By **Steve Bush, CSFM**

» **TONY SENIO** University of Iowa Athletic Fields Manager.

Watering artificial turf: the state of the art

If you tell someone you're installing an irrigation system on a synthetic field, it's likely you'll be met with a puzzled look, followed with a series of questions like:

"You're doing what?"

"Why would you water an artificial field?"

"Isn't the reason for having a synthetic field so we don't have to water it?"

But not far into an explanation of what this procedure entails, the incredulous looks disappear, and they grasp the reasons for and benefits of watering these new-generation fields.

In the past, watering systems have often been to small, lacked sufficient range, or not been capable of applying large enough amounts of water to the field surface in a short enough period of time to make them feasible. Now, however, irrigation technology is catching up with the demand for synthetic surfaces and the desire to water them.

Several companies are attempting to build or currently are marketing large-scale irrigation heads that can be mounted out of the field of play. For example, Underhill sells the M120 and M160 high capacity pop-up heads for in ground installation. Nelson Irrigation produces a water cannon called the "Big Gun." Hunter Industries sells high-volume ST-90 heads, which are then installed in-ground, on or off the actual playing surface. These heads are equipped with a rubberized top to absorb player impact. Other companies are producing heads or modifying existing ones for this market as well.

Many sports turf managers are divided on the topic of watering synthetic fields. But it is important, regardless of your stance, to consider the health and safety risks that accompany an unwatered artificial surface. They include higher surface temperatures, as well as costly complications with sanitation and biological control.

It may come as a surprise, but synthetic surfaces have been watered for years. Since the 1970's, field hockey has been played primarily on artificial surfaces. Even today, athletes prefer to play on a watered, older-generation artificial turf instead of the new synthetic generation with fiber strands. This is because while newer fields need to be kept sopping wet due to their fast-draining fiber surface, the older artificial turf acts more like a tray that holds the moisture. The water reduces amount and severity of abrasions incurred by players who fall or slide on the surface. In addition, water helps the ball stay on the ground more consistently, cuts down on large bounces, and cools the surface by several degrees.

The University of Iowa has been a Midwestern field hockey powerhouse since 1982, a period during which they won their conference 17 times, scored two second place finishes, ranked in the Elite Eight or better in the NCAA tournament, and won three runner-up finishes. Due to hosting NCAA games and countless tournaments, the University demands a superior playing surface and optimal field watering system to provide a consistent competitive surface.

However, when Iowa's field hockey facilities were originally built, the initial contractors mounted Rain Bird 1150 golf heads in concrete around the field. These heads did not provide enough water to the center of the field. To compensate for this, three Nelson "Big Guns" were added: one was placed on the goal backstop supports on each end of the field, and a third one was placed mid-field under the bleachers, requiring that the bleacher pads be removed in the process.

The entire process was tedious and made worse by the fact that field hockey requires the field to be watered before the game and at halftime. In response, the university began seeking a system that would eliminate these hassles and get more water on the field more quickly.

When Bush Sports Turf was recruited for the job, we knew it would be a unique and challenging project, especially since the new watering system needed to

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be installed into the existing facility. This would mean going under, around and through the existing system, buildings, bleachers and sidewalks. We collaborated with Iowa's superintendent of grounds, Ted Thorn, John Deere Landscapes, Underhill, and Hunter to come up with the final design and system components.

The system would consist of the following:

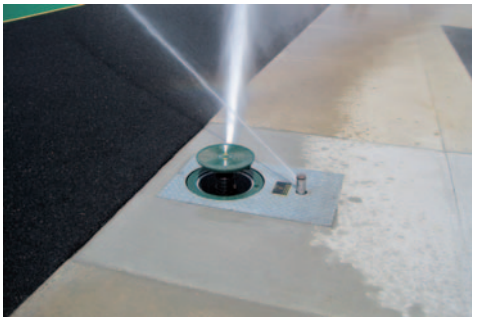
- New water service, Backflow preventer and water meter. New six-inch PVC mainline with all cast iron fittings
- A Watertronics 30 horsepower booster station that would provide an increase from 70 PSI to 115 PSI discharge pressure at 450 gallons-per-minute.
- Six Underhill Mirage M-160 heads, each applying 220 gallons-per-minute
- Six Hunter I-25 high speed rotors
- Custom-made head restraint fixtures for each of the heads
- High-density polyethylene enclosures with laser-cut galvanized steel lids.
- Four quick couplers at each of the four corners
- Hunter ACC decoder control system with composite pedestal and ROAM remote
- A custom warning system connected to PA system
- Emergency system shutoff

The system had to be completely new from the city water main to accommodate the anticipated flow of 450 gallons-per-minute, while running two of the Underhill M-160 heads at a time. This would include a new booster, 6-inch backflow preventer, and water meter. The old system used a 4-inch mainline that would only accommodate a flow of around 200 gallons-per-minute. The other challenge was that the existing system had to be left intact because the adjacent soccer field and surrounding landscaping was tied to the 4-inch main. In response, we installed the new 6-inch mainline loop around the perimeter of the field. This required hand-digging in several spots, due to existing utilities and directional boring under existing pavement and walks. The longest section of sideline required a 160-foot directional bore. All of the fittings were cast iron, with bolted restraining rings and concrete thrust blocks.

>> 160-FOOT MAINLINE glued for directional bore under sidelines.

One problem with irrigation heads in the Midwest is that frost causes them to move up and down, independent of their surroundings. This was an issue with the existing heads on this project, as they had heaved and were sticking up above the concrete. This created a real safety issue. Due to the size of the Underhill M-160 head, we needed a method for keeping the heads from moving up and down and requiring future adjustment. This was especially important since two of the heads were mounted in the concrete at the edge of the field.

We solved this by building a clamping fixture that held the head, as opposed to



» **LEFT:** The old heads had heaved because of frost. **MIDDLE:** I-25 warning head running as Underhill M-160 head comes on. **RIGHT:** Large heads come on.

mounting it in gravel or soil. The fixture anchors to a concrete footing below the 42-inch frost level in our area. A drain was also installed in each of the footings. Next, we built the fixture using the following procedure:

• The heads were clamped into the fixture at the proper elevation to line up with the enclosure lid. This also allowed the entire head and valve assembly to be preassembled in the shop then bolted in place as a single unit.

• A flexible stainless steel connector then connected the assembly to the mainline, eliminating the need for a swing joint.

• This entire unit was then covered with a high-density polyethylene enclosure with a galvanized steel diamond plate lid.

• The lids were modified by laser-cutting a hole that was the size of the M-160 and Hunter I-25 sprinkler tops.

• Due to the size difference in length, a custom bracket was installed under the lid to keep the I-25 at ground level.

These custom modifications allowed for both irrigation heads to be at exactly ground level at all times and creates a smooth top with no voids between the heads and lid.

Due to their size and the 220 gallons-per-minute that each of the Underhill heads apply, we also incorporated a few safety features into the system. This is important in field hockey systems because the field is watered when players are still on or near the field. The system we installed has a warning device that is connected to the controller, and triggered using a Hunter decoder. Before the system starts, an alarm sounds for 5 seconds before a voice announces, "Caution: field watering is about to begin. Please exit the field." Following the announcement, a Hunter I-25 high speed rotor mounted in the enclosure lid runs for 15 seconds to alert anyone within the heads' vicinity to move. Finally, the M-160s activate and run for 5 minutes. The entire watering cycle takes approximately 17 minutes, and applies nearly 6,600 gallons of water to the field.

If on some occasion the safety measures taken are not enough to get individuals to move, an emergency shut-off button is located on the press box at midfield right between the team benches. This button is wired directly to the controller, and will immediately shut down the entire system when pushed. Once things are considered safe again, the button can be twisted back to the "on" position, and the system will resume.

To tie each of these unique features together, the Hunter ACC Decoder Control System with composite pedestal was installed to run the watering system. This controller was chosen for the many extra features it offered, including the ability to program zones in seconds instead of minutes. This was an important feature because the PA system alarm only runs for 5 seconds, and the I-25 warning heads only need to be run for 15 seconds as a quick warning before the large heads initiate.

Another beneficial feature of this controller is its hidden menu

Turfgrass Water Conservation Alliance debuts

The Turfgrass Water Conservation Alliance (TWCA), a non-profit organization dedicated to improving the environment through water conservation initiatives, made its debut at the Midwinter Conference of Turf Producers International earlier this year.

TWCA recognizes and promotes plants that can thrive using limited amounts of water, helping to preserve our water resources. To accomplish this goal, the TWCA program is designed to recognize plants and other live goods in the lawn and garden industry that provide a clear benefit in water conservation. Products that become TWCA qualified will have successfully met a stringent set of criteria. Consumers will be assured that any product with the TWCA qualified seal provides true water conservation benefits.

The use of water to maintain residential lawns, recreational areas and landscapes, and other non-agricultural uses is often criticized and scrutinized by various governing bodies and the general public. To meet the growing tide of concern over non-agriculture water use, it is imperative that researchers work to introduce new plants and other live goods into the market that can survive under reduced or limited water while still maintaining overall plant health.

To learn more about the Turfgrass Water Conservation Alliance and how you too can make a difference, go to www.tgwca.org or email info@tgwca.org. ■

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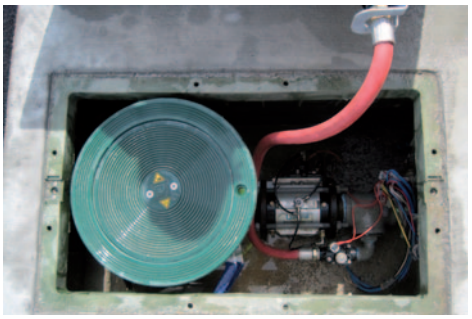

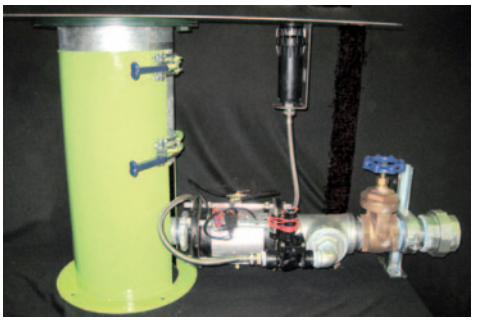

» **LEFT:** The system's emergency shut-off. **MIDDLE:** If service is needed, these enclosures allow easy access. **RIGHT:** Safe walkover field side installation.

that allows you to put heads into station groups. This was a key component, since the main problem with the old system its inability to soak the field as quickly as possible. With the 6-inch mainline, two M-160s are able to run at the same time, which cuts in half the amount of time it takes to water the field. Teams are now able to warm up longer between games and at halftime because they are no longer waiting for the watering system to finish its cycle.

Finally, a Hunter ROAM remote was installed so individual heads or cycles can be started wirelessly from anywhere on the field. It also allows the user to start their pre-programmed cycles or turn on heads individually when needed. This remote has a range of up to 1000 feet, and is easy to use, and installation of the receiver was simple, thanks to Hunter's SmartPort connection on the controller.

As the installation of artificial sports turf fields increases worldwide, it is important to optimize the playing surface with proper field watering equipment. Although much of what is used now for this purpose is new or modified technology, one can only imagine what options will be available in the near future. ■

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