

GOOD CRACK OR BAD CRACK? RESIDENTIAL CRACKS AND WHAT THEY MEAN.

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What does that crack in my basement wall mean? Is my home still structurally sound? Or is this something to be expected in a house? Below, find explanations of common types of cracks and clues to look for that can help you to remedy issues.

WHAT BASEMENT WALL CRACKS MEAN:

Vertical cracks

As concrete shrinks during the curing process, vertical cracks form in the concrete or block, some so small they can hardly be seen. This generally does not affect the basement wall structurally, but could allow moisture to enter if the outside wall's waterproofing isn't flexible enough to span the crack. If moisture is seeping through, you might consider having a basement waterproofing contractor review the leakage. Often a concrete crack can be injected with a sealer to limit further moisture infiltration.



Vertical cracks

Basements may have hairline to 1/16 in wide vertical cracks. Prominent vertical cracks 1/8 in wide or larger could be a sign of distress that may need reviewing.

Horizontal cracks

Sometimes a concrete or block basement wall will bow inward and develop a horizontal crack mid-height; this is where the wall feels the maximum stress from the force of the earth pushing against it. If the wall is plumb (straight up and down and not tilting inward), you can potentially monitor it to see if the size of the crack changes. If the crack continues to enlarge or the wall is out of plumb, a structural engineer's review is recommended.

Diagonal cracks

There are several common types of diagonal cracks in basement walls. One of the most common is when the crack begins at the top of the concrete basement wall and moves diagonally down to a corner. This is usually accompanied with inward tilting of the top of the foundation wall. It can be caused by the earth pushing against the basement wall and an inadequate connection (i.e. missing anchor bolts) between the basement wall and the first floor framing.

Another type of diagonal crack can appear anywhere in the wall and is usually wider at the top and tighter at the bottom. This type of crack is usually caused by the foundation settling.

A third type of diagonal crack appears at the corner of a window or door opening. This can have several causes, but one of the most common is concrete shrinkage similar to that described in the vertical cracks section.

There is no quick rule for diagonal cracks or for your foundation wall tilting inward. If you are experiencing these in your basement walls, we recommend a review.

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Stair stepping cracks in concrete block

Stair stepping cracks are very similar to diagonal cracks except stair stepping cracks occur in concrete block basement walls and diagonal cracks occur in concrete walls. Causes are similar to the diagonal crack issues listed above.

WHAT CRACKS ELSEWHERE MEAN:

Crawlspace foundation or garage foundation cracks

These spaces typically have more shallow depth foundations than basements and are more affected by soils that dry and shrink during extended dry summer weather. If there are interior cracks in the drywall or in the foundation wall that open in the summer and close in the winter, then the foundation wall might need additional support. A structural engineer can assess the situation and make recommendations.

Outside corner foundation cracks

Most houses with brick veneer have triangular shaped cracks on both sides of at least one corner of the foundation wall – occasionally the concrete corner will pop off. This is caused when the brick veneer expands and the concrete foundation below contracts, which is normal. Typically no engineer review is necessary for this situation.



Stair stepping cracks in concrete block

Basement and garage slab cracks

When concrete cures (dries and hardens) it shrinks and wants to crack into relatively square sections; this is why you see control joints on sidewalks to provide weak spots where the concrete can crack without affecting the aesthetics, strength or safety.

Cracks may form with or without control joints. Tight cracks are not considered a structural problem. However, because basement and garage slabs are supported by the ground, $\frac{1}{4}$ in wide or larger cracks, vertical displacement at a crack line (the slab on one side of the crack line is higher than the other), or slab settlement can be a sign of a failure of the ground below and a review is recommended.

NOW WHAT?

Cracks may be harmless or may be an indication of a significant structural problem. It is important to pay attention to your home and monitor any changes to existing cracks or the development of new cracks in your basement walls. Schaefer cannot give engineering advice about how to evaluate a specific crack without reviewing a home's basement wall first. While this blog may discuss general characteristics of cracks, all basement cracks potentially reveal a specific cause and related repair. A qualified structural engineer should be consulted for any crack that a homeowner is unsure about so a specific conclusion and recommendation plan can be developed. If you have concerns about a crack in your basement wall, schedule a structural engineer to review your basement walls; be sure the engineer has extensive experience with residential structures. Schaefer engineers are available to visit your home to determine the nature of your crack and to recommend corrective action if necessary.

Call 513.542.3300 to speak with one of our residential structural engineers.