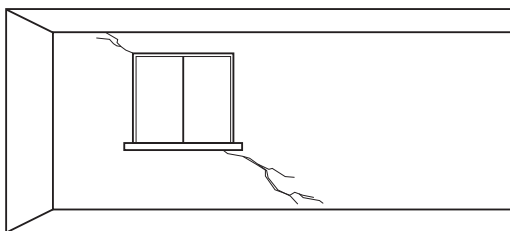




Cracks in Portland Cement Plaster (Stucco)

Stucco is the commonly used name to describe the code compliant 7/8 inch Portland cement membrane used to clad a variety of buildings. Stucco, similar to all Portland cement products, is susceptible to occasional cracking. Building code officials recognize this fact and classify plaster as a “brittle” material and require framed walls to be built with limited (less) deflection in an attempt to minimize the stresses placed upon the relatively thin cement membrane. Fortunately, most cracking in stucco is hairline and only of a cosmetic concern. An excessive number or wide cracks in stucco should be investigated by persons qualified to investigate stucco assemblies. Stucco is used worldwide in all climates on all types of structures over a wide variety of substrates. All stucco walls and ceilings are susceptible to cracking, no matter how good the structure, the design, engineering, mix, application and site supervision. Minor cracking in a stucco assembly is not an automatic indication of an improper stucco application.



Re-entrant crack

Cracking in stucco is simply a form of stress relief. A stucco membrane will continue to gain strength over the years. However, the most vulnerable time for stucco to crack is in the first few months as it is gaining its ultimate strength. Unfortunately, this is also the time the building is being subjected to abnormally high stresses from a variety of sources. The following is a partial list of stresses the stucco membrane is subject to:

- Shrinkage stress as the stucco initially sets
- Building and ground settlement
- Seismic movement
- Wind loads and racking
- Structural loading (live and dead loads)
- Thermal expansion and contraction
- Warping, shrinkage, swelling of lumber or wood-based sheathing
- Vibrations from heavy equipment and/or ongoing construction

Of all the stresses a stucco membrane endures, the applicator has control only over the first source of stress. Stucco is often and typically subjected to more than one of the above stresses at the same time. Stucco can withstand a certain amount of stress, but all stucco has its breaking point.

Some cracks are easily identified and the source of stress is obvious, more often than not the TSIB finds there are multiple sources of stress and pinpointing the precise source of stress that caused the crack is all but impossible. The most common location for cracks to appear is at the corners of window and door penetrations, as this is where stresses tend to concentrate. These types of cracks are known as re-entrant cracks and why the industry typically recommends control joints at these locations.

STRUCTURAL CRACKS:

When TSIB refers to a crack as “structural,” this is not meant to impugn structural design or any inadequacy in the framing. It is simply to identify the source of the stress. Minor hairline cracking in stucco is not a reason for undue concern. Visit www.tsib.org for additional information on stress control, tips to minimize stucco cracking and repair options.

This technical document is to serve as a guideline and is not intended for any specific construction project. The TSIB makes no warranty or guarantee, expressed or implied.