PHD DEFENCE
by Amol Mankar

PHD defence

Fatigue Reliability of Concrete Elements in Bridges and Wind Turbines

3 September 2021
13:00 –17:00

Organised by

DEPARTMENT OF
THE BUILT ENVIRONMENT

AALBORG
UNIVERSITY

THESIS SUMMARY

Fatigue life prediction and fatigue safety verification of new and existing reinforced concrete structures are gaining substantial importance especially for two types of structures namely bridges and wind turbine foundations & support structures (onshore as well as offshore).
For wind turbine structures with an increase in the capacity of energy production, there is an increase in the size of the rotor, nacelle and assembly. This imposes higher load fluctuations, amounting to fatigue cycles of about 10^9 in a lifetime of 20 years.
Similarly, for bridges with the use of high strength concrete, dead load is reduced and an increase in the magnitude of vehicle loads, live load is increased which invite fatigue issues. Thus, slabs of a bridge can experience more than 10^7 fatigue cycles during service life.
On the resistance side, fatigue tests on the concrete show a large scatter of fatigue life for the same concrete under similar test conditions.
Current Ph.D. work focuses on the development probabilistic framework, a tool to estimate and maintain (through inspections) fatigue safety of these structures by handling the uncertainties in both loads and resistances.

ASSESSMENT COMMITTEE

- Assoc. Prof. Christian Frier, Dept. of Built Environment, Aalborg University (chairperson)
- Prof. Bernt Leira, NTNU Norway
- Prof. Dimitry Val, Heriot-Watt University (HWU), Edinburgh United Kingdom

PHD SUPERVISORS

- Prof. John Dalsgaard Sørensen, Dept. of the Built Environment, Aalborg University

MODERATOR

- Prof. Lars Damkilde, Dept. of the Built Environment, Aalborg University

GRADUATE PROGRAMME: Civil Engineering

PROGRAMME

13:00	Welcome by moderator
13:05	Lecture and presentation by Ph.D. student
13:50	Break *During the break, participants can email questions to the moderator, Lars Damkilde (damkilde@build.aau.dk), who will present these questions after the Q&A session with the assessment committee.*
14:00	Q&A session with the assessment committee
16:00	End of defence *The assessment committee enters another "room", evaluates and writes the final assessment.*
Approx. 16:45	The assessment committee re-joins the "Defence room" and announces its decision.
17:00	End of event

HOW TO PARTICIPATE

This PhD defence will be carried out in hybrid format, meaning you can join on location or online:

Location	*Online*
Aalborg University Copenhagen Auditorium (A) 1.008 A.C. Meyers Vænge 15 2450 København SV	Zoom https://aaudk.zoom.us/j/66425298223 Meeting ID: 664 2529 8223 Passcode: 685895

REGISTRATION REQUIRED

Registration required for both participation formats at inst.build.phd@build.aau.dk
Sign-up deadline: 1 September 2021