ROBINSON & COLE LLP

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
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kbaldwin@rc.com
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Also admitted in Massachusetts

June 20, 2014

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Completion of Construction Activity**

Dear Ms. Bachman:

The purpose of this letter is to notify the Siting Council that construction activity associated with the Cellco Partnership d/b/a Verizon Wireless telecommunications facility modifications listed below has been completed.

EM-VER-007-130226 – 260 Beckley Road, Berlin, Connecticut
EM-VER-011-130125 – 811 Blue Hills Avenue, Bloomfield, Connecticut
EM-VER-011-130214 – 785 Park Avenue, Bloomfield, Connecticut
EM-VER-012-130107 – 130 Vernon Road, Bolton, Connecticut
EM-VER-043-130220 – 148 Roberts Road, East Hartford, Connecticut
EM-VER-057-130214 – Butternut Hollow Road, Greenwich, Connecticut
EM-VER-059-130220 – 68 Groton Long Point Road, Groton, Connecticut
EM-VER-062-130128 – 265 Benham Street, Hamden, Connecticut
EM-VER-062-130220 – 890 Evergreen Avenue, Hamden, Connecticut
EM-VER-064-130125 – 590-600 Asylum Avenue, Hartford, Connecticut
EM-VER-064-130220 – 439-455 Homestead Avenue, Hartford, Connecticut
EM-VER-077-130220A – 60 Adams Street, Manchester, Connecticut
EM-VER-077-130220B – 266 Center Street, Manchester, Connecticut
EM-VER-080-130128 – 38 Elm Street, Meriden, Connecticut
EM-VER-096-130125 – 586 Danbury Road, New Milford, Connecticut
EM-VER-094-130114 – 605 Willard Avenue, Newington, Connecticut
EM-VER-094-130220 – 123 Costello Road, Newington, Connecticut
EM-VER-144-130227 – Indian Ledge Road, Trumbull, Connecticut
EM-VER-146-130123 – 777 Talcottville Road, Vernon, Connecticut
EM-VER-152-130301 – 41 Manitock Hill Road, Waterford, Connecticut
EM-VER-156-130227 – 85 Plainfield Avenue, West Haven, Connecticut

EM-VER-164-130128 – 482 Pigeon Hill Road, Windsor, Connecticut
EM-VER-169-130220 – 445 Prospect Street, Woodstock, Connecticut

If you have any questions or need any additional information regarding this facility please do not hesitate to contact me.

Sincerely,

Kenneth C. Baldwin

Copy to:
Sandy M. Carter

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

March 12, 2013

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

RE: **EM-VER-077-130220A** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 60 Adams Street, Manchester, 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;
- Within 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 February 20, 2013. 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/jb

c: The Honorable Leo V. Diana, Mayor, Town of Manchester
Scott A. Shanley, General Manager, Town of Manchester
James Davis, Zoning Enforcement Officer, Town of Manchester
Pom-Pom Gali

ROBINSON & COL

EM-VER-077-130220A

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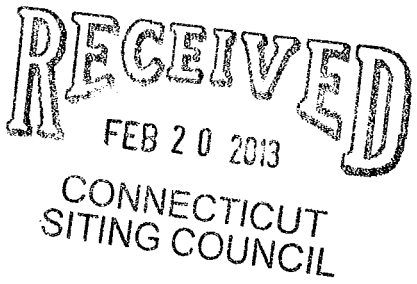
Also admitted in Massachusetts

February 20, 2013



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

Re: **Notice of Exempt Modification – Antenna Swap**
60 Adams Street, Manchester, Connecticut

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 90-foot level on an existing 140-foot tower at the above-referenced address. The tower and underlying property are owned by Pom-Pom Gali. The Council approved Cellco's shared use of this tower in 1998. Cellco now intends to replace six (6) of its antennas with three (3) model SLCP 2X6014 cellular antennas; two (2) APX18-206517-CT2 AWS antennas; and one (1) model BXA-171085-12BF AWS antenna, at the same 90-foot level. Cellco also intends to install three (3) remote radio heads ("RRHs") behind its antennas and one (1) HYBRIFLEX™ fiber cable. Attached behind Tab 1 are the specifications for the replacement antennas, RRHs and HYBRIFLEX™ cable.

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 Leo V. Diana, Mayor for the Town of Manchester. A copy of this letter is also being sent to Pom-Pom Gali, 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 RRHs will be located at the 90-foot level on the 140-foot tower.

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

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

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

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

6. The tower and its foundation can support Cellco's proposed modifications. (*See* Structural Analysis Report attached behind 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,

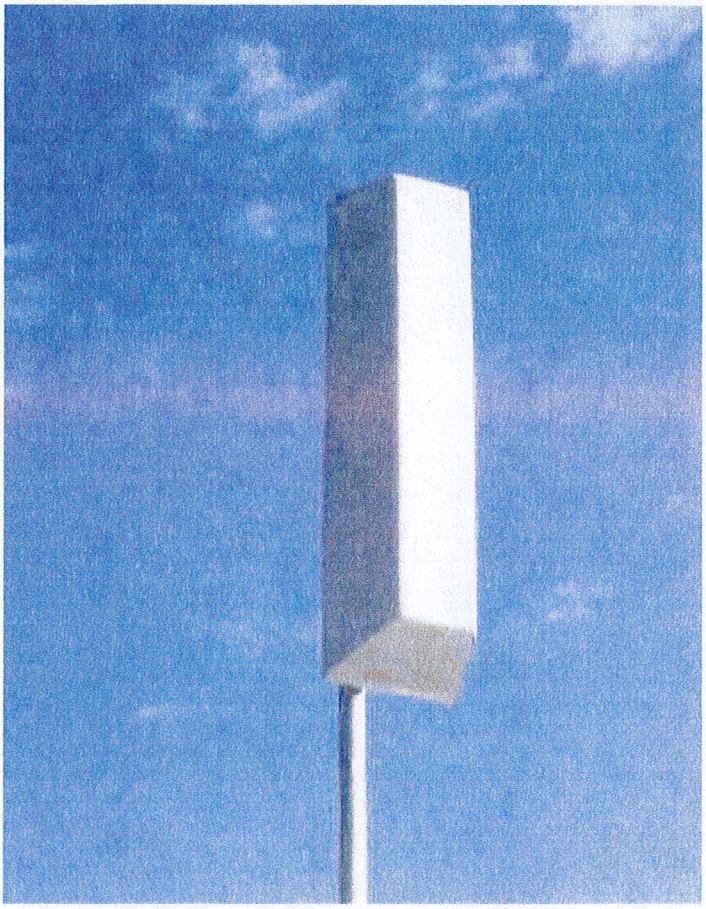
Kenneth C. Baldwin

Enclosures
Copy to:
Leo V. Diana, Mayor
Pom-Pom Gali
Sandy M. Carter

Swedcom

SLCP 2x6014

Dual (2x) Circularly Polarized log-periodic antenna



Features

- Transmit Diversity Gain
- Can be configured to combine space & polarization diversity
- Outstanding performance over the entire band (700 - 800 MHz)
- Excellent Axial Ratio
- Optimized for 4G & 3G systems
- Low intermodulation
- Improved Side-to-side rejection
- Fading reduction
- Excellent isolation between ports

Electrical specifications

Frequency range:	**700-800 MHz**
Impedance:	**50 ohm**
Connector type:	**7/16 Din**
Return loss:	**18 dB**
Polarization:	**Circular**
Gain ea. port [Circular]:	**2x14 dBdC**
Gain ea. port [Linear]:	**2x11 dBdL**
Axial Ratio:	**2 dB**
Isolation between ports (TX band):	**30 dB**
Front-to-back ratio:	**30 dB**
Intermodulation (2x20W):	**IM3 150 dB**
	IM5 160 dB
	IM7/9 170 dB
Power rating:	**2x 500 W**
H-plane (-3 dB point):	**2x 55°**
V-plane (-3 dB point):	**2x 16°**
Lightning protection:	**DC grounded**

Mechanical specifications

Overall height:	**53 in**	**[1346 mm]**
Width:	**14 in**	**[356 mm]**
Depth:	**11 in**	**[279 mm]**
Weight (excluding brackets):	**20 lbs**	**[9 Kg]**
Wind load measured up to:	**150 mph**	**[240 Km/h]**
Wind area (side of antenna):	**5.15 sq. ft.**	**[0.48 sq.m]**
Lateral thrust at 113 mph/ 180 Km/h (worst case):	**263 lbs**	**[1171 N]**

Materials

Radiating Elements:	**Aluminum**
Transformer (Power distribution)	**Ceramic PCB**
Chassis:	**Aluminum**
Radome:	**Grey Fiberglass/PVC**
Mounting bolts:	**Stainless steel**

The SLCP 2x6014 is made in the U.S.A.

Product Data Sheet **APX18-206517-CT2**

Optimizer® Dual Polarized Antenna, 1710-2170, 65deg, 18.5/19.0dBi, 1.8m, FET, 2deg

Product Description

Dense urban networks where site aspect is essential.

Features/Benefits

- **Very broadband design operating from GSM1800 up to 3G-UMTS.**
- **Reduction of visual impact by gathering 3 antennas in a cylindrical volume.**
- **Reduction of site dimensions will ease site acceptance.**
- **Possible camouflage solution on demand.**
- **Wind load thrust highly reduced.**
- **Compatible with usual base stations with 35 dB typical isolation between ports.**
- **Effective polarization diversity ensured by high cross polar discrimination.**
- **Optimized suppression of side lobes allows strong mechanical tilt.**

Technical Specifications

Electrical Specifications

Frequency Range, MHz	1710-1900	1900-2170
Horizontal Beamwidth, deg	68	64
Vertical Beamwidth, deg	5	4.5
Electrical Downtilt Range, deg	2	
Gain, dBi (dBd)	18.5 (16.4)	19 (16.9)
1st Upper Sidelobe Suppression, dB	>20	>18 (typ 20)
Front-To-Back Ratio, dB	>30	>25
Polarization	Dual pol +/-45°	
VSWR	< 1.4:1	
Isolation between Ports, dB	>30 (typ 35)	
3rd Order IMP @ 2 x 43 dBm, dBc	>150, N/A	
7th Order IMP @ 2 x 46 dBm, dBc	N/A, >170	
Impedance, Ohms	50	
Maximum Power Input, W	300	
Lightning Protection	Direct Ground	
Connector Type/Location	(2) 7-16 DIN Female/Bottom	

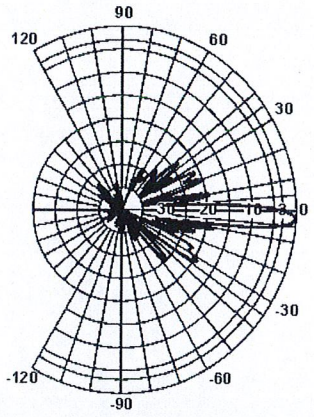
Mechanical Specifications

Dimensions - HxWxD, mm (in)	1840 x 169 x 80 (72.44 x 6.65 x 3.15)
Weight w/o Mtg Hardware, kg (lb)	11 (24.2)
Survival/Rated Wind Speed, km/h (mph)	200 (125) / 160 (100)
Wind Load @ Rated Wind, Front, N (lbf)	553 (124)
Wind Load @ Rated Wind, Max., N (lbf)	553 (124)
Wind Load @ Rated Wind, Side, N (lbf)	322 (72)
Wind Load @ Rated Wind, Rear, N (lbf)	267 (60)
Operation temperature, °C (°F)	-40 to +60 (-40 to +140)
Radome Material/Color	Fiberglass/Light Grey RAL7035
Mounting Hardware Material	Diecasted Aluminum
Radiating Element Material	Brass
Reflector Material	Aluminum
Shipping Weight, kg (lb)	16.5 (36.3)
Packing Dimensions, HxWxD, mm (in)	1964 x 251 x 203 (77.32 x 9.88 x 7.99)

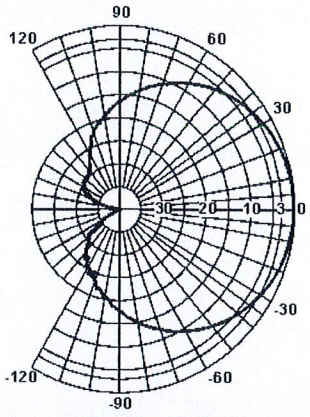
Ordering Information

Mounting Hardware	APM40-2
Mounting Pipe Diameter, mm (in)	60-120 (2.36-4.72)
Mounting Hardware Weight, kg (lb)	3.4 (7.5)

Optimizer® Dual Polarized Antenna, 1710-2170, 65deg, 18.5/19.0dBi, 1.8m, FET, 2deg



Vertical Pattern



Horizontal Pattern

Notes

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

External Document Links

APM40 Series Datasheet
APM40 Series Installation Instructions

BXA-171085-12BF-EDIN-X

Replace "X" with desired electrical downtilt

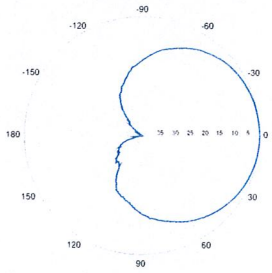
X-Pol | FET Panel | 85° | 18.0 dBi

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 m² Side: 0.19 m²	Front: 3.1 ft² Side: 2.1 ft²
Wind load @ 161 km/hr (100 mph)	Front: 460 N Side: 304 N	Front: 103 lbf Side: 68 lbf

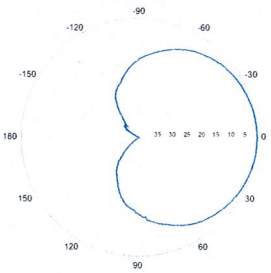
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171085-12BF-EDIN-X-FP		

BXA-171085-12BF-EDIN-X



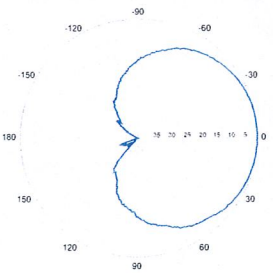
Horizontal | 1710-1880 MHz

BXA-171085-12BF-EDIN-X



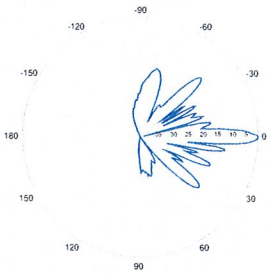
Horizontal | 1850-1990 MHz

BXA-171085-12BF-EDIN-X



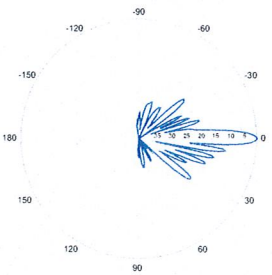
Horizontal | 1920-2170 MHz

BXA-171085-12BF-EDIN-0



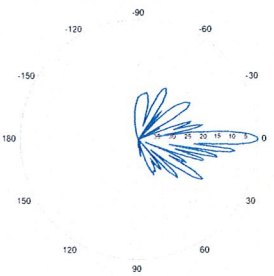
0° | Vertical | 1710-1880 MHz

BXA-171085-12BF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171085-12BF-EDIN-0



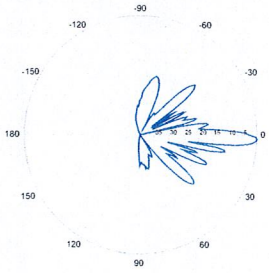
0° | Vertical | 1920-2170 MHz

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

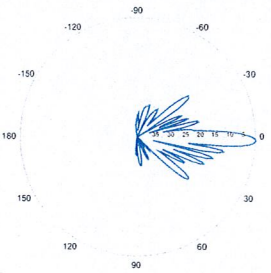
X-Pol | FET Panel | 85° | 18.0 dBi

BXA-171085-12BF-EDIN-2



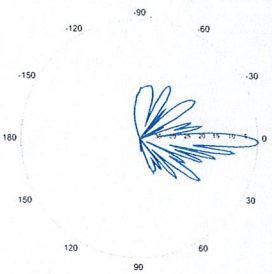
2° | Vertical | 1710-1880 MHz

BXA-171085-12BF-EDIN-2



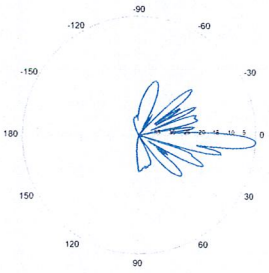
2° | Vertical | 1850-1990 MHz

BXA-171085-12BF-EDIN-2



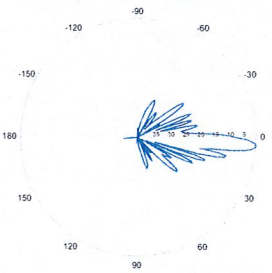
2° | Vertical | 1920-2170 MHz

BXA-171085-12BF-EDIN-4



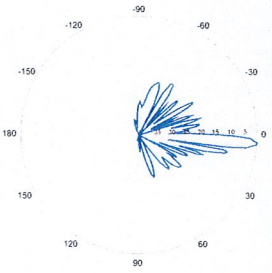
4° | Vertical | 1710-1880 MHz

BXA-171085-12BF-EDIN-4



4° | Vertical | 1850-1990 MHz

BXA-171085-12BF-EDIN-4



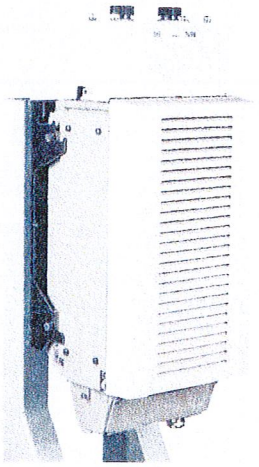
4° | Vertical | 1920-2170 MHz

Alcatel·Lucent

Alcatel-Lucent RRH2x40-AWS

REMOTE RADIO HEAD

The Alcatel-Lucent RRH2x40-AWS is a high-power, small form-factor Remote Radio Head (RRH) operating in the AWS frequency band (1700/2100MHz - 3GPP Band 4). The Alcatel-Lucent RRH2x40-AWS is designed with an eco-efficient approach, providing operators with the means to achieve high quality and capacity coverage with minimum site requirements.



A distributed eNodeB expands deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of an eNodeB to be installed separately, within the same site or several kilometres apart.

The Alcatel-Lucent RRH2x40-AWS is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information. The Alcatel-Lucent RRH2x40-AWS has two transmit RF paths, 40 W RF output power per transmit path, and is designed to manage up to four-way receive diversity. The device is ideally suited to support macro coverage, with multiple-input multiple-output (MIMO) 2x2 operation in up to 20 MHz of bandwidth.

The Alcatel-Lucent RRH2x40-AWS is designed to make available all the benefits of a distributed eNodeB, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX). The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment or require costly cranes to be employed, leaving coverage holes. However, many of these sites can host an Alcatel-Lucent RRH2x40-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

Fast, low-cost installation and deployment

The Alcatel-Lucent RRH2x40-AWS is a zero-footprint solution and operates noise-free, simplifying negotiations with site property owners and minimizing environmental impacts. Installation can easily be done by a single person because the Alcatel-Lucent RRH2x40-AWS is compact and weighs less than 20 kg (44 lb), eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day — a fraction of the time required for a traditional BTS.

Excellent RF performance

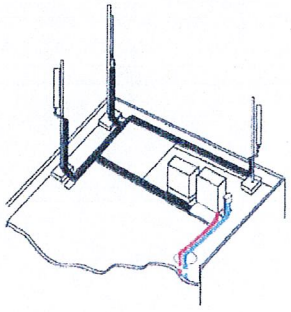
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation costs are reduced or eliminated, and there is no need for a Tower Mounted Amplifier (TMA) because losses introduced by the RF feeder are greatly reduced.
The Alcatel-Lucent RRH2x40-AWS provides more RF power while at the same time consuming less electricity.

Features

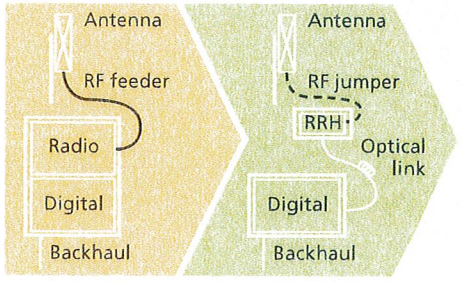
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption

Benefits

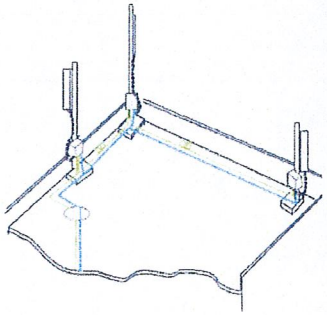
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility to network planning



Macro



RRH for space-constrained cell sites



Distributed

Technical specifications

Physical dimensions

- Height: 620 mm (24.4 in.)
- Width: 270 mm (10.63 in.)
- Depth: 170m (6.7 in.)
- Weight (without mounting kit): less than 20 kg (44 lb)

Power

- Power supply: -48VDC

Operating environment

- Outdoor temperature range:
  - ¬ With solar load: -40°C to +50°C (-40°F to +122°F)
  - ¬ Without solar load: -40°C to +55°C (-40°F to +131°F)
- Passive convection cooling (no fans)
- Enclosure protection
  - ¬ IP65 (International Protection rating)

RF characteristics

- Frequency band: 1700/2100 MHz (AWS); 3GPP Band 4
- Bandwidth: up to 20 MHz
- RF output power at antenna port: 40 W nominal RF power for each Tx port
- Rx diversity: 2-way or 4-way with optional Rx Diversity module
- Noise figure: below 2.0 dB typical
- Antenna Line Device features
  - ¬ TMA and Remote electrical tilt (RET) support via AISG v2.0

Optical characteristics

Type/number of fibers

- Single-mode variant
  - ¬ One Single Mode Single Fiber per RRH2x, carrying UL and DL using CWDM
  - ¬ Single mode dual fiber (SM/DF)
- Multi-mode variant
  - ¬ Two Multi-mode fibers per RRH2x: one carrying UL, the other carrying DL

Optical fiber length

- Up to 500 m (0.31 mi), using MM fiber
- Up to 20 km (12.43 mi), using SM fiber

Digital Ports and Alarms

- Two optical ports to support daisy-chaining
- Six external alarms

CPG2809100912 (09)

Alcatel·Lucent

Product Data Sheet HB158-1-08U8-S8J18

HYBRIFLEX™ RRH Hybrid Feeder Cabling Solution, 1-5/8", Single-Mode Fiber

Product Description

RFS' HYBRIFLEX Remote Radio Head (RRH) hybrid feeder cabling solution combines optical fiber and DC power for RRHs in a single lightweight aluminum corrugated cable, making it the world's most innovative solution for RRH deployments.

It was developed to reduce installation complexity and costs at Cellular sites. HYBRIFLEX allows mobile operators deploying an RRH architecture to standardize the RRH installation process and eliminate the need for and cost of cable grounding. HYBRIFLEX combines optical fiber (multi-mode or single-mode) and power in a single corrugated cable. It eliminates the need for junction boxes and can connect multiple RRHs with a single feeder. Standard RFS CELLFLEX® accessories can be used with HYBRIFLEX cable. Both pre-connectorized and on-site options are available.

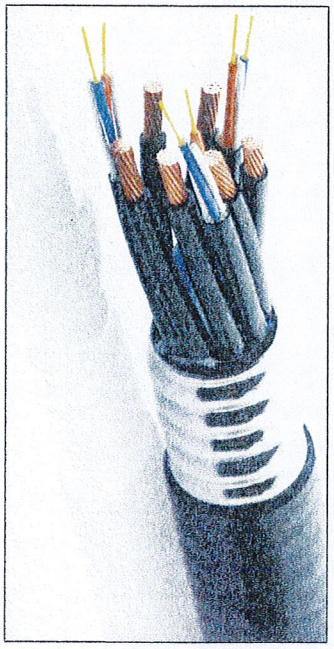


Figure 1: HYBRIFLEX Series

Features/Benefits

- Aluminum corrugated armor with outstanding bending characteristics – minimizes installation time and enables mechanical protection and shielding
- Same accessories as 1 5/8" coaxial cable
- Outer conductor grounding – Eliminates typical grounding requirements and saves on installation costs
- Lightweight solution and compact design – Decreases tower loading
- Robust cabling – Eliminates need for expensive cable trays and ducts
- Installation of tight bundled fiber optic cable pairs directly to the RRH – Reduces CAPEX and wind load by eliminating need for interconnection
- Optical fiber and power cables housed in single corrugated cable – Saves CAPEX by standardizing RRH cable installation and reducing installation requirements
- Outdoor polyethylene jacket – Ensures long-lasting cable protection

Technical Specifications

Structure			
Outer Conductor Armor:	Corrugated Aluminum	[mm (in)]	46.5 (1.83)
Jacket:	Polyethylene, PE	[mm (in)]	50.3 (1.98)
UV-Protection:	Individual and External Jacket		Yes
Mechanical Properties			
Weight, Approximate		[kg/m (lb/ft)]	1.9 (1.30)
Minimum Bending Radius, Single Bending		[mm (in)]	200 (8)
Minimum Bending Radius, Repeated Bending		[mm (in)]	500 (20)
Recommended/Maximum Clamp Spacing		[m (ft)]	1.0 / 1.2 (3.25 / 4.0)
Electrical Properties			
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	068 (0.205)
DC-Resistance Power Cable, 8.4mm² (8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
Fiber Optic Properties			
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		[µm]	50/125
Primary Coating (Acrylate)		[µm]	245
Buffer Diameter, Nominal		[µm]	900
Secondary Protection, Jacket, Nominal		[mm (in)]	2.0 (0.08)
Minimum Bending Radius		[mm (in)]	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL94-V0, UL1666 RoHS Compliant
DC Power Cable Properties			
Size (Power)		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm² (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Environment			
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

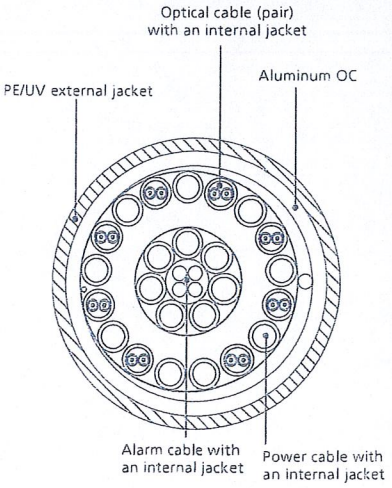


Figure 2: Construction Detail

* This data is provisional and subject to change.

	General	Power	Density					
Site Name: Manchester W								
Tower Height: Verizon @ 90ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T UMTS	2	565	125	0.0260	880	0.5867	0.44%	
*AT&T UMTS	2	1077	125	0.0496	1900	1.0000	0.50%	
*AT&T GSM	4	813	125	0.0748	1900	1.0000	0.75%	
*AT&T GSM	1	491	125	0.0113	880	0.5867	0.19%	
*AT&T LTE	1	1313	125	0.0302	734	0.4893	0.62%	
*Nextel	9	100	100	0.0324	851	0.5673	5.70%	
*PageNet				0.0249	935	0.6233	3.99%	
*Clearwire	2	153	115	0.0083	2496	1.0000	0.83%	
*Clearwire	1	211	115	0.0057	11 GHz	1.0000	0.57%	
*Sprint	11	412	115	0.1232	1962.5	1.0000	12.32%	
Verizon PCS	**11**	**274**	**90**	**0.1338**	**1970**	**1.0000**	**13.38%**	
Verizon Cellular	**9**	**273**	**90**	**0.1091**	**869**	**0.5793**	**18.83%**	
Verizon AWS	**1**	**1750**	**90**	**0.0777**	**2145**	**1.0000**	**7.77%**	
Verizon 700	**1**	**1050**	**90**	**0.0466**	**698**	**0.4653**	**10.02%**	
								75.92%
* Source: Siting Council								

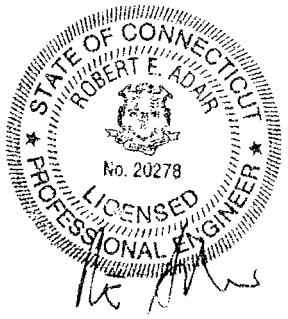
ALL-POINTS TECHNOLOGY CORPORATION, P.C.

STRUCTURAL ANALYSIS REPORT
140' MONOPOLE TOWER
MANCHESTER, CONNECTICUT

Prepared for
Verizon Wireless

Site: Manchester West

November 27, 2012



APT Project #CT1414250

3 SADDLEBROOK DRIVE · KILLINGWORTH, CT 06419 · PHONE 860-663-1697 · FAX 860-663-0935
⊗ P.O. BOX 504 · 116 GRANDVIEW ROAD · CONWAY, NH 03818 · PHONE 603-496-5853 · FAX 603-447-2124

STRUCTURAL ANALYSIS REPORT
140' MONOPOLE TOWER
MANCHESTER, CONNECTICUT
prepared for
Verizon Wireless

EXECUTIVE SUMMARY:

All-Points Technology Corporation, P.C. (APT) performed a structural analysis of this 140-foot monopole tower located in Manchester, Connecticut. The analysis was performed for Verizon Wireless's proposed replacement of six Swedcom SC-E 6014 panel antennas with one Antel BXA-171085/12, two RFS APX18-206517 and three Swedcom SLCP 2x6014 panel antennas, and installation of three Alcatel-Lucent RRH2x40-AWS remote radio heads (RRHs) and one Raycap RDC-4276-PF-48 surge suppressor, fed by one hybrid fiber/power line as detailed below.

Our analysis indicates the tower meets the requirements of the Connecticut Uniform Building and Energy Code and TIA-222 with the proposed equipment.

The base foundation was evaluated from original design drawings. The foundation was determined to be adequately sized for the existing and proposed equipment.

INTRODUCTION:

A structural analysis of this communications tower was performed by APT for Verizon Wireless. The tower is located at 60 Adams Street in Manchester, Connecticut. APT previously visited the tower site on June 29, 2012 to record information regarding physical and dimensional properties of the structure and its appurtenances. The structure was climbed in its entirety to compile data necessary to perform the structural analysis.

This analysis also relied on information provided by others, which included Engineered Endeavors Incorporated (EEI) tower and foundation drawings, Project #GS51376 dated March 24, 1999; a structural analysis report by Hudson Design Group, LLC for AT&T Mobility dated April 6, 2012; a structural analysis report by Bay State Design, Inc. for Clearwire dated February 25, 2010; and a structural analysis by URS Corporation for Verizon Wireless dated March 28, 2012

The structure is a 140-foot, galvanized steel monopole. The analysis was conducted using the following antenna inventory (proposed equipment in **bold** text, reserved equipment shown in *italic* text):

Antenna	Elev.	Mount	Coax.
Vacant mounts	137.5'	(2) 3' standoffs	None
Vacant mount	132'	5' standoff	None
(6) AM-X-WM-17-65, (3) 800-10121 panels, (6) RETs, (6) TMAs, *DC6-48 surge suppressor, (6) RRHs*	125'	12' platform w/rails	(12) 1-5/8", (2) power, fiber
1' & 2' high performance dishes	118'	Pipes on platform below	(2) 1/2"
(3) LLPX310R, (6) DB980H65 panel antennas, (3) DAP heads	115'	14' low profile platform	(6) 1-1/4", (2) 2" conduit
Vacant mounts	105'	(2) 3'-6" standoffs	None
(12) DB844H90 panel antennas	102'	13' platform w/rails	(12) 7/8"
(3) MG D3-900T, (3) BXA-70063/6, **(3) SLCP 2x6014, (1) BXA-171085/12, (2) APX18-206517 panels, (3) RRHs, (1) surge suppressor**, (6) FD9R6004/2C-3L diplexers	90'	12' platform w/rails	(12) 1-5/8", **(1) hybrid**

STRUCTURAL ANALYSIS:

Methodology:

The structural analysis was done in accordance with the Connecticut State Building Code, TIA/EIA-222, Revision F (TIA), Structural Standards for Steel Antenna Towers and Antenna Supporting Structures; and the American Institute of Steel Construction (AISC), Manual of Steel Construction, Allowable Stress Design, Ninth Edition.

The analysis was conducted using an 80 mph fastest mile wind speed (equivalent to 95 mph 3-second gust) and one-half inch of radial ice over the structure and associated appurtenances. The TIA Standard requires a basic wind speed of 80 miles per hour for Hartford County, Connecticut.

Two loading conditions were evaluated in accordance with TIA/EIA-222-F to determine tower capacity. The more demanding of the two cases is used to calculate tower capacity:

- Case 1 = Wind Load (without ice) + Tower Dead Load
- Case 2 = 0.75 Wind Load (with ice) + Ice Load + Tower Dead Load

The TIA/EIA standard permits a one-third increase in allowable stresses for towers less than 700-feet tall. Allowable stresses of tower members were increased by one-third when computing the tower capacity values shown below.

Analysis Results:

The following table summarizes the capacity of the monopole based on combined axial and bending stresses:

Elevation	Capacity
91'-140'	62%
45'-91'	85%
0'-45'	88%
Base plate	86%

The base foundation was evaluated from EEI design drawings. The foundation was found to be adequately sized for the proposed loads. Base reactions were calculated to be as follows:

Compression:	27.5 kips
Total Shear:	20.5 kips
Overturning Moment:	1948 ft-kips

CONCLUSIONS AND SUGGESTIONS:

As detailed above, our analysis indicates that the 140' monopole tower located at 60 Adams Street in Manchester, Connecticut meets the requirements of the Connecticut State Building Code and TIA-222 with Verizon's proposed equipment.

LIMITATIONS:

This report is based on the following:

1. Tower is properly installed and maintained.
2. All members are in an undeteriorated condition.
3. All bolts are in place and are properly tightened.
4. Tower is in plumb condition.

All-Points Technology Corporation, P.C. (APT) is not responsible for any modifications completed prior to or hereafter which APT is not or was not directly involved. Modifications include but are not limited to:

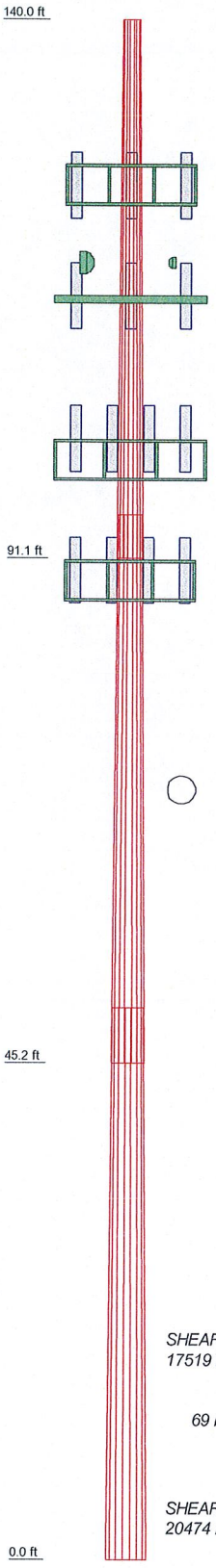
1. Adding or relocating antennas.
2. Installing antenna mounts or waveguide cables.
3. Extending tower.

APT hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon the information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact APT. APT disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Appendix A

Tower Schematic

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	48.91	18	0.1875	4.00	18.0000	27.0836		2214.2
2	49.91	18	0.3125	5.00	25.9657	35.2341	A572-65	5101.6
3	50.18	18	0.3750		33.6805	43.0001		7716.3
								15032.2



AXIAL
35392 lb

SHEAR
17519 lb

MOMENT
1717375 lb-ft

TORQUE 141 lb-ft
69 mph WIND - 0.5000 in ICE

AXIAL
27525 lb

SHEAR
20474 lb

MOMENT
1947838 lb-ft

TORQUE 177 lb-ft
REACTIONS - 80 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
3' x 4" standoff	137.5	14' low-profile platform	115
3' x 4" standoff	137.5	LLPX310R panel	115
5' x 4" standoff	132	LLPX310R panel	115
(2) AM-X-WM-17-65	125	3'-6" x 3 1/2" pipe mount	105
(2) AM-X-WM-17-65	125	3'-6" x 3 1/2" pipe mount	105
(2) AM-X-WM-17-65	125	(4) DB844H90	102
800-10121	125	(4) 6'x2 3/8" Pipe Mount	102
800-10121	125	(4) 6'x2 3/8" Pipe Mount	102
800-10121	125	(4) 6'x2 3/8" Pipe Mount	102
(2) 860-10025 RCU	125	(4) DB844H90	102
(2) 860-10025 RCU	125	(4) DB844H90	102
(2) 860-10025 RCU	125	13' platform w/rails	100
(2) Ericsson RRUS-11	125	BXA-70063/6CF	90
(2) Ericsson RRUS-11	125	MG D3-900T	90
(2) Ericsson RRUS-11	125	MG D3-900T	90
(2) DTMA ABP7819VG12A	125	MG D3-900T	90
(2) DTMA ABP7819VG12A	125	ALU RRH2x40-AWS	90
(2) DTMA ABP7819VG12A	125	ALU RRH2x40-AWS	90
Raycap DC6-48 surge suppressor	125	ALU RRH2x40-AWS	90
(4) 7'x2 3/8" Pipe Mount	125	Raycap RDC-4276-PF-48 J-box	90
(4) 7'x2 3/8" Pipe Mount	125	APXV18-206517	90
(4) 7'x2 3/8" Pipe Mount	125	BXA-171085/12	90
12' platform w/rails	125	APXV18-206517	90
1' HP dish	118	SLCP 2x6014	90
2' HP dish	118	SLCP 2x6014	90
LLPX310R panel	115	SLCP 2x6014	90
Samsung U-RAS DAP unit	115	(2) FD9R6004/2C-3L diplexer	90
Samsung U-RAS DAP unit	115	(2) FD9R6004/2C-3L diplexer	90
Samsung U-RAS DAP unit	115	(2) FD9R6004/2C-3L diplexer	90
(2) DB980H65E-M	115	(4) 7'x2 3/8" Pipe Mount	90
(2) DB980H65E-M	115	(4) 7'x2 3/8" Pipe Mount	90
(2) DB980H65E-M	115	(4) 7'x2 3/8" Pipe Mount	90
(3) 7'x2 3/8" Pipe Mount	115	BXA-70063/6CF	90
(3) 7'x2 3/8" Pipe Mount	115	BXA-70063/6CF	90
(3) 7'x2 3/8" Pipe Mount	115	12' platform w/rails	89

MATERIAL STRENGTH

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

All-Points Technology Corporation
P.O. Box 504
Conway, NH 03818
Phone: (603) 496-5853
FAX: (603) 447-2124

Job: *140' Monopole Tower*			
Project: *CT1414250 Manchester*			
Client: Verizon Wireless	Drawn by: Rob Adair	App'd:	
Code: TIA/EIA-222-F	Date: 11/27/12	Scale: NTS	
Path: C:\Users\Rob Adair\Documents\Jobs\2 Verizon LTE\CT1414250 Manchester\CT1414250 Manchester.eri		Dwg No. E-1	

Appendix B

Calculations

tnxTower	Job	Page
	140' Monopole Tower	1 of 6
All-Points Technology Corporation P.O. Box 504 Conway, NH 03818 Phone: (603) 496-5853 FAX: (603) 447-2124	**Project** CT1414250 Manchester	**Date** 14:39:20 11/27/12
	Client Verizon Wireless	**Designed by** Rob Adair

Tower Input Data

This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

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.
Deflections calculated using a wind speed of 60 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.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	140.00-91.09	48.91	4.00	18	18.0000	27.0836	0.1875	0.7500	A572-65 (65 ksi)
L2	91.09-45.18	49.91	5.00	18	25.9657	35.2341	0.3125	1.2500	A572-65 (65 ksi)
L3	45.18-0.00	50.18		18	33.6805	43.0001	0.3750	1.5000	A572-65 (65 ksi)

Monopole Base Plate Data

Base Plate Data	
Anchor bolt grade	A615-75
Anchor bolt size	2.2500 in
Number of bolts	12
Embedment length	72.0000 in
f'_c	4 ksi
Grout space	2.0000 in
Base plate grade	A572-60
Base plate thickness	1.7500 in
Bolt circle diameter	51.0000 in
Outer diameter	57.0000 in
Inner diameter	41.5000 in
Base plate type	Stiffened Plate
Bolts per stiffener	1
Stiffener thickness	0.7500 in
Stiffener height	8.0000 in

Feed Line/Linear Appurtenances

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
7/8	C	No	Inside Pole	100.00 - 8.00	12	No Ice	0.00	0.54
						1/2" Ice	0.00	0.54
1 5/8	C	No	Inside Pole	90.00 - 8.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1 1/4	C	No	Inside Pole	115.00 - 8.00	6	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
2" conduit	C	No	Inside Pole	115.00 - 8.00	2	No Ice	0.00	2.00
						1/2" Ice	0.00	2.00
1/2	C	No	Inside Pole	118.00 - 8.00	2	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
1 5/8	C	No	Inside Pole	125.00 - 8.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
2" conduit	C	No	Inside Pole	128.00 - 8.00	1	No Ice	0.00	2.00
						1/2" Ice	0.00	2.00
5/8 power	C	No	Inside Pole	125.00 - 8.00	2	No Ice	0.00	0.40
						1/2" Ice	0.00	0.40
1.34" fiber cable	C	No	Inside Pole	125.00 - 8.00	1	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
3/8" safety cable	A	No	CaAa (Out Of Face)	140.00 - 12.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.83
1.57" Hybrid fiber-power cable	C	No	Inside Pole	90.00 - 8.00	1	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
3' x 4" standoff	B	None		0.0000	137.50	No Ice	1.40	0.16	40.00
						1/2" Ice	1.66	0.21	51.31
3' x 4" standoff	C	None		0.0000	137.50	No Ice	1.40	0.16	40.00
						1/2" Ice	1.66	0.21	51.31
5' x 4" standoff	A	None		0.0000	132.00	No Ice	2.33	0.16	75.00
						1/2" Ice	2.75	0.21	93.31
(2) AM-X-WM-17-65	A	From Leg	4.00 0.00 0.00	0.0000	125.00	No Ice	3.42	1.54	30.00
						1/2" Ice	3.78	1.84	47.96
(2) AM-X-WM-17-65	B	From Leg	4.00 0.00 0.00	0.0000	125.00	No Ice	3.42	1.54	30.00
						1/2" Ice	3.78	1.84	47.96
(2) AM-X-WM-17-65	C	From Leg	4.00 0.00 0.00	0.0000	125.00	No Ice	3.42	1.54	30.00
						1/2" Ice	3.78	1.84	47.96
800-10121	A	From Leg	4.00 0.00 0.00	0.0000	125.00	No Ice	5.46	3.29	50.00
						1/2" Ice	5.88	3.64	82.91
800-10121	B	From Leg	4.00 0.00 0.00	0.0000	125.00	No Ice	5.46	3.29	50.00
						1/2" Ice	5.88	3.64	82.91
800-10121	C	From Leg	4.00 0.00 0.00	0.0000	125.00	No Ice	5.46	3.29	50.00
						1/2" Ice	5.88	3.64	82.91
(2) 860-10025 RCU	A	From Leg	4.00 0.00 0.00	0.0000	125.00	No Ice	0.14	0.11	3.00
						1/2" Ice	0.20	0.17	4.36
(2) 860-10025 RCU	B	From Leg	4.00 0.00 0.00	0.0000	125.00	No Ice	0.14	0.11	3.00
						1/2" Ice	0.20	0.17	4.36
(2) 860-10025 RCU	C	From Leg	4.00 0.00 0.00	0.0000	125.00	No Ice	0.14	0.11	3.00
						1/2" Ice	0.20	0.17	4.36

tnxTower	Job: 140' Monopole Tower	Page: 3 of 6
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	Client: Verizon Wireless	Designed by: Rob Adair

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft	°	ft		ft^2	ft^2	lb
(2) Ericsson RRUS-11	A	From Leg	4.00	0.0000	125.00	No Ice	2.94	1.19	55.00
			0.00			1/2" Ice	3.17	1.35	74.32
			0.00						
(2) Ericsson RRUS-11	B	From Leg	4.00	0.0000	125.00	No Ice	2.94	1.19	55.00
			0.00			1/2" Ice	3.17	1.35	74.32
			0.00						
(2) Ericsson RRUS-11	C	From Leg	4.00	0.0000	125.00	No Ice	2.94	1.19	55.00
			0.00			1/2" Ice	3.17	1.35	74.32
			0.00						
(2) DTMA ABP7819VG12A	A	From Leg	4.00	0.0000	125.00	No Ice	1.17	0.35	15.00
			0.00			1/2" Ice	1.31	0.45	21.87
			0.00						
(2) DTMA ABP7819VG12A	B	From Leg	4.00	0.0000	125.00	No Ice	1.17	0.35	15.00
			0.00			1/2" Ice	1.31	0.45	21.87
			0.00						
(2) DTMA ABP7819VG12A	C	From Leg	4.00	0.0000	125.00	No Ice	1.17	0.35	15.00
			0.00			1/2" Ice	1.31	0.45	21.87
			0.00						
Raycap DC6-48 surge suppressor	C	None		0.0000	125.00	No Ice	1.19	1.19	30.00
						1/2" Ice	1.37	1.37	44.34
(4) 7'x2 3/8" Pipe Mount	A	From Leg	4.00	0.0000	125.00	No Ice	1.66	1.66	25.55
			0.00			1/2" Ice	2.39	2.39	38.13
			0.00						
(4) 7'x2 3/8" Pipe Mount	B	From Leg	4.00	0.0000	125.00	No Ice	1.66	1.66	25.55
			0.00			1/2" Ice	2.39	2.39	38.13
			0.00						
(4) 7'x2 3/8" Pipe Mount	C	From Leg	4.00	0.0000	125.00	No Ice	1.66	1.66	25.55
			0.00			1/2" Ice	2.39	2.39	38.13
			0.00						
12' platform w/rails	C	None		0.0000	125.00	No Ice	12.60	10.91	1300.00
						1/2" Ice	13.60	11.78	1969.34
LLPX310R panel	A	From Leg	4.00	0.0000	115.00	No Ice	4.84	1.96	28.60
			0.00			1/2" Ice	5.19	2.22	54.56
			0.00						
LLPX310R panel	B	From Leg	4.00	0.0000	115.00	No Ice	4.84	1.96	28.60
			0.00			1/2" Ice	5.19	2.22	54.56
			0.00						
LLPX310R panel	C	From Leg	4.00	0.0000	115.00	No Ice	4.84	1.96	28.60
			0.00			1/2" Ice	5.19	2.22	54.56
			0.00						
Samsung U-RAS DAP unit	A	From Leg	4.00	0.0000	115.00	No Ice	1.82	0.83	15.00
			0.00			1/2" Ice	2.01	0.97	26.95
			0.00						
Samsung U-RAS DAP unit	B	From Leg	4.00	0.0000	115.00	No Ice	1.82	0.83	15.00
			0.00			1/2" Ice	2.01	0.97	26.95
			0.00						
Samsung U-RAS DAP unit	C	From Leg	4.00	0.0000	115.00	No Ice	1.82	0.83	15.00
			0.00			1/2" Ice	2.01	0.97	26.95
			0.00						
(2) DB980H65E-M	A	From Leg	4.00	0.0000	115.00	No Ice	3.80	2.19	8.50
			0.00			1/2" Ice	4.18	2.56	28.62
			0.00						
(2) DB980H65E-M	B	From Leg	4.00	0.0000	115.00	No Ice	3.80	2.19	8.50
			0.00			1/2" Ice	4.18	2.56	28.62
			0.00						
(2) DB980H65E-M	C	From Leg	4.00	0.0000	115.00	No Ice	3.80	2.19	8.50
			0.00			1/2" Ice	4.18	2.56	28.62
			0.00						
(3) 7'x2 3/8" Pipe Mount	A	From Leg	4.00	0.0000	115.00	No Ice	1.66	1.66	25.55

tnxTower	Job: 140' Monopole Tower	Page: 4 of 6
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	Client: Verizon Wireless	Designed by: Rob Adair

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1/2" Ice	2.39	2.39	38.13
			0.00						
(3) 7'x2 3/8" Pipe Mount	B	From Leg	4.00	0.0000	115.00	No Ice	1.66	1.66	25.55
			0.00			1/2" Ice	2.39	2.39	38.13
			0.00						
(3) 7'x2 3/8" Pipe Mount	C	From Leg	4.00	0.0000	115.00	No Ice	1.66	1.66	25.55
			0.00			1/2" Ice	2.39	2.39	38.13
			0.00						
14' low-profile platform	C	None		0.0000	115.00	No Ice	9.80	8.49	1200.00
						1/2" Ice	10.93	9.47	2063.51
3'-6" x 3 1/2" pipe mount	A	None		0.0000	105.00	No Ice	0.93	0.93	18.00
						1/2" Ice	1.15	1.15	27.07
3'-6" x 3 1/2" pipe mount	C	None		0.0000	105.00	No Ice	0.93	0.93	18.00
						1/2" Ice	1.15	1.15	27.07
(4) DB844H90	A	From Leg	4.00	0.0000	102.00	No Ice	2.87	3.97	10.00
			0.00			1/2" Ice	3.18	4.34	36.27
			0.00						
(4) DB844H90	B	From Leg	4.00	0.0000	102.00	No Ice	2.87	3.97	10.00
			0.00			1/2" Ice	3.18	4.34	36.27
			0.00						
(4) DB844H90	C	From Leg	4.00	0.0000	102.00	No Ice	2.87	3.97	10.00
			0.00			1/2" Ice	3.18	4.34	36.27
			0.00						
(4) 6'x2 3/8" Pipe Mount	A	From Leg	4.00	0.0000	102.00	No Ice	1.43	1.43	21.90
			0.00			1/2" Ice	1.92	1.92	32.73
			0.00						
(4) 6'x2 3/8" Pipe Mount	B	From Leg	4.00	0.0000	102.00	No Ice	1.43	1.43	21.90
			0.00			1/2" Ice	1.92	1.92	32.73
			0.00						
(4) 6'x2 3/8" Pipe Mount	C	From Leg	4.00	0.0000	102.00	No Ice	1.43	1.43	21.90
			0.00			1/2" Ice	1.92	1.92	32.73
			0.00						
13' platform w/rails	C	None		0.0000	100.00	No Ice	13.65	11.81	1200.00
						1/2" Ice	14.72	12.75	1977.13
BXA-70063/6CF	A	From Leg	4.00	0.0000	90.00	No Ice	7.73	3.76	25.00
			0.00			1/2" Ice	8.27	4.19	65.60
			0.00						
BXA-70063/6CF	B	From Leg	4.00	0.0000	90.00	No Ice	7.73	3.76	25.00
			0.00			1/2" Ice	8.27	4.19	65.60
			0.00						
BXA-70063/6CF	C	From Leg	4.00	0.0000	90.00	No Ice	7.73	3.76	25.00
			0.00			1/2" Ice	8.27	4.19	65.60
			0.00						
MG D3-900T	A	From Leg	4.00	0.0000	90.00	No Ice	4.78	3.60	25.00
			0.00			1/2" Ice	5.24	4.04	52.16
			0.00						
MG D3-900T	B	From Leg	4.00	0.0000	90.00	No Ice	4.78	3.60	25.00
			0.00			1/2" Ice	5.24	4.04	52.16
			0.00						
MG D3-900T	C	From Leg	4.00	0.0000	90.00	No Ice	4.78	3.60	25.00
			0.00			1/2" Ice	5.24	4.04	52.16
			0.00						
ALU RRH2x40-AWS	A	From Leg	4.00	0.0000	90.00	No Ice	2.52	1.59	45.00
			0.00			1/2" Ice	2.75	1.80	62.40
			0.00						
ALU RRH2x40-AWS	B	From Leg	4.00	0.0000	90.00	No Ice	2.52	1.59	45.00
			0.00			1/2" Ice	2.75	1.80	62.40
			0.00						
ALU RRH2x40-AWS	C	From Leg	4.00	0.0000	90.00	No Ice	2.52	1.59	45.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1/2" Ice	2.75	1.80	62.40
			0.00						
Raycap RDC-4276-PF-48 J-box	C	None		0.0000	90.00	No Ice	6.69	2.70	35.00
						1/2" Ice	7.03	2.95	76.97
APXV18-206517	A	From Leg	4.00	0.0000	90.00	No Ice	5.17	3.04	30.00
			0.00			1/2" Ice	5.62	3.47	56.60
			0.00						
BXA-171085/12	B	From Leg	4.00	0.0000	90.00	No Ice	4.79	3.62	25.00
			0.00			1/2" Ice	5.24	4.06	52.45
			0.00						
APXV18-206517	C	From Leg	4.00	0.0000	90.00	No Ice	5.17	3.04	30.00
			0.00			1/2" Ice	5.62	3.47	56.60
			0.00						
SLCP 2x6014	A	From Leg	4.00	0.0000	90.00	No Ice	7.21	5.67	25.00
			0.00			1/2" Ice	7.65	6.09	75.49
			0.00						
SLCP 2x6014	B	From Leg	4.00	0.0000	90.00	No Ice	7.21	5.67	25.00
			0.00			1/2" Ice	7.65	6.09	75.49
			0.00						
SLCP 2x6014	C	From Leg	4.00	0.0000	90.00	No Ice	7.21	5.67	25.00
			0.00			1/2" Ice	7.65	6.09	75.49
			0.00						
(2) FD9R6004/2C-3L diplexer	A	From Leg	4.00	0.0000	90.00	No Ice	0.70	0.35	12.00
			0.00			1/2" Ice	0.82	0.45	16.80
			0.00						
(2) FD9R6004/2C-3L diplexer	B	From Leg	4.00	0.0000	90.00	No Ice	0.70	0.35	12.00
			0.00			1/2" Ice	0.82	0.45	16.80
			0.00						
(2) FD9R6004/2C-3L diplexer	C	From Leg	4.00	0.0000	90.00	No Ice	0.70	0.35	12.00
			0.00			1/2" Ice	0.82	0.45	16.80
			0.00						
(4) 7'x2 3/8" Pipe Mount	A	From Leg	4.00	0.0000	90.00	No Ice	1.66	1.66	25.55
			0.00			1/2" Ice	2.39	2.39	38.13
			0.00						
(4) 7'x2 3/8" Pipe Mount	B	From Leg	4.00	0.0000	90.00	No Ice	1.66	1.66	25.55
			0.00			1/2" Ice	2.39	2.39	38.13
			0.00						
(4) 7'x2 3/8" Pipe Mount	C	From Leg	4.00	0.0000	90.00	No Ice	1.66	1.66	25.55
			0.00			1/2" Ice	2.39	2.39	38.13
			0.00						
12' platform w/rails	C	None		0.0000	89.00	No Ice	12.60	10.91	1300.00
						1/2" Ice	13.60	11.78	1969.34

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
1' HP dish	B	Paraboloid w/Shroud (HP)	From Leg	3.00	0.0000		118.00	1.00	No Ice	0.79	15.00
				0.00					1/2" Ice	0.92	25.00
				0.00							
2' HP dish	C	Paraboloid w/Shroud (HP)	From Leg	3.00	0.0000		118.00	2.00	No Ice	3.14	50.00
				0.00					1/2" Ice	3.41	67.50
				0.00							

tnxTower	Job	Page
	140' Monopole Tower	6 of 6
All-Points Technology Corporation P.O. Box 504 Conway, NH 03818 Phone: (603) 496-5853 FAX: (603) 447-2124	**Project** CT1414250 Manchester	**Date** 14:39:20 11/27/12
	Client Verizon Wireless	**Designed by** Rob Adair

Solution Summary

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 91.0885	52.796	10	2.9685	0.0012
L2	95.0885 - 45.1823	25.967	10	2.5073	0.0007
L3	50.1823 - 0	7.270	10	1.3362	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
137.50	3' x 4" standoff	10	51.225	2.9532	0.0012	26074
132.00	5' x 4" standoff	10	47.776	2.9186	0.0011	16296
125.00	(2) AM-X-WM-17-65	10	43.421	2.8700	0.0010	8690
118.00	1' HP dish	10	39.134	2.8122	0.0010	5924
115.00	LLPX310R panel	10	37.325	2.7836	0.0009	5213
105.00	3'-6" x 3 1/2" pipe mount	10	31.461	2.6663	0.0008	3722
102.00	(4) DB844H90	10	29.760	2.6232	0.0008	3428
100.00	13' platform w/rails	10	28.644	2.5922	0.0008	3256
90.00	BXA-70063/6CF	10	23.299	2.4057	0.0006	2650
89.00	12' platform w/rails	10	22.788	2.3843	0.0006	2606

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	140 - 91.0885	Pole	TP27.0836x18x0.1875	1	-7725.78	94624.60	61.8	Pass
L2	91.0885 - 45.1823	Pole	TP35.2341x25.9657x0.3125	2	-16604.20	346294.72	84.5	Pass
L3	45.1823 - 0	Pole	TP43.0001x33.6805x0.375	3	-27504.90	819321.75	87.7	Pass
							Summary	
						Pole (L3)	87.7	Pass
						Base Plate	86.0	Pass
						RATING =	**87.7**	**Pass**