

**RF SAFETY FCC COMPLIANCE SURVEY
SITE: GRIEST BUILDING
DECEMBER 2, 2015**



**The Griest Building
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Lancaster, PA 17602**

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RF Compliance Checklist

Site Name: Griest Building

Project Type: Existing (New or Existing)

Type of Structure: Building

Yes No N/A

Site Access Restricted:

☒ ☐ ☐

Access Notes: Main rooftop access door locked. Lower catwalk access door unlocked. Door leading to penthouse containing both main rooftop and lower catwalk access doors locked. Call building manager John Disanti to schedule access (717) 203-3849.

RF Signage at Access Point #1 (Main Rooftop):

☒ ☐ ☐

RF Signage Notes: "WARNING", "General RF Safety Guidelines" and "NOC" (AT&T & Verizon Wireless) signage currently present.

RF Signage at Access Point #2 (Lower Catwalk):

☒ ☐ ☐

RF Signage Notes: "General RF Safety Guidelines" and "NOC" (AT&T & Verizon Wireless) signage currently present.

Barriers in Place Near W223CH Antenna:

☐ ☒ ☐

Antenna Notes: W223CH antenna is elevated 18' above the main rooftop and 29' above the lower catwalk; therefore, this antenna is considered inaccessible.

Signage Near W223CH Antenna:

☒ ☐ ☐

Signage Notes: W223CH information sign currently present below the existing antenna.

Actions required to bring site into compliance: ☒ None

N/A

Surveyed by: Anthony Handley

Date: 12/2/2015

Griest Building Field Measurements
% FCC Occupational Maximum Permissible Exposure (MPE)

Run Ref. Number: 02

Date: 12/02/15 Start Time: 09:06

Model 8718 S/N: 4076 Cal Date: 10/12/15 Due: 10/12/16

Probe: A8722D S/N: 06003 Cal Date: 10/12/15 Due: 10/12/16

Freq: N/A Cor. Factor: 1.00 Logging Rate: N/A

Avg Mode: Spatial Avg. && Max.

Ref#	Field Strength (Avg)	Max.)
1	4.71	10.53
2	2.19	3.34
3	0.63	1.41
4	5.43	10.23
5	6.64	9.13
6	11.81	14.51
7	12.86	19.06
8	5.78	9.38
9	7.02	11.55
10	9.36	25.08
11	11.83	21.28
12	17.62	26.28
13	13.98	21.88
14	12.30	27.91
15	10.81	25.40
16	14.10	19.85
17	11.87	18.95
18	16.03	24.30
19	10.82	19.38
20	8.23	13.29
21	7.43	12.50
22	9.92	19.20
23	9.44	22.10
24	10.61	17.04
25	4.17	7.54

Ref#	Field Strength (Avg)	Max.)
26	11.03	19.46
27	16.22	32.10
28	16.93	24.56
29	10.05	16.85
30	56.46	105.20
31	18.84	28.25
32	7.03	17.53
33	6.88	11.83
34	10.86	20.41
35	9.19	14.06
36	7.95	15.86
37	9.08	15.05
38	9.72	21.58
39	6.96	15.16
40	7.31	14.19
41	0.28	0.71
42	0.13	0.45
43	0.31	0.88
44	0.51	1.07
45	0.61	0.96
46	1.24	2.29
47	0.53	0.71
48	0.85	1.67
49	1.19	1.89
50	1.29	3.54

Griest Building Field Measurements
% FCC Occupational Maximum Permissible Exposure (MPE)

Run Ref. Number: 02

Date: 12/02/15 Start Time: 09:06

Model 8718 S/N: 4076 Cal Date: 10/12/15 Due: 10/12/16

Probe: A8722D S/N: 06003 Cal Date: 10/12/15 Due: 10/12/16

Freq: N/A Cor. Factor: 1.00 Logging Rate: N/A

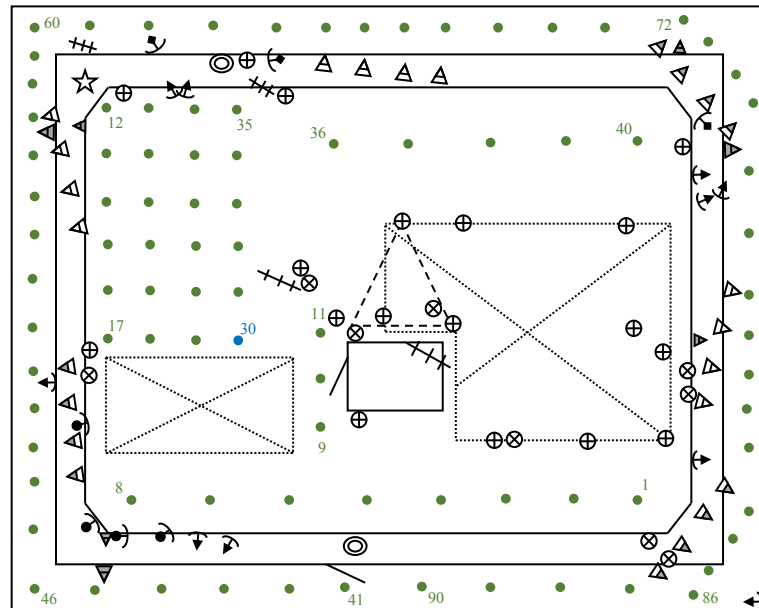
Avg Mode: Spatial Avg. && Max.

Ref#	Field Strength (Avg)	Max.)
51	1.71	4.65
52	2.06	3.13
53	1.83	2.79
54	1.66	2.44
55	3.23	4.97
56	3.81	7.07
57	3.13	5.61
58	4.18	8.27
59	4.76	9.60
60	8.19	15.52
61	4.00	8.10
62	1.69	4.03
63	1.20	3.64
64	1.20	2.98
65	0.92	1.43
66	1.18	2.40
67	3.16	8.57
68	1.41	2.48
69	0.66	1.14
70	0.98	2.48

Ref#	Field Strength (Avg)	Max.)
71	0.93	2.46
72	0.38	0.94
73	0.11	0.19
74	0.17	0.24
75	0.13	0.23
76	0.38	1.41
77	0.08	0.24
78	0.02	0.04
79	0.02	0.02
80	0.31	0.83
81	0.12	0.53
82	0.33	1.41
83	0.16	0.56
84	0.02	0.04
85	0.02	0.02
86	0.02	0.14
87	0.10	0.11
88	0.03	0.04
89	0.01	0.02
90	0.04	0.11

ROOFTOP MEASUREMENT LOCATIONS – GRIEST BUILDING

*Sketch is not drawn to scale and all lengths are only estimated.

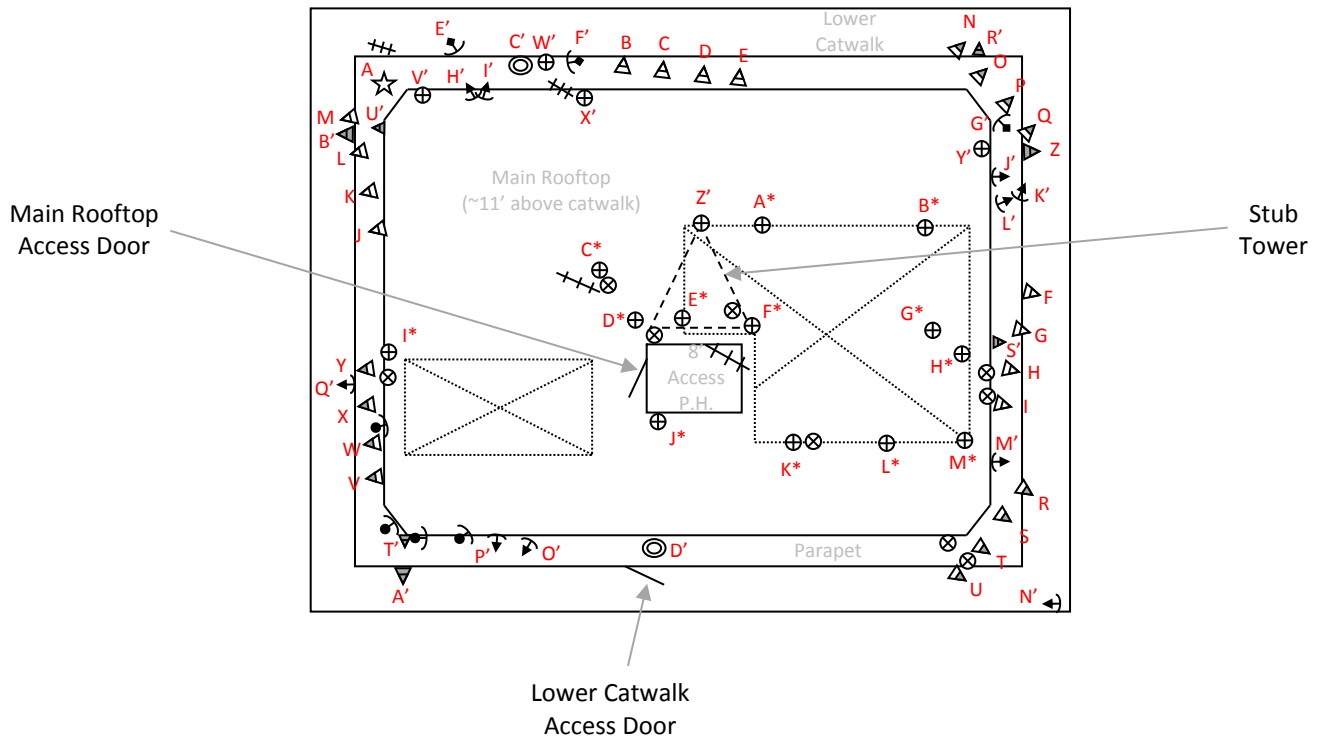


● RF Field Measurement Locations

Spatially-Averaged Power Density Levels (mW/cm^2)	% Occupational MPE
Below General Population MPE	0 to 20
Above General Population MPE/Below Occupational MPE	20 to 100
Above Occupational MPE	Greater Than 100
Above 10x Occupational MPE	Greater Than 1000

ROOFTOP LAYOUT – GRIEST BUILDING

*Sketch is not drawn to scale and all lengths are only estimated.



Existing Antenna Information:

W223CH:

A (Broadband FM Dipole)

Verizon Wireless:

B-E (face A), F-I (face B), J-M (face C)

AT&T:

N-Q (face A), R-U (face B), V-Y (face C)

Sirius XM Radio:

Z (face A), A' (face B), B' (face C)

WTF:

C'-D' (FM loop)

Miscellaneous Antenna Information:

Cage Dish: E'-G'

Microwave Dish: H'-Q'

Point-to-Point Panel: R'-U'

Whip: V'-M*

Rooftop Accessibility:

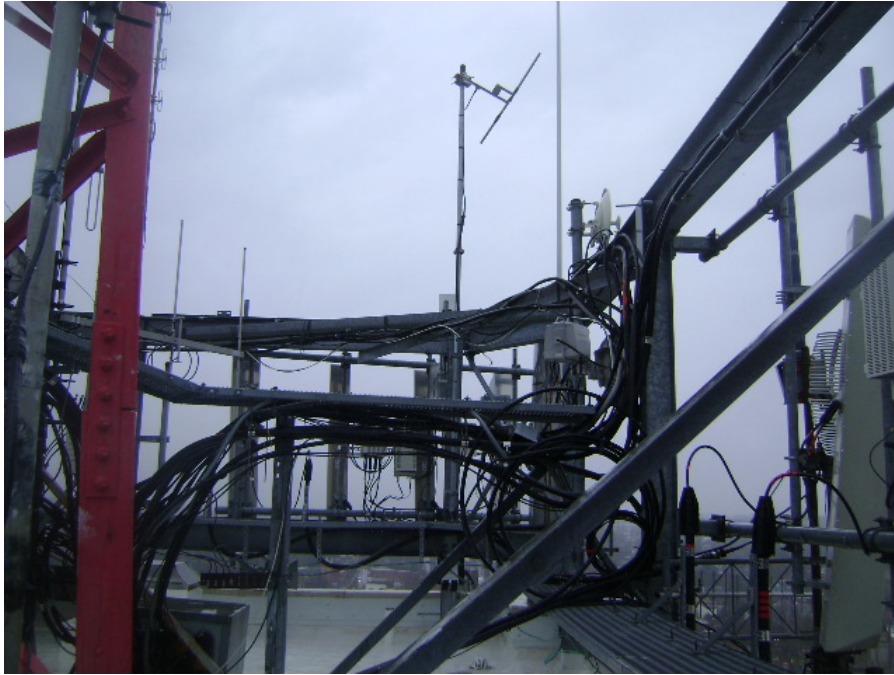
Rooftop: Accessible

Catwalk: Accessible

⊗ GPS Units

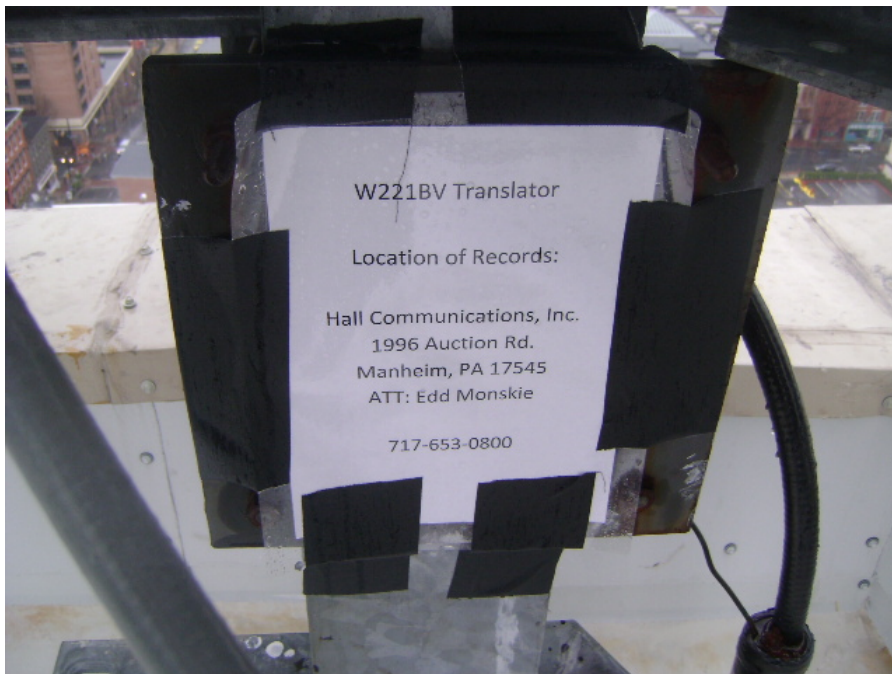
Not to scale

Antenna Locations



W223CH FM TRANSLATOR

W223CH currently has (1) broadband FM dipole antenna pipe-mounted in the northwest corner of the rooftop with a centerline of approximately 18' above the main rooftop and 29' above the lower catwalk, as shown above.



W223CH INFORMATION SIGN

Displayed above is a zoom view of the W223CH information sign currently posted below the existing W223CH antenna (to be revised with new call sign).



**VERIZON WIRELESS
FACE A**



**VERIZON WIRELESS
FACE B**



**VERIZON WIRELESS
FACE C**

VERIZON WIRELESS ANTENNA ARRAY

Verizon Wireless has three sets of four 8' long panel antennas pipe-mounted on steel frames along the north (face A), east (face B) and west (face C) rooftop parapet walls (outside of the main rooftop area) with a centerline of approximately 7' above the main rooftop and 18' above the lower rooftop, as shown in the pictures above.



**AT&T
FACE A**



**AT&T
FACE B**



**AT&T
FACE C**

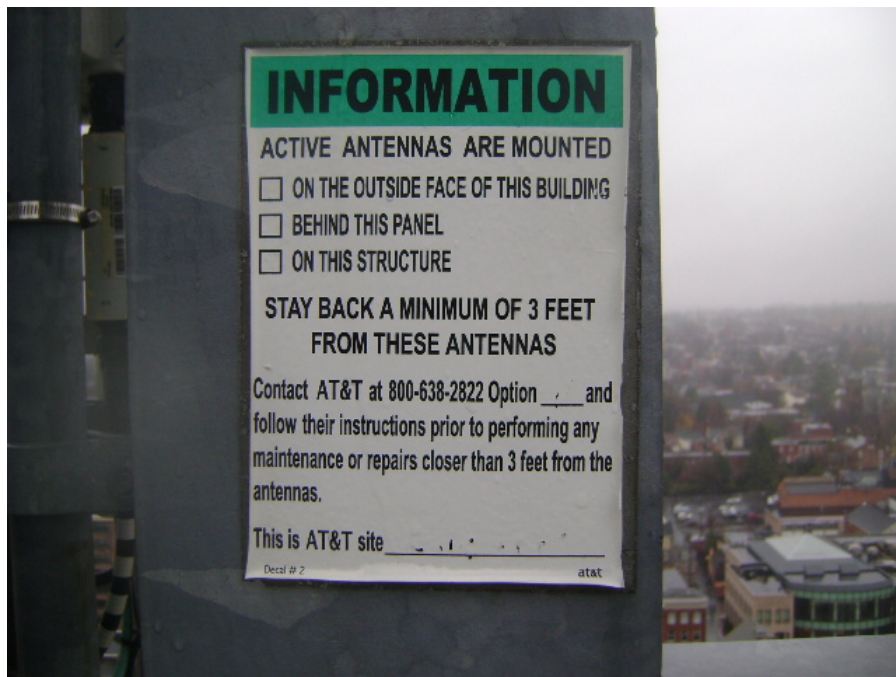
AT&T ANTENNA ARRAY

AT&T has three sets of four 4-6' long panel antennas pipe-mounted in the northeast (face A) and southeast (face B) corners of the main rooftop parapet walls and along the west main rooftop parapet wall (face C) outside of the main rooftop area with a centerlines of approximately 6-7' above the main rooftop, as shown in the pictures above.



AT&T RF SIGNAGE

Displayed above and below are zoom views of the “NOC” & “INFORMATION” signage posted behind each of the AT&T antenna faces on the main rooftop level.





**SIRIUS XM RADIO
FACE A**



**SIRIUS XM RADIO
FACE B**



**SIRIUS XM RADIO
FACE C**

SIRIUS XM RADIO ANTENNA ARRAY

SIRIUS XM Radio has one 2' long panel antenna on each of three faces pipe-mounted on the east (face A), south (face B) and west (face C) faces of the main rooftop with a centerline of approximately 1' above the main rooftop and 12' above the lower catwalk, as shown in the pictures above.



WITF FM LOOP ANTENNAS

WITF-99.9 FM has one loop antenna mounted on the south main rooftop parapet wall elevated approximately 16' above the main rooftop (above) and one loop antenna mounted on the north main rooftop parapet wall elevated approximately 6' above the main rooftop (below). I have been informed that the loop antenna on the north side is currently inactive.





MAIN ROOFTOP MISCELLANEOUS ANTENNAS

Mounted on the main rooftop are a number of miscellaneous dish (cage, microwave & satellite), point-to-point (panel), whip (omni & dipole) and yagi antennas, as shown in the pictures above.

See rooftop layout for antenna locations & Roofview data for details.



MAIN ROOFTOP STUB TOWER & MISCELLANEOUS ANTENNAS

Mounted on the main rooftop is a stub tower containing two miscellaneous dipole antennas and one miscellaneous omni antenna, as shown in the picture above.

See rooftop layout for antenna locations & Roofview data for details.



LOWER CATWALK MISCELLANEOUS ANTENNAS

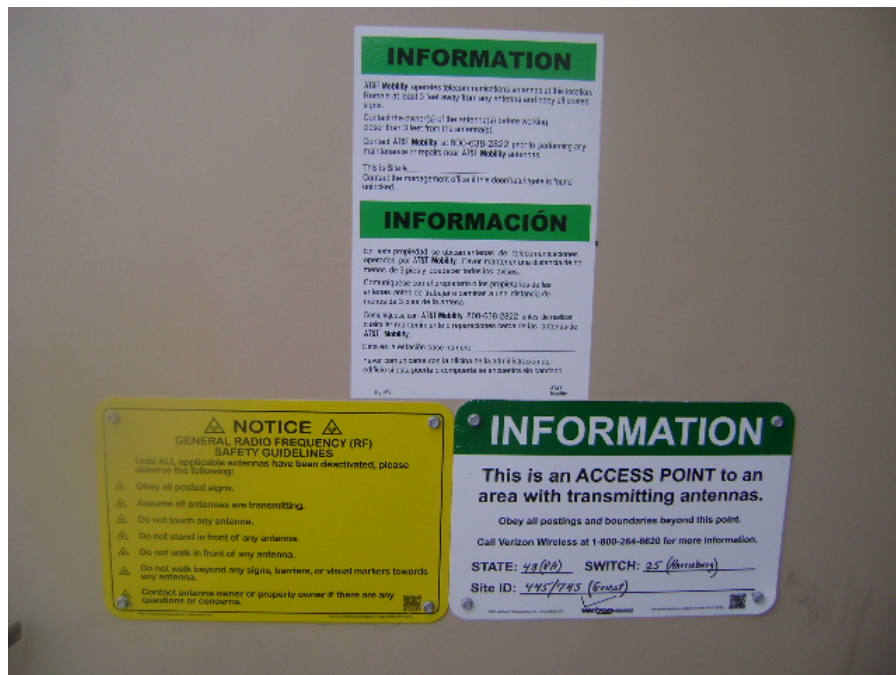
Mounted on the lower catwalk are three miscellaneous dish antennas (cage & microwave) and one miscellaneous yagi antenna, as shown in the pictures above.

See rooftop layout for antenna locations & Roofview data for details.



LOWER CATWALK ACCESS POINT & RF SIGNAGE

Access to the lower catwalk is through the unlocked door displayed above. Displayed below is a zoom view of the “General RF Safety Guidelines”, Verizon Wireless “NOC” and AT&T “INFORMATION” signage posted on the inside of the lower catwalk access door.





ACCESS POINT TO ROOF ACCESS & RF SIGNAGE

Access to the 15th floor penthouse containing the main rooftop and lower catwalk access doors is through the locked door displayed above. Displayed below is a zoom view of the “CAUTION”, AT&T “INFORMATION” and “FCC ASR” signage posted on the outside of the door.





W223CH EQUIPMENT ROOM

Shown above is the 13th floor W223CH in-building equipment room and cabinet.



EQUIPMENT ACCESS POINTS

Access to the various 14th floor in-building radio equipment rooms/cabinets is through the locked doors shown above. There is currently “NOTICE” signage posted on both doors.

ROOFVIEW DATA TABLE – GRIEST BUILDING

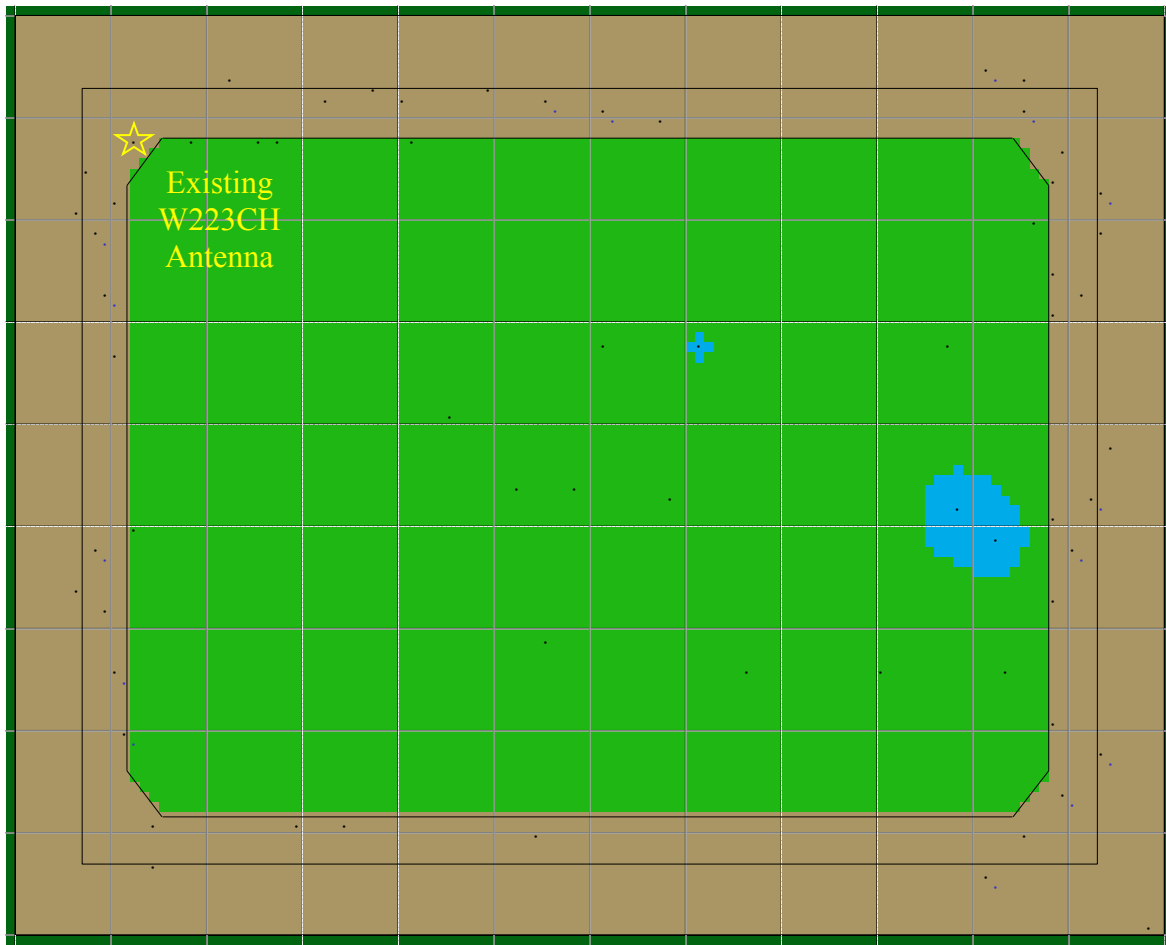
(with respect to main rooftop)

Ant Num	ID	Name	(MHz) Freq	Input Power	Calc Power	Mfg	Model	(ft) X	(ft) Y	(ft) Z	Type	(ft) Aper	dBd Gain	BWdth Pt Dir	ON flag	Antenna Pixel X Y Z	Ant Num
1	W223CH	A	92.50000	250.0	250.0	NICOM	BKG1/P	13.0	78.0	18.0	vc	4.6	0	360	ON	13 78 18.0	1
2	vzwA1	B	880.00000	80.0	80.0			50.0	83.0	3.0	vc	8.0	16	55;10	ON	50 83 3.0	2
3	vzwA2	C	1940.00000	80.0	80.0			56.0	82.0	3.0	vc	8.0	15	55;10	ON	56 82 3.0	3
4	vzwA2	C	2110.00000	80.0	80.0			56.0	82.0	3.0	vc	8.0	15	55;10	ON	56 82 3.0	4
5	vzwA3	D	1940.00000	80.0	80.0			62.0	81.0	3.0	vc	8.0	15	55;10	ON	62 81 3.0	5
6	vzwA3	D	2110.00000	80.0	80.0			62.0	81.0	3.0	vc	8.0	15	55;10	ON	62 81 3.0	6
7	vzwA4	E	746.00000	80.0	80.0			68.0	80.0	3.0	vc	8.0	16	55;10	ON	68 80 3.0	7
8	vzwB1	F	880.00000	80.0	80.0			115.0	48.0	3.0	vc	8.0	16	55;120	ON	115 48 3.0	8
9	vzwB2	G	1940.00000	80.0	80.0			113.0	43.0	3.0	vc	8.0	15	55;120	ON	113 43 3.0	9
10	vzwB2	G	2110.00000	80.0	80.0			113.0	43.0	3.0	vc	8.0	15	55;120	ON	113 43 3.0	10
11	vzwB3	H	1940.00000	80.0	80.0			111.0	38.0	3.0	vc	8.0	15	55;120	ON	111 38 3.0	11
12	vzwB3	H	2110.00000	80.0	80.0			111.0	38.0	3.0	vc	8.0	15	55;120	ON	111 38 3.0	12
13	vzwB4	I	746.00000	80.0	80.0			109.0	33.0	3.0	vc	8.0	16	55;120	ON	109 33 3.0	13
14	vzwG1	J	880.00000	80.0	80.0			11.0	57.0	3.0	vc	8.0	16	55;240	ON	11 57 3.0	14
15	vzwG2	K	1940.00000	80.0	80.0			10.0	63.0	3.0	vc	8.0	15	55;240	ON	10 63 3.0	15
16	vzwG2	K	2110.00000	80.0	80.0			10.0	63.0	3.0	vc	8.0	15	55;240	ON	10 63 3.0	16
17	vzwG3	L	1940.00000	80.0	80.0			9.0	69.0	3.0	vc	8.0	15	55;240	ON	9 69 3.0	17
18	vzwG3	L	2110.00000	80.0	80.0			9.0	69.0	3.0	vc	8.0	15	55;240	ON	9 69 3.0	18
19	vzwG4	M	746.00000	80.0	80.0			8.0	75.0	3.0	vc	8.0	16	55;240	ON	8 75 3.0	19
20	attA1	N	869.00000	1.0	1.0			102.0	85.0	2.0	vc	6.0	16	65;45	ON	102 85 2.0	20
21	attA1	N	1930.00000	1.0	1.0			102.0	85.0	2.0	vc	6.0	16	65;45	ON	102 85 2.0	21
22	attA2	O	869.00000	80.0	80.0			106.0	81.0	2.0	vc	6.0	16	65;45	ON	106 81 2.0	22
23	attA2	O	1930.00000	80.0	80.0			106.0	81.0	2.0	vc	6.0	16	65;45	ON	106 81 2.0	23
24	attA3	P	722.00000	80.0	80.0			110.0	77.0	4.0	vc	4.0	16	65;45	ON	110 77 4.0	24
25	attA4	Q	869.00000	80.0	80.0			114.0	73.0	2.0	vc	6.0	16	65;45	ON	114 73 2.0	25
26	attA4	Q	1930.00000	80.0	80.0			114.0	73.0	2.0	vc	6.0	16	65;45	ON	114 73 2.0	26
27	attB1	R	869.00000	1.0	1.0			114.0	18.0	4.0	vc	4.0	16	65;135	ON	114 18 4.0	27
28	attB1	R	1930.00000	1.0	1.0			114.0	18.0	4.0	vc	4.0	16	65;135	ON	114 18 4.0	28
29	attB2	S	869.00000	80.0	80.0			110.0	14.0	4.0	vc	4.0	16	65;135	ON	110 14 4.0	29
30	attB2	S	1930.00000	80.0	80.0			110.0	14.0	4.0	vc	4.0	16	65;135	ON	110 14 4.0	30
31	attB3	T	722.00000	80.0	80.0			106.0	10.0	4.0	vc	4.0	16	65;135	ON	106 10 4.0	31
32	attB4	U	869.00000	80.0	80.0			102.0	6.0	4.0	vc	4.0	16	65;135	ON	102 6 4.0	32
33	attB4	U	1930.00000	80.0	80.0			102.0	6.0	4.0	vc	4.0	16	65;135	ON	102 6 4.0	33
34	attC1	V	869.00000	1.0	1.0			12.0	20.0	4.0	vc	4.0	16	65;260	ON	12 20 4.0	34
35	attC1	V	1930.00000	1.0	1.0			12.0	20.0	4.0	vc	4.0	16	65;260	ON	12 20 4.0	35
36	attC2	W	869.00000	80.0	80.0			11.0	26.0	4.0	vc	4.0	16	65;260	ON	11 26 4.0	36
37	attC2	W	1930.00000	80.0	80.0			11.0	26.0	4.0	vc	4.0	16	65;260	ON	11 26 4.0	37
38	attC3	X	722.00000	80.0	80.0			10.0	32.0	4.0	vc	4.0	16	65;260	ON	10 32 4.0	38
39	attC4	Y	869.00000	80.0	80.0			9.0	38.0	4.0	vc	4.0	16	65;260	ON	9 38 4.0	39
40	attC4	Y	1930.00000	80.0	80.0			9.0	38.0	4.0	vc	4.0	16	65;260	ON	9 38 4.0	40
41	xmA	Z	2300.00000	50.0	50.0			114.0	69.0	0.0	vc	2.0	16	65;90	ON	114 69 0.0	41
42	xmB	A'	2300.00000	50.0	50.0			15.0	7.0	0.0	vc	2.0	16	65;180	ON	15 7 0.0	42
43	xmC	B'	2300.00000	50.0	50.0			7.0	71.0	0.0	vc	2.0	16	65;270	ON	7 71 0.0	43
44	WITF	C'	99.90000	38.0	38.0			33.0	82.0	6.0	vc	1.0	0	360	ON	33 82 6.0	44
45	WITF	D'	99.90000	38.0	38.0			55.0	10.0	16.0	vc	1.0	0	360	ON	55 10 16.0	45
46	cage	E'	900.00000	0.1	0.1			23.0	84.0	-5.0	vc	2.0	30	65;340	ON	23 84 -5.0	46
47	cage	F'	900.00000	0.1	0.1			41.0	82.0	6.0	vc	2.0	30	65;90	ON	41 82 6.0	47
48	cage	G'	900.00000	0.1	0.1			109.0	74.0	9.0	vc	3.0	30	65;110	ON	109 74 9.0	48
49	MW	H'	5800.00000	0.1	0.1			26.0	78.0	8.0	vc	2.0	30	65;330	ON	26 78 8.0	49
50	MW	I'	5800.00000	0.1	0.1			28.0	78.0	12.0	vc	2.0	30	65;10	ON	28 78 12.0	50
51	MW	J'	5800.00000	0.1	0.1			109.0	65.0	4.0	vc	3.0	30	65;90	ON	109 65 4.0	51
52	MW	K'	5800.00000	0.1	0.1			112.0	63.0	12.0	vc	2.0	30	65;40	ON	112 63 12.0	52
53	MW	L'	5800.00000	0.1	0.1			109.0	61.0	8.0	vc	2.0	30	65;80	ON	109 61 8.0	53
54	MW	M'	5800.00000	0.1	0.1			109.0	21.0	12.0	vc	3.0	30	65;90	ON	109 21 12.0	54
55	MW	N'	5800.00000	0.1	0.1			119.0	1.0	-4.0	vc	1.0	30	65;270	ON	119 1 -4.0	55
56	MW	O'	5800.00000	0.1	0.1			35.0	11.0	8.0	vc	2.0	30	65;210	ON	35 11 8.0	56
57	MW	P'	5800.00000	0.1	0.1			30.0	11.0	13.0	vc	2.0	30	65;180	ON	30 11 13.0	57
58	MW	Q'	5800.00000	0.1	0.1			7.0	34.0	-5.0	vc	4.0	30	65;270	ON	7 34 -5.0	58
59	PtoP	R'	2400.00000	5.0	5.0			106.0	84.0	10.0	vc	1.0	16	65;0	ON	106 84 10.0	59
60	PtoP	S'	2400.00000	5.0	5.0			109.0	41.0	10.0	vc	1.0	16	65;90	ON	109 41 10.0	60
61	PtoP	T'	2400.00000	5.0	5.0			15.0	11.0	10.0	vc	1.0	16	65;180	ON	15 11 10.0	61
62	PtoP	U'	2400.00000	5.0	5.0			11.0	72.0	10.0	vc	1.0	16	65;270	ON	11 72 10.0	62
63	whip	V'	450.00000	100.0	100.0			19.0	78.0	12.0	vc	20.0	0	360	ON	19 78 12.0	63
64	whip	W'	450.00000	100.0	100.0			38.0	83.0	6.0	vc	6.0	0	360	ON	38 83 6.0	64
65	whip	X'	450.00000	100.0	100.0			42.0	78.0	12.0	vc	8.0	0	360	ON	42 78 12.0	65
66	whip	Y'	450.00000	100.0	100.0			107.0	70.0	6.0	vc	12.0	0	360	ON	107 70 6.0	66
67	whip	Z'	450.00000	100.0	100.0			13.0	40.0	12.0	vc	12.0	0	360	ON	13 40 12.0	67
68	whip	A*	450.00000	100.0	100.0			62.0	58.0	54.0	vc	12.0	0	360	ON	62 58 54.0	68
69	whip	B*	450.00000	100.0	100.0			72.0	58.0	6.0	vc	6.0	0	360	ON	72 58 6.0	69
70	whip	C*	450.00000	100.0	100.0			98.0	58.0	12.0	vc	8.0	0	360	ON	98 58 12.0	70
71	whip	D*	450.00000	100.0	100.0			46.0	51.0	8.0	vc	8.0	0	360	ON	46 51 8.0	71
72	whip	E*	450.00000	100.0	100.0			53.0	44.0	20.0	vc	6.0	0	360	ON	53 44 20.0	72
73	whip	F*	450.00000	100.0	100.0			59.0	44.0	54.0	vc	12.0	0	360	ON	59 44 54.0	73
74	whip	G*	450.00000	100.0	100.0			69.0	43.0	55.0	vc	10.0	0	360	ON	69 43 55.0	74
75	whip	H*	450.00000	100.0	100.0			99.0	42.0	4.0	vc	6.0	0	360	ON	99 42 4.0	75
76	whip	I*	450.00000	100.0	100.0			103.0	39.0	6.0	vc	4.0	0	360	ON	103 39 6.0	76
77	whip	J*	450.00000	100.0	100.0			56.0	29.0	20.0	vc	6.0	0	360	ON	56 29 20.0	77
78	whip	K*	450.00000	100.0	100.0			77.0	26.0	9.0	vc	10.0	0	360	ON	77 26 9.0	78
79	whip	L*	450.00000	100.0	100.0			91.0	26.0	6.0	vc	12.0	0	360	ON	91 26 6.0	79
80	whip	M*	450.00000	100.0	100.0			104.0	26.0	13.0	vc	5.0	0	360	ON	104 26 13.0	80

Note: For heights above lower catwalk, add 11' to column 'Z'.

ROOFVIEW PREDICTION ANALYSIS I – GRIEST BUILDING

(with respect to main rooftop – all licensees active)

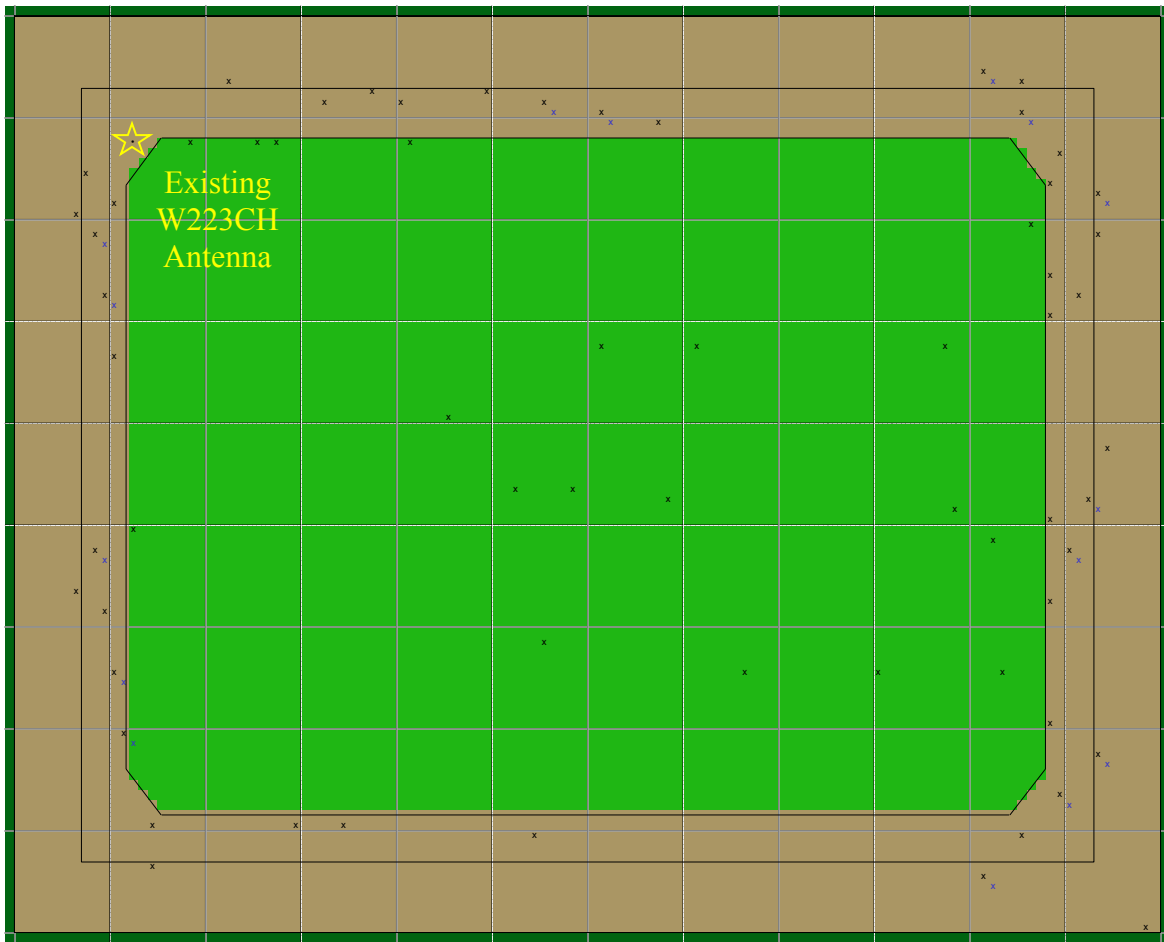


*NOT TO SCALE

Statistical Summary		
%MPE	SQ. FT	%SQ. FT.
	6303	58.36 % of total ROOF Area
0 -20	6212	98.56 % of Selected Area
21 - 100	91	1.44 % of Selected Area
101 - 1000	0	0.00 % of Selected Area
> 1000	0	0.00 % of Selected Area
Roof Area 10800 sq. ft. Max %MPE 71.9 % Min %MPE 0.7 % Using Near/Far Spatial Avg Model With FCC 1997 Occupational Standard		

Spatially-Averaged Power Density Levels (mW/cm ²)	% Occupational MPE
Below General Population MPE	0 to 20
Above General Population MPE/Below Occupational MPE	20 to 100
Above Occupational MPE	Greater Than 100
Above 10x Occupational MPE	Greater Than 1000

ROOFVIEW PREDICTION ANALYSIS II – GRIEST BUILDING (with respect to main rooftop – W223CH only)



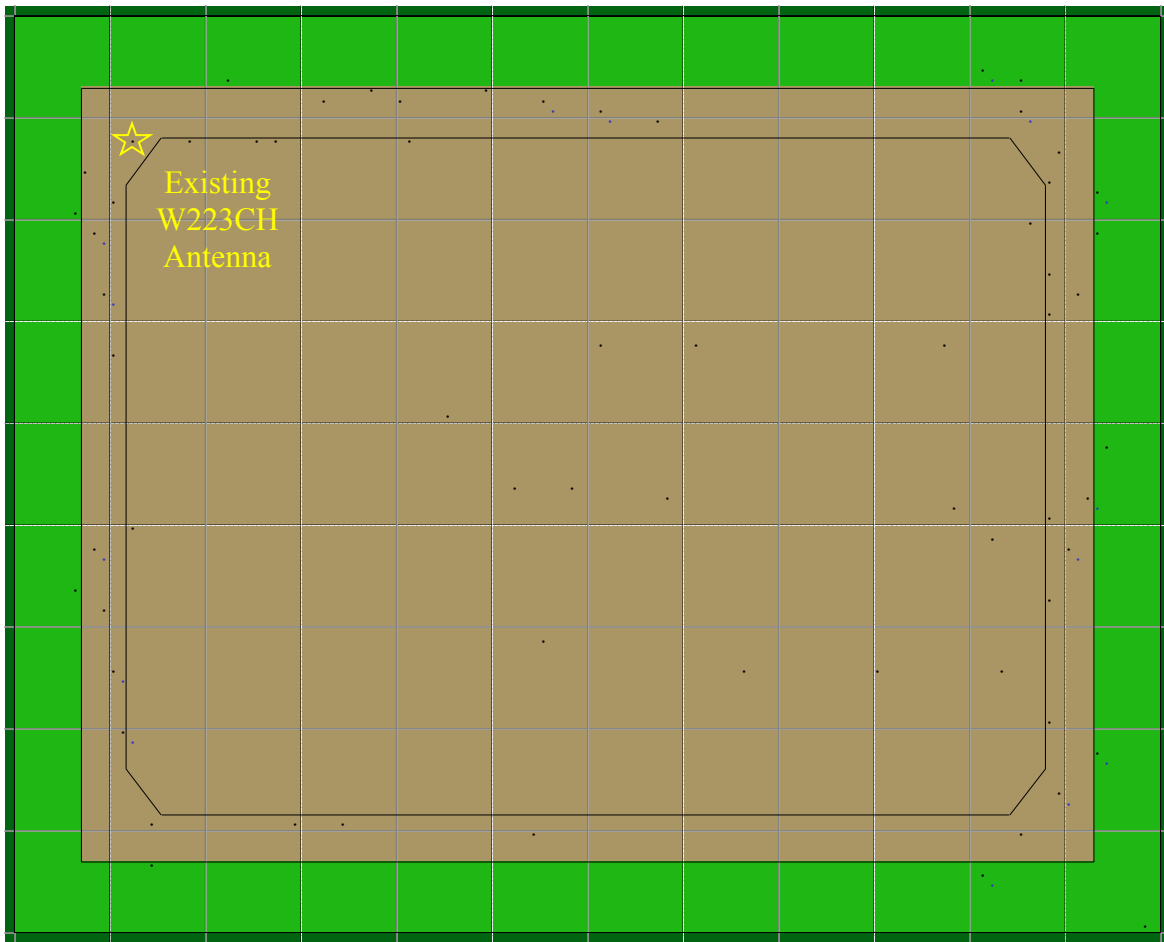
*NOT TO SCALE

Statistical Summary		
%MPE	SQ. FT	%SQ. FT.
	6303	58.36 % of total ROOF Area
0 -20	6303	100.00 % of Selected Area
21 - 100	0	0.00 % of Selected Area
101 - 1000	0	0.00 % of Selected Area
> 1000	0	0.00 % of Selected Area
Roof Area 10800 sq. ft. Max %MPE 4.6 % Min %MPE 0.0 % Using Near/Far Spatial Avg Model With FCC 1997 Occupational Standard		

Spatially-Averaged Power Density Levels (mW/cm ²)	% Occupational MPE
Below General Population MPE	0 to 20
Above General Population MPE/Below Occupational MPE	20 to 100
Above Occupational MPE	Greater Than 100
Above 10x Occupational MPE	Greater Than 1000

ROOFVIEW PREDICTION ANALYSIS III – GRIEST BUILDING

(with respect to lower catwalk – all licensees active)

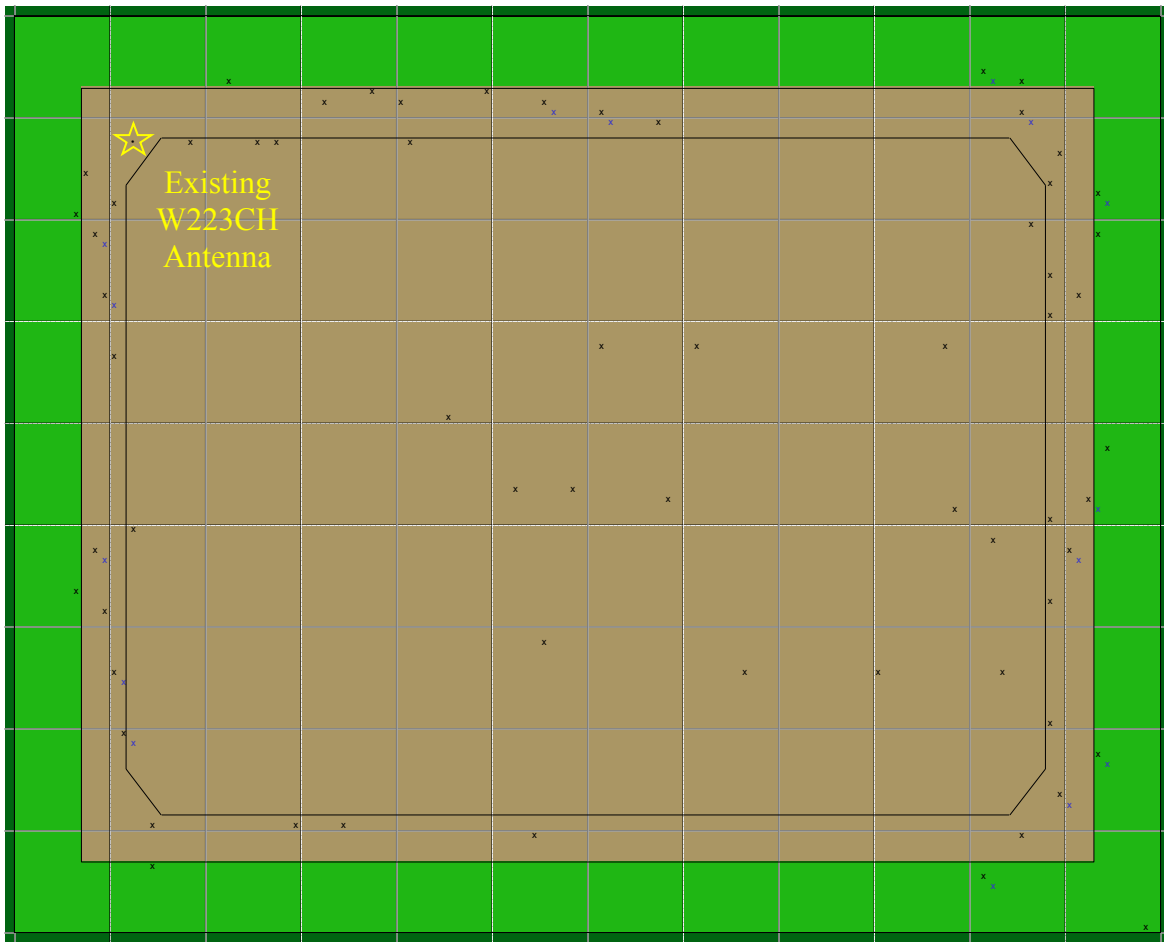


*NOT TO SCALE

Statistical Summary		
%MPE	SQ. FT.	%SQ. FT.
	2744	25.41 % of total ROOF Area
0 -20	2744	100.00 % of Selected Area
21 - 100	0	0.00 % of Selected Area
101 - 1000	0	0.00 % of Selected Area
> 1000	0	0.00 % of Selected Area
Roof Area 10800 sq. ft. Max %MPE 16.8 % Min %MPE 0.1 % Using Near/Far Spatial Avg Model With FCC 1997 Occupational Standard		

Spatially-Averaged Power Density Levels (mW/cm ²)	% Occupational MPE
Below General Population MPE	0 to 20
Above General Population MPE/Below Occupational MPE	20 to 100
Above Occupational MPE	Greater Than 100
Above 10x Occupational MPE	Greater Than 1000

ROOFVIEW PREDICTION ANALYSIS IV – GRIEST BUILDING (with respect to lower catwalk – W223CH only)



*NOT TO SCALE

Statistical Summary		
%MPE	SQ. FT	%SQ. FT.
	2744	25.41 % of total ROOF Area
0 -20	2744	100.00 % of Selected Area
21 - 100	0	0.00 % of Selected Area
101 - 1000	0	0.00 % of Selected Area
> 1000	0	0.00 % of Selected Area
Roof Area 10800 sq. ft. Max %MPE 0.7 % Min %MPE 0.0 % Using Near/Far Spatial Avg Model With FCC 1997 Occupational Standard		

Spatially-Averaged Power Density Levels (mW/cm ²)	% Occupational MPE
Below General Population MPE	0 to 20
Above General Population MPE/Below Occupational MPE	20 to 100
Above Occupational MPE	Greater Than 100
Above 10x Occupational MPE	Greater Than 1000

MILLENNIUM ENGINEERING, P.C.

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Email: pauldugan@comcast.net

December 2, 2015

Attn: Edd Monskie, VP/Engineering
Hall Communications
1996 Auction Road
Manheim, PA 17545

Re: RF Safety FCC Compliance of Existing Communications Facility
Site Name: Griest Building, Collocation on Existing Building
The Griest Building, 8 N. Queen Street, Lancaster, PA 17602 (City of Lancaster, Lancaster County)

Dear Mr. Monskie,

I have performed a complete analysis to provide an independent determination and certification that the existing Hall Communications communications facility at the above referenced property complies with Federal Communications Commission (FCC) exposure limits and guidelines for human exposure to radiofrequency electromagnetic fields (Code of Federal Regulation 47 CFR 1.1307 and 1.1310). As a registered professional engineer I am under the jurisdiction of the State Registration Boards in which I am licensed to hold paramount the safety, health, and welfare of the public and to issue all public statements in an objective and truthful manner.

The existing communications facility consists of collocation on the above referenced building. The existing Hall Communications antenna configuration from the information furnished to me consists of (1) W223CH omnidirectional broadband FM dipole antenna (NiCOM BKG1/P or equivalent) as part of an FM translator system with a centerline of approximately 190' above ground level. This antenna transmits a frequency of 92.5 MHz at a power of 250 watts. The existing W223CH antenna is pipe-mounted on the northwest corner of the main rooftop with a centerline of approximately 18' above the main rooftop and 29' above the lower catwalk.

The existing building currently contains antenna arrays of Verizon Wireless, AT&T and Sirius XM Radio as well as WITF FM loop antennas and a number of miscellaneous dish (cage, satellite & microwave), point-to-point (panel), whip (dipole & omni) and yagi antennas, as shown in the sketch drawings and pictures. On 10/21/2015, we performed field measurements on the main rooftop and lower catwalk around all existing antennas in accessible areas of the rooftop. The highest recorded measurement was 56.46 % whole body spatial average around all existing antenna systems in accessible areas of the rooftop. This relatively high measurement was taken next to an HVAC unit which causes reflection from the multiple transmitters currently collocated on the rooftop. All other measurements were less than 20 % whole body spatial average.

The antenna and operating parameters were modeled with Roofview using reasonable upper limit exposure analysis parameters to allow for usage surges and future growth of the major wireless carriers. Roofview was run with all existing antenna systems for which antenna system details and operating parameters could be obtained. The model was set to the 1997 FCC occupational exposure limit standard with 100 % uptime and using the "near/far spatial average model". The model uses green to represent exposure below 20 % occupational maximum permissible exposure (MPE), blue between 20 % and 100 % occupational MPE, yellow

between 100 % and 1000 % occupational MPE, and red to represent any areas above 1000 % occupational MPE. In the first Roofview plot, all existing antennas were modeled with respect to the main rooftop. In the second Roofview plot, the existing W223CH antenna was modeled alone with respect to the main rooftop. In the third Roofview plot, all existing antennas were modeled with respect to the lower catwalk. In the fourth Roofview plot, the existing W223CH antenna was modeled alone with respect to the lower catwalk.

As shown from our Roofview plots, small areas of the main rooftop below/around existing miscellaneous whip antennas have the potential to reach or exceed 20 % occupational maximum permissible exposure (MPE) while no areas of the lower catwalk below all existing antennas have the potential to reach or exceed 20 % occupational MPE. **However, no areas of the main rooftop or lower catwalk below the existing W223CH antenna have the potential to reach exceed 20 % occupational MPE due to the antenna mounting location and the low power which this system operates. Therefore, no further exposure access controls are warranted or recommended at this time.** There is currently an information sign (to be revised with new call sign) posted below the existing W223CH antenna as well as “WARNING” signage posted at the main rooftop access point and “General RF Safety Guidelines” signage posted at both the main rooftop and lower catwalk access points.

Although the Roofview plots show small areas of the main rooftop that have the potential to exceed the uncontrolled/general population exposure limit, any other areas of the building including the interior of the building and the ground level around the base of the building will remain hundreds of times below the general population exposure limits (well below 1 %) due to the reduction in field strength from building materials and the path loss of the radio frequency signal, even under all upper limit assumptions.

In summary, the existing communications facility complies with all applicable exposure limits and guidelines adopted by the FCC governing human exposure to radiofrequency electromagnetic fields (FCC Bulletin OET 65). Federal law (FCC Rule Title 47 CFR 1.1307 and 1.1310) sets the national standard for compliance with electromagnetic field safety. The FCC exposure limits are 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). **Thus, there is full compliance with the standards of the IRPA, FCC, IEEE, ANSI, and NCRP.**

Respectfully,



Paul Dugan, P.E.
Registered Professional Engineer
Pennsylvania License Number PE-045711-E



DECLARATION OF ENGINEER

Paul Dugan, P.E., declares and states that he is a graduate telecommunications consulting engineer (BSE/ME Widener University 1984/1988), whose qualifications are a matter of record with the Federal Communications Commission (FCC). His firm, Millennium Engineering, P.C., has been retained by Verizon Wireless to perform power density measurements or calculations for an existing or proposed communications facility and analyze the data for compliance with FCC exposure limits and guidelines for human exposure to radiofrequency electromagnetic fields.

Mr. Dugan also states that the calculations or measurements made in the evaluation were made by himself or his technical associates under his direct supervision, and the summary letter certification of FCC compliance associated with the foregoing document was made or prepared by him personally. Mr. Dugan is a registered professional engineer in the Jurisdictions of Pennsylvania, New Jersey, Delaware, Maryland, Virginia, New York, Connecticut, District of Columbia, West Virginia and Puerto Rico with over 30 years of engineering experience. Mr. Dugan is also an active member of the Association of Federal Communications Consulting Engineers, the National Council of Examiners for Engineering, the National Society of Professionals Engineers, the Pennsylvania Society of Professional Engineers, and the Radio Club of America. Mr. Dugan further states that all facts and statements contained herein are true and accurate to the best of his own knowledge, except where stated to be in information or belief, and, as to those facts, he believes them to be true. He believes under penalty of perjury the foregoing is true and correct.


Paul Dugan, P.E.

Executed this the 2nd day of December, 2015.



communications
Narda Microwave East

Certificate of Calibration

L-3 Communications, Narda Microwave-East, hereby certifies that the referenced instrument has been calibrated by qualified personnel to Narda's approved test procedures.

Furthermore, the instrument meets, or exceeds, all published specifications and the calibration has been performed with test instrumentation that, where applicable, is traceable to the National Institute of Standards and Technology.

Narda's calibration measurements are traceable to the National Institute of Standards and Technology to the extent allowed by the bureau's calibration facilities.

Customer: **MILLENNIUM ENGINEERING, P.C.** Certificate #: **149123 1**
MALVERN, PA 19355

Model #: **8718B** Serial #: **04076**

Description: **METER** PO #: **10012015**

Date Calibrated: **12/Oct/2015** R.O. #: **149123**

Hugh Saunders
Hugh Saunders
Test

Ralph Curcio
Ralph Curcio
Quality Assurance

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communications

Narda Microwave East

Certificate of Calibration

L-3 Communications, Narda Microwave-East, hereby certifies that the referenced instrument has been calibrated by qualified personnel to Narda's approved test procedures.

Furthermore, the instrument meets, or exceeds, all published specifications and the calibration has been performed with test instrumentation that, where applicable, is traceable to the National Institute of Standards and Technology.

Narda's calibration measurements are traceable to the National Institute of Standards and Technology to the extent allowed by the bureau's calibration facilities.

Customer: MILLENNIUM ENGINEERING, P.C. Certificate #: 149123 2
MALVERN, PA 19355

Model #: A8722D Serial #: 06003
Description: PROBE PO #: 10012015
Date Calibrated: 12/Oct/2015 R.O. #: 149123

Hugh Saunders

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Test

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