

## Keeping Basements Dry

*Multiple defenses are the best guard against leaks.*

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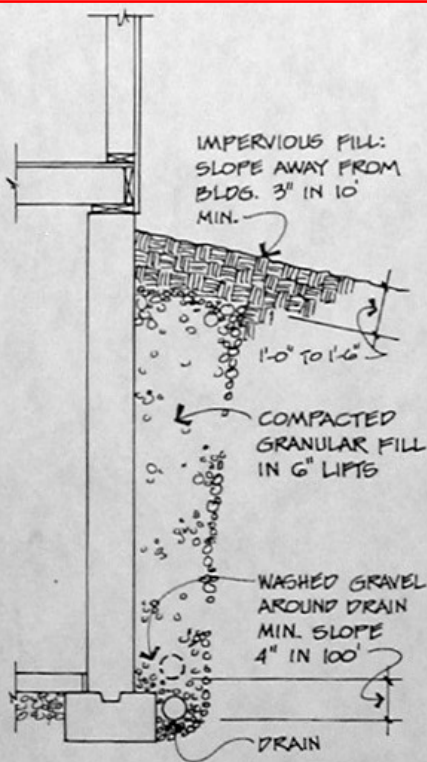
Twice in the past month I've stood eye-to-eye with a half-collapsed foundation wall. Each was on the uphill side of a sloped site. In each case, the land was graded so that water collected behind the foundation and soaked into the ground.

It may be that the grade at first sloped away from the foundation but settled because it was poorly compacted. In any event, saturated soil exerts a force more or less like water. These foundations couldn't take it. Proper surface drainage would have gone a long way toward preventing the problems. Subsurface drainage would have taken care of the rest. Waterproofing the wall? In these cases a good leak might have actually helped by relieving the pressure against the wall.

Foundation leaks are said to cause more callbacks than any other problem in new home construction. They're certainly a big turnoff to homebuyers. Many learn to live with seasonal leaks as if they were natural events like the monsoons. Many a leaky basement I've seen had some of the pieces in place, but the builder didn't get the whole story. Flaws include gravel backfill with no clay cap, drain tiles two feet above the footings, drain tiles with no outlet, and downspouts that pour water into the backfill.

There are sites where you would have to work hard to make a leaky basement. These sites have great natural drainage and little rainfall. On the other hand, there are sites that require fancy engineering to keep water out—areas where the water table is above the basement floor much of the year.

The first step is to figure out what you're building on. Local experience is a good guide. The local building inspector may prove helpful. A few simple tests are also in order to identify the soil type and its drainage abilities. You can find a soil-identification guide in any civil engineering manual. Watch out for clays and silts, which are unstable and expand when wet or frozen. Also conduct a perc test, which you



*For a dry basement, keep water away from the foundation walls. Good surface drainage and proper footing drains are the first priorities.*

may be doing for the septic system anyway. Do it in the spring if possible—the water table is highest then. If main living space is going below grade, consulting with a soils engineer may be good insurance.

### The basics

Above ground and below, the first priority is to keep the water away from the structure. Otherwise, it has to be built as tight as a boat, and even boats need bilges.

**Dampproofing.** Typically a bituminous coating rolled, brushed, or sprayed on, this is the minimal treatment on a foundation wall. It slows down the flow of water vapor and stops some capillary flow, but does little to slow the flow of free water. If water never builds up against the foundation, the dampproofing will suffice. An extra precaution: that costs little is to drape polyethylene over the dampproofing. Even if the plastic

*Steve Bliss is building editor of Solar Age and managing editor of Progressive Builder.*