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New Radon Rough-in Requirements

On December 19, 2014, new requirements for protection from soil gases become effective. BC Building Code provisions for the rough-in for a subfloor depressurization system now require installation of a radon vent pipe which extends through, and terminates outside, the building.

The new requirements provide a more adaptable substructure for future radon mitigation and require the designer to account for routing of the radon vent pipe during the design stage. This change applies to Part 9 dwelling units and buildings containing residential occupancies where floor assemblies separate conditioned space from the ground. There are no changes to building exemptions based on location and building occupancy.¹

The potential for high levels of radon infiltration can be challenging to evaluate prior to construction and a radon problem may only become apparent once the building is completed and occupied. Radon mitigation systems are proven to reduce the likelihood of adverse health effects from radon, such as lung cancer. There are links provided in Appendix A of the BC Building Code for information on testing for radon in your home and guidelines for when mitigation is recommended. Those links, as well as sources for more information on radon, are included in the Appendix to this bulletin. It is the owner's responsibility to test their home, and it is recommended that the home be tested again after installation of a radon mitigation system.

The most common and efficient radon mitigation method is soil depressurization. A soil depressurization system requires:

- a. space for the movement of soil gases between the ground and the air barrier system (see the gas permeable layer in Figure 1) into which a radon vent pipe is inserted;
- b. the radon vent pipe then extends to the exterior of the building and terminates in a safe location (as shown in Figure 1); and
- c. the radon vent pipe to be mechanically assisted, typically by means of a fan installed along the pipe, to create a negative pressure in the space between the air barrier system and the ground and exhaust soil gases outside the building.

The BC Building Code does not require installation of a fan during initial construction, although designers should consider the future installation of a fan (which will require access and electrical supply) somewhere along the radon vent pipe.

The BC Building Code refers to material that creates the space allowing the movement of soil gases between the air barrier system and the ground as a gas permeable layer² (see Figure 1). The gas permeable layer allows for effective depressurization of that space, and functions as the drainage layer required in Article 9.16.2.1. A typical solution is to install coarse clean granular material below the floor on the ground. This allows compliance with 9.16.2.1.(1)

¹ Exceptions are listed in Article 9.13.4.2. and Table C-3 in Appendix C of the BC Building Code.

² The gas permeable layer described in Clause 9.13.4.3.(3)(a) consists of not less than 100 mm of clean granular material containing not more than 10 % of material that will pass a 4 mm sieve.

through either the performance language in 9.13.4.3.(2) or the prescriptive language in 9.13.4.3.(3).

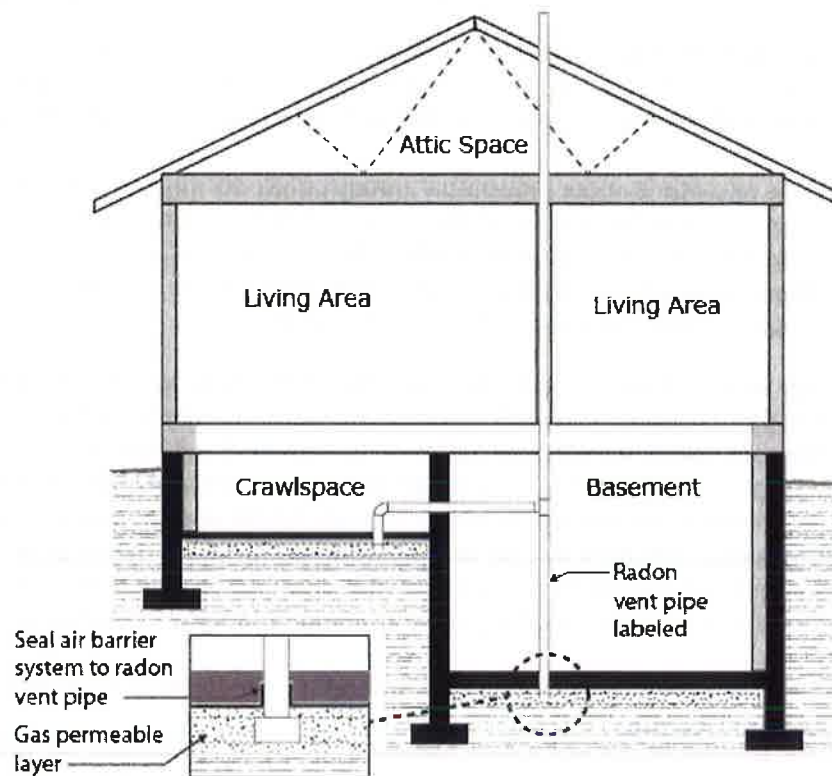


Figure 1

The designer has the performance option in 9.13.4.3.(2) to terminate the radon vent pipe outside the building in a manner that does not constitute a hazard, or use the prescriptive option in 9.13.4.3.(3) and follow the requirements for the location of the termination. The prescriptive termination requirements are similar to the requirements for the termination of plumbing vents³ and will be familiar to designers and builders.

Installing a gas permeable layer and radon vent pipe after initial construction can be costly and invasive. Extending a pipe through the building to the exterior after initial construction can be problematic if the building design did not account for radon mitigation. The provisions for a radon rough-in during initial construction require a small cost and effort at the time of construction to reduce the much larger cost of retrofitting a radon mitigation system after construction. The requirements provide added benefits of improved sub-slab drainage and integrity of the air barrier system.

³ The termination of plumbing vents is described in Article 2.5.6.5. and illustrated in Appendix note A-2.5.6.5.(4) of the BC Plumbing Code.