

MSc-Project (30ECTS):

Validation of the turbulent atmospheric boundary layer in a wind tunnel

The project focuses on getting an insight of the importance of the turbulent atmospheric boundary layer setup. The task is to study the advantages and disadvantages of the methods and evaluate the characteristic wind loads on the high-rise building.

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

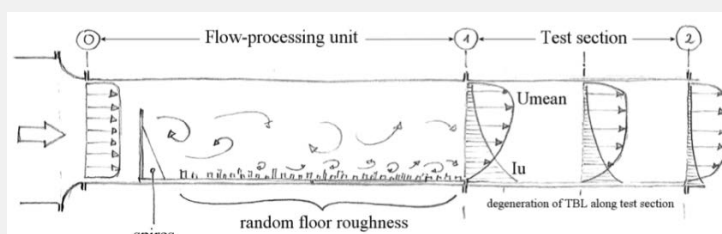
The construction of the turbulent atmospheric boundary layer in a wind tunnel is essential, when the wind load is investigated on a high-rise building in a Wind Tunnel Test.

The flow processing unit in a wind tunnel is the part of the tunnel where the turbulent atmospheric boundary layer is built up. The unit consists of thousands of small roughness elements that are fixed to the floor of the tunnel. Furthermore, surrounding buildings can be included in the Wind Tunnel Test to reflect the area around the building.

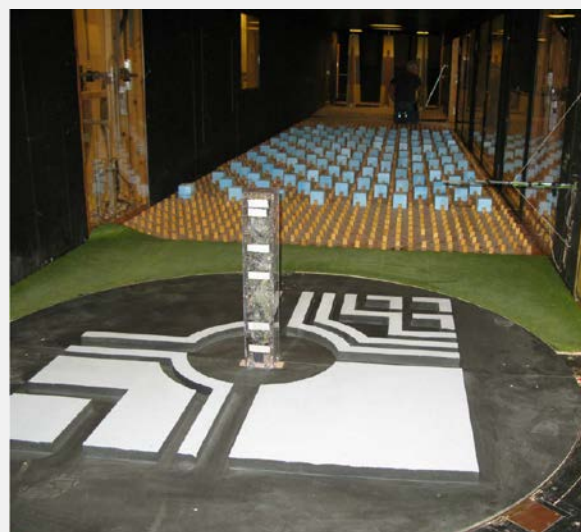
The project consists of executing three test configurations of wind tunnel tests, and thereby compare the deviations of the wind loads on the high-rise building, and to gain insight into the importance of the setup of the turbulent atmospheric boundary layer.

The project shall evaluate the consequences of the wind loads on the high-rise building, the different setups of the flow processing unit imply, and determine the most sufficient test setup.

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.



Typical setup of a wind tunnel, where the turbulent atmospheric boundary layer is built up in the flow-processing unit and the high-rise building are placed in the centre of the test section.



Wind loads measured in a wind tunnel experiment will be used as input data to study the effect of different methods of the turbulent atmospheric boundary layer.