

Visit to Pahang-Selangor Raw Water Transfer Project Site in Hulu Langat, Selangor



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A technical visit to Pahang-Selangor Raw Water Transfer Project Site in Hulu Langat, Selangor was organised on 17 October, 2012 and attended by 20 IEM members, including three TUSTD committee members, two non-members and one from the IEM secretariat.

Upon arrival at the PSRWT's Site Office, the group was greeted by PSRWT project team members from KeTTHA, a consortium of consultants and contractors. We were then given a briefing/presentation on the project overview and the construction of the tunnel and its related setbacks by Puan Norzani bt. Mahmood, Senior Principal Assistant Director with KeTTHA.



Briefing/presentation by Pn. Norzani bt. Mahmood to IEM Members

Basically, the project comprises four main components of works – Kelau Dam, Semantan Intake, twin raw water pumping mains and the transfer tunnel. Kelau Dam is a regulating dam to ensure there is adequate water in the Semantan River during the low flow period. Raw water is pumped from Semantan River in Pahang and transferred to the proposed Langat 2 water treatment plant in Selangor via twin 3m-diameter pumping mains approx. 11.9 km long and 5.2m-diameter water transfer tunnel from Karak (inlet) to Hulu Langat (outlet) approx. 44.6km long. Water flows through the tunnel by gravity at a gradient of 1:1900 and at 75% to 80% full flow.

The tunnel passes through the Main Range and has overburden ranges from 1200m to 20m. Almost 90% of the rock is granite with strength ranging from 175 Mpa to 250 Mpa. The remaining 10% is meta-sedimentary rock. The tunnel construction is divided into eight sections – one cut and cover section (860m) at the inlet conduit, four NATM sections – NATM-1 (1.9 km), NATM-2 (1.9 km) and NATM-3 (2.1 km) near the Karak inlet and NATM-4 (2.8 km) near the Hulu Langat outlet, and three TBM sections of 11+ km each, accessible by four nos. adits. The TBM sections are unlined, but the NATM sections will be lined with rc concrete to reduce frictional loss of flow through the tunnel.



The setbacks in tunnel construction occurred mainly near the fault zones and lineament areas, where steel rib or shotcrete was necessary for strengthening. There was also high ingress of water at these areas where continuous pumping was required to facilitate construction. At locations of extremely high overburden, some rock bursts occurred.

The cut and cover section and all the four NATM sections have been completed and coring by the three TBMs are currently in progress. Overall progress achieved at the date of the visit was about 66% which was on schedule. This project will transfer 1890 MLD of raw water to Selangor to meet its future water demand up to year 2025. The project is due to complete by May 2014.

During the site visit, we were taken to adit 4 as it was the nearest adit from the Hulu Langat site office. We visited the portion of tunnel at TBM-3 section and NATM-4 section. The finished cored surface by TBM is very smooth. We were not able to witness the TBM-3 working as it was a few kilometers away upstream. At NATM-4 section, we witnessed the concreting of the RC lining.

The technical visit ended at 2 p.m. ■



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