**AAMA Publishes Forensic Water Testing Guideline**

This Informational Bulletin provides an overview of the recently published forensic water testing protocol AAMA 511-08 “Voluntary Guideline for Forensic Water Penetration Testing of Fenestration Products.”

**The Need for a New Protocol**

The last Informational Bulletin article provided an update on the recently revised AAMA 502-08 and 503-08 documents, designed for field testing of newly installed fenestration products. The aforementioned AAMA documents were often misused in determining the source of water penetration in existing buildings. The AAMA 502 and 503 documents do not provide the guidance necessary to perform a systematic forensic investigation, which is necessary to properly identify the source of water leakage in exterior walls. Additionally, the industry has not had a standard forensic guideline to follow, which has added to the confusion and the need for a new protocol.

**The Purpose of AAMA 511**

The purpose of AAMA 511 as a diagnostic testing guideline, (Figure 1), is to re-create water leaks that are known to occur. The notion of “recreating leaks” may seem counter productive, but it is actually one of the fundamental purposes and principles behind the development of this guideline. Just because someone reports, “There is a water leak coming from our windows,” doesn’t really prove that the window is the actual cause of the leak. It is entirely possible that the actual source of the water penetration may originate from the surrounding construction; like perhaps the unsealed splice joints in the masonry flashing above the head of the window.

While ASTM E 2128-01a, “Standard Guide for Evaluating Water Leakage of Buildings”, provides the foundation for field investigations of water leakage in building walls, the AAMA 511 document is designed to provide guidance and direct the professional regarding the required information and steps taken when performing the forensic investigation.

**Step by Step Guidance**

ASTM E 2128 identifies seven steps for the forensic investigation. AAMA 511 supports these steps and provides additional...
information regarding each step. The steps are grouped into two main categories, including four steps “prior to testing” and three steps “during and after testing”.

Starting with information gathering, the forensic investigator performs the following:

- Review project documents (specs, shop drawings, installation instructions, etc.);
- Evaluate the design concept, water management concept, and critical details (flashing, sealant, weeps and interfaces);
- Review the building service history (maintenance records, interview building personnel, etc.);
- Perform a visual inspection; (Figure #2). This includes observation of the interior and exterior of the building while considering possible workmanship and product deficiency issues; with the intent of developing a hypothesis regarding the possible water leakage source.

**Objective of this Process**

The objective of this process is to identify the leak path(s) through simulation (testing) of the weather events that produced the reported water penetration issues. This requires gathering actual weather data and information regarding when and where the water leaks were noticed. In the end, the intent is to line-up the actual weather events and conditions with the observance of water penetration, (e.g. Heavy rains measuring over 2”; along with 35 mph winds, occurred during a 12-hour period on April 10th and 11th, 2008. During that time, the maintenance department witnessed water on the 1st floor at the North end of the lobby.)

After gathering the actual weather data, the forensic investigator can calculate the approximate differential air pressures the exterior wall experienced during the actual wind-driven rain events that produced the reported water penetration. This information is then used to establish water test pressures. Per the guideline, water testing starts without the application of a pressure differential, to establish a baseline of performance. This is then followed by testing with pressure.

**Maximum Pressure Differential**

After the test pressure differential is determined from actual weather data it is used to calculate the maximum air pressure differential applied during testing. If however; and this is really important, the maximum air pressure difference exceeds 2/3rds of the rated water penetration resistance test pressure of the fenestration product”, at least one test is required to be conducted at the 2/3rds performance rating first. This is meant to determine if the fenestration product performs at the required field performance level stipulated in AAMA 502 and 503 prior to testing at higher levels.

If the calculated maximum value exceeds the rated performance value of the product and the specimen is tested at the calculated value, the investigator is to consider the fact
that the product was tested beyond its rated performance value when drawing any conclusions on product performance.

**Isolation Procedures Used During Testing**

It is critical to use isolation procedures during testing to differentiate between “fenestration product performance” and “interface and/or construction performance”. To accomplish this, the guideline stipulates that a sequence be established which includes isolation water testing (Figure 3).

**The Sill Dam Test is Still Alive**

Some industry experts have poked a little fun about the sill dam test (“Dam sill test”) over the years (Figure 4), but it does have merit and has been used effectively many times when properly applied. While it was removed from AAMA 502 and 503, because it does not relate to product labeled performance, AAMA 511 includes it as an “optional” investigative test.

When observation and initial water testing leads the investigator to believe that the leak is due to a defective fenestration product, the optional sill dam test offers an additional way to investigate the leak path. Considering that this test may subject the fenestration product to pressures exceeding that of the known weather event, it is not to be used as the sole means of establishing weather or not the product is defective.

**Conclusion**

We believe this new guideline provides significant improvement to the way proper forensic investigations will be performed. We encourage you to be a part of the solution by advising those discussing the need for field testing of an existing building about this new procedure.

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The purpose of this Architectural Testing Informational Bulletin is to update you on the new guideline. The information contained herein is not manufacturer or product specific, and is provided as advisory information to our customers.