



Case Study

Closure and capping of old Landfill at Gorai, Mumbai

Owner: **Brihan Mumbai Municipal Corporation**
 Consultant: **ILFS Ecosmart Ltd**
 Contractor: United Phorphorus Ltd and Van Der Viel, Netherlands
 Land Area: 19 hectares
 Location: Mumbai. Next to Gorai Creek
 Rainfall: >300 cm in 4 months
 Waste dumping Started: 1972
 Peak waste received: 1200 tpd
 Height of waste at the time of closure: 60 to 80 m.
 Cost: 54 Crore
 Recovery of Investment Carbon Credits



Grading of waste

Problem:
 A low lying area near Gorai Creek was used for dumping municipal solid waste for many years by the Brihan Mumbai Municipal Corporation. Since the landfill was old it had no bottom lining system. It had to be closed because of growing human population in the vicinity and leachate discharge into the Gorai Creek. The Corporation of Greater Mumbai entrusted the job to UPL Environmental Engineers Ltd and its JV partner Van Der Viel of Netherlands



Soil Regularization layer

Requirement:-

The landfill had to be closed, minimizing leachate generation and converting landfill gas into electricity.



Geomembrane and Geotextile

Solution:-

The solution was to cap the waste with a geosynthetic lining system so that rain water ingress could be stopped. Leachate escape into the surrounding area would be controlled by installing sheet piles all around the landfill to a depth of 15m. Landfill gas collection points would be established from where it could be collected for flaring or used in generation of electricity.

Materials Used:

Steel Sheet Piles
 400 gsm PP Nonwoven Geotextile as protection to impermeable geomembrane

2.0 mm thick HDPE geomembrane.
Intermas Geocomposite GMG512 for drainage of rain water

Coir erosion control blanket to hold top soil on moderately steep slope

Method of installation

1. Sheet piles were inserted 15m deep all around the waste.
2. The waste was graded to a slope angle of 30 degree with benching every 20 metres..
3. 30 cm thick regularization layer of soil was placed over the waste.
4. Nonwoven geotextile made of polypropylene was installed over the soil regularization layer. Joints were stitched.
5. 2.0 mm thick HDPE geomembrane was installed. Joints were heat welded and checked for leaks.
6. Intermas Drainage geocomposite was placed to allow rain water to drain and prevent the top soil from becoming saturated under heavy monsoons in Mumbai.
7. A 30 cm of top soil which could support growth of vegetation was laid.
8. In some areas, Coir geotextile was laid to control erosion till vegetation could grow dense root. In some areas grass sods were planted.

Watering of slope was not required as rainy season began soon after installation. Watering of slope was not required as rainy season began soon after installation. However, watering was required during the summer season to keep the grass green.



Drainage Geocomposite



Top Soil and Coir Erosion control Blanket



Final Result



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