

Research Topic



Tall Timber Facades – Identification of Cost-effective and Resilient Envelopes for Wood Constructions

Project team:

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Duration:

1.09.2014 – 28.02.2017 (30 Monate)

Funding:

ERA-Net Woodwisdom-Net im 7. Forschungsrahmenprogramm der EU
and the Federal Ministry for Nutrition and Agriculture

Die Vielfalt der Konfigurationen der Gebäudehülle und die Vielfalt der Effekte des externen und internen Klimas benötigen Unterstützung bei der Auswahl von Material und Designoptionen. Basierend auf Methoden der Risikoanalyse wird eine Bemessung und Feuchteschutznachweis entwickelt.

Short description

Moisture safe multi-story wooden buildings

The interest for the use of wood in urban buildings is growing. In order to preserve and develop the chances on the market, wood construction must be reliable, durable, flexible and strong in off-site production/prefabrication. To fulfil most of these requirements a prolonged moisture-safety is necessary, which is in the focus of this project. Together with research and industry partners from four European countries the Chair of Timber Structures and Building Construction is working on solutions.

With an increasing height of timber buildings, the challenge is increasing to provide dry conditions for the expected lifetime of the building. Tall buildings are particularly exposed to high wind pressures combined with driving rain. Additionally, large buildings require longer times of construction in which the structural elements are especially exposed to moisture. Finally yet importantly inspection, maintenance and repair possibilities are limited in high rise structures.

Urban facade typology as a challenge

Compared to fire safety and static questions, the risk of moisture damages is today dramatically underestimated in planning and building processes and in quality management. This may lead to an image risk for timber buildings, if damages will increase in future. Therefore 'safety concepts', similar to those in static calculations, are necessary to improve construction and prevent damage by moisture.



Fig. 1 Moisture caused damage at exterior wall resulting from leaky sill connection.



Fig. 2 Multi-story, urban wooden buildings have complex requirements for facades.

Construction variety and climate impact

The variety of configurations of the building envelope and the diversity of the effects of external and internal climate need assistance in selection of material and design options. Based on risk analysis methods, moisture protection verification will be developed. That will enable planner and producer to make substantiated decisions for specific constructions. In addition, the tool is used to create a guideline for Tall Timber Facades - envelope constructions.

Risk-based design-tool

The main objective of the project is to facilitate the confident design of durable and therefore cost-effective design solutions for tall timber facades. Design will be enabled by a risk based design tool taking into account exposure and vulnerability of façade components and systems consistently.

> read more at <http://fungi.tallfacades.eu>.