

Above-Grade Exterior Walls: Do You Really Need “Waterproofing”?

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Waterproofing—it commonly appears in keynotes on wall sections and details. This is fine if the keynotes are pointing to waterproofing applications on a below-grade exterior wall, underneath an above-grade plaza deck system, or under ceramic tile in a shower pan assembly. The problem is the frequent identification of “waterproofing” behind exterior wall coverings for walls located above grade. You are probably aware that the building code requires protection from water behind exterior wall coverings. That is true; however, the issue here is to what level does that protection need to be?

The intent of this article isn’t to dissuade anyone from using waterproofing for above-grade exterior wall assemblies, but to point out that you may be spending excess money for a system that provides no additional benefit over less-expensive products available on the market. In addition to increased cost, the inclusion of a waterproofing system in an above-grade exterior wall assembly may also create consequential problems.

Defining a “True” Waterproofing System

According to ASTM D 1079, *Standard Terminology Relating to Roofing and Waterproofing*, “waterproofing” is defined as the “treatment of a surface or structure to prevent the passage of water under hydrostatic pressure” (underlining added). The NRCA (National Roofing Contractors Association) *Roofing and Waterproofing Manual* has a nearly identical definition. Hydrostatic pressure is described in ASCE 7, *Minimum Design Loads for Buildings and Other Structures*, as the pressure caused by stagnant water loads applied over a surface. This pressure is exerted downward, lateral, and upward (i.e. uplift or buoyancy).

To understand hydrostatic pressure, imagine a swimming pool filled with water. The bottom surface of the pool is experiencing a downward pressure generated by the weight of the water. Similarly, the vertical sides of the pool are experiencing a lateral pressure. If a hole

was created anywhere, water would leak out under that pressure. A boat on the water is staying afloat due to the upward pressure of water against the bottom surface of the boat. If you put a hole in boat, water would leak into the boat under that pressure. Using the definition and explanations above, an above-grade exterior wall would not experience hydrostatic pressure except in flood conditions; therefore, a true waterproofing system is not required.

Waterproofing systems that conform to the definitions provided above will have permeability characteristics resembling those of vapor retarders, which can create other problems in above-grade exterior wall assemblies. The location of a vapor retarder is not something to take lightly, and should be evaluated based on a building’s geographical location. In many cases, a vapor retarder is installed on the interior side of an exterior wall assembly, in which case a waterproofing system installed toward the exterior surface would create a double vapor retarder condition, thereby trapping any moisture present in the wall. This trapped moisture could lead to mold and corrosion within the wall assembly.

So, if a waterproofing system, as defined by ASTM and NRCA, is not necessary for above-grade, exterior wall assemblies, what system is? Since above-grade exterior walls are not subject to hydrostatic pressure, then those systems that can resist the passage of water *not under hydrostatic pressure* would be the logical assumption. According to ASTM D 1079 and the NRCA *Roofing and Waterproofing Manual*, “dampproofing” is the proper term for these types of systems.

Alternatives to “Waterproofing”

Many people, even those in the construction industry, will confuse dampproofing materials with waterproofing materials and specify the former where the latter is required; thus, resulting in eventual moisture intrusion. Dampproofing may be utilized in below-grade applications, but only where hydrostatic pressure is nonexistent. A geotechnical report should indicate the presence of groundwater and potential hydrostatic pressure.

There are several materials complying with ASTM’s definition of dampproofing, but the most common—one

that most people associate with dampproofing—is the unmodified bituminous type, with or without fiber reinforcement. This common black asphaltic material is frequently used to coat the interior surfaces of planters, the unexposed surfaces of retaining walls, the cavity face of the interior wythe of a masonry cavity wall, and the backup surfaces of masonry veneers. Regarding the latter two, the use of a liquid or mastic material is desirable over sheet materials because of the many wall ties that are required. In most cases, bituminous dampproofing is used in concealed locations due to its inability to resist deterioration from ultraviolet light.

For above-grade exterior wall applications, there are other products that could be considered “dampproofing” systems per ASTM’s and NRCA’s definitions. However, manufacturers avoid using the term “dampproofing” due to its close association with unmodified bituminous materials. Instead, manufacturers will use the building code term of “water-resistive barrier” or another term growing in popularity, the “air barrier,” if the material can qualify as either. In some cases, the dual role of a water-resistive barrier and an air barrier may be performed by the same material.

The *International Building Code* (IBC) states that a “water-resistive barrier” is required behind exterior wall coverings. The purpose of the water-resistive barrier is to prevent moisture from migrating further into a wall assembly and to direct the water, through gravity, back to the exterior. The prescriptive requirement of the IBC requires a No. 15 asphalt felt complying with Type I felt per ASTM D 226, *Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing*. It is easy to understand why asphalt felts are not “waterproofing.” The building code permits the use of other approved materials for water-resistive barriers, but even then, the prevention of water intrusion under a hydrostatic head is not a requirement.

Drawings and Specifications Coordination

When identifying materials and products on drawings, it is best to use the terms that are technically correct and recognized as such by the construction industry. Additionally, the terms used should coordinate with the specifications. If it is decided to utilize a true waterproofing membrane in an above-grade exterior wall, then the use of the term “waterproofing” would be

acceptable in a drawing note. However, if a non-“waterproofing” product is used, identify the product by the term used in the specifications, such as “air barrier” or “water-resistive barrier.” In all cases, do not identify a product by its proprietary name.

Drawings should indicate the extent of the selected material with details focusing on the material’s integration with other building envelope systems, such as windows, curtain walls, and other exterior wall materials. For example, the building code requires flashing with the water-resistive barrier to ensure that any water that penetrates the wall covering material is directed back to the exterior; thus, details should identify flashing around wall openings, shelf angles, and other terminations of the barrier material.

Although the key concept is to prevent water from penetrating the exterior wall system which would lead to mold, mildew, and rot of interior finishes and concealed wall components, it is not necessary to use a true waterproofing system. Even if the intent is *not* to use a membrane that can resist hydrostatic pressure, the use of the term “waterproofing” on the drawings for such barrier applications can be confusing and may generate questions by contractors—especially if “real” waterproofing is appropriately indicated elsewhere in the documents (i.e. basement walls). If not questioned by the contractor, the owner may be paying extra for a product that is unnecessary—and even if the mislabeling is discovered before installation, the owner may not receive a full credit for the cost difference.

To comment on this article, suggest other topics, or submit a question regarding specifications or construction documents in general, contact the author at ron@specsandcodes.com.

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