

Dig this: Underground Metro-3 ready to go under Mithi waters

IN FEB MMRC to start work on 3 underwater tunnels, which will make it the country's second corridor under a riverbed

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MUMBAI: From February, the Mumbai Metro Rail Corporation (MMRC) will begin tunnelling 12.5m below the Mithi riverbed as Mumbai's first underground Metro — the Colaba-Andheri-Seeppz line — goes underwater.

The proposed 33.5km Metro-3 line will be the second metro in the country to have tunnels under a riverbed. The first is being constructed in Kolkata under the Hooghly River.

The MMRC will construct two tunnels of 1.18km length each with tunnel-boring machines, currently used towards Vidyanagari, and a 170m tunnel using the New Austrian Technology Method (NATM). The tunnels will be between Dharavi and Bandra-Kurla Complex (BKC). The south end of BKC station will also be underwater.

To accomplish this engineering feat of constructing under a riverbed, the contractors will adopt several safety methods. The soil and broken rocks above the tunnel will be strengthened to reduce permeability and ingress of water. An "umbrella" of steel bars will be created above the excavation area for safety and there will be a constant check on soil/rocks during excavation.

SK Gupta, director (projects), said, "The challenge is to create a safe curtain for the work to go on and also resist water pressure. Another engineering challenge is that the rocks here are weaker. Our designers, consultants and contractors have worked on this plan for long to make it possible"

With the water levels rising in the river every monsoon, Gupta said more precautions would be taken to control water pressure.

The BKC station is also a crucial intersection point as it is being planned as a three-line station with two main platforms and a cross-over line, which will connect to either side of the mainline.

The cross-over line is being constructed using NATM. This will be the first metro to use NATM underwater.

The MMRC has completed close to 17km of tunnelling in the city with all 17 tunnel-boring machines put to work.

WATER WORKS

Metro-3 will be the second metro in the country to have tunnels under a riverbed. The first one is being constructed under the Hooghly River in Kolkata

ABOUT METRO-3

Metro-3 is the first and only fully underground metro proposed for Mumbai. After it is done, it will be the fifth largest underground tunnel in Asia

33.5 km length
27 stations

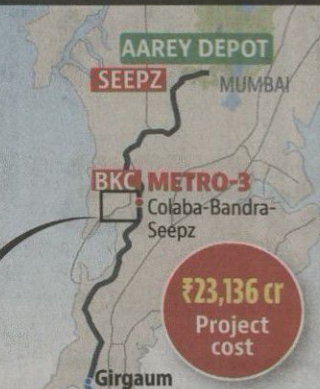
Deadline: December 2021

Expected ridership: Around 13 lakh by the time the project is launched. Around 17 lakh by 2030

Implemented by: Mumbai Metro Rail Corporation Limited (MMRCL), a joint venture of the state and central government

Connect: Six business districts, many educational institutes, the domestic as well as the international airport

Status: Under construction (MMRC has completed approximately 17-km of tunneling)



THE UNDERWATER VISION

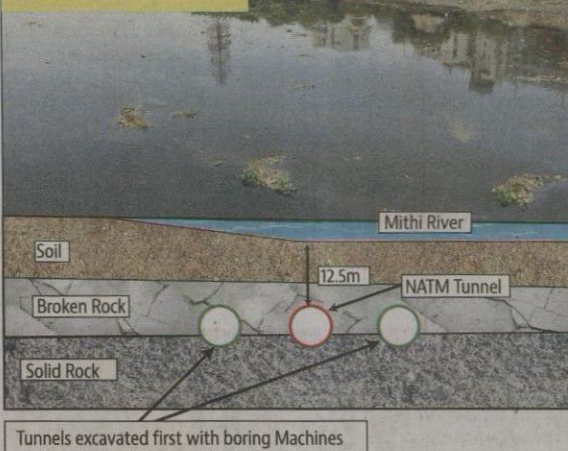
2 tunnels of 1.18km length each, 12.5m below the city's Mithi riverbed, between Dharavi and BKC (to be dug using tunnel-boring machines)

1,170 m cross-line tunnel to be dug using NATM

South-end of BKC station will be underwater

WHAT ARE TUNNEL-BORING MACHINES?

The TBMs are huge machines being used to drill underground tunnels in the city. The 17 highly-mechanised machines being used for Mumbai Metro-3 have been named after the rivers of Maharashtra



WHAT IS NATM?

- The New Austrian Tunneling Method (NATM) is a modern tunnelling method appropriate for congested spaces.
- It is a European method that was also used for the construction of the Delhi metro
- In Mumbai, the technology will be used in seven stations, to

widen the tunnels by using mining and equipment like breakers

ITS ADVANTAGE

For tunnels with variable geometry and in mixed ground conditions, NATM is more cost effective, flexible and safer

CONTRACT AWARDED
The MMRC on Tuesday awarded the contract for automated fare collection (AFC) system

in all of its proposed 27 underground stations to a consortium of M/s. ASIS Elektronik ve Billisim Sistemleri

A.S., Turkey and Kalindee-ASIS joint venture. The AFC system will also follow the integrated ticketing system

that is being implemented by the Mumbai Metropolitan Region Development Authority for seamless travel in the city.