



Reinforcement Basal Reinforcement Constantiakloof, Gauteng

Case Study

Project: Standard Bank, Phase 2
Client: Standard Bank
Consultant: N/A
Contractor: Wreckers

Date: 2006
Product: Rockgrid® PC
Quantity: 3 000 m²

Problem

On examination of the site, it was noted that the poor quality silty and clayey sub-grade material was mixed with compost and general waste. There was insufficient bearing capacity to support earthmoving and compaction plant. A high perched water table exacerbated the problem. Large settlements were expected and the stone column installation rigs were unable to access the site under these conditions.

Solution

To overcome the above construction constraints, a 1.5 m soil raft was recommended. The raft would consist of a base layer of warp knit polyester composite **RockGrid® PC** with a biaxial Ultimate Tensile Strength of 50/50 kN/m, dump rock, a thick nonwoven geotextile, **bidim® A5** and backfill material.

First, 2 m of waste material was removed. Then the composite geogrid was installed with a minimum 500 mm overlap. The **Rockgrid® PC** 50/50 kN/m geogrid increases the bearing capacity of the sub-grade, prevents loss of the drainage aggregate into the soft sub-grade,



The sub-grade material - insufficient load bearing capacity



Removal of waste material



Installation of Rockgrid® PC geogrid



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prevents the ingress of fines into the drainage layer and facilitates dissipation of pore water. This layer was followed by a 500 mm dump rock layer.

A **bidim[®]** A5 was installed between this dump rock and the subsequent 1.0 m backfill layer to act as both a drainage and separation layer to prevent the ingress of the backfill material into the dump rock drainage layer.



Dump rock layer

Benefits

The geosynthetic reinforced raft provided a flexible but stiff platform with a drainage layer below. This reinforced the basal layer and made the site accessible to the vibro-compaction rigs to begin construction of the stone columns.

The positions of the stone columns were surveyed in and at these points the geosynthetic layers were exposed in narrow excavations to cut the geosynthetic open to allow for the installation of the columns. The costly alternative of excessive volumes of dump rock to establish a working platform was avoided and construction of the foundations for the new building commenced within a shorter time frame.



Applying backfill over the drainage/separation nonwoven