

JOINTS IN CONCRETE SLABS ON GRADE

WHAT are Joints?

Concrete expands and shrinks with changes in moisture and temperature. The overall tendency is to shrink and this can cause cracking at an early age. Irregular cracks are unsightly and difficult to maintain, but generally do not affect the integrity of concrete. Joints are simply pre-planned cracks. Joints in concrete slabs can be created by forming, tooling, sawing, and placement of joint formers.

Some forms of joints are:

- Contraction joints – are intended to create weakened planes in the concrete and regulate the location where cracks, resulting from dimensional changes, will occur.
- Isolation or expansion joints – separate or isolate slabs from other parts of the structure, such as walls, footings, or columns; and driveways and patios from sidewalks, garage slabs, stairs, lightpoles and other points of restraint. They permit independent vertical and horizontal movement between adjoining parts of the structure and help minimize cracking when such movements are restrained.
- Construction joints – are surfaces where two successive placements of concrete meet. They are typically placed at the end of a day's work but may be required when concrete placement is stopped for longer than the initial setting time of concrete. In slabs they may be designed to permit movement and/or to transfer load. The location of construction joints should be planned. It may be desirable to achieve bond and continue reinforcement through a construction joint.

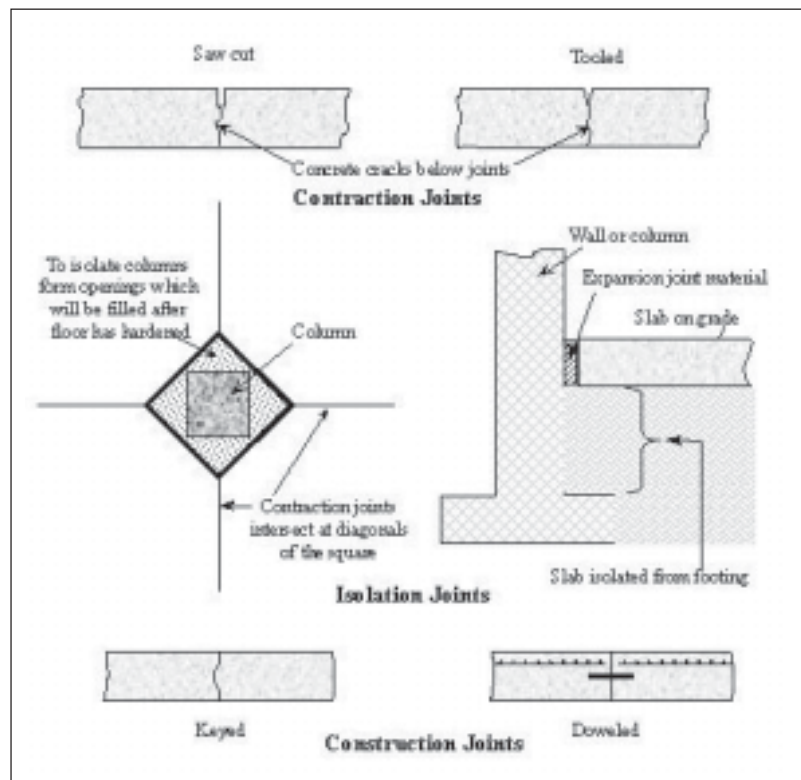
WHY are Joints Constructed?

Cracks in concrete cannot be prevented entirely, but they can be controlled and minimized by properly designed joints. Concrete cracks because:

- Concrete is weak in tension, therefore, if its natural tendency to shrink is restrained, tensile stresses

that exceed its tensile strength can develop, resulting in cracking.

- At early ages, before the concrete dries out, most cracking is caused by temperature changes or by



the slight contraction that takes place as the concrete sets and hardens. Later, as the concrete dries, it will shrink further and either additional cracks may form or preexisting cracks may become wider.

Joints provide relief from the tensile stresses, are easy to maintain and are less objectionable than uncontrolled or irregular cracks.

HOW to Construct Joints

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