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16. Abstract  <p>Since the implementation of Superpave asphalt mixtures in South Carolina, there have been concerns about the use of 4" diameter Marshall specimens used in SC-T-70, Laboratory Determination of Moisture Susceptibility. These concerns are due to the increased coarse aggregate content in Superpave mixtures. This research project evaluated the use of 6" diameter gyrotory made specimens to observe whether they would yield similar and more repeatable Tensile Strength Ratio (TSR) results than the 4" diameter specimens.</p> <p>The objective of this research was to compare the test results from the smaller diameter Marshall specimens with the larger diameter gyrotory specimens for the TSR. The Marshall specimens (4") and the gyrotory specimens (6") of the same mixes were used to determine if the test results reasonably compared. The results of this research were used to determine whether to revise SC-T-70 to include the use of 6" gyrotory specimens for determining the wet conditioned strengths and TSR.</p> <p>The data obtained from the moisture susceptibility testing was evaluated by comparing the wet conditioned strength to the dry conditioned strength to determine a TSR value of the different size specimens. In addition to the wet conditioned strengths and TSR values, the samples were rated for visual stripping for fine and coarse aggregate within the specimens. Several specimens were tested to failure (without an anti-stripping agent) to determine if the different size specimens gave comparable results. A line of equality showed that the larger gyrotory samples (without an anti-stripping agent) yielded higher TSR values probably due to the orientation of the material within the gyrotory mold being less susceptible to moisture damage. For the samples with hydrated lime as an anti-stripping agent, the TSR results compared favorably. The results of this research will benefit the Department as well as the Asphalt Contractors in verifying and designing asphalt mixtures using a more accurate method of testing.</p> <p>Based on the research findings, it is recommended that all mixtures designed with the gyrotory compactor have the TSR results determined using 95mm-high, 6" diameter gyrotory specimens. It is also recommended that after one season of further mix design verification, if everything remains consistent with this research's findings, the minimum wet tensile strength requirement be increased from 65 psi to 70 psi and the minimum TSR requirement be increased from 85% to 90%. Additionally, SC-T-70 should be revised immediately to reflect these recommendations.</p>					
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