District heating tunnel at Dybbølsbro station
Shafts carried out with secant piles and sheet piles

In connection with the construction of a new district heating and district cooling supply system to "The White Meat City", being one of the creative hotspots in Copenhagen, the current coal bridge, crossing the railway area at Dybbølsbro, was to be closed down as routing. Instead a new district heating tunnel was installed under the railway tracks.

Tunnelling in high-traffic terrain
The assignment for HOFOR A/S – Greater Copenhagen Utility was carried out by Per Aarsleff A/S in a joint venture with the sister company Entreprenørfirmaet Østergaard A/S. Our primary work tasks included construction of access shafts and installation of a 144-metre long tunnel with an outer diameter of 3 metres below the railway area in central Copenhagen. There were many pre-cautions associated with the start of the project as the tunnel had to cross a high-traffic railway area.

Underground challenges
During the process we encountered an old quay protection which made it impossible to drive the sheet piles in one of the construction pits. At first we made an attempt to predrill the sheet piles with 12" drillings, but without much effect. In consultation with the client and the consulting engineer the execution method was changed to be a secant pile wall in half of the construction pit.

The secant piles were drilled into the ground without any problems, which emphasizes that this type of retaining wall was the right choice of execution method. However, many wearing parts of all kinds were used in connection with drilling the secant piles, probably because we drilled through a layer of many big stones. The execution of secant piles prolonged the construction period as the work process with secant piles is slower than e.g. traditional sheet piling.

One of the challenges of the project was a big leak in the retaining wall, making it impossible to reduce the water level with the established filter wells. In order to solve the problem we established an extra 12" filter well on the outside of the retaining wall by the leak.
Aarsleff Ground Engineering is one of Europe’s leading piling contractors, and we undertake a wide variety of piling, drilling and foundation projects in Denmark and abroad. We have offices in Poland, Sweden, Germany and the UK. Our fleet covers fully hydraulic piling and drilling rigs as well as cranes and vibrators.

Data
Construction pit:
• 1,160 m² of AZ20-700 sheet piles, 14 m long
• 240 m of HEB-waling
• 22 uplift anchors, 15 m long
• 54 DN880 secant piles, 14 m long
• 24 drillings of 12” for sheet piles, 10 m deep

Groundwater lowering:
• 2 predrillings of 8”, 26 m deep

• 9 filter wells of 8”, 14 m deep
• 1 filter well of 12”, 14 m deep
• 2 emergency power systems
• 2 alarm systems

Client
HOFOR A/S

Contractor
Østergaard-Aarsleff J.V. I/S

Cooperative partner
Entreprenørfirmaet Østergaard

Type of contract
Subcontract

Consulting engineer
Moe A/S

Construction period
April 2013 – November 2014

Contract value
DKK 11 million