References

The New Deichmanske Library - Bjørvika, Oslo



Uponor involvement

8.000 kvm

The New Deichmanske Library - Bjørvika, Oslo

Deichman is equipped with Thermally Active Building System - a system for storing the energy in the concrete ceiling. It is primarily a cooling system, but it can also be used as a heating system. When in cooling mode, no energy is used as the heat is drawn into the concrete, only when it is transferred from the concrete and into the water pipes that are cast in the decking. The need for installed power is reduced, and operating expenses are significantly reduced as opposed to in a air-based cooling system. The TABS is cast into the Prefab elements, which is a BubbleDeck construction with spans up to 10.5 meters. The building is situated in Bjørvika, right next to the Norwegian Opera House. The total area is approximately 23,500 m2 , divided into 5 floors above ground and 2 floors below ground.
Deichman has 4 floors equipped with TABS - Thermal Active Building System. This is a cooling and heating concept where we store the energy in the concrete ceilings. New in Norway, but a proven concept in central parts of Europe. Uponor has designed and delivered equipment to more than 1,000 buildings with TABS since 1997.
TABS - Thermal Active Building Systems - is a principle for thermal activation of concrete ceilings. The surplus heat in the room is stored in the concrete layer, and extracted from the building via water-conducting pipes that are embedded in the concrete. The cooling capacity is 60 W / m2.
The room temperature will vary from a selected starting temperature, e.g. 20 degrees, in the morning and increase to a chosen maximum level, eg. 25 degrees - which often occurs towards the end of the workday. The circulation pump for the cooling water will then start. The two temperatures are chosen according to the building's application, and is optional.
In heating mode, the TABS ceilings can deliver 30 W / 2. Deichman is a so called passive energy house with a heat requirement of about 15 W / m2. The flow temperature of the circulation water regulates the effect.

Project Facts:

Location	Completion
Oslo, Bjørvika, Norway	2019
Vrsta objekta	Product systems
Office building	Površinsko grejanje i hlađenje
Address	Project Type
Bjørvika, Oslo	New building

Partners

Skanska is the main contractor for the raw building structure, and it is scheduled for completion in the autumn of 2017. After that, AF Contractors will take over and finish the internal works, including the glass facade. The performing architect is Lund Hagem Architects.

All illustrations used in this reference belongs to Lund Hagem Arcitects.

In the phase where the surplus heat is drawn into the concrete ceilings the building does not need energy for cooling.
It only uses energy when the heat is pulled out of the concrete and into the water. The ventilation system does not contribute to cooling or heating in the building at all. TABS take care of this.
TABS is the real reason why the building has less energy consumption. The operating costs will also be significantly reduced compared to a conventional air-based cooling system.
Biaxial elements – the BubbleDeck - are used with cast TABS pipes that are already installed in the prefab phase at the concrete plant in Telemark. The BubbleDeck is made up of large plastic bubbles that lies very close together, surrounded by reinforcing iron. This is lowered into a concrete bath where the height of the concrete deck becomes approximately 7 cm. The finished, tempered element looks like a platon covering, with partially embedded plastic balls, surrounded by reinforced iron.
The BubbleDeck elements are numbered and each one has a unique place in the building constuction. Deichman has a complicated geometric shape. This entails that the elements needs to have many different shapes and sizes. The TABS project is therefore adapted to each individual element - about 480 different sizes. When all elements are transported into place, the entire ceiling is cast out to a total height of 40 cm.
On top of the concrete ceiling an elevated floor with steel legs is installed. This is also 40 cm, and will act as a technical mezzanine. The ventilation air is also distributed in this middle floor by means of a displacement ventilation method.
The installation of BubbleDeck - elements with TABS will be completed in the middle of July 2017.

Uponor is also the supplier of manifolds and pipes on the middle floor. In addition, the piping system for tap water will be supplied.
Deichman will be ready in 2019.

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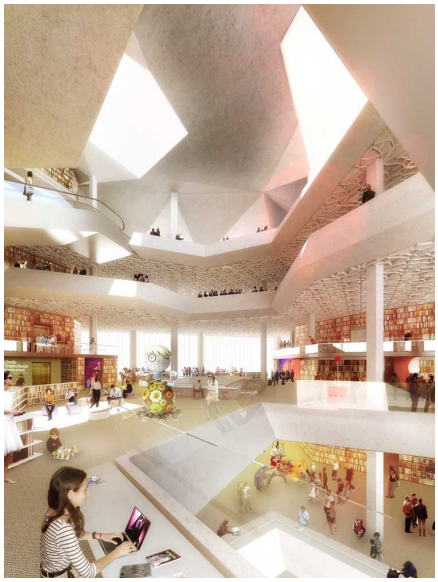









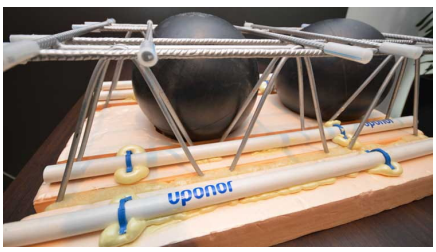

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