



## Evening Talk on Redevelopment of Monuments: Challenges and Solutions with Innovation Idea

by Dr Boon Chia Weng

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The Evening Talk on Redevelopment of Monuments: Challenges and Solutions with Innovation Idea was organized by the Geotechnical Engineering Technical Division (GETD) on 27<sup>th</sup> June 2018 at the Tan Sri Prof. Chin Fung Kee Auditorium, Wisma IEM. The evening talk was delivered by Ir Alan Lai from AECOM. A total of 25 participants attended the evening talk.

The speaker began his evening talk by giving a brief introduction to the project. The project requires redevelopment of an existing development in the commercial and cultural hub of Hong Kong. The redevelopment involved the construction of a new basement and a podium structure. It is located at a leisure high end retail environment neighbouring to the junction of two main roads and adjacent to several commercial buildings, with a sloping topography. The new building also had to merge with an existing historical monument complex including an underground discussed tunnel and the signature trees. The excavation was over 17 m deep and a lateral support with a 3 m clearance from the historical monument was required.

According to Alan, the main challenges of the project were namely:

- to preserve an existing underground declared monument,
- to preserve three numbers of trees and signal tower at a higher ground elevation,
- there is a stepped ground elevation, and the higher ground adjacent to the excavation had to be maintained through retaining systems
- conventional retaining systems were evaluated to be less effective:
  - The use of ground anchors from two opposite ends results in overlapping at the fixed lengths
  - As the development is next to a main road, it is not possible to use struts
  - There is a tunnel reserve few meter below existing ground which limited the embedded depth of retaining structure or pile foundation which limits the adoption of cantilever structures

The key solution that the speaker offered to the project was the Directional Drilling Method to construct the pipes end-to-end of the retaining wall to brace the ground. This was efficient and was able to avoid local obstructions from the underground monument. Actually, such directional drilling method is not a new technique which is commonly adopted for utilities installation but not for retaining structure. He learned this technique in detail when he worked for other projects which he borrowed that technique to apply to this project to overcome the site challenges. The speaker shared his view and experiences and encouraged the effort for innovation, which does not necessarily require a new invention, but the adoption of similar methods from other areas of applications can also lead to benefits.

According to the speaker, an underpinning solution for the trees was executed by mainly two methods. The first is through the construction of steel members underneath the roots of the trees. The second is by retaining the soil below the roots by forming a cylindrical structure.



After the Question and Answer session, the chairman of GETD, Ir. Lee Peir Tien presented a token of appreciation to Ir Alan Lai for delivering the evening talk.