Technical University of Denmark

Popular science summary of the PhD thesis

PhD student	Peter Kolt Rasmussen
Title of the PhD thesis	Prefabricated Timber-Concrete Composite Deck with Dry-Dry Notched Connections Designed for Disassembly
PhD school/Department	DTU Construct

Science summary

* Please give a short popular summary in Danish or English (approximately half a page) suited for the publication of the title, main content, results and innovations of the PhD thesis also including prospective utilizations hereof. The summary should be written for the general public interested in science and technology:

The construction industry is obliged to contribute to reducing carbon emissions, and increasing the use of timber as a building material holds a potential for doing so. However, when it comes to floor structures, pure timber solutions can have difficulties meeting the functional requirements for, e.g., acoustics and accelerations, due to their lightweight nature. An efficient way to overcome this is by casting concrete on top of the timber and optimizing the structural behavior by activating the composite action between the two materials. Various composite solutions have already been designed. However, all of these revolve around in-situ casting “wet” concrete directly onto the dry timber, which has some noticeable drawbacks, including the risk of fungal attacks and prevention of material reuse. To avoid these drawbacks and, at the same time, utilize the Danish know-how within the area of prefabricated solutions, the focus of this project is to develop a prefabricated Timber-Concrete Composite (TCC) deck element that features a dry-dry interface, deconstructable connections, and a carbon-minimized concrete. The feasibility of the new deck was examined through experimental campaigns, and novel design approaches were developed to couple the local connection behavior to the global deck response.

Please email the summary to the PhD secretary at the department