

Indore Metro rolls out smoothly, thanks to IIT-Bombay's intervention

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MUMBAI: Indore celebrated a new chapter in urban commute on May 31 with PM Narendra Modi inaugurating a 6-km Metro line from Gandhi Nagar station to Super Corridor Station-3, but behind the smooth run of its first ride lies a quiet intervention from IIT-Bombay.

Rewind to 2022. The concrete was not set right. Initial pile foundation tests failed. Worry lines deepened. That's when Madhya Pradesh Metro Rail Corporation (MPMRCL) knocked on the doors of IIT-B, where steel met science.

"They reached out in Jan 2022 when MPMRCL authorities faced a problem with the initial pile foundation design and construction," recalled Prof Deepankar Choudhury, chair professor and former

head of civil engineering at IIT-B.

Choudhury, who also shaped the foundation strategy for India's longest sea bridge Atal Setu, travelled to Indore with his then PhD students, Chaidul Chaudhuri and Vansittee Dilli Rao. What they found was sobering: In many piles, the concrete hadn't flowed fully to the bottom, with a shortfall in lengths. Gaps as large as two metres stared back, posing a serious risk to the entire metro superstructure.

"Anything built over such uncertainty was a hazard," Choudhury said. "We proposed supplementary piles and redesigned the pile cap with detailed finite element analysis, considering customised location-specific ground conditions," Choudhury explained. The compromised piles were repurposed as auxiliary supports, their strength recalibrated by a new configuration. That is the mind beneath Indore's Metro.

These findings were recently published in a leading journal of the American Society of Civil Engineers, International Journal of Geomechanics, by Choudhury and his former PhD scholars of IIT-B.