

## **Technical report**

### **AGS (HK) Technical Visit to Central Kowloon Route - Kai Tak West**

**Date: 27th July 2019**

By Joanne Lau

The Central Kowloon Route (CKR) is a strategic 4.7km long dual 3-lane trunk route between Yau Ma Tei Interchange in West Kowloon, Kowloon Bay and the proposed Kai Tak Development area in East Kowloon. Upon commissioning in 2025, the travel time through Central Kowloon would reduce from 30 minutes to around 5 minutes, which is of great significance in time saving, relieving traffic congestion and improving air quality in the nearby areas.

The site visit on 27th July focused on the ongoing Kai Tak West (KTW) contract (Contract No. HY/2014/07), which comprises of three major sites in Ma Tau Kok, Kowloon Bay and Kai Tak Development Area. The alignment of the CKR in KTW involves a cut-and-cover tunnel at Ma Tau Kok and a 370m long underwater tunnel passing through the sea bed at Kowloon Bay. In the Kai Tak Area, there will be a 390m long underground tunnel ventilation adit (Figure 1), in addition to a cut-and cover tunnel, depressed road and underpass connecting with the future road network. At the beginning, the operation team gave the participants an introduction to the Project and KTW works at the Ma Tak Kok Community Liaison Centre. Video clips of Building Information Modelling (BIM) were shown to vividly demonstrate the working sequence and how construction activities interact with the existing landscape.

The Access shaft structures are being constructed at Ma Tau Kok to facilitate tunnel construction of CKR by other contractors, and we observed the installation of excavation and lateral support of the access shaft (Figure 2). The construction and demolition materials were removed from the Ma Tau Kok site by dump trucks and were transported to a temporary barging point at Kai Tak.

From the Ma Tau Kok site, we could see the temporary marine platforms extending from the former Kai Tak Runway in Kowloon Bay. This belongs to the Stage 1 temporary cofferdam construction for the proposed cut-and-cover underway tunnel. Questions were raised regarding the water-cutoff performance of the cofferdam. The operation team explained that water seepage into the cofferdam is minimized by the (1) outer sheet pile wall, (2) inner pipe pile wall and (3) temporary grouting in the reclaimed platform at potentially weaker locations such as corners.

Towards the end, we had a chance to examine the patented clutch pipe piling technology (Figure 3) implemented in the cofferdam in the Kai Tak site. This kind of prefabricated pipe pile has a special clutch weld on two sides of the casing to prevent large water inflow. The clutches can be

positioned and weld to fit the piling layout. The benefit of this clutch system has already improved much from the traditional system of pipe pile wall with soil gaps such that the gaps should be treated by grouting method. As a pilot scheme in the Kai Tak works area, two sizes of pipe piles in 610mm and 813mm diameters have been adopted.



Fig.2 ELS works of the access shaft in Ma Tau Kok site



Fig.1 ELS works of the underground tunnel ventilation adit in Kai Tak site



Fig. 3 Clutch Pipe Pile