

102 Rivonia Road

Design & Construct Contract for Lateral Support, Bulk Excavation and Foundation Piling for Ernst & Young Offices in Sandton, South Africa



Project Facts

Owner

Eris Properties

Client

Eris Properties

Consultant

Aurecon (Engineers)

Quantity

5 600m² Gunite & Anchors
30 No. Foundation Piles
130 000m³ Excavation

Period of time

March to August 2012

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This project entailed the completion of 5 600m² of lateral support and the removal of 130 000m³ of soil from the proposed basement area. We encountered granitic rock that could only be removed through drilling and blasting in the critical area for the first handover. Geotech reports indicated this band of rock to be elsewhere on the basement excavation.

In order to overcome the time constraints, an aggressive design was prepared in-house for the 5 600m² basement. A combination of soldier piles, anchors and gunite arches 125mm thick was tabled. A further design challenge also had to be overcome as, on the eastern face of the basement, the new Alexander Forbes Head Office was being constructed. This face is just short of 110m in length and has six levels of parking below ground level. A narrow wedge of soil 8m wide had to be supported between the two basements as a connector road was being built between the two basements, thus preventing the removal of the soil wedge during construction phase. Our Design Department presented a solution to “tie” the two basements together with 32mm Gewi bars and whalers. This necessitated pin-point precision drilling in order to drill through the gunite arches in the neighbouring building’s basement. The tie bars were installed at 5 different levels so as to cater for the different basement slab layouts and configurations.



Product Description

5 600m² Lateral Support comprising of:

- J 150 No. 600mm Ø Soldier Piles, ranging in depth from 15 to 22m
- J 460 No. Strand Anchors, varying in capacity from 450 to 750kN installed through the soldier piles
- J 600 No. 25mmØ Gewi Bars 6,0m long
- J 52 No. Tie-through Anchors
- J 5 600m² of 125mm thick Gunite

A diabase dyke was detected along a portion of the face adjacent to the Gautrain Station for about 50m and resulted in additional anchors having to be installed.

In total, 3 additional rows of anchors were provided along this face culminating in a total of 8 rows. This was also the highest face on the project as well as the area required first by the building contractor for access to the lift cores. Construction emphasis was given to this area resulting in the time constraints being met.

A total excavation volume of 130 000m³ was carried out by the end date, of which 8 000m³ was hard rock.

Project was successfully completed within the set milestones.

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