



Designation: D7208 – 06

Standard Test Method for Determination of Temporary Ditch Check Performance in Protecting Earthen Channels from Stormwater-Induced Erosion¹

This standard is issued under the fixed designation D7208; 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 guidelines, requirements, and procedures for evaluating the ability of temporary ditch checks to protect earthen channels from stormwater-induced erosion. Critical elements of this protection are the ability of the temporary ditch check to:

- 1.1.1 Slow and/or pond runoff to encourage sedimentation, thereby reducing soil particle transport downstream;
- 1.1.2 Trap soil particles up stream of structure; and
- 1.1.3 Decrease soil erosion.

1.2 This test method utilizes full-scale testing procedures, rather than reduced-scale (bench-scale) simulation, and is patterned after conditions typically found on construction sites at the conclusion of earthwork operations, but prior to the start of revegetation work. Therefore this test method considers only unvegetated conditions.

1.3 This test method provides a comparative evaluation of a temporary ditch check to baseline bare soil conditions under controlled and documented conditions.

1.4 The values stated in SI units are to be regarded as standard. The inch-pound units given in parentheses are provided for information purposes only.

1.5 *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. Also, the user must comply with prevalent regulatory codes, such as OSHA (Occupational Health and Safety Administration) guidelines, while using the test method.*

¹ This test method is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.25 on Erosion and Sediment Control Technology.

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2. Referenced Documents

2.1 ASTM Standards:²

D698 Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³))

D6460 Test Method for Determination of Rolled Erosion Control Product (RECP) Performance in Protecting Earthen Channels from Stormwater-Induced Erosion

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *temporary ditch check (in erosion control)*, *n*—a non-permanent barrier consisting of rocks, straw bales, excelsior logs, wattles, lumber, rock bags, interlocking pre-cast concrete blocks, or other materials installed or constructed across a drainage way, swale, or other ephemeral waterway to reduce flow velocity, decrease erosion, and promote soil retention.

4. Summary of Test Method

4.1 The performance of a temporary ditch check in reducing stormwater-induced erosion is determined by subjecting the material to simulated stormwater flow in a controlled and documented environment.

4.2 Key elements of the testing process include:

- 4.2.1 Calibration of the stormwater simulation equipment;
- 4.2.2 Preparation of the test channel;
- 4.2.3 Documentation of the temporary ditch check(s) to be tested;
- 4.2.4 Installation of the temporary ditch check(s);
- 4.2.5 Performance of the test;

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.

- 4.2.6 Collection of hydraulic, topographical, and associated data;
- 4.2.7 Analysis of the resultant data; and
- 4.2.8 Reporting.

5. Significance and Use

5.1 This test method evaluates temporary ditch checks and their means of installation to:

- 5.1.1 Reduce soil loss and sediment concentrations in stormwater runoff under conditions of varying channel conditions and soil type; and
- 5.1.2 Improve water quality exiting the area disturbed by earthwork activity by reducing suspended solids.

5.2 This test method models and examines conditions typically found on construction sites involving earthwork activities, including: highways and roads; airports; residential, commercial and industrial developments; pipelines, mines, and landfills; golf courses; etc.

5.3 This test method is a performance test. It is a comparative tool for evaluating the erosion control characteristics of different temporary ditch checks and can be used for quality control to determine product conformance to project specifications. Take caution when comparing results from different laboratories because information about between-laboratory precision is incomplete and slight differences in soil and other environmental and geotechnical conditions may affect temporary ditch check performance. Unique project-specific conditions should be taken into consideration.

6. Apparatus

6.1 *Water Delivery System*—The water delivery system shall include pump(s), piping, channels, and water control structures, as necessary, to achieve the desired hydraulic conditions.

The water control structures shall regulate the flow and to direct it into the desired test channel. The water delivery system shall be constructed such that turbulence at the entrance to the test channel is minimized. Use of flow straighteners (for example, tube racks or vanes) are recommended to reduce turbulence and achieve uniform flow conditions. A direct flow system (that is, controlled flow diverted from a natural waterway) may also be employed for this purpose. The water delivery system in Fig. 1 shows an example of a closed-loop water delivery system.

6.2 *Water Source*—Any water source shall be suitable for this use provided that it is not sediment laden or contains deleterious materials that could impair the operation of the pumps.

6.3 *Total Station System*—The total station system is a standard surveying instrument that is capable of measuring vertical and horizontal angles, and distance, simultaneously to determine measurement point coordinates (that is, X, Y and Z axis) and that uses an internal data logger to store this information for future use. In lieu of a total station system, manual surveying equipment may be used provided that equivalent accuracy is achievable. Periodic calibration and certification of this equipment shall be performed.

6.4 *Velocity Probe*—A velocity probe capable of measuring point velocities to an accuracy of ± 0.03 m/s (0.1 ft/s) shall be used to identify flow conditions during test operation. Acceptable types of probes include electromagnetic, spinning cup, propeller, and static tube devices. Periodic calibration and certification of this equipment shall be performed.

6.5 *Miscellaneous*—Other miscellaneous equipment includes: meteorological equipment (wind speed, temperature, precipitation), and cameras or video recorders.

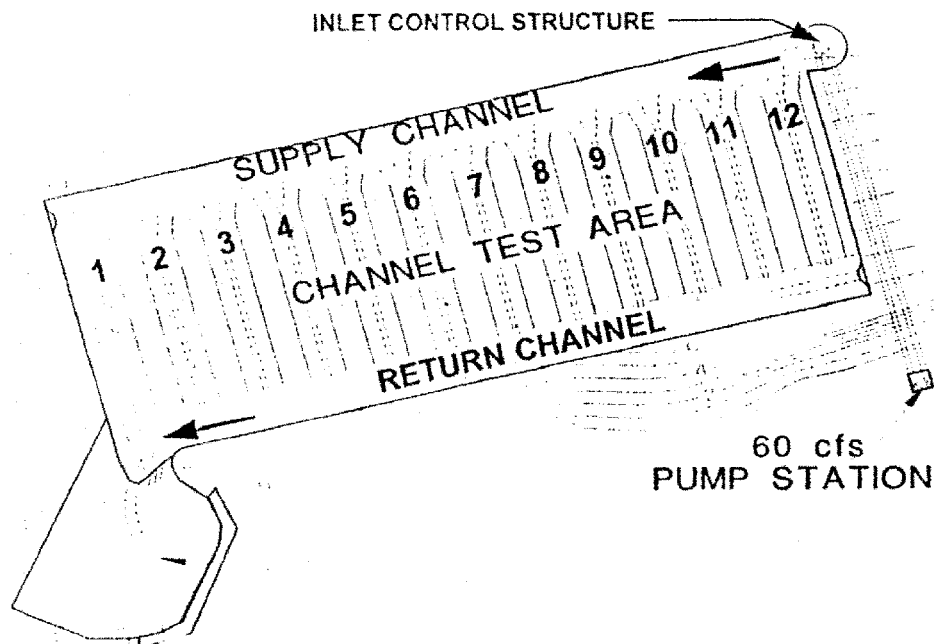


FIG. 1 Typical Closed Looped Water Delivery System