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October 10, 2023

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

Re: **Notice of Exempt Modification – Facility Modifications**
Cellco Partnership d/b/a Verizon Wireless

P2P Project – 175 Dickinson Road, Glastonbury, Connecticut

Dear Attorney Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently holds a license, issued by the Federal Communications Commission ("FCC"), to provide wireless communications services in the 28 GHz frequency range. To meet its FCC license requirements for frequency use and deployment, Cellco plans to deploy a new, "Point to Point" ("P2P") 28 GHz microwave system at numerous cell sites in Connecticut. Initially, these frequencies will help Cellco maintain certain security systems currently used to monitor cell site equipment. This notice pertains to the P2P system that will be deployed at Cellco's existing cell site at 175 Dickenson Road in Glastonbury, Connecticut (Cellco's "East Glastonbury 2 Cell Site").

To establish the referenced P2P system, Cellco will install two (2) point to point microwave dish antennas on the roof of the existing equipment shelter at the East Glastonbury 2 Cell Site. Unlike the broadcast antennas on the tower, the P2P dish antennas will communicate only with each other. Shelter-mounted dish antennas will be installed at opposite ends of the shelter roof, approximately 20 feet apart, at a height of approximately twelve (12) feet above grade. The antennas would be attached to a non-penetrating ballast-mounted antenna mast. A copy of the Proposed Shelter View, antenna mount illustration and dish antenna specifications are included in Attachment 1.

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 the Town Manager and Land Use Officer

in the Town of Glastonbury. A copy of this filing will also be sent to the property owner of the East Glastonbury 2 Cell Site facility location.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. The proposed 28 GHz antennas will be installed on roof of the existing equipment shelter, approximately 12 feet above grade.

2. The proposed modifications 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 installation of the 28 GHz antennas will not increase radio frequency ("RF") emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. Included in Attachment 2 is a Calculated Radio Frequency Emissions Report verifying that RF emissions from the East Glastonbury 2 Cell Site with the P2P system installed will comply with the FCC Standards.

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

6. According to the attached August 14, 2023, letter from Dewberry Engineers Incorporated, Cellco's existing equipment shelter roof and the proposed ballast sled antenna mounting system can support the proposed 28 GHz antenna installations. A copy of the Dewberry letter is included in Attachment 3.

A Certificate of Mailing verifying that this filing was sent to the municipal officials and the property owner is included in Attachment 4.

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,

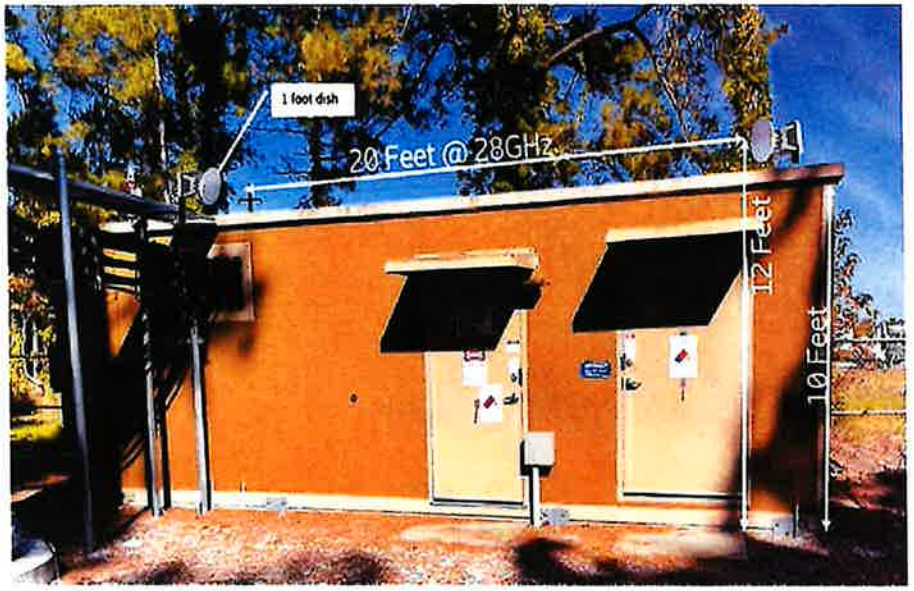
Kenneth C. Baldwin

Enclosures
Copy to:
Jonathan Luiz, Town Manager
Shelley Caltagirone, Director of Planning and Land Use Services
Randall Chapman and Karrie-Lynn Bronzi, Property Owner
Aleksey Tyurin, Verizon Wireless

ATTACHMENT 1

Proposed shelter view

- Rohn Non-Penetrating Roof mount (not quoted HW/Logistics per RFP)
- 30-inch mast
- Quick assembly
- 8 blocks @ 32lbs = 256 lbs of ballast (TBD)
- Cable management will consist of
  - Zip ties
  - Angle adaptors with snap-ins
  - PVC pipe runs across roof top
    - Possible Fiberbond chase (still being reviewed)



- Hatch plate to be used
- Existing grounding points
- No new penetrations
  - Roof or walls
- Indoor
  - Existing rack power
    - 2 x 10amp
  - Existing cable trays

Technical Specifications

WTM 4100

ANSI with A2C+ Operation

General Specifications

General

Frequency Bands		5 - 38 GHz
Physical Configurations		1+0, 2+0 ACCP (via A2C+), 2+0 XPIC (via external OMT)
Modulation and Coding	*Fixed or Adaptive*	QPSK to 4096 QAM / Hitless AM
Channel Sizes		3.75, 5, 10, 20, 25, 30, 40, 50, 60, 80 and 100 MHz
Capacity (standard single channel)	*Airlink Capacity*	up to 918 Mbit/s*
Capacity (A2C mode)	*Airlink Capacity*	up to 1836 Mbit/s*
Encryption		256-bit AES Payload Encryption
Design Tools	*Recommended*	Aviat Design™ on aviatcloud.com (includes MIMO, Multi-band)
	Supported	Pathloss 5 (basic support only)

Power Supply

Voltage	*DC*	±20 to 57V
	PoE	48Vdc (44 to 58Vdc)
Consumption		50 Watts nominal
		65 Watts maximum

Physical

Size (h-w-d), including antenna interfaces		11.5in x 10.5in x 4in (295mm x 270mm x 95mm)
Weight, including antenna interfaces		12lbs (5.5 kg)
Operating Temperature	*Guaranteed*	-27 to +131°F (-33° to +55°C)
	Extended	-49 to +159°F (-45° to +65°C)[1]
Humidity	*Guaranteed*	100%
Altitude	*Guaranteed*	15,000 ft (4500m)

Standards Compliance

EMC		FCC CFR 47, Part 15, ICES-003
Operation		EN 300 019-2-4, Class 4.1
Safety		UL 60950-1, UL 60950-22, UL 62368-1
RF Performance	*All Federal Frequencies*	FCC CFR 47, Part 101 Manual of Regulations for Federal Radio Frequency Management
Maximum Permissible Exposure		EN 50385
Water Ingress		IEC 60529, IP66
Lightning Protection		Internal, compliant to IEC 61000-4-5, Class 5
Security		FIPS 197 validated (Certificate A980)

Transmitter / Receiver

Transmitter

Transmit Power Tolerance	*5-28 GHz*	± 2.0 dB
	38 GHz	± 2.5 dB
Transmitter Source		Synthesized
Frequency Stability		± 5 ppm
Manual Transmitter Power Control Range		Configurable in 0.1 dB steps from min to max power levels
Automatic Transmitter Power Control Range		Configurable over the 20dB attenuation range
	Resolution / Speed	0.1 dB steps / 50dB/s
Synthesizer Resolution		250 KHz
Transmitter Mute		> 50 dB

*[ ] See notes in last page

Transmitter / Receiver

Receiver

Receiver Source		Synthesized
Frequency Stability		± 5 ppm
Receiver Overload	*BER = 1E-6*	-20 dBm
Residual (Background) Bit Error Rate		Better than 1E-13
RSSI Accuracy [4]	*-30 to -70 dBm, -27 to +131°F (-33° to +55°C)*	Better than ± 2.5dB
	-20 to -30 dBm, -27 to +131°F (-33° to +55°C)	Better than ± 3.5dB
	-20 to -30 dBm, -49 to +149°F (-45° to +65°C)	Better than ± 4.5dB

Networking

CE/L2

Switch capability	50 Gbps non-blocking
Quality of Service (QoS)	8 COS, Scheduling, Policing, Storm Control, Shaping
QoS Mapping	PCP (802.1p), DSCP, H-QoS
VLANs	IEEE 802.1Q and IEEE 802.1ad (Q-in-Q)
Spanning Tree	Rapid and multiple protocols (RSTP, MSTP)
Ethernet OAM	IEEE 802.3ah, IEEE 802.1ag, ITU-T Y.1731
Congestion Avoidance	WRED, per queue
	Packet Buffer – 180 Mbyte
Jumbo frames	Up to 9600 bytes

Synchronisation

Precision Time Protocol	IEEE 1588v2 TC or BC

General Specifications

Interfaces

Traffic	*2x fixed RJ45*	10/100/1000BT Electrical
	2x optional SFP	1, 2.5 & 10Gbps speeds, both
		Optical (Single and Multi-mode) and Electrical
Power	*Direct*	24Vdc or 48Vdc
	Power over Ethernet	Via 10/100/1000BT Electrical port
USB support	*Management*	Local setup, sw/fw upgrade, config backup
Wireless connection		via Wifi
RSSI		Dual voltmeter pins

Management

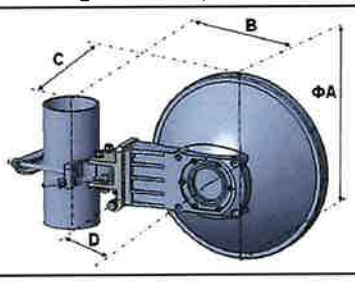
Local Management	Configuration save & load
	Wireless USB dongle to support Wifi
	Aviat OS software upgrade
Event Capture	Event and Alarm capture, time stamp and logging
Statistics	RMON 1 Ethernet and radio performance statistics
Network Management	SNMPv2c ProVision or MIB interface support
	IPv4 addressing with an In-Band Management VLAN. Telnet or SSH access
	Aviat Cloud – Manage Advanced
Clock	Simple Network Time Protocol (SNTP V4), embedded real time clock

*[ ] See notes in last page

Microwave Antenna Specifications

SLA0328S3S49A20
0.3m Ultra High Performance Antenna
Flange Type Rectangular

Electrical Specifications	
Frequency (GHz)	27.5~29.5
Polarization	Single(V or H)
Gain , Low(dBi)	37.7
Gain, Mid(dBi)	38
Gain, Top(dBi)	38.3
Beam Width	2.0°
Cross-pol. Discrimination_XPD (dB)	30
F/B Ratio (dB)	64
VSWR / RL (dB)	1.3/17.7
Regulatory Compliance	ETSI EN 302217 Range 4 Class 3
Mechanical Specifications	
Diameter (m)	0.3
Antenna Color	Cool Gray 1C
Radome Options	Foam
Interface Type	UBR320 OR Customized
Side Struts, Included	0
Azimuth Adjustment	Coarse : 360 ° Fine : ±15 °
Elevation Adjustment	Fine : ±15 °
Diameter of Mounting Pole (mm)	Φ51~Φ114
Wind Velocity Survival Rating (km/h)	252
Wind Velocity Operational (km/h)	200
Ice-load (mm)	25.4
Operational Temperature (℃)	-45~+60
Packaging	Carton
L×W×H (mm)	480*480*267
Wind Load Specifications	
Axial Force (N) @ survival wind speed	444
Side Force (N) @ survival wind speed	219
Twisting Moment (N•m) @ survival wind speed	141



Dimensions (mm)	ΦA	B	C	D
	386	318	137	180

Note:

1. The values of B and C are measured at the pole diameter of 114mm
2. The thickness of the radome is not included in the dimensions of A and C

*Guangdong Shenglu Telecommunication Tech. Co.,Ltd.*Revision 2.1 2020-Nov
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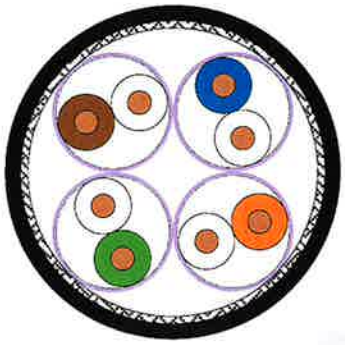
02YSCH 4X2X0.62/1.5-100 PIMF BK
Cat 6A



Design:

Wire
Bare copper wire (22AWG) — Ø 0.62 mm (0,024 in dia)
Insulation of foamed Polyethylene (PE) with skin — Ø 1.50 mm (0,059 in dia)

Screened pair
2 wires twisted to a pair
Alulaminate foil overlapped, applied longitudinally

Core:
4 screened pairs
Sequence of colors: WH/BL, WH/OR, WH/GN, WH/BR
Shield braiding of tinned copper wires
Coverage about 80%

Jacket:
Thermoplastic copolymer (FRNC)BK — Ø (8.8±0.3) mm (0.346 ±0.012 in dia)
Wall thickness about 0.80 mm

Inkjet -marking: "sequential length in metres" LEONI L * S/FTP CAT 6A SOLID CABLE 22AWG 4PR
"internal lot number"

Electrical data at 20° C

Coductor resistance		≤	65	Ohm/km
Insulation resistance		≥	5	GOhm*km
Capacitance (1kHz)			46	pF/m
Phase delay			460	ns/100 m
Skew at 100 MHz			10	ns/100 m
Characteristic impedance	100 MHz		100±10	Ohm
Operating voltage (peak)			125	V
Test voltage			1000	V

ATTACHMENT 2

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

Calculated Radio Frequency Emissions Report

verizon

East Glastonbury 2 CT

175 Dickinson Road, Glastonbury, CT 06033

October 4, 2023

Table of Contents

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1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed installation of Verizon's 28 GHz microwave antenna to be mounted at 12' AGL on roof of the equipment shelter located at 175 Dickinson Road in Glastonbury, CT. The coordinates of the monopole tower are 41° 39' 21.24" N, 72° 31' 23.79" W.

Verizon is proposing the following:

1) Install one (1) 28 GHz point-to-point microwave system.

This report considers the planned[1] antenna configuration for Verizon as well as existing antenna configuration for AT&T[2], Dish[3] T-Mobile[4] and Verizon[5] to derive the resulting % MPE of its proposed installation.

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/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment C 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 C 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.

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[1] As referenced to Verizon's Far Field Calculation sheet updated 06/07/2023 included in Attachment D.

[2] As referenced to AT&T's Connecticut Siting Council Notice of Exempt Modification – 175 Dickinson Road, Glastonbury, Connecticut, dated 12/22/2020

[3] As referenced to DISH's Connecticut Siting Council Tower Share Application – 175 Dickinson Road, Glastonbury, Connecticut, dated 12/01/2021

[4] As referenced to T-Mobile's Connecticut Siting Council Exempt Modification Application – 175 Dickinson Road, Glastonbury, Connecticut, dated 05/16/2022

[5] As referenced to Verizon's Radio Frequency Design Sheet (RFDS) updated 4/27/2022

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:

$$\text{Power Density} = \left(\frac{\text{GRF}^2 \times 1.64 \times \text{ERP}}{4\pi \times R^2}\right) \text{X Off Beam Loss}$$

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

Off Beam Loss is determined by the selected antenna patterns

Ground reflection factor (GRF) of 1.6

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. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the final installations.

4. Antenna Inventory

Table 1 below outlines Verizon's existing antenna configuration for the site. The associated data sheets and antenna patterns for these specific antenna models are included in Attachment C.

Operator		TX Freq (MHz)	Power at Antenna (Watts)	Ant Gain (dBi)	Power EIRP (Watts)	Antenna Model	Beam Width	Mech. Tilt	Length (ft)	Antenna Centerline Height (ft)
Verizon	Alpha	700	160	14.9	4944	NHH-65B-R2B	65	0	5.99	167
		850	160	15.0	5060		60			
		1900	160	17.9	9866		69			
		2100	240	18.0	15143	NHHSS-65B-R2BT4	64	0	5.99	167
		3500	20	17.7	1178		54			
		3700	200	25.5	70963	MT6407-77A	-	0	2.92	167
	Beta	700	160	14.9	4944	NHH-65B-R2B	65	0	5.99	167
		850	160	15.0	5060		60			
		1900	160	17.9	9866		69			
		2100	240	18.0	15143	NHHSS-65B-R2BT4	64	0	5.99	167
		3500	20	17.7	1178		54			
		3700	200	25.5	70963	MT6407-77A	-	0	2.92	167
	Gamma	700	160	14.9	4944	NHH-65B-R2B	65	0	5.99	167
		850	160	15.0	5060		60			
		1900	160	17.9	9866		69			
		2100	240	18.0	15143	NHHSS-65B-R2BT4	64	0	5.99	167
		3500	20	17.7	1178		54			
		3700	200	25.5	70963	MT6407-77A	-	0	2.92	167
	P2P	28000	0.2	38	1287	SLA0328S3S49A20	2	0	1	12

Table 1: Proposed Antenna Inventory

5. Calculation Results

The calculated power density results are shown in Figure 1 below. For completeness, the calculations for this analysis range from 0 feet horizontal distance (directly below the antennas) to a value of 3,000 feet horizontal distance from the site. In addition to the other worst-case scenario considerations that were previously mentioned, the power density calculations to each horizontal distance point away from the antennas was completed using a local maximum off beam antenna gain (within ± 5 degrees of the true mathematical angle) to incorporate a realistic worst-case scenario.

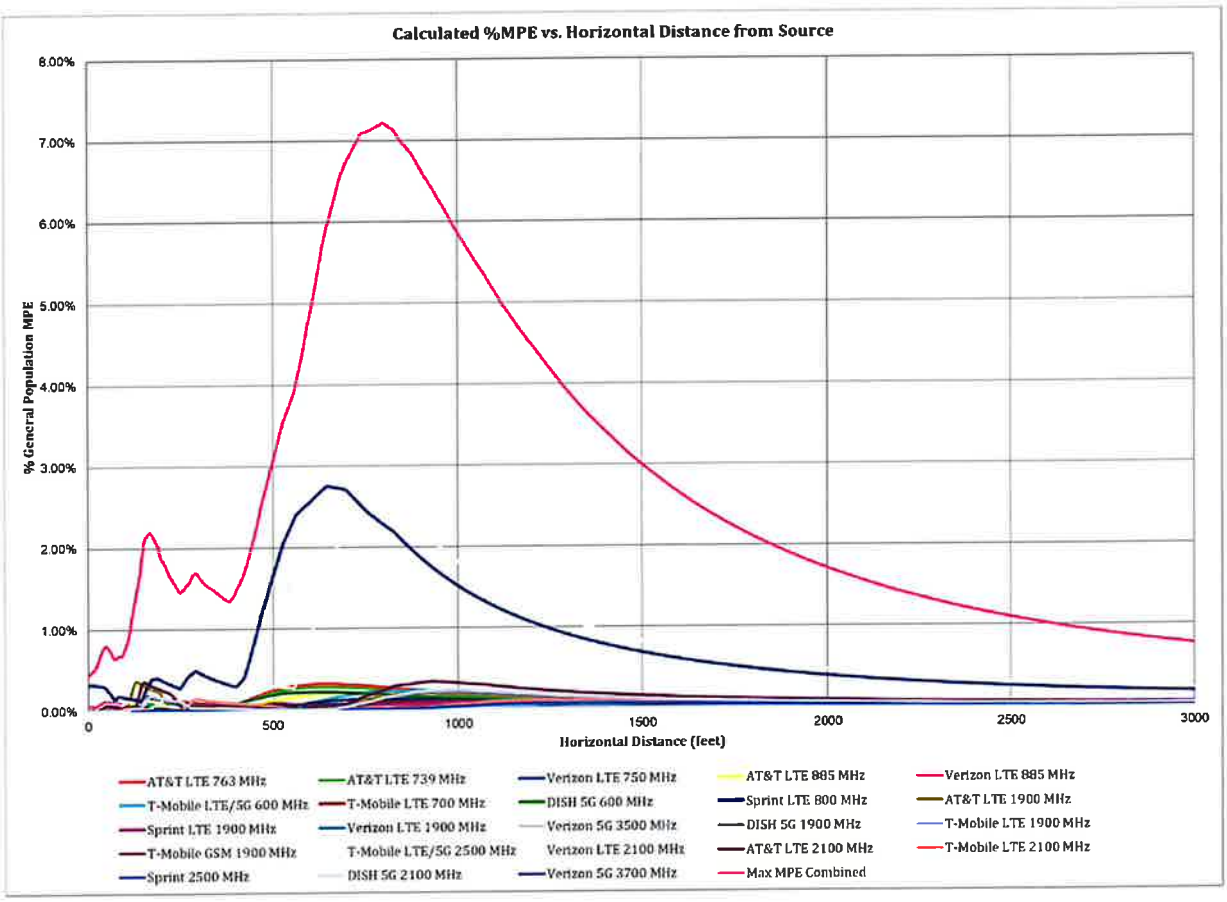


Figure 1: Graph of General Population % MPE vs. Distance

The highest combined value for % MPE for existing emitters (7.21% of the General Population limit) is calculated to occur at a horizontal distance of 800 feet from antennas. The maximum %MPE generated by the proposed 28 GHz microwave system is 0.12% and occurs at the distance of 344 feet. While the peak % MPE generated by the proposed 28 GHz microwave system does not occur at the same point as the peak cumulative %MPE for all existing emitters, as a very conservative calculation of the total %MPE, we add the 7.33% predicted at 800 feet to the 0.12% predicted for the 28 GHz system at 344 feet to arrive at a total maximum % MPE of 7.33%.

Please note that the percent of MPE calculations close to the site take into account off beam loss, which is determined from the vertical pattern of the antennas used. Therefore, RF power density levels may increase as the distance from the site increases. At distances of approximately 1500 feet and beyond, one would now be in the main beam of the antenna pattern and off beam loss is no longer considered. Beyond this point, RF levels become calculated solely on distance from the site and the percent of MPE decreases significantly as distance from the site increases.

Table 2 below lists percent of MPE values as well as the associated parameters that were included in the calculations. The highest percent of MPE value was calculated to occur at a horizontal distance of 800 feet from the site (reference Figure 1).

As stated in Section 3, all 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. Obstructions (trees, buildings etc.) that would normally attenuate the signal are not taken into account. In addition, a six foot height offset was considered in this analysis to account for average human height. As a result, the predicted signal levels are significantly higher than the actual signal levels will be from the final configuration. The results presented in Figure 1 and Table 2 assume level ground elevation from the base of the tower out to the horizontal distances calculated.

Carrier	Number of Transmitters	Power out of Base Station Per Transmitter (Watts)	Antenna Height (Feet)	Distance to the Base of Antennas (Feet)	Power Density (mW/cm^2)	Limit (mW/cm^2)	% MPE
AT&T LTE 1900 MHz	1	160.0	137.0	800	0.001623	1.000	0.16%
AT&T LTE 2100 MHz	1	240.0	137.0	800	0.002403	1.000	0.24%
AT&T LTE 739 MHz	1	160.0	137.0	800	0.001192	0.493	0.24%
AT&T LTE 763 MHz	1	160.0	137.0	800	0.001399	0.509	0.27%
AT&T LTE 885 MHz	1	160.0	137.0	800	0.001084	0.590	0.18%
DISH 5G 1900 MHz	1	160.0	147.0	800	0.001434	1.000	0.14%
DISH 5G 2100 MHz	1	160.0	147.0	800	0.001468	1.000	0.15%
DISH 5G 600 MHz	1	120.0	147.0	800	0.000743	0.400	0.19%
Sprint 2500 MHz	1	160.0	157.0	800	0.000069	1.000	0.01%
Sprint LTE 1900 MHz	1	160.0	157.0	800	0.000699	1.000	0.07%
Sprint LTE 800 MHz	4	40.0	157.0	800	0.000734	0.567	0.13%
T-Mobile GSM 1900 MHz	1	120.0	176.0	800	0.000138	1.000	0.01%
T-Mobile LTE 1900 MHz	1	120.0	176.0	800	0.000138	1.000	0.01%
T-Mobile LTE 2100 MHz	1	120.0	176.0	800	0.000070	1.000	0.01%
T-Mobile LTE 700 MHz	1	60.0	176.0	800	0.000451	0.467	0.10%
T-Mobile LTE/5G 2500 MHz	1	240.0	176.0	800	0.026178	1.000	2.62%
T-Mobile LTE/5G 600 MHz	1	140.0	176.0	800	0.000898	0.400	0.22%
Verizon 5G 3500 MHz	1	20.0	167.0	800	0.000154	1.000	0.02%
Verizon 5G 3700 MHz	1	200.0	167.0	800	0.022764	1.000	2.28%
Verizon LTE 1900 MHz	1	160.0	167.0	800	0.000056	1.000	0.01%
Verizon LTE 2100 MHz	1	240.0	167.0	800	0.000127	1.000	0.01%
Verizon LTE 750 MHz	1	160.0	167.0	800	0.000440	0.500	0.09%
Verizon LTE 885 MHz	1	160.0	167.0	800	0.000314	0.567	0.06%
						Total	**7.21%**
Verizon LTE 28GHz	1	0.2	12.0	344	0.001248	1.000	0.12%
						Grand Total	**7.33%**

Table 2: Maximum Percent of General Population Exposure Values

6. Conclusion

The above analysis verifies that RF exposure levels from the site with Verizon's proposed 28 GHz microwave antenna will be well below the maximum permissible levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Using the conservative calculation methods and parameters detailed above, the maximum cumulative percent of MPE in consideration of all existing transmitters and the proposed 28 GHz microwave system is calculated to be 7.33% of the FCC limit (General Population/Uncontrolled). This maximum cumulative percent of MPE value is calculated to occur 800 feet away from the site.

7. 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/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.

Report Prepared By: Ram Acharya
RF Engineer 1
C Squared Systems, LLC

October 3, 2023
Date

Reviewed/Approved By: Martin Lavin
Senior RF Engineer
C Squared Systems, LLC

October 4, 2023
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 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

Verizon's Radio Frequency Design Sheet updated 10/21/2022

AT&T's filing, Connecticut Siting Council Notice of Exempt Modification – Antenna Add - 150 Meriden Waterbury Road (aka 1 Service Road) Glastonbury, CT, dated 9/23/2022

As referenced to Dish Wireless LLC's filing, Connecticut Siting Council Tower Share Application – 150 Meriden Waterbury Road , Glastonbury, CT, dated 11/19/2021

T-Mobile's filing, Connecticut Siting Council Notice of Exempt Modification – 150 Meriden Waterbury Road , Glastonbury, CT, dated 10/1/2020

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

(A) Limits for Occupational/Controlled Exposure[6]

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

(B) Limits for General Population/Uncontrolled Exposure[7]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	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	-	-	f/1500	30
1500-100,000	-	-	1.0	30

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

Table 3: FCC Limits for Maximum Permissible Exposure

[6] 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.

[7] 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.

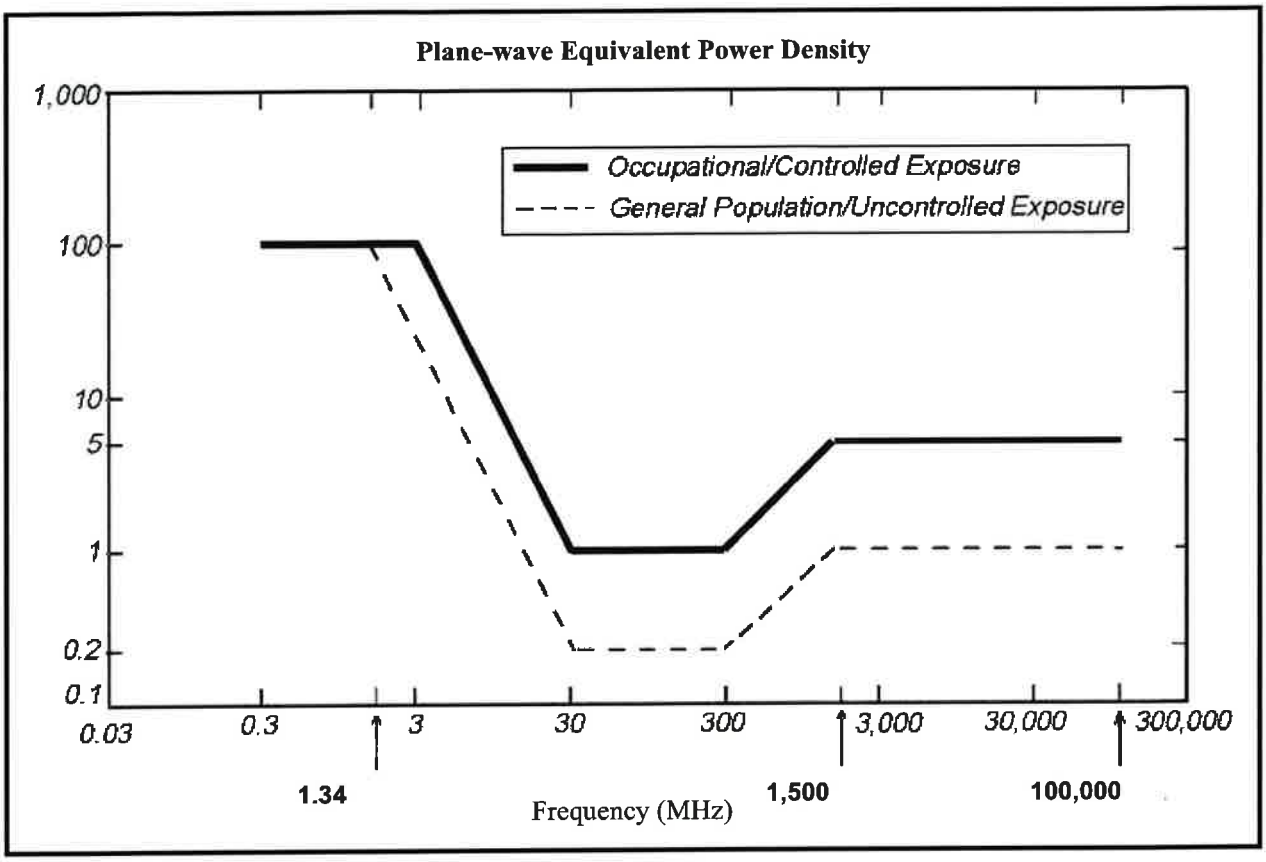
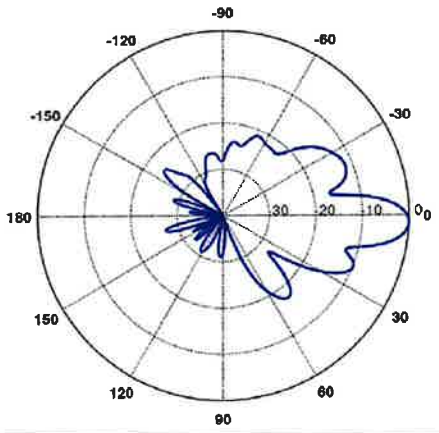
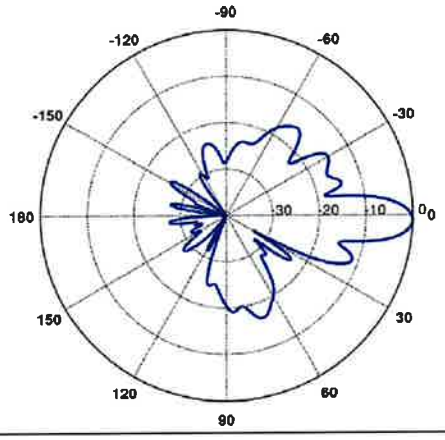


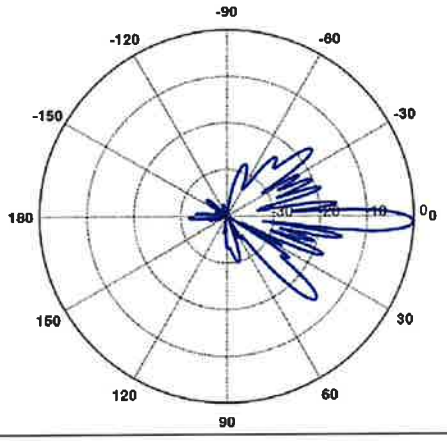
Figure 2: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: Verizon Antenna Model Data Sheets and Electrical Patterns

LTE 700 MHz Manufacturer: COMMSCOPE Model #: NHH-65B-R2B Frequency Band: 698-806 MHz Gain: 14.5 dBi Vertical Beamwidth: 12.4° Horizontal Beamwidth: 65° Polarization: ±45° Dimensions (L x W x D): 71.97" x 11.85" x 7.09"	
LTE 850 MHz Manufacturer: COMMSCOPE Model #: NHH-65B-R2B Frequency Band: 806-896 MHz Gain: 15.0 dBi Vertical Beamwidth: 11.2° Horizontal Beamwidth: 60° Polarization: ±45° Dimensions (L x W x D): 71.97" x 11.85" x 7.09"	

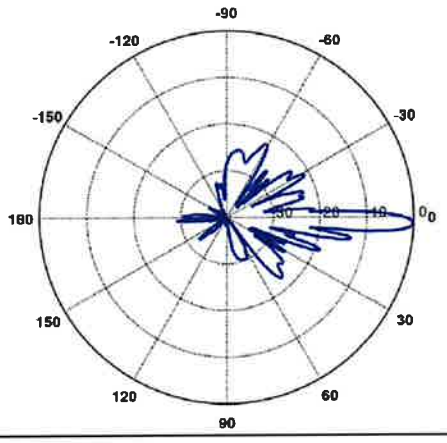
LTE 1900 MHz

Manufacturer:	COMMSCOPE
Model #:	NHH-65B-R2B
Frequency Band:	1850-1990 MHz
Gain:	17.9 dBi
Vertical Beamwidth:	5.2°
Horizontal Beamwidth:	69°
Polarization:	±45°
Dimensions (L x W x D):	71.97" x 11.85" x 7.09"



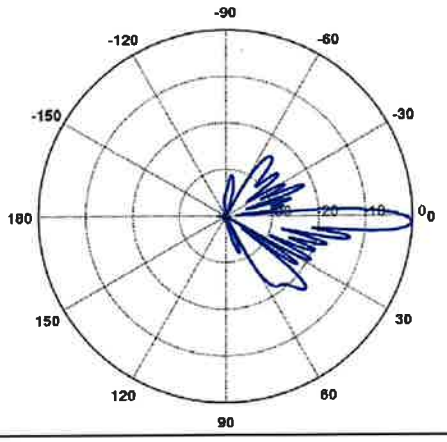
LTE 2100 MHz

Manufacturer:	COMMSCOPE
Model #:	NHHSS-65B-R2BT4
Frequency Band:	1920-2200 MHz
Gain:	18.0 dBi
Vertical Beamwidth:	4.9°
Horizontal Beamwidth:	64°
Polarization:	±45°
Dimensions (L x W x D):	72.97" x 11.85" x 7.13"



LTE 3500 MHz

Manufacturer:	COMMSCOPE
Model #:	NHHSS-65B-R2BT4
Frequency Band:	3550-3700 MHz
Gain:	17.7 dBi
Vertical Beamwidth:	5.7°
Horizontal Beamwidth:	54°
Polarization:	±45°
Dimensions (L x W x D):	72.97" x 11.85" x 7.13"



Attachment D: Far Field Calculation Sheet

Band	28 GHz
Operating Frequency (MHz)	27,500
General Population MPE (mW/cm^2)	1.000
ERP Per Transmitter (Watts)	785
Number of Transmitters	1
Antenna Centerline (feet)	12
Total ERP (Watts)	785
Total ERP (dBm)	59
Maximum % of General Population Limit	0.12%
Distance to Maximum % of General Population Limit (feet)	344

ATTACHMENT 3

Dewberry Engineers Inc.
99 Summer Street, Suite 700
Boston, MA 02110-1200

617.695.3400
617.695.3310 fax
www.dewberry.com

Dewberry

August 14, 2023

Alex Tyurin
Verizon Wireless
99 East River Drive
East Hartford, CT 06108

Dear Mr. Tyurin:

Verizon Wireless has proposed to install (2) new Rohn FRM Ballast Sleds, (2) new 0.3m Microwave Antenna, and (2) WTM4000 Radio on the rooftop of an equipment shelter at various locations in Connecticut. The proposed equipment will be mounted on the rooftop of the ground mounted equipment shelter with a maximum height of 15' to the CL of the dish. **This assessment letter is limited to Connecticut sites only.**

Dewberry Engineers Inc. (Dewberry) has reviewed the latest antenna design provided by Verizon Wireless and has determined, based on a maximum ultimate wind speed of 140 mph, exposure D, per ANSI/TIA-222-H and 2022 CT State Building Code, that the proposed ballast sled and equipment shelter roof have adequate capacity to support the proposed equipment configuration. Each proposed ballast sled requires (6) CMU ballast blocks (34 lb . ea.), equaling 204 lbs of ballast to be evenly distributed across both trays. The proposed ballast sled, including ballast blocks, do not exceed the 40 psf minimum allowable roof live load of the existing shelter. **The proposed ballast frame is controlled by overturning moment and the maximum utilization of the proposed mount is 43.0%.** Dewberry assumes that the new antennas and associated equipment are installed per the manufacturer's specifications.

This assessment is based on our assumption that the ground mounted equipment shelter, and proposed ballast mounts are in good condition and were constructed in accordance with ANSI/TIA-222-H standards and the 2022 CT State Building Code. If, during construction, any damage, deterioration, and/or discrepancies are noticed, Dewberry is to be notified to assess any deviation from the assumed condition. Any alteration in equipment loading described above and on the associated plans will void any conclusions expressed herein and will require further analysis and design. No structural qualification is made or implied by this structural letter for existing structural members not supporting the proposed installation.

If you have any questions, please do not hesitate to call me at 617-531-0744.

Sincerely,
Dewberry Engineers Inc.

Brandon Kelsey, P.E. (CT)
CT License No.: 36967
Structural Project Engineer

ATTACHMENT 4

Verizon/P2P - E. Glastonbury 2

UNITED STATES POSTAL SERVICE®

Certificate of Mailing — Firm

Name and Address of Sender	TOTAL NO. of Pieces Listed by Sender	TOTAL NO. of Pieces Received at Post Office™	Affix Stamp Here *Postmark with Date of Receipt.*
Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103	3	3	neopost 10/10/2023 US POSTAGE $003.19⁰ ZIP 06103 041L12203937
	Postmaster, per *(name of receiving employee)*		

USPS® Tracking Number / Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Jonathan Luiz, Town Manager Town of Glastonbury 2155 Main Street Glastonbury, CT 06033				
2.	Shelley Caltagirone, Director of Planning and Land Use Services Town of Glastonbury 2155 Main Street Glastonbury, CT 06033				
3.	Randall Chapman and Karrie-Lynn Bronzi P.O. Box 7 Troy, ME 04987				
4.					
5.					
6.					

OLD STATE HOUSE STATION 06103 OCT 10 2023 USPS