



Building Guide ILLOWA Chapter of ICC



Single Family Residential Radon Control Methods

Radon is a tasteless, colorless and odorless naturally occurring radioactive gas found in soil and rock. It seeps from the ground into homes through cracks in the foundation, walls and joints. Radon is a leading cause of lung cancer, second only to cigarette smoking. Installing a radon system during construction is less expensive than trying to mitigate after a house has been built, it also can enhance the value of the property.

How a radon system works: Crushed stone under a house provides an easy pathway for the radon to migrate towards the vent piping, where it is drawn upwards and released safely into the atmosphere. During construction a Passive Subslab Depressurization System shall be installed. A passive system is basically a vent pipe routed through conditioned space connecting the sub-slab area with outdoor air, drawing the gas toward the vent and out the roof. The passive system will lower radon levels even without a fan but it may not be enough. A simple radon test will provide the answer. If the test shows elevated levels (4 pCi/L or more) an Active Subslab Depressurization System will be required. This is basically adding a fan to the existing vent pipe.

FIVE BASIC TECHNIQUES FOR RADON RESISTANT NEW CONSTRUCTION

1. PVC PIPE carries radon from under the slab to above the roof. A straight run of piping reduces friction losses. Piping must not be in an exterior wall; interior locations allow the thermal conduction of heat to cause air in the pipe to rise. Attic section needs space for the fan if required. Proper venting requires the pipe to extend above the roof. Four inch PVC pipe is the best for system quietness and efficiency.

2. PLASTIC SHEETING is placed on top of the crushed stone. The plastic is part of an air barrier between the basement and the subslab, and also is a moisture blocking layer. (Ensure plastic is not punctured during pouring or working of concrete.)

3. ELECTRICAL JUNCTION BOX in case a radon fan is needed later. The Nation Electric Code (NEC) requires a plugged fan to be within 6 feet of an outlet. Vent pipe and junction box placement need to account for this.



4. SEAL AND CAULK all openings in the concrete floor. As part of an air barrier between the subslab and the basement, seal the floor-wall joints and control joints with urethane caulking, and the sump lids with silicon caulking. If a fan needs to be installed after testing, this barrier will prevent basement air from being drawn under the subslab.

5. CRUSHED STONE under the slab allows radon to move freely underneath the house. (Four to six inches of washed and clean 2B stone is the best.)

CRAWL SPACES shall be covered with a soil-gas-retarder (AF103.5.2), have proper ventilation (AF103.5.1), any penetrations through floors shall be caulked or otherwise filled to prevent air leakage (AF103.4.9) and Access doors and other openings between basements and adjoining crawl spaces shall be closed, gasketed or otherwise filled to prevent air leakage (AF103.4.10).

When a house is ready for occupancy, a radon test shall be performed to see if a Active system will be required.

DISCLAIMER: ILLOWA Chapter of the ICC has created this handout to assist with plans submittal under the 2009 International Residential Code, and it is not intended to cover all circumstances. Please check with the Department of Building Safety for additional requirements.