You are cordially invited to the seminar organised by PTRC.

Seminar on
3D Printing of Sustainable Concrete Structures
– Challenges and Achievements So Far

Abstract:
Concrete is used worldwide as one of the major construction materials, both in situ and prefabricated. It is cheap, fire resistant and durable. However, the costs of a typical concrete structures consist of about 50% on the formwork needed. Besides, the cement production is responsible for a serious part of the exhaust of greenhouse gases. Printing of concrete structures potentially could save on the costs, improve productivity and could above all seriously limit the environmental impact by using less material. However, printing of concrete structures is far from self-evident. No slump concrete is required and the materials properties, both in the fresh state and hardened state depend on many environmental parameters, print path and print speed. These relationships need to be known in order to make the print process more robust and the result safe from a structural point of view. Besides, printed concrete lacks the presence of reinforcement. The seminar discusses the research being performed at the Eindhoven University of Technology (TU/e), Netherlands.

Speaker:
Prof Theo SALET is a Professor and Chair of Concrete Structures at the Department of the Built Environment of Eindhoven University of Technology (TU/e) in the Netherlands. He is also leading the Building Engineering Department at the Witteveen+Bos Consulting Engineers.

Prof Salet’s research became more and more focused on 3D printing of sustainable concrete structures over the past years. The aim is to design and construct more sustainable and mass customised concrete structures, with more added value. In this research the following subtopics of previous research programs come together: evolutionary structural optimisation, parametric design combined with design tools, innovative types of concrete (e.g. fiber-reinforced concrete and ultra-lightweight concrete) and forensic engineering by means of (discrete) non-linear finite element modelling.

During his professional career, Prof Salet worked on many international tunnelling and bridge projects all over the world, including the design of new underground metro lines in two ancient inner cities in Europe. He was initially a researcher and structural engineer, and later assuming leading positions as contract manager and project director. Over the years he also became involved in both building and industrial projects related to sustainable urban transformations. Most of them include challenges with respect to deep building pits in soft soil conditions, high water tables and situated close to existing buildings.

Date: 14 July 2016 (Thursday)
Time: 10.30am to 11.30am
Venue: CEE Seminar Room A, Block N1, Level B1, N1-B1b-06
School of Civil and Environmental Engineering (CEE), Nanyang Technological University