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KENNETH C. BALDWIN

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Direct (860) 275-8345

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

February 22, 2013

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

RE: **EM-VER-080-130128** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 38 Elm Street, Meriden, 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 January 25, 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,

L Roberts

Linda Roberts
Executive Director

LR/CDM/jb

c: The Honorable Michael S. Rohde, Mayor, City of Meriden
Lawrence Kendzior, City Manager, City of Meriden
Dominick Caruso, City Planner, City of Meriden
Ashley Harriman

CONNECTICUT SITING COUNCIL

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

February 6, 2013

The Honorable Michael S. Rohde
Mayor
City of Meriden
City Hall
142 East Main Street
Room 124
Meriden, CT 06450

RE: **EM-VER-080-130128** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 38 Elm Street, Meriden, Connecticut.

Dear Mayor Rohde:

The Connecticut Siting Council (Council) received a request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72, a copy of which has already been provided to you.

If you have any questions or comments regarding the proposal, please call me or inform the Council by February 22, 2013.

Thank you for your cooperation and consideration.

Very truly yours,

LRoberts

Linda Roberts
Executive Director

LR/jb

c: Lawrence Kendzior, City Manager, City of Meriden
Dominick Caruso, City Planner, City of Meriden

CSC
CONNECTICUT SITING COUNCIL

ROBINSON & COLE

EM-VER-080-130128

KENNETH C. BALDWIN

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Also admitted in Massachusetts

ORIGINAL

January 25, 2013

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

Re: **Notice of Exempt Modification – Antenna Swap**
38 Elm Street, Meriden, Connecticut

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains fifteen (15) wireless telecommunications antennas at the 66-foot above-ground level on an existing roof-top lattice tower at the above-referenced address. The tower and underlying property are owned by Ashley Harriman LLC. The Council approved Cellco's shared use of this tower in 1995. Cellco now intends to replace six (6) of its antennas with three (3) model BXA-171085-8CF PCS antennas and three (3) model BXA-171063-8CF AWS antennas, at the same level on the tower. Cellco also intends to install six (6) remote radio heads (RRHs) on the tower behind its antennas. Cellco will also remove its six (6) coaxial cable diplexers and install one additional coaxial cable. Attached behind Tab 1 are the specifications for the replacement antennas and RRHs.

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 Michael Rohde, Mayor of the City of Meriden. A copy of this letter is also being sent to Ashley Harriman LLC, the owner of the property on which the tower is located.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRHs will be located at the same level on the existing roof-top 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.

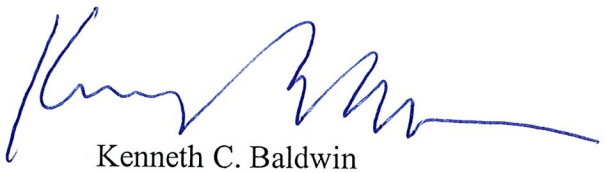
4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. Far Field Approximation tables for RF emissions at each of Cellco's operating frequencies at the modified facility are 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 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:
Michael Rohde, Meriden Mayor
Ashley Harriman LLC
Sandy M. Carter

BXA-171085-8CF-EDIN-X

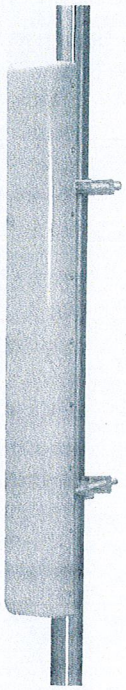
Replace "X" with desired electrical downtilt.

X-Pol | FET Panel | 85° | 16.4 dBi

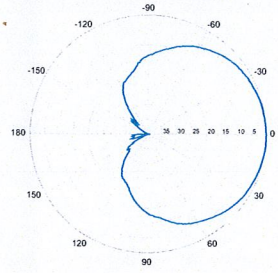
Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	88°	85°	80°
Vertical beamwidth	7°	7°	7°
Gain	13.5 dBd / 15.6 dBi	13.9 dBd / 16.0 dBi	14.3 dBd / 16.4 dBi
Electrical downtilt (X)	0, 2, 4		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back isolation	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Center (Back)		
Operating temperature	-40° to +60° C / -40° to +140° F		

Mechanical Characteristics		
Dimensions Length x Width x Depth	1232 x 154 x 105 mm	48.5 x 6.1 x 4.1 in
Depth with t-brackets	133 mm	5.2 in
Weight without mounting brackets	4.8 kg	10.5 lbs
Survival wind speed	296 km/hr	184 mph
Wind area	Front: 0.19 m² Side: 0.14 m²	Front: 2.0 ft² Side: 1.5 ft²
Wind load @ 161 km/hr (100 mph)	Front: 281 N Side: 223 N	Front: 63 lbf Side: 50 lbf

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

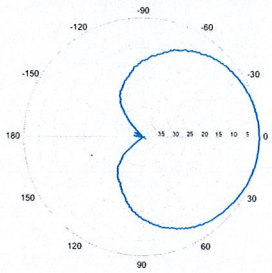


BXA-171085-8CF-EDIN-X



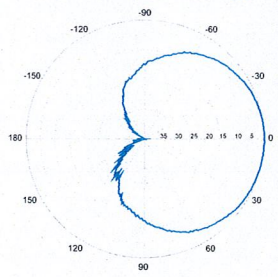
Horizontal | 1710-1880 MHz

BXA-171085-8CF-EDIN-X



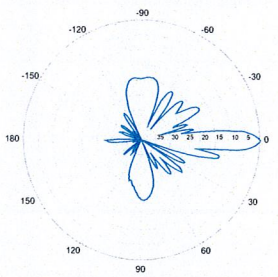
Horizontal | 1850-1990 MHz

BXA-171085-8CF-EDIN-X



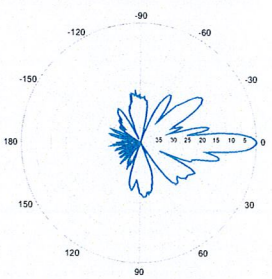
Horizontal | 1920-2170 MHz

BXA-171085-8CF-EDIN-0



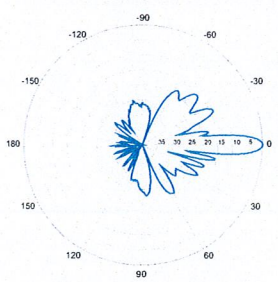
0° | Vertical | 1710-1880 MHz

BXA-171085-8CF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171085-8CF-EDIN-0

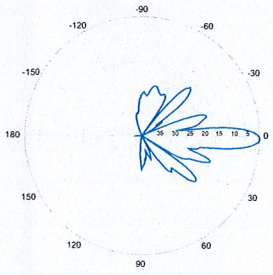


0° | Vertical | 1920-2170 MHz

BXA-171085-8CF-EDIN-X

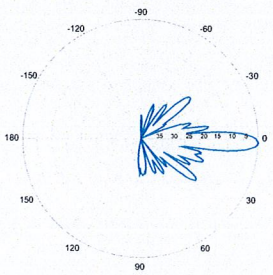
X-Pol | FET Panel | 85° | 16.4 dBi

BXA-171085-8CF-EDIN-2



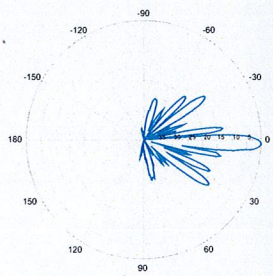
2° | Vertical | 1710-1880 MHz

BXA-171085-8CF-EDIN-2



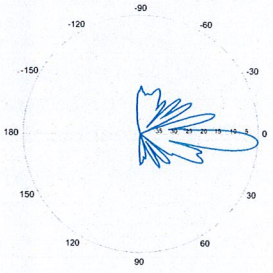
2° | Vertical | 1850-1990 MHz

BXA-171085-8CF-EDIN-2



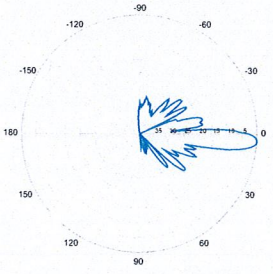
2° | Vertical | 1920-2170 MHz

BXA-171085-8CF-EDIN-4



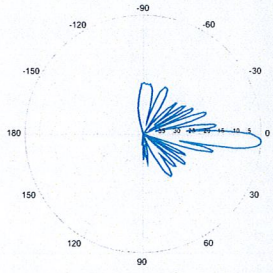
4° | Vertical | 1710-1880 MHz

BXA-171085-8CF-EDIN-4



4° | Vertical | 1850-1990 MHz

BXA-171085-8CF-EDIN-4



4° | Vertical | 1920-2170 MHz

BXA-171063-8CF-EDIN-X

Replace "X" with desired electrical downtilt.

X-Pol | FET Panel | 63° | 17.4 dBi

Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	68°	65°	60°
Vertical beamwidth	7°	7°	7°
Gain	14.5 dBd / 16.6 dBi	14.9 dBd / 17.0 dBi	15.3 dBd / 17.4 dBi
Electrical downtilt (X)	0, 2, 4, 8		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back isolation	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Center (Back)		
Operating temperature	-40° to +60° C / -40° to +140° F		

Mechanical Characteristics		
Dimensions Length x Width x Depth	1232 x 154 x 105 mm	48.5 x 6.1 x 4.1 in
Depth with t-brackets	133 mm	5.2 in
Weight without mounting brackets	4.8 kg	10.5 lbs
Survival wind speed	296 km/hr	184 mph
Wind area	Front: 0.19 m² Side: 0.14 m²	Front: 2.0 ft² Side: 1.5 ft²
Wind load @ 161 km/hr (100 mph)	Front: 281 N Side: 223 N	Front: 63 lbf Side: 50 lbf

Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
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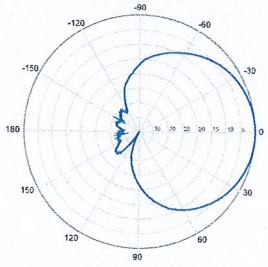
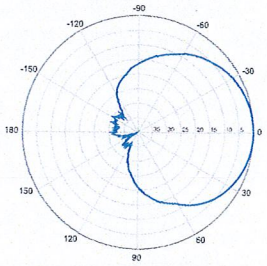
Concealment Configurations	For concealment configurations, order BXA-171063-8CF-EDIN-X-FP		

BXA-171063-8CF-EDIN-X



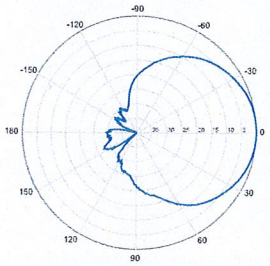
Horizontal | 1710-1880 MHz

BXA-171063-8CF-EDIN-X



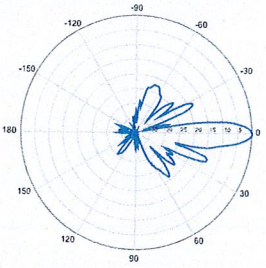
Horizontal | 1850-1990 MHz

BXA-171063-8CF-EDIN-X



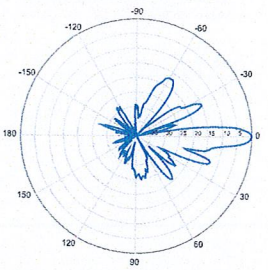
Horizontal | 1920-2170 MHz

BXA-171063-8CF-EDIN-0



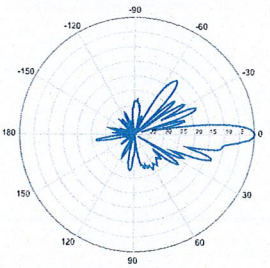
0° | Vertical | 1710-1880 MHz

BXA-171063-8CF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171063-8CF-EDIN-0

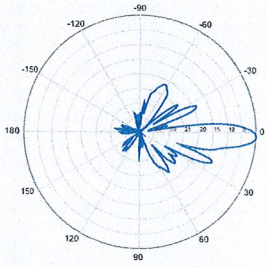


0° | Vertical | 1920-2170 MHz

BXA-171063-8CF-EDIN-X

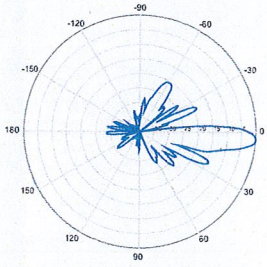
X-Pol | FET Panel | 63° | 17.4 dBi

BXA-171063-8CF-EDIN-2



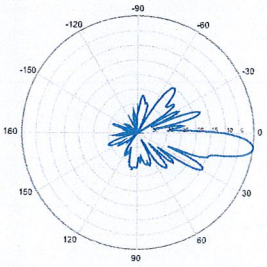
2° | Vertical | 1710-1880 MHz

BXA-171063-8CF-EDIN-4



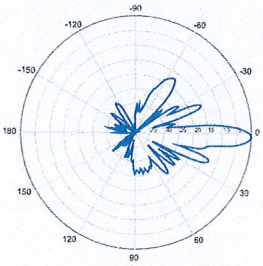
4° | Vertical | 1710-1880 MHz

BXA-171063-8CF-EDIN-8



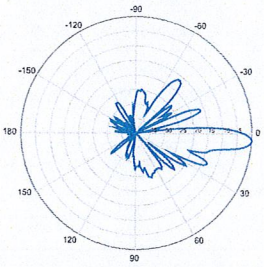
8° | Vertical | 1710-1880 MHz

BXA-171063-8CF-EDIN-2



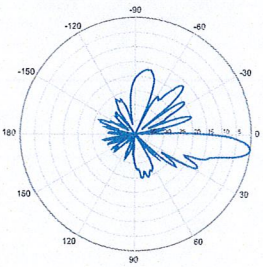
2° | Vertical | 1850-1990 MHz

BXA-171063-8CF-EDIN-4



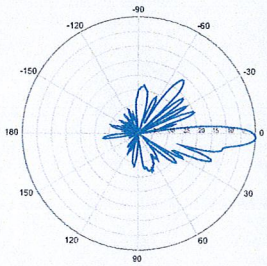
4° | Vertical | 1850-1990 MHz

BXA-171063-8CF-EDIN-8



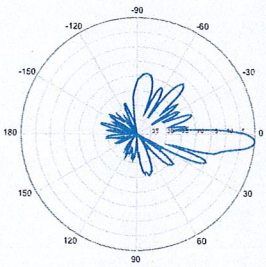
8° | Vertical | 1850-1990 MHz

BXA-171063-8CF-EDIN-2



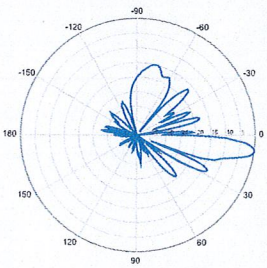
2° | Vertical | 1920-2170 MHz

BXA-171063-8CF-EDIN-4



4° | Vertical | 1920-2170 MHz

BXA-171063-8CF-EDIN-8

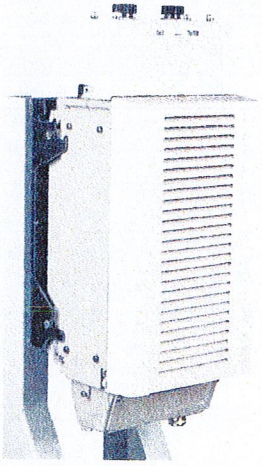


8° | Vertical | 1920-2170 MHz

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

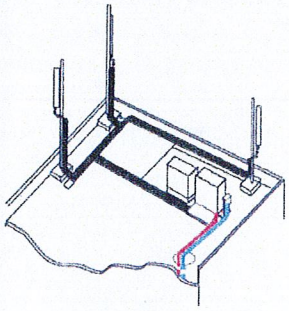
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation 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

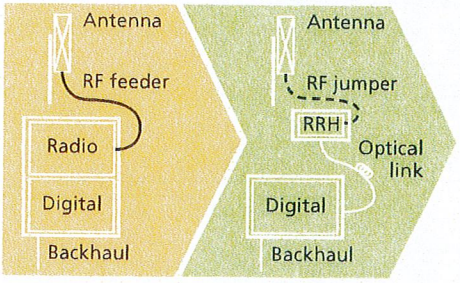
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption

Benefits

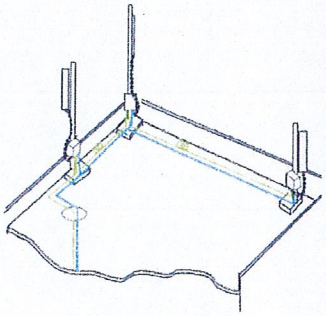
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility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

Alcatel·Lucent

Far Field Approximation
with downtilt variation

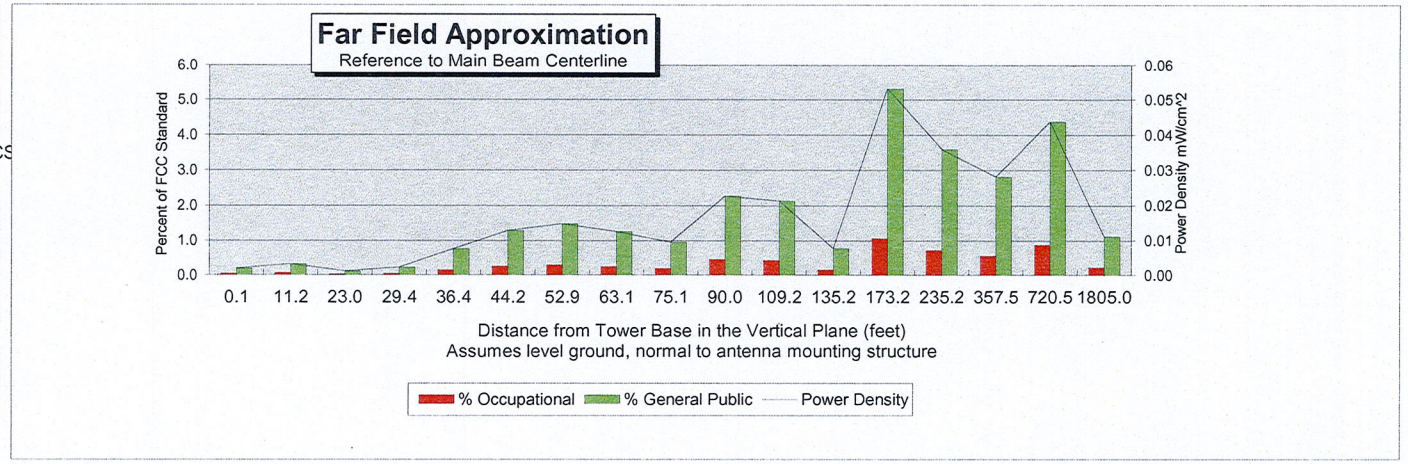
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Meriden E, CT
Site #:	
Date:	01/17/13
Name:	Justin Kober
File Name:	Meriden E, CT - FF Power PCS

Operating Freq. (MHz)	**1970.0**
Antenna Height (ft):	**66.0**
Antenna Gain (dBi):	**16.1**
Antenna Size (in.):	**48.5**
Downtilt (degrees):	**0.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**4060.0**



Enter Main Beam Distance in feet below:

Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	2.0	
Solve for r, dx to antenna	63.0	64.0	67.1	69.5	72.8	76.9	82.3	89.1	98.1	109.9	126.1	149.1	184.3	243.5	363.0	723.2	1806.1	
Distance from Antenna Structure Base in Horizontal plane	0.1	11.2	23.0	29.4	36.4	44.2	52.9	63.1	75.1	90.0	109.2	135.2	173.2	235.2	357.5	720.5	1805.0	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.05	0.04	0.03	0.04	0.01	
Percent of Occupational Standard	0.0	0.1	0.0	0.0	0.2	0.3	0.3	0.2	0.2	0.5	0.4	0.2	1.1	0.7	0.6	0.9	0.2	
Percent of General Population Standard	0.2	0.3	0.1	0.2	0.8	1.3	1.5	1.2	1.0	2.3	2.1	0.8	5.3	3.6	2.8	4.4	1.1	

Antenna Type BXA-171085-8CF
Max% 5.32%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

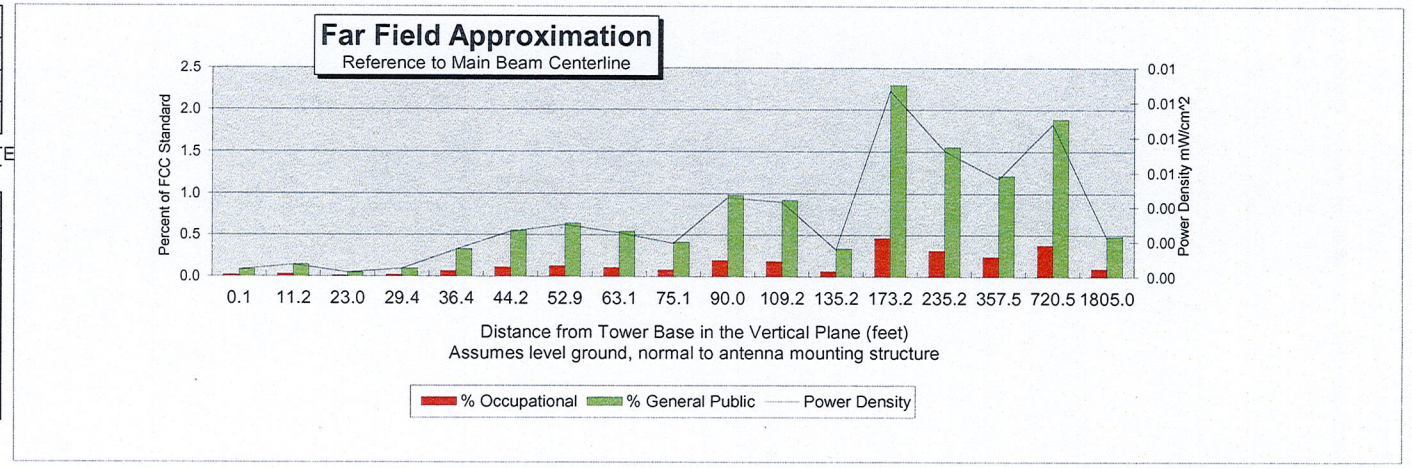
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Meriden E, CT
Site #:	
Date:	01/17/13
Name:	Justin Kober
File Name:	Meriden E, CT - FF Power LTE

Operating Freq. (MHz)	**698.0**
Antenna Height (ft):	**66.0**
Antenna Gain (dBi):	**15.6**
Antenna Size (in.):	**72.1**
Downtilt (degrees):	**0.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**914.0**



Enter Main Beam Distance in feet below:

Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	2.0	
Solve for r, dx to antenna	63.0	64.0	67.1	69.5	72.8	76.9	82.3	89.1	98.1	109.9	126.1	149.1	184.3	243.5	363.0	723.2	1806.1	
Distance from Antenna Structure Base in Horizontal plane	0.1	11.2	23.0	29.4	36.4	44.2	52.9	63.1	75.1	90.0	109.2	135.2	173.2	235.2	357.5	720.5	1805.0	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.5	0.3	0.2	0.4	0.1	
Percent of General Population Standard	0.1	0.1	0.0	0.1	0.3	0.6	0.6	0.5	0.4	1.0	0.9	0.3	2.3	1.6	1.2	1.9	0.5	

Antenna Type P65-16-XL-2
Max% 2.29%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

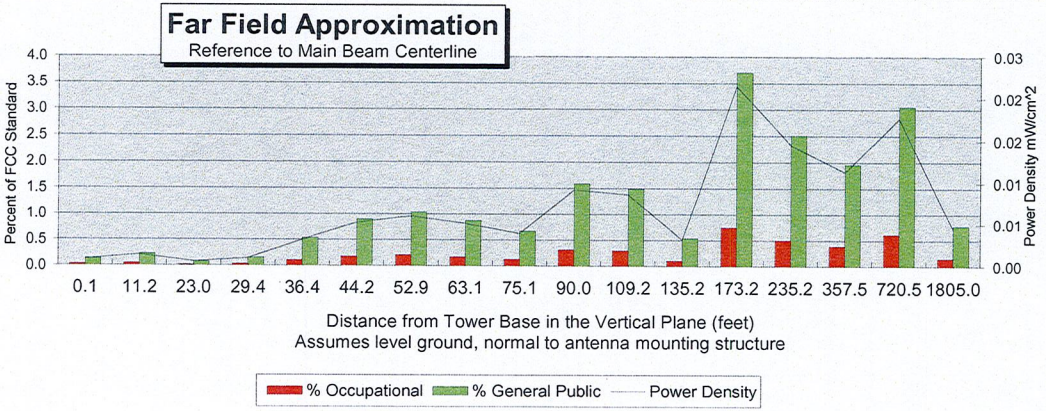
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Meriden E, CT
Site #:	
Date:	01/17/13
Name:	Justin Kober
File Name:	Meriden E, CT - FF Power Cell

Operating Freq. (MHz)	**869.0**
Antenna Height (ft):	**66.0**
Antenna Gain (dBi):	**16.2**
Antenna Size (in.):	**70.9**
Downtilt (degrees):	**0.0**
Feedline Loss (dB):	**2.0**
Power @ J4 (w):	**2538.0**



Enter Main Beam Distance in feet below:

Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	2.0	
Solve for r, dx to antenna	63.0	64.0	67.1	69.5	72.8	76.9	82.3	89.1	98.1	109.9	126.1	149.1	184.3	243.5	363.0	723.2	1806.1	
Distance from Antenna Structure Base in Horizontal plane	0.1	11.2	23.0	29.4	36.4	44.2	52.9	63.1	75.1	90.0	109.2	135.2	173.2	235.2	357.5	720.5	1805.0	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.02	0.01	0.01	0.02	0.00	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.3	0.3	0.1	0.7	0.5	0.4	0.6	0.2	
Percent of General Population Standard	0.1	0.2	0.1	0.2	0.5	0.9	1.0	0.9	0.7	1.6	1.5	0.5	3.7	2.5	2.0	3.0	0.8	

Antenna Type LPA-80080/6CF
Max% 3.70%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

Estimated Radiated Emission

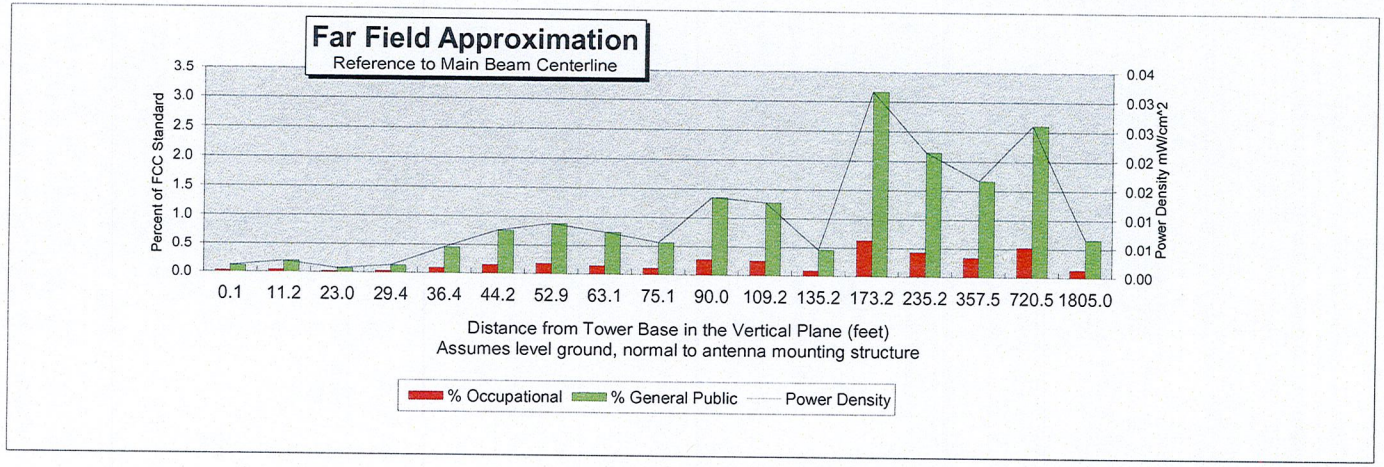
Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

verizonwireless

Location:	Meriden E, CT
Site #:	
Date:	01/17/13
Name:	Justin Kober
File Name:	Meriden E, CT - FF Power AWS

Operating Freq. (MHz)	**2145.0**
Antenna Height (ft):	**66.0**
Antenna Gain (dBi):	**17.5**
Antenna Size (in.):	**48.5**
Downtilt (degrees):	**0.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**1750.0**



Enter Main Beam Distance in feet below:

Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	2.0	
Solve for r, dx to antenna	63.0	64.0	67.1	69.5	72.8	76.9	82.3	89.1	98.1	109.9	126.1	149.1	184.3	243.5	363.0	723.2	1806.1	
Distance from Antenna Structure Base in Horizontal plane	0.1	11.2	23.0	29.4	36.4	44.2	52.9	63.1	75.1	90.0	109.2	135.2	173.2	235.2	357.5	720.5	1805.0	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.03	0.02	0.02	0.03	0.01	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.3	0.3	0.1	0.6	0.4	0.3	0.5	0.1	
Percent of General Population Standard	0.1	0.2	0.1	0.1	0.5	0.8	0.9	0.7	0.6	1.4	1.3	0.5	3.2	2.1	1.7	2.6	0.7	

Antenna Type BXA-171063-8CF
Max% 3.16%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, anc
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

45-ft Existing ROHN Lattice Tower

Proposed Verizon Wireless
Antenna Upgrade

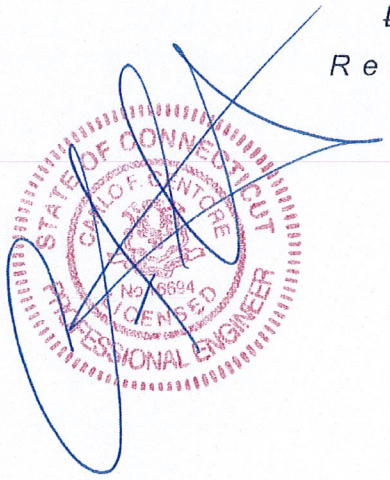
Verizon Site Ref: Meriden East

38 Elm Street
Meriden, CT

Centek Project No. 12124.CO52

~~Date: January 4, 2013~~

Rev 1: January 24, 2013



Prepared for:

Verizon Wireless
99 East River Road, 9th Floor
East Hartford, CT 06108

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Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna installation proposed by Verizon Wireless on the existing self supporting lattice tower located in Meriden, Connecticut.

The host tower is a 65-ft AGL (45-ft tower mounted on a steel dunage frame ±24' above grade), three legged, tapered lattice tower originally designed and manufactured by ROHN eng. file no. 31065JC, dated November 1994. The tower geometry and structure member sizes were obtained from the aforementioned ROHN design documents.

Antenna and appurtenance information were obtained from a previous structural report prepared by Centek Engineering job no. 10001.CO13 dated April 19, 2010 and a Verizon RF data sheet.

The tower is made of three (3) tapered vertical sections consisting of pipe legs and diagonal lateral support bracing consisting of structural steel angle shapes. The vertical tower sections are connected by bolted flange plates while legs and bracing are connected by bolted gusset connections. The width of the tower face is 6.52-ft at the top and 8.56-ft at the base.

Verizon is proposing the removal of six (6) panel antennas and six (6) diplexers and the installation of six (6) panel antennas, six (6) RRH's and one (1) distribution box mounted to the existing three (3) 15' Boom Gates. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

The existing, proposed and future loads considered in this analysis consist of the following:

- TOWN (Reserved):
  Antennas: One (1) 8-ft parabolic dish mounted on one (1) 6-ft pipe with a RAD center elevation of ±55-ft above finished grade (±31-ft above tower base).
  Coax Cables: One (1) WE65 coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- VERIZON (Existing to Remain):
  Antennas: Four (4) Antel LPA-80080/6CF panel antennas, two (2) Antel LPA-80063/6CF panel antennas and three (3) Powerwave P65-16-XL-2 panel antennas mounted on three (3) 15' Boom Gates with a RAD center elevation of ±66-ft above finished grade (±42-ft above tower base).
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- **VERIZON (Existing to Remove):**
  Antennas: Six (6) Decibel 948F85T2E-M panel antennas and six (6) RFS FD9R6004/2C-3L diplexers mounted on three (3) 15' Boom Gates with a RAD center elevation of ±66-ft above finished grade (±42-ft above tower base).

- **VERIZON (Proposed):**
  Antennas: Three (3) Antel BXA-171063-8CF panel antennas, three (3) Antel BXA-171085-8CF panel antennas, three (3) Alcatel-Lucent RRH2x40-AWS Remote Radio Heads, three (3) Alcatel-Lucent RRH2x40-07-U Remote Radio Heads and one (1) RFS DB-T1-6Z-8AB-0Z main distribution mounted on three (3) existing 15' Boom Gates with a RAD center elevation of ±66-ft above finished grade (±42-ft above tower base).
  Coax Cables: One (1) 1-5/8" Ø fiber line running on a leg/face of the existing tower as specified in Section 3 of this report.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All coax cables routed as specified in Section 3 of this report.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower shaft, and the model assumes that the shaft members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (fastest mile) with no ice and a 75% reduction of wind force with ½ inch accumulative ice to determine stresses in members as per guidelines of TIA/EIA-222-F-96 entitled "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Allowable Stress Design (ASD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix K of the CSBC[1] and the wind speed data available in the TIA/EIA-222-F-96 Standard. The higher of the two wind speeds is utilized in preparation on the tower analysis.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA/EIA-222-F, gravity loads of the tower structure and its components, and the application of ½" radial ice on the tower structure and its components.

Basic Wind Speed:	New Haven; v = 85 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	Meriden; v = 100 mph (3 second gust) equivalent to v = 80 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	TIA/EIA wind speed controls.	
Load Cases:	Load Case 1; 85 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 2; 74 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 74 mph wind speed velocity represents 75% of the wind pressure generated by the 85 mph wind speed.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 3; Seismic – not checked	*[Section 1614.5 of State Bldg. Code 2005] does not control in the design of this structure type*

[1] The 2005 Connecticut State Building Code as amended by the 2009 CT State Supplement. (CSBC)

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software tnxTower. Allowable stresses were determined based on Table 5 of the TIA/EIA code with a 1/3 increase per Section 3.1.1.1 of the same code.

Calculated stresses were found to be within allowable limits. In Load Case 1, per tnxTower "Section Capacity Table", this tower was found to be at **85.0%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T3)	24'-0"-44'-0"	71.3%	**PASS**
Diagonal (T2)	44'-0"-64'-0"	85.0%	**PASS**

Steel Dunnage Frame and Anchors

The existing steel dunnage frame consists of W beams and bracing bearing on four (4) HSS14x14 steel columns.

Tower legs are connected to the steel dunnage frame by means of (4) 5/8" ∅, ASTM A325 anchor bolts per leg via a 5"x5"x3/4" base plate.

Review of the steel dunnage frame and anchor design consisted of verification of applied loads obtained from the tower design calculations and code checks of allowable stresses:

- The tower leg reactions developed from the governing Load Case 1 were used in the verification of the steel dunnage frame. The steel dunnage frame was found to be within allowable limits

Reactions	Design Loading (1)	Proposed Loading	Result
Compression	50.9 kips	49.3 kips	**PASS**
Tension	46.3 kips	44.6 kips	**PASS**
Overturning Moment	356.3 ft-kips	353 kip-ft	**PASS**

Note: (1) Design loading taken from ROHN design documents eng. file no. 31065JC, drawing no. C941513 dated November 1994.

- The anchor bolts were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	58.8%	PASS

Conclusion

This analysis shows that the subject tower **is adequate** to support the proposed modified antenna configuration.

The analysis is based, in part, on the information provided to this office by Verizon Wireless. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:

Carlo F. Centore, PE
Principal ~ Structural Engineer

STATE OF CONNECTICUT
CARLO F. CENTORE
No. 16694
LICENSED
PROFESSIONAL ENGINEER

Prepared by:

Timothy J. Lynn, EIT
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the "as new" condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

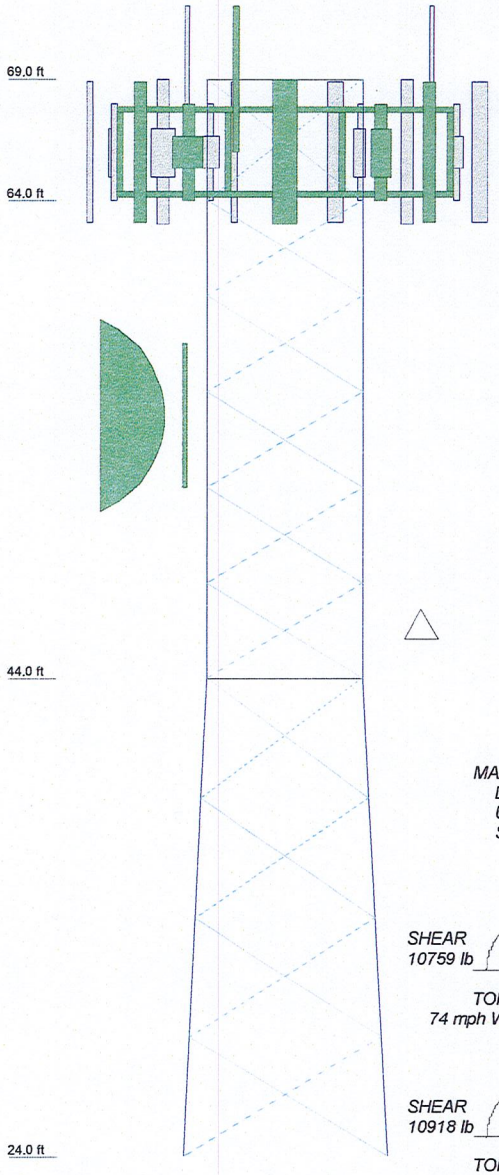
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

tnxTower is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, *tnxTower*, formerly RISATower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- *tnxTower* can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- *tnxTower* contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

Section	T1	T2	T3
Legs	ROHN 2 EH	ROHN 2 X-STR	ROHN 2.5 EH
Leg Grade	A572-50	A572-50	A572-50
Diagonals	L1 1/2x1 1/2x3/16	L1 1/2x1 1/2x3/16	L1 3/4x1 3/4x3/16
Diagonal Grade	A36	A36	A36
Top Girts	L1 1/2x1 1/2x3/16	N.A.	L1 1/2x1 1/2x3/16
Face Width (ft) 8.563	6.521		6.563
# Panels @ (ft)	1 @ 5	5 @ 4	4 @ 5
Weight (lb) 1822.1	194.9	691.7	935.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
6'x3" Pipe Mount (Empty)	69	BXA-171063-8CF (Verizon - Proposed)	66
6'x3" Pipe Mount (Empty)	69	P65-16-XL-2 (Verizon - Existing)	66
6'x3" Pipe Mount (Empty)	69	BXA-171085-8CF (Verizon - Proposed)	66
LPA-80080-6CF (Verizon - Existing)	66	LPA-80080-6CF (Verizon - Existing)	66
BXA-171063-8CF (Verizon - Proposed)	66	Rohn 6'x15' Boom Gate (3) (Verizon - Existing)	66
P65-16-XL-2 (Verizon - Existing)	66	DB-T1-6Z-8AB-0Z (Verizon - Proposed)	66
BXA-171085-8CF (Verizon - Proposed)	66	RRH2x40-AWS (Verizon - Proposed)	66
LPA-80080-6CF (Verizon - Existing)	66	RRH2x40-AWS (Verizon - Proposed)	66
LPA-80063/6CF (Verizon - Existing)	66	RRH2x40-AWS (Verizon - Proposed)	66
BXA-171063-8CF (Verizon - Proposed)	66	RRH2x40-07-U (Verizon - Proposed)	66
P65-16-XL-2 (Verizon - Existing)	66	RRH2x40-07-U (Verizon - Proposed)	66
BXA-171085-8CF (Verizon - Proposed)	66	RRH2x40-07-U (Verizon - Proposed)	66
LPA-80063/6CF (Verizon - Existing)	66	6'x4" Pipe Mount (Town Reserved)	55
LPA-80080-6CF (Verizon - Existing)	66	8 FT DISH (Town Reserved)	55

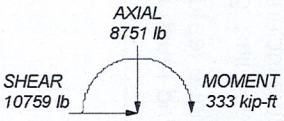
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

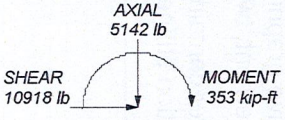
TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 85%

MAX. CORNER REACTIONS AT BASE:
DOWN: 49247 lb
UPLIFT: -44602 lb
SHEAR: 6405 lb



TORQUE 12 kip-ft
74 mph WIND - 0.5000 in ICE



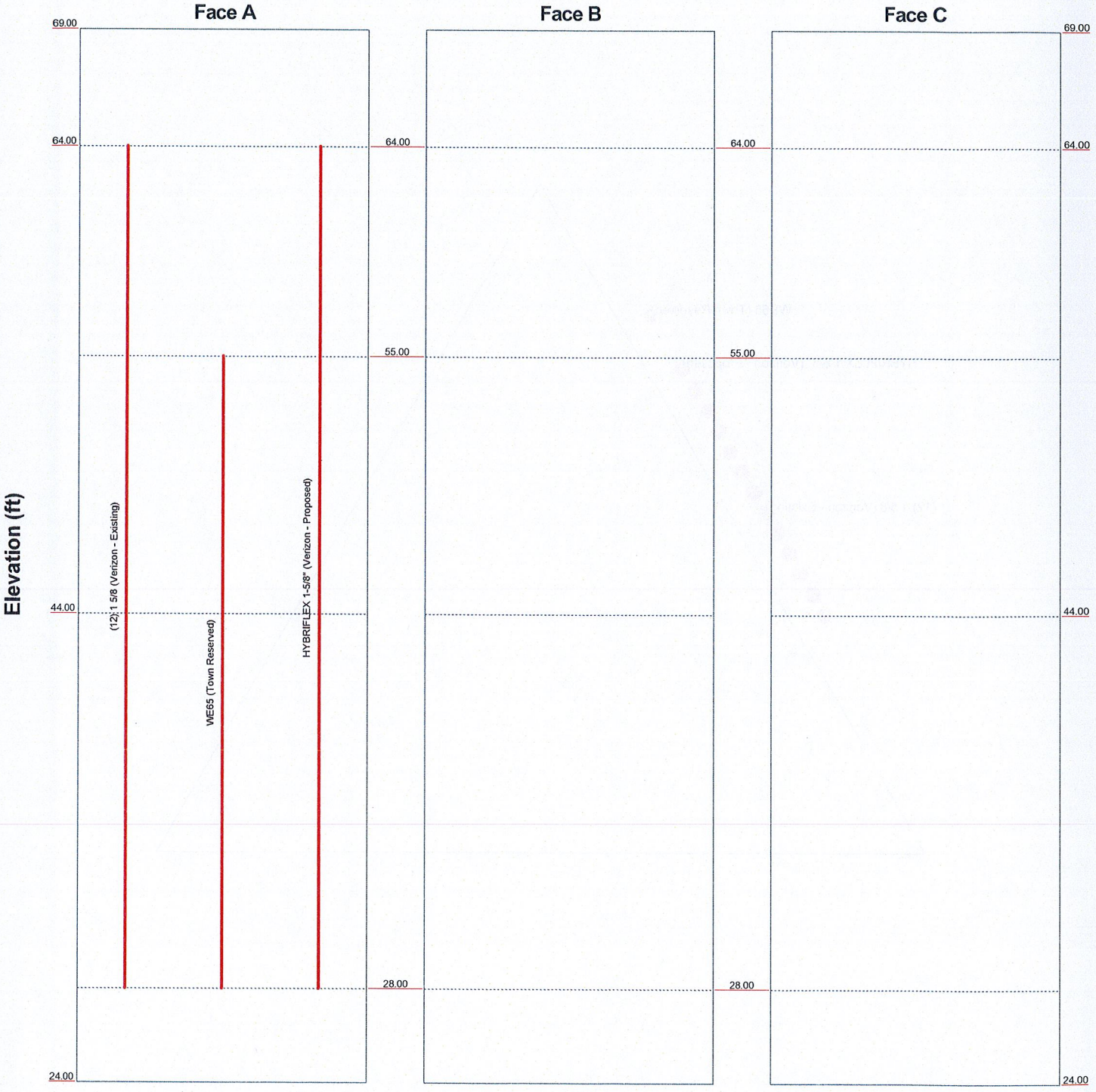
TORQUE 15 kip-ft
REACTIONS - 85 mph WIND

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: *12124.CO52 - Meriden East*			
Project: *45ft ROHN Lattice Tower - 38 Elm St., Meriden, CT*			
Client: Verizon Wireless	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 01/24/13	Scale: NTS	
Path: J:\Jobs\1212400.WI\CO52 - Meriden East\Rev (1)\Calcs\ERI Files\45-ft Rohn SSV Lattice.eri		Dwg No. E-1	

Feedline Distribution Chart
24' - 69'

Round | Flat | App In Face | App Out Face | Truss Leg



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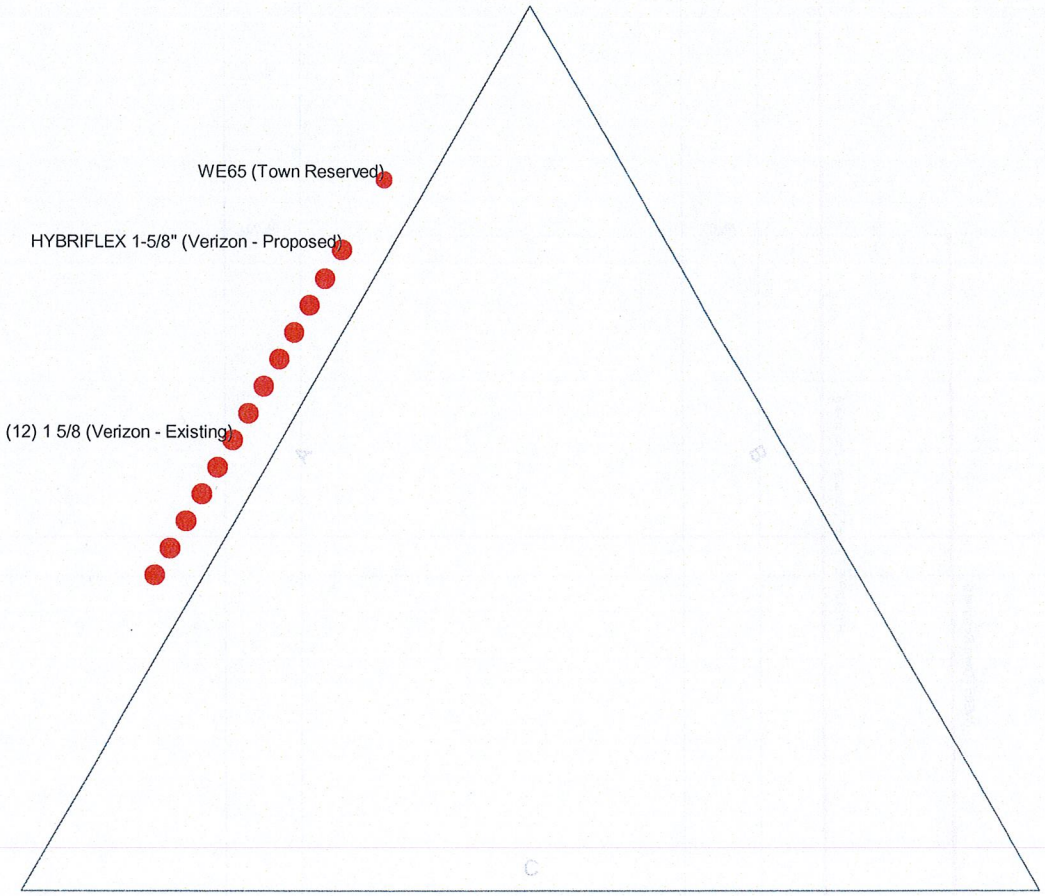
Client: Verizon Wireless	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 01/24/13	Scale: NTS	
Path: J:\Jobs\12124\00.WMCO52 - Meriden East\Rev (1)\Cad's\ERI Files\45-ft_Rohn_SSV_Lattice.eri		Dwg No. E-7	

Feedline Plan

Round Flat App In Face App Out Face



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Job: ***12124.CO52 - Meriden East***		
Project: ***45ft ROHN Lattice Tower - 38 Elm St., Meriden, CT***		
Client: Verizon Wireless	Drawn by: TJL	App'd:
Code: TIA/EIA-222-F	Date: 01/24/13	Scale: NTS
Path: J:\Jobs\12124\00.WTCO52 - Meriden East\Rev (1)\Cals\ERI Files\45-ft Rohn SSV Lattice.er		Dwg No. E-7

tnxTower	Job	Page
	12124.CO52 - Meriden East	1 of 23
Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	**Project** 45ft ROHN Lattice Tower - 38 Elm St., Meriden, CT	**Date** 09:53:56 01/24/13
	Client Verizon Wireless	**Designed by** TJL

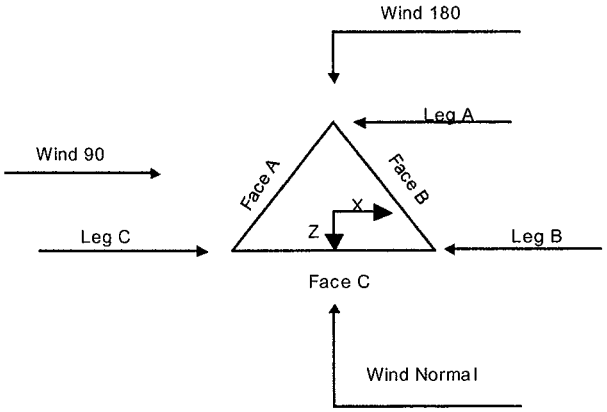
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 69.00 ft above the ground line.
The base of the tower is set at an elevation of 24.00 ft above the ground line.
The face width of the tower is 6.52 ft at the top and 8.56 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member 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		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	69.00-64.00			6.52	1	5.00
T2	64.00-44.00			6.52	1	20.00
T3	44.00-24.00			6.56	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	69.00-64.00	5.00	X Brace	No	No	0.0000	0.0000
T2	64.00-44.00	4.00	X Brace	No	No	0.0000	0.0000
T3	44.00-24.00	5.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 69.00-64.00	Pipe	ROHN 2 EH	A572-50 (50 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T2 64.00-44.00	Pipe	ROHN 2 X-STR	A572-50 (50 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T3 44.00-24.00	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 69.00-64.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T3 44.00-24.00	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 69.00-64.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 64.00-44.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 44.00-24.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X / Y	K Brace Diags X / Y	Single Diags X / Y	Girts X / Y	Horiz. X / Y	Sec. Horiz. X / Y	Inner Brace X / Y
T1 69.00-64.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 64.00-44.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 44.00-24.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

[1] *Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 69.00-64.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 64.00-44.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 44.00-24.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 69.00-64.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T2 64.00-44.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T3 44.00-24.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 69.00-64.00	Flange	0.6250 A325N	4	0.5000 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 64.00-44.00	Flange	0.6250 A325N	4	0.5000 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 44.00-24.00	Flange	0.6250 A325N	4	0.5000 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (Verizon - Existing)	A	Yes	Ar (CfAe)	64.00 - 28.00	3.0000	0	12	12	1.0000 1.9800	1.9800		1.04

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
WE65 (Town Reserved)	A	Yes	Ar (CfAe)	55.00 - 28.00	3.0000	0.28	1	1	1.5836	1.5836		0.53
HYBRIFLEX 1-5/8" (Verizon - Proposed)	A	Yes	Ar (CfAe)	64.00 - 28.00	3.0000	0.2	1	1	1.9800	1.9800		1.90

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	69.00-64.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	64.00-44.00	A	44.352	0.000	0.000	0.000	293.43
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T3	44.00-24.00	A	36.431	0.000	0.000	0.000	238.56
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	69.00-64.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	64.00-44.00	A	0.500	12.302	54.633	0.000	0.000	864.36
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T3	44.00-24.00	A	0.500	11.391	43.707	0.000	0.000	704.47
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	69.00-64.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T2	64.00-44.00	A	0.000	3.269	3.249	4.903
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T3	44.00-24.00	A	0.000	2.436	2.781	4.206
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	69.00-64.00	0.0000	0.0000	0.0000	0.0000
T2	64.00-44.00	-9.8853	-6.6814	-8.5941	-5.9190
T3	44.00-24.00	-8.5506	-6.0452	-7.6857	-5.5739

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
6'x3" Pipe Mount	A	From Face	4.00	0.0000	69.00	No Ice	1.77	1.77	34.74
(Empty)			2.00			1/2" Ice	2.13	2.13	47.98
			0.00						
6'x3" Pipe Mount	B	From Face	4.00	0.0000	69.00	No Ice	1.77	1.77	34.74
(Empty)			2.00			1/2" Ice	2.13	2.13	47.98
			0.00						
6'x3" Pipe Mount	C	From Face	4.00	0.0000	69.00	No Ice	1.77	1.77	34.74
(Empty)			2.00			1/2" Ice	2.13	2.13	47.98
			0.00						
LPA-80080-6CF	A	From Face	4.00	0.0000	66.00	No Ice	4.33	9.09	21.00
(Verizon - Existing)			-6.00			1/2" Ice	4.76	9.64	69.24
			0.00						
BXA-171063-8CF	A	From Face	4.00	0.0000	66.00	No Ice	2.94	2.16	11.00
(Verizon - Proposed)			-4.00			1/2" Ice	3.26	2.46	29.78
			0.00						
P65-16-XL-2	A	From Face	4.00	0.0000	66.00	No Ice	8.40	4.12	20.00
(Verizon - Existing)			0.00			1/2" Ice	8.95	4.56	64.53
			0.00						
BXA-171085-8CF	A	From Face	4.00	0.0000	66.00	No Ice	2.94	2.16	10.50
(Verizon - Proposed)			4.00			1/2" Ice	3.26	2.46	29.28
			0.00						
LPA-80080-6CF	A	From Face	4.00	0.0000	66.00	No Ice	4.33	9.09	21.00
(Verizon - Existing)			6.00			1/2" Ice	4.76	9.64	69.24
			0.00						
LPA-80063/6CF	B	From Face	4.00	0.0000	66.00	No Ice	10.31	9.01	27.00
(Verizon - Existing)			-6.00			1/2" Ice	10.87	9.55	100.95
			0.00						
BXA-171063-8CF	B	From Face	4.00	0.0000	66.00	No Ice	2.94	2.16	11.00
(Verizon - Proposed)			-4.00			1/2" Ice	3.26	2.46	29.78
			0.00						

tnxTower	Job: 12124.CO52 - Meriden East	Page: 7 of 23
Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Project: 45ft ROHN Lattice Tower - 38 Elm St., Meriden, CT	Date: 09:53:56 01/24/13
	Client: Verizon Wireless	Designed by: TJL

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
P65-16-XL-2	B	From Face	4.00	0.0000	66.00	No Ice	8.40	4.12	20.00
(Verizon - Existing)			0.00			1/2" Ice	8.95	4.56	64.53
			0.00						
BXA-171085-8CF	B	From Face	4.00	0.0000	66.00	No Ice	2.94	2.16	10.50
(Verizon - Proposed)			4.00			1/2" Ice	3.26	2.46	29.28
			0.00						
LPA-80063/6CF	B	From Face	4.00	0.0000	66.00	No Ice	10.31	9.01	27.00
(Verizon - Existing)			6.00			1/2" Ice	10.87	9.55	100.95
			0.00						
LPA-80080-6CF	C	From Face	4.00	0.0000	66.00	No Ice	4.33	9.09	21.00
(Verizon - Existing)			-6.00			1/2" Ice	4.76	9.64	69.24
			0.00						
BXA-171063-8CF	C	From Face	4.00	0.0000	66.00	No Ice	2.94	2.16	11.00
(Verizon - Proposed)			-4.00			1/2" Ice	3.26	2.46	29.78
			0.00						
P65-16-XL-2	C	From Face	4.00	0.0000	66.00	No Ice	8.40	4.12	20.00
(Verizon - Existing)			0.00			1/2" Ice	8.95	4.56	64.53
			0.00						
BXA-171085-8CF	C	From Face	4.00	0.0000	66.00	No Ice	2.94	2.16	10.50
(Verizon - Proposed)			4.00			1/2" Ice	3.26	2.46	29.28
			0.00						
LPA-80080-6CF	C	From Face	4.00	0.0000	66.00	No Ice	4.33	9.09	21.00
(Verizon - Existing)			6.00			1/2" Ice	4.76	9.64	69.24
			0.00						
Rohn 6'x15' Boom Gate (3)	A	None		0.0000	66.00	No Ice	53.20	53.20	1790.00
(Verizon - Existing)						1/2" Ice	63.30	63.30	2230.00
6'x4" Pipe Mount	C	From Leg	1.00	0.0000	55.00	No Ice	2.09	2.09	54.72
(Town Reserved)			0.00			1/2" Ice	2.46	2.46	71.85
			0.00						
DB-T1-6Z-8AB-0Z	A	From Face	4.00	0.0000	66.00	No Ice	5.60	2.33	44.00
(Verizon - Proposed)			0.00			1/2" Ice	5.92	2.56	80.13
			0.00						
RRH2x40-AWS	A	From Face	4.00	0.0000	66.00	No Ice	2.52	1.59	44.00
(Verizon - Proposed)			-4.00			1/2" Ice	2.75	1.80	61.40
			0.00						
RRH2x40-AWS	B	From Face	4.00	0.0000	66.00	No Ice	2.52	1.59	44.00
(Verizon - Proposed)			-4.00			1/2" Ice	2.75	1.80	61.40
			0.00						
RRH2x40-AWS	C	From Face	4.00	0.0000	66.00	No Ice	2.52	1.59	44.00
(Verizon - Proposed)			-4.00			1/2" Ice	2.75	1.80	61.40
			0.00						
RRH2x40-07-U	A	From Face	4.00	0.0000	66.00	No Ice	2.25	1.23	50.00
(Verizon - Proposed)			4.00			1/2" Ice	2.45	1.39	66.85
			0.00						
RRH2x40-07-U	B	From Face	4.00	0.0000	66.00	No Ice	2.25	1.23	50.00
(Verizon - Proposed)			4.00			1/2" Ice	2.45	1.39	66.85
			0.00						
RRH2x40-07-U	C	From Face	4.00	0.0000	66.00	No Ice	2.25	1.23	50.00
(Verizon - Proposed)			4.00			1/2" Ice	2.45	1.39	66.85
			0.00						

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
8 FT DISH	C	Paraboloid w/o	From	2.00	Worst		55.00	8.00	No Ice	50.30	251.00
(Town Reserved)		Radome	Leg	0.00					1/2" Ice	51.29	514.30
				0.00							

Tower Pressures - No Ice

$G_H = 1.224$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1 69.00-64.00	66.50	1.222	23	33.597	A	2.747	1.983	1.983	41.93	0.000	0.000
					B	2.747	1.983		41.93	0.000	0.000
					C	2.747	1.983		41.93	0.000	0.000
T2 64.00-44.00	54.00	1.151	21	134.798	A	5.809	52.268	7.917	13.63	0.000	0.000
					B	9.058	7.917		46.64	0.000	0.000
					C	9.058	7.917		46.64	0.000	0.000
T3 44.00-24.00	34.00	1.009	19	156.058	A	8.119	46.031	9.599	17.73	0.000	0.000
					B	10.900	9.599		46.83	0.000	0.000
					C	10.900	9.599		46.83	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.224$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1 69.00-64.00	66.50	1.222	17	0.5000	34.013	A	2.747	4.648	2.817	38.09	0.000	0.000
						B	2.747	4.648		38.09	0.000	0.000
						C	2.747	4.648		38.09	0.000	0.000
T2 64.00-44.00	54.00	1.151	16	0.5000	136.465	A	58.787	26.321	11.250	13.22	0.000	0.000
						B	9.058	17.288		42.70	0.000	0.000
						C	9.058	17.288		42.70	0.000	0.000
T3 44.00-24.00	34.00	1.009	14	0.5000	157.726	A	50.401	28.198	12.938	16.46	0.000	0.000
						B	10.900	19.243		42.92	0.000	0.000
						C	10.900	19.243		42.92	0.000	0.000

Tower Pressure - Service

$G_H = 1.224$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 69.00-64.00	66.50	1.222	8	33.597	A	2.747	1.983	1.983	41.93	0.000	0.000
					B	2.747	1.983		41.93	0.000	0.000
					C	2.747	1.983		41.93	0.000	0.000
T2 64.00-44.00	54.00	1.151	7	134.798	A	5.809	52.268	7.917	13.63	0.000	0.000
					B	9.058	7.917		46.64	0.000	0.000
					C	9.058	7.917		46.64	0.000	0.000
T3 44.00-24.00	34.00	1.009	6	156.058	A	8.119	46.031	9.599	17.73	0.000	0.000
					B	10.900	9.599		46.83	0.000	0.000
					C	10.900	9.599		46.83	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	0.00	194.95	A	0.141	2.806	0.58	1	1	3.897	302.43	60.49	C
69.00-64.00			B	0.141	2.806	0.58	1	1	3.897			
			C	0.141	2.806	0.58	1	1	3.897			
T2	293.43	691.69	A	0.431	2.006	0.665	1	1	40.550	2119.92	106.00	A
64.00-44.00			B	0.126	2.862	0.578	1	1	13.634			
			C	0.126	2.862	0.578	1	1	13.634			
T3	238.56	935.50	A	0.347	2.179	0.631	1	1	37.183	1849.56	92.48	A
44.00-24.00			B	0.131	2.841	0.579	1	1	16.456			
			C	0.131	2.841	0.579	1	1	16.456			
Sum Weight:	531.99	1822.13						OTM	94.95 kip-ft	4271.92		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	0.00	194.95	A	0.141	2.806	0.58	0.825	1	3.417	265.13	53.03	C
69.00-64.00			B	0.141	2.806	0.58	0.825	1	3.417			
			C	0.141	2.806	0.58	0.825	1	3.417			
T2	293.43	691.69	A	0.431	2.006	0.665	0.825	1	39.533	2066.78	103.34	A
64.00-44.00			B	0.126	2.862	0.578	0.825	1	12.049			
			C	0.126	2.862	0.578	0.825	1	12.049			
T3	238.56	935.50	A	0.347	2.179	0.631	0.825	1	35.762	1778.89	88.94	A
44.00-24.00			B	0.131	2.841	0.579	0.825	1	14.549			
			C	0.131	2.841	0.579	0.825	1	14.549			
Sum Weight:	531.99	1822.13						OTM	91.06 kip-ft	4110.80		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	0.00	194.95	A	0.141	2.806	0.58	0.8	1	3.348	259.80	51.96	C
69.00-64.00			B	0.141	2.806	0.58	0.8	1	3.348			
			C	0.141	2.806	0.58	0.8	1	3.348			
T2	293.43	691.69	A	0.431	2.006	0.665	0.8	1	39.388	2059.19	102.96	A
64.00-44.00			B	0.126	2.862	0.578	0.8	1	11.823			
			C	0.126	2.862	0.578	0.8	1	11.823			
T3	238.56	935.50	A	0.347	2.179	0.631	0.8	1	35.559	1768.79	88.44	A
44.00-24.00			B	0.131	2.841	0.579	0.8	1	14.276			
			C	0.131	2.841	0.579	0.8	1	14.276			
Sum Weight:	531.99	1822.13						OTM	90.51 kip-ft	4087.78		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	0.00	194.95	A	0.141	2.806	0.58	0.85	1	3.485	270.46	54.09	C
69.00-64.00			B	0.141	2.806	0.58	0.85	1	3.485			
			C	0.141	2.806	0.58	0.85	1	3.485			
T2	293.43	691.69	A	0.431	2.006	0.665	0.85	1	39.678	2074.37	103.72	A
64.00-44.00			B	0.126	2.862	0.578	0.85	1	12.275			
			C	0.126	2.862	0.578	0.85	1	12.275			
T3	238.56	935.50	A	0.347	2.179	0.631	0.85	1	35.965	1788.99	89.45	A
44.00-24.00			B	0.131	2.841	0.579	0.85	1	14.821			
			C	0.131	2.841	0.579	0.85	1	14.821			
Sum Weight:	531.99	1822.13						OTM	91.62 kip-ft	4133.81		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	0.00	324.34	A	0.217	2.539	0.594	1	1	5.508	290.08	58.02	C
69.00-64.00			B	0.217	2.539	0.594	1	1	5.508			
			C	0.217	2.539	0.594	1	1	5.508			
T2	864.36	1133.67	A	0.624	1.791	0.768	1	1	79.012	2766.12	138.31	A
64.00-44.00			B	0.193	2.619	0.589	1	1	19.241			
			C	0.193	2.619	0.589	1	1	19.241			
T3	704.47	1452.18	A	0.498	1.902	0.697	1	1	70.045	2281.67	114.08	A
44.00-24.00			B	0.191	2.626	0.589	1	1	22.227			
			C	0.191	2.626	0.589	1	1	22.227			
Sum Weight:	1568.84	2910.19						OTM	118.13 kip-ft	5337.88		

tnxTower	Job	Page
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Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Project 45ft ROHN Lattice Tower - 38 Elm St., Meriden, CT	Date 09:53:56 01/24/13
	Client Verizon Wireless	Designed by TJL

Tower Forces - With Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
T1	0.00	324.34	A	0.217	2.539	0.594	0.825	1	5.028	264.77	52.95	C
69.00-64.00			B	0.217	2.539	0.594	0.825	1	5.028			
			C	0.217	2.539	0.594	0.825	1	5.028			
T2	864.36	1133.67	A	0.624	1.791	0.768	0.825	1	68.724	2405.96	120.30	A
64.00-44.00			B	0.193	2.619	0.589	0.825	1	17.656			
			C	0.193	2.619	0.589	0.825	1	17.656			
T3	704.47	1452.18	A	0.498	1.902	0.697	0.825	1	61.225	1994.36	99.72	A
44.00-24.00			B	0.191	2.626	0.589	0.825	1	20.319			
			C	0.191	2.626	0.589	0.825	1	20.319			
Sum Weight:	1568.84	2910.19						OTM	103.37 kip-ft	4665.09		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
T1	0.00	324.34	A	0.217	2.539	0.594	0.8	1	4.959	261.15	52.23	C
69.00-64.00			B	0.217	2.539	0.594	0.8	1	4.959			
			C	0.217	2.539	0.594	0.8	1	4.959			
T2	864.36	1133.67	A	0.624	1.791	0.768	0.8	1	67.254	2354.50	117.73	A
64.00-44.00			B	0.193	2.619	0.589	0.8	1	17.429			
			C	0.193	2.619	0.589	0.8	1	17.429			
T3	704.47	1452.18	A	0.498	1.902	0.697	0.8	1	59.965	1953.32	97.67	A
44.00-24.00			B	0.191	2.626	0.589	0.8	1	20.047			
			C	0.191	2.626	0.589	0.8	1	20.047			
Sum Weight:	1568.84	2910.19						OTM	101.27 kip-ft	4568.97		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
T1	0.00	324.34	A	0.217	2.539	0.594	0.85	1	5.096	268.39	53.68	C
69.00-64.00			B	0.217	2.539	0.594	0.85	1	5.096			
			C	0.217	2.539	0.594	0.85	1	5.096			
T2	864.36	1133.67	A	0.624	1.791	0.768	0.85	1	70.194	2457.41	122.87	A
64.00-44.00			B	0.193	2.619	0.589	0.85	1	17.882			
			C	0.193	2.619	0.589	0.85	1	17.882			
T3	704.47	1452.18	A	0.498	1.902	0.697	0.85	1	62.485	2035.41	101.77	A
44.00-24.00			B	0.191	2.626	0.589	0.85	1	20.592			
			C	0.191	2.626	0.589	0.85	1	20.592			
Sum Weight:	1568.84	2910.19						OTM	105.48 kip-ft	4761.20		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	0.00	194.95	A	0.141	2.806	0.58	1	1	3.897	104.65	20.93	C
69.00-64.00			B	0.141	2.806	0.58	1	1	3.897			
			C	0.141	2.806	0.58	1	1	3.897			
T2	293.43	691.69	A	0.431	2.006	0.665	1	1	40.550	733.54	36.68	A
64.00-44.00			B	0.126	2.862	0.578	1	1	13.634			
			C	0.126	2.862	0.578	1	1	13.634			
T3	238.56	935.50	A	0.347	2.179	0.631	1	1	37.183	639.99	32.00	A
44.00-24.00			B	0.131	2.841	0.579	1	1	16.456			
			C	0.131	2.841	0.579	1	1	16.456			
Sum Weight:	531.99	1822.13						OTM	32.85 kip-ft	1478.17		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	0.00	194.95	A	0.141	2.806	0.58	0.825	1	3.417	91.74	18.35	C
69.00-64.00			B	0.141	2.806	0.58	0.825	1	3.417			
			C	0.141	2.806	0.58	0.825	1	3.417			
T2	293.43	691.69	A	0.431	2.006	0.665	0.825	1	39.533	715.15	35.76	A
64.00-44.00			B	0.126	2.862	0.578	0.825	1	12.049			
			C	0.126	2.862	0.578	0.825	1	12.049			
T3	238.56	935.50	A	0.347	2.179	0.631	0.825	1	35.762	615.53	30.78	A
44.00-24.00			B	0.131	2.841	0.579	0.825	1	14.549			
			C	0.131	2.841	0.579	0.825	1	14.549			
Sum Weight:	531.99	1822.13						OTM	31.51 kip-ft	1422.42		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	0.00	194.95	A	0.141	2.806	0.58	0.8	1	3.348	89.90	17.98	C
69.00-64.00			B	0.141	2.806	0.58	0.8	1	3.348			
			C	0.141	2.806	0.58	0.8	1	3.348			
T2	293.43	691.69	A	0.431	2.006	0.665	0.8	1	39.388	712.52	35.63	A
64.00-44.00			B	0.126	2.862	0.578	0.8	1	11.823			
			C	0.126	2.862	0.578	0.8	1	11.823			
T3	238.56	935.50	A	0.347	2.179	0.631	0.8	1	35.559	612.04	30.60	A
44.00-24.00			B	0.131	2.841	0.579	0.8	1	14.276			
			C	0.131	2.841	0.579	0.8	1	14.276			
Sum Weight:	531.99	1822.13						OTM	31.32	1414.46		

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
									kip-ft			

Tower Forces - Service - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
T1	0.00	194.95	A	0.141	2.806	0.58	0.85	1	3.485	93.58	18.72	C
69.00-64.00			B	0.141	2.806	0.58	0.85	1	3.485			
			C	0.141	2.806	0.58	0.85	1	3.485			
T2	293.43	691.69	A	0.431	2.006	0.665	0.85	1	39.678	717.78	35.89	A
64.00-44.00			B	0.126	2.862	0.578	0.85	1	12.275			
			C	0.126	2.862	0.578	0.85	1	12.275			
T3	238.56	935.50	A	0.347	2.179	0.631	0.85	1	35.965	619.03	30.95	A
44.00-24.00			B	0.131	2.841	0.579	0.85	1	14.821			
			C	0.131	2.841	0.579	0.85	1	14.821			
Sum Weight:	531.99	1822.13						OTM	31.70 kip-ft	1430.39		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	838.05					
Bracing Weight	984.08					
Total Member Self-Weight	1822.13			-0.03	2.66	
Total Weight	5142.56			-0.03	2.66	
Wind 0 deg - No Ice		105.89	-10666.40	-339.27	-1.79	-14.61
Wind 30 deg - No Ice		5462.07	-9170.72	-293.16	-173.61	-10.47
Wind 45 deg - No Ice		7653.44	-7503.24	-240.31	-243.93	-7.27
Wind 60 deg - No Ice		9314.82	-5332.84	-171.28	-297.24	-3.57
Wind 90 deg - No Ice		10740.73	-105.89	-4.48	-342.17	4.23
Wind 120 deg - No Ice		9368.40	5241.50	165.73	-296.64	10.92
Wind 135 deg - No Ice		7503.69	7353.48	233.95	-237.64	13.26
Wind 150 deg - No Ice		5278.66	9064.83	288.65	-165.91	14.70
Wind 180 deg - No Ice		-105.89	10482.27	334.76	7.10	14.50
Wind 210 deg - No Ice		-5462.07	9170.72	293.09	178.92	10.47
Wind 225 deg - No Ice		-7653.44	7503.24	240.24	249.24	7.27
Wind 240 deg - No Ice		-9474.29	5424.91	173.44	306.39	3.69
Wind 270 deg - No Ice		-10740.73	105.89	4.41	347.48	-4.23
Wind 300 deg - No Ice		-9208.93	-5149.43	-163.58	298.10	-10.93
Wind 315 deg - No Ice		-7503.69	-7353.48	-234.02	242.95	-13.26
Wind 330 deg - No Ice		-5278.66	-9064.83	-288.71	171.22	-14.70
Member Ice	1088.05					
Total Weight Ice	8753.57			-0.82	5.98	
Wind 0 deg - Ice		80.82	-10566.58	-319.98	2.59	-12.32
Wind 30 deg - Ice		5146.34	-8691.92	-267.97	-153.63	-9.01
Wind 45 deg - Ice		7168.23	-7053.11	-218.47	-216.50	-6.49

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 60 deg - Ice		8666.44	-4968.83	-154.91	-263.43	-3.53
Wind 90 deg - Ice		10152.71	-80.82	-4.22	-307.37	2.65
Wind 120 deg - Ice		9251.52	5213.30	155.82	-274.64	8.23
Wind 135 deg - Ice		7053.94	6938.82	212.03	-211.70	10.31
Wind 150 deg - Ice		5006.37	8611.10	262.93	-147.75	11.67
Wind 180 deg - Ice		-80.82	9797.67	301.48	9.38	11.81
Wind 210 deg - Ice		-5146.34	8691.92	266.32	165.60	9.01
Wind 225 deg - Ice		-7168.23	7053.11	216.83	228.47	6.49
Wind 240 deg - Ice		-9332.33	5353.28	161.70	290.00	4.09
Wind 270 deg - Ice		-10152.71	80.82	2.57	319.33	-2.65
Wind 300 deg - Ice		-8585.62	-4828.85	-149.03	272.01	-8.28
Wind 315 deg - Ice		-7053.94	-6938.82	-213.67	223.67	-10.31
Wind 330 deg - Ice		-5006.37	-8611.10	-264.57	159.72	-11.67
Total Weight	5142.56			-0.03	2.66	
Wind 0 deg - Service		36.64	-3690.80	-116.69	0.11	-5.06
Wind 30 deg - Service		1889.99	-3173.26	-100.74	-59.35	-3.62
Wind 45 deg - Service		2648.25	-2596.28	-82.45	-83.68	-2.51
Wind 60 deg - Service		3223.12	-1845.27	-58.57	-102.12	-1.24
Wind 90 deg - Service		3716.51	-36.64	-0.85	-117.67	1.46
Wind 120 deg - Service		3241.66	1813.67	58.05	-101.92	3.78
Wind 135 deg - Service		2596.43	2544.46	81.65	-81.50	4.59
Wind 150 deg - Service		1826.53	3136.62	100.58	-56.68	5.09
Wind 180 deg - Service		-36.64	3627.08	116.54	3.18	5.02
Wind 210 deg - Service		-1889.99	3173.26	102.12	62.64	3.62
Wind 225 deg - Service		-2648.25	2596.28	83.83	86.97	2.51
Wind 240 deg - Service		-3278.30	1877.13	60.72	106.74	1.28
Wind 270 deg - Service		-3716.51	36.64	2.23	120.96	-1.46
Wind 300 deg - Service		-3186.48	-1781.81	-55.90	103.87	-3.78
Wind 315 deg - Service		-2596.43	-2544.46	-80.27	84.79	-4.59
Wind 330 deg - Service		-1826.53	-3136.62	-99.20	59.97	-5.09

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 45 deg - No Ice
5	Dead+Wind 60 deg - No Ice
6	Dead+Wind 90 deg - No Ice
7	Dead+Wind 120 deg - No Ice
8	Dead+Wind 135 deg - No Ice
9	Dead+Wind 150 deg - No Ice
10	Dead+Wind 180 deg - No Ice
11	Dead+Wind 210 deg - No Ice
12	Dead+Wind 225 deg - No Ice
13	Dead+Wind 240 deg - No Ice
14	Dead+Wind 270 deg - No Ice
15	Dead+Wind 300 deg - No Ice
16	Dead+Wind 315 deg - No Ice
17	Dead+Wind 330 deg - No Ice
18	Dead+Ice+Temp
19	Dead+Wind 0 deg+Ice+Temp
20	Dead+Wind 30 deg+Ice+Temp
21	Dead+Wind 45 deg+Ice+Temp

Comb. No.	Description
22	Dead+Wind 60 deg+Ice+Temp
23	Dead+Wind 90 deg+Ice+Temp
24	Dead+Wind 120 deg+Ice+Temp
25	Dead+Wind 135 deg+Ice+Temp
26	Dead+Wind 150 deg+Ice+Temp
27	Dead+Wind 180 deg+Ice+Temp
28	Dead+Wind 210 deg+Ice+Temp
29	Dead+Wind 225 deg+Ice+Temp
30	Dead+Wind 240 deg+Ice+Temp
31	Dead+Wind 270 deg+Ice+Temp
32	Dead+Wind 300 deg+Ice+Temp
33	Dead+Wind 315 deg+Ice+Temp
34	Dead+Wind 330 deg+Ice+Temp
35	Dead+Wind 0 deg - Service
36	Dead+Wind 30 deg - Service
37	Dead+Wind 45 deg - Service
38	Dead+Wind 60 deg - Service
39	Dead+Wind 90 deg - Service
40	Dead+Wind 120 deg - Service
41	Dead+Wind 135 deg - Service
42	Dead+Wind 150 deg - Service
43	Dead+Wind 180 deg - Service
44	Dead+Wind 210 deg - Service
45	Dead+Wind 225 deg - Service
46	Dead+Wind 240 deg - Service
47	Dead+Wind 270 deg - Service
48	Dead+Wind 300 deg - Service
49	Dead+Wind 315 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	69 - 64	Leg	Max Tension	32	4.18	-0.01	0.00
			Max. Compression	19	-1402.00	-0.05	0.85
			Max. Mx	6	-898.40	1.33	0.02
			Max. My	10	-893.79	0.11	1.20
			Max. Vy	14	-1067.71	0.79	-0.02
			Max. Vx	2	-1036.69	-0.11	0.86
		Diagonal	Max Tension	6	1167.83	0.00	0.00
			Max. Compression	6	-1170.76	0.00	0.00
			Max. Mx	22	-871.51	0.01	-0.00
			Max. My	6	-550.41	0.00	0.00
			Max. Vy	22	6.91	0.01	-0.00
			Max. Vx	6	-0.56	0.00	0.00
		Top Girt	Max Tension	5	491.18	0.00	0.00
			Max. Compression	13	-492.36	0.00	0.00
			Max. Mx	18	5.22	-0.02	0.00
			Max. My	34	-2.10	0.00	0.00
			Max. Vy	18	10.90	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
T2	64 - 44	Leg	Max Tension	5	21203.34	0.56	-0.01
			Max. Compression	13	-24666.88	0.63	-0.04
			Max. Mx	13	-12602.20	0.77	-0.03
			Max. My	9	-1426.56	0.01	1.11
			Max. Vy	13	-430.21	0.77	-0.03
			Max. Vx	17	1333.44	-0.01	0.22

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max Tension	10	4223.60	0.00	0.00
			Max. Compression	2	-4307.28	0.00	0.00
			Max. Mx	30	2617.96	0.01	0.00
			Max. My	2	-3711.10	-0.00	0.01
			Max. Vy	30	-8.58	0.01	0.00
			Max. Vx	2	2.05	-0.00	0.01
T3	44 - 24	Leg	Max Tension	5	42317.61	0.44	-0.02
			Max. Compression	13	-46783.58	0.55	-0.04
			Max. Mx	24	-26939.44	0.84	-0.13
			Max. My	17	-1933.02	-0.00	0.55
			Max. Vy	24	-307.60	0.84	-0.13
			Max. Vx	17	-205.87	-0.00	0.55
		Diagonal	Max Tension	19	3678.72	0.00	0.00
			Max. Compression	19	-3849.80	0.00	0.00
			Max. Mx	21	726.83	0.03	0.00
			Max. My	10	-3502.51	0.00	-0.01
			Max. Vy	21	12.79	0.03	0.00
			Max. Vx	10	2.89	0.00	0.00
		Top Girt	Max Tension	22	285.45	0.00	0.00
			Max. Compression	13	-74.50	0.00	0.00
			Max. Mx	18	260.78	-0.02	0.00
			Max. My	34	259.20	0.00	0.00
			Max. Vy	18	10.97	0.00	0.00
			Max. Vx	34	-0.32	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	13	49247.18	5419.45	-3413.90
	Max. H_x	13	49247.18	5419.45	-3413.90
	Max. H_z	20	-33155.93	-4271.38	3691.13
	Min. Vert	5	-44602.28	-5126.64	3233.74
	Min. H_x	22	-38365.60	-5276.45	3310.96
	Min. H_z	11	42421.22	4146.04	-3767.43
Leg B	Max. Vert	7	47586.18	-5810.87	-2496.87
	Max. H_x	32	-38972.14	5621.41	2592.34
	Max. H_z	33	-37683.03	5433.49	2598.60
	Min. Vert	15	-44183.55	5534.51	2328.30
	Min. H_x	7	47586.18	-5810.87	-2496.87
	Min. H_z	7	47586.18	-5810.87	-2496.87
Leg A	Max. Vert	2	47520.54	-989.97	6246.17
	Max. H_x	11	-37856.17	1195.57	-5165.35
	Max. H_z	2	47520.54	-989.97	6246.17
	Min. Vert	10	-43483.00	987.92	-5911.41
	Min. H_x	3	41295.95	-1210.22	5382.46
	Min. H_z	27	-37810.65	794.79	-6118.05

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	kip-ft	kip-ft	kip-ft
Dead Only	5142.19	0.01	-0.00	-0.03	2.66	0.00
Dead+Wind 0 deg - No Ice	5142.06	105.93	-10667.26	-339.69	-1.77	-14.62
Dead+Wind 30 deg - No Ice	5142.19	5462.59	-9171.49	-293.53	-173.81	-10.47
Dead+Wind 45 deg - No Ice	5142.27	7654.16	-7503.88	-240.61	-244.21	-7.27
Dead+Wind 60 deg - No Ice	5142.30	9315.67	-5333.32	-171.50	-297.59	-3.57
Dead+Wind 90 deg - No Ice	5142.18	10741.65	-105.94	-4.48	-342.59	4.23
Dead+Wind 120 deg - No Ice	5142.06	9369.16	5241.91	165.96	-296.99	10.93
Dead+Wind 135 deg - No Ice	5142.13	7504.43	7354.10	234.25	-237.91	13.27
Dead+Wind 150 deg - No Ice	5142.16	5279.08	9065.61	289.01	-166.09	14.71
Dead+Wind 180 deg - No Ice	5142.27	-105.89	10483.20	335.17	7.14	14.51
Dead+Wind 210 deg - No Ice	5142.16	-5462.48	9171.53	293.44	179.16	10.47
Dead+Wind 225 deg - No Ice	5142.09	-7654.03	7503.88	240.53	249.55	7.27
Dead+Wind 240 deg - No Ice	5142.05	-9475.03	5425.35	173.65	306.77	3.69
Dead+Wind 270 deg - No Ice	5142.16	-10741.62	105.86	4.43	347.91	-4.23
Dead+Wind 300 deg - No Ice	5142.27	-9209.74	-5149.89	-163.77	298.47	-10.94
Dead+Wind 315 deg - No Ice	5142.24	-7504.35	-7354.10	-234.29	243.26	-13.27
Dead+Wind 330 deg - No Ice	5142.16	-5279.12	-9065.58	-289.06	171.45	-14.71
Dead+Ice+Temp	8751.31	-0.00	0.00	-0.82	5.99	0.00
Dead+Wind 0 deg+Ice+Temp	8740.16	80.82	-10566.85	-320.53	2.61	-12.33
Dead+Wind 30 deg+Ice+Temp	8740.15	5146.46	-8692.14	-268.44	-153.88	-9.02
Dead+Wind 45 deg+Ice+Temp	8740.14	7168.40	-7053.29	-218.85	-216.86	-6.50
Dead+Wind 60 deg+Ice+Temp	8740.13	8666.64	-4968.94	-155.18	-263.88	-3.54
Dead+Wind 90 deg+Ice+Temp	8740.15	10152.96	-80.80	-4.21	-307.89	2.65
Dead+Wind 120 deg+Ice+Temp	8740.16	9251.75	5213.44	156.10	-275.10	8.23
Dead+Wind 135 deg+Ice+Temp	8740.15	7054.13	6938.99	212.41	-212.05	10.31
Dead+Wind 150 deg+Ice+Temp	8740.08	5006.47	8611.35	263.40	-147.97	11.68
Dead+Wind 180 deg+Ice+Temp	8740.13	-80.82	9797.90	302.00	9.41	11.83
Dead+Wind 210 deg+Ice+Temp	8740.15	-5146.49	8692.12	266.78	165.90	9.02
Dead+Wind 225 deg+Ice+Temp	8740.15	-7168.43	7053.29	217.20	228.87	6.50
Dead+Wind 240 deg+Ice+Temp	8740.16	-9332.57	5353.42	161.97	290.50	4.10
Dead+Wind 270 deg+Ice+Temp	8740.14	-10152.96	80.84	2.58	319.88	-2.65
Dead+Wind 300 deg+Ice+Temp	8740.12	-8585.82	-4828.96	-149.28	272.48	-8.29
Dead+Wind 315 deg+Ice+Temp	8740.13	-7054.10	-6938.99	-214.03	224.06	-10.31
Dead+Wind 330 deg+Ice+Temp	8740.14	-5006.48	-8611.32	-265.02	160.01	-11.68
Dead+Wind 0 deg - Service	5142.18	36.66	-3691.09	-117.56	1.12	-5.06
Dead+Wind 30 deg - Service	5142.19	1890.16	-3173.51	-101.59	-58.40	-3.62
Dead+Wind 45 deg - Service	5142.19	2648.49	-2596.49	-83.28	-82.77	-2.52
Dead+Wind 60 deg - Service	5142.19	3223.40	-1845.43	-59.36	-101.24	-1.24
Dead+Wind 90 deg - Service	5142.19	3716.86	-36.64	-1.57	-116.80	1.46
Dead+Wind 120 deg - Service	5142.18	3241.93	1813.80	57.40	-101.03	3.78
Dead+Wind 135 deg - Service	5142.17	2596.64	2544.65	81.03	-80.59	4.59
Dead+Wind 150 deg - Service	5142.18	1826.68	3136.87	99.98	-55.74	5.09
Dead+Wind 180 deg - Service	5142.19	-36.63	3627.38	115.95	4.20	5.02
Dead+Wind 210 deg - Service	5142.18	-1890.10	3173.51	101.52	63.73	3.62
Dead+Wind 225 deg - Service	5142.18	-2648.44	2596.48	83.21	88.09	2.52
Dead+Wind 240 deg - Service	5142.18	-3278.54	1877.27	60.06	107.89	1.28
Dead+Wind 270 deg - Service	5142.18	-3716.76	36.62	1.51	122.12	-1.46
Dead+Wind 300 deg - Service	5142.19	-3186.73	-1781.96	-56.69	105.02	-3.78
Dead+Wind 315 deg - Service	5142.18	-2596.63	-2544.66	-81.10	85.91	-4.59
Dead+Wind 330 deg - Service	5142.18	-1826.66	-3136.87	-100.05	61.06	-5.09

Solution Summary

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
1	-0.00	-5142.56	0.00	-0.01	5142.19	0.00	0.007%
2	105.89	-5142.56	-10666.40	-105.93	5142.06	10667.26	0.008%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
3	5462.07	-5142.56	-9170.72	-5462.59	5142.19	9171.49	0.008%
4	7653.44	-5142.56	-7503.24	-7654.16	5142.27	7503.88	0.008%
5	9314.82	-5142.56	-5332.84	-9315.67	5142.30	5333.32	0.008%
6	10740.73	-5142.56	-105.89	-10741.65	5142.18	105.94	0.008%
7	9368.40	-5142.56	5241.50	-9369.16	5142.06	-5241.91	0.008%
8	7503.69	-5142.56	7353.48	-7504.43	5142.13	-7354.10	0.009%
9	5278.66	-5142.56	9064.83	-5279.08	5142.16	-9065.61	0.008%
10	-105.89	-5142.56	10482.27	105.89	5142.27	-10483.20	0.008%
11	-5462.07	-5142.56	9170.72	5462.48	5142.16	-9171.53	0.008%
12	-7653.44	-5142.56	7503.24	7654.03	5142.09	-7503.88	0.008%
13	-9474.29	-5142.56	5424.91	9475.03	5142.05	-5425.35	0.008%
14	-10740.73	-5142.56	105.89	10741.62	5142.16	-105.86	0.008%
15	-9208.93	-5142.56	-5149.43	9209.74	5142.27	5149.89	0.008%
16	-7503.69	-5142.56	-7353.48	7504.35	5142.24	7354.10	0.008%
17	-5278.66	-5142.56	-9064.83	5279.12	5142.16	9065.58	0.008%
18	-0.00	-8753.57	0.00	0.00	8751.31	-0.00	0.026%
19	80.82	-8753.57	-10566.58	-80.82	8740.16	10566.85	0.098%
20	5146.34	-8753.57	-8691.92	-5146.46	8740.15	8692.14	0.100%
21	7168.23	-8753.57	-7053.11	-7168.40	8740.14	7053.29	0.101%
22	8666.44	-8753.57	-4968.83	-8666.64	8740.13	4968.94	0.101%
23	10152.71	-8753.57	-80.82	-10152.96	8740.15	80.80	0.100%
24	9251.52	-8753.57	5213.30	-9251.75	8740.16	-5213.44	0.097%
25	7053.94	-8753.57	6938.82	-7054.13	8740.15	-6938.99	0.102%
26	5006.37	-8753.57	8611.10	-5006.47	8740.08	-8611.35	0.102%
27	-80.82	-8753.57	9797.67	80.82	8740.13	-9797.90	0.102%
28	-5146.34	-8753.57	8691.92	5146.49	8740.15	-8692.12	0.100%
29	-7168.23	-8753.57	7053.11	7168.43	8740.15	-7053.29	0.101%
30	-9332.33	-8753.57	5353.28	9332.57	8740.16	-5353.42	0.097%
31	-10152.71	-8753.57	80.82	10152.96	8740.14	-80.84	0.100%
32	-8585.62	-8753.57	-4828.85	8585.82	8740.12	4828.96	0.102%
33	-7053.94	-8753.57	-6938.82	7054.10	8740.13	6938.99	0.102%
34	-5006.37	-8753.57	-8611.10	5006.48	8740.14	8611.32	0.101%
35	36.64	-5142.56	-3690.80	-36.66	5142.18	3691.09	0.008%
36	1889.99	-5142.56	-3173.26	-1890.16	5142.19	3173.51	0.008%
37	2648.25	-5142.56	-2596.28	-2648.49	5142.19	2596.49	0.008%
38	3223.12	-5142.56	-1845.27	-3223.40	5142.19	1845.43	0.008%
39	3716.51	-5142.56	-36.64	-3716.86	5142.19	36.64	0.008%
40	3241.66	-5142.56	1813.67	-3241.93	5142.18	-1813.80	0.008%
41	2596.43	-5142.56	2544.46	-2596.64	5142.17	-2544.65	0.008%
42	1826.53	-5142.56	3136.62	-1826.68	5142.18	-3136.87	0.008%
43	-36.64	-5142.56	3627.08	36.63	5142.19	-3627.38	0.008%
44	-1889.99	-5142.56	3173.26	1890.10	5142.18	-3173.51	0.007%
45	-2648.25	-5142.56	2596.28	2648.44	5142.18	-2596.48	0.008%
46	-3278.30	-5142.56	1877.13	3278.54	5142.18	-1877.27	0.007%
47	-3716.51	-5142.56	36.64	3716.76	5142.18	-36.62	0.007%
48	-3186.48	-5142.56	-1781.81	3186.73	5142.19	1781.96	0.008%
49	-2596.43	-5142.56	-2544.46	2596.63	5142.18	2544.66	0.008%
50	-1826.53	-5142.56	-3136.62	1826.66	5142.18	3136.87	0.008%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	□▯▯.00000001	0.00000001	0.00064945
2	Yes	4	0.00000001	0.00084873
3	Yes	4	0.00000001	0.00086232

4	Yes	4	0.00000001	0.00087074
5	Yes	4	0.00000001	0.00087403
6	Yes	4	0.00000001	0.00086164
7	Yes	4	0.00000001	0.00084660
8	Yes	4	0.00000001	0.00084910
9	Yes	4	0.00000001	0.00085735
10	Yes	4	0.00000001	0.00087350
11	Yes	4	0.00000001	0.00086820
12	Yes	4	0.00000001	0.00086297
13	Yes	4	0.00000001	0.00086083
14	Yes	4	0.00000001	0.00087238
15	Yes	4	0.00000001	0.00087998
16	Yes	4	0.00000001	0.00087380
17	Yes	4	0.00000001	0.00086284
18	Yes	7	0.00000001	0.00053270
19	Yes	5	0.00000001	0.00039318
20	Yes	5	0.00000001	0.00040540
21	Yes	5	0.00000001	0.00040749
22	Yes	5	0.00000001	0.00041004
23	Yes	5	0.00000001	0.00040806
24	Yes	5	0.00000001	0.00039896
25	Yes	5	0.00000001	0.00041527
26	Yes	5	0.00000001	0.00041584
27	Yes	5	0.00000001	0.00041162
28	Yes	5	0.00000001	0.00039745
29	Yes	5	0.00000001	0.00039529
30	Yes	5	0.00000001	0.00037936
31	Yes	5	0.00000001	0.00039157
32	Yes	5	0.00000001	0.00040181
33	Yes	5	0.00000001	0.00040303
34	Yes	5	0.00000001	0.00040373
35	Yes	4	0.00000001	0.00084091
36	Yes	4	0.00000001	0.00084093
37	Yes	4	0.00000001	0.00084272
38	Yes	4	0.00000001	0.00084290
39	Yes	4	0.00000001	0.00083613
40	Yes	4	0.00000001	0.00083037
41	Yes	4	0.00000001	0.00083338
42	Yes	4	0.00000001	0.00083959
43	Yes	4	0.00000001	0.00085416
44	Yes	4	0.00000001	0.00086134
45	Yes	4	0.00000001	0.00086304
46	Yes	4	0.00000001	0.00086432
47	Yes	4	0.00000001	0.00086960
48	Yes	4	0.00000001	0.00086812
49	Yes	4	0.00000001	0.00086234
50	Yes	4	0.00000001	0.00085430

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
T1	69 - 64	0.596	46	0.0827	0.0497
T2	64 - 44	0.503	46	0.0826	0.0497
T3	44 - 24	0.144	46	0.0509	0.0271

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
69.00	6'x3" Pipe Mount	46	0.596	0.0827	0.0497	69442
66.00	LPA-80080-6CF	46	0.541	0.0829	0.0500	69442
55.00	8 FT DISH	46	0.328	0.0736	0.0428	48443

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	69 - 64	1.692	13	0.2336	0.1438
T2	64 - 44	1.429	13	0.2335	0.1438
T3	44 - 24	0.412	13	0.1444	0.0784

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
69.00	6'x3" Pipe Mount	13	1.692	0.2336	0.1438	24212
66.00	LPA-80080-6CF	13	1.535	0.2343	0.1445	24212
55.00	8 FT DISH	13	0.932	0.2081	0.1236	17398

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	69	Leg	A325N	0.6250	4	1.05	13491.20	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1170.76	4123.34	0.284 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.6250	1	491.18	6117.19	0.080 ✓	1.333	Member Bearing
T2	64	Leg	A325N	0.6250	4	5300.83	13498.10	0.393 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	4307.28	4123.34	1.045 ✓	1.333	Bolt Shear
T3	44	Leg	A325N	0.6250	4	10579.40	13498.60	0.784 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	3849.80	4123.34	0.934 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.6250	1	285.45	6117.19	0.047 ✓	1.333	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	69 - 64	ROHN 2 EH	5.00	5.00	78.1 K=1.00	19.390	1.4807	-1364.06	28710.10	0.048* ✓
T2	64 - 44	ROHN 2 X-STR	20.00	4.00	62.6 K=1.00	22.265	1.4773	-24666.90	32890.90	0.750 ✓
T3	44 - 24	ROHN 2.5 EH	20.03	5.01	65.0 K=1.00	21.839	2.2535	-46783.60	49214.50	0.951 ✓

* DL controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	69 - 64	L1 1/2x1 1/2x3/16	7.83	3.80	155.4 K=1.00	6.185	0.5273	-1170.76	3261.42	0.359 ✓
T2	64 - 44	L1 1/2x1 1/2x3/16	7.26	3.52	143.9 K=1.00	7.211	0.5273	-4307.28	3802.92	1.133 ✓
T3	44 - 24	L1 3/4x1 3/4x3/16	9.28	4.66	162.9 K=1.00	5.625	0.6211	-3451.39	3493.47	0.988 ✓

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	69 - 64	L1 1/2x1 1/2x3/16	6.52	6.05	247.6 K=1.00	2.437	0.5273	-492.36	1284.94	0.383 ✓
T3	44 - 24	KL/R > 200 (C) - 5 L1 1/2x1 1/2x3/16 KL/R > 200 (C) - 50	6.56	6.09	249.3 K=1.00	2.403	0.5273	-74.50	1267.12	0.059 ✓

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	69 - 64	ROHN 2 EH	5.00	5.00	78.1	30.000	1.4807	4.18	44420.50	0.000 ✓
T2	64 - 44	ROHN 2 X-STR	20.00	4.00	62.6	30.000	1.4773	21203.30	44317.80	0.478 ✓
T3	44 - 24	ROHN 2.5 EH	20.03	5.01	65.0	30.000	2.2535	42317.60	67606.20	0.626 ✓

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	69 - 64	L1 1/2x1 1/2x3/16	7.83	3.80	102.8	29.000	0.3076	1167.83	8920.90	0.131 ✓
T2	64 - 44	L1 1/2x1 1/2x3/16	7.26	3.52	95.4	29.000	0.3076	4223.60	8920.90	0.473 ✓
T3	44 - 24	L1 3/4x1 3/4x3/16	8.45	4.26	97.7	29.000	0.3779	3678.72	10960.00	0.336 ✓

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	69 - 64	L1 1/2x1 1/2x3/16	6.52	6.05	166.1	29.000	0.2900	491.18	8411.13	0.058 ✓
T3	44 - 24	L1 1/2x1 1/2x3/16	6.56	6.09	167.3	29.000	0.2900	260.88	8411.13	0.031* ✓

* DL controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	69 - 64	Leg	ROHN 2 EH	3	-1364.06	28710.10	7.4	Pass
T2	64 - 44	Leg	ROHN 2 X-STR	13	-24666.90	43843.57	56.3	Pass
T3	44 - 24	Leg	ROHN 2.5 EH	46	-46783.60	65602.93	71.3	Pass
T1	69 - 64	Diagonal	L1 1/2x1 1/2x3/16	9	-1170.76	4347.47	26.9	Pass
T2	64 - 44	Diagonal	L1 1/2x1 1/2x3/16	20	-4307.28	5069.29	85.0	Pass
T3	44 - 24	Diagonal	L1 3/4x1 3/4x3/16	56	-3451.39	4656.80	74.1	Pass
T1	69 - 64	Top Girt	L1 1/2x1 1/2x3/16	5	-492.36	1712.82	28.7	Pass
T3	44 - 24	Top Girt	L1 1/2x1 1/2x3/16	50	-74.50	1689.07	4.4	Pass
							Summary	

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
						Leg (T3)	71.3	Pass
						Diagonal (T2)	85.0	Pass
						Top Girt (T1)	28.7	Pass
						Bolt Checks	78.4	Pass
						RATING =	**85.0**	**Pass**

Element Map

Section No.	Section Elevation ft	Component Type	Element List
T1	69.00-64.00	Leg	1-3
		Diagonal	7-12
		Top Girt	4-6
T2	64.00-44.00	Leg	13-15
		Diagonal	16-45
T3	44.00-24.00	Leg	46-48
		Diagonal	52-75
		Top Girt	49-51
			Total number of elements: 75

SITE NAME	MERIDEN E CT	ECP - CELL #	AWS1	2	151
LATITUDE	41-32-03.35 N	LONGITUDE	72-47-47.35 W		
Additional Comments: swap PCS ant for xpol, add AWS, RRH & fiber, add RRH for 700, remove diplexers.		SAVE BUTTON			
		STRUCTURE TYPE	ROOF TOP		

AWS - LTE ANTENNA ADD	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	2100 MHz eNodeB		2100 MHz eNodeB		2100 MHz eNodeB	
ANTENNA TYPE	BXA-171063-8CF-EDIN-0		BXA-171063-8CF-EDIN-0		BXA-171063-8CF-EDIN-0	
QTY OF ANTENNAS PER FACE	#N/A		#N/A		#N/A	
ORIENTATION (DEG)	30		150		270	
DOWN TILT (MECH/DEG)	0		0		0	
RAD CTR (FT AGL)	66		66		66	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						
RRH - QTY/MODEL	1	ALU RH_2X40-AWS	1	ALU RH_2X40-AWS	1	ALU RH_2X40-AWS
SECTOR DISTRIBUTION BOX	1	DB-E1-3B-8AB-0Z	1	DB-E1-3B-8AB-0Z	1	DB-E1-3B-8AB-0Z
MAIN DISTRIBUTION BOX	1				DB-T1-6Z-8AB-0Z	

700 Mhz - LTE Current Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	700 eNodeB		700 eNodeB		700 eNodeB	
ANTENNA TYPE	P65-16-XL-2_2_790_-2		P65-16-XL-2_2_790_-2		P65-16-XL-2_2_790_-2	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	30		150		270	
DOWN TILT (MECH/DEG)	0		0		0	
RAD CTR (FT AGL)	66		66		66	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						

700 Mhz - LTE Future Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	700 eNodeB		700 eNodeB		700 eNodeB	
ANTENNA TYPE	P65-16-XL-2_2_790_-2		P65-16-XL-2_2_790_-2		P65-16-XL-2_2_790_-2	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	30		150		270	
DOWN TILT (MECH/DEG)	0		0		0	
RAD CTR (FT AGL)	66		66		66	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						
RRH - QTY/MODEL	1	ALU RH_2X40-700	1	ALU RH_2X40-700	1	ALU RH_2X40-700

850 Celluar - Current Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	Cellular Mod 4.0B		Cellular Mod 4.0B		Cellular Mod 4.0B	
ANTENNA TYPE	LPA-80080/6CF		LPA-80063/6CF		LPA-80080/6CF	
QTY OF ANTENNAS PER FACE	2		2		2	
ORIENTATION (DEG)	30		150		270	
DOWN TILT (MECH/DEG)	0		0		0	
RAD CTR (FT AGL)	66		66		66	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL	2	FD9R6004/2C-3L	2	FD9R6004/2C-3L	2	FD9R6004/2C-3L

850 Celluar - Future Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	Cellular Mod 4.0B		Cellular Mod 4.0B		Cellular Mod 4.0B	
ANTENNA TYPE	LPA-80080/6CF		LPA-80063/6CF		LPA-80080/6CF	
QTY OF ANTENNAS PER FACE	2		2		2	
ORIENTATION (DEG)	30		150		270	
DOWN TILT (MECH/DEG)	0		0		0	
RAD CTR (FT AGL)	66		66		66	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL	0	FD9R6004/2C-3L	0	FD9R6004/2C-3L	0	FD9R6004/2C-3L
DIPLEX WITH LTE CABLE						

1900 PCS - Current Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	PCS Mod 4.0B		PCS Mod 4.0B		PCS Mod 4.0B	
ANTENNA TYPE	948F85T2E-M_2		948F85T2E-M_2		948F85T2E-M_2	
QTY OF ANTENNAS PER FACE	2		2		2	
ORIENTATION (DEG)	30		150		270	
DOWN TILT (MECH/DEG)	0		0		0	
RAD CTR (FT AGL)	66		66		66	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						

1900 PCS - Future Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	PCS Mod 4.0B		PCS Mod 4.0B		PCS Mod 4.0B	
ANTENNA TYPE	BXA-171085-8CF-EDIN-2		BXA-171085-8CF-EDIN-2		BXA-171085-8CF-EDIN-2	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	30		150		270	
DOWN TILT (MECH/DEG)	0		0		0	
RAD CTR (FT AGL)	66		66		66	
TMA - QTY / MODEL						
DIPLEX WITH CELLULAR CABLE						

NUMBER OF CABLE'S NEEDED								Fiber Lines Model number			
TOTAL # FIBER LINES	1	TOTAL # OF MAINLINES			12			FIBER LINE MODEL #			HB158-1-08U8-S8J18
TOTAL # TOP JUMPERS	12	TOTAL # OF TOP JUMPERS			12			FIBER TOP JUMPER MODEL #			HB114-1-08U4-S4J18
Equipment Cable Ordering		MAIN CABLE	12	+	0			TOP JUMPER #	12	+	0
TX / RX FREQUENCIES								TX POWER OUTPUT			
Cellular A-Band		PCS F / AWS-Band		700 Mhz C - E				Cellular (Watts)			20
TX - 869-880,890-891.5 MHz		TX - 1970-1975 / 2145-2155		TX - 746-757				PCS (Watts)			16
RX - 824-835,845-846.5 MHz		RX - 1890-1895 / 1745-1755		RX - 776-787				LTE/ AWS (Watts)			40
ALPHA				BETA				GAMMA			
Ant.	Freq.	Func.	Color Code	Ant.	Freq.	Func.	Color Code	Ant.	Freq.	Func.	Color Code
A1-A	800	Tx1/Rx0	RED	A5-A	800	Tx2/Rx0	BLUE	A9-A	800	Tx3/Rx0	GREEN
A1-B	1900	Tx1/Rx0	RED/ WHITE	A5-B	1900	Tx2/Rx0	BLUE/ WHITE	A9-B	1900	Tx3/Rx0	GREEN/WHITE
A2	700	Tx1/Rx0	RED/ ORANGE	A6	700	Tx2/Rx0	BLUE/ ORANGE	A10	700	Tx3/Rx0	GREEN/ORANGE
A3	700	Tx4/Rx1	RED/RED/ ORANGE	A7	700	Tx5/Rx1	BLUE/BLUE/OR ANGE	A11	700	Tx6/Rx1	GREEN/GREEN/ORANGE
A4-B	1900	Tx4/Rx1	RED/RED/ WHITE	A8-B	1900	Tx5/Rx1	BLUE/BLUE/WH ITE	A12-B	1900	Tx6/Rx1	GREEN/GREEN/WHITE
A4-A	800	Tx4/Rx1	RED/RED	A8-A	800	Tx5/Rx1	BLUE/BLUE	A12-A	800	Tx6/Rx1	GREEN/GREEN
F1-A	1700	Tx/Rx	RED/ BROWN	F1-B	1700	Tx/Rx	BLUE/BROWN	F1-C	1700	Tx/Rx	GREEN/BROWN
F1-D	1700	Tx/Rx	RED/RED/ BROWN	F1-E	1700	Tx/Rx	BLUE/BLUE/BR OWN	F1-F	1700	Tx/Rx	GREEN/GREEN/BROWN
RF ENGINEER				RF MANAGER				INITIALS			DATE
Prepared By: Maria Montrose				Robert Hesselbach							12/19/2012

LTE 700 & AWS to share fiber line, LTE 700 coax runs to be used for 850/1900 after diplexers removed.

ROOFTOP ONLY

QTY=1
QTY=3

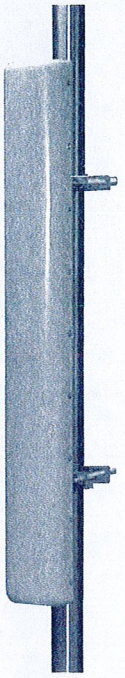
BXA-171063-8CF-EDIN-X

Replace "X" with desired electrical downtilt.

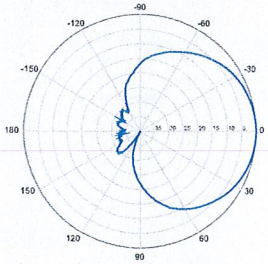
X-Pol | FET Panel | 63° | 17.4 dBi

Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	68°	65°	60°
Vertical beamwidth	7°	7°	7°
Gain	14.5 dBd / 16.6 dBi	14.9 dBd / 17.0 dBi	15.3 dBd / 17.4 dBi
Electrical downtilt (X)	0, 2, 4, 8		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back isolation	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Center (Back)		
Operating temperature	-40° to +60° C / -40° to +140° F		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1232 x 154 x 105 mm		48.5 x 6.1 x 4.1 in
Depth with t-brackets	133 mm		5.2 in
Weight without mounting brackets	4.8 kg		10.5 lbs
Survival wind speed	296 km/hr		184 mph
Wind area	Front: 0.19 m² Side: 0.14 m²		Front: 2.0 ft² Side: 1.5 ft²
Wind load @ 161 km/hr (100 mph)	Front: 281 N Side: 223 N		Front: 63 lbf Side: 50 lbf

Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-8CF-EDIN-X-FP		

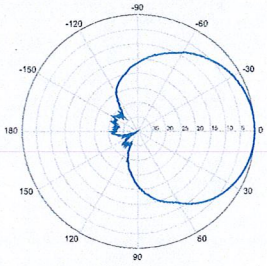


BXA-171063-8CF-EDIN-X



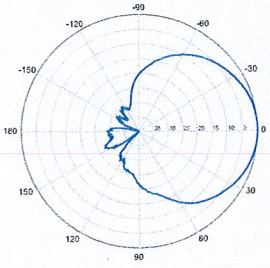
Horizontal | 1710-1880 MHz

BXA-171063-8CF-EDIN-X



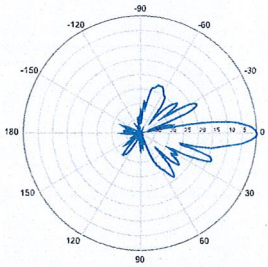
Horizontal | 1850-1990 MHz

BXA-171063-8CF-EDIN-X



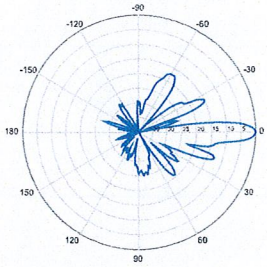
Horizontal | 1920-2170 MHz

BXA-171063-8CF-EDIN-0



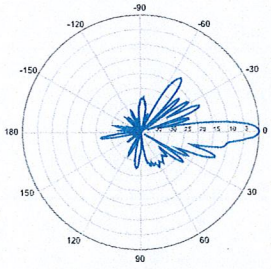
0° | Vertical | 1710-1880 MHz

BXA-171063-8CF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171063-8CF-EDIN-0



0° | Vertical | 1920-2170 MHz

BXA-171085-8CF-EDIN-X

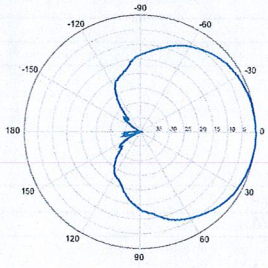
Replace "X" with desired electrical downtilt.

X-Pol | FET Panel | 85° | 16.4 dBi

Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	88°	85°	80°
Vertical beamwidth	7°	7°	7°
Gain	13.5 dBd / 15.6 dBi	13.9 dBd / 16.0 dBi	14.3 dBd / 16.4 dBi
Electrical downtilt (X)	0, 2, 4		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back isolation	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Center (Back)		
Operating temperature	-40° to +60° C / -40° to +140° F		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1232 x 154 x 105 mm		48.5 x 6.1 x 4.1 in
Depth with t-brackets	133 mm		5.2 in
Weight without mounting brackets	4.8 kg		10.5 lbs
Survival wind speed	296 km/hr		184 mph
Wind area	Front: 0.19 m^2 Side: 0.14 m^2		Front: 2.0 ft^2 Side: 1.5 ft^2
Wind load @ 161 km/hr (100 mph)	Front: 281 N Side: 223 N		Front: 63 lbf Side: 50 lbf

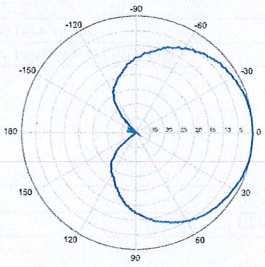
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171085-8CF-EDIN-X-FP		

BXA-171085-8CF-EDIN-X



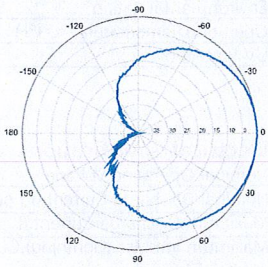
Horizontal | 1710-1880 MHz

BXA-171085-8CF-EDIN-X



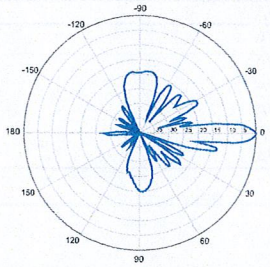
Horizontal | 1850-1990 MHz

BXA-171085-8CF-EDIN-X



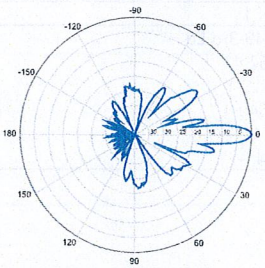
Horizontal | 1920-2170 MHz

BXA-171085-8CF-EDIN-0



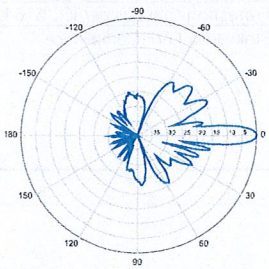
0° | Vertical | 1710-1880 MHz

BXA-171085-8CF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171085-8CF-EDIN-0



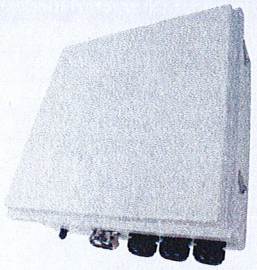
0° | Vertical | 1920-2170 MHz

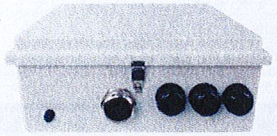
Product Data Sheet DB-B1 and DB-T1 Series

DC and Fiber Management Distribution Boxes for HYBRIFLEX™ Cable

Product Description

The RFS Distribution Box design comes with the option for pluggable over voltage protection (OVP) for up to 6 remote radios and the connection for 6 pairs of optical fiber with LC optical fiber cable management. There is a hybrid cable input with a jumper configuration for power and optical fiber to the remote radio heads (RRHs). A custom wall, a 2-inch pole, and an H-Frame mounting bracket are included. Both the compact and standard design are available with lightening protection.





Features/Benefits

- Designed to accommodate varying diameters of HYBRIFLEX™ (combined power and fiber optic) cables – up to 2 inches
- Supports Single- and Multi-Mode Optical fiber
- NEMA 4x rated enclosure – allows **flexibility for indoor or outdoor installation** on a roof or tower top
- Weatherproof enclosure and ports – **improves system reliability**
- Modular design – makes replacement or addition of OVP easy without removal of other components within the box
- Strikesorb OVP technology – protects equipment from damaging surges up to 60 kA on an 8/20 waveform and up to 5 kA on a 10/350 waveform (certain models only)
- Low residual voltage and high impedance – **ideally suited for RRH technology** – won't shut down the RRH the way spark gap technology does (certain models only)

Technical Specifications

Mechanical Specifications

Model Number	DB-B1-6C-8AB-0Z	DB-T1-6Z-8AB-0Z
Enclosure Design	Standard, 6 OVP's	Standard without OVP
Dimensions - H x W x D, mm (in)	610 x 610 x 254 (24 x 24 x 10)	610 x 610 x 254 (24 x 24 x 10)
Weight, kg (lb)	20 (44)	20 (44)
Suppression Connection Method	Compression lug, #2-#14 AWG Copper, #2-#12 Aluminum	
Fiber Connection Method	LC-LC Single- or Multi-mode duplex	
Environmental Rating	NEMA 4x	
Operating Temperature, °C (°F)	-40 to +80 (-40 to +176)	
UV Protection	ISO 4892-2 Method A Xenon-Arc 2160 hrs	

Electrical Specifications

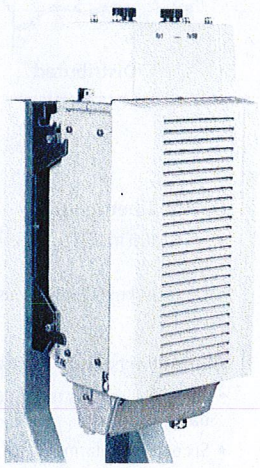
Nominal Operating Voltage	48 VDC	
Nominal Discharge Current (I_n) per UL 1449 3rd Ed	20 kA 8/20 µs	N/A
Maximum Discharge Current (I_{max}) per NEMA LS-1	60 kA 8/20 µs	N/A
Maximum Impulse (Lightning) Current (I_{imp}) per IEC 61643-1	5 kA 10/350 µs	N/A
Maximum Continuous Operating Voltage (U_c)	75 VDC	N/A
Voltage Protection Rating per UL1449 3rd Ed	400 V	N/A
Protection Class as per IEC 61643-1	Class 1	N/A
Strikesorb OVP Compliance	ANSI/UL 1449-3rd Ed	N/A
	IEEE C62.41	N/A
	NEMA LS-1	N/A
	IEC 61643-1	N/A
	IEC 61643-12	N/A
	EN 61643-11	N/A

* This data is provisional and subject to change.

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

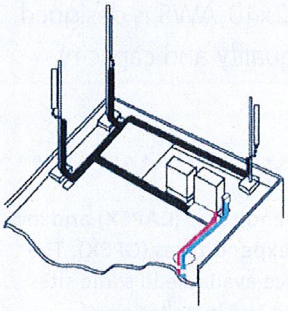
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation 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

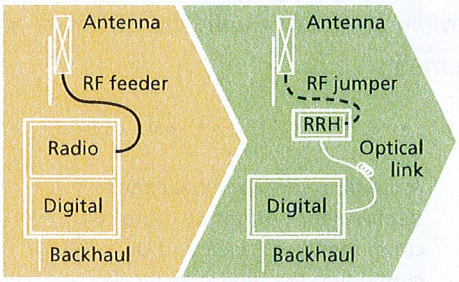
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption

Benefits

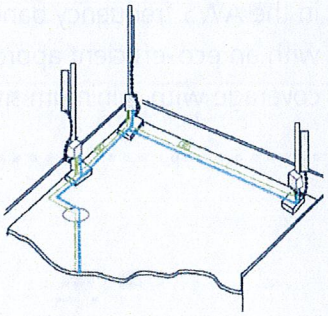
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility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

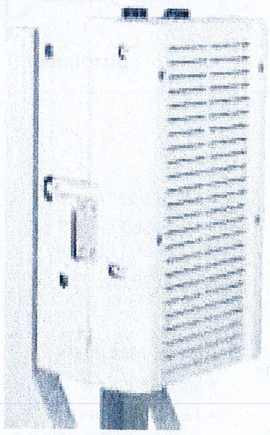
- Two optical ports to support daisy-chaining
- Six external alarms

Alcatel·Lucent

Alcatel-Lucent RRH2x40-07-L

REMOTE RADIO HEAD

The Alcatel-Lucent RRH2x40-07-L is a high-power, small form-factor Remote Radio Head (RRH) operating in the North American Digital Dividend / 700MHz frequency band (3GPP Bands 12 and 17). The Alcatel-Lucent RRH2x40-07-L 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 RRH2x40-07-L 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 RRH2x40-07-L has two transmit RF paths, 40 W RF output power per transmit path, and is designed to manage up to two-way receive diversity. The device is ideally suited to support macro coverage, with multiple-input multiple-output (MIMO) 2x2 operation in up to 15 MHz of bandwidth.

The Alcatel-Lucent RRH2x40-07-L 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 RRH2x40-07-L 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 RRH2x40-07-L 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 RRH2x40-07-L is compact and weights less than 27 kg (60 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

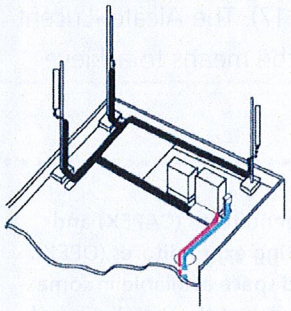
Because of its small size and weight, the Alcatel-Lucent RRH2x40-07-L can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-07-L where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and 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 RRH2x40-07-L provides more RF power while at the same time consuming less electricity.

Features

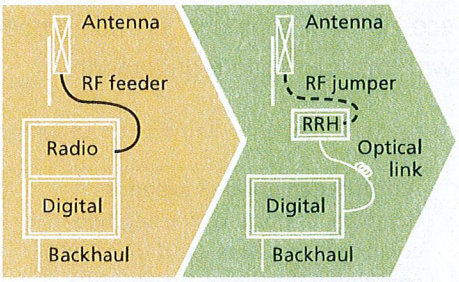
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless), noise-free, and heaterless unit
- Best-in-class power efficiency, with significantly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

Benefits

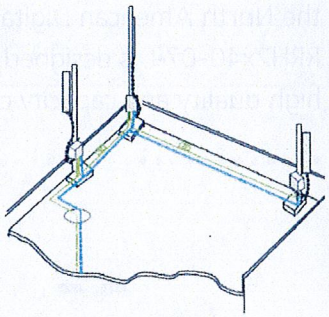
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility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



Macro



RRH for space-constrained cell sites



Distributed

Technical specifications

Physical dimensions

- Height: 520 mm (20.5 in.)
- Width: 270 mm (10.63 in.)
- Depth: 226m (8.9 in.)
- Weight (without mounting kit): less than 27 kg (60 lb)

Power

- Power supply: -48V

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: 700 MHz; 3GPP Band 12 (incl Band 17)
- Bandwidth: up to 15 MHz
- RF output power at antenna port:
  - ¬ 40 W nominal RF power for each Tx port
- Rx diversity: 2-way or 4-way
- Noise figure: below 2.5 dB typical
- ALD features
  - ¬ TMA
  - ¬ Remote electrical tilt (RET) support (AISG v2.0)

Optical characteristics

Type/number of fibers

- Up to 3.12 Gb/s line bit rate
- Single-mode variant
  - ¬ One SM fiber (9/125 µm) per RRH2x, carrying UL and DL using CWDM (at 1550/1310 nm)
- Multi-mode variant
  - ¬ Two MM fibers (50/125 µm) per RRH2x: one carrying UL, the other carrying DL (at 850 nm)

Optical fiber length

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

Alarms and ports

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

CPG2809100914 (09)

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