



United States
Department of
Agriculture

Soil
Conservation
Service

Columbia,
Missouri



Urban Conservation Tips



Underground Drain Pipes

Description

Drainage systems featuring underground pipes are designed to intercept water and carry it to more desirable locations without causing soil erosion. Underground drain pipes can correct both surface and subsurface drainage problems. Surface drainage systems carry away surface water. Subsurface drainage systems intercept water below the surface.

Application

Underground drain pipes can be used to intercept subsurface moisture to lower a water table, or intercept seepage that contributes to wet surface conditions. In bottomland or flat land areas with isolated water-logged pockets, subsurface drainage systems are used to improve infiltration. Better infiltration means the surface will dry faster.

Underground drain pipes also are widely used to:

- * Remove surface runoff caught by diversions, terraces and waterways.
- * Carry away water exiting from gutter downspouts so that water falling from the downspouts does not erode the ground beneath the downspout.
- * Remove standing water near buildings, airport runways and recreational areas.
- * Catch and carry away subsurface moisture around foundations, a common cause of wet basements.

- * Drain puddles and isolated wet areas.
- * Control pests by eliminating stagnant water that acts as a breeding ground.
- * Carry away water that enters the pipes through grates placed in streets, driveways and parking lots.

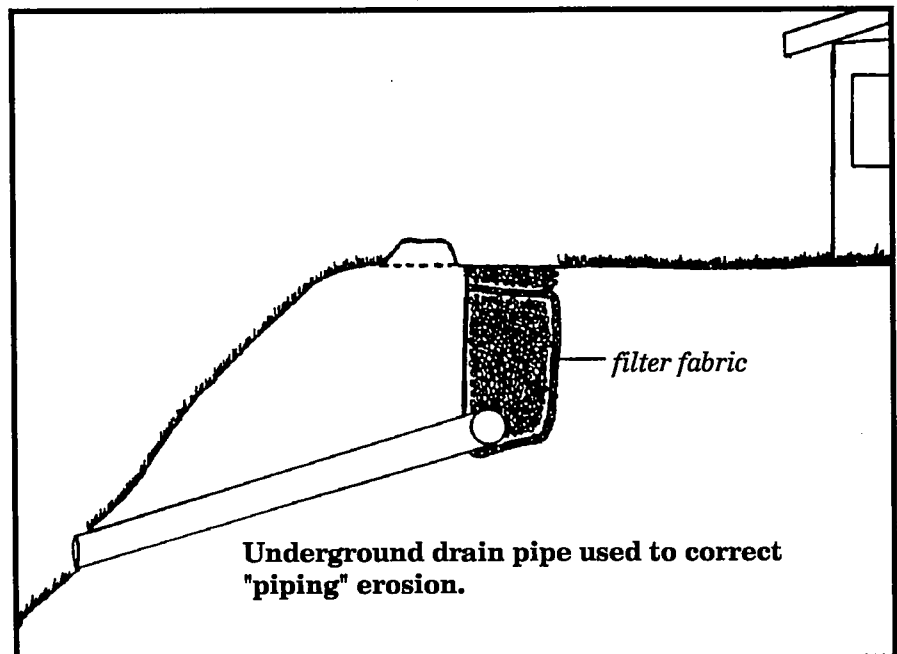
Construction Tips

Following are some things to consider when installing underground drain pipes as part of surface and subsurface drainage systems.

Surface Drainage Systems

- * Grates are needed at the inlet to the pipes to keep debris out of the system. Domed grates are preferred.

- * Solid pipes should be used. Pipes with holes are used only to intercept water beneath the surface, not as carriers of surface water.
- * Welded steel or corrugated metal grates will be necessary if vehicles will be driven over them.
- * Soil used to fill around the pipes should be well compacted to prevent seepage along the outside of the pipe. Such seepage is referred to as piping erosion.
- * Anti-seep collars (plates attached to the pipes) should be used to discourage erosion along the outside of the pipe.
- * The water inlet should be large enough to handle the volume of water likely to reach the inlet
(over)



during a storm.

- * The outlet end of the pipe should be on a gentle slope, perhaps with a small rock apron, so that the water exiting the pipe does not cause erosion there.

- * The water should exit the pipe at the surface. Only very sandy, porous soils can drain the water within the soil.

- * Install a guard at the pipe's outlet to prevent rodents from entering the pipe.

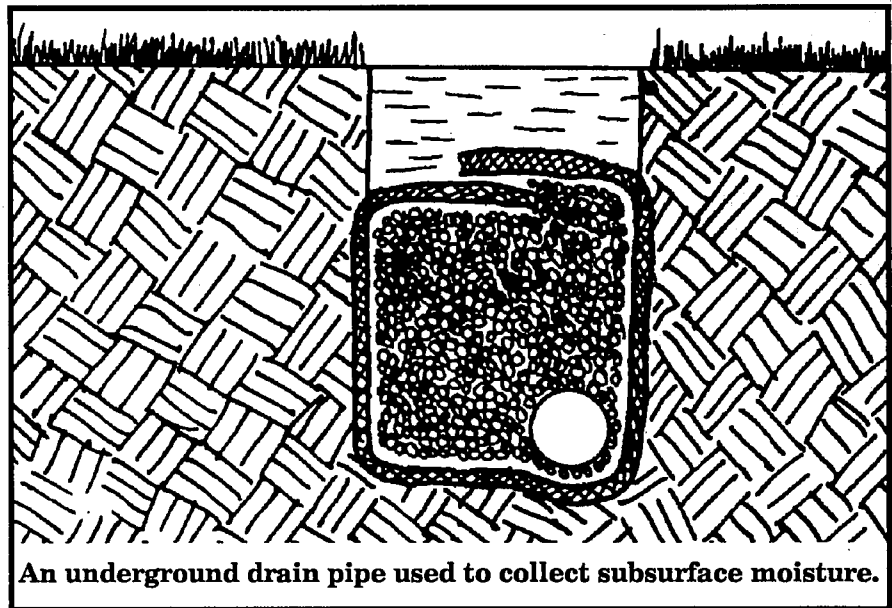
Subsurface Drainage Systems

- * Pipes should be installed in a uniformly-sloping trench that drains to a natural outlet or to an outlet constructed to withstand the erosiveness of the exiting water.

- * Pipe placed around houses needs to be carefully backfilled with one-inch diameter gravel or rock that does not contain lime dust.

- * Use perforated pipe to allow underground water to enter the pipe. But use a section of solid pipe at the outlet of an underground drain pipe to help prevent soil erosion near the outlet.

- * Wrap pipe and gravel in filter fabric to prevent fine soil particles from entering and clogging the drain pipe.



- * Care needs to be taken so that the pipe is not crushed when backfilling with rock and soil.

- * Perforated pipe should not be used on grades in excess of 10 percent.

- * Install guards at pipe outlets to keep rodents from entering the pipe.

- * The trench should have a low area in its floor that will cradle the pipe.

- * Riser pipes can be installed, or the gravel field around the pipe can be extended to the surface to collect water more efficiently.

Maintenance

Maintenance of surface and

subsurface drainage systems utilizing underground pipes is a must. Be sure to keep both outlets and inlets clear of trash, and inspect the systems after storms. Promptly remove debris, which can gather at the inlets of underground drain pipes. Be sure sediment or trash does not plug the outlets, and cause water to back up in the line.

Where To Get Help

For more information about underground drain pipes, contact your local Soil Conservation Service office. It is listed in the telephone directory under "U.S. Government, Department of Agriculture."