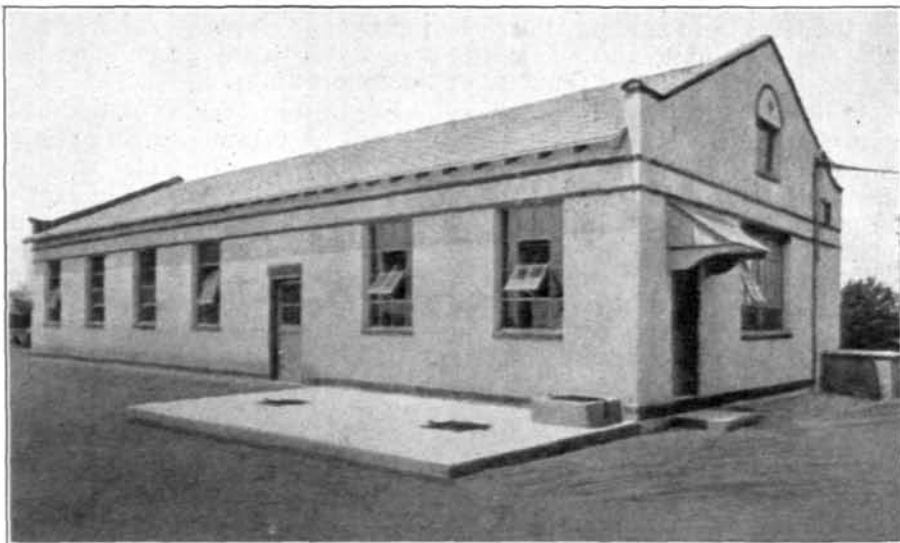


## Water System of the Country Club of Atlantic City

By H. Kendall Read

The Country Club of Atlantic City is located on the mainland about five miles from the coast. There are 27 holes, and the soil is of a very light sandy texture. The course is in play 12 months of the year and receives unusually hard wear. While the sandy soil provides ideal drainage, at the same time it requires a large amount of water particularly in periods of drought.

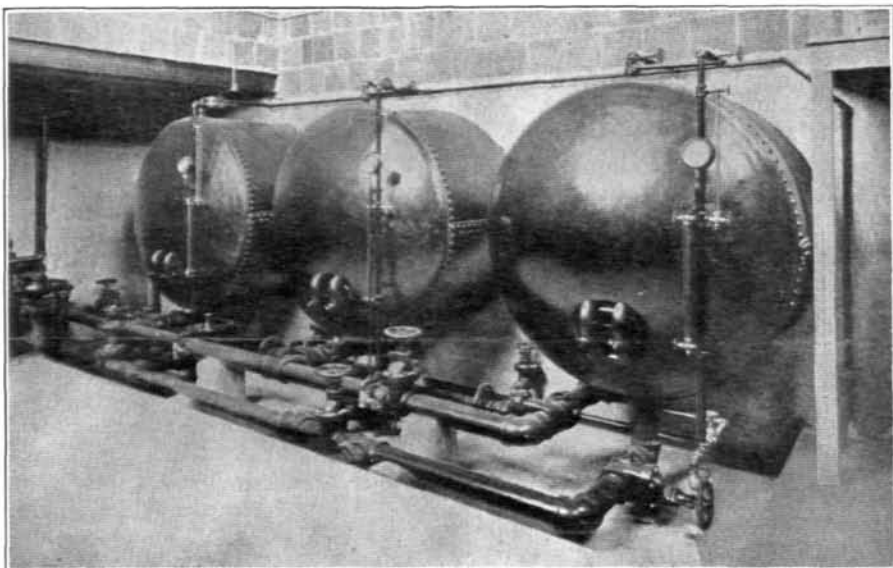
Before we created the present water system we depended upon a local water company, and neither our supply nor pressure was sufficient for our needs. As we had no stream on our property and the spring supply was insufficient we had to make recourse to a well. A 10-inch pipe-casing well was drilled to a depth of 180 feet, and we



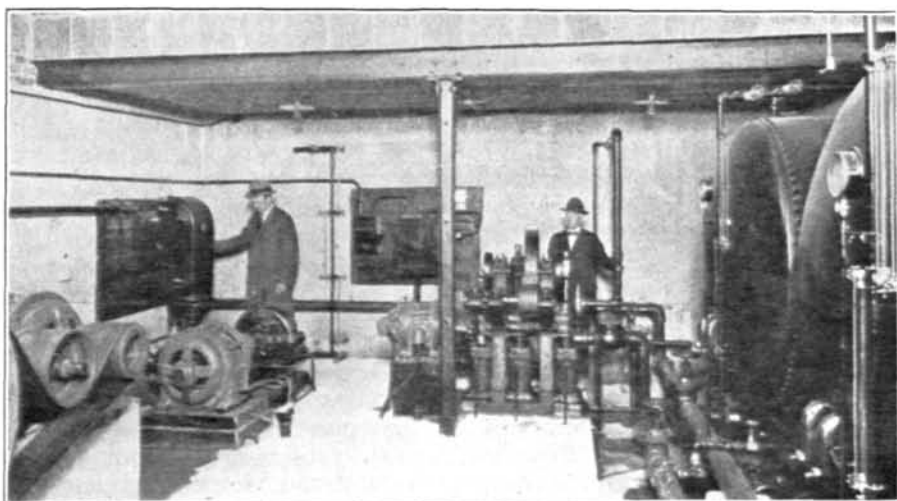
General utility building at the Country Club of Atlantic City, used for storage of golf course equipment, workshop, and housing the water-supply pumping plant.

struck an excellent water-bearing stratum at 134 feet. As this water stratum continued to a depth of 174 feet we were permitted the use of 40 feet of 8-inch screen. After this well was finished it was found that the natural water level was 25 feet from the surface but its pumping level was 40 feet from the surface. This compelled the use of an air compressor instead of a suction pump. After completion the well was given a 30-hour pumping test, which not only cleaned out all the fine sand but showed us that the well had a capacity of 500 gallons per minute. It was necessary to erect a building to house the pumping equipment, which was made large enough at the same time to provide a first-class workshop and storage room. This building is 70 feet long by 30 feet wide and is absolutely fireproof. All the pumping machinery is in one end in a space the width of the building, 30 feet by 20 feet, which space was excavated to a depth of 10 feet.

The system includes three large storage pressure tanks, two 36 feet long and 6 feet in diameter, and one 24 feet long and 6 feet in



Storage tanks for clubhouse water supply at the Country Club of Atlantic City.



Interior of the pump room, Country Club of Atlantic City, showing electric-driven centrifugal pump (left) and vertical triplex clubhouse water-supply pump (right). On the extreme right are the storage tanks.

diameter. These tanks extend back under the building with their ends protruding into the pump room for necessary connections. To obtain the water from the well an air compressor with a capacity of 500 gallons a minute is used. The water runs from the well top by gravity to a reservoir 20 feet long, 10 feet wide, and 10 feet deep, constructed adjacent to the pump house but absolutely separate. Of course all of this construction work is of reinforced concrete.

For watering the golf course we use a horizontal centrifugal pump directly connected to a 50-horsepower electric motor with a capacity of 450 gallons a minute against 125 pounds pressure. We do not use

over 60 pounds pressure on our sprinkler system, but the higher pressure is immediately available for use in case of fire, and for which fire plugs are properly located. The club has its own fire hose equipment, which is contained in a small building and is readily accessible.

The clubhouse supply pump is a vertical triplex power pump, with a capacity of 100 gallons a minute at 100 pounds pressure, directly connected to a  $7\frac{1}{2}$ -horsepower electric motor with automatic regulator and starter. This controlling apparatus works in connection with the pressure of the storage tanks and starts and stops the pump automatically, thereby maintaining abundance of water at all times for clubhouse purpose. A 4-inch galvanized wrought iron main carries the water from the storage tanks to the clubhouse.

Another important feature of the whole layout is the fact that the piping connections between the pumps, tanks, fire hydrants, clubhouse, and sprinkling piping are so arranged that they are all interconnected, which permits great flexibility of operation.

Our distribution plan on the course is based upon a 4-inch line which makes a convenient loop to cover the entire 27 holes. From this main loop, pipes are run to take care of greens, tees, and fairways. These lead lines vary in size from  $2\frac{1}{2}$  inches to  $1\frac{1}{2}$  inches. We have no lines anywhere under  $1\frac{1}{2}$  inches. All pipe is galvanized wrought iron, which is considered practically everlasting. While this pipe is more expensive than steel, we believe it is cheaper in the end because of its greater durability. The labor cost of an installation of this kind is such an important item that it pays to use the best materials available.

I have said nothing about our sprinkler system, for the reason that I am not entirely satisfied with it. We expect to do some experimental work along this line during the present season, and I hope that some worthwhile experience may be built up which we can give to BULLETIN readers in a subsequent article.

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## A Water System in California

By E. W. Van Gorder

The water system of the Castlewood Country Club, at Pleasanton, Calif., is typical of the systems that have been recently installed on California golf courses. Hoseless fairway systems are becoming more popular as constant improvement in sprinklers and valves gives them additional flexibility. While the cost of installation is considerably more expensive, the great saving in labor and in hose replacement makes them more economical over a period of years. Two men can cover our fairways in 16 hours, giving them a watering of from 45 to 60 minutes. Southern California courses whose water requirements are somewhat higher than ours may require additional men.

In this state, where fairways must be watered from 8 to 10 months of the year, water costs form an expensive item in the budget. We are fortunate in having a perpetual right to 90,000,000 gallons of water a year. This is delivered free of charge to a reservoir on the lower end of our property. Any water used in excess of this amount costs the exorbitant price of 21.6 cents per 100 cubic feet. Needless to say, we try to keep within the 90,000,000 gallons, which is about enough for the course and clubhouse. Owing to the increas-