

Can New Settlement Cracks Occur in a 20 Year old house???

The short and skinny answer is YES. However, most homeowners are not satisfied with that short answer.

This article identifies several conditions that can contribute to ongoing settlement which can cause cracking to residential housing and other types of construction.

Most people believe that their foundation supports their house. In the truest sense, this is not correct. A typical concrete block foundation used to support the floor and wall system of a residential house is part of a system which supports that house. This system includes concrete footings, and load bearing soil which support the footings and concrete block foundation walls. Concrete block foundation walls and concrete footings rely on the load bearing capacity of soil to prevent against cracking and shifting of various members in the structure. Load bearing capacity of soil varies based on type of soil and the ratio of void spaces in the soil, moisture in the soil, and soil mass. As these ratios change, the load bearing capacity of the soil changes. When the load bearing capacity of the soil is reduced,

additional settlement can occur to a structure of any age, even one that is 20 or more years old.

When subsoil shifting occurs, settlement cracking can follow. The most common type of settlement cracking occurs when soil consolidation takes place as a result of initial loading when a new structure is placed on the existing soil.

Typically cracks seen from these activities show up in the first few years after a structure is built.

However, several

conditions exist that can cause subsoil shifting over the life of a structure. When this subsoil shifting takes place, additional settlement can occur.

Surface water runoff can erode the soil around a foundation and weaken the integrity of the soil, thus causing additional settlement to occur.

Photo 3

Subsurface water runoff can redistribute the soil underneath a footing or foundation and cause additional settlement to occur. **Excessive rainfall and**

drought cycles can cause soil particles to redistribute, thus leading to additional settlement. **Large canopy trees**, planted in close proximity to a structure, can **place high water demands** on the soil around that structure. It is not uncommon for root systems of large canopy trees to extend 1 to 1 1/2 times the canopy radius out from the trunk of the tree. The water demands of these trees during a drought period can cause additional soil consolidation and lead to severe settlement cracking. Photographs 1 and 2 show severe ground cracking which resulted from drought conditions and water demands from large canopy trees. In addition to this ground cracking, severe settlement cracking is seen to extend from cracks in the ground to the exterior brick wall of the residence. Photograph 3 shows large canopy trees in close proximity to the side of the residence where severe settlement cracking has occurred.

Site evaluations by trained and experienced experts can help you

identify conditions which may cause settlement of older homes. In addition to site evaluations, 3-D Topographical Analysis software can be used to determine surface

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Photo 1

Photo 2

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SERVICE ALERT

VCE has a tool available which assists our roof experts in determining whether hail damage occurred to a specific structure. More information to follow in next newsletter.

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settlement of older homes. In addition to site evaluations, 3-D Topographical Analysis software can be used to determine surface and subsurface water runoff conditions which can contribute to soil consolidation. Damage type and location correlation can be used to corroborate differential settlement causation determination by identifying companion or reflective type damage typically found where differential settlement has occurred.

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With my training as a Civil Engineer, I bring an understanding of soil mechanics to each structural analysis in order to determine causation for claimed damages. Often settlement cracks are blamed on blasting. Cracks that could be attributed to blasting have distinct characteristics. These characteristics are those associated with an instantaneous reverse stressing of a material. Differential settlement cracks are typically caused by a continuous stressing of materials. The manifestation of each of these categories of cracks are unique.

by Wade C. Hutchison

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