The Institution of Engineers, Malaysia

WEBINAR TALK ON

"Geomechanical Correlation of Subsurface Deformation Induced by Tunnel Excavation for KVMRT, Malaysia"

15 September 2022 (Thursday)
4.00 p.m. – 6.00 p.m.

SYNOPSIS

Tunnelling construction is an inevitable cause of ground settlement in the built environment. Predicting the surface ground settlement in tunnelling remains a challenge especially to geotechnical engineers and predominantly the application of twin tunnel boring machine. The presentation will show the investigation the surface ground settlement induced by the Earth Pressure Balance (EPB) twin tunnel boring machine in Kenny Hill Formation (KHF) for Klang Valley Mass Rapid Transit (MRT) Line 1: Sungai Buluh- Kajang (SBK) tunnel underground works. The fundamental of ground settlement by the empirical Gaussian distributions used the actual ground settlement data from this project and was back-analysed by author's self-coded MATLAB algorithm. Here, the live data of twin tunnel EPB machine comprised of 21 parameters from major (Earth Pressure, Total Grouting, Soil Conditioning, Thrust Speed, Foam Injection, Tail Sealing, Soil Conditioning and Cutterhead) to minor geo-mechanical (Cutter Head: Rotation-Torque-Pressure, Screw Conveyor: Rotation-Torque, Tail Sealing and Sealing Grease Injection, Foam Injection: Foam Addictive-Water/Ring, Solution/ Ring and Average Foam, Soil Conditioning: Bentonite/Ring and Cutter Head Flushing Water/ Ring) were collected and analyzed together with manually logged tunnel shift reports.

The tunnel machine interaction to ground settlement is studied by Artificial Neural Network (ANN) to identify which twin EPB tunnel parameters affected the ground settlement the most. The three main domain of geo-mechanical deformation (Loss of Face, Shield, and Tail) were tested in the ANN architecture which contributes to the sequential surface settlement and tunnel volume loss. The analysis has also shown within twin tunnel EPB have different geo-mechanical contributor relationship of ground surface settlement and tunnel volume loss with varies percentage of 87 % and 55 % of RMSE result respectively.

ABOUT THE SPEAKER

Ir. Dr Hj. Ahmad Shukri bin Hj. Abd Rashid holds Ph. D from at Universiti Teknologi PETRONAS in year 2020, obtained his Master in Geotechnical Engineering from Newcastle Upon Tyne University, UK in 2010 and Bachelor Degree (Hons) in Civil Engineering from Universiti Teknologi Malaysia in 2000. He has 22 years of experience in Civil Engineering industry with various positions in Public Works Department (JKR) and Government Linked Company (GLC) – MRT Corporation Sdn. Bhd and also in Private Sector either in Contractor and Consultant. He joined JKR in 2004 in various departments in JKR. He has been secondment in MRT Corporation from 2013 to 2016 and involved in Feasibility and Preliminary Design for Joint Engineering Studies – Rapid Transit System (RTS) and Cross Border Road Link (CBRL) between Malaysia- Singapore under JKR- SPAD (Malaysia)- LTA(Singapore) in Year 2013. Currently he is the Expert Engineering Forensic for Malaysian Anti-Corruption Commission (MACC), Putrajaya since 1st December 2021 and secondment until Dec 2023.

Registration Fees

IEM Members : RM 15.00 I IEM Non Members : RM 50.00

CPD Hours : 2.0   CPD Ref No : IEM2022/HQ/305/T(w)

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