

Abstract submission:

Test Method for Water Penetration and Leakage Through Masonry Wall Construction

Introduction

Currently the following standards are available for diagnostics of masonry wall water leakage:

- *ASTM E 514 Standard Test Method for Water Penetration and Leakage Through Masonry*
- *ASTM C 1601 Standard Test Method for Field Determination of Water Penetration of Masonry Wall Surfaces*
- *RILEM Test Method 11.4- RILEM Tube*

The two existing ASTM methods involve relatively complex equipment and setup. They only measure water absorption or penetration through the outer surface of the masonry wall.

The RILEM tube is very simple and only measures a very small area. It also measures only water absorption or penetration through the outer surface of the masonry wall.

None of these methods test the ability of the entire masonry wall assembly to resist water penetration to the inside of the building. Yet in many cases, this is the most important thing building owners need to know.

The proposed test procedure, adapted from window & curtainwall testing, recognizes the need to view the innermost layer of the masonry wall system in order to prove that water is not traveling beyond that point, causing leaks, damage and the potential for mold.

Test method executive summary

The method requires the removal of interior finishes in order to gain visibility to the interior side of the masonry construction. If a water resistive barrier, such as “house wrap” is present, this must remain intact during the testing. Typically, drywall, insulation and vapor barriers are removed. In severe leakage areas, this demolition is usually done anyway as a part of the leak remediation.

A spray rack, as used in *ASTM E1105 Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Curtain Walls and Doors by Uniform or Static Air Pressure Difference* is placed on the exterior surface of the masonry wall using the same rack placement (1 foot away) and the same delivery rate (5 gal/sf/hour), however a pressurized chamber is not used.

Since water from the spray rack will run down the wall beneath the spray rack, the area beneath the spray rack can be considered to be within the test area so long as that area is no greater in height than 1.5 times the spray rack itself.

Recommended test duration: One hour minimum

Failure is defined as the appearance of water on the interior side of the innermost layer of the masonry wall construction, inclusive of any water resistive barriers.



Spray rack on exterior face of masonry wall



Interior view of the results of the masonry water spray test

The exposed interior surface of the masonry wall construction is observed during the test.

Locations where leaks are observed are outlined with marker and identified with the number of minutes that elapsed from start of test until the time the outline was drawn.

If the leak grows, another outline can be redrawn and marked with the updated duration, so that a record of the progression of the leak can be made.

At the end of the test, these outlines are photographed and included with the test results. The test report can also include an estimate of the percentage of wall surface which was wet at the end of the test.

Follow-up testing

As is true for most tests, the same test can (and should) be used to validate proposed remedial procedures, and new results can easily be compared with the wall markings that remained from the previous testing. New markings would be applied with a different color marker. The interior face of the test area should be photographed at the end of the test.

Follow-up testing – multiple remediation methods

In order to evaluate results of remedial methods which are being considered, separate but adjacent areas can be remediated and tested at one time. Some remedial methods (such as waterproofing sprays) are applied to the exterior, whereas some (such as new inner barriers) are applied to the interior. With planning and layout, the remedial applications can be partially overlapped to test each method separately and also together where they overlap.

Respectfully submitted,



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