



129 Rivonia Road - The Marc

Gauteng, South Africa

Design and construct contract for earth retention, bulk excavation and foundation piling for a two-tower mixed use development in Sandton, South Africa.



The project

The 129 Rivonia Road development consists of two high-rise towers. One of the project's office towers is 12-storeys high and the other 16-storeys, with a combined floor area of about 62000m². Nestled below the two office towers sits the retail podium, spanning about 15000m² and, to service the precinct plunging seven levels below, is the multi-level parking basement of around 100000m².

We were entrusted to laterally support and excavate a super-basement to provide the hollow core for the new building structure. At its deepest point the excavation would reach a depth of 24 meters.

The primary phase of our work was to support the existing boundary walls with the iconic Balalaika and Protea Hotels, this paving the way for the second phase. The action on this phase was to support the walls with 249 no. four-strand anchors and, simultaneously, 82 no bore piles were installed on the northern and eastern faces.

The second and final phase would encompass the excavation and lateral support to the new proposed basement layout, including the demolition and removal of the existing four-basement parking garage.

The challenge

Numerous unforeseen challenges were encountered during the earth retention and excavation phase and these had to be accommodated in the specified programme time.

The lateral support was complicated by diabase intrusions which was encountered as water-bearing and often saturated silt and required additional support. Copious amounts of ground water from approximately 12 meters below original ground level had to be accommodated to maintain access throughout the site.

The "unbelievable" volume of ground water present on the site, resulted in the constant collapsing of the soldier-piled side walls, which necessitated the temporary casing of all the piles.

Another significant challenge was the discovery of 3000m³ of contaminated soil, which was detected by a strong petrol odour. Envirowaste was called in to isolate the contaminated area and it had to be excavated with great care.

The solution

Meticulous planning and execution in the safe removal of existing slabs and beams, combined with the installation of the new lateral support solution, proved to be one of the secrets to the success of this project. The accurate placing and installation of the concrete soldier piles to avoid services was carried out without any damages or disruptions being caused. Exceptionally long strand anchors were installed along the Maude Street and Rivonia Road faces while exercising extreme care not to drill into neighbouring basements.

The full scope of works included earth retention comprising of 185 No. 600mm and 750mm diameter bored piles ranging in depth from 16 to 28m, 1187 no. strand anchors installed through the soldier piles, 663 no. rock bolts and 10400m² of 150mm thick gunite walls.

Project facts

Owner(s)

Eris Properties Group

Solutions

Excavation support

Keller business unit(s)

Keller South Africa

Markets

Commercial

Main contractor(s)

Eris Properties Group

Techniques

Bored piles - cased

Anchors

Shotcrete / Gunite

Engineer(s)

Aurecon

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