

'Sports Turf Drainage'

by Dr. James A. Murphy,
Specialist in Turfgrass
Management

Adequate drainage is essential to maximize field use, minimize maintenance problems and provide a desirable environment for turfgrass growth. The main idea in planning drainage is to protect the playing surface from excess water. Many fields attempt to accomplish this by surface flow (drainage). Catch basins and surface inlets (vertical drains) are used around the perimeter of the field to move the excess water away.

Techniques used to protect the root zone from becoming waterlogged include subsurface pipe to intercept a rising water table and vertical or slit drainage (shallow and very close spacing). High sand content root zones work quite well since the depth of the root zone aids in displacing the soil interface deeper so that saturated conditions would mostly occur well below the depth of turf rooting. Root zones constructed from native soil (often problematic) work by encouraging surface runoff (centerline to sideline paths for water flow off field).

Both internal and surface drainage must be considered. Good internal drainage allows excess water to move out of and away from the surface layer where it could be a problem. Surface drainage is sufficient when excess rainfall can runoff the surface layer. Turf areas with minimal surface drainage require high infiltration and internal drainage.

Good surface drainage requires a slope of 2% (1 foot fall over 50 feet). A 1% slope can be effective; however, any imperfections (depressions) along the run of the slope will likely pond water under high rainfall. When surface drainage is inadequate and internal drainage can not removed the

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excess water, vertical drains are necessary to remove the surface water.

Cross drains and perimeter drains are two types of vertical drains. Cross drains are a corrective action used when adequate surface drainage does not exist. Cross drains are placed directly on the playing surface to prevent water from accumulating and running to low portions of the playing surface. Cross drains can be as simple as silt trenches filled with a uniformly sized coarse sand or fine gravel, or prefabricated drains within the trenches. To be effective the trenches need to be open to the surface, thus the trenches should be back-filled to the surface with a readily draining material (i.e., sand, fine gravel, etc.). Covering with a finer-textured soil will seal off the trenches. Slit trenches of various widths and depths have been used successfully to improve surface water conditions. Typically, the trenches are no more than a couple inches in width.

Perimeter drains are placed outside the playing field areas to collect surface runoff (surface inlets) and move the excess water away. Cross drains may be connected with perimeter drains to the direct excess water away from the field.

Subsurface drain tiles are used in fine- and medium-textured soils to lower a water table that is too near the playing surface. Very wet (saturated) soil conditions must exist before water will move from the soil into the drain tile. Therefore, placing drain tiles at shallow soil depths will do little to create drier soil conditions. ♦

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