Water, Water Everywhere

Solutions for wet-basement problems

BY JOSH GARSKOF

If you've got water in your basement, you're not alone. A whopping 60 percent of basements in the U.S. have moisture problems, according to an estimate by the American Society of Home Inspectors. Which isn't that surprising, when you look at a basement the way *This Old House* general contractor Tom Silva does: "A basement is just a big hole in the ground," he says. "And nature wants to fill holes with water."

Water can come from rain washing down the foundation walls from above, groundwater seeping in from below, a leaking pipe, even a misdirected sprinkler. Whatever the source, it will find its way through even the tiniest flaws in a foundation. Apart from damage to possessions and furnishings, a waterlogged basement fills a house with excess humidity, which corrodes pipes and electrical panels, encourages the growth of mold and rot, and attracts insects.

On the following pages, Tom shows how he dries up a basement. The first steps—plugging cracks, extending downspouts, covering window wells—are simple, quick, and inexpensive. If those don't solve the problem, he moves on to more elaborate (and costly) fixes, which generally require professional help. Tom recommends using a company that specializes in basement waterproofing (see "Find a Waterproofing Pro," right) and sticking to the proven strategies outlined here. "Solutions that sound too good to be true probably are," he says.

FIND A WATERPROOFING PRO

When you have an intractable water problem, it makes sense to hire a waterproofing contractor with the equipment and expertise to do the job quickly, safely, and effectively. Steer clear of outfits that offer a one-size-fits-all approach. You want options based on a careful assessment of your particular conditions. The National Association of Waterproofing and Structural Repair Contractors, a trade group, lists about 140 member companies on its Web site, *www.nawsrc.org*.

Quick Fixes

Look for the obvious places where water can enter. Plugging those leaks may be all you need to keep your basement dry.

▲ FILL CRACKS AND GAPS

Problem: Whether because of settling, poor workmanship, or just old age, foundations can develop seams, cracks, and gaps that are an open invitation for water. Look for cracks in corners, under windows and doors, and where the basement floor meets the walls. Gaps often open up around windows, where an exterior stairwell meets the foundation, and anywhere pipes penetrate.

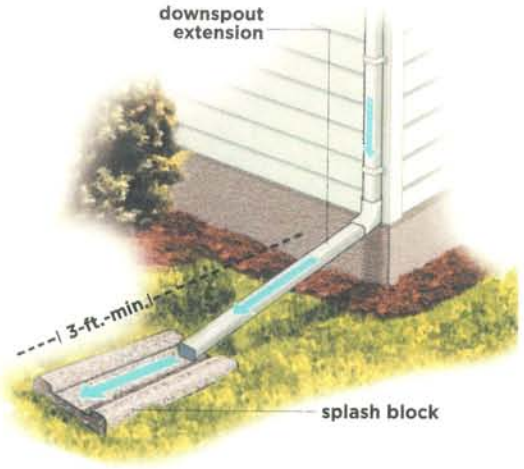
Solution: Tom patches cracks in concrete with hydraulic cement. "It expands, so it's almost like welding the concrete back together. And it sets fast, so you can plug holes even if water is actively coming through." For masonry foundations, he digs the old mortar out of the joints and fills them with new.

▲ COVER EXPOSED OPENINGS

Problem: Many basements depend on window wells to bring in natural light, and on an exterior stairwell that provides access to and from the outside. Both these features make great rain catchers if not properly covered. If you see dark water stains under the windows and on the steps and sides of the stairwell, there's a good chance they're leaking.

Solution: Add clear plastic window-well covers, which let in light while keeping out water and debris. Standard sizes are available in home centers for $10 to $40. Custom covers can cost as much as $125.

Refit a weathertight metal or fiberglass door over the stairwell. They're sold in lumberyards for between $200 and $300.



▲ IMPROVE GUTTER SYSTEM

Problem: An average-size roof sheds 1,000 gallons of water for every inch of rain that falls. If the gutters leak and overflow, or downspouts don't extend far enough from the house, all that rainwater could end up in your basement.

Solution: Attach downspout extensions and add splashblocks to carry the water at least 3 feet from the foundation (above).

If you don't like the look of extensions, or they're in inconvenient spots, bury a drainpipe to carry water to daylight or to a drywell—a perforated barrel buried at least 8 feet from the foundation (below). A filter at the top of the downspout keeps the drain clear; filter fabric wrapped around the drywell keeps its holes clear.

Keep gutters in good shape with twice-yearly cleanings and necessary repairs.

ILLUSTRATIONS: IAN WORPOLE

FLOOD STOPPERS

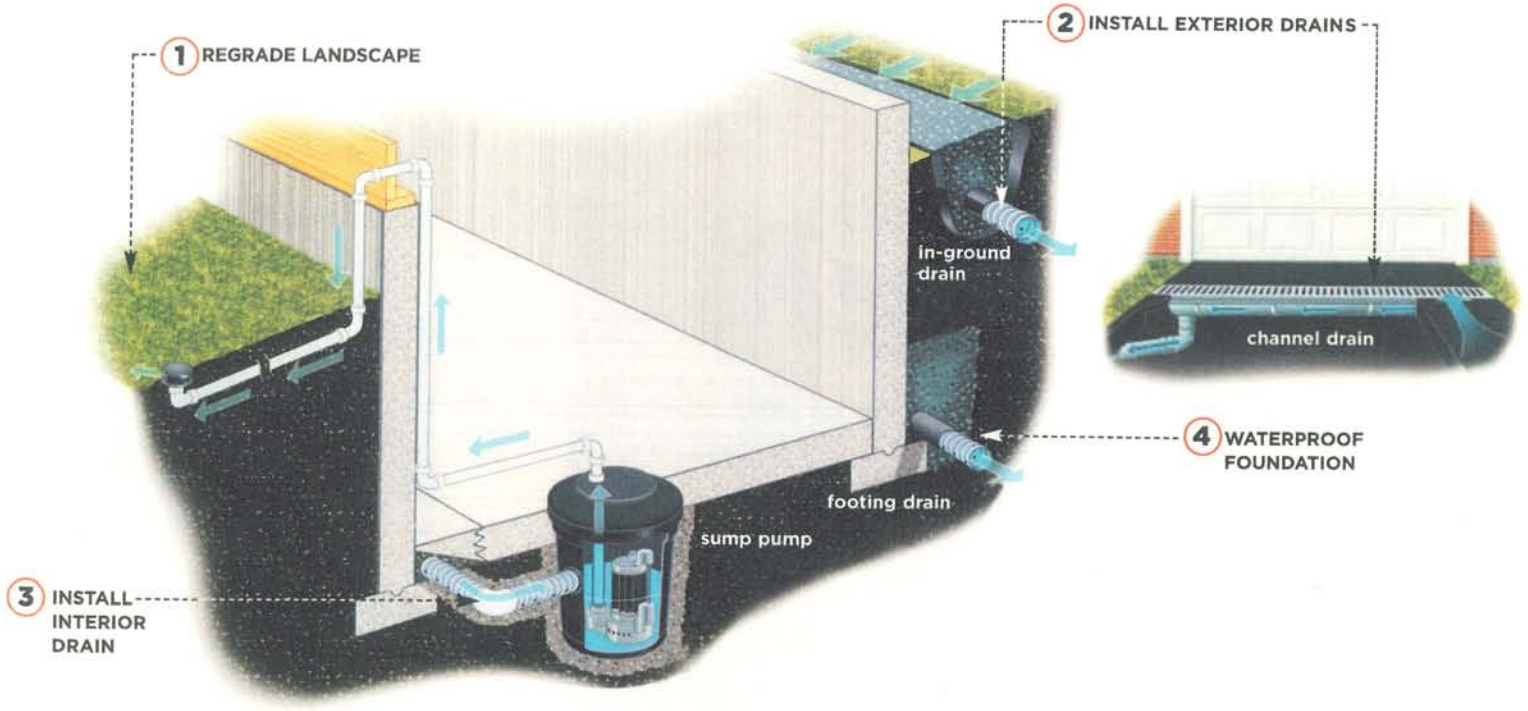
Even a bone-dry basement is still vulnerable to flooding from a source we all take for granted: household plumbing. A burst washing-machine hose, a cracked toilet, frozen pipes, or a rusted water heater can spew countless gallons for hours or even days, unless you have an electric shutoff valve. Mounted on the water-supply main just downstream from the main shutoff valve, this device stops water flow automatically in the event of a plumbing catastrophe.

The most basic automatic shutoffs sense an unusual or prolonged flow and close down the valve. The more advanced device at left employs wireless, battery-operated sensors with probes placed beneath water-using appliances. When a probe detects water, the sensor signals the electric shutoff to close. (The system can also notify your home-security company in the event of a shutdown.) In cold climates, a wireless freeze sensor is a useful add-on. By signaling the main valve to close when a supply pipe's temperature drops below 38 degrees, it protects against the flooding that can happen after frozen pipes burst.

—Scott Schilling

Professional Solutions

When quick fixes aren't enough, then more elaborate—and expensive—measures may be in order. The illustration below shows four different ways to deal with a persistent wet basement, ranked in order of increasing complexity. Choose the solution that best fits your situation and budget and causes the least disruption to your home and property.



1 REGRADE THE LANDSCAPE

Problem: Ideally, a house should sit up on top of a hill so that water always runs away from it. But often the backfill against the foundation has settled, or the surrounding property—a yard, patio, driveway, or walkway—is pitched toward the house.

Solution: The easiest fix is to regrade around the foundation. Ground should slope away from the house at least ½-inch per foot and be at least 8 inches away from any wood trim or siding.

Another option is to create swales and bumps in the yard to redirect water flow. This often requires bringing in heavy earth-moving equipment and uprooting trees and shrubs.

2 INSTALL EXTERIOR DRAINS

Problem: Surface water is running toward the foundation but regrading isn't practical (e.g., your entire neighborhood funnels water toward your basement).

Solution: Dig a defensive line in the yard or at the edge of a driveway or walkway to capture and redirect the surface water before it reaches the house. In yards, make an in-ground drain by burying a perforated drainpipe in a stone-filled trench. Slope the pipe so water heads to a drywell or an above-ground opening a safe distance from the house.

On improperly sloped walkways and driveways, a channel drain with a metal grate, set flush with the surrounding surface, serves the same purpose.

3 INSTALL INTERIOR DRAIN

Problem: A high water table is constantly pushing against the foundation from below, or grading and gutter work hasn't made a difference when it rains.

Solution: Put in a sump pump. The sump, a lined pit punched through the basement floor, collects the rising water; the pump kicks on automatically when the sump is filled, expelling water through a pipe to the outside. (A battery backup is recommended to keep the pump running if power goes out in a big rainstorm.) Water exiting the pipe should discharge at least three feet from the foundation.

If the sump alone doesn't do the job, it can be connected to a perforated drainpipe buried under the slab around the perimeter of the basement floor. This so-called French drain is highly effective, and a good precaution if you have (or plan on having) a finished basement. Just be prepared: Installing a French drain involves cutting though the floor, burying the pipe in crushed stone, and patching the floor; a messy, noisy, and costly undertaking.

4 WATERPROOF THE FOUNDATION

Problem: Nothing else has worked, or you don't like the idea of being dependent on a sump pump.

Solution: Dig out around the foundation, waterproof the exterior with high-tech membranes and drainage fabrics, bury a perforated footing drain in crushed stone and lead it to daylight or a drywell. "I would only do that if the problem was very drastic, or if the landscape was being excavated anyway for another purpose," Tom says. "It's a very expensive proposition."

For help identifying the source of your basement problem, go to www.thisoldhouse.com or America Online Keyword: This Old House and type "wet basement" in the search box.