



Standard Test Method for Nonrepetitive Static Plate Load Tests of Soils and Flexible Pavement Components, for Use in Evaluation and Design of Airport and Highway Pavements¹

This standard is issued under the fixed designation D 1196; 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 test method covers the making of nonrepetitive static plate load tests on subgrade soils and pavement components, in either the compacted condition or the natural state, and provides data for use in the evaluation and design of rigid and flexible-type airport and highway pavements.

1.2 The values stated in inch-pound units are to be regarded as the standard.

1.3 *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. Terminology

2.1 Definitions:

2.1.1 *deflection*—the amount of downward vertical movement of a surface due to the application of a load to the surface.

2.1.2 *rebound deflection*—the amount of vertical rebound of a surface that occurs when a load is removed from the surface.

2.1.3 *residual deflection*—the difference between original and final elevations of a surface resulting from the application and removal of one or more loads to and from the surface.

3. Significance and Use

3.1 Field, in-place nonrepetitive static load tests are used for the evaluation and design of pavement structures. Nonrepetitive static plate load tests are performed on soils and unbound base and subbase materials to determine the modulus of subgrade reaction or a measure of the shear strength of pavement components.

4. Apparatus

4.1 *Loading Device*—A truck or trailer or a combination of both a tractor-trailer, an anchored frame, or other structure loaded with sufficient weight to produce the desired reaction on the surface under test. The supporting points (wheels in the

case of a truck or trailer) shall be at least 8 ft (2.4 m) from the circumference of the largest diameter bearing plate being used.

4.2 *Hydraulic Jack Assembly*, with a spherical bearing attachment, capable of applying and releasing the load in increments. The jack shall have sufficient capacity for applying the maximum load required, and shall be equipped with an accurately calibrated gage that will indicate the magnitude of the applied load.

4.3 *Bearing Plates*—A set of circular steel bearing plates not less than 1 in. (25.4 mm) in thickness, machined so that they can be arranged in pyramid fashion to ensure rigidity, and having diameters ranging from 6 to 30 in. (152 to 762 mm). The diameters of adjacent plates in the pyramid arrangement shall not differ by more than 6 in.

NOTE 1—A minimum of four different plate sizes is recommended for pavement design or evaluation purposes. For evaluation purposes alone, a single plate may be used, provided that its area is equal to the tire-contact area corresponding to what may be considered as the most critical combination of conditions of wheel load and tire pressure. For the purpose of providing data indicative of bearing index (for example, the determination of relative subgrade support throughout a period of a year), a single plate of any selected size may be used.

4.4 *Dial Gages*, two or more, graduated in units of 0.001 in. (0.03 mm) and capable of recording a maximum deflection of 1 in. (25.4 mm) or other equivalent deflection-measuring devices.

4.5 *Deflection Beam*, upon which the dial gages shall be mounted. The beam shall be a 2½-in. standard black pipe or a 3 by 3 by ¼-in. (76 by 76 by 6-mm) steel angle, or equivalent. It shall be at least 18 ft (5.5 m) long and shall rest on supports located at least 8 ft (2.4 m) from the circumference of the bearing plate or nearest wheel or supporting leg. The entire deflection measuring system shall be adequately shaded from direct rays of the sun.

4.6 *Miscellaneous Tools*, including a spirit level, for preparation of the surface to be tested and for operation of the equipment.

5. Procedure

5.1 Carefully center a bearing plate of the selected diameter under the jack assembly. Set the remaining plates of smaller diameter concentric with, and on top of, the bearing plate. Set

¹ This test method is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.39 on Non Destructive Testing of Pavement Structures.

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