

What to Know About Sub-Slab Depressurization for St. Louis Homes

If you have finished a radon test and the results came back above 4.0 pCi/L, you have probably heard that a mitigation system is the fix. The most common approach in the St. Louis area is sub-slab depressurization. It is a method that has been used for decades, and when installed correctly, it can drop radon levels by 90 percent or more. But how does it work, and what should a homeowner expect from the process?

I have seen a lot of confusion around this topic. Some people assume a mitigation system is just a fan in the basement, or that it will cost thousands of dollars they do not have. The reality is more straightforward. A properly designed sub-slab depressurization system addresses the root cause of radon entry: pressure differences between the soil beneath your home and the indoor air.

Let us walk through what [sub-slab depressurization](#) means, how it is installed, and what it costs in the St. Louis market.

How Sub-Slab Depressurization Works

Beneath a concrete slab, soil gas moves freely. Radon, which is a radioactive gas produced by the natural decay of uranium in the ground, moves with that soil gas. The gas enters your home through cracks, gaps around pipes, and even through the concrete itself. Sub-slab depressurization reverses that flow. Instead of soil gas being pulled into the living space, a fan creates a vacuum beneath the slab. That vacuum draws the soil gas out through a vent pipe and exhausts it safely above the roof line, where it dilutes into the outdoor air.

In a typical active sub-slab depressurization system, a contractor drills a small hole through the slab, excavates a shallow pit beneath it, and installs a length of PVC piping. That piping connects to a fan, usually mounted in the attic or on the exterior of the home. The fan runs continuously, pulling a slight vacuum on the soil beneath the slab. That vacuum prevents radon from migrating upward into the house.

It is important to understand that sub-slab depressurization is not a one-size-fits-all solution. The effectiveness depends on the soil type, the condition of the slab, and the quality of the installation. A well-sealed slab helps the system work more efficiently. If there are large gaps or unsealed sump openings, the fan may pull conditioned air from the house rather than soil gas from beneath the slab. That reduces performance and can increase energy costs.

Passive vs. Active Depressurization

During new construction, builders often install a passive stack. This is a vertical vent pipe that runs from beneath the slab up through the roof, relying on natural convection and wind effects to draw soil gas out. In theory, a passive stack can reduce radon levels. In practice, it rarely achieves the same reduction as an active system. Without a fan, the vacuum is weak. In St. Louis, where soil conditions can vary block by block, a passive stack alone may not bring radon levels below the EPA action level.

Active sub-slab depressurization, by contrast, uses a fan to create a consistent vacuum. The fan is the heart of the system. It must be sized correctly for the volume of soil beneath the slab and the length of the vent pipe. A fan that is too small will not generate enough vacuum. A fan that is too large can be noisy and may pull too much soil gas, exhausting it faster than the system can handle. Reputable radon contractors like Air Sense Environmental take measurements before selecting the fan.

What to Expect During Installation

A typical radon mitigation installation in St. Louis takes a few hours to a full day, depending on the complexity of the home. The contractor will start with a radon test to confirm the baseline radon levels. Then they inspect the slab, the foundation, and the sump if one exists. They look for cracks, gaps around utility entries, and any openings that could allow soil gas to bypass the system.

The next step is to choose the location for the suction point. The goal is to place it where the vacuum will affect the largest area beneath the slab. That is often near the sump, because the sump pit already provides a void that the vacuum can pull from. If no sump exists, the contractor drills a hole and creates a small cavity.

After the piping is installed, the fan is mounted. The vent pipe is routed to the exterior, with the exhaust outlet placed at least ten feet from any window or door, and at least two feet above the roof line. That prevents the exhausted radon from re-entering the home. Finally, the contractor applies sealant around all penetrations through the slab. This includes the suction point, any cracks, and the gap around the vent pipe.

A post-mitigation test is performed after the system has been running for at least 24 hours. This test confirms that radon levels have fallen below the EPA action level. Most contractors guarantee the system will reduce radon to below 4.0 pCi/L, and many aim for well below that.

Cost Estimate for St. Louis Homeowners

Radon mitigation costs vary, but in the St. Louis area, a typical sub-slab depressurization system ranges from \$1,200 to \$2,500. The price depends on the difficulty of the installation, the materials needed, and whether the home has a sump that can be used. A home with a

crawl space may require a different approach, such as a membrane system, which can cost more. A simple slab-on-grade installation with an existing sump is usually on the lower end.

Air Sense Environmental provides detailed cost estimates before any work begins. They break down the cost of the fan, the piping, the sealant, and the labor. They also explain whether any additional sealing of the slab is necessary. Sealing cracks and gaps can improve system performance, but it adds to the total cost. In some cases, the slab is in good condition and only the suction point needs sealing.

Some homeowners worry about the ongoing cost of running the fan. A typical radon mitigation fan uses about as much electricity as a 50-watt light bulb. Running it 24/7 adds roughly \$5 to \$10 per month to the electric bill. That is a small price for reducing a known lung cancer risk.

Why Professional Installation Matters

Radon mitigation is not a DIY project. The system must be designed to handle the specific soil gas conditions under your home. A poorly installed system can create a vacuum that is too weak, or worse, it can draw radon from one area and push it into another part of the house. A radon contractor brings experience with local soil conditions, fan selection, and code requirements. In St. Louis, many homes have clay soils that require a higher vacuum. A contractor who only works in sandy soil areas might undersize the fan.

Post-mitigation testing is another reason to hire a professional. The contractor confirms the system is working. If radon levels remain high, they can adjust the system or add additional suction points. A DIY system might leave you with a false sense of security.

If you are planning a new home, ask your builder about radon-resistant construction. This includes a layer of gravel beneath the slab, a vapor barrier, a passive stack, and sealed joints. Even with these measures, an active sub-slab depressurization system may still be needed after the home is built. But starting with a radon-resistant foundation makes retrofitting an active system easier and cheaper.

Final Thoughts

Sub-slab depressurization is the most effective method for reducing radon levels in homes with a concrete slab foundation. The system is simple in concept, but the details matter. The fan, the piping, the sealant, and the placement of the suction point all affect performance. In St. Louis, where radon levels can be elevated, a professional installation is worth the investment. Get a radon test, talk to a contractor, and get a cost estimate before deciding. Once the system is installed, you can stop worrying about radon and focus on everything else that makes a house a home.