

Flexterra® FGM™ and Terra-Tubes® Case Study: Greening-up “Mountains” of Slag

Innovative solution transforms foreboding landscape into “Ireland”



Situation

Over the years CVRD Inco had produced a mountain of slag that was threatening to overrun part of Sudbury, Ontario, Canada. The company’s Sudbury facility is one of the world’s largest fully-integrated nickel, copper and precious metal mining, milling, smelting and refining operations. The slag, a by-product of the smelting process, had become both a dominant feature of the landscape and a major challenge to CVRD Inco’s role as a good corporate citizen and environmental steward. As a result, the company decided to study new ways to accelerate its ongoing reclamation of the slag piles and quickly convert them into green landscape.

Problem

An area of the city known as Gatchell had expanded to a point almost adjacent to the slag, and in some areas the two were becoming separated only by a busy roadway. As the slag and the city grew toward a potential “merger,” the company recognized a need to change the materials it had been using for slope reclamation.

Mike Peters, CVRD grounds supervisor and greenhouse manager at Sudbury, outlined some of the challenges.

- The massive slag accumulation would need to be reshaped, graded and compacted. Because it was adjacent to a roadway with limited land available, the resulting slopes would be steep (gradient of 3H:1V) and in some cases rise to an elevation of 100 feet (30 meters).
- Due to the highly acidic nature of the slag, another growth medium (in this case, clay) would have to be incorporated.

“We had done slope reclamation elsewhere by hydroseeding using a basic mulch,” Peters said. “But this was on more gradual slopes (4H:1V) and we weren’t completely satisfied with the erosion control. So, we began looking for something more reliable.”

Flexterra® FGM™

TERRA-TUBES®
Fiber Filtration Tubes

Solution

CVRD Inco first targeted a 20-acre (8 hectare) section of slag piles adjacent to the roadway. According to Mike Peters, “In some cases the slag was almost up to the road, so starting here was important not only to mitigate possible problems of blowing dust or erosion onto the roadway, but to make a visible statement to the community that we were working to reduce our environmental footprint.”

Work began in October 2006 and continued through February 2007. The mammoth slag piles were reshaped to create a series of slopes, each 100 feet (30 meters) long and divided from the next by a horizontal bench 20 feet (6 meters) wide. This required a slope gradient of 3H:1V. As a result, John Reynolds of Mulch-It, Putnam, Ontario, and Cathy Wall of Quality Seeds, Woodbridge, Ontario, were asked to propose a method to successfully establish growth on the steep new slopes.

Following on-site consultation with erosion control experts Steve Zwilling and Dwight Johnson of Profile Products, Wall and Reynolds made their recommendation—install Terra-Tubes® Fiber Filtration Tubes as slope interruption devices—then hydroseed using a custom legume/grass mixture applied in a hydraulic slurry with Flexterra® Flexible Growth Medium™.

CVRD Inco tested this recommendation using a small-scale demonstration area. “In May 2007 we applied the Flexterra/seed mixture on the dam of a nearby tailings pond,” Mike Peters said. “The area greened up quickly and became well-established—this confirmed our decision to proceed with these materials on the larger project.”

Meanwhile, CVRD began modifying the surface of the slag piles by incorporating an 18 inch (46 cm) layer of clay as a growth medium. An estimated 80,000 cubic yards (61,164 cubic meters) of the material were trucked in, spread by bulldozers and then horizontally track-packed to stabilize the surface and aid in erosion control.

Next, more than a mile (1.6 km) of Terra-Tubes was installed across the graded and packed slag. Well-proven as a slope interruption device, Terra-Tubes are frequently used in conjunction with Flexterra for erosion control on steep, difficult slopes. They were placed at 35 foot (11 meter) intervals across the slopes and, by early August, CVRD Inco was ready to begin hydroseeding. Each hydroseeder load contained 1,000 pounds (454 kilograms) of Flexterra with 50 pounds (23 kilograms) of the special legumes/grasses

blend plus fertilizer and lime. Steve Zwilling from Profile recommended applying Flexterra at a higher rate than normal—4,500 pounds per acre (5,100 kilograms/hectare). “Because the material had to last over a long winter and because of the length of the slope, we needed a little heavier coverage,” he said.

Work began along the top tier of slopes. “We gave this priority,” Mike Peters said, “so that by establishing growth we could help minimize erosion on the lower areas until there was time to cover them. We knew we were crowding the end of the season, but our plan was to establish as much growth as possible before the first frost and then continue dormant seeding. In particular, the amount of dormant seeding we’d be doing made it important to have a product that would support the slopes and prevent erosion right through until germination in the spring.”

“We were confident Flexterra could meet these objectives better than other options,” said Mulch-It’s John Reynolds. “Compared with other hydraulically applied erosion control materials it requires no cure time—so you get an immediate protective cover. Also, compared with rolled erosion control blankets, there’s no “tenting” that can allow erosion when application has to be made on an irregular surface.”

Flexterra employs a patented technology which combines Thermally Refined® wood fibers with crimped, interlocking, man-made fibers and performance-enhancing additives. This creates an intimate bond with the soil surface, enhances seed germination and provides immediate erosion protection on steep, difficult slopes.

The Result

Some 17 acres (7 hectares) of the slopes had been covered by mid-October 2007. Mike Peters said, “We’ve had excellent germination and, as a result, the area where we began in August is now totally green. In fact, we get comments from area residents that, ‘It looks like Ireland up there.’ We were able to test the Flexterra early on because we had a heavy rain event not long after our first hydroseeding. It held up well and did a good job of preventing erosion.

“We’re very pleased with the results so far. You can’t imagine how good it makes you feel when you’re up there working on those slopes and a car drives by, honks and you look down to see the driver giving you a ‘thumbs-up’ sign—that’s when you’re sure you’re doing the right thing, with the right materials.”

Key

Product Properties

Flexterra® FGM™ Flexible Growth Medium™

Extensive documentation from independent laboratory tests combined with jobsite reports show that Flexterra can be more efficient and cost effective in situations where:

- A stronger mechanical and chemical bond is needed to withstand greater surface flow and/or severe slopes.
- Immediate erosion protection is required to eliminate risk from impending wet weather.
- Faster, more complete germination is needed. Tests show Flexterra can provide over 50 percent better germination when compared with excelsior and straw blankets.
- Quick, cost-effective application is necessary. Particularly on large projects, Flexterra requires less labor and is faster to apply than traditional blanket products.

Terra-Tubes® Fiber Filtration Tubes

Terra-Tubes Fiber Filtration Tubes have been proven through independent testing to be the industry’s most effective storm water treatment device. They:

- Effectively trap, filter and treat sediment-laden runoff while reducing hydraulic energy. Only Terra-Tubes provide three primary functions of flow, filtration and flocculation.
- Treat water in low-flow channels, across slopes and around detention ponds and drainage inlet structures.
- Are an effective BMP for reducing turbidity in storm water run-off on slopes when used in conjunction with Flexterra.



Your Trusted Partner In Soil Solutions

PROFILE Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
(800) 508-8681
www.profileproducts.com