

# ARE YOU IMPROVING DRAINAGE OR JUST BURYING YOUR MONEY?



Trench drains installed on a football practice field at the University of Tennessee.

By Charles R. Dixon

**L**andscape architects, as well as contractors working on renovation or design projects, usually have to address surface drainage and runoff. On steep slopes, drainage swales and retaining walls are usually installed. Catch basins are strategically placed to channel surface water away.

On gentle slopes such as parks, public athletic fields and commercial landscapes, there is usually the consideration of drain trenches with plastic drain pipe to route water from the area. We have been asked to consult on applications from residential

turf to professional sports fields about installing drainage trenches. We usually find that the client has one of two basic ideas in mind. One idea often presented to us is to scrape the topsoil back and lay a gravel blanket over trenches containing drain pipe. The other idea is to cut in trenches and fill with pipe and gravel, and then cover the gravel with the soil removed from the trench. On the surface it sounds reasonable. In practice, it usually is as effective as taking a wad of dollar bills and burying it in the ground.

Most soils that need modifying with drainage are poorly drained, have low permeability and poor internal soil

structure. Placing drainage under the surface without creating a path for water to reach the tile or gravel is a total waste of money. On steep slopes, gravity will move water to drains. The main concerns should be erosion and soil stabilization. On relatively flat areas, the water has to move along the surface contour or vertically downward. Trenches and contours are designed to address soil drainage during periods of high rainfall or saturated flow conditions. The primary driving force moving water during saturated flow is gravity. The rate at which water flows is dependent on slope and the pore size of the soil or



media it is moving through. Soils that are heavier in texture than a loamy sand usually have slower rates of movement. Quite often we see loams used to backfill trenches that render the gravel drainage totally ineffective.

Parks and public sports fields have to have enough surface contour to cause water to move toward drainage grates or catch basins. Ideally, soccer fields should be flat for play. To have a flat field, the growing medium will have to be sand, not native soils. Sports fields with low budgets will have to put up with crowned fields to remove water.

The next level of improvement is the installation of drain trenches. The rationale for trenches is to decrease the distance that water travels before it is rapidly removed. The key to a drain is to make sure water can reach the gravel. This means that the trench should be backfilled to the surface with sand and not native soil. It is also a good idea to create a sand cap over

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the area to maintain permeability and to reduce the potential for adjacent topsoil from sealing the trench. We call it plating. Golf courses are using the idea to drain fairways that are poorly drained. The closer the trenches, the shorter the distance water travels until it is removed. The trench concept is viable for many applications such as parks, commercial grounds, sports fields and golf courses.

In the last few years, new types of materials are available that incorporate plastic and geotextile. No matter what you choose to construct the drain field, keep in mind a few

concepts in design: 1. If you cannot afford to install proper trenches, use the money to create surface contour and install catch basins. 2. Do not try to improve poorly drained soils by incorporating sand. It usually creates a more compacted surface and reduces drainage. It takes at least an 80-percent sand mixture to achieve enough bridging to positively impact drainage. 3. If drainage is to be installed, make sure that surface water can permeate to the tile or water-conducting materials. French drains are usually effective. Consider sand to backfill the trench to the surface. Consider a sand plate to maintain continuity to the trench. Make sure the drain system drains to proper receptacles such as surface water. Many towns will not allow drains to be tied into storm drains. Make sure you are in compliance with local regulations and codes.

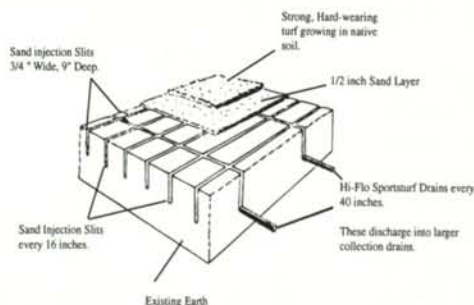
*Charles R. Dixon is the president of technical operations for Turf Diagnostics & Designs Inc. of Olathe, KS.*

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