

Joints in Concrete Pavements

Part III – Joint Spacing for Parking Areas

By Randell C. Riley, P.E.



One of the more frequent questions I get about joint layout and joint spacing is "How far apart should the joints be?" Implied in the dangling construction of the question is usually the word cut, formed or tooled. Which type doesn't make that much difference. The spacing does, and for this reason it is a very good question.

Over the years I have been involved in pavement design I have seen a gradual evolution to shorter and shorter joint spacings. When I first started in the business, the "rule of thumb" was 2.5 times the thickness in inches expressed in feet or about 30 times pavement thickness. For example, a 6-inch pavement would require a joint spacing of 15 feet. In recent years in an effort

to more tightly control the incidence of random cracking, the industry has suggested tightening the tolerances still further. A common "rule-of-thumb" today is 27 times pavement thickness on granular subbase or soil and 21 to 25 times pavement thickness on stabilized material or pavements placed as some type of overlay of an existing pavement.

To most people unfamiliar

"In my entire professional career as a concrete paving engineer, I have never been called to look at a problem caused in a project by having too many joints."



For a good review of the principles of jointing, "Design and Construction of Joints for Concrete Highways," 10000.01P, is an excellent publication. Though written for highways, the same principles apply to parking areas. Available from American Concrete Pavement Association, Skokie, Illinois.

with pavement design the latter recommendation seems contrary to common sense. Why would joint spacing be less on a stabilized platform than on subgrade or granular material?

In reality, the harder the platform on which the pavement is placed, the greater impact of differential temperature shrinkage and drying shrinkage on the structure.

On a stable or very hard platform the pavement will curl and warp.

The uplift of the slab corners and edges (a phenomenon sometimes observed in warehouse floors) results in stresses being induced, not just by vehicle loading, but by the weight of the concrete hanging unsupported in space. Granted that the space is usually less than a few hundredths of an inch, but to the concrete slab it makes no difference. As soon as the concrete lifts, whether at the middle of the slab or at the corners, the tensile stresses can exceed the strength of the concrete and cracking will result.

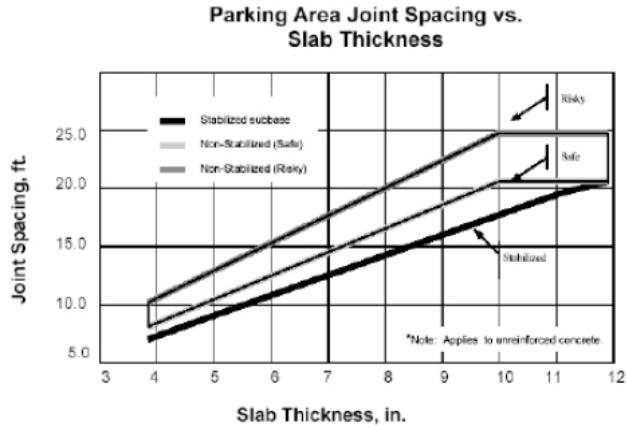
Slabs placed on softer subgrade or unbound granular material can actually settle into the platform resulting in more uniform support. Think of the analogy of sitting on one of those nice soft reclining loungers compared to the types of chairs you usually have to sit in while enduring one of my long-winded design presentations. Where is it easiest to relax, and why do you think I like you to have those nice stiff high-back chairs? A pavement "feels" the same way you do in those chairs. For this reason the joint spacing can be longer on a softer subgrade. More of the pavement is supported. Curling and warping are still present, but the support, though less, covers a broader area underneath the pavement.

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So, back to the original question: "How far apart should the joints be?" The chart shown below provides

guidelines as to the target joint spacing. But consider it a place to start. Shorter joint spacing is always better. If there is one overriding concept in figuring out what the joint spacing should be, keep in mind one thing. In my professional career as a concrete paving engineer, I have never been called to look at a problem caused in a project by having too many joints!

Next time, more on parking lot jointing and the "Tension Ring."



About Randall C. Riley, P.E.

Randall Riley is an Engineering Consultant for the Illinois Chapter - ACPA, Illinois Ready Mixed Concrete Association and the Great Lakes Cement Promotion Association. He is actively involved in the day to day promotion of long-life quality concrete pavements. He can be reached at 217-793-4933 or on the Internet at pccman@insightBB.com.