

Tim Anderson, superintendent at Naperville Country Club, used erosion control blankets to stabilize some areas of the course that were most susceptible to washouts during construction. Photo: Arthur Hills/Steve Forrest and Associates

Mitigating Mother Nature

The right strategies make for successful **EROSION** control *By John Torsiello*

Water is the lifeblood of a golf course. It nurtures turfgrass and, when managed properly, helps create a lush, green playground that makes those who maintain it smile with pride.

But water from rain storms and snow melt can be a destructive force, wreaking havoc on fairways, greens, tee boxes and rough, as it rushes down slopes and rises out of lowland areas and streambeds.

That's why architects, builders and owners spend so much time, energy and money developing viable and long-lasting erosion control plans.

Not only is erosion control a must to avoid costly cleanups, reseeding and even regrading, it helps protect wetlands and groundwater supplies from sediment from erosion, especially during the construction phase of golf course development.

"There's so much focus on the environment

and its protection nowadays that anything you can do to create a more sensitive golf course is worth doing," says Jason Straka, a course designer with Hurdzan-Fry Golf Course Design in Columbus, Ohio.

Managing stormwater and irrigation drainage is an important component of any golf course design.

"You want to get the water off the surface efficiently," says Steve Forrest, a partner with Arthur Hills/Steve Forrest and Associates in Toledo, Ohio. "When you're talking about stormwater, the first approach is to make sure the water is moving over the site and that it doesn't sit there and kill the grass.

"With any kind of surface slope, you always strive for a 3-percent minimum grade," he adds. "You get the water into the ground through drainage culverts and pipes as quick as possible. The more inlets you have, the more drainage and less erosion you will encounter."

DEGREES OF DIFFICULTY

Managing stormwater runoff is related directly to the topography of a course.

"I'd say 90 percent of courses built need some erosion control," Forrest says. "If you're in a desert, where the course receives minimal rainfall and the filtration rate is so high, you don't need to worry about it much."

Golf courses built on flat terrain with soils conducive to quick drainage (i.e., soil that's heavy with clay and loam) demand the usual attention to drainage. But courses that wind up and down slopes, are located close to environmentally sensitive areas and have sandy soil can be challenging.

"You can have a rain event occur over the same slope on sandy and heavy clay soil, and the erosion on the sandy soil will be 4-feet deep, and the erosion on the clay soil will be 8-inches deep," says Paul Clute, a semiretired golf course builder.



Jason Straka likes to have superintendents involved in the entire erosion control process. Photo: Hurdzan-Fry Golf Course Design

Soil type is one of the two biggest factors related to erosion. The other is the speed at which water moves over the ground.

"You must control the speed of the water, and you do that by dispersing the energy," Clute says. "You design areas on the course with severe slopes to allow the water to run at a consistent pitch and then, as the water goes faster and faster, drop it down vertically to a

rocky area, a stream bed, a drainage canal or a piping system."

Another method of controlling water's speed is designing natural areas into the course and revegetating areas off the normal route of play once work is complete.

"Natural areas seem to be more acceptable to American golfers now," Clute says. "High, natural grass and shrubbery in areas with severe slopes are extremely helpful to slow water down until it reaches a level area."

SUPER INVOLVEMENT

Including the superintendent in erosion control planning and implementation is crucial to long-term viability of the work, Forrest says.

"You always want the superintendent in on the matter and encourage his or her participation," he says. "We want to make sure the superintendent understands what the regulatory agency is trying to accomplish and understand how it's to

be handled and the philosophy behind it all."

Straka likes to have a superintendent involved in the entire erosion control process.

"I'll test upstream if there's water coming into or by the course because I want to know what nutrients and sediments the course might be subjected to during construction and after," he says. "That way, the superintendent can have as much information as possible to help him control any situation."

There are some superintendents Clute has talked to who believe erosion control should be part of a regular maintenance budget.

COST CONSIDERATIONS

As with difficulty, erosion control costs range widely and typically depending on a site's conditions. Courses built on steep or sloping terrain or around sensitive natural environments can add \$1 million to \$2 million to the overall price tag of a project, Forrest says.



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"Erosion control always has its own line item and, particularly when sodding large amounts of a course to get grass in quickly to prevent damage from storms, you can add a couple million dollars to the project's overall cost."

Environmental guidelines concerning storm-water discharge must be met, or builders and owners run the risk of incurring fines.

"We were closely scrutinized by the state concerning runoff into the wetlands on our course," says Will Heintz, superintendent at Pound Ridge Golf Club in New York, which opened in July. "You have to have the right frame of mind when dealing with the government regulations and not have an arrogant attitude. If you don't do things the way they want, they can shut you down and slap you with fines of \$25,000 or \$30,000 a day for not being compliant."

Not only does noncompliance to wetland protection regulations hit a developer and/or builder in the wallet, it doesn't help a course's

image as being a good neighbor to surrounding property owners and the community. That's why architects, builders, superintendents and course owners say proper planning and use of best management practices is vital when developing a sound erosion control plan that reduces the risk of adverse environmental conditions. Plus, use of erosion control products during and after construction can prevent costly erosion-related repairs down the road.

Although cumbersome and time consuming, state and federal environmental regulations are merely part of the cost of conducting business.

"Working with the regulatory agents or agencies, a civil engineer, and wetland and environmental consultants is all part of the deal," Forrest says. "You establish what needs to be done up front and move in the proper sequence so you don't undo what you're trying to accomplish when preserving and protecting environmentally sensitive areas."

That often means developing small parcels of property before moving on to the next area. Forrest is working on a project in Maryland where the team can work on only 20 acres at a time because the county doesn't want to expose any more ground to the possibility of erosion at one time.

"It affects the planning and construction schedule," he says. "You might be building a green in that 20-acre section, but it's affected by an irrigation line that might have to come in from an area outside the parcel. It gets tricky sometimes."

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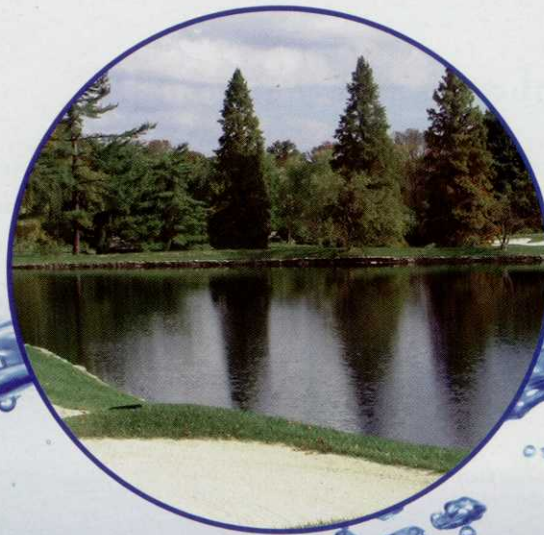
An important aspect of successful erosion control is the design of a drainage system that can handle large rain events with minimal disturbance to the golf course. It's also vital for builders to establish grass in a dense and uniform manner as quickly as possible to hold valuable topsoil in

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Will Heintz, superintendent at Pound Ridge Golf Club, says one has to have the right frame of mind when dealing with government regulations. Photo: Jim Krajicek

pockets, opt for sodding large parts of the golf course, an ideal method for establishing thick grass quickly, especially on rough areas around raised greens, around bunkers and on areas off fairways with severe slopes. Laying down sod was the choice for the developers of Bull's Bridge Golf Club, a 4-year-old layout in the hill country of Kent in northwest Connecticut that has an elevation change of 400 feet through the course.

"We sodded roughly 60 acres for erosion control, and it worked out wonderfully," says Rob Giampietro, superintendent at Bull's Bridge. "When you compare sodding to hydroseeding, it cost about 50 percent more. But you get quick results and immediate erosion protection. When there was discussion of installing a practice range, I recommended sod. We brought in 24 truck loads and sodded six acres in early May two years ago, and we were able to use it a few weeks later."

DURING CONSTRUCTION

To prevent erosion during construction, builders incorporate drainage or silt ponds that act as catch basins for stormwater and sediment that otherwise would run into fragile environmental areas or onto adjoining property. Many times the ponds are dismantled when the course is completed, but some superintendents might opt to leave the catch basins intact to act as fall-backs during heavy rains that could damage the course and contaminate nearby sensitive areas with sediment.

"You can leave these basins or small silt ponds up after the course is complete," Clute says. "But superintendents have to realize they must clean them out periodically to remove the silt, otherwise the area will grow in with vegetation while the water is still trying to get in."

The use of hay bales and plastic fencing to control erosion during construction are simple yet effective ways to manage rainwater flow and prevent damage to a course, especially when working around creeks, ponds and lakes.

"Our second hole has a 110-foot drop from tee to green, and we struggled with that for several years, using hundreds of hay bales," Giampietro says. "We had a silt fence every 20 feet and just had to keep working at it. One thing I've noticed is that having curbing on cart paths helps channel water downhill and into drainage areas and catch basins. You can make all the plans you want, but you can't anticipate Mother Nature's fury all the time." **GCI**

place during heavy rainfalls. The latter sounds easier than it is. But there are ways to halt the ravages of Mother Nature.

One such method for attaining rapid turf growth is to hydroseed large fairway areas. When combined with protective, single-netted straw erosion control blankets, hydroseeding can result in quick and efficient grassing of many areas on a course. It's wise to staple the erosion control blankets down to ensure the surface it's protecting remains relatively undisturbed while vegetation becomes established.

Tim Anderson, superintendent at Naperville Country Club in Illinois, worked with this type of blankets before the course reopened in the fall of 2007.

"After we seeded the first few of holes, we tended to have washouts after heavy rain events," Anderson says. "We used blankets to stabilize some areas of the course that were most susceptible to washouts, and they held up well. We were going to use perhaps one semi load of blankets but wound up using five semi loads at \$17,000 apiece. We treated the blankets as a builder's insurance policy. It was an expense we hadn't planned for, but it helped us get the course reopened on schedule."

Some developers, especially those with deep



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