

# Custom design for quality sprinkler systems



**COVER  
STORY**

**The benefits of a properly designed and installed irrigation system: healthy turf, dollar savings.**

by James T. Holter



**Q**UALITY IRRIGATION systems result in more than just healthy turf. The proper system will also help you make the most of your time and money through water and power conservation.

An irrigation system is a long-term investment, one which can affect your budget for years to come. But purchasing a new system should not be approached with intimidation. A buying decision should be based on the knowledge of what an irrigation system can do, and how new options make them more site-specific than ever before.

Irrigation systems provide a basic, yet vital service: they get water to turf, so it can better meet the needs of the users, whether they are playing golf, football or going on a picnic. The options available to tailor a system, however, have become more advanced, and provide the opportunity to save time, money and resources.

**Cost management**—With computer-controlled systems, you can regulate water and power consumption quickly and even remotely, says Bud Knowles, president of Wolf Creek, a Rain Bird distributor in Dayton, Ohio.

According to Knowles, systems with modern options avoid using too much water and put back into the soil only what was lost through evapotranspiration.

Computers also make it easier to adjust the irrigation system to meet seasonal requirements.

"The biggest fallacy that most people have with irrigation systems is they turn them on, and they let them run at one pace all year," according to Bruce Funnell, Wolf Creek specifications expert. "That's silly. It doesn't make any sense, but people do it all the time."

Plants have different water requirements in different seasons because they are in different stages of development. They could be expanding their roots or developing their blades, Funnell explains. Also, daily fluctuations in the weather make frequent adjustments necessary. With

computer-controlled systems, Funnell says, you can make these adjustments almost effortlessly.

When you adjust for seasonal needs, you not only do what is best for the turf, but you keep water and power consumption at a minimum. Low-voltage equipment that meets the specific needs of the site will make for even greater savings.

**Custom comforts**—High-tech features make purchasing a new system quite attractive. A quality irrigation system, designed to easily adapt to future developments, saves money in the long run and time the day after installation.

"Superintendents should make sure that they have a good, quality-designed system," says Funnell, "one that meets all of their requirements and gives them the flexibility that they need. The better system that they have—if it was installed correctly—is the first step to saving money."

"It's not the installation of the system that's going to cost them," he says. "It's the operation of the system over the next 20 years or so."

You, Funnell warns, should not be "penny-wise but pound-foolish." You should make the initial investment necessary to meet your future needs, tailoring the system to your site and getting the best design advice available.

With all of the current options, customizing has become a greater concern. The question of whether a site needs equipment such as weather stations or moisture sensors could have potentially expensive answers. Environmental factors, physical





aspects of the site and, most importantly, the needs of who will use the site are imperative in finding cost-effective answers.

**Green needs**—Steve Morton, superintendent at Mallard Creek Golf Course, Columbia Station, Ohio, has installed Toro Network LTC stand-alone control units on the irrigation system feeding the nine new holes on the 27-hole course.

The new digital units give Morton accuracy that he says he couldn't get with mechanical controls.

"You can set them (mechanicals) for five minutes," Morton says. "and they'll run for six or seven."

The original 18 holes still use mechanical units. The maintenance staff took in all the clocks and recalibrated them, but they still don't work right. Morton will replace them next year with digital units.

Morton can also set the system to turn on automatically, an option of which he hasn't taken advantage. When pipes are installed, some dirt and debris inevitably gets in the system, he says. If he doesn't closely watch the system, a pebble might stick in a valve and flood the area without him even knowing it.

With the stand-alone units, Morton can easily vary applications from day to day and season to season. Although rainfall in the Columbia Station area has been regular recently, he's made three or four small

adjustments in the last two weeks. Morton appreciates the ability to fine-tune the system and expects the turf does too.

Morton says Mallard Creek



spent just the right amount for the system. He and management looked at all the options, he says, from various pump models and parts to remote control units. They purchased just what they needed and did all the installation that they had the time and the qualifications to do.

Moisture sensors are another option that Morton feels would be unnecessary.

"I don't think I want to depend on moisture sensors to tell me how much water to put down," he says. "I can go around the course and look. I can see if there's a problem anywhere. If a couple extra heads need running, I'll add time to them."

Whether a system uses "high-tech



**Steve Morton and his crew at Mallard Creek saved about \$20,000 when they designed and installed this pump station.**

options," Morton says, depends on the golf course. Mallard Creek, for example, is a public course. The customers don't demand amenities that would take Morton away from the irrigation system and force him to install a more independent unit.

**Landscape applications**—The scenario at Case Western Reserve University in Cleveland is a good example of how landscape personnel should analyze their irrigation needs before buying.

The university has purchased a computer-controlled irrigation system in order to conserve time and water and better feed newly-landscaped acreage. The entire project is planned for completion in 1997, in conjunction with new building and field construction.

The system is controlled by a Toro OSMAC central computer, and will cover 52 zones, from intramural athletic fields to lawn areas.

"It will be an elaborate system," says John Michalko, landscape superintendent at Case Western, "more so than I've ever dealt with."

Operators will be able to program the computer four ways: over phone lines, from the central computer, from field units, and over the university's exclusive radio frequency. Multiple control options were required, Michalko says, because of labor and growth considerations. With radio control, new zones do not have to be hard-wired to the central computer. Built with expansion in mind, the system will evolve to meet future needs of the university.

The system can be updated with moisture sensors, a weather station, a leak

detection system and sensors to measure evapotranspiration. These are all options that the system was designed to accept, according to Robert Dye, irrigation sales representative at North Coast Distributing Inc., a Toro distributor in Cleveland.

**Expecting the unexpected**—Operators typically will use radio control to adjust the system. If Michalko programs the irrigation system to turn on at a certain time, then learns of a conflicting game time, he can program the changes in one session at the central computer.

"[The system] can be left to have a start time every day or every other day," says Dye.

The system is housed in an area around a new library and above a parking garage. This part of the system will automatically shut off before it overloads the deck with water. The parking garage was one application that made this system unique, Dye says. The moisture level concerns in many ways mandated the design of this part of the system. Another trick was having the main lines bypass the roof area.

Michalko doesn't need a weather station or moisture sensors because he has the staff to make the decisions such equipment would handle. What Michalko *does* need is a system that is economical in terms of hardware and does well with water management. That is what he took the time to find, and he is confident that is the system he is installing.

He's also dealing with a common industry employee trend.

"It's the same old buzzword: you have to

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(Right) Michalko: new irrigation system can be adapted to meet future needs.

(Below) Morton: stand-alone units offer scheduling versatility.



## Irrigation solutions

■ Computer controlled systems open up a whole new world of options that make running an irrigation system cheaper and easier. Features range from remote control to water sensors. Not all options are right for each site, but you save time and save money when you know the options that work.

• **Remote Control.** A computer-controlled system offers great advantages in terms of time management. With such a system, you can enter relevant data into a computer and expect the system to operate quite independently.

"All [the superintendent] has to do is tweak the system on a daily basis as he is touring the golf course," according to Bud Knowles, president of the Wolf Creek distributorship. "Otherwise the computer will control the whole thing."

This option would work well for a superintendent who has extensive duties away from the irrigation system.

• **Weather Stations.** Weather stations are not cost-effective for every site, but larger operations can save money with one by knowing how much and how often to run its irrigation system.

A weather station will save water, Knowles explains, by keeping pump operation at a minimum. This saves money in terms of power consumption as well, he adds.

"But if you're a good water manager," cautions Bruce Funnell, Wolf Creek's specification manager, "it would be hard to justify a weather station just in terms of water savings."

The big opportunity to save money with a weather station is in labor management. If you have to drive around to multiple locations and continually adjust something, Funnell explains, a weather station will drastically decrease the amount of time needed for adjustments.

• **Moisture Sensors.** These are another great way to know when to turn off the pumps, but, unfortunately, are even more cost-prohibitive than weather stations.

"Soil conditions vary from one site to another site, or one hole to another

hole, so moisture sensors would have to be over the whole golf course to really be effective," according to Knowles.

These might be right for areas that traditionally have been trouble spots. For such sites, Knowles says, strategically placed moisture sensors can help you control the problem.

• **Vertical Turbines.** For the most part, centrifugal pumps have been replaced with vertical turbine pumps, according to Knowles.

The reason, Knowles says, is that vertical turbine pumps operate at 15 percent to 20 percent greater efficiency than centrifugal pumps.

• **Vertical Frequency Drive.** VFD permits a pump station to save electricity, based on the water needs of site.

VFD controls the velocity of the water going through the system, which manages water hammer and reduces physical problems such as loose fittings and blown pipes.

Conventional systems control pressure with a pressure regulating valve. A VFD pump, though, avoids pressure problems altogether. There is no need for a solution to a problem that doesn't exist.

A VFD pump works by applying pressure at a constant, Knowles says. "This is another large advantage to [VFD pumps], that you do not have a large fluctuation in pressure."

• **Lightning Protection.** Some new technologies protect an irrigation system from lightning, Knowles points out.

"One of the things we handle is called the high LDP," Knowles says. "It senses the lightning coming into the area. When it senses the lightning, it will disconnect the power to the computer or to the pump station."

That power will stay off as long as the lightning is in the area. Once the lightning has left the area, the whole system will kick back on without any instructions from the superintendent.

With the high use of computers in irrigation systems, a good lightning protection system is important. Computer circuits are very sensitive to fluctuations in current. It wouldn't take much for a routine thunderstorm to cause thousands of dollars in damage.

do more with less," says Michalko. "That means you have to get more sophisticated in the type of equipment and chemicals you use and your scheduling."

He also has a knack for instilling pride in his crew.

"If they take more pride in what they're doing," Michalko promises, "they will produce more."

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