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Drought cracked foundations

As soil dries and shrinks, some buildings lose critical support

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This summer's prolonged drought sapped the life from trees and gardens, and now it's threatening to dry out the bank accounts of homeowners who are finding worrisome cracks in their foundations.

As the clay soil in the region dried out, it pulled away from the foundations of homes, shifting the weight distribution on the foundations and often resulting in cracks that can mean potentially expensive repairs.

The problem is keeping foundation repair companies in the area busier than they've ever been.

Steve Cohen, owner of Buckeye Structures, said his 26-year-old company is booked through December.

"We're busy every day," he said.

While most of the cracks are cosmetic and can be easily patched, many require structural fixes that can range from a few thousand dollars to more than \$10,000.

And ground movements such as landslides and settling typically aren't covered by homeowners insurance policies.

Ernest Pace of Sharonville found out earlier this month just how expensive the problem can be. He and his wife, Rachel, are looking at paying up to \$10,000 for repairs to his 18-year-old, two-story brick house.

They discovered the problem when Rachel noticed drywall tape wrinkling the paint in their family room.

"I've gotten over the initial shock," Ernest said. "But I'll be crying all over again when I get the bill."

The cause of the problem is the highly elastic clay in the soil.

"As it dries out, it actually shrinks," Bill Turner, president of Criterium-S.T.A. Engineers in Springdale, said.

When the soil shrinks, it can pull away from the concrete footing on which the home's foundation rests. With nothing to support the weight of the building, it pulls and twists, causing cracks in the foundation and around windows and doors that won't shut because one side of the jamb is lower than the other.

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It can happen quickly, as Taye Alf, a Price Hill real estate investor, found out earlier this month.

About six months ago, she bought a small two-story brick home on Montague Street in Covington in a foreclosure sale. She spent about \$20,000 to refurbish the 101-year-old house and found someone to rent it. Last month, she stopped by to collect the rent from her tenant and discovered a large crack in the kitchen wall. The tenant said there was an even larger one in the upstairs bedroom.

"I knew, when I had the house appraised (before purchase), none of those cracks were there," she said. She hired Turner, who found cracks, some almost a half-inch wide, running up from the foundation to the second floor on the exterior brick, where an addition meets the original house.

The building is structurally OK, but Alf, who owns houses in Price Hill and Covington, knows the problems will eventually have to be fixed.

"You can't sell a house with cracks in the foundation," said Alf, who estimates she's probably looking at another \$6,000, at least, in repairs. "I hadn't heard of this problem before, but when you rehab houses, you kind of expect the unexpected."

BUSINESSES AFFECTED, TOO

It's not just homes but commercial buildings on shallow foundations that can see settling as the clay soil dries out, Cohen said recently as his workers prepared to dig out a building foundation on Industrial Road near Florence.

Permanent repairs typically involve digging under the concrete footer on which the foundation sits and driving metal rods or pouring concrete piles under the footer in undisturbed soil underneath. In some cases, the contractor uses hydraulic jacks to lift the footer before anchoring it with the piles.

Buckeye Structures uses a system of metal rods with a screw augur on the end driven into the ground. Its system has hydraulic sensors to measure the ground pressure as the augur screws into the ground. When the sensor hits 2,500 psi (pounds per square inch), the workers know they've hit stable soil. The rods are then anchored to the footing using a special bracket. The number of piles, whether concrete or metal, varies depending on the weight of the structure, the amount of settling and other factors. Costs start about \$1,000 a pile.

Steven Schaefer, chairman of the Evendale-based structural engineering firm that bears his name, said foundation cracking is a chronic issue in the area that's been aggravated by this year's drought.

Despite record rainfall in October, the Greater Cincinnati and Northern Kentucky region has received just over 28 inches of rain this year, according to the National Weather Service in Wilmington. That's more than eight inches below normal, making 2007 one of the region's 10 driest years on record.

"Every five or 10 years, it gets real bad," said Schaefer, who's writing a pamphlet on the problem. "The good news is that the clay can only shrink so much. And when the drought ends or moisture from a wet winter saturates the clay, the soil will eventually expand back to its original volume. Often, the swelling will close the cracks."

But with winter coming, it's important to cover the cracks or fill them with caulk or other flexible material to prevent moisture from working its way into them, freezing and aggravating the problem, he said.

Schaefer said the problem is most apparent in homes where the ground slopes from front to back, typically with a walkout basement in the rear. Because the clay around the walkout is shallower than in front, often no more than 30 inches above the footer, it shrinks faster, stressing the foundation, which can lead to cracks.

Homes on level sites but with additions on a slab or other shallow foundation also can see cracking problems, and large trees near a house can aggravate the problem by sucking up moisture in the clay, he said.