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PICKING UP THE PIECES

Landslide disables Idaho mountain town corridor

By Dori Topholm

In April 2011, a series of storms deposited record amounts of precipitation in northern and north central Idaho.

The spring snow runoff combined with the rainfall skyrocketed the precipitation to 200% the normal amount for the area. Clearwater County officials issued a disaster declaration on April 2 following a series of mishaps in the area that included plugged culverts, which then caused a series of floods, mudslides, and road slumping and washouts. An additional rainfall event on April 5 added approximately 1 in. of rain.

By April 8, a massive landslide occurred as a result of the intense runoff, causing significant damage to road infrastructure and surrounding slopes. A horseshoe bend area at mile marker 13 of the Dent Bridge Road, which serves as the main travel corridor between the mountain towns of Orofino and Elk River, was destroyed. An estimated 50,000 cu ft of debris slid down the mountain, taking almost the whole width of the road with it, and continued to slide down to a lower switchback and completely covered the road below. The Clearwater County Sheriff's Office stated that once the landslide finally came to rest after movement throughout the day, it was about 70 ft wide and deep and stretched down an approximately 800-ft-long hill slide slope.

Disaster Response

In response to the slide and the imminent danger to locals, a revised

disaster declaration was submitted by Clearwater County to include the Dent Bridge Road slide; the county sought state assistance for repair of the roads and bridges and remediation of the landslide site. Lonnie Simpson, president of Debco Construction of Orofino, Idaho, was asked to help assess the damage of the slide and respond with his recommendations for both emergency and permanent response, repairs and remediation. Simpson's initial conclusion was that the temporary and emergency repair would cost approximately \$70,000 and the long-term, permanent repairs would cost closer to \$1.2 million.

Almost immediately, a Debco construction crew began to clear the roads of debris and start construction of a temporary road that would reroute traffic around the dangerous slide area. The Dent area—a small mountain community consisting of 61 homes and families just north of the slide—was directly impacted. It was imperative that alternative access be erected to allow access to and from the community and eliminate immediate threat to local citizens' health and safety. Additional emergency efforts included the excavation and implementation of two ditches in the attempt to divert water away from the sites and prevent another slide from occurring. The consistent rainfall caused the ground to become saturated, and erosion control was tough to achieve, as the water would penetrate the land before reaching the culverts. Authorities suggested the distinct



The treatment of the slope was completed just before the end of fall 2013.

probability that there would be another slide because water was running at the top of the slide, disappearing into the soil and reappearing at the bottom.

Teams from various organizations and companies worked for the next 18 months to secure funding for remediation, observe the long-term effects of the slide and propose designs of remediation. Fortunately, during this time of planning and observation, there were no significant erosion events.

Recovery

During the fall of 2013, a series of BMPs were put into place at the slide site to ensure stability throughout the long Idaho winter and allow for permanent regeneration of the natural landscape. Debco Construction continued management of the project and worked to excavate the site to create a terrain that would encourage natural water flow patterns. The team trenched out rock groin diversion ditches with strategically placed curves and terraces to slow the water flow, and layered the base with a bed of crushed rock in efforts to decrease soil particle movement. Once a favorable design of the terrain was achieved, straw wattles were installed every 6 to 10 ft perpendicular to the slope surrounding the rock groin ditches. With the aforementioned BMPs in place, a team from Apex Erosion Control LLC of Clarkston, Wash., sprayed the entire eroded slope with a specially formulated hydroseeding slurry.

The intensity of the slope, the weather impact in the area and the probability of another landslide called for a slurry that would be instantly effective and long lasting. The hydromulch chosen for the job necessitated third party testing as well as field testing to provide extreme erosion control for up to 18 months without the need of re-application. The slurry mix that was specified for the project on a per-acre basis was composed of 3,500 lb of NaturesOwn X9000 alternative fiber hydromulch, 1,800 lb of biosol, 500 lb of humate, 10 lb of microriza and 200 lb of ammonia sulfate fertilizer.

Apex Erosion Control LLC deployed two of its trucks equipped with Xtreme hydroseeding machines to the site for two days to mix and apply the slurry to the 2:1 to 3:1 slopes at a rate of 1,000 gal



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per minute, reaching distances of 300 to 400 ft. The massive 4,000-gal hydroseeding trucks equipped with 220-hp motors gave the team the force that they needed to apply slurry to the difficult terrain. In order to reach areas that stretched into the dense trees and near the center of the slide and to apply minimal disturbance to the groomed and treated slopes, the team dragged hoses from the trucks to the application sites to assure adequate application. "The slurry that we applied was specified to create immediate remediation," said John Larson, CEO of Apex Erosion Control LLC, during an interview following the application.

The treatment of the slope was completed just before the winter of 2013. This area receives an average precipitation of 15 in. during the fall and winter months,

about 50% rain and 50% snow. The slurry that was applied to the slope was formulated to combat the winter conditions and will allow the seed to lie encapsulated and dormant over the winter.

"I am optimistic about the erosion control and vegetation that we are looking to see in the spring," said Rob Simon, road and bridge supervisor of Clearwater County. The project already has shown signs of a successful outcome and the odds are good that it will prove to be a successful erosion control project. **SWS**

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