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Standard Guide for Evaluating Water Leakage of Building Walls[1]

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1. Scope

1.1 This guide describes methods for determining and evaluating causes of water leakage of exterior walls. For this purpose, water penetration is considered leakage, and therefore problematic, if it exceeds the planned resistance or temporary retention and drainage capacity of the wall, is causing or is likely to cause premature deterioration of a building or its contents, or is adversely affecting the performance of other components. A wall is considered a system including its exterior and interior finishes, fenestration, structural components and components for maintaining the building interior environment.

1.2 Investigative techniques discussed may be intrusive, disruptive or destructive. It is the responsibility of the investigator to establish the limitations of use, to anticipate and advise of the destructive nature of some procedures, and to plan for patching and selective reconstruction as necessary.

1.3 *This practice does not purport to address all of the safety concerns, if any, associated with its use. Establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Awareness of safety and familiarity with safe procedures are particularly important for above-ground operations on the exterior of a building and destructive investigative procedures which typically are associated with the work described in this guide.*

2. Referenced Documents

2.1 *ASTM Standards:*

E 331 Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference[2]

E 514 Test Method for Water Penetration and Leakage Through Masonry[3]

E 547 Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Differential[2]

E 631 Terminology of Building Construction[2]

E 1105 Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Curtain Walls and Doors by Uniform or Cyclic Static Air Pressure Difference[2]

2.2 *American Architectural Manufacturers Association (AAMA) Standards:*

501.2 Field Check of Metal Storefronts, Curtain Walls and Sloped Glazing Systems for Water Leakage[4]

502 Specification for Field Testing of Windows and Sliding Doors[4]

503 Specification for Field Testing of Metal Storefronts, Curtain Walls and Sloped Glazing Systems[4]

3. Terminology

3.1 Refer to Terminology E 631.

3.2 *Definitions:*

3.2.1 *incidental water*—unplanned water infiltration that penetrates beyond the primary barrier and the flashing or secondary barrier system, of such limited volume that it can escape or evaporate without causing adverse consequences.

3.2.2 *water absorption*—a process in which a material takes in water through its pores and interstices and retains it wholly without transmission.

3.2.3 *water infiltration*—a process in which water passes through a material or between materials in a system and reaches a space that is not directly or intentionally exposed to the water source.

3.2.4 *water leakage*—water that is uncontrolled, exceeds the resistance, retention or discharge capacity of the system, or causes subsequent damage or premature deterioration.

3.2.5 *water penetration*—a process in which water gains access into a material or system by passing through the surface exposed to the water source.

3.2.6 *water permeation*—a process in which water enters, flows and spreads within and discharges from a material.

4. Significance and Use

4.1 This guide is intended to provide building professionals with a comprehensive methodology for evaluating water leakage through walls. It addresses the performance expectations and service history of a wall, the various components of a wall,

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[2] *Annual Book of ASTM Standards*, Vol 04.11.

[3] *Annual Book of ASTM Standards*, Vol 04.05.

[4] Available from AAMA, 1827 Walden Office Square, Suite 104, Schaumburg, IL 60173–4268.

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