

Tunnelling Work On Metro Set To Start At Nehru Park For Chennai Central-St Thomas Mount Corridor By Month-End

# 50 FEET UNDER YOUR STREET

V Ayyappan | TNN

A giant tunnelling machine sits at the bottom of a wide shaft that is deep enough to swallow a five-storey building (50-60 feet high) in the middle of Poonamallee High Road near Nehru Park. Lowered with a crane that can lift 400 tonnes, the machine's black diamond-lined spiral cutter head has been placed against the concrete wall of the shaft from where it will start boring into the ground under the city.

When it's done, the machine will emerge from the earth, cutter head first, in a similar shaft in Egmore.

More components of the machine will be lowered into the shaft and assembled in the coming days so Chennai Metro Rail Ltd can start the tunnel-

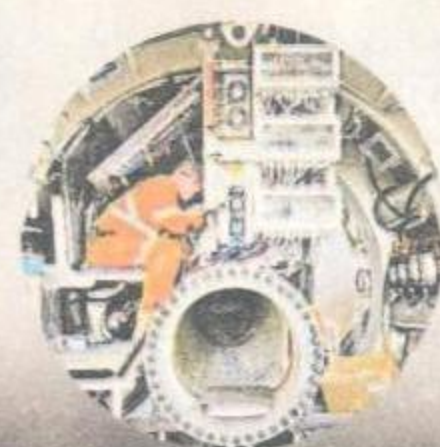
**MOST OF THE OPERATIONS ARE AUTOMATIC THOUGH WORKERS CAN CONTROL ITS WORKING FROM A COMPUTERISED OPERATIONS CENTRE**

ling work by the end of this month or early July. The tunnel boring work will start at Nehru Park for the transit system's Chennai Central-St Thomas Mount corridor. Preparations are underway to start tunnel boring at sites in Egmore and Kilpauk and near Pachaiyappa's College.

The machine is capable of cutting through rock and hard soil. Metro officials said they needed the best equipment because the soil under the city is hard and rocky at depths below 13 metres. Tunnel boring machines consist of various parts including the cutter head that can be fitted with different blades according to the soil condition, a screw conveyor that removes soil and rock, a hydraulic thrust cylinder that

## HOW THE TUNNEL WILL BE BORED

**1** Tunnel boring machine is fitted with cutters made of black diamonds. The rotating cutting shield can bore through hard and rocky surfaces



**2** Loose soil collects inside the excavation chamber. A pressure zone is created in the chamber, which will keep the earth inside until it is pulled out



**3** Man lock compartment separates the high pressure excavation chamber from the rest of the machine, thereby shielding the mechanics from pressure variations



**4** The screw conveyor belt rotates and pulls out the soil in the excavation chamber and deposits it in the belt. The speed can be increased or decreased depending on the amount of soil

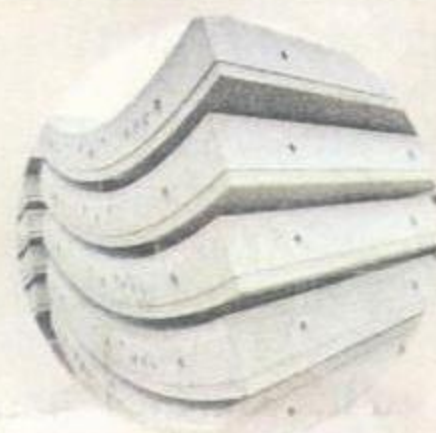


**5** The cylindrical shaped equipment installs concrete wall as soon as the machine bores and moves forward. The tunnel walls are shaped like rings and made up of seven concrete segments

**6** Soil from the excavation chamber is removed using the screw conveyor belt and is transported out using a series of conveyor belts. When the soil reaches the end of the conveyors, it is loaded into carts



**7** The concrete tunnel walls are made of several segments. They keep the tunnel from collapsing. The wall segments are watertight and prevent ground water from seeping into the tunnel



Graphic: Kannan Sundar

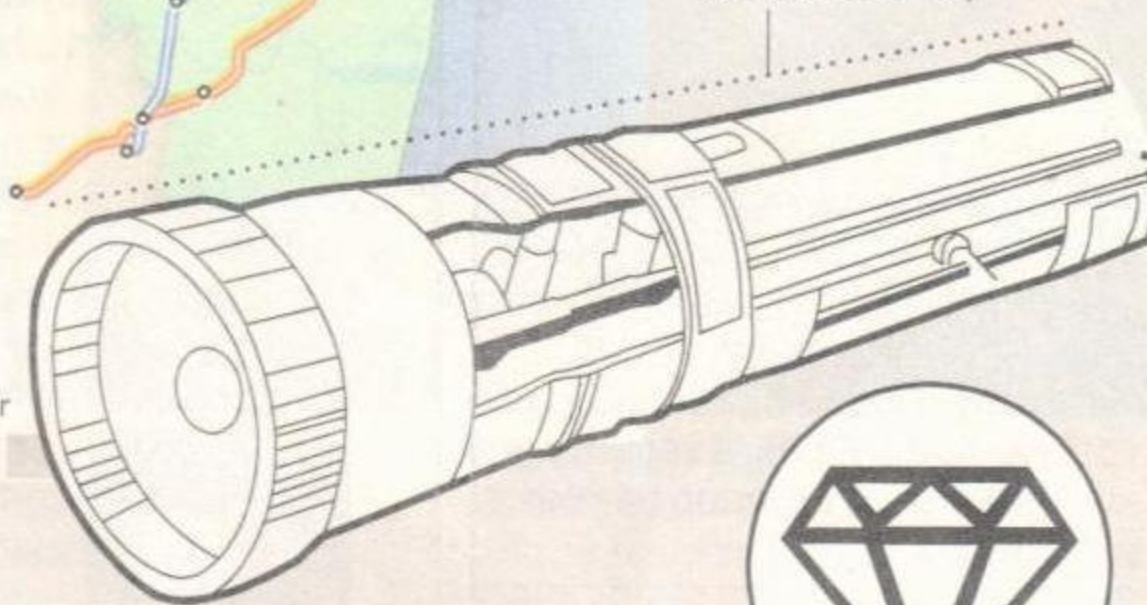
Nehru Park underground station



**NUTS & BOLTS**  
Length of boring machine

90m

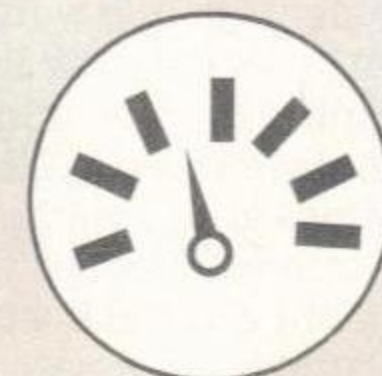
(after all the components are assembled)



The cutter head of the tunnel boring machine will have black diamonds that can cut through hard and rocky surfaces



The boring portion alone will weigh more than 400 tonnes



It will bore at a speed of 5-10m a day



Engineers, who will be monitoring the progress, can correct the path of the machine using a computer

## Metro rail keeps safety protocol firmly on track

V Ayyappan | TNN

Ram Lal, a construction worker from Bihar, was amused when metro rail officials handed him a pair of thick gloves before he started work. He had always worked bare-handed. Lal found that he could use the gloves to beat the heat by placing them on his head under his helmet. Many workers from West Bengal found it uncomfortable to wear the steel-toe boots given to them as part of their gear when they arrived at metro rail work sites.

Chennai Metro Rail Ltd (CMRL) has held a series of briefing sessions to get workers to comply with safety regulations, but some employees still do not follow the rules and end up with minor bruises and other injuries.

About 100 to 200 men work at each metro construction site on elevated and underground stations and viaducts and will soon start on the laying of tracks along metro corridors across the city. "Safety of workers is always a concern during the construction of large public facilities, but work on Chennai's metro rail has luckily been mostly incident-free so far," a CMRL official said.

With tunnelling work set to start on Poonamallee High Road, the company has decided to minimise the possibility of workers being injured on site and keep its safety record clean with a unique safety programme: Behaviour-based safety training.

Larsen and Toubro (L&T), one of the firms contracted for the transit project, has started the new safety training for workers at the Nehru Park underground metro station

site, where tunnel boring will start by end of the month.

"The training is meant to minimize injuries. We want the workers to be safe when they work around the giant boring machines 20 metres below ground level," an L&T official said. The company will have cranes ready at the sites to pull out workers if an accident takes place inside a

**TO MINIMISE THE POSSIBILITY OF WORKERS BEING INJURED AND KEEP ITS SAFETY RECORD CLEAN, CMRL HAS BEGUN A UNIQUE PROGRAMME CALLED BEHAVIOUR-BASED SAFETY TRAINING**

shaft, he said, and water, oxygen and firefighting equipment will be at hand.

A majority of the workers are from Bihar, Uttar Pradesh, West Bengal and Odisha. They come from a variety of backgrounds but communication is not a problem because they all understand Hindi.

"To ensure that they do not take safety measures lightly, we got professionals to study their behavior and reactions to different work situations and design the safety training accordingly. The training will be conducted along with the daily briefing," said a senior CMRL official.

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