



**An Evening Talk On “Challenges and Performance of a 37m Deep Underground Basement Excavation Construction in Kuala Lumpur CBD”**

by Ir. Frankie Cheah

Ir. Frankie Cheah is currently a committee member of Tunnelling and Underground Space Technical Division.

The Tunnelling and Underground Space Technical Division (TUSTD) organised an evening talk on “Challenges and Performance of a 37m Underground Basement Excavation Construction in Kuala Lumpur Downtown”, on 20<sup>th</sup> July 2017, at Wisma IEM. The evening talk, attended by 75 participants among them there were Consultants, Specialist Contractors and Developers. The evening talk was delivered by Ir. Muhammad Hafiz Bin Jalaluddin, General Manager of Econpile (Malaysia) Sdn Bhd (see Fig. 1) The evening talk mainly describes the challenges faced and the construction experiences gained from this 37m deep excavation project especially with the selection of semi top down method.



Fig. 1 - View of Ir. Muhammad Hafiz Bin Jalaluddin delivering his lecture.

## **Introduction**

As we all know that construction completion time plays an important element in the deep excavation project, particularly when the project site is located in an urban area and surrounded by heavy traffic volume, buildings and underground services. Therefore, the selection of appropriate excavation procedures and associated supporting system has become more challenging when it is required to ensure that the methodology to comply with the conforming schedule and at the same time to minimize the impact of the excavation to avoid inducing ground movement to both adjacent buildings and infrastructures. Ir. Hafiz started the evening talk by giving a brief overview of the project. The project comprises of 6 levels of underground basement car-park with a maximum depth of 37m excavation and located in the Golden Triangle of the congested Central Business District (CBD) of Kuala Lumpur.

## **Project Description**

The private development is situated in downtown of Kuala Lumpur. It is a 6-level underground basement car-park with a maximum excavation depth of 37m with layout of 61m x 53m in plan (see Fig.2).



Fig. 2 - Aerial View of the Overall Development

Ir. Hafiz mentioned that the construction started with the demolition of the front podium of approximately 1700m<sup>2</sup> in area. The semi top down construction method with kingposts was adopted by Econpile akin to a strut-slab system, in place of the conventional steel strut and walers system. The selection of semi top down construction has been proven effective in controlling the retaining wall deflections and adjacent ground deformation, while attaining a timely construction period. One of the advantages for this site to Econpile as mentioned by Ir. Hafiz is that site is located at Kenny Hill Formation with relatively high SPT-N value. The high SPT-N value indicates that the soil is stiff. Furthermore, with the right selection of construction method such as top down construction also contributed to the success of this project (see Figs. 3 and 4).

During the talk, Ir. Hafiz also outlined other construction challenges and activities such as: -

- Removal of the existing 450mm CBPs and 1m diameter building piles.
- Installation of new CBPs ranging from 600mm to 1.35m in diameter for average penetration length of 45m
- 3m large diameter foundation bored piles with penetration length of 70m
- Sequential ring slab construction and excavation in a semi top-down fashion together with pre-loading against the CBP wall adjacent to St. Mary building.

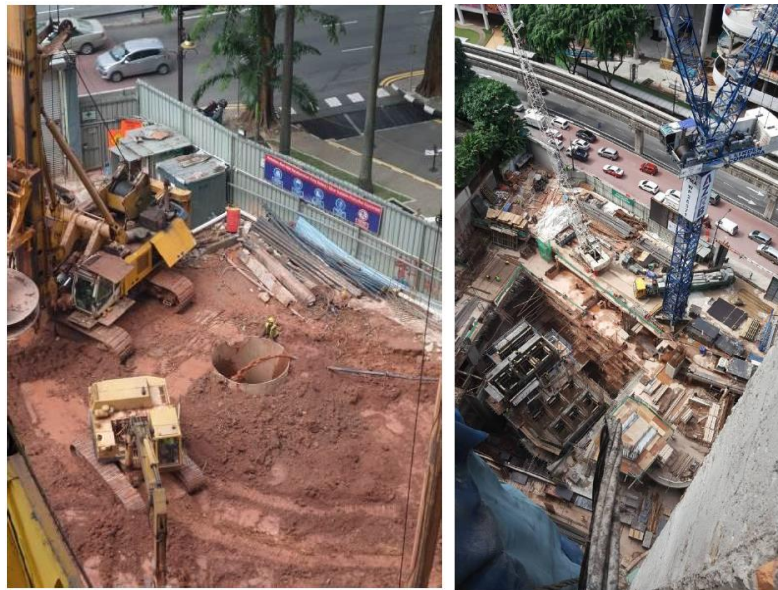


Fig. 3 (Left) Large Diameter Foundation Piles Installation

Fig. 4 (Right) Partial View (Top) of the construction update

The evening talk was followed by Questions and Answers (Q&A) session from the participant and to our surprise that the majority of questions are from both substructure contractors and consultant consultants. Finally, as a token of appreciation TUSTD Chairman, Ir. Syed Rajah, presented a memento to Ir. Muhammad Hafiz (see Fig. 5).

The evening talk was ended with a simple sharing section from our committee member, Ir. Dr Ooi Teik Aun on Malaysia's success in winning the bid to host the prestigious ITA-AITES World Tunnel Congress (WTC) 2020 after defeating formidable challengers namely India and Australia at the 43<sup>rd</sup> ITA General Assembly thus putting IEM and Malaysia in the Tunnelling World League.

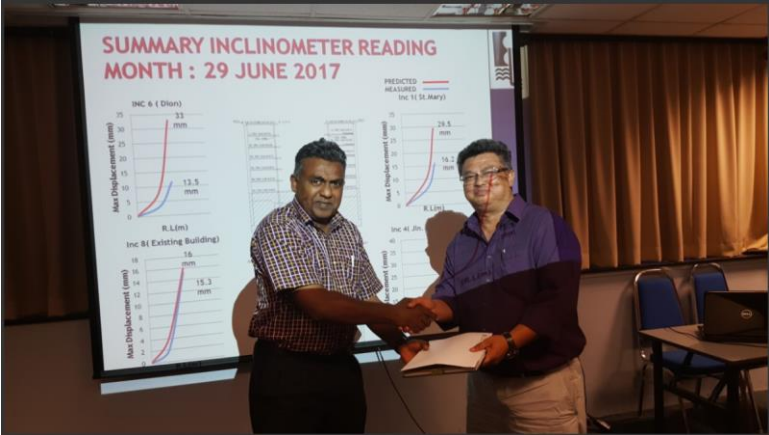


Fig. 5 TUSTD Chairman, Ir. Syed Rajah presenting a memento to Ir. Muhammad Hafiz (right)