

# Interpretive Guide on Canadian referenced RADON Guidelines and Standards for Architects, Engineers and Design Professionals

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The Canadian National Radon Proficiency Program (C-NRPP) sets the national standards for radon training and certification.

[www.c-nrpp.ca](http://www.c-nrpp.ca)

## What is Radon?

Radon is a naturally occurring, radioactive gas formed by the breakdown of uranium in soil, rock, and water. Radon is invisible, odourless, and tasteless, making it undetectable without proper testing equipment. **All regions of Canada have some level of radon, and it is found in all buildings at varying levels. Radon levels can only be determined by testing the air in the building; soil testing is not recommended to determine potential indoor radon levels.**

C-NRPP trains and certifies professionals based on residential mitigation techniques. The principals may then be combined with expertise in commercial buildings to perform commercial radon mitigation. A list of C-NRPP professionals may be found at: [www.c-nrpp.ca/find-a-professional](http://www.c-nrpp.ca/find-a-professional)

## Radon Guidelines and Standard Documents:

In Canada there are several radon-related documents that are referenced in code or by various organizations. The purpose of this technical bulletin is to provide an overview of which document should be referenced in different situations.

## How to use this document:

This document is broken into three sections. The first section is a list of all the documents that are relevant to Architects, Engineers and Design professionals who work with radon mitigation systems. The second section is a brief overview of the radon related matters included in each document listed, and how relevant/up to date the material included is. The third section is a chart intended for use as a reference guide to quickly look up which documents contain information on each area of radon mitigation systems and mitigation processes.

## List of standards applicable to radon in Canada:

- [CGSB Standard 149.12 \(2024\) \(existing construction\)](#)
- [CGSB Standard 149.11 \(2024\) \(new construction\)](#)
- [Alberta Infrastructure Specification, Radon Mitigation Rough-in Section 31 21 13](#)
- [Health Canada Reducing Radon Levels in Existing Homes: A Canadian Guide for Professional Contractors](#),
- [ANSI/AARST SGM-MFLB-2023 Soil Gas Mitigation Standards for Existing Multifamily, School, Commercial and Mixed-Use Buildings](#)
- [ANSI/AARST CC-1000-2018-0523: Soil gas control systems in new multifamily, school, commercial and mixed-use buildings](#)
- [ASHRAE 62.1-2025 and clarification](#)
- [EPA document - Radon Prevention in the Design and Construction of Schools and Other Large Buildings](#)
- [ITRC mitigation system design](#)

## Radon Relevant Sections of the National Building Code:

*This information is based on the 2025 National Building Code; provincial codes may differ or reference different versions of the standards.*

- 3.1.1.5 Radon \* Ontario Building Code only
- 5.4.1.1 Required Resistance to Air Leakage (Note A-5.4.1.1.)
- 5.4.1.2 Air Barrier Assemblies
- 6.2.1.1. Good Engineering Practice (See Note A-6.2.1.1)
- 9.13.4.1 Soil Gas Control
- 9.13.4.2 Protection from Soil Gas Ingress
- 9.13.4.3 Providing for the Rough-in for a Subfloor Depressurization System (See Note A-9.13.4.3)
- 9.14.4 Granular Drainage Layer
- 9.14.5.2 Sump Pits
- 9.25.3 Air Barrier Systems
- 9.25.4 Vapour Barriers
- 9.32.3.8 Protection Against Depressurization (See Note A-9.32.2.8)

**SECTION 2:** See the chart in Section 3 for a more extensive list of what is included in each document.

CGSB Standard 149.12 (2024) (existing construction), published 2024, previous version 2019

- Existing buildings
- No building type specified, however the technical provisions originate from successful mitigation in single family dwellings
- Information on active systems only

CGSB Standard 149.11 (2024) (new construction), published 2024, previous version 2019

- New construction
- No building type specified, however the technical provisions originate from successful mitigation in single family dwellings
- Provides information on passive soil gas systems

Alberta Infrastructure Specification, published 2020

- New buildings
- Alberta government owned and supported permanent occupied buildings
- Entire document is relevant to radon control systems

This document has specific technical requirements for gravel. It also contains references to ASTM standards, and the EPA document.

Health Canada Reducing Radon Levels in Existing Homes: A Canadian Guide for Professional Contractors, published 2010

- Focused on existing buildings, but does include a reference to new residential construction.
- Document focused on basics of radon, radon entry, radon mitigation through sub-slab and sub-membrane as well as information about block wall and masonry foundation, it also includes

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information about mitigation through ventilation and health and safety recommendations for mitigation professionals.

This was the first document developed on radon mitigation in Canada: it was developed prior to - and used as a basis for - the CGSB standards. Some information is outdated.

ANSI/AARST SGM-MFLB-2023: Soil gas mitigation standards for existing multifamily, school, commercial and mixed-use buildings, published 2023

- Existing large buildings
- Entire document is relevant
- Document based in United States, utilizing US guidance, additional considerations should be made for the climate you are working in.

This document prioritizes Active Soil Depressurization but includes a section on other forms of mitigation. A decision-making flow chart is included to guide the design process, and the decision between mitigation measures.

ANSI/AARST CC-1000-2018-0523: Soil gas control systems in new multifamily, school, commercial and mixed-use buildings, published 2018

- New Multifamily, school, commercial and mixed-use buildings
- Information on alternatives of sub slab materials, good for regions where sourcing clean course aggregate for granular layer is difficult.
- Document based in United States, utilizing US guidance, additional considerations should be made for the Canadian guidance, standards and climate should be considered.

This document provides details on installing radon rough-ins. Has provisions for a variety of sub slab materials, and problems that commonly arise when performing radon rough-ins.

ASHRAE 62.1 - 2022 and clarification, published 2022

- New and existing Commercial/Industrial buildings, and additions to existing buildings
- Document focused on indoor air quality, limited references specifically to radon

The document doesn't specify offset distances for radon mitigation systems, or air classifications for radon mitigation requirements.

EPA document - Radon Prevention in the Design and Construction of Schools and Other Large Buildings, published 1994

- Written for architects and engineers
- New and existing schools or other large buildings
- Focused on slab-on-grade construction, but includes provisions for basement and crawlspace foundations
- Document is obsolete, but it is included because it is referenced in the National Building Code.
- Document based in United States, utilizing US guidance, additional considerations should be made for the Canadian guidance, standards and climate should be considered.

This document is outdated, and the EPA website says to reference the AARST document. This document includes costing information that is not included in the AARST document, but the costs are

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outdated and no longer helpful. This document is referenced in part 6.2.1.1 of the NBC with respect to good engineering practices by name only, and no technical information is given.

## ITRC mitigation system design

- New and existing commercial and residential buildings
- This document is held in high regard in engineering circles
- Contains information on VOCs, but less that is specific to radon

This document primarily contains information that is relevant for VOCs, but still has information applicable to radon. It is non-prescriptive, and for bigger picture considerations, and references many other documents. It contains check lists for mitigation design, post mitigation, and OM&M considerations.

When consulting the above guidance documents, it is important to note that some of these documents include technologies that are not recommended. It is the responsibility of the designer to make sure all relevant local codes are being followed. C-NRPP highly recommends consulting the expertise of a C-NRPP mitigation professional as they will be more familiar with the Canadian radon guidance.

Topic	CGSB 149.11 (2024)	CGSB 149.12 (2024)	Alberta Infrastructure Specification (2024)	Health Canada Reducing Radon Levels in Existing Homes	AANSI/AARST SGM-MFLB (2023)	ANSI/AARST CC-1000 - 2018-0523	ASHRAE 62.1 - 2022 and clarification	EPA Radon Prevention in the Design & Construction of Schools & Other Large Buildings	ITRC VI Guidance (US VI Guide)	National Building Code (2025)
	Clearly Defines Radon Action / Target Level	✓	✓	✓	✓	References US levels.	References US levels.	X	References US levels.	X
References C-NRPP (or NRPP, US)	✓	✓	✓	X	References US NRPP	✓	✓	X	X	X
Clearly defines stakeholder Roles / Responsibilities	✓	✓	✓	X	✓	✓	X	X	X	X
Pre-Mitigation Design Guidance	✓	✓	✓	✓	✓	X	X	✓	✓	X
Radon Measurement Protocols	✓	✓	✓	✓	References US guidance	References US levels.	X	✓	X	In notes and appendix
Post Occupancy Measurement	✓	X	✓	X	X	✓	X	X	X	X
Post-Mitigation Measurement	X	✓	X	✓	References US guidance	X	X	✓	✓	X
<b>System Design Principles</b>										
New Construction	✓	X	✓	X	X	✓	X	✓	✓	✓
Existing Construction	X	✓	X	✓	✓	X	X	✓	✓	X
Sub-Slab depressurization	X	✓	X	✓	✓	✓	X	✓	✓	X
Sub-membrane depressurization	X	✓	X	✓	✓	X	X	✓	✓	X
Rough In	✓	X	✓	X	X	✓	X	✓	✓	✓
Passive Stack	✓	X	X	X	✓	✓	X	✓	✓	✓
Rough-in/Passive activation	✓	X	X	X	X	✓	X	X	✓	✓
Gas permeable layer	✓	X	X	✓	X	✓	X	✓	✓	✓
Ventilation	✓	✓	X	✓	✓	✓	✓	✓	X	✓
Sealing	✓	✓	✓	✓	✓	✓	X	✓	✓	✓
<b>Interaction w/ Systems or installation details</b>										
Sealing penetrations	✓	✓	✓	✓	✓	✓	X	✓	✓	✓
Termination/ Exhaust Requirements	✓	✓	X	✓	✓	✓	✓	X	✓	✓
Firestop requirements	✓	✓	X	X	X	X	X	X	X	✓
Labelling	✓	✓	✓	✓	✓	✓	X	✓	✓	✓
<b>Components/Materials</b>										
Pipe	✓	✓	✓	✓	✓	✓	X	✓	X	✓
Label	✓	✓	✓	✓	X	✓	X	✓	X	✓
Membrane	✓	✓	✓	✓	✓	✓	X	✓	✓	✓
Sealant	✓	✓	✓	✓	X	✓	X	✓	X	✓
Fan	✓	✓	X	✓	✓	✓	X	✓	X	X
<b>System Monitoring &amp; Alarms</b>										
Operational Maintenance and monitoring	X	✓	X	✓	✓	✓	X	✓	✓	X
QA/QC at commissioning	✓	✓	✓	X	✓	✓	X	X	✓	X
Detailed Documentation	✓	✓	✓	X	✓	✓	X	✓	✓	X
<b>Safety Considerations</b>										
NORM	X	X	X	✓	X	X	X	X	X	X
OH&S Guidance	X	✓	X	✓	✓	✓	✓	X	✓	✓
<b>Other Considerations</b>										
Radon in Water	X	X	X	X	X	X	X	✓	X	X
Radon Emanation	X	X	X	X	X	X	X	✓	X	X

X	Red is not included in the document.
clarification	Yellow is vague language or out of country references in document.
✓	Green is included in the document.

The referenced documents above do not list all code requirements and do not mention critical life safety and system design requirements. It is the responsibility of the architect, engineer and designer to be aware of what items need to be considered for each installation.