## Robinson+Cole

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Also admitted in Massachusetts

February 21, 2018

Melanie A. Bachman, Esq. Executive Director/Staff Attorney Connecticut Siting Council 10 Franklin Square New Britain, CT 06051

Re: Notice of Exempt Modification – Facility Modification 300 Tresser Boulevard, Stamford, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas attached to the façade of a mechanical penthouse on the roof of the building at 300 Tresser Boulevard in Stamford (the "Property"). Equipment associated with Cellco's antennas is located inside the building. The building and the Property are owned by Cornerstone/Bayview Inc. The Council approved Cellco's facility at the Property in 1987 (Docket No. 73) and retains jurisdiction over this roof-top facility.

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 Stamford Mayor, David Martin; Ralph Blessing, Stamford's Land Use Bureau Chief; and Cornerstone/Bayview Inc., the owner of the building and the Property.

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Melanie A. Bachman, Esq. February 21, 2018 Page 2

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 building.
- 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) safety standard. A Calculated Radio Frequency Report for Cellco's modified facility is included behind Attachment 2.
- 5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
- 6. The host building can support Cellco's proposed modifications. (*See* Structural Assessment Letter included in <u>Attachment 3</u>).

A copy of the parcel map and owner information for the Property is included in <u>Attachment 4</u>. A Certificate of Mailing verifying that this filing was sent to municipal officials and the owner of the Property is included in <u>Attachment 5</u>.

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).

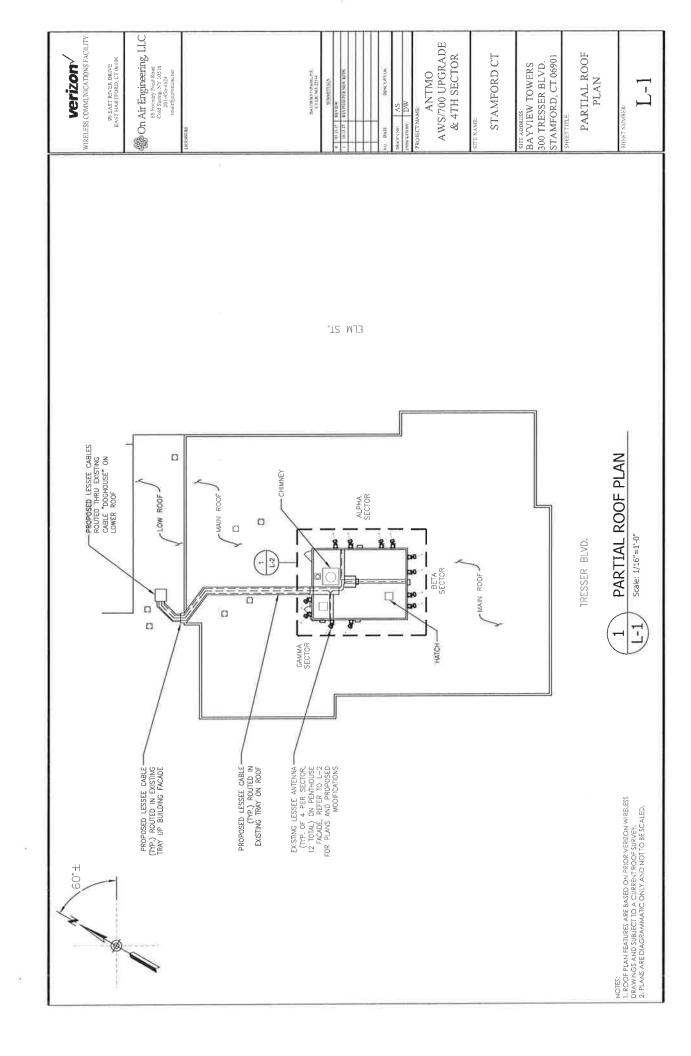
Sincerely

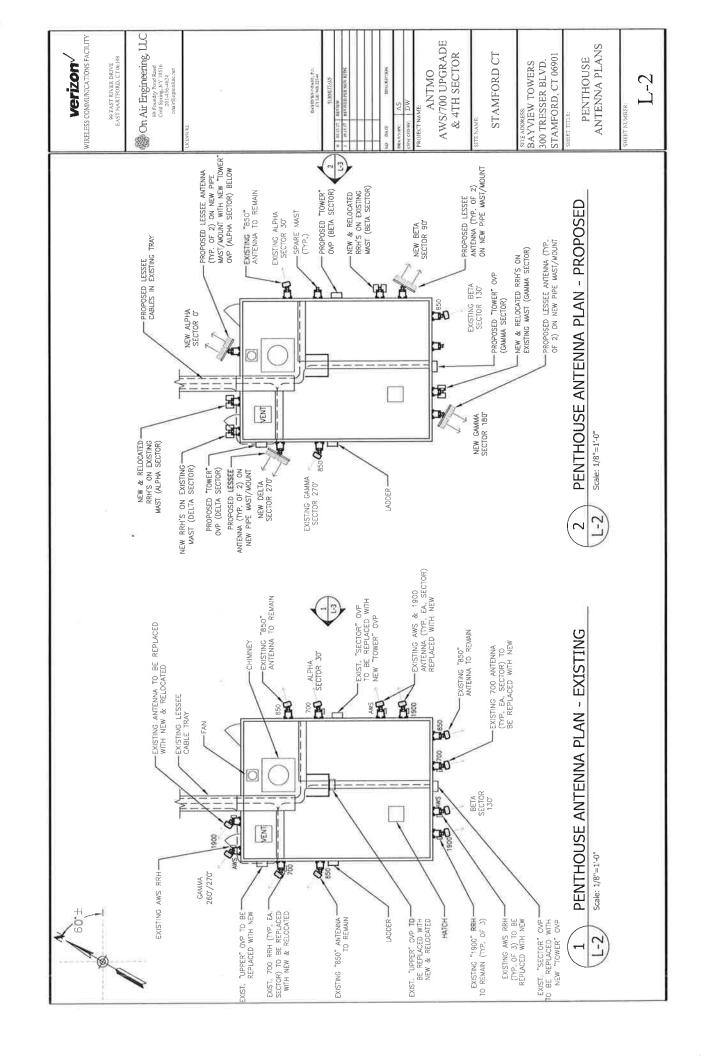
Kenneth C. Baldwin

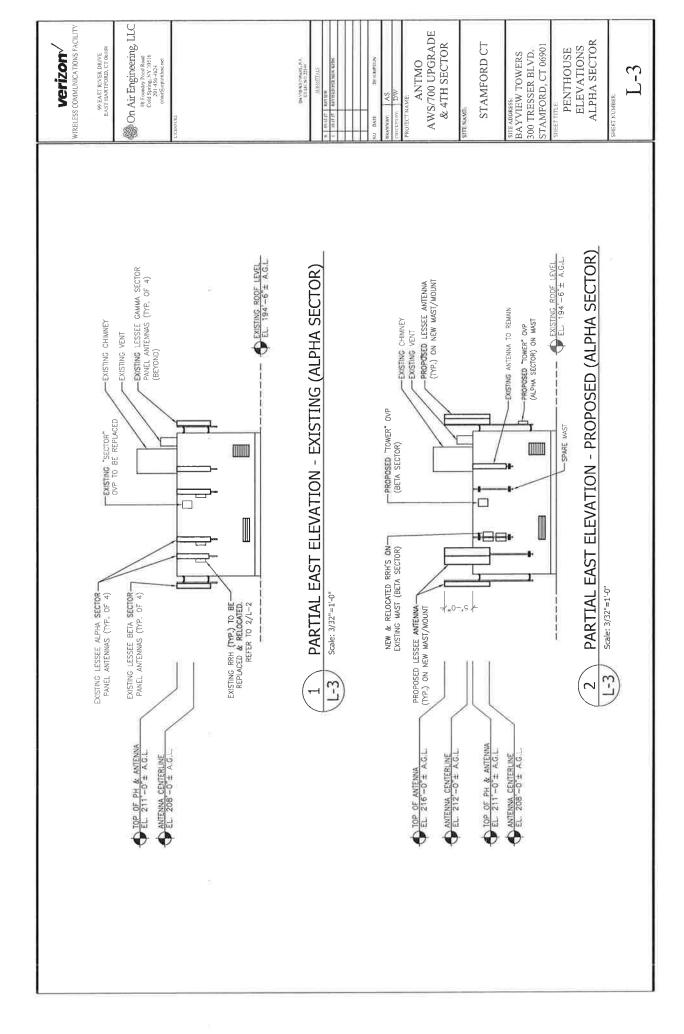
Enclosures Copy to:

David Martin, Mayor Ralph Blessing, Land Use Bureau Chief Cornerstone/Bayview Inc. Tim Parks

## **ATTACHMENT 1**











#### JAHH-65C-R3B

8-port sector antenna, 2x 698-787, 2x 824-894 and 4x 1695-2360 MHz, 65° HPBW, 3x RET and low bands have diplexers. Internal SBT's on first LB(Port 1) and first HB (Port 5)

- Internal SBT on low and high band allow remote RET control from the radio over the RF jumper cable
- One RET for 700MHz, one RET for 850MHz, and one RET for both high bands to ensure same tilt level for 4x Rx or 4x MIMO
- Internal filter on low band and interleaved dipole technology providing for attractive,
   low wind load mechanical package
- Separate RS-485 RET input/output for low and high band

#### **Electrical Specifications**

Frequency Band, MHz Gain, dBi	<b>698-787</b> 15.5	<b>824-894</b> 16.2	<b>1695-1880</b> 18.2	<b>1850-1990</b> 18.6	<b>1920-2200</b> 18.7	<b>2300-2360</b> 18.7
Beamwidth, Horizontal, degrees	67	64	62	60	61	64
Beamwidth, Vertical, degrees	9.8	8.4	5.7	5.3	5.0	4.5
Beam Tilt, degrees	0-11	0-11	2-12	2-12	2-12	2-12
USLS (First Lobe), dB	23	22	20	20	21	20
Front-to-Back Ratio at 180°, dB	30	30	29	35	38	39
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	30	30	30	30
VSWR   Return Loss, dB	1.5   14.0	1.5   14.0	1.5   14.0	1.5   14.0	1.5   14.0	1.5   14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port at 50°C, maximum, watts	200	200	250	250	250	200
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

#### Electrical Specifications, BASTA\*

Electrical Specifications,	BASIA,					
Frequency Band, MHz	698-787	824-894	1695-1880	1850-1990	1920-2200	2300-2360
Gain by all Beam Tilts, average, dBi	15.2	16.0	17.5	18.2	18.3	18.3
Gain by all Beam Tilts Tolerance, dB	±0.3	±0.4	±0.7	±0.5	±0.5	±0.7
	0 °   15.2	0 °   15.8	2°   17.2	2 °   17.8	2°   17.8	2° 17.8
Gain by Beam Tilt, average, dBi	5 °   15.2	5 °   16.0	7° 17.6	7° 18.4	7 °   18.5	7 °   18.4
	11 °   15.2	11 °   16.0	12 °   17.5	12 °   18.3	12 °   18.4	12 °   18.2
Beamwidth, Horizontal Tolerance, degrees	±1.1	±1.6	±3.9	±3	±3	±4.6
Beamwidth, Vertical Tolerance, degrees	±0.5	±0.4	±0.3	±0.2	±0.3	±0.2
USLS, beampeak to 20° above beampeak, dB	18	17	16	16	16	15
Front-to-Back Total Power at 180° ± 30°, dB	25	23	25	31	29	30
CPR at Boresight, dB	23	22	20	23	22	19
CPR at Sector, dB	12	13	10	13	11	8

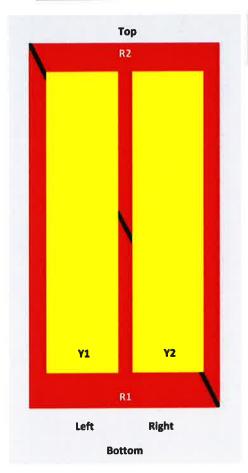
<sup>\*</sup> CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.



JAHH-65C-R3B

#### **Array Layout**

#### JAHH-65A-R3B JAHH-65B-R3B JAHH-65C-R3B



Агтву	Freq (MHz)	Conns	RET (SRET)	AISG RET UID
RI	698-798	1-2	1	ANxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
R2	824-894	3.4	2	ANasasasasasasasas2
YI	1695-2360	5-6	3	ANxxxxxxxxxxxxxxxxxx3
Y2	1695-2360	7-8	1	

View from the front of the antenna

(Sizes of colored boxes are not true depictions of array sizes)

#### **General Specifications**

Operating Frequency Band 1695 - 2360 MHz | 698 - 787 MHz | 824 - 894 MHz

Antenna Type Sector

Band Multiband

Performance Note Outdoor usage

Total Input Power, maximum 800 W @ 50 °C

#### **Mechanical Specifications**

RF Connector Quantity, total 8
RF Connector Quantity, low band 4
RF Connector Quantity, high band 4



IAHH-65C-R3B

RF Connector Interface 4.3-10 Female Color Light gray

Grounding Type RF connector body grounded to reflector and mounting bracket

Radiator Material Aluminum | Low loss circuit board

Radome Material Fiberglass, UV resistant

Reflector Material Aluminum
RF Connector Location Bottom

Wind Loading, frontal 424.0 N @ 150 km/h 95.3 lbf @ 150 km/h Wind Loading, lateral 360.0 N @ 150 km/h 80.9 lbf @ 150 km/h

Wind Loading, maximum 897.0 N @ 150 km/h 201.7 lbf @ 150 km/h

Wind Speed, maximum 241 km/h | 150 mph

#### **Dimensions**

 Length
 2432.0 mm | 95.7 in

 Width
 350.0 mm | 13.8 in

 Depth
 208.0 mm | 8.2 in

 Net Weight, without mounting kit
 36.4 kg | 80.2 lb

#### **Remote Electrical Tilt (RET) Information**

Input Voltage 10–30 Vdc
Internal Bias Tee Port 1 | Port 5

Internal RET High band (1) | Low band (2)

Power Consumption, idle state, maximum 2 W Power Consumption, normal conditions, maximum 13 W

Protocol 3GPP/AISG 2.0 (Single RET)

RET Interface 8-pin DIN Female | 8-pin DIN Male

RET Interface, quantity 2 female | 2 male

#### **Packed Dimensions**

 Length
 2570.0 mm | 101.2 in

 Width
 460.0 mm | 18.1 in

 Depth
 350.0 mm | 13.8 in

 Shipping Weight
 51.0 kg | 112.4 lb

#### **Regulatory Compliance/Certifications**

#### Agency Classification

RoHS 2011/65/EU Compliant by Exemption

China RoHS SJ/T 11364-2006 Above Maximum Concentration Value (MCV)

ISO 9001:2008 Designed, manufactured and/or distributed under this quality management system







JAHH-65C-R3B

#### **Included Products**

BSAMNT-3 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

#### \* Footnotes

Performance Note

Severe environmental conditions may degrade optimum performance

## ALCATEL-LUCENT B13 RRH4X30-4R

Alcatel-Lucent B13 Remote Radio Head 4x30-4R is the newest addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering.

**Supporting 2Tx/4Tx MIMO and 4-way Rx diversity**, Alcatel-Lucent B13 RRH4x30-4R allows operators to have a compact radio solution to deploy LTE in the 700U band (700 MHz, 3GPP band 13), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent B13 RRH4x30-4R product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x60 W or 4x30 W RF output power. It supports also 4-way Rx diversity and up to 10MHz instantaneous bandwidth.

The Alcatel-Lucent B13 RRH4x30-4R is a near zero-footprint solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

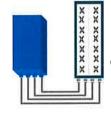
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.



- Supporting LTE in 700 MHz band (700U, 3GPP band 13)
- LTE 2Tx or 4Tx MIMO (SW switchable)
- Output power: Up to 2x60W or 4x30W
- 10MHz LTE carrier with 4Rx Diversity
- Convection-cooled (fan-less)
- Supports AISG 2.0 ALD devices (RET, TMA) through RS485 or RF ports

#### **BENEFITS**

- Compact to reduce additional footprint when adding LTE in 700U band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through MIMO4
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall



4x30W with 4T4R or 2x60W with 2T4R

Can be switched between modes via SW w/o site visit



#### **TECHNICAL SPECIFICATIONS**

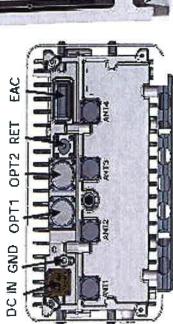
Features & performance				
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)			
Frequency band	U700 (C) (3GPP bands 13): DL: 746 - 756 MHz / UL: 777 - 787 MHz			
Instantaneous bandwidth - #carriers	10MHz – 1 LTE carrier (in 10MHz occupied bandwidth)			
LTE carrier bandwidth	10 MHz			
RF output power	2x60W or 4x30W (by SW)			
Noise figure - RX Diversity scheme	2 dB typ. (<2.5 dB max) – 2 or 4 way Rx diversity			
Sizes (HxWxD) in mm (in.)  Volume in L  Weight in kg (ib) (w/o mounting HW)	550 x 305 x 230 (21.6" x 12.0" x 9") (with solar shield) 38 (with solar shield) 26 (57.2) (with solar shield)			
DC voltage range DC power consumption	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 550W typical @100% RF load ( in 2Tx or 4TX mode)			
Environmental conditions  Wind load (@150km/h or 93mph)	-40°C (-40°F) /+55°C (+131°F) IP65 Frontal:<200N / Lateral :<150N			
Antenna ports	4 ports 7/16 DIN female (50 ohms) VSWR < 1.5			
CPRI ports	2 CPRI ports (HW ready for Rate7, 9.8 Gbps) SFP single mode dual fiber			
AISG interfaces	1 AISG2.0 output (RS485) Integrated Smart Bias Tees (x2)			
Misc. Interfaces	4 external alarms (1 connector) – 4 RF Tx & 4 RF Rx monitor ports - 1 DC connector (2 pins)			
Installation conditions	Pole and wall mounting			
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27			

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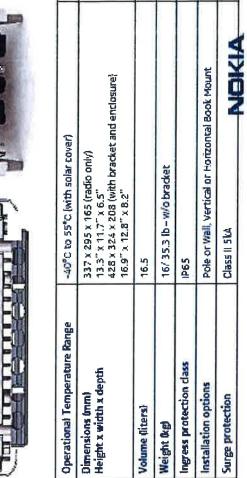


# AHCA AirScale RRH 4T4R B5 160W

Supported Frequency bands	3GPP band 5	
Frequencies	DL 869-894MHz, UL 824-849MHz	
Number of TX/RX paths/pipes	4TX/4RX	20
Instantaneous Bandwidth IBW	25MHz [Full Band]	5
Occupied Bandwidth OBW	25MHz (Full Band)	*
Output Power	4T4R @ 40/// 2T4R @ 60W	
RF Sharing	LTE WCOMs, LTE + NS-IOT supported	
256 QAM Back Off	No backoff at 40N and 0.8dB at 60V.	
Supply Voltage / Voltage Range	DC-484 / -36y to -60y	f)
Typical Power Consumption	365W [50% ETSI Busy Hour Load at 4TX @ 40M]	
	529W [100% RF Load at 4 TX @ 40M]	
	574W [100% IS Load at 4 TX @ 40W with SBT and AISG ON]	o Dec
Antenna Ports	4 Parts, 4.3-10+	. E.
Optical Ports	2x CPRI 9.8 Gbps	
ALD Control Interfaces	AISG3.0 from ANT1,2,3, 4 and RET (Power supply ANT1 and ANT3)	Volun
Other interfaces	External Alarm MOR-26 Serial connector (4 inputs, 1 Output) DC Circular Power Connector	Ingre



PINDIN



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## ALCATEL-LUCENT B25 RRH4X30

Alcatel-Lucent Band 25 Remote Radio Head 4x30W is the new addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering.

**Supporting 2Tx/4Tx MIMO and 4-way Rx diversity**, Alcatel-Lucent B25 RRH4x30 allows operators to have a compact radio solution to deploy LTE in the PCS band (1.9 GHz, 3GPP band 25), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent B25 RRH4x30 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x60 W or 4x30 W RF output power. It supports also 4-way Rx diversity, LTE carriers from 3 MHz up to 20 MHz and up to 65 MHz instantaneous bandwidth.

The Alcatel-Lucent B25 RRH4x30 is a near zero-footprint solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

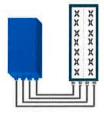
Its compactness and slim design makes the Alcatel-Lucent B25 RRH4x30 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.



- Supporting LTE in 1.9 GHz band (PCS, 3GPP band 2 & 25)
- LTE 2Tx or 4Tx MIMO (SW switchable)
- Output power: Up to 2x60W or 4x30W
- Ready for 3, 5, 10, 15 or 20MHz LTE carrier operation with 4Rx Diversity
- Ready to support up to 4 carriers anywhere in 65MHz instantaneous bandwidth
- Convection-cooled (fan-less)
- Supports AISG 2.0 devices (RET, TMA) through RS485 or RF ports

#### **BENEFITS**

- · Compact to reduce additional footprint when adding LTE in PCS band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Full flexibility for multiple carriers operation over entire PCS spectrum
- Improves downlink spectral efficiency and cell edge throughput through MIMO4
- Increases LTE coverage thanks to 4-way Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options (Pole or Wall)



4x30W with 4T4R or 2x60W with 2T4R

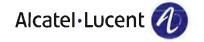
Can be switched between modes via SW w/o site visit



#### TECHNICAL SPECIFICATIONS

	Features & performance
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	3GPP bands 2 & 25 (PCS-G) DL: 1930 - 1995 MHz UL: 1850 - 1915 MHz
Instantaneous bandwidth - #carriers	65MHz – Up to 4 LTE carriers (in 40MHz occupied bandwidth)
LTE carrier bandwidth	3, 5, 10, 15 or 20 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure (3GPP band 2) RX Diversity scheme	2.0 dB typ. (<2.5 dB max) 2 or 4 way Rx diversity
Sizes (HxWxD)(w/ solar shield) in mm (in Volume (w/ solar shield) in L Weight (w/ solar shield) in kg (lb)	538 x 304 x 182 (21.2" x 12.0" x 7.2") 30 24 (53)
DC voltage range DC power consumption	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 580W typical @100% RF load
Environmental conditions  Wind load (@150km/h or 93mph)	-40°C (-40°F) /+55°C (+131°F) IP65 Frontal:<200N / Lateral :<150N
Antenna ports	4 ports 7/16 DIN female (50 ohms) VSWR < 1.5 (> 14dB)
CPRI ports	2 CPRI ports (HW ready for Rate7 / 9.8 Gbps)
AISG Interfaces	1 AISG2.0 output (RS485), +24V/2A DC power Integrated Smart Bias Tees (x2)
Misc. Interfaces	1 external alarms connector (4 alarms) 4 RF Tx & 4 RF Rx monitor ports 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27

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## **ALCATEL-LUCENT B66A RRH4X45**

The Alcatel-Lucent B66a Remote Radio Head 4x45 is the newest addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering. Its operational range covers beyond that of B4 (AWS) and B10 (AWS+).

Supporting 2Tx/4Tx MIMO and 2-way/4-way Rx diversity, the Alcatel-Lucent B66a RRH4x45 allows operators to have a compact radio solution to deploy LTE in the 2100 band (3GPP band 4, 10, and 66), providing them with the means to achieve high capacity, high quality, high reliability, large instantaneous bandwidth, and high coverage with minimum site requirements.

The Alcatel-Lucent B66a RRH4x45 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x90W or 4x45W RF output power. It also supports 4-way Rx diversity at the 70 MHz instantaneous bandwidth.

The Alcatel-Lucent B66a RRH4x45 is a compact (near zero-footprint) solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

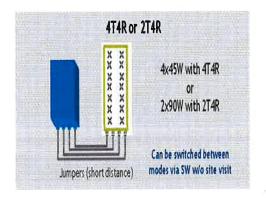
Its compactness and slim design makes the Alcatel-Lucent B66a RRH4x45 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

#### **FEATURES**

- Supporting LTE in 2110 2180 MHz band/DL, 1710-1780MHz/UL (3GPP band 4, 10, and 66a)
- LTE 2Tx or 4Tx MIMO (SW selectable)
- Configuration: 2T2R/2T4R/4T4R
- Output power: Up to 2x90W or 4x45W (SW configurable)
- 70MHz LTE carrier with 4Rx Diversity
- Convection-cooled (fan-less)
- Supports AISG 2.0 ALD devices (RET, TMA) through RS485 or RF ports

#### **BENEFITS**

- Compact to reduce additional footprint when adding LTE in AWS 1-3 band
- Selection of MIMO configuration (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through 4Tx MIMO
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall





#### **TECHNICAL SPECIFICATIONS**

Features & Performance				
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R selectable by SW)			
Frequency band	AWS 1-3, B4/B66a DL: 2110-2180 MHz / UL: 1710-1780 MHz			
Instantaneous bandwidth - #carriers	70 MHz - 4 LTE MIMO carriers (In 70 MHz occupied bandwidth)			
LTE carrier bandwidth	5, 10, 15, 20 MHz			
RF output power	2x90W or 4x45W (selectable by SW)			
Noise figure - RX Diversity scheme Receiver Sensivity (FRC A1-3)	2 dB typical (<2.5 dB max) – 2 or 4 way Rx diversity -104.5 dBm maximum			
Sizes (HxWxD) in mm (in.)	655x299x182 (25.8x11.8x7.2) (with solar shield)			
Volume in Liters	640x290x160 (25.2x11.4x6.3) (without solar shield) 35.5 (with solar shield) 29.7 (without solar shield)			
Weight in kg (lb) (w/a mounting HW)	25.8kg (56.8lb) (with solar shield)			
DC voltage range	Nominal: -48V, -40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption			
DC power consumption	750W typical @100% RF load (in 2Tx or 4Tx mode); Add 58W for 2A*29V for AISG			
Environmental conditions	-40°C (-40°F) /+55°C (+131°F) UL50E Type 4 Enclosure			
Wind load (@150km/h or 93mph)	250N (56lb) Frontal/150N (34lb) Lateral			
Antenna ports	4 ports 4.3-10 female (50 ohms) VSWR < 1.5			
CPRI ports	2 CPRI ports (HW ready for Rate 7, 9.8 Gbps) SFP: SMDF (HW supports also SMSF and MMDF)			
AISG interfaces	1 AISG 2.0 output (RS485) Integrated Smart Blas Tees (x2)			
Misc. Interfaces	4 external alarms (1 connector) 1 DC connector (2 pins)			
Installation conditions	Pole and wall mounting			
Regulatory compilance	3GPP 36.141 / 3GPP 36.113 / GR-487 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27 / FCC Part 15 / GR-3178-CORE			

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#### Product Description

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

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

#### Features/Benefits

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



Figure 1: HYBRIFLEX Series

#### Technical Specifications

5F 11 + F		VERSON BUCKING	Die engineen
Outer Conductor Armor	Corrugated Aluminum	[mm (in)]	46.5 (1.83)
Jacket:	Polyethylene, PE	[mm (in)]	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
Medicing of earlighters			
Weight, Approximate		[kg/m (lb/ft)]	1 9 (1.30)
Minimum Bending Radius	Single Bending	(mm (in))	200 (8)
Minimum Bending Radius	Repeated Bending	[mm (in)]	500 (20)
Recommended/Maximum	Clamp Spacing	[m (ft)]	1.0 / 1.2 (3.25 / 4.0)
ร์เคาการล่า สายอยู่และสะ			
DC-Resistance Outer Con-	ductor Armor	[Wkm (W1000ft)]	068 (0.205)
DC-Resistance Power Cab	le, 8.4mm² (8AWG)	[D/km (D/1000ft)]	2.1 (0.307)
2 - Continues			
Version			Single-mode ONI3
Quantity, Fiber Count	•		16 (8 pairs)
Core/Clad		[µm]	50/125
Primary Coating (Acrylate)		(µm)	245
Buffer Diameter, Nominal		(µm)	900
Secondary Protection, Jack	et, Nominal	[mm (in)]	2.0 (0.08)
Minimum Bending Radius		[mm (in)]	104 (4.1)
Insertion Loss @ waveleng	th 850nm	dB/km	3.0
Insertion Loss @ waveleng	th 1310nm	dB/km	1.0
Standards (Meets or excee			UL94-V0, UL1666
	7100		RoHS Compliant
activities within a spen	1.45%		
Size (Qower)		[mm: [AWG)]	8 A (8)

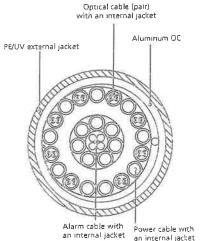
DC PY SWI CANIE PLEDWINES		
Size (Power)	[mm (AWG)]	8 4 (8)
Quantity, Wire Count (Power)		16 (8 pairs)
Size (Alarm)	[mm (AVVG)]	0.8 (18)
Quantity, Wire Count (Alarm)	1	4 (2 pairs)
Type		UV protected
Strands		19
Primary Jacket Diameter, Nominal	[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)		NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant

Installation Temperature	[°C (°F)]	-40 to +65 (-40 to 149)
Operation Temperature	[°C (°F)]	-40 to +65 (-40 to149)

This data is provisional and subject to change

RFS The Clear Choice®

HB158-1-08U8-38J1B



Piques 3: Construction Detail

Print Date: 27.6.2012

Rev: Pl

Radio Fraquency Systems

# **ATTACHMENT 2**



C Squared Systems, LLC 65 Dartmouth Drive Auburn, NH 03032 (603) 644-2800 support@csquaredsystems.com

## Calculated Radio Frequency Emissions Report



Stamford

300 Tresser Blvd, Stamford, CT 06901

## Table of Contents

1. Introduction	
2. FCC Guidelines for Evaluating RF Radiation Exposure Limits	1
3. RF Exposure Prediction Methods	2
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#### 1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modifications to the existing Verizon Wireless antenna arrays on the rooftop of the building located at 300 Tresser Blvd in Stamford, CT. The coordinates of the building are 41° 03' 11.12" N, 73° 32' 00.88" W.

Verizon is proposing the following modifications:

- 1) Remove three existing 751 MHz LTE antennas (one per sector);
- 2) Remove three existing 1900 MHz LTE antennas (one per sector);
- 3) Remove three existing 2100 MHz LTE antennas (one per sector);
- 4) Remove six remote radio heads (RRHs) for 751/2100 MHz LTE (two per sector);
- 5) Retain three existing remote radio heads (RRHs) for 1900 MHz LTE (one per sector);
- 6) Install eight replacement quad-band 751/875/1900/2100 MHz LTE antennas (two per sector);
- 7) Install twelve remote radio heads (RRHs) for 751/875/2100 MHz LTE (three per sector);
- 8) Add one additional remote radio head (RRH) for 1900 MHz LTE;
- 9) Adjust the electrical and mechanical downtilts of all 751/1900/2100 MHz LTE antennas;
- 10) Increase the 751/875/1900/2100 MHz LTE antenna centerlines by 4'.

#### 2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm²). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

Stamford CT 1 February 20, 2018



#### 3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

Power Density = 
$$\left(\frac{1.6^2 \times EIRP}{4\pi \times R^2}\right) \times OffBeamLoss$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = 
$$\sqrt{(H^2 + V^2)}$$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna patterns

These calculations assume that the antennas are operating at 100 percent capacity, that all antenna channels are transmitting simultaneously, and that the radio transmitters are operating at full power. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the final site configuration.

#### 4. Calculation Results

The table below outlines the power density information for the site. Due to the directional nature of the proposed Verizon antennas, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the building. Please refer to Attachment C for the vertical patterns of the proposed Verizon antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm²)	Limit	%МРЕ
Verizon	205	1970	I	1604	0.0146	1.0000	0.15%
Verizon	205	869	9	358	0.0293	0.5793	0.51%
Verizon	205	2145	1	1750	0.0159	1.0000	0.16%
Verizon	205	746	1	612	0.0056	0.4973	0.11%
		Numerous	Misc. Anten	nas			1.00%
Verizon	212	751	1	2625	0.0223	0.5007	0.44%
Verizon	212	875	1	4113	0.0349	0.5833	0.60%
Verizon	208	875	9	564	0.0448	0.5833	0.77%
Verizon	212	1900	1	5360	0.0454	1.0000	0.45%
Verizon	212	2100	1	8228	0.0698	1.0000	0.70%
						Total:	3.96%

Table 1: Carrier Information 12

<sup>&</sup>lt;sup>1</sup> The existing CSC filing for Verizon should be removed and replaced with the updated Verizon values provided in Table 1. The power density information for carriers other than Verizon was taken directly from the CSC database dated 6/1/2017. Please note that %MPE values listed are rounded to two decimal points. The total %MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

<sup>&</sup>lt;sup>2</sup> Antenna heights listed for Verizon are in reference to the On Air Engineering, LLC, Lease Exhibit, dated October 15, 2017.



#### 5. Conclusion

The above analysis verifies that emissions from the proposed site configuration will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. The highest, cumulative expected percent of Maximum Permissible Exposure at ground level is 3.96% of the FCC Uncontrolled/General Population limit.

#### 6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.

Daniel L. Goulet-

C Squared Systems, LLC

February 20, 2018

Date



#### **Attachment A: References**

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

IEEE C95.1-2005, IEEE Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz IEEE-SA Standards Board

IEEE Std C95.3-2002 (R2008), IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board



#### Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

### (A) Limits for Occupational/Controlled Exposure<sup>3</sup>

Frequency Range	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time $ E ^2$ , $ H ^2$ or S (minutes)
(MHz)			(100)*	
0.3-3.0	614	1.63	(100)*	Ö
3.0-30	1842/f	4.89/f	(900/f <sup>2</sup> )*	6
30-300	61.4	0.163	1.0	6
300-1500	-	\$ <b>=</b> 0	f/300	6
1500-100,000	=	( <del>-</del>	5	6

#### (B) Limits for General Population/Uncontrolled Exposure 4

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time $ E ^2$ , $ H ^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	$(180/f^2)*$	30
30-300	27.5	0.073	0.2	30
300-1500	<u> </u>	<u>~</u>	f/1500	30
1500-100,000	-	7=1	1.0	30

f = frequency in MHz \* Plane-wave equivalent power density

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

Stamford CT 5 February 20, 2018

<sup>&</sup>lt;sup>3</sup> Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

<sup>&</sup>lt;sup>4</sup> General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.



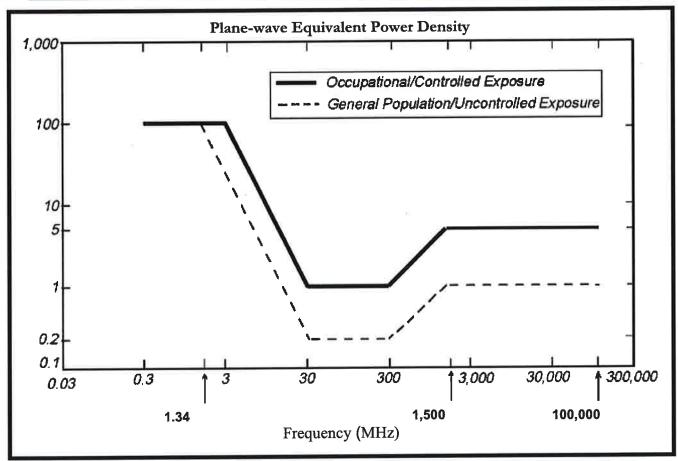


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)



#### Attachment C: Verizon Wireless' Antenna Model Data Sheets and Electrical Patterns

7

#### **751 MHz LTE**

Manufacturer: Commscope

Model #: JAHH-65C-R3B 10

Frequency Band: 698-787 MHz

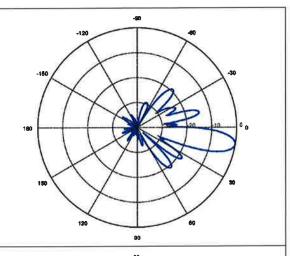
Gain: 15.5 dBi

Vertical Beamwidth: 9.8°

Horizontal Beamwidth: 67°

Polarization: ±45°

Size L x W x D: 95.7" x 13.8" x 8.2"



#### 875 MHz CDMA/EVDO

Manufacturer: Amphenol

Model #: BXA-70063/6CF\_4

Frequency Band: 806-900 MHz

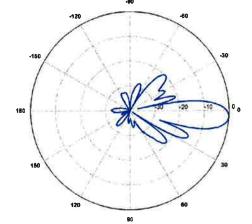
Gain: 16.6 dBi

Vertical Beamwidth: 11°

Horizontal Beamwidth: 63°

Polarization: ±45°

Size L x W x D: 71.0" x 11.3" x 6.0"



#### **875 MHz LTE**

Manufacturer: Commscope

Model #: JAHH-65C-R3B\_10

Frequency Band: 824-894 MHz

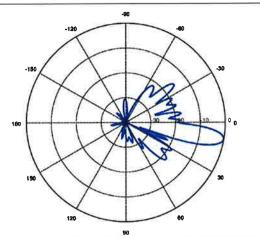
Gain: 16.2 dBi

Vertical Beamwidth: 8.4°

Horizontal Beamwidth: 64°

Polarization: ±45°

Size L x W x D: 95.7" x 13.8" x 8.2"





#### **1900 MHz LTE**

Manufacturer: Commscope

Model #: JAHH-65C-R3B\_7

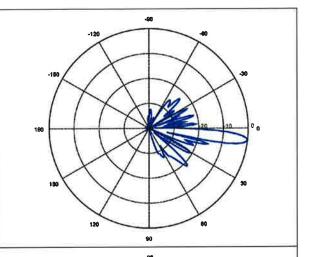
Frequency Band: 1850-1990 MHz

Gain: 18.6 dBi

Vertical Beamwidth: 5.3°
Horizontal Beamwidth: 60°

Polarization: ±45°

Size L x W x D: 95.7" x 13.8" x 8.2"



#### **2100 MHz LTE**

Manufacturer: Commscope

Model #: JAHH-65C-R3B\_7

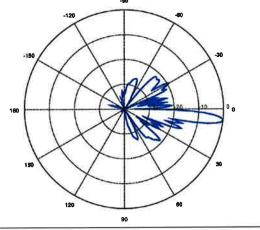
Frequency Band: 1920-2200 MHz

Gain: 18.7 dBi

Vertical Beamwidth: 5.0° Horizontal Beamwidth: 61°

Polarization: ±45°

Size L x W x D: 95.7" x 13.8" x 8.2"



# **ATTACHMENT 3**

88 Foundry Pond Road Cold Spring, NY 10516 onair@optonline.net

February 14, 2018

Mr. Aleksey Tyurin Verizon Wireless 20 Alexander Drive Wallingford, CT 06108

Re:

Stamford CT - Structural Assessment Letter - 850-LTE Carrier Add & Sector Split Bayview Towers, 300 Tresser Blvd., Stamford, CT 06492

#### Dear Aleksey:

This letter serves as a Structural Assessment for the proposed Cellco Partnership (d/b/a Verizon Wireless) antenna modification on the above referenced building. Verizon is proposing the following changes to their existing facility, further detailed in "design exhibits" prepared by our office dated February 14, 2018.

- Modify existing RF antenna configuration from a 3-sector site to a 4-sector site
- Replace (9) existing antennas with (8) new antennas (relocate as per plans)
- Add (1) new wall mount bracket assembly and replace (3) existing wall mounts with new
- Existing (3) antennas to remain (850 CDMA in original 3-sector configuration)
- Add (4) new '850-LTE' remote radio heads (RRH's) (1 per sector)
- Replace (3) 'AWS' RRH's with (3) new RRH's; add (1) new 'AWS' RRH for 4th sector
- Replace (3) '700' RRH's with (3) new RRH's; add (1) new '700' RRH for 4th sector
- Existing (3) '1900' RRH's to remain; add (1) new '1900' RRH for 4th sector
- Existing (2) Raycap 'Upper' OVP to remain; relocate per plans
- Existing (2) Raycap 'Sector' OVP's to be replaced with Raycap 'Upper' OVP's (2 total)

The host structure is a 21-story hi-rise residential building with Verizon's equipment room located inside on the 1st floor. Verizon's antennas are flush mounted to the rooftop stairwell/elevator penthouse on pipe mast supports and wall mount "slider" brackets. Verizon's existing RRH's are located with the antennas on the same masts and OVP's mounted to the penthouse facade and cable tray. The 2-story penthouse is composed of concrete walls and floors with the elevator machine room at the second level. Verizon's proposed (8) antennas will extend 5 ft. above the PH roof and mounted in pairs (2 antennas on shared brackets). New mounts are required for this loading with the alpha sector on a new corner mount bracket and the other (3) sectors on wall mount brackets, replacing existing mounts. The proposed and relocated RRH's will be located on spare masts and remain flush mounted to the façade. Our office has evaluated the existing penthouse structure and determined that it is capable of supporting the proposed loading.

In conclusion, the proposed Verizon Wireless modification will not negatively impact the structural integrity of the host building and will be installed in accordance with the 2016 Connecticut State Building Code, adopted model codes (as amended) and all referenced standards, including TIA-222-G. Our findings are based on the assumption that the hosting structure and all structural members and appurtenances were properly designed, detailed installed and have been properly maintained since erection. Should you have any questions please do not hesitate to contact our office.

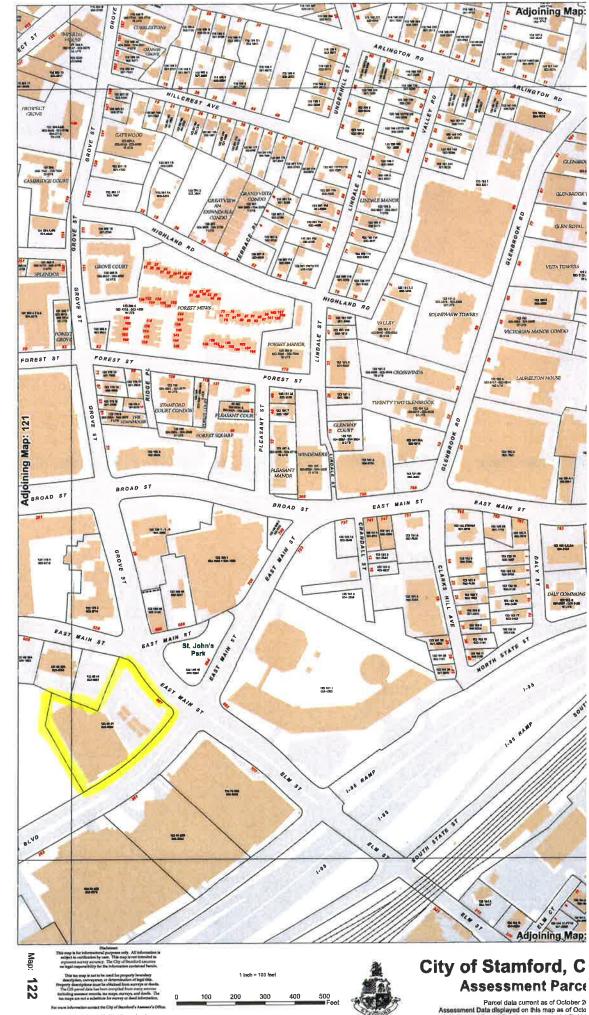
David A. Weinpahl P. CT License No. 22144

Managing Partner

On Air Engineering, LLC

DW:dw

# **ATTACHMENT 4**



Parcel data current as of October 2s assessment Data displayed on this map as of Octo Building and Paved Roads based on aerial flight? Man Coordinates based on NAD 83 Connecticut

#### **667 EAST MAIN STREET**

**Location** 667 EAST MAIN STREET

**Mblu** 002/6361///

Acct# 002-6361

Owner BAYVIEW PRESERVATION

**PARTNERS** 

**Assessment** \$14,162,330

**Appraisal** \$20,231,900

**PID** 9373

**Building Count** 1

#### **Current Value**

	Appraisal		
Valuation Year	Improvements	Land	Total
2017	\$16,102,280	\$4,129,620	\$20,231,900
	Assessment		
Valuation Year	Improvements	Land	Total
2017	\$11,271,600	\$2,890,730	\$14,162,330

#### **Owner of Record**

Owner

**BAYVIEW PRESERVATION PARTNERS** 

Sale Price

\$13,500,000

Co-Owner

**Book & Page** 10585/1

Address

**50 WESTIN STREET** 

HARTFORD, CT 06120-1504

Sale Date

11/15/2012

Instrument

#### **Ownership History**

Ownership History						
Owner Sale Price Book & Page Instrument Sale Date						
BAYVIEW PRESERVATION PARTNERS	\$13,500,000	10585/ 1	00	11/15/2012		
CORNERSTONE/BAYVIEW INC	\$12,380,000	4841/ 122	00	09/30/1997		
N H T ASSOCIATES	\$0	2196/ 154	25	12/30/1982		

#### **Building Information**

#### **Building 1: Section 1**

Year Built:

1971

Living Area:

162,500

Building Attributes		
Field	Description	
STYLE	Apt High Rise	

Stories:	21	
Occupancy	200	
Exterior Wall 1	Brick/Masonry	
Exterior Wall 2		
Roof Structure	Flat	
Roof Cover	Rolled Compos	
Interior Wall 1	Drywall/Plaste	
Interior Wall 2		
Interior Floor 1	Vinyl/Asphalt	
Interior Floor 2	Carpet	
Heating Fuel	Gas/LP	
Heating Type	Hot Wtr Bbd	
АС Туре	None	
Bldg Use	Apartment MDL-94	
Total Rooms		
Total Bedrms	0	
Total Baths	0	
1st Floor Use:	800C	
Heat/AC	None	
Frame Type	FireProofSteel	
Baths/Plumbing	Average	
Ceiling/Wall	Ceil & Wall	
Rooms/Prtns	Average	
Wall Height	8	
% Comn Wall		

#### **Building Photo**



(http://images.vgsi.com/photos/StamfordCTPhotos//\00\13\04/

#### **Building Layout**

BAS[11300]

FUS[150200]

FBM[1000]

UBM[5732]

	<u>Legend</u>		
Code	Description	Gross Area	Living Area
FUS	Upper Story, Finished	150,200	150,200
BAS	First Floor	11,300	11,300
FBM	Finished Basement - Comm	1,000	1,000
UBM	Basement, Unfinished	5,732	0
		168,232	162,500

#### **Extra Features**

Extra Features <u>Legend</u>					
Code	Description	Size	Value	Bldg #	
EL2	Elev Pass	44 STOPS	\$1,227,600	1	
RP6	Porch Up Cov	8400 S.F	\$166,660	1	
RP6	Porch Up Cov	648 S.F	\$12,860	1	
RP6	Porch Up Cov	2880 S.F	\$57,140	1	
PGB	Parking Garage Below	35502 S.F	\$1,166,600	1	

SPR1	Sprinklers - Wet	35502 S.F.	\$35,220	1
------	------------------	------------	----------	---

#### Land

Land Use

800C

Use Code Description

Apartment MDL-94

Zone

CCN

Neighborhood 1000 Alt Land Appr No

Category

#### **Land Line Valuation**

Size (Acres)

2.27

Depth

**Assessed Value** \$2,890,730

Appraised Value \$4,129,620

#### Outbuildings

Outbuildings <u>Legend</u>						
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
LP3	Patio Concr			19500 S.F.	\$89,510	1
LP4	Pavng Asphit			50000 S.F	\$36,000	1
AP1	Fence Chn Lk			200 L.F.	\$1,730	1
CEL2	Cell - Roof Top			1 SITES	\$138,750	1
CSHD	Cell Equipment			400 S.F.	\$9,600	1

#### **Valuation History**

Appraisal					
Valuation Year	Improvements	Land	Total		
2016	\$8,736,500	\$4,373,180	\$13,109,680		
2015	\$8,736,500	\$4,373,180	\$13,109,680		
2014	\$8,736,500	\$4,373,180	\$13,109,680		

Assessment					
Valuation Year	Improvements	Land	Total		
2016	\$6,115,560	\$3,061,230	\$9,176,790		
2015	\$6,115,560	\$3,061,230	\$9,176,790		
2014	\$6,115,560	\$3,061,230	\$9,176,790		

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# **ATTACHMENT 5**

Marine should defense it SERVICE a North NO Name should defense it Serviced at Post Office N Rechriston & Cole LLP 280 Trumbull Street Harford, CT 06103  Postmaster, per (name of noceving) miphypesy CO-EN-Price Class Firm-specific identifier  1. Raph Bisong, Land Lice Bureau Charl State and ZTP Code "") State Andress State	Affix Stamp Here Postmark with Date of Receipt.  Postage Postage Fee Special Handling	Darcel Airlift
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