



# Tanks for cooling water and

**Architects  
Lundgaard &  
Tranberg A/S  
produced an  
exceptionally  
exciting design  
for the new  
headquarters  
of SEB at the  
corner of  
Bernstoffsgade  
and Kalvebod  
Brygge in  
Copenhagen,  
Denmark.**

**L**andscape architects SLA created a landscape garden that winds between the two buildings from the street level near Bernstoffsgade to about 8 m above the surrounding ground. In this staircase-shaped garden, trees were planted and greeneries laid out to give an overall impression of a 'green' area. The actual foundation of the garden was built of concrete.

Rambøll was in charge of all technical consultation and project planning, including the building of an effective drainage system under the entire plot to prevent unexpected buoyancy. A system for gathering surface water from non-traffic areas was also built; this water is used for an extensive irrigation and dripwater system in the garden, so as to minimize the use of drinking water for the watering of trees and bushes.

Between the two buildings and under the garden there is a two-storey underground parking facility. The stormwater from this area is gathered in a separate drainage system for cleansing in an

oil trap before discharging it into the public sewer network.

## **Sea water used for cooling**

Rambøll in consultation with SEB designed a system that uses sea water from the Copenhagen harbour to cool the two buildings. Horizontal directional drilling was used to install two inlet pipes and one outfall pipe of DN/OD 500 mm WehoPipe, PN10, with two DN/ID 2500 mm Weho tanks, each with a depth of 4.5 m, forming a buffer tank.

In each of these two tanks, two pumps were installed together with the required pressure pipes, valves, level control, etc.

The return tank for the cooling water is also a Weho tank, DN/ID 3000 mm with a depth of 4.7 m.

The three tanks are connected to the three sea-water pipes and also to each other with solid-wall polyethylene pipes, allowing the greatest possible flexibility in case of blockage or other problems in the system.

◀ All the tanks are placed in a 'tank trench' along Kalvebod Brygge.

▼ Each tank was delivered as a complete element that could be lifted into place immediately.

▶ Seen in the overall context, the tank assembly does not look like much, but it actually consists of polyethylene tanks which are so large that in Denmark only KWH Pipe is capable of producing them.



# collecting stormwater

Stormwater from the garden is collected with an ACO-Drain system and led through a sand trap (DN/ID 2000 mm Weho tank, depth 4.5 m) to a storage tank (DN/ID 3000 mm Weho tank, depth 4.5 m).

The sand trap and storage tank are also connected with WehoPipe PE-HD pipe, and from the storage tank there is an overflow pipe to the return tank, so that if there is much rain and therefore minimal need for watering the garden, the excess stormwater is conveyed to the harbour together with the return water from the cooling system.

All the tanks were placed in a 'tank trench' along Kalvebod Brygge whose bottom elevation is -2.5 m. To secure the tanks against buoyancy they were fitted with a solid 40 mm PE footplate that extends about 200 mm beyond the external tank wall.

Based on a buoyancy calculation, a concrete block was cast on top of the footplate to such a

height as to ensure the necessary stability. Moreover, the structured wall of the tanks was filled with water to give the tanks extra weight, which provides extra security against buoyancy.

All underground pipe connections were welded.

## Heavy traffic load sustained

The tops of the tanks are located at different levels because of the stepwise design of the garden, and in places where traffic will pass over the tanks a well ring was installed around each tank, topped by a concrete cover which can sustain a traffic load of up to 40 tonnes.

In areas with only pedestrian traffic, a concrete cover was placed directly over the Weho tank.

The concrete underlay for the garden was poured over the concrete covers referred to above, so that the only remaining access to the tanks is through steel covers set in the concrete.

## INFO

» **Project:** Installation of tanks for cooling water and gathering of stormwater in connection with the construction of SEB's new headquarters in Copenhagen.

» **Builder:** SEB Ejendomme

» **Consultant:** Rambøll

» **Contractor:** M.J. Eriksson A/S

» **Installation:**

- 2 x DN/ID 2400 mm, 2 x DN/ID 3000 mm and 1 x DN/ID 2000 mm Weho tanks with depths between 4.5 m and 4.7 m.

- Connected with PE100, PN10 pressure pipes in varying sizes.