The Hindu | 20-12-2011

Tunnelling will throw up debris, and challenges too

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CHENNAI: With the city receiving its first batch of Tunnel Boring Machines that will be used to build the Metro Rail network's underground section, it is only a matter of time before massive subterranean holes begin to take shape beneath the surface.

While motorists would never get to see any of the tunnels for the next 3-4 years, the impact of the construction work would be clearly felt by most residents. Large-scale diversions, such as the one that came into effect in Anna Nagar, would be in place in at least 19 other locations.

Bangalore's Namma Metro has an underground section that is only 8.8-km long. Yet, ever since construction began in January this year, traffic flow has been severely affected in many parts there. Chennai's underground corridor, in comparison, is much larger.

Sanjay Arora, Additional Commissioner of Police – Traffic (in-charge) says: "We are preparing for a long-haul scenario. Each location where an underground station is set to come up will be blocked for more than a year after the area-specific diversion plan kicks in."

He says that all plans would be uploaded on to Chennai City Traffic Police's Facebook page well ahead of time and pamphlets would be distributed on the spot.

Private traffic wardens are also set to be deployed round the clock in 23 locations. "Given the scenario, we will try our best to minimise the impact on traffic flow," Mr.Arora adds.

But much of the 'pain' would be due to underground station construction. Tunnelling, on the other hand, would have little or no impact at the surface level. Chennai Metro Rail Limited Managing Director K.Rajaraman says that people will not even know that holes are being drilled beneath the surface.

Out of the 11 TBMs that would eventually be in operation, the first one would be launched from Washermenpet.

The tunnelling would be controlled by precision electronic systems. The cutting rotor (shield) of each TBM would also be supported by a 78 metre long trailing assembly, consisting of components that provide mechanical support and help remove the excavated material.

To put it simplistically, the TBM works similar to an earthworm with cycles of digging forward and dragging the rear end afterwards. A series of hydraulic systems push the TBM forward (excavating the soil), while the rear end of it is braced against the tunnel wall. When the TBM head has excavated to its maximum length, the 'shield' and the rear end is pulled forward.

MAMMOTH TASK AHEAD: *The cutting rotor of a tunnel boring machine getting ready to be transported to a Metro Rail site, from the Chennai port on Monday.* — PHOTO: K. PICHUMANI

Elaborate measures would be put in place for collection, transfer and disposal of an estimated 1.85 million metric cube of excavated soil. Nearly four lakh truck trips would be required in a span of 4-5 years, which translates to 218 trips per day. "We have been allotted several abandoned stone quarries beyond Tambaram," Mr.Rajaraman says.

ROADS & RAILS

At its peak, the Metro Rail tunnelling operation would churn out enough debris to rival the amount of solid waste generated by the city.

Apart from logistical issues, there are also a number of concerns regarding the proposed permanent changes to entry/exit arrangements at major mass-transit systems near underground Metro stations. For example, station floor plans reveal that the Central Metro Station, which would be the largest in the city, would alter approaches to at least four modes of transport – Central railway station, Park MRTS station, Moore Market suburban station and public transit buses.

Experts say that many of these approaches have not been well thought out. Rumi Roy of the Delhi Development Authority says: "In Delhi, for example, the old Delhi railway station is very difficult to access from the nearby Metro station."

"Once the ground is dug up for an underground Metro, it will stay that way for a long time. Integration has to be well thought out. We have to design systems that would last many decades," she adds.