



Cascade Radon, Inc.
Testing, Mitigation,
Systems Design
CCB 180537 / CASCARI927C1
Fed ID 26-1809992

12839 NE Airport Way Bldg. 9
Portland, Oregon 97230
Phone: (503) 421-4813
Fax: (503) 281-6170
Office@CascadeRadon.com

Jefferson High School

(C-65037)

5210 N Kerby Ave., Portland, OR 97217

December 29, 2017



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Purpose

Initial short-term testing was performed by PBS Engineering and Environmental Inc. in 36 locations throughout the building beginning December 12, 2016 and ending December 15, 2016. Testing indicated 9.2 pCi/L in room A75 and 11 pCi/L in Office A36 of the building. In January of 2017 a follow up test was performed in these two rooms using a continuous radon monitor as a confirmation test, the result of those tests came back with a radon average of 7.9 pCi/L in room A75 and 10.7 pCi/L in the Office A36. Due to the radon averages testing twice the EPA's action level, Cascade Radon was hired to diagnose the the effected room and develop a mitigation strategy to reduce the radon levels.

The installation of two sub-slab depressurization systems was used to reduce the radon below the EPA action level of 4 pCi/L. See attached pages for a description of the system components.



System #1 mitigation fan is located on the roof above the wood shop. This fan creates negative pressure beneath the concrete slab to mitigate the adjacent Office A36.



System #2 mitigation fan is located on the western roof of the building. Vent piping runs down the side of the building, into the receiving room and into the faculty dining room A75. This system was painted to help it blend in on the more visible western exterior.

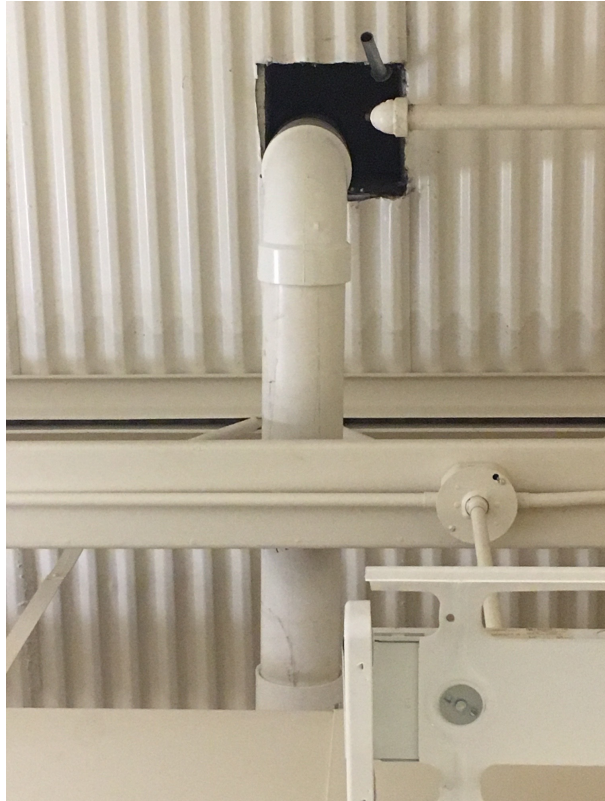


Suction point location in a storage coral of the wood shop.



Pressure Gauge

System #1, initial suction point is located in a storage coral in the wood shop. The vent piping continues to the fan location on the roof above. The system includes a manometer (pressure gauge), which is a simple means of seeing the system is working mechanically. A manometer also shows how much negative pressure (depressurization) the system is creating. It is understood such a pressure gauge DOES NOT monitor radon levels.



This portion of system #1 is the vent piping continuing from the suction point across the wood shop and through the roof deck to the mitigation fan on the roof.



System #2, the suction point is located in The faculty serving room adjacent to room A75. The vent piping continues to the fan located on the western roofline. The system includes a manometer (pressure gauge), which is a simple means of seeing the system is working mechanically. A manometer also shows how much negative pressure (depressurization) the system is creating. It is understood such a pressure gauge DOES NOT monitor radon levels.



Vent routing from Faculty Serving room up into the drop ceiling of the corridor.



Vent piping coming through the foundation wall from the corridor drop ceiling and into the receiving room.

Vent routing from the receiving room through the receiving corridor and to the exterior foundation wall.



Exterior vent routing to the fan location on the western roof



Credentials

Cascade Radon, Inc.
12839 NE Airport Way Bldg. 9
Portland, OR 97230
(503)421-4813
office@cascaderadon.com
CCB180537
CASCARI977C1
NEHA/NRPP# 104815RMT
NRSB# 1G0008

Snyder Roofing of Oregon LLC
12650 SW Hall Blvd.
Tigard, OR 97223
(503)620-5252
Snyder-builds.com
CCB135987

Christensen Electric, Inc.
17201 NE Sacramento Street
Portland, OR 97230
(503)419-3300
info@christenson.com
CCB458

Accurate Concrete Cutting
6816 NE 40th Ave.
Vancouver, WA 98661
lj@accurate-concrete-cut.com
CCB191788
W.A. Contr. License# ACCURCC153M2



CASCADE RADON, INC.

Testing, Mitigation,
Systems Design
CCB 180537 / CASCARI927C1

12839 NE Airport Way
Portland, OR 97230
Phone: (503) 421-4813
Fax: (503) 281-6170
Office@CascadeRadon.com

December 29, 2017
C-65037

To: Portland Public Schools
501 N. Dixon Street
Portland, OR 97227

RE: Jefferson High School
5210 N Kerby Ave.
Portland, OR 97217

Effective: November 30, 2017

Cascade Radon, Inc. warrants that all work has been performed in a workmanlike manner and according to the best standard practices. All materials and equipment are new, unless otherwise specified, and of first quality.

Cascade Radon, Inc. guarantees that the installation will maintain average, long-term, indoor radon levels, based upon approved 9 month duration Alpha-Track testing at or below 4 pCi/L for a period of 10 years.

With the exception of the exhaust fan unit(s), Cascade Radon, Inc. warrants that all labor, work, materials and equipment will be free from faults in material or workmanship for period of ten (10) years from the date of substantial completion.

Includes 5-year manufactures replacement warranty on exhaust fan unit(s), beginning at time of initial activation, with any related work and materials provided at no cost to the Client.

All warranties and guarantees are transferable to future owners of the same property.

Warranty or service inquires, please call (503) 421-4813

Sincerely,
Wade Gervais
Division Manager
Cascade Radon, Inc.

AMG LEGEND

AMG LEGEND

Performance Figures – AMG Legend, AMG Radon Extract Fan

CFM at STATIC PRESSURE in w.g.

Model	Volts	Watts	Max. Amps	0"	0.5"	0.75"	1.0"	1.25"	1.5"	1.75"	2.0"	2.2"	2.4"	2.6"
AMG Legend	115V 60 Hz	125	1.32	353	280	245	210	180	149	110	70	43	19	0

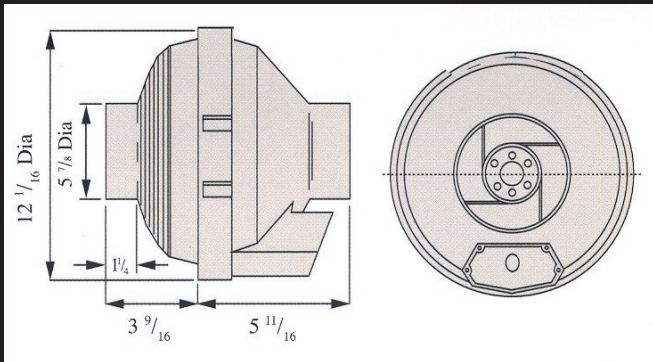
Weight 8 lbs. 3 oz. Fan Speed: 3100 rpm

Performance shown is for installation type D-Ducted inlet, Ducted outlet.

Performance ratings do not include the effects of appurtenances in the airstream.

Speed (rpm) shown is nominal. Performance is based on actual speed of test.

The performance figures shown have been corrected to standard air density.



AMG EAGLE

AMG EAGLE

Performance Figures – AMG Eagle, AMG Radon Extract Fan

CFM at STATIC PRESSURE in w.g.

Model	Volts	Watts Max.	Amps	0"	0.5"	0.75"	1.0"	1.25"	1.5"	1.75"	2.0"	2.25"	2.5"	2.75"	3.0"	3.25"	3.5"	3.985"
AMG Eagle	115V 60 Hz	160	1.37	124	114	109	104	99	91	83	76	69	61	52	41	30	18	0

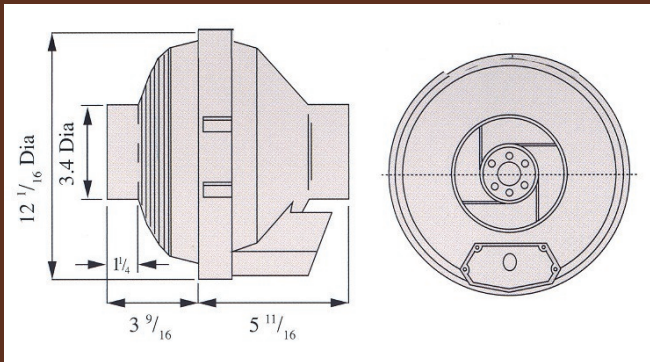
Weight 12 lbs. 1 oz. Fan Speed: 3150 rpm

Performance shown is for installation type D-Ducted inlet, Ducted outlet.

Performance ratings do not include the effects of appurtenances in the airstream.

Speed (rpm) shown is nominal. Performance is based on actual speed of test.

The performance figures shown have been corrected to standard air density.





TEST DETAILS:

Jefferson High School
 5210 N Kerby Ave
 Portland, OR 97217

Portland Public School

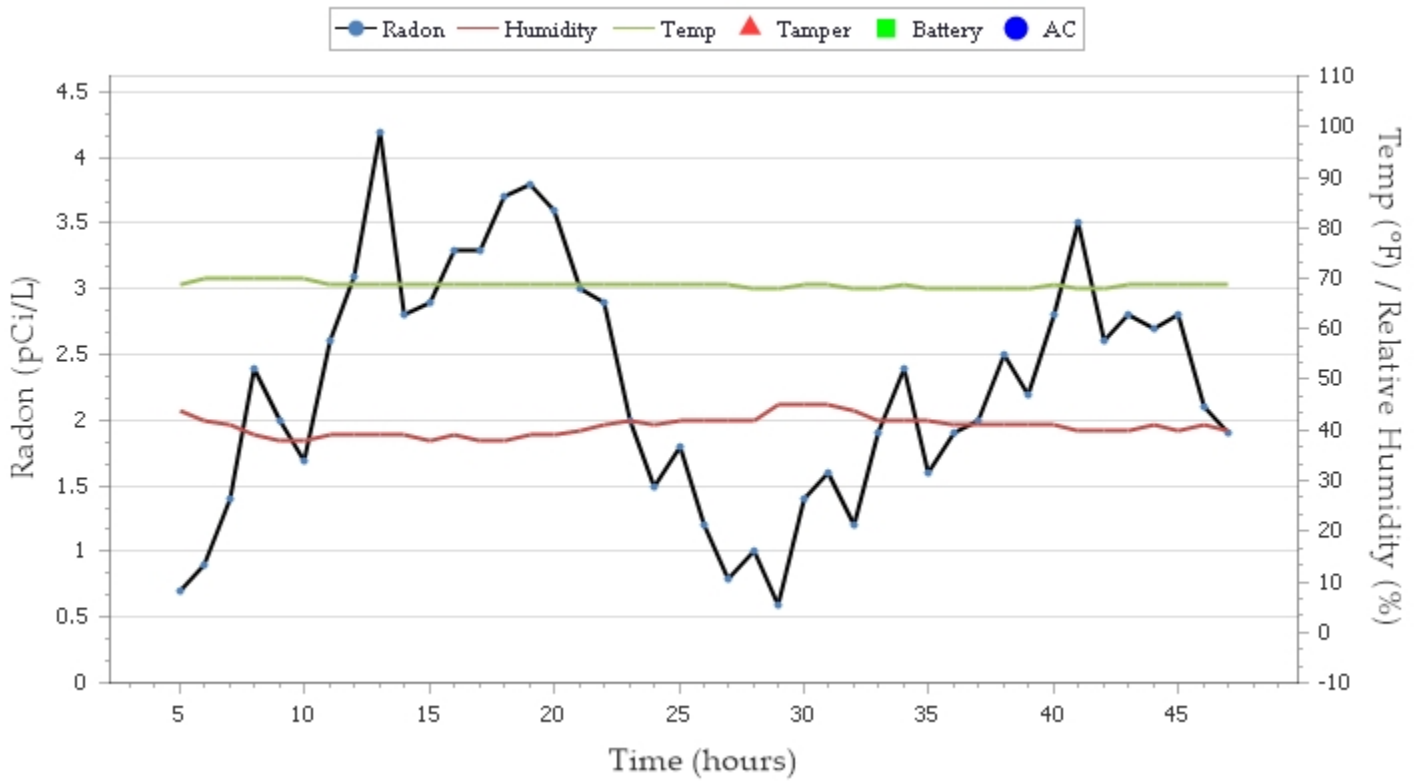
Test Start Date/Time: Tuesday, November 14, 2017 // 10:07 AM
Test End Date/Time: Thursday, November 16, 2017 // 10:11 AM
Location of Instrument: Woodshop Office (A41E)

Notes:

TEST RESULTS:

Average: 2.2 pCi/L

Test ID# 80188



Tamara Linde	Date
Certification #:	
License 1:	CCB 180537/ CASCARI927C1
License 2:	NRPP 108946RT, 108953RT



INTERVAL REPORT:

Hour	T	B	AC	pCi/L	Temp	Humd	Alpha
1				0.5	67	49	19
2				0.4	69	46	16
3				0.6	69	44	21
4				0.6	69	42	21
5				0.7	69	44	25
6				0.9	70	42	29
7				1.4	70	41	48
8				2.4	70	39	80
9				2.0	70	38	66
10				1.7	70	38	56
11				2.6	69	39	85
12				3.1	69	39	100
13				4.2	69	39	135
14				2.8	69	39	91
15				2.9	69	38	96
16				3.3	69	39	108
17				3.3	69	38	109
18				3.7	69	38	119
19				3.8	69	39	123
20				3.6	69	39	117
21				3.0	69	40	98
22				2.9	69	41	94
23				2.0	69	42	66
24				1.5	69	41	50
25				1.8	69	42	58
26				1.2	69	42	39
27				0.8	69	42	27
28				1.0	68	42	33
29				0.6	68	45	22
30				1.4	69	45	46
31				1.6	69	45	53
32				1.2	68	44	41
33				1.9	68	42	63
34				2.4	69	42	78
35				1.6	68	42	53
36				1.9	68	41	64
37				2.0	68	41	67
38				2.5	68	41	81
39				2.2	68	41	73
40				2.8	69	41	93
41				3.5	68	40	114
42				2.6	68	40	84
43				2.8	69	40	90
44				2.7	69	41	88
45				2.8	69	40	93
46				2.1	69	41	69
47				1.9	69	40	62

Minimum: 0.6 pCi/L **Maximum:** 4.2 pCi/L **Average:** 2.2 pCi/L

Tamara Linde _____ Date _____
 Certification #:
 License 1: CCB 180537/ CASCARI927C1
 License 2: NRPP 108946RT, 108953RT



TEST DETAILS:

Jefferson High School
 5210 N Kerby Ave
 Portland, OR 97217

Portland Public Schools

Test Start Date/Time: Thursday, November 30, 2017 // 4:00 PM

Test End Date/Time: Tuesday, December 05, 2017 // 4:00 PM

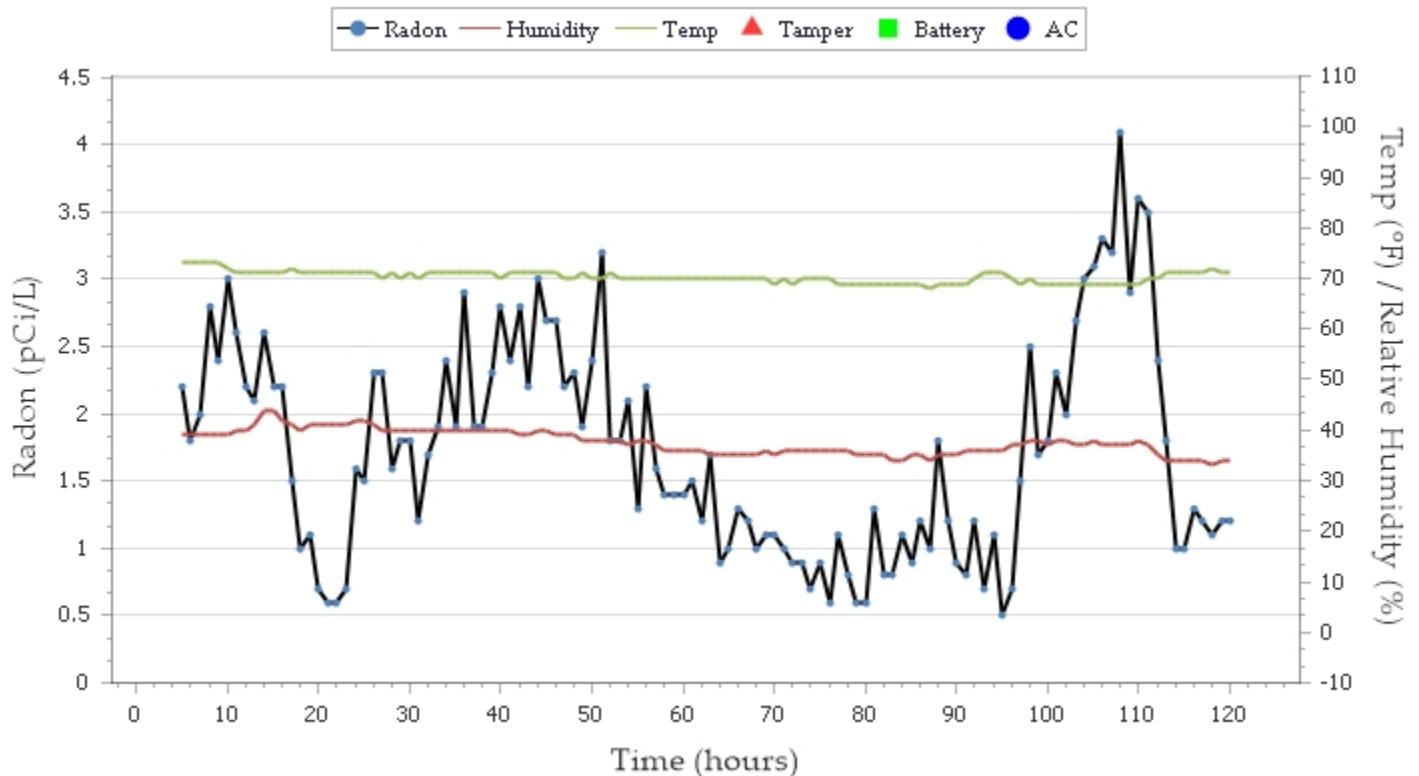
Location of Instrument: A75/Faculty Dining

Notes:

TEST RESULTS:

Average: 1.7 pCi/L

Test ID# 80038



Tamara C Linde

12/6/17

Tamara Linde

Date

Certification #:

License 1:

CCB 180537/ CASCARI927C1

License 2:

NRPP 108946RT, 108953RT



INTERVAL REPORT:

Hour	T	B	AC	pCi/L	Temp	Humd	Alpha
1				0.8	68	50	27
2				1.1	71	42	37
3				1.6	72	40	52
4				2.0	72	39	63
5				2.2	73	39	69
6				1.8	73	39	58
7				2.0	73	39	63
8				2.8	73	39	90
9				2.4	73	39	76
10				3.0	72	39	95
11				2.6	71	40	82
12				2.2	71	40	70
13				2.1	71	41	67
14				2.6	71	44	82
15				2.2	71	44	71
16				2.2	71	42	72
17				1.5	72	41	50
18				1.0	71	40	33
19				1.1	71	41	35
20				0.7	71	41	23
21				0.6	71	41	21
22				0.6	71	41	20
23				0.7	71	41	25
24				1.6	71	42	53
25				1.5	71	42	47
26				2.3	71	41	75
27				2.3	70	40	74
28				1.6	71	40	52
29				1.8	70	40	57
30				1.8	71	40	57
31				1.2	70	40	40
32				1.7	71	40	55
33				1.9	71	40	60
34				2.4	71	40	77
35				1.9	71	40	60
36				2.9	71	40	91
37				1.9	71	40	61
38				1.9	71	40	61
39				2.3	71	40	73
40				2.8	70	40	90
41				2.4	71	40	76
42				2.8	71	39	90
43				2.2	71	39	71
44				3.0	71	40	95
45				2.7	71	40	87
46				2.7	71	39	87
47				2.2	70	39	71
48				2.3	70	39	73
49				1.9	71	38	61
50				2.4	70	38	76
51				3.2	70	38	102
52				1.8	71	38	57
53				1.8	70	38	59
54				2.1	70	37	67
55				1.3	70	38	42
56				2.2	70	38	72
57				1.6	70	37	52



58	1.4	70	36	44
59	1.4	70	36	44
60	1.4	70	36	44
61	1.5	70	36	50
62	1.2	70	36	39
63	1.7	70	35	54
64	0.9	70	35	30
65	1.0	70	35	33
66	1.3	70	35	41
67	1.2	70	35	40
68	1.0	70	35	34
69	1.1	70	36	36
70	1.1	69	35	35
71	1.0	70	36	34
72	0.9	69	36	30
73	0.9	70	36	30
74	0.7	70	36	25
75	0.9	70	36	31
76	0.6	70	36	20
77	1.1	69	36	35
78	0.8	69	36	28
79	0.6	69	35	19
80	0.6	69	35	20
81	1.3	69	35	41
82	0.8	69	35	27
83	0.8	69	34	27
84	1.1	69	34	35
85	0.9	69	35	31
86	1.2	69	35	39
87	1.0	68	34	34
88	1.8	69	35	58
89	1.2	69	35	40
90	0.9	69	35	30
91	0.8	69	36	26
92	1.2	70	36	38
93	0.7	71	36	25
94	1.1	71	36	35
95	0.5	71	36	18
96	0.7	70	37	24
97	1.5	69	37	50
98	2.5	70	38	79
99	1.7	69	38	54
100	1.8	69	37	57
101	2.3	69	38	74
102	2.0	69	38	64
103	2.7	69	37	86
104	3.0	69	37	94
105	3.1	69	38	100
106	3.3	69	37	106
107	3.2	69	37	102
108	4.1	69	37	129
109	2.9	69	37	93
110	3.6	69	38	114
111	3.5	70	37	112
112	2.4	70	35	76
113	1.8	71	34	59
114	1.0	71	34	32
115	1.0	71	34	34
116	1.3	71	34	41
117	1.2	71	34	40
118	1.1	72	33	37
119	1.2	71	34	39

Tamara Linde
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120		1.2	71	34	38		
Minimum:	0.5 pCi/L	Maximum:		4.1 pCi/L		Average:	1.7 pCi/L

Tamara C Linde

12/6/17

Tamara Linde

Date

Certification #:

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CCB 180537/ CASCARI927C1

License 2:

NRPP 108946RT, 108953RT