



Radon Detection Specialists, Inc.

Commercial Radon Survey Report

Client: Community Consolidated School District 181
Site Address: Madison School
611 S Madison
Hinsdale, IL 60521
Survey Date: April 11, 2012 to April 13, 2012

Initial Test

RDS-R-002
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Licensed for Residential and Commercial Radon Testing

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Client: C.C.S.D. 181
Site Address: Madison School, 611 S Madison, Hinsdale, IL
Survey Date: 4/11/12 to 4/13/12

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Basics of Radon and Radon Health Impacts

Radon is recognized by the United States Environmental Protection Agency (USEPA) as well as the scientific and medical communities as a Class A carcinogen, accounting for 15,000 – 22,000 lung cancer deaths annually. Exposure to radon gas is the leading cause of lung cancer among non-smokers.

Radon is a cancer-causing, naturally occurring, radioactive gas which comes from our soil. It can't be seen, smelled or tasted. The only way to know if the level of radon gas in your building exceeds the recommended action level of 4.0 pCi/L is to test. The Department of Nuclear Safety in Illinois requires those testing for radon in commercial buildings, schools and multi-family housing communities, as well as individual residences, to be licensed.

The amount of radon in the soil depends on soil chemistry, which naturally varies. Radon levels in the soil can range from a few hundred to several thousands of pCi/L (pico Curies per liter of air). The amount of radon that escapes from the soil and enters the building depends on the weather, soil porosity, soil moisture, and the suction within the building.

Radon is the leading cause of lung cancer among non-smokers.

There is no safe level of radon exposure. Any exposure causes some risk of developing cancer. In two 1999 reports, the National Academy of Sciences (NAS) concluded after an exhaustive review that radon is the second leading cause of lung cancer. Only cigarette smoking poses a greater risk. The NAS estimates that 15,000 to 22,000 Americans die every year from radon-related lung cancer. That's 10% of all lung cancer deaths annually.

The alpha radiation from radon and its decay products cause damage to the sensitive lung tissue. Most of the radiation dose is not actually from radon itself, but rather from radon's chain of short-lived decay products that are inhaled and lodge in the airways of the lungs. These radionuclides decay quickly, producing other radionuclides that continue damaging the lung tissue. Those particles that are retained long enough release radiation and damage the surrounding lung tissue. It is this damage that can lead to lung cancer.

What other health risks are related to radon exposure?

No other respiratory ailments are linked to radon exposure

There are preliminary studies that are looking at the link between radon exposure and the development of Parkinson's and Alzheimer's disease. These are early studies. For more information on this issue, please visit our website and read the press release.



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Scope of Work Performed:

At the request of Jim Prusa, Facilities Coordinator for District 181, RDS performed radon testing at Madison School, located at 611 S Madison, Hinsdale, Illinois. This scope of work included a 2 day (short-term) radon test in all classrooms, offices, and common use spaces of the subject building.

A total of 58 devices were deployed, including one continuous radon monitor. Of the 57 passive devices deployed, 48 were single measurements, 6 were duplicates and 3 were blanks.

Testing was conducted from Wednesday, April 11, 2012 to Friday, April 13, 2012. The devices used were electret ionization chambers (Eperms™) manufactured by RAD ELEC, Inc. and a continuous radon monitors manufactured by Sun Nuclear, model 1027. The report includes a table that details all device measurement results. Because radon levels fluctuate hourly, daily, weekly, seasonally and yearly, these results should not be used to estimate radon levels of rooms that were not tested, or to estimate future radon levels of rooms that were tested. Changes to the building components (both structural and mechanical) can effect radon concentrations. Duplicate devices have been averaged together and demonstrate the precision of the measurements.

The testing was conducted in accordance with the Illinois Emergency Management Agency Division of Nuclear Safety (IEMA) and the United States Environmental Protection Agency (USEPA) testing protocols for commercial radon measurements, the device manufacturer's recommendations, and the RDS Quality Assurance Plan.



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Quality Assurance Plan for this Site

Pre-Deployment Testing Strategy

Tests will be conducted in all classrooms, offices and common use spaces in the subject building. A minimum of 1 detector will be placed every 2000 square feet in open areas. Tests will not be conducted in rooms that are not frequently occupied such as closets, storage rooms, restrooms, hallways, and stairwells unless the space is considered alterable for future regular use, or the measurement is taken for diagnostic purposes.

Materials and Methods

RDS will use electret ionization chambers and a continuous radon monitor to measure radon levels in the air in the above referenced property. The test will comply with all protocols set forth by IEMA, as well as the RDS Quality Assurance Plan. Duplicate tests will be conducted for not less than 10% of the total single devices placed to measure precision. Field blanks will be deployed for not less than 5% of the total number of tests deployed to measure background gamma radiation. Spike tests will be conducted at a minimum of 3% for the total amount of devices deployed (annually) to measure accuracy. The initial voltage reading will take place not more than 24 hours prior to deployment and the final voltage of the devices will be determined within 24 hours of retrieval.

RDS will locate devices in such a way to limit unintentional interference from building occupants. A walk-through inspection of the building prior to device deployment will allow RDS to document observations regarding radon entry mechanisms and general building pressure gradients. Test results will be reported in picoCuries per liter (pCi/L) of air. The effects of the HVAC system on radon progeny will not be evaluated and working level exposure (WL) will not be calculated during this test.



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Explanation of Device Results and Site Notes

Appendix A provides a detailed drawing showing device locations, if an appropriate and accurate drawing is provided by the client and dimensional device plotting is possible. If Appendix A is blank, please refer to the Device Placement columns provided in Appendix B (Room Use and Room Number) as an explanation of device locations.

Appendix B identifies all of the devices deployed and their reported radon levels. The results were determined using calculations supplied by the device manufacturer.

The radon levels were **BELOW** the recommended action level in all locations tested, with the exception of three locations. Air exchange rates for the facility were not available at the time of testing. Air exchange rates can affect the radon concentration based on dilution of radon gas.

Notes Regarding Appendix B:

All radon levels are expressed in picoCuries per liter (pCi/L) of air.

The building was tested according to IEMA, and USEPA protocol in regard to device placement and analytical methods of calculating results.

Tampering was not detected at the time the devices were retrieved, unless noted in the Comment Column.

Devices were placed strategically to reduce accidental interference by building occupants.

Duplicates are averaged together. It is the average of the two devices upon which decisions with regard to mitigation should be based.

Site Notes:

1. The subject building was occupied and fully-functional during this initial short-term survey.
2. The subject building is a two-story brick structure with multiple foundations.
3. The subject building has two distinct basement portions. One serves as District 181 Storage, and has one sump pump located in the SE corner of the area. The other basement serves as mechanical space. These basement portions were appropriately sampled, as well as the subject classrooms above the basements.
4. Upon device retrieval, the testing device located in Room 102 (Computer Lab) was noted to have its chamber closed prematurely. The results for this test device are invalid.
5. Upon device retrieval, the window in the SW corner of the gym was open. It is not known to what effect, if any, this had on the radon levels detected in this area.



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Survey Summary

The radon levels found during this short-term survey were BELOW the USEPA and IEMA Action Level of 4.0 pCi/L, with the exception of Room 115 and storage rooms S1 and S2 located in the Gym.

Recommendations

It is the recommendation of this testing professional to perform another short-term test in Room 115 and the two storage rooms in the gymnasium. If the results of the second short-term test confirm elevated readings, consultation with an Illinois licensed mitigation firm will be recommended.

If the results of the second short-term test do not confirm elevated readings, long-term testing will be recommended in the areas where elevated levels were previously found. Long-term testing (testing lasting 90 days or more) provides a better understanding of building radon concentrations and the risks of exposure to radon on an annual basis.

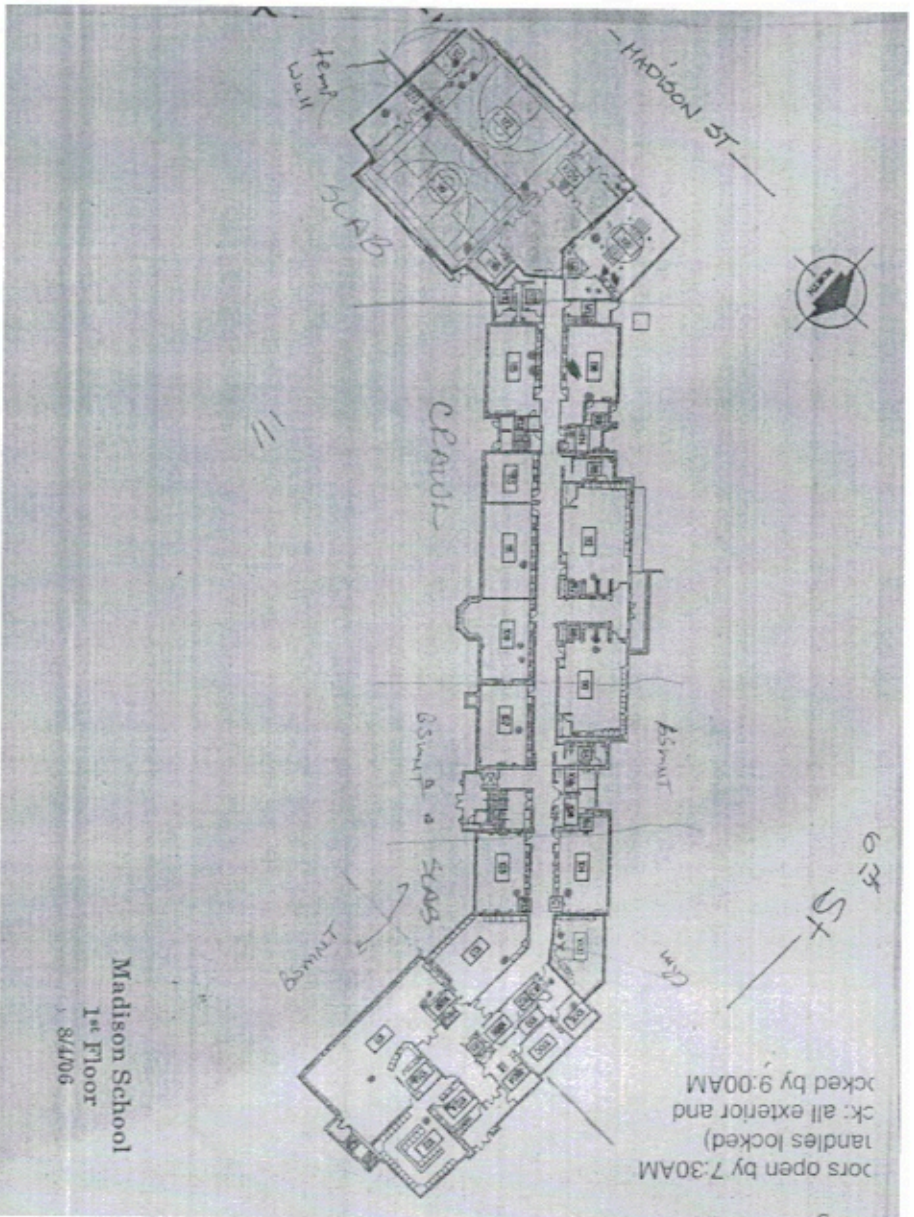
 *Radon Detection Specialists* is licensed for both residential and commercial radon testing in Illinois. For more information regarding radon testing and mitigation practices in the state of Illinois, please visit the Illinois Emergency Management Agency Department of Nuclear Safety's website, www.radon.illinois.gov or call the state of Illinois Radon Program at 217-782-1325.

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Appendix A: Site Plan Showing Device Locations

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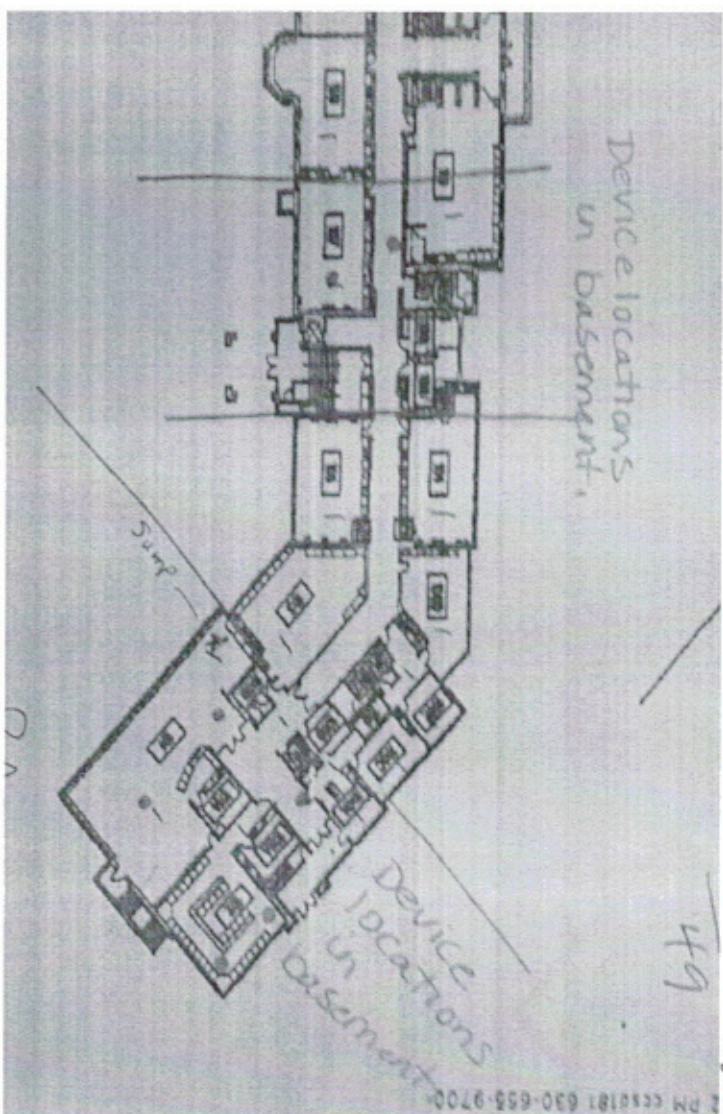
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Appendix B: Individual Device Results Table

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Electret	Device Placement			Start			Stop			Exposure Period	Radon Level (pCi/L)	Control Measurement Duplicate/Blank	Duplicate Device Avg. Radon Level (pCi/L)	Comments
	Foundation	Room Use	Room No.	Date	Time	Volts	Date	Time	Volts					
SFS721	Basement	SE District Storage		4/1/12	1:05 PM	431	4/13/12	3:00 PM	420	2.08	2.1			
SGC391	Basement	SW District Storage		4/1/12	1:05 PM	475	4/13/12	3:00 PM	466	2.08	1.6			
SGC439	Basement	NW District Storage		4/1/12	1:10 PM	500	4/13/12	3:00 PM	492	2.08	1.3			
SFS511	Basement	NE District Storage		4/1/12	1:10 PM	254	4/13/12	3:00 PM	245	2.08	1.7			
SGC592	Basement	NE Woodshop		4/1/12	1:10 PM	612	4/13/12	3:00 PM	599	2.08	2.4			
SGC334	Above Basement	Computer Room		4/1/12	1:15 PM	555	4/13/12	2:25 PM	552	2.05	0.1			Invalid test results; please see Site Notes
SFS519	Above Basement	MDF	102A	4/1/12	1:15 PM	250	4/13/12	2:25 PM	246	2.05	0.4			
SGC548	Above Basement	LRC	101	4/1/12	1:20 PM	628	4/13/12	2:30 PM	622	2.05	0.8			
SGC504	Above Basement	LRC	101	4/1/12	1:20 PM	587	4/13/12	2:30 PM	594	2.05	0.1			
SDF231	Above Basement	LRC	101	4/1/12	1:20 PM	228	4/13/12	2:30 PM	222	2.05	1.0	Duplicate	0.5	

All radon levels are expressed in picoCuries per liter (pCi/L).
 Results of duplicate devices are averaged to determine the radon level in that location.

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	Foundation	Room Use	Room No.	Date	Time	Volts	Date	Time	Volts					
SFS560	Above Basement	LRC Office	101A	4/11/12	1:20 PM	439	4/13/12	2:30 PM	436	2.05	0.1			
SGC461	Above Basement	Main Office	100A	4/11/12	1:20 PM	603	4/13/12	2:30 PM	594	2.05	1.5			
SFS535	Above Basement	Nurse	100B	4/11/12	1:20 PM	502	4/13/12	2:30 PM	496	2.05	0.9			
SGC556	Slab	Principal	100E	4/11/12	1:20 PM	670	4/13/12	2:30 PM	659	2.05	2.0			
SFS664	Slab	Workroom	100	4/11/12	1:20 PM	360	4/13/12	2:30 PM	349	2.05	2.2			
SFS692	Slab	Staff Center	100D	4/11/12	1:25 PM	418	4/13/12	2:30 PM	410	2.05	1.4			
SFS458	Slab	Art	103	4/11/12	1:25 PM	294	4/13/12	2:30 PM	286	2.05	1.5			
SFS501	Above Basement	Art Storage	103B	4/11/12	1:25 PM	235	4/13/12	2:35 PM	230	2.05	0.7			
SGC563	Above Basement	Klin Room	103B	4/11/12	1:30 PM	553	4/13/12	2:35 PM	548	2.05	0.6			
SFS661	Above Basement	Klin Room	103B	4/11/12	1:30 PM	409	4/13/12	2:35 PM	402	2.05	1.2	Duplicate	0.9	

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	Foundation	Room Use	Room No.	Date	Time	Date	Time					
SFS5566	Slab	Classroom	104	4/11/12	1:30 PM	4/13/12	2:35 PM	366	2.05	1.4		
SFS463	Slab	Classroom	105	4/11/12	1:30 PM	4/13/12	2:35 PM	512	2.05	1.6		
SGC549	Slab	Office	106	4/11/12	1:30 PM	4/13/12	2:35 PM	438	2.05	1.1		
SGI123	Slab	Office	108	4/11/12	1:30 PM	4/13/12	2:35 PM	756	2.05	0.8		
SFS596	Basement	Riser Room S	M4	4/11/12	1:35 PM	4/13/12	3:05 PM	437	2.06	1.4		
SFS663	Basement	Riser Room N	M4	4/11/12	1:35 PM	4/13/12	3:05 PM	237	2.06	1.2		
SFS446	Basement	West Room	M4	4/11/12	1:35 PM	4/13/12	3:05 PM	348	2.06	1.7		
SGC460	Above Basement	Classroom	107	4/11/12	1:40 PM	4/13/12	2:40 PM	595	2.04	0.8		
SFS709	Above Basement & Crawl	Classroom	110	4/11/12	1:40 PM	4/13/12	2:40 PM	381	2.04	1.9		
SDF079	Above Basement & Crawl	Classroom	110	4/11/12	1:40 PM	4/13/12	2:40 PM	221	2.04	1.8	Duplicate	
											1.9	

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	Foundation	Room Use	Room No.	Date	Time	Date	Time					
SGC537	Above Crawl	Classroom	109	4/11/12	1:45 PM	4/13/12	2:40 PM	554	2.04	0.6		
SFS682	Above Crawl	Classroom	109	4/11/12	1:45 PM	4/13/12	2:40 PM	338	2.04	-0.9	Blank	
SFS484	Above Crawl	Classroom	112	4/11/12	1:45 PM	4/13/12	2:40 PM	459	2.04	1.4		
SGC535	Above Crawl	Classroom	111	4/11/12	1:45 PM	4/13/12	2:40 PM	600	2.04	0.6		
SEY682	Above Crawl	Classroom	113	4/11/12	1:45 PM	4/13/12	2:40 PM	189	2.04	1.8		
SDM742	Above Crawl	Office	114	4/11/12	1:45 PM	4/13/12	2:45 PM	543	2.04	1.3		
SFS668	Above Crawl	Office	114	4/11/12	1:45 PM	4/13/12	2:45 PM	489	2.04	-0.6	Blank	
SGC589	Above Crawl	Classroom	116	4/11/12	1:50 PM	4/13/12	2:45 PM	493	2.04	1.6		
SFS615	Above Crawl	Classroom	115	4/11/12	1:50 PM	4/13/12	2:45 PM	273	2.04	4.9		
SDF066	Above Crawl	Classroom	115	4/11/12	1:50 PM	4/13/12	2:45 PM	360	2.04	4.5	Duplicate	
											4.7	

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	Foundation	Room Use	Room No.	Date	Time	Volts	Date	Time	Volts					
SGC425	Above Crawl	Custodian Office	M1	4/11/12	1:50 PM	597	4/13/12	3:05 PM	590	2.05	1.1			
SGC512	Above Crawl	Storage	C2	4/11/12	1:50 PM	580	4/13/12	3:05 PM	573	2.05	1.1			
SFS662	Slab	PE Office	117	4/11/12	1:50 PM	471	4/13/12	2:45 PM	466	2.04	0.6			
SFS496	Slab	Gym - North	119	4/11/12	1:55 PM	345	4/13/12	2:45 PM	336	2.03	1.7			Invalid device results; please see Site Notes
SFS451	Slab	Gym - South	119	4/11/12	1:55 PM	374	4/13/12	2:45 PM	367	2.03	1.2			Invalid device results; please see Site Notes
SEY494	Slab	Gym - Storage	S2	4/11/12	1:55 PM	191	4/13/12	2:45 PM	171	2.03	4.8			
SGC502	Slab	Kitchen	120	4/11/12	1:55 PM	673	4/13/12	2:50 PM	668	2.04	0.6			
SGC467	Slab	MPR - N	122	4/11/12	2:00 PM	620	4/13/12	2:50 PM	612	2.03	1.3			
SGH853	Slab	MPR - S	122	4/11/12	2:00 PM	765	4/13/12	2:45 PM	755	2.03	1.7			
SFS509	Slab	MPR - S	122	4/11/12	2:00 PM	310	4/13/12	2:45 PM	301	2.03	1.7	Duplicate	1.7	

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	Foundation	Room Use	Room No.	Date	Time	Volts	Date	Time	Volts					
SGH734	Slab	Gym Storage	S1	4/11/12	2:00 PM	755	4/13/12	2:50 PM	724	2.03	6.6			
SGC557	Slab	Music	Vestibule - W	4/11/12	2:05 PM	614	4/13/12	2:50 PM	609	2.03	0.6			
SGH716	Slab	Music	Vestibule - W	4/11/12	2:05 PM	747	4/13/12	2:50 PM	743	2.03	0.3	Duplicate	0.5	
SGC452	Slab	Music Storage	118	4/11/12	2:05 PM	662	4/13/12	2:50 PM	661	2.03	-0.4			Below the lower limits of detection
SGH651	Slab	Music Storage	118	4/11/12	2:05 PM	754	4/13/12	2:50 PM	755	2.03	-0.8	Blank		
SFSS555	Slab	Music	118	4/11/12	2:05 PM	530	4/13/12	2:50 PM	527	2.03	0.1			
SGH728	Slab	Conference Room	100C	4/11/12	3:20 PM	751	4/13/12	3:15 PM	738	2.00	2.4			
CRM 8060	Slab	Staff Center	100D	4/11/12	1:25 PM		4/13/12	2:30 PM			1.5			See hourly results attached

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