

India Metro tunnels & structures

Detailed Designs for MMRC Mumbai Metro Line 3 (Colaba-Bandra-Seepz) – Impact Assessment of the TBM tunnels to existing overlaying structures

Mumbai, India

Project

Mumbai Metro Line 3 (Colaba-Bandra-Seepz): Contract UG-07 – Design and Construction of Underground Section including three (3) Underground Stations at Marol Naka, MIDC and Seepz, and Associated Tunnels, Mumbai, India. Impact Assessment of the TBM tunnels to existing overlaying structures.

Construction Cost

Total estimated cost: ~320 million €

Project Schedule

Design: 2018
Construction: 2016 – ongoing

Project Description

Evaluation and verification of the impact on existing viaduct of Line 1 of Mumbai Metro due to the under-passing of TBM tunnel of Metro Line 3

Construction Method

- Tunnels: Bored excavation with EPB - TBMs (Earth Pressure Balance – Tunnel Boring Machines) and Hard Rock TBM

Geology

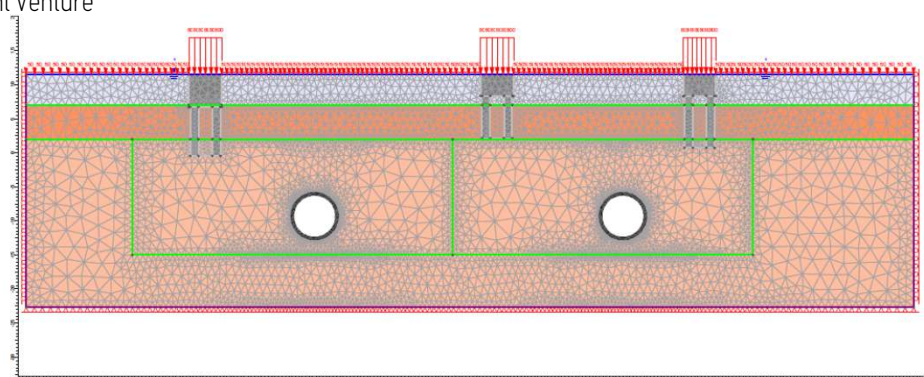
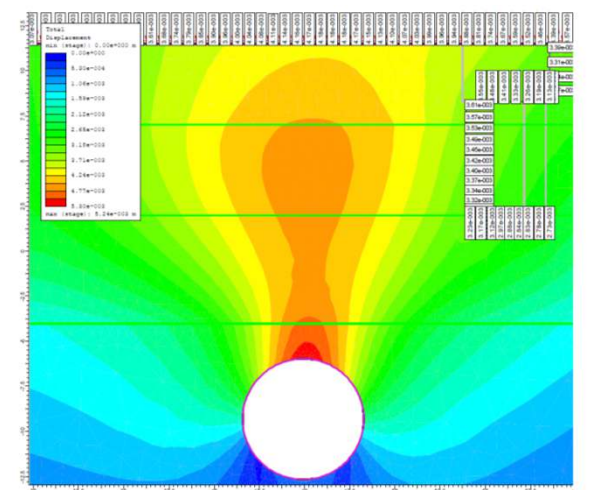
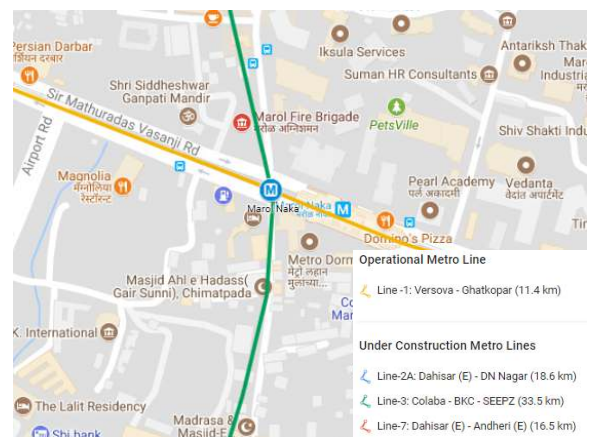
Soil cover of various consistency and small to medium thickness
Bedrock of basalt and breccia of various jointing and disturbance
TBM overburden: ~20m

Our Services

- Review and check of existing available data and reports of MML3 tunnel
- Review and check of existing available as-built drawings of MML1 viaduct structures at the area of intersection
- Review and check of design assumptions, analysis, methodology
- Independent proof check and verification of the impact of the TBM tunnel construction on adjacent structures and their foundation
- Ground modification measures proposal for risks mitigations
- Ground settlement contours within the influence zone of the tunnelling works
- Risk Assessment of viaduct due to tunnelling works
- Monitoring recommendations
- Recommendations for specific measures to be taken
- Designs were provided in common with INDUS CONSULTRANS Pvt. Ltd. India

Client

Mumbai Metro One Private Limited Joint Venture



India Metro tunnels & stations

Detailed Designs for MMRC Mumbai Metro Line 3 (Colaba-Bandra-Seepz) – Four (4) Underground Stations, one (1) Mid-Ventilation Shaft, TBM and NATM Tunnels

Mumbai, India

Project

Mumbai Metro Line 3 (Colaba-Bandra-Seepz): Contract UG-05 – Design and Construction of Underground Section including four (4) Underground Stations at Dharavi, B.K.C., Vidyanagri and Santacruz, one (1) Mid-Ventilation Shaft at Agreepada Hutment and Associated Tunnels as well as two (2) Tunnel Sidings in B.K.C. – Mumbai, India

Construction Cost

Total estimated cost: ~400 million €

Project Schedule

Design: 2016 – ongoing
Construction: 2016 – ongoing

Project Description

Two (2) single track TBM tunnels

Total length: ~8km (2 x 4km),

Cross section: 35m² Effect. cross section: 26m²

Four (4) Underground Stations: Dharavi, B.K.C., Vidyanagri and Santacruz

Length: ~ 250-475m (including cross over)

Width (C&C boxes): 19.50m ~ 30m, Depth: 25~30m

Four (4) final levels: Foundation level / Platform level / Concourse level / Roof level

NATM sections (including NATM parts of stations)

Total length: ~0.6km, Cross section: 11.5-70.0m² Effect. cross section: 6.5-55.0m²

One (1) Mid-Ventilation Shaft:

Length: ~ 26m, Width (C&C box): ~ 26m, Depth: 25m

Construction Method

- Tunnels: Bored excavation with EPB - TBMs (Earth Pressure Balance – Tunnel Boring Machines) and Hard Rock TBM
- NATM: Conventional excavation & mild, controlled blasting techniques
- C&C station boxes: Secant pile walls with pre-stressed anchors and/or struts combined with reinforced cut slopes – Conventional excavation & mild, controlled blasting techniques

Final Lining

- Concrete M45 for TBM tunnels' segments
- Concrete M35 for cast-in-situ concrete
- Reinforcement Fe500

Geology

Soil cover of various consistency and small to medium thickness

Bedrock of basalt and breccia of various jointing and disturbance

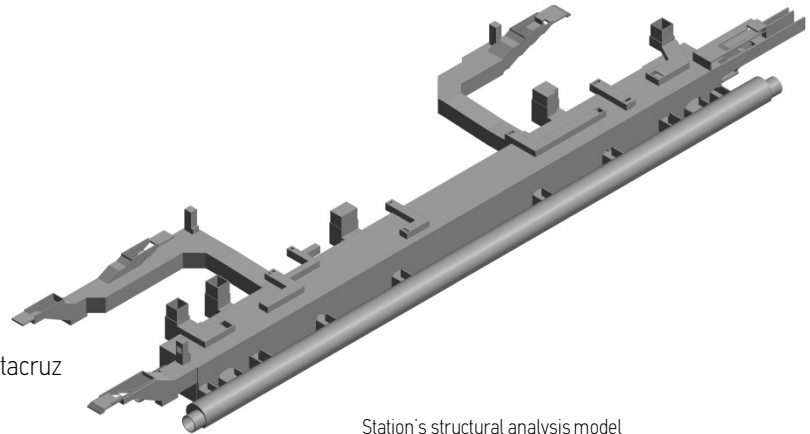
TBM overburden: 10–17m

Our Services

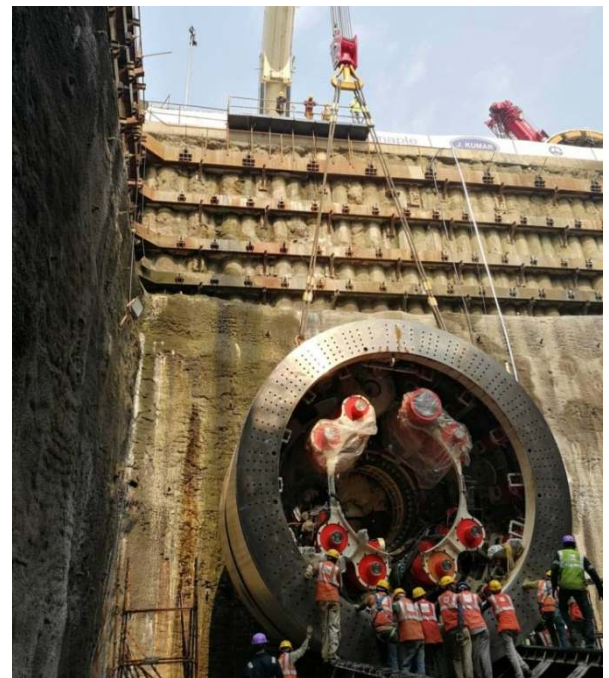
- Geotechnical Evaluation
- Stations Temporary works: Geotechnical and Structural Designs
- Stations Permanent works: Structural and Architectural Designs, Detailed Reinforcement (BIM/Revit Design) and Waterproofing Drawings, E/M Designs
- TBM Tunnels Design, NATM Tunnels Designs, Cross Passages Designs
- Designs provided in common with INDUS CONSULTRANS Pvt. Ltd. India and PSP CONSULTING ENGINEERS GmbH Germany

Client

JV J. Kumar Infraprojects Ltd / China Railway No.3 Engg Group Co. Ltd



Station's structural analysis model



Construction works