



# Flood problems down the drain

by Frank Aaron



Employees of the Upper Montclair Country Club study flooding of the sixth green at a siphon culvert on the main channel, at top. The sixth green as it appears today, above. Downstream improvements have made the operation of the siphon culvert much more efficient.

*Although this New Jersey club had to wait five years to test out its improved drainage, the summer of '67 proved it right.*

The rain had stopped and the sky had cleared, but there was little relief for Karl Ostberg, greens superintendent at Upper Montclair Country Club in Clifton, N.J., who stood looking at the lake which covered much of the first and ninth fairways of the 27-hole course. During this wet summer of 1961, the high water had become a familiar sight. These fairways had flooded before, and Ostberg knew they would continue to flood until something was done to improve the drainage.

Other areas of the 192-acre course were under water too, and in several places the grass was dying because of the constant seepage. Much of the sixth green had disappeared under water from a nearby pond that had overflowed.

When thinking back to that summer, Ostberg sadly recalls, "Things were so wet here that in some places the sod would actually float above the soil. Water built up such pressure under the sod that it rose in large bubbles much like a water blister."

At a recent New Jersey golf superintendents' meeting, Ostberg remembered talking with a fellow superintendent about his drainage problem. Arthur Elmers, greens superintendent of Preakness Hills Country Club, suggested that Ostberg contact the Northeast Jersey Soil Conservation District for guidance in solving his drainage problems. Ostberg took his suggestion and soon the Upper Montclair Country Club was a district cooperator, making it eligible for technical assistance from the United States Soil Conservation Service.

On the morning of July 24, soil conservationist Harold C. Waters stopped to see Ostberg. They toured the course looking at problem areas. Shortly after Waters left, rain started to fall. By 6:30 p.m., four inches had fallen and much of the course was under several inches of water. Being in the area, Waters stopped back. What he saw convinced him that the major problem was the main ditch, which was supposed to drain the flooded areas.

Running about 3,900 feet through the center of the course, the ditch was too narrow and shallow to handle heavy rains. Also, four bridge culverts in the ditch were too high and too small to allow water through fast enough.

Channel improvement—deepening and widening—was Waters' suggestion for the main ditch, as well as replacement of two bridge culverts with wooden foot bridges.

Another major problem was drainage on the fairways. Water remained on them for days with no way of reaching the main ditch. For this, Waters recommended installation of nearly 9,000 feet of four-inch tile lines under the fairways.

Club directors gave their hearty approval, and construction began that winter on the drainage ditch. First, the culverts were removed. Then, 1,300 feet of the main ditch were lowered and the bottom was widened to six feet. The sides were sloped on a 1½-to-1 ratio and seeded with inoculated crownvetch and Kentucky 31 tall fescue. This legume-grass mixture is especially effective in controlling erosion on steep banks. The banks were heavily limed at a rate of 100 pounds per 1,000 square feet and fertilized with 10-6-4 at a rate of 25 pounds per 1,000 square feet. They were then mulched.

Midway along the main ditch are two unusual siphon culverts. They had been installed years ago to carry ditch water under four large water mains. The improved channel below these culverts gave them a free outlet.

During 1962 and 1963, more than 1,000 feet of

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Greens superintendent, Karl Ostberg, inspecting growth of crownvetch and tall fescue on the banks of the main drainage ditch.

## flood problems Continued from preceding page



Karl Ostberg examines main drainage ditch shortly after channel improvements were made. Around 1,300 feet of the ditch were lowered and the bottom widened.



Karl Ostberg, right, and Harold Waters, SCS soil conservationist, discuss results of seeding ditch banks. Proper seeding has improved ditch's appearance.



Harold Waters, SCS soil conservationist is shown the high-water mark of a recent storm by Karl Ostberg, superintendent at Upper Montclair Country Club.

four-inch tile lines were installed by country club employees. In several places tile lines laid years ago were discovered. Where possible, these old lines were cleaned out and re-used. Others were discarded because they were broken beyond use or had no traceable outlets.

New tile lines were installed on the first and ninth fairways, connecting with a channel that flowed into a nearby waterhole.

As luck would have it, the wetland preventative measures had to wait a few years to prove themselves, because the summer of 1962 was the first of five years of drought in New Jersey. The improved drainage system remained virtually untested.

Ostberg felt that the work had solved most of the drainage problems, but it remained for the wet summer of 1967 to prove him right. This time, with more than normal rainfall, there was no duplication of the 1961 flooding. The heavy rains came, but fairways and greens quickly drained and the water remained within the banks of the main ditch.

Ostberg realizes that some work is still needed. One recent storm brought 2.7 inches of rain, closing the course for a day and a half. But remembering the conditions as they were before the drainage improvements were made, Ostberg can look optimistically toward the future. □