Site Visit on 2 Levels Basement Excavation and Retaining Structure System at MAWIP's – Headquarters

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The Geotechnical Engineering Technical Division of IEM had organised a technical site visit to the proposed Majlis Agama Wilayah Persekutuan (MAWIP)'s Headquarters at Jalan Perak, Kuala Lumpur on 25 March 2008 in conjunction with a Seminar on 'Excavation and Retaining Walls' held a day earlier at the Tropicana Golf and Country Resort. The visit was attended by 17 participants.

We arrived at the site at about 10.00 a.m. and were briefed by Tn. Hj. Majid Kamari, the project manager from TH Technologies Sdn Bhd. He explained that the project consists of the construction and completion of sub-structure works for one block of 34-floor headquarters for TH Technologies.

This includes seven floors of car park, one floor for a multipurpose hall and two floors of underground basement car park at Lot 168 and 169, Section 57, Jalan Perak. The contract period for the sub-structure is from 1 August 2007 to 31 July 2008. The scope of the contract is as follows:

1) Earthworks
2) Contiguous Bored Piles (CBP)
3) Bored Piling
4) Lowest Slab Basement B2 (RL29.15m)
5) Substructure Works B1 (RL32.225m) and GF (RL34.9m and RL35.9m)
6) Prestress Work (Ground Floor)
7) M&E Works

The geology of this site comprise of the Kuala Lumpur Kenny Hill Formation. It is mostly sandy/clayey silt and silty sand. Generally, it is considered to be a 'good' ground. The groundwater table is fairly low at about 5m below ground (RL30.65m).

Briefing at the site office

RC wall supported on 900mm CBP

Soil with SPT N values greater than 50 were found between 11m and 16m bgl. The original ground level was between RL34.7m and RL32.8m.

In view of the relatively shallow excavation depth at RL28.5m and low water table, the sub-structure was designed as a combination of a cantilever contiguous bored pile wall of approximately 4.3m to 5.1m high and open cut (RC wall). Instrumentation was installed before excavation began to monitor lateral wall deformations during excavation works.

Two sizes of CBP were utilised, depending on the height of the retained soil as tabulated below:

Type	Retaining Cantilever Height	Length	Diameter of CBP
1	Approx 5m	13.50m	900mm
2	Approx 4m	12.70m	750mm

The design catered for the excavation to be conducted strut free to reduce construction time and cost. The gap of CBP is about 75mm which is sealed with cement grout and skin wall which is 150mm thick (waterproofed using additive SIKA-1). At the time of the site visit, basement B2 has already been cast and B1 was about to be constructed. The pile caps for the foundation had already been completed.

The site is located in a highly developed area with Maybank's Etiqa Office Tower and Impiana Hotel on the north side; Bovis Office Tower on the west side; an open space car park on the east side and a public road bordering the site in the southern part. All the structures on the northern and western part of the site are on pile foundations while the open space car park and the public road are on filled ground.

B1 slab is being constructed

A closer look at the cement grout sealed CBP and reinforcement for the 150mm skin wall

The instrumentation monitoring program was conducted, which included the following:-

i) Six inclinometers installed in the core of CBP to monitor wall deflection
ii) Water standpipe and pneumatic piezometer – one of each to monitor the groundwater level
iii) 10 settlement markers to monitor the settlement of surrounding site

No building markers were installed on the surrounding structures. We were also informed that the maximum deflection recorded was only 8mm on 3 March 2008, after reaching maximum excavation level.

The sizes of bored pile foundation at this site are 750mm, 1200mm, 1500mm and 1800mm respectively depending on the intensity of the column load.

After the briefing at the site office, we were given the opportunity to walkabout basement B2 to have a closer look at the CBP and basement work. The site visit ended at about 12.00 noon. ■