

## 90 Rivonia

Basement Lateral Support for Webber Wentzel's New Headquarters in Sandton, South Africa



### Project Facts

#### Owner

Redefine Properties

#### Client

Redefine Properties

#### Consultants

Pure Consulting (Engineers)

#### Quantity

2 900m<sup>2</sup> lateral support

#### Period of time

May 2013 to November 2013

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The preparation works for Webber Wentzel's new head office basement were challenging.

Of the total excavation of 68 000m<sup>3</sup>, no less than 16 500m<sup>3</sup> was extremely hard blue granitic rock, a very hard material which required extensive drilling and blasting. A Diabase dyke was encountered along the Rivonia Road face when the soldier piles were installed. This was unexpected and required a completely different piling application and technique, which entailed the replacement of 40 no. auger drilled soldier piles with 610mm diameter percussion-drilled piles, taking in excess of a month to install.

A very hard rock outcrop along the south eastern boundary posed one of the major difficulties of the project with the outcrop not identified in the geotechnical investigation. This was therefore not defined in the scope of works and lateral support design. This outcrop, comprised of a fault plane between the Granite and diabase bedrock, had two very different weathering patterns, greatly affecting the design of the lateral support solution. The location of this outcrop extended to the existing foundations of the Alexander Forbes building situated on the common boundary line between the properties.



**Product Description**

**2 900m<sup>2</sup> Lateral Support comprising of:**

- J 96 No. 600mm diameter Soldier Piles
- J 240 No. Strand Anchors
- J 250 No. Rock Bolts
- J 2 900m<sup>2</sup> gunite face area

Blasting had to be implemented in restricted sections in order to protect and prevent damages to the neighbouring building foundations. A successful outcome to this obstacle was achieved in the end.

The perimeter piles at the position of the dyke were subsequently changed from an auger cast in-situ soldier pile to a down the hole hammer type large diameter ODEX pile. The latter enabled a clear definition of the underlying bedrock mitigating the risk of superficial refusal on a hard rock quartzite pegmatites, commonly found in residual granite stratum, and hard rock diabase corestones. The reduced risk enabled an optimised lateral support design.

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