Underground Mass Transit Station

Diaphragm Wall

C854 FARRER RD STATION & TUNNELS

SINGAPORE

Retaining walls for a mass transit railway station and cut & cover tunnels

The Circle Line is a 33km extension to the Singapore mass transit system comprising 29 stations. Contract C854 involves the construction of a station at Farrer Road and cut and cover tunnels including receiving shafts for TBM's arriving from the adjacent stations.

The new station is situated under a busy semi-expressway running through a highly residential area of Singapore requiring significant traffic management and complex works programming.

Bachy Soletanche built the diaphragm walls for the permanent retaining wall of the station box and cut & cover tunnels. The nature of the site, with the station being built below a busy six lane semiexpressway, meant that careful traffic phasing was required to allow access to all areas but this also gave limited working areas in which to place the heavy plant. Added to this was the residential zone which imposed limited working hours and strict environmental controls and some major utilities crossings.

Excavation of the diaphragm wall within a 'traffic island'

OWNER:	LAND TRANSPORT AUTHORITY
ENGINEER:P	ARSONS BRINKERHOFF PTE LTD
MAIN CONTRACTOR:	TAISEI CORPORATION
PERIOD OF WORKS:	JULY 2005 - SEPTEMBER 2006

WORKS PERFORMED:

Diaphragm wall

- Perimeter: 646m
- Surface area: 25,644m^2
- Depth: up to 48m
- Thickness: 1000mm & 1200mm

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With limited on site space, reinforcement cages were made off-site and transported when required to the project. Carefully managed logistics was essential due to the limited hours available. By ensuring concreting of the panels was completed in the early evening the contractor was able to avoid disturbance to the neighbouring residents. Additional noise abatement measures were also fitted to and around the cranes and the bentonite plant.

The diaphragm wall panels were mainly load bearing and were excavated into the underlying rock formation. In one specific area a nest of hard boulders was identified and was overcome by the experienced Bachy Soletanche grab operators.
Using up to four excavation rigs, including a KS3000 hydraulic grab Bachy Soletanche successfully completed the whole of the works despite the challenging space and environmental constraints imposed by the location and the difficult geological conditions.

KS3000 Hydraulic Rig working parallel to the diaphragm wall

General view of the bentonite plant and the construction of the retaining walls for a station entrance

General view of the site