



JOINTS IN CONCRETE SLABS

Although concrete expands and contracts with changes in moisture and temperature, it is the overall nature of concrete to shrink and, consequently, crack. Cracks cannot be prevented from occurring, but they can be controlled and minimized through the use of properly designed joints. In fact, joints are simply preplanned cracks. Some forms of joints include:

- **Control joint.** These joints are constructed to create zones of weakness so that cracks will occur at the desired location.
- **Isolation joint.** Used to separate or isolate slabs from other structural elements like walls, footings or columns, these joints permit movement of the slab and help prevent cracking when such movements are prevented.
- **Construction joints.** These are placed at the end of a day's work. When using reinforced concrete, often a conscious effort is made to clean the joint and bond the next day's work.

How to Construct Joints

Joints must be carefully designed and properly constructed if uncontrolled cracking of concrete flatwork is to be avoided. The following practices should be followed:

- The maximum joint spacing in feet should not exceed 2.5 times the thickness in inches. For example, joints in an 8" slab should be placed no further apart than 20'.
- All panels should be as square as possible, and the length should not be greater than 1.5 times the width.
- The joint groove should have a depth of one-quarter the thickness of the slab, but not less than one inch.
- Control joints can be tooled during finishing or sawed with a carborundum blade at an early stage. Sawed joints may not be practical if the concrete contains super hard aggregate like quartz gravel or trap rock. Sawing is easier if aggregates like limestone or sandstone are used. When using abrasive saw blades, sawing is often best done at an age of one day or even earlier.
- Pre-molded joint filler, building paper or polyethylene should be used to isolate slabs from walls or footings.
- To isolate columns from slabs, form circular or square openings that will not be filled in until after the floor has hardened.
- If wire mesh is used in the slab, cut out alternate wires across the control joints. Note that while the use of wire mesh will not prevent cracking, it does tend to keep cracks and joints tightly closed.

Products Used: Celotex Black Fiber Expansion Joint-4" x 6"; Rigid Vinyl Expansion Joint-4" x 6"; Metal Screed Key (with stakes)-3 1/2" x 5 1/2".