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AMONG HOME OWNERS, FEW THINGS CAN MATCH THE AGGRAVATION caused by a wet basement. And there's no comfort in company: According to one estimate, 60 percent of all houses in the nation have foundation leaks, and the number climbs to 90 percent for houses built with cinderblocks. Water is a home's greatest enemy. Accumulating in the basement even in tiny amounts, it can warp floorboards (even in rooms above), rust the life out of appliances and turn finished rooms into mildewy caves unfit for habitation. Just as bad is the considerable cost of trying to find the leaks and fix them.

to drain all *the water that might leak into a house, a perimeter drain must be laid next to the footings, below the level of the basement floor.*

Water seepage is like cancer, says Tom Maiorano, president of U.S. Basement Waterproofing in Pleasantville, New York, a business he runs with his sons Dean and Ron. "It shows up in one little spot, and before you know it, you've got a big problem."

Even crawl spaces and poured slab foundations are susceptible to water damage. If drained improperly, they can trap moisture and leak. Hidden from view, the problem is easy to ignore until it's too late. John Annunziata, a licensed home inspector in Westchester County, near New York City, slid around one wet crawl space and found that the beams were so bad "you could squeeze them like a sponge."

As frustrating as basement and crawl-space leaks are, many can be fixed with minor effort. "In a lot of cases, the problems occur because the site isn't right," says Norm Abram. This condition can be corrected, he says, "by helping the natural drainage away from the foundation." To do this, Tom Silva suggests clearing away plantings and gently building up the soil to slope away from the foundation, with a grade of at least one inch per four feet. (To protect against rot and insects, however, the soil should be kept at least eight inches away from wood siding.)

Downspouts can also be a source of trouble. Some end right at the foundation, where, during rainstorms, pools of runoff water can seep through cracks in the walls. Simply re-routing the water by extending the downspout a few feet away from the house can help. For bigger problems, the downspouts

A foundation coating makes the walls damp-proof—they'll resist the penetration of moisture—but not waterproof. The 60-mil-thick fibered cement coating is smeared on walls exposed by the excavation. For extra protection, a 22-mil-thick plastic rubberized sheet is smoothed over the cement. It forms a solid barrier that will stop water from penetrating unseen cracks.


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can be connected to a pipe buried at least 18 inches deep that relies on gravity to drain water farther away from the foundation.

But not every problem has such an easy fix. At certain times of the year, the rising water table can force itself into basements through a phenomenon known as hydrostatic pressure, which nothing can stop. "I've seen it actually squirting up through basement floors and into the air," Tom says. In these cases, no amount of patching, regrading or drainage pipe will help. "You've got to find where the water's coming from and get it out of there."

During a particularly fierce Nor'easter in October 1996, Betty McMoran found the basement of her Connecticut home filling with water for the first time since the house was built in 1956. It was hardly a deluge: A carpet-cleaning company sucked up just five gallons of water. Still, she says, "when I saw that water, I knew it was only going to get worse." During an inspection, Tom Maiorano found the problem: McMoran's house had been built into a rocky hillside, and runoff water drained directly against the front foundation wall. To complicate things, a puddle of water near the front door turned out to be a spring, which kept the ground saturated year-round. "The miracle is that this was her first leak," he says.

When regrading is not the answer, Maiorano suggests building either an interior or an exterior perimeter drain to stop leakage. McMoran chose the exterior system, because she didn't want to rip up the carpet and floors in her finished basement. "I wanted the mess outside," she says. First, work crews excavated around the front of the house down to the footings. They laid a drainage pipe in gravel to draw water away to a deep runoff trench dug to one side of the yard. As a precaution, the foundation walls were waterproofed not just with a 60-mil coating of tar, but with a 22-mil rubberized sheet and an inch of foam insulation as well. "It's a lot of material," Maiorano says, "but there's no other way to make sure it works." Finished in three days, the new drains and the waterproofing were costly, but the expense seemed worth it when the next storm arrived. "Guess what—no water!" she says with delight. "I ran down about eight times to check."

McMoran may now be free of water worries, but her friend Pinky Markey didn't get off so easily. After the Nor'easter, her insurance company declared her basement disaster "an act of God" and covered all damage. But to prevent another flood, the Markeys must build an exterior perimeter drain around their entire house.

Markey lately finds herself yearning for a basement-free life. "I want to do the Henry David Thoreau thing," she says. "Give me some woods, and give me a cabin. We humans can survive in the simplest of environments, as long as it's warm." And dry.

Drainage Details: 1. Waterproofing expert Dean Maiorano maneuvers an excavator across the front of a house and digs down to the footings. 2. After the foundation is sealed, corrugated drain pipe is laid in the trench, with gravel spread on top. Sheets of rigid insulation protect the waterproofing. 3. After backfill reaches the halfway point, a second drainpipe is added to collect runoff from downspouts. 4. Both pipes lead to buried collection pipes.

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STOPPING LEAKS FROM THE INSIDE

With the aid of a hydraulic jackhammer, a channel was chiseled into the basement slab, parallel to one of the foundation walls.

DURING A RAINSTORM AT THEIR NEW house in Brewster, New York, David Angley and his family found their downstairs recreation room filling with water. "There was nothing we could do but stack up the furniture, roll up the carpets and start pumping it out," he says. The cause? An inspector later found that the exterior footing drains had been damaged during construction.

They could be replaced, but a cheaper solution lay indoors: running a drainpipe along the basement wall. For $4,000, a crew jackhammered a trench into the basement floor, then dug it out so 4-inch corrugated piping with slits on all sides would lie below the concrete slab. Interior drainage systems require a gravity feed or a sump pump, which is installed in a shallow well. Once the pipe was placed in the trench and covered with gravel, a plastic vapor barrier was laid on top and then the excavation was patched with cement. "We've had lots of rain since," Angley says, "but it's been dry as a bone."

Silva's quick fix

BASEMENT LEAKS COME IN AS MANY VARIETIES AS HOME OWNERS THEMSELVES. BUT FOR THE ONES YOU CAN ACTUALLY SEE—WATER LITERALLY DRIPPING IN THROUGH A CRACK IN THE FOUNDATION WALL—TOM SILVA RECOMMENDS A TEMPORARY FIX THAT WILL KEEP WATER AT BAY UNTIL YOU CAN LOCATE AND RESOLVE THE SOURCE OF THE LEAK: PATCH THE CRACK WITH HYDRAULIC CEMENT, A PRODUCT THAT EXPANDS RATHER THAN SHRINKS AS IT HARDENS. THE FIRST STEP IS TO CHISEL OUT THE CRACK TO A DEPTH OF ABOUT A QUARTER INCH. "YOU HAVE TO HAVE A PLACE ON EACH SIDE FOR THE CEMENT TO BOND TO," TOM SAYS. HYDRAULIC CEMENTS COME IN TWO TYPES: THOSE THAT SET IN FIVE MINUTES AND THOSE THAT TAKE 15 MINUTES. USE THE FASTER-SETTING CEMENT. WORKING QUICKLY, PUSH THE CEMENT IN WITH A SMALL TROWEL, THEN SMOOTH IT OUT. "I'VE STOPPED WATER RUNNING IN THROUGH A CRACK IN A MATTER OF MINUTES," HE SAYS. THE KEY IS IN THE PREPARATORY CHISELING. "IF YOU DON'T DO THAT, YOU'LL BE WASTING YOUR MONEY."


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Cutting through a basement slab is messy work, but sometimes it's the best way to banish basement water problems. The resulting trench is stuffed with a drainpipe and gravel, then sealed with cement.