Building good drainage for synthetic fields

WHEN IT RAINS....well, it won't necessarily pour, but it will rain. And when it does, you'd better hope you have efficient drainage for your field. No matter how well constructed a field is, or how good it looks, it's not going to hold up for the long term if it can't shed water. Unlike its natural counterpart, artificial turf won't turn into a muddy mess in inclement weather, but it can (and will) have problems if it doesn't drain well.

A good drainage system should work invisibly; the athletes and spectators using the facility shouldn't be aware of it. But you as a manager should be aware, and at all times. It's one of the most important components in the integrity of your field.

A good drainage system works on multiple levels. Here is a quick recap:

WITHIN THE FIELD ITSELF

The turf itself is permeable; water trickles down through, and into the system that moves it away from the field. Once it has passed below the turf surface, it will meet with one of several subsurface systems, depending on what was installed at the time of construction. Both systems are used with great effect. Installation of these systems takes place once work on the sub-base has been completed. Two systems are:

- Flat drains, 6" to 12" wide and 1" to 2" thick, with or without a wrapping of filter fabric, placed on the completed sub-grade of the field, in a diagonal or herringbone pattern, about 15' to 30' apart.
- Perforated pipes, 4" to 10" in diameter (also laid out in a diagonal or herringbone pattern), laid in trenches and surrounded by filter fabric and clean stone. (Note: This system is more expensive, but widely acknowledged as more efficient.)

The system chosen should depend on the specific use of the field, the climate, amount of rainfall and more. Proper preparation of the site with regard to expected weather conditions is also key to the success of a field as a whole.

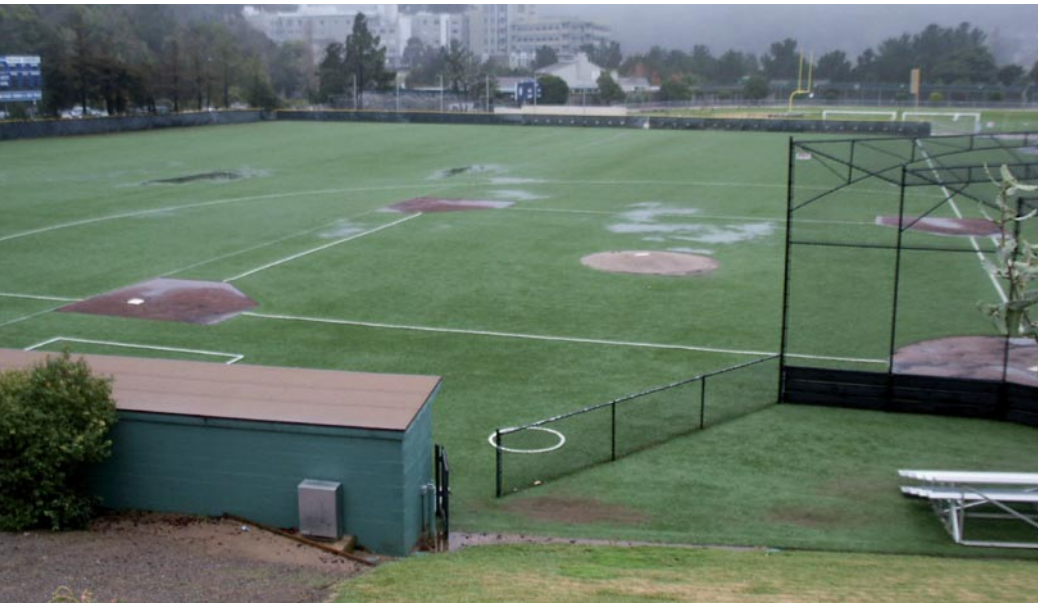
"Typically, we do not have the freeze/thaw problems here in the Southeast as they have in areas in the Northeast and Midwest," says Dan Wright, vice president of SportsTurf, located in Whitesburg, Georgia. "It is extremely important in wetter areas that the subgrade is dry, has 95% compaction, and is protected by an impermeable filter fabric to keep the subgrade from getting saturated."

Some fields, often those without infill, contain an additional layer, have a shockpad or elastic layer (e-layer for short) positioned between the base and the turf. An e-layer is porous, meaning that water can drain through it and into the regular drainage system.

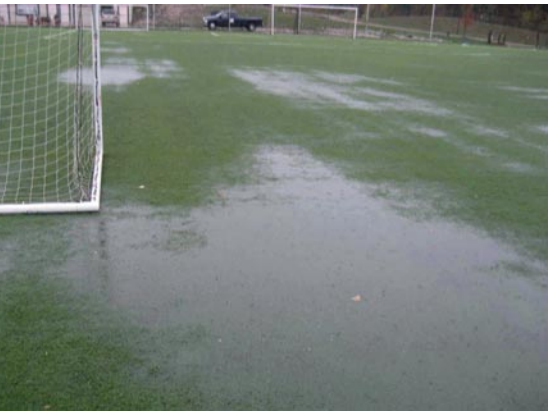
AROUND THE FIELD

The systems mentioned above are meant to handle water that is on the field as a result of precipitation, irrigation or as overspray from irrigation of

>> A FIELD WITH AN EFFICIENT DRAINAGE SYSTEM can allow play to continue even during a rainy day, which becomes essential when one field has to multi-task for many sports. This photo was taken on a misty day when facilities can continue to be used. The setting is the athletic campus of Durfee High School, located in Fall River, MA. Photo courtesy of Gale Associates, Inc., Weymouth, MA.



>> **Above: POOR DRAINAGE** of synthetic turf must be traced back to its source. It may be an easy fix (such as clean-outs that have become clogged with debris) or it may be something requiring extensive work. Photo courtesy of William E. Fee, Carducci Landscape Architects, San Francisco.



>> **Above Left: A FIELD THAT DOESN'T DRAIN WELL** isn't going to provide an enjoyable game for anyone. Photo courtesy of DOC Sports Surface Contractors LLC, Fort Washington, MD.
>> **Above Right: IT'S NOT HARD TO IDENTIFY A FIELD** that has drainage problems. Water will collect on the surface and not disperse. Keep an eye on the system during bad weather events that occur during non-game times and make sure to address any problems right away. Photo courtesy of William E. Fee, Carducci Landscape Architects, San Francisco.

adjacent fields; in other words, they are meant to handle what falls directly on the field. But a second part of the battle against water calls for keeping excess water from flowing onto the field as runoff from another area. Ideally, a field is constructed at a slightly higher elevation than the surrounding land which would virtually eliminate the possibility of runoff—but very few projects have all components of the ideal world. Therefore, it becomes necessary to create and employ preventive mechanisms.

Perimeter drainage systems, which intercept water and keep it off the field, take several forms. In many cases, fields will employ more than one system, including:

• A series of natural swales (drainage channels covered by grass or other vegetation) is one very economical way of directing water. Swales that are surfaced with asphalt or concrete are also efficient, but less economical.

• Catch basins located around the perimeter of the field can intercept water and direct it to another place, most often a storm sewer or drain pit.

• French drains (several different types are available) can be used to carry water away as well

• Open pan drains (curb and gutter assemblies) are popularly used around the inside edges of tracks that encircle sports fields.

• Integral curb drains (made of polymeric materials) used around the inside edges of a track have outlets to a storm drainage system and serve as a termination point for the turf itself on the field.

Whenever possible, systems should be set up so as to facilitate upkeep.

"An important item to incorporate into any synthetic turf drainage system design is an easy method to access and clean the drainage system," says Devin Conway of the Verde Design Group in Santa Clara, California. "For perforated or solid wall collection pipes, this is typically done through the installation of cleanouts or junction boxes. Where these are located and if they are exposed within the synthetic turf are important items to discuss with the owner and the maintenance staff."

MAINTENANCE

A field is only as good as its drainage system, but the drainage system is only as good as the diligence with which a person maintains it.

Perimeter drainage features, including swales, French drains and catch basins will not work effectively if they become clogged. If water is flowing onto the field, check for buildup of silt or vegetation, then remove it. Better yet, don't wait: Keep all grass and other vegetation trimmed back. Neutralize roots or use root barriers. Do an occasional cleanout of all systems with a pressure hose to help keep the water moving. More stubborn and entrenched clogs may require excavation. (In attempting to locate the clog in order to dig, remember that most of these types of clogs occur in areas where there are elevation changes or where there are changes in the direction the water flows).

The question does present itself: will a freeze/thaw cycle hurt drainage systems? Snow and ice themselves aren't going to harm the surface of a field, and given time, will melt and drain through the surface the

way rainwater does. Remember that if any components of your drainage system, such as swales, have asphalt components, there may be cracking and shrinking that occurs as a result of continued weathering. A deep, hard freeze can cause blockages in pipes; with time and more moderate temperatures, these too should melt.

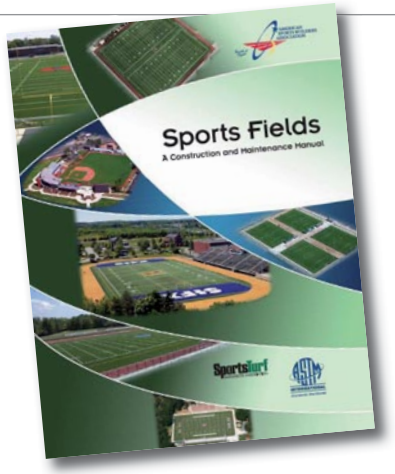
"Most pre-manufactured drainage composites and drain products can withstand extreme weather fluctuations, but always best to verify with the manufacturer to verify any product limitations or installation criteria that may be limited by weather," says Conway.

Some fields remain open in cold weather while at others, athletes must wait until all moisture, including anything caught in the infill, has melted and migrated downward. If the weather is so cold that your turf is slippery because of ice, and your pipes underneath are blocked (meaning that no drainage is likely to occur anyway), use of the fields isn't recommended. Athlete safety, and the safety of those maintaining the turf, should be the first considerations in making the call on whether to use a field in cold weather.

Because it's under your field rather than on top of it, drainage isn't a glamorous aspect of a facility (the color and design of the turf, the markings, logo, etc. tend to get a lot of attention because they're the visual elements; you don't often hear a spectator say, "Wow, great drainage.") As a result, when an administration or an owner is looking into cutting expenses in the construction of a new sports field, the temptation may be to cut what can't be seen.

Ideally, good drainage (the kind you invest in and pay attention to throughout the year) will never be seen. That's because it works. On the other hand, inferior drainage either around the perimeter or on the field itself will be seen. It'll be seen by you and your athletes and spectators, in the form of puddles on your turf. It'll be seen when subsurface and surface problems come back to haunt the finished facility long before you've stopped bragging about your new field. Most of all, it'll be seen in the bottom line when costly repairs need to be made.

You will regret cheaping out and not putting in enough ways to move the water off your facility. You'll never regret making the investment of funds in a good system, and of time to keep it functioning well. And in this case, you always get a good return on your investment. ■



>> ASBA's NEWEST PUBLICATION deals with issues of field drainage, as well as design, construction and maintenance of both artificial turf and natural grass fields. The book is available through ASBA, www.sports builders.org, or 866-501-ASBA (2722)

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ASBA presents FIRST GREEN AWARD

MONROE COMMUNITY COLLEGE PAC Center, Rochester, NY has been recognized with the American Sports Builders Association's inaugural Green Award, which recognizes eco-friendly design and construction excellence.

Completed in October 2008, the PAC Center, designed by Concord, MA-based Clough Harbour & Associates, is a 56,000-square foot athletic, fitness and recreational facility on Monroe's Brighton Campus. It accommodates a wide range of uses including health and physical education classes, team sports, intramural leagues, community wellness programs and individual fitness.

And in addition to helping with general wellness, it's healthy for the environment. During the design portion of the facility, the college chose to pursue LEED Certification, something which added complexity not just to the drawing-board process and the construction phase but to every level of the planning.

Projects are scored individually and anonymously by a committee of ASBA members, based on considerations such as layout and design, site work, drainage, base construction, surface, amenities, innovation and overall impression. Winning entries are those whose cumulative scores meet or exceed the standard.

The PAC Center boasts a wealth of amenities for its users including a field house with a 136' x 220' synthetic turf field (Sportexe), two retractable batting cages, a two-lane walking/jogging track surrounding the turf field, an interactive lobby for entry to the campus sports facility, a 3,500 sq. ft. fitness center with cardio and strength training equipment, 1,800 sq. ft. of training space including hot and cold hydrotherapy pools, locker rooms, a multi-purpose room, a cleat lobby with public rest rooms, office space and equipment storage areas.

Among the center's eco-friendly facilities are:

- A high energy efficient field house
- Energy cost reduction of over 30% from the ASHRAE Standard 90.1, 2004
- 30% reduction in water use from the Energy Policy Act of 1992 Fixture Performance Requirements
- A diversion of over 50% of construction waste away from landfills
- Nearly 40% of all construction materials had recycled content
- More than 10% of all materials were generated within 500 miles of the project.

Even the landscaping of the center was eco-friendly, thanks to the selection of sustainable plants including drought-resistant sedum, as well as picea glauca, nyssa sylvatica, cercis canadensis, syringa reticulata and ilex crenata.

In addition, the location (a former practice field) was eco-friendly, since the project is served by two bus lines within 1/4-mile of the site. Bicycle storage facilities are provided as well, for the convenience of those who are already aware of the need to be eco-friendly, and who are only too glad to be able to exercise in a facility that is as well.-Mary Helen Sprecher ■