



Rijkswaterstaat
Ministerie van Infrastructuur en Waterstaat

MSc-graduation topic

Vibration assessment for riverine bridges during flooding

Monitoring, interpretation and/or modelling

Water. Wegen. Werken. Rijkswaterstaat.

What do we do?

The Netherlands is a front runner in the field of hydraulic engineering. The design of our dikes, locks, sluices and barriers can be considered as the most advanced worldwide. The department of Hydraulic and Ecological Engineering of Rijkswaterstaat deals with the preparation and supervision of complex infrastructural projects and programmes nationwide. Large projects such as the redevelopment of Meuse river (Maaswerken), Lock improvement program and the renovation of the Afsluitdijk are some examples.

Who are we looking for ?

- You are in the last phase of your study, specializing in Hydraulic Engineering and/or Flood Risk
- You have skills and interest in modelling and/or monitoring
- You are a team-player who is also able to work independently and take initiatives.
- You have good communication skills

What do we offer?

This research is the perfect opportunity to combine your MSc graduation project with a real experience of hydraulic engineering applications, whilst contributing to one of the projects relevant for The Netherlands. You will be collaborating with and be supervised by experts from Rijkswaterstaat and TU Delft. In addition, you will receive a stipend and reimbursement of travel costs.

What is the plan?

During the flooding events of July 2021, unusual vibrations were noted for various bridges in the Netherlands, Germany and Belgium. Bridge failures are usually linked with relevant financial and human losses, thus preventive actions need to be taken to avoid them. Therefore, it is needed to develop a methodology to assess when "signals", as vibrations, could mean a change of condition of a bridge and undermine its functionality or limit state. This MSc research will explore how to evaluate bridge vibrations during a flood event, in relation to emergency decision-making and actions (e.g. whether the bridge is safe or not, whether the bridge should be closed or not).

Your role comprises to investigate causes/effects of flooding-induced vibration for concrete bridges, identifying /indicators for assessing bridge health conditions during flooding. According to your interests and skills, the project could be more modelling-oriented (e.g. to develop a Finite Element Analysis model with DIANA Software Suite) or monitoring-oriented (e.g. explore available data and sensors for vibration-based warning).

Do you want to contribute to this interesting hydraulic engineering research?

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