Drip Irrigation Improves Water Management

Shadow Creek **North Las Vegas, Nev. 89031**
Timothy Cloninger, superintendent

Issue

Shadow Creek golf course in North Las Vegas, Nevada, features 100 acres of naturalized areas comprised of tall grasses and more than 6,000 planted pine trees. The irrigation system in these naturalized areas consisted of full-circle sprinklers spaced approximately 65 feet apart. This design offered relatively uniform coverage, but it did not allow the maintenance staff to water grasses and trees according to their specific water requirements. Irrigating the trees adequately resulted in overwatering of the desert-adapted grasses, which encouraged the growth of undesirable weeds and thick, dense grasses that impacted pace of play.

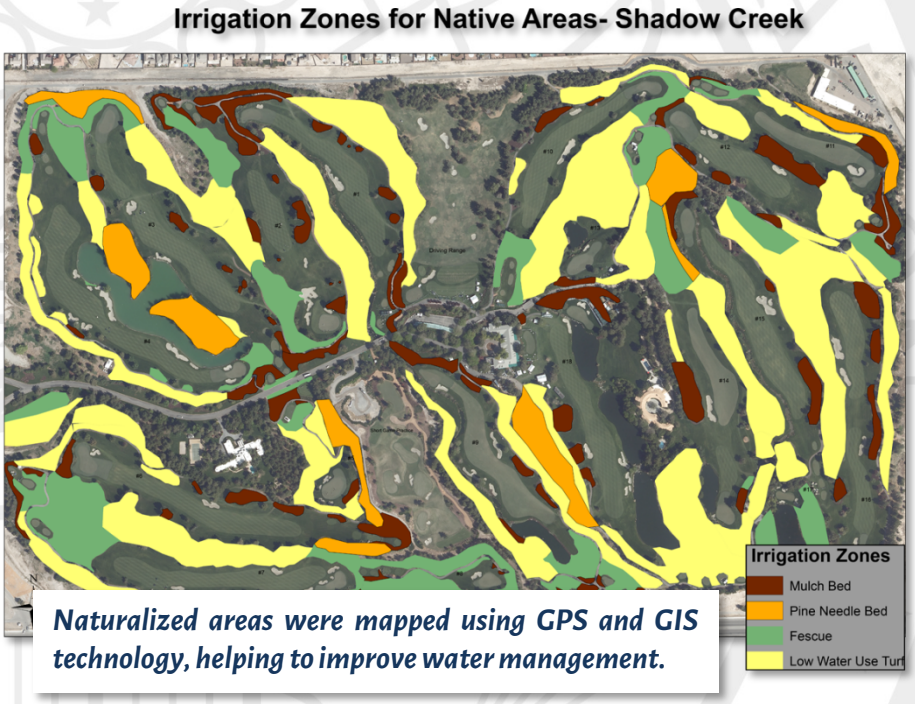
Two loops of in-line drip tubing were installed around the base of each tree on nine holes at Shadow Creek.

Tree health was also suffering because pine trees should be watered deeply and infrequently, but deep and infrequent watering was not possible using overhead sprinklers across 100 acres of severe slopes and poor soils. From 2012 through 2014, 406 trees died and many of those deaths could be attributed to inadequate soil moisture. For the benefit of the trees and naturalized grasses, it was clear that the irrigation design would have to be upgraded to enable independent watering.

Action

Superintendent Tim Cloninger proposed installing drip irrigation for all of the trees in the naturalized areas. This would allow the trees and naturalized grasses to be irrigated separately, according to their specific water requirements. The enhanced irrigation capabilities would also help the course adhere to their drought management plan by using less water for the grasses while keeping the trees healthy.

From the fall of 2014 through the spring of 2015, drip irrigation was installed for the trees on nine holes at Shadow Creek. Each tree is watered by two in-line drip loops around its base. The drip system was installed by in-house staff; they began the process on three holes and finished the next six in phases. The drip system consists of four to six valves per hole, with a valve supplying water to roughly 70 trees. Each valve is outfitted with a "Y" strainer to filter the water and a pressure reducer.



Naturalized areas were mapped using GPS and GIS technology, helping to improve water management.

Results

Shadow Creek spent approximately $90,000 to install the drip system for nine holes and saved $300,000 in water costs in one year. Upgrading to drip irrigation around the trees reduced total water use by 27 percent in the first year. Further

reductions are expected as Cloninger and his maintenance staff installs drip irrigation for all trees on the remaining nine holes.

In addition to the water savings, the trees are healthier because they are deep-watered at an appropriate frequency. They also receive fertilizer and wetting agents through the drip lines when necessary. Sixty fewer trees died in the year following drip installation than the average losses in the three years prior. Over time, the quality and playability of the naturalized grasses will also improve with reduced water inputs.

The drip irrigation project has yielded many benefits, but there were also some challenges. The project was time consuming; it took five full-time employees approximately six months to complete nine holes of drip installation. The steep, rocky terrain made trenching difficult, with some areas requiring hand trenching. The staff learned a great deal from the challenges they encountered during the first phase of this project, such as the best methods and parts to use when installing the system. That knowledge will be invaluable during the second nine-hole phase and during future drip irrigation projects at the facility.