

Jointing and Crack Control in Decorative Concrete Applications

Problems and Practice #5

During the pre-job conference for decorative concrete projects, crack control is a commonly overlooked item. Contraction joints are needed to minimize random cracking. These joints are usually cut to a depth of $\frac{1}{4}$ the slab thickness, and at spacings of 24 to 36 times the slab thickness.

Contraction joints are formed by grooving the fresh concrete, sawing the concrete with an early-entry saw shortly after finishing, or sawing the concrete after it has hardened enough so the joint edges don't spall. Sawed joints are less noticeable than grooved joints. Joints can sometimes be hidden in grout lines of the decorative concrete pattern if the lines are roughly parallel. For surfaces with random patterns, joint location will be more obvious, regardless of how the joints are formed. The impact of these joints on final appearance should be demonstrated to the owner with photos of similar completed projects. When a mock-up is required, it should include a sample joint so the owner or general contractor can approve the appearance of the end product.

Despite all efforts to prevent random cracking in decorative concrete slabs or overlays, some such cracking may still occur. ACI 302.1R-04 makes the following statement regarding cracking:

“Some random cracking should be expected; a reasonable level might be random visible cracks to occur in 0 to 3% of the floor slab panels formed by saw-cutting, construction joints, or a combination of both.”

Reinforcing steel or wire mesh may be used in decorative concrete to minimize the width of random cracks. Reinforcement won't prevent cracking, but the right amount will make any random

cracks less noticeable by preventing them from opening too widely. Adding synthetic fibers to the concrete may help prevent plastic shrinkage cracks. When fibers are used, possible effects on surface appearance should be discussed or demonstrated.

Jointing, and the possibility of a few random cracks, should be part of the agenda for preliminary discussions with owners, or at pre-construction meetings. Topics should include:

- Contraction joint depth and spacing
- Joint type: grooved or saw cut with either early-entry or conventional saws
- Sawing procedure: Dry cutting minimizes the possible effect of water-cooled saws on color, but may create a dust problem
- Reinforcement amount and placement
- Mock-up construction, where applicable

Decorative concrete contractors will do everything possible to minimize random cracking. Owners or general contractors must recognize the need to address cracking issues at the inception of a project so their expectations, paired with the contractor's efforts to minimize cracking, meet the job requirements for appearance and performance. If you have any questions, contact your ASCC/DCC concrete contractor or the ASCC Technical Hotline at (800) 331-0668.



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