

LAST TBM BREAKS THROUGH AT MUMBAI CENTRAL STATION

After five years of work, TBMs fall silent

SWEETY ADIMULAM

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THE 17 tunnel boring machines (TBM) that have been at work round-the-clock through Mumbai's underbelly for the last five years fell silent with the tunnelling of the Colaba-Bandra-SEEPZ underground Metro attaining completion. The final breakthrough was achieved by TMB Tansa-1, which broke through at Mumbai Central Station on November 30.

This 42nd breakthrough marked the completion of the tunnelling work of the entire metro line. A breakthrough is defined when a tunnel boring machine (TBM) manages to bore through the defined route and emerges successfully at a designated end. The Mumbai Metro Line 3 is a 33-km-long fully underground line that will snake through subterranean Mumbai to connect Colaba-Bandra-SEEPZ.

The Mumbai Metro Rail Corporation, which is building the underground metro line had deployed 17 TBMs weighing nearly 900 tonnes and 110-metre-long

for the tunnelling work.

Each of these TBMs is named after a river and was manned by a 100-member team. These machines managed to dig through five to six metres of rock every day.

The first TBM to commence work was Krishna-1 when it was lowered at the Naya Nagar shaft in September 2017. The first breakthrough was achieved by TBM Wainganga-1 of package 7 at the Chhatrapati Shivaji Maharaj International Airport Terminal 2 from Pali ground at Marol Naka in September 2018. A total of 42 breakthroughs have been achieved in metro line 3 so far. The 41st breakthrough was attained by Robbins-made TBM Tansa-2, which had completed a downline drive of 832.5 meters from Mahalaxmi Metro Station to Mumbai Central Metro Station in 262 days using 555 concrete rings.

Whereas the final breakthrough 42nd was done by Tansa-1 TBM at Mumbai Central Metro station. Robbins made TBM Tansa-1 completed its most challenging drive of 837 meters from Mahalaxmi Metro Station to Mumbai Central Metro Station upline in 243 days using 558 concrete

rings. The Package-3 includes Mumbai Central, Mahalaxmi, Science Museum, Acharya Atre Chowk and Worli Metro Stations, is one of the longest stretches of the line-3 corridor.

These machines have constructed a tunnel network that spans 54.5 km while excavating 18.80 lakh cubic metric tonnes of muck equivalent to 3.76 lakh truckloads of excavated material.

Besides the tunnelling work, segment casting work was also carried out simultaneously. About 2,86,000 (2.86 lakh) cubic metric tonnes of concrete and 29,500 metric tonnes of steel were used to construct segment rings.

Subodh Gupta, Director (Projects) of MMRC, said the muck was taken by the contractor as it was not useful for metro construction work. "The TBM machine cutter grinds the rock, which is in the form of sand. Such a quality of sand is not useful for construction. Moreover, it needs to be processed before use, since the excavated material 'muck' comprises a mixture of various earth elements. The muck from the station area was given to the Mumbai Port Authority for port filling," he said.