

CONSTRUCTION WORK HAS REACHED STAGE II; WALLS BEING BUILT BETWEEN PLATFORMS; TRAFFIC ABOVE SHIFTED TO ADJACENT LANES

Metro's underground frame is up

STEP-BY-STEP

A 3-dimensional view of the metro rail frame shows traffic moving on the surface; construction work below is complete

STAGE 1

Guide wall: Grabs or huge arms dig out a trench to build a thin guide wall. This wall — usually 1m thick and ensures the grab goes down accurately

Diaphragm wall: The earth is dug along the periphery of the station at a width of 5m. Concrete is then poured into this gap. This is done to prevent the soil from collapsing around the edges during excavation

Plunge columns: After the construction of diaphragm walls, concrete columns (1m by 1m) or pillar-like structures are built in several places inside the station

STAGE 2

Excavation: The soil within the diaphragm wall and plunge columns is removed. Each station has three levels — roof, concourse and platform — and each has a slab. During excavation, a slab is built at each level — just like in buildings

- ▶ **Roof** | At the level of the road
- ▶ **Concourse** | Ticketing area
- ▶ **Platform** | Where tracks are laid

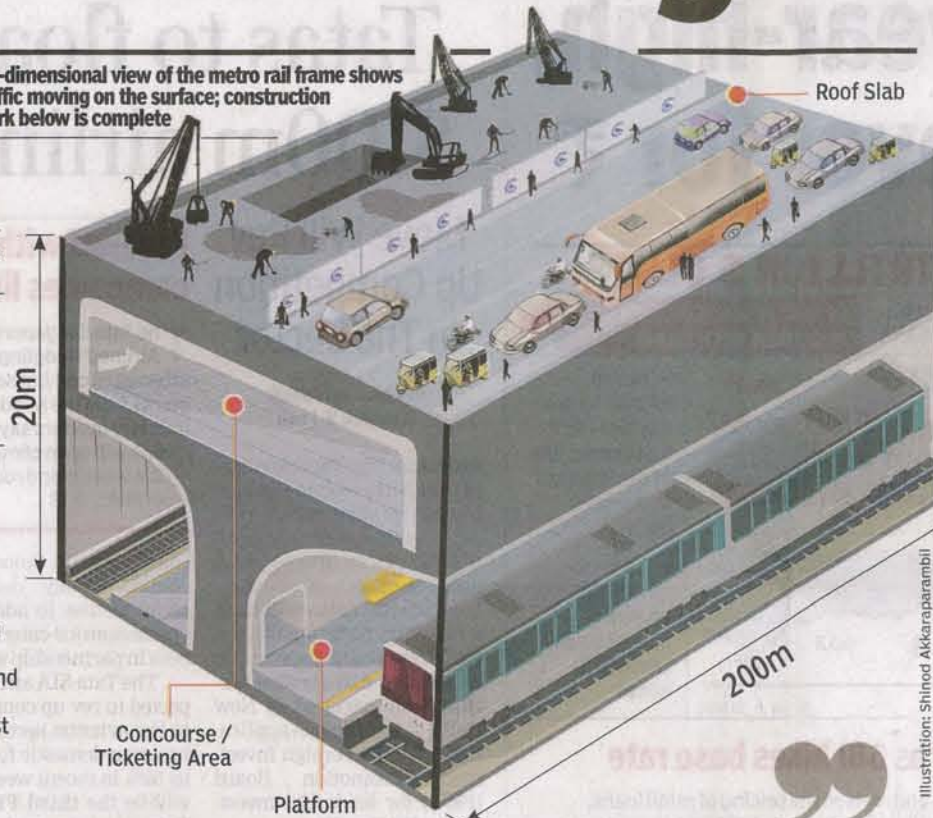
Entry/exit: Each station has four openings and two levels. Staircase, lifts and escalators would be built at each opening and for each level.

Average dimension of an underground station: 200m wide and 20m deep

STAGE 3

Tracks are usually laid at a depth of 16m-17m

While we work under the ground on one half of the station, traffic flows above the ground on the other side. When work finishes on one side under the ground, the medians above are shifted, traffic moves across, and the other half is taken over for construction — CMRL OFFICIAL



Karthikeyan Hemalatha | TNN

Thursday afternoon's unusual heat did not deter motorists at the bustling Nandanam signal on Anna Salai to pause for a minute to look at the King-Kong sized machine on the road. Huge arms — or grabs in technical language — were scooping soil by the tonne at the junction.

The machine is not new to the city. "Work to build the diaphragm walls underground has been going on for some time in other areas. But such a huge machine on a narrow road has caught everyone's attention," said an official from Chennai Metro Rail Limited.

What most commuters may have failed to notice is that they are now driving on the other half of the road. To ensure that construction of Chennai's most ambitious transport project does not hamper traffic flow, authorities have split the construction of underground stations.

"While we work under the ground on one half of the station, traffic flows over ground on the other side. When work finishes on one side under the ground, the medians above are shifted, traffic moves across, and the other half is taken over for construction," said the official.

Commuters are now driving and riding over the future Nandanam metro station. "We are splitting the construction under the ground as



MEANS TO AN END: The grab machine, which excavates soil in order to build the diaphragm wall, in action at the Nandanam signal

the traffic police told us not create congestion," said the official. Over the next week, construction will finish on the DMS side of the road, and will shift to the other half.

Anna Salai was made one way in March 2012. In some places such as near LIC and Government Estate on Anna Salai and near Pachaiyappa's College and Nehru Park on Poonamallee High Road, iron plates have been placed on the road. "Construction is going on under these plates," said the official.

For the underground stations, diaphragm walls and plunge columns need to be built to ensure that soil does not collapse on the edges as

the excavation progresses. While the excavation is going on, slabs will be built simultaneously. There are three slabs for an underground station. The roof slab is at the level of the road. A few metres below is the concourse slab. "This is where passengers will come to buy tickets," said the official. After this, is base slab where the tracks are laid and where passengers will come board trains. "Stairs, escalators and lifts will be provided at both levels," said the official. Each station will be 200m long and about 20m deep.

As for underground tunnels, CMRL has finished tunneling 7,935m or (21.9%) of the 36,308m required.

REPORT CARD

In the 19 underground stations, stage 1 (digging up, making guide walls) has been completed



Washermenpet | Stage 1 and Stage 2 completed. Concourse and base slab level excavation in progress

Mannadi | Stage 1 and Stage 2 completed. Preparatory works for casting roof slab in progress

High Court | Stage 1 and Stage 2 completed. Concourse and base slab level excavation in progress



Central | Stage 1 and Stage 2 completed. Casting of roof slab and concourse slab completed in extended shaft towards May Day Park

Egmore | Stage 1 and Stage 2 completed

Government Estate | Stage 1 completed

LIC | Stage 1 completed

Thousand Lights | Stage 1 completed. Guide wall construction for plunge column is in progress

AG - DMS | Stage 1 completed

Teynampet | Stage 1 and Stage 2 completed

Chennai Metro Rail



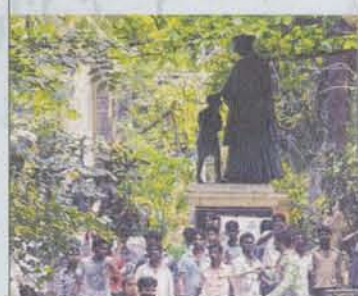
Nandanam | Stage 1 completed

Saidapet | Stage 1 completed. Temporary base slab completed to handle tunnel boring machines. 194 sq m base slab and 44 sq m roof slab completed at Saidapet ramp

Nehru Park | Stage 1 completed, stage 2 in progress

Kilpauk | Stage 1 completed. Stage 2 in progress

Pachaiyappa's College | Stage 1 and stage 2 completed



Shenoy Nagar | Stage 1 and stage 2 completed. Base slab excavation in progress

Anna Nagar East | Stage 1 and stage 2 completed

Anna Nagar Tower | Stage 1 and stage 2 completed. Base slab excavation in progress

Thirumangalam | Stage 1 and stage 2 completed. Guide wall work in progress for entry structures

UNDERGROUND METRO STATIONS 19 Thirumangalam | 18 Anna Nagar Tower | 17 Anna Nagar East | 16 Shenoy Nagar | 15 Washermenpet | 14 Kilpauk | 13 Nehru Park | 12 Saidapet | 11 Nandanam | 10 Teynampet | 9 AG-DMS | 8 Thousand Lights | 7 LIC | 6 Government Estate | 5 Egmore | 4 Central | 3 High Court | 2 Mannadi | 1 Washermenpet

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— Under Study — Underground — Elevated