



## Case Study

application	<b>Subgrade Stabilization/Construction Platform</b>	job owner	<b>City &amp; County of Denver</b>
location	<b>City Park/17th Ave &amp; Colorado Blvd; Denver, CO</b>	engineer	<b>Parsons</b>
product	<b>Mirafi® HP270 &amp; HP570</b>	contractor	<b>Concrete Works of Colorado, Inc.</b>

TenCate™ develops and produces materials that function to increase performance, reduce costs and deliver measurable results by working with our customers to provide advanced solutions.

### THE CHALLENGE

City Park Ferril Lake Improvements:  
The entire lake and surrounding shorelines needed to be rehabilitated.

The city pond at the Denver City Park had years of deposits built up on the bottom that was negatively affecting the ecosystem of the pond. Concrete Works of Colorado won the bid to remove it. They had planned on building a network of haul roads throughout the pond to transport equipment and haul the muck out. The original haul road design consisted of five feet of a 4" minus stone placed directly on the bottom of the pond at the proposed elevation for the pond bottom. However, the base of the

pond was so soft, CBR < 0.5, the first truck that tried to drive on the haul road sunk into the muck. It cost the contractor considerable time and money to remove the truck. The contractor called Bowman Construction Supply to find out if they had a solution. Bowman and the Contractor decided to try a high strength geotextile solution.

### THE DESIGN

The design Bowman suggested used Mirafi® HP570 and HP270, two of TenCate's high strength, woven polypropylene geotextiles. The new haul road section consisted of Mirafi® HP570 along the proposed new pond bottom elevation, three and a half feet of the 4" minus stone, a layer of Mirafi® HP270 and then one and a half feet of a crushed base rock. The high strength of the Mirafi® HP570 (4,800 lb/ft) combined with its excellent water flow (30 gal/min/ft2) was used to stabilize and consolidate the soil and provide reinforcement and

confinement for the haul road. The Mirafi® HP270, with its superior water flow (50 gal/min/ft2) and high strength and (2,640 lb/ft) and durability was used to separate and reinforce between the aggregate layers. It also allowed the contractor to use less expensive crushed rock base for the top one and a half feet, thereby saving material costs for the rock.



An end-dump is used to place the rock onto the geotextile.



Mirafi® HP570 being installed in a very soft pond bottom.



Mirafi® HP570 installed with appropriate overlap.

**THE CONSTRUCTION**

The installation of the newly designed haul road went very smoothly. To clear muck for the haul road, the contractor used a backhoe seated on a metal plate for support. The Mirafi® HP570 was rolled out with appropriate overlaps for the soil conditions, and the 4" minus stone was back dumped, spread and compacted on the Mirafi® HP570 in one foot lifts. The Mirafi® HP270 and crushed stone were placed similarly.

**THE PERFORMANCE**

Once the first few hundred feet of the geotextile reinforced haul road was built, the contractor successfully tested it with some of his heavier equipment. They proceeded to finish all of the haul roads with the geotextile reinforced design. The Mirafi® HP geotextiles not only saved material costs, they saved the contractor valuable time that would have otherwise been spent waiting for the pond to dry and strengthen, or both time and material on continuing to excavate and bringing in more rock. Once the geotextile reinforced haul road was built, the contractor had to do very minimal maintenance on the haul road. The contractor's loaded and unloaded belly dumps made about 26,000 passes in the sixty days it took them to complete the job. The geotextile reinforced haul road allowed him to complete this job on schedule, with minimal maintenance, and without fear of losing more equipment into the pond muck.



Track equipment is used to place the rock onto the geotextile.



The rock material is being worked out over the Mirafi® HP570 geotextile.



The Mirafi® HP270 was then placed on top of the rock material before the base course is brought up.



Completed section utilized as a haul road.

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