

Draining Gutter Runoff

Once the water's gone down the downspout, inexpensive plastic pipes carry it away from the house

BY BYRON PAPA

To keep roof runoff away from foundations, my local code requires that water from downspouts drain at least 5 ft. away from the house. Many builders comply with the letter of this law by leading downspouts into buried 4-in. pipes that surface about 5 ft. from the house. Sometimes, though, 5 ft. away is uphill. I suspect that the water ends up back at the foundation.

On my houses, I drain roof runoff well away using inexpensive corrugated-plastic pipe. I tie the gutter drains to the footing drains beyond the house (photo left). I don't drain roof runoff directly into the footing drains because the added volume could overload them and flood the foundation. All the drains slope to daylight and terminate at one or two points (photo facing page).

Planning simplifies installation

Before beginning, I have my gutter installer visit the site to mark the downspout locations. Next, I sketch the drain layout. This sketch relieves me of having to think much in the flurry of running the pipes and helps in creating a materials list. I note any changes that have been made to the original plan during installation and revise a copy to give to the homeowner.

I use unslotted 4-in. pipe for the gutter drains to be sure that no water from them ever wets the footings. This pipe comes in rolls of 50 ft., 100 ft. and 250 ft.; these lengths minimize waste and allow me to limit underground joints to those needed for tee- or wye-fittings. The pipe is flexible enough that elbows aren't needed. Joints are openings for roots to enter and clog pipes, so the fewer joints, the better.

Smooth-wall PVC pipe is an option that might allow better flow than corrugated pipe. I don't use it because it's more expensive and because it comes in 10-ft. lengths that must be spliced underground.

Downspout connections double as clean-outs

I begin the gutter drains with vertical sections at the two downspouts where the final grade will be highest. From these points, I bend the pipes horizontal and run one around the house clockwise, the other counterclockwise. I let the ends stick above grade and cut them off when the gutter installer runs the downspouts. Commonly available adapters fit the downspouts to the pipe (photo right). The downspouts detach easily, providing access to clean the drains of clogs.

Additional downspouts can tap into these pipes with wyes, but I'm careful not to overload a single pipe. One 4-in. pipe will handle



Transition neatly joins downspout to drain. Although the downspout could feed directly into the drain, transitions cost little and keep out debris that could lead to clogs.

Foundation and gutter drains join beyond the house. Otherwise, water from the gutters might flow out of the perforated foundation drains, flooding the footings.

runoff from one 3-in. by 4-in. downspout or two 2-in. by 3-in. downspouts. The rule of thumb is that each square inch of a downspout's section can drain 100 sq. ft. of roof, and that factor applies to drain pipes, too. Following that rule, one 4-in. pipe can drain about 1,200 sq. ft. of roof. I try to pitch the drains $\frac{1}{4}$ in. per ft., but on flat lots, there isn't always enough elevation difference to make this degree of pitch possible.

Gutter and footing drains connect away from the house

I build most of my houses on crawlspace or slab foundations, so the foundation and gutter drains often run very close together (sometimes even side by side). I gather all the pipes together in a common trench leading to their outfall, where they empty to the surface. In this trench, I tie the footing drains into the gutter drains. This plan reduces the number of pipes at the termination (drawing below). A caution: If the house has underground utilities, I check that their installation hasn't damaged these drains.

I've considered stepping up to 6-in. pipe instead of running separate 4-in. pipes. I decided against this option because 6-in. pipe is stiff and difficult to handle. And although one 6-in. pipe will handle

slightly more flow than will two 4-in. pipes, it's also much more expensive than two 4-in. pipes.

An average three-bedroom house usually ends up with four pipes at the outfall point. I use two outfalls to avoid concentrating the flow from bigger houses. The pipes terminate in a bed of pebbles that's downhill and that is at least 10 ft. from the house (photo below). I'm careful not to place the outfall in a location where it can flood a neighboring lot.

Sometimes, when site conditions preclude an adequate drainage swale around a house, I'll place a catch basin in the poorly drained area and tie it to the gutter drains. My local Home Depot sells plastic catch basins that accept the pipe I use.

When all the pipes are laid, I top them off with 2 in. or 3 in. of gravel, then fold filter fabric over the gravel toward the foundation wall. The remaining backfill pins down the fabric. The foundation and gutter drains for a typical 2,500-sq. ft. house cost about \$800 for pipe, gravel, fabric and labor. Most houses get foundation drains anyway, and the gutter drains account for less than half this cost. □

Byron Papa is a builder in the Raleigh/Durham and Chapel Hill area of North Carolina. Photos by the author.

SUBSURFACE DRAINS TAKE ROOF RUNOFF AWAY FROM THE HOUSE

Codes call for drains to carry the water at least 5 ft. from the house, but farther is better. Gutter drains can tie to foundation drains far enough away from the house that roof runoff won't back up and flood the foundation.

