



# Virginia Ready-Mixed Concrete Association

## Joint Information

Incorrect jointing practices are a major problem in flatwork or slab construction. This leads to uncontrolled or random cracking, and a poor quality job.

### Three types of joints are commonly used:

#### **isolation, control, and construction .**

**Isolation joints** are used to separate slabs from fixed objects such as walls or posts. This allows movement of the slab with relation to the fixed object. The joint is formed by putting isolation joint material around the object and casting the concrete to it. Asphaltic or expanded PVC materials are commonly used.

Concrete shrinks slightly as it loses moisture. After hardening, changes in temperature and moisture cause expansion and contraction, which can lead to cracking. **Control joints** are purposely placed in the concrete to allow for these dimensional changes and to encourage cracks to develop in predetermined locations, rather than in a random manner. To help assure that cracks develop at the joints, tool or cut the slab to a depth of one-quarter of its thickness (1 inch for a 4-inch slab, 1 1/2 inches for a 6-inch slab). Jointing tools and saws are available for this purpose. Don't cut all the way through the slab as this will destroy the aggregate interlock, interrupting load transfer between adjacent panels.

Determine control joint spacing using the "2d rule." The thickness of the slab in inches is doubled to determine the maximum joint spacing in feet. For example, a 4-inch thick slab requires a joint spacing of 8 feet. A 6-inch slab requires 12 foot spacing. Joint spacing should not exceed 15 feet. A slab should appear to be made up of panels. Further, the larger dimension of the panel should not be more than 1 1/2 times the smaller dimension.

### **Secondary Reinforcement**

When control joints cannot be tolerated, reinforcing steel mesh or synthetic fibers can be used as a substitute. The mesh does not eliminate cracking, and frequent random cracks may develop. However, the mesh helps hold the cracks together and the individual segments in position. The synthetic fibers do help reduce initial cracking.

Extra care is needed when using reinforcing mesh as it should be located uniformly at the center of the slab. Mesh in flat sheets, rather than roll form, is easier to position properly and is recommended. The mesh is held in position by using special supports called chairs. Once

in place, do not walk on the mesh to avoid pushing it out of position. Avoid pulling or pushing the mesh into position through the concrete as this can disturb positioning of the aggregate and create a weak area where cracks may form.

A better option for secondary reinforcement would be to use synthetic fibers, which are added to the concrete at the ready mix plant.

**Construction joints** are used where work is to be terminated for a period of time. If possible make construction joints coincide with control joints. The ideal construction joint consists of both a thickened slab edge and a keyway cast into the edge, although either one technique or the other is usually sufficient. The purpose of the joint is to minimize movement between adjacent slab sections. Construction joints should conform to the dimensions given in.

An edger, which is like a short steel trowel with a rounded side and, somewhat similar to a jointing tool, can be used adjacent to the forms. Edging increases the consolidation and strength of the slab edges, and aids in form removal. When correctly used, an edger produces a more attractive rounded edge, which is less severe on tires and livestock, and can reduce concrete crumbling