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FEB 15 2013

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CONNECTICUT  
SITING COUNCIL

ORIGINAL

Also admitted in Massachusetts

February 14, 2013

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

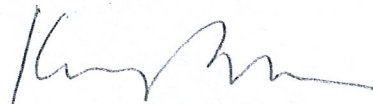
Re: **Notice of Completion of Construction**  
**EM-VER-143-120214—Burr Mountain Road, Torrington, Connecticut**  
**EM-VER-143-120917—218 Wheeler Road, Torrington, Connecticut**  
**EM-VER-020-120319—12 Nepaug Road, Burlington, Connecticut**  
**EM-VER-054-120806—Hebron Avenue, Glastonbury, Connecticut**  
**EM-VER-074-120214—383 Torrington Road, Litchfield, Connecticut**  
**EM-VER-130-111202—Horse Fence Hill Road, Southbury, 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



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STATE OF CONNECTICUT  
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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

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

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

April 4, 2012

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

RE: **EM-VER-020-120319** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 12 Nepaug Road, Burlington, 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 March 16, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Linda Roberts  
Executive Director

LR/CDM/laf

c: The Honorable Catherine R. Bergstrom, First Selectman, Town of Burlington  
Robert J. Coates, Planning and Zoning Chairman, Town of Burlington  
Christopher B. Fisher, Esq., Cuddy & Feder LLP



STATE OF CONNECTICUT  
CONNECTICUT SITING COUNCIL

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

March 21, 2012

The Honorable Catherine R. Bergstrom  
First Selectman  
Town of Burlington  
200 Spielman Highway  
Burlington, CT 06013

RE: **EM-VER-020-120319** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 12 Nepaug Road, Burlington, Connecticut.

Dear First Selectman Bergstrom:

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 4, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts  
Executive Director

LR/jbw

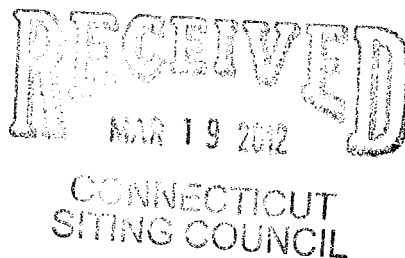
Enclosure: Notice of Intent

c: Robert J. Coates, Planning and Zoning Chairman, Town of Burlington

280 Trumbull Street  
 Hartford, CT 06103-3597  
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March 16, 2012

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



Re: **Notice of Exempt Modification – Antenna Swap  
 12 Nepaug Road, Burlington, Connecticut**

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the 99-foot level on an existing 120-foot tower at the above-referenced address. The tower is owned by AT&T. Cellco’s use of the tower was approved by the Council in 2006. Cellco now intends to replace all of its existing antennas with six (6) model LPA-80080-4CF cellular antennas; three (3) model BXA-171085-8BF PCS antennas; and three (3) model BXA-70063-6CF LTE antennas, all at the same level on the tower. Cellco also intends to install six (6) coax cables diplexers on its existing antenna platform. Attached behind Tab 1 are specifications for the proposed replacement antennas and cable diplexers.

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 Theodore Shafer, First Selectman of the Town of Burlington. A copy of this letter is also being sent to Audrey Weaver, 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 and cable diplexers will be located at the same 99-foot level on the existing 120-foot tower.



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Linda Roberts  
March 16, 2012  
Page 2

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

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

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

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

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

Sincerely,



Kenneth C. Baldwin

Enclosures

Copy to:

Theodore Shafer, Burlington First Selectman  
Audrey Weaver  
Sandy M. Carter

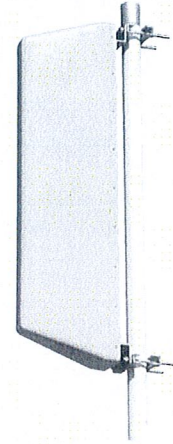


# LPA-80080-4CF-EDIN-X

V-Pol | Log Periodic | 80° | 12.5 dBd

Replace "X" with desired electrical downtilt

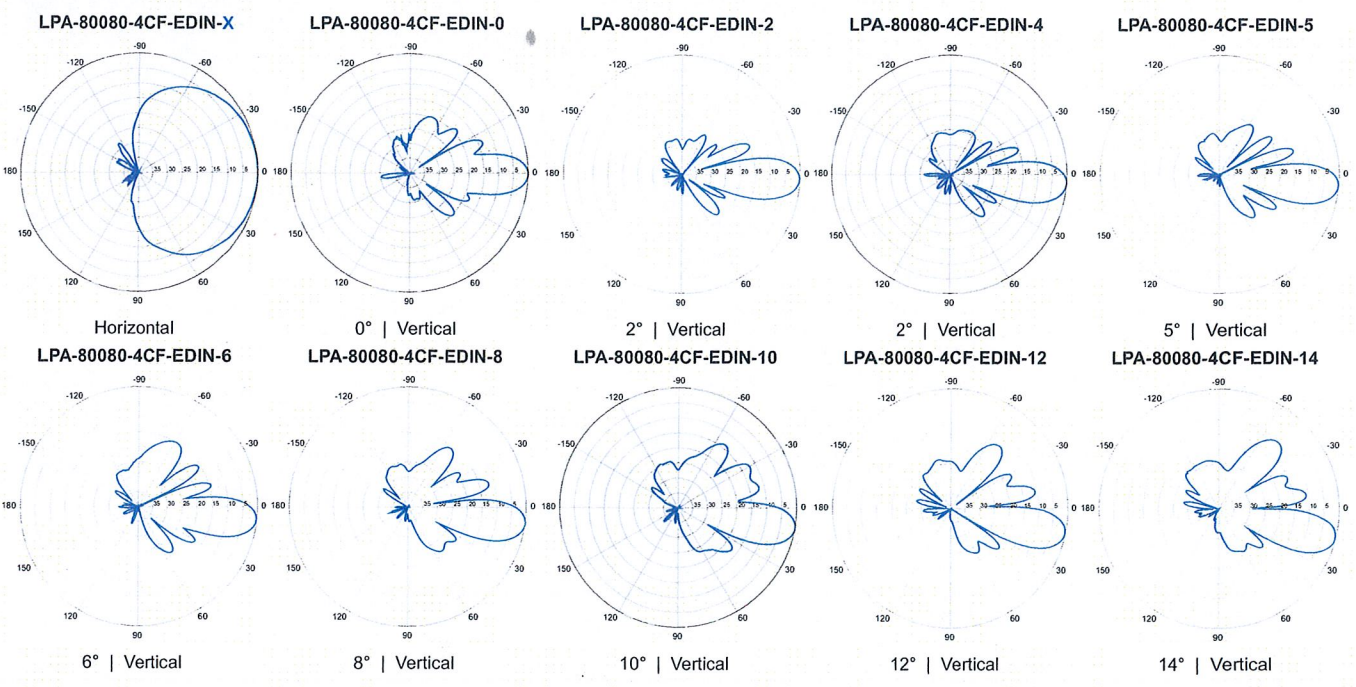
Antenna is also available with NE connector(s)  
Replace "EDIN" with "NE" in the model number  
when ordering.



Electrical Characteristics	
Frequency bands	806-960 MHz
Polarization	Vertical
Horizontal beamwidth	80°
Vertical beamwidth	15°
Gain	12.5 dBd (14.6 dBi)
Electrical downtilt (X)	0, 2, 4, 5, 6, 8, 10, 12, 14
Impedance	50Ω
VSWR	≤1.4:1
Upper sidelobe suppression (0°)	-14.2 dB
Front-to-back ratio (+/-30°)	-34.7 dB
Null fill	15% (-16.48 dB)
Input power	500 W
Lightning protection	Direct Ground
Connector(s)	1 Port / EDIN or NE / Female / Center (Back)

Mechanical Characteristics	
Dimensions Length x Width x Depth	1200 x 140 x 335 mm      47.2 x 5.5 x 13.2 in
Depth of antenna with z-bracket	375 mm      14.8 in
Weight without mounting brackets	5.4 kg      12 lbs
Survival wind speed	> 201 km/hr      > 125 mph
Wind area	Front: 0.17 m <sup>2</sup> Side: 0.40 m <sup>2</sup> Front: 1.8 ft <sup>2</sup> Side: 4.3 ft <sup>2</sup>
Wind load @ 161 km/hr (100 mph)	Front: 254 N    Side: 574 N      Front: 57 lbf    Side: 129 lbf

Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting & Downtilt Bracket Kit (0-20°)	21699999	50-102 mm    2.0-4.0 in	5.4 kg    12 lbs
Lock-Down Brace	If the lock-down brace is used, the maximum diameter of the mounting pipe is 88.9 mm or 3.5 in.		



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

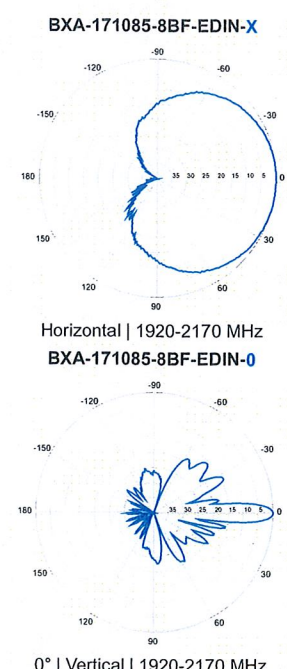
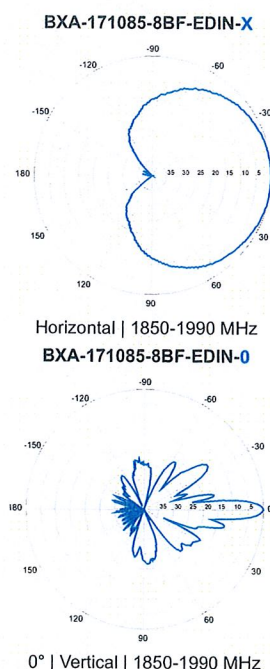
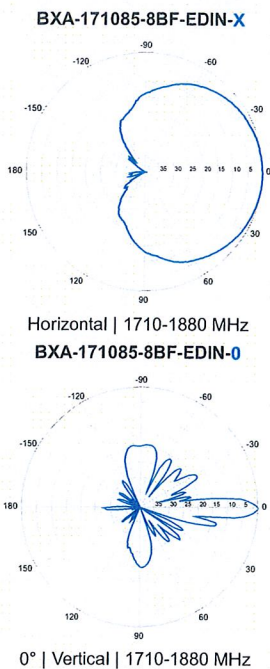
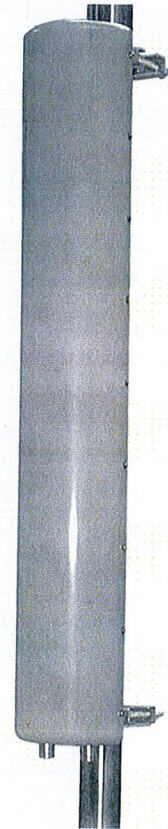


## BXA-171085-8BF-EDIN-X

Replace 'X' with desired electrical downtilt.

X-Pol | FET Panel | 85° | 16.4 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	7°	7°	7°
Gain	13.5 dBd / 15.6 dBi	13.9 dBd / 16.0 dBi	14.3 dBd / 16.4 dBi
Electrical downtilt (X)	0, 2, 4		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back isolation	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Bottom		
Operating temperature	-40° to +60° C / -40° to +140° F		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1232 x 154 x 105 mm	48.5 x 6.1 x 4.1 in	
Depth with t-brackets	133 mm	5.2 in	
Weight without mounting brackets	4.8 kg	10.5 lbs	
Survival wind speed	296 km/hr	184 mph	
Wind area	Front: 0.19 m <sup>2</sup> Side: 0.14 m <sup>2</sup>	Front: 2.0 ft <sup>2</sup> Side: 1.5 ft <sup>2</sup>	
Wind load @ 161 km/hr (100 mph)	Front: 281 N Side: 223 N	Front: 63 lbf Side: 50 lbf	
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171085-8BF-EDIN-X-FP		



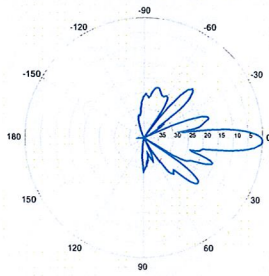
Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product.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



**BXA-171085-8BF-EDIN-X**

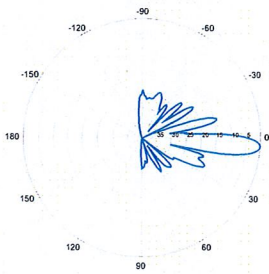
X-Pol | FET Panel | 85° | 16.4 dBi

**BXA-171085-8BF-EDIN-2**



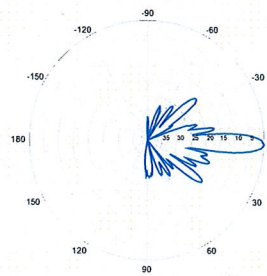
2° | Vertical | 1710-1880 MHz

**BXA-171085-8BF-EDIN-4**



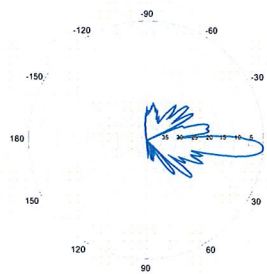
4° | Vertical | 1710-1880 MHz

**BXA-171085-8BF-EDIN-2**



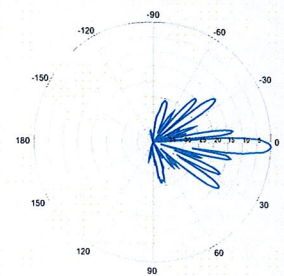
2° | Vertical | 1850-1990 MHz

**BXA-171085-8BF-EDIN-4**



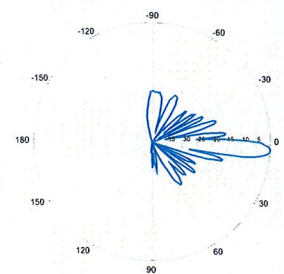
4° | Vertical | 1850-1990 MHz

**BXA-171085-8BF-EDIN-2**



2° | Vertical | 1920-2170 MHz

**BXA-171085-8BF-EDIN-4**



4° | Vertical | 1920-2170 MHz

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



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

X-Pol | FET Panel | 63° | 14.5 dBd

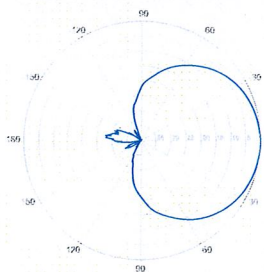
Replace "X" with desired electrical downtilt.

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



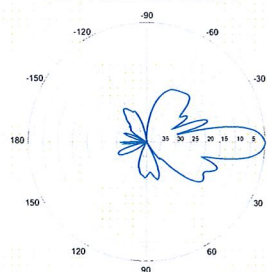
Electrical Characteristics	696-900 MHz		
Frequency bands	696-806 MHz	806-900 MHz	
Polarization	±45°		
Horizontal beamwidth	65°	63°	
Vertical beamwidth	13°	11°	
Gain	14.0 dBd (16.1 dBi)	14.5 dBd (16.6 dBi)	
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10		
Impedance	50Ω		
VSWR	≤1.35:1		
Upper sidelobe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

BXA-70063-6CF-EDIN-X



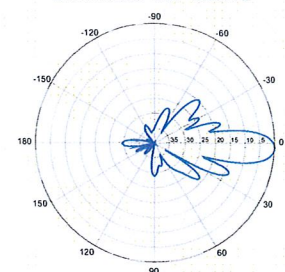
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

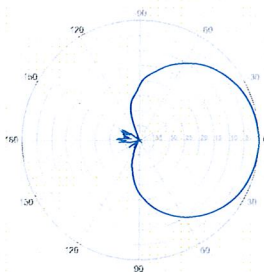


0° | Vertical | 750 MHz

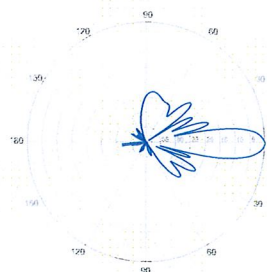
BXA-70063-6CF-EDIN-2



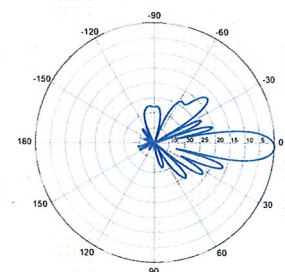
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



2° | Vertical | 850 MHz

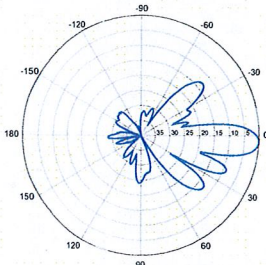
Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product.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



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

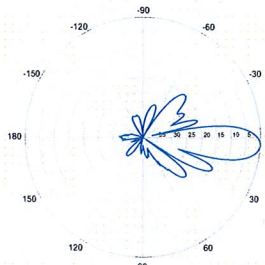
X-Pol | FET Panel | 63° | 14.5 dBd

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



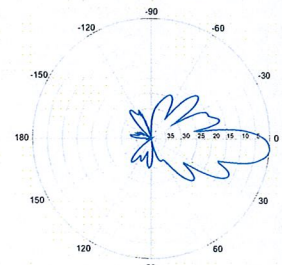
3° | Vertical | 750 MHz

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

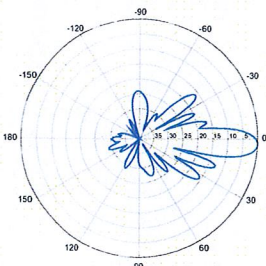


4° | Vertical | 750 MHz

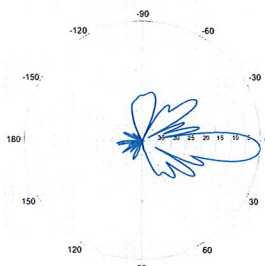
**BXA-70063-6CF-EDIN-5**



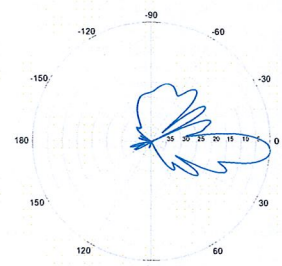
5° | Vertical | 750 MHz



3° | Vertical | 850 MHz

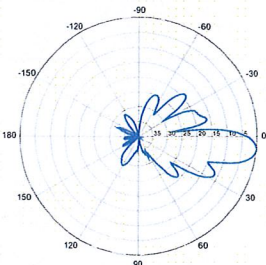


4° | Vertical | 850 MHz



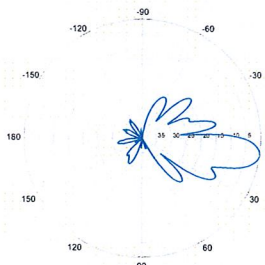
5° | Vertical | 850 MHz

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



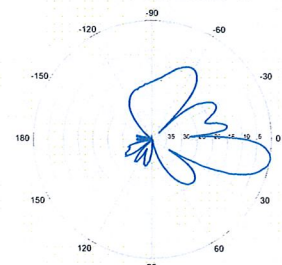
6° | Vertical | 750 MHz

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

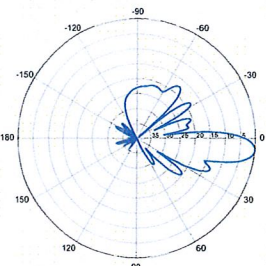


8° | Vertical | 750 MHz

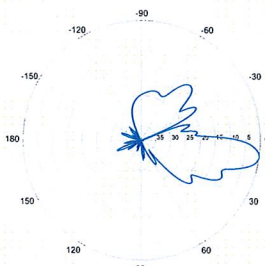
**BXA-70063-6CF-EDIN-10**



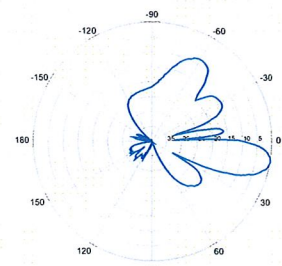
10° | Vertical | 750 MHz



6° | Vertical | 850 MHz



8° | Vertical | 850 MHz



10° | Vertical | 850 MHz

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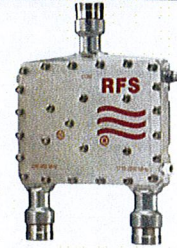




## ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

## Product Description

The ShareLite FD9R6004 Series of diplexers are designed to enable feeder sharing between systems in the 698-960 MHz range and in the 1710-2200 MHz range. The diplexer is equipped with in-line connector placement so it can be installed in the BTS cabinet or at the tower top. This is especially valuable in crowded sites or when the feeders are not easily accessible. Due to its wideband design, the FD9R6004 Series can accommodate many combining solutions between 698-960 MHz and 1710-2200 MHz systems such as LTE 700 MHz, Cellular 800 MHz with PCS, GSM900 with GSM1800, or GSM900 with UMTS. This diplexer features a highly selective filter. It provides a high level of isolation between ports, while keeping the insertion loss on both paths at an extremely low level. The FD9R6004 diplexers are available with various DC pass options, helpful in configurations with or without the Tower Mount Amplifiers installed.



## Features/Benefits

- LTE ready design
- Extremely Low Insertion Loss
- High level of Rejection between bands – Protection against interferences
- Extremely High Power Handling Capability
- Integrated DC block/bypass versions available
- Very compact & small size design – Easy installation and reduced tower load
- In-line long-neck connectors for easy connection & waterproofing
- Exceptional reliability & environmental protection (IP 67)
- Equipped with 1 \* Breathable Vent – Prevent any humidity inside the product
- Mounting hardware for Wall and Pole mount provided (P/N SEM2-1A)
- Grounding already provided through the mounting bracket
- Kit available for easy dual mount

## Technical Specifications

Product Type	Diplexer/Cross Band Coupler
Frequency Range 1, MHz	698-960
Frequency Range 2, MHz	1710-2200
Application	LTE700, GSM900, UMTS, GSM1800, Cellular 800, PCS
Configuration	Sharelite Single diplexer, outdoor, DC pass in the 1710-2170MHz path, with mounting hardware SEM2-1A
Mounting	Wall Mounting: With 4 screws (maximum 6mm diameter); Pole Mounting: With included clamp set 40-110mm (1.57-4.33)
Return Loss All Ports Min/Typ, dB	19/23
Power Handling Continuous, Max, W	1250 at common port; 750 in low frequency path & 500 in high frequency path
Power Handling Peak, Max, W	15000 in low frequency path & 8000 in high frequency path
Impedance, Ohms	50
Insertion Loss, Path 1, dB	0.07 typ.
Insertion Loss, Path 2, dB	0.13 typ.
Rejection Between Bands Min/Typ, dB	58/64@698-960MHz; 60/70@1710-2200MHz
IMP Level at the COM Port, Typ, dBm	-112 @ 2x43
DC Pass in Low Frequency Path	No
DC Pass in High Frequency Path	Yes
Temperature Range, °C (°F)	-40 to +60 (-40 to +140)
Environmental	ETSI 300-019-2-4 Class 4.1E
Ingress Protection	IP 67
Lightning Protection	EN/IEC61000-4-5 Level 4
Connectors	In-line long-neck 7-16-Female
Weight, kg (lb)	1.2 (2.6)
Shipping Weight, kg (lb)	3.2 (7) for 2 * single units in 1 * box, 9.8 (21.6) for 6 * units = 3 * Boxes in 1 * overwrap
Dimensions, H x W x D, mm (in)	147 x 164 x 37 (5.8 x 6.5 x 1.5)
Shipping Dimensions, H x W x D, mm (in)	254 x 406 x 82 (10 x 16 x 3.2) for 2 * Single Units in 1 * box, 280 x 406 x 241 (11 x 16 x 9.5) for 6 * units = 3 * Boxes in 1 * overwrap
Volume, L	0.43
Housing	Aluminum

## Notes

All information contained in the present datasheet is subject to confirmation at time of ordering



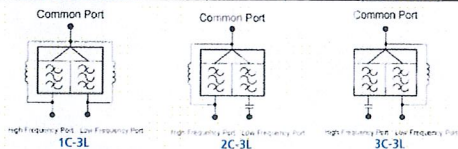


ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

Other Documentation

FD9R6004/2C-3L Installation Instructions: Wideband\_Diplexer\_Installation\_Rev5.pdf

Selection Guide Diplexer 698-960 / 1710-2200MHz					
	Model Number	Full DC Pass	DC Pass High Band	DC Pass Low Band	Mounting Hardware Included
Single	FD9R6004/1C-3L				X
	FD9R6004/2C-3L				X
	FD9R6004/3C-3L				X
Dual	KIT-FD9R6004/1C-DL				X
	KIT-FD9R6004/2C-DL				X
	KIT-FD9R6004/3C-DL				X

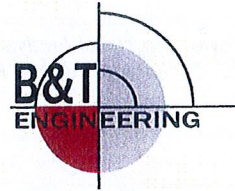


The FD9R6004 Series is upgradeable to a Dual Diplexer kit by means of 2 diplexers and mounting hardware kits SEM2-1A and SEM2-3

Mounting Hardware and Ground Cable Ordering Information		
Model Number	Description	
SEM2-1A	Mounting Hardware, Pole mount ø40-110mm (Included with the Single and Dual Diplexer) Wall Screws M6 (Not included with the product)	
SEM2-3	Assembly kit for 2 pcs of FD9R6004/1C-3L (Can be ordered separately but included with the Dual Diplexer Kit)	
CA020-2	Ground Cable, 2m, includes lugs (Optional)	
CA030-2	Ground Cable, 2m, includes lugs (Optional)	
SEM6	Mounting Hardware for 6 Diplexers, Tower Base (Optional)	

All information contained in the present datasheet is subject to confirmation at time of ordering

		General	Power	Density				
Site Name: Burlington W								
Tower Height: Verizon @ 99ft								
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total
*New Cingular	6	296	119	0.0451	880	0.5867	7.69%	
*New Cingular	3	427	119	0.0325	1930	1.0000	3.25%	
*Sprint	11	227	110	0.0742	1962.5	1.0000	7.42%	
*Pocket	3	631	88	0.0879	2130	1.0000	8.79%	
Verizon PCS	11	274	99	0.1106	1970	1.0000	11.06%	
Verizon Cellular	9	273	99	0.0901	869	0.5793	15.56%	
Verizon AWS	1	680	99	0.0249	2145	1.0000	2.49%	
Verizon 700	1	886	99	0.0325	698	0.4653	6.99%	
								63.25%
* Source: Siting Council								



March 12, 2012

Ms. Charlotte Malone  
AT&T Towers  
5895 Windward Pkwy, Suite 250  
Alpharetta, GA 30004  
(770) 708-6121

B&T Engineering, Inc.  
1717 S. Boulder, Suite 300  
Tulsa, OK 74119  
(918) 587-4630  
ctuttle@btengineering.com

**Subject:** **Structural Analysis Report**

**Carrier Designation:** **Verizon Wireless Co-Locate**

**Carrier Site Number:** N/A

**Carrier Site Name:** Burlington West, CT

**AT&T Designation:** **AT&T Site Number:** 84261-A

**AT&T Site Name:** Burlington-Nepaug Road

**Engineering Firm Designation:** **B&T Engineering, Inc. Project Number:** 84029.002

**Site Data:** **12 Nepaug Rd, Burlington, CT, Hartford County**  
**Latitude 41° 46' 56.83", Longitude -72° 59' 22.675"**  
**118.5 Foot - Monopole Tower**

Dear Ms. Malone,

B&T Engineering, Inc. is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower.

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:

Existing + Reserved + Proposed Equipment

Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.

**Sufficient Capacity**

Tower: 70.5%

Foundation: 49.7%

The analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2003 IBC with 2005 CT supplement 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 B&T Engineering, Inc. appreciate the opportunity of providing our continuing professional services to you and AT&T Towers. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:



Kristin Mears, E.I.  
Project Engineer

Chad E. Tuttle, P.E.  
President



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tnxTower Output

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## 1) INTRODUCTION

This tower is a 118.5 ft. monopole tower.

## 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
99	99	3	Antel	BXA-171085-8BF_2	--	--	Verizon
		3	Antel	BXA-70063-6CF_2			
		6	Antel	LPA-80080-4CF			
		6	RFS	FDR6004/2C-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
120	120	6	Ericsson	RRUS-11	3	7/8	AT&T Future
		3	Powerwave	P65-16-XLH-RR			
		6	Powerwave	7770.00	12	1 5/8	AT&T Existing
		6	Powerwave	LGP21401 TMA			
		6	Powerwave	LGP13519			
		1	--	LP Platform			
109	109	6	Andrew	950F85T2E-M	6	1 1/4	Existing
		1	--	LP Platform			
99	99	6	Antel	LPA-185090/8CF_2	--	--	To Be Removed
		6	Antel	LPA-80090-4CF			
		1	--	LP Platform	12	1 5/8	Verizon Existing
88	88	3	--	Flush Mount	3	1 5/8	Pocket Existing
		3	Kathrein	742 213			

**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)
<i>Information unknown</i>						

### 3) ANALYSIS PROCEDURE

**Table 4 - Documents Provided**

Document	Remarks	Reference	Source
Tower Data	Tower Data taken from Previous SA by GPD Associates	Date:12/17/2008	Siterra
Foundation Design	Foundation Data from previous SA by GPD Associates	Date:12/17/2008	Siterra
Soil Properties	Geotech Report by JGI, Project No. 04143G	Date:02/24/2004	Siterra
	Site Lease Application/NOC2 Form	Date:12/29/2011	Siterra
Loading	Phone Conversation w/ Charlotte Malone	Date: 01/05/2012	On File
	Previous SA by GPD Associates	Date:12/17/2008	Siterra
Structural Analysis	URS Corporation	Date: 10/28/2005	Siterra
	URS Corporation	Date: 03/13/2004	Siterra

#### 3.1) Analysis Method

tnxTower (version 6.0.3.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

#### 3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
- 5) Mount areas and weights are assumed based on photographs provided.
- 6) The NOC form only shows Powerwave LGP21401 TMAs at 120' level. No quantity was given. (6) Powerwave LGP 21401 TMAs and (6) LGP 13519 TMAs were used in this analysis based on the 2008 mapping and 2008 analysis.
- 7) This analysis is a rerun of the 12/21/2011 analysis to change proposed loading. All existing antennas are now going to be removed, adding new diplexers, and removing previously proposed coax.

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

**4) ANALYSIS RESULTS**

**Table 5 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	119 - 96.92	Pole	TP28.214x23x0.188	1	-5.383	837.886	27.9	Pass
L2	96.92 - 48.67	Pole	TP39.232x26.895x0.25	2	-14.056	1554.305	68.7	Pass
L3	48.67 - 0.5	Pole	TP50.105x37.551x0.313	3	-24.960	2499.255	70.5	Pass
Summary								
Pole (L3)							70.5	Pass
<b>RATING =</b>							<b>70.5</b>	<b>Pass</b>

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	59.9	Pass
1	Base Plate	Base	54.9	Pass
1	Base Foundation	Base	49.7	Pass

<b>Structure Rating (max from all components) =</b>	<b>70.5%</b>
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Notes:

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

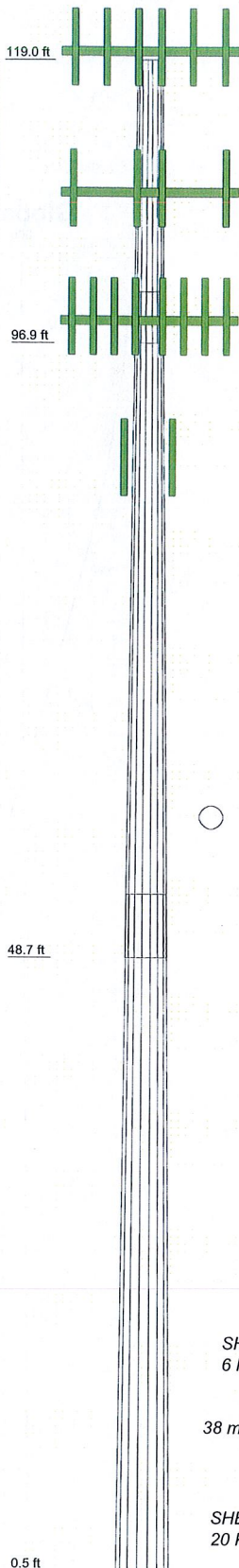
**4.1) Recommendations**

N/A

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



Section	1	2	3
Length (ft)	22.080	52.250	53.170
Number of Sides	18	18	18
Thickness (in)	0.188	0.250	0.313
Socket Length (ft)	4.000	5.000	
Top Dia (in)	23.000	26.895	37.551
Bot Dia (in)	28.214	39.232	50.105
Grade		A572-65	
Weight (K)	1.2	4.9	8.2



### DESIGNED APPURTENANCE LOADING

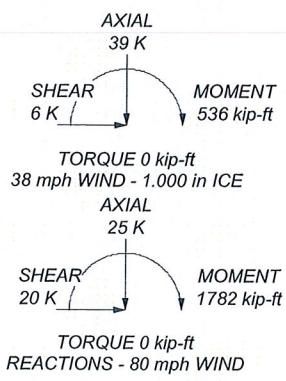
TYPE	ELEVATION	TYPE	ELEVATION
P65-16-XLH-RR w/Mount Pipe (ATT-F)	120	(2) 6' x 2" Mount Pipe (E)	109
P65-16-XLH-RR w/Mount Pipe (ATT-F)	120	Platform Mount (LP 714-1) (E)	109
P65-16-XLH-RR w/Mount Pipe (ATT-F)	120	BXA-171085-8BF_2 w/Mount Pipe (Verizon-P)	99
(2) RRUS-11 (ATT-F)	120	BXA-171085-8BF_2 w/Mount Pipe (Verizon-P)	99
(2) RRUS-11 (ATT-F)	120	BXA-171085-8BF_2 w/Mount Pipe (Verizon-P)	99
(2) RRUS-11 (ATT-F)	120	BXA-70063-6CF_2 w/Mount Pipe (Verizon-P)	99
(2) 7770.00 w/Mount Pipe (ATT-E)	120	BXA-70063-6CF_2 w/Mount Pipe (Verizon-P)	99
(2) 7770.00 w/Mount Pipe (ATT-E)	120	BXA-70063-6CF_2 w/Mount Pipe (Verizon-P)	99
(2) 7770.00 w/Mount Pipe (ATT-E)	120	BXA-70063-6CF_2 w/Mount Pipe (Verizon-P)	99
(2) LGP21401 TMA (ATT-E)	120	BXA-70063-6CF_2 w/Mount Pipe (Verizon-P)	99
(2) LGP21401 TMA (ATT-E)	120	(2) LPA-80080/4CF w/Mount Pipe (Verizon-P)	99
(2) LGP21401 TMA (ATT-E)	120	(2) LPA-80080/4CF w/Mount Pipe (Verizon-P)	99
(2) LGP13519 (ATT-E)	120	(2) LPA-80080/4CF w/Mount Pipe (Verizon-P)	99
(2) LGP13519 (ATT-E)	120	(2) LPA-80080/4CF w/Mount Pipe (Verizon-P)	99
(2) LGP13519 (ATT-E)	120	(2) LPA-80080/4CF w/Mount Pipe (Verizon-P)	99
6' x 2" Mount Pipe (ATT-E)	120	(2) FD9R6004/2C-3L (Verizon-P)	99
6' x 2" Mount Pipe (ATT-E)	120	(2) FD9R6004/2C-3L (Verizon-P)	99
6' x 2" Mount Pipe (ATT-E)	120	(2) FD9R6004/2C-3L (Verizon-P)	99
Platform Mount (LP 714-1) (ATT-E)	120	(2) FD9R6004/2C-3L (Verizon-P)	99
(2) 950F85T2E-M w/ Mount Pipe (E)	109	Platform Mount (LP 714-1) (Verizon-E)	99
(2) 950F85T2E-M w/ Mount Pipe (E)	109	742 213 w/ Mount Pipe (Pocket-E)	88
(2) 950F85T2E-M w/ Mount Pipe (E)	109	742 213 w/ Mount Pipe (Pocket-E)	88
(2) 950F85T2E-M w/ Mount Pipe (E)	109	742 213 w/ Mount Pipe (Pocket-E)	88
(2) 6' x 2" Mount Pipe (E)	109	Flush Mount (Pocket-E)	88
(2) 6' x 2" Mount Pipe (E)	109	Flush Mount (Pocket-E)	88

### MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

### TOWER DESIGN NOTES

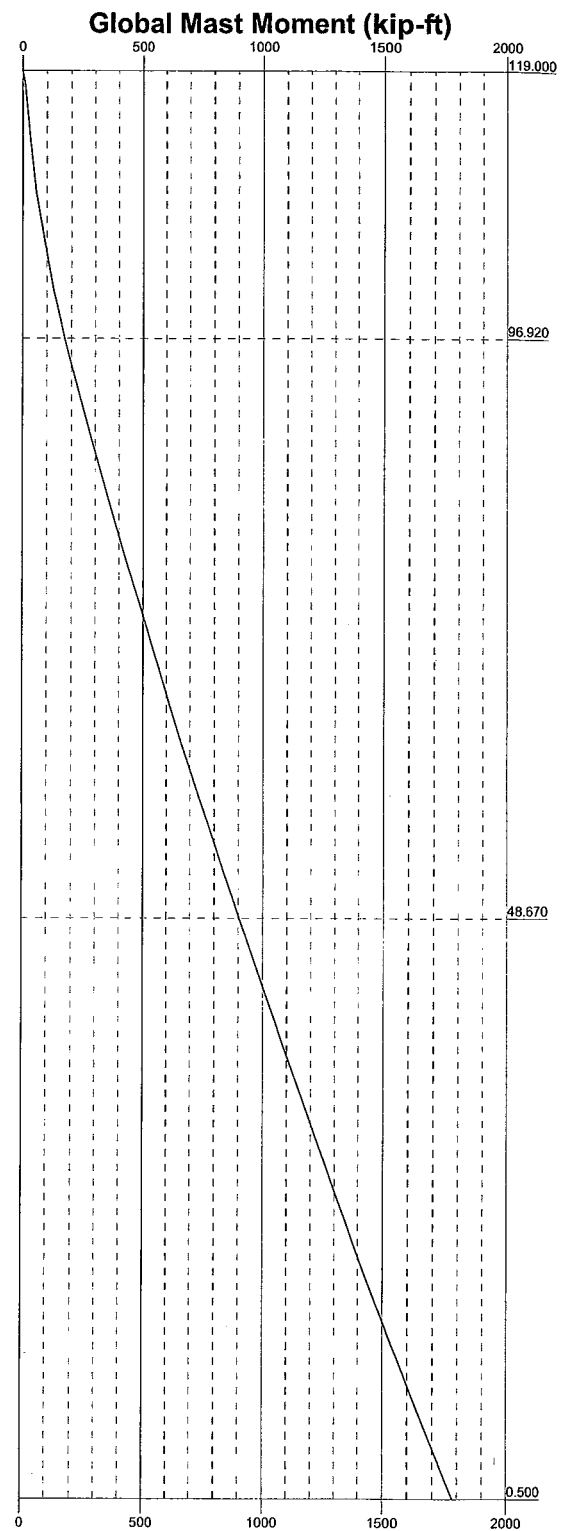
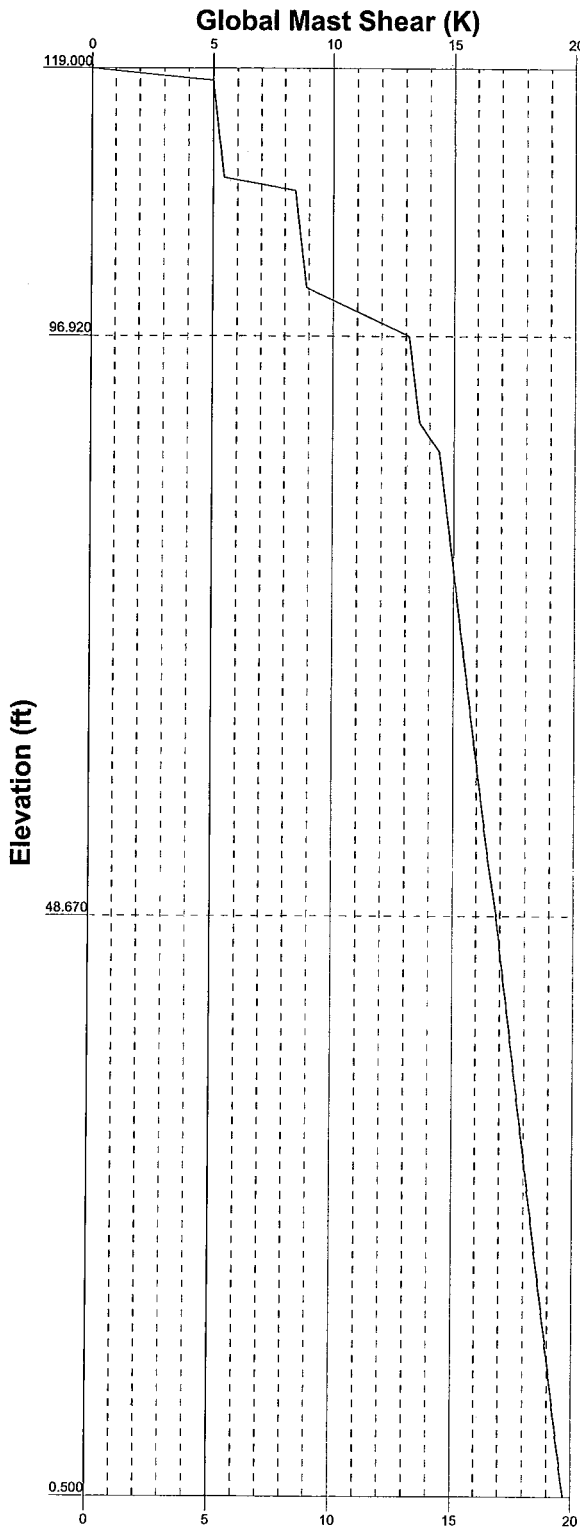
1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 70.5%




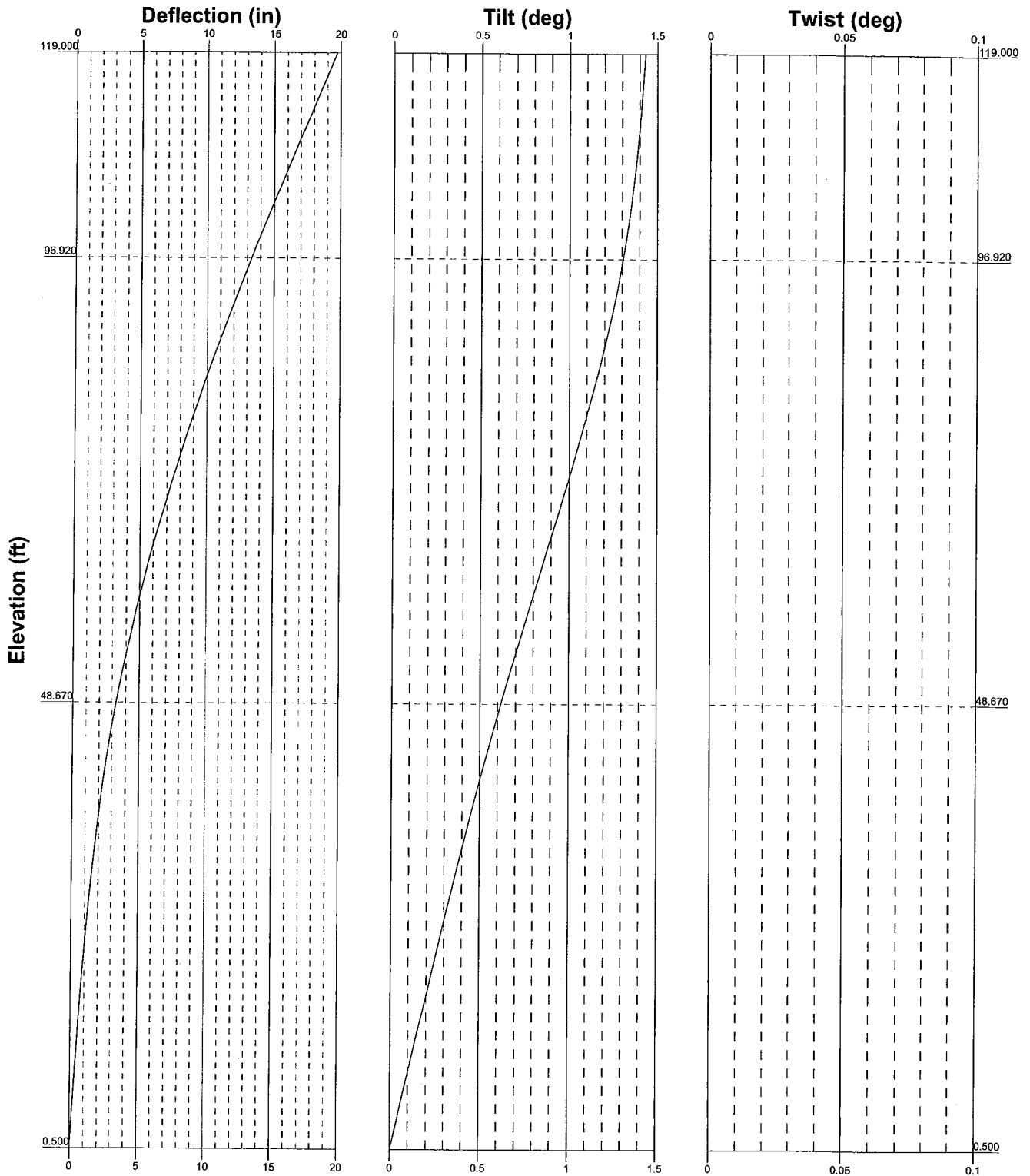
<b>B&amp;T Engineering, Inc.</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job: <b>84029 - Burlington-Nepaug Road, CT (Site# 84261-A)</b>
	Project: <b>119' EEI Monopole / Verizon Wireless Co-Locate</b>
	Client: AT&T Towers
	Code: TIA/EIA-222-F
	Path:
Drawn by: K. Mears	App'd:
Date: 01/06/12	Scale: NTS
	Dwg No. E-1


----- Vx      - - - - - Vz

----- Mx      - - - - - Mz



 <p><b>B&amp;T Engineering, Inc.</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	<b>Job: 84029 - Burlington-Nepaug Road, CT (Site# 84261-A)</b>		
	Project: <b>119' EEI Monopole / Verizon Wireless Co-Locate</b>		
	Client: AT&T Towers	Drawn by: K. Mears	App'd:
	Code: TIA/EIA-222-F	Date: 01/06/12	Scale: NTS
	Path:		Dwg No. E-4

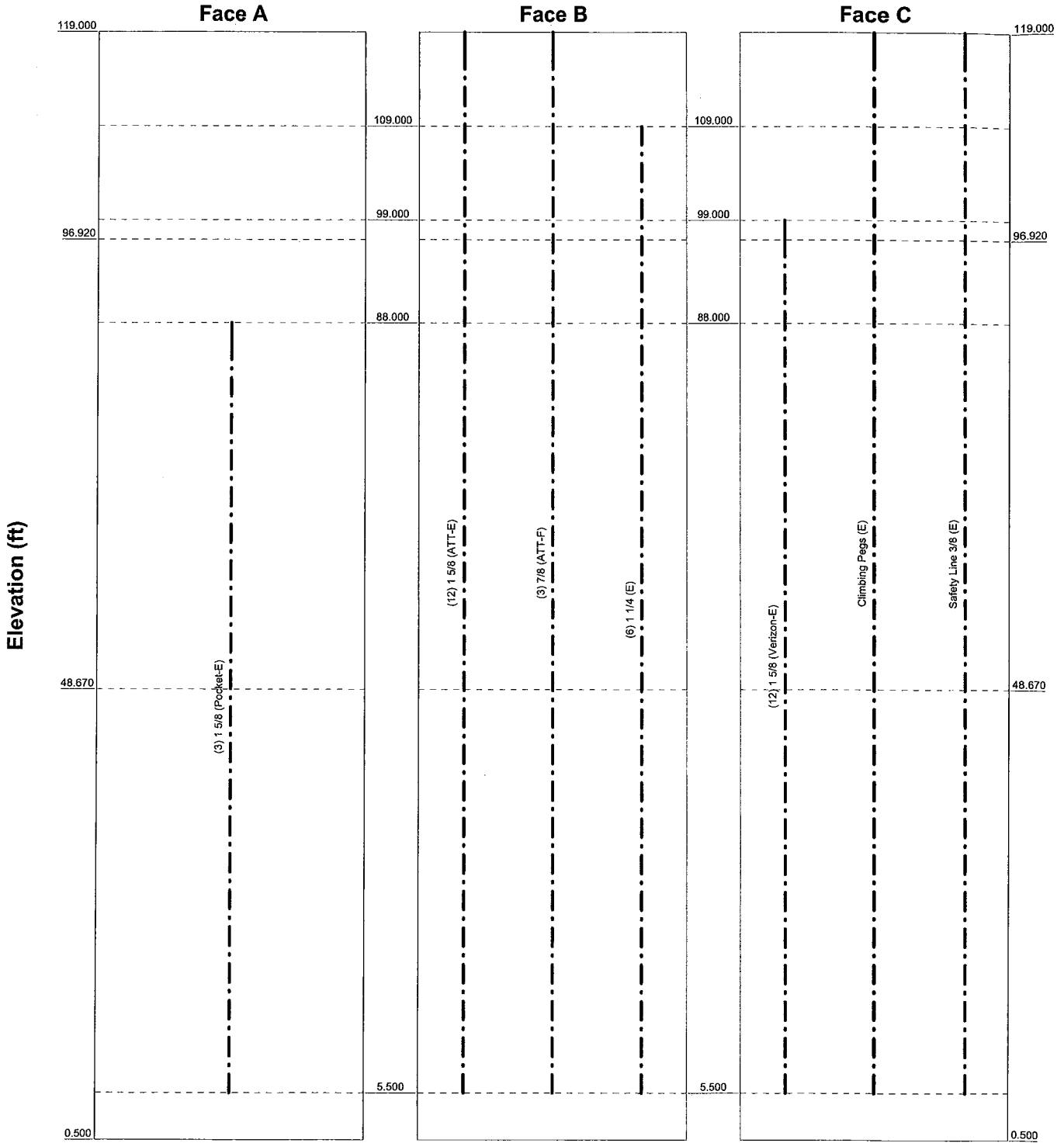


 <p><b>B&amp;T Engineering, Inc.</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	Job: <b>84029 - Burlington-Nepaug Road, CT (Site# 84261-A)</b>	
	Project: <b>119' EEI Monopole / Verizon Wireless Co-Locate</b>	
	Client: <b>AT&amp;T Towers</b>	
	Drawn by: <b>K. Mears</b>	
	App'd:	
Code: <b>TIA/EIA-222-F</b>	Date: <b>01/06/12</b>	Scale: <b>NTS</b>
Path:	Dwg No. <b>E-5</b>	

# Feedline Distribution Chart

## 6" - 119'

\_\_\_\_\_ Round \_\_\_\_\_
\_\_\_\_\_ Flat \_\_\_\_\_
\_\_\_\_\_ App In Face \_\_\_\_\_
\_\_\_\_\_ App Out Face \_\_\_\_\_
\_\_\_\_\_ Truss Leg \_\_\_\_\_



	<b>B&amp;T Engineering, Inc.</b>		Job: <b>84029 - Burlington-Nepaug Road, CT (Site# 84261-A)</b>		
	1717 S. Boulder, Suite 300		Project: <b>119' EEI Monopole / Verizon Wireless Co-Locate</b>		
	Tulsa, OK 74119		Client: <b>AT&amp;T Towers</b>	Drawn by: <b>K. Mears</b>	App'd:
	Phone: (918) 587-4630		Code: <b>TIA/EIA-222-F</b>	Date: <b>01/06/12</b>	Scale: <b>NTS</b>
	FAX: (918) 295-0265		Path:		Dwg No. <b>E-7</b>

<b>tnxTower</b>  <b>B&amp;T Engineering, Inc.</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 84029 - Burlington-Nepaug Road, CT (Site# 84261-A)	<b>Page</b> 1 of 14
	<b>Project</b> 119' EEI Monopole / Verizon Wireless Co-Locate	<b>Date</b> 10:01:43 01/06/12
	<b>Client</b> AT&T Towers	<b>Designed by</b> K. Mears

## 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 1.000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.000 pcf.
- A wind speed of 38 mph is used in combination with ice.
- Temperature drop of 50.000 °F.
- Deflections calculated using a wind speed of 50 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.333.
- Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

## Options

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

## Tapered Pole Section Geometry

Section	Elevation <i>ft</i>	Section Length <i>ft</i>	Splice Length <i>ft</i>	Number of Sides	Top Diameter <i>in</i>	Bottom Diameter <i>in</i>	Wall Thickness <i>in</i>	Bend Radius <i>in</i>	Pole Grade
L1	119.000-96.920	22.080	4.000	18	23.000	28.214	0.188	0.750	A572-65 (65 ksi)
L2	96.920-48.670	52.250	5.000	18	26.895	39.232	0.250	1.000	A572-65 (65 ksi)
L3	48.670-0.500	53.170		18	37.551	50.105	0.313	1.250	A572-65 (65 ksi)



<b>tnxTower</b>  <b>B&amp;T Engineering, Inc.</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 84029 - Burlington-Nepaug Road, CT (Site# 84261-A)	<b>Page</b> 2 of 14
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	<b>Client</b> AT&T Towers	<b>Designed by</b> K. Mears

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>2</sup>	w in	w/t
L1	23.355	13.576	892.615	8.098	11.684	76.396	1786.405	6.789	3.718	19.829
	28.649	16.679	1655.242	9.949	14.333	115.486	3312.662	8.341	4.636	24.724
L2	28.269	21.142	1896.321	9.459	13.662	138.798	3795.138	10.573	4.293	17.174
	39.837	30.932	5938.454	13.839	19.930	297.968	11884.722	15.469	6.465	25.859
L3	39.329	36.936	6471.148	13.220	19.076	339.229	12950.811	18.472	6.059	19.389
	50.878	49.388	15469.853	17.676	25.453	607.773	30960.062	24.699	8.268	26.459

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft <sup>2</sup>	in					in	in
L1 119.000-96.920				1	1	1.05		
L2 96.920-48.670				1	1	1.05		
L3 48.670-0.500				1	1	1.05		

### Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number	Number Per Row	Clear Spacing	Width or Diameter	Perimeter	Weight
				ft			in	in	in	klf
*****										

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

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number	C <sub>A</sub> A <sub>A</sub>	Weight
				ft		ft <sup>2</sup> /ft	klf
1 5/8 (ATT-E)	B	No	Inside Pole	119.000 - 5.500	12	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.001 0.001 0.001
7/8 (ATT-F)	B	No	Inside Pole	119.000 - 5.500	3	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.001 0.001 0.001
*****							
1 1/4 (E)	B	No	Inside Pole	109.000 - 5.500	6	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.001 0.001 0.001
*****							
1 5/8 (Verizon-E)	C	No	Inside Pole	99.000 - 5.500	12	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.001 0.001

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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C <sub>A</sub> A <sub>A</sub>		Weight klf
						In Face	Out Face	
*****						4" Ice	0.000	0.001
1 5/8 (Pocket-E)	A	No	Inside Pole	88.000 - 5.500	3	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
*****								
Climbing Pegs (E)	C	No	CaAa (Out Of Face)	119.000 - 5.500	1	No Ice	0.000	0.001
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
Safety Line 3/8 (E)	C	No	CaAa (Out Of Face)	119.000 - 5.500	1	No Ice	0.037	0.000
						1/2" Ice	0.137	0.001
						1" Ice	0.238	0.001
						2" Ice	0.437	0.002
						4" Ice	0.838	0.004
*****								

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub>		Weight K
					In Face	Out Face	
L1	119.000-96.920	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.359
		C	0.000	0.000	0.000	0.828	0.043
L2	96.920-48.670	A	0.000	0.000	0.000	0.000	0.123
		B	0.000	0.000	0.000	0.000	0.871
		C	0.000	0.000	0.000	1.809	0.639
L3	48.670-0.500	A	0.000	0.000	0.000	0.000	0.135
		B	0.000	0.000	0.000	0.000	0.780
		C	0.000	0.000	0.000	1.619	0.572

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

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub>		Weight K
						In Face	Out Face	
L1	119.000-96.920	A	1.152	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.359
		C		0.000	0.000	0.000	5.917	0.058
L2	96.920-48.670	A	1.098	0.000	0.000	0.000	0.000	0.123
		B		0.000	0.000	0.000	0.000	0.871
		C		0.000	0.000	0.000	12.930	0.672
L3	48.670-0.500	A	1.000	0.000	0.000	0.000	0.000	0.135
		B		0.000	0.000	0.000	0.000	0.780
		C		0.000	0.000	0.000	11.100	0.599

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### Feed Line Center of Pressure

Section	Elevation <i>ft</i>	$CP_x$	$CP_z$	$CP_x$	$CP_z$
		<i>in</i>	<i>in</i>	<i>Ice</i> <i>in</i>	<i>Ice</i> <i>in</i>
L1	119.000-96.920	-0.048	0.028	-0.286	0.165
L2	96.920-48.670	-0.048	0.028	-0.299	0.173
L3	48.670-0.500	-0.043	0.025	-0.266	0.153

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement <i>ft</i>	$C_A A_A$		Weight <i>K</i>	
			Horz Lateral <i>ft</i>	Vert <i>ft</i>			Front <i>ft</i> <sup>2</sup>	Side <i>ft</i> <sup>2</sup>		
P65-16-XLH-RR w/Mount Pipe (ATT-F)	C	From Leg	3.000	0.000	0.000	120.000	No Ice	8.637	6.362	0.079
			0.000	0.000			1/2" Ice	9.290	7.538	0.141
			0.000	0.000			1" Ice	9.910	8.427	0.216
							2" Ice	11.176	10.239	0.393
							4" Ice	13.829	14.099	0.886
P65-16-XLH-RR w/Mount Pipe (ATT-F)	B	From Leg	3.000	0.000	0.000	120.000	No Ice	8.637	6.362	0.079
			0.000	0.000			1/2" Ice	9.290	7.538	0.141
			0.000	0.000			1" Ice	9.910	8.427	0.216
							2" Ice	11.176	10.239	0.393
							4" Ice	13.829	14.099	0.886
P65-16-XLH-RR w/Mount Pipe (ATT-F)	A	From Leg	3.000	0.000	0.000	120.000	No Ice	8.637	6.362	0.079
			0.000	0.000			1/2" Ice	9.290	7.538	0.141
			0.000	0.000			1" Ice	9.910	8.427	0.216
							2" Ice	11.176	10.239	0.393
							4" Ice	13.829	14.099	0.886
(2) RRUS-11 (ATT-F)	C	From Leg	3.000	0.000	0.000	120.000	No Ice	4.424	1.186	0.055
			0.000	0.000			1/2" Ice	4.708	1.351	0.081
			0.000	0.000			1" Ice	5.001	1.526	0.110
							2" Ice	5.613	1.900	0.179
							4" Ice	6.940	2.753	0.368
(2) RRUS-11 (ATT-F)	B	From Leg	3.000	0.000	0.000	120.000	No Ice	4.424	1.186	0.055
			0.000	0.000			1/2" Ice	4.708	1.351	0.081
			0.000	0.000			1" Ice	5.001	1.526	0.110
							2" Ice	5.613	1.900	0.179
							4" Ice	6.940	2.753	0.368
(2) RRUS-11 (ATT-F)	A	From Leg	3.000	0.000	0.000	120.000	No Ice	4.424	1.186	0.055
			0.000	0.000			1/2" Ice	4.708	1.351	0.081
			0.000	0.000			1" Ice	5.001	1.526	0.110
							2" Ice	5.613	1.900	0.179
							4" Ice	6.940	2.753	0.368
(2) 7770.00 w/Mount Pipe (ATT-E)	C	From Leg	3.000	30.000	0.000	120.000	No Ice	6.218	4.353	0.057
			0.000	0.000			1/2" Ice	6.769	5.198	0.103
			0.000	0.000			1" Ice	7.296	5.919	0.159
							2" Ice	8.385	7.411	0.293
							4" Ice	10.691	10.763	0.680
(2) 7770.00 w/Mount Pipe (ATT-E)	B	From Leg	3.000	30.000	0.000	120.000	No Ice	6.218	4.353	0.057
			0.000	0.000			1/2" Ice	6.769	5.198	0.103
			0.000	0.000			1" Ice	7.296	5.919	0.159
							2" Ice	8.385	7.411	0.293
							4" Ice	10.691	10.763	0.680
(2) 7770.00 w/Mount Pipe (ATT-E)	A	From Leg	3.000	30.000	0.000	120.000	No Ice	6.218	4.353	0.057
			0.000	0.000			1/2" Ice	6.769	5.198	0.103
			0.000	0.000			1" Ice	7.296	5.919	0.159

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	<b>Project</b> 119' EEI Monopole / Verizon Wireless Co-Locate	<b>Date</b> 10:01:43 01/06/12
	<b>Client</b> AT&T Towers	<b>Designed by</b> K. Mears

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K
			Horz Lateral ft	Vert ft					
							2" Ice 8.385	7.411	0.293
							4" Ice 10.691	10.763	0.680
(2) LGP21401 TMA (ATT-E)	C	From Leg	3.000	0.000	30.000	120.000	No Ice 1.288	0.364	0.014
			0.000	0.000			1/2" Ice 1.445	0.479	0.021
							1" Ice 1.611	0.602	0.030
							2" Ice 1.969	0.874	0.055
							4" Ice 2.788	1.522	0.135
(2) LGP21401 TMA (ATT-E)	B	From Leg	3.000	0.000	30.000	120.000	No Ice 1.288	0.364	0.014
			0.000	0.000			1/2" Ice 1.445	0.479	0.021
							1" Ice 1.611	0.602	0.030
							2" Ice 1.969	0.874	0.055
							4" Ice 2.788	1.522	0.135
(2) LGP21401 TMA (ATT-E)	A	From Leg	3.000	0.000	30.000	120.000	No Ice 1.288	0.364	0.014
			0.000	0.000			1/2" Ice 1.445	0.479	0.021
							1" Ice 1.611	0.602	0.030
							2" Ice 1.969	0.874	0.055
							4" Ice 2.788	1.522	0.135
(2) LGP13519 (ATT-E)	C	From Leg	3.000	0.000	30.000	120.000	No Ice 0.338	0.207	0.005
			0.000	0.000			1/2" Ice 0.422	0.280	0.008
							1" Ice 0.515	0.362	0.012
							2" Ice 0.726	0.551	0.024
							4" Ice 1.252	1.034	0.071
(2) LGP13519 (ATT-E)	B	From Leg	3.000	0.000	30.000	120.000	No Ice 0.338	0.207	0.005
			0.000	0.000			1/2" Ice 0.422	0.280	0.008
							1" Ice 0.515	0.362	0.012
							2" Ice 0.726	0.551	0.024
							4" Ice 1.252	1.034	0.071
(2) LGP13519 (ATT-E)	A	From Leg	3.000	0.000	30.000	120.000	No Ice 0.338	0.207	0.005
			0.000	0.000			1/2" Ice 0.422	0.280	0.008
							1" Ice 0.515	0.362	0.012
							2" Ice 0.726	0.551	0.024
							4" Ice 1.252	1.034	0.071
6' x 2" Mount Pipe (ATT-E)	C	From Leg	3.000	0.000	0.000	120.000	No Ice 1.425	1.425	0.022
			0.000	0.000			1/2" Ice 1.925	1.925	0.033
							1" Ice 2.294	2.294	0.048
							2" Ice 3.060	3.060	0.090
							4" Ice 4.702	4.702	0.231
6' x 2" Mount Pipe (ATT-E)	B	From Leg	3.000	0.000	0.000	120.000	No Ice 1.425	1.425	0.022
			0.000	0.000			1/2" Ice 1.925	1.925	0.033
							1" Ice 2.294	2.294	0.048
							2" Ice 3.060	3.060	0.090
							4" Ice 4.702	4.702	0.231
6' x 2" Mount Pipe (ATT-E)	A	From Leg	3.000	0.000	0.000	120.000	No Ice 1.425	1.425	0.022
			0.000	0.000			1/2" Ice 1.925	1.925	0.033
							1" Ice 2.294	2.294	0.048
							2" Ice 3.060	3.060	0.090
							4" Ice 4.702	4.702	0.231
Platform Mount [LP 714-1] (ATT-E)	C	None			0.000	120.000	No Ice 37.470	37.470	1.600
							1/2" Ice 44.230	44.230	2.040
							1" Ice 50.990	50.990	2.480
							2" Ice 64.510	64.510	3.360
							4" Ice 91.550	91.550	5.119
*****									
(2) 950F85T2E-M w/ Mount Pipe (E)	C	From Leg	3.000	0.000	0.000	109.000	No Ice 3.015	5.661	0.033
			0.000	0.000			1/2" Ice 3.467	6.545	0.071
							1" Ice 3.903	7.306	0.120
							2" Ice 4.804	8.949	0.237

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	<b>Client</b> AT&T Towers	<b>Designed by</b> K. Mears

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement		C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Vert						
			ft	ft	°	ft		ft <sup>2</sup>	ft <sup>2</sup>	K
(2) 950F85T2E-M w/ Mount Pipe (E)	B	From Leg	3.000	0.000	0.000	109.000	4" Ice	6.712	12.536	0.592
							No Ice	3.015	5.661	0.033
							1/2" Ice	3.467	6.545	0.071
							1" Ice	3.903	7.306	0.120
							2" Ice	4.804	8.949	0.237
(2) 950F85T2E-M w/ Mount Pipe (E)	A	From Leg	3.000	0.000	0.000	109.000	4" Ice	6.712	12.536	0.592
							No Ice	3.015	5.661	0.033
							1/2" Ice	3.467	6.545	0.071
							1" Ice	3.903	7.306	0.120
							2" Ice	4.804	8.949	0.237
(2) 6' x 2" Mount Pipe (E)	C	From Leg	3.000	0.000	0.000	109.000	4" Ice	6.712	12.536	0.592
							No Ice	1.425	1.425	0.022
							1/2" Ice	1.925	1.925	0.033
							1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
(2) 6' x 2" Mount Pipe (E)	B	From Leg	3.000	0.000	0.000	109.000	4" Ice	4.702	4.702	0.231
							No Ice	1.425	1.425	0.022
							1/2" Ice	1.925	1.925	0.033
							1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
(2) 6' x 2" Mount Pipe (E)	A	From Leg	3.000	0.000	0.000	109.000	4" Ice	4.702	4.702	0.231
							No Ice	1.425	1.425	0.022
							1/2" Ice	1.925	1.925	0.033
							1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
Platform Mount [LP 714-1] (E)	C	None			0.000	109.000	4" Ice	4.702	4.702	0.231
							No Ice	37.470	37.470	1.600
							1/2" Ice	44.230	44.230	2.040
							1" Ice	50.990	50.990	2.480
							2" Ice	64.510	64.510	3.360
***** BXA-171085-8BF_2 w/Mount Pipe (Verizon-P)	C	From Leg	3.000	0.000	30.000	99.000	4" Ice	7.519	9.639	0.542
							No Ice	3.407	3.581	0.052
							1/2" Ice	3.883	4.383	0.084
							1" Ice	4.350	5.062	0.125
							2" Ice	5.360	6.471	0.228
BXA-171085-8BF_2 w/Mount Pipe (Verizon-P)	B	From Leg	3.000	0.000	30.000	99.000	4" Ice	7.519	9.639	0.542
							No Ice	3.407	3.581	0.052
							1/2" Ice	3.883	4.383	0.084
							1" Ice	4.350	5.062	0.125
							2" Ice	5.360	6.471	0.228
BXA-171085-8BF_2 w/Mount Pipe (Verizon-P)	A	From Leg	3.000	0.000	30.000	99.000	4" Ice	7.519	9.639	0.542
							No Ice	3.407	3.581	0.052
							1/2" Ice	3.883	4.383	0.084
							1" Ice	4.350	5.062	0.125
							2" Ice	5.360	6.471	0.228
BXA-70063-6CF_2 w/Mount Pipe (Verizon-P)	C	From Leg	3.000	0.000	30.000	99.000	4" Ice	7.519	9.639	0.542
							No Ice	7.751	5.583	0.052
							1/2" Ice	8.295	6.520	0.108
							1" Ice	8.846	7.334	0.175
							2" Ice	9.974	9.011	0.334
BXA-70063-6CF_2 w/Mount Pipe (Verizon-P)	B	From Leg	3.000	0.000	30.000	99.000	4" Ice	12.335	12.565	0.783
							No Ice	7.751	5.583	0.052
							1/2" Ice	8.295	6.520	0.108
							1" Ice	8.846	7.334	0.175
							2" Ice	9.974	9.011	0.334
							4" Ice	12.335	12.565	0.783



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	<b>Client</b> AT&T Towers	<b>Designed by</b> K. Mears

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub>		Weight	
			Horz Lateral	Vert			Front	Side		
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
BXA-70063-6CF_2 w/Mount Pipe (Verizon-P)	A	From Leg	3.000		30.000	99.000	No Ice	7.751	5.583	0.052
			0.000				1/2" Ice	8.295	6.520	0.108
			0.000				1" Ice	8.846	7.334	0.175
							2" Ice	9.974	9.011	0.334
							4" Ice	12.335	12.565	0.783
(2) LPA-80080/4CF w/Mount Pipe (Verizon-P)	C	From Leg	3.000		30.000	99.000	No Ice	3.110	7.482	0.034
			0.000				1/2" Ice	3.585	8.378	0.080
			0.000				1" Ice	4.022	9.152	0.137
							2" Ice	5.013	10.752	0.270
							4" Ice	7.153	14.168	0.651
(2) LPA-80080/4CF w/Mount Pipe (Verizon-P)	B	From Leg	3.000		30.000	99.000	No Ice	3.110	7.482	0.034
			0.000				1/2" Ice	3.585	8.378	0.080
			0.000				1" Ice	4.022	9.152	0.137
							2" Ice	5.013	10.752	0.270
							4" Ice	7.153	14.168	0.651
(2) LPA-80080/4CF w/Mount Pipe (Verizon-P)	A	From Leg	3.000		30.000	99.000	No Ice	3.110	7.482	0.034
			0.000				1/2" Ice	3.585	8.378	0.080
			0.000				1" Ice	4.022	9.152	0.137
							2" Ice	5.013	10.752	0.270
							4" Ice	7.153	14.168	0.651
(2) FD9R6004/2C-3L (Verizon-P)	C	From Leg	3.000		30.000	99.000	No Ice	0.367	0.085	0.003
			0.000				1/2" Ice	0.451	0.136	0.005
			0.000				1" Ice	0.543	0.196	0.009
							2" Ice	0.755	0.343	0.020
							4" Ice	1.281	0.740	0.063
(2) FD9R6004/2C-3L (Verizon-P)	B	From Leg	3.000		30.000	99.000	No Ice	0.367	0.085	0.003
			0.000				1/2" Ice	0.451	0.136	0.005
			0.000				1" Ice	0.543	0.196	0.009
							2" Ice	0.755	0.343	0.020
							4" Ice	1.281	0.740	0.063
(2) FD9R6004/2C-3L (Verizon-P)	A	From Leg	3.000		30.000	99.000	No Ice	0.367	0.085	0.003
			0.000				1/2" Ice	0.451	0.136	0.005
			0.000				1" Ice	0.543	0.196	0.009
							2" Ice	0.755	0.343	0.020
							4" Ice	1.281	0.740	0.063
Platform Mount [LP 714-1] (Verizon-E)	C	None			0.000	99.000	No Ice	37.470	37.470	1.600
							1/2" Ice	44.230	44.230	2.040
							1" Ice	50.990	50.990	2.480
							2" Ice	64.510	64.510	3.360
							4" Ice	91.550	91.550	5.119
*****										
742 213 w/ Mount Pipe (Pocket-E)	C	From Leg	1.000		30.000	88.000	No Ice	5.373	4.620	0.049
			0.000				1/2" Ice	5.950	6.000	0.091
			0.000				1" Ice	6.501	6.982	0.144
							2" Ice	7.611	8.852	0.277
							4" Ice	9.933	12.794	0.682
742 213 w/ Mount Pipe (Pocket-E)	B	From Leg	1.000		30.000	88.000	No Ice	5.373	4.620	0.049
			0.000				1/2" Ice	5.950	6.000	0.091
			0.000				1" Ice	6.501	6.982	0.144
							2" Ice	7.611	8.852	0.277
							4" Ice	9.933	12.794	0.682
742 213 w/ Mount Pipe (Pocket-E)	A	From Leg	1.000		30.000	88.000	No Ice	5.373	4.620	0.049
			0.000				1/2" Ice	5.950	6.000	0.091
			0.000				1" Ice	6.501	6.982	0.144
							2" Ice	7.611	8.852	0.277
							4" Ice	9.933	12.794	0.682
Flush Mount	C	From Leg	1.000		0.000	88.000	No Ice	1.000	1.000	0.100

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>1</sub> Front	C <sub>A</sub> A <sub>2</sub> Side	Weight
			Horz Lateral	Vert					
(Pocket-E)			0.000						
			0.000			1/2" Ice	2.000	2.000	0.150
						1" Ice	3.000	3.000	0.200
						2" Ice	5.000	5.000	0.300
						4" Ice	9.000	9.000	0.500
Flush Mount (Pocket-E)	B	From Leg	1.000		0.000	88.000	No Ice	1.000	0.100
			0.000				1/2" Ice	2.000	0.150
			0.000				1" Ice	3.000	0.200
							2" Ice	5.000	0.300
							4" Ice	9.000	0.500
Flush Mount (Pocket-E)	A	From Leg	1.000		0.000	88.000	No Ice	1.000	0.100
			0.000				1/2" Ice	2.000	0.150
			0.000				1" Ice	3.000	0.200
							2" Ice	5.000	0.300
							4" Ice	9.000	0.500

\*\*\*\*\*

## 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

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Comb. No.	Description
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

### Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	119 - 96.92	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-11.393	0.024	-0.014
			Max. Mx	11	-5.383	126.966	-0.008
			Max. My	8	-5.383	0.013	-126.961
			Max. Vy	11	-8.906	126.966	-0.008
			Max. Vx	8	8.906	0.013	-126.961
			Max. Torque	26			0.007
L2	96.92 - 48.67	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-25.612	0.105	-0.061
			Max. Mx	11	-14.056	819.877	-0.033
			Max. My	8	-14.056	0.057	-819.853
			Max. Vy	11	-16.487	819.877	-0.033
			Max. Vx	8	16.487	0.057	-819.853
			Max. Torque	26			0.030
L3	48.67 - 0.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-39.257	0.208	-0.120
			Max. Mx	11	-24.960	1781.531	-0.066
			Max. My	8	-24.960	0.115	-1781.483
			Max. Vy	11	-19.691	1781.531	-0.066
			Max. Vx	8	19.691	0.115	-1781.483
			Max. Torque	26			0.054

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	39.257	0.000	0.000
	Max. H <sub>x</sub>	11	24.975	19.673	0.000
	Max. H <sub>z</sub>	2	24.975	0.000	19.673
	Max. M <sub>x</sub>	2	1781.351	0.000	19.673
	Max. M <sub>z</sub>	5	1781.302	-19.673	0.000
	Max. Torsion	26	0.054	2.824	4.892
	Min. Vert	11	24.975	19.673	0.000
	Min. H <sub>x</sub>	5	24.975	-19.673	0.000
	Min. H <sub>z</sub>	8	24.975	0.000	-19.673
	Min. M <sub>x</sub>	8	-1781.483	0.000	-19.673
	Min. M <sub>z</sub>	11	-1781.531	19.673	0.000
	Min. Torsion	20	-0.054	-2.824	-4.892

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### Tower Mast Reaction Summary

Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>y</sub>	Overturning Moment, M <sub>x</sub>	Overturning Moment, M <sub>y</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	24.975	0.000	0.000	0.065	0.112	0.000
Dead+Wind 0 deg - No Ice	24.975	0.000	-19.673	-1781.351	0.115	-0.029
Dead+Wind 30 deg - No Ice	24.975	9.837	-17.038	-1542.759	-890.636	-0.017
Dead+Wind 60 deg - No Ice	24.975	17.038	-9.837	-890.684	-1542.710	-0.000
Dead+Wind 90 deg - No Ice	24.975	19.673	0.000	0.066	-1781.302	0.017
Dead+Wind 120 deg - No Ice	24.975	17.038	9.837	890.816	-1542.710	0.029
Dead+Wind 150 deg - No Ice	24.975	9.837	17.038	1542.891	-890.636	0.033
Dead+Wind 180 deg - No Ice	24.975	0.000	19.673	1781.483	0.115	0.029
Dead+Wind 210 deg - No Ice	24.975	-9.837	17.038	1542.891	890.865	0.017
Dead+Wind 240 deg - No Ice	24.975	-17.038	9.837	890.816	1542.939	-0.000
Dead+Wind 270 deg - No Ice	24.975	-19.673	0.000	0.066	1781.531	-0.017
Dead+Wind 300 deg - No Ice	24.975	-17.038	-9.837	-890.684	1542.939	-0.029
Dead+Wind 330 deg - No Ice	24.975	-9.837	-17.038	-1542.758	890.865	-0.033
Dead+Ice+Temp	39.257	0.000	0.000	0.120	0.208	0.000
Dead+Wind 0 deg+Ice+Temp	39.257	0.000	-5.649	-535.570	0.219	-0.046
Dead+Wind 30 deg+Ice+Temp	39.257	2.824	-4.892	-463.800	-267.630	-0.027
Dead+Wind 60 deg+Ice+Temp	39.257	4.892	-2.824	-267.722	-463.708	-0.000
Dead+Wind 90 deg+Ice+Temp	39.257	5.649	0.000	0.126	-535.478	0.027
Dead+Wind 120 deg+Ice+Temp	39.257	4.892	2.824	267.975	-463.708	0.046
Dead+Wind 150 deg+Ice+Temp	39.257	2.824	4.892	464.053	-267.630	0.054
Dead+Wind 180 deg+Ice+Temp	39.257	0.000	5.649	535.823	0.219	0.046
Dead+Wind 210 deg+Ice+Temp	39.257	-2.824	4.892	464.053	268.067	0.027
Dead+Wind 240 deg+Ice+Temp	39.257	-4.892	2.824	267.975	464.146	-0.000
Dead+Wind 270 deg+Ice+Temp	39.257	-5.649	0.000	0.126	535.915	-0.027
Dead+Wind 300 deg+Ice+Temp	39.257	-4.892	-2.824	-267.722	464.146	-0.046
Dead+Wind 330 deg+Ice+Temp	39.257	-2.824	-4.892	-463.801	268.067	-0.054
Dead+Wind 0 deg - Service	24.975	0.000	-7.685	-696.191	0.115	-0.011
Dead+Wind 30 deg - Service	24.975	3.842	-6.655	-602.934	-348.027	-0.007
Dead+Wind 60 deg - Service	24.975	6.655	-3.842	-348.076	-602.885	-0.000
Dead+Wind 90 deg - Service	24.975	7.685	-0.000	0.066	-696.142	0.007
Dead+Wind 120 deg - Service	24.975	6.655	3.842	348.208	-602.885	0.011
Dead+Wind 150 deg - Service	24.975	3.842	6.655	603.066	-348.027	0.013
Dead+Wind 180 deg - Service	24.975	0.000	7.685	696.323	0.115	0.011
Dead+Wind 210 deg - Service	24.975	-3.842	6.655	603.066	348.257	0.007
Dead+Wind 240 deg - Service	24.975	-6.655	3.842	348.208	603.115	-0.000
Dead+Wind 270 deg - Service	24.975	-7.685	-0.000	0.066	696.372	-0.007
Dead+Wind 300 deg - Service	24.975	-6.655	-3.842	-348.076	603.115	-0.011
Dead+Wind 330 deg - Service	24.975	-3.842	-6.655	-602.934	348.257	-0.013

### 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	0.000	-24.975	0.000	0.000	24.975	0.000	0.000%
2	0.000	-24.975	-19.674	0.000	24.975	19.673	0.002%
3	9.837	-24.975	-17.038	-9.837	24.975	17.038	0.000%
4	17.038	-24.975	-9.837	-17.038	24.975	9.837	0.000%
5	19.674	-24.975	0.000	-19.673	24.975	0.000	0.002%
6	17.038	-24.975	9.837	-17.038	24.975	-9.837	0.000%
7	9.837	-24.975	17.038	-9.837	24.975	-17.038	0.000%
8	0.000	-24.975	19.674	0.000	24.975	-19.673	0.002%
9	-9.837	-24.975	17.038	9.837	24.975	-17.038	0.000%
10	-17.038	-24.975	9.837	17.038	24.975	-9.837	0.000%
11	-19.674	-24.975	0.000	19.673	24.975	0.000	0.002%



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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	
12	-17.038	-24.975	-9.837	17.038	24.975	9.837	0.000%
13	-9.837	-24.975	-17.038	9.837	24.975	17.038	0.000%
14	0.000	-39.257	0.000	0.000	39.257	0.000	0.000%
15	0.000	-39.257	-5.649	0.000	39.257	5.649	0.000%
16	2.824	-39.257	-4.892	-2.824	39.257	4.892	0.000%
17	4.892	-39.257	-2.824	-4.892	39.257	2.824	0.000%
18	5.649	-39.257	0.000	-5.649	39.257	0.000	0.000%
19	4.892	-39.257	2.824	-4.892	39.257	-2.824	0.000%
20	2.824	-39.257	4.892	-2.824	39.257	-4.892	0.000%
21	0.000	-39.257	5.649	0.000	39.257	-5.649	0.000%
22	-2.824	-39.257	4.892	2.824	39.257	-4.892	0.000%
23	-4.892	-39.257	2.824	4.892	39.257	-2.824	0.000%
24	-5.649	-39.257	0.000	5.649	39.257	0.000	0.000%
25	-4.892	-39.257	-2.824	4.892	39.257	2.824	0.000%
26	-2.824	-39.257	-4.892	2.824	39.257	4.892	0.000%
27	0.000	-24.975	-7.685	-0.000	24.975	7.685	0.001%
28	3.843	-24.975	-6.655	-3.842	24.975	6.655	0.000%
29	6.655	-24.975	-3.843	-6.655	24.975	3.842	0.000%
30	7.685	-24.975	0.000	-7.685	24.975	0.000	0.001%
31	6.655	-24.975	3.843	-6.655	24.975	-3.842	0.000%
32	3.843	-24.975	6.655	-3.842	24.975	-6.655	0.000%
33	0.000	-24.975	7.685	-0.000	24.975	-7.685	0.001%
34	-3.843	-24.975	6.655	3.842	24.975	-6.655	0.000%
35	-6.655	-24.975	3.843	6.655	24.975	-3.842	0.000%
36	-7.685	-24.975	0.000	7.685	24.975	0.000	0.001%
37	-6.655	-24.975	-3.843	6.655	24.975	3.842	0.000%
38	-3.843	-24.975	-6.655	3.842	24.975	6.655	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	5	0.00000001	0.00010541
3	Yes	8	0.00000001	0.00005198
4	Yes	8	0.00000001	0.00005200
5	Yes	5	0.00000001	0.00010522
6	Yes	8	0.00000001	0.00005203
7	Yes	8	0.00000001	0.00005197
8	Yes	5	0.00000001	0.00010542
9	Yes	8	0.00000001	0.00005204
10	Yes	8	0.00000001	0.00005202
11	Yes	5	0.00000001	0.00010523
12	Yes	8	0.00000001	0.00005198
13	Yes	8	0.00000001	0.00005204
14	Yes	4	0.00000001	0.00000001
15	Yes	7	0.00000001	0.00004082
16	Yes	7	0.00000001	0.00005677
17	Yes	7	0.00000001	0.00005680
18	Yes	7	0.00000001	0.00004081
19	Yes	7	0.00000001	0.00005689
20	Yes	7	0.00000001	0.00005678
21	Yes	7	0.00000001	0.00004084
22	Yes	7	0.00000001	0.00005692
23	Yes	7	0.00000001	0.00005689
24	Yes	7	0.00000001	0.00004085

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25	Yes	7	0.0000001	0.00005681
26	Yes	7	0.0000001	0.00005692
27	Yes	5	0.0000001	0.00005498
28	Yes	6	0.0000001	0.00010930
29	Yes	6	0.0000001	0.00010938
30	Yes	5	0.0000001	0.00005496
31	Yes	6	0.0000001	0.00010958
32	Yes	6	0.0000001	0.00010927
33	Yes	5	0.0000001	0.00005499
34	Yes	6	0.0000001	0.00010960
35	Yes	6	0.0000001	0.00010952
36	Yes	5	0.0000001	0.00005497
37	Yes	6	0.0000001	0.00010932
38	Yes	6	0.0000001	0.00010964

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119 - 96.92	19.737	36	1.431	0.000
L2	100.92 - 48.67	14.445	36	1.338	0.000
L3	53.67 - 0.5	3.965	35	0.695	0.000

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.000	P65-16-XLH-RR w/Mount Pipe	36	19.737	1.431	0.000	23864
109.000	(2) 950F85T2E-M w/ Mount Pipe	36	16.772	1.389	0.000	11932
99.000	BXA-171085-8BF_2 w/Mount Pipe	36	13.907	1.323	0.000	6332
88.000	742 213 w/ Mount Pipe	35	10.973	1.207	0.000	4987

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119 - 96.92	50.458	11	3.658	0.000
L2	100.92 - 48.67	36.933	11	3.422	0.000
L3	53.67 - 0.5	10.141	11	1.778	0.000

<b>tnxTower</b>  <b>B&amp;T Engineering, Inc.</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 84029 - Burlington-Nepaug Road, CT (Site# 84261-A)	<b>Page</b> 13 of 14
	<b>Project</b> 119' EEI Monopole / Verizon Wireless Co-Locate	<b>Date</b> 10:01:43 01/06/12
	<b>Client</b> AT&T Towers	<b>Designed by</b> K. Mears

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

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
120.000	P65-16-XLH-RR w/Mount Pipe	11	50.458	3.658	0.000	9405
109.000	(2) 950F85T2E-M w/ Mount Pipe	11	42.880	3.551	0.000	4702
99.000	BXA-171085-8BF_2 w/Mount Pipe	11	35.559	3.383	0.000	2493
88.000	742 213 w/ Mount Pipe	11	28.059	3.086	0.000	1961

**Compression Checks**

**Pole Design Data**

Section No.	Elevation	Size	L	L <sub>u</sub>	Kl/r	F <sub>a</sub>	A	Actual P	Allow. P <sub>a</sub>	Ratio P
	ft		ft	ft		ksi	in <sup>2</sup>	K	K	P <sub>a</sub>
L1	119 - 96.92 (1)	TP28.214x23x0.188	22.080	0.000	0.0	39.000	16.117	-5.383	628.572	0.009
L2	96.92 - 48.67 (2)	TP39.232x26.895x0.25	52.250	0.000	0.0	38.873	29.995	-14.056	1166.020	0.012
L3	48.67 - 0.5 (3)	TP50.105x37.551x0.313	53.170	0.000	0.0	37.963	49.388	-24.960	1874.910	0.013

**Pole Bending Design Data**

Section No.	Elevation	Size	Actual M <sub>x</sub>	Actual f <sub>bx</sub>	Allow. F <sub>bx</sub>	Ratio f <sub>bx</sub> /F <sub>bx</sub>	Actual M <sub>y</sub>	Actual f <sub>by</sub>	Allow. F <sub>by</sub>	Ratio f <sub>by</sub> /F <sub>by</sub>
	ft		kip-ft	ksi	ksi		kip-ft	ksi	ksi	
L1	119 - 96.92 (1)	TP28.214x23x0.188	126.974	14.133	39.000	0.362	0.000	0.000	39.000	0.000
L2	96.92 - 48.67 (2)	TP39.232x26.895x0.25	819.926	35.122	38.873	0.904	0.000	0.000	38.873	0.000
L3	48.67 - 0.5 (3)	TP50.105x37.551x0.313	1781.63	35.177	37.963	0.927	0.000	0.000	37.963	0.000

3

**Pole Shear Design Data**

Section No.	Elevation	Size	Actual V	Actual f <sub>v</sub>	Allow. F <sub>v</sub>	Ratio f <sub>v</sub> /F <sub>v</sub>	Actual T	Actual f <sub>vt</sub>	Allow. F <sub>vt</sub>	Ratio f <sub>vt</sub> /F <sub>vt</sub>
	ft		K	ksi	ksi		kip-ft	ksi	ksi	
L1	119 - 96.92 (1)	TP28.214x23x0.188	8.907	0.553	26.000	0.043	0.000	0.000	26.000	0.000
L2	96.92 - 48.67 (2)	TP39.232x26.895x0.25	16.487	0.550	26.000	0.042	0.000	0.000	26.000	0.000
L3	48.67 - 0.5 (3)	TP50.105x37.551x0.313	19.692	0.399	26.000	0.031	0.000	0.000	26.000	0.000



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	<b>Project</b> 119' EEI Monopole / Verizon Wireless Co-Locate	<b>Date</b> 10:01:43 01/06/12
	<b>Client</b> AT&T Towers	<b>Designed by</b> K. Mears

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$P_a$	$F_{bx}$	$F_{by}$	$F_v$	$F_{vt}$			
L1	119 - 96.92 (1)	0.009	0.362	0.000	0.043	0.000	0.371	1.333	H1-3+VT ✓
L2	96.92 - 48.67 (2)	0.012	0.904	0.000	0.042	0.000	0.916	1.333	H1-3+VT ✓
L3	48.67 - 0.5 (3)	0.013	0.927	0.000	0.031	0.000	0.940	1.333	H1-3+VT ✓

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P <sub>allow</sub> K	% Capacity	Pass Fail
L1	119 - 96.92	Pole	TP28.214x23x0.188	1	-5.383	837.886	27.9	Pass
L2	96.92 - 48.67	Pole	TP39.232x26.895x0.25	2	-14.056	1554.305	68.7	Pass
L3	48.67 - 0.5	Pole	TP50.105x37.551x0.313	3	-24.960	2499.255	70.5	Pass
Summary								
Pole (L3)							70.5	Pass
<b>RATING =</b>							<b>70.5</b>	<b>Pass</b>

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



ALL FEEDLINES ROUTED  
INSIDE MONOPOLE

PROJECT#: 84029

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



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

## TIA Rev F

### Site Data

Site#: 84261-A

Site Name: Burlington-Nepaug Road, (

Pole Manufacturer: Other

### Anchor Rod Data

Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	60	in

### Plate Data

Diam:	66	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	13.25	in

### Stiffener Data (Welding at both sides)

Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

### Pole Data

Diam:	50.105	in
Thick:	0.3125	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

### Stress Increase Factor

ASIF: 1.333

### Reactions

Moment:	1782	ft-kips
Axial:	25	kips
Shear:	20	kips

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

### Anchor Rod Results

Maximum Rod Tension: 116.7 Kips  
 Allowable Tension: 195.0 Kips  
 Anchor Rod Stress Ratio: 59.9% **Pass**

Rigid
Service, ASD
Fty*ASIF

### Base Plate Results

Base Plate Stress: 32.9 ksi  
 Allowable Plate Stress: 60.0 ksi  
 Base Plate Stress Ratio: 54.9% **Pass**

Flexural Check

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length:
33.01

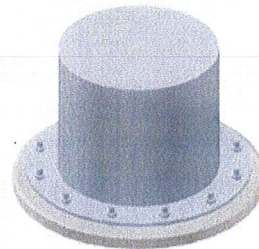
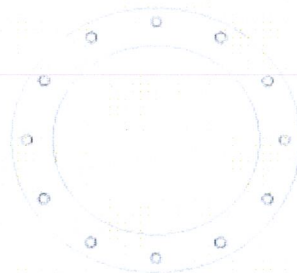
n/a

### 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



\* 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



**(Bearing and Stability Checks) Tool for TIA Rev F or G - Application (MP, SST with unitbase)**

**Site Data**

Site#: 84261-A

Site Name: Burlington - Nepaug Road, CT

Monopole Base Reaction Forces		
TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	25	kips
Unfactored WL Axial, PW:	0	kips
Unfactored WL Shear, V:	20	kips
Unfactored WL Moment, M:	1782	ft-kips

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

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	30	kips
0.90	0.9D+1.6W, Pu:	22.5	kips
1.35	Vu:	27	kips
	Mu:	2405.7	ft-kips

Pad & Pier Data		
Base PL Dist. Above Pier:	0	in
Pier Dist. Above Grade:	6	in
Pad Bearing Depth, D:	5	ft
Pad Thickness, T:	3	ft
Pad Width=Length, L:	25	ft
Pier Cross Section Shape:	Round	<--Pull Down
Enter Pier Diameter:	7	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	38.48	ft^2
Pier Height:	2.50	ft
Soil (above pad) Height:	2.00	ft

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

(No Soil Wedges) [Reaction+Conc+Soil]	553.73	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	2519.49	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 = 4.55 ft  
 Orthogonal qu= 1.53 ksf  
 qu/φ\*qn Ratio= 17.01% **Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 = 3.22 ft  
 Diagonal qu= 1.61 ksf  
 qu/φ\*qn Ratio= 17.85% **Pass**

<-- Press Upon Completing All Input

Soil Parameters		
Unit Weight, γ:	120.0	pcf
Ultimate Bearing Capacity, qn:	12.00	ksf
Strength Reduct. factor, φ:	0.75	
Angle of Friction, φ:	30.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: φ*qn:	9.00	ksf
Passive Pres. Coeff., Kp	3.00	

**Overtuning Stability Check**

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

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	27.0	kips
Pad Force Location Above D:	1.29	ft
φ(Passive Pressure Moment):	34.71	ft-kips
Factored O.T. M(WL), "1.6W":	2554.2	ft-kips
Factored OT (MW-Msoil), M1	2519.49	ft-kips

(w/ Soil Wedges) [Reaction+Conc+Soil]	421.52	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	2457.43	ft-kips

Orthogonal ecc3 = M2/P2 = 5.83 ft  
 Ortho Non Bearing Length, NBL= 11.66 ft  
 Orthogonal qu= 1.30 ksf  
 Diagonal qu= 1.50 ksf

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	1.15	ft
Sum of Soil Wedges Wt:	6.91	kips
Soil Wedges ecc, K1:	9.98	ft
Ftg+Soil above Pad wt:	436.4	kips
Unfactored (Total ftg-soil Wt):	443.35	kips
1.2D. <b>No Soil Wedges.</b>	553.73	kips
0.9D. <b>With Soil Wedges</b>	421.52	kips

Max Reaction Moment (ft-kips) so that qu=φ\*qn = 100% Capacity Rating

Resistance due to Cohesion (Vertical)		
φ*(1/2*Cu)(Total Vert. Planes)	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

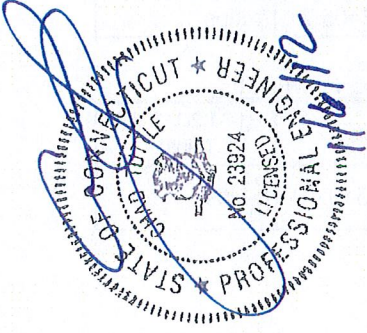
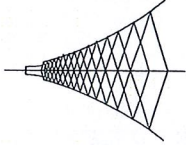
Actual M:	1782.00		
M Orthogonal:	3584.29	49.72%	Pass
M Diagonal:	3584.29	49.72%	Pass





**Letter of Explanation (LOE)**  
**MUST be attached to any Structural Analysis**

Site Name Burlington Nepaug Road  
 Site Number 84261-A  
 PE of Record Chad E. Tuttle, P.E.



ALL STRUCTURES	Statement in COL A is Correct	from Col A	N/A	Alternate Value / Concept Used	Explanation	Yes	No	NA	Comments / Reference
Structure Analyzed to F Code	X								
<p>Note: ALL G analyses MUST be justified. A simple notation of jurisdiction requirement will suffice. F BUILT TOWERS in G Code jurisdictions MUST have the new "5% Grace" Test Applied. G to be applied ONLY where this is exceeded. This 5% test applies to "like for like" only</p>									
Guy Tensions Adjusted Within Code to Find Optimum tension / Minimum Reinforcement (Applies to Guyed Tower Failures Only). Note: AT&T requires a pulse chart for altered Tensions			X						
Antenna Azimuths Inputted Per AT&T Information. NOTE that new antennas should be calculated at 0 degrees to allow flexibility.	X								
All Yield Stresses >= 50 ksi (legs)	X								
All Yield Stresses >= 36 ksi (Diagonals and Horizontals)			X						
Structures Designated Class II (G Only)			X						
Exposure B Rating Used (Topography)			X						
K' value for Slenderness ratio < 1.0			X						
Shielding of All Aperturances Used when Appropriate PER 2.6.8.4 (G Code Only)			X						
0.75 Reduction "Shape" Factor (Figure 2.6) for platform mounts, 0.8 for T-Boom Mounts Used (G Only)			X						
Pipes and round Members have 1.0 Drag Factors. Note if Pipe is attached to flat antenna, these must be considered separately if differing Drag factors are used		X			In compliance with TIA-222-F Table 3				
Are Tower Diagonals Designed as "Tension Only"			X						



MODIFICATION SECTION	Statement in COL A is Correct	Deviation from Col A	N/A	Alternate Value / Concept Used	Explanation	Yes	No	N/A	Comments / Reference
Guyed									
Guyed Only: Reinforcement Recommendation accompanies Optimum Guy Tensioning Scenario.									
Compression Failing Legs / Diagonals / Horizontals: Effective Length Reduced by U-Bolled Member									
<i>NOTE: Welded Solution Must be Explained and will only be considered in cases where other reinforcing methods will not work.</i>									
Self Supporting									
Compression Failing Legs / Diagonals / Horizontals: Effective Length Reduced by U-Bolled Member									
<i>NOTE: Welded Solution Must be Explained and will only be considered in cases where other reinforcing methods will not work.</i>									
Monopole									
Compression Collars									
<i>NOTE: Welded Solution Must be Explained and will only be considered in cases where other reinforcing methods will not work.</i>									
Foundation									
Guyed Anchor Failure: Berm Solution									
SS Foundation Pad and Pier Failure Berm									
SS Foundation Caisson / Concrete Cap									
Monopole: Cap									