

Radon Resistant New Construction (RRNC)

Radon is a naturally occurring, radioactive gas and is the leading cause of lung cancer in non-smokers. Radon resistant new construction methods can be effective in improving indoor air quality and reducing radon entry into buildings. Read this fact sheet to learn more about building healthy homes.

Why Build With RRNC Methods?

Homes built with RRNC methods can be effective in reducing radon levels by venting radon away from the home. It is easier and less costly to install features during construction than after the home is built. All of these techniques and materials are commonly used in construction. No special materials are required.

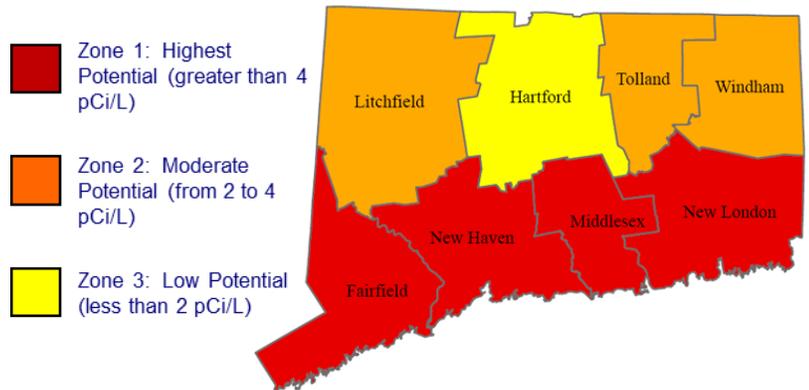
Is My Region in a High Risk Area For Radon?

This map shows the radon potential by county in Connecticut. High radon level areas are called Zone 1 areas. The United States Environmental Protection Agency (EPA) and the Connecticut Department of Public Health (CT DPH) recommend builders and architects use RRNC methods in both Zone 1 and Zone 2 areas.

Is Radon a Significant Health Risk?

The EPA estimates that radon gas causes over 21,000 lung cancer deaths per year in the U.S. The EPA set an *action level* for radon at 4 picocuries per liter (pCi/L). "Picocuries per liter" is a unit of measure for radiation. It is recommended that homeowners take steps to reduce radon levels in indoor air to below 4 pCi/L.

Connecticut Radon Potential Map



This map is not used to determine if a home in a given zone should be tested for radon. Homes with elevated levels of radon have been found in all three zones. All homes should be tested regardless of geographic location.

How Does Radon Enter a Home?

Can be drawn into a house from the soil as a result of air pressure differences through:

- ✓ Cracks in foundation
- ✓ Cavities inside walls
- ✓ Joints between floor and wall
- ✓ Gaps around service pipes and in suspended floors

As warm air rises, the "stack effect" causes unconditioned replacement air to enter the lower portion of the house.



What are the Steps to Building Radon Out?

There are 4 basic steps to building radon out.

1. Install a 4" layer of clean gravel or aggregate beneath the slab;
2. Lay polyethylene sheeting on top of the gravel layer;
3. Include a gas-tight venting pipe from the gravel layer through the building to the roof; and
4. Seal and caulk the foundation thoroughly.

Radon Resistant New Construction Basic Features

You and your builder can design your new home to keep radon out. Both gravel and plastic sheeting are already required under Connecticut Building Code. For a small additional cost, you can make your new home radon resistant. Have your builder take these four steps.

Step 1: Sub Slab Layout

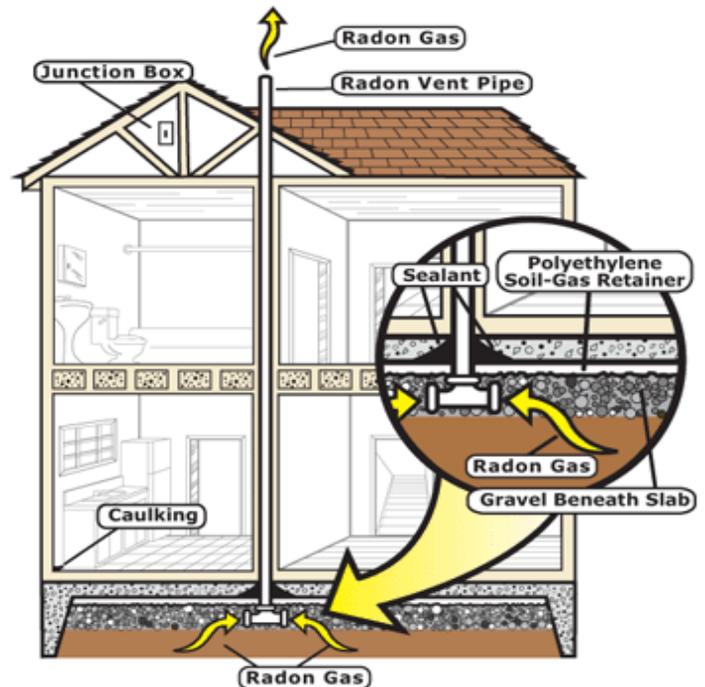
- 1. Install Gravel Layer** (creates a permeable layer)
 - √ Aggregate size: 1 - 1½ inch diameter, no fines
 - √ Place 4-6 inches thick in a uniform layer
- 2. Install Soil-Gas Collection System**
 - √ Bury a perforated 3-4 inch diameter PVC pipe in gravel layer
 - √ Slope pipe towards collection point
 - √ Keep subslab pipe ends uncapped
 - √ Centrally locate non-perforated tee assembly
 - √ Protect exposed pipe end from concrete mix while pouring foundation
 - √ Label visible interior pipe "Radon Vent System"
- 3. Install a Sealed Polyethylene Membrane** (acts as a vapor barrier)
 - √ Use 6-mil thick or 3-mil cross laminated polyethylene
 - √ Place sheeting on top of gravel and subslab pipes
 - √ Overlap seams 12 inches & seal with duct tape
 - √ Run sheeting 12 inches up side walls and secure prior to pouring foundation

Step 2: Radon System Piping

- 1. Pipe From Sub-Slab Gravel Through Roof** (vents radon gas above the home)
 - √ Run 3-4 inch diameter schedule 40 PVC pipe vertically through the building floors
 - √ Support pipe every 6 feet in horizontal runs; every 8 feet in vertical runs
 - √ Label all portions of visible pipe "Radon Vent System"
- 2. Vent Stack Pipe Discharge**
 - √ Terminate vent stack pipe 12 inches above roof
 - √ Locate vent stack pipe 10 feet away from windows or other openings including furnace flue

Step 3: Electrical Wiring

- 1. Install Electrical Outlet** (allows for future Installation of fan)
 - √ Install unswitched electrical junction box in attic
 - √ Locate within 6 feet of the vent pipe
 - √ Label circuit breaker



A "Passive Radon Control System" relies on natural air pressure to draw the radon out of the house.

Step 4: Fan Installation

- 1. Every Home Must Be Tested for Radon After Occupancy**
 - √ An average radon test result will determine if the passive system is adequately reducing radon levels.
 - √ You may need to have a fan installed to activate the radon reduction system to reduce radon levels to below 4 pCi/L.

For more information about RRNC, call your Local Health Department/District
or
visit the Connecticut Department of Public Health
Radon Program website:

www.ct.gov/dph/radon