Designation: D8107 – 17

Standard Practice for Determining Sediment Pond Skimmer Flow Rate[1]

This standard is issued under the fixed designation D8107; 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 the setting up and running of a test to determine the clear water flow rate at various depths of a floating sediment pond skimmer.

1.2 This practice is limited to large-scale test conditions, and does not address hydraulic modeling or pipe-flow based calculations.

1.3 The values stated in SI units are to be regarded as the standard.

1.4 All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice D6026, unless superseded by this standard.

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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D653 Terminology Relating to Soil, Rock, and Contained Fluids

D3740 Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

D6026 Practice for Using Significant Digits in Geotechnical Data

3. Terminology

3.1 *Definitions*—For definitions of other terms used in this practice, refer to Terminology D653.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *floating sediment pond skimmer, n*—a buoyant device that releases/drains water from the surface of sediment ponds, traps or basins at a controlled rate of flow.

4. Summary of Practice

4.1 This practice is for evaluating the clear water flow rate of a floating sediment pond skimmer versus pond depth, including details for setting up a performance test that can be used for design characterization as well as quality assurance to determine product conformance to project specifications.

5. Significance and Use

5.1 This practice covers the guidelines, requirements and procedures for evaluating the flow rate of a floating sediment pond skimmer versus pond depth. This practice refers to large-scale testing procedures, and is patterned after conditions typically found on construction sites within a sediment basin. This practice outlines test preparation, test execution, data collection, data analysis and reporting procedures for any size calibrated basin.

6. Apparatus

6.1 *Apparatus/Facility:*

6.1.1 Testing is performed in a calibrated basin (that is, it has a known surface area at any known depth) of sufficient size to facilitate multiple, accurate depth readings under the expected flow rates, but not less than 0.9 m deep × 1.2 m wide × 6.1 m long. A typical basin is shown in Fig. 1

6.1.2 The basin shall be outfitted with a skimmer discharge pipe having a diameter no smaller than that of the pipe joining it to the floating skimmer head. The discharge pipe shall have a valve or stopper that can be controlled or removed/replaced from the outside of the basin to initiate and stop flow through the skimmer. It is also recommended to also have a valved drainage pipe to enable lowering of the water surface within the basin if desired to take flow rate measurements at various depths without waiting for discharge exclusively through the skimmer.

6.1.3 A water supply connected to the basin either via a gravity flow system or a pump and associated piping is needed to fill the calibrated basin. A depth measuring system, such as a calibrated ruler mounted on the side of the basin shall be provide for the measurement of water depth during the test. The depth measuring system must not be moved, repositioned,

[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] 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.

FIG. 1 Typical Testing Basin (in background)

jarred, and tampered with once the first reading of each replicate has been taken. The depth measuring system may be paired with volume calculations or an automated flow gauge.

6.2 *Test Set-Up:*

6.2.1 The skimmer is attached to the discharge pipe prior to pond filling using reducers/connectors as directed by the client. The connection must be watertight so that all discharge is through the floating skimmer headworks/inlet. (See Fig. 2.)

6.3 *Pre-Test Documentation*—Maintain a test folder for each test, including the following information:

6.3.1 Calibrated basin dimensions and pictures of the test setup.

6.3.2 Product manufacturer; product name; description; specifications; size; and a picture of the material, if practical.

6.3.3 Technician identification and date/time of testing.

6.4 *Test Operation and Data Collection:*

6.4.1 With the valve on the discharge pipe closed, and the skimmer to be tested in place, fill the test basin with water to the maximum desired depth. Filling should proceed slowly enough to allow all air within the skimmer assembly to bleed completely during filling.

6.4.2 Once the basin is filled to the desired depth, allow the water surface to become still and record the depth on the ruler mounted to the sidewall.

6.4.3 Open the discharge pipe valve and start timing when water begins exiting the discharge pipe.

6.4.4 Record depth and associated time at least every minute until the flow stops or the skimmer is resting on the bottom of the basin.

6.4.5 Record and tabulate water surface elevation as a function of time.

6.4.6 From the change in surface elevation with time, calculate flow rate between each data point in accordance with Eq 1.

$$(Depth_1 - Depth_2)*\text{Basin Area}/(Time_2 - Time_1) \quad (1)$$

6.4.7 Repeat the test two more times on each skimmer style (size).

6.4.8 Plot flow rate versus depth and fit a trendline to the data to establish the flow rate versus depth relationship for the tested device.

7. Report

7.1 Report at a minimum the following information:

7.1.1 General information, including test facility location, date, time and operator(s),

7.1.2 Test basin configuration and preparation,

7.1.3 Calibration data,

7.1.4 Materials documentation including skimmer material and installation description,

7.1.5 Test operation, data collected, and data analysis.

8. Precision and Bias

8.1 No statement is made about either the precision or bias of this practice.

9. Keywords

9.1 floating pond skimmer; sediment pond outlet

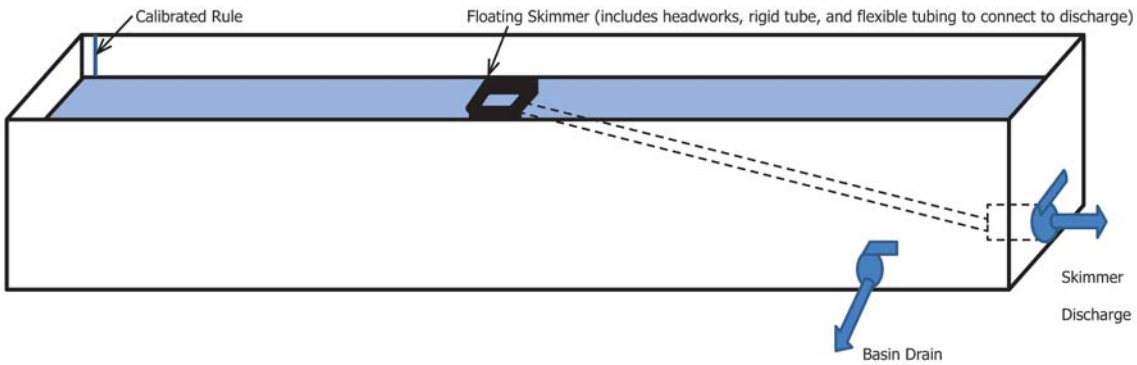

FIG. 2 Schematic of Setup