



TECHSUMMARY *May 2009*

State Project No. 736-99-1366 / LTRC Project No. 06-1B

Implementation of Testing Equipment for Asphalt Materials

INTRODUCTION

Three new automated methods for related asphalt material and mixture testing were evaluated under this study. Each of these devices is designed to reduce testing time considerably and reduce operator error by automating the testing process. The Therymolyne SSDetect, Instrrotek CoreLok, and Instrrotek CoreDry devices were evaluated throughout the state in nine district laboratories plus the Louisiana Transportation Research Center (LTRC) asphalt laboratory. The test methods for each of these devices were evaluated against the standard methods described in AASHTO T-84 and AASHTO T 166 (DOTD TR 304-03). Each laboratory used the SSDetect device to evaluate the G_{sb} (bulk specific gravity) and absorption properties of fine aggregates. The CoreLok device was used to evaluate the G_{mb} (bulk specific gravity) of Superpave gyratory compacted (SGC) asphalt mixtures. The CoreDry device was used to evaluate the dry weights of SGC asphalt mixtures.



OBJECTIVE

The objective of this study was to examine laboratory variations of the test equipment described herein and develop specifications as needed for implementation based on field verification evaluations of test procedures and equipment considered.

METHODOLOGY

Round robin testing was performed by each of the nine Louisiana Department of Transportation and Development (LADOTD) districts for each of the three devices. LTRC prepared nine samples of sand and fine aggregate limestone, which were evaluated using

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conventional methods as compared to the SSDetect device by each of LADOTD's nine districts. LTRC also provided three Superpave Gyrotory specimens and three open graded friction course gyrotory specimens, which were evaluated using the CoreLok testing device.

Fifteen roadway cores were obtained in each of the nine districts from ongoing projects and were evaluated using the CoreDry and CoreLok devices and compared to conventional methods of testing.

CONCLUSIONS

Results indicated that the SSDetect device shows better consistency in measuring the G_{sb} (dry) of the fine aggregates when compared to the conventional method, AASHTO T 84. The SSDetect method also shows better repeatability and reproducibility results than conventional methods for testing G_{sb} of fine aggregates. Both AASHTO T 166 and CoreLok test methods are capable of measuring G_{mb} values for wearing course mixtures. However, the CoreLok device is more critical for determining voids in open graded mixtures because the conventional procedure to measure the saturated surface dry (SSD) weight is not applicable to open graded mixtures. The CoreLok procedure for computing G_{mb} of asphalt mixtures is highly repeatable and reproducible. The CoreDry method is a direct correlation to the conventional method. A cost analysis estimated a total annual savings to LADOTD of approximately \$95,000.00.



RECOMMENDATIONS

It is recommended that each of these devices be made available to each district for use to provide accurate and timely testing results for satisfying the quality assurance of asphalt materials and mixtures. Plans are also being made to hold a training seminar for all potential users.