

# Implementation of ASTM C157: Testing of Length Change of Hardened Concrete

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## **Introduction**

The Kansas Department of Transportation (KDOT) has a history of using tests such as concrete strength, permeability, and air void structure as design and acceptance criteria on concrete paving and bridge deck projects. In 2012, the KDOT Concrete Research group concluded a study on testing the length change of hardened concrete according to ASTM C157 (2008), commonly referred to as free shrinkage. This free shrinkage test was reviewed as a possible design or acceptance test for construction projects, primarily relating to bridge decks where even minimal cracking is detrimental.

## **Project Description**

This report includes testing of 15 laboratory mixes and concrete from seven field projects for a total of 23 sets of prisms. Six prisms were cast for each mix, with three specimens cured for 7 days, and three cured for 14 days. Shrinkage measurements for each mix were taken for 1 year.

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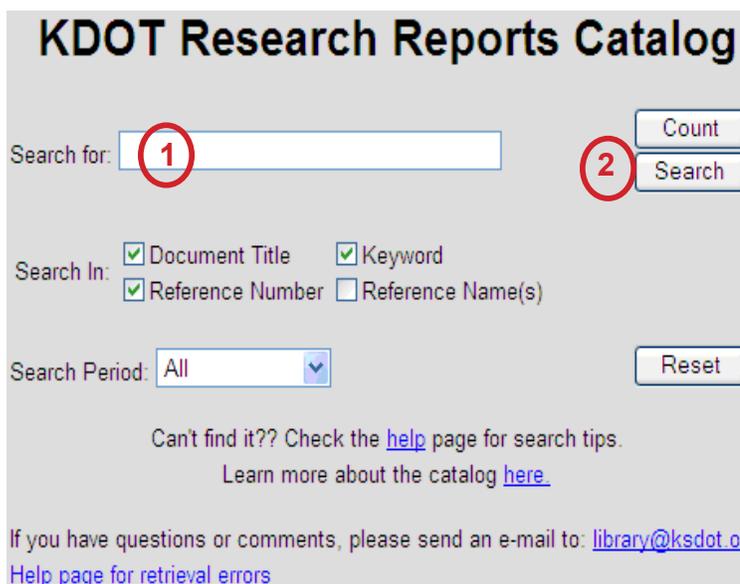
## Project Results

It has been concluded that ASTM C157 has been successfully implemented at KDOT's central testing laboratory should future testing be required. Further research should be completed to determine whether a performance-based acceptance specification for free shrinkage should be implemented at KDOT and how the use of SCMs might affect said specification. However, the equipment required and conditions under which this test is conducted would indicate that this test would have to be conducted by private laboratories and not Kansas contractors. This may preclude this test from being incorporated as a design or acceptance requirement.

## Project Information

For information on this report, please contact Rick Kreider, Bureau Chief, Bureau of Research, Kansas Department of Transportation; 2300 SW Van Buren, Topeka, KS 66611; (785) 296-1195 phone; [RickK@ksdot.org](mailto:RickK@ksdot.org).

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