



You are cordially invited to the seminars organised by Protective Technology Research Centre (PTRC).

Seminars on

- 1. Construction Materials and Technology Choice: A Rational Economic Approach**
- 2. A Living, Learning Building: Construction of the Melbourne School of Design**
- 3. Globalisation of the Australian Construction Supply Chain**

Abstract 1:

The total cost of construction will comprise the cost of the raw materials, the labour to shape and assemble these materials, the purchase (or rental) of tools, machinery and other construction equipment, overheads (management, head office, compliance with all regulations, fees, and insurances) and finally the builder's profit. Modern construction methods employ various elements or sub-assemblies that can be fabricated elsewhere to reduce the physical work at the construction site. Various studies have suggested that improvements in productivity and quality in building construction can be attained only through intensive industrialisation and automation of the building process. This means that many developing economies, faced with increasing demand for building products and services, are finding it difficult to develop policies that advance their local construction industries in the most appropriate directions with regard to construction materials and technologies. A careful choice of both material and technology can have significant economic and social consequences.

The aim of this presentation is to examine the drivers and factors relevant to the selection of materials and technology for the construction of buildings in several countries around the world. A series of construction cost ratios is computed based on selected basic inputs necessary for the construction of buildings. Differences in local practice, availability of local resources (raw materials, labour, capital and technology), domestic building materials industries, and local regulations all combine to influence the construction cost of a building. Decisions on appropriate materials and technology are examined by comparing the cost ratios for labour, materials and plant to uncover patterns of use in 27 countries. The findings will inform current research and policy initiatives to manage the exploitation of indigenous resources, to develop domestic building materials industries, to improve construction methods, and to modernise and upgrade the construction sector, particularly in developing countries.

Abstract 2:

A living learning building, the site has been an educational tool since 2010 with a myriad of exhibitions, touring opportunities, photo-documentation and studio activity around the site. The design of the building facilitates collaborative interdisciplinary engagement and the critical exploration of complex built environment issues. The unique transparency of the space supports the vision of a pedagogical building. Exposed materials and structures, such as the underside of the Y-Stairs, give insight into construction techniques and fabrication. Features such as the steel mesh balustrade and open top gallery allow for sight-lines and transparency between levels. Embedded in the design is a commitment to sustainability and green architecture.

The Melbourne School of Design building has been awarded a 6 Star Green Star Design - Education Design v1 rating by the Green Building Council of Australia and is the first education facility to be awarded the maximum 10 Green Star innovation credits.

This presentation will critically discuss the design, procurement, planning and construction processes for the successful delivery of this award-winning building. We will demonstrate how productivity and profitability in the industry is achieved by examining technology choice.

Video: https://www.youtube.com/watch?time_continue=80&v=j-ulHuaX1xY



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Abstract 3:

Globalisation of the construction supply chain in Australia has led to an increasing volume of products and services being procured by construction companies or their subcontractors from manufacturers or suppliers overseas. Led by the rapidly falling communication and coordination costs, the various stages of building construction need not be performed near to each other anymore, leading to increasing offshoring of manufacturing production to lower production cost countries in Asia. This study aims to characterise the extent to which the Australian construction sector has embraced global supply chains, and to determine the drivers for the increase in imports. Direct and indirect imports into the Australian construction industry are estimated at 7% and 14% respectively. The main driver for this increase in imports is the manufacturing industry's loss of competitiveness in the domestic sector to lower production cost countries in Asia. In addition to the lower cost of imported products, other drivers for increased imports are increased competition, globalisation of Australian manufacturers, excess production capacity in Asia, and the shift to services. In response to these structural changes and increased global competition, labour needs to be retrained and reallocated from less competitive sectors to higher value-added or higher skilled jobs.

Speaker:

Dr Toong-Khuan CHAN is Assistant Dean (International) and Senior Lecturer in Construction Management and Technology, at the Faculty of Architecture Building and Planning, University of Melbourne, Australia. His research interests are in the areas of construction economics and technology, and he has published extensively in major engineering and construction journals and conference proceedings. He has received substantial funding from various agencies to support his research in the areas of industry economics, DfMA, construction management, transportation and wireless sensors. He is currently working with industry partners to develop a prefabricated plumbing system based on DfMA principles for the Australian construction sector. Dr Chan has also spent many years in the petrochemical and construction industries in South-East Asia, including consulting for major construction and multi-national companies. He has taught at the Nanyang Technological University in Singapore and the Malaysia University of Science and Technology in Malaysia. He now teaches topics ranging from economics of building, and strategic management, to the more technical topics of concrete structures construction. Dr Chan holds a PhD from the University of Cambridge and a Bachelor of Engineering (Civil) degree from the University of Malaya.

Date: 28 Mar 2018 (Wednesday)

Time: 1.30pm to 4.30pm

Change in Venue: CEE Seminar Room D, Block N1, Level B4, N1-B4c-09b

School of Civil and Environmental Engineering (CEE), Nanyang Technological University | Singapore