Monopiles for the offshore wind turbines are increasing in diameter becoming relatively thin-walled. At the same time windfarms are planned in locations with less favourable soil conditions, with hard layers, boulders or other unknown obstructions that can lead to highly asymmetrical pile tip loads during driving of the piles causing local deformation of part of the pile tip.

The result can be that whereas the top of the pile is installed at the right depth, the bottom of the pile has not reached the depth and state as designed.

This thesis is a continuation of this subject picking up where the earlier study finished.

To understand what happens to the bottom end of a pile when driven into an underground local obstacle

Understanding this phenomenon can lead to better understanding the design and installation issues when driving piles.

The study includes in depth analysis of the pile/soil/boulder interaction both static and dynamic in FEM modelling to gain insight in the forming and propagation of local pile deformations in order to predict the final result after driving.

The main question to be answered is of course what the effect of such deformations is on the stability of the monopile under wind, wave and turbine loads.

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