

Case Study

application	Municipal Solid Waste Landfill
location	Laogang, Shanghai China
product	Mirafi® FW400 & FW700

engineer
contractor

Goldens Association
Shanghai Laogan MSW Treatment
Company Limited

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

Shanghai is one of the four municipalities in China with a status equivalent to that of a province, reporting directly to the central government in Beijing. The Shanghai municipality covers an area of 6,340 square km and has a population of about 16 million. Shanghai is also China's largest economic centre.

Like all mega-cities, Shanghai produces a huge amount of solid waste daily. It was estimated in 1994 that Shanghai generated 35,000 tonnes of municipal solid waste per day or 12.5 million tonnes per year, of which two-thirds were generated by industry and one-third by households. Part of the generated waste is recycled and part is disposed of in

solid waste landfills.

THE DESIGN

The Shanghai Laogang Municipal Solid Waste Landfill is situated at Laogang town, Nanhui District, some 60 km from the city centre. The landfill is located adjacent to the coast and occupies 360 hectares with an anticipated total capacity of more than 34 million tonnes of waste over a 20-year concession contract. Initial intake is estimated to be 6,300 tonnes per day. The landfill, which was designed to meet international standards and comply with all relevant local Chinese regulations, incorporates a double geomembrane liner system in the base of the landfill, a leachate collection and treatment system, and will also incorporate a landfill gas collection and management system.

THE CONSTRUCTION

The foundation beneath the landfill consists of soft marine clay. To ensure quick and controlled consolidation of this soft clay foundation a drainage layer in conjunction with Prefabricated Vertical Drains (PVD's) was installed across the base of the landfill. The drainage layer consisted of a Mirafi® FW700 woven monofilament geotextile filter placed directly on the soft clay foundation prior to placement of the granular drainage layer. The Mirafi® FW700 geotextile filter combines the properties of good tensile strength and efficient filtering capability. There had been previous unsatisfactory use of low permeability woven slit tape geotextiles as a stabilization layer over similar, soft ground conditions hence, the specification of a high permeability woven monofilament geotextile filter. Following this, the PVD's were installed through the drainage layer into the soft clay foundation.



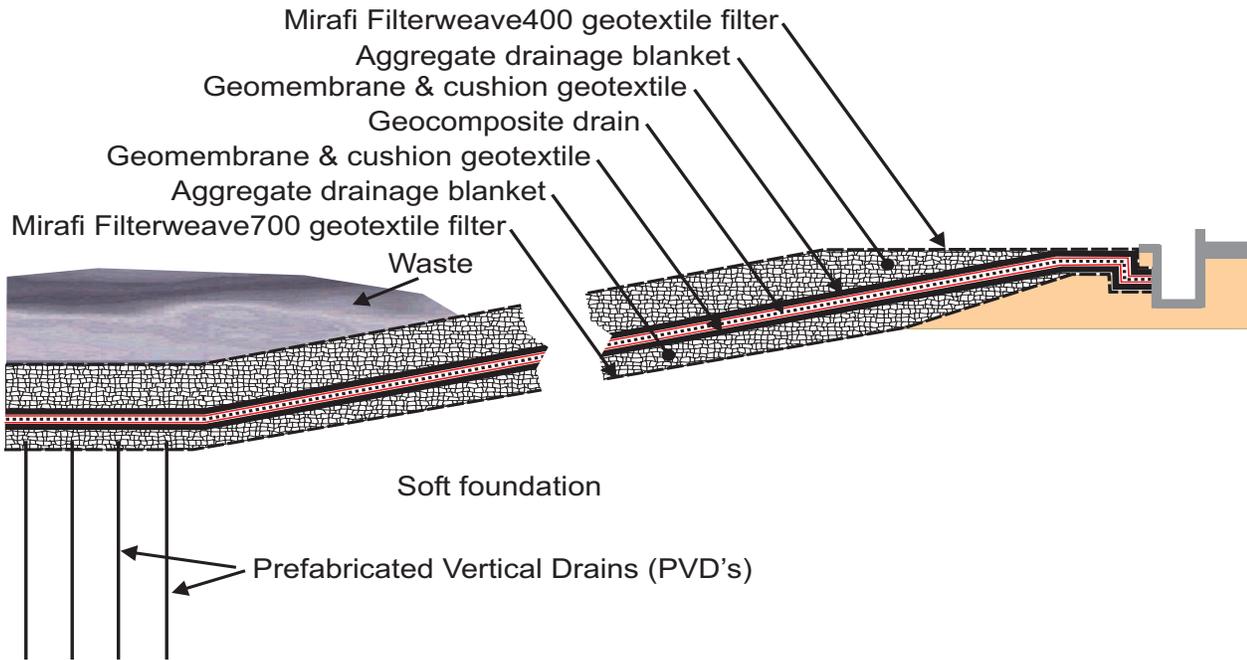
The Shanghai Laogang Municipal Solid Waste Landfill uses Mirafi® FW700 directly on the soft clay foundation and Mirafi® FW400 across the top of the liner.

Following installation of the foundation drainage system a double-geomembrane liner, consisting of two layers of HDPE geomembrane separated by a geocomposite drainage layer, was installed in the base of the landfill.

Above the upper geomembrane layer in the base of the landfill a granular drainage blanket was placed for the leachate collection system. To protect this granular drainage blanket from clogging from the Municipal Solid Waste leachate a woven geotextile filter was placed across the top. Mirafi® FW400, a woven monofilament geotextile filter of very low clogging potential, was used in this location.



Rolls of Mirafi® BXG11 being deployed over areas of soft subgrade soil.



Base Liner Detail

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