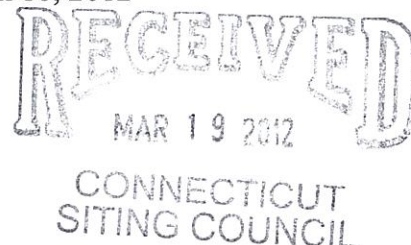


280 Trumbull Street  
Hartford, CT 06103-3597  
Main (860) 275-8200  
Fax (860) 275-8299  
kbaldwin@rc.com  
Direct (860) 275-8345

March 16, 2012



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

Re: **Notice of Exempt Modification – Antenna Swap  
350 Hartland Boulevard, Hartland, Connecticut**

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 110-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 2008. Cellco now intends to replace ten (10) of its twelve (12) existing antennas with four (4) model LPA-80063-6CF cellular antennas; three (3) model BXA-171085-12BF PCS antennas; and three (3) model BXA-70063-6CF LTE antennas, all at the same 110-foot level. Cellco also intends to install six (6) coax cable diplexers on its existing antenna platform. Attached behind Tab 1 are the specifications for the 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 Wade E. Cole, First Selectman of the Town of Hartland. A copy of this letter is also being sent to Marlene Jung, 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 110-foot level on the existing 120-foot tower.



*Law Offices*

BOSTON

PROVIDENCE

HARTFORD

NEW LONDON

STAMFORD

WHITE PLAINS

NEW YORK CITY

ALBANY

SARASOTA

*www.rc.com*

11557681-v1

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

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 the AT&T Structural Analysis Summary 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:

Wade E. Cole, Hartland First Selectman  
Marlene Jung  
Sandy M. Carter





## LPA-80063-6CF-EDIN-X

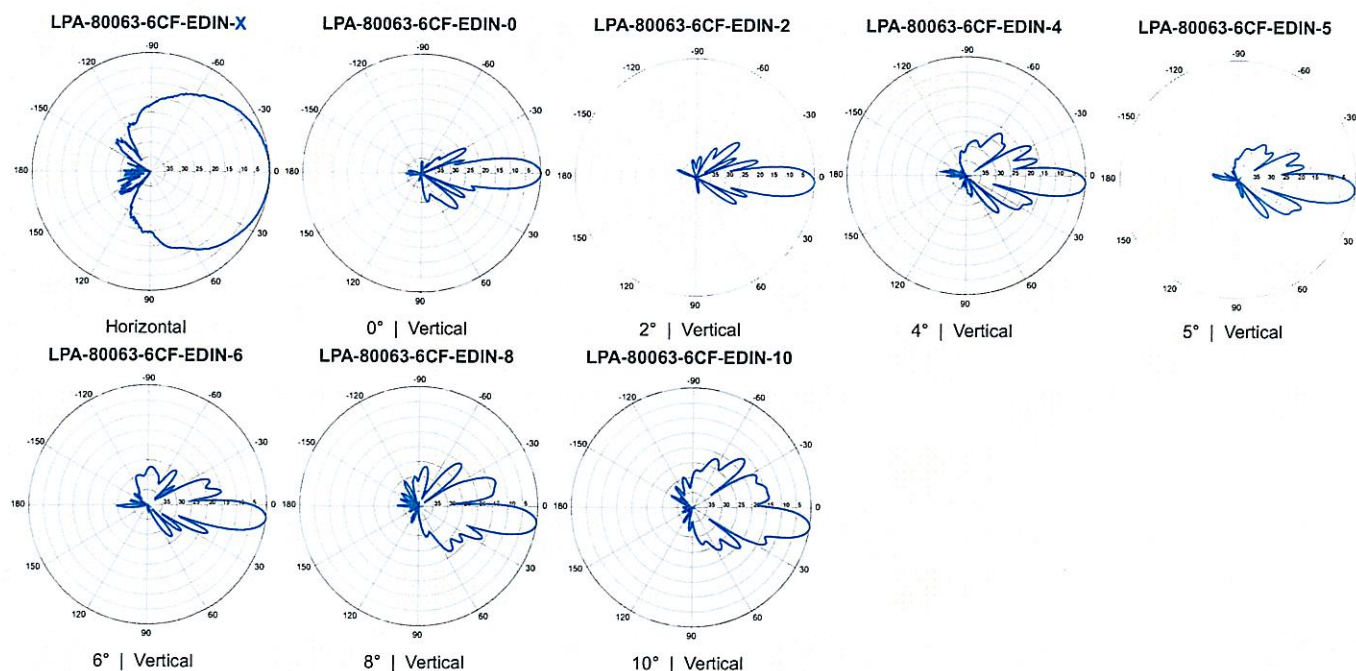
V-Pol | Log Periodic | 63° | 14.5 dBd

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                      |   |
|---|---|
| Frequency bands                                 | 806-960 MHz   |
| Polarization                                    | Vertical  |
| Horizontal beamwidth                            | 63°   |
| Vertical beamwidth                              | 10°   |
| Gain  | 14.5 dBd (16.6 dBi)   |
| Electrical downtilt (X)                         | 0, 2, 4, 5, 6, 8, 10  |
| Impedance                                       | 50Ω   |
| VSWR  | ≤1.4:1  |
| Null fill                                       | 5% (-26.02 dB)  |
| Input power                                     | 500 W   |
| Lightning protection                            | Direct Ground   |
| Connector(s)                                    | 1 Port / EDIN or NE / Female / Center (Back)  |
| Mechanical Characteristics                      |   |
| Dimensions Length x Width x Depth               | 1805 x 385 x 332 mm      71.1 x 15.2 x 13.1 in  |
| Depth of antenna with z-bracket                 | 372 mm      14.6 in   |
| Weight without mounting brackets                | 12.3 kg      27 lbs   |
| Survival wind speed                             | > 201 km/hr      > 125 mph  |
| Wind area                                       | Front: 0.70 m <sup>2</sup> Side: 0.59 m <sup>2</sup> Front: 7.5 ft <sup>2</sup> Side: 6.3 ft <sup>2</sup> |
| Wind load @ 161 km/hr (100 mph)                 | Front: 885 N    Side: 757 N      Front: 199 lbf    Side: 170 lbf  |
| Mounting Options                                |   |
| 3-Point Mounting & Downtilt Bracket Kit (0-20°) | Part Number      Fits Pipe Diameter      Weight   |
|   | 21700000      50-102 mm    2.0-4.0 in      11 kg    25 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-171085-12BF-EDIN-X

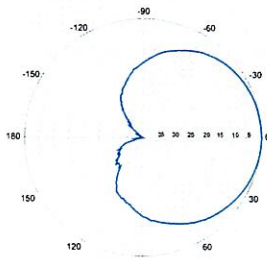
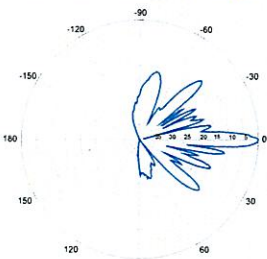
Replace "X" with desired electrical downtilt.

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 <sup>2</sup> Side: 0.19 m <sup>2</sup> | Front: 3.1 ft <sup>2</sup> Side: 2.1 ft <sup>2</sup> |                     |
| 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 |  |  |                     |

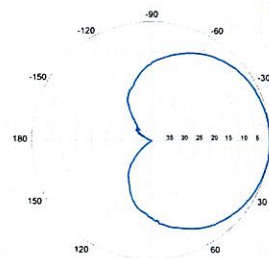
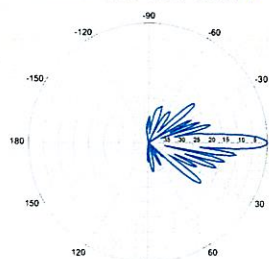


BXA-171085-12BF-EDIN-X

Horizontal | 1710-1880 MHz  
BXA-171085-12BF-EDIN-0

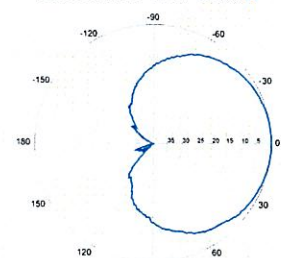
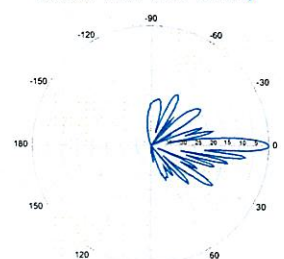
0° | Vertical | 1710-1880 MHz

BXA-171085-12BF-EDIN-X

Horizontal | 1850-1990 MHz  
BXA-171085-12BF-EDIN-0

0° | Vertical | 1850-1990 MHz

BXA-171085-12BF-EDIN-X

Horizontal | 1920-2170 MHz  
BXA-171085-12BF-EDIN-0

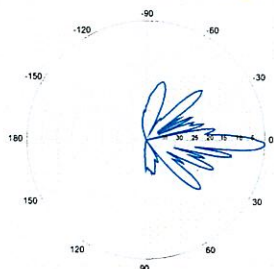
0° | Vertical | 1920-2170 MHz

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

**BXA-171085-12BF-EDIN-X**

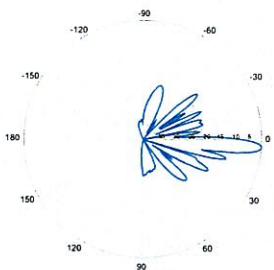
X-Pol | FET Panel | 85° | 18.0 dBi

**BXA-171085-12BF-EDIN-2**



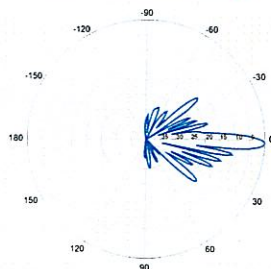
2° | Vertical | 1710-1880 MHz

**BXA-171085-12BF-EDIN-4**



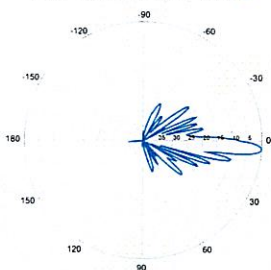
4° | Vertical | 1710-1880 MHz

**BXA-171085-12BF-EDIN-2**



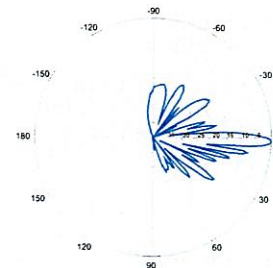
2° | Vertical | 1850-1990 MHz

**BXA-171085-12BF-EDIN-4**



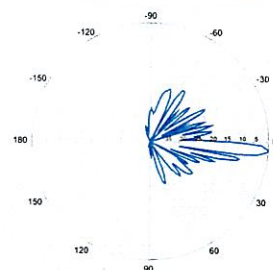
4° | Vertical | 1850-1990 MHz

**BXA-171085-12BF-EDIN-2**



2° | Vertical | 1920-2170 MHz

**BXA-171085-12BF-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

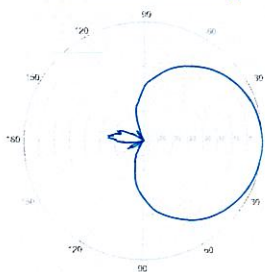
Replace "X" with desired electrical downtilt.

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 |                           |                            |                           |

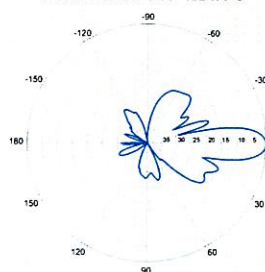


BXA-70063-6CF-EDIN-X



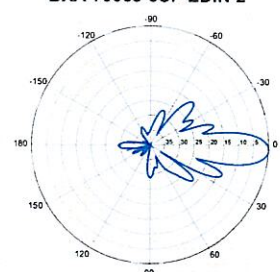
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

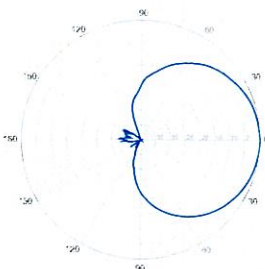


0° | Vertical | 750 MHz

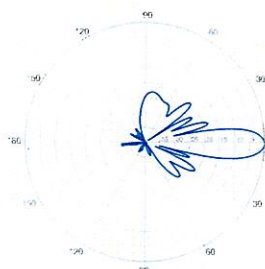
BXA-70063-6CF-EDIN-2



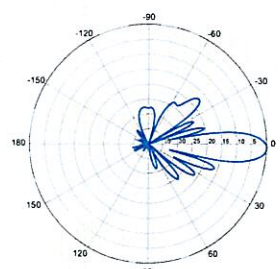
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



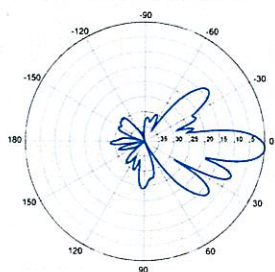
2° | Vertical | 850 MHz

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**

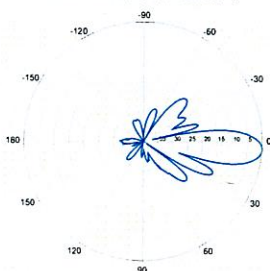
X-Pol | FET Panel | 63° | 14.5 dBd

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



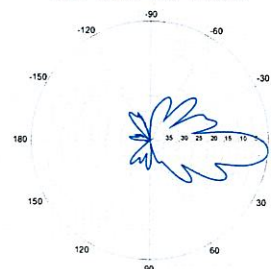
3° | Vertical | 750 MHz

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

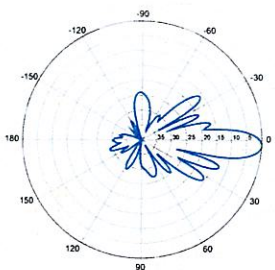


4° | Vertical | 750 MHz

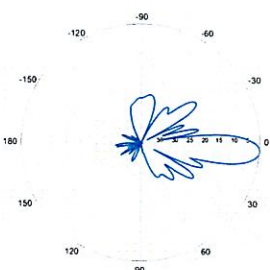
**BXA-70063-6CF-EDIN-5**



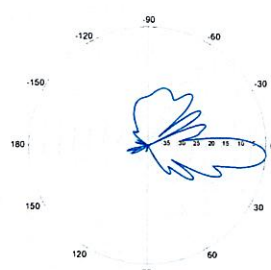
5° | Vertical | 750 MHz



3° | Vertical | 850 MHz

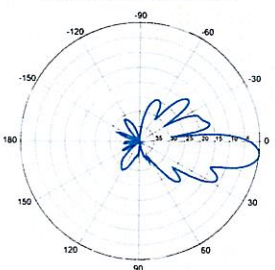


4° | Vertical | 850 MHz



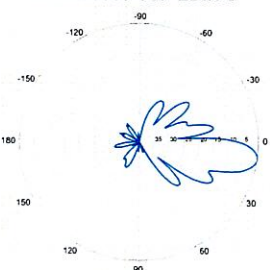
5° | Vertical | 850 MHz

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



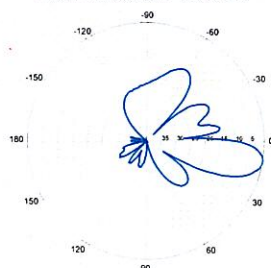
6° | Vertical | 750 MHz

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

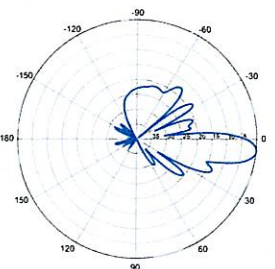


8° | Vertical | 750 MHz

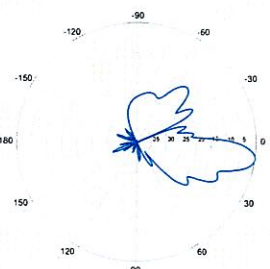
**BXA-70063-6CF-EDIN-10**



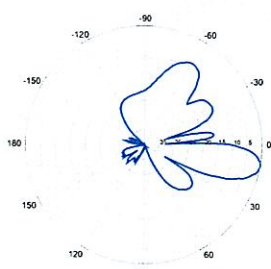
10° | Vertical | 750 MHz



6° | Vertical | 850 MHz



8° | Vertical | 850 MHz



10° | Vertical | 850 MHz

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.





## 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

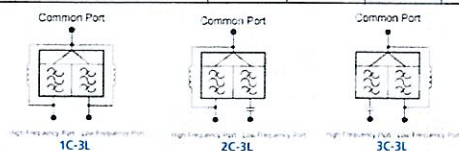


## ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path




## 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/C-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)  |  |







# AT&T STRUCTURAL ANALYSIS SUMMARY

93099VERCT-S

## Site Information

Description: 120' Monopole Tower Manufacturer: Engineered Endeavors, Inc.  
Site Number: 93099 Site Name: Hartland – Hartland Boulevard  
Location: 350 Hartland Blvd Applicable Codes: TIA/EIA-222-F  
East Hartland, CT 06027 Connecticut Building Code

## Existing Loads

| Carrier | Elevation | Number of Antennas and Tower Mounted Equipment | Number of Coaxial Cables and Feedlines |
|---------|-----------|--|--|
| AT&T    | 120'      | Six (6) panel antennas and six (6) TMAs        | Twelve (12) 1 5/8" coax (I)            |
| Verizon | 110'      | Twelve (12) panel antennas*                    | Twelve (12) 1 5/8" coax (I)            |

\* Ten (10) panel antennas to be removed.

## Proposed Additional Loads

| Carrier | Elevation | Number of Antennas and Tower Mounted Equipment | Number of Coaxial Cables and Feedlines |
|---------|-----------|--|--|
| AT&T    | 120'      | Three (3) panel antennas and six (6) RRUs      | Three (3) 7/8" coax (I)                |
| Verizon | 110'      | Ten (10) panel antennas and six (6) diplexers  | --                                     |

(I) = coaxial cables routed inside monopole

(O) = coaxial cables routed outside monopole

## Analysis Results

Tower Stress Level with Proposed Equipment: 26.7% Pass

Based on the acceptable stress levels in the tower, the foundation is considered to have been designed and constructed with adequate capacity to support the existing and proposed loads.

The tower fully complies with TIA/EIA-222-F standards for antenna supporting structures. Therefore, the existing tower and foundation are deemed **sufficient** for the proposed load cases.

Analysis Prepared by: Charles E. Carrillo, E.I.T.

Analysis Reviewed by: Chris A. Krafft, P.E.





## AT&T STRUCTURAL ANALYSIS SUMMARY

93099VERCT-S

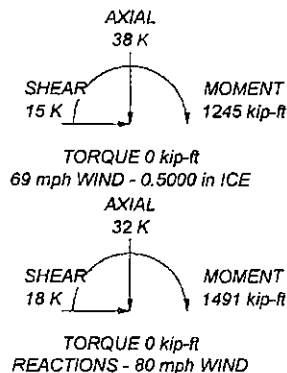
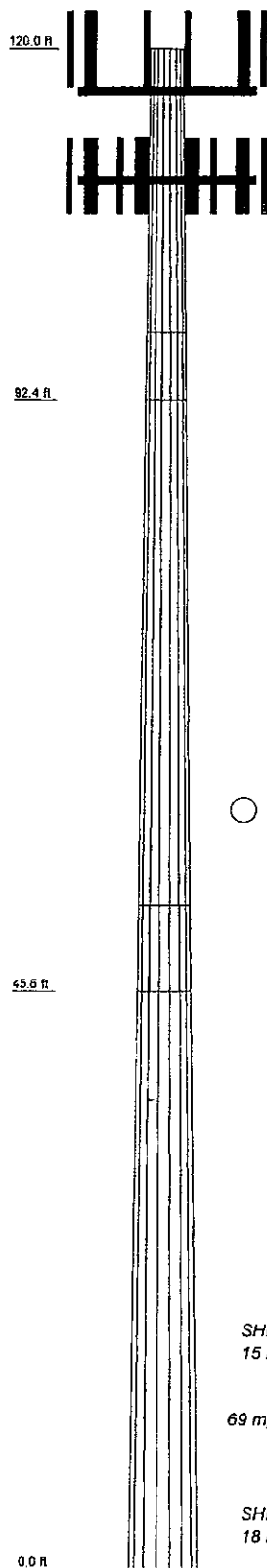
### Assumptions, Disclaimers, and Notes

1. *The accuracy of loads listed in this report is the responsibility of AT&T. If the existing or proposed load cases are different than those analyzed, this report should be considered obsolete and further analysis will be required.*
2. *Capacity of the structural members is based on theoretical values assuming grade 65 ksi steel for the pole shafts, 50 ksi steel for the base plate, and 75 ksi steel for the anchor bolts.*
3. *It is the responsibility of the client and/or the tower owner to ensure no un-documented equipment is installed on the tower between now and the construction. If additional equipment is installed on the tower this report should be considered obsolete and further analysis will be required.*
4. *This analysis assumes that the tower structural components, 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.*
5. *The existing tower was analyzed using the trxTower computer program version 6.0.0.8. The loading criteria were developed from the "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures" outlined in the American National Standard Institute TIA/EIA-222-F. A basic wind speed of 80 mph, fastest mile, is required for this site located in Hartland County, Connecticut based on the requirements of the Connecticut Building Code.*
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. *Existing tower and foundation information was obtained from the following sources:*
  - Structural Analysis completed by GPD Associates, dated 06/25/2008.*
  - Tower photos taken during Site Assessment walks, provided by AT&T.*
  - Co-location information provided by AT&T.*

*This analysis was performed under the assumption that all information provided to Black & Veatch is current and correct. If it is not, this report should be considered obsolete and further analysis will be required. Black & Veatch has not investigated the tower loading or performed a tower mapping and takes no responsibility for the verification of information provided by AT&T.*



| Section            | 1       | 2       | 3       |
|--------------------|---------|---------|---------|
| Length (ft)        | 27.62   | 52.04   | 52.42   |
| Number of Sides    | 18      | 18      | 18      |
| Thickness (in)     | 0.2500  | 0.3750  | 0.4375  |
| Socket Length (ft) | 5.25    | 6.83    | 47.7630 |
| Top Dia (in)       | 29.3000 | 35.3804 | 63.0000 |
| Bot Dia (in)       | 37.4000 | 50.5000 | 13.6    |
| Grade              |         | A572-65 |         |
| Weight (K)         | 2.5     | 9.0     | 13.6    |



### DESIGNED APPURTENANCE LOADING

| TYPE   | ELEVATION | TYPE  | ELEVATION |
|--|-----------|---|-----------|
| PiROD 15' Low Profile Platform (ATI / E)     | 117       | LPA-80080-6CF w/mount pipe (Verizon / E)      | 110       |
| 7770.00 w/mount pipe (ATI / E)               | 117       | BXA-171085-12BF w/mount pipe (Verizon / Prop) | 110       |
| 7770.00 w/mount pipe (ATI / E)               | 117       | BXA-171085-12BF w/mount pipe (Verizon / Prop) | 110       |
| 7770.00 w/mount pipe (ATI / E)               | 117       | BXA-171085-12BF w/mount pipe (Verizon / Prop) | 110       |
| 7770.00 w/mount pipe (ATI / E)               | 117       | BXA-171085-12BF w/mount pipe (Verizon / Prop) | 110       |
| 7770.00 w/mount pipe (ATI / E)               | 117       | LPA-80063-6CF w/mount pipe (Verizon / Prop)   | 110       |
| LGP21401 (ATI / E)                           | 117       | LPA-80063-6CF w/mount pipe (Verizon / Prop)   | 110       |
| LGP21401 (ATI / E)                           | 117       | LPA-80063-6CF w/mount pipe (Verizon / Prop)   | 110       |
| LGP21401 (ATI / E)                           | 117       | LPA-80063-6CF w/mount pipe (Verizon / Prop)   | 110       |
| LGP21401 (ATI / E)                           | 117       | LPA-80063-6CF w/mount pipe (Verizon / Prop)   | 110       |
| LGP21401 (ATI / E)                           | 117       | LPA-80063-6CF w/mount pipe (Verizon / Prop)   | 110       |
| LGP21401 (ATI / E)                           | 117       | LPA-80063-6CF w/mount pipe (Verizon / Prop)   | 110       |
| P65-16-XLH-RR w/ Mount Pipe (ATI / Future)   | 117       | BXA-70063-6CF_2 w/mount pipe (Verizon / Prop) | 110       |
| P65-16-XLH-RR w/ Mount Pipe (ATI / Future)   | 117       | BXA-70063-6CF_2 w/mount pipe (Verizon / Prop) | 110       |
| P65-16-XLH-RR w/ Mount Pipe (ATI / Future)   | 117       | BXA-70063-6CF_2 w/mount pipe (Verizon / Prop) | 110       |
| (2) Ericsson RRUS 11 (ATI / Future)          | 117       | (2) FDR6004/2C-3L (Verizon / Prop)            | 110       |
| (2) Ericsson RRUS 11 (ATI / Future)          | 117       | (2) FDR6004/2C-3L (Verizon / Prop)            | 110       |
| (2) Ericsson RRUS 11 (ATI / Future)          | 117       | (2) FDR6004/2C-3L (Verizon / Prop)            | 110       |
| PiROD 15' Low Profile Platform (Verizon / E) | 110       |   |           |
| LPA-80080-6CF w/mount pipe (Verizon / E)     | 110       |   |           |

### MATERIAL STRENGTH

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

### TOWER DESIGN NOTES

- Tower is located in Hartford County, Connecticut.
- Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
- Tower is also designed for a 69 mph basic wind with 0.50 in ice.
- Deflections are based upon a 50 mph wind.
- 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.
- TOWER RATING: 26.7%

|  |   |  |   |  |
|--|---|--|---|--|
| <b>BLACK &amp; VEATCH</b><br>Building a world of difference. | <b>Black &amp; Veatch Corp.</b><br>10950 Grandview Drive<br>Overland Park, KS 66210<br>Phone: (913) 458-2000<br>FAX: (913) 458-8136 |  | Job: <b>Hartland - Hartland Boulevard</b><br>Project: <b>166951 (93099VERCT-S)</b><br>Client: <b>AT&amp;T Towers</b> Drawn by: <b>Taylor P. Murphy, E.I.T.</b> App'd:<br>Code: <b>TIA/EIA-222-F</b> Date: <b>12/29/11</b> Scale: <b>NTS</b><br>Path: _____ Dwg No. <b>E-1</b> |  |
|  |   |  |   |  |
|  |   |  |   |  |
|  |   |  |   |  |
|  |   |  |   |  |

|  |         |                               |             |                             |
|--|---------|-------------------------------|-------------|-----------------------------|
| <b>tnxTower</b><br><br><b>Black &amp; Veatch Corp.</b><br>10950 Grandview Drive<br>Overland Park, KS 66210<br>Phone: (913) 458-2000<br>FAX: (913) 458-8136 | Job     | Hartland - Hartland Boulevard | Page        | 1 of 6                      |
|  | Project | 166951 (93099VERCT-S)         | Date        | 19:09:31 12/29/11           |
|  | Client  | AT&T Towers                   | Designed by | Taylor P. Murphy,<br>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 Hartford County, Connecticut.

Basic wind speed of 80 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 69 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      | 120.00-92.38 | 27.62          | 5.25          | 18              | 29.3000      | 37.4000         | 0.2500         | 1.0000      | A572-65<br>(65 ksi) |
| L2      | 92.38-45.59  | 52.04          | 6.83          | 18              | 35.3604      | 50.5000         | 0.3750         | 1.5000      | A572-65<br>(65 ksi) |
| L3      | 45.59-0.00   | 52.42          |               | 18              | 47.7630      | 63.0000         | 0.4375         | 1.7500      | A572-65             |



|  |         |                               |             |                             |
|--|---------|-------------------------------|-------------|-----------------------------|
| <b>tnxTower</b><br><br><b>Black &amp; Veatch Corp.</b><br>10950 Grandview Drive<br>Overland Park, KS 66210<br>Phone: (913) 458-2000<br>FAX: (913) 458-8136 | Job     | Hartland - Hartland Boulevard | Page        | 2 of 6                      |
|  | Project | 166951 (93099VERCT-S)         | Date        | 19:09:31 12/29/11           |
|  | Client  | AT&T Towers                   | Designed by | Taylor P. Murphy,<br>E.I.T. |

| 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               | Iu/Q            | w       | w/I    |
|---------|----------|-----------------|-----------------|---------|---------|-----------------|-----------------|-----------------|---------|--------|
|         | in       | in <sup>2</sup> | in <sup>4</sup> | in      | in      | in <sup>3</sup> | in <sup>4</sup> | in <sup>3</sup> | in      |        |
| L1      | 29.7520  | 23.0512         | 2457.6656       | 10.3127 | 14.8844 | 165.1169        | 4918.5651       | 11.5278         | 4.7168  | 18.867 |
|         | 37.9770  | 29.4785         | 5139.9730       | 13.1883 | 18.9992 | 270.5363        | 10286.7093      | 14.7421         | 6.1424  | 24.57  |
| L2      | 37.4568  | 41.6413         | 6439.2383       | 12.4198 | 17.9631 | 358.4711        | 12886.9495      | 20.8246         | 5.5634  | 14.836 |
|         | 51.2790  | 59.6613         | 18938.2043      | 17.7944 | 25.6540 | 738.2164        | 37901.3280      | 29.8363         | 8.2280  | 21.941 |
| L3      | 50.5157  | 65.7174         | 18595.5016      | 16.8006 | 24.2636 | 766.3950        | 37215.4717      | 32.8649         | 7.6363  | 17.454 |
|         | 63.9719  | 86.8759         | 42960.0437      | 22.2097 | 32.0040 | 1342.3336       | 85976.6153      | 43.4462         | 10.3180 | 23.584 |

| 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<br>120.00-92.38 |                        |                  |              | 1                             | 1                             | 1            |  |  |
| L2 92.38-45.59     |                        |                  |              | 1                             | 1                             | 1            |  |  |
| L3 45.59-0.00      |                        |                  |              | 1                             | 1                             | 1            |  |  |

### Monopole Base Plate Data

#### Base Plate Data

|                       |             |
|-----------------------|-------------|
| Base plate is square  |             |
| Base plate is grouted |             |
| Anchor bolt grade     | A615-75     |
| Anchor bolt size      | 2.2500 in   |
| Number of bolts       | 32          |
| Embedment length      | 72.0000 in  |
| f <sub>c</sub>        | 3 ksi       |
| Grout space           | 3.0000 in   |
| Base plate grade      | A572-50     |
| Base plate thickness  | 3.5000 in   |
| Bolt circle diameter  | 71.0000 in  |
| Outer diameter        | 75.0000 in  |
| Inner diameter        | 62.0000 in  |
| Base plate type       | Plain Plate |

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

| Description                         | Face or Leg | Allow Shield | Component Type | Placement     | Total Number | C <sub>AA</sub>     | Weight       |
|-------------------------------------|-------------|--------------|----------------|---------------|--------------|---------------------|--------------|
|                                     |             |              |                | ft            |              | ft <sup>2</sup> /ft | plf          |
| LDF7-50A (1-5/8 FOAM)<br>(AT&T / E) | C           | No           | Inside Pole    | 120.00 - 8.00 | 12           | No Ice<br>1/2" Ice  | 0.00<br>0.82 |

|  |         |                               |             |                             |
|--|---------|-------------------------------|-------------|-----------------------------|
| <b>tnxTower</b><br><br><b>Black &amp; Veatch Corp.</b><br>10950 Grandview Drive<br>Overland Park, KS 66210<br>Phone: (913) 458-2000<br>FAX: (913) 458-8136 | Job     | Hartland - Hartland Boulevard | Page        | 3 of 6                      |
|  | Project | 166951 (93099VERCT-S)         | Date        | 19:09:31 12/29/11           |
|  | Client  | AT&T Towers                   | Designed by | Taylor P. Murphy,<br>E.I.T. |

| Description                               | Face<br>or<br>Leg | Allow<br>Shield | Component<br>Type     | Placement<br>ft | Total<br>Number |          | $C_{AA}$<br>ft <sup>2</sup> /ft | Weight<br>plf |
|---|-------------------|-----------------|-----------------------|-----------------|-----------------|----------|---------------------------------|---------------|
| LDF5-50A (7/8 FOAM)<br>(AT&T / Future)    | C                 | No              | Inside Pole           | 120.00 - 8.00   | 3               | No Ice   | 0.00                            | 0.33          |
|   |                   |                 |                       |                 |                 | 1/2" Ice | 0.00                            | 0.33          |
| LDF7-50A (1-5/8<br>FOAM)<br>(Verizon / E) | B                 | No              | Inside Pole           | 110.00 - 8.00   | 12              | No Ice   | 0.00                            | 0.82          |
|   |                   |                 |                       |                 |                 | 1/2" Ice | 0.00                            | 0.82          |
| Safety Line 3/8<br>(Existing)             | C                 | No              | CaAa (Out Of<br>Face) | 120.00 - 8.00   | 1               | No Ice   | 0.04                            | 0.22          |
|   |                   |                 |                       |                 |                 | 1/2" Ice | 0.14                            | 0.75          |

### Feed Line/Linear Appurtenances Section Areas

| Tower<br>Section | Tower<br>Elevation<br>ft | Face | $A_R$<br>ft <sup>2</sup> | $A_F$<br>ft <sup>2</sup> | $C_{AA}$<br>In Face<br>ft <sup>2</sup> | $C_{AA}$<br>Out Face<br>ft <sup>2</sup> | Weight<br>K |
|------------------|--------------------------|------|--------------------------|--------------------------|--|---|-------------|
| L1               | 120.00-92.38             | A    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                  |                          | B    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.17        |
|                  |                          | C    | 0.000                    | 0.000                    | 0.000                                  | 1.036                                   | 0.31        |
| L2               | 92.38-45.59              | A    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                  |                          | B    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.46        |
|                  |                          | C    | 0.000                    | 0.000                    | 0.000                                  | 1.755                                   | 0.52        |
| L3               | 45.59-0.00               | A    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                  |                          | B    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.37        |
|                  |                          | C    | 0.000                    | 0.000                    | 0.000                                  | 1.410                                   | 0.42        |

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

| Tower<br>Section | Tower<br>Elevation<br>ft | Face<br>or<br>Leg | Ice<br>Thickness<br>in | $A_R$<br>ft <sup>2</sup> | $A_F$<br>ft <sup>2</sup> | $C_{AA}$<br>In Face<br>ft <sup>2</sup> | $C_{AA}$<br>Out Face<br>ft <sup>2</sup> | Weight<br>K |
|------------------|--------------------------|-------------------|------------------------|--------------------------|--------------------------|--|---|-------------|
| L1               | 120.00-92.38             | A                 | 0.500                  | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                  |                          | B                 |                        | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.17        |
|                  |                          | C                 |                        | 0.000                    | 0.000                    | 0.000                                  | 3.798                                   | 0.32        |
| L2               | 92.38-45.59              | A                 | 0.500                  | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                  |                          | B                 |                        | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.46        |
|                  |                          | C                 |                        | 0.000                    | 0.000                    | 0.000                                  | 6.433                                   | 0.54        |
| L3               | 45.59-0.00               | A                 | 0.500                  | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                  |                          | B                 |                        | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.37        |
|                  |                          | C                 |                        | 0.000                    | 0.000                    | 0.000                                  | 5.168                                   | 0.44        |

### Feed Line Center of Pressure

| Section | Elevation<br>ft | $CP_x$<br>in | $CP_z$<br>in | $CP_x$<br>Ice<br>in | $CP_z$<br>Ice<br>in |
|---------|-----------------|--------------|--------------|---------------------|---------------------|
| L1      | 120.00-92.38    | -0.0481      | 0.0278       | -0.1655             | 0.0955              |
| L2      | 92.38-45.59     | -0.0482      | 0.0278       | -0.1684             | 0.0972              |
| L3      | 45.59-0.00      | -0.0391      | 0.0226       | -0.1384             | 0.0799              |



|  |         |                               |             |                             |
|--|---------|-------------------------------|-------------|-----------------------------|
| <b>tnxTower</b><br><br><b>Black &amp; Veatch Corp.</b><br>10950 Grandview Drive<br>Overland Park, KS 66210<br>Phone: (913) 458-2000<br>FAX: (913) 458-8136 | Job     | Hartland - Hartland Boulevard | Page        | 4 of 6                      |
|  | Project | 166951 (93099VERCT-S)         | Date        | 19:09:31 12/29/11           |
|  | Client  | AT&T Towers                   | Designed by | Taylor P. Murphy,<br>E.I.T. |

### Discrete Tower Loads

| Description                                 | Face<br>or<br>Leg | Offset<br>Type | Offsets:<br>Horz<br>Lateral<br>Vert<br>ft<br>ft<br>ft | Azimuth<br>Adjustment<br>° | Placement<br>ft |                    | C <sub>AA</sub><br>Front<br>ft <sup>2</sup> | C <sub>AA</sub><br>Side<br>ft <sup>2</sup> | Weight<br>K  |
|---|-------------------|----------------|---|----------------------------|-----------------|--------------------|---|--|--------------|
| PiROD 15' Low Profile Platform (AT&T / E)   | C                 | None           |   | 0.0000                     | 117.00          | No Ice<br>1/2" Ice | 17.30<br>22.10                              | 17.30<br>22.10                             | 1.50<br>2.03 |
| 7770.00 w/mount pipe (AT&T / E)             | A                 | From Face      | 4.00<br>6.00<br>3.00                                  | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 6.00<br>6.46                                | 4.14<br>4.80                               | 0.05<br>0.10 |
| 7770.00 w/mount pipe (AT&T / E)             | A                 | From Face      | 4.00<br>-6.00<br>3.00                                 | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 6.00<br>6.46                                | 4.14<br>4.80                               | 0.05<br>0.10 |
| 7770.00 w/mount pipe (AT&T / E)             | B                 | From Face      | 4.00<br>6.00<br>3.00                                  | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 6.00<br>6.46                                | 4.14<br>4.80                               | 0.05<br>0.10 |
| 7770.00 w/mount pipe (AT&T / E)             | B                 | From Face      | 4.00<br>-6.00<br>3.00                                 | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 6.00<br>6.46                                | 4.14<br>4.80                               | 0.05<br>0.10 |
| 7770.00 w/mount pipe (AT&T / E)             | C                 | From Face      | 4.00<br>6.00<br>3.00                                  | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 6.00<br>6.46                                | 4.14<br>4.80                               | 0.05<br>0.10 |
| 7770.00 w/mount pipe (AT&T / E)             | C                 | From Face      | 4.00<br>-6.00<br>3.00                                 | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 6.00<br>6.46                                | 4.14<br>4.80                               | 0.05<br>0.10 |
| LGP21401 (AT&T / E)                         | A                 | From Face      | 4.00<br>6.00<br>3.00                                  | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 1.23<br>1.38                                | 0.26<br>0.34                               | 0.01<br>0.02 |
| LGP21401 (AT&T / E)                         | A                 | From Face      | 4.00<br>-6.00<br>3.00                                 | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 1.23<br>1.38                                | 0.26<br>0.34                               | 0.01<br>0.02 |
| LGP21401 (AT&T / E)                         | B                 | From Face      | 4.00<br>6.00<br>3.00                                  | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 1.23<br>1.38                                | 0.26<br>0.34                               | 0.01<br>0.02 |
| LGP21401 (AT&T / E)                         | B                 | From Face      | 4.00<br>-6.00<br>3.00                                 | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 1.23<br>1.38                                | 0.26<br>0.34                               | 0.01<br>0.02 |
| LGP21401 (AT&T / E)                         | C                 | From Face      | 4.00<br>6.00<br>3.00                                  | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 1.23<br>1.38                                | 0.26<br>0.34                               | 0.01<br>0.02 |
| LGP21401 (AT&T / E)                         | C                 | From Face      | 4.00<br>-6.00<br>3.00                                 | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 1.23<br>1.38                                | 0.26<br>0.34                               | 0.01<br>0.02 |
| P65-16-XLH-RR w/ Mount Pipe (AT&T / Future) | A                 | From Face      | 4.00<br>0.00<br>3.00                                  | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 8.64<br>9.29                                | 6.36<br>7.54                               | 0.05<br>0.12 |
| P65-16-XLH-RR w/ Mount Pipe (AT&T / Future) | B                 | From Face      | 4.00<br>0.00<br>3.00                                  | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 8.64<br>9.29                                | 6.36<br>7.54                               | 0.05<br>0.12 |
| P65-16-XLH-RR w/ Mount Pipe (AT&T / Future) | C                 | From Face      | 4.00<br>0.00<br>3.00                                  | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 8.64<br>9.29                                | 6.36<br>7.54                               | 0.05<br>0.12 |
| (2) Ericsson RRUS 11 (AT&T / Future)        | A                 | From Face      | 4.00<br>0.00<br>3.00                                  | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 2.94<br>3.17                                | 1.25<br>1.41                               | 0.06<br>0.07 |
| (2) Ericsson RRUS 11 (AT&T / Future)        | B                 | From Face      | 4.00<br>0.00<br>3.00                                  | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 2.94<br>3.17                                | 1.25<br>1.41                               | 0.06<br>0.07 |

|  |         |                               |             |                             |
|--|---------|-------------------------------|-------------|-----------------------------|
| <b>tnxTower</b><br><br><b>Black &amp; Veatch Corp.</b><br>10950 Grandview Drive<br>Overland Park, KS 66210<br>Phone: (913) 458-2000<br>FAX: (913) 458-8136 | Job     | Hartland - Hartland Boulevard | Page.       | 5 of 6                      |
|  | Project | 166951 (93099VERCT-S)         | Date        | 19:09:31 12/29/11           |
|  | Client  | AT&T Towers                   | Designed by | Taylor P. Murphy,<br>E.I.T. |

| Description   | Face<br>or<br>Leg | Offset<br>Type | Offsets:<br>Horz<br>Lateral<br>Vert<br>ft<br>ft<br>ft | Azimuth<br>Adjustment<br>° | Placement<br>ft |                    | C <sub>A</sub> A <sub>A</sub><br>Front<br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub><br>Side<br>ft <sup>2</sup> | Weight<br>K  |
|---|-------------------|----------------|---|----------------------------|-----------------|--------------------|---|--|--------------|
| (2) Ericsson RRUS 11<br>(AT&T / Future)             | C                 | From Face      | 4.00<br>0.00<br>3.00                                  | 30.0000                    | 117.00          | No Ice<br>1/2" Ice | 2.94<br>3.17  | 1.25<br>1.41   | 0.06<br>0.07 |
| PiROD 15' Low Profile<br>Platform<br>(Verizon / E)  | A                 | None           |   | 0.0000                     | 110.00          | No Ice<br>1/2" Ice | 17.30<br>22.10  | 17.30<br>22.10   | 1.50<br>2.03 |
| LPA-80080-6CF w/mount<br>pipe<br>(Verizon / E)      | A                 | From Face      | 4.00<br>6.00<br>0.00                                  | 0.0000                     | 110.00          | No Ice<br>1/2" Ice | 4.49<br>4.97  | 10.97<br>11.98   | 0.06<br>0.13 |
| LPA-80080-6CF w/mount<br>pipe<br>(Verizon / E)      | A                 | From Face      | 4.00<br>-6.00<br>0.00                                 | 0.0000                     | 110.00          | No Ice<br>1/2" Ice | 4.49<br>4.97  | 10.97<br>11.98   | 0.06<br>0.13 |
| BXA-171085-12BF w/mount<br>pipe<br>(Verizon / Prop) | A                 | From Face      | 4.00<br>2.00<br>0.00                                  | 0.0000                     | 110.00          | No Ice<br>1/2" Ice | 4.86<br>5.35  | 5.12<br>6.16   | 0.04<br>0.08 |
| BXA-171085-12BF w/mount<br>pipe<br>(Verizon / Prop) | B                 | From Face      | 4.00<br>2.00<br>0.00                                  | 0.0000                     | 110.00          | No Ice<br>1/2" Ice | 4.86<br>5.35  | 5.12<br>6.16   | 0.04<br>0.08 |
| BXA-171085-12BF w/mount<br>pipe<br>(Verizon / Prop) | C                 | From Face      | 4.00<br>2.00<br>0.00                                  | 0.0000                     | 110.00          | No Ice<br>1/2" Ice | 4.86<br>5.35  | 5.12<br>6.16   | 0.04<br>0.08 |
| LPA-80063-6CF w/mount<br>pipe<br>(Verizon / Prop)   | B                 | From Face      | 4.00<br>6.00<br>0.00                                  | 0.0000                     | 110.00          | No Ice<br>1/2" Ice | 10.48<br>11.10  | 10.57<br>11.74   | 0.05<br>0.14 |
| LPA-80063-6CF w/mount<br>pipe<br>(Verizon / Prop)   | B                 | From Face      | 4.00<br>-6.00<br>0.00                                 | 0.0000                     | 110.00          | No Ice<br>1/2" Ice | 10.48<br>11.10  | 10.57<br>11.74   | 0.05<br>0.14 |
| LPA-80063-6CF w/mount<br>pipe<br>(Verizon / Prop)   | C                 | From Face      | 4.00<br>6.00<br>0.00                                  | 0.0000                     | 110.00          | No Ice<br>1/2" Ice | 10.48<br>11.10  | 10.57<br>11.74   | 0.05<br>0.14 |
| LPA-80063-6CF w/mount<br>pipe<br>(Verizon / Prop)   | C                 | From Face      | 4.00<br>-6.00<br>0.00                                 | 0.0000                     | 110.00          | No Ice<br>1/2" Ice | 10.48<br>11.10  | 10.57<br>11.74   | 0.05<br>0.14 |
| BXA-70063-6CF_2 w/mount<br>pipe<br>(Verizon / Prop) | A                 | From Face      | 4.00<br>-2.00<br>0.00                                 | 0.0000                     | 110.00          | No Ice<br>1/2" Ice | 7.87<br>8.46  | 5.70<br>6.75   | 0.04<br>0.10 |
| BXA-70063-6CF_2 w/mount<br>pipe<br>(Verizon / Prop) | B                 | From Face      | 4.00<br>-2.00<br>0.00                                 | 0.0000                     | 110.00          | No Ice<br>1/2" Ice | 7.87<br>8.46  | 5.70<br>6.75   | 0.04<br>0.10 |
| BXA-70063-6CF_2 w/mount<br>pipe<br>(Verizon / Prop) | C                 | From Face      | 4.00<br>-2.00<br>0.00                                 | 0.0000                     | 110.00          | No Ice<br>1/2" Ice | 7.87<br>8.46  | 5.70<br>6.75   | 0.04<br>0.10 |
| (2) FD9R6004/2C-3L<br>(Verizon / Prop)              | A                 | From Face      | 4.00<br>0.00<br>0.00                                  | 0.0000                     | 110.00          | No Ice<br>1/2" Ice | 0.37<br>0.45  | 0.08<br>0.14   | 0.00<br>0.00 |
| (2) FD9R6004/2C-3L<br>(Verizon / Prop)              | B                 | From Face      | 4.00<br>0.00<br>0.00                                  | 0.0000                     | 110.00          | No Ice<br>1/2" Ice | 0.37<br>0.45  | 0.08<br>0.14   | 0.00<br>0.00 |
| (2) FD9R6004/2C-3L<br>(Verizon / Prop)              | C                 | From Face      | 4.00<br>0.00<br>0.00                                  | 0.0000                     | 110.00          | No Ice<br>1/2" Ice | 0.37<br>0.45  | 0.08<br>0.14   | 0.00<br>0.00 |



|  |         |                               |             |                             |
|--|---------|-------------------------------|-------------|-----------------------------|
| <b>tnxTower</b><br><br><b>Black &amp; Veatch Corp.</b><br>10950 Grandview Drive<br>Overland Park, KS 66210<br>Phone: (913) 458-2000<br>FAX: (913) 458-8136 | Job     | Hartland - Hartland Boulevard | Page        | 6 of 6                      |
|  | Project | 166951 (93099VERCT-S)         | Date        | 19:09:31 12/29/11           |
|  | Client  | AT&T Towers                   | Designed by | Taylor P. Murphy,<br>E.I.T. |

### Section Capacity Table

| Section No. | Elevation ft  | Component Type | Size                 | Critical Element | P K    | SF*P <sub>allow</sub> K | % Capacity      | Pass Fail        |
|-------------|---------------|----------------|----------------------|------------------|--------|-------------------------|-----------------|------------------|
| L1          | 120 - 92.38   | Pole           | TP37.4x29.3x0.25     | 1                | -6.63  | 433.50                  | 15.6            | Pass             |
| L2          | 92.38 - 45.59 | Pole           | TP50.5x35.3604x0.375 | 2                | -15.72 | 1549.03                 | 23.9            | Pass             |
| L3          | 45.59 - 0     | Pole           | TP63x47.763x0.4375   | 3                | -31.73 | 3040.97                 | 26.7            | Pass             |
|             |               |                |                      |                  |        |                         | Summary         |                  |
|             |               |                |                      |                  |        |                         | Pole (L3)       | 26.7 Pass        |
|             |               |                |                      |                  |        |                         | Base Plate      | 20.6 Pass        |
|             |               |                |                      |                  |        |                         | <b>RATING =</b> | <b>26.7 Pass</b> |

Program Version 6.0.0.8 - 9/7/2011 File:c:/Documents and Settings/All Users/Application  
Data/Documentum/dmcl/000004b3/0ac10ac3.hst/802b2784/93099VERCT-S Structural Analysis85043a3e.eri