Metro Project

Tender Predesigns, General and Detailed Final Designs (GFD, DFD) for Thessaloniki Metro Extension to Kalamaria for two (2) single track TBM tunnels, one (1) station and one (1) forestation

Thessaloniki, Greece

Project

Tender Predesigns, General Final Designs (GFD) and Detailed Final Designs (DFD) for two (2) single track TBM tunnels, one (1) station and one (1) forestation of the project: "Design, Construction and Commissioning of Thessaloniki Metro Extension to Kalamaria", Greece

Construction Cost

Total cost: approx. € 312 m.

Project Schedule

Design: 2012 – on going
Construction: 2013 – on going

Project Description

Two (2) single track TBM tunnels
Total length: ~ 7km
Cross section: 30.20m^2 Effect. cross section: 22.10m^2
1 Pumping shaft for each tunnel
Mikra Station
Length: ~ 320m (including crossovers) , Width: 16.60m - 23.80m,
Depth: 18.70m - 21.90m
4 final levels: Foundation level / Platform level / Concourse & EM level /Roof level
Two (2) tunnels for TBM start up: Length: ~36m (each)
Cross section: 2x 44.8m^2 Effective cross section: 2x37.2m^2
Mikra Forestation Tunnel
Length: ~ 360m, Width: 10.60m-28.50m, Depth: 13m-14.50m
2 final levels: Foundation level /Roof level
Terminal shaft: Length:8.00m, Width: 9.60m, Depth: 9.60m

Construction Method

Two (2) single track TBM tunnels: Mechanical excavation with EPB - TBM (Earth Pressure Balance – Tunnel Boring Machine)
Mikra Station: Construction with Cut & Cover method reinforced concrete piles rows / Prestressed anchors/ Struts
Two (2) tunnels excavated with conventional means for TBM start up
Mikra Forestation: Construction with Cut & Cover method
Reinforced concrete piles rows / Prestressed anchors

Final Lining

- Concrete C40/50 for TBM tunnels' segments, Reinforcement B500c
- Concrete C30/37 for station's & forestation's permanent structures
- Reinforcement B500c

Geology

Neogene, quaternary deposits and recent superficial man made deposits, Overburden: 7 -20m

Our Services

- Geotechnical – structural evaluation
- Geotechnical and structural predesigns
- Geotechnical and structural General Final Designs (GFD)
- Geotechnical and structural Detailed Final Designs (DFD)

TBM installation works – false tunnel construction

Station pit temporary support by reinforced piles and prestressed anchors

Station pit -NATM construction for the installation of the TBMs

Client

AKTOR S.A.

Metro Project

Thessaloniki Metro Extension to Kalamaria - Final TBM Designs at the active fault zone area of Pylea – Panorama Region at Thessaloniki.

Thessaloniki, Greece

Project

General Final Designs (GFD) and Detailed Final Designs (DFD) for the dimensioning of the final lining of the precast segments of the single track TBM tunnels at the vicinity of the probably active fault zone of Pylea – Panorama Region of the project: "Design, Construction and Commissioning of Thessaloniki Metro Extension to Kalamaria", Greece

Construction Cost

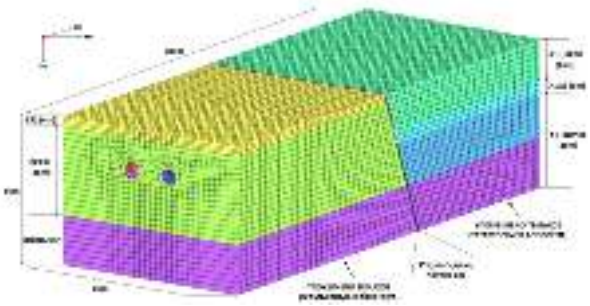
Total cost: approx. € 312 m.

Project Schedule

Design: 2016 – on going
Construction: 2016 – on going

Project Description

Two (2) single track TBM tunnels
Total length: ~ 7km
Cross section: 30.20m^2 Effect. cross section: 22.10m^2



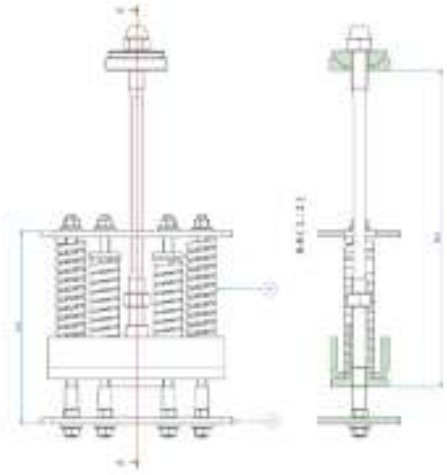
3D prospective display of the fault zone area

Construction Method

Two (2) single track TBM tunnels: Mechanical excavation with EPB - TBM (Earth Pressure Balance – Tunnel Boring Machine)

Final Lining

- Concrete C40/50 for precast segments with special connection system in order the induced deformation of the tunnel during the activation of the fault zone to be safely absorbed and tunnel's collapse to be avoided.
- Reinforcement B500c



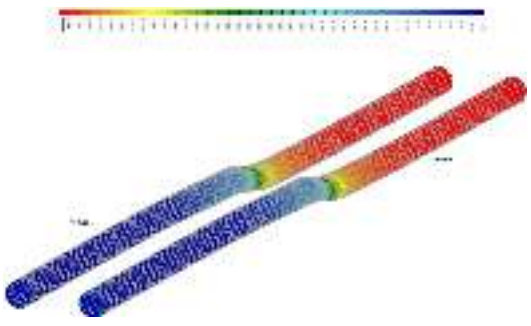
Special connection system at Pylea fault area

Geology

Quaternary deposits (soft to stiff sandy clay and loose clayey sand with gravels) and sandstone marl series (stiff clay and dense clayey sand) are encountered at the fault zone area. In this area the initial emerge of the sandstone marl series is also identified.
Overburden: 13 -16m
Ground water head: 10 -13m

Our Services

- Geotechnical evaluation of the fault zone area
- Computation of the pseudo-static two-dimensional and three-dimensional response of the TBM tunnels in the event of fault zone activation (soil-tunnel-fault interaction)
- Computation of the dynamic response of the TBM tunnels in the event of fault zone activation
- Dimensioning of the final lining of the precast segments and execution of respective adequacy checks
- Check of tunnel's alignment after fault zone activation



Dimensioning of precast segments at the fault zone area

Client

AKTOR S.A.