

Methods for Accelerated Repair and Replacement of Expansion Joints

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Bridge deck expansion joints allow for the movement of bridge decks exposed to thermal expansion and dynamic loading. While expansion joints prevent the buildup of stresses in bridge decks, they are often one of the first components of a bridge deck to fail. Therefore, there is a dire need for accelerated repair or replacement options and techniques, especially in areas with high traffic volumes. Currently, extensive research is being conducted on Accelerated Bridge Construction (ABC) initiatives to reduce lane closure time. However, less attention has been devoted to accelerated repair and replacement of bridge deck expansion joints. This project has developed methods for the accelerated replacement as well as elimination of bridge deck expansion joints. For those bridges requiring expansion joints, bottlenecks in the replacement process were identified. Different methods and options for the accelerated replacement of expansion joints were identified, including demolition methods, concrete types, and joint type. Additionally, a cost analysis of these different options was completed. For those bridges not requiring expansion joints, the option of a deck over backwall (or deck extension detail) was explored. Laboratory studies were conducted comparing these detail to the typical replacement of expansion joints to evaluate the effectiveness of the different methods.

Keywords: Expansion Joints; Bridge Repair; Accelerated Bridge Construction