

Secant piles for Odeon

Construction pit for new music and theatre hall



AARSLEFF

In June, the citizens of Odense took the first step towards a richer city life. The closure of the street Thomas B. Thriges Gade, one of the city's busiest streets with 25,000 cars each day, made room for the new music and theatre hall, Odeon.

Per Aarsleff A/S has carried out the construction pit for Odeon in One Company collaboration between the divisions Construction and Ground Engineering. The project comprised installation of more than 600 secant piles, excavation and removal of soil, construction of sewer, dewatering of the construction pit and in situ casting of foundations and floor slab at basement level.

Construction pit with secant pile walls

To carry out a construction pit which required a minimum of dewatering, we established a closed cofferdam with DN520-millimetre secant piles of a length up to 14 metres installed from level +9 and level +6 to level -5. To provide the wall with the required moment of resistance, we reinforced every other secant pile with HEB or IPE steel beams.

Subsequently, we mounted concrete element walls approx. 50 millimetres in front of the drilled secant pile wall. We managed to mount the element walls around all the secant piles without causing collision between the secant pile wall and the element walls. This was due to a very accurate 3D measurement of the secant piles' surface, which resulted in a quick and precise identification of where to cut the secant piles.

Temporary ground anchors

To support the cofferdam against the pressure from the outside, we installed 73 temporary ground anchors in lengths of 15 metres which were to anchor the secant piles in level +7. The ground anchors were removed when we had established the floor slab and the middle deck in the underground parking.

Monitoring the groundwater table

To keep the cofferdam completely dry, we installed 14 relief wells inside the secant pile walls and 11 monitoring wells outside the secant pile walls. In connection with the groundwater lowering, we monitored the groundwater table outside the con-

struction pit to avoid unintentional impact on the groundwater table and thereby on the neighbouring structures.

Special challenges

The work area bordered on to the existing concert hall and residential buildings, so noise and dust issues as well as public access conditions remained a constant focus. The construction pit was carried out while the underground parking facility at Thomas B. Thriges Gade was being constructed, so all contractors in the area collaborated in terms of coordination of interfaces and logistics.



Data

608 secant piles:

- DN520 mm, 11-14 m long
- 196 tons of HEB and IPE steel beams
- 1,695 m³ of concrete

14 relief wells and water treatment:

- 14 relief wells, 8" with DN125 mm filter
- Sedimentation container for water treatment of pumped-up water

73 temporary ground anchors:

- 15-m-long strand anchors
- 73 UNP beams

11 monitoring wells

Client

Odense Municipality

Contractor

Per Aarsleff A/S

Type of contract

Subcontract

Consultant

COWI A/S

Construction period

June 2014 - May 2015

Contract value

DKK 40.5 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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