

# Waterproofing: The Responsible Choice

**I**n ever-increasing numbers, single-family and multi-family homeowners are demanding construction products and services that add value and longevity to their homes in an environmentally acceptable, ecologically friendly manner. Today, this demand is migrating downward — to the basement.

## Dampproofing vs. Waterproofing

Despite the fact that the majority of homebuilders questioned in the National Home Builders Association's annual surveys report basement leaks that cost an average of \$1,000 to \$2,000 per callback, in many cases the industry has been slow to migrate from traditional dampproofing to genuine waterproofing materials. Until recently, one's basement was an "out of sight, out of mind" consideration. Now, the tide seems to be slowly turning in favor of waterproofing products as homeowners, builders and code officials seek improved construction practices that minimize the negative effects of wet basements and maximize the available living space in today's new homes.

The distinction between waterproofing and dampproofing products may not be readily apparent, yet the superior performance of waterproofing products sets them apart. Dampproofing products, typically asphalt emulsion or cutback coatings, retard moisture penetration under non-hydrostatic conditions. Waterproofing products prevent water penetration under intermittent or continuous hydrostatic pressure. The International Residential Code and the Inter-



national Building Code require the use of waterproofing products in high water table conditions and for those portions of the foundation that enclose livable space.

In addition, *The Building Foundation Design Handbook*, prepared under the auspices of the University of Minnesota Underground Space Center, suggests that intermittent hydrostatic pressure can occur after rain showers, irrigation, or snow melt. Virtually all basement foundation walls are subject to this type of intermittent hydrostatic pressure; consequently, it just makes sense to waterproof the basement.

## Trends to Watch

One of the factors driving the trend towards waterproofing basements is a

general increase in new home prices, which can make expansion through renovation more popular than moving. Another trend is the general decrease in the amount of land available for new

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construction, combined with growing concerns that environmental resources be conserved.

In today's world, it makes good economic and environmental sense to take advantage of an existing asset — the basement — rather than expanding above-ground living space, which further depletes finite building material and land resources. A basement can be more than just storage space. It can be a home office, a family room, a personal gymnasium or a playroom for the kids. And, it can be any or all of these things at a fraction of the cost of expanding the above-ground living space.

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A wet basement is unlivable and potentially unhealthy. Moisture vapor whisked into today's energy-efficient homes can cause mold, mildew, and rot. Fortunately, there are many waterproofing products that provide moisture protection superior to traditional dampproofing methods. When waterproofing products are properly applied and used in conjunction with insulation and/or drainage materials, it is possible to keep moisture out of structures for 30 years or more.

### **An Overview of Waterproofing Solutions**

Approved waterproofing product types are listed in the building codes, and these include:

- Two-ply hot mopped felts.
- Not less than 6-mil polyvinyl chloride.
- 40-mil polymer modified asphalt.
- 6-mil polyethylene.
- Other approved methods or materials.

This final, catchall category is for products that don't fall into any of the categories above it. Approval is generally determined by testing agencies affiliated with the code agencies, which confirm performance through research and testing.

Waterproofing products can be used on a stand-alone basis; however, most water-

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proofing manufacturers recommend that their materials be used as part of a waterproofing system. The typical waterproofing system consists of three components:

1. The waterproofing membrane.
2. An insulation, drainage or protection course.
3. An exterior or interior drainage system that funnels moisture into the storm sewer system or sump crock.

## Understanding Waterproofing Systems

Insulating the exterior basement wall during home construction protects the waterproofing membrane, minimizes heat loss through the basement wall, reduces home

energy use and lowers utility bills. Wall insulation is preferred to insulating the basement ceiling because less insulation is required (approximately 21 percent less in a standard 36 foot by 48 foot basement). With wall insulation there is less likelihood of thermal and air leakage. An uninsulated foundation may account for up to 50 percent of the heat lost from an otherwise tightly sealed, well-insulated house. Insulating the basement wall from the exterior also prevents freeze-thaw damage to the foundation and maximizes usable interior space.

Currently, there is some concern that many exterior insulation products are susceptible to insect infestation. Insects use the insulation as a pathway into the house and are a cause of concern to homeowners and building code officials alike. The U.S. Department of Energy is working with regulatory groups to establish regulatory guidelines for cost-effective, insect-free thermal protection.

The installation of pre-fabricated drainage panels is an alternative to the use of exterior foundation insulation. In addition to protecting the waterproofing membrane from damage by the backfill, prefabricated drainage panels are designed to facilitate

the movement of ground water, to provide an unobstructed path for water movement from grade to footing, and to collect and move water away from the foundation. In areas subjected to continuous hydrostatic pressure and high water tables, the combination of a waterproofing membrane and drainage panels minimizes water intrusion into the basement and ensures a dry, comfortable living space.

The third component in the waterproofing system is the exterior or interior drainage system, which collects and funnels ground water away from the foundation wall into the storm sewer system, to the daylight of roadside drainage sewers, or to a sump crock. The traditional drainpipe or tile system, covered with gravel (up to and on the footing), and the newer strip drain system are both effective methods for collecting and transporting water away from the foundation wall. Although strip drain systems are generally considered to drain water more effectively at a reduced installation cost, traditional pipe and aggregate systems, properly installed by a specialty sub-contractor, remain a viable alternative for many applications.

## Conclusion

Waterproofing new residential foundations should be more than an “out of sight, out of mind” consideration. Waterproofing the foundation maximizes the home’s available living space, while conserving land and the finite natural resources required for building products, such as the petroleum, water, timber, and minerals that are wasted when cheaper, less effective construction practices are employed.

When a home is waterproofed rather than dampproofed, its interior environment is improved because the likelihood of water intrusion, high levels of condensation, mold growth, etc., is reduced. Finally, the addition of exterior foundation insulation to a waterproofing application reduces the home’s overall energy requirements and the associated costs to produce that energy.

For all these reasons, waterproofing new building residential foundations is one of the best decisions that today’s environmentally responsible home buyer can make. **AR&W**