

November 20, 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 – 56 Cosgrove Road, Willington, 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 56 Cosgrove Road in Willington, Connecticut (the “Willington Cell Site”). The existing Willington site was approved by the Council in July 1986 (Docket No. 58). A copy of the Council’s Decision and Order in Docket No. 58 is included in Attachment 1.

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 Willington 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 2.

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

28319613-v1

Robinson+Cole

Melanie A. Bachman, Esq.
November 20, 2023
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R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Willington's Chief Elected Official and Land Use Officer. A copy of this letter is being sent to the owner of the Property.

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 shelter at the cell site, approximately twelve (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 3 is a Calculated Radio Frequency Emissions Report verifying that RF emissions from the Willington 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 shelter can support the proposed 28 GHz antenna installations. A copy of the Dewberry letter is included in Attachment 4.

A Certificate of Mailing verifying that this filing was sent to the municipal officials and the property owner for each location is included in Attachment 5.

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:

Erika Wieceński, First Selectman
Michael D'Amato, Zoning Agent
Estate of Isabel Drobney, Property Owner
Aleksy Tyurin, Verizon Wireless

ATTACHMENT 1

DOCKET NO. 58

AN APPLICATION OF HARTFORD CELLULAR
COMPANY FOR A CERTIFICATE OF
ENVIRONMENTAL COMPATIBILITY AND PUBLIC
NEED FOR THE CONSTRUCTION, MAINTENANCE,
AND OPERATION OF FACILITIES TO PROVIDE
CELLULAR SERVICE IN HARTFORD, TOLLAND AND
MIDDLESEX COUNTIES.

CONNECTICUT SITING
COUNCIL

July 11, 1986.

D E C I S I O N A N D O R D E R

Pursuant to the foregoing opinion, the Connecticut Siting Council (Council) hereby directs that a Certificate of Environmental Compatibility and Public Need as provided by Section 16-50k of the General Statutes of Connecticut (CGS) be issued to the Hartford Cellular Company for the construction, maintenance, and operation of cellular mobile phone telecommunication towers and associated equipment in the towns of Glastonbury, Haddam, Hartford, Portland, Rocky Hill, Somers, Vernon, Windsor, and Willington subject to the conditions below.

- 1) The proposed Bloomfield and Middlefield sites are rejected without prejudice.
- 2) The antennas on the Glastonbury tower shall be mounted no higher than the 180' level of this existing tower.
- 3) The Portland and Rocky Hill towers shall be monopoles.
- 4) The towers shall be no taller than necessary to provide the proposed service, and in no event shall exceed total heights, including antennas, of
 - a) 193' at the Haddam site;
 - b) 173' at the Portland site;

- c) 153' at the Rocky Hill site;
- d) 173' at the Somers site;
- e) 173' at the Vernon site;
- f) 153' at the Willington site;
- g) 173' at the Windsor site.

5) The Hartford site receive antennas shall be mounted below the top of the high point of the building to preclude visibility.

6) Any future actions requiring the removal of the existing Glastonbury tower to be shared by the certificate holder shall also apply to the equipment mounted on that tower by the certificate holder, regardless of that equipment's status under Chapter 277a of the CGS.

7) The certificate holder shall submit a development and management (D&M) plan for the Haddam, Portland, Rocky Hill, Somers, Vernon and Windsor sites pursuant to Sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies (RSA), except that irrelevant items in Section 16-50j-76 need only be identified as such. In addition to the requirements of Section 16-50j-76, the D&M plan shall provide plans for evergreen screening around the fenced perimeter at the Haddam, Somers, Vernon, and Windsor sites. The D&M plan shall include a proposal for painting the approved monopole structures to blend with the sky. The D&M plan must be approved prior to facility construction. Any changes to specifications in the D&M plan must be approved by the Council prior to facility operation.

8) All certified facilities shall be constructed, operated, and maintained as specified in the Council's record and in the

site plan required by order number 7.

9) The certificate holder shall comply with any future radiofrequency (RF) standards promulgated by state or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facilities granted in this decision shall continue to be in compliance with such standards.

10) The certificate holder shall permit public or private entities to share space on the towers approved herein, for due consideration received, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. In addition to complying with Section 16-50j-73 of the RSA, the certificate holder shall notify the Council of the addition of any equipment to any approved tower.

11) A fence not lower than 8' shall surround each tower and associated equipment.

12) Unless necessary to comply with order 13, no lights shall be installed on any of these towers.

13) The facilities' construction and any future tower sharing shall be in accordance with all applicable federal, state, and municipal laws and regulations. Shared uses by entities not subject to jurisdiction pursuant to Section 16-50k of the CGS shall be subject to all applicable federal, state, and municipal laws and regulations.

14) Construction activities shall take place during daylight working hours.

15) This decision and order shall be void and the towers and associate equipment shall be dismantled and removed, or reapplication for any new use shall be made to the Council before any such new use is made, if the towers do not provide or permanently cease to provide cellular service following completion of construction.

16) This decision and order shall be void if all construction authorized herein is not completed within three years of the issuance of this decision, or within three years of the completion of any appeal if appeal of this decision is taken, unless otherwise approved by the Council.

Pursuant to CGS Section 16-50p, we hereby direct that a copy of the decision and order shall be served on each person listed below. A notice of the issuance shall be published in the Hartford Courant, Middletown Press, Manchester Journal Inquirer, and the Willimantic Chronicle.

The parties to the proceeding are:

Metro Mobile (applicant)
5 Eversley Avenue
Norwalk, Connecticut 06855
ATTN: Armand Mascioli
General Manager

Howard L. Slater, Esq. (its attorneys)
Scott A. Gursky, Esq.
Byrne, Slater, Sandler,
Shulman & Rouse, P.C.
111 Pearl Street
Hartford, Connecticut 06103

Richard Rubin, Esq.
Fleischman and Walsh, P.C.
1725 N Street, N.W.
Washington, D. C. 20036

Mr. William Wamester
1225 Randolph Road
Middletown, Connecticut 06457

The Southern New England Telephone Company
227 Church Street
New Haven, Connecticut 06506
ATTN: Peter J. Tyrrell, Esq.

Mr. James W. Tilney

represented by:
Patricia A. Ayars
Samuel Baily, Jr.
Robinson & Cole
One Commercial Plaza
Hartford, CT. 06103-3597

Mr. Samuel DuBosar, Chairman
Bessie Bennett, Esq.
Town Plan & Zoning Commission
P.O. Box 337
Bloomfield, Connecticut 06002

Town of Somers

represented by:
Mr. Robert F. Peters
Town Counsel
Tatoian, Devline, Peters
& Davis
11 South Road
P.O. Box 415
Somers, CT. 06071

Town of Haddam
represented by:

Lucy R. Petrella
Chairperson
Town Office Building
Route 9A
P.O. Box 87
Haddam, CT. 06438

Midstate Regional Planning Agency

represented by:
Thomas M. Gilligan
Regional Planner
P.O. Box 139
Middletown, CT. 06457

Dr. Donald P. LaSalle
Director
Talcott Mountain Science Center
Montevideo Road
Avon, Connecticut 06001

Barnard Tilson (service waived)
Secretary
Avon Planning and Zoning
60 West Main Street
Avon, Connecticut 06001

Alden Giddings
33 Privelege Road
Bloomfield, Connecticut 06002

Town of Bloomfield

represented by:

Joseph M. Suggs, Jr.
Deputy Mayor
Town Hall
880 Bloomfield Avenue
P.O. Box 337
Bloomfield, CT. 06002
(service waived)

Town of Middlefield

represented by:

David Silverstone, Esq.
Silverstone & Koontz
37 Lewis Street
Hartford, CT. 06103

with a copy to:

Geoffrey Colegrove
Midstate Regional Planning Agency
100 DeKoven Drive
Middletown, CT. 06457

Zoning Commission
Town of Somers

represented by:

Joseph A. Paradis
Chairman
Town Hall
600 Main Street
P.O. Box 803
Somers, CT. 06071

Barbara Sirwilo, Secretary (service waived)
Planning & Zoning Commission
Town of Rocky Hill
600 Old Main Street
P.O. Box 657
Rocky Hill, Connecticut 06067

H. Robert Goodrich (service waived)
Goodrich Lane
Portland, Connecticut 06480

The Honorable Richard P. Antonetti
State Representative (service waived)
5 Sachem Circle
Meriden, Connecticut 06450

John Hevrin
R.D. #1 - Plains Road
Haddam, Connecticut 06438




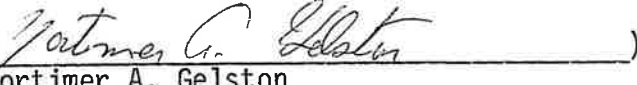

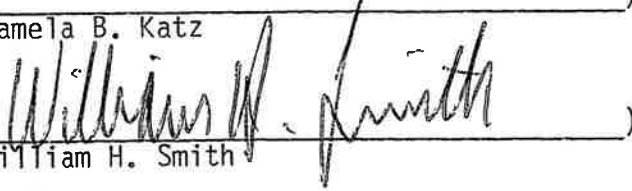
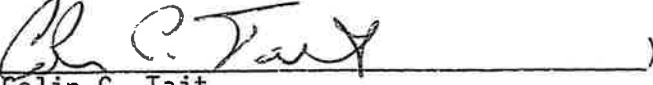
Norman and Darlene Manning (represented by)

Elizabeth Allen, Esq.
P.O. Box 467
Higganum, CT. 06441
(service waived)

C E R T I F I C A T I O N

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut, this 11th day of July, 1986.

<u>Council Members</u>	<u>Vote Cast</u>
_____) Gloria Dibble Pond Chairperson	Absent
 _____) Commissioner John Downey Designee: Patricia Shea	Yes
 _____) Commissioner Stanley Pac Designee: Christopher Cooper	Yes
 _____) Owen L. Clark	Yes
 _____) Mortimer A. Gelston	Yes
 _____) James G. Horsfall	Yes
_____) Pamela B. Katz	Absent
 _____) William H. Smith	Yes
 _____) Colin C. Tait	Yes

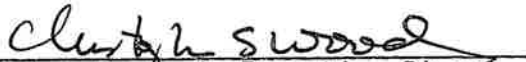
STATE OF CONNECTICUT
COUNTY OF HARTFORD

)
:
)

ss. New Britain, July 11, 1986

I hereby certify that the foregoing is a true and correct copy of the decision and order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:



Christopher S. Wood, Executive Director
Connecticut Siting Council

**TOWN OF WILLINGTON
APPLICATION FOR ZONING AND BUILDING PERMIT**

NOTICE: This application must be typed or printed in ink and filed

The undersigned hereby applies for a permit to ERECT (X), ALTER (), ENLARGE (), REPAIR (), REMOVE (), DEMOLISH (), a building or structure herein described and in accordance with plans and specifications submitted in duplicate, herewith, as shown on accompanying survey map.

LOCATION: Whitford Hill, Willington, CT (State & County to which this location is related) E. (), W. (), S. (), N. () side
 LOT # ZONE INTENDED USE OF BUILDING mobile telephone system To house electrical equipment for
 SIZE OF LOT: #FT. FRONT #FT. DEEP AREA OF LOT
 SIZE OF BUILDING: 124 FT. X 21 FT. NO. OF STORIES 1 TOTAL FLOOR AREA 325 S. SQ. FT.
 DISTANCE OF BUILDING FROM LOT LINES: FRONT SEE ATTACHED PLAN SIDE REAR
 WORK WILL START ON OR ABOUT November 1, 1986
 OWNER OF LAND Martin W. & Leahraia M. Prohary ADDRESS Cosgrove Rd., Willington, CT
 OWNER OF BUILDING MEIRO MOBILE CTS of Hartford ADDRESS Swanley Ave., Norwalk, CT
 ARCHITECT CON-SERV, INC. ADDRESS Karen Ctr., S-3 Billerica, MA
 BUILDER NORFAST ENGINEERING & CONSTRUCTION CORP. ADDRESS 740 A Main Street, Woburn, MA 01801
 MOBILE IMPROVEMENT CONT. REG. # N/A

This space to be used for Buildings to be Altered, Enlarged, Repaired, Removed or Demolished, Change in use and Special Permit Application.

STATE PROPOSED WORK TO BE DONE OR CHANGE IN USE IN DETAIL:
 (Attach separate sheet if necessary)

Terry D. II
By or 1-800-712-2873

HOW IS THIS WORK NECESSARY?
 HOW WILL THIS WORK BE COMPLETED?
 IF YOU INTEND TO DO THIS WORK IN SEVERAL PHASES, HAVE YOU OBTAINED THE NECESSARY PERMITS OR LICENSES, DO YOU HAVE THE NECESSARY SPECIAL PERMITS, ORDINANCE OR ORDINANCE, WATER (), SEWER (), AND ()?

I hereby agree to comply with the requirements of the Zoning Regulations of the Town of Willington and the provisions of the State Building Code and all other State and Health Codes. The plans and specifications submitted herewith have been prepared in accordance with and are intended to meet these requirements. I hereby certify that I am familiar with the regulations or that I have employed competent persons to assist me in the preparation of the plans and specifications. I further agree that as owner or agent for the owner that the work will be done in accordance with these regulations and that I will employ whatever competent assistance or workmen as may be needed to carry on the work in accordance with the regulations and to remove, replace, or repeat any work not found to be in accordance with the regulations by any authority.

Id. of Person responsible 67-354875 Date of Submission 10/24/86
 IMPORTANT: I hereby certify that I have read and understand the foregoing information. SIGNED [Signature]
 (Name of duly Authorized Agent (Applicant))
 ADDRESS

DO NOT WRITE BELOW THIS LINE

PERMIT NO. / DATE	Map/Parcel	Building Zoning
		<u>455</u>
COMMENTS/CONDITIONS:		<u>LS</u>
<u>CEMETERIAL SAVING COUNCIL OF CT NEEDS FOUND</u> Est. Cost Const. <u>90,000</u> Total <u>28,000</u> Footer <u>15,000</u> Build <u>25,000</u> Site <u>15,000</u> <u>90,000</u>		Driveway _____
		Heating _____
		Electrical _____
		Plumbing _____
		Septic _____
	Other _____	
	TOTAL PD. <u>440 p.d.</u>	
	(chk #/cash)	

* [Signature] 12-11-86
 ZONING AGENT / DATE WILLINGTON DEPARTMENT

PLANNING & ZONING COMMISSION

Wilmington, Connecticut 06279

ZONING PERMIT

This permit is hereby applied for in accordance with the requirements of the Wilmington Zoning Regulations for, Date of Application 19 4/11/09

new construction swimming pool change of use other
 addition sign excavating/filling

Zoning District Lot Area Lot Frontage Required Approvals (see chart)

Record Map # Subdivision Lot No. Special Permit, yes , no

Location Site Plan Approval, yes , no

(House Number) (Street)

Property Owner Address Phone

PROPERTY USE:

Single Family Residence Commercial Other
 Multi-Family Residence Industrial

PROPOSED STRUCTURES

Existing Structures: No. Use

1. Description
 2. Dimensions
 3. Livable Floor Area
 4. Estimated Cost of Construction \$
- L. Health Dept. Approval: # Date:
- C. Driveway permit: # Date:

Conditions of Approval:

Reasons for Denial:

- Plot Plan Attached
 Conforming All Aspects
 Non Conforming

Variance granted to

For Date 19

Permit void if:

- a. Work or activity not commenced within 3 months of the date of issuance
- b. Construction authorized not completed within 1 year of the date of issuance.

This permit, if issued, is based upon the plot plan submitted. Falsification, by misrepresentation or omission; or failure to comply with the conditions of approval of this permit shall constitute a violation of the Wilmington Zoning Regulations.

Signature of owner or authorized agent (Agent's phone) Permit hereby Issued Denied

Fee of PAID

Date 4/14/09

Permit # 2009-0001

by J. Jorgensen
LAND USE AGENT
WILMINGTON LAND USE AGENCY

Zip #

ZONING CERTIFICATE OF COMPLIANCE

Wilmington, Connecticut 06279

Issued to Address Zone

For (Premises covered by certificate)
(House No.) (Street)

Lot # Record # Subdivision #

To verify that a plot plan (attached) certified by on 19 of the above-referenced lot and the structures thereon has been presented to the Zoning Enforcement Officer, and such plan indicates that the construction or use is in conformance with all the applicable Zoning Regulations. Such lot, structures, and/or use are hereby authorized for occupancy. This certificate is based on the certified plot plan submitted. Falsification, by misrepresentation or omission shall constitute a violation of the Wilmington Zoning Regulations and shall invalidate this Certificate.

Date 19

by

LAND USE AGENT
PLANNING ZONING COMMISSION

ATTACHMENT 2

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	<i>Fixed or Adaptive</i>	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)	<i>Airlink Capacity</i>	up to 918 Mbit/s*
Capacity (A2C mode)	<i>Airlink Capacity</i>	up to 1836 Mbit/s*
Encryption	256-bit AES Payload Encryption	
Design Tools	<i>Recommended</i>	Aviat Design™ on aviatcloud.com (includes MIMO, Multi-band)
	<i>Supported</i>	Pathloss 5 (basic support only)

Power Supply

Voltage	<i>DC</i>	±20 to 57V
	<i>PoE</i>	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	<i>Guaranteed</i>	-27 to +131°F (-33° to +55°C)
	<i>Extended</i>	-49 to +159°F (-45° to +65°C) ^[1]
Humidity	<i>Guaranteed</i>	100%
Altitude	<i>Guaranteed</i>	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	FCC CFR 47, Part 101	
	<i>All Federal Frequencies</i>	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	<i>5-28 GHz</i>	± 2.0 dB
	<i>38 GHz</i>	± 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	
	<i>Resolution / Speed</i>	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	<i>BER = 1E-6</i>	-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
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General Specifications

Interfaces

Traffic	<i>2x fixed RJ45</i>	10/100/1000BT Electrical
	<i>2x optional SFP</i>	1, 2.5 & 10Gbps speeds, both Optical (Single and Multi-mode) and Electrical
Power	<i>Direct</i>	24Vdc or 48Vdc
	<i>Power over Ethernet</i>	Via 10/100/1000BT Electrical port
USB support	<i>Management</i>	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

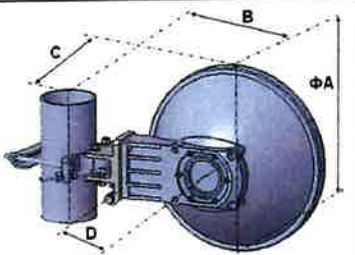
*[] See notes in last page



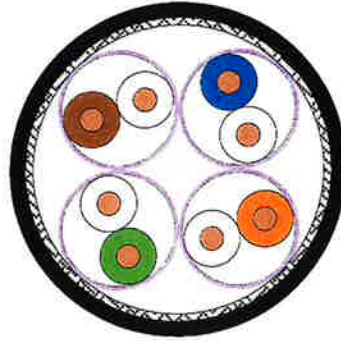
Microwave Antenna Specifications

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 (°C)	-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	ΦA	B	C	D
	(mm)	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					

02YSCH 4X2X0.62/1.5-100 PIMF BK Cat 6A



Design:

Wire

Bare copper wire (22AWG)
Insulation of foamed Polyethylene (PE) with skin

Ø 0.62 mm (0,024 in dia)
Ø 1.50 mm (0,059 in dia)

Screened pair

2 wires twisted to a pair
Alulaminat 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
Wall thickness about 0.80 mm

Ø (8.8±0.3) mm (0.346 ±0.012 in dia)

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

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ATTACHMENT 3



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

Calculated Radio Frequency Emissions Report



Willington CT
56 Cosgrove Road, Willington, CT 06279

November 16, 2023

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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 56 Cosgrove Road in Willington, CT. The coordinates of the monopole tower are 41° 53' 32.90" N, 72° 15' 38.1" W.

Verizon is proposing the following:

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

This report considers the planned¹ antenna configuration for Verizon as well as existing antenna configuration for DISH², T-Mobile³ and Verizon⁴ 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/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 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.

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

² As referenced to T-Mobile's Connecticut Siting Council Notice of Exempt Modification – Cosgrove Road Whifford Hill, West Willington, Connecticut, dated 01/06/2023

³ As referenced to T-Mobile's Connecticut Siting Council Notice of Exempt Modification – Cosgrove Road Whifford Hill, West Willington, Connecticut, dated 01/06/2023

⁴ 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:

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

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	138	
		850	160	15.0	5060		60				
		1900	160	17.9	9866		69				
		2100	240	18.4	16604		64				
		3700	200	25.5	70963	MT6407-77A	-	0	2.92	138	
	Beta	700	160	14.9	4944	NHH-65B-R2B	65	0	5.99	138	
		850	160	15.0	5060		60				
		1900	160	17.9	9866		69				
		2100	240	18.4	16604		64				
		3700	200	25.5	70963	MT6407-77A	-	0	5.99	138	
	Gamma	700	160	14.9	4944	NHH-65B-R2B	65	0	5.99 1	138	
		850	160	15.0	5060		60				
		1900	160	17.9	9866		69				
		2100	240	18.4	16604		64				
		3700	200	25.5	70963	MT6407-77A	-	0	2.92	138	
	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.

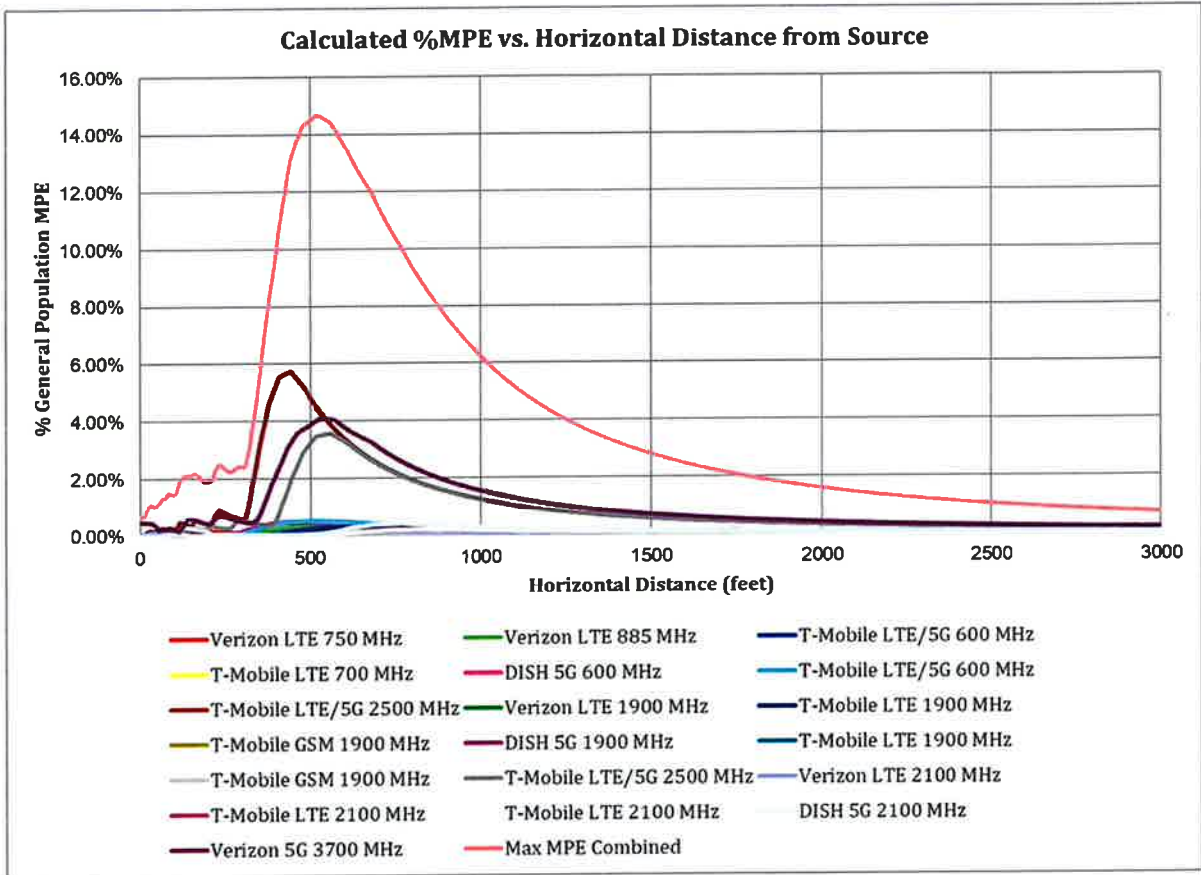


Figure 1: Graph of General Population % MPE vs. Distance

The highest combined value for % MPE for existing emitters (14.65% of the General Population limit) is calculated to occur at a horizontal distance of 529 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 14.65% predicted at 529 feet to the 0.12% predicted for the 28 GHz system at 344 feet to arrive at a total maximum % MPE of 14.77%.

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 529 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
DISH 5G 1900 MHz	1	160.0	114.0	529	0.000625	1.000	0.06%
DISH 5G 2100 MHz	1	160.0	114.0	529	0.000492	1.000	0.05%
DISH 5G 600 MHz	1	160.0	114.0	529	0.001945	0.400	0.49%
T-Mobile GSM 1900 MHz	1	15.0	100.0	529	0.000185	1.000	0.02%
T-Mobile GSM 1900 MHz	1	15.0	125.0	529	0.000022	1.000	0.00%
T-Mobile LTE 1900 MHz	1	160.0	100.0	529	0.001971	1.000	0.20%
T-Mobile LTE 1900 MHz	1	160.0	125.0	529	0.000237	1.000	0.02%
T-Mobile LTE 2100 MHz	1	160.0	125.0	529	0.000262	1.000	0.03%
T-Mobile LTE 2100 MHz	1	160.0	125.0	529	0.000262	1.000	0.03%
T-Mobile LTE 700 MHz	1	120.0	125.0	529	0.000763	0.467	0.16%
T-Mobile LTE/5G 2500 MHz	1	160.0	100.0	529	0.043123	1.000	4.31%
T-Mobile LTE/5G 2500 MHz	1	160.0	125.0	529	0.034929	1.000	3.49%
T-Mobile LTE/5G 600 MHz	1	120.0	125.0	529	0.001102	0.400	0.28%
T-Mobile LTE/5G 600 MHz	1	120.0	100.0	529	0.002091	0.400	0.52%
Verizon 5G 3700 MHz	1	200.0	138.0	529	0.040918	1.000	4.09%
Verizon LTE 1900 MHz	1	160.0	138.0	529	0.000911	1.000	0.09%
Verizon LTE 2100 MHz	1	240.0	138.0	529	0.000861	1.000	0.09%
Verizon LTE 750 MHz	1	160.0	138.0	529	0.002064	0.500	0.41%
Verizon LTE 885 MHz	1	160.0	138.0	529	0.001739	0.567	0.31%
						Total	14.65%
Verizon LTE 28GHz	1	0.2	12.0	344	0.001248	1.000	0.12%
						Grand Total	14.77%

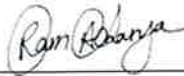
Table 2: Maximum Percent of General Population Exposure Values

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 **14.77%** of the FCC limit (General Population/Uncontrolled). This maximum cumulative percent of MPE value is calculated to occur 529 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

November 15, 2023

Date



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

November 16, 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

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

(A) Limits for Occupational/Controlled Exposure⁵

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

⁵ 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.

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 Exposure⁶

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 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.

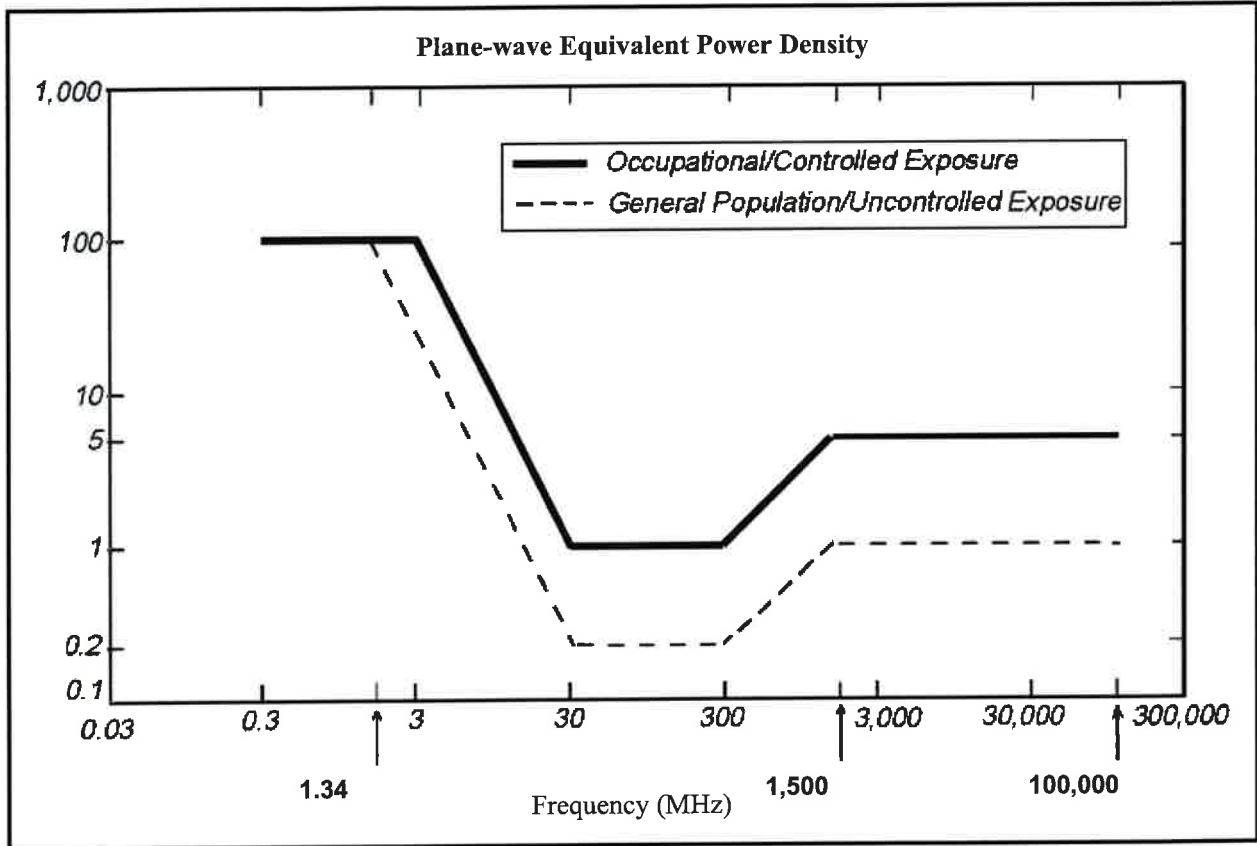
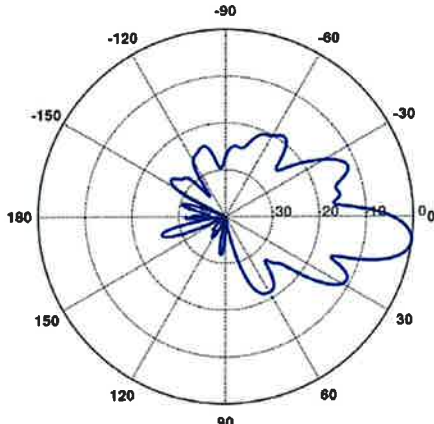
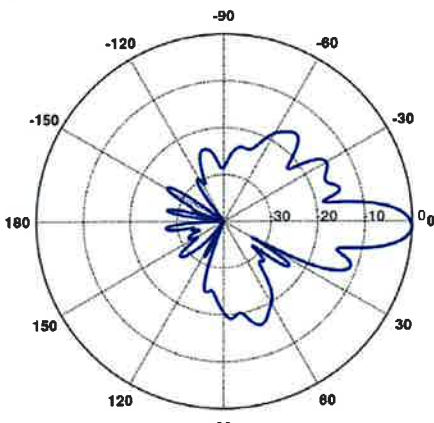
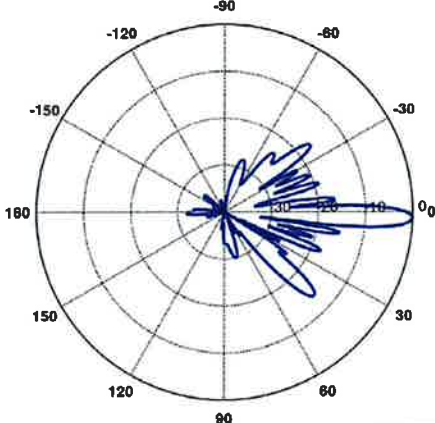
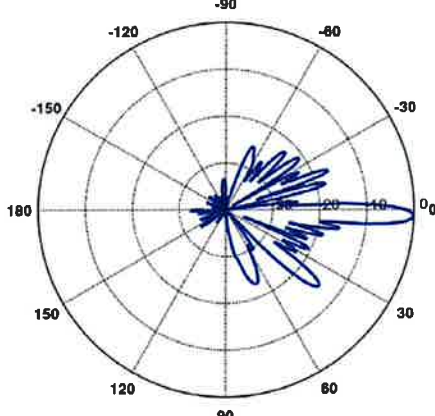


Figure 2: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: Verizon Antenna Model Data Sheets and Electrical Patterns

<p>LTE 700 MHz</p> <p>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"</p>	
<p>LTE 850 MHz</p> <p>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"</p>	

<p>LTE 1900 MHz</p> <p>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"</p>	
<p>LTE 2100 MHz</p> <p>Manufacturer: COMMSCOPE Model #: NHHSS-65B-R2B Frequency Band: 1920-2200 MHz Gain: 18.0 dBi Vertical Beamwidth: 4.9° Horizontal Beamwidth: 64° Polarization: ±45° Dimensions (L x W x D): 71.97" x 11.85" x 7.09"</p>	

Attachment D: Far Field Calculation Sheet

Band	28 GHz
Operating Frequency (MHz)	27,500
General Population MPE (mW/cm²)	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 4



Dewberry Engineers Inc. | 617.695.3400
99 Summer Street, Suite 700 | 617.695.3310 fax
Boston, MA 02110-1200 | www.dewberry.com

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 5

Certificate of Mailing — Firm



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 Robinson & Cole LLP
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