

Cost and Design Factors in Fairway Watering

By J. A. ROSEMAN

THIS information on fairway watering systems has been gathered after having checked the watering systems at Chicago Golf, Bob-O-Link and Olympia Fields, in addition to personally installing the system at Illinois Golf.

It appears to the writer that the drainage system which has been established by the Sanitary District, the general drainage systems of the city of Chicago and suburban towns, together with the many drainage outlets established by the present day subdividers and the draining work done by the Forest Preserve has been the means of draining a great deal of land adjacent to golf courses in the Chicago district. In addition, the golf clubs themselves have been so anxious to have their courses so thoroughly drained that they can play golf within a few hours after a very hard rain and have placed so many miles of tile in their property to guarantee early spring golf that all of the courses are bound to suffer from summer heat and lack of rain, such as we have experienced in the past two months. It does seem, then, that these Chicago golf clubs must resort to fairway sprinkling if we are to have fairly soft fairway and green turf all summer long.

Water Demands

Two of the principal points in connection with fairway sprinkling, then, I find to be: First, adequate water supply with adequate pressure; second, cost of initial installation of water mains and equipment. To adequately water fairways the minimum water supply should be 250 gallons per minute, and it is not possible to get too much, since 65 gallons per minute is required on the usual system where we water only tees and greens. A uniform pressure of not less than 60 to 65 pounds is required and 75 pounds is better than 60 pounds if you are to sprinkle the fairways at the minimum expense.

At Illinois Golf we built a 75,000-gallon tank, elevated 120 feet, which gives us about 65 pounds pressure. We then dug a lake on the course which would beautify the landscape, add to the attractiveness of

the course, serve as a hazard and hold in the neighborhood of 2,000,000 gallons of water. Drain tiles from traps, bunkers and greens were fed into this lake and a water line from the tank also ran to the lake to be used only in case of emergency should the water in the lake fail to maintain a desired level. Our original plan called for the sinking of a second deep well with which to supply the lake or from which to pump to this 75,000-gallon tank and in turn sprinkle over the fairways. The system, however, was designed to pump from the lake to the tank or from the lake direct to the fairway sprinkling system, or from the tank to the lake, depending upon the conditions to be met. The water when pumped from the lake would be delivered by a centrifugal pump capable of throwing 275 gallons per minute and producing a pressure of 75 pounds.

As I said before, the first items on this subject are source of supply, possible quantity available and method of producing the water. I have found that deep wells in our vicinity must be sunk somewhere between 1,200 and 1,400 feet to get more than 125 gallons per minute and the cost of these wells will average \$8.00 per foot.

Costs on Illinois Basis

The well will cost approximately \$10,000 and the pump with a 25-horse power motor will cost somewhere between \$4,500 and \$5,000, and a 75,000-gallon tank 125 to 130 feet high will cost somewhere around \$5,000. A lake or a swimming tank capable of holding 75,000 gallons will cost about 20 per cent more than the elevated tank, but the centrifugal pump used to deliver from the lake to the watering system will cost materially less than the deep well pump. The deep well pump costs about \$4,500 and the centrifugal pump will come somewhere around \$1,000, but if you install an automatic pump with a pressure tank the cost of the pump equipment operating from the lake or river would run in the neighborhood of \$4,000.

I always prefer the elevated tank because of the constant and uniform flow of water at a given pressure, and if I had a

I think I would prefer pumping up into the tank and then get the pressure from gravity rather than depending on keeping the pump working all the time I was watering. So far as watering equipment is concerned, each club must figure on its own particular system of producing volume of pressure of water and locate its own source of supply.

Describes Systems

Having decided on the source, I have found just two systems for watering fairways which I shall describe. One is to lay cast iron pipe below frost level or approximately 5½ feet in the ground. Illinois started with 6-inch cast iron mains, dropped to 4-inch where that size was adequate and then to 3-inch and some of the short laterals are 2-inch. The labor cost of placing this pipe below frost line will run from 45 to 55 cents per lineal foot. The cost of the pipe will vary from year to year and the prices are obtainable from pipe manufacturers. The quantities required will vary on each course, depending upon the layout of the course and the possibility of using one main line for more than one fairway. In some cases it is possible to use a single line for as many as three fairways, and with a small length of laterals it is possible to use one line for as many as four fairways, so it would hardly be possible to make an average estimate on the average golf course as to the number of feet of each size necessary.

I found the most satisfactory system was to run the line down through the rough and have a standpipe or water plug every 125 feet. These plugs would be so placed that they would not interfere with the play and also not interfere with the mowing. Each of these fire plugs is equipped with "stop and drain," which means that when the hydrant is shut off it automatically drains itself below frost line. All of these hydrants have 2-inch connections and I find it most satisfactory to attach a 2-inch by 1½-inch reducer, so that the sprinklers are throwing a full 1½-inch supply of water.

After trying many sprinklers from the larger putting green sprinklers up to the size which could not be handled by hand power, we employed a special sprinkler which cost \$45 each. We used 1½-inch heavy duty electric hose made up in 50-foot lengths, so that it is easier to handle.

I find that Bob-O-Link and Flossmoor are using sprinklers on carriages where they must lug around exceptionally long

lengths of hose. I tried to avoid this by eliminating these carriages and cutting the hose into 50-foot lengths so as to eliminate labor. The sprinkler I designed can throw much more extensive and a greater quantity of water as compared with these carriage sprinklers, which must be kept in one spot for several hours before any real growth-producing supply of water is distributed.

I also tried the underground system of having sprinkler heads placed under the ground, but this did not work out very satisfactorily. Summing it up, I might give an average cost which would apply to any course similar to Illinois. The Illinois system covered the fairway sprinkling and usual tee and green sprinkling system combined in one. The cost ran approximately \$14,000 for material and \$11,000 for labor, making a total of \$25,000. Fairway sprinkling *only* would naturally cost less, inasmuch as all of the Chicago district clubs have the putting green and tee sprinkling system well in the ground. Some of this present system might be used for fairway sprinkling, that is in such places where you find pipe large enough to carry the water necessary for the fairway.

17,000 feet of 6-inch pipe below frost line—

Pipe costs 74 cents per foot. Installation cost averages 55 cents per foot.

7,000 feet of 4-inch pipe—Pipe costs 60 cents per foot. Installation cost averages 52 cents per foot.

— feet of 3-inch pipe—Pipe costs 40 cents per foot. Installation cost averages 50 cents per foot.

— feet of 2-inch pipe—Pipe costs 38 cents per foot. Installation cost averages 40 cents per foot.

9 Sprinklers at \$45 each.

600 feet of 1½-inch hose with couplings, 48 cents per foot.

Another system of pipe line could be installed which would be a great deal cheaper and require the same number of feet, but instead of placing the pipe below frost line it would be placed 18 inches to two feet deep, so the installation cost would be reduced about 30 cents per lineal foot. The pipe could be lessened because you would use galvanized wrought steel instead of cast iron pipe. Then instead of having fire hydrants which cost \$25 each, you could use what we call "stand" pipe, which is nothing more or less than a piece of two-inch pipe with a valve on the top of it. If this shallow system were installed

an air compressor must be purchased with which to blow out this shallow system some time in November before freezing weather comes. This galvanized steel pipe will last about twenty years and the beauty of the shallow pipe is if it does spring a leak you will notice it and it is not hard to repair, since it is only 18 inches to two feet deep.

Summarizing the whole system, a fair estimate on the cost of an irrigation system would be:

Well	\$10,000
Pump	5,000
Tank	6,000
Lake—	
2,000,000-gallon lake.....	15,000
100,000-gallon lake.....	6,000
Pump—	
Centrifugal working from lake...	1,000
Watering System—Underground system for 6,500-yard course below frost line approximately (<i>Fairways only</i>)	
Material	9,000
Labor	9,000

Sprinklers	450
Hose—600 feet of fairway hose.....	300
Shallow installation pipe line complete—	
Material	5,400
Labor	4,800
Fairway sprinklers	500
Fairway hose	300

These figures would be materially lessened by using part of the present pipe line system now installed.

I have listed all these various things that the club might select the particular items they would require and the cost figures are not exceptionally low nor exceptionally high.

Again I say it is impossible for anyone to make a real estimate or lay out a definite plan without thoroughly analyzing the particular course for which the irrigation system is desired. No one can say where to place these fire hydrants until they see the course and to secure the best layout without knowing the course would be like trying to play golf after reading golf articles or stories.

Be First with the Latest

Keep your eye open for the new golf specialties. Order small amounts as starters but make the most of them in your displays so you'll get your shop recognized as headquarters for the first and best in golf and its accessories.

These cane seats are good specimens of this type of merchandise. It was thought at first that they wouldn't go at all in this country, although they were fine for Eng-

land with its damp ground. However, the great favor enjoyed by white golf clothes has put these combination canes and seats in good selling repute. Alert pros are making money out of them. Robert Taylor at Minikahda sold the two dozen of his first order quickly and plans to push them to the gallery at the National Amateur. It's picking up business like this that accounts for the fat incomes enjoyed by professionals who are keen business men.



A few days ago this was the site of a fine equipment shed, stocked with \$15,000 worth of maintenance machinery and supplies. Just a spark and a night wind, and the result is shown here. Now the club is learning a lot about insurance.