

# **Presto GEOWEB® Cellular Confinement System Protects Storm Water Retention Basin Slopes**

## **The Problem**

Usiminas, a Brazilian steel company located in Ipatinga, Minas Gerais, is increasing its production capacity from four million tons annually. The increase in capacity is necessary to keep up with the Brazilian automotive market, which is currently consuming 30% of Usiminas' production. To increase Usiminas' production capacity, construction of a new industrial infrastructures, material storage facilities, and increasing the capacity of the existing storm water retention and drainage system was necessary.

Increased hard surface area and increases in anticipated storm water runoff required the construction of a storm water retention basin to collect and control the release of accumulated runoff.

## **The Solution**

After reviewing several alternatives, the Geoweb® cellular confinement system, manufactured by Presto Products Company, was chosen to protect the storm water retention basin's slopes. The Geoweb® system confines the infill material minimizing the downward migration of embankment materials by functioning as small check-dams in the upper soil layer.

The system infilled with topsoil and vegetated offers an aesthetically-pleasing, green appearance while increasing the soil's erosion resistance by encapsulating and interlocking with the vegetative root zone. The system also helps prevent rills and gullies from forming, particularly in areas of concentrated flow over erosive soils. The Geoweb® solution was submitted to Usiminas' strict environmental control group for approval. The company recently achieved ISO 14000 certification (known as "ISO Green").

Besides its effectiveness in providing slope protection, the Geoweb system was chosen because of its cost-effectiveness, ease and speed of installation, non-special labor or equipment requirements, the possibility of using local soils, and the assurance of a good vegetated layer.

## **The Installation**

The 88 m long by 55 m wide by 6 m deep basin was built in a sandy soil area, leaving the 30° slopes with a high potential for erosion damage, especially at the water surface level within the basin.

Sections of Geoweb® 2.44 m wide by 6.10 m long by 100 mm in depth (8 ft x 20 ft x 4 in) were expanded and anchored with 10 mm diameter CA-50 steel anchor stakes. The anchored sections were then infilled with two types of material: reinforced concrete in the lower part, where there will be a longer duration of water contact, and topsoil vegetated with grass in the upper part. In order to protect the 5,400 m<sup>2</sup> of slopes, 358 Geoweb® sections were used.

