

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

Also admitted in Massachusetts

June 20, 2014

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

RECEIVED  
JUN 26 2014

CONNECTICUT  
SITING COUNCIL

Re: **EM-VER-015-121217 – Cellco Partnership d/b/a Verizon Wireless  
623 Pine Street, Bridgeport, Connecticut**

Dear Ms. Bachman:

On January 9, 2013, the Siting Council acknowledged receipt of Cellco's notice of intent to modify its telecommunications facility at 623 Pine Street in Bridgeport. The modification involved the replacement of certain antennas and the installation of remote radio heads and a fiber optic cable.

As a condition of the acknowledgement, Cellco was required to provide the Council with a letter stating that the recommendations specified in the structural report were implemented. Attached is a Tower Modification Certification Letter verifying that these conditions have been satisfied. All construction associated with these modifications has now been completed.

If you have any questions please do not hesitate to contact me or Rachel Mayo.

Sincerely,



Kenneth C. Baldwin

Attachment  
Copy to:

Sandy M. Carter  
Brian Ragozzine  
Mark Gauger



Law Offices

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June 5, 2014

**Mr. Mark Gauger**  
Verizon Wireless  
99 East River Drive  
East Hartford, Connecticut 06108

**Re: Existing Telecommunications Facility Tower Modification Certification Letter**

**Project:** Verizon Bridgeport SW  
623 Pine Street  
Bridgeport, CT

**Tower Owner:** RCSC (Robert Knapp)

**Engineer:** KM Consulting Engineers, Inc.  
32 West Upper Ferry Road  
Ewing, NJ 08628

**Centek Project No.:** 14055.004

Dear Mr. Gauger,

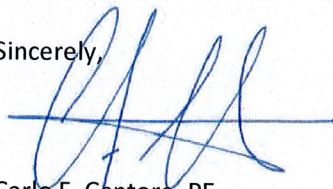
We are providing this "Existing Telecommunications Facility Tower Modification Certification Letter" with regard to the antenna upgrade by Verizon Wireless at the above referenced project.

The following are the basis for substantiating compliance with the KM Consulting Engineers structural analysis report (KM Project No. 121101.01) dated July 01, 2013:

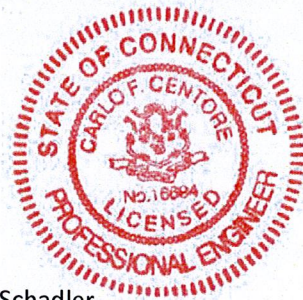
- Review of the FDH structural analysis report dated 07/01/2013.
- Field observations by Centek personnel of the coax and RRH installation on 06/04/2014 which determined all coax lines and RRH's were installed in general compliance with the recommendations of the structural analysis report prepared by KM Consulting Engineers on 07/01/2013.

The work under this Contract has been reviewed and found, to the Engineer's best knowledge, information and belief, to be completed in general compliance with the documents referenced above.

Sincerely,



Carlo F. Centore, PE  
Principal ~ Structural Engineer



CC: Rachel Mayo, Tim Parks, Steve Schadler



STATE OF CONNECTICUT  
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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

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

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

January 9, 2013

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

RE: **EM-VER-015-121217** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 623 Pine Street, Bridgeport, 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:

- Prior to the installation of its proposed antennas, Verizon submit documentation certified by a professional engineer that the tower reinforcements shown on the drawings prepared by KM Consulting Engineers and dated August 29, 2012 have been completed;
- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not more than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated December 14, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

Very truly yours,

Linda Roberts  
Executive Director

LR/CDM/jb

c: The Honorable Bill Finch, Mayor, City of Bridgeport  
Michael Nidoh, Planning Director, City of Bridgeport  
Radio Communications Corporation





STATE OF CONNECTICUT  
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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

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

December 26, 2012

The Honorable Bill Finch  
Mayor  
Bridgeport City Hall Annex  
999 Broad Street  
Bridgeport, CT 06604

RE: **EM-VER-015-121217** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 623 Pine Street, Bridgeport, Connecticut.

Dear Mayor Finch:

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 January 9, 2013.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts  
Executive Director

LR/laf

c: Michael Nidoh, Planning Director, City of Bridgeport

EM-VER-015-121217

280 Trumbull Street  
Hartford, CT 06103-3597  
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Direct (860) 275-8345

**ORIGINAL**

Also admitted in Massachusetts



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

Re: **Notice of Exempt Modification – Facility Modification  
623 Pine Street, Bridgeport, Connecticut**

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the 110-foot level on an existing 250-foot tower at the above-referenced address. The tower is owned by Radio Communications Corp. Cellco’s use of the tower was approved by the Council in 2000. Cellco now intends to add three (3) model BXA-171063-8BF AWS antennas to the tower, for a total of fifteen (15) antennas, at the same 110-foot level. Cellco also intends to install three (3) Remote Radio Heads (“RRH’s”) on its existing antenna mounting support frames. Attached behind Tab 1 are the specifications for the additional antennas and RRH’s.

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 William Finch, Mayor of the City of Bridgeport. A copy of this letter is also being sent to Radio Communications Corp, 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).



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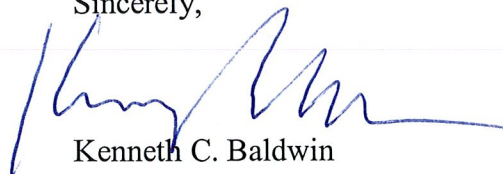
11998568-v1

Linda Roberts  
December 14, 2012  
Page 2

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's additional antennas and RRH's will be located at the 110-foot level on the existing 250-foot tower.
2. The proposed modifications do not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundaries.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the additional antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative power density table for Cellco's modified facility is included behind Tab 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support Cellco's proposed modifications. (*See Structural Analysis 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:

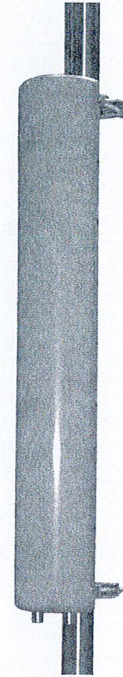
William Finch, Bridgeport Mayor  
Radio Communications Corp  
Sandy M. Carter



## BXA-171063-8BF-EDIN-X

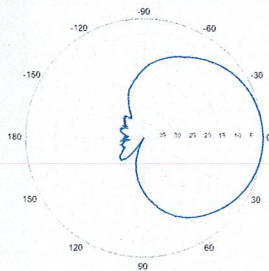
Replace "X" with desired electrical downtilt.

X-Pol | FET Panel | 63° | 17.4 dBi

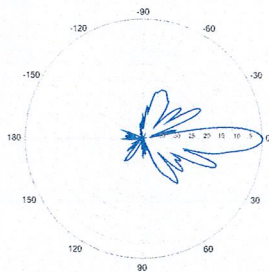


Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	68°	65°	60°
Vertical beamwidth	7°	7°	7°
Gain	14.5 dBd / 16.6 dBi	14.9 dBd / 17.0 dBi	15.3 dBd / 17.4 dBi
Electrical downtilt (X)	0, 2, 4, 8		
Impedance	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 / Bottom		
Operating temperature	-40° to +60° C / -40° to +140° F		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1232 x 154 x 105 mm		48.5 x 6.1 x 4.1 in
Depth with t-brackets	133 mm		5.2 in
Weight without mounting brackets	4.8 kg		10.5 lbs
Survival wind speed	296 km/hr		184 mph
Wind area	Front: 0.19 m <sup>2</sup> Side: 0.14 m <sup>2</sup>	Front: 2.0 ft <sup>2</sup> Side: 1.5 ft <sup>2</sup>	
Wind load @ 161 km/hr (100 mph)	Front: 281 N Side: 223 N	Front: 63 lbf Side: 50 lbf	
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-8BF-EDIN-X-FP		

BXA-171063-8BF-EDIN-X

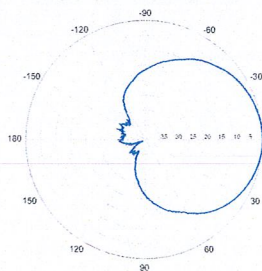


Horizontal | 1710-1880 MHz  
BXA-171063-8BF-EDIN-0

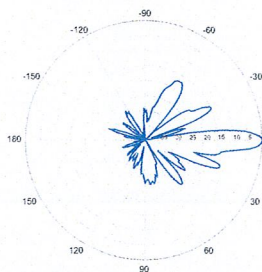


0° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-X

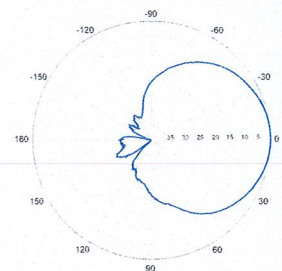


Horizontal | 1850-1990 MHz  
BXA-171063-8BF-EDIN-0

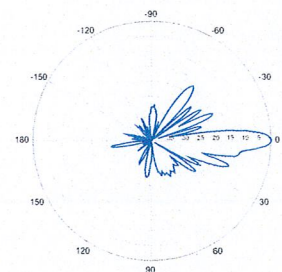


0° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-X



Horizontal | 1920-2170 MHz  
BXA-171063-8BF-EDIN-0



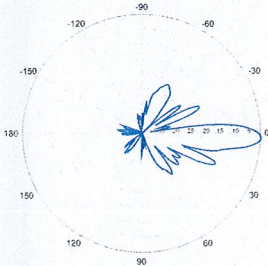
0° | Vertical | 1920-2170 MHz

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

**BXA-171063-8BF-EDIN-X**

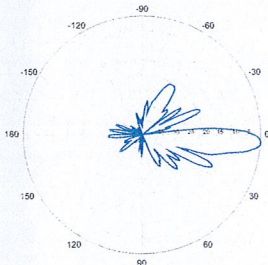
X-Pol | FET Panel | 63° | 17.4 dBi

**BXA-171063-8BF-EDIN-2**



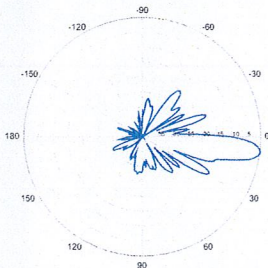
2° | Vertical | 1710-1880 MHz

**BXA-171063-8BF-EDIN-4**



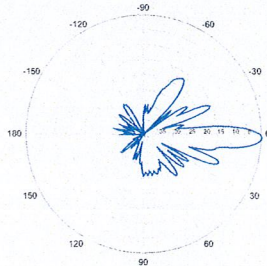
4° | Vertical | 1710-1880 MHz

**BXA-171063-8BF-EDIN-8**



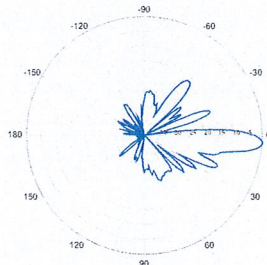
8° | Vertical | 1710-1880 MHz

**BXA-171063-8BF-EDIN-2**



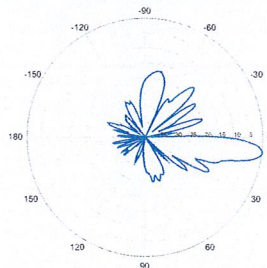
2° | Vertical | 1850-1990 MHz

**BXA-171063-8BF-EDIN-4**



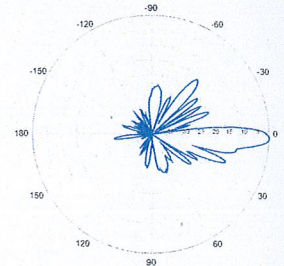
4° | Vertical | 1850-1990 MHz

**BXA-171063-8BF-EDIN-8**



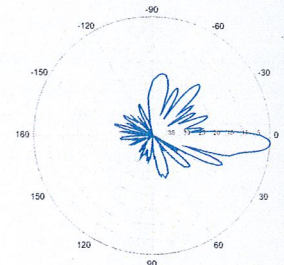
8° | Vertical | 1850-1990 MHz

**BXA-171063-8BF-EDIN-2**



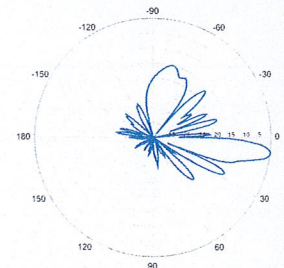
2° | Vertical | 1920-2170 MHz

**BXA-171063-8BF-EDIN-4**



4° | Vertical | 1920-2170 MHz

**BXA-171063-8BF-EDIN-8**



8° | Vertical | 1920-2170 MHz

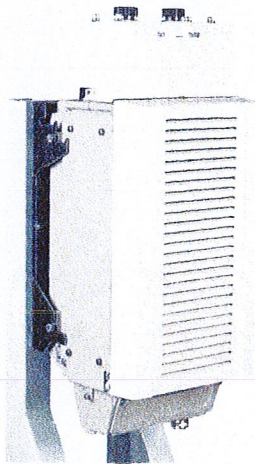
Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product.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



## 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

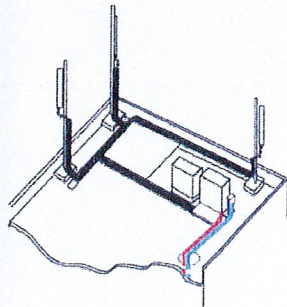
capital expenditures (CAPEX) and low operating expenditures (OPEX). The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment or require costly cranes to be employed, leaving coverage holes. However, many of these sites can host an Alcatel-Lucent 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

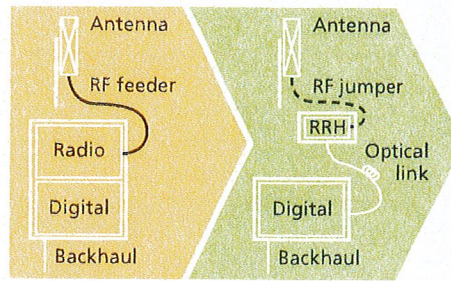
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation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



Macro

## Features

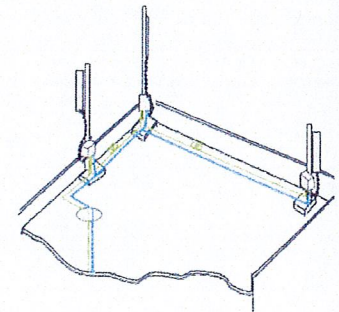
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption



RRH for space-constrained cell sites

## 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



Distributed

## Technical specifications

### Physical dimensions

- Height: 620 mm (24.4 in.)
- Width: 270 mm (10.63 in.)
- Depth: 170mm (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

[www.alcatel-lucent.com](http://www.alcatel-lucent.com) Alcatel, Lucent, Alcatel-Lucent and the Alcatel-Lucent logo are trademarks of Alcatel-Lucent. All other trademarks are the property of their respective owners. The information presented is subject to change without notice. Alcatel-Lucent assumes no responsibility for inaccuracies contained herein. Copyright © 2010 Alcatel-Lucent. All rights reserved. CPG2809100912 (09)

		General		Power		Density							
Site Name: Bridgeport SW													
Tower Height: Verizon @ 110Ft.													
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total					
*Sprint iDEN	12	100	85	0.0597	851	0.5673	10.53%						
*Clearwire	2	153	118	0.0079	2496	1.0000	0.79%						
*Clearwire	1	211	123	0.0050	18 GHz	1.0000	0.50%						
*Sprint WiMAX	3	562	85	0.0839	2657	1.0000	8.39%						
*Microwave	2	1096	240	0.0137	22500	1.0000	1.37%						
*T-Mobile LTE	2	24	180	0.0005	2100	1.0000	0.05%						
*T-Mobile GSM/UMTS	2	12	180	0.0003	1950	1.0000	0.03%						
*T-Mobile UMTS	2	12	180	0.0003	2100	1.0000	0.03%						
*Unknown	1	500	272	0.0024	162	0.2000	1.22%						
*Unknown	3	3500	267	0.0530	930	0.6200	8.54%						
*Unknown	6	500	260	0.0160	450	0.3000	5.32%						
*MetroPCS	7	734	126	0.1164	2310	1.0000	11.64%						
Verizon PCS	15	262	110	0.1168	1970	1.0000	11.68%						
Verizon Cellular	9	265	110	0.0709	869	0.5793	12.23%						
Verizon AWS	1	1750	110	0.0520	2145	1.0000	5.20%						
Verizon 700	1	863	110	0.0256	698	0.4653	5.51%						
								83.02%					
* Source: Siting Council													

# STRUCTURAL ANALYSIS REPORT

for



Bridgeport  
KM No.: 121101.00

250 Ft. Self Support Tower  
Bridgeport, CT

Prepared By:



**KM CONSULTING ENGINEERS, INC.**

32 West Upper Ferry Rd, Ewing, NJ 08628  
Ph: (609) 538-0400 Fax: (609) 538-8858

November 2, 2012

Prepared to TIA/EIA-222-F June 1996  
Structural Standards for Steel Antenna Towers  
and Antenna Supporting Structures

**Verizon Wireless  
Bridgeport**

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## **1.0 EXECUTIVE SUMMARY**

### **Structure**

Owner/Manager: Radio Communications Tower

Location: 623 Pine Street  
Bridgeport, CT

Manufacturer: Rohn

### **Equipment**

Existing tower inventory plus the proposed installation are detailed in Section 2.0 "Tower Inventory."

### **Synopsis**

Load Case No. 1: The existing tower superstructure with the current and proposed Verizon antenna inventory.

The tower superstructure has sufficient capacity, and therefore meets the current TIA standards. The tower superstructure is rated at 95.4%.

Information on the existing foundations has been reviewed. Utilizing the proposed loading reactions of the tower, a foundations analysis indicates that the existing capacity of the foundation will meet the TIA/EIA-222-F and IBC standards.

*- End of Executive Summary -*

**2.0 TOWER INVENTORY**

**DESIGNED APPURTENANCE LOADING**

TYPE	ELEVATION	TYPE	ELEVATION
Omni antenna	276.5	1' dish (Clearwire)	121
yaggi in radom	264	Panel Antenna w/mount pipe (Clearwire)	118
Beacon	264		
Omni antenna	264	Panel Antenna w/mount pipe (Clearwire)	118
Omni antenna	264	Panel Antenna w/mount pipe (Clearwire)	118
Top Platform	264		
Omni antenna	256 - 239	(2) APL866513 w/Mount Pipe (Verizon)	110
Omni antenna	238	mounting frames w/stable bar (Verizon)	110
(2) Ericsson AIR21 Panel Antenna (T-Mobile)	180	mounting frames w/stable bar (Verizon)	110
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(2) Ericsson AIR21 Panel Antenna (T-Mobile)	180	Lucent P65-16-XL-2 (Verizon)	110
APX16PV_PVL (T-Mobile)	180	MGD3-800-TX (Verizon)	110
APX16PV_PVL (T-Mobile)	180	MGD3-800-TX (Verizon)	110
APX16PV_PVL (T-Mobile)	180	Remote Radio Head (Verizon)	110
TMA (T-Mobile)	180	Remote Radio Head (Verizon)	110
TMA (T-Mobile)	180	Remote Radio Head (Verizon)	110
TMA (T-Mobile)	180	BXA-171063-8BF (Verizon)	110
(2) MetroPCS Antenna (MetroPCS)	138	BXA-171063-8BF (Verizon)	110
(2) MetroPCS Antenna (MetroPCS)	138	BXA-171063-8BF (Verizon)	110
(2) MetroPCS Antenna (MetroPCS)	138	Management Distribution Box (Verizon)	110
mounting frames w/stable bar (MetroPCS)	138	PX2F-52-N7A (County)	100
mounting frames w/stable bar (MetroPCS)	138	mounting frames w/stable bar (Nextel)	83
mounting frames w/stable bar (MetroPCS)	138	mounting frames w/stable bar (Nextel)	83
mounting frames w/stable bar (MetroPCS)	138	mounting frames w/stable bar (Nextel)	83
1' dish (Clearwire)	121	(4) sector antenna (Nextel)	83
1' dish (Clearwire)	121	(4) sector antenna (Nextel)	83
		(4) sector antenna (Nextel)	83

\*Proposed Addition of (3) BXA-171063-8BF antennas, (3) RRHs and (1) Management Distribution Box @ 110' AGL

### **3.0 COMMENTARY**

Our scope of work is to determine if the existing structure is capable of withstanding the additional stresses/forces imposed by the installation of the proposed equipment noted in the tower inventory. The tower is a 250' Rohn self support tower with a triangular platform located at the top of the tower.

The tower geometry, inventory, structural member sizes and foundation information was obtained from previous analysis by KM Consulting Engineers, Inc. dated June 27, 2012.

The reinforcement drawings by KM Consulting Engineers, Inc. dated August 29, 2012 were included in the analysis and assume to be completed.

The following report will provide analytical calculations and commentary regarding the capacity of the proposed tower and subsequent recommendations.



## **4.0 ANALYSIS PROCEDURE**

KM Consulting Engineers, Inc. carried out their structural analysis by correlating field inspection and tower member data into proprietary software designed specifically for communication tower analysis.

These programs run in conjunction with the guidelines set down in the TIA/EIA-222-F June 1996 Standard entitled "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures."

The existing tower is analyzed by placing wind forces on the structure in 30° positional increments around the tower (ie. wind pressure directly onto the tower corners, faces and parallel to the faces). This enables the user to "create" a three-dimensional representation, yielding results for worst case scenarios. In effect, the production of these results allows the user to study the structural integrity of the tower when influenced by wind forces from any direction.

The proceeding report includes analysis for the tower with the addition of antenna in the scenarios stated. For clarity, the analysis shall include worst case loadings and a typical elevation view with maximum foundation loads tabulated.

Should the client require to be furnished with a full copy of our analysis, we will gladly do so (approximately 80 pages).

### **Codes and Standards**

ACI - American Concrete Institute - *Building Code Requirements for Structural Concrete (ACI 318-05)*, 2005

AISC - American Institute of Steel Construction - *Manual of Steel Construction, Allowable Stress Design*, 14<sup>th</sup> edition, 2010

TIA - Telecommunications Industry Association - *TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures*, 1996

IBC 2003- International Building Code

## **5.0 TOWER ANALYSIS RESULTS**

The tower was analyzed for the inventory detailed in Section 2.0 "Tower Inventory".

Structural wind speed is in accordance with TIA/EIA-222-F listing applicable to Fairfield County, CT: 85 MPH (fastest mile), no ice and 74 MPH (fastest mile),  $\frac{3}{4}$ " radial ice.

All allowable capacities have been calculated to comply with the permitted TIA allowable increases (for wind).

**Load Case No. 1:** Existing inventory with the addition of (3) BXA-171063-8BF antennas, (3) Remote Radio Heads, (1) Management Distribution Box and (1) 1-5/8" Hybriflex cable.

The tower superstructure has sufficient capacity, and therefore meets the current TIA standards. The tower superstructure is rated at 95.4%. The foundation is deemed acceptable.

The reinforcement drawings by KM Consulting Engineers, Inc. dated August 29, 2012 were included in the analysis and assume to be completed. The proposed Verizon installation cannot be completed until the reinforcement design by KM Consulting Engineers, Inc. is verified to be complete.

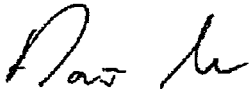
## 6.0 RECOMMENDATIONS

Further to our calculations, we conclude that the tower superstructure and base foundation have adequate capacity and therefore meet the current TIA/EIA-222-F design standards.

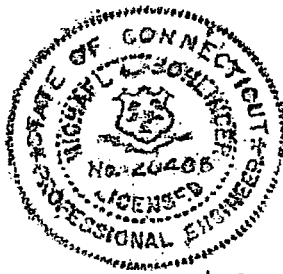
The reinforcement drawings by KM Consulting Engineers, Inc. dated August 29, 2012 were included in the analysis and assume to be completed. The proposed Verizon installation cannot be completed until the reinforcement design by KM Consulting Engineers, Inc. is verified to be complete.

Please do not hesitate to contact our office with any questions or concerns regarding this report.

Prepared By:



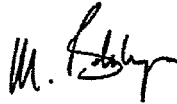
Domenic Aversa, EIT  
Project Manager



11/02/12

M.B.

Reviewed and Approved by:

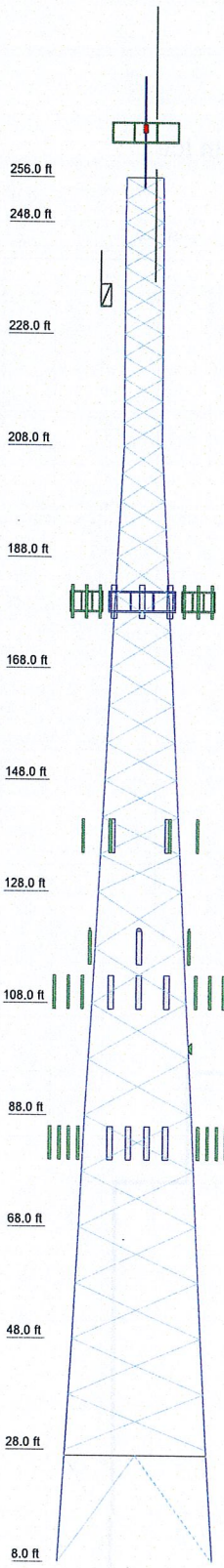


Michael L. Bohlinger, PE  
Principal  
CT License No. 20405

## **7.0 APPENDIX**

**LOAD CASE 1**

Section	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs			P10x.5		ROHN 8 EH	ROHN 8 EHS	A572-50	ROHN 5 EH	ROHN 4 EH	ROHN 3 EH			
Diagonals			L5x5x3/8		L4x4x0.31	L4x4x3/8	L2 1/2x2 1/2x1/4	L3x3x1/4	L2 1/2x2 1/2x1/4				
Diagonal Grade													
Top Girts													
Red. Diagonals													
Inner Bracing													
Face Width (ft)	27.8333	23.229	21.25	19.25	17.0833	14.969	12.916	10.916	8.916	6.833			
# Panels @ (ft)	1 @ 19			10 @ 10			9 @ 5.66667	4 @ 5				12 @ 4	
Weight (lb)	49432.4	7164.6	6867.4	8022.3	4628.9	4185.6	3083.2	2923.5	2590.2	1952.2	1586.8	1379.3	478.2



**DESIGNED APPURTENANCE LOADING**

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**SYMBOL LIST**

MARK	SIZE	MARK	SIZE
A	ROHN 3 STD	C	L3x3x1/4
B	L1 3/4x1 3/4x3/16		

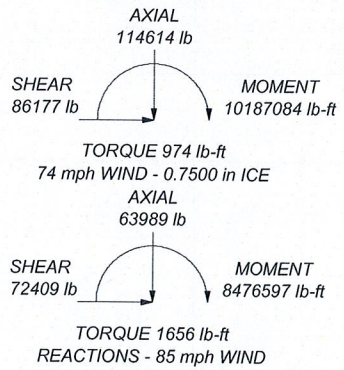
**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi			

**TOWER DESIGN NOTES**

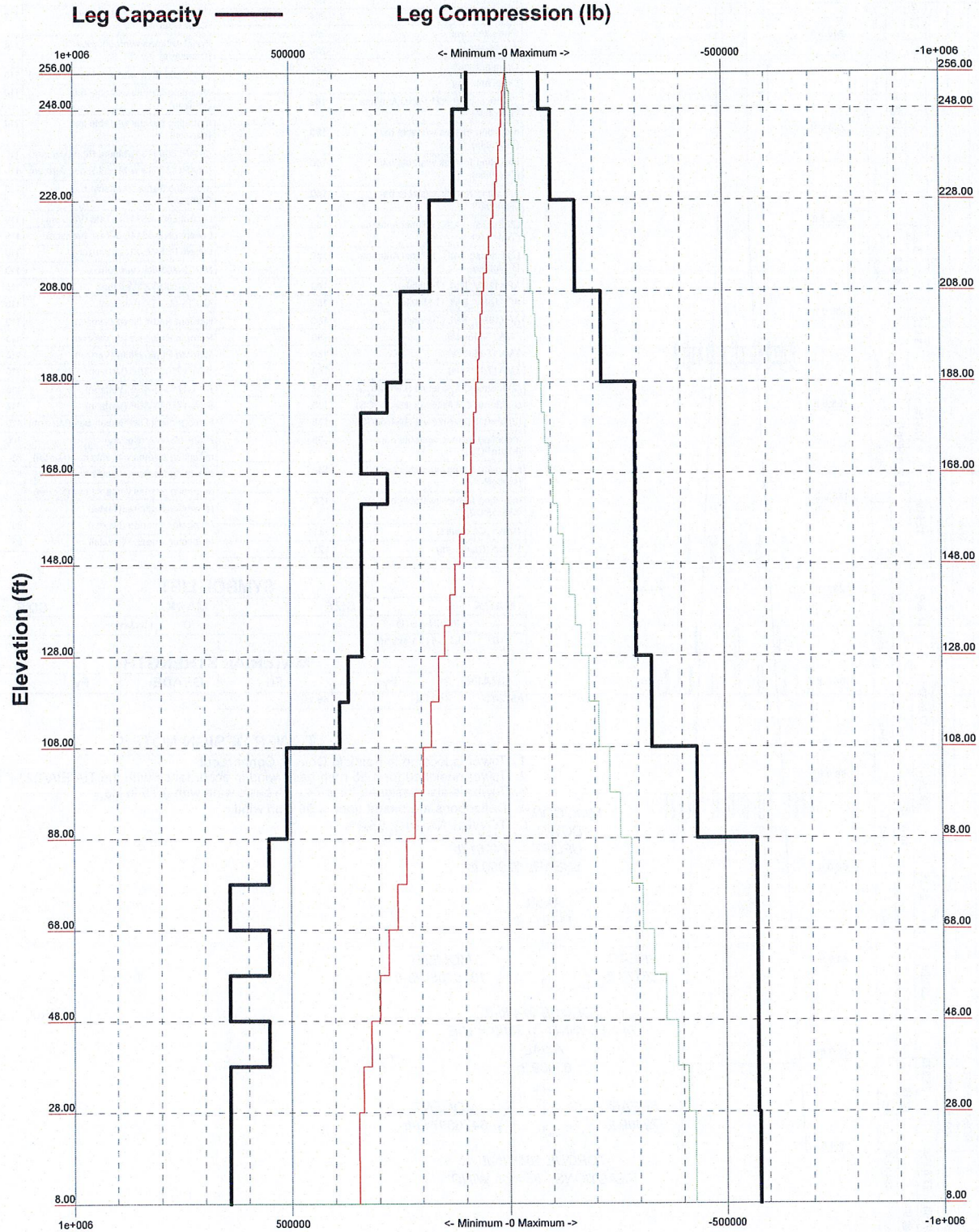
1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.75 in ice.
4. Deflections are based upon a 60 mph wind.

MAX. CORN DOWN:  $\frac{1}{1000}$   
 UPLIFT: -374061 lb  
 SHEAR: 52960 lb



<b>KM Consulting Engineers Inc.</b> 32 West Upper Ferry Road Ewing, NJ. 08628 Phone: (609) 538-0400 FAX: (609) 538-8858	Job: <b>Bridgeport RCI Tower</b>
	Project: <b>250' Rohn Self Support Tower</b>
	Client: Verizon Wireless      Drawn by: Michael Bohlinger      App'd:
	Code: TIA/EIA-222-F      Date: 11/02/12      Scale: NTS
	Path: K:\SSS Inc\Bridgeport\Engineering\Bridgeport LCI1.dwg Dwg No. E-1

TIA/EIA-222-F - 85 mph/74 mph 0.7500 in Ice



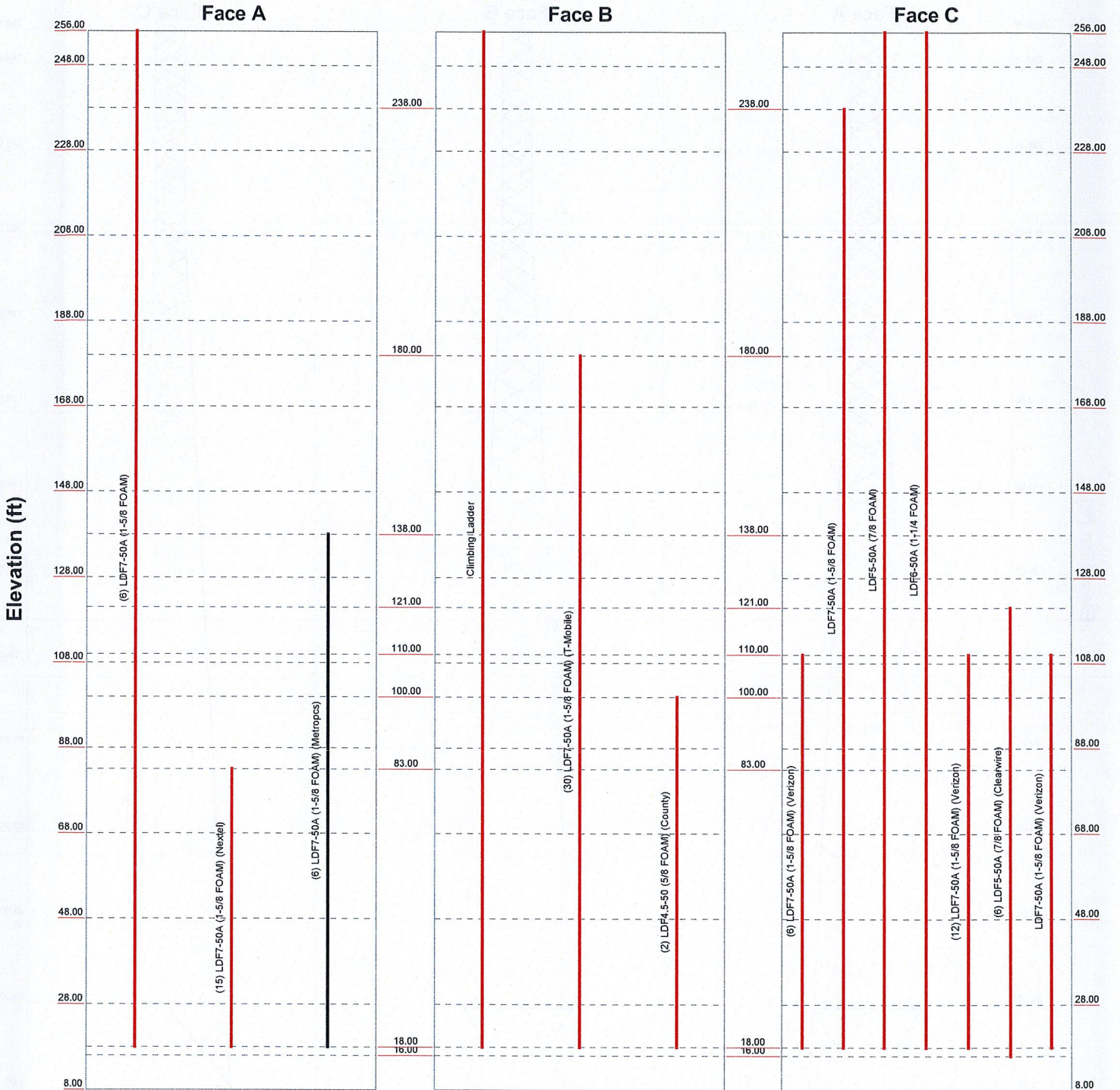
**KM Consulting Engineers Inc.**  
 32 West Upper Ferry Road  
 Ewing, NJ. 08628  
 Phone: (609) 538-0400  
 FAX: (609) 538-8858

<b>Job: Bridgeport RCI Tower</b>		App'd:
Project: 250' Rohn Self Support Tower		Scale: NTS
Client: Verizon Wireless	Drawn by: Michael Bohlinger	Dwg No. E-3
Code: TIA/EIA-222-F	Date: 11/02/12	
Path: K:\VSS Incl\Bridgeport\Engineering\Bridgeport LC1.epr		

# Feedline Distribution Chart

## 8' - 256'

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



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 Phone: (609) 538-0400  
 FAX: (609) 538-8858

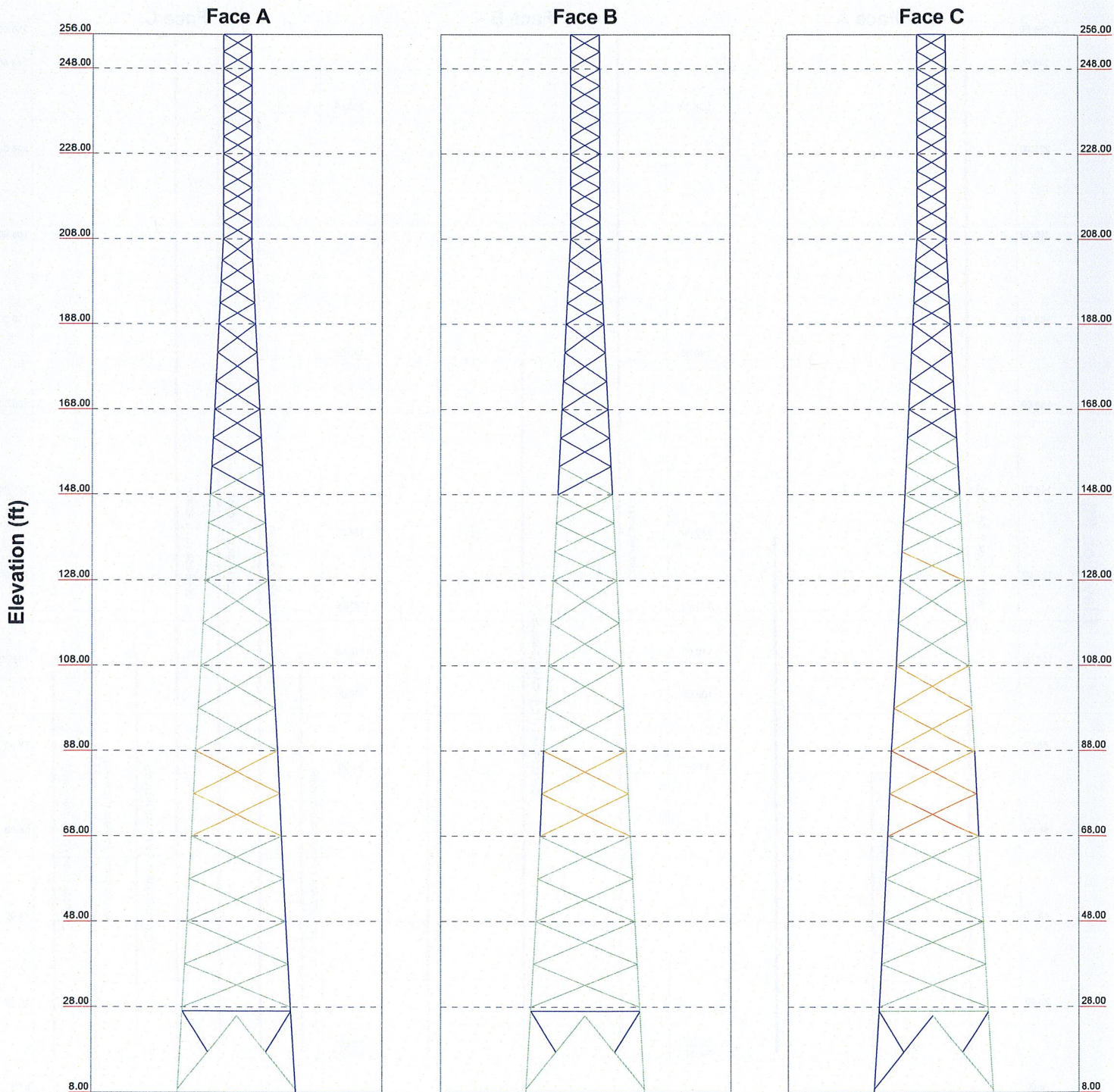
<b>Job: Bridgeport RCI Tower</b>	
<b>Project: 250' Rohn Self Support Tower</b>	
Client: Verizon Wireless	Drawn by: Michael Bohlinger
Code: TIA/EIA-222-F	Date: 11/02/12
Path: K:\VSS Inc\Bridgeport\Engineering\Bridgeport LC1.rvt	App'd: NTS
	Dwg No. E-7



# Stress Distribution Chart

8' - 256'

■ > 100% 
 ■ 90%-100% 
 ■ 75%-90% 
 ■ 50%-75% 
 ■ < 50% Overstress



**KM Consulting Engineers Inc.**  
 32 West Upper Ferry Road  
 Ewing, NJ. 08628  
 Phone: (609) 538-0400  
 FAX: (609) 538-8858

<b>Job: Bridgeport RCI Tower</b>		
Project: 250' Rohn Self Support Tower		
Client: Verizon Wireless	Drawn by: Michael Bohlinger	App'd:
Code: TIA/EIA-222-F	Date: 11/02/12	Scale: NTS
Path: K:\VSS Incl\Bridgeport\Engineering\Bridgeport LC1.eri		Dwg No: E-8

<b>tnxTower</b>  <b>KM Consulting Engineers Inc.</b> 32 West Upper Ferry Road Ewing, NJ. 08628 Phone: (609) 538-0400 FAX: (609) 538-8858	Job	Bridgeport RCI Tower	Page	36 of 37
	Project	250' Rohn Self Support Tower	Date	14:33:49 11/02/12
	Client	Verizon Wireless	Designed by	Michael Bohlinger

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio P/P <sub>a</sub>
T13	28 - 8	ROHN 3 STD	11.12	10.26	105.8	30.000	2.2285	6497.34	66854.10	0.097

### Redundant Hip Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio P/P <sub>a</sub>
T13	28 - 8	ROHN 1.5 STD	14.83	14.83	285.7	30.000	0.7995	103.88	23983.70	0.004

### Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio P/P <sub>a</sub>
T13	28 - 8	ROHN 3 STD	12.73	12.73	131.3	30.000	2.2285	245.67	66854.10	0.004

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P <sub>allow</sub> lb	% Capacity	Pass Fail
T1	256 - 248	Leg	ROHN 3 STD	3	-8780.62	76206.01	11.5	Pass
		Diagonal	L1 3/4x1 3/4x3/16	8	-1479.93	6904.95	21.4	Pass
T2	248 - 228	Top Girt	L3x3x1/4	4	-584.57	17508.29	3.3	Pass
		Leg	ROHN 3 EH	21	-27706.20	102570.88	27.0	Pass
T3	228 - 208	Diagonal	L2x2x1/4	23	-2785.95	13590.20	20.5	Pass
		Leg	ROHN 4 EH	54	-56218.00	157673.90	32.4 (b)	Pass
T4	208 - 188	Diagonal	L2x2x1/4	56	-3944.93	14108.47	35.7	Pass
		Leg	ROHN 5 EH	87	-74535.80	218465.36	28.0	Pass
T5	188 - 168	Diagonal	L2x2x1/4	89	-2372.88	8319.80	45.9 (b)	Pass
		Leg	ROHN 6 EH	114	-96693.30	294794.27	34.1	Pass
T6	168 - 148	Diagonal	L2 1/2x2 1/2x1/4	116	-4672.55	10570.13	28.5	Pass
		Leg	ROHN 6 EH	135	-129069.00	294794.27	32.8	Pass
T7	148 - 128	Diagonal	L3x3x1/4	137	-7315.86	14250.70	44.2	Pass
		Leg	ROHN 6 EH	156	-169618.00	294787.61	43.8	Pass
T8	128 - 108	Diagonal	ROHN 8 EHS	177	-210765.00	332528.83	51.3	Pass
		Leg	L4x4x3/8	179	-12089.50	26862.75	59.2 (b)	Pass
T9	108 - 88	Diagonal	ROHN 8 EH	192	-258321.00	435191.16	57.5	Pass
		Leg	L4x4x0.31	194	-13392.30	18685.06	71.7	Pass

<b>tnxTower</b>  <b>KM Consulting Engineers Inc.</b> 32 West Upper Ferry Road Ewing, NJ. 08628 Phone: (609) 538-0400 FAX: (609) 538-8858	Job	Bridgeport RCI Tower	Page	37 of 37
	Project	250' Rohn Self Support Tower	Date	14:33:49 11/02/12
	Client	Verizon Wireless	Designed by	Michael Bohlinger

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P <sub>allow</sub> lb	% Capacity	Pass Fail	
T10	88 - 68	Leg	P10x.5	207	-309300.00	574275.04	53.9	Pass	
		Diagonal	L5x5x3/8	209	-16064.80	38315.75	41.9	Pass	
T11	68 - 48	Lcg	P10x.5	222	-361560.00	574277.70	63.0	Pass	
		Diagonal	L5x5x3/8	224	-17151.70	32860.98	52.2	Pass	
T12	48 - 28	Leg	P10x.5	237	-411435.00	574259.04	71.6	Pass	
		Diagonal	L5x5x3/8	239	-17941.10	28177.62	63.7	Pass	
T13	28 - 8	Leg	P10x.5	252	-428543.00	578731.26	74.0	Pass	
		Diagonal	ROHN 3 STD	258	-23364.50	33932.05	68.9	Pass	
		Top Girt	ROHN 3 STD	253	-14183.80	27653.08	51.3	Pass	
		Redund Diag 1	ROHN 3 STD	263	-6497.34	39609.96	16.4	Pass	
		Bracing							
		Redund Hip 1	ROHN 1.5 STD	272	-71.59	10575.57	0.7	Pass	
		Bracing							
		Redund Hip Diagonal	ROHN 1.5 STD	273	-59.61	1948.97	3.1	Pass	
		Bracing							
		Inner Bracing	ROHN 3 STD	275	-221.60	25741.16	22.8	Pass	
							Summary		
							Leg (T13)	74.0	Pass
							Diagonal (T10)	95.4	Pass
							Top Girt (T13)	51.3	Pass
							Redund Diag 1	16.4	Pass
							Bracing (T13)		
							Redund Hip 1 Bracing (T13)	0.7	Pass
							Redund Hip Diagonal Bracing (T13)	3.1	Pass
							Inner Bracing (T13)	22.8	Pass
							Bolt Checks	95.4	Pass
							<b>RATING =</b>	<b>95.4</b>	<b>Pass</b>