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# Drainage Around the Home

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**Fixing a wet basement is much like the leaky roof story: When it's raining, you don't want to fix the leak; and when it's not raining, the roof doesn't leak.**

The past year has been a reminder of the benefits of good drainage for homesites. Although drainage may not provide protection from major flooding that has plagued some areas, good drainage can protect from localized flooding and high water tables.

Damage to homes in flood-prone areas can be expensive. Protecting existing homes from flooding damage is often costly and involves structural changes to the house. The best advice is to avoid building in flood-prone areas in the first place.

New homes in areas with localized flooding and high water table can be protected by proper design, landscaping, and tile drainage beneath the house. There is simply no excuse for a wet basement in a new home.

Make sure that surface drainage carries water away from the house and minimizes ponding in the area. Have at least 5 percent slope away from the dwelling, in other words, 6 inches of drop in 10 feet. Use roof gutters and diversions to channel flow away. Landscaping channels can help to divert excess water away from low areas and into suitable drainage such as street gutters or stone sewers. In some cases, underground tile may be needed in the landscape to remove excess water.

Gutters and downspouts with extensions are essential to carry rainwater away from the house. Often, installing new gutters or replacing old ones dries up a basement. Position the downspouts away from the foundation and walls of the house.

For new construction, most high water tables can be controlled with drainage around the foundation and under the basement floor. Place tile drains around the outside of the

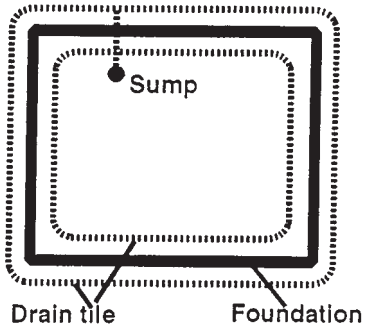


**Figure 1.** Example plan layout of drainage tile around foundation and below basement floor.

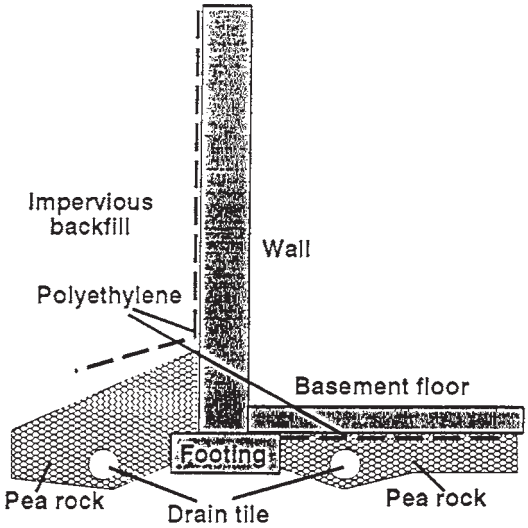


**Figure 2.** Cross section of basement wall and floor showing drain tile for new construction.

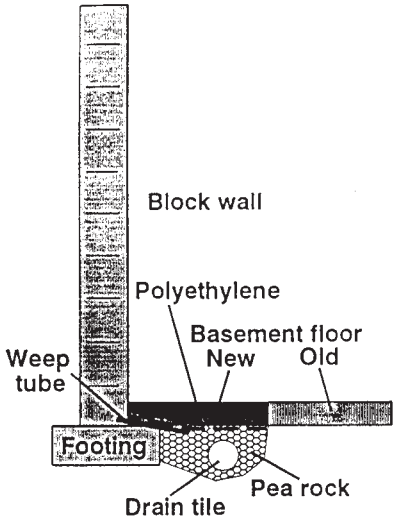


**Figure 3.** Cross section of basement wall and floor when retrofitting from the inside of the basement.

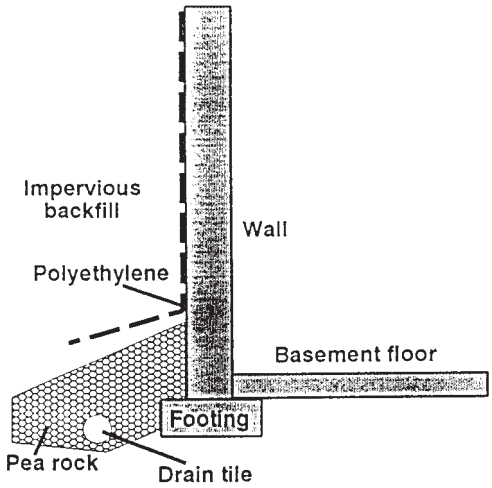


**Figure 4.** Cross section of basement wall and floor when retrofitting from the outside of the basement wall.

foundation and also under the basement floor. Underlay the entire floor area with at least 6 inches of very porous material such as pea rock. Place a 6-mil polyethylene film on top of the pea rock to keep moisture from migrating from the ground through the slab. Place pea rock around the outer drains also with polyethylene film to keep water away from the basement wall.

Figure 1 is an example of a plan layout for drainage tile that would be placed below the basement floor and around footings. Figure 2 is a cross-section of basement wall and floor showing placement of the drain tile. The minimal added cost of this system during construction is small compared to the possible damage of having a wet basement and expense of retrofitting.

The purpose of the pea rock is to break the capillary action between the ground and the concrete floor, making a drier floor. The pea rock also allows the water that accumulates under the floor to easily move to the tile drains and into the sump.

The retrofitting process is more difficult and costly for existing homes and may involve trenching around the foundation and/or digging up a portion of the basement floor. Figure 3 shows one possible plan for repairing a wet basement. It involves removing a portion of the basement floor, excavating below the floor, installing rock and drain tile, drilling weep holes through the wall and repairing the basement floor. Weep holes used with this method are used only with block basements. There still may be an advantage to installing drain tile underneath the perimeter of the basement floor. Steps include:

- Remove a 14- to 16-inch-wide section of concrete floor around the perimeter of the basement. Dig a trench 2 to 3 inches deeper than the footing around the perimeter inside the footing.
- Drill 3/4 inch diameter holes through to each cavity of the block at the lower level of the block wall.
- Place 2 inches of pea rock in the bottom of the trench for a bed for the drain tile.
- Lay 4-inch perforated plastic drain tile on the rock bed. Run a section to a sump that is dug deeper than the tile line.
- Install plastic weep tubes into the hole of the block. Discharge them near the drain tile.
- Backfill the trench with pea rock and cover the rock and weep tubes with polyethylene film.
- Replace the concrete floor and install a sump pump.

Figure 4 illustrates the cross section where the drainage is installed from the outside by excavating below the footing level and installing rock and tile.

Bring all the tile drains into a sump box that will accommodate a sump pump. Pipe the discharge from the sump pump outside to suitable drainage such as a street gutter. Never discharge flow from the sump to a sanitary sewer or septic system as that will overload the system.

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