

How Sub-Slab Depressurization Works for St. Louis Homes

If you have lived in the St. Louis area for any length of time, you have probably heard about radon. It is a naturally occurring soil gas that can enter homes through cracks in the foundation. The standard fix is a sub-slab depressurization system, but what does that actually involve, and what should a homeowner expect from the process? In this article I will walk through the mechanics, the costs, and the practical decisions that come with radon mitigation in St. Louis.

Why Radon Is a Local Concern

St. Louis sits on a mix of glacial till and limestone bedrock. That geology produces higher than average radon levels in many neighborhoods. The EPA has designated much of the metro area as Zone 1, meaning predicted indoor radon levels above 4 pCi/L. That is the action level where mitigation is recommended. A single radon test can tell you whether your home is in that range, but a short-term test is just the first step. If levels come back high, you need a durable solution, and that is where sub-slab depressurization comes into play.

There are other methods, like sealing cracks or installing a passive stack. But for most homes with a basement or slab-on-grade foundation, an active [sub-slab depressurization](#) system is the most reliable way to reduce radon. It is not a new technology, but getting it right requires a good radon contractor who understands local soil conditions and building codes.

How Sub-Slab Depressurization Works

Think of the system as a vacuum that pulls soil gas from underneath your concrete slab and vents it safely above the roof line. A fan is mounted somewhere in the attic or on the exterior wall, connected to a vent pipe that runs through the slab and into the gravel layer below. When the fan runs, it creates negative pressure under the slab. That pressure differential keeps radon from being pushed into the living space through cracks or gaps. Instead, the gas flows through the piping and out into the open air.

The key parts are the suction point, the piping, and the fan. The suction point is a hole cut through the slab, usually four to six inches in diameter. The pipe extends down into the gravel, where the vacuum can draw the soil gas. The rest of the pipe runs up through the interior of the house or along the exterior wall, terminating above the roof. The fan is sized to move a specific volume of air, typically measured in cubic feet per minute. A common mistake is undersizing the fan or using a fan not rated for continuous duty. A quality fan will run 24/7 for years with minimal maintenance.

One thing that surprises homeowners is the importance of sealing. A sub-slab depressurization system works best when the slab is relatively tight. If there are large cracks or gaps around the perimeter, the vacuum will pull air from those openings instead of from the gravel layer. That reduces efficiency. A good radon contractor will seal cracks with a urethane sealant and may also seal the gap between the slab and the foundation wall. It is not glamorous work, but it makes a difference.

In some newer homes, builders include a passive stack during construction. That is basically a pipe that runs from the gravel layer to the roof, relying on natural convection and wind to create a small vacuum. It is called radon-resistant construction, and it can work in some cases. But passive systems are less reliable than active ones. Many homeowners find that even with a passive stack, radon levels remain elevated, especially in the winter when the stack effect in the house can actually draw more soil gas inside. That is when they retrofit an active fan to the existing pipe, turning it into an active sub-slab depressurization system.

Cost Estimates and What Drives Them

Every St. Louis home is different, and cost estimates vary. A typical active sub-slab depressurization system runs between \$1,200 and \$2,800 installed. The range depends on several factors. The number of suction points matters. A house with a large or irregular foundation may need two or even three suction points to get uniform vacuum coverage. The route of the piping also affects cost. Running pipe through finished living space takes more labor and materials than running it through an unfinished basement or garage. And the type of fan matters. A high-quality, energy-efficient fan costs more upfront but pays for itself in lower electric bills and longer life.

I have worked with Air Sense Environmental on several projects, and they emphasize that a proper cost estimate should include a post-mitigation test. That is a radon test performed after the system is installed, usually at least 24 hours after startup, to confirm that radon levels have dropped below 4 pCi/L. Without that test, you have no way of knowing whether the system is actually working. A reputable contractor will include the post-mitigation test in the price or offer it as a separate service for a small fee.

Another cost factor is the type of foundation. A slab-on-grade home is straightforward. A home with a crawl space requires a different approach, often sealing the crawl space floor and installing a fan that vents to the outside. A house with a finished basement adds complexity because the piping has to be concealed or run through closets and utility areas. Some homeowners choose to have the system installed in the garage, with the pipe running up the exterior wall. That works well and keeps the fan out of living spaces.

What to Expect During Installation

The process usually takes one to two days. On the first day, the contractor will perform a radon test if one has not been done recently. Then they will locate the suction point, cut the hole through the slab, and dig out a small cavity in the gravel below. They will install the piping and any necessary sealant around the hole. The fan gets mounted in the attic or on the exterior wall. The vent pipe is run to the outside, with a weatherhead to keep rain and debris out. Finally, the system is turned on, and the contractor checks for proper vacuum pressure.

After installation, the homeowner should run the fan continuously. It is a common question: does the fan have to run all the time? Yes. If you turn it off, the vacuum goes away, and radon levels will climb back up. The fan is designed to run for years, and replacing it is a simple job. Some fans have a status indicator that shows the vacuum level, so you can tell at a glance if the system is working.

One thing to keep in mind is that the fan creates a small amount of noise. It is not loud, but you can hear a low hum when you stand near the vent pipe. If that bothers you, ask the contractor about a quieter model or consider locating the fan in a garage or attic where the sound is less noticeable.

Long-Term Performance and Maintenance

A well-installed sub-slab depressurization system should last 20 years or more. The fan is the only moving part, and it may need replacement after 10 to 15 years. The piping and the sealant should hold up indefinitely if they are installed correctly. The most common issue is a loss of vacuum, which can happen if the seal around the suction point fails or if the fan stops working. A simple check is to hold a piece of paper near the suction point while the fan is running. If the paper sticks, you have vacuum. If not, call a radon contractor to diagnose the problem.

Some homeowners wonder if they should test radon levels again after a few years. Yes, it is a good idea. The soil can shift, and new cracks can appear. A follow-up radon test every two to three years gives peace of mind. If levels are still low, the system is working. If they have crept up, the contractor can inspect the system and make adjustments.

Summing Up the Choice

Radon mitigation is not a luxury; it is a health measure. In St. Louis, where radon levels are consistently above the EPA action level in many neighborhoods, a sub-slab depressurization system is the most effective tool we have. The upfront cost is modest compared to the potential health benefits, and the ongoing cost is just the electricity to run a small fan.

If you are shopping for a contractor, ask about their experience with active sub-slab depressurization specifically. Not all radon contractors use the same methods. Get a cost estimate in writing that includes the post-mitigation test. And do not be afraid to ask questions. A good contractor will explain the system in plain language and show you the components as they are installed.

In my experience, the difference between a mediocre system and a great one comes down to attention to detail: the quality of the sealant, the placement of the suction point, the sizing of the fan. A system that is designed for your specific house will outperform a one-size-fits-all setup every time. Talk to a local radon contractor like Air Sense Environmental, who understands the soil and building types in St. Louis, and you will get a solution that works for years to come.

And remember, the goal is not just to pass a radon test; it is to live in a home where the air you breathe is as safe as it can be. Sub-slab depressurization, done right, gets you there.