

**Design & Construction of Friction Foundation  
Diaphragm Wall, Shaft Grouted Barrettes**



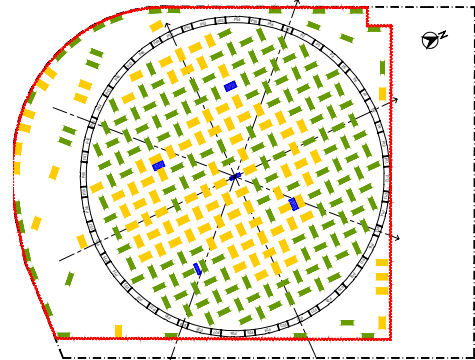
*The site is located within the West Kowloon reclamation nearby the existing MTRC Kowloon Station.*

Foundation for a prestigious project, one of the tallest towers in the world, 100m deep barrettes for around 500m tall building.

Due to the variable level, to the excessive depth and to the uncertain grading of the rock, the shaft grouted friction barrettes were adopted as the foundation system. Barrettes are located within a 76m diameter circular shaft. The shaft is designed for four level basement and 25m deep excavation.

Before the commencement of the actual works, an extensive testing programme took place on 5 preliminary barrettes in order to check and confirm the design parameters.

Beside the difficult soil conditions, the main challenger was the programme of the works. Three reverse circulation excavation machines and a maximum of labour and staff have been mobilized for a successful completion of the works.



*From design ...*

**SCOPE OF WORKS:**

- Design and Construction of:
  - Circular shaft 76m diameter, using Diaphragm Wall 1.5m thick, 70m deep.
  - 287 shaft grouted barrettes 1m and 1.5m thick and up to 105m deep.
  - Perimeter composite retaining wall (sheetpiles and slurry wall), 10,500m<sup>2</sup> of slurry cut-off wall.
  - Pumping test, instrumentation and monitoring including monitoring of the adjacent MTR tunnel and structures.
  - 5 preliminary barrettes and 5 loading tests, 4000 T each, to check out and confirm the design parameters.
- Design of the raft (76m diameter, 8m thick)

Construction Period : February 2002 to March 2003

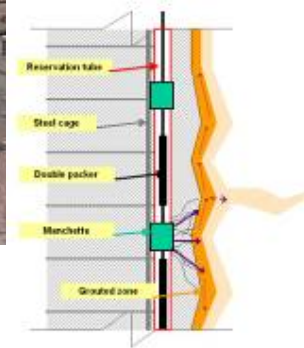


*to construction ...*

**MAIN QUANTITIES**

|                |   |                        |
|----------------|---|------------------------|
| Excavation     | : | 90,252 m <sup>2</sup>  |
| Concrete       | : | 80,600 m <sup>3</sup>  |
| Steel          | : | 7,687 T                |
| Shaft Grouting | : | 159,000 m <sup>2</sup> |
| Cut-off Wall   | : | 10,500m <sup>2</sup>   |

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Shaft Grouting

*Cement grout is injected at high pressure in order to enhance the friction at the interface concrete/soil.*



*Preliminary  
Static Load Test  
4000T*



**CLIENT :**  
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