

Evaluation of Louisiana's Statistically Based Quality Control and Acceptance Specifications

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Problem

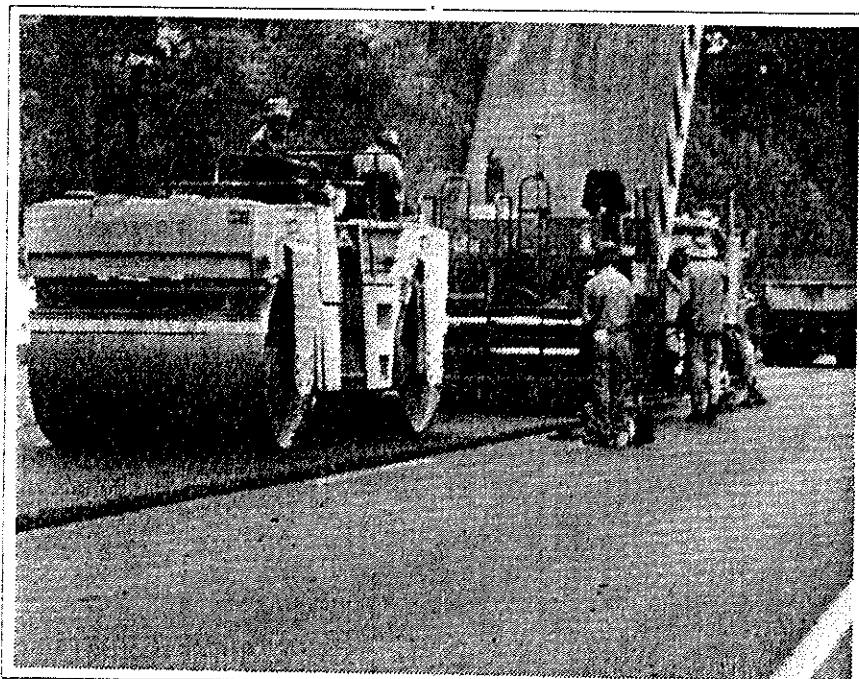
Louisiana's statistically based specification system was initiated in 1971 based on historical data. The system was validated in studies undertaken in 1975 and 1979.

Using variation known concepts, Louisiana's specifications are predicated on contractor quality control and department acceptance testing. A Materials Test Data Reporting System (MATT) was initiated to archive all materials and construction data. While this data base has been used occasionally

to adjust specifications, no further validation has occurred since 1979.

Variation known specifications based on mean values were chosen for ease of application. However, the present system provides no incentive for a contractor to reduce variation.

Many changes have been incorporated into the current DOTD specification since the last validation. These include the use of absorptive aggregates to provide friction in wearing course mixes after the moratorium on asphalt concrete friction courses; elimination of a mineral filler requirement; and the change to finer



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gradations. The FHWA has questioned the appropriateness of some of these changes. Industry has questioned many of the specification changes with respect to uncertainty and subjectivity.

A variability unknown specification uses both the mean and standard deviation values to determine a percent within limits. In such a specification, as the standard deviation decreases the lot mean can shift toward the specification limit and still be found acceptable. This provides an incentive for the contractor to reduce variation and thus provide the state with a more uniform product. The variability unknown specification is no more difficult to apply, with the use of personal computers or charts, and should lead to a better product.

Objectives

The objectives of the study are to evaluate:

- The department's statistically based specifications for asphaltic concrete,

- The variability in quality produced under those specifications, and
- The potential methods to improve the specifications and provide a more consistent asphaltic concrete.

Description

The starting point in the evaluation is to examine the background and current status of the quality of asphaltic concrete accepted by DOTD since 1987. Data from the department's Materials Test system, MATT, will be extracted from tape files for use in a personal computer statistical analysis program. (The MATT data base which contains all project construction information was inaugurated in 1977.)

The study will evaluate the department's current statistically based specification for asphaltic concrete, the variability in quality produced under those specifications, and improvements to the system.

Implementation Potential

Both reduced costs and improved quality of pavements can be achieved with a proper statistical specification. Changes to the current variability known specification can be implemented immediately. Based on the department's acceptance of a variability unknown specification, appropriate tables and charts and a training manual should be developed and a training program initiated for implementation. It is believed that such a specification will lead to less uncertainty for contractors and will provide the basis for more uniform pavement materials.