

MSc-Project (30ECTS):

Investigation of the height of a high-rise buildings influence on the characteristic wind loads

The project focuses on determine the critical height, where the background response of the wind load becomes dominating. The task is to study the development of the wind loads on different heights of high-rise buildings.

Keywords: wind load; high-rise building; structural dynamics in frequency and time domain; statistics

High-rise buildings are affected by strong turbulent wind flow as they protrude above the surrounding buildings, and can thereby entail the background response to be dominating.

The general housing of the cities in Denmark is 6-7 stories. The rising request of high-rise buildings in Denmark entails unexplored investigations of the characteristic wind load on high-rise buildings that protrude above the surrounding buildings.

It is therefore interesting to investigate how high the high-rise building can be, compared to the surrounding buildings, before the background response becomes dominating.

The project consists of executing wind tunnel tests of four different heights of a genetic rectangular shape high-rise building with surrounding buildings, and thereby compare the deviations of the wind loads on the high-rise building, and gain insight of the impact the surrounding buildings create.

The project shall elaborate the development of the wind loads on different heights of high-rise buildings and determine the critical height where the background response becomes dominating.

The project will be a part of an Industrial PhD project, where the results of the master project will be used in the PhD project for investigation of CFD simulations.



The typical high-rise buildings to be investigated in the experiments are intended situated in Denmark, where the high-rise building will protrude from the surrounding housing.



Wind loads measured in a wind tunnel experiment will be used as input data, to study the effect of different heights of the high-rise building.