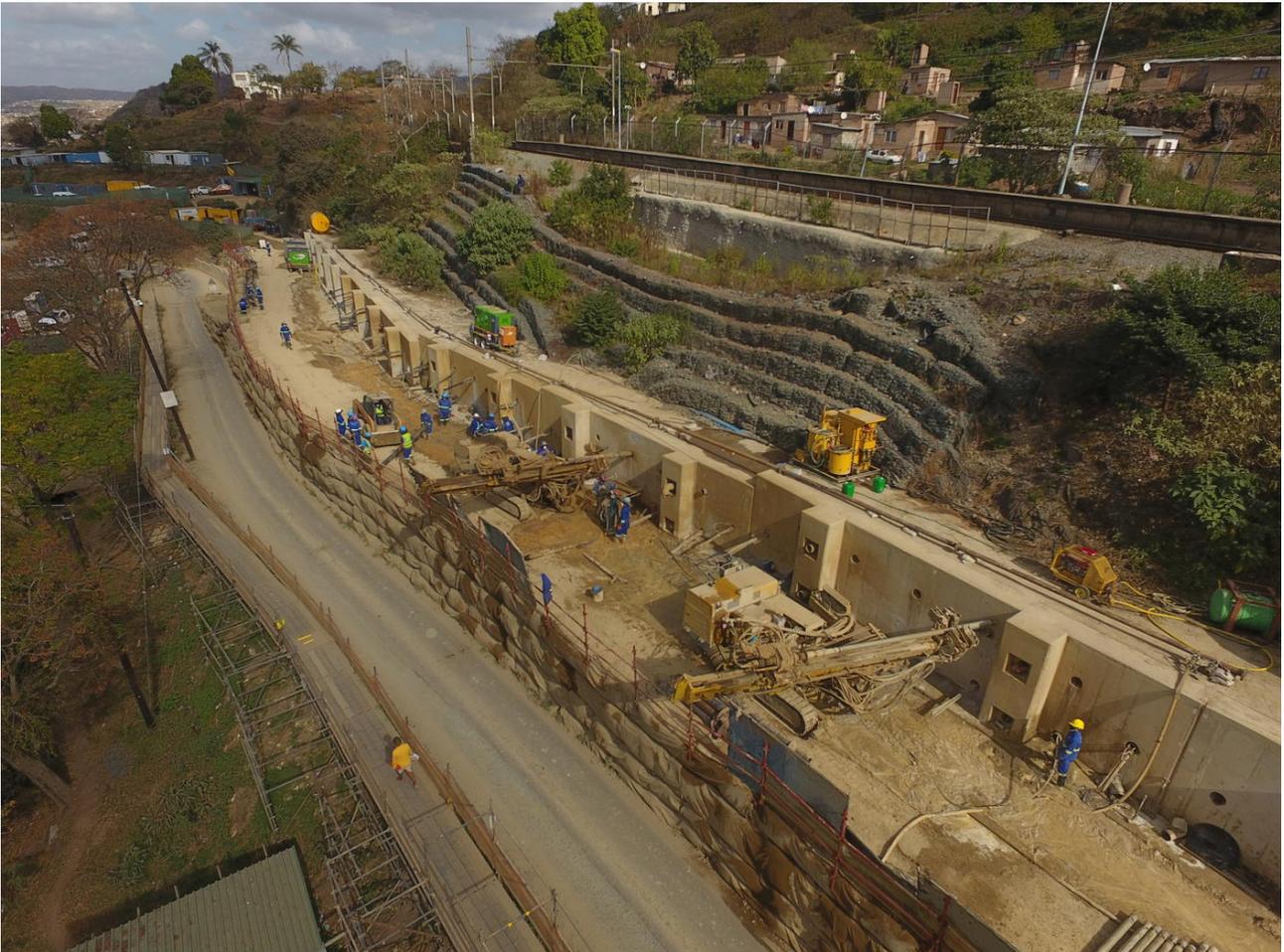


Thornwood Embankment Rehabilitation

KwaZulu-Natal, South Africa

Challenging slope stabilization project at Transnet's Thornwood Railway Station, located west of Durban in South Africa.



The project

Transnet's Thornwood Railway Station, and the steep embankment on which it is situated on, forms part of the critical national railways network line that transport goods between Johannesburg and Durban.

Excessive geotechnical movements were identified at the embankment of the station, prompting national rail company, Transnet Freight Rail to act accordingly to avert a possible total collapse of the infrastructure.

Keller recognised the technical difficulties and the challenging conditions that the installation of the anchors posed and formulated a feasible and constructible solution.

The challenge

There were several challenges that had to be faced, such as the inconsistent ground conditions before the competent rock, which made drilling conditions extremely challenging. This included drilling through a previously constructed gabion wall of up to 3m thick, followed by overburden with a mixture of clay, sand and boulders (up to 3m diameter).

Another challenge was the restricted working area, which entailed a two-way road nearby that had to be reduced to a single-lane road to accommodate the drill rig working platform. Despite these efforts, the working area was still confined. Traffic control was put in place to ensure minimal disturbance to the community road.

The solution

The project involved the design, supply and installation solution comprising 132 no. 830kN permanent ground anchors of up to 40m in length.

A Symmetrix 193 casing drilling system was utilised for drilling of the cased portion over the free length portion of the anchor holes. The casings were advanced until competent rock was encountered, which was up to 40m deep.

The fixed length portion of the anchor was then drilled past the casing into the competent rock utilising a conventional 6" DTH hammer and a 165mm drill bit. Due to the high comprehensive strengths on the competent rock (up to 250 MPa) and highly fractured in some places, special modified drilling bits were also used.

Project facts

Owner(s)

Transnet

Keller business unit(s)

Keller South Africa

Main contractor(s)

RME - Rehabilitation, Maintenance and Emergency Services

Solutions

Slope stabilisation

Markets

Infrastructure

Techniques

Anchors

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