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Hartford, CT 06103-3597
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Also admitted in Massachusetts

February 21, 2014

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

Re: **Notice of Exempt Modification – Facility Modification
411 West Putnam Avenue, Greenwich, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains a roof-top wireless telecommunications facility at 411 West Putnam Avenue in Greenwich, Connecticut (the “Property”). By virtue of its 1992 approval of an AT&T facility at the Property, the Council maintains jurisdiction over this non-tower facility. The building and the Property are owned by Florida Sherwood Forest LTD. Cellco’s facility consists of twelve (12) panel antennas on the roof of the building. The antennas maintain a centerline height of approximately 52 feet above ground level. Cellco now intends to modify its facility by adding three (3) model MGD3-800TX, 2100 MHz antennas, for a total of fifteen (15) antennas, all at the same level and location on the roof. Cellco also intends to install three (3) remote radio heads (“RRHs”) behind its 2100 MHz antennas; and one (1) HYBRIFLEX™ antenna cable. Included in Attachment 1 are specifications for Cellco’s new antennas, RRHs and HYBRIFLEX™ cable.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Peter Tesai, First Selectman for the Town of Greenwich and the Florida Sherwood Forest LTD.

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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12750822-v1

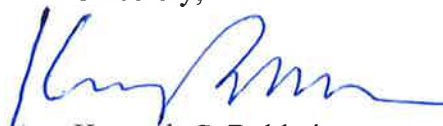
ROBINSON & COLE_{LLP}

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February 21, 2014
Page 2

1. The proposed modifications will not result in an increase in the height of the existing antenna structures. The new antennas will be located at the same height of 52 feet above ground level.
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 modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. Far Field Approximation tables for each of Cellco's operating frequencies are included behind Attachment 2. The Far Field calculations demonstrate that Cellco's modified facility will operate well within the RF emissions limits established by the FCC.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The roof of the building at the Property can support Cellco's proposed modifications. A Structural Evaluation Letter is included in Attachment 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:

Peter Tesai, Greenwich First Selectman
Katie Blankley, Deputy Director Planning & Zoning/Assistant Town Planner
Florida Sherwood Forest LTD
Sandy M. Carter



ATTACHMENT 1



SINGLE-BAND PANEL ANTENNA

BROADBAND 1710-2170 MHz

MGD3-800TX

ELECTRICAL SPECIFICATIONS

BROADBAND 1710-2170 MHz

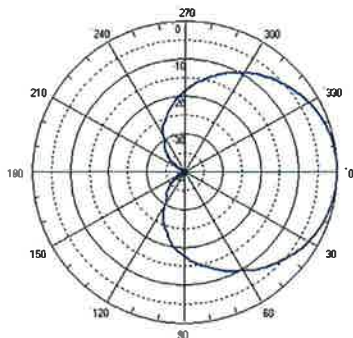
1710 - 2170		
1710-1880	1850-1990	1920-2170
H66° V7.2°	H64° V6.6°	H63° V6.3°
Fixed Tilt	Fixed Tilt	Fixed Tilt
0°, 2°, 4°, 6°	0°, 2°, 4°, 6°	0°, 2°, 4°, 6°

Antenna Model	MGD3-800TX		
Polarization	± 45°		
Frequency	1710-2170		
	1710 - 1880	1850 - 1990	1920 - 2170
Horizontal Beamwidth	66°	64°	63°
Vertical Beamwidth	7.2°	6.6°	6.3°
Gain (dBi)	18	18	18.5
Vertical Electrical Tilt	FIXED 0°, 2°, 4°, 6°	FIXED 0°, 2°, 4°, 6°	FIXED 0°, 2°, 4°, 6°
Upper Sidelobe Suppression for the 1 st lobe above main beam (dB)	20	20	20
Front-to-Back Ratio @ 180° ± 20° (dB)	> 30	> 30	> 30
VSWR	< 1.4 : 1	< 1.4 : 1	< 1.4 : 1
Cross Polar Ratio @ ± 60° (dB)	> 10	> 10	> 10
Isolation between Ports (dB)	> 30	> 30	> 30
Maximum Power Per Input (W)	250		
Intermodulation (dBc)	< -150		
Impedance (Ω)	50		

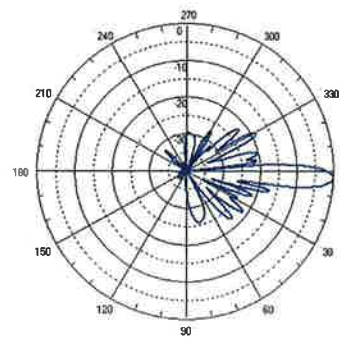


MECHANICAL SPECIFICATIONS

Connectors	2 X 7/16 Female	
Connector Position	Bottom	
Survival Wind Speed	km/h (mph)	200 (125)
Front Windload		
N @ 160 km/h	(lbs @ 100 mph)	370 (85)
Lateral Windload		
N @ 160 km/h	(lbs @ 100 mph)	170 (40)
Radome Color	Grey, paintable	
Humidity	100%	
Antenna Weight	kg (lbs)	7 (15)
Antenna Dimension	1340 X 170 X 100 (53 X 7 X 4)	
mm (in) H X W X D		



H&V Pattern



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 Phone: +52 55 1106 2623
 RYMSA Wireless U.S.A: sales@rymsawireless.com
 Phone: +1 888 622 6095
www.rymsawireless.com

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

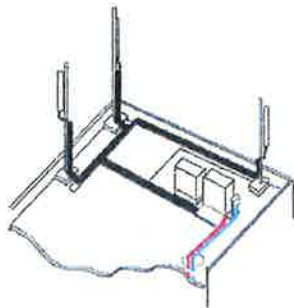
capital expenditures (CAPEX) and low operating expenditures (OPEX). The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment or require costly cranes to be employed, leaving coverage holes. However, many of these sites can host an Alcatel-Lucent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

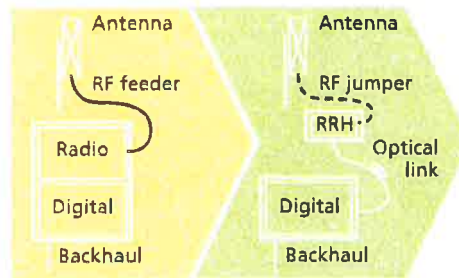
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation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

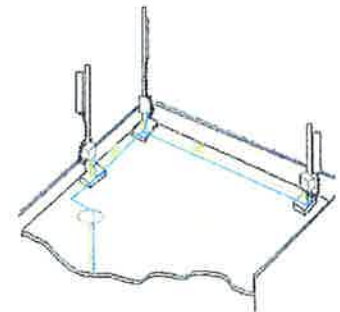
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption



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: 170 mm (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

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

Product Description

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

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

Features/Benefits

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



Figure 1: HYBRIFLEX Series

Technical Specifications

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
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)
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	0.68 (0.255)
DC-Resistance Power Cable 8.4mm (18AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)

Version:	Single-mode OM3
Quantity, Fiber Count	16 (8 pairs)
Core/Clad	[μm] 50/125
Primary Coating (Acrylate)	[μm] 245
Buffer Diameter, Nominal	[μm] 900
Secondary Protection, Jacket, Nominal	[mm (in.)] 2.0 (0.08)
Minimum Bending Radius	[mm (in.)] 104 (4.1)
Insertion Loss @ wavelength 850nm	dB/km 3.0
Insertion Loss @ wavelength 1310nm	dB/km 1.0
Standards (Meets or exceeds)	UL94-V0 UL1666 RoHS Compliant

Size (Power)	[mm (AWG)]	8.4 (8)
Quantity, Wire Count (Power)		16 (8 pairs)
Size (Alarm)	[mm (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)		4 (2 pairs)
Type		UV protected
Strands		19
Primary Jacket Diameter, Nominal	[mm (in.)]	6.8 (0.27)
Standards (Meets or exceeds)		NFPA 130, ICEA S-95-658 UL Type X-HW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1292/FT4 RoHS Compliant

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

* This data is provisional and subject to change

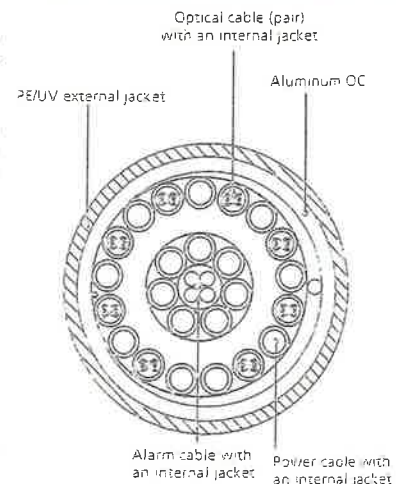


Figure 3: Construction Detail

All information contained in the present datasheet is subject to confirmation at time of ordering

ATTACHMENT 2

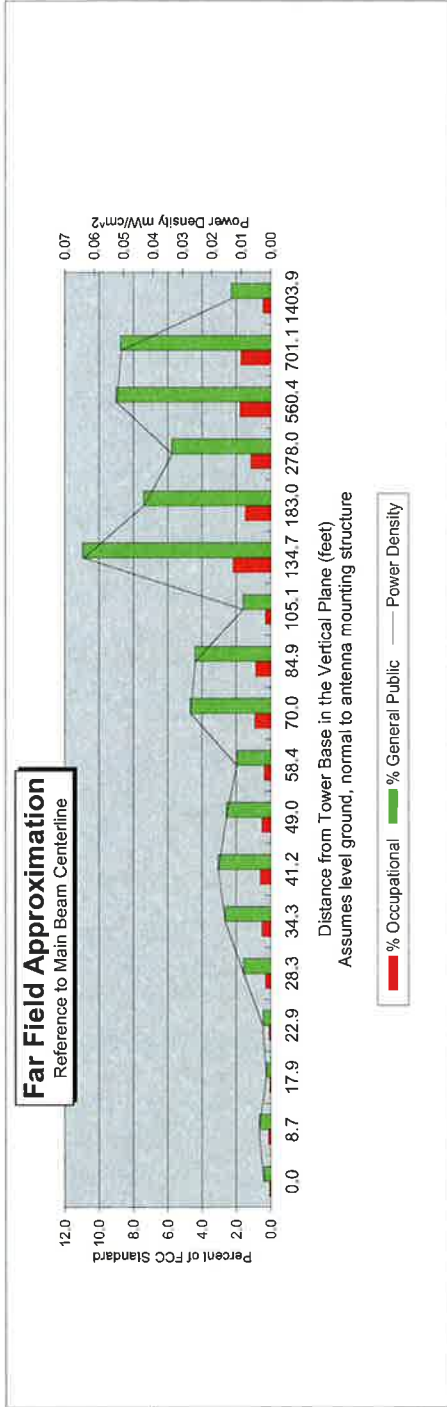
Far Field Approximation
with downtilt variation

Estimated Radiated Emission
Single Emitter Far Field Model
Dipole / Wire/ Yagi Antenna Types



Location:	Greenwich SW, CT
Site #:	5-0092
Date:	12/13/13
Name:	Ryan Ulanday
File Name:	Greenwich SW, CT - FF Power

Operating Freq. (MHz)	869.0
Antenna Height (ft):	52.0
Antenna Gain (dBi):	15.7
Antenna Size (in.):	48.0
Downtilt (degrees):	0.0
Feedline Loss (dB):	0.0
Power @ J4 (w):	3249.0



This approximation is only valid in the far field, which begins at: **28.7 Feet**

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	4.0	2.0
Solve for r, dx to antenna	49.0	49.8	52.2	54.1	56.6	59.8	64.0	69.3	76.3	85.5	98.0	116.0	143.3	189.4	282.3	562.5	702.8	1404.7
Distance from Antenna Structure Base in Horizontal plane	0.0	8.7	17.9	22.9	28.3	34.3	41.2	49.0	58.4	70.0	84.9	105.1	134.7	183.0	278.0	560.4	701.1	1403.9
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	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	0.2	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	2.56
Power Density (mW/cm²)	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.01	0.01	0.03	0.03	0.01	0.06	0.04	0.03	0.05	0.05	0.01
Percent of Occupational Standard	0.1	0.1	0.0	0.1	0.3	0.5	0.6	0.5	0.4	0.9	0.9	0.3	2.2	1.5	1.2	1.8	1.7	0.5
Percent of General Population Standard	0.4	0.7	0.2	0.5	1.6	2.6	3.0	2.6	2.0	4.7	4.4	1.6	10.9	7.4	5.8	9.0	8.7	2.3

Antenna Type DB844G65ZAXY
Max% 10.95%

Instructions:

- 1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to be 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, and J4 Pt.
- 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.

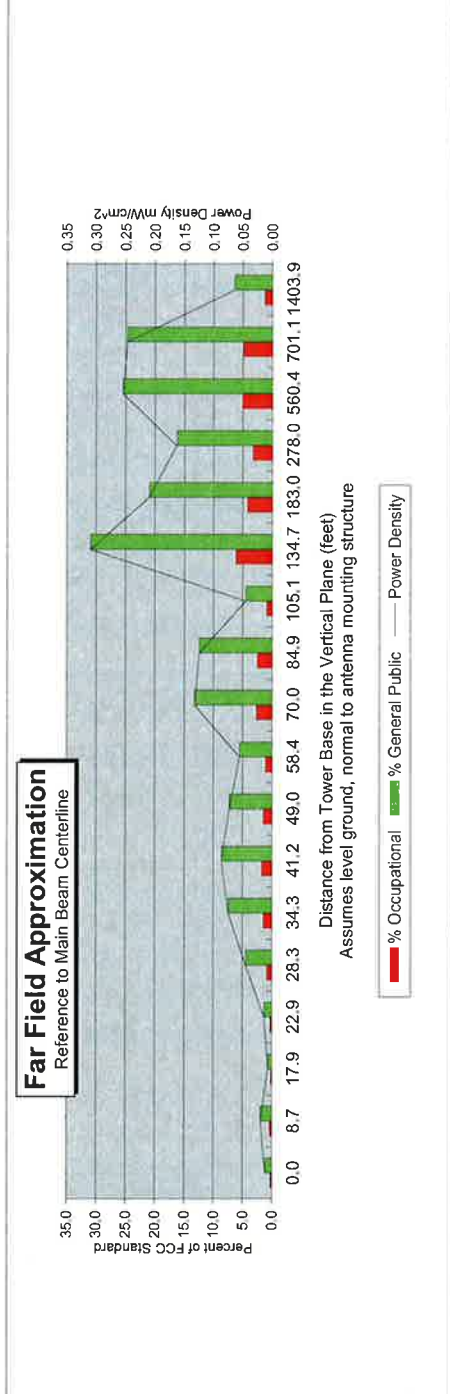
Far Field Approximation
with downtilt variation

Estimated Radiated Emission
Single Emitter Far Field Model
Dipole / Wire/ Yagi Antenna Types



Location:	Site Name, CT
Site #:	5-0092
Date:	12/13/13
Name:	Ryan Ulanday
File Name:	Greenwich SW, CT - FF Power

Operating Freq. (MHz)	1971.0
Antenna Height (ft):	52.0
Antenna Gain (dBi):	18.7
Antenna Size (in.):	54.3
Downtilt (degrees):	0.0
Feedline Loss (dB):	0.0
Power @ J4 (w):	7935.0



This approximation is only valid in the far field, which begins at: 36.7 Feet

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	4.0	2.0	Enter Main Beam Distance in feet below:
Solve for r, dx to antenna	49.0	49.8	52.2	54.1	56.6	59.8	64.0	69.3	76.3	85.5	98.0	116.0	143.3	189.4	282.3	562.5	702.8	1404.7	
Distance from Antenna Structure Base in Horizontal plane	0.0	8.7	17.9	22.9	28.3	34.3	41.2	49.0	58.4	70.0	84.9	105.1	134.7	183.0	278.0	560.4	701.1	1403.9	#NUM!
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	0
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	0.2	0	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	2.56	2.56
Power Density (mW/cm²)	0.01	0.02	0.01	0.01	0.04	0.07	0.09	0.07	0.06	0.13	0.12	0.04	0.31	0.21	0.16	0.25	0.25	0.06	#NUM!
Percent of Occupational Standard	0.2	0.4	0.1	0.3	0.9	1.5	1.7	1.5	1.1	2.6	2.5	0.9	6.2	4.2	3.3	5.1	4.9	1.3	#NUM!
Percent of General Population Standard	1.1	1.9	0.7	1.3	4.4	7.4	8.6	7.3	5.5	13.2	12.4	4.5	30.9	20.9	16.3	25.4	24.7	6.5	#NUM!

Antenna Type MG D3-800T0
Max% 30.91%

Instructions:

- 1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to be 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, and J4 Pt.
- 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.

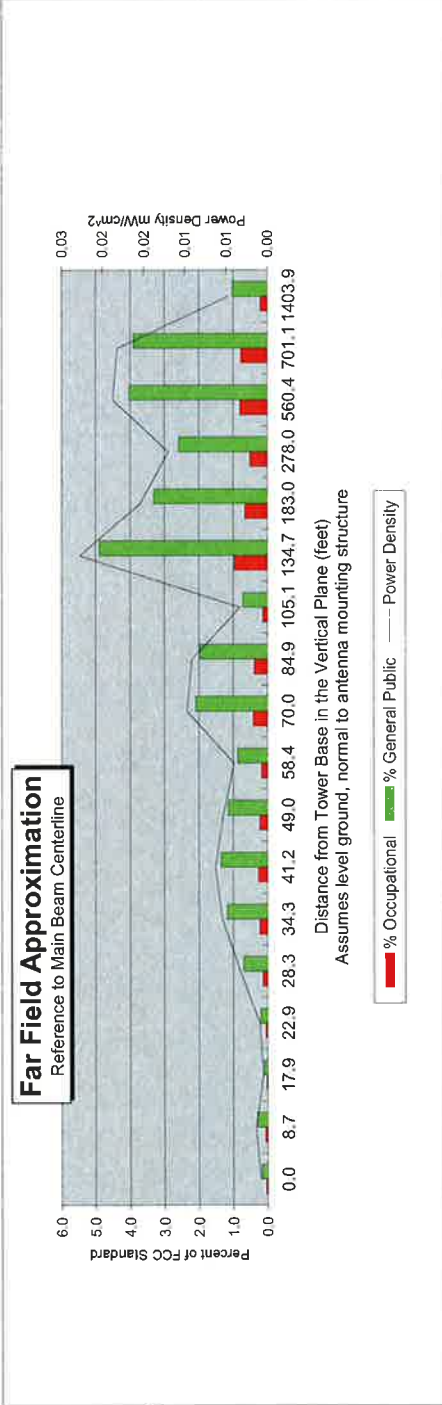
Far Field Approximation
with downtilt variation

**Estimated Radiated Emission
Single Emitter Far Field Model
Dipole / Wire/ Yagi Antenna Types**



Location:	Greenwich SW, CT
Site #:	5-0092
Date:	12/13/13
Name:	Ryan Ulanday
File Name:	Greenwich SW, CT - FF Power

Operating Freq. (MHz)	696.0
Antenna Height (ft):	52.0
Antenna Gain (dBi):	16.7
Antenna Size (in.):	71.0
Downtilt (degrees):	0.0
Feedline Loss (dB):	0.0
Power @ J4 (w):	926.0



This approximation is only valid in the far field, which begins at: **62.6 Feet**

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	4.0	2.0
Solve for r, dx to antenna	49.0	49.8	52.2	54.1	56.6	59.8	64.0	69.3	76.3	85.5	98.0	116.0	143.3	189.4	282.3	562.5	702.8	1404.7
Distance from Antenna Structure Base in Horizontal plane	0.0	8.7	17.9	22.9	28.3	34.3	41.2	49.0	58.4	70.0	84.9	105.1	134.7	183.0	278.0	560.4	701.1	#NUM!
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	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	0.2	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	2.56
Power Density (mW/cm²)	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	0.02	0.01	0.02	0.02	0.00
Percent of Occupational Standard	0.0	0.1	0.0	0.0	0.1	0.2	0.3	0.2	0.2	0.4	0.4	0.1	1.0	0.7	0.5	0.8	0.8	0.2
Percent of General Population Standard	0.2	0.3	0.1	0.2	0.7	1.2	1.4	1.1	0.9	2.1	2.0	0.7	4.9	3.3	2.6	4.0	3.9	1.0

Antenna Type BXA-70063-6CF
Max% 4.89%

Instructions:

- 1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to be 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, and J4 Pt.
- 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

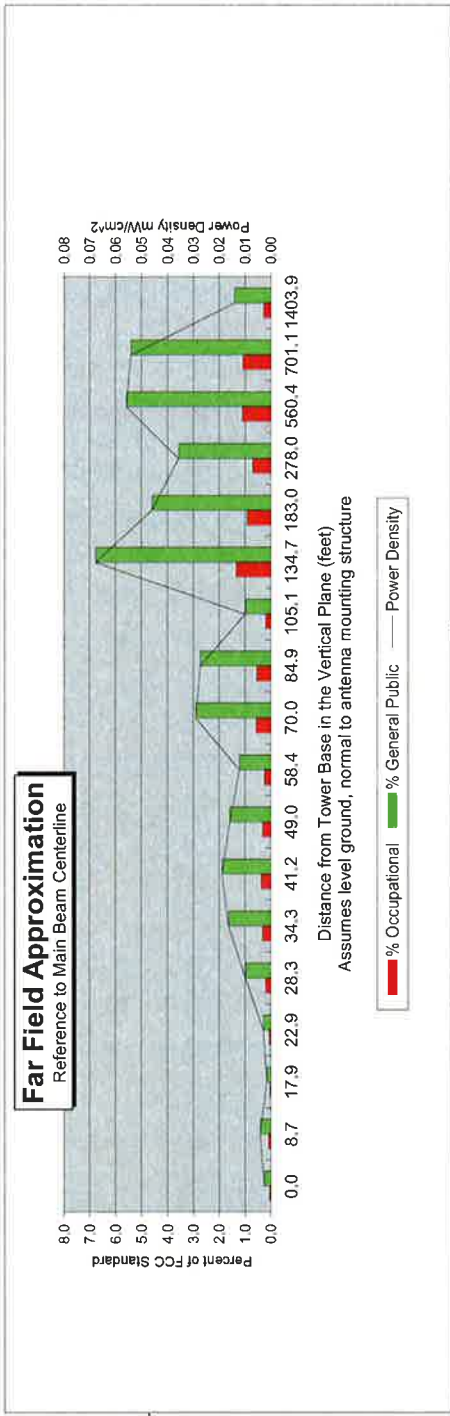
Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types



Location:	Greenwich SW, CT
Site #:	5-0092
Date:	12/13/13
Name:	Ryan Ulanday
File Name:	Greenwich SW, CT - FF Power

Operating Freq. (MHz)	2110.0
Antenna Height (ft):	52.0
Antenna Gain (dBi):	18.6
Antenna Size (in.):	54.3
Downtilt (degrees):	0.0
Feedline Loss (dB):	0.0
Power @ J4 (w):	1750.0



This approximation is only valid in the far field, which begins at: **36.7 Feet**

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	4.0	2.0
Solve for r, dx to antenna	49.0	49.8	52.2	54.1	56.6	59.8	64.0	69.3	76.3	85.5	98.0	116.0	143.3	189.4	282.3	562.5	702.8	1404.7
Distance from Antenna Structure Base in Horizontal plane	0.0	8.7	17.9	22.9	28.3	34.3	41.2	49.0	58.4	70.0	84.9	105.1	134.7	183.0	278.0	560.4	701.1	#NUM!
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	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	0.2	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	2.56
Power Density (mW/cm²)	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.01	0.03	0.03	0.01	0.07	0.05	0.04	0.06	0.05	0.01
Percent of Occupational Standard	0.0	0.1	0.0	0.1	0.2	0.3	0.4	0.3	0.2	0.6	0.5	0.2	1.4	0.9	0.7	1.1	1.1	0.3
Percent of General Population Standard	0.2	0.4	0.1	0.3	1.0	1.6	1.9	1.6	1.2	2.9	2.7	1.0	6.8	4.6	3.6	5.6	5.4	1.4

Antenna Type MG D3-800T0
Max% 6.77%

Instructions:

- 1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to be 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, and J4 Pt
- 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.

ATTACHMENT 3

December 9, 2013

Mr. Aleksey Tyurin
Verizon Wireless
99 East River Drive
East Hartford, CT 06108

*Re: Structural Evaluation Letter ~ Antenna Upgrade
Verizon Wireless Site Ref ~ Greenwich SW
411 West Putnam Avenue
Greenwich, CT 06830*

Centek Project No. 13001.080

Dear Mr. Tyurin,

Centek Engineering Inc. has reviewed the proposed Verizon Wireless antenna upgrade at the above referenced site. The purpose of the review is to determine the structural adequacy of the existing 47-ft +/- tall host building to support the proposed modified antenna configuration. The existing installation consists of three (3) antenna sectors located on roof mounted ballast frames. The review considered the effects of wind load, dead load, ice load and seismic forces in accordance with the 2005 Connecticut State Building Code as amended by the 2009 CT State Supplement.

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

- **Verizon (Existing to Remain):**
Antennas: Two (2) Antel BXA-70063-6CF panel antennas, one (1) Swedcom SLXW5514 panel antenna, six (6) Andrew DB844G65ZAXY panel antennas, three (3) RYMSA MG D3-800T0 panel antennas and six (6) RFS FD9R6004/2C-3L diplexers mounted on three (3) ballast frames with a RAD center elevation of 52-ft +/- AGL.
Coax: Twelve (12) 1-5/8-in dia. coaxial cables routed within existing cable tray system.
- **Verizon (Proposed):**
Antennas: Three (3) RYMSA MG D3-800T0 panel antennas, three (3) Alcatel-Lucent RRH2x40-AWS Remote Radio Heads and three (3) RFS DB-E1-3B-8AB-0Z sector distribution boxes mounted on three (3) ballast frames with a RAD center elevation of 52-ft +/- AGL.
Coax: Three (3) 1-1/4" dia. Hybriflex Fiber jumper cables routed from the main distribution box to the sector distribution boxes. (All cables to follow the route of the existing cable tray system).
- **Verizon (Proposed):**
Antennas: One (1) RFS DB-T1-6Z-8AB-0Z main distribution box mounted within the existing Verizon Wireless equipment room.

CEN TEK engineering, INC.
Structural Evaluation Letter
Verizon Wireless ~ Greenwich SW
411 West Putnam Avenue
Greenwich, CT 06830

The proposed antenna installation meets the requirements of the 2005 Connecticut State Building Code considering the basic wind speed (3-second gust) of 100 mph as required in Appendix K of the Connecticut supplement per Table 1609.3.1. Our findings are based on the assumption that the hosting structure, all structural members and appurtenances were properly designed, detailed, fabricated, installed and have been properly maintained since erection.

In conclusion, the proposed Verizon antenna upgrade will not negatively impact the structural integrity of the existing antenna support structure or host building. If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:



Carlo F. Centore, PE
Principal ~ Structural Engineer

