Kansas Department of Transportation

TECHNICAL SUMMARY

Durable Recycled Superpave Mixes in Kansas

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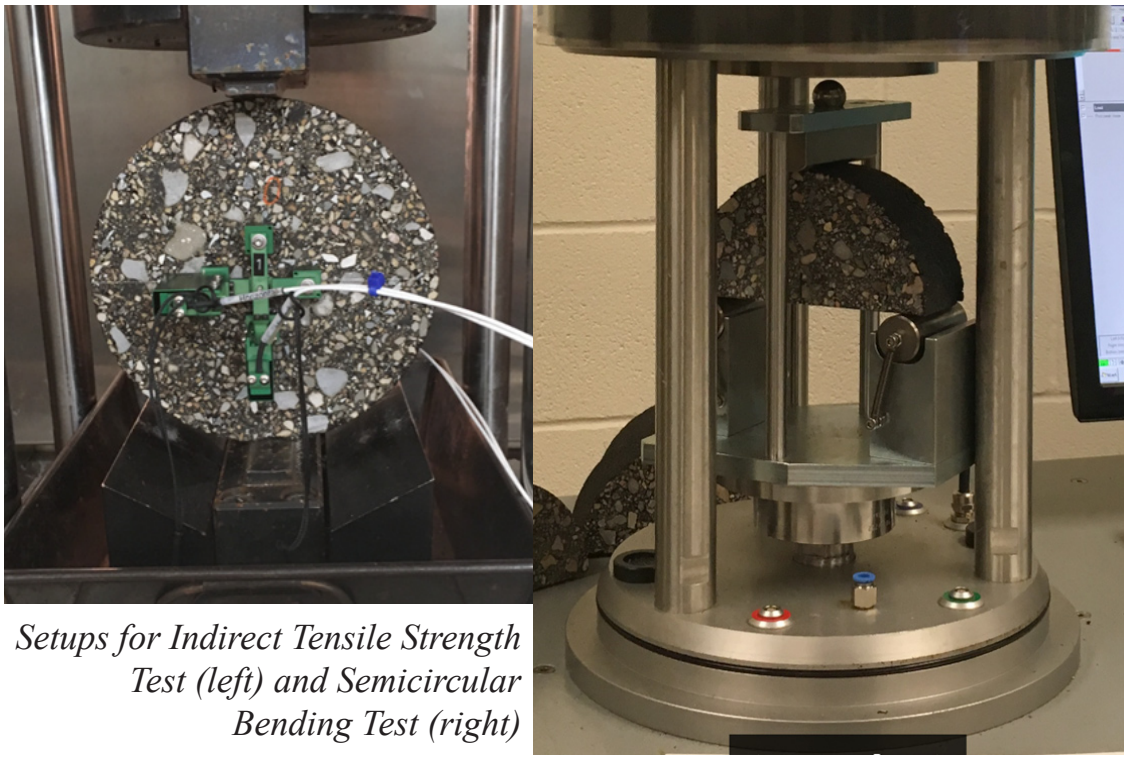
Introduction

The use of economical and environment-friendly recycled asphalt materials has become increasingly popular for asphalt pavement construction. In general, reclaimed asphalt pavement (RAP) and recycled asphalt shingles (RAS) are used in hot-mix asphalt (HMA). However, as higher amounts of RAP/RAS material are being promoted, the potential for premature pavement distresses, especially cracking, is increasing.



Setups for Indirect Tensile Strength Test (left) and Semicircular Bending Test (right)

Project Description

In this research, four recycled Superpave mixtures (SR) obtained from Kansas Department of Transportation (KDOT) projects with varying RAP and RAS contents have been evaluated. Two of these mixtures contained 10% RAP and 5% RAS, while the other two contained 25% RAP but no RAS. Illinois semicircular bending (IL-SCB) and Florida indirect tensile strength (FL-IDT) tests were performed to assess mixture cracking and fracture properties.

Project Results

These test results showed that mixtures containing 10% RAP and 5% RAS have relatively low fracture energy (FE) and flexibility index (FI) but higher resilient modulus. However, creep compliance and energy ratio (ER) of these mixtures are lower. These results indicate that mixtures containing 10% RAP and 5% RAS are stiffer, more prone to cracking, and tend to absorb less fracture energy. Mixtures with 25% RAP and no RAS showed the opposite behavior.

Project Information

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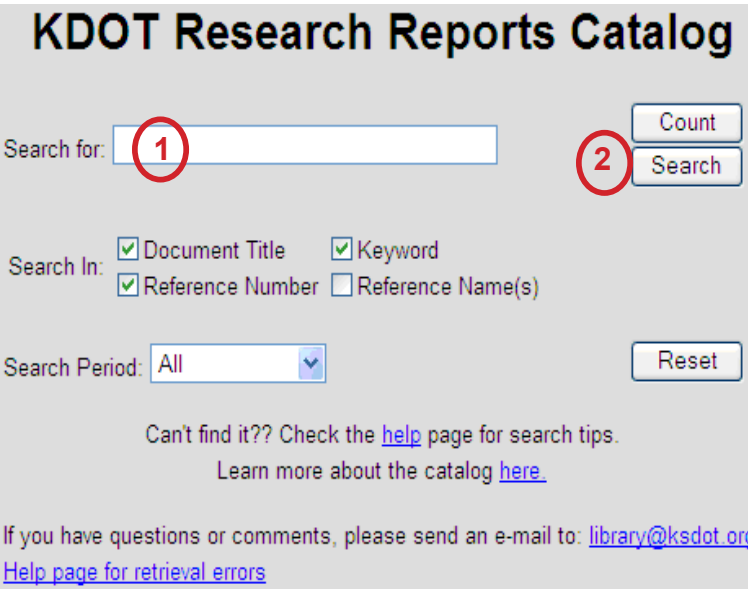

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