

Dike And Levee Upgrade/Repair

CASE STUDY



The Problem:

Economically upgrade and repair dikes that have suffered from severe surface erosion and growth of undesirable vegetation.

Project:

Sarnia, Ontario Tank Farm Retrofit

Consulting Engineers:

Associated Geotechnical Systems (AGS)

General Contractor:

Associated Geotechnical Systems (AGS)

Location:

Sarnia, Ontario, Canada

Time frame:

September 1990



The Solution:

Presto Geoweb® Cellular Confinement System

Dikes that protect three tanks at a petrochemical company in Sarnia, Ontario, Canada suffered from severe surface erosion problems and growth of undesirable vegetation. A cost-effective solution was sought to upgrade and repair the dikes to current standards.

The dike systems, surrounding tanks containing liquid petroleum products, required an impermeable geomembrane system to contain spills and prevent ground contamination in case of tank rupture. The petrochemical firm selected Presto's concrete-filled Geoweb® cellular confinement system to protect the geomembrane and provide erosion control on the side slopes. The Geoweb system offered significant advantages over alternative systems considered for this project.



The Right Solution!

Presto Geoweb® Cellular Confinement System

Alternative designs considered included reinforced concrete, emulsion spray coverings, and rip-rap facings. The Geoweb® system was chosen over the alternatives because it offered complete protection of the geomembrane liner, easier clean up in the event of tank leaks, and superior aesthetics. The concrete-filled system provided lower installed cost, reduced maintenance, and provided a safe walking surface for maintenance personnel.

The tank dike areas measure approximately 3,120 sq. meters (34,600 sq. ft.) per tank. Slopes were 2.5 h:1 v with a slope length of 7.9 meters (26 ft.). A polyethylene liner was placed directly over the slope surface, making the dikes impermeable. The liner was overlaid with layers of nonwoven geotextile to provide protection to the liner during the concrete pouring. A 6.6 cm (2.6 in.) deep Geoweb layer was placed over the geotextiles, filled with 14 MPa (2,000 psi) concrete, and finished flush with the top of the cells.

Although they were working on slopes with limited access, the crew placed 1,120 sq. meters (12,000 sq. ft.) of liner, geotextile, and unfilled Geoweb sections per day. A telescoping boom bucket excavator rapidly transferred 1,300 sq. meters (14,000 sq. ft.) of concrete per day into the system's cells. The Geoweb system's ability to conform to slope irregularities contributed to high productivity, a consistent measurable concrete thickness, and a quality finished system.

The concrete-filled Geoweb system provides benefits that are unavailable or cost-prohibitive with other systems. Managers at the petrochemical company are pleased with the Geoweb system and plan to use the system at facilities scheduled for upgrades or retrofits.



Completed concrete infilled Geoweb dike protection system.



Application of concrete infill.



Geoweb panels conform to slope irregularities, improving quality and reducing infill waste.



Dike with severe surface erosion and undesirable vegetation.



The Right Solution!

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