Improved Water Storage And Efficient Irrigation

Crystal Downs Country Club **Frankfort, Mich. 49635**
Michael Morris, CGCS, superintendent

Issue

The maintenance department at Crystal Downs Country Club aims to provide players with a firm and fast golf course. However, their ability to do so was limited by their aging irrigation system. The pump station was inefficient and had antiquated, unserviceable controls. This resulted in unacceptable system pressure, flow and sprinkler performance. In addition, the central control system did not allow for individual head control or station-based programming. This made it almost impossible to irrigate with the precision necessary to provide consistently firm and fast conditions. Improving the water source for the irrigation system and upgrading the central control system would help address these issues.

Action

A reputable certified irrigation consultant was hired to design the new system with the following criteria in mind: better control of pressure and flow, energy efficiency, improved sprinkler performance and accommodations for pipe and sprinkler upgrades in the future. A modern central control system would allow for individual head control and enable the staff to make adjustments in the field with digital tablets.

Superintendent Michael Morris, CGCS, and the irrigation consultant worked together to research options for the pump station, main line piping and irrigation control systems. They decided to locate the new pump station at the highest point on the property. This would make it easier to eliminate air from the system and gravity would provide a significant amount of the pressure required to operate the irrigation system. They also utilized an innovative underground water storage system that would help conserve water and reduce maintenance costs.

Results

Prior to the upgrade, the irrigation system required 205 horsepower to produce 900 gallons per minute discharging at a pressure of 120 pounds per square inch (psi). The new system needs only 90 horsepower to produce 1500

gallons per minute at a pressure between 50 and 80 psi. This reduces both energy consumption and the total watering time. In fact, there was a measured 15-percent improvement in energy efficiency with the new system.

Pipes, fittings and sprinklers require fewer repairs because system pressure and flow have been improved. Stress on irrigation components from air in the system and water hammer is no longer a concern and the underground tank eliminates the need for water filtration and pond management expenses.

In past years, water use for irrigation ranged between 17 million and 19 million gallons per year depending on the weather. The new irrigation controls and the addition of a dedicated irrigation technician helped reduce golf course water use by 30 percent. Golfers have responded positively to the firmer, faster conditions that are possible with the new system.

Improving an irrigation system is a complex process with many people involved. Careful planning and communication are essential for success. You must have a clear understanding of the total irrigated acreage and the irrigation philosophy for the golf course. You must also be able to answer questions about the deficiencies of the existing system, the components of the new system and the eventual impact on course conditions.

It is important to spend extra time planning and building consensus before beginning an irrigation project. There should be a clear understanding of the course's irrigation philosophy and the long-term goals for the golf course. Issues such as playability, course restoration, water use and energy conservation should all be discussed thoroughly. Once those matters are settled, the nuts and bolts will fall right into place.

Storing water in an underground tank eliminated pond maintenance expenses and any water loss due to evaporation.