

CONSTRUCTION OF MRT STATION IN SINGAPORE: TOP DOWN METHOD / UNDERGROUND TUNNELING WORKS

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Abstract:

“Top Down Method Construction” is one of the Construction Method in Constructing MRT stations, tunnel shaft and the MRT Station Box in particular, whereby supported by the Earth Retaining Structure Support (E.R.S.S) or the Temporary Earth Retaining Structures (T.E.R.S) These are composed of Diaphragm Walls (D. Walls), Cross Walls, Contiguous Bored Piles (CBP Walls) , Barrette Piles, Kingpost, Steel Strutting works. Top Down Method is the most advance method when it comes to the area of constructing MRT stations in a location of the existing buildings or structures located nearby the proposed MRT station itself, and or located in between the existing buildings and or along the line of busiest road traffic and on top of the proposed MRT station and tunnel.

It also requires a high level of safety concern for the public and the nearby structures and buildings, the movement of traffic using the public transport system above the proposed MRT stations during the execution of the Top Down Method Construction. To name a few, the live utility services diversion works and supporting works, the soil investigation works, soil improvement, deep excavation (Top Down Method Excavation Cycle), the lifting operation, confined space environment inside the proposed MRT station and other related construction activities inside the MRT station and tunnels, the monitoring works of all in placed monitoring instrument before and during construction works.

The topic presentation will briefly introduced those construction methodologies, sequence of works, the safety and associated risk in every construction activities and the construction techniques in highly standard safety manners. These methodologies has been applied also to the Singapore deepest MRT station (The Bencoolen MRT station), total depth 43m. It’s about 14-storey high, and the other technical challenges encounter during and after the construction works. Top Down Method Construction are made easy if the sequence and methodology are all in placed and the high standard of safety is the most top priority before the construction progress, that is why in the daily mass safety toolbox meeting all of us shouting for “Safety First” and not last.

Keywords: Top Down Construction methodology and sequence, safety in tunneling works, DEEP EXCAVATION

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He started his professional careers in Kingdom of Saudi Arabia (K.S.A) from 1987-1993. He moved to Singapore in 1993 and started tunneling and underground construction since 1999. He has almost 19 years experienced in the tunneling and underground construction industry in Singapore.

He has worked on the “longest underground highway (tunnels) in Asia. The Kallang PayaLebar Expressway (K.P.E) / The Marina Coastal Expressway (M.C.E) and the numerous MRT lines in Singapore. Changi Airport Line (MRT Station / Tunnels), Circle Lines 1 & 2 (C885 and C886), Downtown Line 1, 2, 3, Marina Bay Sand Singapore (MBS), Resorts World Sentosa (The World’s Largest Aquarium), The Suntec City Projects (The World’s Biggest Fountain), The Changi Airport (Terminal 2) buildings and MRT station (The World’s Best Airport)

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