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Standard Practice for Random Sampling of Construction Materials¹

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^{ε1} NOTE—Footnote 1 and 3.1 were editorially corrected in December 2010.

1. Scope

1.1 This practice covers the determination of random locations (or timing) at which samples of construction materials can be taken. For the exact physical procedures for securing the sample, such as a description of the sampling tool, the number of increments needed for a sample, or the size of the sample, reference should be made to the appropriate standard method. The selection procedures in Section 6 utilize the table of four-digit numbers given in Table 1.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

- C172 Practice for Sampling Freshly Mixed Concrete
- C183 Practice for Sampling and the Amount of Testing of Hydraulic Cement
- D75 Practice for Sampling Aggregates
- D140 Practice for Sampling Bituminous Materials
- D345 Test Method for Sampling and Testing Calcium Chloride for Roads and Structural Applications
- D979 Practice for Sampling Bituminous Paving Mixtures
- D5361 Practice for Sampling Compacted Bituminous Mixtures for Laboratory Testing
- E105 Practice for Probability Sampling of Materials
- E122 Practice for Calculating Sample Size to Estimate, With Specified Precision, the Average for a Characteristic of a Lot or Process
- E141 Practice for Acceptance of Evidence Based on the

¹ This practice is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.30 on Methods of Sampling.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

Results of Probability Sampling

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *representative sample, n*—(1) a random sample; or (2) an unbiased sample.

3.1.1.1 *random sample, n*—a sample obtained from a lot of material in such a manner that all parts of the lot have a known probability of being included in the sample.

3.1.1.2 *Discussion*—An example of random sample is the case where specifications limit roadway sampling to within one foot of the edge, therefore the probability of inclusion of samples within one foot of the edge is zero.

3.1.1.3 *unbiased sample, n*—a sample obtained from a lot of material in such a manner that all parts of the lot have an equal probability of being included in the sample.

4. Significance and Use

4.1 This practice is useful for determining the location or time, or both, to take a sample in order to minimize any unintentional bias on the part of the person taking the sample.

NOTE 1—The effectiveness of this practice in achieving random samples is limited only by the conscientiousness of the user in following the stipulated procedures.

4.2 The selection procedures and examples in this standard provide a practical approach for ensuring that construction material samples are obtained in a random manner. Additional details concerning the number of sample increments, the number of samples, the quantities of material in each, and the procedures for extracting sample increments or samples from the construction lot or process are contained in Practices C172, C183, D75, D140, D979, D5361, and Test Method D345.

4.3 This standard contains examples citing road and paving materials. The concepts outlined therein are applicable to the random sampling of any construction material and can easily be adapted thereto.

4.4 Additional sampling guidance is provided in Practice E105 concerning probability sampling, Practice E122 concerning choosing sample sizes to estimate the average quality of a lot or process (see Note 2), and in Practice E141 for acceptance of evidence based on results of probability sampling.

