Site Drainage

Unless rainwater runoff is directed away from a building, the excess water can undermine a foundation. Hydrostatic pressure against the walls and erosion of the soil under the footings can cause serious cracking and uneven settlement. The water can also leak through cracks in the foundation or seep through basement walls and floors, resulting in a damp, musty basement.

Keeping a foundation dry requires a drainage system made up of several elements. Footing drains collect and carry off excess groundwater at the base of the structure. Gutters and downspouts channel rainwater off the roof, often into surface drains that carry runoff away from the building. A key feature of a drainage system is the ground (or grade) itself, which should slope away from the building a minimum of 1 inch per foot for about 6 feet to divert surface water away from the foundation.

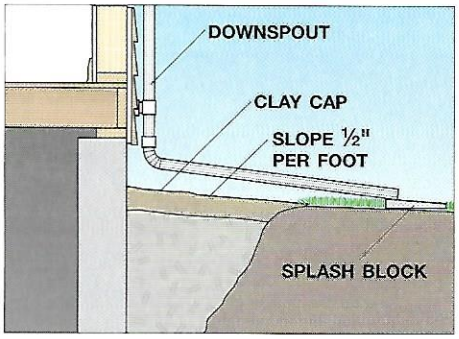
Water from downspouts and drains typically runs through pipes to storm sewers or dry wells. A dry well is essentially a large hole in the ground filled with crushed rocks and gravel. Burlap or other filter fabric is laid over the gravel and then covered with sod. Surface and groundwater that would have flowed against the foundation drop instead into the very porous well and slowly filter back into the surrounding soil. (See "Building Dry Wells," p. 569.)

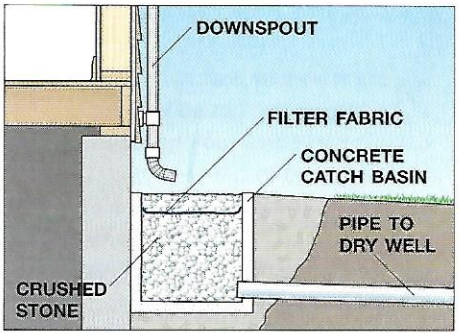
Footing Drains

A footing drainage system consists of 4-inch-diameter perforated drainpipe placed around the foundation either right on top of the footing or alongside it. The drainpipes connect to a leader pipe that either surfaces farther downhill or drains into a storm sewer or dry well.

The footing drains are embedded in gravel with their perforations facing down so that rising water will flow into the pipe and be carried off. Filter fabric covers the gravel bed to keep fine particles from clogging the drain pipe. Gravel backfill (placed against the foundation up to a foot below grade), drainage mats, or boards conduct water down to the footing drains. That way, water can be carried away from the foundation before it has a chance to build up and begin to seep through cracks in the foundation.

Roof Runoff





Your roof may be capable of shedding torrents of rain, and your gutter and leader system may be capable of carrying the flow down to the ground. But on many houses, that's where controlled drainage ends. Downspouts deposit the deluge of water beside the foundation, where it can leak into the basement, erode joints in masonry, and eventually undermine the foundation footing. There are several ways to reduce these problems. One is to regrade around the foundation to create a slope away from the building. Even a gradual slope extending a few feet will do. Second, carry water away from the building by extending the downspout. Placing a splash block under the downspout also helps. Where this isn't practical, direct water to a buried drainpipe or dry well.

Surface Drain Systems

USE: ▶ circular saw with masonry blade • cold chisel • hacksaw ▶ pipe • surface drain • pipe collars

Foundation drains set underground carry off subterranean water. But many walls are rimmed by concrete walks that need drainage as well. To give rainwater a place to go, form a channel in the surface concrete, and insert segmented drain fittings. Water enters through a grille and drains through a pipe to a dry well or outlet away from the house.

1 *Set prefabricated surface drains* *in a formed channel in walkways and patios that butt against foundations.*

2 *Slots in the top grid* *of the drain filter water running down the foundation and channel it into a pipe built into the unit.*

3 *At the end of the drain channel,* *connect a pipe collar to the fitting and direct the water into a standard drainpipe.*