



## Structural Analysis Report

For

**150 West Post Road,  
White Plains, NY**

**Site Name: WST WHP N030**

**KMB ID: 321.5002.Z04**

Prepared For:

**Squan  
329 Harold Avenue  
Englewood, NJ 07631**

Date: May 03, 2022  
Revision #2

*Analyzed By:*

A handwritten signature in blue ink that reads 'Arindam Bose'.

Arindam Bose  
Structural Engineer

*Reviewed By:*



Stephen A. Bray, P.E.  
Professional Engineer  
PE License Number: 086064  
NY Certificate of Authorization: 081784



## Contents

1. Introduction
2. Design Codes
3. Conclusion
4. Appendix A – Calculations
5. Appendix B – Pole Specifications



## **1.0 Introduction**

Pursuant to your request, we have prepared this report describing the methodology and codes used to review the reactions imparted upon the existing steel traffic signal pole with the proposed telecommunications equipment.

This analysis has been performed using Risa3D, a commercially available engineering software program, to create a theoretical mathematical model of the pole members and calculate primary member stresses under various loading conditions.

Information for the existing pole was obtained through a site visit, dated 12/16/20. However, certain assumptions due to concealed conditions and/or measurements not obtainable on-site were made:

- Section 8" O.D. x 0.188" thk from top to bottom.
- Pole shaft material has been considered 6063-T6.
- The transformer base has been considered to be designed to the capacity of the pole.

Additionally, the following attachments are considered to be installed on the steel pole:

<b>Height AGL [ft]</b>	<b>Attachment/Equipment Description</b>	<b>Status</b>
21.75	<b>(3) Samsung antennas</b>	<b>Proposed</b>
11.75	<b>Meter</b>	<b>Proposed</b>
9.4	<b>Disconnect</b>	<b>Proposed</b>
8.0	Crosswalk Signal	Existing
18.6	Secondary Spool	Existing
13.25	Traffic Light	Existing
29.0	Street Sign + Support Arm	Existing



## **2.0 Design Codes**

As part of the design process, engineers licensed to practice in the State of New York, have reviewed the existing pole, foundation, and proposed equipment loading. The applicable design codes which govern the structural analysis of this project are as follows:

- *2020 International Building Code & 2018 International Building Code*
- *Minimum Design Loads for Buildings and other Structures – ASCE 7-16*
- *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures*
  - *TIA/EIA-222-H*
  - *115 mph ultimate wind*
  - *1 in ice thickness*
  - *60 mph under service loads*
  -

## **3.0 Conclusion**

### **Pole:**

Based on the attached calculations, we hereby determine that the existing steel pole will be stressed to **85.2%** of its max allowable capacity.

Proposed pipe reinforcement for the newly drilled holes is not considered in this analysis, moreover the existing structure outside the base of the pole is not considered as a part of this analysis.

Hence, we conclude that the existing aluminium pole can safely support the proposed telecom equipment as documented within the Appendix A calculations provided the assumptions stated in this report are valid.

Existing foundation and soil information was not provided at the time of this analysis. Therefore, a foundation analysis for this pole has not been performed. proposed loading.

Should there be any modifications to the existing or proposed equipment configuration KMB shall be notified to update the report. Should you have any questions or comments do not hesitate to contact us.



# **Appendix A**

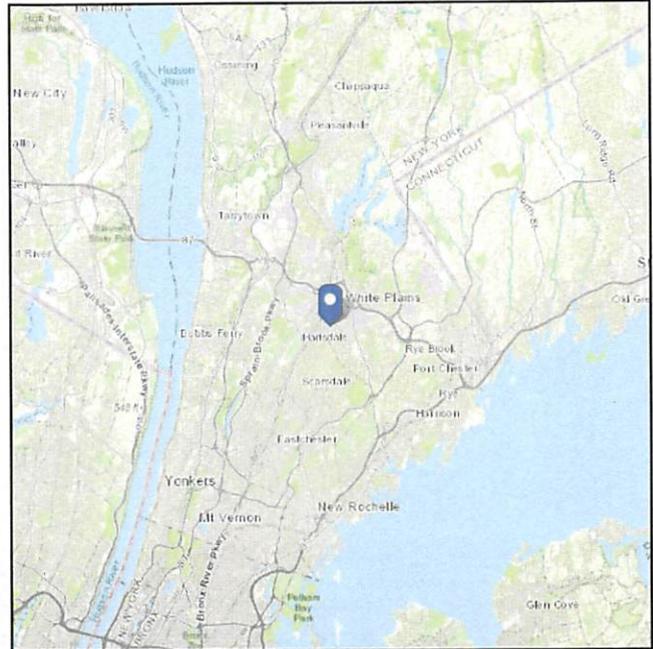
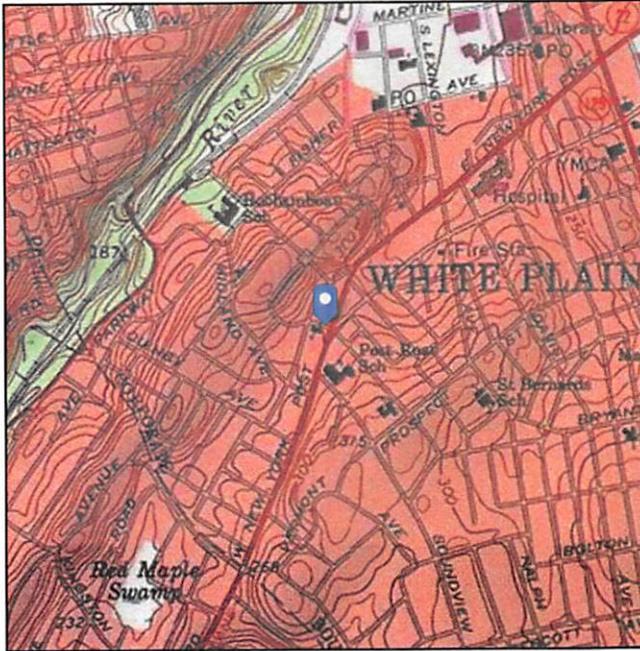
## **Structural Calculations**

# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

**Standard:** ASCE/SEI 7-16  
**Risk Category:** II  
**Soil Class:** D - Stiff Soil

**Elevation:** 247.16 ft (NAVD 88)  
**Latitude:** 41.021767  
**Longitude:** -73.775412



## Wind

### Results:

Wind Speed:	115 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	96 Vmph

**Data Source:** ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1-CC.2-4, and Section 26.5.2  
**Date Accessed:** Thu Mar 18 2021

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

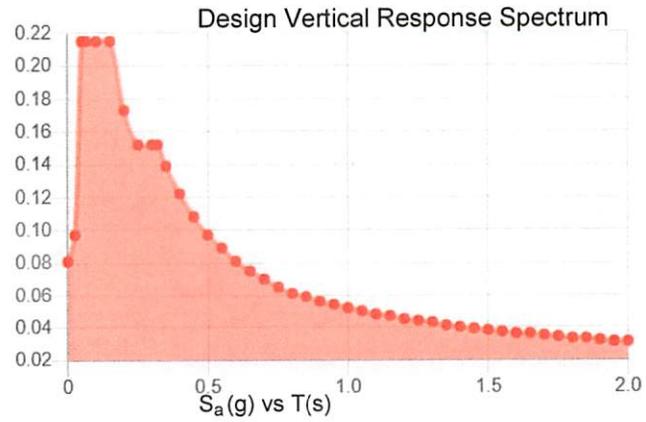
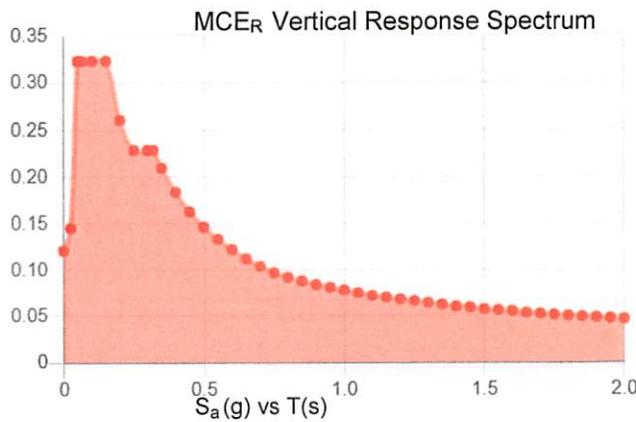
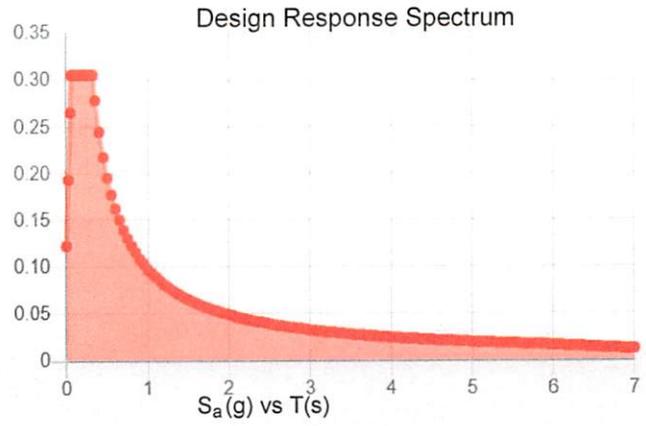
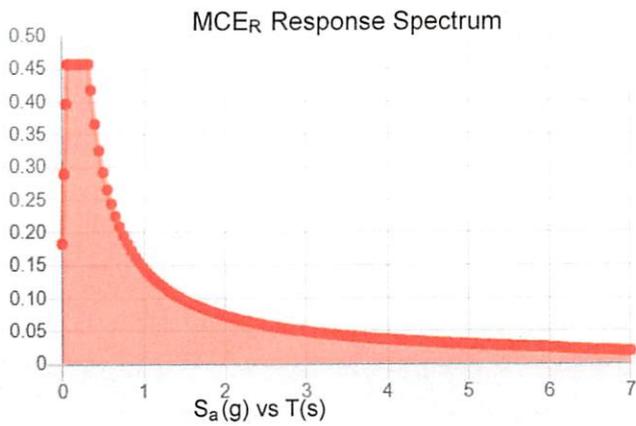
**Seismic**

Site Soil Class: D - Stiff Soil

Results:

$S_S$ :	0.292	$S_{D1}$ :	0.097
$S_1$ :	0.061	$T_L$ :	6
$F_a$ :	1.567	PGA :	0.18
$F_v$ :	2.4	PGA <sub>M</sub> :	0.259
$S_{MS}$ :	0.457	$F_{PGA}$ :	1.44
$S_{M1}$ :	0.146	$I_e$ :	1
$S_{DS}$ :	0.305	$C_v$ :	0.883

Seismic Design Category B



Data Accessed:

Thu Mar 18 2021

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.



## Ice

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### Results:

Ice Thickness: 1.00 in.

Concurrent Temperature: 15 F

Gust Speed: 50 mph

**Data Source:** Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

**Date Accessed:** Thu Mar 18 2021

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

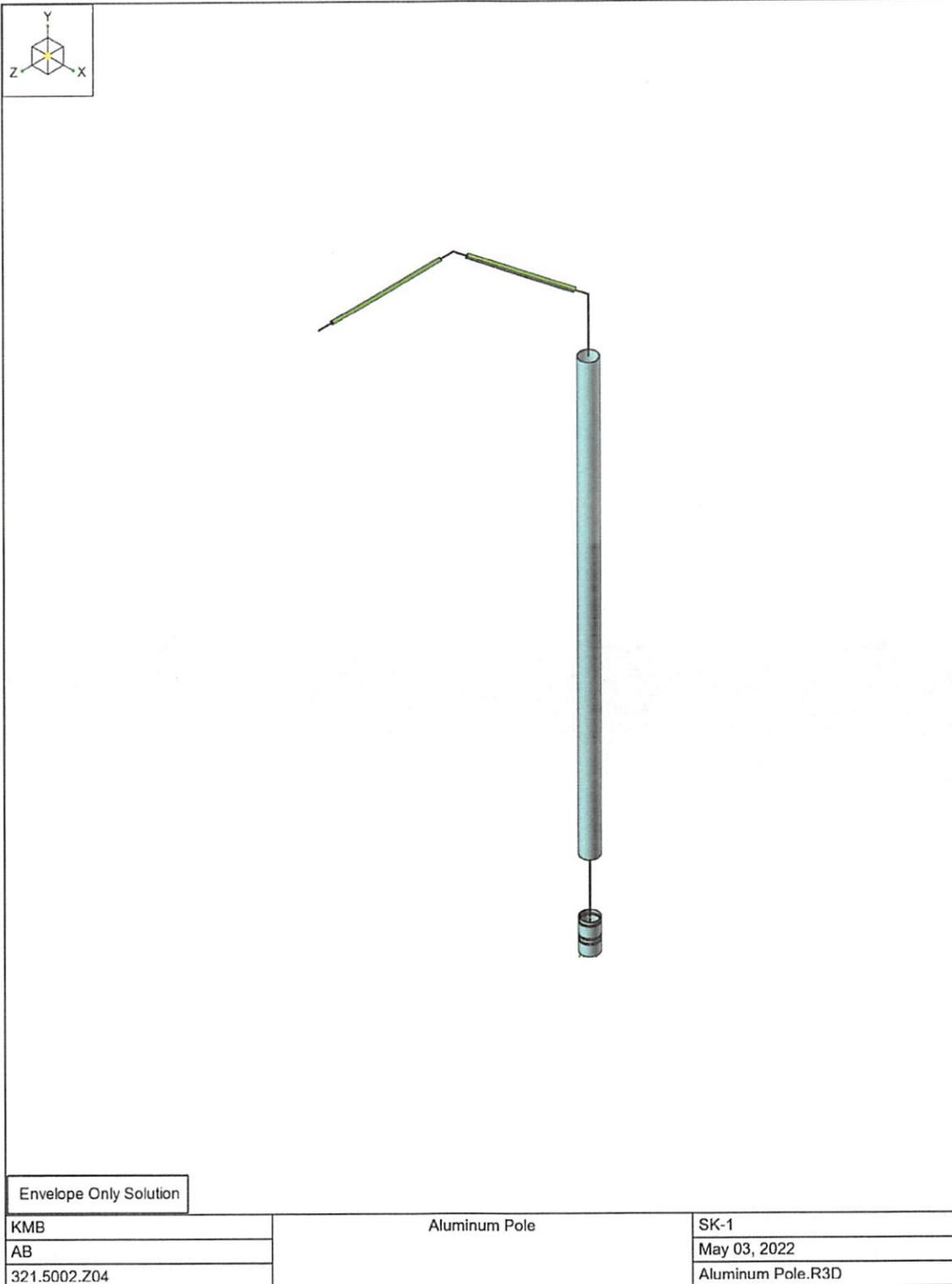
Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

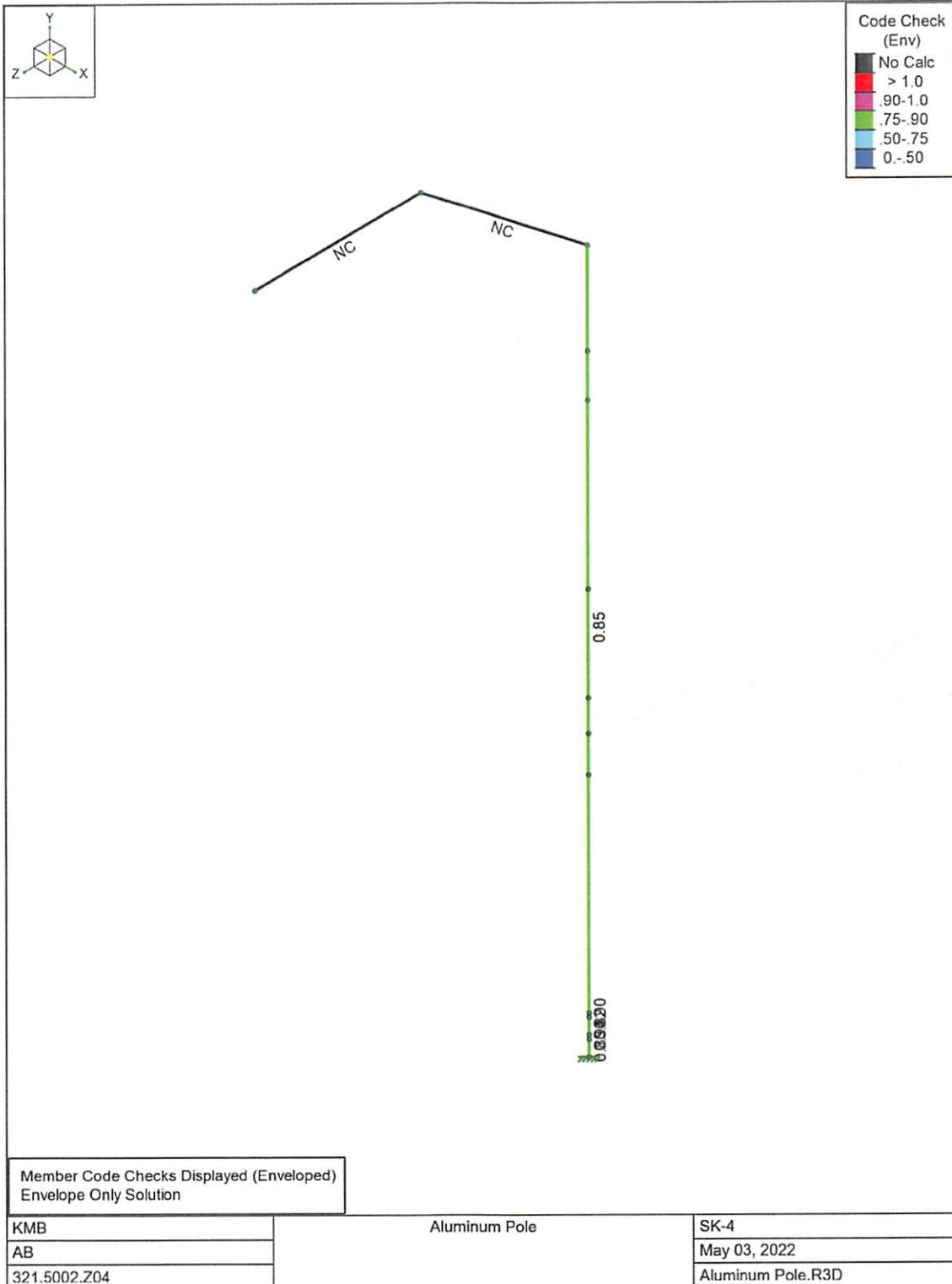
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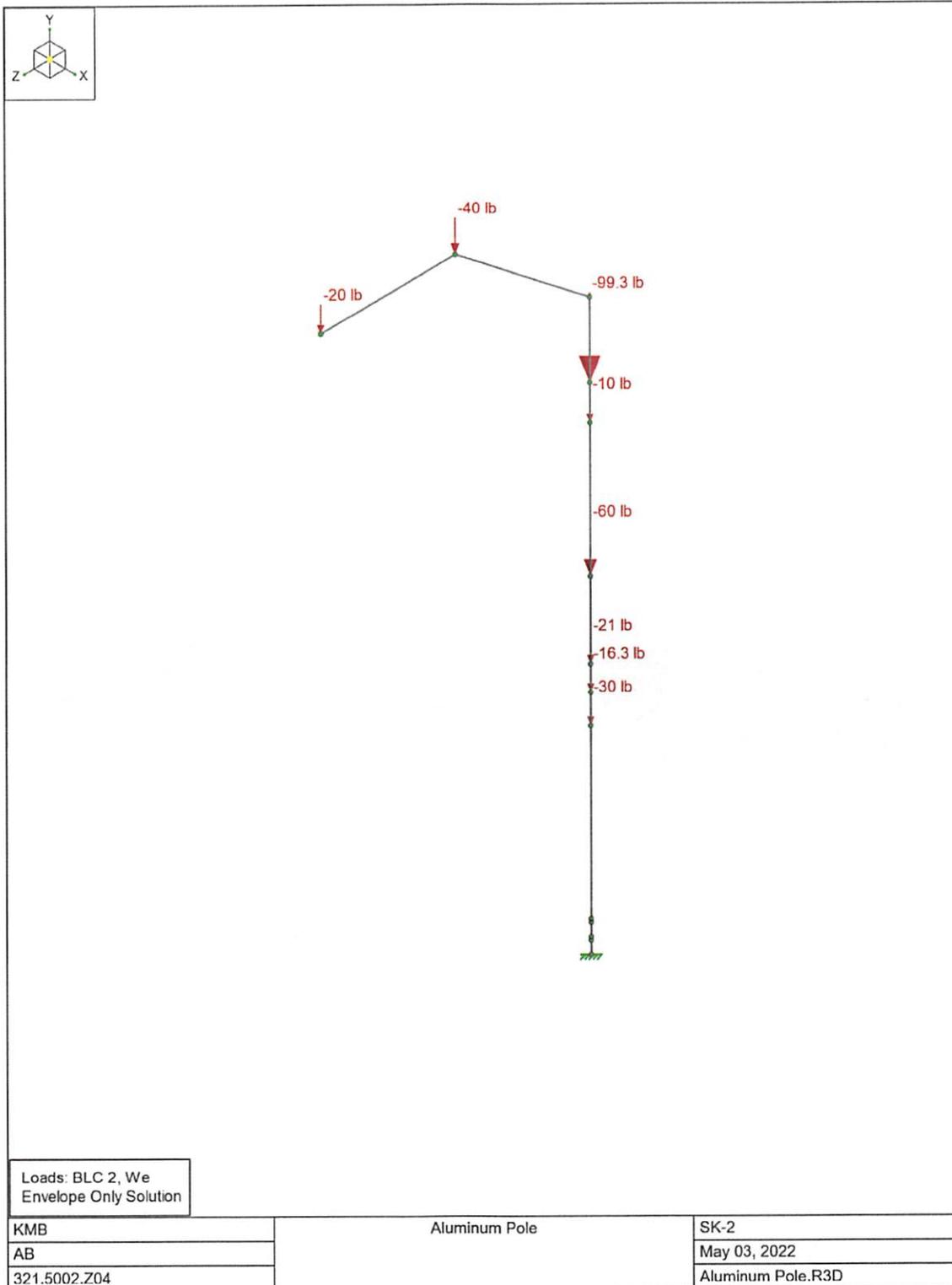
The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

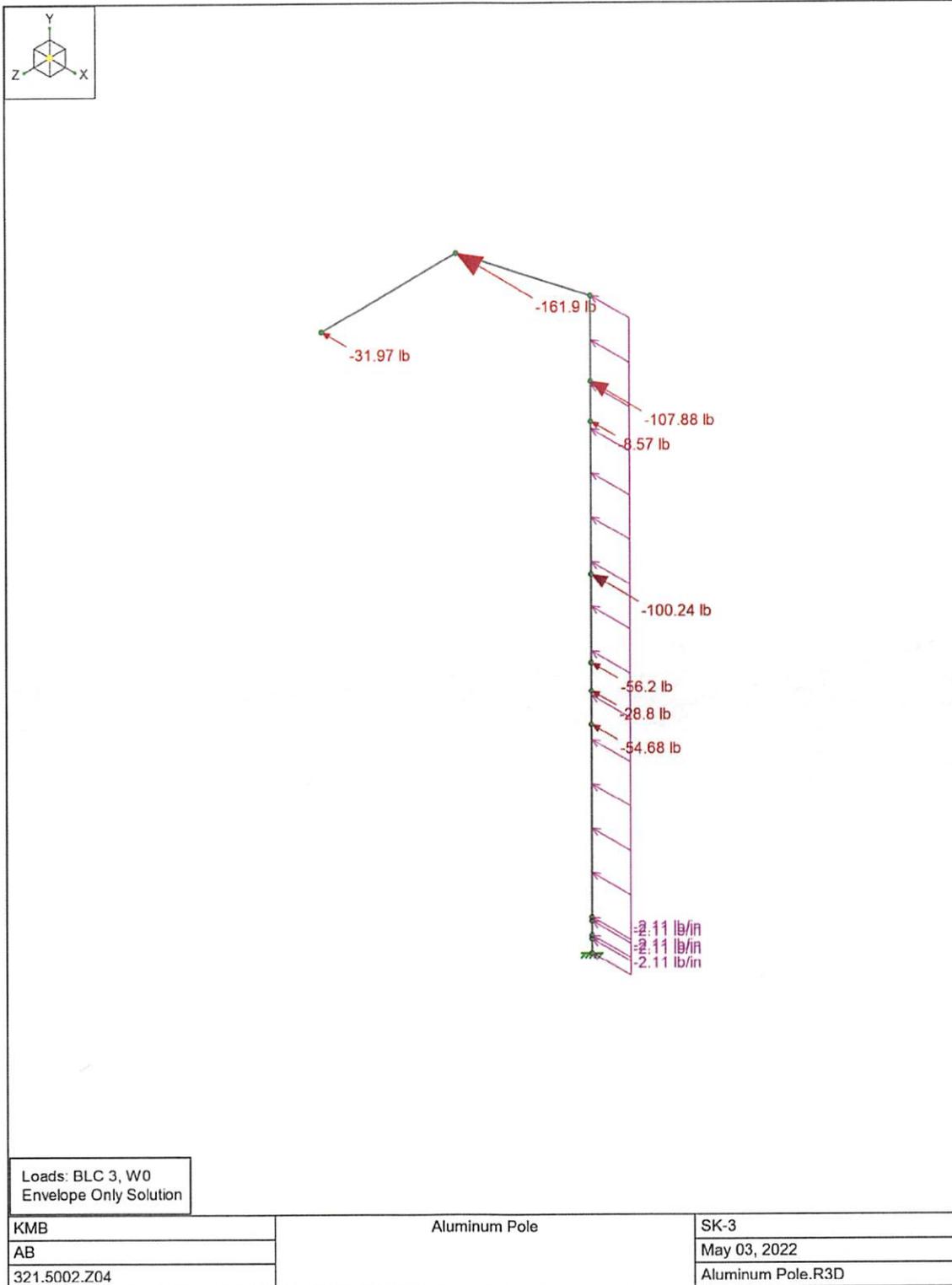
ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

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**Model Settings**

Solution  
Members

Number of Reported Sections	2
Number of Internal Sections	100
Member Area Load Mesh Size (in <sup>2</sup> )	144
Consider Shear Deformation	Yes
Consider Torsional Warping	Yes

Wall Panels

Approximate Mesh Size (in)	24
Transfer Forces Between Intersecting Wood Walls	Yes
Increase Wood Wall Nailing Capacity for Wind Loads	Yes
Include P-Delta for Walls	Yes
Optimize Masonry and Wood Walls	Yes
Maximum Number of Iterations	3

Processor Core Utilization

Single	No
Multiple (Optimum)	Yes
Maximum	No

Axis

Vertical Global Axis

Global Axis corresponding to vertical direction	Y
Convert Existing Data	Yes

Default Member Orientation

Default Global Plane for z-axis	XZ
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Plate Axis

Plate Local Axis Orientation	Nodal
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Codes

Hot Rolled Steel	AISC 15th (360-16): LRFD
Stiffness Adjustment	Yes (Iterative)
Notional Annex	None
Connections	None
Cold Formed Steel	None
Stiffness Adjustment	Yes (Iterative)
Wood	None
Temperature	< 100F
Concrete	None
Masonry	None
Aluminum	AA ADM1-15: LRFD
Structure Type	Building
Stiffness Adjustment	Yes (Iterative)
Stainless	None
Stiffness Adjustment	Yes (Iterative)

Concrete

Compression Stress Block	Rectangular Stress Block
Analyze using Cracked Sections	Yes
Leave room for horizontal rebar splices (2*d bar spacing)	No



Company : KMB  
 Designer : AB  
 Job Number : 321.5002.Z04  
 Model Name : Aluminum Pole

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**Model Settings (Continued)**

List forces which were ignored for design in the Detail Report	Yes
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Rebar

Column Min Steel	1
Column Max Steel	8
Rebar Material Spec	ASTM A615
Warn if beam-column framing arrangement is not understood	No

Shear Reinforcement

Number of Shear Regions	4
Region 2 & 3 Spacing Increase Increment (in)	4

Seismic

RISA-3D Seismic Load Options

Code	ASCE 7-16
Risk Category	I or II
Drift Cat	Other
Base Elevation (ft)	
Include the weight of the structure in base shear calcs	Yes

Site Parameters

S <sub>v</sub> (g)	1
SD <sub>v</sub> (g)	1
SD <sub>s</sub> (g)	1
T <sub>v</sub> (sec)	5

Structure Characteristics

T Z (sec)	
T X (sec)	
C <sub>v</sub> X	0.02
C <sub>v</sub> Exp. Z	0.75
C <sub>v</sub> Exp. X	0.75
R Z	3
R X	3
Ω <sub>v</sub> Z	1
Ω <sub>v</sub> X	1
C <sub>v</sub> Z	1
C <sub>v</sub> X	1
ρ Z	1
ρ X	1

**Aluminum Properties**

Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e <sup>-5</sup> F <sup>-1</sup> ]	Density [lb/ft <sup>3</sup> ]	Table B.4	kt	Ftu [ksi]	Fty [ksi]	Fcy [ksi]	Fsu [ksi]	Ct
1 3003-H14	10100	3787.5	0.33	1.3	172.8	Table B.4-1	1	19	16	13	12	141
2 6061-T6	10100	3787.5	0.33	1.3	172.8	Table B.4-2	1	38	35	35	24	141
3 6063-T5	10100	3787.5	0.33	1.3	172.8	Table B.4-2	1	22	16	16	13	141
4 6063-T6	10100	3787.5	0.33	1.3	172.8	Table B.4-2	1	30	25	25	19	141
5 5052-H34	10200	3787.5	0.33	1.3	172.8	Table B.4-1	1	34	26	24	20	141
6 6061-T6 W	10100	3787.5	0.33	1.3	172.8	Table B.4-1	1	24	15	15	15	141

**Aluminum Section Sets**

Label	Shape	Type	Design List	Material	Design Rule	Area [in <sup>2</sup> ]	Iyy [in <sup>4</sup> ]	Izz [in <sup>4</sup> ]	J [in <sup>4</sup> ]
1 P2.5 SCH. 40	P2.5 SCH. 40	None	None	6061-T6	Typical	1.704	1.53	1.53	3.059
2 P3 SCH. 40	P3 SCH. 40	None	None	6061-T6	Typical	2.228	3.017	3.017	6.034
3 P4.5x0.5 HD	P4.5x0.5 HD	None	None	6061-T6	Typical	6.283	12.763	12.763	25.525
4 P2 SCH 40	P2 SCH 40	None	None	6061-T6	Typical	1.075	0.666	0.666	1.331
5 AL5	P2 SCH 40	None	None	6061-T6	Typical	1.075	0.666	0.666	1.331
6 P8x0.188	P8x0.188	None	None	6063-T6	Typical	4.614	35.217	35.217	70.435
7 Pole Hole	8" X 0.188" Pole Hole	None	None	6063-T6	Typical	4.614	30.217	30.217	70.435

**Node Boundary Conditions**

Node Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot [k-ft/rad]	Y Rot [k-ft/rad]	Z Rot [k-ft/rad]
1 N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2 N5						
3 N6						
4 N7A						
5 N8						
6 N10A						

**Member Primary Data**

Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
1 M1	N1	N11	P8x0.188	None	None	6063-T6	Typical
2 M2	N7	N4	RIGID	None	None	RIGID	Typical
3 M3	N4	N9	RIGID	None	None	RIGID	Typical
4 M4	N11	N12	Pole Hole	None	None	6063-T6	Typical
5 M5	N12	N13	P8x0.188	None	None	6063-T6	Typical
6 M6	N13	N14	Pole Hole	None	None	6063-T6	Typical
7 M7	N14	N9	P8x0.188	None	None	6063-T6	Typical

**Member Advanced Data**

Label	Physical	Deflection Ratio Options	Seismic DR
1 M1	Yes	** NA **	None
2 M2	Yes	** NA **	None
3 M3	Yes	** NA **	None
4 M4	Yes	** NA **	None
5 M5	Yes	** NA **	None
6 M6	Yes	** NA **	None
7 M7	Yes	** NA **	None



**Aluminum Design Parameters**

	Label	Shape	Length [ft]	Function
1	M1	P8x0.188	0.5	Lateral
2	M4	Pole Hole	0.125	Lateral
3	M5	P8x0.188	0.5	Lateral
4	M6	Pole Hole	0.125	Lateral
5	M7	P8x0.188	21.75	Lateral

**Basic Load Cases**

	BLC Description	Category	Y Gravity	Nodal	Distributed
1	Self We	DL	-1.1		
2	We	DL		10	
3	W0	WL		10	5

**Load Combinations**

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
1	Dead + Wind 0°	Yes	Y	1	1.2	2	1.2	3	1

**Envelope Member Section Stresses**

Member	Sec		Axial[ksi]	LC	y Shear[ksi]	LC	z Shear[ksi]	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC	
1	M1	1	max	0.114	1	-0.491	1	0	1	23.579	1	-23.579	1	0.748	1	-0.748	1
2			min	0.114	1	-0.491	1	0	1	23.579	1	-23.579	1	0.748	1	-0.748	1
3		2	max	0.113	1	-0.486	1	0	1	22.81	1	-22.81	1	0.748	1	-0.748	1
4			min	0.113	1	-0.486	1	0	1	22.81	1	-22.81	1	0.748	1	-0.748	1
5	M2	1	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
6			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
7		2	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
8			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
9	M3	1	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
10			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
11		2	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
12			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
13	M4	1	max	0.113	1	-0.487	1	0	1	26.585	1	-26.585	1	0.872	1	-0.872	1
14			min	0.113	1	-0.487	1	0	1	26.585	1	-26.585	1	0.872	1	-0.872	1
15		2	max	0.113	1	-0.485	1	0	1	26.362	1	-26.362	1	0.872	1	-0.872	1
16			min	0.113	1	-0.485	1	0	1	26.362	1	-26.362	1	0.872	1	-0.872	1
17	M5	1	max	0.113	1	-0.486	1	0	1	22.619	1	-22.619	1	0.748	1	-0.748	1
18			min	0.113	1	-0.486	1	0	1	22.619	1	-22.619	1	0.748	1	-0.748	1
19		2	max	0.112	1	-0.48	1	0	1	21.86	1	-21.86	1	0.748	1	-0.748	1
20			min	0.112	1	-0.48	1	0	1	21.86	1	-21.86	1	0.748	1	-0.748	1
21	M6	1	max	0.112	1	-0.481	1	0	1	25.477	1	-25.477	1	0.872	1	-0.872	1
22			min	0.112	1	-0.481	1	0	1	25.477	1	-25.477	1	0.872	1	-0.872	1
23		2	max	0.112	1	-0.48	1	0	1	25.257	1	-25.257	1	0.872	1	-0.872	1
24			min	0.112	1	-0.48	1	0	1	25.257	1	-25.257	1	0.872	1	-0.872	1
25	M7	1	max	0.112	1	-0.484	1	0	1	21.671	1	-21.671	1	0.748	1	-0.748	1
26			min	0.112	1	-0.484	1	0	1	21.671	1	-21.671	1	0.748	1	-0.748	1
27		2	max	0.016	1	-0.087	1	0	1	1.139	1	-1.139	1	0.722	1	-0.722	1
28			min	0.016	1	-0.087	1	0	1	1.139	1	-1.139	1	0.722	1	-0.722	1



Company : KMB  
 Designer : AB  
 Job Number : 321.5002.Z04  
 Model Name : Aluminum Pole

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**Envelope AA ADM1-15: LRFD - BUILDING Member Aluminum Code Checks**

Member	Shape	Code Check	Loc[ft]	LC	Shear	Check	Loc[ft]	LC	$\phi$ Pnc[lb]	$\phi$ Pnt[lb]	$\phi$ Mny[k-ft]	$\phi$ Mnz[k-ft]	$\phi$ Vny[lb]	$\phi$ Vnz[lb]	Cb	Eqn
1	M1	P8x0.188	0.852	0	1	0.1	0	1	103813.178	103813.178	21.192	21.192	31143.953	31143.953	1.013	H.3-3
2	M4	8" X 0.188" Pole Hole	0.936	0	1	0.1	0	1	103815	103815	18.663	18.663	31144.5	31144.5	1.003	H.3-3
3	M5	P8x0.188	0.819	0	1	0.099	0	1	103813.178	103813.178	21.192	21.192	31143.953	31143.953	1.014	H.3-3
4	M6	8" X 0.188" Pole Hole	0.899	0	1	0.099	0	1	103815	103815	18.663	18.663	31144.5	31144.5	1.003	H.3-3
5	M7	P8x0.188	0.846	0	1	0.099	0	1	39423.704	103813.178	19.977	19.977	31143.953	31143.953	1.957	H.3-3

May 18, 2022

Department of Public Works  
City of White Plains  
255 Main Street  
White Plains, New York 10601

**SUBJECT:** Verizon Site WST\_WHP\_N030  
150 West Post Road, White Plains, NY 10601

Dear Commissioner:

ENVIROBUSINESS, INC. (EBI) is pleased to provide this Radio Frequency Electromagnetic Energy (RF-EME) Supplemental Letter for the referenced site. This letter responds to your request to provide documentation of any additional telecommunications facilities authorized by the Federal Communications Commission (FCC) within 75' of the subject site.

EBI has evaluated the documentation provided by Verizon Wireless, studied available online aerial and street level imagery, and searched the FCC's Antenna Structure Registration<sup>1</sup> for additional telecommunications facilities in the immediate vicinity of the proposed Verizon Wireless installation. Upon a best effort review of these resources, EBI has found no known telecommunications facilities within 75' of the subject site.

Please do not hesitate to contact me at (717) 606-2645, or [asimpson@ebiconsulting.com](mailto:asimpson@ebiconsulting.com) with any comments or questions you may have regarding this letter.

Sincerely yours,



Andrew Simpson  
Project Manager II / Field Technical Lead

---

<sup>1</sup> The FCC's ASR applies only to sites over 200' tall. However, a best effort search was completed yielding no antenna registrations within 0.5 kilometers of the subject site.

# Radio Frequency - Electromagnetic Energy (RF-EME) Jurisdictional Report

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Site No. 526000  
WST\_WHP\_N030  
150 West Post Road  
White Plains, New York 10601  
Westchester County

EBI Project No. 6221002720  
May 18, 2022



Prepared for:  
Verizon Wireless  
4 Centerock Road  
West Nyack, NY 10994

Prepared by:



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## **EXECUTIVE SUMMARY**

### **Purpose of Report**

EnviroBusiness Inc. (dba EBI Consulting) has been contracted by Verizon Wireless to conduct radio frequency electromagnetic (RF-EME) modeling for Verizon Wireless' proposed facility ("Facility") located on the existing light pole at 150 West Post Road in White Plains, New York ("Site") to determine RF-EME exposure levels from proposed Verizon Wireless communications equipment at this Site. As described in greater detail in Appendix C of this report, the Federal Communications Commission (FCC) has developed Maximum Permissible Exposure (MPE) Limits for the general population and for occupational activities. The FCC requires wireless system operators to perform an assessment of potential human exposure to RF fields emanating from all transmitting antennas at a site whenever antenna operations are added or modified, and to ensure compliance with the MPE limit in the FCC regulations. This report summarizes the results of RF-EME modeling in relation to relevant FCC RF-EME regulations/compliance standards.

This report describes modeling calculations of RF levels associated with the proposed antennas. We have performed these modeling calculations employing standard FCC mathematical models for calculating the effects of the antennas in a conservative manner. Therefore, our results provide worst-case RF levels to ensure the conclusions are conservative with regard to compliance with the FCC limit for safe continuous exposure.

### **Statement of Compliance**

In this case, there are no other existing antenna carriers at the Site to include in the compliance assessment. Note that FCC regulations require any future antenna collocators to assess and assure continuing compliance based on the cumulative effects of all then-proposed and then-existing antennas at the Site. As presented in the sections below, our conclusions are based on worst-case modeling calculations related to the existing and proposed antennas.

At ground level, the conservatively calculated maximum cumulative exposure level from Verizon Wireless at this Site is approximately 7.45 percent of the FCC's general population limit (1.49 percent of the FCC's occupational limit).

At the antenna face level, the worst-case emitted power density may exceed the FCC's general population limit within approximately 6 feet directly in front of Verizon Wireless' proposed antennas and within approximately 5 feet below the bottom of Verizon Wireless' proposed antenna on the utility pole. However, Verizon Wireless' antennas transmit in front of the antennas into free space/midair in these locations, so that no walking surfaces are affected.

As a precaution Verizon Wireless recommends RF signage as outlined in Section 4.0 to the extent not already installed. Additionally, workers climbing the light pole should be informed about the presence and locations of antennas and their associated fields. It is also recommended that in connection with a lockout/tagout procedure, any non-Verizon Wireless worker/contractor who will be working on the light pole contact Verizon Wireless since only Verizon Wireless has the ability to lockout/tagout the Facility, or to authorize others to do so.

## **1.0 INTRODUCTION**

Verizon Wireless' public utility wireless communications facilities typically consist of: 1) electronic transceivers (the radios or cabinets) connected to wired telephone lines; and 2) antennas that send and

receive the wireless signals created by the transceivers to be most commonly received by individual subscriber units (wireless telephones). Transceivers are typically connected to antennas by fiber or coaxial cables.

Because of the short wavelength of the radio waves used in wireless services, the antennas require line-of-site paths for good propagation, and are typically installed a distance above ground level, affording a larger line of sight area. Antennas are constructed to propagate towards the horizon, with as little energy as possible scattered towards the ground or the sky. This design, combined with the low power of such facilities, typically results in no exposure approaching Maximum Permissible Exposure (MPE) levels, with the exception of areas in close proximity in front of the antennas.

Emissions at or below MPE limits do not represent any health risk, since they are designed to provide a substantial margin of safety. Importantly, such limits are calculated to allow for continuous exposures, including a prudent margin of safety for all persons, regardless of age, gender, size or health.

## 2.0 SITE DESCRIPTION

This project site includes the following proposed wireless telecommunication antennas on a light pole located at 150 West Post Road in White Plains, New York.

Ant #	NAME	Antenna Radiation Centerline	Antenna Model
1	Verizon Wireless	21.8	Samsung ATIK04
2	Verizon Wireless	21.8	Samsung ATIK04
3	Verizon Wireless	21.8	Samsung ATIK04

The above table contains an inventory of proposed Verizon Wireless Antennas. Note that for modeling purposes, EBI uses a conservative/worst-case assumed set of antenna specifications and powers. The FCC guidelines incorporate two separate tiers of exposure limits that are based upon occupational exposure limits (for workers) and general population exposure limits for members of the general population. This analysis has considered exposures with respect to both occupational and general population limits to provide a fully comprehensive report. Additional information regarding occupational/general population exposure limits is provided in Appendix C.

## 3.0 WORST-CASE MODELING CALCULATIONS

EBI has performed MPE modeling calculations using RoofMaster™ software to estimate the worst-case cumulative power density resulting from operation of antennas at the Site. RoofMaster™ is a widely-used MPE modeling program that has been developed to predict RF power density values for rooftop and tower telecommunications sites produced by antennas that are typically used in connection with wireless services. Using the computational methods set forth in Federal Communications Commission (FCC) Office of Engineering & Technology (OET) Bulletin 65, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields" (OET-65), RoofMaster™ calculates predicted power density in a scalable grid based on the contributions of all RF sources characterized in the study scenario. At each grid location, the cumulative power density is expressed as a percentage of the FCC limits. Manufacturer antenna pattern data is utilized in these calculations. RoofMaster™ models consist of the Far Field model as specified in OET-65 and an implementation of the OET-65 Cylindrical Model (Sula9). The models utilize several operational specifications for different types of antennas to produce a plot of spatially-averaged power densities that can be expressed as a percentage of the applicable exposure limit.

For this report, EBI utilized antenna and power data provided by Verizon Wireless and information gathered from other sources. As noted above, EBI used the conservative/worst-case assumed set of antenna specifications and power. EBI then compared the resultant worst-case MPE levels to the FCC's occupational exposure limits outlined in OET Bulletin 65. The parameters used for modeling are summarized in the Site Description antenna inventory table in Section 2.0.

There are no other wireless carriers with equipment installed at this site.

The inputs used in the modeling are summarized in the Site Description antenna inventory table in Section 2.0. Signage recommendations based on the RoofMaster™ modeling results are presented in Appendix B.

At ground level the maximum cumulative exposure level from Verizon Wireless at this Site is approximately 7.45 percent of the FCC's general population limit (1.49 percent of the FCC's occupational limit).

#### **4.0 MITIGATION/SITE CONTROL OPTIONS**

EBI's modeling indicates that based on worst-case modeling calculations related to the proposed antennas at ground level, the maximum cumulative exposure level from all carriers on this Site is approximately 7.45 percent of the FCC's general population limit (1.49 percent of the FCC's occupational limit). As noted above, there may be exposures that exceed the FCC's general population limits, but as these transmit in front of the antennas into free space/midair, no walking surfaces are affected. As a precaution, and in order to alert people accessing the light pole, blue Notice signs are recommended for installation 5 feet below the bottom of the antennas on opposite sides of the light pole.

Implementation of the signage recommended above will bring this site into compliance with the FCC's rules and regulations.

#### **5.0 SUMMARY AND CONCLUSIONS**

EBI has prepared a Radiofrequency – Electromagnetic Energy (RF-EME) Compliance Report in connection with Verizon Wireless' proposed telecommunications equipment to be installed by at 150 West Post Road in White Plains, New York to determine worst-case calculated RF-EME exposure levels from the proposed Facility at this Site. This report summarizes the results of RF-EME modeling in relation to relevant Federal Communications Commission (FCC) RF-EME compliance standards for limiting human exposure to RF-EME fields.

As presented in the sections above, based on the FCC criteria, at ground level, the conservatively calculated maximum cumulative exposure level from Verizon Wireless at this Site is approximately 7.45 percent of the FCC's general population limit (1.49 percent of the FCC's occupational limit).

At the antenna face level, the worst-case emitted power density may exceed the FCC's general population limit within approximately 6 feet directly in front of Verizon Wireless' proposed antennas and within approximately 5 feet below the bottom of Verizon Wireless' proposed antennas on the utility pole. However, Verizon Wireless' antennas transmit in front of the antennas into free space/midair in these locations, so that no walking surfaces are affected.

As a precaution Verizon Wireless recommends RF signage as outlined in Section 4.0 to the extent not already installed. Additionally workers climbing the light pole should be informed about the presence and locations of antennas and their associated fields. It is also recommended that in connection with a lockout/tagout procedure, any non-Verizon Wireless worker/contractor who will be working on the light

pole contact Verizon Wireless since only Verizon Wireless has the ability to lockout/tagout the Facility, or to authorize others to do so.

The results of the calculations, along with the described control measures (if any), combine to satisfy the FCC's RF compliance requirements and associated guidelines.

As noted above, because of the conservative calculation methodology and operational assumptions applied in the analysis based on the table in Section 2.0, the actual MPE levels of the proposed Verizon Wireless antennas will likely be less significant than the calculated results here indicate.

## **6.0 LIMITATIONS**

This report was prepared at the request of Verizon Wireless. It was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same locale under like circumstances. The conclusions provided by EBI are based solely on the information provided by the client. The observations in this report are valid on the date of the investigation. Any additional information that becomes available concerning the Site should be provided to EBI so that our conclusions may be revised and modified, if necessary. This report has been prepared in accordance with Standard Conditions for Engagement and authorized proposal, both of which are integral parts of this report. No other warranty, expressed or implied, is made.

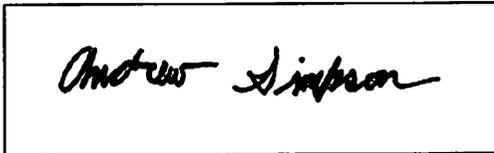
## **Appendix A**

### **Certifications**

## Preparer Certification

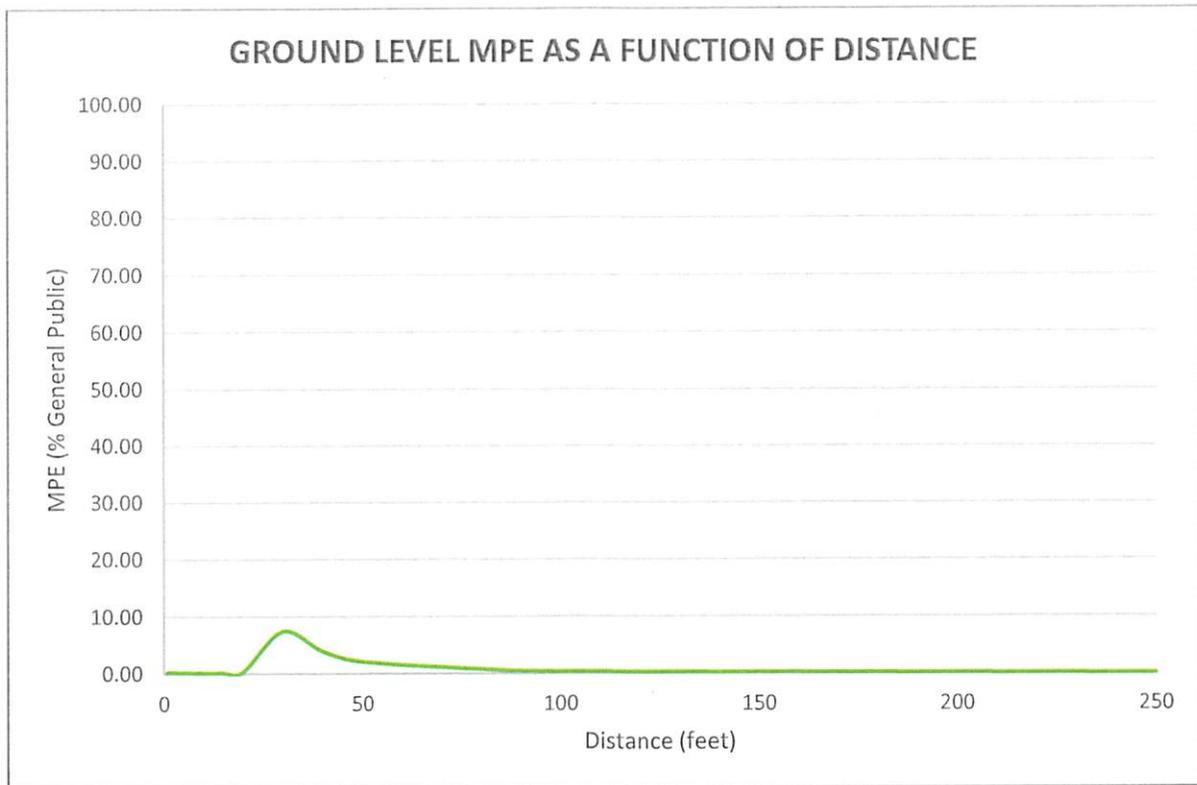
I, Andrew Simpson, state that:

- I am an employee of EnviroBusiness Inc. (d/b/a EBI Consulting), which provides RF-EME safety and compliance services to the wireless communications industry.
- I have successfully completed RF-EME safety training, and I am aware of the potential hazards from RF-EME and would be classified "occupational" under the FCC regulations.
- I am fully aware of and familiar with the Rules and Regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation.
- I have reviewed the data provided by the client and incorporated it into this Site Compliance Report such that the information contained in this report is true and accurate to the best of my knowledge.



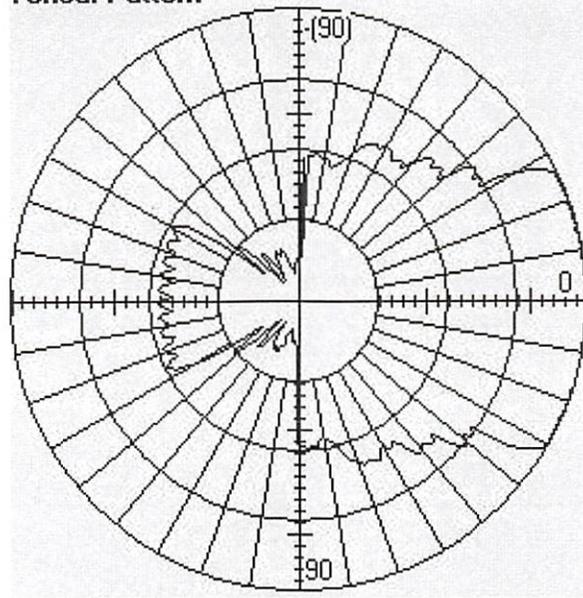
## **Appendix B**

### **Safety Information**



\*FCC MPE calculated based on power density

### Vertical Pattern



Samsung AT1K04

## RF Signage and Safety Information

### RF Signage

Areas or portions of any transmitter site may be susceptible to high power densities that could cause personnel exposures in excess of the FCC guidelines. These areas must be demarcated by conspicuously posted signage that identifies the potential exposure. Signage must be viewable regardless of the viewer's position. Signs must be legible and readily viewable and readable at a minimum distance of five feet (1.52 meters) from the boundary (and as necessary on approach to this boundary) at which the applicable limits are exceeded, and that controls or indicators be placed at compliance boundaries. The minimum readable letter height at 5 feet from the signage is 0.20 inches for the Message and 0.44 inches for the Signal.

GUIDELINES	NOTICE	CAUTION	WARNING
This sign will inform anyone of the basic precautions to follow when entering an access point to an area with transmitting radiofrequency equipment.	This sign indicates that RF emissions may exceed the FCC General Population MPE limit.	This sign indicates that RF emissions may exceed the FCC Occupational MPE limit.	This sign indicates that RF emissions may exceed at least 10x the FCC Occupational MPE limit.
			
NOC INFORMATION			
Information signs are used as a means to provide contact information for any questions or concerns. They will include specific cell site identification information and the Verizon Wireless Network Operations Center phone number.			

### Physical Barriers

Physical barriers are control measures that require awareness and participation of personnel. Physical barriers are employed as an additional administration control to complement RF signage and physically demarcate an area in which RF exposure levels may exceed the FCC General Population limit. **Example:** chain-connected stanchions

### Indicative Markers

Indicative markers are visible control measures that require awareness and participation of personnel, as they cannot physically prevent someone from entering an area of potential concern. Indicative markers are employed as an additional administration control to complement RF signage and visually demarcate an area in which RF exposure levels may exceed the FCC General Population limit. **Example:** paint stripes

### Occupational Safety and Health Administration (OSHA) Requirements

A formal adopter of FCC Standards, OSHA stipulates that those in the Occupational classification must complete training in the following: RF Safety, RF Awareness, and Utilization of Personal Protective Equipment. OSHA also provides options for Hazard Prevention and Control:

Hazard Prevention	Control
<ul style="list-style-type: none"> <li>• Utilization of good equipment</li> <li>• Enact control of hazard areas</li> <li>• Limit exposures</li> <li>• Employ medical surveillance and accident response</li> </ul>	<ul style="list-style-type: none"> <li>• Employ Lockout/Tag out</li> <li>• Utilize personal alarms &amp; protective clothing</li> <li>• Prevent access to hazardous locations</li> <li>• Develop or operate an administrative control program</li> </ul>

**Appendix C**  
**Federal Communications**  
**Commission (FCC) Requirements**

The FCC has established Maximum Permissible Exposure (MPE) limits for human exposure to Radiofrequency Electromagnetic (RF-EME) energy fields, based on exposure limits recommended by the National Council on Radiation Protection and Measurements (NCRP) and, over a wide range of frequencies, the exposure limits developed by the Institute of Electrical and Electronics Engineers, Inc. (IEEE) and adopted by the American National Standards Institute (ANSI) to replace the 1982 ANSI guidelines. Limits for localized absorption are based on recommendations of both ANSI/IEEE and NCRP.

The FCC guidelines incorporate two separate tiers of exposure limits that are based upon occupational/controlled exposure limits (for workers) and general population/uncontrolled population exposure limits for members of the general population.

**Occupational/controlled exposure limits** apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

**General population/uncontrolled exposure limits** apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment-related.

Table I and Figure I (below), which are included within the FCC's OET Bulletin 65, summarize the MPE limits for RF emissions. These limits are designed to provide a substantial margin of safety. They vary by frequency to take into account the different types of equipment that may be in operation at a particular facility and are "time-averaged" limits to reflect different durations resulting from occupational and general population exposures.

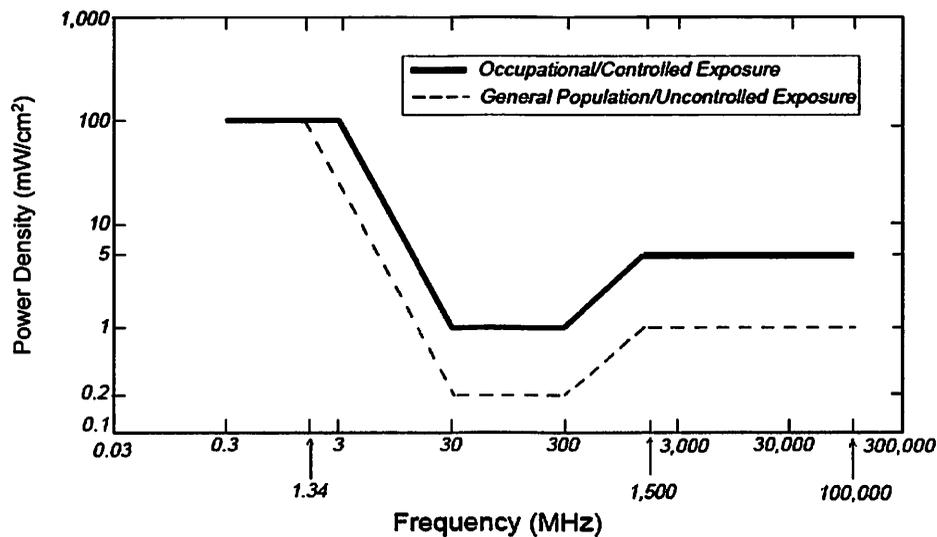
The FCC's MPEs are measured in terms of power (mW) over a unit surface area (cm<sup>2</sup>). Known as the power density, the FCC has established an occupational MPE of 5 milliwatts per square centimeter (mW/cm<sup>2</sup>) and an uncontrolled MPE of 1 mW/cm<sup>2</sup> for equipment operating in the 1900 MHz frequency range. For the Verizon Wireless equipment operating at 700 MHz or 850 MHz, the FCC's occupational MPE is 2.83 mW/cm<sup>2</sup> and an uncontrolled MPE of 0.57 mW/cm<sup>2</sup>. For the Verizon Wireless equipment operating at 1900 MHz, the FCC's occupational MPE is 5.0 mW/cm<sup>2</sup> and an uncontrolled MPE limit of 1.0 mW/cm<sup>2</sup>. These limits are considered protective of these populations.

Table I: Limits for Maximum Permissible Exposure (MPE)				
(A) Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time [E] <sup>2</sup> , [H] <sup>2</sup> , or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f <sup>2</sup> )*	6
30-300	61.4	0.163	1.0	6
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time [E] <sup>2</sup> , [H] <sup>2</sup> , or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1,500	--	--	f/1,500	30
1,500-100,000	--	--	1.0	30

f = Frequency in (MHz)

\* Plane-wave equivalent power density

Figure 1. FCC Limits for Maximum Permissible Exposure (MPE)  
 Plane-wave Equivalent Power Density



Based on the above, the most restrictive thresholds for exposures of unlimited duration to RF energy for several personal wireless services are summarized below:

Personal Wireless Service	Approximate Frequency	Occupational MPE	Public MPE
Microwave (Point-to-Point)	5,000 - 80,000 MHz	5.00 mW/cm <sup>2</sup>	1.00 mW/cm <sup>2</sup>
Broadband Radio (BRS)	2,600 MHz	5.00 mW/cm <sup>2</sup>	1.00 mW/cm <sup>2</sup>
Wireless Communication (WCS)	2,300 MHz	5.00 mW/cm <sup>2</sup>	1.00 mW/cm <sup>2</sup>
Advanced Wireless (AWS)	2,100 MHz	5.00 mW/cm <sup>2</sup>	1.00 mW/cm <sup>2</sup>
Personal Communication (PCS)	1,950 MHz	5.00 mW/cm <sup>2</sup>	1.00 mW/cm <sup>2</sup>
Cellular Telephone	870 MHz	2.90 mW/cm <sup>2</sup>	0.58 mW/cm <sup>2</sup>
Specialized Mobile Radio (SMR)	855 MHz	2.85 mW/cm <sup>2</sup>	0.57 mW/cm <sup>2</sup>
Long Term Evolution (LTE)	700 MHz	2.33 mW/cm <sup>2</sup>	0.47 mW/cm <sup>2</sup>
Most Restrictive Frequency Range	30-300 MHz	1.00 mW/cm <sup>2</sup>	0.20 mW/cm <sup>2</sup>

MPE limits are designed to provide a substantial margin of safety. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

Verizon Wireless' public utility wireless communications facilities typically consist of: 1) electronic transceivers (the radios or cabinets) connected to wired telephone lines; and 2) antennas that send the wireless signals created by the transceivers to be received by individual subscriber units (wireless telephones). Transceivers are typically connected to antennas by fiber or coaxial cables.

Because of the short wavelength of the radio waves used in wireless services, the antennas require line-of-site paths for good propagation, and are typically installed above ground level, affording a larger line of sight area. Antennas are constructed to propagate towards the horizon, with as little energy as possible scattered towards the ground or the sky. This design, combined with the low power of such facilities, typically results in no exposure approaching Maximum Permissible Exposure (MPE) levels, with the exception of areas directly in front of the antennas.

### FCC Compliance Requirement

A site is considered out of compliance with FCC regulations if there are areas that exceed the FCC exposure limits and there are no RF hazard mitigation measures in place. Any carrier which has an installation that contributes more than 5% of the applicable MPE must participate in mitigating these RF hazards.

**Appendix D**  
**City of White Plains Guidelines For Cellular Antenna Applications**



## **Guidelines for Cellular Antenna Applications**

The following list represents typical requirements of the Planning Board and Department of Public Works in addition to the Special Permit requirements of the Zoning Ordinance. Additional information may be requested on a case by case basis.

1. Electromagnetic wave emission power densities should be calculated using data from a worst case scenario. Reports of RF exposure levels on compliance with FCC regulations must be signed and sealed by a professional engineer.
2. The application should include a list of all applicable formulas with each variable defined. Units should be consistent, with power densities stated in  $\text{mW}/\text{cm}^2$ .
3. Final results should always include the percentage of FCC maximum permitted exposure (%MPE) for an uncontrolled environment and a controlled environment.
4. Power density graphs should be included which show the power density expressed as a percentage of FCC maximum permitted exposure and as a continuous function of the distance measured from 0 feet to 200 feet. If a chart is used instead of a graph, the chart should show the power density with the distance given in two-foot increments from 0 to 10 feet, and in ten-foot increments from 10 to 200 feet. If the antenna is placed on a low-rise building or in a low-lying area, information on the beam spread of the antennas and its effect on radiation levels should be included.
5. If there is more than one source of radiation within 75ft of the proposed site, then a table of each source of radiation in  $\text{mW}/\text{cm}^2$  should be included. The cumulative radiation levels in  $\text{mW}/\text{cm}^2$  and total %MPE for uncontrolled environment & controlled environment must be calculated.
6. In the case where the uncontrolled environment exceeds the maximum permitted exposure, and only a controlled environment falls within the maximum permitted exposure, the applicant should explain what measure will be taken to control and limit exposure to radiation.
7. If the applicant uses a less than 100% reflection factor, the applicant should justify why that is appropriate.
8. Proposed antenna connections must be designed by a New York State licensed professional engineer in accordance with the latest TIA/EIA specifications for sustained winds of 100mph. A note must be placed on the plan referring to this specification.
9. The TIA is proposing to use three-second gusts and the use of load-reduction factor design. Further consideration is being proposed by these groups for ice loading and seismic effects. The TIA and the American Society of Civil Engineers are currently working on respective changes to align their organizations' documents to ensure that wind speeds, wind-speed averaging and other structural designs agree. The TIA formulas should be used with 100mph winds. Thus, this "standard" which is not intended to supersede applicable codes, but rather represents accepted industry practices for minimum design standards, can adequately safeguard the proposed

TOTAL P. 83

antennas from the uncertain effects of the adjacent urban buildings and the history of storms in this vicinity. Such design criteria (TIA criteria with 100mph winds) should be finalized in a report to the Commissioner of Public Works directly from the applicant's licensed engineer.

10. Per past practice for previous transmitters, applicants will be required to examine electromagnetic wave emission levels from the antennas to determine if these levels are within FCC and New York State Department of Health standards. To that end, the Commissioner of Public Works will hire a qualified, independent testing company to perform the necessary tests. Testing costs will be paid for via an escrow account placed with the City of White Plains by the applicant in the amount of \$3,500.00. The applicant will then be required to replenish the escrow account up to the original amount of \$3,500.00 as funds are drawn down to pay for testing. It is estimated that tests will thereafter be conducted at five (5) year intervals, or sooner in the event of any alteration to the facility. Test scope and frequency shall be left to the sole discretion of the Commissioner of Public Works. Further, the applicant shall provide the Commissioner of Public Works with a report detailing calculated data pertaining to Maximum Permissible Exposure (MPE) levels, especially at distances less than 75 feet from the antennas.
11. The FCC requires compliance with paragraphs (b)(1) through (b)(3) of Section FCC 97-303, 12 FCC Rcd 13494, 1997, which deals with safety limits for human exposure to RF emissions. It is the responsibility of the respective telecommunications licensees, not tower owners to undertake an evaluation and file Environmental Assessments, if required, due to non-compliance with the RF rules. The Department of Public Works shall be provided with copies of the licensee's calculations and reports concerning these regulations.
12. The applicant should submit a list of other sites that were considered for filling the gap in coverage or capacity connected with this application.

Date: May 26, 2022

RE: Notice of An Application for Small Wireless Facility in the City of White Plains  
Node No. N030 Closest to Property Located at 150 West Post Road

Dear Property Owner:

Verizon Wireless has filed a small wireless facility application pursuant to its Wireless Telecommunications System Franchise Agreement with the City of White Plains ("City"), which authorizes the installation of antennas and ancillary equipment on poles (municipal and privately owned) in the rights of way in the City.

In accordance with Chapter 4-23 of the White Plains Municipal Code, since your property is within 500 feet of the proposed small wireless facility, you are hereby notified that (i) an application for Verizon Wireless' small wireless facility is being considered by the Commissioner of Public Works and if a traffic pole is involved, by the Deputy Commissioner of Parking for Transportation, (ii) the Commissioner(s) may consider whether a nearby location might have less of an aesthetic impact and be a safer location as well as the necessity of a general location to provide adequate service coverage for Verizon Wireless' network and (iii) all comments should be promptly emailed to [DPWadmin@Whiteplainsny.gov](mailto:DPWadmin@Whiteplainsny.gov) within 15 days of the date of this notice.

Thank you,

Verizon Wireless