

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

Roseway Heights Elementary

(C-65492)

7334 NE Siskiyou Street, Portland, OR 97213

May 24, 2018



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

Purpose

Initial testing was performed throughout the school on March 28, 2016 to March 31, 2016 by PBS Engineering and Environmental Inc. Testing indicated 7.9 pCi/L in the boiler room of the building. PBS performed additional testing starting in October 2016 to May 2017 as a confirmation long-term test to determine if mitigation was needed. The result of this 7 month test was 4.0 pCi/L in the boiler room. Cascade Radon was hired to diagnose boiler room and develop a mitigation strategy to reduce the radon levels.

The installation of a sub-slab depressurization system 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 and post-mitigation testing.



The suction point is located on the western wall of the boiler room. Schedule 80 vent piping was used in the boiler room to protect against accidental impacts. The vent piping exits the southern exterior wall and then to fan location on the roof. 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 pipe routing to the southern exterior wall in the boiler room. Vent piping was transitioned back to schedule 40 piping when high enough and out of harms way.



Exterior vent pipe continues up the side of the building and over the parapet wall to the fan location on the roof. The vent pipe was shrouded to deter climbing.



This system required a Festa AMG Fury model fan, which is designed for the more porous rocky soil found beneath the concrete slab. If left to operate continuously the lifespan of this fan typically is 10 to 15 years.

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 Ij@accurate-concrete-cut.com CCB191788 W.A. Contr. License# ACCURCC153M2



CASCADE RADON, INC.

Testing, Mitigation, Systems Design CCB 180537 / CASCARI927C1

May 24, 2018 C-65492

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

RE: Roseway Heights Elementary School

7334 NE Siskiyou St. Portland, OR 97213

Effective: January 26, 2018

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.

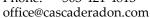
All warranties and guarantees are transferable to future owners of the same property.

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

Sincerely, Wade Gervais Division Manager Cascade Radon, Inc. 12839 NE Airport Way Portland, OR 97230 Phone: (503) 421-4813 Fax: (503) 281-6170 Office@CascadeRadon.com Tamara Linde Cascade Radon 12839 NE Airport Way Portland, OR 97230 Phone:

503-421-4813

503-281-6170 Fax:





TEST DETAILS:

Roseway Heights 7334 NÉ Siskiyou St Portland, OR 97213 Multnomah

Portland Public Schools

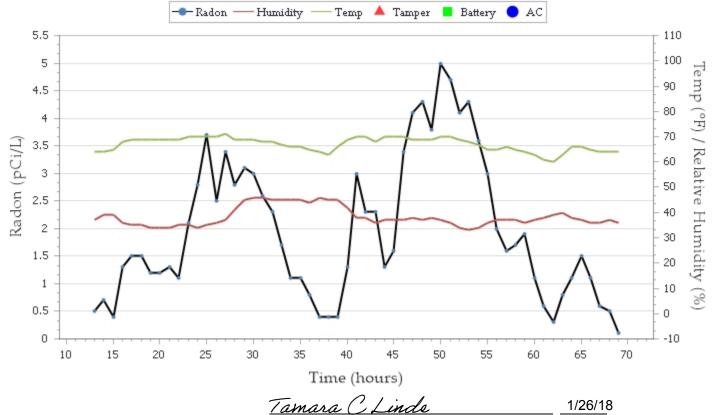
Test Start Date/Time: Tuesday, January 16, 2018 // 2:46 PM **Test End Date/Time:** Friday, January 19, 2018 // 12:02 PM

Location of Instrument: Boiler Room East Wall

Notes:

TEST RESULTS:

1.9 pCi/L Test ID# Average: 80036



Tamara Linde Date

Certification #:

License 1: CCB 180537/ CASCARI927C1 License 2: NRPP 108946RT, 108953RT

Version 1.6 RadStar RS800 Radon Detector/Monitor Serial#: 02368 Calib.#: 00327 Bkgnd06 Test ID#: 80036 Page 1 of 3 Tamara Linde Cascade Radon 12839 NE Airport Way Portland, OR 97230

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INTERVAL REPORT:

Hour	T	В	AC	pCi/L	Temp	Humd	Alpha
13				0.5	64	37	17
14				0.7	64	39	25
15				0.4	65	39	14
16				1.3	68	36	42
17				1.5	69	35	49
18				1.5	69	35	48
19				1.2	69	34	39
20				1.2	69	34	38
21				1.3	69	34	43
22				1.1	69	35	37
23				2.1	70	35 35	66
23 24				2.1	70 70	34	89
25				3.7	70 70	35 35	
						33	118
26				2.5	70 71	36	81
27				3.4	71	37	108
28				2.8	69	41	90
29				3.1	69	45	98
30				3.0	69	46	95
31				2.6 2.3	68	46	83
32				2.3	68	45	75
33				1.7	67	45	56
34				1.1	66	45	36
35				1.1	66	45	36
36				0.8	65	44	28
37				0.4	64	46	14
38				0.4	63	45	13
39				0.4	66	45	15
40				1.3	69	42	41
41				3.0	70	38	97
42				2.3	70	38	75
43				2.3	68	36	73
44				1.3	70	37	43
45				1.6	70	37	53
46				3.4	70	37	108
47				4.1	69	38	131
48				4.3	69	37	137
49				3.8	69	38	119
50				5.0	70	37	159
51				4.7	70	36	150
52				4.1	69	34	131
53				4.3	68	33	136
54				3.6	67	34	115
55				3.0	65	36	94
56				2.0	65	37	63
57				1.6	66	37	52
58				1.7	65	37	56
59					64	26	60
60				1.9		36 37	
				1.1	63	3/	35
61 62				0.6	61	38	19 10
62				0.3	60	39 40	10
63				0.8	63	40	28
64				1.1	66	38	36
65				1.5	66	37	47
66				1.1	65	36	37
67				0.6	64	36	21
68				0.5	64	37	18
69				0.1	64	36	6

RadStar RS800Radon Detector/MonitorVersion 1.6Serial#:02368Calib.#:00327 Bkgnd06 Test ID#:80036Page 2 of 3

Tamara Linde Cascade Radon 12839 NE Airport Way Portland, OR 97230

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1813 Fax: 3



1/26/18

Date

Minimum: 0.1 pCi/L Maximum: 5.0 pCi/L Average: 1.9 pCi/L

Tamara C Linda

Tamara Linde Certification #:

License 1:

CCB 180537/ CASCARI927C1

License 2: NRPP 108946RT, 108953RT

RadStar RS800 Radon Detector/Monitor Version 1.6 Serial#: 02368 Calib.#: 00327 Bkgnd06 Test ID#: 80036 Page 3 of 3



CERTIFICATE OF CALIBRATION RadStar RS800 Continuous Monitor

This instrument has been calibrated in accordance with the procedures set forth by the manufacturer. Please retain this certificate for your records

Cal Date: 5-5-(7 Last Cal Date: Next Cal Date: Device Serial Number: 2368 Device Type: RS800 Device Status: Passed X Failed	5-5-18						
NRPP Chamber#TC103 Radon Gas Concentration: 20.1 pCi/l Rad7 Serial Numbers: 0356 0352 Chamber Temperature: 70.6 °F Chamber Humidity: Start Chamber Exposure: 08/15/16 09:00 Stop Chamber Exposure:	48.1 %RH 08/17/16 09:00						
Calibration Number (as found, if applicable) Calib#=(10240/(Hourly Counts/pCi/l)) Calibration Number (Final) 327							
RadonAway 3 Saber Way Ward Hill, Massachusetts 01835 978-521-3703 This RadStar Continuous Radon Monitor has been calibrated by the Manufacturer using a standard operating procedure for the calibration of the RS800, TP010 Rev E. This procedure provides for the following performance checks: System Functional Checks Battery Check Back Ground Check in Nitrogen Chamber Exposure in known Radon Gas Concentration Adjustment to Calibration Number, if necessary Adjustment to Background, if necessary Verification Chamber Exposure, if necessary Verification Chamber Exposure, if necessary The manufacturer, RadonAway performs quarterly inter-comparisons with a Secondary Chamber							
NRPP Device Code 476 Device group 18 USEPA Verified							
Radon Measurement Specialist: NRSB #6SS0002, NRPP #100842RT	nae.						