

# MEMBER FIELD GUIDE TO THE 2015 MINNESOTA RESIDENTIAL CODE RADON REQUIREMENTS V.2.0



## Member Field Guide to the 2015 Minnesota Residential Code Radon Requirements

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## LETTER FROM THE PRESIDENT

Dear Members of the Builders Association of Minnesota,

On behalf of the 2,300 members of the Builders Association of Minnesota (BAM), I am pleased to present the *BAM Member Field Guide to the 2015 Minnesota Residential Code Radon Requirements*. BAM's mission is to help our members excel in the residential construction and remodeling industry. This guide is a tool to help members reach that goal.

This guide would not have been possible without the hard work of several dedicated members. These individuals served on code committees and councils and technical advisory committees, and generously gave of their time and talent to advocate for the industry and the best possible code for Minnesota.

I'd also like to thank you for your membership with the Association. These guides exist because of your membership, and they are a big part of the value of membership.

Sincerely,

Kurt Welker, 2017 President  
Builders Association of Minnesota

## FORWARD

Several resources were used to develop this guide and BAM wishes to extend sincere gratitude for the production of these guides for BAM's membership:

Illustrations were generously donated by BAM Member George Cundy, Terrace Development and Design.

Production work was provided by  
Ed Von Thoma, Building Knowledge Inc.

**BUILDING  
KNOWLEDGE**

Code guide review was provided by a group of dedicated BAM members. A big thank you to each member for their time, expertise, and dedication to excellence and the industry.

## INTRODUCTION

The *BAM Member Field Guide to the 2015 Minnesota Residential Code Radon Requirements* was developed to help residential contractors, subcontractors, suppliers, local code officials, and others in the residential construction industry understand important code changes. On February 14, 2015 Minnesota will start enforcing the 2012 International Residential Code (IRC) with Minnesota-specific amendments. Minnesota's version of the code is the 2015 Minnesota Residential Code.

The commentary provided in this document is for reference only. Please refer to a copy of the 2012 IRC published by the International Code Council (ICC) and the 2015 Minnesota Building Code published by the Minnesota Department of Labor and Industry for specific code language. Only specific sections of code language are included in their entirety in this guide.

This guide is intended as a training and reference tool for the residential construction industry. The Builders Association of Minnesota specifically disclaims any responsibility to any party for the content of this guide or any errors or omissions that it may contain. Check actual code sections for precise intent of a specific code section. Summaries of code changes or specific code sections are provided for information only.

The link to a PDF version of this guide can be downloaded directly from [www.bamn.org/regulation](http://www.bamn.org/regulation).

**Note: the Minnesota Department of Labor and Industry and the International Code Council have the Radon provisions of the 2015 Minnesota Residential Code available for free online access at : [2015 Minnesota Provisions to the Minnesota State Building Code \(Including Radon\)](#)**

# MEMBER FIELD GUIDE TO THE 2015 MINNESOTA BUILDING CODE RADON REQUIREMENTS

Passive radon control systems are required for all NEW single-family, two-family, town-homes, condominiums, apartment buildings, as well as multistory and mixed-occupancy buildings that include any residential occupancies.

Note on mixed occupancy buildings: Residential occupancies in contact with the earth will need a radon control system. Nonresidential occupancies in contact with the earth will NOT need a radon control system. The assemblies that connect nonresidential and residential occupancies will need to be sealed to prevent the movement of air and airborne gases between the occupancies.

Hotels, motels, and crawl space foundations that are directly vented to the outside are exempt from this code.

Additions to an existing home that already has a radon control system installed will need a radon control system.

A summary of the steps for creating a passive radon control system follows along with an illustration on page 10.

## **1. SUB-SLAB GAS PERMEABLE MATERIAL**

There are three methods for the sub-slab gas permeable material:

### **A. UNIFORM LAYER OF CLEAN AGGREGATE**

A uniform layer of clean aggregate, a minimum of 4 inches thick. The aggregate material will be able to pass through a 2-inch sieve and be retained by a 1/4-inch sieve.

### **B. UNIFORM LAYER OF SAND, NATIVE OR FILL**

A uniform layer of sand, native or fill, a minimum of 4 inches thick. The sand is then covered by a layer or strips of geotextile drainage matting designed to allow the lateral flow of soil gases.

### **C. OTHER MATERIALS, SYSTEMS, OR FLOOR DESIGNS**

Other materials, systems, or floor designs if the material, system, or floor design is professionally engineered to provide depressurization under the entire soil-gas membrane.

## **2. SOIL GAS MEMBRANE INSTALLATION**

Lay 6 mil-poly over the entire floor area or use 3-mil cross-laminated poly.

### **A. POLY**

Poly has to be lapped at least 12".



## **B. PUNCTURE OR TEARS**

All punctures or tears have to be sealed and patched with the same kind of material, maintaining a minimum 12" lap.

## **3. "T" FITTING**

Install a "T" fitting below the soil gas membrane connected to 10 feet of perforated pipe on each side of the two openings of the "T" fitting. The "T" fitting can also be connected to the interior drain tile system. The third opening of the "T" fitting is connected to the vent pipe. The perforated pipe or drain tile and the "T" fitting need to be the same size as the vent pipe. Make sure the connections to the "T" fitting are tight.

## **4. SEAL ALL ENTRY ROUTES FOR RADON GAS**

Seal all potential entry routes to prevent the movement of air or airborne gases through a floor, wall, or ceiling assembly (think of this step as applying the tight air sealing your crews already do in the attic, to the slab).

### **A. FLOOR OPENINGS**

Seal floor openings around bathtubs, showers, water closets, pipes, wires, etc.

### **B. CONCRETE JOINTS**

Seal all concrete joints, isolation joints, construction joints or any other joints in the concrete slab, or the joint between the concrete slab and a foundation wall.

### **C. FOUNDATION WALLS**

Seal all joints, cracks, or other openings around all penetrations of both exterior and interior surfaces of foundation walls.

Hollow block masonry walls will need a solid course at or above the exterior ground surface. The solid course can be a continuous course of solid masonry; one course of masonry grouted solid or a solid concrete beam.

When a brick veneer or other masonry ledge is installed, the masonry course immediately below the veneer or ledge needs to be solid or filled.

#### **D. UNCONDITIONED CRAWL SPACES**

All penetrations through floors or walls into unconditioned crawl spaces need to be sealed. Access doors into unconditioned crawl spaces need to be gasketed. Crawl space to be directly vented to outside.

#### **E. SUMPS**

A sump connected to interior drain tile may serve as the termination point for the vent pipe, if the sump cover is sealed or gasketed and designed to accommodate the vent pipe. If a sump is used as the termination point of the radon control system a back flow prevention device is required in the sump pump water discharge line to prevent the radon control system from drawing outside air rather than air from below the soil gas membrane.

### **5. VENT PIPE**

Install a 3" or 4" ABS or PVC gastight pipe to vent subsoil gases that have collected under the soil-gas membrane to the exterior of the dwelling.

#### **A. SINGLE VENT PIPE**

The vent pipe must be primed and glued at all fittings. The vent pipe runs from the sub-slab gas permeable material and extends all the way through the building and terminates at least 12 inches above the surface of the roof. The vent pipe must also be at least 10 feet from any window or other opening into the conditioned space of the building. Any vent pipe that runs through unconditioned spaces must have a minimum R-4 insulation.

## **B. MULTIPLE VENT PIPES**

In buildings where interior footings or other barriers separate the gas-permeable material into two or more areas, each area needs to be fitted with an individual radon control system or connected to a single radon gas vent pipe terminating above the roof.

## **C. VENT PIPE DRAINAGE**

All components of the radon gas vent pipe system need to provide drainage to the ground beneath the soil-gas membrane.

## **D. VENT PIPE ACCESSIBILITY**

Make sure there is enough space around the vent pipe to allow for the future installation of a fan in the attic. This space needs to be a minimum of 24 inches in diameter, centered on the axis of the vent pipe, and has to extend for a minimum vertical distance of 3 feet.

## **E. VENT PIPE IDENTIFICATION**

The vent pipe must be labeled at every story and in attics and crawl spaces with the words "Radon Gas Vent System".

## **F. COMBINATION FOUNDATIONS**

Combination basement/crawl space or slab-on grade/crawl space foundations will need to have separate radon gas vent pipes installed in each type of foundation area. Each radon gas vent pipe will terminate above the roof or be connected to a single vent pipe that terminates above the roof.

## **6. POWER SOURCE**

Add one electrical receptacle in the attic near the pipe where a fan would be located. The power source cannot be installed in any conditioned space, basement, or crawl space.

## **7. REQUIREMENTS FOR ACTIVE RADON CONTROL SYSTEMS**

### **A. RADON GAS VENT PIPE FAN**

The radon fan needs to be rated for continuous operation and provide a minimum of 50 cubic feet per minute. The radon gas vent pipe fan needs to be installed outdoors, in attics, or in garages. The radon gas vent pipe fan cannot be installed in conditioned spaces of a building. This is necessary so that the fan will only pressurize the vent outside the living space, which will prevent the exposure of radon gas into the dwelling if the vent system should experience a joint failure. A catwalk is NOT required to access the radon gas vent pipe fan.

### **B. SYSTEM MONITORING DEVICE**

Install an audible alarm, a manometer, or other similar device to indicate when the fan is not operating.

### **C. LIGHT AND RECEPTACLE OUTLET**

Install a switch-controlled light and the receptacle outlet near the fan in accordance with the Minnesota Electrical Code.

## **ADDITIONAL INFORMATION**

The Minnesota Department of Health promotes an above code program called Radon Resistant New Construction Gold Standard. Builders that agree to comply with the requirements of RRNC Gold Standard program will receive free marketing on the Minnesota Department of Health's website.

Find out more about the Department of Health's RRNC Gold Standard:

<http://www.health.state.mn.us/divs/eh/indoorair/radon/goldstand/index.html>

See page 10 for the illustration: Passive Radon Control System.

## **STILL HAVE QUESTIONS?**

Send your detailed energy code questions to BAM at [info@bamn.org](mailto:info@bamn.org).

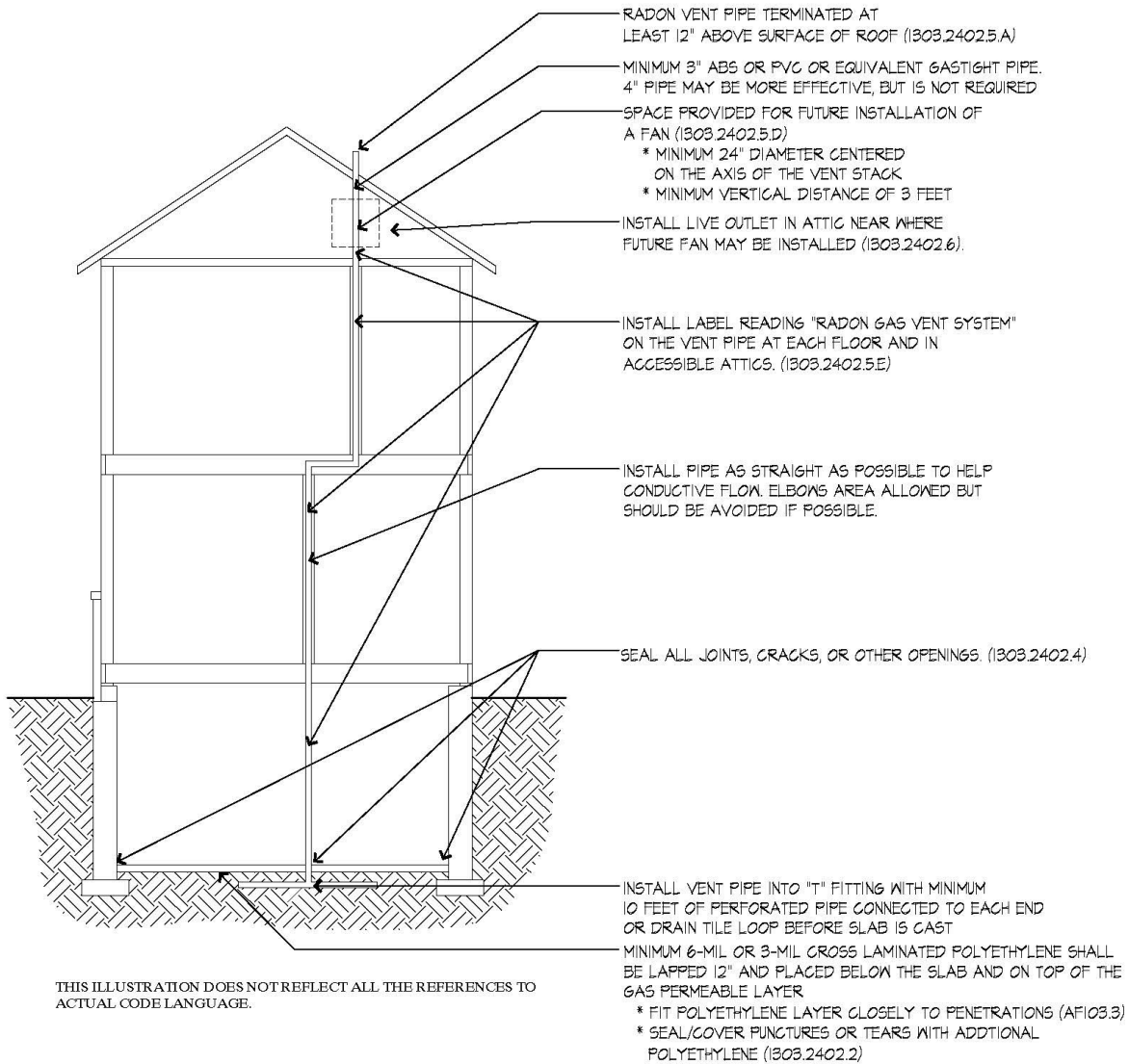
BAM will post the most commonly asked questions on BAM's Code Q & A website page.

See [www.bamn.org/regulation](http://www.bamn.org/regulation) for more information.

# ILLUSTRATION: PASSIVE RADON CONTROL SYSTEM

## Passive Radon Control System

- APPLIES TO BASEMENTS, CONDITIONED CRAWLSPACES, SLAB-ON-GRADE BUILDINGS AND OTHER FOUNDATIONS UNDER CONDITIONED SPACE
- MINIMUM CODE REQUIREMENTS ARE LISTED. OTHER SYSTEM COMPONENTS ARE SUGGESTIONS FOR BEST PRACTICE INSTALLATIONS BASED ON MINNESOTA DEPARTMENT OF HEALTH RECOMMENDATIONS.



THIS ILLUSTRATION DOES NOT REFLECT ALL THE REFERENCES TO ACTUAL CODE LANGUAGE.





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