

Hofmeyer, H.

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Subject: Research Seminar by a Visiting Professor



Science and Engineering Faculty
School of Civil Engineering and Built Environment

Research Seminar

Date: 12 April 2019 **Time:** 11:00 am.

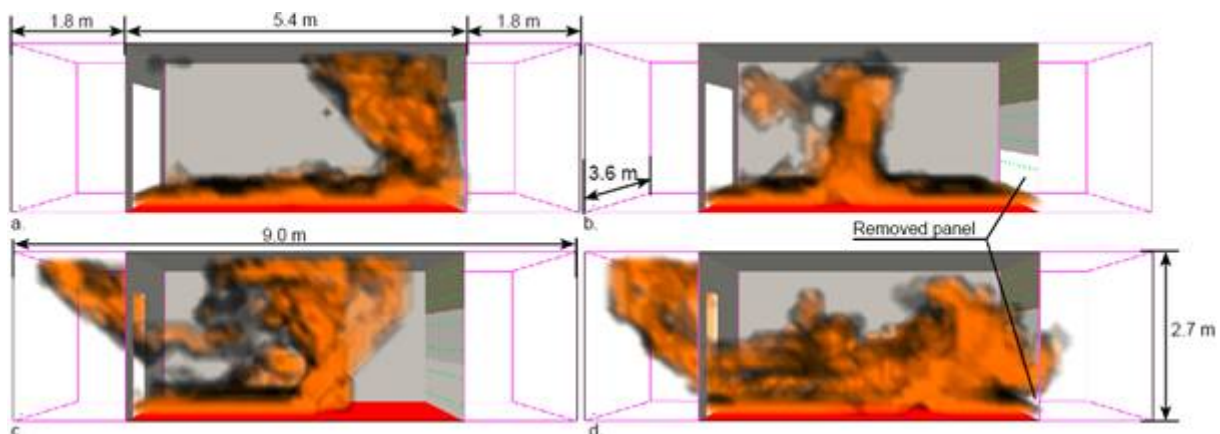
Venue: Room W204, Gardens Point Campus, QUT

Speaker: Associate Professor Hèrm Hofmeyer



Fire Safe Buildings with Thin-Walled Steel and Insulation Systems

ABSTRACT: Most industrial buildings have walls, roofs, and claddings that can be constructed using thin-walled steel and insulation systems. These systems are extremely light-weight, easy to construct and suitable for thick insulation layers, and thus potentially reducing materials and energy for a many buildings worldwide. However, the mechanical behaviour of thin-walled steel and insulation system in fire is largely unknown. This is because the different components (beams, struts, connections, panels and insulation) influence each other and thus the overall system behaviour: a system effect. Besides, a fire clearly influences its mechanical behaviour, but the loss of system integrity, e.g. gaps or openings, also influences the fire: a coupling effect.



This seminar presents the developments of a new simulation approach by coupling thermo-mechanical system behaviour with thermo-mechanical connection behaviour to take into account the system effect. Secondly, this mechanical behaviour is two-directionally coupled to fire behaviour to take into account the coupling effect. Temperature-dependent behaviour of connections is simulated via a multi-scale approach, while insulation degradation is also incorporated. Full-scale experiments are being carried out, and together with existing experiments, the new simulation approach is validated. The resulting approach is compared with approaches without system and coupling effects, which leads to a description of boundary conditions and assumptions under which each approach can be applied.

SPEAKER: Hèrm Hofmeyer (1972) is an Associate Professor in the Department of the Built Environment at Eindhoven University of Technology (TU/e). His research strengths and focus are on two types of research: (1) Computational Structural Design involving the application of Computer Science to building structures and their design process and (2) Application and further development

of finite element method for structural engineering. Hèrm obtained his MSc in Computer Aided Structural Design/Applied Mechanics in 1994. While working as a part-time lecturer in architectural design studios, he completed his PhD in Applied Mechanics/Steel Structures in 2000. After his PhD, he became a part-time Assistant Professor and a part-time Specialist and Project Leader at ABT consulting engineers. Since 2006, he is a full-time Associate Professor with 'Ius Promovendi' (the right to award PhDs), and was unit vice-chair until 2016. Hèrm was a visiting PhD student at Universität Stuttgart, Germany and QUT, and recently a visiting scholar at the Université de Liège, Belgium, and RWTH Aachen, Germany. He received a University Teaching Qualification with the highest distinction, and received the Bronze Award 'MSc lecturer of the year'. Finally, he is a member of ECCS-TC7, CIB-W78, and the Graduate School of Engineering Mechanics.