

RADON CONTROL FOR PART 9 BUILDINGS

Plan and site installation requirements for under-slab radon control (2024 BCBC)

Purpose

The purpose of this bulletin is to provide direction for the installation of radon control barriers and rough-ins for under-slab depressurization as required by the 2024 B.C. Building Code (BCBC).

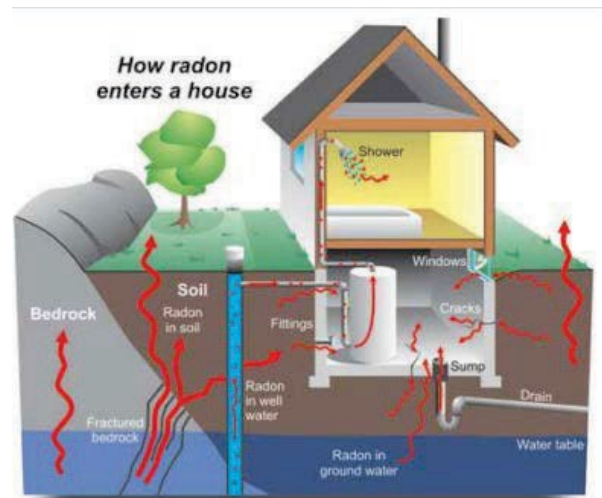
Application

Included are references to the installation standards for systems in **all Part 9 buildings (Residential and Non-Residential)** intended to be occupied for greater than 4 hours within a 24-hour period.

Background and References

Air entering a dwelling through below-grade leaks in the envelope can increase "soil gas" contamination which can include water vapor and other pollutants such as radon.

Radon is a colourless, odourless, radioactive gas that occurs naturally as a result of the decay of uranium. It is found to varying degrees as a component of soil gas in all regions of Canada and is known to enter dwelling units by infiltration into basements and crawl spaces. The presence of radon in sufficient quantity leads to an increased risk of lung cancer.



BC Building Code - Part 9

9.13.4. Soil Gas Control

9.13.4.3. Rough-in for a Subfloor Depressurization System

9.25.3.6. Air Barrier Systems in Floors-on-ground

9.36.2.8. Thermal Characteristics of Building Assemblies Below-Grade or in Contact with the Ground

CAN/CGSB-149.11 – Sections 7.1.3, 7.2.4.6 or 7.3.4 referenced for Code compliance)

[Radon control options for new construction in low-rise residential buildings](#)

- Please note that the BCBC refers to CAN/CGSB-149.11 for the installation of pipes and fittings as well as exhaust pipe terminations.

CAN/CGSB-149.11-2019

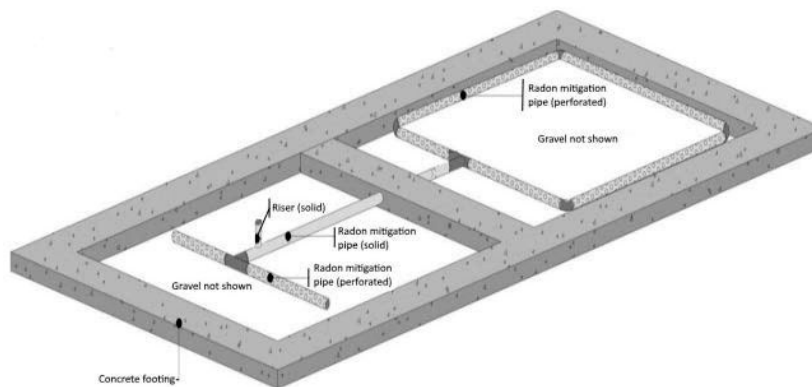


Figure 7.1.2.7— Possible interconnection of two gas permeable layers

Required Radon Systems

A Radon control system inspection is required after installation of under-slab plumbing but prior to slab insulation, hydronic heating, and the placing of concrete. The air barrier inspection will consist of a review of:

- Sealing of air barrier joints and edges to foundation wall or top of footings
- Sealing around penetrations including floor drains, sumps, and plumbing knock outs
- Rough in piping installation for a subfloor depressurization system

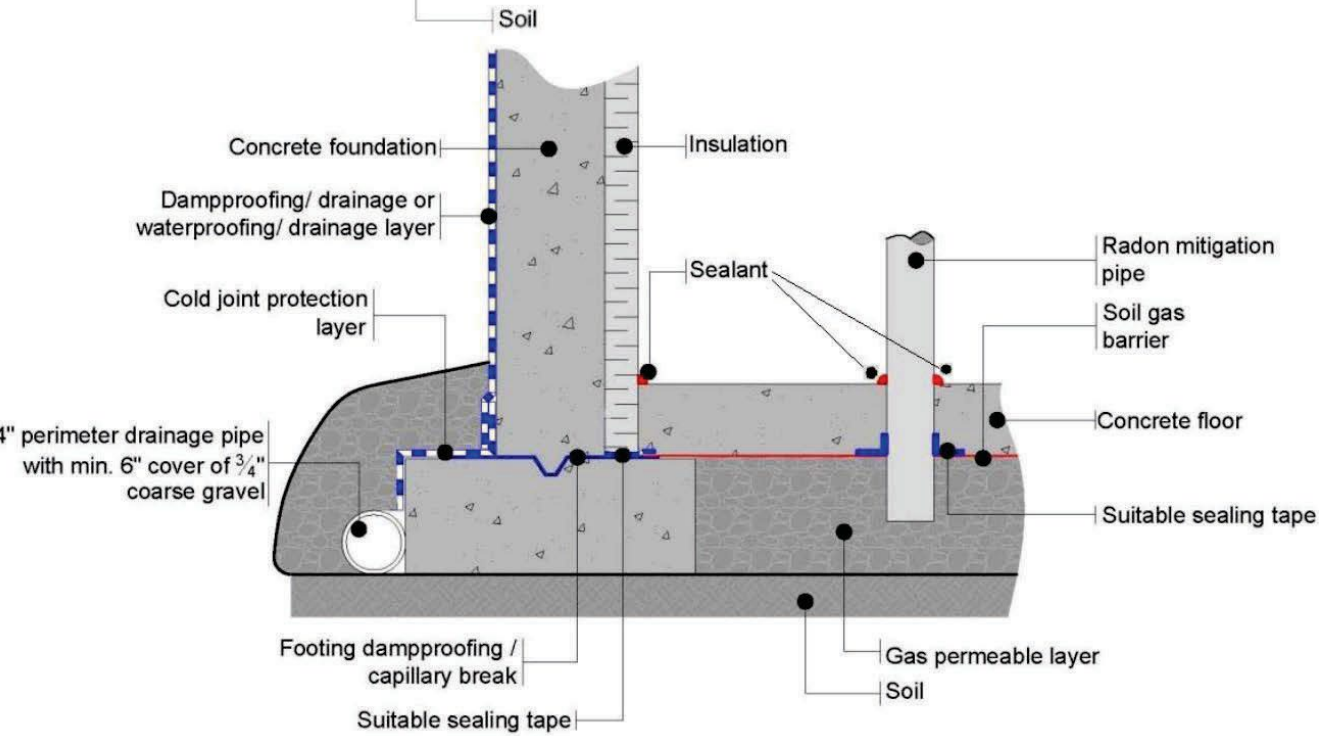
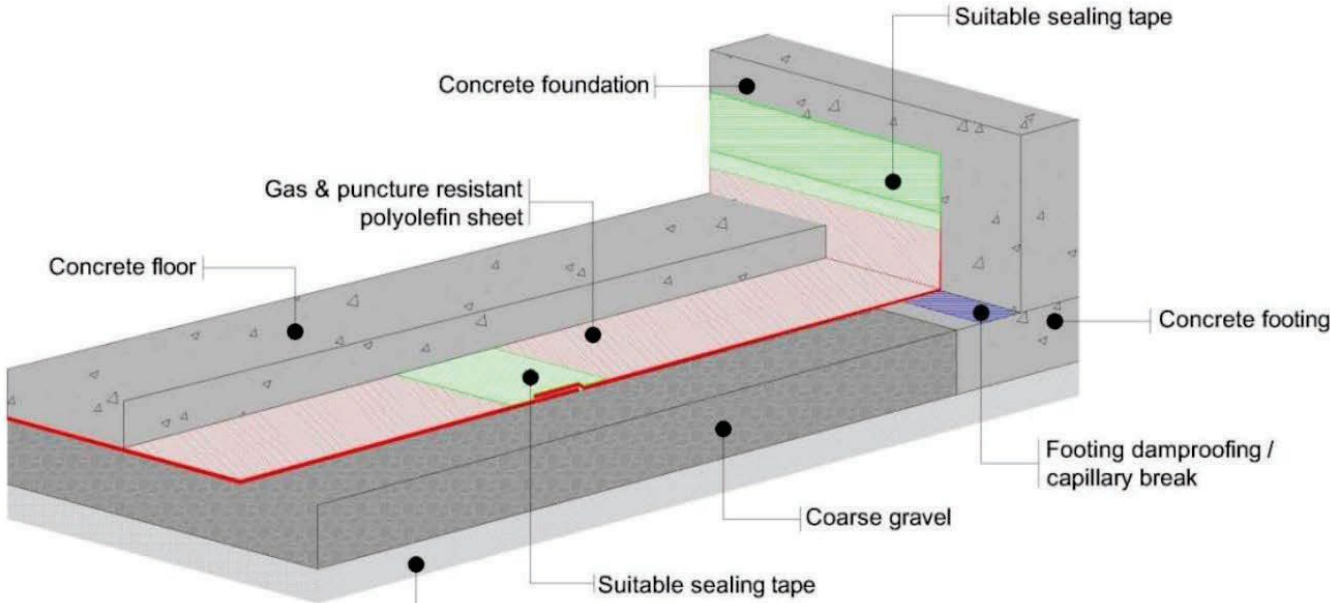
The BC Building Code does not require a radon extraction fan unless venting out the side of a building. In systems where venting is through the roof, there are no specific requirements for an installed depressurization fan other than that it be airtight. A fan installed along the radon vent pipe must maintain the airtightness of the radon vent pipe and the integrity of the air barrier in order to limit leakage from the radon vent pipe into the building.

Renovations and Additions

Additions and significant renovations or buildings/spaces being altered from un-occupied to occupied space (e.g. garage to living space) will be required to meet soil gas and rough-in depressurization system requirements. Some alternate ways of providing a depressurizing system will be considered if presented as part of a building permit for renovations. (e.g. A vented subfloor)

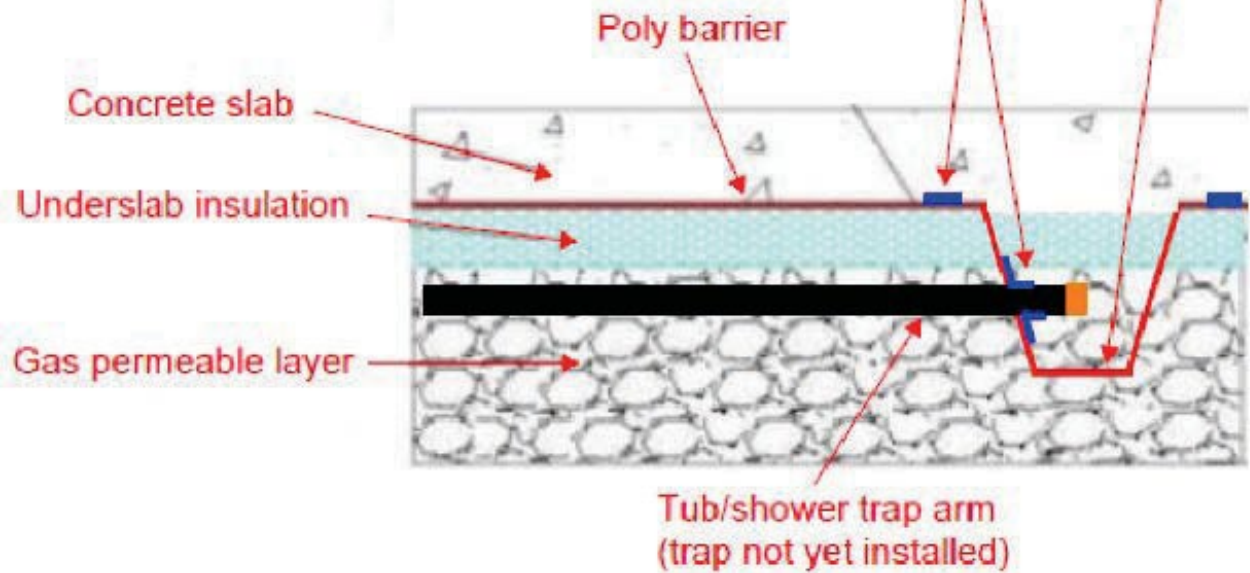
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Appendix 1 - Slab Sealing Best Practices

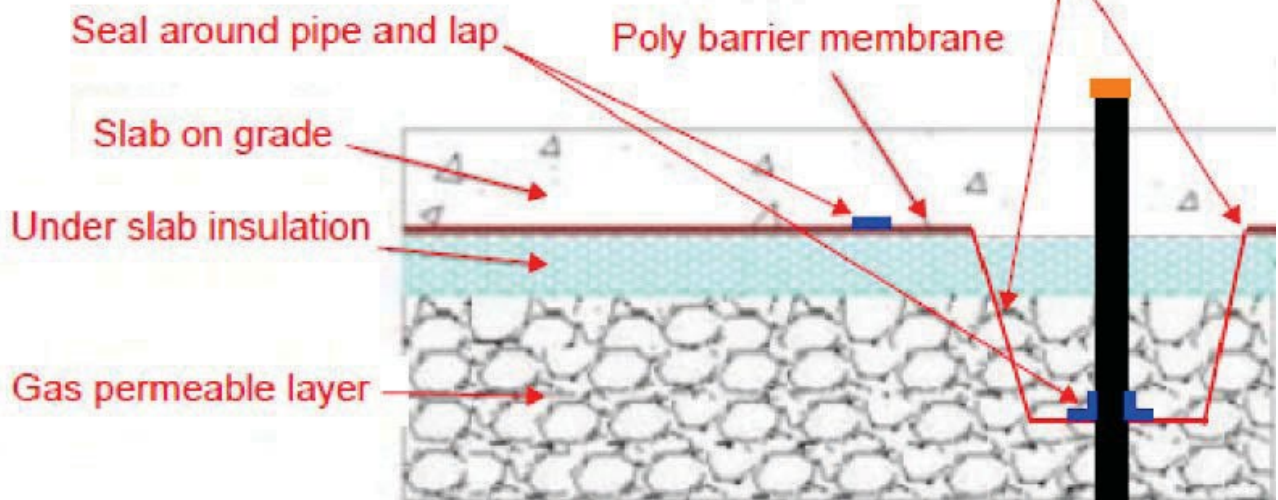


Poly barrier installed at underslab plumbing stage, then sealed to the rest of the poly barrier prior to slab pour

Seal around pipe and seal poly barrier laps prior to slab pour



Poly barrier installed at plumbing under slab stage and sealed to the poly barrier, with a min 300mm lap, prior to pouring slab.



Appendix 2 - Rough-in Depressurization Piping Requirements (CAN/CGSB-149.11- 2019)

7.1.3 Pipe and fittings

7.1.3.1 The following are the minimum requirements for permitted pipe used in the construction of soil gas collector and suction points.

7.1.3.1.1 Pipes shall have a nominal internal diameter of not less than 10 cm (4 in).

7.1.3.1.2 The pipe material shall be resistant to the service environment or shall comply with 7.1.3.2.

7.1.3.1.3 PVC pipes installed completely or in part above grade shall comply with Schedule 40 specifications regarding wall thickness, inside and outside diameters and pressure ratings.

NOTE Where possible, radon pipe should have a different colour or identifying markings than DWV piping. Additional information on Schedule 40 pipe can be found in ASTM E1465 and ANSI/AARST RRNC 2.0.

7.1.3.1.4 Where vertical pipe is installed in the cavity of a wood-frame or steel-frame wall, the top and bottom plates and any horizontal framing members (such as blocking) shall have hidden steel shield plate installed to protect the pipe.

7.1.3.1.5 When pipe passes through a fire rated wall or ceiling, the base of its penetration on its fire rated side shall be fitted with an intumescent collar to maintain its fire resistance.

7.1.3.1.6 Horizontal pipe runs shall be minimized.

NOTE If horizontal runs are required, it is suggested that 22.5° fittings be used so that the stack momentum is maintained.

7.1.3.1.7 Where horizontal pipe runs are necessary, pipes shall be supported as required by the local plumbing code for DWV piping.

7.1.3.1.8 Pipes shall be installed so as to minimize exposure to cold temperatures and shall be insulated where located in unconditioned space.

7.1.3.1.9 Horizontal pipes above and below ground shall be installed with at least a 1% slope to return water to the soil or according to Table 7.1.3.1.9.

Table 7.1.3.1.9 — Recommended Pipe Gradient at Various Flow Rates

Nominal Pipe Size ID (mm)	Flow Rate (L/s)	Recommended Gradient
100	10	1:100
100	25	1:50
100	50	1:30

7.1.3.2 Acceptable pipe and fitting specifications

Where the pipe material conforms to one of the following standards, it shall be deemed to comply with 7.1.3.1.2 of this standard.

7.1.3.2.1 PVC flue gas venting pipe and fittings shall meet the requirements of ULC S636 and all pipe, fittings and cement shall come from one manufacturer and the cement shall conform to manufacturer's specification and be adequate for the application conditions.

7.1.3.2.2 Pipe materials shall conform to one of the following standards: ASTM F891, CSA B181.1 or ASTM F628.

7.1.3.2.3 Pipes and fittings described in 7.1.3.2 shall be joined with products meeting the requirements of the respective pipe manufacturer.

7.1.3.2.4 Primer shall be applied where required.

7.1.3.2.5 PVC building drain sewer pipe shall meet the requirements of CSA B182.1 and shall conform to SDR 35 specifications. Fittings shall be made of PVC and conform to the requirements of CSA B182.1. Pipes and fittings shall be joined with PVC solvent cement meeting manufacturer's specification and application conditions. This pipe shall only be used for below ground applications unless otherwise specified by the local authority.

7.1.3.2.6 Other types of piping not mentioned in this standard shall meet or exceed the minimum performance criteria specified in 7.1.3.1.1 and 7.1.3.1.2.

Appendix 3 - Outlet Clearance Requirements (CAN/CGSB-149.11-2019)

7.2.4.6. The exterior pipe termination of the passive stack terminated above the roof top shall be directed vertically conforming to Table 7.2.4.6 and Figure 7.2.4.6.

Table 7.2.4.6 — Minimum passive radon stack termination clearances for roof top discharge

Location	Minimum dimension (m)
Vertical clearance above the roof at the point of penetration	0.30
Vertical clearance <u>above</u> windows or doors	0.60
Vertical clearance <u>above</u> mechanical air supply inlet (air intake)	0.90
Horizontal clearance from windows, doors or mechanical air supply inlet	3
Clearance horizontally from a vertical wall that extends above the roof penetrated	3

Table 7.3.4.3 — Clearance distances for active radon reduction systems

Locations	Suggested clearances (m)	Required minimal clearances (m)
Clearance to a mechanical air supply inlet	3	2
Clearance to permanently closed window	1	0.60
Clearance to a openable window	2	2
Clearance from a door that may be opened	2	1
Clearance to outside corner	0.30	0.30
Clearance to inside corner	0.30	0.30
Clearance above paved sidewalk or paved driveway located on public property	2	2
Clearance above grade, veranda, porch, deck, or balcony	1	0.30
Vertical Clearance below soffits or from any attic venting component	1	1
Horizontal clearance from an area directly below the discharge where there is a risk of injury from ice fall	2	1