

## Radon Vent Systems

### Minimizing Radon & Moisture Vapor Entry When Building a New Home

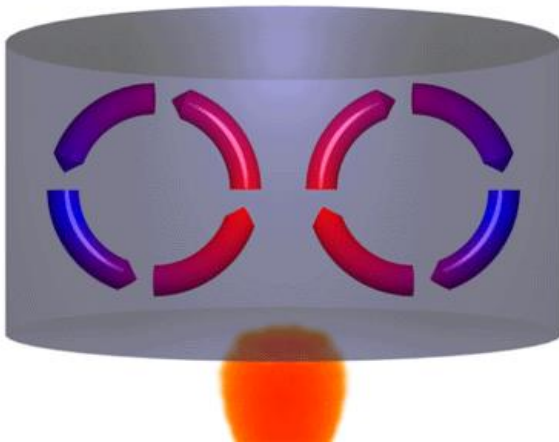
With a little planning, and little expense, you can have a passive soil gas ventilation system (SGVS) installed in a new home during construction. With this component in a new home, you can minimize the entry of radon gas and prevent the intrusion of moisture vapor.



← Soil air is laden with moisture vapor, which can condense and freeze at low temperatures.

Radon gas increases your risk of developing lung cancer. Moisture vapor affects the efficiency of your air conditioner in the summer months when you want to cool your home. Both gases can enter your home through a sump pit and cracks and joints in the floor. Fortunately, you can minimize these two problems by using an inexpensive passive, soil gas ventilation system (SGVS). Designed to function without power, a passive SGVS operates by natural convection. The theory is simple: warm air moves through the porous rock beneath the basement floor; then it rises through the warm, vertical ventilation pipe.

### How Natural Convection Works



Natural convection fuels the operation of the system. The system has no components that require electricity. By providing a pipe to vent soil gases below the basement floor, the area beneath the

home can be depressurized and soil gas can rise through the vertical pipe without entering the home. Here, we describe a passive soil gas ventilation system described that will significantly improve indoor air quality and help make your home more comfortable.

### **Passive, Soil Gas Ventilation System (SGVS)**

SGVS consist of a four-inch layer of 1/4- to two-inch gravel aggregate. This layer's purpose to create a permeable layer for the flow of soil gases and to create a capillary break from the soil moisture below the home.



← A sheet of six mil. Polyethylene sheeting (or three mil. cross-laminated sheeting) laying on top of the gravel aggregate.



← A 3- or 4-inch diameter PVC ventilation pipe, rising vertically from the gravel bed beneath the basement floor through the attic, and out letting above the roof.



← As a best management practice, seal all joints, cracks, and openings around utility penetrations in the floor and walls below grade. Use an elastomeric sealant to provide an airtight seal.



← You can also adapt the SGVS to treat a crawlspace. Soil gas is trapped beneath a sheet of 6-mil plastic (or better) membrane which is laid on the soil surface throughout the entire crawlspace. Then the membrane is attached about 12" up on the side walls.

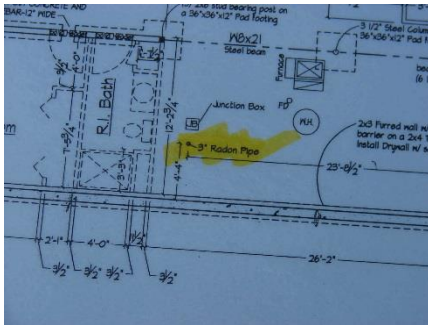
### **Important Considerations**



← To function without a fan, the soil gas ventilation pipe must be installed vertically (plumb); even warm air will not rise when channeled through a horizontal run of pipe like this.



←The vertical, soil gas ventilation pipe must be installed within the conditioned floor area of the home. If the ventilation pipe is installed in an exterior wall, it will be typically too cold to function by natural convection. Most vertical ventilation pipes can be hidden within an interior wall.



←A PSGVS is a formal building system. As such, it should appear on the construction drawings for all floors. When the passive SGVS appears on the set of construction blueprints, almost any worker can ensure that it is installed properly in the intended location



←The outlet of a passive soil gas ventilation system should penetrate the roof on the back-side of the home.



← Be sure to clearly label the soil gas ventilation pipe so it doesn't get confused with other utility systems.

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### **For More Information**

Please refer to the Radon Program's Index Page, [http://dhhs.ne.gov/publichealth/Pages/radon\\_index.aspx](http://dhhs.ne.gov/publichealth/Pages/radon_index.aspx), or contact us using the information provided below:

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