



ASSOCIATION
INTERNATIONALE DES TUNNELS
ET DE L'ESPACE SOUTERRAIN

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INTERNATIONAL TUNNELLING
AND UNDERGROUND SPACE
ASSOCIATION



Danish Society for Tunnels and Underground Works



MEMBER NATION ACTIVITY REPORT



Danish Society for Tunnels and Underground Works





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PRESENTATION

Danish Society for Tunnels and Underground Works

Members:

- 37 Company Members
- 13 Personal Members
- 12 Young Members



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2015 - ACTIVITIES

Main activities:

Five Member Meetings / Site visits i 2015

One half-day seminar in connection with AGM



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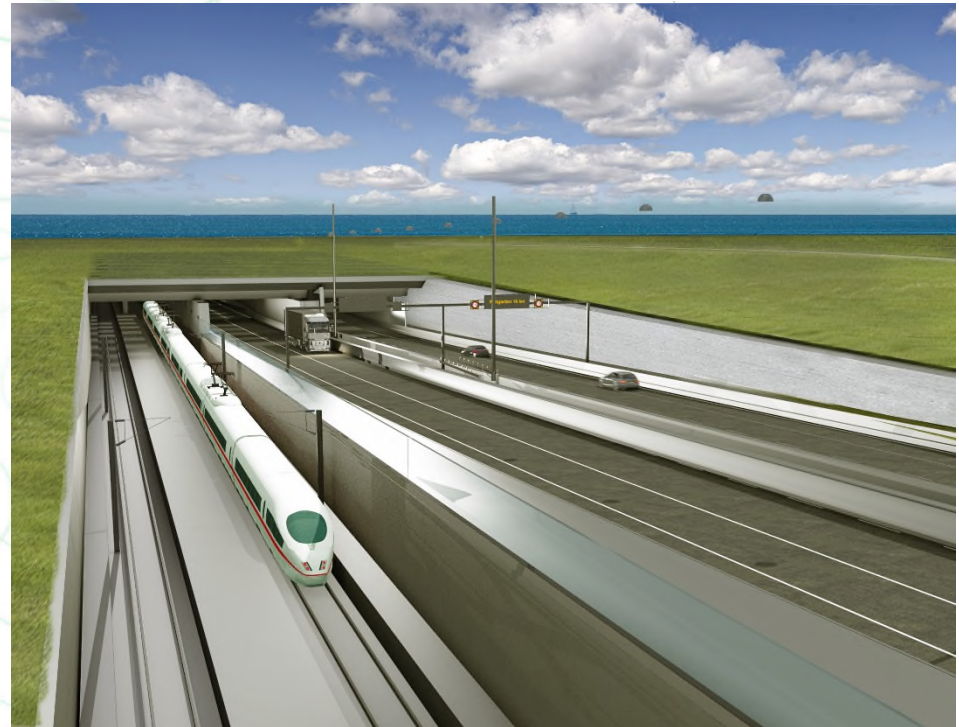


Danish Society for Tunnels and Underground Works



FEHMARNBELT FIXED LINK

- April 2015: The 18 km immersed tunnel was approved in the Danish Parliament
- March 2016: Award of major civil works contracts
- May 2016: Signing of civil works contracts





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TUNNELS - UNDERGROUND WORKS

Copenhagen Metro - Cityringen

Cityringen consists of 17 underground stations in and will be completed in 2019.

In collaboration with the municipal authorities of Copenhagen and Frederiksberg, the Danish government has concluded a contract to expand the existing Metro with a new city circle line (Cityringen).

Cityringen is a completely new Metro line constructed on the same principles as the existing Copenhagen Metro net. The Cityringen circle line will be a 15 km underground railway under downtown Copenhagen, the "bridge quarters" and Frederiksberg.

Lord Mayor of Copenhagen Frank Jensen celebrates that 50 % of the tunnel has been completed mid-December 2015.





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TUNNELS – UNDERGROUND WORKS

Copenhagen Metro – Nordhavn

A 2.5 km extension of the new Cityringen metro line in Copenhagen has been designed by the Ramboll-Arup JV in association with COBE Architects.

The project consists of a twin running tunnel, 1.8 km long, from a bifurcation chamber at the Cityringen Metro, running to a new underground station at Nordhavn and then a short section of cut and cover tunnel and ramp leading up to a 250 m long elevated portion of the line, terminating at the new Orientkaj station. The underground works contract has been awarded to MetNord JV (Züblin and Hochtief).

The execution of the secant piles for the station box is completed ahead of schedule.

The station box is used as launching shaft for the TBM's starting in March 2016.

The elevated section and Orientkaj station was contracted to MetNord JV and construction works will start in April 2016.





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TUNNELS – UNDERGROUND WORKS

Copenhagen Metro – Sydhavn

A 5 km extension of Cityringen to the South harbour area is being designed.

The project consists of 5 new stations and 5 km of metro lines. The tunnels will be twin running tunnel constructed by two TBM of either EPB or slurry type. The tunnel will be located in the Copenhagen limestone and for the Southern part in Bryozoa limestone. There is a known fault zone, the Carlsberg fault, in between the two types of limestone. The stations will be cut&cover stations following the same concept as used for the Cityringen metro line with the architectural design adjusted to the local town conditions. The project includes two cross overs to be constructed in open box or caverns structures. The South Harbour metro extension will connect to the Cityringen at the Havneholmen bifurcation chamber presently being constructed as part of Cityringen.

The tender process for Contractors was initiated in Dec. 2015 and the project is planned for completion in 2023



TUNNELS – UNDERGROUND WORKS

Nordhavnsvej

Client: Municipality of Copenhagen

Consultant: Ramboll, Contractor: Züblin

Nordhavnsvej (Northern Harbour Road) is under construction and will be opened in 2018. The tunnel will be approximately 1.65 km long including a 620 m Cut & Cover tunnel. The cross section of the tunnel consists of 2 road lanes in each direction.



Nordhavnstunnel

Client: Danish Road Directorate

Consultant: Ramboll

The Nordhavnstunnel (North Harbour Tunnel) will connect Nordhavnsvejen with the new Nordhavn development (an



The project is now in the EIA phase. Construction is expected to start at the earliest early 2018. The project consists of a 1 - 1,5 km long road cut and cover tunnel, 2 lanes in each direction.



TUNNELS – UNDERGROUND WORKS

TP4 Urban Tunnels, Copenhagen – Ringsted

Client: Banedanmark

Contractor: Per Aarsleff A/S

Construction period: February 2014 to April 2017.

Total project comprising 3.7 km of new railway as part of the new railway from Copenhagen to Ringsted.

Kulbane tunnel:

695 m long tunnel consisting of permanent sheet pile walls with element deck and base slab cast in situ. The sheet pile walls and the ceiling are covered with fire insulation which is sprayed on. The current situation is that sheet piles, concrete and fire insulation are 100% complete. Installations are ongoing.

Hvidovrevej tunnel:

560 m long tunnel consisting of secant pile walls with inner wall of concrete cast in situ, base slab cast in situ and element deck. Walls and ceiling are covered with fire insulation. The current situation is that secant pile walls are 100% complete. Base slab and inner walls are being carried out.





TUNNELS – UNDERGROUND WORKS

Damhusledningen

Tunneling, Damhusåen Stream, Copenhagen

Client: HOFOR

Contractor: Østergaard A/S

Construction of a 3.4-km-long reservoir pipe of DN3000 mm along the Damhusåen Stream, incl. structures. The tunnel is divided into 4 sections of 960 m, 640 m, 740 m and 1060 m. 5 construction pits are established with secant piles of 12-20 m in diameter and with a depth of about 18 m. 3 start pits and 2 reception pits. Subsequently, structures of various designs are cast in the pits. The tunneling is carried out in the Copenhagen limestone of varying hardness with flint layers of different thicknesses.

The reservoir pipe is established by tunneling with an EPB machine which has just completed section no. 3 of 740 m. On 7 March 2016, the EPB machine started on the last section of 1060 m, with expected completion in August 2016. The last section crosses the railway at Hvidovre Station.





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FUTURE ACTIVITIES

6 – 8 member meetings / site visits will be arranged

Seminar in connection with ITA Board meeting in Denmark in June