



## Soil Gas Mitigation Strategy

Due to recent findings from a study conducted by Kingston, Frontenac, Lennox and Addington (KFL&A) Public Health, the City of Kingston is implementing soil gas control measures in new construction and additions of low-rise residential buildings. This strategy applies to new building permits applied for after August 31, 2019.

Health Canada guidelines dictate that radon gas concentrations above 200 Becquerel's per cubic metre (Bq/m<sup>3</sup>) require remediation. As such, this strategy requires soil gas control requirements as per the Ontario Building Code (OBC) subsection 9.13.4., and SB-9 (Requirements for Soil Gas Control).

### Construction Requirements

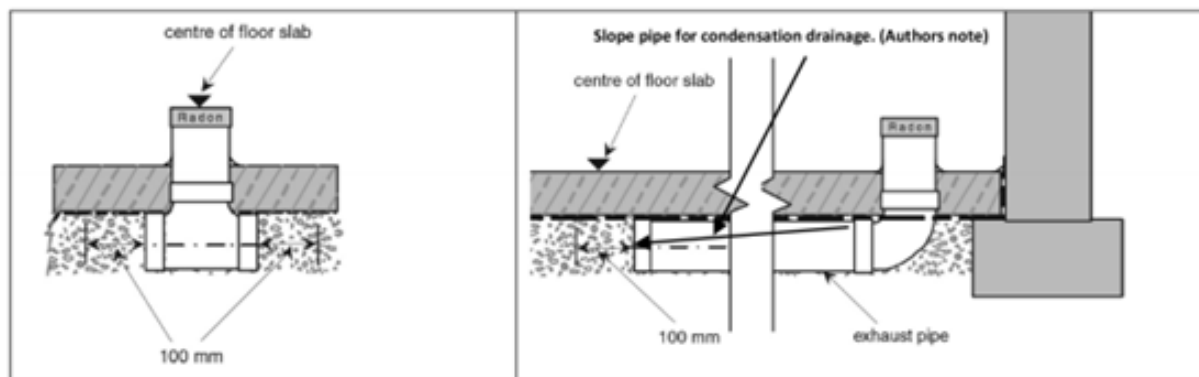
Building permit drawings shall clearly indicate details associated with one of the following three radon gas mitigation options to be constructed on site:

#### Option 1

1. A 100mm diameter PVC pipe rough-in through the floor slab adjacent an exterior wall extending under the slab and terminating at or near the center in conformance with Subsection 3.2, Sentences (1) through (5) of SB-9,
  - a. Minimum 150mm granular material for a radius not less than 300mm centered on the pipe, with the bottom of the pipe open to the granular, and
  - b. The upper end of the pipe shall be provided with a removable seal, and labeled to indicate for "soil gas removal only".
2. Mandatory radon gas testing in conformance with Subsection 3.2, Sentence (6) of SB-9.

Please note: where concentration levels exceed 200 Bq/m<sup>3</sup>, a subsoil depressurization system is to be installed in conformance with Subsection 3.2, sentence (9) of SB-9.

#### Option 1: Sub-Slab depressurization rough-in



## Option 2

1. A soil gas barrier on the foundation walls (bituminous dampproofing) in conformance with Division B, 9.13.4.2 (3), and
2. under the basement floor slab using 6 mil polyethylene lapped not less than 300mm in conformance with Figures SB-9A or SB-9B of SB-9, and
3. sealing along the perimeter of the basement floor slab and at all penetrations using flexible sealant (polyurethane caulking) in conformance with Division B, 9.13.4.2.(4)(a) and SB-9.

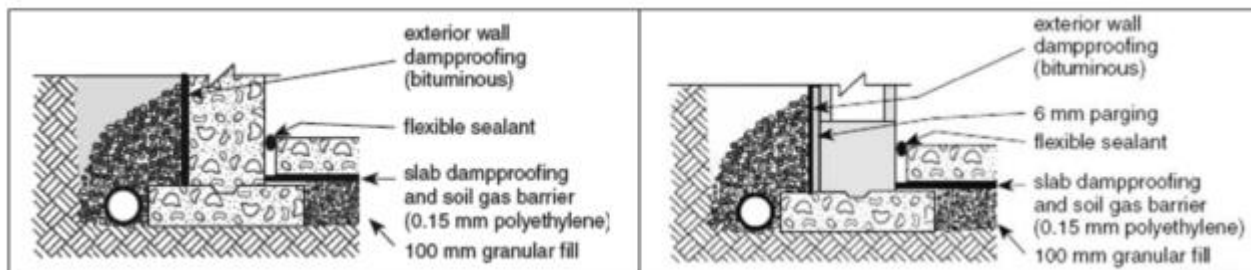
Please note: spray foam can be substituted as a radon gas barrier under basement floor slabs where installed in conformance with CCMC Evaluation Report 14073-R.

## Option 3

1. A soil gas barrier on the foundation walls (bituminous dampproofing) in conformance with Division B, Sentence 9.13.4.2 (3) and Figure SB-9A or SB-9B of SB-9.
2. Installation of a sub slab depressurization system installed in accordance with Health Canada guideline "Reducing Radon Levels in Existing Homes: A Canadian Guide for Professional Contractors".
  - a. A properly labelled 100mm PVC pipe shall be installed through the floor slab adjacent an exterior wall extending under the slab into a centrally located 150mm thick bed of granular material. In accordance with Subsection 3.2, sentences (1) through (5) of SB-9, and
  - b. Above the slab, 100mm grey PVC piping shall be installed, extending either through the roof or the rim joist, and shall have a continuous duty centrifugal inline radon fan.

Please note: where an ICF foundation is being used, and radon option 2 or 3 is chosen, replace "bituminous dampproofing" with "waterproofing membrane" approved for installation over ICF foundations.

## Option 2 and 3: Dampproofing and Soil Gas Control at floor and wall junctions



**SB-9A – Solid Wall**

**SB-9B – Hollow Wall**

## Required Inspections

The owner of a property on which construction takes place or their authorized agent shall arrange for the following inspections:

1. The installation of the rough-in soil gas pipe, and granular material prior to pouring the basement slab,
2. The installation of soil gas barrier on foundation wall (bituminous dampproofing) and under floor slab (6 mil polyethylene ) prior to covering or pouring the basement slab, and
3. Sealing of the perimeter of the slab adjacent to the foundation wall and any slab penetrations (polyurethane caulking ) prior to covering.
4. Pipe cap and labelling, and inline fan (where required) prior to occupancy.

## Testing

Depending on the radon gas mitigation option chosen by the builder, the building may be subject to mandatory radon gas testing.

It is the Owners responsibility to conduct the radon test to determine the radon concentration in the building, and submit the results to the City of Kingston at [buildingpermits@cityofkingston.ca](mailto:buildingpermits@cityofkingston.ca)

All radon testing will consist of long-term tests (minimum 91 days) completed during the winter season, when windows and doors are generally closed, and are recommended to be carried out by a [Canadian National Radon Proficiency Program \(C-NRPP\)](#) certified professional.

## Testing Results and mitigation

The following is required where mandatory radon gas testing results come back over 200 Becquerel's per cubic metre (Bq/m<sup>3</sup>):

1. The Owner is responsible for mitigation and installation of a subfloor depressurization system.
2. Measures shall be taken to ensure that any resultant decrease in soil temperature will not adversely affect the foundation, and documentation to this affect is to be provided by a qualified person.
3. After installation, the Owner is to submit testing results indicating levels below 200 Becquerel's to the City of Kingston at [buildingpermits@cityofkingston.ca](mailto:buildingpermits@cityofkingston.ca).

Health Canada recommends that you hire a professional certified under the Canadian National Radon Proficiency Program (C-NRPP) as lowering radon levels in a home requires specific technical knowledge and skills to ensure the job is done properly. To find a list of certified professionals contact the Canadian National Radon Proficiency Program (C-NRPP) at 1-855-722-6777, go to [www.c-nrpp.ca](http://www.c-nrpp.ca) or email [radon@hc-sc.gc.ca](mailto:radon@hc-sc.gc.ca).

## Tarion Warranty

New homes in Ontario come with a new home warranty that is provided by your builder and backed by [Tarion](#). This warranty also covers radon gas levels exceeding 200 Bq/m<sup>3</sup> in new homes for seven years from the date of occupancy.