



Standard Test Method for Open Channel Flow Measurement of Water Indirectly by Using Width Contractions¹

This standard is issued under the fixed designation D5129; 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.

^{ε1} NOTE—Editorial corrections were made throughout in July 2015.

1. Scope

1.1 This test method covers the computation of discharge (the volume rate of flow) of water in open channels or streams using bridges that cause width contractions as metering devices.²

1.2 This test method produces the maximum discharge for one flow event, usually a specific flood. The computed discharge may be used to help define the high-water portion of a stage-discharge relation.

1.3 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 *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*:³

D1129 Terminology Relating to Water

D2777 Practice for Determination of Precision and Bias of Applicable Test Methods of Committee D19 on Water

¹ This test method is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.07 on Sediments, Geomorphology, and Open-Channel Flow.

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² This test method is similar to methods developed by the U.S. Geological Survey and described in documents referenced in Footnote 5.⁵

³ 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.

D3858 Test Method for Open-Channel Flow Measurement of Water by Velocity-Area Method

2.2 *ISO Standard*:⁴

ISO 748 Liquid Flow Measurements in Open Channels—Velocity-Area Measurements

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, refer to Terminology **D1129**.

3.2 *Definitions of Terms Specific to This Standard*:

3.2.1 *alpha (α)*—a velocity-head coefficient that adjusts the velocity head computed on basis of the mean velocity to the true velocity head.

3.2.2 *area (A)*—the area of a cross section, parts of a cross section, or parts of bridges below the water surface. Subscripts indicate specific areas as follows:

A_i = area of subsection i ,

A_j = area of piers or piles that is submerged,

A_1 = area of total cross Section 1 (see Fig. 1), and

A_3 = gross area of Section 3.

3.2.3 *conveyance, (K)*—a measure of the carrying capacity of a channel cross section, or parts of a cross section, and has units of cubic feet per second or cubic metres per second. Conveyance is computed as follows:

$$K = \frac{1.486}{n} AR^{2/3}$$

where:

n = the Manning roughness coefficient,

A = the cross-section area, ft² (m²), and

R = the hydraulic radius, ft (m).

*in SI units = 1.0

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

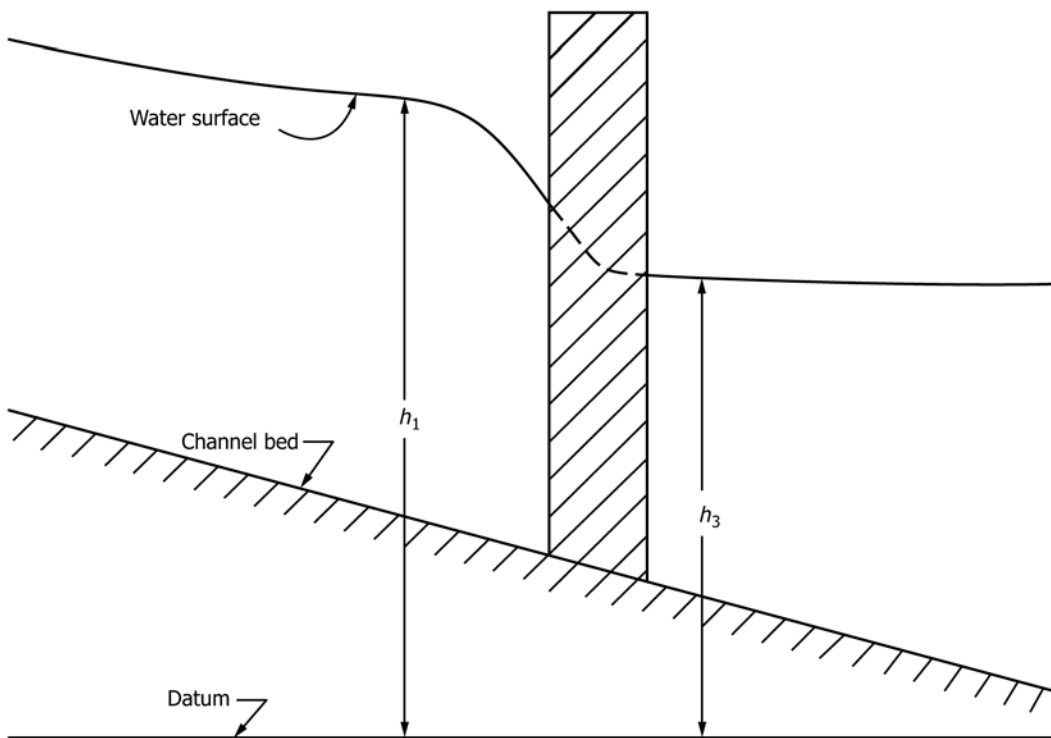
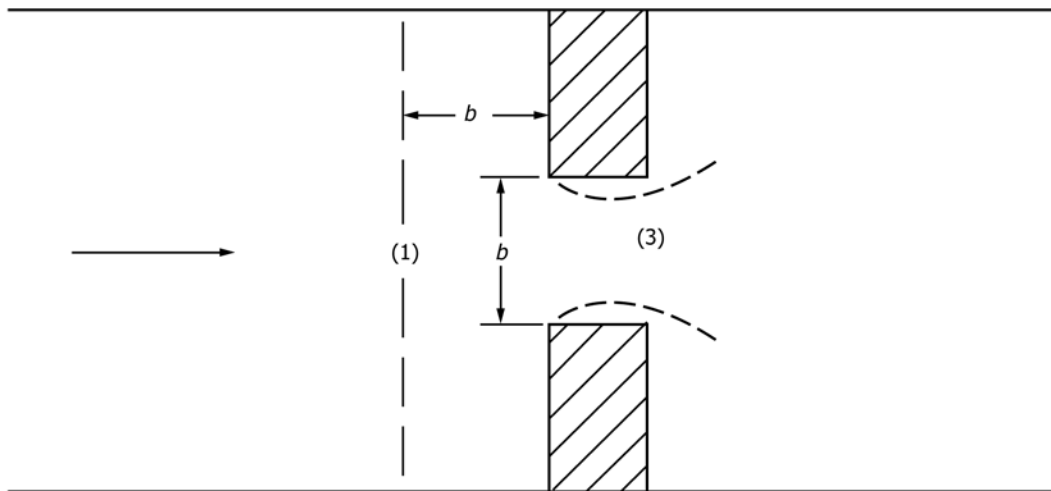


FIG. 1 Definition Sketch of an Open-Channel Contraction