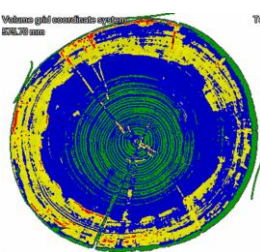


Reliability of timber pile foundations



Introduction

Most historical structures in the western part of the Netherlands are founded on timber piles. With an age of up to 500 years, an assessment of their structural performance is increasingly becoming important. Both mechanical and material degradation, as well as increasing loads on the piles may be the reason for such an assessment. Also, some recent failures of quay walls have led to the conclusion that a better understanding of the long-term load carrying capacity is necessary.

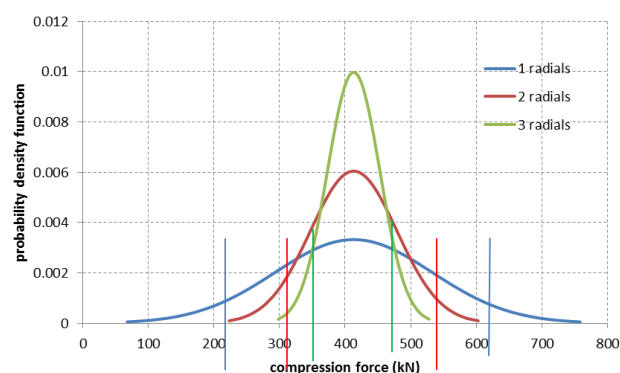
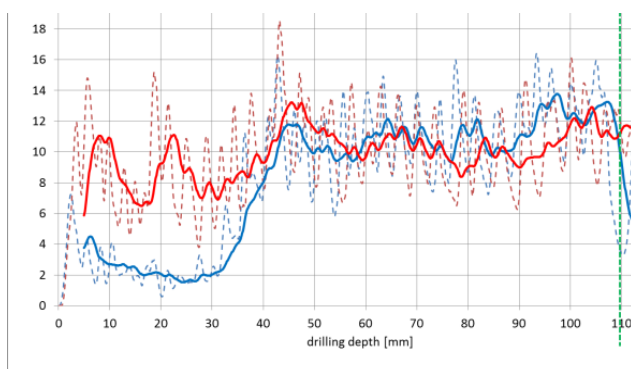
In this Ph.D. project, an integral model for the calculation of the residual load-carrying capacity of timber piles will be developed, in close cooperation with foundation engineering experts and the city of Amsterdam. A combination of theoretical modelling and experimental work on both new and old piles should lead to a comprehensive understanding of the degradation processes. The ultimate goal of the project is the integration of a timber reliability model with existing foundation calculation methods which can be used by practicing engineers.

Aspects that need to be considered are:

- Influences of long term mechanical loads and biological (fungal and bacterial) degradation mechanism and their interaction using a variety of assessment methods (mechanical testing, microscopy, CT-Scanning, NIR).
- Reliability and Service life modelling concepts (Bayesian statistics, Monte-Carlo simulations) preferably with respect to wood.
- Interaction with soil mechanics (creep, skin friction).

We are looking for a candidate with a background in structural engineering or material science to develop further our existing models for timber service life. Programming skills (pref. Python) and a hands-on mentality with regard to experimental work and foundation test sites are required. The working language is English. Because of the close cooperation with the city of Amsterdam and other communities, the PhD student should be prepared to acquire basic knowledge of the Dutch language.

The position is for 4 years. Salary: 2325 - 2972 euros monthly (full-time basis), 40 hours/week.



Applications send to

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