

Water Systems of the Philadelphia Country Club

By M. E. Farnham

The two courses of the Philadelphia Country Club are about eight miles apart and the water system of each is a distinct unit.

At our Bala course, one of the oldest courses in the district, the water is obtained from a stream which crosses the property. The flow of water is about 200 gallons a minute. A small pond supplies the intake to the system. The water is hard and also is likely to carry considerable sediment into the system. The pump house is located about 50 feet from the pond, the pump itself being only 4 feet above water level. The pump is a triplex displacement pump rated at 135 gallons a minute at 100 pounds pressure. It is driven by a 10-horsepower electric motor automatically controlled. The pump starts when the pressure drops to 70 pounds and stops at 90 pounds. The water is delivered direct to a pressure tank located on the slope at the rear of the pump house. The size of this tank is 6 by 36 feet.

The course is piped with mains to its various parts. The pipe and fittings are galvanized iron, reducing from 5-inch at the tank to 1½-inch outlets along the fairways and 1-inch outlets at the greens and tees. All valves are brass gate valves and are set in boxes below the surface. The pipes are laid about one foot deep. Each green has two outlets, placed at opposite corners. There is an outlet at each tee, and from one to three outlets for each fairway. Control valves at various places on the course permit cutting off part of the system if necessary.

There are three weak points warranting emphasis in connection with this system. The automatic control has at times failed to function properly, resulting in damage to the motor. There are not enough outlets along the fairways. The capacity of the pump is not sufficient during dry spells.

At our Spring Mill course, which was built in 1925, the source of water supply is a stream largely fed by springs on our property. The flow is only about 100 gallons a minute, but a pond furnishes a reservoir of 1,000,000 gallons. Here also we have a hard water carrying considerable sediment, especially after rains. The pump house is located at the dam and the pump is 6 feet above water level. In this case we have a centrifugal pump, rated at 300 gallons a minute at 120 pounds pressure, driven by a 30-horsepower electric motor. The control is manual. The water is delivered direct into a 6-inch main, which after leaving the pump house branches off to supply the various parts of the course. All pipes and fittings are galvanized iron, laid about a foot deep. The valves are 1-inch brass gate valves situated in underground boxes. There is an outlet at each green and tee, and along the fairways outlets are placed approximately every 80 feet.

The water system at our Spring Mill course has given perfect satisfaction at all times. The supply of water would, however, not be sufficient for constant watering of the fairways, should that be necessary, but to take care of such a contingency provisions have been made for connecting with the local water supply.

At both of our courses the water system is used only for watering the course, and our program of watering is the same for each course. In the Philadelphia district the watering of fairways is necessary only during dry spells, except on such courses in adjacent New Jersey

as are built on sandy soil. Some years the watering of fairways is not necessary, and in most seasons the turf is not killed in the absence of watering. Nevertheless watered fairways are distinctly better than fairways which are allowed to remain unwatered throughout the season. When the ground begins to get hard and dry we keep fairway sprinklers going on some part of the course 24 hours daily. We use a number of types of portable sprinklers with $\frac{3}{4}$ -inch hose. We have found that a sprinkler which throws a small amount of water and can be left in one location for several hours will keep the turf at that place green for more than two weeks even in the driest season. This is on a clay soil.

We water our greens and tees in the morning. When for any reason it is desirable to be through with the watering at an early hour in the morning, we begin to water before the usual work hours. We do not approve of night watering if it can be avoided. In the first place, it is difficult to get dependable men for night work; in the second place, even a good man can not see to work to best advantage at night. We use sprinklers with $\frac{3}{4}$ -inch hose for all routine watering, having found this to be the most efficient method, the ground being more thoroughly watered in this way. Hand watering is likely to be superficial.

Under our conditions the most important feature of a sprinkler is that it have no small outlet holes to become readily plugged with the dirt which is in our water. This is a feature which is likely to be of considerable importance where surface water is used. Gears or rapidly moving parts in a sprinkler are also a potential source of trouble.

We have no standard length of time during which we water, having found it impossible to work out any such standard, due to the wide variation on our courses in soil condition, areas to be covered, sprinkler volumes, and water pressure.

Golf Course Irrigation in Florida

By Joseph P. McAloon

Fortunately for golf courses on the eastern coast of Florida, irrigation does not present a problem as serious as in most other sections of the country. St. Augustine Links are operated only four months in the year, from December 15 to April 15, and during that particular time our fairways, which consist of Bermuda grass and carpet grass, seem to require little, if any, watering, since these grasses are dormant during that period. In fact, it seems that the only occasion for watering our fairways is when we are renovating them or establishing a turf. After the turf on the fairways has been established the normal rain supply during the year seems to take care of the situation nicely. During the eight months the course is closed there is very little watering done on the greens and tees, other than what is necessary whenever renovating the turf. During the playing season the greens and tees are watered practically every day with regular $\frac{3}{4}$ -inch sprinklers, and for this we are using two-purpose sprinklers, which are proving satisfactory. During the operating season we use $1\frac{1}{2}$ -inch hose fitted with a home-made galvanized iron sprinkler for drenching the greens after they have received an application of top-dressing or commercial