

# BUNKERS: The Right Track

*A new bunker construction method reduces sand erosion.*

by PATRICK M. O'BRIEN

**M**ANY golf course superintendents spend tens of thousands of dollars annually for labor to repair sand bunkers after heavy rains. It takes many hours to reposition sand back again on the faces with shovels and mechanical blades. Time spent repairing bunkers is time taken away from other important maintenance practices.

The maintenance staff at The Farm Golf Club, Rocky Face, Georgia, faced a nightmare after every rain event with 82 steep sand-faced bunkers. According to Tim Kennelly, CGCS, it took 60 to 100 labor hours to reposition the sand. After only a few storms and washouts, the bunker sands turned red from the clay that eventually plugged the drainage tile. Plugged lies and muddy sand were a constant headache for the staff, and the membership found the bunker conditions unacceptable.

Several courses in Georgia and the Carolinas have recently renovated bunkers with a new technique called the "Enhanced Bunker Drainage Method." Billy Fuller of Cupp Design, Inc., first came upon this novel idea during his tenure as the golf course superintendent at Augusta National. The unique feature is a 1.5- to 2.0-inch gravel blanket over the entire bunker floor. Water flows through this gravel layer to the drain lines. The movement of sand is practically eliminated.

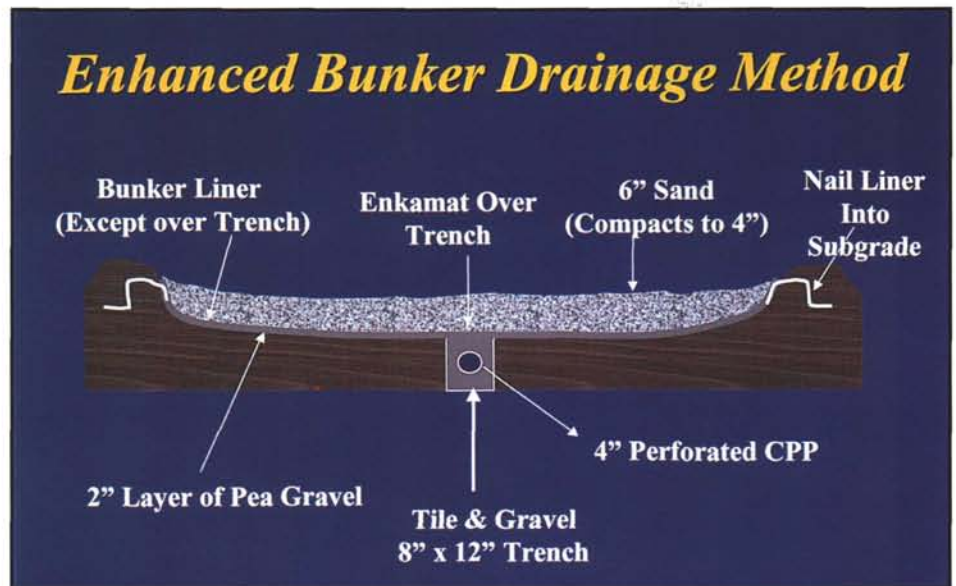
The key construction steps in the Enhanced Bunker Drainage Method are as follows:

1. Regrade the subgrade of the bunker to conform to the general slope of the finished grade.

2. Check the original outfall drainage pipe on the bunker floor to ensure it still functions. Flushing dyed water through the pipe and viewing its exit at the outlet is essential. If this drainage system doesn't work, replace it at this time.

3. Install a new subsurface drainage system in the compacted subgrade and reattach to the old drainage outfall pipe. In most instances, 4-inch smooth-wall perforated plastic pipe works well.

4. Install the gravel blanket to a compacted depth of 1.5 to 2.0 inches over the bunker floor. Washed pea



The "Enhanced Bunker Drainage Method" includes a gravel layer and a liner that allows storm water to reach the drain lines without dragging sand with it.

gravel or crushed stone with a size of  $\frac{1}{4}$  to  $\frac{3}{8}$  inch is preferred.

5. Install the filter cloth. The 7.5-ounce non-woven Trevira product is the most popular product for this bunker renovation method. Metal staples are used to secure the filter cloth to the bunker floor and edges.

6. Install the plastic edge liner over the filter cloth liner at the bunker sides. Precut the plastic liner to the desired height. Staple the edging into the bunker sidewall.

7. Cut the filter cloth over the drainage lines on the bunker floor and install Enkamat. Placing the Enkamat over the drain lines prevents clogging and insures water flow to the drainage tile.

8. Install the bunker sand to a compacted depth of 4 to 6 inches.

9. Divert surface water away from the bunker (if needed). Any surface water flowing into the bunker can cause minor washouts if not diverted.

This unique building method solves many bunker renovation concerns. The filter cloth is secured with staples on the bunker floor and edges. No tucking of the filter cloth is needed due to the placement of the new plastic edging product. Bunker edging has been simplified with the permanent edge barrier

system, which allows workers to see the edging and avoid damaging the filter cloth while trimming bunker edges. Drainage is maximized with the Enkamat product over the drain lines. Sand is not piled to depths of 2 to 4 feet on the bunker faces anymore. Little or no new sod is required after the renovation in most instances. With proper maintenance, the original bunker design is kept intact for years.

This bunker renovation method is more expensive compared to traditional methods. Costs are similar to building a putting green. Construction is practically all done by hand work and wheelbarrows. The higher cost will be offset by a huge reduction in labor and sand replacement costs. A contractor should be hired to renovate all bunkers, but "if you have 10 or fewer bunkers to renovate, a larger maintenance crew can handle this project," said Kennelly.

Today, we have one solution to remedy the age-old problem of bunker washouts. Using this easy formula can keep your bunkers on the right track.

*As Director of the USGA Green Section Southeast Region, PAT O'BRIEN helps keep golf course superintendents on the right track.*