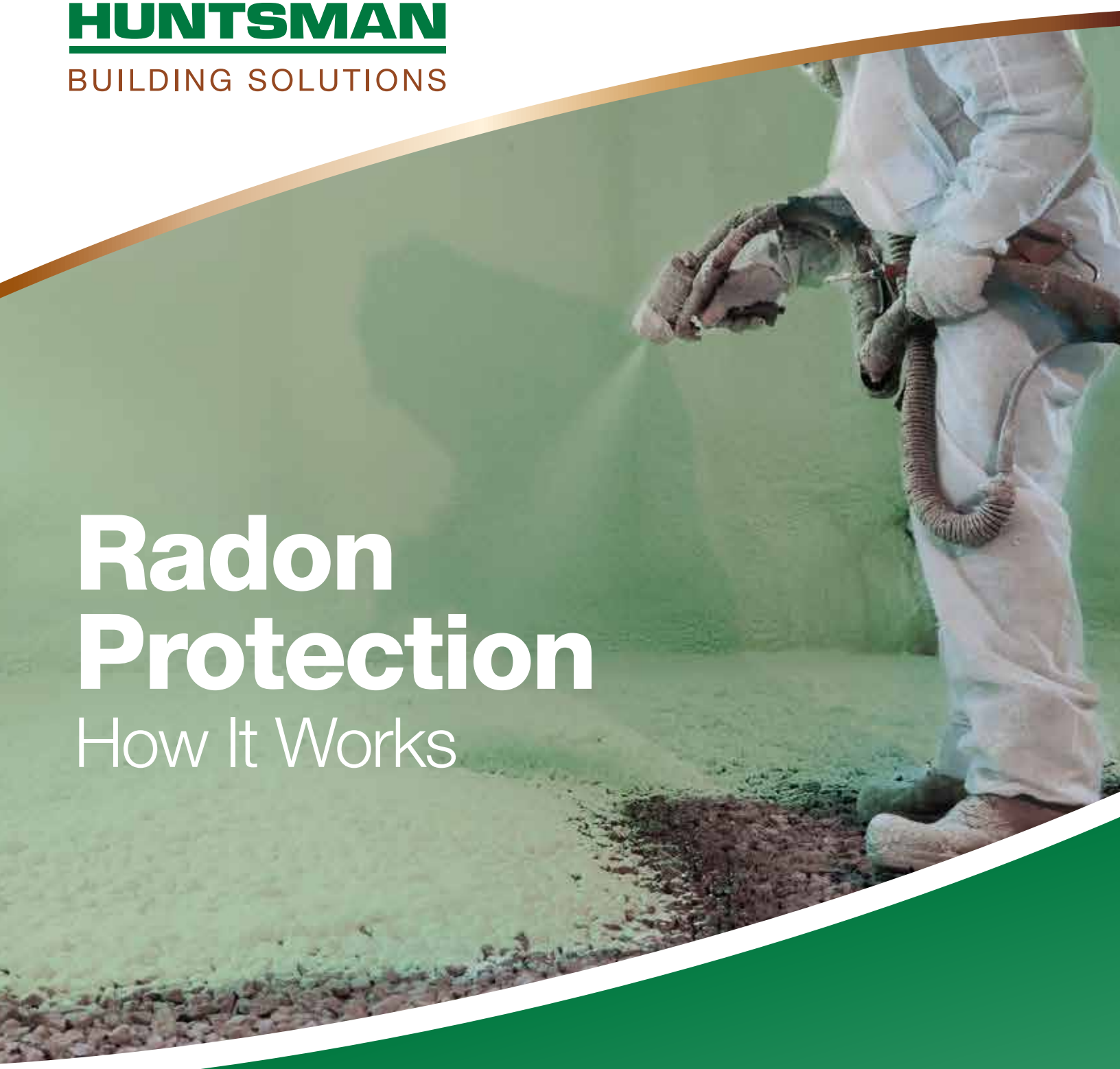
HUNTSMAN
BUILDING SOLUTIONS



Radon Protection

How It Works

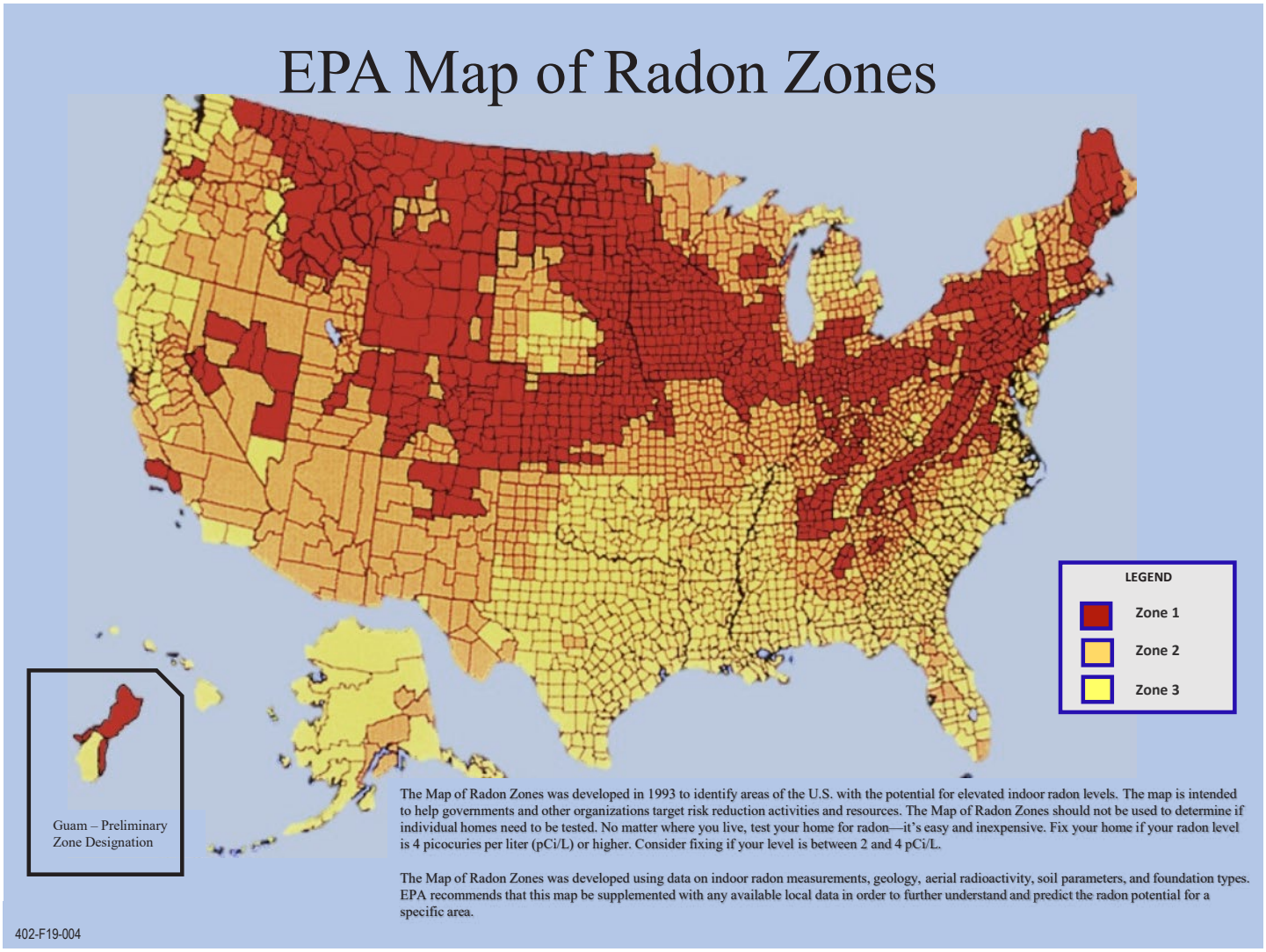
RADON PROTECTION WITH THE WORLD'S LEADING SPRAY FOAM

Heatlok XT High Yield and Heatlok XT High Lift are Produced in the USA and consists of 22% of recycled and renewable content

What is Radon?

Radon, a colorless, odorless, radioactive gas, is the second leading cause of lung cancer. Heavier than air, radon can accumulate in basements, increasing the risk of exposure to the homeowner.

Radon can infiltrate in several places, especially cracks or openings in the floor slab, cracks in the foundation wall, or sumps. The Environmental Protection Agency (EPA) and The American Lung Association recommend testing for radon in your home.



Source: EPA

Here are the EPA's recommendations for reducing radon infiltration in basements:

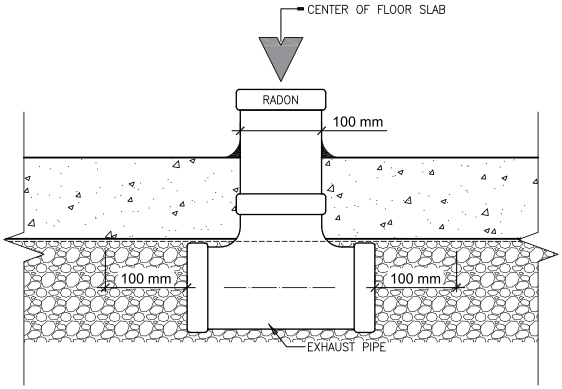
- Install a membrane or sealing product under the floor slab
- Seal the joint between the foundation wall and the floor slab
- Seal all openings in the foundation wall and floor slab
- Seal all posts and load-bearing walls to the floor slab and membrane
- Install floor drains that prevent gas infiltration
- Install sealed lid on sumps

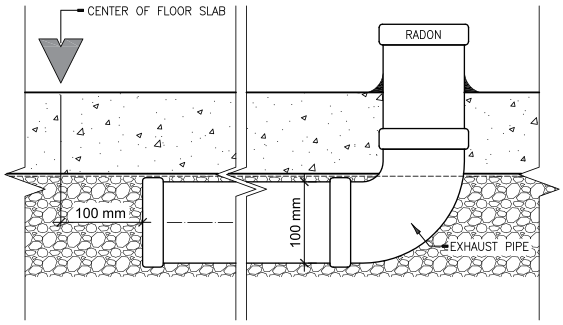
How to Build a Radon-Free Basement

These are the 6 steps to build a radon-proof basement in a new building:

1. Install A Depressurization Pipe

A perforated pipe 4 inches in diameter must be installed in 3/4 inch gravel net and run to the center of the surface of the floor slab. This pipe is installed preventatively and will be connected to an exhaust fan if, after the work is completed, a test shows a radon concentration over 4 pCi/L (150 Bq/m^3).



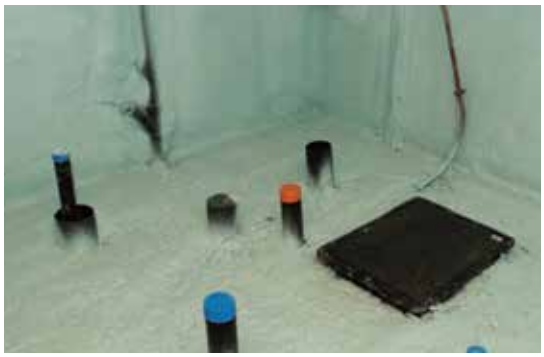


2. Install An Air Barrier

Heatlok XT High Yield and Heatlok XT High Lift are ICC compliant air barrier products, in accordance with ASTM E2178, and provide perfect air-tightness under the foundation slab, as well as being insulating. Heatlok XT High Yield and Heatlok XT High Lift are radon gas resistant, as demonstrated by K124/02/95 (method C of ISO/TS 11665-13) and is 9 times more effective than a 6-mil polyethylene membrane at 1.25" (32mm). The minimum thickness to apply is 1.25" (32mm) to meet insulation, airtightness and vapor barrier requirements.

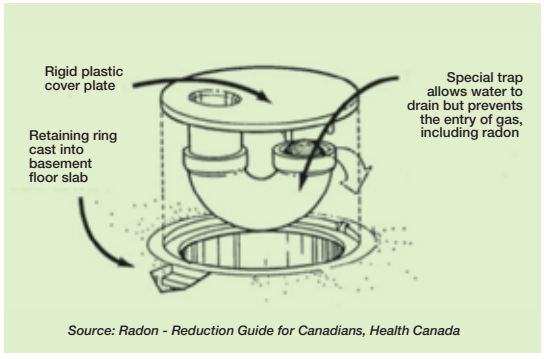
3. Seal The Joints

The perfect continuity of Heatlok XT High Yield and Heatlok XT High Lift seal the foundation wall joint to the slab, leaving no seams in the basement insulation anywhere: wall, slab, rim joist. The product is sprayed on-site and molds perfectly to the building structure. The continuity between the airtight slab and the wall is perfect. The installation of Heatlok XT High Yield and Heatlok XT High Lift require no sealant, tape or cutting of materials, so there are no compatibility issues between materials.



4. Seal All Openings

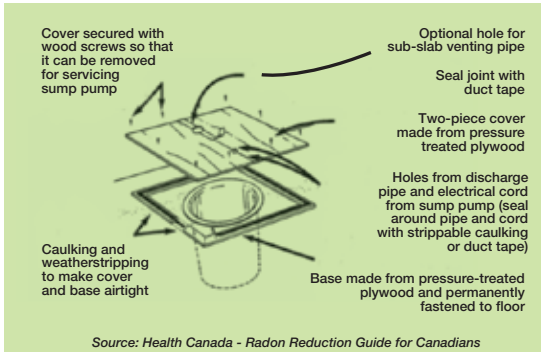
Heatlok XT High Yield and Heatlok XT High Lift seal openings and posts, leaving no room for error. The products seal and expand 30 times their initial volume in 5 seconds.



Source: Radon - Reduction Guide for Canadians, Health Canada

5. Install Floor Drains

Radon can use water as a vehicle for infiltration. It is, therefore, important to install floor drains that are specifically designed to prevent gas infiltration.



Source: Health Canada - Radon Reduction Guide for Canadians

6. Install A Sealed Lid on Sumps

Sumps can communicate directly with the gravel. It is therefore important to use specifically designed sealed lids.

Protection Requirements

The basement can often be a risky area: high humidity, floods, mold, etc. With the new energy requirements of The International Residential Code (IRC), it is recommended to insulate under the basement concrete slab. Where required, the insulation must have a minimum value of R-5 full surface or R-7.5 for 4 feet (1.2 metre) around the perimeter. In addition, IRC Appendix F, recommends the installation of protection against radon gas entry. Heatlok XT High Yield and Heatlok XT High Lift provide superior insulation, a perfect air barrier system and a vapor barrier all in one single application. It also prevents soil gases, mainly radon, from entering the building. In short, the occupants are warm, comfortable and protected from radon.

With an R value of R-6.9/inch, Heatlok XT High Yield and Heatlok XT High Lift, applied 1.25" (32 mm) thick, provides R-6.9 x 1.25 = R-8.63 insulation under the entire surface of the slab, exceeding Building Code requirements. Due to its high compression strength (23 psi), Heatlok XT High Yield and Heatlok XT High Lift can be sprayed directly on crushed stone and provides continuous insulation with no joints.

During construction, workers can move with wheelbarrows and equipment without damaging Heatlok XT High Yield or Heatlok XT High Lift; it will not crack or break. The entire basement can be sprayed in a single step. Application is very quick and generates no waste.

The EPA recommends the safe threshold for radon gas in buildings. In addition to its high insulation factor, Heatlok XT High Yield and Heatlok XT High Lift act as an air and vapor retarder. 1.25" (32 mm) of product exceeds the air barrier material requirements by 500 times, creating an air barrier system. The product is tested in accordance with ASTM E2178 and ASTM E283. When applied, the product adheres and expands 30 times its initial volume in 5 seconds.

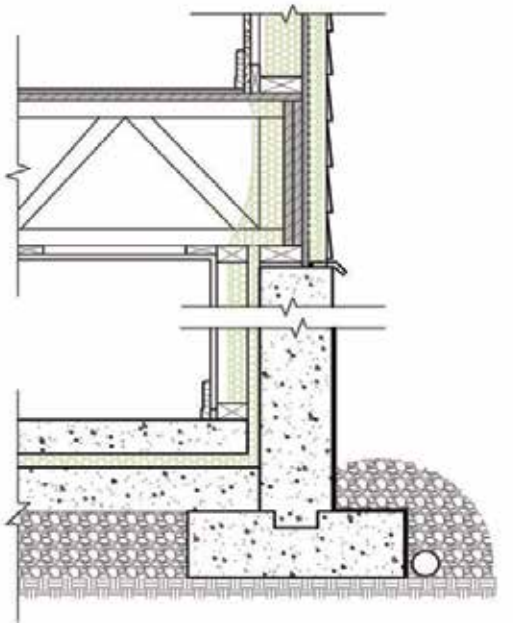
TABLE R403.3(1)
MINIMUM FOOTING DEPTH AND INSULATION REQUIREMENTS FOR FROST-PROTECTED FOOTINGS IN HEATED BUILDINGS

AIR FREEZING INDEX (°F - DAYS)	MINIMUM FOOTING DEPTH, D (INCHES)	VERTICAL INSULATION R-VALUE	HORIZONTAL INSULATION R-VALUE	
			ALONG WALLS	AT CORNERS
1,500 OR LESS	12	4.5	NOT REQUIRED	NOT REQUIRED
2,000	14	5.6	NOT REQUIRED	NOT REQUIRED
2,500	16	6.7	1.7	4.9
3,000	16	7.8	6.5	8.6
3,500	16	9.0	8.0	11.2
4,000	16	10.1	10.5	13.1

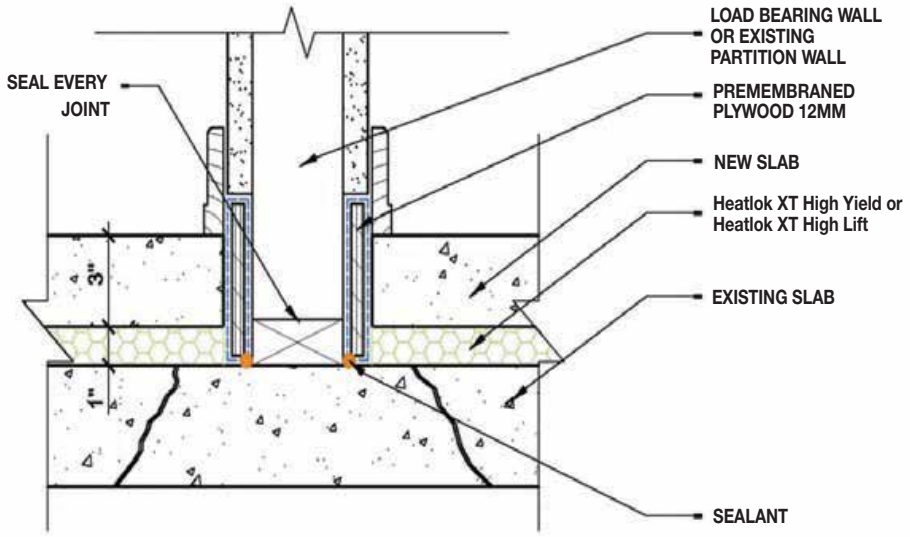
Reference Article for Radon NBCC-2010 - 2015 IRC Code
5.4.1.1.1(e)-A 5.4.1.1 - 9.13.4 - 9.25.3 - 9.36.2.9

Renovation

A simple solution to prevent radon infiltration in existing buildings. Spray Heatlok XT High Yield or Heatlok XT High Lift on the existing slab, the foundation wall, and the rim joist, and then pour a new slab. It is important to verify the floor/ceiling height, since this will add approximately 4” to the floor thickness.



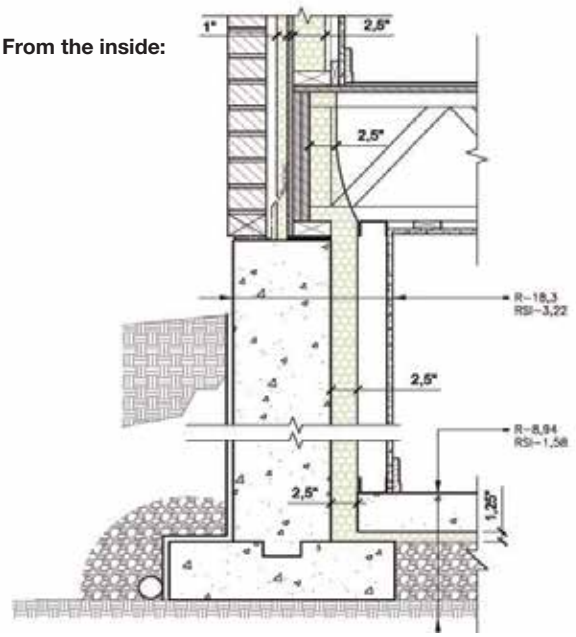
Detail for sealing a bearing wall or an existing divider.



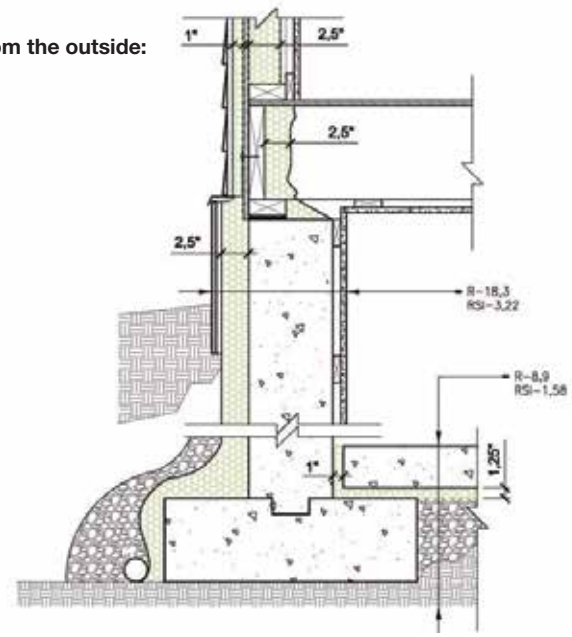
New Construction

Preventing radon gas infiltration in new construction is even simpler.

From the inside:



From the outside:



The Solution For Lasting Comfort

A basement is a high-humidity area prone to mold and mildew development. According to independent laboratory testing (ASTM C 1338), mold will not grow in Heatlok XT High Yield or Heatlok XT High Lift, as it is not a nutrient source for bacteria. The product is water and humidity resistant. Numerous studies have shown that it is the ideal insulation for flood prone areas as it has the highest rating (Class 5) for flood resistant materials. The spray polyurethane foam may remain in place even after a flood. The foam does not degrade and, once dry, Heatlok XT High Yield or Heatlok XT High Lift recover all of their physical properties.

In short, the installation of Heatlok XT High Yield or Heatlok XT High Lift under the slab and on foundation walls saves time and materials, while providing lasting superior-quality insulation and airtightness at a competitive price. Heatlok XT High Yield and Heatlok XT High Lift are suitable for application on all building types and its installation generates no waste or job site trash. The product is sold in liquid form in returnable or recycled containers, therefore there is no excess packaging.

References

1. Passive Radon Control System for New Construction. (May 1995). United States Environmental Protection Agency.
2. Building Radon Out. A Step-by-Step Guide On How To Build Radon-Resistant Homes. (April 2001). United States Environmental Protection Agency.
3. 2015 International Residential Code, Appendix F.

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