

Cantilever style: OMR to get 'hanging' metro stations

Structures Would Use Less Space, Won't Disrupt Flow Of Traffic During Construction, And Leave Room For Road Expansion

Illustration: Shinod Akkaraparambil



Experts said the advantage of building cantilevered stations is that they do not need much space during construction. And as they rest on a row of columns they appear to be hanging. The station design could also be tweaked to fit into narrow roads. This is an efficient use of space, unlike phase-1 where CMRL acquired more than 75 hectares of land, a large portion of which went into building the 13 elevated stations along the two corridors.

CMRL is now attempting the cantilever method for phase-1 extension to build six stations to along a 7km distance along the narrow roads of north Chennai.

In phase-2, a two-level sleek looking structure will spread out on both sides of the road. Two arms would project out of the structure on either sides of the road which would form the entry/exit points for the stations. The rest of the elevated corridors, which includes the viaduct and the tracks, will look like a natural extension of the structure.

Commuters would be able to take the stairs or escalators to get to the concourse or ticketing level of the station, built at the centre of the road. An elevator or escalator will take them to the level above to board a train. The OMR elevated line will be above a flyover that would be built simultaneously to link the IT corridor.

Chennai is, however, not the first to try building such unique structures. Hyderabad was the first city in the country to have cantilevered metro stations. There were 63 elevated stations designed to rest on columns built in the middle of the road.

The cantilevered structures, say experts, are quite challenging to design and construct. "They may save space and look elegant, but designing them is more challenging than a double support structure. A lot of parameters including earthquake stability have to be considered," said Prof Ravindra Gettu, associate dean, Industrial Consultancy and Sponsored Research, IIT Madras.

EFFICIENT ENGINEERING

Metro work along OMR could have thrown traffic out of gear, but cantilever construction will cause minimal inconvenience

Round-up of OMR metro rail line	
Phase-2	
Distance covered	107.55km
Budget	₹85,047cr
No. of corridors	3
No. of stations	116
No. of elevated stations	27
Status - Detailed Project Report awaiting Centre's approval	

- Why is it better?**
- > In case of metro rail, it will reduce the amount of land acquired for construction as the station will appear to be hanging
 - > The stations will look sleek and can be built along narrow streets
 - > In the absence of ground-up structures, obstruction of traffic flow will be minimal during and after building of the metro line

- > Phase-1 extension between Tondiarpet and Wimco Nagar may have cantilever style stations
- > Hyderabad metro was first to have stations using cantilever method

- > Will not limit the expansion of roads as the columns supporting the structure is in the centre of the road and not on the side
- > Delinks construction of the station box with the entry structure

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In less than a decade, commuters will walk into metro stations along Old Mahabali-puram Road that would seem to take a leaf out of futuristic films. Standing on the concourse level of these stations would give a clear view of the trains running above and the vehicles moving below.

Chennai Metro

Rail Ltd (CMRL) is planning to build elevated stations for phase-2 using the balanced cantilever method, where the entire structure will be supported by a row of columns built at the centre of the road allowing smooth flow of traffic below. "The stations in phase-1 have been built with the gateway projecting on one side of the viaduct and the station box on it. In this case, station will project from the pier itself," said a metro rail official.

CMRL has planned 27 elevated stations along the two corridors of phase-2, which will be built with this method, and most of them will be on Old Mahabali-puram Road between Tidel Park and Siruseri Sipcot.

