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Radon Control for Part 9 Buildings

No.: BUILDING-58
Date: 2024-09-27

Purpose

The purpose of this bulletin is to provide a consistent interpretation of the installation of radon control barrier as outlined in the *BC Building Code 2024 (BCBC)*.

Background

What is radon?

The natural radioactive element uranium is present everywhere in rocks and soil. The radioactive decay of uranium produces radium, which in turn decays to radon, a radioactive colourless and odourless inert gas.

As introduced by the Building and Safety Standards Branch Information Bulletin, radon is a gas that can move easily through bedrock, soil and ground water; either escaping into the outdoor air or seeping into a building. All soil contains varying concentrations of uranium, radon can be presented in all types of soil. Radon that moves from the ground into the outdoor air is rapidly diluted to low concentrations and is not a health concern. However, inside a building, radon can accumulate to a high level and become a long-term health concern.

Exposure to high levels of radon in indoor air results in an increased risk of developing lung cancer. The risk of lung cancer depends on the level of radon, how long a person is exposed to those levels, and their smoking habits.

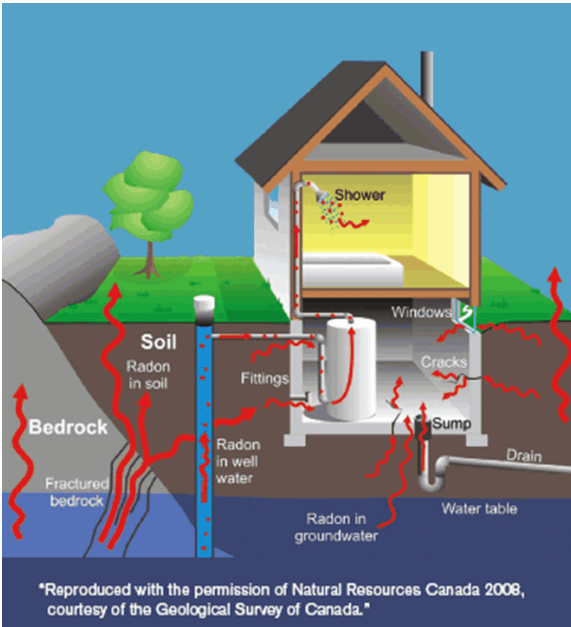
How can radon get into a building?

The air pressure inside a building is usually lower than in the soil surrounding the foundation. This difference in pressure (also known as the stack effect) draws air and other gases, including radon, from the soil into the building.

Radon can enter a building at any place it finds an opening where the building contacts the soil, including cracks in foundation walls and in floor slabs, construction joints, gaps around service pipes, support posts, window casements, floor drains, sumps or cavities inside walls. See Figure 1 illustrating possible routes of radon entry.

See over →

Figure 1: Radon Entry Routes

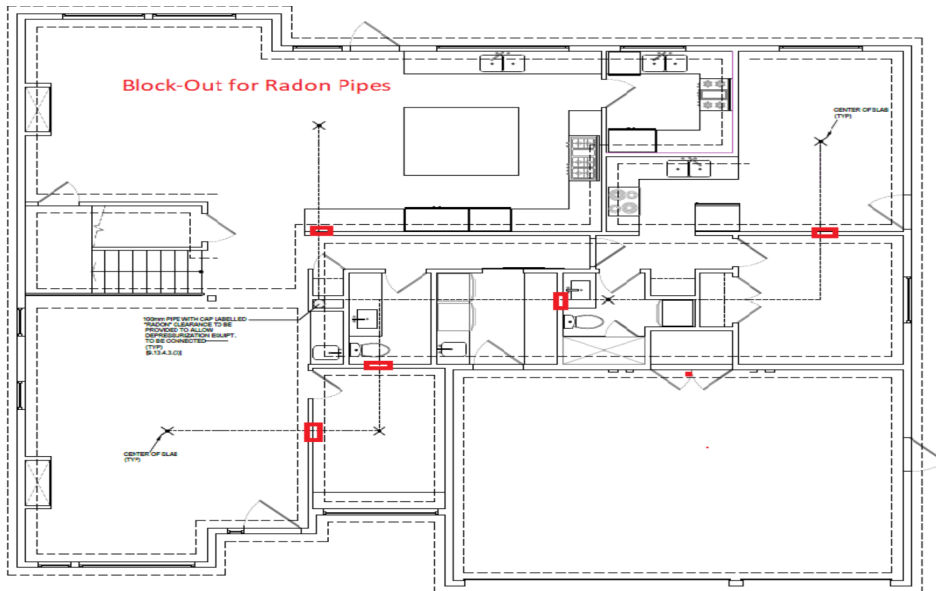


Implementation

The installation requirement for an air barrier and subfloor depressurization system to reduce the radon concentration to a level below the guideline specified by Health Canada became mandatory **effective March 08, 2024**. Building Permit Application must provide the following, but not limited to, to demonstrate compliance with Division B Part 9, Subsection 9.13.4 of the *BCBC*:

- **Floor Plan:** showing location of radon pipes, location of inlets granular materials, air barrier material, and radon pipes materials (see Figure 2).

Figure 2: Example of Radon Layout and Block-outs



See attached →

- **Elevation Plan:** showing location of vertical radon pipes, location of exhaust, location of property line (see the example in Figures 3 & 4).

Figure 3: Level 1 Radon Rough-in

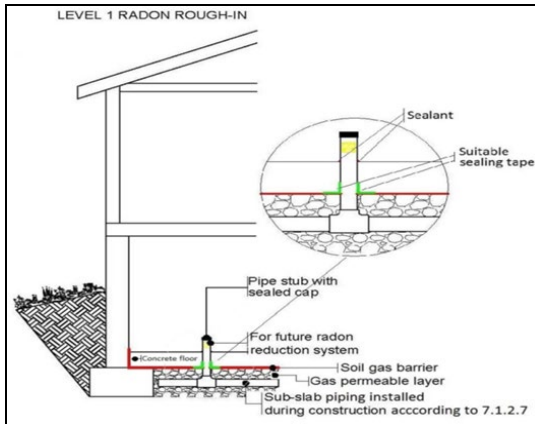
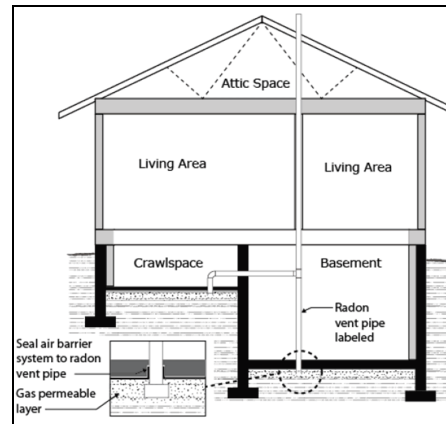


Figure 4: Level 2 Full Passive Vertical Radon Stack



For Inspection, please fulfil the following:

- Provide block-outs for radon pipes at Forms Inspection, where pipes are penetrating footings/foundations
- Project Engineer must provide input on their field memo report for radon pipes penetrating footing
- There are 2 stage inspections, first inspection is for the radon pipes layout and second inspection is for granular material and air barrier installation
- Provide 100 mm/ 4" perforated radon pipes throughout the living space
- Minimum 100 mm/ 4" course clean granular material, minimum 50mm/2" under radon pipes, granular material is required throughout the living space
- Air barrier installation, all joints and penetrations require complete seal
- Radon pipes stack require to exhaust through roof

Reference:

- [BC Building Code 2024](#)
- [Information Bulletin, Building and Safety Standard Branch, Radon Rough-in Requirements](#)
- Canadian General Standards Board, [Radon Control Options for New Construction in Low-rise Residential Buildings](#)
- [ASTM E1465, "Standard Practice for Radon Control Options for the Design and Construction of New Low-Rise Residential Buildings \(Withdrawn 2017\)"](#)
- [ANSI/AARST CCAH-2013, "Reducing Radon in New Construction of One & Two Family Dwellings and Townhouses" standards](#)
- [Health Canada, Guide for Radon Measurements in Residential Dwellings \(Homes\)](#)