

The Netherlands



Name: Department of Tunnelling and Underground Works (TTOW) of the Royal Institution of Engineers (KIVI) in the Netherlands

Type of Structure: Non profit, The Royal Institution of Engineers in the Netherlands is an association with individual members who are also member of the various departments of the association. The Department of Tunnelling and Underground Works is one of the larger departments within the association.

Number of Members: 582

ASSOCIATION ACTIVITIES DURING 2018 AND TO DATE

In 2018 the Department of Tunnelling and Underground Works performed several activities:

- Lecture day 'Bored Tunnels, current status of projects in The Netherlands'. Theme session on Maintenance aspects of existing bored tunnels in the Betuwe route, construction status of Rotterdamse Baan and Rijnland route bored tunnel.
- Congress 'Beyond a Tunnel Vision' in Brussels organised in corporation with: COB/IE-Net/ABTUS-BVOTS/KIVI-TTOW/BESIX/TOV
- TTOW Young Members site visit to 'Rotterdamse Baan' Bored tunnel project, also invited to other TTOW activities.
- Visit to Scandinavia: The Bored tunnels on the Follo Line project in Oslo, Norway; Immersed tunnel in Gothenburg, Sweden; Existing tunnel on the Öresund link, Denmark. In cooperation with the Norwegian association NTT
- ITA presentation evening and annual meeting of TTOW
- The COB (Centre of Underground Space) has created an online overview of Dutch tunnels. It shows that twenty-eight tunnel projects (green = new, orange = renovation) have been scheduled for the upcoming ten years.

CURRENT TUNNELLING ACTIVITIES

Blankenburg connection: Maasdelta tunnel (immersed tube) & Aalkeettunnel (in situ)

The Blankenburg connection on the new A24 motorway consists of 2 tunnels: the Maasdelta tunnel, which is an immersed tube tunnel under the Scheur (Nieuwe Waterweg) waterway and the Holland tunnel, an in-situ tunnel through a natural habitat called the Krabbeplass. 20

years of management and maintenance are incorporated in the project (DBFM contract).

The Maasdelatunnel will be some 945m in length and the Holland tunnel about 510m. The whole connection will be partly paid for by toll collection. In 2018, works started for the Maasdelta tunnel with the construction of cofferdams for the building docks in which the two tunnel elements for the Maasdelatunnel will be constructed.

Victory Boogie Woogie (Rotterdamsebaan) – (TBM)

In the Rotterdamsebaan project, an additional entrance for The Hague is created via a TBM tunnel – the Victory Boogie Woogie tunnel. The TBM (just finished) is called Catharina-Amalia, named after one of the daughters of the King of the Netherlands. Durability

and sustainability has played a large role. The twin-tube tunnel is 1860m in length (drilled section 1640m) with an inner diameter of 10m. Each tunnel tube provides two traffic lanes. Every 250m there is a cross-passage.

A9 Gaasperdammerweg (in situ)

A 3km long tunnel of 5 tubes in the A9 through the Southeast of Amsterdam. The main civil works for the tunnel finished in 2017. At the moment, tunnel installations is ongoing. The tunnel is equipped with fireproofing boards and the roof of the tidal flow tube is under construction.

Rijnlandroute (TBM)

In the Rijnlandroute project, a connection between the A4 with the A44 motorways is established near Leiden. The twin-tube TBM tunnel is 2.5km in length. Each tunnel tube provides two traffic lanes. 15 years of management and maintenance are also part of the contract. The project is in the execution phase, the building pits for the ramps are ready and the starter pit is ready for the installation of the TBM, which is foreseen to start boring in June 2019.

Zuidasdok Amsterdam (in situ)

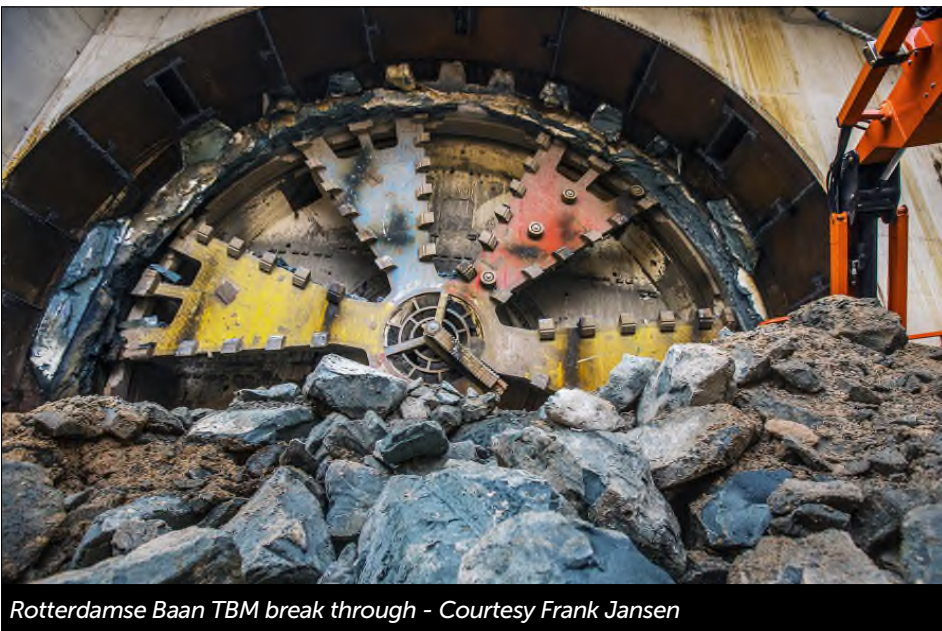
The Zuidasdok project establishes an extension of the existing A10 Zuid motorway, the ring road of Amsterdam. In a combined approach, the existing public transport hub will be extended and the motorway will be led through a series



RijnlandRoute



Maasdelatunnel water works



Rotterdamse Baan TBM break through - Courtesy Frank Jansen

of new tunnels. There will be two tunnels, each about 1km long. Each tunnel has two tubes; one four-lane tube for transit traffic and one two-lane tube for local traffic. On top of the tunnels, new public space will be developed, also providing space for the expansion of the public transport hub. The project was awarded in 2017 and is currently in the preliminary design stage.

Maastunnel Rotterdam (renovation)

The renovation of the Maastunnel is currently in the second half of the second year of renovation. Works are still proceeding according to plan. Currently, the new traffic floor is nearing completion. The Maastunnel is a monument which requires a special approach in bringing the tunnel up to the latest standards.

In 2015, concrete damage was registered at a single immersion joint. It

turned out that many immersion joints were damaged. After analysis of the failure mechanism a renovation scheme started and in 2018 the first joints were successfully restored. The first tube is finished; the second tube is under construction.

Other Renovation projects (renovation mainly tti):

- IJtunnel & Schiphol tunnel (scheduled finish 2019)
- Koningstunnel (renovation in progress)
- Heinenoordtunnel & Kiltunnel (in preparation)
- Roertunnel & Swalmentunnel (in preparation, tunnel safety systems only)

FUTURE TUNNELLING ACTIVITIES

A16 – Rottemerentunnel (in situ)

The A16 motorway from the traffic junction Terbregseplein will be lengthened and connected to the

A13 motorway near Rotterdam. In this connecting road, a new tunnel is required - the Rottemerentunnel (preliminary working name). The Rottemerentunnel is planned to be opened in 2024 and will be around 2235m in length. There will be two tubes with two lanes per tube and an emergency lane.

The project was awarded in 2018 and is currently in the critical design stage and construction works will start in the first quarter of 2019. The project has an energy-neutral design with optimal integration of the new road into its environment.

Renovation Eerste and Tweede Heinenoordtunnel

In 2023, the Heinenoordtunnel (1969) in the A29 near Barendrecht will undergo renovation. At the moment, research on the scope and impact of the renovation is ongoing.

Renovation Kiltunnel

Between 2020 and 2022, the Kiltunnel between Dordrecht and 's Gravendeel will be renovated. The tunnel safety installations will be renewed and the civil structure will be renovated where necessary.

Other future renovation projects (renovation mainly tti up to 2022):

- Eerste and Tweede Beneluxtunnel
- Buitenveldertunnel
- Noordtunnel
- Sijtwendetunnel
- Westerscheldetunnel
- Drechttunnel
- Piet Hein Tunnel

STATISTICS

1. Length or volume excavated - % mechanized/% conventional during 2018

Mechanized tunnelling (TBM) 258000m³. Conventionally excavated volume: 0m³

2. Amount (USD or EUR) of tunnelling/ underground space facilities awarded in 2018

A16 Rotterdam: €984M

3. List of tunnels completed

North-South Subwaytunnel
Amsterdam

4. List of tunnels under construction

See above list 'Current Tunneling activities'