



## Designation: D5957 – 98 (Reapproved 2021)

# Standard Guide for Flood Testing Horizontal Waterproofing Installations<sup>1</sup>

This standard is issued under the fixed designation D5957; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This guide provides the user with a method for testing the watertightness of waterproofing installations applied to horizontal surfaces having a slope not greater than 20 mm/m (2 % slope) (1/4 in. per ft).

1.2 This guide is intended for waterproofing installation on parking garages and plaza deck type applications over habitable spaces or on elevated structures, but is not intended for use on building roofing systems. Applicable waterproofing membrane installations that may be tested using this guide are fully adhered or bonded sheet membranes, liquid or fluid-applied membranes, or loose-laid sheet membranes.

1.3 The procedures presented here are not intended for use on those waterproofing installation applications that are for long-term water storage or continuously submerged environments, such as swimming pools, fountains, tank liners with hydrostatic pressure, or water storage units (storage period greater than 48 h).

1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

<sup>1</sup> This guide is under the jurisdiction of ASTM Committee D08 on Roofing and Waterproofing and is the direct responsibility of Subcommittee D08.22 on Waterproofing and Dampproofing Systems.

Current edition approved Dec. 1, 2021. Published December 2021. Originally approved in 1996. Last previous edition approved in 2013 as D5957 – 98 (2013). DOI: 10.1520/D5957-98R21.

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

D1079 Terminology Relating to Roofing and Waterproofing

2.2 *ACI Document:*<sup>3</sup>

ACI 515 Guide to the Use of Waterproofing, Dampproofing, Protective, and Decorative Barrier Systems for Concrete

## 3. Terminology

3.1 For definitions of terms relating to roofing and waterproofing, see Terminology D1079.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *sacrificial sheet*—a material used to form a temporary seal between a containment assembly and the waterproofing system. The material used for a sacrificial sheet shall not cause damage nor be detrimental to the primary system.

## 4. Summary of Guide

4.1 This guide uses a series of temporary containment assemblies of pond water on horizontal surfaces to determine the watertightness of waterproofing installations.

4.2 The area to be tested is subdivided as required by the containment assemblies, and drains within the subdivided area are temporarily blocked to prevent water leakage into the drainage system.

4.3 Water is ponded in the subdivided area and maintained for a minimum period of 24 h. The space below the test location is monitored for leakage during the test period.

## 5. Significance and Use

5.1 This guide describes the techniques used to test for watertightness of waterproofing installations on horizontal services having a slope not greater than 20 mm/m (2 % slope) (1/4 in./ft). See also ACI 515.

<sup>2</sup> 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.

<sup>3</sup> Available from American Concrete Institute (ACI), P.O. Box 9094, Farmington Hills, MI 48333.

5.2 The structural capacity of the substrate to which the waterproofing system is to be installed should be reviewed by a licensed structural engineer to verify that the loads associated with the use of procedures described in this guide do not exceed code and design restrictions. Lateral loads will be imposed on curbs or walls used for containment of the water during the test procedures and their effect should be accounted for. The effects of equipment, planters, or other movable objects present within the test area should be considered.

NOTE 1—Potable water weighs approximately 1000 kg/cubic m (62.3 lb per cubic ft) at 22 °C (71.6 °F) or 1 g/cm<sup>2</sup>/cm depth (5.19 lb/ft<sup>2</sup> per in. depth).

5.3 This guide describes a procedure to test for watertightness of waterproofing installations under ponded water with a short-term hydrostatic head measuring not more than 100 mm (4 in.).

NOTE 2—Increasing the amount of water forming a hydrostatic head beyond 100 mm (4 in.) of water may be considered provided the impact of increased loads on the substrate has been reviewed and approved by a licensed structural engineer.

5.4 For the purposes of this guide, the installation of the waterproofing membrane and flashing should be completed and the materials fully cured. Manufacturers should specify a minimum time period for materials to cure prior to performing flood test, however, no testing should be performed during the first 24 h following installation of system materials (48 h min if materials are installed at a time when ambient temperatures are below 10 °C (50 °F)).

5.5 The additional loads imposed upon the structure during the test period will affect the deflection of structural items. The effects shall be analyzed by a licensed structural engineer prior to placement of additional loads. Critical locations shall be monitored during the duration of the test period.

5.6 This guide is not recommended to be used if freezing temperatures are expected to occur during the test period. Ponded water can freeze and become adhered to the waterproofing system, resulting in pulling or tearing of the flashings away from the substrate or may break interior corners.

5.7 The intent of this guide is to provide a measure of confidence of the waterproofing installation to remain water-

tight for the service life of the system, based upon the observed performance of the system under ponded water for a limited period of time.

## 6. Materials

6.1 *Drain Plugs*—Pneumatically inflatable devices consisting of a rubber ball, draw chain and ring, and preset, built-in pressure relief valve; compression plugs having a screw mechanism; or other standard plumbing fixtures.

6.2 *Standard Air Pressure Hand Pump with Hose*—Pressure gauge is optional.

6.3 *Vertical-Sided Shallow Pan*.

6.4 *Containment Assemblies*—Assemblies to form temporary dams can be constructed using one or more of the following materials. Refer to Figs. 1-4 for examples of constructed containment assemblies.

6.4.1 Nominal 50 mm (2 in.) thick by 100 or 150 mm (4 or 6 in.) wide wood members,

6.4.2 Polyethylene film having a minimum thickness of 6 mils,

6.4.3 Sandbags,

6.4.4 Duct tape,

6.4.5 Waterproofing membrane materials,

6.4.6 Adhesives and sealants,

6.4.7 Scale or similar measuring device, and

6.4.8 Extruded or expanded polystyrene insulation boards, approximately 30 cm (12 in.) wide.

6.5 *Garden Hoses or Firehoses*—Standard size.

NOTE 3—If firehoses are used, then set the hose of a flow disperser such that the nozzle and initial flow are not in direct contact with the membrane.

6.6 *Plastic Bucket*—Standard wash bucket with bottom panel removed. Four holes measuring approximately 25.4 mm (1 in.) diameter equally spaced around the bucket at approximately 25.4 mm (1 in.) from the bottom.

## 7. Procedure

7.1 Testing should be performed only after waterproofing membrane and flashings are inspected and any deficiencies repaired.

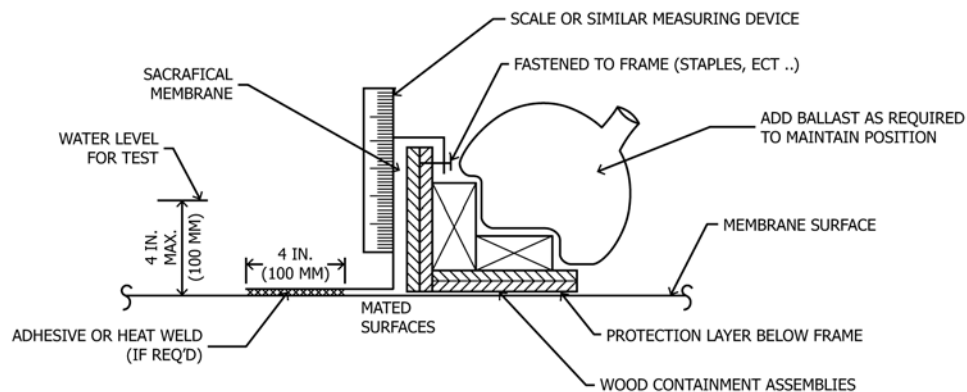


FIG. 1 Containment Assembly—Option No. 1

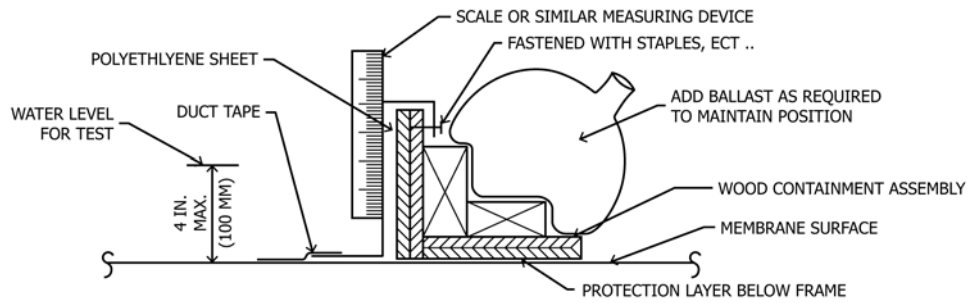


FIG. 2 Containment Assembly—Option No. 2

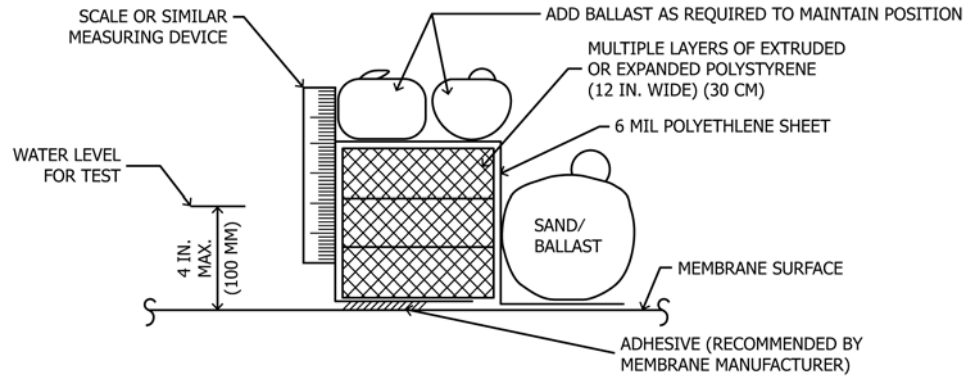


FIG. 3 Containment Assembly—Option No. 3

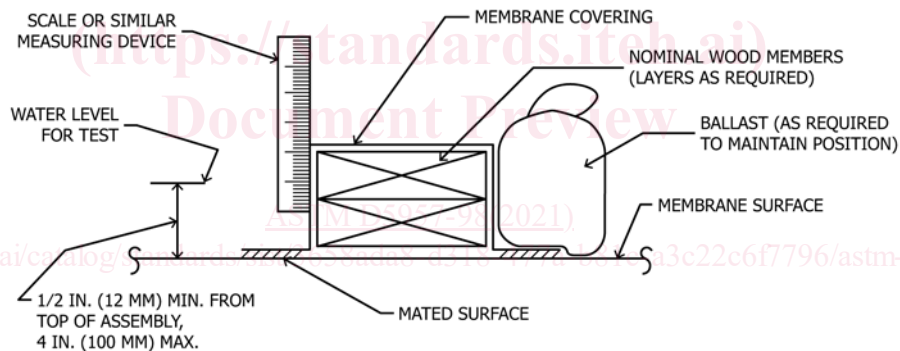


FIG. 4 Containment Assembly—Option No. 4

7.2 Testing prior to installation of drainage layer, protection layer, pavers, or overburden. (See also [Appendix X1](#).)

7.3 If a protection layer is required prior to flood testing, it is recommended that a temporary protection layer be loose laid and removed prior to testing of the waterproofing system.

7.4 *Installation of Temporary Containment Assemblies:*

7.4.1 Construct containment assemblies to be nondestructive, nonpenetrating of the waterproofing installation, and easily removable.

7.4.2 Containment assemblies consist of a sacrificial sheet or a polyethylene sheet adhered to the surface of the waterproofing membrane. Seal the sheet as recommended by the waterproofing membrane manufacturer, or seal it by using a watertight seal, such as duct tape or similar material. Following completion of the testing, cut the sacrificial sheet around the

adhered portion, leaving the adhered portion in place unless otherwise required by the membrane manufacturer.

7.4.3 Containment assemblies also may consist of materials that are the same or compatible with the installed waterproofing system. Such materials could include felts, sheet membrane, and sealants. These materials can be installed in a manner similar to that used for night tie-offs, which can be removed after the flood test or left in place, depending on the waterproofing system utilized.

7.4.4 Securely wrap and attach the sacrificial or polyethylene sheet to the containment frame.

7.4.5 Sandbags can be used to hold the containment frame or may be used in place of the frame and in conjunction with the polyethylene sheet. Seal the polyethylene sheet to the waterproofing membrane as noted above. Make certain that the