

# Groundwater lowering, Kay Fiskers Square

Pump tests and groundwater lowering below excavation level



**AARSLEFF**

At the end of 2019, Aarsleff executed a prolonged groundwater lowering for the construction of a 65,000 square metre office building at Kay Fiskers Square in Ørestad, Copenhagen. We carried out the work in a subcontract for Hoffmann A/S, whereas the client was the Norwegian Pension Fund, KLP.

The groundwater lowering comprised 8 manually adjusted pumping wells in the same dimension to monitor the water level in the centre of the construction pit. Outside the construction site, the impact of the groundwater lowering on the local area was observed in 3 monitoring wells.

## Preliminary design phase

Aarsleff's inhouse groundwater lowering specialists were already involved six months prior to the execution of the project, as geotechnical drillings and pump tests took place in connection with the preliminary design phase of the groundwater management.

The test results showed that it was necessary to de-pressurise the main groundwater reservoir to approx. two metres above completed excavation to avoid the risk of uplift failure. However, Hoffmann and the client wanted to keep the construction pit dry by lowering the groundwater to below the excavation level to limit the simple dry keeping of the construction pit.

## Groundwater lowering

The pumped-up groundwater was handled in two water treatment plants; one for simple drainage and one for primary groundwater. The water from both plants was discharged into the channel Nordre Landkanal that has a very sensitive water environment due to a relatively small water exchange. As the groundwater contained a high concentration of ammonium, an increased number of water samples were taken in the channel Nordre Landkanal to ensure the aquatic environment in the canal. Water from both plants was periodically discharged to the sewage system.



#### Data

- Preliminary geotechnical drillings and pump tests
- 8 pumping wells
- 4 observation/back-up pumping wells
- 3 monitoring wells
- 2 water treatment plants
- 24-hour alarm and emergency power system
- Elevated pipeline system for operation.

#### Client

KLP Ejendomme A/S

#### Contractor

Hoffmann A/S

#### Type of contract

Subcontract

#### Consulting engineer

Rambøll A/S

SWECO A/S

#### Construction period

Preliminary investigations:  
November 2017

Groundwater lowering:  
June 2018-November 2019

#### Contract value

DKK 3.1 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, Norway, Germany and the UK.

We have 35 to 40 different units ranging from fully hydraulic piling and drilling rigs, cranes and vibrators.

#### Contact

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