

Large diameter bored piling

CANARY WHARF LONDON, UK



Basement walls and bearing piles for a major commercial development

Canary Wharf is located in the heart of the London Docklands, to the east of the city and has been undergoing regeneration since the mid-1980s.

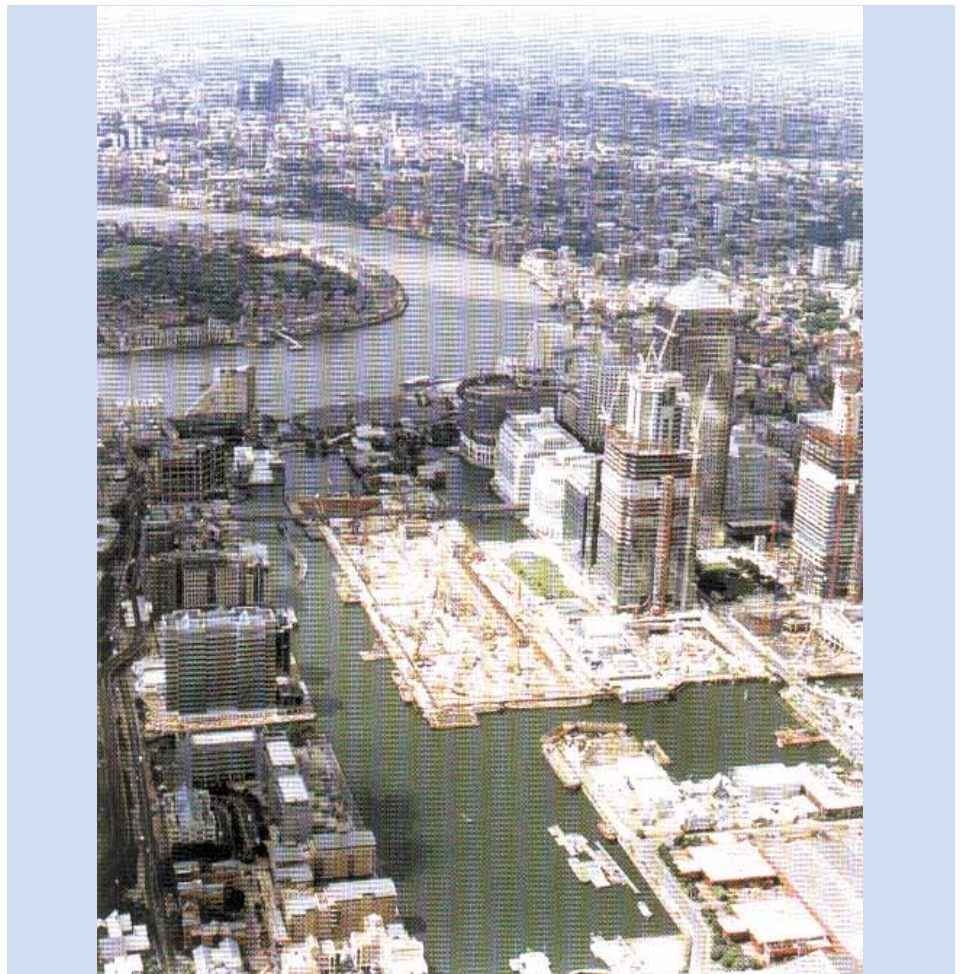
Bachy Soletanche were awarded various contracts on the New Heron Quay (HQ) development. This comprised installing some 1100 piles over a 14 month period.

The works comprised hard/hard secant piling to form basement walls to buildings HQ5 and HQ1, and Bearing Pile installation to the main Heron Quay Cofferdam, to form foundations for buildings HQ2 and HQ3.

Specially adapted rigs were utilised for lowhead wall operations, adjacent to the Docklands Light Railway System, which crosses the site.

Ground Profile

The general soil conditions underlying the site were fill, terrace gravels, Lambeth clays, Lambeth sands and gravels, and Thanet sands. Two water level conditions prevailed, the upper aquifer in the terrace gravels, and the lower in the Thanet



Aerial view of Canary Wharf site

CLIENT:	CANARY WHARF DEVELOPERS LIMITED
MAIN CONTRACTOR:	CANARY WHARF CONTRACTORS LIMITED (CWCL)
CONSULTING ENGINEER:	OVE ARUP & PARTNERS
DURATION OF WORKS:	14 MONTHS (AUG 1999 - OCT 2000)

WORKS QUANTITIES:

Development	900mm	1200mm	1500mm	Depth Range
HQ5/3a/2/1		55	768	18 to 30m
HQ5 wall	70	84		15 to 30m
HQ1 wall	60	63		15.5 to 30m

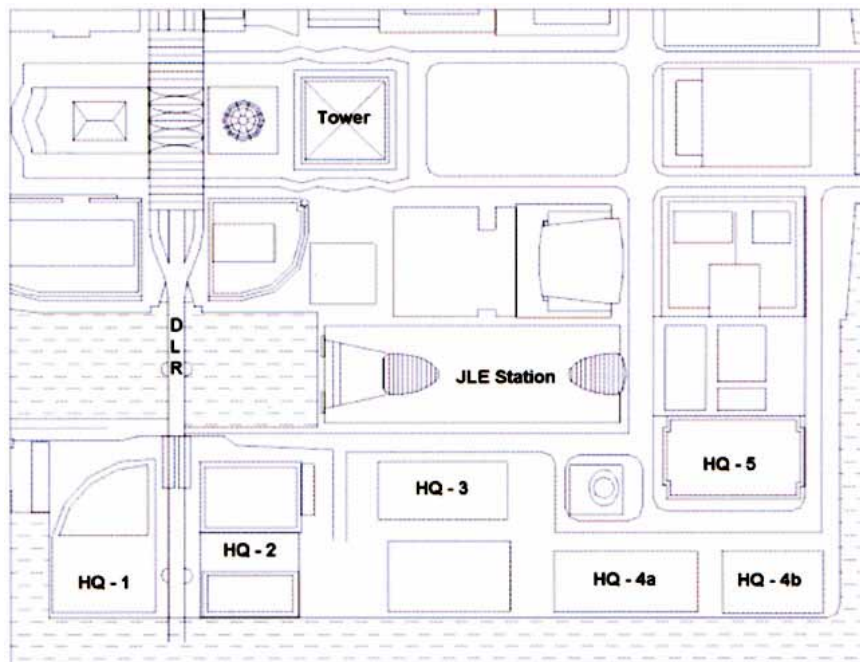


sands. Unique to Canary Wharf was the artificially low water table in the Thanet sands, which reduced the ground water to beneath the pile-constructed bases. This allowed Bachy Soletanche to drill piles without the aid of drilling fluids. However, a requirement of the Performance Specification required pile bores to be charged with a temporary support fluid prior to concreting, thus minimizing the risk of pile collapse during concreting operations.

Construction Methods

- All piles at Heron Quay were constructed in the following manner:
- Install temporary casing (6-15m in length)
- Temporary casings to secant walls extended to 30m
- Drill pile to design depth
- Flood empty bore with bentonite support fluid
- Insert reinforcement cage (with reservation tubes already attached)
- Concrete pile

The day after pile construction the Tube a Manchettes (TaM) attached to the steel cages, would be opened and the pile base concrete cracked using water under pressure up to 20 bar. This then left the pile ready for base grouting operations a day later.



Plan of proposed development

For base grouting, grout would be injected through the reservation tubes to the base of the pile in compliance with the Performance Specification requirement of minimum volume, pile uplift and residual pressure.

Special Requirements

On sections of the development it was a requirement for piles to be installed through old dock wall (mass brick and concrete). This was achieved only by utilising Bachy Soletanche's high torque piling rigs. The wall was cored using 1200mm and 900mm diameters

to depths of 15m. All piles on the contract required base grouting to minimise settlements and enhance load - bearing capabilities. Working test piles were required to loads up to 30 Mega Newtons (3000 tons) using Bachy Soletanche's standard test assemblies.

In order to complete the installation of 1500mm diameter piles, within a 12m height restriction under the Docklands Light Railway, a standard rig was modified. Plant operated in agreed orientations to the line, with defined jib/mast fall zone areas!



Construction work in progress

