

Hold Steady

Bonded fiber matrix product provides cost-effective way to achieve quick germination and control erosion at Patriot Hills GC

BY JASON SCHMADERER



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Just as lakes, wetlands or other water hazards add to the challenge for golfers, they also test the skills of golf course builders. Unless bare soil is protected from erosion by storm water, snow melt or irrigation runoff during construction, sediment could wash off site and pollute other bodies of water farther downstream. The steeper and longer the slopes and the more erodible the soils, the greater this threat is.

In addition to having an impact on water quality, such sediment pollution could also violate construction permits and run the risk of costly fines or a shut down of the project. The construction permits are part of the National Pollutant Discharge Elimination System (NPDES) program, established by the federal Clean Water Act. The NPDES program now requires a permit for any construction activity that disturbs one acre or more of land. Previously, these permits were required only when construction activities disturbed five or more acres. State and local government can require even more stringent provisions. Ultimately, an NPDES permit requires the project owner to prepare an erosion and sediment control plan to protect water quality from storm-water runoff that leaves the site during construction.

Controlling erosion to prevent wind and water from dislodging soil particles is the first line of defense against off-site transport of

sediment. It's also the key to minimizing costs of sediment control, which is designed to remove sediment from storm water before the runoff is discharged from the site.

Problem

It was against this background that Turco Golf Builders in Suffern, N.Y., began construction of Patriot Hills GC in Stony Point, N.Y., in the summer 2001. The 18-hole municipal course recently opened. In addition to attracting local Rockland County golfers, the course is convenient to the New York metropolitan area and northern New Jersey.

The irrigated bentgrass fairways traverse 6,600 yards of hilly terrain and are surrounded by Kentucky bluegrass primary roughs and fescue-buffalograss secondary roughs. Elsewhere, numerous rock walls, exposed during construction, accent the landscape, which offers views of the Hudson River in several locations.

"There's a lot of elevation change throughout the course," says Joe Smyth, certified superintendent of Patriot Hills. "On four holes, it changes 100 feet or more from tee to green. The degree of slope is 3:1 or steeper on at least half of the fairways and even steeper on the roughs. Some of the slopes are as long as 150 yards. Erosion was a major concern in building the course."

Problem

Covering seeded slopes with loose straw or hydromulch would have been ineffective in controlling erosion because of the slope lengths and gradients at Patriot Hills GC.

Solution

A mechanically bonded fiber matrix provided a cost-effective way to achieve quick germination and control erosion, according to the superintendent.

Balance pH, Test Water to Ensure Water Quality

Sediment pollution isn't the only thing that has an impact on water quality. *Golfdom* asked two veteran irrigation consultants and members of the American Society of Irrigation Consultants — Jim Barrett and Dave Davis — to provide tips on how superintendents can improve water quality on their golf courses.

"Balancing water pH and controlling algae in lake irrigation water are two things superintendents can do to improve water quality and make maintenance of existing turf easier," says Davis, adding that acid treatment of lake water is one method of pH control. He also says that ozonation of lake water helps control algae, which keeps sprinkler heads clean.

"In some cases, simple blending of poorer quality water with better quality water is all that is needed," Davis says.

Barrett stresses that superintendents should have their courses' water sources tested regularly by a qualified lab. He adds that acid injectors and sulfur burners can be used to treat chemical imbalances.

The easily dispersible clay particles in the clay-loam soils added to this concern. So did the water features — a pond on one hole and a total of about four acres of wetlands on two other holes. In all, about 20 acres of slopes on fairways, roughs and areas around greens, tees and bunkers at Patriot Hills called for measures to limit sediment loss because of runoff.

Solution

When it comes to controlling erosion, grass and other vegetation are naturals. Leaves and stems absorb the energy and soften the erosive impact of raindrops and reduce the amount of runoff by intercepting it. Meanwhile, the root systems anchor the soil.

Because of the slope lengths and gradients at Patriot Hills, covering seeded slopes with loose straw or hydromulch would have been ineffective in controlling erosion. On a previous golf course construction project, Smyth had installed sod to establish a quick, permanent protective cover. But for this project, costs of sod exceeded the erosion-control budget. Rolled-erosion control blankets were not an option because they also exceeded the budget.

So Smyth examined a less-costly approach, one he had never used. He tested a few spray-on erosion control products. He opted for an advanced mechanically bonded fiber matrix, Conwed Fibers 3000 M-BFM. Smyth said it provided a cost-effective way to achieve quick germination and control erosion.

Dick Grant, whose company Chesapeake Turf LLC did the seeding and erosion control work on the project, said the fiber matrix allowed turf to grow up through it and conform closely to humps, dips and other surface irregularities for maximum soil protection.

In addition to a chemical bonding of wood fiber and soil particles, the crimped and interlocking wood fibers of Conwed Fibers 3000 M-BFM create a mechanical bond for enhanced erosion control. These fibers absorb the impact energy of rain drops and retain up to 15 times their weight in water. That reduces stormwater runoff and transfers more moisture to the

seed bed, improving germination and turf establishment.

The Conwed Fibers product doesn't need a lot of time to cure and is effective almost immediately after application.

A series of trials at San Diego State University confirms the effectiveness of the product in controlling erosion. In one test, which simulated a 10-year storm event, a fully cured 3,000-pound-per-acre application of the M-BFM reduced erosion by nearly 100 percent compared to bare, untreated soil. In three consecutive simulated 50-year storm events, a fully cured 3,500-pound-per-acre application of the product also reduced erosion by nearly 100 percent. When applied at the minimum rate of 3,000 pounds per acre and allowed to cure for only two hours before it was subjected to a simulated 10-year storm event, the product reduced erosion by 98 percent.

Outlook

Last year, Chesapeake Turf completed seeding and erosion control between August and November. The M-BFM was applied with seed and fertilizer at an average rate of 3,800 pounds per acre, covering about 1 acre to 1.5 acres a day. A hot, dry summer and fairly normal fall weather was followed by above-average rainfall the rest of the seeding period, Smyth reports. The weather included several storms in which 1 inch or more of rain fell within about two hours.

"The Conwed product performed well, and there was little runoff from the storms," he says. "As expected, the seed germinated in about five to six days and produced a good, uniform stand."

The product also prevented seeds in the roughs from washing onto the fairways and the sand traps. "The M-BFM is a nice alternative for controlling erosion if you don't have the budget for sod," Smyth says. ■



A test showed that an application of the fiber matrix material reduced erosion by almost 100 percent compared to bare, untreated soil.

Editor's note: This article was written by Jason Schmaderer, who formerly worked for Swanson Russell Associations, a marketing and communications firm in Lincoln, Neb., that represents Conwed Fibers, a division of Profile Products LLC.