**Draintile versus crushed rock**
**Radon Removal Inc.**

**Is 4" of crushed rock under slabs needed to comply with the new radon code (Appendix F)?** During the drafting of the code, we debated two opposing philosophies regarding the section on sub-floor preparation. The staff from public health wanted a passive radon system optimized to reduce radon without a fan – which requires 4" of clean rock under the entire slab. I argued that passive systems were complex, ineffective and a waste of money. We just need a system that works well if a fan has to be installed. Interior draintile is needed – 4" of rock is not. Public health prevailed, and the option of draintile was not listed. The final draft of the section reads as follows:

***AF103.2 Subfloor preparation.*** *A layer of gas-permeable material shall be placed under all concrete slabs and other floor systems that directly contact the ground and are within the walls of the living spaces and conditioned crawl spaces of the building, to facilitate the installation of an active sub-slab depressurization system, if needed. The gas permeable layer shall consist of one of the following:*
*1. A uniform layer of clean aggregate, a minimum of 4 inches thick. The aggregate shall consist of material that will pass through a 2 inch sieve and be retained by a _ inch sieve.*
*2. A uniform layer of sand (native or fill), a minimum of 4 inches thick, overlain by a layer or strips of geotextile drainage matting designed to allow the lateral flow of soil gases.* [My note: Not very effective]
*3. Other materials, systems, or floor designs with a demonstrated capability to permit depressurization across the entire sub-floor area.*

Option 1, besides the cost of the rock, requires a 3" or 4" radon vent to be installed on both sides of footings that bisect the slab and in each slab or crawl space of a multilevel home.

The effectiveness of draintile has been demonstrated for over 20 years, plus only one radon vent is needed. Building officials should accept draintile under Option 3, with the following evidence of its ability:

1. ASTM 1465-06 *Standard Practice for Radon Control Options for the Design and Construction of New Low-Rise Residential Buildings,* Table 2, Type 3 and Table 4, Type 3, allow 4" draintile buried in a 12" wide band of 1" to 1 _" stone at the perimeter of the foundation.

2. The EPA's EPA/402-K-01-002 *Building Radon Out, A Step –by – Step Guide on How To Build Radon Resistant Homes*, pages 35 to 39, recommends 3" or 4" draintile at the interior perimeter of the building.

3. Other jurisdictions, (i.e.: Ft. Collins CO) have amended Appendix F to include interior draintile as an option.

If you agree, you may want to add something like the following to the prints you submit for plan review:

Appendix F *Subfloor Preparation* will be met by installing a continuous loop of 4" draintile in a 12" wide bed of clean rock ,extending around all of the interior perimeter of the basement, grade level slab and crawl space, in substantial conformance with ASTM 1465-06 *Standard Practice for Radon Control Options for the Design and Construction of New Low-Rise Residential Buildings,* Table 2, Type 3 and Table 4, Type 3, and EPA/402-K-01-002 *Building Radon Out: A Step –by – Step Guide on How To Build Radon Resistant Homes.*

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