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Out of Sight

BY MATTHEW MIKUCKI

“Where did you hide your irrigation controllers?”

Almost every superintendent who visits his course asks Dave Davies, certified golf course superintendent at TPC San Francisco Bay at Stonebrae Country Club in Hayward, Calif., that question. It turns out, there are no irrigation control pedestals at Stonebrae. The golf course irrigation system uses a unique device called a decoder that allows the entire control system to be hidden underground.

Underground decoder systems for golf course irrigation have been in use for more than 20 years. However, the technology is relatively new to the western United States.

Decoder technology, long used in other industries, was adapted for irrigation control in Europe, where it became the system of choice during the 1980s. In the 1990s, these systems migrated to the northeastern United States, where they are now one of the most popular configurations used to intelligently irrigate golf course turfgrass.

While decoders are sophisticated electronic devices, the irrigation control system is really quite simple. A computerized central control system is linked by buried cable to many decoders — small devices distributed throughout the course, below ground in a

valve box or even buried directly in the earth. Software installed on the central computer intelligently manages the hundreds or even thousands of valve-in head sprinklers, electric valves and sensors installed on a golf course. In this way, decoders replace traditional above-ground, pedestal-mounted field satellite controllers with a below-ground system that is just as powerful, yet entirely out of view.

The decoder itself is an uncomplicated, waterproof device that’s about the size of a soda can. Decoders are designed to interact with software running on a desktop computer via a two-wire path that carries power and communication signals. In addition to their underground installation advantages, a simple two-wire path is the other major difference between decoder systems and satellite control systems.

Centrally controlled irrigation systems using satellite controllers have one set of wiring supplying power to the pedestal and another set of wiring serving as the communication path used to signal the controllers from the central computer. Even before one begins to consider the significant cost advantages of decoder systems related to the wire alone, their simple design also has a tremendous impact on how the system is installed,

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Superintendents rave about underground decoder systems used for golf course irrigation



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maintained and even expanded. A decoder is typically located in the ground next to a valve-in-head sprinkler or located in a valve box at the end of a lateral irrigation pipe. Since below-ground decoders only require a simple two-wire path to both operate and power the decoders, far less copper wire is required when building a typical system of this type.

Depending on the design, an average 18-hole golf course may use 30 percent to 60 percent less wire than a comparably sized controller-based system, which could save up to between \$25,000 and \$150,000 in material and labor costs alone. Elimination of all this copper wire also simplifies the design and improves the overall expected system reliability, further reducing the total cost of ownership.

“Eliminating satellite controllers on the golf course means there’s one less thing to worry about,” said Kyle Dykstra, certified

golf course superintendent at Sierra View Country Club in Roseville, Calif. “The crew no longer has to trim weeds or mow around the satellite controllers.”

Dykstra played an important role in the decision to install a below-ground decoder system at Sierra View. He says no single factor motivated him to select decoders over field controllers. But when he put all the pieces together and thought about the entire irrigation system, decoders just made sense.

Because the technology was new to him, Dykstra did what any responsible superintendent would do before making the decision to use decoders. He learned the technology and conducted some of his own research. As with any technology on the golf course, the most important part of that research was talking to other superintendents who already had decoder systems. The extremely positive feedback he received from every course he called was a significant factor in his decision.

According to Dykstra, eliminating insect problems and improving the visibility and aesthetics of the golf course, plus the reliability and ease of troubleshooting the system were among the most important reasons he ultimately chose decoders for the new irrigation system at Sierra View. Now, three years after the decoder system was installed, Dykstra can’t recall encountering a single problem with his decoders.

Back at TPC San Francisco Bay at Stonebrae, one of the many decoder system benefits Davies has experienced is the ease with which the system can be expanded. When the system was first installed in 2006, the design for much of the landscaped areas had not been finalized, and therefore irrigation could not be installed. As the incomplete areas came online, the staff simply located an existing wire, then spliced in a new decoder — a process that’s no more complex than installing a sprinkler and simply isn’t possible with a satellite control system.

“All they have to do is string a little wire and pipe, and they’re done,” Davies says. “That’s when the light bulb went on — the irrigation team could not believe how easy it was to add new sprinklers to the system.”

As soon as the decoder is spliced into the

wire path, a new four- or six-station loop immediately becomes available for landscape irrigation. Davies also says that Stonebrae architect David McLay Kidd created a design with “nothing above ground on the golf course other than the flagsticks.” Having a system that could eliminate the negative visual impact of controllers was a key component of the architect’s overall vision for the course.

In the last several years, decoder systems like the ones at Stonebrae and Sierra View have begun to spring up in hot, dry climates typical of the western United States. Advances in the technology now allow for larger systems, making decoders a practical option. When decoder systems were first popularized in Europe and the northeastern United States, they were used as supplemental irrigation in those cooler climates with regular rainfall. These early systems were not designed for courses requiring 1,500-plus sprinklers to maintain turf in more arid climates like California. Today, below-ground decoder systems are capable of controlling as many as 4,000 individual sprinklers from a single central-control computer.

One commonly asked question about decoder systems is how well they handle in-field sprinkler control. With decoders, in-field control is limited to a hand-held radio or a cell phone with Internet connectivity. Because decoder systems are completely underground, they do not have easily accessible pedestals with control panels that can be seen and touched. This can be a little unusual to someone who has always used field controllers. Davies actually uses hand-held radio control to his advantage.

“The people who are doing the irrigation work have been forced to learn the mobile control system,” Davies says. “It is a benefit to the golf course since they learn to use the map and are more adept at using the central control software.”

The benefits of below-ground decoder technology are numerous. Less wire (and the resulting lower cost), invisible control and simple expansion make decoders an option for many courses. Even with the relatively long history of this technology, the rate at which new decoder systems are installed



continues to increase year after year. Decoders are being installed on new golf courses, course expansions and major and minor renovations throughout the world. Each year, more superintendents will find themselves being asked the same question that Davies hears so often: “Where did you hide your controllers?” ■

Matthew Mikucki is golf central control product manager for Rain Bird in Tucson, Ariz.

Architect David McLay Kidd created a design for TPC San Francisco Bay with “nothing above ground on the golf course other than the flagsticks,” making underground decoders the perfect choice for the course’s control system.