Longitudinal Cracking in Jointed Plain Concrete Pavement: Synthesis of Practices and Performance in the Midwest

Samuel Owusu-Ababio¹ & Robert L. Schmitt²

ABSTRACT
A survey of six Midwestern states was conducted as part of a research study to develop guidance on the optimal panel width for improving jointed plain concrete pavement performance. This paper presents an analysis of the various elements associated with current panel width practices for jointed plain concrete pavements as reported by the Midwestern states. The elements include: policies and procedures for panel width selection on two- and multi-lane rural highways, commonly used panel widths, frequency of longitudinal cracking occurrence, probable causes of longitudinal cracking, and treatment methods.

The analysis revealed that there is considerable variation among the states on the elements. However, pavement thickness appears to be the dominant factor in the selection of panel width. While 12- and 15-ft panel widths are common on 2-lane 2-way rural pavements, the 12-ft panel section is likely to be used on rural multilane pavements. The 12-ft and 15-ft wide panels were reported to have higher longitudinal cracking frequencies compared to 13- and 14-ft wide panels. The higher frequencies were attributed to inadequate subbase compaction, poor joint saw-cut timing, misaligned dowel bars, and faulty vibrators. In addition, 12-ft panels on 2-lane facilities located in cut/fill sections and in the vicinity of highway structures were reported to exhibit higher cracking frequencies compared to 15-ft panels at similar locations.

Keywords: JPCP, Panel, Cracking, Performance, Midwest

¹P.E., Professor., Dept. of Civil and Envr. Engr., Univ. of Wisc., Platteville, WI, 53818. Phone: 608-342-1554  Fax: 608-342-1566  owusu@uwplatt.edu.

²P.E., Professor, Dept. of Civil and Envr. Engr., Univ. of Wisc., Platteville, WI, 53818. Phone: 608-342-1239  Fax: 608-342-1566  schmitro@uwplatt.edu.