

Finansparken Bjergsted, Stavanger: an innovative timber-framed office building

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Abstract

Degree of Freedom, in collaboration with the architects Helen & Hard and SAAHA, have designed a sustainable, cost-effective, innovative building for the new headquarters for Sparebank 1 in Stavanger, Norway. The project is currently at construction stage.

The structural system above ground level uses mass timber as the principal load bearing elements (a natural, renewable and readily available local material). Floors are cross-laminated timber (CLT) panels supported by glued laminated (glulam) timber beams and columns. For strength and complex geometrical requirements laminated veneer lumber (LVL) made of beech is also used for some elements. The three basement levels and the four communications and services cores are of reinforced concrete.

During the concept design phase, a steel frame alternative, which would have been 5% cheaper, was disregarded due to the higher carbon footprint.

Mass timber structural elements are engineered for strength and are prefabricated with strict tolerances for a rapid construction process. The beams are shaped and fabricated with openings to suit both the architectural aesthetics and services requirements by means of a fully integrated BIM system which brings to the present the future trends in structural engineering.

A truly innovative part of the design is that all the connections between the main structural elements are timber to timber, using high strength timber dowels. These connections are capable of transferring all the necessary forces, mainly by direct pressure between two timber elements. Due to the high quality and the strict tolerances in the fabrication of the mass timber components the connections can be executed with a high level of precision and safety.



Figure 1. Exterior views of the building (© Helen & Hard|Saaha)