

LANDFILL PERIMETER CONSTRUCTION BY REINFORCED SOIL BOLOGNA, ITALY

LANDFILLS

Product: Paradrain geogrids

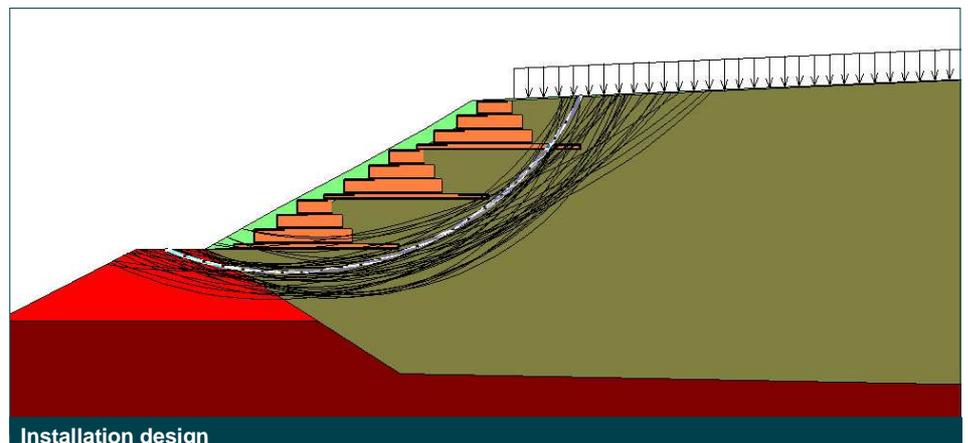
Problem

When cells within this landfill are nearly full, the containment embankments are raised. Historically, these embankments had been constructed from clay materials, but this caused many problems during winter and remedial works were frequently required. A more reliable solution was required.

Solution

A series of tests showed the effectiveness of a unique, multi-function geogrid, Paradrain within the clay material. Paradrain is a high strength polyester geogrid with robust polyethylene sheathing. The ribs of Paradrain are profiled into a channel section, which in turn is capped by a geotextile. This forms a drainage channel on the surface of each geogrid rib which effectively consolidates the clay material by dissipating pore water pressure rapidly. This feature enables marginal fills to be considered for reinforced soil structures. The design of the structure was carried out using MacSTARS software (Fig. 4).

Construction of the reinforced soil slopes progressed using a 'rising formwork' method (Fig.5,6,7 & 8). Paragrads were placed horizontally within the slope, and the clay backfill compacted upon them. The formwork temporarily holds the geogrid face at the appropriate angle whilst backfilling and compaction takes place. At the appropriate level, the Paragrads are wrapped back into the slope, enveloping the compacted fill. The formwork is then removed, and lifted to the next layer of geogrid.



Two strengths of Paradrain were used:

- 150 kN/m for the longest layers at the embankment base
- 50 kN/m for the reinforcement within the embankment

In this project, as the reinforced soil slopes were within the landfill, aesthetic face finish was not critical and no biodegradable erosion protection matting was not required at the front face to establish vegetation; the normal approach with reinforced soil slopes.

The client was pleased that there was no drop in the production rate of raising the containment embankments compared to his previous non-reinforced slopes. The added benefit was greater structural stability of the containment embankments and reduced maintenance.

The operation of this landfill proceeded with successive cells being raised.



During construction



During construction



During construction



During construction



During construction

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