American Lung Association.

Radon Measurement Guidance for Schools

This guidance provides schools with an overview of the expectations, measurement process and requirements for radon testing.

What is Radon?

Radon is a naturally occurring radioactive gas released in rock, soil, and water from the decay of uranium. It moves up through the ground and enters school buildings through cracks in the foundation, floors, walls, basement or other openings. Once indoors, it can become trapped at dangerous levels. Any building can have a radon problem, regardless of building age, foundation type, or presence of a basement.

Why Test Schools for Radon?

There are no immediate symptoms from radon, but long-term exposure can lead to lung cancer. Over time, radon breaks down into radioactive particles known as radon decay products. These decay products can become trapped in the lungs when inhaled and damage lung tissue by emitting radiation. Children have higher breathing rates and different lung sizes, which could cause children to breathe more radon into their lungs when exposed.

State Testing Requirements in Schools

Several states have laws that require schools to conduct radon testing, install mitigation systems or to incorporate radon-resistant new construction (RRNC) techniques. For a summary of current state radon testing requirements in schools, visit the Environmental Law Institute.

Where to Purchase Test Kits?

Short-term (3-7 days) charcoal-based radon test kits are recommended for school testing. Many test kits will be needed to cover testing areas for the building. Test kits may be purchased through state radon programs or the American Lung Association at Lung.org/radon-test.

When to Test?

- The best time for testing is between November 1 and March 31. These are colder months when the building's HVAC system is running, which helps assess radon levels in normal conditions.
- Test on school days, when students occupy the building, not during weekends or holidays.
- Testing from Monday through Thursday is recommended, with overnight shipping so the devices are analyzed on Friday.
- Test when HVAC maintenance and filter changes are current.
- Schools should be tested every five (5) years if the initial radon level is under 4.0 pCi/L (picocuries per liter of air). Test sooner if there are significant changes that affect radon levels, such as soil, HVAC system or foundation. Test sooner if untested areas start to be occupied. If a mitigation system is installed, radon testing should be conducted within 24 hours – 30 days from the installation and then every two (2) years.

According to the Environmental Protection Agency (EPA), a nationwide survey estimates one in five schools has at least one schoolroom with a short-term radon level above the action level of 4.0 pCi/L. The EPA estimates that more than 70,000 schoolrooms in use today have high short-term radon levels. The only way to detect radon in your school is to test.

Test Placement and Closed Building Conditions

Test under closed building conditions, meaning heating and cooling systems are set to normal occupied operating conditions and windows and doors are closed (except momentary entry and exit).

- Testing is conducted in every occupied, or intended to be occupied, space that has floor or wall contact with the ground. This includes all classrooms, offices, gyms, cafeterias and industrial arts rooms on the ground level. Also test rooms above untested areas that are not habitable, such as above tunnels, crawl spaces and garages. Deploy all radon test kits at the same time.
- Plan for one radon test kit for 10% of randomly selected occupied rooms on each upper floor.
- Plan for one radon test kit for every 2000 square feet of large, open spaces, such as cafeterias, lobbies and gyms.
- For schools with moveable walls, place the walls in their fully extended position and test each section.
- Test all modular/portable classrooms.
- Quality control tests (called blanks, duplicates and spikes) will be needed.

Place radon test kits where they will not be disturbed. Place at least three (3) feet from doors and windows to the outside, at least one (1) foot from exterior walls and between two (2) and six (6) feet from the floor. Also, place the test kits away from drafts, furnace vents, humidifiers and direct sunlight.

Who Should Conduct Radon Testing in Schools?

Some states require a licensed person to do the testing or manage the testing onsite. Some states may allow school staff to do the testing without a credential. Even if there are no requirements in your state, it is recommended to use a certified professional or have school staff get certified. Many states also require radon professionals to be licensed. You can find radon measurement professionals by contacting your state's radon program.

A staff member or representative of your school district can become certified by completing training and exam requirements as outlined by the National Radon Proficiency Program (NRPP) or National Radon Safety Board (NRSB).

Interpreting Results

The EPA action level for radon is 4.0 pCi/L. If radon level is elevated, conduct a second round of testing. A continuous radon monitor (CRM) is recommended for follow-up testing in elevated rooms because it can determine if elevated levels are present during occupied times (radon levels can fluctuate with the operation of ventilation). Many licensed radon professionals own CRMs and they can also be rented through radon vendors. Rooms with elevated radon during occupied times should be mitigated.

Radon mitigation systems draw radon gas from the air below the building through a PVC pipe and vent to the outside above the roof. An active soil depressurization (ASD) system uses a continuously running fan to draw the radon up through the pipe and prevent it from entering the building. Non-Active soil depressurization (non-ASD) does not use a fan. Note, in some cases, HVAC systems may be adjusted to increase fresh air intake, which helps dilute radon gas and reduce its concentration inside the building. Credentialed professionals should be used for radon mitigation.

Additional Resources

1. ANSI/AARST Protocol for Conducting Measurements of Radon and Radon Decay Products in Multifamily, School, Commercial and Mixed-Use Buildings
2. EPA Radon in Schools
3. Minnesota Department of Health Radon Testing in Schools Guide