

Innovative techno for jetty construction

PILING for the new dry bulk terminal jetty at Richards Bay, part of the third export expansion project, has been constructed using technology never before seen in a South African marine application.

It involved the use of an environment-friendly polymer drilling fluid which poses no threat to marine life as it disperses in sea water.

The project, worth R60-million, was carried out by a joint venture comprising LTA Civil Engineering and Ground Engineering (GEL) together with partners Interbeton of the Netherlands and Development Construction International for Portnet.

The work involved installing 124 piles, with diameters of both 1,8 m and 1,2 m socketed into bedrock at depths of up to 72 m from floating platforms in a water depth of 20 m.

The general pile construction process consists of placing a 40 m length of steel casing weighing up to 40 t in position using a 225 t crane on a floating barge.



Construction work at Richards Bay jetty

The casing is driven to a depth of 40 m using a 45 t diesel hammer, after which drilling equipment on a second barge bores through soft material to bedrock level.

A further 6 m is bored into bedrock to form a rock socket, with final depths of over of 70 m.

Stability of the drilled hole is maintained throughout the drilling process, by the polymer drilling fluid.

From a third barge, the full-length steel reinforcement cage is installed with concrete being placed through a trémie pipe extending to the pile base.

Displaced polymer is pumped to a floating mixing and processing plant for treatment and storage prior to re-use.

Pile load testing was undertaken using technology supplied by US company Loadtest using the Osterberg Cell technique, another first in South Africa.

Piles were tested to loads of up to 2 800 t.

The jetty, which extends 350 m from the existing quay wall into the harbour, is 65 m wide.

Cranes, barges and other specialised equipment came from the Netherlands, barges and tugboats from

Indonesia, polymer drilling fluids and pile-load-testing equipment from the United States.

Cranes and drilling equipment were also brought in from Italy and diesel piling hammers from Germany.

There were also a number of international personnel on the project, such as the technical adviser and plant manager from Interbeton, the KB Technologies polymer control engineer from Portugal and various other

specialists from the Netherlands, Thailand and the US.

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