

Contraction Joints in Elevated Slabs

ACI 318 “Building Code Requirements for Structural Concrete,” ANSI/ASCE 3 “Standard for the Structural Design of Composite Slabs,” and SDI #30 “Design Manual for Composite Decks, Form Decks, and Roof Decks” do not require the use of contraction joints for elevated structural slabs. Occasionally, however, project specifications require contractors to saw cut contraction joints in elevated slabs.

Contraction joints are used in slabs-on-ground to create weakened planes that limit the frequency and width of random cracks caused by volume changes due to restrained drying shrinkage, thermal contraction, or both. Elevated slabs usually consist of a structurally reinforced concrete slab, a concrete slab composite with a steel deck, or a concrete slab on a steel deck. All three types of slabs may also be exposed to restrained drying shrinkage and thermal contraction that can cause cracks. Saw cutting an elevated slab, however, doesn’t create the same weakened plane that it does in a slab-on-ground. The reinforcing steel and steel deck, either composite or noncomposite, provide more restraint than the subgrade for a slab-on-ground. Therefore, cracks typically occur between the joints cut in the elevated slab.

The cracks that form aren’t usually an issue because all three design documents mentioned

previously require shrinkage and temperature steel that’s placed in the slab to control crack width, tying the slab together to ensure it’s acting as assumed in design. Thus the design intent seems clear: let the cracks occur and control the crack width by using reinforcing steel. An article published in *Concrete Construction* (August 1999) called “Let it Crack,” by J. Thomas Ryan, advocates a similar design intent. Ryan indicates that contraction joints in concrete slabs on metal decks are of little value and that cracking between joints is inevitable. He recommends using no contraction joints, allowing random cracks to form, and patching only those that affect the serviceability of the floor.

ASCC contractors will saw cut elevated slabs if required by project specifications. The concrete contractor, however, is not responsible if all cracks don’t form in these contraction joints. We recommend that designers save the cost of the saw cutting and joint filling. Topping slabs, bonded or unbonded, are outside the scope of this position statement.

ASCC concrete contractors will work with all parties in addressing these issues. If you have any questions, contact your ASCC concrete contractor or the ASCC Technical Hotline at (800) 331-0668.