

# Secant piles at TP4

Almost 2,000 secant piles bored in high-traffic areas



**AARSLEFF**

TP4 is the first section of the new high-speed railway between Copenhagen and Ringsted. Per Aarsleff A/S is carrying out the design and build contract for TP4 in an internal One Company collaboration. The design and build contract is the biggest single contract for the major railway project. The project includes comprehensive piling work in a densely populated area with high traffic, so a solution with secant piles was chosen to reduce noise and vibrations. The secant pile walls also had a cut-off effect for the primary groundwater aquifer, as the secant piles were installed into the firm limestone, and pumping wells were established inside the walls. This allowed us to reduce lowering of the groundwater table in the surrounding area and prevent distribution of contamination. Last but not least, the secant pile walls are part of the permanent tunnel and ditch structures.

## Own equipment

A total of 2,000 secant piles form the structural elements of the new permanent 560-metre tunnel,

Hvidovre-tunnelen, as well as the 440-metre ditch structure. The secant piles were established as retaining walls from ground level. The expected lifespan is 120 years. With a pile length of 12 metres and a diameter of 1.2 metres, we carried out large-scale drilling work through layers of limestone and flint with a thickness of up to 1 metre. For this reason, we used our three biggest drilling rigs – the two models BG36H and BG39 from Bauer as well as Casagrande C850 NG.

## Logistic challenges

TP4 covers the entire first section of the new railway line Copenhagen-Ringsted, so a major part of the drilling work was carried out in densely populated areas with high traffic in Copenhagen and Hvidovre. All secant piles were established at a very narrow construction site, which meant limited space and put high demands on logistics and planning – also in relation to the neighbours. Finally, we had great focus on existing pipes in the ground.



#### Data

- 1,980 secant piles of DN1180 mm (average length of 12 m)
- 23,760 total metres drilled
- 6 m of top soil at a maximum and underlying limestone of H3-H5

#### Client

Banedanmark

#### Contractor

Per Aarsleff A/S

#### Type of contract

Design and build

#### Consulting engineer

Cowi A/S

#### Construction period

June 2015–April 2017  
(secant piles from  
October–December 2015)

#### Contract value

DKK 915 million (secant piles  
approx. DKK 100 million)

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.

#### Contact

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