

## THE HIDDEN MEANING OF CRACKS

"It's an emergency! You'd better get over here right away!" This phone call from one of my clients literally sent chills down my spine, and I immediately rushed to the construction site. As I pulled up, there was a group of people anxiously awaiting, including two who looked very worried: my clients. The general contractor and several subcontractors wore expressions that looked more like annoyance than alarm. "We have major structural problems. Just look at these cracks!" snapped the owner, while his wife looked ready to burst into tears.

He pointed to a line in the foundation that, from my distance, looked like it might be a large crack. As I got closer, however, I saw that it was clearly a pour line. After close examination, I indicated to everyone that it was of no structural significance and would be covered up in the finishing of the home. Although my client was a bit embarrassed, I encouraged him to continue alerting me of any cracks he might see, but before "pulling the fire alarm" and mustering all the troops.

Cracks come in all shapes and sizes and carry different meanings. On another project, for example, a seemingly minor horizontal crack in a wood beam did cause me great alarm. I insisted that the beam be replaced in spite of the adamant objections of the contractor who asserted that there was no problem. In fact, a horizontal crack in a wood beam could possibly lead to a catastrophic and sudden "horizontal shear failure." Such a warning sign of imminent collapse may appear to an owner (or even an experienced contractor) as normal wood checking.

Most materials crack, and many cracks are at such a small scale that they are invisible to the naked eye. Brittle materials like concrete and

stucco are always riddled with cracks, but they are usually minor and not very noticeable.

When cracks do become visible, they are signs of movement. Often, the movement is due to normal shrinkage from drying or temperature changes. Larger cracks are a sign of movement perpendicular to the crack that may or may not be significant. Here is a brief outline of some typical cracks and what they might mean. If you have specific cracks that concern you, get a professional opinion before you form a definitive conclusion.

**Plaster.** Plaster almost always has a lot of cracking. Usually, the cracks are covered up by the paint that forms the actual finish. If you've ever removed paint from an old plaster surface, you may have seen how littered with cracks it can be. When cracks form a relatively uniform "spider web" pattern, it is often a sign of movement due to vibration or shrinkage. For example, a ceiling may have such cracks due to ceiling joists with attic storage above, or walls can "spider web" crack due to moisture changes in the wood. When cracks run long distances and are 1/16 of an inch or greater, they may be a sign of structural movements in the wall behind or foundation settling.

Diagonal cracks at the corners of windows or doors can be due to stress concentrations. They occur because the smaller amount of material there effectively magnifies small movements. Imagine, in a brittle material like plaster, how small a movement is necessary to cause a crack. Often, even if a crack is structurally based, it isn't necessarily a cause for alarm. A 1/16 of an inch crack looks massive running diagonally across a wall, for example, although 1/16 of an inch of settlement might be of little concern from a

structural standpoint, especially if it has occurred over a long period of time. Brittle materials can hold walls in place and then give way suddenly, instantly showing the gradual movement and creep that have occurred over a multi year period.

**Wallboard.** Cracks at the joints of wallboard have similar characteristics to plaster. Cracks that run in the body of the board itself, however, and that can tear the paper facing are usually significant and a greater cause for alarm. They should definitely be investigated.

Nail popping often accompanies cracking in wallboard. This is usually due to shrinkage of wood that drives nails out of the surface.

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