

Development, Testing, and Application of Precast Paving Notch

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ABSTRACT

Bridge owners are frequently faced by the need to replace critical bridge components during strictly limited or overnight road closure periods. This paper presents the development, testing, and application of a precast concrete bridge element specifically designed for the Iowa Department of Transportation to address this condition.

A paving notch (also known as a corbel or a paving support) consists of a horizontal shelf constructed on the rear of a bridge abutment and is used to support the adjacent roadway pavement. Over time, these paving notches have been observed to deteriorate due to a number of conditions, including improper reinforcing steel placement, backfill settlement, and an open expansion joint which tends to fill with dirt and debris and “push” the approach pavement off the paving notch over time.

A precast paving notch system was developed for use in either new construction or as rapid replacement. This system is designed to be installed in single-lane-widths to permit staged construction under traffic. The paving notch system consists of a rectangular, precast concrete element that is connected to the rear of the abutment using high-strength threaded steel rods and epoxy adhesive similar to that used in segmental bridge construction.

Researchers at Iowa State University have performed full-scale laboratory testing of the paving notch replacement system. Following these successful tests, a field application site has been selected for the implementation of this new system.

This paper presents the development of the precast paving notch system, the results of laboratory testing, and the installation and monitoring of the field application.

Key words: accelerated construction—bridge repair—paving support—post-tensioned pavement—post-tensioning—precast