Innovation in the Jakarta Mass Rapid Transit project with real-time monitoring

Country
Indonesia

Project type
Structural

Sector
Transport

Main product
Monitoring solution

Context

The Jakarta MRT (Mass Rapid Transit) is a modern urban rail transportation system in Jakarta, Indonesia, created to tackle the city's chronic traffic congestion and enhance its public transportation network. This transformative project marks a significant milestone in modernizing Jakarta's infrastructure, showcasing the city's commitment to sustainable urban mobility. Additionally, the MRT serves as an inspiring model for future transportation initiatives across Indonesia, paving the way for more efficient, environmentally friendly urban transit systems.

The first section of the North–South Line was inaugurated in March 2019. The CP203 section of Phase 2 of the MRT project includes constructing a 1.4-kilometer tunnel between Mangga Besar Station and the Kota Tua area, as well as building Kota Station and Glodok Station. Construction is expected to be completed by 2027.

During the second phase of the project, the instrumentation monitoring specialist, PT Sarana Jaya Nusasentosa, was tasked with monitoring soil settlement above and alongside the tunnel in an urban environment complicated by the presence of buildings, cables, obstacles, and bridges.

Solution

To visualize soil movement in real time, Worldsensing Digital Data Loggers were installed to connect the in-place extensometers, transmitting raw data. Additionally, Laser Tiltmeters were deployed, positioned directly downward into boreholes to monitor settlement where internet connectivity was unavailable. A repeater was installed to resolve the connectivity issue.

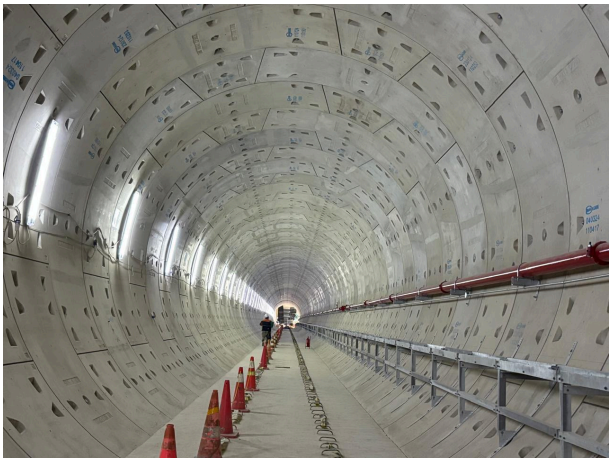
"A laser tiltmeter originally intended for measuring convergence in the tunnel was used as an alternative monitoring solution to determine soil settlement values"

Kelvin Budiman
Project Engineer
PT Sarana Jaya Nusasentosa

Benefits

The use of real-time monitoring in this second phase of the Jakarta MRT project benefits both the operator and the local community by enhancing safety, efficiency, and sustainability.

For the operator, it facilitates early risk detection, reduces costs, improves decision-making, ensures regulatory compliance, and bolsters its reputation. For the community, it guarantees safer construction, minimizes disruptions, protects the environment, builds trust through transparency, and accelerates access to the MRT's economic and transportation benefits. This innovative technology promotes urban resilience while ensuring the project is managed responsibly and efficiently.



Advantages

- The client found an alternative monitoring solution by utilising
- Laser Tiltmeters initially deployed for tunnel convergence monitoring to monitor settlement.
- The deployment of Worldsensing devices enabled real-time visualization of soil movement. This facilitated early risk detection, improved decision-making, ensured safer construction practices, and minimized disruptions during the project.
- The technology protected the environment, built trust through transparency, and accelerated access to the economic and transportation benefits of the MRT system, fostering urban resilience.