Oslo

Deichman – the new Oslo Public Library

The City of Oslo is building a new public library in Bjørvika in Oslo city centre. Its key location will make the new library a thriving hub – a state-of-the-art meeting place for learning and knowledge exchange. Together with the new Munch Museum, this represents the largest ever investment in cultural edifices in the City of Oslo.

Deichman – the new Oslo Public Library is a modern, sustainable and high-quality building. The main architectural concept for the library is a contiguous and open library space covering five floors, as well as a complete basement. From the vantage point of the ground floor, you can gaze all the way up to the unique folding roof on the top floor. Each floor has a unique geometric design and contributes to creating an attractive pattern. The folding roof and the diverse geometric shapes give the entire library a particular distinctiveness.

From the folding roof, three diagonal light shafts illuminate the entire building all the way down to each of the three main entrances. In combination with the easily permeable façade, the light shafts permit an abundance of daylight to fill the new public library.

The façade is frosted and light permeable (diffused/translucent) and constitutes a key architectural element of the new public library. The façade creates a light and airy interior that makes the library glow like a lamp at night when the interior lighting is switched on.

The library also has a spectacular cantilever that appears to float in free air towards the west. At its furthest point, the cantilever extends 18 metres beyond the body of the building and floats 20 metres above the ground. In the interior, the cantilever creates a bright and natural kind of atrium with a wide descent from the 4th to the 3rd floor, from where there is a stunning view of the city and fjord.

Deichman – the new Oslo Public Library will be at the cutting edge of the development of the modern public library and will be a magnet for visitors. The new public library will be a place to borrow books, read, play games, watch films, study, attend lectures, participate in courses and debates, borrow a computer, visit the café, as well as take part in a whole range of events. The library will be a portal to knowledge and enlightenment and will cater for diverse needs.

The new main library will be a meeting place for the general public. Each floor has a different role and it could generally be said that as you ascend each successive floor,

it becomes quieter. The basement will contain both a cinema and a multi-purpose hall. The library is expected to receive 2 million visitors per year and around 5,000–7,000 visitors every day.

Deichman – the new Oslo Public Library will open to the public in the spring of 2020.

Environmental ambitions

Oslo City Council has set ambitious environmental goals for the project with the requirement that the building is at the forefront in terms of both energy savings and reduced climate gas emissions. Environmental and sustainability considerations have been addressed from the very start of the project.

Deichman – the new Oslo Public Library is a model project for the FutureBuilt programme and is being constructed in accordance with the criteria of at least 50 % less climate gas emissions than equivalent buildings. Reductions in climate gas emissions apply to the areas of transport, energy and choice of materials and entail reducing climate gas emissions throughout the building's life cycle – during the planning, construction and operational phase.

Deichman – the new Oslo Public Library is being constructed as a passive house, i.e. the energy requirements of the building will be reduced through “passive measures” such as a well insulated façade and reduced energy consumption for ventilation and cooling.

As a model project in the FutureBuilt programme, the new library has helped to inspire and motivate public and private stakeholders to take environmental and sustainability considerations into account in construction processes from the very start.

Examples of environmental measures:

Façade
The façade solution has been specially developed for Deichman – the new Oslo Public Library. The solution contributes to safeguarding the environmental standard of the building through the use of proper insulation and solar shading, while also combining an exciting architectural expression.

The façade primarily comprises matt glass, although it also features some transparent surfaces through which the city can be seen. The glass comprises three layers: an outside layer that improves the insulating properties, 3-layer insulating glass in the middle, as well as glass on the interior that spreads light into the building. The building has active solar shading (tensile overlay controlled by a weather station) on the exterior of the thermal shaft, which reduces energy consumption for cooling.

The load-bearing elements of the façade are an innovation. They are made from composite fibre elements filled with mineral wool. The composite fibre elements have excellent insulating properties with minimal heat loss, thereby contributing to reduced energy consumption in the building.

The composite fibre elements have the same load-bearing capacity as steel and are able to carry the façade on its own. This also provides environmental benefits in terms of reduced use of steel and aluminium, both of which are very energy-intensive to produce.

By using fibreglass in the façade, the City of Oslo has chosen a solution that is eco-friendly and forward-looking. This is the first construction project to build a façade with the actual load-bearing structure made from fibreglass.

Ventilation system

Deichman – the new Oslo Public Library is being built with a data floor that contains most of the technology (as opposed to the ceiling, which is the standard practice). The ventilation system is also located in the data floor and a high volume of new and eco-efficient technology is being used here.

The new main library is using decentralised ventilation units. The data floor works like a pressure chamber, and central ventilation outlets are being used. These reduce the number of ducts in the building and also significantly reduce the requirement for fan energy.

District heating and cooling from seawater

Deichman – the new Oslo Public Library is connected to a district heating plant. The district heating plant was connected during the construction phase in order to use eco-friendly heating as soon as possible.

The new library is also connected to a seawater cooling plant, which reduces the energy requirements for cooling.

Cooling pipes have been laid in the concrete surfaces to enable the concrete structure to be used for lowering the air temperature. This will reduce the volume of ventilation air and also energy consumption.

Low carbon concrete

The new library has been built from low carbon concrete in order to reduce climate gas emissions.

One of the greatest environmental challenges when using concrete is the high level of climate gas emissions generated when cement is made. Low carbon is defined as concrete that has been adapted to limit climate gas emissions – for example, through the use of new additives such as fly ash as a replacement for cement or that a high proportion of climate-neutral fuel is used during production in order to reduce CO2 emissions.

Recycled steel in the structure and in reinforcing rods

Recycled steel has been used in both the building's structure and reinforcing rods.

Materials with a long life cycle

Deichman – the new Oslo Public Library has been built from robust materials with a long life cycle. The building has been designed with a technical life cycle of 200 years on load bearing and structure.

Energy control system

The building is equipped with an energy control system that optimises the building's energy consumption.

Well served by public transport

The new library is centrally located close to Jernbanetorget and is well served by public transport.

Facts

- Client: The Municipal Undertaking for Culture and Sports Facilities of the City of Oslo
- Project management: ÅF Advansia AS
- Architects: Lund Hagem Arkitekter/Atelier Oslo AS
- Interior architect: AS Scenario Interiørarkitekter
- Consulting engineers: Multiconsult, COWI, Rambøll and Asplan Viak
- Gross floor area: 19,600 m2
- Functional area: 13,560 m2
- Number of floors: five, with mezzanines, as well as a complete basement
- Construction period: 2014–2019
- Library opens: 2020
- Expected number of visitors: 2 million visitors per year
- Environment and energy: Eco-friendly passive house and a 50% reduction in CO2 emissions relative to equivalent buildings. The building is a FutureBuilt project and is supported by Enova SF.