

ABI Equipment Limited

Piling Equipment Specialists

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Martello Piling Ltd asked ABI Equipment Ltd to supply specialist equipment consisting of a Delmag RH28 rotary bored piling rig and Kelly bar for their civil engineering project in Middlesbrough.

The piling works were carried out over a nine week period commencing at the end of September 2017.

Manhattan Gate Bridge Middlesbrough

Main Contractor: Balfour Beatty

Client: Dawson-WAM

Piling Sub contractor: Martello Piling Ltd

Piling Equipment supplier: ABI Equipment Ltd

The Project

The Manhattan Gate project is part of Middlesbrough's Middlehaven Dock regeneration scheme. The development includes the construction of the Middlehaven Dock Bridge, a £10million lift bridge that will replace the existing footbridge. The bridge is located near the Temenos sculpture and is the main access link to the Riverside Stadium, the home of Middlesbrough Football Club.

Project Features

The Delmag RH28 was used to install 10No. Ø900mm land based piles and 5No. Ø1200mm marine piles during the ground work phase for the new bridge. The installation of the marine piles required Martello Piling to use a 220 tonne jack up barge and also to drill through the dock basin in order to form the pile.



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Project difficulties and restrictions

The marine piles were installed using a 220 tonne jack up barge. Martello Piling were working 11m above the concrete base of the dock and they also had to contend with a tidal rise and fall within the basin of 5m. The cages for the piles were fabricated with a 15m steel tube placed around the circumference of the cage to prevent any loss of concrete and to allow the finished concrete level to protrude above the water level.

Piling Method

All the piles were constructed open bore with a cage installed prior to the concrete being poured. The piling method for the 10No. land based piles was as follows:-

- Install 17.0m permanent liner
- Drill out material to pile depth of 23m
- Use Delmag RH28 fitted with 33m Kelly bar to install pile.

The 5No. marine piles were installed using a 220 tonne jack up barge. A piling gate was attached to the barge and the piles were guided through this to their correct position. The barge provided a stable platform 11m above the level of the concrete dock basing from which to work, and also mitigated the 5m rise and fall of the tide. The piling method for the marine piles was as follows:-

- Position casing for installation using pile gate
- Pump water out of casing
- Drill down into dock basin
- Install pile



Type of Piling

A total of 15No. piles were installed to a depth of 23m.. The ground conditions for the 10No. land based piles were clay overlying sand with the pile finishing in a 2-3m mudstone socket. The 5No. marine based piles were drilled through the 3m thick concrete dock basing before finishing in a 10m mudstone socket.

Paul Gwynne, Operations Director for Martello Piling Ltd commented; "We found the Delmag RH28 perfectly suited to the challenges of this project. Its versatility meant that we only needed one machine to install both the marine and land based piles. It performed consistently and reliably which meant that we were able to complete the piling works for the project on time."

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