

## **Review of Sampling Strategies in QC and QA of Asphalt Surfacing and Methods of Acceptance**

*Vajira Jayasundara<sup>1</sup> and Wasantha Mampearachchi<sup>2</sup>*

### **Abstract**

Sampling is a key component of any quality assurance (QA)/ quality control (QC) plan; it significantly affects the determination of quality and acceptance of work done. To determine density and compaction, core samples are taken from asphalt pavement, and their results highly contribute to final acceptance. In Sri Lanka, this is done according to the guideline given in ICTAD specifications. In clause 506.6 of ICTAD, a re-coring procedure is given for thickness deficiencies. But not given any procedure for compaction deficiencies. So, the practice of most road construction projects is, if samples obtained from the relevant sections are unable to achieve specified compaction limit, reject the whole section. Also, since any special procedure is not specified in ICTAD specifications, samples are mostly taken on the direction of the engineer. When core samples are taken intentionally and directionally at lower density locations by visual observation, the contractor is compelled to compact more so that conforming density is achieved at every location deviating from the procedure established during trial section. This leads to bad practices in the industry as well as directly affects the quality of the asphalt pavement. The objective of this study is, produce a review of successful practices used for asphalt sampling and acceptance. Standard and international practices of sampling and acceptance were studied in the literature survey. And Questionnaires and interviews were used to get attitudes of industry about existing practice and standard sampling practices. Although standard practices for random sampling are set out in ASTM D3665, many countries seem to use their own stratified random sampling practice, using random number tables for generating random numbers to select sampling locations. Among them two commonly used methods of acceptance were discovered: (1) Taking at least 3 samples from each section rather than testing one location only and calculating PWL factors based on results. Here final acceptance is done using PWL factors of asphalt content and gradation and roughness factors together. (2) using contractor's QC test results which obtain using stratified random sampling, after ensuring those accuracies using f and t-test methods. And get an average of results. Currently, most contractors are performing hot bin grading daily in asphalt batching plants. By analysis of asphalt content and gradation of different road constructions projects, clearly shows those values do not much deviate from specified limits. Therefore, it can be assumed no issues of sampling practice for asphalt content and gradation. Based on these findings, it is recommended to modify clauses in ICTAD specification for sampling on compacted asphalt surface; use contractors' test results obtained from stratified random sampling, should be used after verifying their accuracy for final acceptance.

**Keywords:** *asphalt sampling, quality control, quality assurance, acceptance plan*

Authors Details;

1. Undergraduate Student, Department of Civil Engineering, University of Moratuwa.  
[vajira7991@gmail.com](mailto:vajira7991@gmail.com)
2. Professor, Department of Civil Engineering, University of Moratuwa.  
[wasanthak@uom.lk](mailto:wasanthak@uom.lk)