Standard Method of Test for

Penetration Test and Split-Barrel Sampling of Soils

AASHTO Designation: T 206-19

Technical Subcommittee: 1b, Geotechnical Exploration, Instrumentation, Stabilization, and Field Testing

Release: Group 3 (July)

ASTM Designation: D1586-11



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1. SCOPE 1.1. This test method describes the procedure, generally known as the Standard Penetration Test (SPT), for driving a split-barrel sampler to obtain a representative soil sample and a measure of the resistance of the soil to penetration of the sampler. 1.2. This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety concerns 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. For a specific precautionary statement, see Section 5.4.1. 1.3. The values stated in SI units are to be regarded as the standard. Note 1—ASTM D4633 can be used for measuring the energy that enters the drill rod string during testing due to the hammer impact. Note 2—ASTM D6066 can be used when testing loose sands below the water table for liquefaction studies or when a higher level of care is required when drilling these soils. This practice provides information on drilling methods, equipment variables, energy corrections, and blow-count normalization. 2 REFERENCED DOCUMENTS 2.1. AASHTO Standard:

■ R 13, Conducting Geotechnical Subsurface Investigations

2.2. *ASTM Standards*:

- D4633, Standard Test Method for Energy Measurement for Dynamic Penetrometers
- D6066, Standard Practice for Determining the Normalized Penetration Resistance of Sands for Evaluation of Liquefaction Potential

3. TERMINOLOGY

- **3.1**. *Description of Terms Specific to This Standard*:
- **3.1.1**. *anvil*—that portion of the drive-weight assembly that the hammer strikes and through which the hammer energy passes into the drill rods.
- 3.1.2. *cathead*—the rotating drum or windlass in the rope-cathead lift system around which the operator wraps a rope to lift and drop the hammer by successively tightening and loosening the rope turns around the drum.
- **3.1.3**. *drill rods*—rods used to transmit downward force and torque to the drill bit while drilling a borehole.
- 3.1.4. *drive-weight assembly*—a device consisting of the hammer, hammer fall guide, the anvil, and any hammer drop system.
- 3.1.5. *hammer*—that portion of the drive-weight assembly consisting of the $63.5 \pm 1 \text{ kg} (140 \pm 2 \text{ lb})$ impact weight that is successfully lifted and dropped to provide the energy that accomplishes the sampling and penetration.
- 3.1.6. *hammer drop system*—that portion of the drive-weight assembly by which the operator accomplishes the lifting and dropping of the hammer to produce the blow.
- 3.1.7. *hammer fall guide*—that part of the drive-weight assembly used to guide the fall of the hammer.
- 3.1.8. *N-value*—the blow count representation of the penetration resistance of the soil. The *N*-value, reported in blows per foot, equals the sum of the number of blows required to drive the sampler over the depth interval of 150 to 450 mm (6 to 18 in.) (see Section 7.3).
- 3.1.9. ΔN —the number of blows obtained from each of the 150-mm (6-in.) intervals of sampler penetration (see Section 7.3).
- 3.1.10. *number of rope turns*—the total contact angle between the rope and the cathead at the beginning of the operator's rope slackening to drop the hammer, divided by 360 degrees (see Figure 1).