

Slippery Slope

Hydraulic mulch repairs a mountainside slope, ensures highway safety

By Tom Wedegaertner

Rocky peaks overlooking the Ocoee River, nuzzled into eastern Tennessee's Polk County, provide dramatic scenery for road travelers on Highway 64, which closely hugs the celebrated flow. Home to whitewater rafting competitions during the 1996 Summer Olympics, the Ocoee River and its surrounding region annually welcome a large population of water enthusiasts and rely heavily on recreation and tourism to keep the local economy afloat. The Ocoee, however, was not always the serene attraction it is today.

In the fall of 2009, torrential rain events across the South pounded the mountainous region with some of the fiercest rain Mother Nature had to offer. As a result, the steep mountainside terrain weakened and crumbled, causing severe rockslides along several highways in Tennessee and North Carolina.

One major rockslide occurred at mile marker 17 on Highway 64, above the Ocoee River, in October 2009. The event prompted the Tennessee Department of Transportation (TDOT)

to close the highway for emergency repairs. Large rock surfaces cracked, loosening the earth underneath and causing boulders and debris to crash to the highway below—dangerously close to a popular rafting launch site. Closing off one of the main veins through the area, TDOT had little time to spare to secure the mountainside and ensure its safety against future rain events and subsequent erosion.

TDOT selected Blalock Construction, Sevierville, Tenn., as the general contractor to expedite repairs. After clearing rock and debris off the road and out of the river, Blalock Construction tasked subcontractor TennesSEED Sod & Turf, Athens, Tenn., with erosion and sediment control by reestablishing proper vegetation.

Specification

After careful assessment, TennesSEED Sod & Turf President Jeanne Pennington, who led the repair project, ruled out an erosion control or turf reinforcement mat as possible solutions due to the extreme rocky nature

of the steep 1:1 slope. Proper installation of a mat would prove difficult, and Pennington was concerned that intimate contact with the soil would be a serious challenge resulting in under-rilling and additional erosion.

The slope required a solution that could aid workers in securing and vegetating the 250-ft slope equally from bottom to top, without having to physically make contact with the dangerous, unstable or hard-to-reach portions of the site. Pennington recommended a hydraulically applied mulch and approached Jason Painter of JenHill Construction Materials, Hendersonville, Tenn., to carefully analyze the needs of the site and help select the proper high-performance hydraulic erosion control product.

"I asked him for the best product that would achieve our desired result in one shot," Pennington said. Painter recommended North American Green's HydraCX2 Extreme Slope Matrix. While the mulch was attractive to engineers because of the sustainable straw and cotton plant components, it was selected primarily for its ability to quickly and effectively establish vegetation and control the erosion caused by the region's harsh rainstorms.

Application

Crews mixed the hydromulch with three kinds of seed—fescue, rye and millet—specified by TDOT to achieve plush growth and create a fix that blended seamlessly into the native environment. The seed combination was then mixed with the slurry in preparation for a one-step application.

"[This] hydromulch stands out among similar products because of the way it easily empties out of the bag and



A major rockslide in Tennessee threatened Highway 64 and the Ocoee River.



Workers hydromulched the 250-ft, 1:1 slope, resulting in significant vegetation growth.

into the machine,” said Pennington, referring to the T330 hydroseeder used to hydraulically apply the mulch. “It doesn’t clog up equipment, and yet, once out of the hydroseeder, the coverage on the site is thick and has impressive staying power.”

The hydromulch, first applied in one direction and then again in the opposite direction for optimum coverage, was shot from the highway up toward the 250-ft, 1:1 slope.

Developed by Mulch and Seed Innovations LLC, Centre, Ala., along with Cotton Inc., HydraCX2 Extreme Slope Matrix is a hydraulic erosion control product made with mechanically processed straw fibers and reclaimed cotton plant material. It is a high-performance product containing proprietary performance-enhancing tackifiers that form a protective layer to hold soils in place and increase vegetation establishment.

The solution discourages excessive water retention and contains nitrogen, phosphorus and potassium nutrients that are key to plant growth, according to Wae Ellis, vice president of sales and marketing for Mulch and Seed Innovations. The cotton plant material features post-industrial waste from the cotton ginning process, making it a new reclaimed option in the erosion control industry.

Project Outcome

Following product application, Pennington observed that none of the material slid off the steep mountainside. “A significant portion of the site was made up of rock faces,” she said, “and considering that we were shooting from 250 ft below at some points, the HydraCX2 hydromulch adhered perfectly—thick and evenly across the site. We could see no evidence of slippage or misting away in the breeze the higher up we shot the mulch.”

Within 10 days of the initial application, the first signs of significant growth appeared on the slope. “The hydromulch assisted in establishing and growing healthy vegetation that would safely secure the site against future rockslides, while returning the mountainside to its natural beauty,” Pennington said.

“It performed the way we anticipated, filling in and vegetating where there was soil and settling into the crevices of the rocks.”

Within a few months, spring had sprung along the Ocoee and Highway 64, bringing with it new growth and the serenity that had once been associated with the winding and rippling route. More importantly, the repair of the Highway 64 stretch reintroduced a sturdy mountainside, a renewed forest

habitat and a safe passageway for travelers and water enthusiasts alike. **SWS**

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