RESEARCH NOTE

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Field Control of Asphalt Concrete Paving Mixtures

The Oregon Department of Transportation (ODOT) controls the quality of its AC paving mixtures by using a statistical pay factor system based on random sampling and testing of aggregate gradation, asphalt content, and compaction density. Concerns about potential toxicity of solvents used for asphalt extraction led to the desire for less hazardous quality control procedures. As a result, ODOT eliminated the use of solvents. Asphalt content is now controlled using a nuclear asphalt content gage and aggregate gradations are determined from cold feed samples.

The goal of this study was to develop information and evaluate new methods for controlling quality of the AC mixture in the mat. Specifically, this research project evaluated a gyratory compactor in the field laboratory to determine mix quality. Specimens were prepared from companion mixture samples using both gyratory and kneading compaction. The properties of the mixtures were compared using a variety of standard tests including density, voids, Marshall stability, Hveem stability, etc.

The results of this research study include the following conclusions and recommendations:

Conclusions:

1. The gyratory compactor worked well in the field laboratory. Compared to the kneading compactor, it is relatively inexpensive and simple to operate. The compacted specimens appear to represent the mixture quite well as shown by density and voids.

2. The measured stability values on gyratory compacted specimens are equal to or better than those for kneading compacted specimens; the results appear to be more consistent than kneading or Marshall compacted specimens.

3. AC mixtures can be controlled in the field by monitoring stability; however, there is significant variability in the results.

4. The void content measured in gyratory compacted field specimens may be used as a field control parameter.

Recommendations:

1. Advance the gyratory method of compaction as a method of field acceptance for asphalt concrete mixtures. This should be delayed until the new SHRP compactor is available.

2. Track the field performance of the four projects evaluated in this study for a period of 2-3 years to see if actual performance correlates with any of the test results evaluated.

3. Develop specifications for controlling asphalt concrete mixtures with a field compaction device used to fabricate specimens to measure voids in the mineral aggregate (VMA).

Recently, the final report for this project was published. If you want additional information regarding this project or a copy of the report, please contact:

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