



### **RADON REQUIREMENTS**

Building code information for one- or two-family dwellings and townhomes.

#### **Gas Permeable Material Preparation**

(1303.2402 Subpart 1)

- A gas-permeable material shall be placed on the prepared subgrade under all floor systems. The gas-permeable material shall consist of one of the following:
  - A uniform layer of clean aggregate, a minimum of 4" thick. The aggregate shall consist of material that will pass through a 2" sieve and be retained by a 1/4" sieve.
  - A uniform layer of sand, native of fill, a minimum of 4" thick, overlain by a layer or strips of geotextile drainage matting designed to allow the lateral flow of soil gases.
  - 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.

#### **Soil-Gas Membrane Installation**

(1303.2402 Subpart 2)

- A soil-gas membrane (continuous membrane of 6 mil polyethylene or 3 mil cross-laminated polyethylene) shall be placed on top of the gas-permeable material prior to placing a floor on top of or above the soil. The soil-gas membrane shall cover the entire floor area. Separate sections of membrane must be lapped at least 12". The membrane shall fit closely around any penetration of the membrane to reduce the leakage of soil gases. All punctures or tears in the soil-gas membrane shall be repaired by sealing and patching the soil-gas membrane with the same kind of material, maintaining a minimum 12" lap.

#### **"T" Fitting**

(1303.2402 Subpart 3)

- A "T" fitting shall be installed beneath the soil-gas membrane with a minimum of 10' of perforated pipe connected to any 2 openings of the "T" fitting, or by connecting the 2 openings to the interior drain tile system. The 3<sup>rd</sup> opening of the "T" fitting shall be connected to the vent pipe. The perforated pipe or drain tile and the "T" fitting shall be the same size as the vent pipe. All connections to the "T" fitting shall be tight fitting.

#### **Potential Entry Routes**

(1303.2402 Subpart 4)

- Potential entry routes for radon gas shall be sealed according to this subpart as applicable:
  - Floor openings:
    - Openings around bathtubs, showers, water closets, pipes, wires, or other objects that penetrate the soil-gas membrane and the concrete slab or other floor systems shall be sealed.
  - Concrete joints:
    - All control joints, isolation joints, construction joints, or any other joints in the concrete slab, or the joint between the concrete slab and a foundation wall shall be sealed. All gaps and joints shall be cleared of all loose material prior to sealing.
  - Foundation walls:
    - Penetrations of all foundation wall types shall be sealed. Joints, cracks, or other openings around all penetrations of both exterior and interior surfaces of foundation walls shall be sealed.
    - Hollow block masonry foundation walls shall be constructed with either:
      - A continuous course of solid masonry at or above the exterior ground surface.
      - One course of masonry grouted solid at or above the exterior ground surface.
      - A solid concrete beam at or above the finished exterior ground surface.

- Unconditioned crawl spaces:
  - All penetrations through floors or walls into unconditioned crawl spaces shall be sealed. Access doors into unconditioned crawl spaces shall be gasketed. Crawl space ventilation shall be provided according to part 1303.2400.
- 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. The sump pump water discharge pipe shall have a backflow preventer installed.

### **Vent Pipes**

(1303.2402 Subpart 5)

- The vent pipe shall be a 3" or 4" diameter ABS or PVC pipe.
  - Single vent pipe
    - The vent pipe shall be primed and glued at all fittings and shall extend up from the radon control system's collection point to a point terminating a minimum of 12" above the roof. The vent pipe shall be located at least 10' away from any window or other opening into the conditioned spaces of the building. Vent pipes routed through unconditioned spaces shall be insulated with a minimum of R-4 insulation. Vent pipes within the conditioned envelope of the building shall not be insulated.
  - Multiple vent pipes
    - In buildings where interior footings or other barriers separate the gas-permeable material into 2 or more areas, each area shall be fitted with an individual radon control system in accordance with a single vent pipe, or connected to a single radon gas vent pipe terminating above the roof a minimum of 12" above the roof.
  - Vent pipe drainage
    - All components of the radon gas vent pipe system shall be installed to provide drainage to the ground beneath the soil-gas membrane.
  - Vent pipe accessibility
    - Radon gas vent pipes shall be provided with space around the vent pipe for future installation of a fan. The space required for the future fan installation shall be a minimum of 24" in diameter, centered on the axis of the vent pipe, and shall extend a minimum distance of 3 vertical feet.
      - Exception: Accessibility to the radon gas vent pipe is not required if the future fan installation is above the roof system and there is an approved rooftop electrical supply provided.
  - Vent pipe identification
    - All radon gas vent pipes shall be identified with at least 1 label on each story and in attics and crawl spaces. The label shall read: "Radon Gas Vent System".
  - Combination foundations
    - Combination basement/crawl space or slab-on grade/crawl space foundations shall be separate radon gas vent pipes installed in each type of foundation area. Each radon gas vent pipe shall terminate above the roof or shall be connected to a single vent pipe that terminates above the roof.

### **Power Source**

(1303.2402 Subpart 6)

- A power source consisting of an electrical circuit terminating in an approved electrical box shall be installed during construction in the anticipated location of the vent pipe fan to allow for future installation of a fan into a passive radon control system to make the system an active radon control system. The power source shall not be installed in any conditioned space, basement, or crawl space.

### **Air-Handling Units & Ducts**

(Minnesota Rules, Chapter 1346 - Minnesota Mechanical & Fuel Gas Code)

- Air-handling units:
  - Units in crawl spaces shall be sealed to prevent air from being drawn into the unit.
    - Exception: units with gasketed seams or units that are otherwise sealed by the manufacturer to prevent leakage.

- Ducts:
  - Ductwork passing through or beneath a slab shall be of seamless material unless the air-handling system is designed to maintain continuous positive pressure within such ducting. Joints in such ductwork shall be sealed to prevent air leakage.
  - Ductwork located in crawl spaces shall have all seams and joints sealed by closure systems in accordance with Minnesota Rules, Chapter 1346.

*The information in this handout is just an overview. See the 2020 Minnesota Provisions to the Minnesota State Building Code & the 2020 Minnesota Mechanical and Fuel Gas Code for complete information.*