Metro uses 'earthworm' to hasten underground work

Slurry tunnel boring machines are being used for the first time in India

Anil Kumar Sastry

BANGALORE: Burrowing like an earthworm at 20 metres below the surface almost round the clock, the 330-tonne slurry tunnel boring machines can drill into the earth at least 18 metres a day.

At this rate, the boring machines are expected to emerge near the M. Chinnaswamy Cricket Stadium latest by August 2012 after drilling twin tunnels for a length of around 4.5 km. Continental Engineering Corporation-Soma-CEC International Corporation India Joint Venture has undertaken the job of drilling and construction of four underground stations.

The custom-made machines, manufactured by Japanese company Hitachi Zosen, are powered by a 3,000-KW diesel generator located at KSRTC's Kempe Gowda Bus Station.

A first

The reporter, who got into the machine shaft 60 feet below the surface in its location at Majestic here Friday, was told by Robert L. Moncrieff, Managing Director of Rona Consulting Company, Thailand, consultant for the contractor, that the machine is being used for the first time in India.

Having been in the tunnel boring business for at least four decades, Mr. Moncrieff said they are widely used in the west and Japan. The Hitachi boring machines create tunnels with a circular cross section through soil and rock, causing minimum disturbance and effecting a smooth tunnel wall. Mr. Moncrieff said the earth generated during boring is mixed with water to make it slurry, which is transported through pipes to the slurry treatment plant at Majestic. Here the debris is separated from water and transported to filling yards while the water will be reused to produce slurry again.

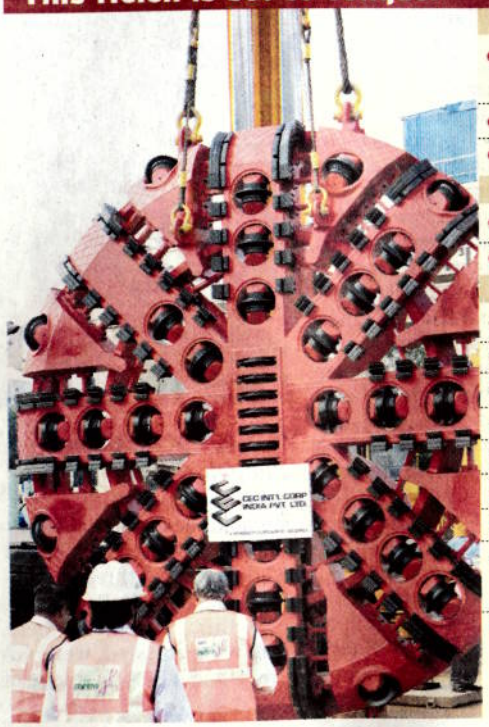
Though the machines have to be dismantled and reassembled at every underground station site — Central College, Vidhana Soudha, Cricket Stadium and City Railway Station; all the controls and the main plant will remain at Majestic from where the entire operation is monitored and controlled. The two machines were bought by the contractor at a cost of $ 10 million each, he said.

Two shifts

Work is divided into two shifts of 12 hours each. After their shift, the workers return to the main plant walking through the already-burrowed tunnel.

There are 520 staff working in the tunnelling project. Besides Indians, they include British, Canadian, Japanese, Filipinos, Taiwanese and Thai nationals. The machines and personnel work for 26 days a month. On the remaining days, the staff are on holiday, leaving the machines to be overhauled.

This Helen is set to conquer



Dimension of TBM Helen

- Excavation diameter by disc cutter - 6.52 m
- Shield outer diameter - 6.44 m
- Overall length - 9.78 m

Weight of TBM Helen

- Cutter head - 48 tonnes
- Machine body - 281 tonnes

Other details

- General consultants - Rites-OC-PBI-Systra
- Contractor - CEC-SOMA-CICI JV
- Designer - Mogtt-MacDonald India Ltd
- Contract duration - 174 weeks
- Project length - 4.5 km approx
- Twin tunnels - 2.4 km each
- Bored tunnel diameter - 6.44 m
- Prefabricated concrete rings - 5.6 m diameter, 1.5 m width
- Underground stations - Cricket Stadium, Vidhana Soudha, Central College and City Railway Station