MASTER'S DISSERTATION AT ENGINEERING ACOUSTICS

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WIND-INDUCED TRANSMISSION OF LOW FREQUENCIES FOR A TALL MULTI-STOREY BUILDING

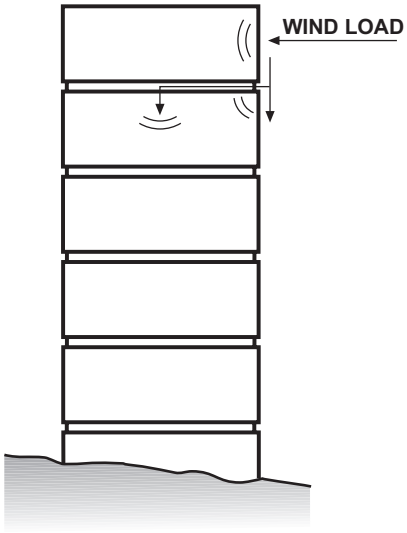
BACKGROUND

The building industry accounts for a big part of the world's carbon dioxide emissions. A better knowledge of sustainable construction and production phases have led to increasing interest in the material wood. Multi-storey buildings are important for the continuing urbanization.

To compete with number of storeys the understanding of wind induced vibrations has to increase. Wooden manufacturers and developers are eager to further increase the no of storeys for buildings with structural bearing system made of wood. The higher the building the more important to understand the impact of structural material and their characteristics to reduce vibrations due to wind load. Due to the low mass of wood, the structural stiffness is decreased and vibrations that are induced by wind or from the ground are easily transmitted through the construction.

PURPOSE AND AIM

The purpose of this Master Thesis is to analyse the vibrations and the low frequencies induced by wind load in a tall multi-storey wood construction. An analysis of how the noise will radiate into the room will also be done. The goal is to achieve an estimated value of the vibrations and at which frequency range these mainly appear in



the construction when wind load is induced. Also, the radiated noise will be compared with current restrictions and regulations.

APPROACH

To obtain an estimation of the accelerations in the construction, a finite element model of an already built multi-storey wood construction will be analysed and recreated. A validation with measured accelerations and sound levels on situ will be done.

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