More views on synthetic turf irrigation

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RUNOFF & BMPS

Irrigation of synthetic turf is an issue which will be debated as to whether it is a necessity or a luxury. Whichever side you align yourself with, the need to manage storm water runoff or irrigation water, will become an important issue as states and metropolitan areas begin to implement Best Management Practices (BMP).

Most everyone is familiar with storm water retention basins or "Bio-remediation"; the intent of such a facility is to collect and filter storm water runoff from parking lots or other paved areas, filter out debris and chemicals deposited by cars and people and reduce peak flow amounts from a storm event. These same principles are being applied to synthetic turf fields in more and more communities.

Certain permitting agencies in Pennsylvania and Maryland, for example, have adopted a policy that all synthetic fields shall be treated the same as any paved surface requiring new installations to collect runoff, detain and clean the water before releasing into a regulated watershed. This is requiring the sports field designer to incorporate innovative methods to address BMP's to meet newly adopted policies.

Some options have been to create detention basins below the synthetic turf surface within a deeper stone profile thus increasing the storage capacity of the base stone and controlling the outflow of storm water through smaller outflow pipes. Another common option is to create a large subsurface detention basin at the perimeter of the field allowing for a certain amount of ground water recharge to occur and only allowing excess storm water to flow into a watershed at a reduced volume and flow.

Since synthetic fields require some irrigation to either reduce heat gain or flush contaminants from the surface and infill, there is an opportunity to capture and reuse storm water that falls on the field. There a many different types of subsurface storm water capture systems available for collection and storage. Several are complete systems with booster pumps to supplement an irrigation system or an engineer can design a system to meet specific needs.

As more and more sports complexes are installing multiple fields to meet increased user demand the need to address storm water runoff becomes more acute. To understand the impact of a single 1-inch storm event on a regulation soccer field the collective runoff quantity would exceed 58,000 gallons. If we were to assume an average monthly rainfall amount of 4 inches, a single field will receive 232,000 gallons each month. A 12-field complex would receive 2,784,000 gallons of runoff per month. The ability to capture this water for reuse to irrigate synthetic fields to reduce summer heat gain would significantly reduce the cost of domestic water to accomplish the same effect.

The benefits of collection and storage would allow for sufficient irrigation water to reduce excessive surface temperatures reducing heat stress issues with players. Studies have shown that the amount of water required to reduce synthetic turf surfaces 14 degrees for a period of 2 hours is approximately 3,000 gallons. With summer temperatures reaching 90 degrees or higher, synthetic surfaces can reach 180 and higher. The need to manage these surface temperatures through irrigation to protect players from heat related illness or reduce the potential of contracting infections from pathogens or microbes on the playing surface increases the importance of having a sensible water management program that includes a storm water collection and reuse system as part of the field design. Incorporating a subsurface collection and booster pump to operate the irrigation system has the capability to provide the needed quantity of water to manage surface temperatures and reduce the potential of health-related issues for players.

PUBLIC SAFETY ANGLE

Issues with synthetic turf and its impact on public health safety and welfare require more attention. As more synthetic turf installations occur each year to meet the growing demand of citizens, associated safety issues need to be addressed before making the purchase. The safety issues related to excessive surface temperatures on synthetic turf fields currently presents the greatest risk to public health and safety followed by contaminants which can become embedded in the infill and backing material.

Management of the synthetic turf surface and infill system should have a set of standards manufacturers and owners should implement and comply with or each installation to protect public safety. Municipalities or state agencies need to press for a published set of guidelines to protect the public and ensure adopted guidelines are met just as they do for other facilities such as public pools.

Studies show that a synthetic turf surface can reach temperatures as high as 89 degrees above ambient due to the heat gain capability of the synthetic turf pile and infill material. The highest recorded synthetic surface temperature to date was 196.4 degrees by Penn State University at the Center for Sports Surface Research. Currently the only effective option for mitigation of surface temperature is the application of water through an underground irrigation system or a traveling water wheel. Although studies show the effectiveness of surface irrigation will only reduce temperatures 14 degrees for a period of 2 hours the real benefit arises when surfaces temperatures reach 120 degrees which at this point become a health risk to smaller children who are more susceptible to 2nd and 3rd degree burns at these temperatures. The ability to apply water to reduce temperatures at this point becomes a good management tool to protect the public.

Education of the public of what to look for when heat related illness occurs and published guidelines posted in areas easily seen by the public will provide some additional protection. Coaches and referees should also be instructed in the use of a hand held temperature gauge to monitor temperatures and thereby know when to either stop play until conditions improve and or activate an irrigation system to reduce surface temperatures.

Managers of outdoor synthetic fields should also require access to ample drinking water and cooling stations placed around the field to reduce heat stress during hot periods when the field is in use. The addition of shade structures around the perimeter of a field would greatly reduce surface temperatures in shaded areas.

There is no doubt synthetic turf fields provide the public with a quality playing surface which can withstand heavy daily use. There is also a need to address public health safety and welfare and establish a set of guidelines which will set the standard for safe use. ■

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