi)
L3	34.75-0.00	40.00		18	40.2022	51.8000	0.3750	1.5000	A607-65

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	
									(65 ksi)

Tapered Pole Properties

Section	Tip Dia.	Area	I	r	C	I/C	J	It/Q	w	w/t
	in	in^2	in^4	in	in	in^3	in^4	in^2	in	
L1	18.2777	10.6007	424.9328	6.3234	9.1440	46.4712	850.4248	5.3013	2.8380	15.136
	32.7810	19.1008	2485.8681	11.3939	16.3998	151.5795	4975.0072	9.5522	5.3518	28.543
L2	32.4004	30.1882	3532.9213	10.8046	15.6200	226.1799	7070.4913	15.0970	4.8616	15.557
	43.0033	41.6959	9309.0430	14.9233	21.5138	432.7010	18630.3350	20.8519	6.9036	22.092
L3	42.3681	47.4044	9499.8339	14.1387	20.4227	465.1598	19012.1679	23.7067	6.4156	17.108
	52.5991	61.2086	20450.2462	18.2559	26.3144	777.1504	40927.4014	30.6101	8.4568	22.551

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft^2	in					in	in
L1 120.00-70.75				1	1	1		
L2 70.75-34.75				1	1	1		
L3 34.75-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		C_AA_A	Weight
				ft			ft^2/ft	plf
Safety Line 3/8 (Existing)	C	No	CaAa (Out Of Face)	120.00 - 6.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
1/2" Fiber cable (AT&T-Existing)	A	No	Inside Pole	120.00 - 7.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
7/8" DC cable (AT&T-Existing)	A	No	Inside Pole	120.00 - 7.00	2	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
LDF6-50A (1-1/4 FOAM) (AT&T-Existing)	A	No	Inside Pole	120.00 - 7.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
3" lightweight flexible tubing (AT&T-Existing)	A	No	Inside Pole	120.00 - 7.00	1	No Ice	0.00	0.20
						1/2" Ice	0.00	0.20
LDF7-50A (1-5/8 FOAM) (AT&T-Future)	C	No	CaAa (Out Of Face)	120.00 - 7.00	1	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
LDF7-50A (1-5/8 FOAM) (AT&T-Future)	C	No	CaAa (Out Of Face)	120.00 - 7.00	5	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
LDF7-50A (1-5/8 FOAM) (Verizon-Existing)	B	No	Inside Pole	109.00 - 7.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM) (Verizon-Proposed)	B	No	CaAa (Out Of Face)	109.00 - 7.00	1	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A (1-5/8 FOAM) (Verizon-Proposed)	B	No	CaAa (Out Of Face)	109.00 - 7.00	5	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	120.00-70.75	A	0.000	0.000	0.000	0.000	0.44
		B	0.000	0.000	0.000	7.574	0.56
		C	0.000	0.000	0.000	11.598	0.25
L2	70.75-34.75	A	0.000	0.000	0.000	0.000	0.32
		B	0.000	0.000	0.000	7.128	0.53
		C	0.000	0.000	0.000	8.478	0.19
L3	34.75-0.00	A	0.000	0.000	0.000	0.000	0.25
		B	0.000	0.000	0.000	5.495	0.41
		C	0.000	0.000	0.000	6.573	0.14

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_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	120.00-70.75	A	0.500	0.000	0.000	0.000	0.000	0.44
		B		0.000	0.000	0.000	11.398	0.91
		C		0.000	0.000	0.000	21.448	0.73
L2	70.75-34.75	A	0.500	0.000	0.000	0.000	0.000	0.32
		B		0.000	0.000	0.000	10.728	0.86
		C		0.000	0.000	0.000	15.678	0.53
L3	34.75-0.00	A	0.500	0.000	0.000	0.000	0.000	0.25
		B		0.000	0.000	0.000	8.269	0.66
		C		0.000	0.000	0.000	12.222	0.41

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	120.00-70.75	-0.0788	0.2524	-0.1811	0.3764
L2	70.75-34.75	-0.0427	0.2852	-0.1413	0.4352
L3	34.75-0.00	-0.0363	0.2340	-0.1237	0.3692

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
PiROD 13' Low Profile Platform (Monopole) (AT&T-Existing)	B	None		0.0000	120.00	No Ice 1/2" Ice	15.70 20.10	15.70 20.10	1.30 1.76
(2) Powerwave 7770 w/ Mount Pipe (AT&T-Existing)	A	From Leg	3.00 0.00 3.00	30.0000	120.00	No Ice 1/2" Ice	6.50 7.19	4.58 5.66	0.06 0.10
(2) Powerwave 7770 w/ Mount Pipe (AT&T-Existing)	B	From Leg	3.00 0.00 3.00	30.0000	120.00	No Ice 1/2" Ice	6.50 7.19	4.58 5.66	0.06 0.10
(2) Powerwave 7770 w/ Mount Pipe (AT&T-Existing)	C	From Leg	3.00 0.00 3.00	30.0000	120.00	No Ice 1/2" Ice	6.50 7.19	4.58 5.66	0.06 0.10
AM-X-CD-16-65-00T w/Mount Pipe (AT&T-Existing)	A	From Leg	3.00 2.00 3.00	60.0000	120.00	No Ice 1/2" Ice	6.85 7.36	5.44 6.24	0.05 0.11
AM-X-CD-16-65-00T w/Mount Pipe (AT&T-Existing)	B	From Leg	3.00 2.00 3.00	60.0000	120.00	No Ice 1/2" Ice	6.85 7.36	5.44 6.24	0.05 0.11
SBNH-1D6565C w/ Mount Pipe (AT&T-Existing)	C	From Leg	3.00 2.00 3.00	60.0000	120.00	No Ice 1/2" Ice	11.67 12.39	9.83 11.35	0.09 0.18
Powerwave 7770 w/ Mount Pipe (AT&T-Future)	A	From Leg	3.00 -2.00 3.00	30.0000	120.00	No Ice 1/2" Ice	6.50 7.19	4.58 5.66	0.06 0.10
Powerwave 7770 w/ Mount Pipe (AT&T-Future)	B	From Leg	3.00 -2.00 3.00	30.0000	120.00	No Ice 1/2" Ice	6.50 7.19	4.58 5.66	0.06 0.10
Powerwave 7770 w/ Mount Pipe (AT&T-Future)	C	From Leg	3.00 -2.00 3.00	30.0000	120.00	No Ice 1/2" Ice	6.50 7.19	4.58 5.66	0.06 0.10
(2) LGP 21401 (AT&T-Existing)	A	From Leg	3.00 0.00 3.00	30.0000	120.00	No Ice 1/2" Ice	1.29 1.45	0.36 0.48	0.01 0.02
(2) LGP 21401 (AT&T-Existing)	B	From Leg	3.00 0.00 3.00	30.0000	120.00	No Ice 1/2" Ice	1.29 1.45	0.36 0.48	0.01 0.02
(2) LGP 21401 (AT&T-Existing)	C	From Leg	3.00 0.00 3.00	30.0000	120.00	No Ice 1/2" Ice	1.29 1.45	0.36 0.48	0.01 0.02
(2) LGP21903 (AT&T-Existing)	A	From Leg	3.00 0.00 3.00	30.0000	120.00	No Ice 1/2" Ice	0.00 0.00	0.18 0.25	0.01 0.01
(2) LGP21903 (AT&T-Existing)	B	From Leg	3.00 0.00 3.00	30.0000	120.00	No Ice 1/2" Ice	0.00 0.00	0.18 0.25	0.01 0.01
(2) LGP21903 (AT&T-Existing)	C	From Leg	3.00 0.00 3.00	30.0000	120.00	No Ice 1/2" Ice	0.00 0.00	0.18 0.25	0.01 0.01
(2) Ericsson RRUS 11 (AT&T-Existing)	A	From Leg	3.00 0.00 3.00	60.0000	120.00	No Ice 1/2" Ice	2.94 3.17	1.25 1.41	0.06 0.07
(2) Ericsson RRUS 11 (AT&T-Existing)	B	From Leg	3.00 0.00 3.00	60.0000	120.00	No Ice 1/2" Ice	2.94 3.17	1.25 1.41	0.06 0.07
(2) Ericsson RRUS 11 (AT&T-Existing)	C	From Leg	3.00 0.00 3.00	60.0000	120.00	No Ice 1/2" Ice	2.94 3.17	1.25 1.41	0.06 0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Demarcation Box (DC6-48-60-18-8F)	A	From Leg	1.00 0.00 3.00	0.0000	120.00	No Ice 1/2" Ice	1.47 1.67	1.47 1.67	0.03 0.05
(AT&T-Existing)									
PiROD 13' Low Profile Platform (Monopole)	A	None		0.0000	109.00	No Ice 1/2" Ice	15.70 20.10	15.70 20.10	1.30 1.76
(Verizon-Existing)									
(2) LPA-80080-6CF w/Mount Pipe	A	From Face	3.00 0.00 0.00	30.0000	109.00	No Ice 1/2" Ice	4.59 5.14	10.75 12.03	0.05 0.11
(Verizon-Existing)									
(2) LPA-80080-6CF w/Mount Pipe	B	From Face	3.00 0.00 0.00	30.0000	109.00	No Ice 1/2" Ice	4.59 5.14	10.75 12.03	0.05 0.11
(Verizon-Existing)									
(2) LPA-80080-6CF w/Mount Pipe	C	From Face	3.00 0.00 0.00	30.0000	109.00	No Ice 1/2" Ice	4.59 5.14	10.75 12.03	0.05 0.11
(Verizon-Existing)									
APX75-866514T0 w/Mount Pipe	A	From Face	3.00 2.00 0.00	30.0000	109.00	No Ice 1/2" Ice	10.00 10.72	6.57 7.88	0.06 0.13
(Verizon-Proposed)									
BXA-70063-6CF w/ Mount Pipe	B	From Face	3.00 2.00 0.00	30.0000	109.00	No Ice 1/2" Ice	7.99 8.64	5.82 6.99	0.05 0.10
(Verizon-Proposed)									
BXA-70063-6CF w/ Mount Pipe	C	From Face	3.00 2.00 0.00	30.0000	109.00	No Ice 1/2" Ice	7.99 8.64	5.82 6.99	0.05 0.10
(Verizon-Proposed)									
BXA-171085-12BF w/ Mount Pipe	A	From Face	3.00 -2.00 0.00	30.0000	109.00	No Ice 1/2" Ice	4.98 5.53	5.23 6.40	0.04 0.08
(Verizon-Proposed)									
BXA-171085-12BF w/ Mount Pipe	B	From Face	3.00 -2.00 0.00	30.0000	109.00	No Ice 1/2" Ice	4.98 5.53	5.23 6.40	0.04 0.08
(Verizon-Proposed)									
BXA-171085-12BF w/ Mount Pipe	C	From Face	3.00 -2.00 0.00	30.0000	109.00	No Ice 1/2" Ice	4.98 5.53	5.23 6.40	0.04 0.08
(Verizon-Proposed)									
(2) PCS1900 Dual Duplex (TMA)	A	From Face	3.00 0.00 0.00	30.0000	109.00	No Ice 1/2" Ice	0.00 0.00	1.06 1.21	0.02 0.02
(Verizon-Existing)									
(2) PCS1900 Dual Duplex (TMA)	B	From Face	3.00 0.00 0.00	30.0000	109.00	No Ice 1/2" Ice	0.00 0.00	1.06 1.21	0.02 0.02
(Verizon-Existing)									
(2) PCS1900 Dual Duplex (TMA)	C	From Face	3.00 0.00 0.00	30.0000	109.00	No Ice 1/2" Ice	0.00 0.00	1.06 1.21	0.02 0.02
(Verizon-Existing)									

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

Comb. No.	Description
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 Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	21	29.45	-0.02	-16.67
	Max. H_x	11	22.41	19.28	0.03
	Max. H_z	2	22.41	0.03	19.30
	Max. M_x	2	1676.69	0.03	19.30
	Max. M_z	5	1675.27	-19.28	-0.03
	Max. Torsion	2	1.01	0.03	19.30
	Min. Vert	1	22.41	0.00	0.00
	Min. H_x	5	22.41	-19.28	-0.03
	Min. H_z	8	22.41	-0.03	-19.30
	Min. M_x	8	-1678.11	-0.03	-19.30
	Min. M_z	11	-1675.81	19.28	0.03
	Min. Torsion	8	-1.01	-0.03	-19.30

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	22.41	0.00	0.00	0.70	0.26	0.00
Dead+Wind 0 deg - No Ice	22.41	-0.03	-19.30	-1676.69	4.00	-1.01
Dead+Wind 30 deg - No Ice	22.41	9.61	-16.69	-1450.10	-834.27	-0.85
Dead+Wind 60 deg - No Ice	22.41	16.68	-9.62	-834.76	-1448.93	-0.47
Dead+Wind 90 deg - No Ice	22.41	19.28	0.03	4.44	-1675.27	0.04
Dead+Wind 120 deg - No Ice	22.41	16.71	9.68	842.64	-1452.65	0.54
Dead+Wind 150 deg - No Ice	22.41	9.67	16.73	1455.24	-840.72	0.89
Dead+Wind 180 deg - No Ice	22.41	0.03	19.30	1678.11	-3.46	1.01
Dead+Wind 210 deg - No Ice	22.41	-9.61	16.69	1451.53	834.81	0.85
Dead+Wind 240 deg - No Ice	22.41	-16.68	9.62	836.19	1449.47	0.47
Dead+Wind 270 deg - No Ice	22.41	-19.28	-0.03	-3.02	1675.81	-0.04
Dead+Wind 300 deg - No Ice	22.41	-16.71	-9.68	-841.22	1453.19	-0.54
Dead+Wind 330 deg - No Ice	22.41	-9.67	-16.73	-1453.82	841.26	-0.90
Dead+Ice+Temp	29.45	0.00	0.00	2.09	0.58	0.00
Dead+Wind 0 deg+Ice+Temp	29.45	-0.02	-16.67	-1470.17	2.35	-0.93
Dead+Wind 30 deg+Ice+Temp	29.45	8.31	-14.43	-1272.04	-732.85	-0.76
Dead+Wind 60 deg+Ice+Temp	29.45	14.41	-8.32	-732.50	-1271.53	-0.39
Dead+Wind 90 deg+Ice+Temp	29.45	16.65	0.02	3.89	-1469.33	0.09
Dead+Wind 120 deg+Ice+Temp	29.45	14.43	8.35	739.81	-1273.27	0.55
Dead+Wind 150 deg+Ice+Temp	29.45	8.34	14.45	1278.06	-735.88	0.86
Dead+Wind 180 deg+Ice+Temp	29.45	0.02	16.67	1474.44	-1.15	0.94
Dead+Wind 210 deg+Ice+Temp	29.45	-8.31	14.43	1276.32	734.06	0.77
Dead+Wind 240 deg+Ice+Temp	29.45	-14.41	8.32	736.78	1272.73	0.39
Dead+Wind 270 deg+Ice+Temp	29.45	-16.65	-0.02	0.39	1470.55	-0.09
Dead+Wind 300 deg+Ice+Temp	29.45	-14.43	-8.35	-735.53	1274.48	-0.55
Dead+Wind 330 deg+Ice+Temp	29.45	-8.34	-14.45	-1273.79	737.09	-0.86
Dead+Wind 0 deg - Service	22.41	-0.01	-6.68	-580.01	1.56	-0.35
Dead+Wind 30 deg - Service	22.41	3.33	-5.78	-501.56	-288.65	-0.30
Dead+Wind 60 deg - Service	22.41	5.77	-3.33	-288.53	-501.44	-0.16
Dead+Wind 90 deg - Service	22.41	6.67	0.01	2.00	-579.80	0.01
Dead+Wind 120 deg - Service	22.41	5.78	3.35	292.19	-502.73	0.19
Dead+Wind 150 deg - Service	22.41	3.35	5.79	504.28	-290.88	0.31
Dead+Wind 180 deg - Service	22.41	0.01	6.68	581.43	-1.02	0.35
Dead+Wind 210 deg - Service	22.41	-3.33	5.78	502.99	289.19	0.30
Dead+Wind 240 deg - Service	22.41	-5.77	3.33	289.96	501.99	0.16
Dead+Wind 270 deg - Service	22.41	-6.67	-0.01	-0.58	580.35	-0.01
Dead+Wind 300 deg - Service	22.41	-5.78	-3.35	-290.77	503.28	-0.19
Dead+Wind 330 deg - Service	22.41	-3.35	-5.79	-502.85	291.43	-0.31

Solution Summary

Load Comb.	Sum of Applied Forces PX	PY	PZ	Sum of Reactions PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-22.41	0.00	0.00	22.41	0.00	0.000%
2	-0.03	-22.41	-19.30	0.03	22.41	19.30	0.000%
3	9.61	-22.41	-16.69	-9.61	22.41	16.69	0.000%
4	16.68	-22.41	-9.62	-16.68	22.41	9.62	0.000%
5	19.28	-22.41	0.03	-19.28	22.41	-0.03	0.000%
6	16.71	-22.41	9.68	-16.71	22.41	-9.68	0.000%
7	9.67	-22.41	16.73	-9.67	22.41	-16.73	0.000%
8	0.03	-22.41	19.30	-0.03	22.41	-19.30	0.000%
9	-9.61	-22.41	16.69	9.61	22.41	-16.69	0.000%
10	-16.68	-22.41	9.62	16.68	22.41	-9.62	0.000%
11	-19.28	-22.41	-0.03	19.28	22.41	0.03	0.000%
12	-16.71	-22.41	-9.68	16.71	22.41	9.68	0.000%
13	-9.67	-22.41	-16.73	9.67	22.41	16.73	0.000%
14	0.00	-29.45	0.00	0.00	29.45	0.00	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
15	-0.02	-29.45	-16.67	0.02	29.45	16.67	0.000%
16	8.31	-29.45	-14.43	-8.31	29.45	14.43	0.000%
17	14.41	-29.45	-8.32	-14.41	29.45	8.32	0.000%
18	16.65	-29.45	0.02	-16.65	29.45	-0.02	0.000%
19	14.43	-29.45	8.35	-14.43	29.45	-8.35	0.000%
20	8.34	-29.45	14.45	-8.34	29.45	-14.45	0.000%
21	0.02	-29.45	16.67	-0.02	29.45	-16.67	0.000%
22	-8.31	-29.45	14.43	8.31	29.45	-14.43	0.000%
23	-14.41	-29.45	8.32	14.41	29.45	-8.32	0.000%
24	-16.65	-29.45	-0.02	16.65	29.45	0.02	0.000%
25	-14.43	-29.45	-8.35	14.43	29.45	8.35	0.000%
26	-8.34	-29.45	-14.45	8.34	29.45	14.45	0.000%
27	-0.01	-22.41	-6.68	0.01	22.41	6.68	0.000%
28	3.33	-22.41	-5.78	-3.33	22.41	5.78	0.000%
29	5.77	-22.41	-3.33	-5.77	22.41	3.33	0.000%
30	6.67	-22.41	0.01	-6.67	22.41	-0.01	0.000%
31	5.78	-22.41	3.35	-5.78	22.41	-3.35	0.000%
32	3.35	-22.41	5.79	-3.35	22.41	-5.79	0.000%
33	0.01	-22.41	6.68	-0.01	22.41	-6.68	0.000%
34	-3.33	-22.41	5.78	3.33	22.41	-5.78	0.000%
35	-5.77	-22.41	3.33	5.77	22.41	-3.33	0.000%
36	-6.67	-22.41	-0.01	6.67	22.41	0.01	0.000%
37	-5.78	-22.41	-3.35	5.78	22.41	3.35	0.000%
38	-3.35	-22.41	-5.79	3.35	22.41	5.79	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	0.00010534
3	Yes	4	0.00000001	0.00087482
4	Yes	4	0.00000001	0.00094577
5	Yes	4	0.00000001	0.00001857
6	Yes	4	0.00000001	0.00095179
7	Yes	4	0.00000001	0.00088987
8	Yes	4	0.00000001	0.00009496
9	Yes	4	0.00000001	0.00096842
10	Yes	4	0.00000001	0.00089244
11	Yes	4	0.00000001	0.00002154
12	Yes	4	0.00000001	0.00090714
13	Yes	4	0.00000001	0.00097403
14	Yes	4	0.00000001	0.00000001
15	Yes	5	0.00000001	0.00004610
16	Yes	5	0.00000001	0.00007911
17	Yes	5	0.00000001	0.00008118
18	Yes	5	0.00000001	0.00004570
19	Yes	5	0.00000001	0.00008165
20	Yes	5	0.00000001	0.00007973
21	Yes	5	0.00000001	0.00004616
22	Yes	5	0.00000001	0.00008231
23	Yes	5	0.00000001	0.00008001
24	Yes	5	0.00000001	0.00004578
25	Yes	5	0.00000001	0.00008013
26	Yes	5	0.00000001	0.00008227
27	Yes	4	0.00000001	0.00002066

28	Yes	4	0.00000001	0.00005899
29	Yes	4	0.00000001	0.00006979
30	Yes	4	0.00000001	0.00000943
31	Yes	4	0.00000001	0.00006987
32	Yes	4	0.00000001	0.00006044
33	Yes	4	0.00000001	0.00002010
34	Yes	4	0.00000001	0.00007413
35	Yes	4	0.00000001	0.00006129
36	Yes	4	0.00000001	0.00000952
37	Yes	4	0.00000001	0.00006259
38	Yes	4	0.00000001	0.00007401

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	120 - 70.75	Pole	TP32.283x18x0.1875	1	-7.43	213.15	84.4	Pass
L2	70.75 - 34.75	Pole	TP42.35x30.748x0.3125	2	-13.06	798.01	57.7	Pass
L3	34.75 - 0	Pole	TP51.8x40.2022x0.375	3	-22.40	1798.04	51.2	Pass
							Summary	
						Pole (L1)	84.4	Pass
						RATING =	**84.4**	**Pass**

BLACK & VEATCH Building a world of difference.	Client:	AT&T Towers	Design:	J. Riley
	Project:	176850 (27067VERCT-S (Rev 2))	Date:	10/15/2012
10950 Grandview Drive	Site:	Mansfield Four Corners	Verify:	
Overland Park, KS 66210	Title:	Base Plate Capacity Calculation (Square)	Date:	
Phone: (913) 458-2000			Code:	TIA/EIA-222-F

Template Version 1.0 Page:

Base Plate Information:

Bolt Grade:	A615-75	
Bolt Diameter:	2 1/4	in
Number of Bolts, n:	16	
Base Plate Grade:	A572-55	
Base Plate Thickness, tp:	3.00	in
Bolt Circle Diameter, DBC:	59.0	in
Bolt Spacing:	7.0	in
Plate width, Do:	57.0	in
Pole Diameter, Dp:	51.80	in
Pole to Base Plate Weld Size:	3/16	in
Base Plate Type:	Plain Plate	
Grout Spacing:	3.0	in
Number of Leveling Nuts per bolt:	1.0	
Number of Stiffeners, ns:		
Stiffener Thickness, ts:		in
Stiffener Height, hs:		in

Tower Reactions (Per tnxTower):

Axial, Pu:	22	kip
Shear, Vu:	19	kip
Overturning Moment, Mu:	1681	kip-ft

Design Resistance Factor:

ASD Overstress Factor:	1.333
Bolts Tension Reduction Factor:	0.33
Bolts Shear Reduction Factor:	0.17
Bolts Flexure Reduction Factor:	0.75
Plate Flexure Reduction Factor:	0.75

BLACK & VEATCH
Building a world of difference.
10950 Grandview Drive
Overland Park, KS 66210
Phone: (913) 458-2000

Client:	AT&T Towers	*Design:*	J. Riley
Project:	176850 (27067VERCT-S (Rev 2))	*Date:*	10/15/2012
Site:	Mansfield Four Corners	*Verify:*	
Title:	Base Plate Capacity Calculation (Square)	*Date:*	
		Code:	TIA/EIA-222-F

Calculation:

Anchor Bolt Capacity Check:

Max Axial Force:	86.85	kip
Max Shear Force:	1.19	kip
Max Bending Moment due to Shear:	0.63	kip-in
Nominal Bolt Design Tensile Capacity:	194.81	kip
Nominal Bolt Design Shear Capacity:	90.10	kip
Nominal Bolt Design Flexural Capacity:	163.47	kip-in

Controlling Anchor Bolt Capacity: **44.6%**

Conclusion: Existing anchor bolt has adequate capacity to support the existing and proposed loads.

Base Plate Capacity Check:

Distance Between Bolts to Pole, c:	2.31	in
Angle Between Bolts, θ:	20.4	degree
Effective Width, b_{eff}:	28.00	in
Plate Stress, σ:	19.08	ksi

Base Plate Capacity: **34.7%**

Conclusion: Existing base plate has adequate capacity to support the existing and proposed loads.

BLACK & VEATCH
Building a world of difference.
10950 Grandview Drive
Overland Park, KS 66210
Phone: (913) 458-2000

Client:	AT&T Towers - Central	*Design:*	J.Riley
Project:	176850 (27067VERCT-S (Rev 2))	*Date:*	10/15/2012
Site:	Mansfield Four Corners	*Verify:*	
Title:	**Monopole Tower Foundation Capacity Comparison**	*Date:*	
		Code:	TIA/EIA-222-F

Template Version 1.1

Foundation analysis

Original Tower Design Reactions:

Foundation:

shear:	23.0	Kip
Overturning moment:	1800.0	Kip-ft

TnxTower Reactions:

Foundation:

Shear:	19.0	Kip
Overturning moment:	1681.0	Kip-ft

Stress Ratio:

Anchor:

Shear:	**82.6%**
Overturning moment:	**93.4%**

Conclusion: **Calculated reactions are less than those for which the foundation was originally designed. Therefore, the existing foundation is considered to have been designed and constructed with adequate capacity to support the existing and proposed loads.**

Controlling Foundation Stress Ratio: **93.4%**