

# Enhancing Concrete's Performance

## Jointing Concrete

Jointing is an essential part of any concrete pavement design. Proper joint placement, depth, and timing are all critical pieces for a successful project.

There are three types of joints typically used in concrete pavement, each having a specific job within the slab.

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Our Design Assistance Program (DAP) gives you access to a dedicated team of pavement professionals who will help you bring your paving project to life, while fully complying with all the latest industry standards. There is no charge for DAP, as it is a sponsored service from our NRMCA members.

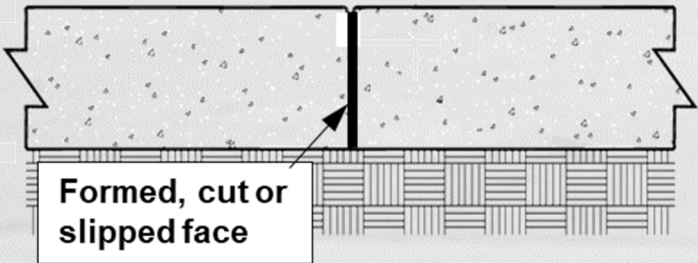
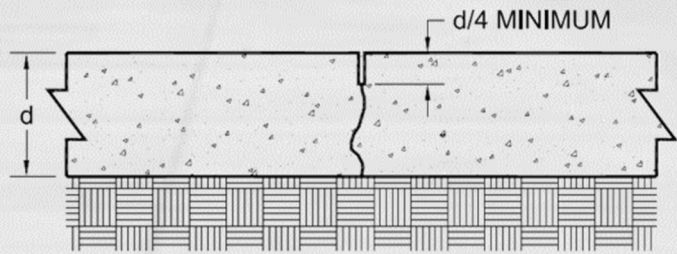
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# Three Types of Joints for Concrete Flatwork

## Contraction (Control) Joints:

Contraction joints are strategically placed throughout the site to enable panel shrinkage. Properly spaced contraction joints activate cracking below the sawcut which creates aggregate interlock. This interlock allows for load transfer between slabs.

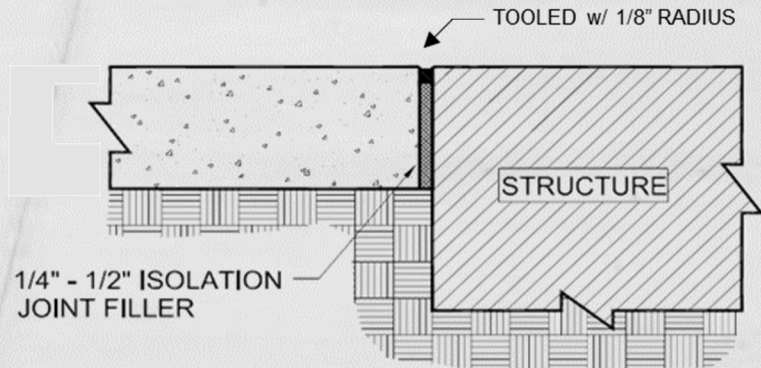


## Construction Joints:

These butt-type joints are created during interruptions in paving operations. There is little to no load transfer naturally occurring across a construction joint. A thickened edge transition or a load transfer device may be required.

## Isolation Joints:

Isolation joints separate the fresh concrete from any fixed structure. The isolation material allows the pavement to move independently, minimizing cracks that may occur due to settlement.



# Characteristics That Affect Joints

It is known that concrete cracks due to the shrinkage that occurs during the drying process. Joints are strategically placed throughout the concrete surface to relieve those stresses. Several things need to happen for the joints to activate properly.

## Horizontal Spacing of Joints:

Joints should be laid out according to ACI PRC330-21. The maximum horizontal spacing is determined by the thickness of the concrete slab. The accompanying table shows typical maximum joint spacings, based on a modulus of subgrade reaction of  $k = 100$ .

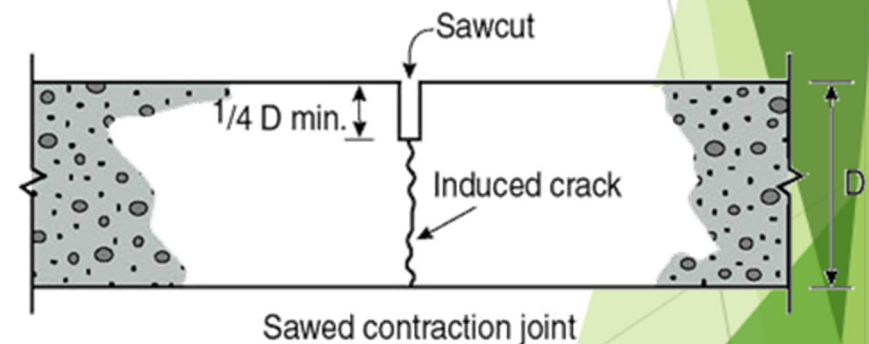
Concrete Thickness	Joint Spacing
4 inches up to 5 inches	10 feet
5 inches up to 6 inches	12.5 feet
6 inches and greater	15 feet

## Timing of Contraction Joint Cuts:

The timing for saw-cuts depends on several factors such as mix design, weather, sawing equipment, etc. Generally speaking, joints should be sawn as soon as the concrete will withstand the energy of sawing without raveling or dislodging the aggregate. If using a conventional saw, saw-cuts should generally be made within 4 to 12 hours, depending on weather.

## Depth of Contraction Joint Cuts:

When using a conventional saw, the depth of the cut joint should be a minimum of  $\frac{1}{4}$  of the concrete slab thickness. If using an early-entry saw, the minimum joint depth should be 1" for pavement thickness of 9" or less. Anything less may not activate the joint and cracks may occur.



You can find more information on proper jointing of concrete pavement in the American Concrete Institute's *ACI PRC-330-21: Commercial Concrete Parking Lots and Site Paving Design and Construction - Guide*, or email us at [info@paveahead.com](mailto:info@paveahead.com)