

## **APPLICABILITY OF STANDARD DENSITY IN QUALITY CONTROL AND QUALITY ACCEPTANCE OF ASPHALT SURFACING**

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Proper compaction plays a vital role in maintaining the quality of asphalt pavement works. As a quality control (QC) and quality acceptance (QA) parameter, the degree of compaction expressed as a percentage ratio between field density and the reference density is employed in the pavement industry. Currently, Marshall density, maximum density and control strip density are used to establish the reference density and formulate the degree of compaction. However, for decades, Marshall laboratory density has been the mainstream practice to specify the reference density in Sri Lanka. This study focuses on developing a systematic approach called the "Standard density method" to establish the reference density. The standard density is determined as the mean value of densities of Marshall test specimens from morning and evening operations for a specified number of days after the commencement of construction. The experiments were designed to evaluate the feasibility of the concept of standard density by comparing current practices with the proposed method. Field core density and Marshall laboratory density measurements were collected from various road projects, and compaction performances were evaluated. A graphical comparison, a statistical test method (t-test) and validation tests were conducted to analyze the compaction performance and acceptance of the proposed method. The findings showed that standard reference density could be used as the most effective QC / QA testing parameter for roads that use the same asphalt mixture design, batching plant, laying and compaction procedures. Moreover, statistics revealed a significant relationship between the level of compaction results in both current and proposed methods in major projects. Furthermore, the results showed that the standard density method is very sensitive to the variations in asphalt manufacturing, placing, laying and compaction procedures.

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