

# Rudra cuts through 40-yr-old pile of waste

S LALITHA @Bengaluru

TUNNEL Boring Machine (TBM) 'Rudra' is set to hang up its boots within a fortnight. Its last journey, running to over 2km, deserves to be told as it encountered an unprecedented hurdle no machine in India or possibly the world, has experienced -- a massive garbage mound of waste dating back to over four decades.

One of the nine TBMs deployed to build the underground corridor (Nagawara-Kalena Agrahara line) for Phase-II, Rudra got stuck almost a year ago between Dairy Circle and Lakkasandra Stations at a depth of 15 metres underground. An entanglement of medical waste, animal fossils, implant wastes, tyres, confectionery and tobacco covers dating back to the 1980s, figured in the dumpyard.

When Rudra emerges at Langford Town Metro Station after tunnelling for 5.34km from Dairy Circle to Vellara shaft, it will mark the culmination

of a remarkable and emotional journey for the entire team of Afcons Infrastructure Limited, contracted by BMRL with the tunnelling job here. This will end their tunnelling as its other two TBMs, Vamika and Varada, did their work unhindered by major issues.

Detailed investigation by the Afcons team revealed that an ancient, forgotten quarry existed there, invisible to all.

D Murugadasan, vice-president, Afcons, told TNIE, "We

realised that unless a robust solution could be found, this could prove to be the end of the project. After detailed investigations and brainstorming and taking into confidence the owners of granite shops here, we began probe drilling with additional soil investigation to assess the extent of the quarry. We trained our focus solely on ensuring stability of the tunnel tube during the operational stage, without disturbing the existing structures on top."

## TBMs' TRICKY PATH

TBM Rudra achieved an average productivity of 120 running metre per month, with a peak productivity of 200 running metre per month



## RUDRA STATS

**2081m**

Travel distance

**03**

Breakthroughs

**1486**

Segments

**122**

Cutter head interventions

The Afcons team then constructed a curtain Reinforced Cement Concrete (RCC) wall which was anchored to the bottom rock at a depth of 18 metres from the ground level with special piling methodology, he said. "We carefully replaced the garbage with lean concrete on the dodgy tunnel alignment. The curtain wall acted as a protective barrier for the tunnel tube during construction and also during operational stages."

He lauded BMRL and Afcons engineers for pulling off this tricky task. Among other challenges were the three-layer traffic at Dairy Circle Junction, where it drilled below a flyover, a road and an underpass.

The Aala Masjid was also quite close to the spot where Rudra got trapped, during Ramadan. "The team acted pre-emptively to ensure the mosque area was fortified in advance. Umbrella grouting was done to stabilise the foundation of the structure and ensure a smooth run for Rudra."