



Testing, Mitigation, System Design
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Radon Survey Analysis Job# 19-C110R

for

Eagle Point School District Table Rock Elementary c/o Angie Hamilton

property located at

2830 Maple ct

White City, OR 97503

December 19th 2019



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ESB#10782

Introduction

The following report documents a study of radon levels for the property located at 2830 Maple Ct White City OR 97503. The goal of this study is to determine indoor radon levels for all areas in contact with the ground. Testing was performed per Oregon Health Authority School Testing Protocols.

Analysis assumes that the buildings tested were maintained under “closed-building” conditions (windows closed and exterior doors shut immediately after entering and exiting), as well as normal indoor temperatures, for the duration of the testing period. The H-VAC system for each building was set to normal occupied settings for the entirety of the testing period.

Conclusions and Recommendations

Test was a “Short-Term” test, with minimum duration of 72 hours. See the chart below of areas in buildings that were tested, and the corresponding levels found. All current test results are provided in Table 1. Maps of the test levels are provided in Appendix A. Note that all ninety-seven (97) locations tested had results below the USEPA Action Level of 4.0 pCi/L.

No mitigation action is recommended at this time. While the USEPA recommends buildings be fixed if the radon level is 4.0 pCi/L or more, because there is no known safe level of exposure to radon, the US EPA also suggests individuals consider fixing buildings for radon levels between 2.0 pCi/L and 4.0 pCi/L.

This report represents the average radon concentration for the period that testing was and at the specific location(s) within the building. The concentration of radon gas in indoor air can vary widely; it fluctuates daily, seasonally, and with weather conditions. Indoor radon levels may be affected by barometric pressure, strong winds, rain-soaked ground, snow cover, heating and A/C systems, building construction, open windows, and the like. For further confirmation of average, long-term radon levels, it is suggested that long-term, Alpha-Track type radon testing be performed.

NOTE: It is recommended that any building indicating low radon values be retested at least every 5 years. In areas where mitigation has been performed, it is recommended to test using long-term testing at least every 2 years.

Radon Level Measurements

The building tested was assumed occupied during testing. The measurement technique used (124) AirChek activated charcoal kits.

Test Start Date: 11/20/2019

Test End Date: 11/23/2019

Measurements of radon levels were made in the following areas:

Table 1: Results

Lower Table Rock Campus

Room	Floor	Kit ID #	Test Start Time	Test End Time	Result (pCi/L)
West cafeteria	1	9315926	03:20 PM	11:21 AM	0.3
Se cafeteria	1	9315927	03:17 PM	11:17 AM	0.6
Kitchen	1	9315931	03:22 PM	11:24 AM	0.5
Kitchen office	1	Duplicate Avg*	03:25 PM	11:24 AM	0.7
Pod three teacher	1	9315935	03:02 PM	11:55 AM	1.2
7	1	9315936	03:03 PM	11:59 AM	1.0
Maintenance	1	Duplicate Avg*	03:34 PM	11:28 AM	0.3
12	1	9315939	03:05 PM	11:57 AM	1.0
11	1	9315941	03:07 PM	11:57 AM	1.4
10 office	1	9315942	03:08 PM	11:57 AM	1.4
7 office	1	9315945	03:04 PM	11:59 AM	1.6
Staff Room	1	9315946	03:18 PM	11:47 AM	0.3
3	1	9315947	01:50 PM	11:48 AM	0.8
Room 26/office	1	9315949	03:19 PM	11:18 AM	0.5
9	1	Duplicate Avg*	02:58 PM	11:54 AM	1.1
17	1	9315952	02:48 PM	12:02 PM	0.3
8	1	9315954	02:54 PM	11:52 AM	1.0
13	1	Duplicate Avg*	02:08 PM	11:39 AM	0.3
8 office	1	9315958	02:57 PM	11:53 AM	1.6
10	1	9315959	03:09 PM	11:55 AM	1.0
14	1	9315960	02:12 PM	11:41 AM	0.3
16 office	1	9315965	02:29 PM	12:07 PM	0.7
21	1	9315966	02:30 PM	12:07 PM	0.3
20	1	9315967	02:31 PM	12:06 PM	0.6
19	1	9315968	02:35 PM	12:05 PM	0.3
Work room	1	9315971	01:27 PM	11:33 AM	0.6
Principal	1	Duplicate Avg*	01:28 PM	11:34 AM	0.4
16	1	9315973	02:23 PM	12:08 PM	0.6
19 office	1	9315975	02:33 PM	12:06 PM	0.3
18	1	9315976	02:36 PM	12:04 PM	0.6

Room	Floor	Kit ID #	Test Start Time	Test End Time	Result (pCi/L)
17 office	1	9315978	02:37 PM	12:04 PM	0.5
Library/large group room	1	9315981	01:31 PM	11:37 AM	0.6
Library office	1	9315983	01:34 PM	11:36 AM	0.6
6	1	9315984	01:38 PM	11:44 AM	0.3
Room 24	1	9315985	01:35 PM	11:36 AM	0.9
1 office	1	9315986	01:55 PM	11:45 AM	0.3
5	1	9315987	01:42 PM	11:50 AM	0.7
4	1	9315988	01:45 PM	11:49 AM	0.5
First pod teacher area	1	9315989	01:41 PM	11:46 AM	0.7
3 office	1	9315990	01:51 PM	11:48 AM	0.8
13 office	1	9315991	02:06 PM	11:39 AM	0.6
13 quiet room	1	9315992	02:05 PM	11:40 AM	0.3
Secretary	1	9315993	01:23 PM	11:33 AM	0.5
Health room	1	9315994	01:18 PM	11:32 AM	0.3
2	1	9315996	01:52 PM	11:47 AM	0.7
1	1	9315997	01:54 PM	11:46 AM	0.9
5 office	1	9315998	01:44 PM	11:50 AM	0.3
Main office	1	Duplicate Avg*	01:20 PM	11:30 AM	0.3
Second pod teacher area	1	Duplicate Avg*	02:25 PM	12:03 PM	0.3
South gym	1	9316243	03:38 PM	11:19 AM	0.3
Sw gym	1	9316559	03:38 PM	11:20 AM	0.8
Nw gym	1	9316560	03:39 PM	11:21 AM	0.5
Stage	1	9316567	03:31 PM	11:26 AM	0.5
27	1	9315970	02:23 PM	12:35 PM	Lost in Transit

Upper Table Rock Campus

Room	Floor	Kit ID #	Test Start Time	Test End Time	Result (pCi/L)
A7	1	9315802	04:50 PM	01:07 PM	1.2
B3	1	9315803	05:15 PM	01:22 PM	0.8
B5	1	9315805	05:17 PM	01:21 PM	0.8
B6	1	9315807	05:18 PM	01:18 PM	1.0
A3	1	9315808	04:47 PM	01:03 PM	1.1
A4	1	9315809	04:43 PM	01:04 PM	1.0
A3 office	1	9315810	04:47 PM	01:04 PM	1.2
A2	1	9315811	04:42 PM	01:00 PM	1.0
A1 office	1	9315812	04:40 PM	01:02 PM	1.6
Exam room	1	9315813	04:36 PM	12:57 PM	0.9
Family room	1	Duplicate Avg*	04:31 PM	12:59 PM	0.8
Nurse	1	9315816	04:34 PM	12:58 PM	1.3
B2	1	9315817	05:10 PM	01:24 PM	1.0
B1 office	1	9315818	05:09 PM	01:24 PM	1.5
B4 office	1	9315819	05:13 PM	01:20 PM	0.9
B4	1	9315820	05:12 PM	01:19 PM	0.8
B1	1	Duplicate Avg*	05:04 PM	01:22 PM	1.1
A7 office	1	9315823	04:52 PM	01:07 PM	1.5
A5	1	Duplicate Avg*	04:48 PM	01:09 PM	1.3
A10	1	9315831	04:57 PM	01:10 PM	1.3
A9 office	1	9315832	04:56 PM	01:11 PM	1.3
A8	1	9315833	04:58 PM	01:05 PM	1.2
B10	1	9315834	05:26 PM	01:15 PM	1.1
A6	1	9315835	05:00 PM	01:05 PM	1.0
A9	1	9315837	04:53 PM	01:09 PM	1.3
A1	1	9315838	04:41 PM	01:01 PM	1.2
C1	1	9315839	04:14 PM	12:37 PM	0.8
Health room	1	9315840	04:37 PM	12:56 PM	0.8

Room	Floor	Kit ID #	Test Start Time	Test End Time	Result (pCi/L)
Work room	1	9315841	04:26 PM	12:55 PM	1.0
West gym	1	9315842	04:10 PM	12:39 PM	0.8
Cafeteria	1	9315844	04:02 PM	01:26 PM	0.6
Kitchen	1	9315846	04:05 PM	12:43 PM	0.6
Ne gym	1	9315847	04:08 PM	12:41 PM	0.6
South gym	1	9315848	04:06 PM	12:40 PM	0.5
C2	1	9315849	04:13 PM	12:38 PM	0.9
Rogue main office	1	9315850	04:29 PM	12:57 PM	0.8
Librarian office	1	Duplicate Avg*	04:20 PM	12:45 PM	0.7
Library	1	9315853	04:18 PM	12:44 PM	0.7
B9 office	1	9315934	05:26 PM	01:14 PM	1.3
B7	1	9315937	05:23 PM	01:16 PM	0.7
B8	1	9316236	05:20 PM	01:17 PM	0.7
B8 office	1	9316237	05:21 PM	01:18 PM	0.8
B9	1	9316308	05:24 PM	01:13 PM	0.8

Duplicate measurements were conducted as a means to assess the precision of the test measurements. The criteria of acceptance is that the average relative percent difference (ARPD) of the results of the two measurement results for results whose averages are greater than 4.0pCi/L, should be within 25%. The results of the collated duplicates are provided in Table 2. The applicable ARPD for this survey was not applicable and is thus in compliance.

*Table 2: *Duplicate Table*

Room	Kit ID#	Test Start Time	Test End Time	Result (pCi/L)	Average (pCi/L)	Avg > 3.9 pCi/L?	RPD %
Main Office	9315911	01:20 PM	11:30 AM	0.3	0.3	No	N/A
	9315999	01:20 PM	11:30 AM	0.3			
Principal	9315972	01:28 PM	11:34 AM	0.5	0.4	No	N/A
	9315982	01:28 PM	11:34 AM	0.3			
13	9315955	02:08 PM	11:39 AM	0.3	0.3	No	N/A
	9315956	02:08 PM	11:39 AM	0.3			
Second Pod	9316000	02:25 PM	12:03 PM	0.3	0.3	No	N/A

Room	Kit ID#	Test Start Time	Test End Time	Result (pCi/L)	Average (pCi/L)	Avg > 3.9 pCi/L?	RPD %
Teacher area	9315974	02:25 PM	12:03 PM	0.3			
9	9315950	02:58 PM	11:54 AM	1.0	1.1	No	N/A
	9315957	02:59 PM	11:54 AM	1.2			
Kitchen Office	9315932	03:25 PM	11:24 AM	0.7	0.7	No	N/A
	9315969	03:25 PM	11:24 AM	0.7			
Maintenance	9315943	03:35 PM	11:28 AM	0.3	0.3	No	N/A
	9315943	03:35 PM	11:28 AM	0.3			
Librarian office	9315851	04:20 PM	12:45 PM	0.7	0.7	No	N/A
	9315852	04:20 PM	12:45 PM	0.7			
Family Room	9315814	04:31 PM	12:59 PM	0.8	0.8	No	N/A
	9315815	04:31 PM	12:58 PM	0.7			
A5	9315824	04:48 PM	01:09 PM	1.2	1.3	No	N/A
	9315801	04:49 PM	01:09 PM	1.3			
B1	9315821	05:04 PM	01:22 PM	1.1	1.1	No	N/A
	9315822	05:04 PM	01:22 PM	1.1			
B8	9316236	05:20 PM	01:17 PM	0.7	0.7	No	N/A
	9315836	05:20 PM	01:17 PM	0.7			
Average RPD for Duplicate Averages more than 3.9 pCi/L:							No
In Compliance:							Yes

As a means to determine any biases in the results, detectors were deployed but not opened. At the time of test retrieval of the regular test, the devices were removed from their packaging and sent to the laboratory for blind analysis. The results of these unexposed devices are shown in Table 3. As can be seen, the laboratory reported these at the lower level of detection, indicating that no biases were introduced in handling and shipping of the devices.

Table 3: Blanks

Room	Blank #	Kit ID #	Result (pCi/L)	In Compliance?
17	1	9315951	0.3	Yes
Staff Room	2	9315940	0.3	Yes
Stage	3	9315925	0.3	Yes

Room	Blank #	Kit ID #	Result (pCi/L)	In Compliance?
Work Room	4	9315843	0.3	Yes
A9	5	9315827	0.3	Yes
B4 Office	6	9315806	0.3	Yes
Blank in Transit	7	9316105	0.3	Yes
Blank in Transit	8	9316108	0.3	Yes
Blank in Transit	9	9316146	0.3	Yes

A device was also selected from the lot of detectors that were utilized for exposure to a known radon environment at a spiking chamber (Bowser-Morner, NEHANRPP ID# 101 TC). After exposure, the device was submitted as a blind measurement to the laboratory. A comparison of the reported reading from the lab and the known concentration in the chamber is as follows:

Chamber concentration to which device was exposed:	26.2 pCi/L
Concentration reported by lab:	22.7
Relative percent difference (RPD):	14.3

Chamber concentration to which device was exposed:	26.2 pCi/L
Concentration reported by lab:	23.4
Relative percent difference (RPD):	11.3

Chamber concentration to which device was exposed:	26.2 pCi/L
Concentration reported by lab:	23.7
Relative percent difference (RPD):	10.0

The RPD between the reported and spiking concentration is well within normal limits.

Key:

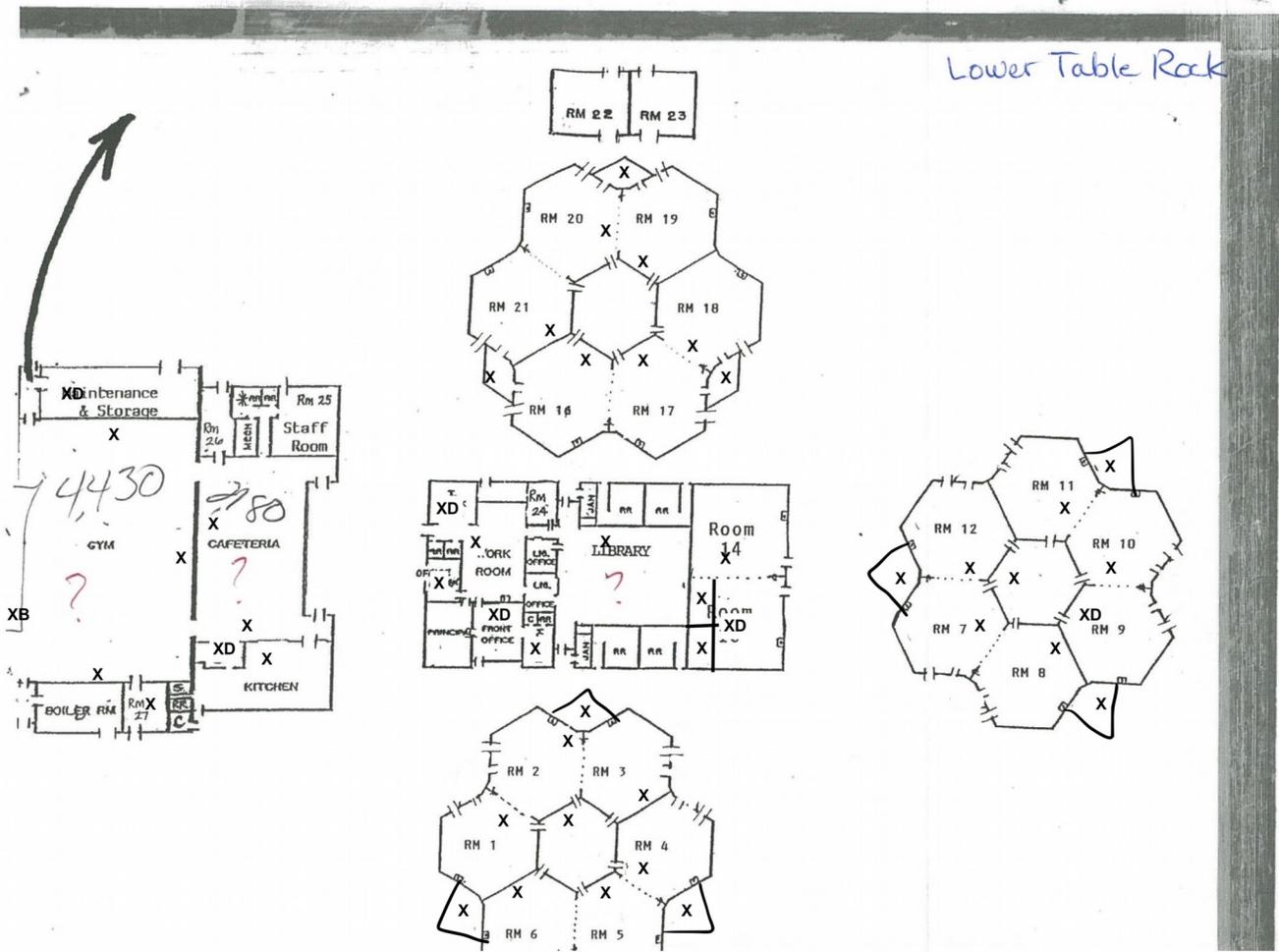
pCi/L: Picocuries per liter – units of radon concentration.

Average (Avg): Cumulative average of the entire period since the test started.

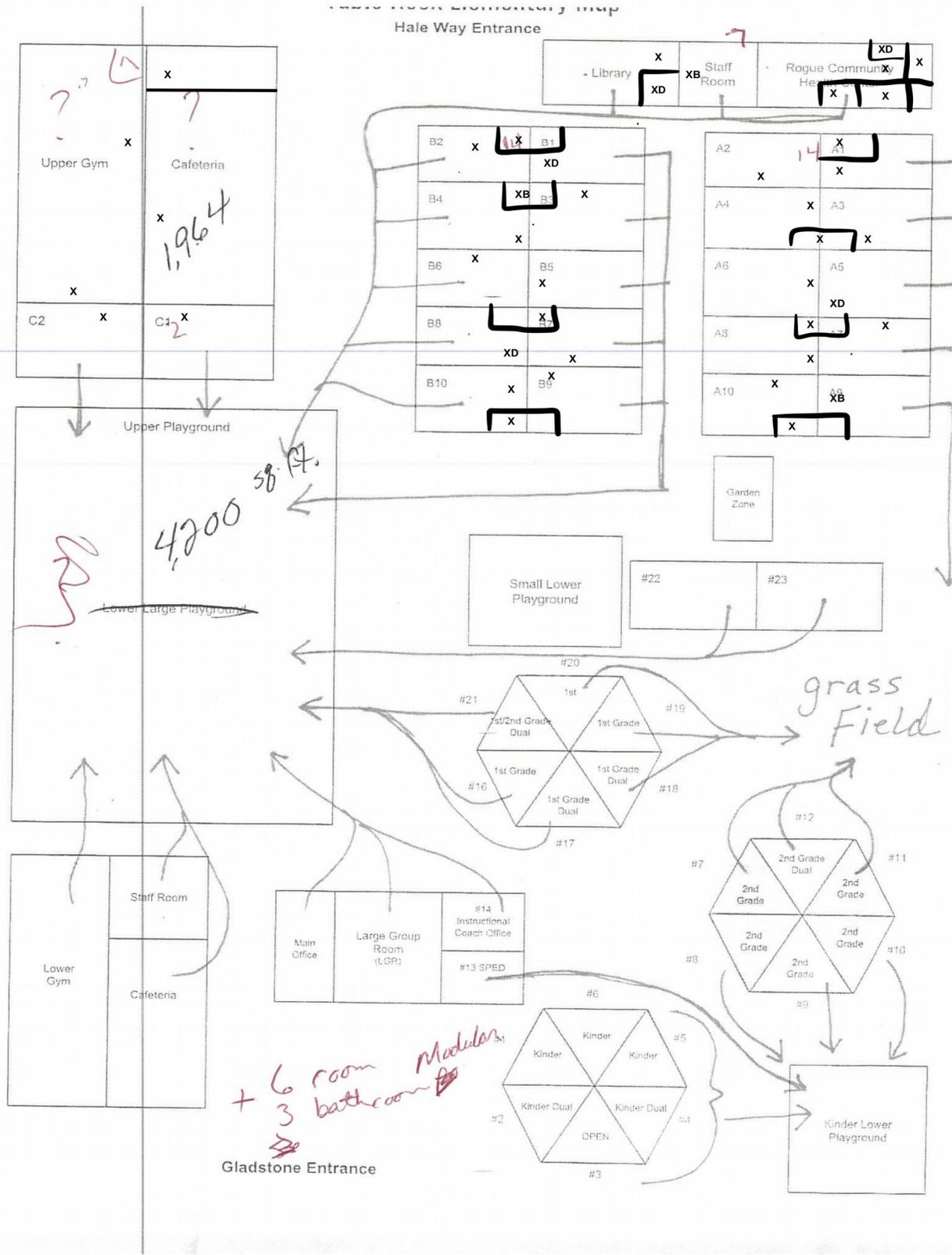
Please contact me if you have any questions.

Thank you,
 Rachell Meyers
 NRPP 110320 RT

Appendix A: Test Placement Map

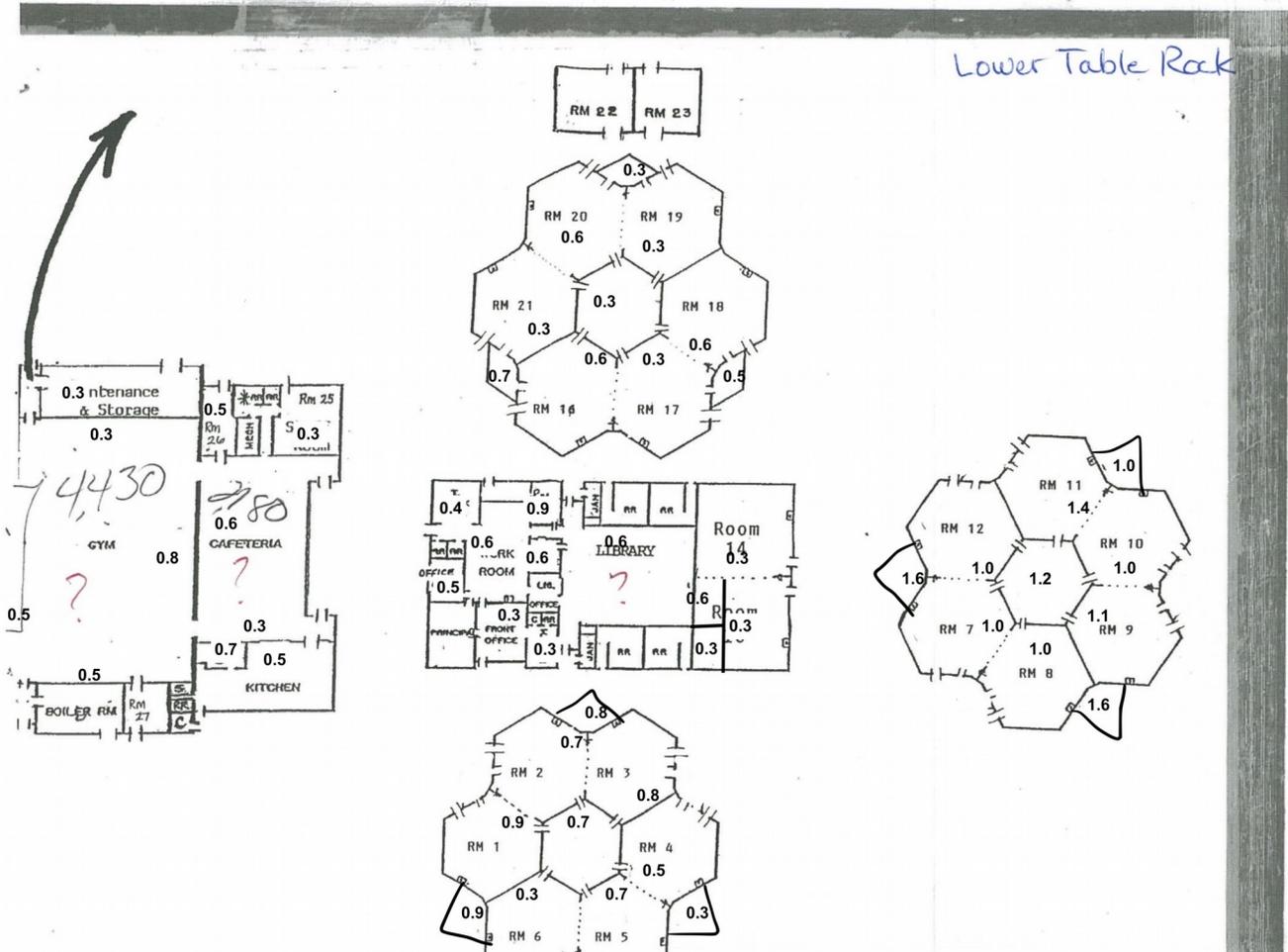


Hale Way Entrance

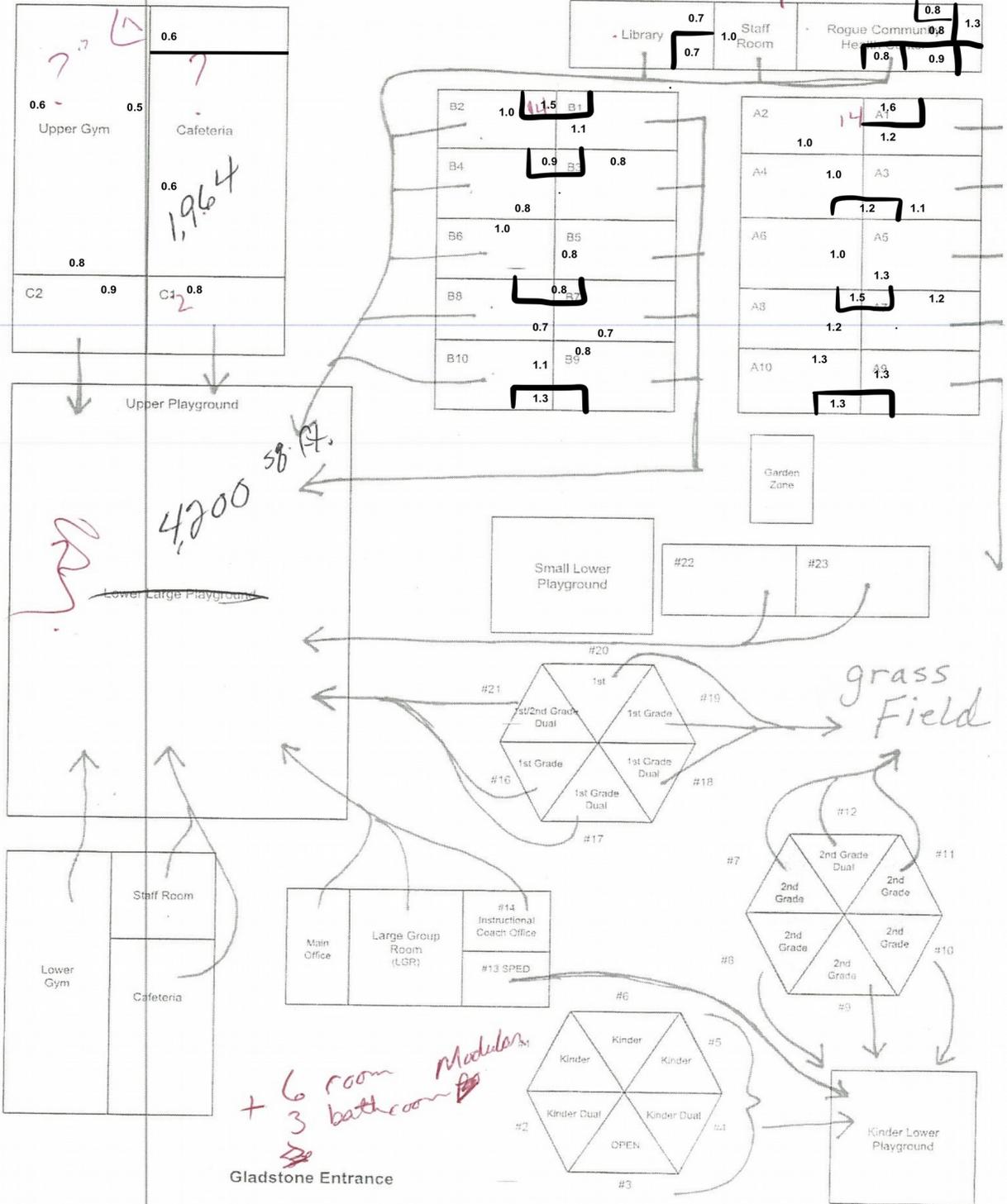


Gladstone Entrance

Appendix B: Test Results Map



Hale Way Entrance



Gladstone Entrance