

Cracks in Slabs on Ground

ASCC Position Statement #29

Random cracking caused by drying shrinkage or thermal contraction of concrete slabs on ground is a common complaint of facility owners. They often argue that faulty design, materials, or construction must have caused such cracks. But even when plans and specifications for slabs on ground are based on the best guidance in industry publications, some random cracking is likely. As stated in the Foreword to ACI 302.1R-04, “Guide for Concrete Floor and Slab Construction,” published by the American Concrete Institute:

“Even with the best floor designs and proper construction, it is unrealistic to expect crack-free and curl-free floors. Consequently, every owner should be advised by both the designer and contractor that it is normal to expect some amount of cracking and curling on every project, and that such occurrence does not necessarily reflect adversely on either the adequacy of the floor’s design or the quality of its construction.”

ACI 224R-01, “Control of Cracking in Concrete Structures,” indicates that there are many specific causes of cracking and the document is “... designed to help the engineer and the contractor in developing crack-control measures.” When designers and contractors develop crack-control measures, contractor compliance with the plans and specifications will produce a structure with a cracking potential that is determined by the designer’s and specifier’s decisions regarding reinforcement, joint spacing, concrete properties, and other variables. Alleged causes of random cracks are sometimes assigned to contractors based on conjecture: inadequate curing, joints sawn too late, or too much water added to the concrete. But unless such causes can be verified, they are guesses. ASCC contractors will assume responsibility for cracks that are a direct result of noncompliance with the project plans and specifications, even though noncompliance doesn’t always cause cracks.

We suggest providing a project crack repair allowance, such as a unit price per lineal foot of cracking when fault can’t be assigned for random cracks. Section 3.2.5.3 of the ACI 302.1R-04 states that random visible cracks might reasonably be expected to occur in 0 to 3% of the floor slab panels formed by saw-cutting, construction joints, or a combination of both. The 3% value could be used to cap the crack repair allowance.

The decision to repair, however, should be made with the knowledge that crack repair products and methods don’t hide the cracks and may accentuate them. If aesthetics are the only concern, a use-as-is decision may be best. Removing and replacing cracked panels in a floor is often an economic waste that is counter to sustainability ideals. It is not likely to solve the aesthetics problem either, because replacement concrete usually doesn’t match the color of the uncracked panels.

Under hard-wheeled traffic, spalling at the crack edges can affect floor performance and crack repair may be warranted. Crack repair is also warranted when faulting has occurred at the cracks or when cracks are wide enough to affect performance.

If you have any questions, contact your ASCC concrete contractor or the ASCC Technical Hotline at (800) 331-0668.



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