



Ultimate Guide to STOP Basement Water Leaks

by Walt Keaveny, Risk Manager, MS, PE, PG

Three Things Cause Problems in Homes --- Water, Water, and Water!

Water is a home's greatest enemy. Due primarily to gravity, water often finds its way into basements. In fact, over half of all basements have some moisture issues. Basement walls and floors are the most common locations for water leaks in a home. This guide may help to identify the source of water to stop the leak.

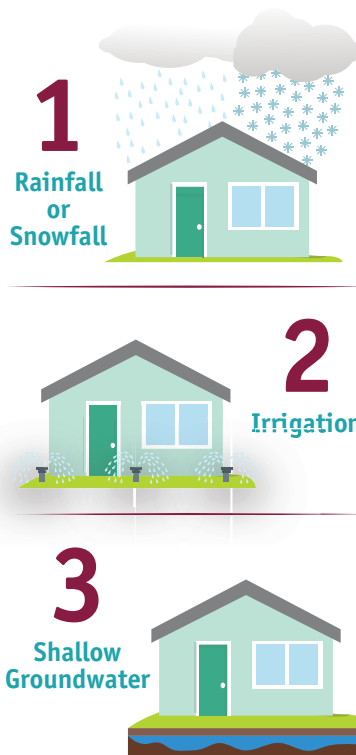
Basements are essentially below-grade space surrounded by soil. Soil generally contains a significant amount of moisture, and that moisture normally causes higher humidity and some dampness or condensation in basements. This can often be corrected with simple adjustments to the heating, ventilation, and air conditioning (HVAC) system, or by using a dehumidifier.

What is not normal is a water leak that is seen trickling. This is important to correct. Fortunately, water leaks in basements rarely represent a structural deficiency. However, it is beneficial to terminate the source of water to avoid: (1) saturating soils that support the foundation, (2) rot and degradation of wooden framing, (3) damage to drywall and finishes, (4) damage to household items, (5) mold, and (6) vermin.

Three Major Water Sources Cause Basement Leaks

By far the most common source of water for basement leaks is rainfall. Hundreds or even thousands of gallons of water can fall on a roof from a single rainfall event. In colder climates or seasons, snowmelt may replace rainfall as a source

of water. Another major source of water is irrigation. Any irrigation near the foundation should be closely monitored to avoid generating excess water. The last major source of water is shallow groundwater. If groundwater is present, the elevation can fluctuate over time depending on the season, frequency of rainfall, amount of irrigation, and nearby bodies of water.



Water Migration into Basements

Any water that makes its way to the foundation will be stopped by basement walls and floors made of either poured concrete or concrete blocks...right? Wrong! It's important to note that concrete is porous and does not stop water migration. In fact, concrete actually absorbs water like a wick due to a phenomenon called *capillary suction*. Concrete walls and floors may also have normal shrinkage cracks, seams, joints,

windows, and utility penetrations that can accelerate water migration.

Damp Proofing versus Waterproofing

The exterior surface of most basement walls in newer homes is typically spray-coated with *damp proofing*. Damp proofing is used as a capillary-suction moisture break on concrete walls (a plastic barrier below the floor serves the same purpose). If a significant source of water is identified before a basement is constructed, then a waterproofing membrane is typically installed instead of damp proofing. Waterproofing serves to capture water that contacts walls and conveys it to foundation drains (aka, drain tiles). This avoids the build-up of hydrostatic pressure and resultant leaks. Foundation drains convey water to a daylight discharge point or to a sump pump.

White Powdery Deposits

Don't be alarmed if there are some limited white powdery deposits on concrete basement walls or floors. This is relatively common. It is called *efflorescence*, and it is simply caused by moisture in concrete that evaporates, leaving behind mineral deposits. This is similar to the white residue remaining in a pot after boiling away the water. A dilute solution of white vinegar and water can be used to wash it away.

Got a Leak – Need to Seek the Source

Basement leaks can generally be avoided with routine maintenance. If a leak does occur, most often it is relatively simple to stop. The key is to identify the source of water. First, consider a few basic

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questions. Where does the leak occur? When did the leak first start? Is it periodic or constant? Does it get worse after rainfall or irrigation events? Once you've answered these foundational questions, use the checklist to the right to identify the source of the water.

Basement Waterproofing Specialist

Hopefully this guide helped identify the source of water and stopped the leak. If not, it may be prudent to call a basement waterproofing specialist for additional diagnosis and recommendations. The local Building Official is a good source of referrals for specialists. The specialist may dig a hole adjacent to the basement wall near a leak to identify an exterior water source. The specialist may recommend sealing any leaking areas of concrete walls or floors by injecting a special sealant. In rare cases, if the water source cannot be stopped, the specialist may recommend either an exterior or interior drainage system to intercept and properly discharge water.

Water is the enemy, but it can be defeated with routine maintenance and prudent response to any leaks.



Water Source Checklist

- ☐ Is there soil erosion, soil settlement, soil saturation, standing water, or flooding around the foundation?
- ☐ Do rain gutters overflow due to being clogged with debris?
- ☐ Do rain gutter downspouts and extensions flow freely, and discharge water at least 5 feet from the foundation?
- ☐ Do any sump pumps operate properly?
- ☐ Has the foundation drain system been checked for clogs?
- ☐ Is the ground surface at least 6 inches below the top of the basement wall?
- ☐ Does the ground surface slope downward at least 6 inches in the first 10 feet away from the foundation? *(If 10 feet of land is not available, does the water drain away in a swale or ditch located at least 5 feet from the foundation, or collect in area catch basins?)*
- ☐ Are there any barriers that keep water from draining at least 5 feet from the foundation, such as flowerbeds, edging, berms, planters, sidewalks, patios, or driveway?
- ☐ Does water drain to the foundation from surrounding properties?
- ☐ Do any storm drains and area catch basins operate properly?
- ☐ Is the ground surface within 5 feet of the foundation receiving excessive irrigation?
- ☐ Has the irrigation system been checked for leaks?
- ☐ Do drainage systems in window wells and sunken stairwells operate properly?
- ☐ Is the groundwater elevation below the basement floor elevation?
- ☐ Are there leaks or overflow from the pool or spa, associated piping, or water features?
- ☐ Are there leaks from sewer pipes or the septic system?
- ☐ Are there leaks from faulty, damaged, or frozen pipes and faucets? *(To check for non-visible leaks, turn off all water and check to see if the water meter stops. Also check for abnormally elevated water bills.)*
- ☐ Is there overflow from floor drains, tubs, or toilets?
- ☐ Are there any leaking pipes or hoses from the water heater, humidifier, water tank, dishwasher, or washing machine?



About the author: Walt Keaveny, MS, PE, PG is the Risk and Underwriting Manager for America's leading new home warranty company, 2-10 Home Buyers Warranty. Mr. Keaveny is licensed as both a Professional Engineer and Professional Geoscientist with over 30 years of engineering and construction experience. His articles have been broadly distributed by the NAHB and local HBAs.

