

# Golf & Turf Drainage

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# Play Longer, Better – And Drier – With Engineered Turf Drainage

The increasing popularity of golf, field sports and other outdoor events places growing demands on turf design and maintenance. Technology is responding with new soil/sand composites, hybrid seeds, improved forms of artificial turf and other advances.

But underneath it all, proper drainage is perhaps your most productive investment in the long-term health and playability of recreational surfaces. Consider the following benefits of a well designed and maintained drainage system:

## Healthier Grass and Sod

Good drainage promotes deeper root growth and the “knitting” effect of the roots, which stabilizes your playing surface and lessens the tearing of the turf.

## More Effective Use of Soil Nutrients

A well drained field will improve the uptake of nitrogen, potassium and magnesium.

## Reduced Risk of Disease

Turf that does not continuously sit in damp soils will be more resistant to fungus and disease.

## Maximum Playability

Fewer games and events will be cancelled or extensively delayed due to heavy rain. A well drained golf course allows golfers to resume play faster, with less damage to the course.

## Reduced Compaction

Drainage lessens the surface deformation caused by heavy traffic and soil compaction.

## Removal of Soluble Salts

Drainage improves turf quality in arid and semi-arid areas through the leaching of soluble salts.

## Safer Surfaces

Good drainage reduces field damage and turf instability, providing players with better footing and less chance of injury.

The bottom line for designers, owners and managers is that proper drainage increases the playability of turf surfaces while reducing maintenance and repair costs.





# Everything For Turf Drainage



## N-12® Dual Wall Pipe

Smooth interior wall provides excellent flow. Durable for rapid outlet and transfer of storm water. Built-in gasketed bell and spigot joints allow for quick installation. Delivered in 6m (20') lengths, 100-1,500 mm (4"-60") diameters with solid or perforated walls.



## Singlewall Corrugated Pipe

Singlewall 75-600 mm (3"-24") diameter perforated or solid pipe serves well for localized collection and drainage. Coils available in 75-300 mm (3"-12") and 6 m (20') lengths are available in larger diameters.



## AdvanEdge® Site Drain Pipe

A perforated panel-shaped HDPE core in 300 mm (12") width and coils up to 30 m (100'). Can be used with or without a geotextile sock, which filters fines. Install AdvanEdge vertically in trenches or laid flat directly on the subgrade.



## Nyroplast® Drains & Basins

Designed for rapid collection of surface water from playing surfaces. Ductile iron grates easily withstand loadings from carts, mowers, tractors and truck vehicle traffic. Easy to install, these drains provide watertight connections and corrosion resistance.



## Duraslot® Trench Drains

Linear drains designed to capture sheet flow from sloping surfaces, including parking lots, cart paths and other traffic and building drainage areas. This slot drain is long lasting and corrosion resistant with 50 mm (2") wide grates and HDPE conveyance pipe.



## StormTech® Chambers

StormTech chambers increases storm water runoff capacity from the field, stadium seating, running tracks and adjacent roof drains and parking surfaces.



## Fittings

All ADS pipe come with a variety of fittings to make installation of the pipe quick and easy. Fittings include couplers, end caps, tees, wyes and elbows.



## Inserta Tee® Lateral Connections

This high-performance lateral connection is watertight, air testable and modernized to fit any mainline pipe type.



## Turf Flow Pipe

Turf Flow's flexibility enables it to be used in many applications other pipes cannot accommodate. Available in 50 mm (2") plain, wide and narrow slot.

# Golf Courses

## Course Drainage

Unmanaged storm water can result in ponding and over saturated area's which damages turf and reduces the number of rounds that can be played. Tee boxes and fairways can be effectively drained with ADS polyethylene pipe.

Nyloplast inline drains and drain basins collect surface water from low spots. Small diameter, perforated, single wall pipe is used for laterals and local collection, feeding larger trunks and outlet lines made with N-12 HDPE dual wall and HP Storm dual wall polypropylene pipe.

N-12 pipe will convey collected stormwater from the course with its smooth interior wall, which provides excellent hydraulics. N-12 comes in 6 m (20') lengths, which reduce the number of joints required and decreases installation time.

HP Storm pipe provides greater pipe rigidity and is the perfect choice when premium joint performance is required. Coupled with the superior strength of polypropylene, HP Storm's smooth interior wall offers additional strength and superior flow rates. HP Storm allows native soils to be utilized and has many ideal applications for your golf course, including:

- Deep burials
- Heavy traffic loading
- Poor soil conditions
- Lake-interconnect pipes





## Putting Greens

For more than four decades, the USGA has been publishing a wealth of data on golf course design and construction, and is considered the world's foremost authority in this field. In 2004, after three years of research in conjunction with The Ohio State University, the USGA issued a revised recommendation for putting green construction.

For the first time, this new standard permits both round pipe and now flat pipe for green drainage. The flat pipe must conform to ASTM D7001, be a minimum of 300 mm (12") in width, and not covered by a geotextile sleeve (waffle drains or any tubing encased in geotextile sleeves are specifically prohibited). AdvanEdge flat pipe is in full compliance with all the specifications of ASTM D7001.



## Trenchless Green Drainage

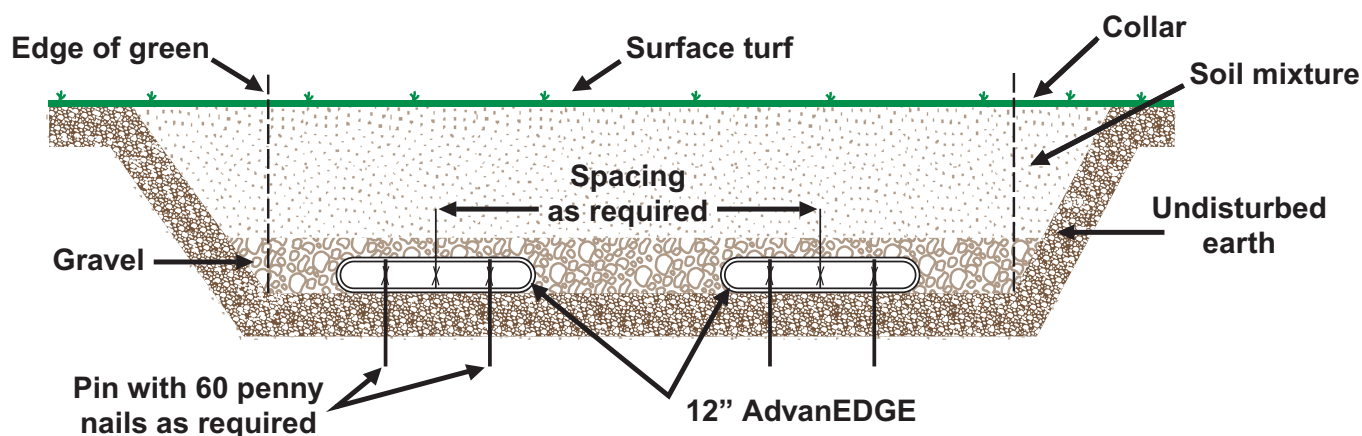
The use of AdvanEdge flat pipe placed directly on the green's sub-base has two distinct benefits: better drainage performance and lower installed cost. The panel pipe's large surface area results in a water removal rate almost twice that of 4" (100 mm) round pipe. And because there are no trenches to dig, no gravel backfill to buy or install, and no trench spoils to dispose of, green construction costs can be significantly reduced.

An AdvanEdge drainage layout can be installed in less than two hours, compared to a full day for trenched round pipe. One expert has estimated the cost savings to be as much as \$40,000 for 18 holes.



## AdvanEdge Pipe for USGA Putting Greens

In the United States, two basic types of putting greens are predominant. USGA greens are more prevalent nationally than California Greens, using a soil mixture root zone above a layer of gravel.





# Golf Courses

## Traditional Green Drainage

ADS round pipe and fittings are also well suited for drainage of putting greens. Illustrated below is a typical layout using 100 mm (4") perforated laterals and 150 mm (6") solid N-12 pipe installed in gravel-filled trenches in the subgrade.

## Course Drainage Conveyance

For minimal disruption to turf on greens and fairways, small diameter N-12 dual wall pipe is a perfect drainage option. N-12 provides watertight pipe and fittings for easy and quick installation.

The corrugated outer wall and smooth interior wall provide increased pipe stiffness and better hydraulics to move stormwater off the course.

N-12, manufactured from high-density polyethylene (HDPE) is less brittle than PVC pipe. HDPE is resistant to the effects of chemicals, abrasion and hot soils and provides long-term durability



## Course Drainage Capture

Proper golf course drainage promotes healthier grass and sod and more effective use of soil nutrients.

A Nyloplast Universal Inline Drain is a durable and watertight pipe fitting for stormwater inlets. The universal inline drain can be installed along athletic fields, on golf cart paths and in fairways.

The Universal Inline Drain is available in 200, 300 and 600 mm (8", 12" & 24") diameters. The flexible design adapts to various pipe sizes and grates. The drain is made from resilient, sustainable and corrosion-resistant materials.

The Universal Inline Drain is light weight for safer installation and is easily adaptable in the field based on site conditions. The drain is stocked and locally available at distributors.





# Athletic Fields

## Pipe Depth

Most athletic fields have uniformly structured soils in the root zone, which drain relatively quickly. The depth of the pipe is primarily determined by the permeability of the surrounding soil, and the inches of water that need to be removed in a 24-hour period.

Turf grass root zones are fairly shallow, and drainage for most athletic fields is needed in only the top foot of soil. This, plus rapid water removal requirements, dictates a drain depth of one to two feet. However, in areas where salinization may be a problem, a deeper drain depth may be warranted.

Many times, particularly in stadiums, a 150 to 200 mm (6" to 8") soil/sand mix is imported to the site. This soil is usually of higher permeability than the existing subgrade, which can be compacted up to 95%. Because the imported soil does drain quickly, it is important to position the drainage lines close to the soil mixture in order to accept and carry the water away to an outlet. Pipe should never be covered with an impermeable layer of soil.

Turf aeration equipment should also be considered. Some aeration tines can penetrate to a depth of 230 mm (9"), which could damage the buried pipe.

## Chamber drainage system

Chamber capacity is one of the biggest advantages to using chambers on a complete stadium complex design.

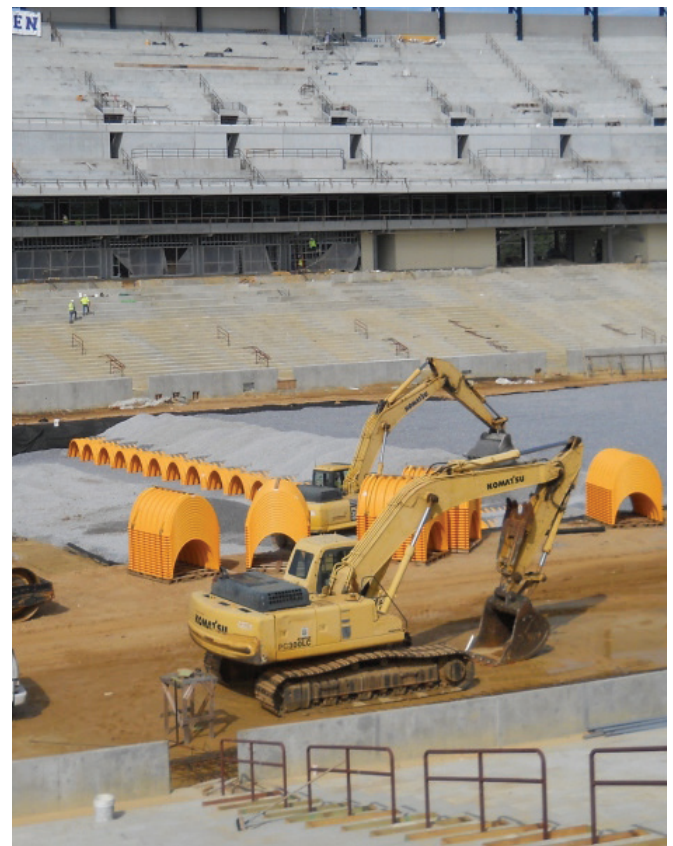
A well-designed and maintained drainage system will provide:

*Healthier natural playing surfaces* - Good drainage promotes deeper root growth and the "knitting" effect of roots, which stabilizes the playing surface. Turf that has good drainage will be more resistant to fungus, disease and increases long-term playability and minimizes recovery time.

*Functional synthetic playing surfaces* - Synthetic or artificial surfaces are becoming more and more popular because of maintenance ease and quick recovery time. These surfaces depend on proper subsurface drainage systems to maintain playability.

*Maximum playability* - Fewer games and events will be canceled or delayed due to heavy rain. Games are able to resume play faster with less playing surface damage.

*Safer surfaces* - Good drainage reduces field deformation and turf instability, providing players with better footing and less injury chance. This is true for both natural and synthetic playing surfaces.







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