

Into the FUTURE

TIMES NEWS NETWORK

In their special suits and wearing oxygen masks, they look like astronauts floating around. They are, in fact, Chennai Metro Rail workers called to repair or change a cutting tooth in a machine boring a tunnel underground.

These elite technicians entered a vacuum behind the cutter face in the foremost part of the machine four times to change cutter teeth while boring from Shenoy Nagar (Thiru Vi Ka Park) to Anna Nagar Tower. This will be the first underground section to be commissioned next year so that trains can be run from Alandur to Shenoy Nagar via Koyambedu.

"It is a near-vacuum where people will float if they fall. But they stand on a platform while working. A doctor checks their health parameters before they enter the space and after they come out," said a CMRL official.

Two machines have bored two parallel tunnels over 1.8km from Shenoy Nagar to Anna Nagar Tower station and will start boring till Thirumangalam from where a ramp will link it to the elevated Koyambedu station.

Metro rail was lucky on the 1.8km stretch. "We could bore through as if it was butter. The soil was soft and had the same consistency. The only problem we faced were the borewells which residents did not tell us about," said CMRL director (projects) R Ramanathan.

A tunnel-boring machine includes the core, many gantries carrying concrete tunnel walls and a conveyor to remove excavated soil. Workers arrive in batches on a small train. The machine has power and water, ventilation and a room where special prayers are offered every time a breakthrough is made.

"Five to six people work on the machine while it bores more than 18 metres underneath the surface. Around 30 people will be underground at the station site and at the completed tunnel," Ramanathan said.

Metro rail plans to complete the entire underground stretch by end-2016. However, it is tough to put a deadline because Chennai has a unique soil condition — one part rock and another soft soil.

Soil and too many small buildings cut down the speed of boring machines. "If the soil is the same the machine can bore through fast. In Chennai we have a mix of clay and rock and water table is not too deep like in Delhi. It took one and half years to build the tunnel from Nehru park," said Ron Michael, deputy project director of Embayee, general consultant for metro rail, who had built tunnels in Hong Kong.

A Sneak Peek Into Metro Rail's Tunnels 18M Under Road Between Shenoy Ngr And Thirumangalam, The Underground Stretch That Will Open Next Year



Pics: L R Shankar



TUNNELS OF TRANSIT: (clockwise from top) The underground tunnel that connects Shenoy Nagar and Anna Nagar Tower stations; the entrance of the tunnel at Shenoy Nagar; the mini-train that helps transport metro rail workers and excavated earth; the tunnel-boring machine at the under-construction Anna Nagar Tower station; a metro rail worker explains the functioning of the control room of a tunnel-boring machine



Paper work vs station work: It's a race against time

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Chennai Metro Rail may be using state-of-the-art technology, but it still has to follow cumbersome bureaucratic procedures. More than six tonnes of paper — drawings, designs, photographs, technical details and reports — will have to be shipped to the Research Design and Standards Organisation (RDSO) to get approval for the Alandur-Koyambedu line.

Trucks have started dispatching papers to the RDSO office in Lucknow where they will be studied and then forwarded to the commissioner of railway safety in Bangalore who will visit Chennai for a speed trial to clear the line for commissioning. The process will take nine months before which CMRL is trying to complete the incomplete stations.

RDSO, a railways wing, sets the parameters by which all trains and stations are built.

"Trucks have started to move the documents; many of them include detailed drawings of each portion of the stations and tunnels. RDSO will have to go through it and then brief the commissioner of railway safety who has to conduct speed trials on the line by running the train at 90kmph before clearing it for passenger service," said CMRL director (projects) R Ramanathan.

Metro rail technology is new for the country and RDSO officials first learned about it when they studied and cleared Delhi Metro Rail.

"We have briefed them about the project using slide-shows and power point presentations. If there is a need for more clarification, CMRL officials will visit Lucknow again," Ramanathan said.

The highly automated trains are interconnected to signals and stations. All signals and information needed for operation should reach the control panel inside the motor car. This is new for railways. Metro rail will need 10 trains to operate services on Alandur-Koyambedu elevated line.

"RDSO officials have been sent abroad to study metro rail systems and familiarize themselves with the technology," said Ramanathan.