

# The Netherlands

**Name:** Department of tunnelling and underground works (TTOW) of the Royal Institute of Engineers

**Type of Structure:** Non-profit. The Royal Dutch Engineering Society for tunnelling and underground works is an association of 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:** 506 (2022) & ca. 50 Young Members



## ASSOCIATION ACTIVITIES DURING 2022 AND TO DATE

Our department has celebrated its 50-year anniversary with a party themed "Connection generations though Tunneling!" This year the department also hosted the following events:

- A workshop themed: How to develop an Interface design to an integral design.
- Annual meeting "ITA-avond".
- A double site visit "project marathon" on the A16 and A24 tunnelling project sites.
- The YM-department organised a site visit to the A16 tunnelling Project.
- The YM department organised a site visit to the Baak Blankenburg (immersed tube) tunnelling project.

## CURRENT TUNNELLING ACTIVITIES Rijnlandroute (TBM)

The Rijnlandroute project has been

underway for a few years now. The twin tube tunnel between the A4 with the A44 motorways near Leiden is 2.5km in length. The TBM-driven tunnels were finalised in 2020 with as opening expected by 2023. The opening was delayed due to a fire in the storage facility where all of the tunnel's technical installations were stored. The tunnel technical installations are now underway and testing of all systems is progressing.

### Zuidasdok Amsterdam (in-situ)

In 2020 the client reconsidered this major project for Amsterdam. The tunnel project is split into three independent projects, with the client responsible for the integral design of the total project. Procurement of the three individual projects started in 2021. In 2023 the procurement of the tunnel project will commence.

### Blankenburg connection: Maasdelta tunnel (immersed tube) & Hollandtunnel (in-situ)

The Blankenburg connection, the new A24 motorway, contains two tunnels: the Maasdelta tunnel, which is an immersed tube tunnel under the Scheur (which is the primary access towards the harbour of Rotterdam); and the Holland tunnel, an in-situ tunnel through a natural habitat, (see picture 1). Twenty years of maintenance is incorporated in the design, build, finance and maintain project contract. The Blankenburg connection is scheduled for completion in 2024.

The Maasdelta tunnel will be about 945m in length and is characterised by its very deep ramps (photo). In 2018, execution started for the Maasdelta tunnel with the deep ramps now finished and covered. The two tunnel elements are constructed in a dry dock and are stored in a harbour basin, waiting for immersion which is planned for April 2023 (See picture 2 and 3). The closed ramps are finished and tunnel technical installations are being placed.

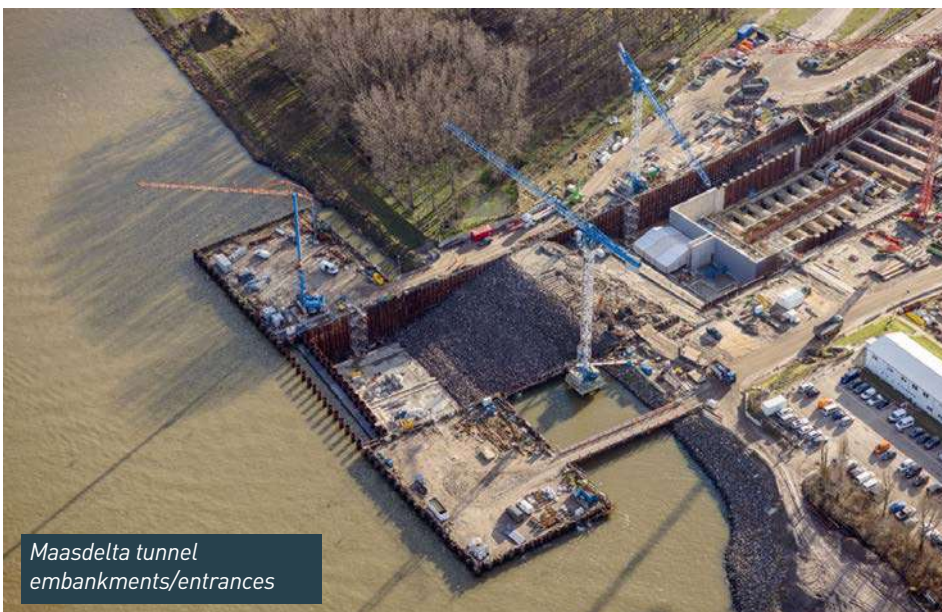
The civil structure of the Holland tunnel is almost complete, tunnel technical installations are being installed and integration testing is planned to be completed in 2023.

### A16 – Rottemerentunnel (in-situ)

The A16 motorway from junction Terbregse plein will be lengthened and



Holland tunnel

Maasdelta tunnel  
embankments/entrances

connected to the A13 motorway near Rotterdam, The Hague airport. In this connecting road, a new tunnel is required; the Rottemeren tunnel. The Rottemeren tunnel will have a length of 2235m. There will be two tubes with two lanes per tube and an emergency lane. The project has an energy-neutral design with optimal integration of the new road in its environment. While most concrete works on the tunnel are finished, the installation of the technical systems is underway and opening is scheduled for 2024.

#### Renovation project and challenge:

A lot of tunnels in the west of the Netherlands were constructed during the second half of the last century. To keep tunnels open and safe for future access they need to be renovated and brought up to date in terms of fire safety and operational control. In the district South Holland over the coming years seven tunnels will systematically being

renovated in a uniform and standardized protocol for efficient and safe future use. This starts with the Heinenoord tunnel:

#### The Heinenoordtunnel (1969) refurbishment

The project was awarded in October 2020. The final contract close took place in April 2021. The engineering of the renovation works is ongoing, with the works commencing in 2023 with the first scheduled nightly traffic closures to renovate the segment joints and renew the fire resistant coverings.

#### The Roer and Swalmentunnel (2009) refurbishment

In 2021 the MDCM-contract to renew several tunnel safety systems of these two tunnels was awarded. During 2022 the engineering of the renovation works started. The refurbishment works will commence in 2023. The contract is called an MDCM-contract, Maintain, Design,

Construct and Maintain. In the 1st maintenance period the contractor can get acquainted with the tunnel systems and operational software to prepare and design the renewal of the different tunnel safety systems.

Also the municipality of Amsterdam has prepared a refurbishment scheme for five tunnels. (Piet Hein tunnel, Arena tunnel, Spaarndammertunnel, Michiel de Ruijter tunnel, and the IJ-tunnel). Amsterdam is aiming to standardise the maintenance and operations procedures for this set of tunnels. The first two tunnels have been renovated and are open for traffic, the Piet Heintunnel and the Michiel de Ruytertunnel:

#### The Piet Hein tunnel (1993) refurbishment

After 25 years of active duty for the Municipality of Amsterdam the tunnel was closed to traffic for two years. Only tram line 26 was allowed through during the refurbishment works. The replacement and renovation project consisted of the renewal of new systems for ventilation, lightings, and fire safety systems but also the installation of new fire resistant covers, water and sewage system and emergency escape system. The tunnel was also outfitted with a new tunnel control system. The Piet Hein was successfully reopened at the end of 2022.

### FUTURE TUNNELLING ACTIVITIES

#### Future tunnel projects:

- Zuidasdok
- Extension of the North South Line Metro from Amsterdam to Schiphol Airport is under investigation.

#### Tunnel Renovation projects (mainly tunnel safety systems up to 2024):

- Eerste and Tweede Benelux tunnel
- Buitenveldertunnel
- Noordtunnel
- Sijtwendetunnel
- Westerscheldetunnel
- Drechttunnel

#### Future tunnel projects (Renovation - after 2024):

- Botlektunnel
- Hubertustunnel
- Thomassentunnel
- Wijkertunnel
- Zeeburgertunnel
- Arenatunnel
- IJ-tunnel