

## CASE STUDY

**Reinforcement | Subgrade Stabilisation | Welgedacht Waste Water Treatment Works, Gauteng**

Apr 2013

Client East Rand Water Care Company (ERWAT)

Contractor Protech Khutele

Consultant SSI Royal Haskoning DHV / ARQ

Product **Rockgrid® PC** | 28 500m<sup>2</sup>

Rep Winnie van der Merwe

### Problem

Population growth necessitated expansion of the facility from its existing 35MI/d capacity to 85MI/d by the addition of a new 50 MI/d treatment plant. This expansion would involve bulk earthworks and reinforcement of earth mattresses over stone columns.

A geotechnical evaluation of the site confirmed that the design of the foundations had to address the highly compressible soils and shallow water table. The hillwash and wad horizons were considered unsuitable as foundations for these major water-retaining structures, which are large in plan dimension and intolerant of differential settlement, and would have to be founded 4 – 6m below natural ground level. Although the underlying dolomite would provide a suitable founding stratum, its depth would necessitate piled foundations.

### Solution

The foundation systems finally adopted consisted of the preparation and compaction of the selected subgrade, and construction of engineered mattresses of varying thicknesses, with or without stone column supports extending down, either to a depth of 6m, or to the top of the dolomite bedrock.

In the areas where stone columns or rock-filling of the bedrock irregularities were used, 2 layers of **RockGrid® PC 200/200** were placed within a fill layer above the columns or rock-fill. This was



*Rockgrid® PC laid at excavation depth*



*Rockgrid® PC 500mm overlap with riversand between the overlays to increase the friction angle between the layers*

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carried out prior to the construction of the engineered mattress foundations in order to provide tensile reinforcing to the undersides of the mattresses upon which the structures were later constructed.

### Benefits

An economical, locally-produced product solved a subgrade stabilisation problem.



*Rockgrid® PC + 150mm ballast stone + Rockgrid® PC + G7*