



Designation: D4580 – 23

Standard Practice for Measuring Delamination in Concrete Bridge Decks by Sounding¹

This standard is issued under the fixed designation D4580; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers procedures for surveying concrete bridge decks by sounding to determine delamination in the concrete. It is not intended that the procedures described herein are to be used on bridge decks that have been overlaid with asphalt mixtures. The procedures may be used on bridge decks that have been overlaid with portland cement concrete mixtures; however, areas indicated to be delaminated may have a lack of bond between the overlay and the underlying bridge deck (**Note 1**).

NOTE 1—The influence of variable field conditions such as traffic noise, vibration, moisture content of the concrete, and the like, are not completely known and additional investigation may be needed. It is generally agreed that the practice should not be used on frozen concrete.

1.2 The following three procedures are covered in this practice:

1.2.1 *Procedure A, Electro-Mechanical Sounding Device*—This procedure uses an electric-powered tapping device, sonic receiver, and recorder mounted on a cart. The cart is pushed across the bridge deck and the delamination is recorded on the recorder.

1.2.2 *Procedure B, Chain Drag*—This procedure consists of dragging a chain over the bridge deck surface. The detection of delamination is accomplished by the operator noting dull or hollow sounds. Tapping the bridge deck surface with a steel rod or hammer may be substituted for the chain drag.

1.2.3 *Procedure C, Rotary Percussion*²—This procedure consists of rolling a dual-wheel, multi-toothed apparatus attached to an extension pole over the bridge deck surface. The

percussive force caused by the tapping wheels will create either a dull or hollow sound, indicating any delamination.

1.3 *Units*—The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

1.5 Since a complete Precision and Bias statement for this standard has not been developed, the standard practice is to be used for research and informational purposes only. Therefore, this standard should not be used for acceptance or rejection of a material for purchasing purposes.

1.6 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Significance and Use

2.1 This practice may be used in conjunction with other methods in determining the general condition of concrete bridge decks.

2.2 This practice may be used in determining specific areas of delamination requiring repair.

PROCEDURE A – ELECTRO-MECHANICAL SOUNDING DEVICE

3. Summary of Procedure

3.1 Longitudinal lines at a predetermined spacing are established on the bridge deck.

¹ This practice is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.32 on Bridges and Structures.

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² The rotary sound detecting device for concrete and procedure are patent pending in the U.S. Patent and Trademark Office by Philip K. Clark Company, Inc., 503 Central Drive, Suite 102, Virginia Beach, VA 23454. Interested parties are invited to submit information regarding the identification of an alternative(s) to this patent pending item to ASTM International Headquarters, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. Your comments will receive careful consideration at a meeting of the responsible technical subcommittee,¹ which you may attend.