COMPARISON OF SHEAR STRENGTH PARAMETERS OBTAINED FROM DIFFERENT PROTOCOLS FOR WEARING COURSE MIXTURES

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ABSTRACT
Rutting resistance of an asphalt mixture is significantly dependent on its shear strength. In order to characterize shear strength properties of asphalt mixtures, this study aimed to investigate relationships between two different methods, i.e., the combination of the unconfined compression (UC) and the indirect tensile tests, and the combination of the UC and the circle shear (CS) tests. In addition, the UC test combined with the CS test was conducted using the Marshall cylindrical specimens to verify whether this protocol could address the shear strength of asphalt mixtures. Shear strength parameters of a variety of dense-, coarse-, and fine-graded mixtures with 12.5-mm nominal maximum particle size were comparatively evaluated. Wheel tracking test was also performed to assess the rutting resistance of asphalt mixtures. The results showed that the cohesion parameters of the two methods were correlated well, whereas there was not a strong relationship for the internal friction angle parameters between the two methods. Moreover, the cohesion obtained from the combination of the UC and the CS tests using the Marshall specimens had a potential application for evaluating rutting performance of asphalt mixtures.