The GEOWEB System Solves Soft Subgrade Problems for PORT OF OAKLAND

SSPCo

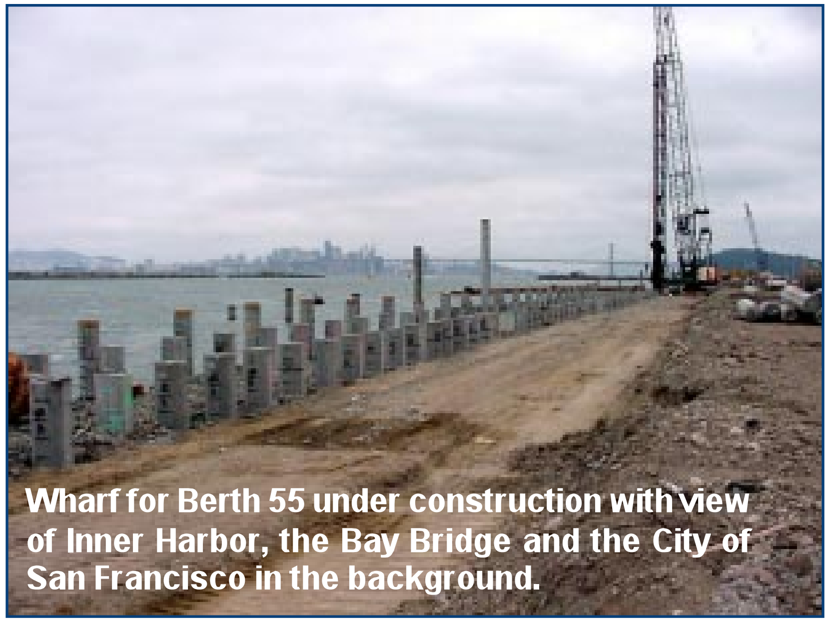
Soil Stabilization Products Company, Inc.

PORT OF OAKLAND

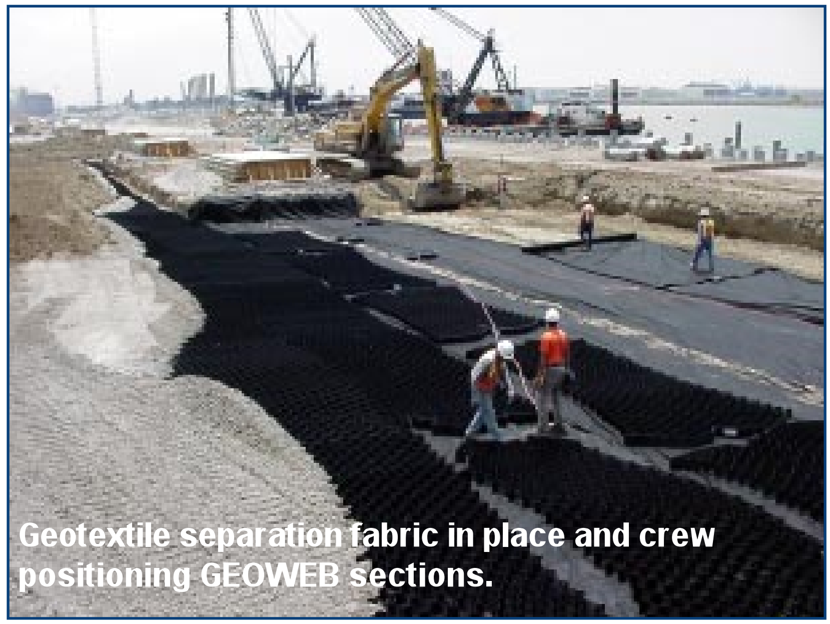
The Port of Oakland, the fourth largest port in the United States, is in the midst of a modernization and enlargement program. The VISION 2000 project will spend almost 700 million dollars developing a 531 acre former Navy site for additional berths for ocean going container ships and an intermodal terminal for transferring containers between docked ships and rail lines. The site is immediately adjacent to San Francisco Bay and water quality concerns require use of product technology that is accepted by public agencies with regulatory responsibilities over the San Francisco Bay estuary and surrounding watershed. The wharf for Berth 55 is being constructed above a “Bay Mud” native subgrade which remains in a saturated condition due to the high water table. Design engineers and contractors working for the Port are faced with an extreme challenge working on top of this soft foundation. They are tasked with constructing pavements capable of supporting the intense activity of container ship loading and unloading operations handled by specialized equipment with axle loads ranging from 100,000 to 212,000 pounds (100 to 212 kips).

THE PROBLEM

While cement and lime are often mixed with soils in an attempt to improve their engineering properties, these chemical products are not permitted to be used within 500 feet of San Francisco Bay due to water quality concerns. These calcium based stabilizers also produce a rigid layer which is highly susceptible to cracking when constructed over soft ground conditions and subjected to extremely heavy loads. With ground conditions so soft that contractors were unable to place select fill materials and achieve the required degree of compaction, the **GEOWEB®** Cellular Confinement System was ideally suited for this Port of Oakland project.



Wharf for Berth 55 under construction with view of Inner Harbor, the Bay Bridge and the City of San Francisco in the background.



Geotextile separation fabric in place and crew positioning GEOWEB sections.

Crew stapling sections together with pneumatic staple gun.

Articulated All-Terrain Dump Truck end dumping crushed concrete infill.

Placing crushed concrete infill into GEOWEB cells.

Compaction operations in progress with additional fill being placed in background on top of GEOWEB reinforced work platform.

GEOWEB SOLVES THE PROBLEM

The **GEOWEB** Cellular Confinement System solves soft subgrade problems by creating a load-supporting, load-distributing structure with high flexural strength and stiffness. Loads are spread across the system and the three-dimensional webwork behaves like a stiff but flexible horizontal laminar element beneath the load bearing surface. The cell hoop strength, passive resistance of adjacent filled cells, and frictional interaction between the infill and cell walls all contribute to the support structure. Unlike rigid slab-like layers, a **GEOWEB** reinforced layer can accommodate subgrade movement without loss of structural integrity.

CONSTRUCTION

The Port of Oakland application placed the **GEOWEB** System over geotextile separation fabric. Crushed concrete was utilized for infill and as a cover layer. The system supported construction equipment as the infill material was placed and compacted. The stiffened flexural beam immediately supported construction operations so that subbase, base course and pavement operations could proceed without delay. The **GEOWEB** installation, pictured here in progress, was the first of ongoing installations reinforcing the subgrade for the Berth 55 Wharf project.

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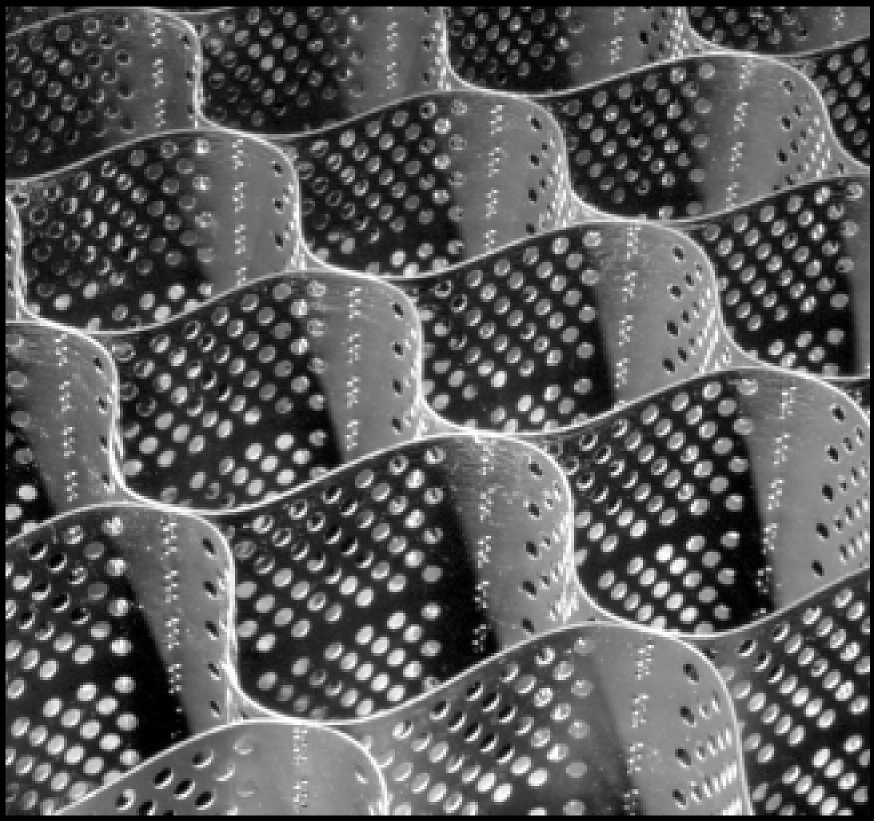

Presto GEOWEB ®Cellular Confinement System

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