

# The Intricacies of an Irrigation Maintenance Budget

by Erik Christiansen  
EC Design Group, Ltd.

The most frequently asked questions when becoming involved with an irrigation project design or feasibility study are what kind of maintenance is required with the system and how to budget this expense. My answers to these questions are very general, because it is difficult to answer them simply in terms of equipment. Yes, maintenance on most irrigation systems requires an obvious outlay for parts to replace or repair sprinklers (pipe fittings, wire splice kits, valve assemblies, etc.), but this article will focus on the sometimes hidden costs involved in modernizing your irrigation system.

Today's systems are often extremely complex and are sold on the premise that they can make the superintendent's life much easier. The latter is both true and false. For the record, I am a fan of technology, and these systems can truly give the superintendent the tools to be a better water manager. Modern irrigation systems have the ability to perform much more accurate, efficient and controlled watering than ever before, but luxury has a price. Variable frequency drive pump stations, computerized central control packages, weather stations, and the use of radio frequency signals instead of wire are all mainstreamed advances requiring additional attention.

In setting up an irrigation budget and/or maintenance schedule properly, you need to consider the five major irrigation components and related services: water source/pump station, piping, sprinklers, valves and controllers. The first and maybe the most important components are the water source and pump station. In the case of potable water source, you also need to consider the backflow preventer. For irrigation systems using municipal or potable water, yearly certification of

your backflow preventer is required. You should always check local and state codes because maintenance must be performed by a certified backflow device tester and requires a certification fee.

## Water Source

System water tests from your water source should be performed at the start of the season. It is always a good idea to test your water source during peak operation as well. Relatively inexpensive tests can measure salt content, sodium hazards, water pH, toxic-ions and bicarbonates. In addition, some tests can provide information about suspended solids in water. These tests tell the superintendent many things about the water source and what may be happening to water quality. Water tests can be done very easily by taking a water sample from one foot below the water's surface in ponds or directly from the irrigation system after it has been running a minimum of 30-40 minutes. Since the average Midwest golf course applies over 30 million gallons of water—considerably more in arid regions—in a season. It is nice to know not only how your water source will directly affect your system, but also what agronomic issues could be faced.

## Pump Station

The pump station should have high quality water in adequate amounts to perform its operating schedule. It should run automatically with properly functioning controls to prevent air and water hammer. Occasionally listen to the pump. You should be able to hear cavitation, bearing problems, and air and water hammer. Early detection can save a lot of aggravation. Spring start-up, in-season maintenance and winterization are important, and most pump station manufacturers offer a pump station service that may be worth your serious consideration.

## Pipe

The second major component is the irrigation piping network that carries water from the water source throughout the system. Frost heave, bad glue joints, tree spades, tree root feeders or anything digging deeper than 18" can ultimately cause a problem. Having enough repair couplings on hand to fix any size pipe on your golf course is a good idea. The same is true for common fittings that could be used for future expansions and/or repair. Make sure when selecting a cement to use for potential repairs that you choose the proper primer and cement for the size of pipe you are repairing and temperature you're working on. As an irrigation consultant, I prefer ductile iron fittings instead of glued schedule 40 fittings because of their durability. But some glue fittings are necessary in all repairs.

## Sprinkler Heads

The third component is the actual sprinkler heads. Just as important as having extra sprinklers and sprinkler parts on hand for emergency repair is spending the time to inspect sprinkler operation and coverage. Some of the turf issues on your greens, tees and fairways could be caused by improper coverage. As designers, we are continually concerned with matching precipitation of sprinkler heads. Older systems tend to get dirt and debris in the nozzles that could alter the gallons per minute (GPM) output of the sprinkler and change the precipitation rate, causing dry spots and hydrophobic conditions. These older systems are usually expanded over time which also can affect operation pressure, changing precipitation rates. Catch dishes can be used for analyzing precipitation rates (R factors) on your course. It is a good idea to stock sprinkler heads in order to repair your system quickly. Valve assemblies, solenoids, nozzles, drive assemblies and bodies are also handy to have available to maintain or fix a problem. When budgeting irrigation expenses, you should consider time spent checking and observing your system to make sure everything is

working properly. Weekly system checks can help prevent problems caused by non rotating heads or clogged nozzles.

## Valves

Valves are the fourth component, both block valves and isolation valves for the main line. Although block valve systems are becoming less popular and are being replaced by electric valve-in-head systems for more flexibility, there are still a lot of block systems in the field. Block valves require solenoid maintenance, diaphragm assemblies and, in some cases, valve bodies. These, along with time spent to repair them, need to be considered when setting up an irrigation budget.

## Controllers

The fifth and final components are the satellite controllers and the central system. Field satellites can be affected by lightning, so you need to stock a lot of fuses and check your lightning rod connections. The central controller (if you have one) is something a superintendent uses almost every watering day, but may be susceptible to software and hardware issues. Different manufacturers offer different service programs to help update hardware and support any software issue you may have.

By carefully considering these five, major irrigation components and the time spent and outside services required to keep your system operating properly, you not only will have a more efficient, trouble-free irrigation system, but you also should be able to predict an accurate annual irrigation budget.

*Erik Christiansen is president of EC Design Group, Ltd., an irrigation consulting firm specializing in golf course, athletic field and large commercial irrigation feasibility studies and design. EC Design Group, Ltd. P.O. Box 65036, West Des Moines, IA 50265, Tel. (515) 225-6365, FAX (515) 225-6366.*