The first step in this process was to install a large sump basin in an out-of-play area utilizing a perforated aluminum pipe measuring 5 feet long by 32 inches in diameter. This basin was placed on concrete block footers to prevent excessive settling. An area approximately 3 feet in radius around this pipe was backfilled with ¾-inch gravel, and a Phillips geotextile fabric liner (#8 NP) was used between the native sandy soil and backfill material to maintain a clean, porous zone around the catch basin.

Lateral drainage lines were then dug to the problem drainage areas. These trenches were also lined with the same geotextile fabric material used around the catch basin, and the trenches were backfilled to within 6 inches of the surface with the ¾-inch gravel material. Note that special attention was given during installation of the fabric to allow enough material to overlay the surface of the rock within the trench. The remainder of the trench was topped off with a coarse sand material to reestablish a smooth, rock-free surface.

The main component of this power drainage system, a Teel brand #3 P5 11 110-volt, ⅓-horsepower sump pump purchased from the Grainger Corporation, was installed within the sump pipe. This pump is equipped with a built-in pressure-sensing switch to provide automatic operation. This particular pump is also equipped with a ½-inch discharge port to effectively move from 2,300 gallons of water per hour at 20 feet of head pressure to as much as 4,450 gallons per hour at only 5 feet of head pressure.

For a power supply, this particular setup, requiring an operational load of only 6 amps, was tied to an adjacent condominium building with an agreement made to pay the condominium association a fee of $100 per year.

At a more remote location on the course, a similar sump pump drainage system was installed in 1993 utilizing a nearby irrigation satellite as the power source. The amperage draw available through the irrigation control system at this site was matched with an appropriately sized pump to complete this arrangement.

As Walt reported, this system has performed flawlessly over the past 18 months. This speaks quite well for this drainage method, which has run virtually non-stop since installation, due to the fact that lack of rainfall throughout the state of Florida in 1994 definitely was not an issue!

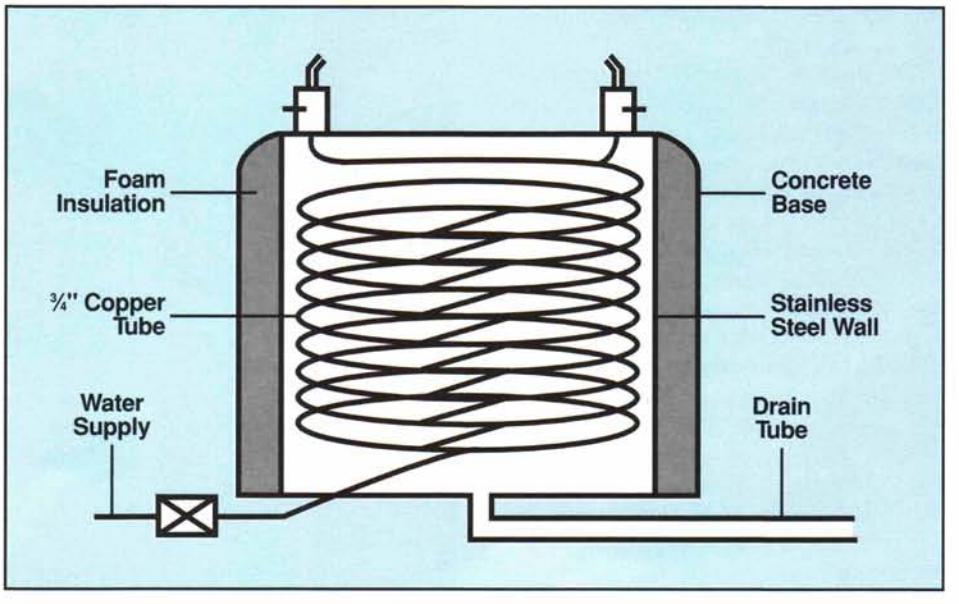
As for cost of installation, a total of about $3,000 per drainage system was spent. This figure includes backhoe rental, geotextile fabric, gravel, sand, perforated sump pipe, and pump.

So, to correct those previously "impossible" drainage problems, try putting this power drainage solution into service. Efficient removal of excess surface water equates to increased potential revenues and better quality turf as the course can be opened for play much sooner following excessive rainfall activity. Furthermore, a reduction in pesticides can also be realized, as overall healthier turf conditions can be produced and maintained on a consistent basis.

Cool, Clear Water (Without Electricity)

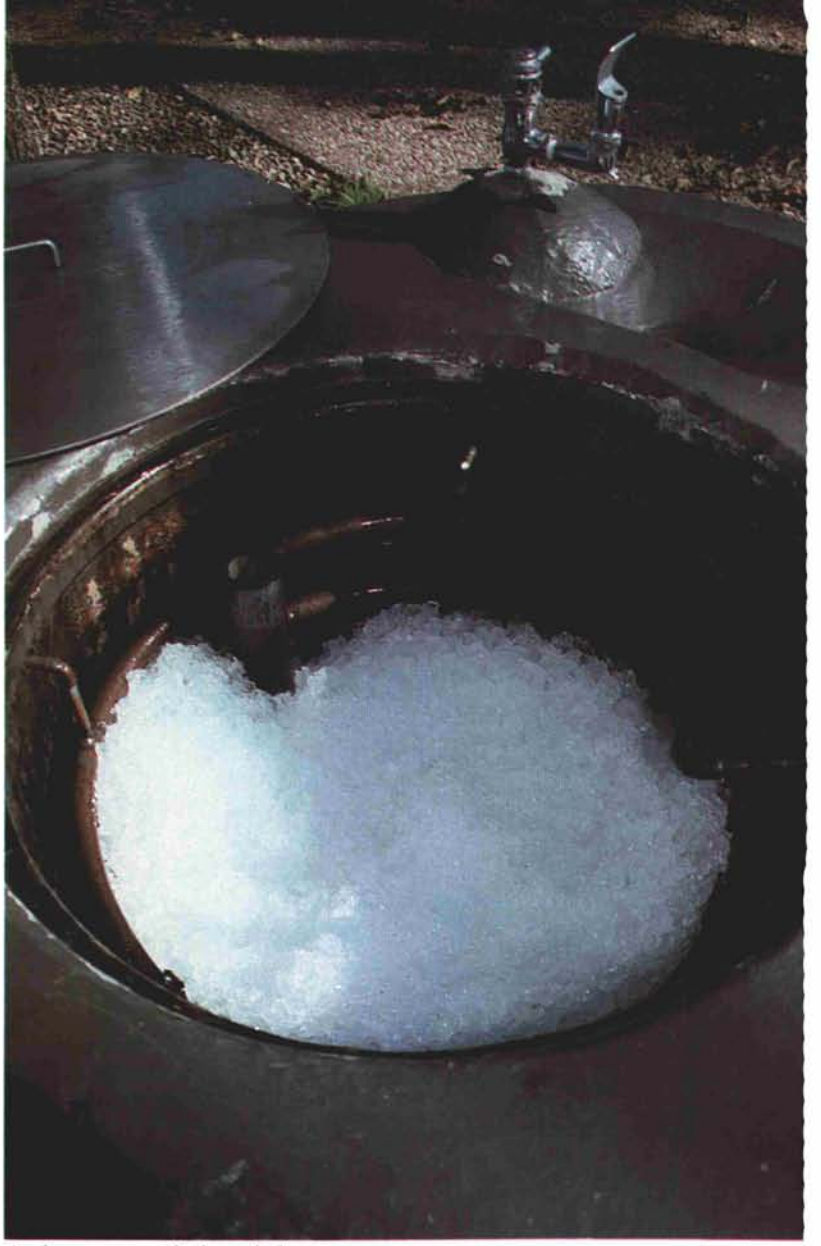
by JAMES F. MOORE
Director, Mid-Continent Region, USGA Green Section

THE GREENS are perfect, the fairways immaculate, and the tees pool-table level, but the players are still ready to tar and feather the superintendent. Why? Because there is no cold water on the course! Ask any superintendents and they will quickly confirm that among the most vehement complaints they field during the summer concern the availability and quality of the drinking water on the course (followed closely by the availability of toilet paper). While cold, clear water is usually not much of a problem on those courses fortunate to have 115-volt wiring throughout the property (usually installed at the same time the irrigation system was last replaced), most golfers must rely on the superintendent to



A permanent, clean, and nearly tamper-proof source of cold water — without electricity.

A continuous coil of 1" copper tubing brings water from the supply to the fountains.



As the water travels through the copper coil, it is rapidly cooled by the ice.

provide water jugs and fresh water on a daily basis — and it had better be cold!

Water jugs are a poor solution. Problems can include paper cups blowing into the next county, the strained back of the unfortunate employee who has to lift the filled jug onto the stand, and the weathering of the plastic jugs as they are subjected to the summer heat and sun. And let's not forget the need to check the jugs at least twice on a hot day when the water consumption is up. The most unpalatable problem of all is the unavoidable suspicion shared by all that someone earlier in the day might have done something really gross. This leads to the irresistible urge to remove the lid and check the contents. This is closely followed by the inevitable decision to scoop out a little ice. This could be the reason the water takes on the taste of sweat, grass, and leather golf grips by mid-afternoon.

For many years at Northwood Country Club in Dallas, Texas, they have employed a solution to all of these problems. According to Mark Price, CGCS, superintendent of Northwood, their "fix" is almost maintenance free, ensures clean, uncontaminated water, and requires no electricity. The concept is remarkably simple. Potable water is run through a copper coil surrounded by ice. By the time the water passes through the coil and exits the fountain, it is ice cold.

Northwood uses two variations of this idea. The first is to construct a hollow base that has numerous fountains on the top. The inside is lined with insulating foam that is held in place by stainless steel sheeting. The copper coil is then mounted in a way that allows ice to completely surround the tubing. The opening to the cavity is covered with a metal lid that is easily removed to load the ice. Water from the fountain draws back into the cavity and, along with the water from the melting ice, is removed via a drain tube in the bottom of the structure. Each morning the cavity is filled with ice, which keeps the water cool all day.

A second option is to construct the structure to hold the ice and coil below ground. This makes it easier on the crew since ice does not have to be lifted above the waist to fill the cooling cavity. Obviously, there could be many variations to this simple idea to fit the individual needs of your course.

One thing is certain; your golfers will be much happier on the next hot day of summer.