



This circular storage reservoir assures the Merion Cricket Club a supply of 300 thousand gallons of water for course needs. It is filled gradually by pumping from adjacent streams.

Merion's New Water Plant Is Golf Club Jewel

THE Merion Cricket club has recently placed in service an exceptionally complete and modern sprinkling system on the East golf course at Ardmore. For a number of years this golf course has been maintained at a high standard of excellence, but those charged with this responsibility had been seriously handicapped by lack of sprinkling facilities particularly on the fairways. Heretofore all tees and greens were sprinkled, but the purchased water supply used for this purpose was both expensive and inadequate. There was serious doubt as to the ability of the local water company to continue the furnishing of sufficient water, especially for fairways. After very careful study and investigation it was decided advisable and economical to de-

velop an independent supply and to modernize the sprinkling facilities.

The primary object was to have available at all times an adequate supply of water at a satisfactory pressure for all tees, greens and fairways in order that they might be kept in first-class condition throughout the playing season. The standard as set up at Merion is an innovation in respect to nozzle pressure, water volume and flexibility of application and the results obtained will be watched with interest, especially by those interested in the maintenance of golf courses.

The normal sources of the new water supply is a small stream flowing through the club property, being the head waters of Cobbs creek and a tributary of same which joins the main creek on club



Arnold Gerstall, Merion's green-chairman for the past 5 years.



To prevent fairway erosion during the annual rainy season, this concrete flume has been built at the San Gabriel (Cal.) C. C. in the former river-bed. This view was taken during construction of the flume.

property in the vicinity of the eleventh green. These sources of supply are temporarily impounded by means of low concrete dams, each complete with screened inlet, shut-off and blow-off valves. The water in each dam thence flows by gravity into a circular storage reservoir.

Protect Stream Flow

This reservoir has a capacity of 300,000 gallons, and is of the cut and rolled earthen embankment type, being floored and lined with reinforced concrete. The primary purpose of the reservoir is to balance the supply to the pumps and to avoid the taking at any time of the entire stream flow. For many reasons it was deemed advisable to maintain a natural flow of water in Cobbs creek and the tributary down stream from the diverting dams. From an aesthetic standpoint alone the green committee was of the opinion that this was of considerable importance.

From the reservoir the water flows through pipes by gravity to two centrifugal pumping units in the pump house near by. These are motor driven and they discharge directly into the irrigation lines. One pump has a rated capacity of 100 gallons per minute with a discharge pressure of 115 lbs. per square inch. This unit is operated when it is desired to sprinkle small areas, such as the greens or tees. It is powered with a 15-horsepower motor. The second pump has a rated capacity of 300 gallons per minute with a discharge pressure of 115 lbs. per square inch. This unit is operated when it is desired to

sprinkle fairways, and is powered with a 40-horsepower motor. At such times as it is desired to sprinkle greens, tees and fairways both units are operated in parallel. The smaller unit supports sprinklers of the type usable on greens and tees and the large unit takes care of sprinklers of a type usable on fairways.

Pumps Have Excess Capacity

Service tests have demonstrated that the pumping units will support a somewhat greater sprinkler load if occasion demands. In actual service the combined output of both pumps has reached 475 gallons per minute. No attendants are necessary in the pumping station during sprinkling operation as the motors and pumps are fully protected automatically against overload, service stops, etc. The pumps were furnished by the American Well Works Co., motors and switching equipment being furnished by the Westinghouse Electric Co.

The new distribution system including lateral connection is practically all of cast iron pipe. Some idea of the extent of the system can be had by noting the following summary of pipe line as installed:

Inches.	Feet.
2	8,589
3	3,132
4	4,908
6	3,264
10	1,056

20,949

A total of practically four miles of pipe

line was installed. The laterals in general are composed of a screw joint cast iron pipe, while the supply mains consist entirely of caulked lead joints. Briefly, the distribution system layout consists of three mains of large diameter laid between the fairways. To these are connected 160 laterals. At the end of each lateral necessary hose connection facilities are provided. A liberal number of sectionalizing line valves have been installed so that maintenance work can be carried on as required by shutting off a minimum portion of the facilities. The pipe was furnished by the McWane Pre-Caulked Cast Iron Pipe Co. and the United States Cast Iron Pipe Co. The valves were furnished by Chapman Valve Co. The Murdock Mfg. & Supply Co. furnished the hose connection boxes.

Have Emergency Supply

The hose connection facilities are located at strategic points along the supply mains. The connections are self-contained—that is, each consist of hose connection and shut-off valve housed in cast iron boxes with cast steel lid. These are compact, being set with top flush with ground along the edges of the fairways. To provide for necessary water supply in reservoir during extremely dry weather without diverting the entire flow in Cobbs Creek and tributary, two emergency supplies have been arranged. One consists of a connection with the Philadelphia Suburban Water Co. mains to discharge into the reservoir, if required by simply opening of a valve. The second emergency supply consists of a well drilled on

the club property as a part of this improvement. This is a flowing well and will yield, it is estimated, on pumping about 100 gallons per minute. In case of extended drought, a pump can be set on this well to discharge into the tributary noted above. The water would then flow down the tributary and thence to the reservoir just as the natural stream flow travels. These emergency supplies are available on short notice and will be used as such.

Provide for Future

In constructing certain features of the system the green-committee provided for future expansion. Large lateral connections were used so that an underground sprinkling system can be installed without sacrificing any part of the present distribution facilities. Actual construction work was started late in October, 1929, and practically completed early in January, 1930.

Practically all of the work was done by labor employed directly by the golf club under the supervision of Joseph Valentine, greenkeeper. The plans and the various features of the entire project, including the purchase of pipe, motors, pumps, etc., were handled under the general supervision of Arnold Gerstell, chairman of the green-committee. In this way the system was constructed at the lowest possible cost consistent with good practice. Technical features of design and construction were looked after by W. B. McCaleb of St. Davids, Pa., after consultation with Wendell Miller of Wendell P. Miller and Associates, and W. S. Flynn of Toomey & Flynn.

Thoroughly automatic in operation, the equipment in Merion's new pump-house needs no attendant during the hours the course is being sprinkled.

