



Radon Mitigation in New Construction

About Radon

- Radon is a gas that occurs naturally in the ground and some rocks.
- Radon is colorless, odorless, and invisible. It is impossible to tell if you have inhaled it.
- Radon can enter buildings through cracks and openings in foundations.
- Radon occurs at low concentrations in outside air but can accumulate to higher levels in buildings, especially in basements or ground-floor spaces. Most people experience their greatest exposure to radon in their homes.
- Long-term exposure to radon is the leading cause of lung cancer among nonsmokers.
- The Environmental Protection Agency (EPA) estimates that radon causes about 21,000 deaths per year.

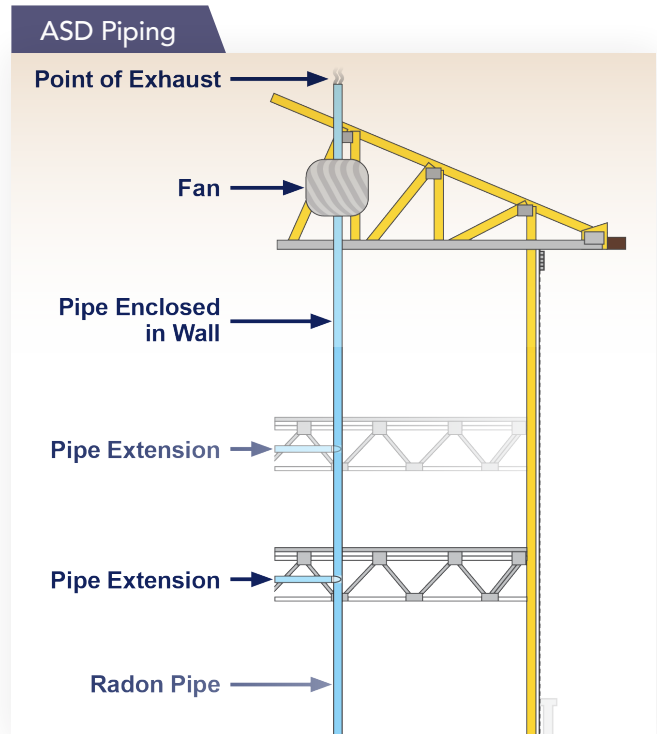
Radon Mitigation in New Buildings

- In 1994, the EPA recommended installing Active Soil Depressurization (ASD) systems during construction of all large buildings to mitigate the possibility of radon exposure.
- ASD systems are common and cost-effective solutions for mitigating radon in buildings with ground-level living spaces and basements or crawl spaces directly above foundation slabs.
- Passive soil depressurization systems may also be installed during construction. These are ASDs without fans. Sometimes the passive system is sufficient to lower radon levels. A fan may be added to activate the system.

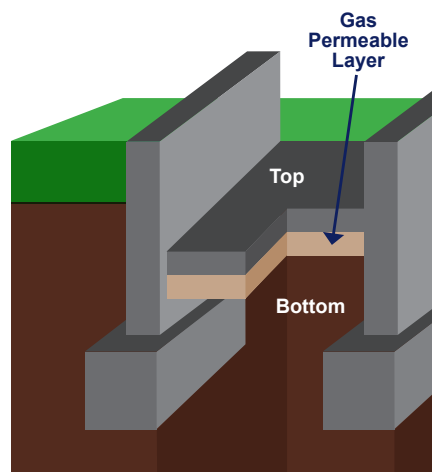
Soil Gas Collection Plenums

- A plenum is a three-dimensional enclosure constructed for collecting radon and other soil gases from under foundation slabs and from behind walls that surround an open space or gas-permeable layer. Foundation areas should form soil-gas collection plenums.
- The top layer of the plenum must be sealed off from earthen material. Ducts must be installed to direct radon-contaminated air away via pipes.

- Radon gas flows from the soil into the gas-permeable layer of the plenum and then is directed up through the ducts into the radon pipe.
- All plenum components must be sealed with a soil-gas retarder membrane. Such components include drains, sumps, ducts, access openings, cracks, or any other opening.



A newly constructed building only needs to be mitigated for radon if it has tested for elevated radon levels.



Use soil gas retarder on all exposed earth surfaces.



Radon Mitigation in New Construction (continued)

Pressure Field Extension Evaluation

Prior to installing the exhaust pipes, test the vacuum of the plenum. Connect a fan to the main exhaust trunk.

All installed vent piping must be air- and watertight and slope at least 1/8 inch per foot, and joint and routing insulation must follow local and state codes. Install ASD fans in vertical exhaust vent piping, near the point of exhaust.

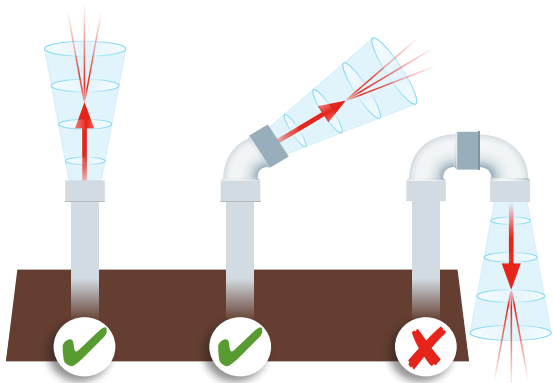


Construction of all soil-gas mitigation systems must be managed by a Qualified Radon Professional and carried out by Qualified Contractors. To be considered qualified, these professionals must be certified according to requirements from the National Radon Proficiency Program (NRPP) or the National Radon Safety Board (NRSB).

Radon Piping and Exhaust

Piping in radon control systems must be at least 3 inches in diameter, sloped, and insulated against damage. Piping must be compliant with all local or state regulations.

Exhaust vents must be a safe distance from any building openings and from any frequently occupied outdoor spaces, including sidewalks. Vents must be outdoors and no more than 45° from vertical. In addition, the vent exhaust must be at least 1 foot above the roof at the highest point of penetration and at least 10 feet from any openings including windows, doors, or equipment air intake openings.



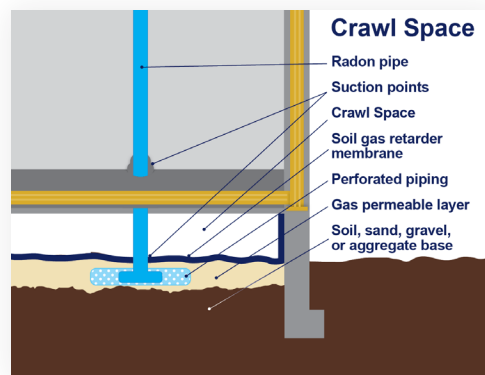
Activation

When the exhaust system has been joined to the plenum, the system is called a passive soil depressurization system. If the building still tests for elevated radon levels, activate the system by installing and turning on a radon fan near the exhaust point (usually in an attic directly under the roof).

Joined Systems

Some larger multifamily buildings may contain multiple plenums that can be joined to a single soil gas vent system. Similarly, multiple vent systems can be joined

by a larger primary trunk exhaust pipe connecting to a single exhaust location.

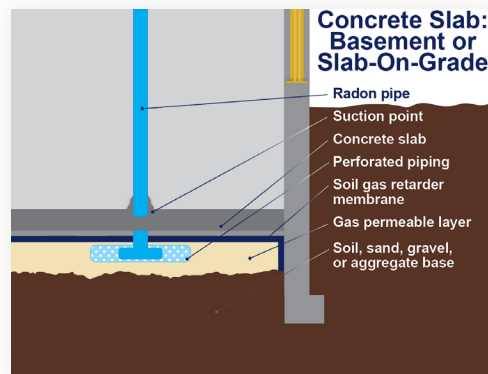


Complete Systems

For a system to be considered complete, all components of the system must be properly labeled, and the system evaluated by an HVAC specialist. The contractor responsible for installing the system must prepare and maintain a written operation and maintenance plan for use by property owners, managers, and occupants. If radon levels are 4pCi/L or greater, mitigation or activation of the ASD system is necessary. EPA also recommends considering mitigation if radon levels are between 2 and 4pCi/L.

The Qualified Contractor will take the following steps after completion of the ASD installation:

1. Conduct a short-term radon test in the building within 60 days after residents move in.
2. Provide a long-term radon test kit to occupants of each dwelling unit.
3. Inspect all components for proper function and compliance.
4. Ensure that ASD components are equipped with monitors, including a negative pressure meter, fan notification system, and electrical power monitor.
5. Label all ASD components and provide property owners with system operation info and radon test data.



Note: Some states have specific requirements for radon mitigation system installation.