



香港大學
THE UNIVERSITY OF HONG KONG



Modular Integrated Construction

Technical Training Course

HKU, 25 April 2018

Centre for Innovation in Construction and Infrastructure Development



Modular Integrated Construction (MiC) Technical Training Course

Organised by **Centre for Innovation in Construction and Infrastructure Development (CICID)**
The University of Hong Kong

Date: 25 April 2018 (Wednesday)
Time: 9:00 am – 5:00 pm
Venue: Room HW231-232, 2/F Haking Wong Building, HKU

INTRODUCTION

Modular integrated construction (MiC) is a game-changing disruptively-innovative approach to transforming fragmented site-based construction of buildings and facilities into integrated value-driven production and assembly of prefinished modules. MiC brings the opportunity for achieving enhanced quality, productivity, safety and sustainability. The factory-controlled process leads to reduced material waste and improved air quality. Concurrent prefabrication and site work accelerates construction schedule, improves construction safety, and achieves better quality control. Modular construction process also enables better building engineering and greater BIM application for advancing design opportunities. This one-day MiC Technical Training Course is organized by the CICID, Department of Civil Engineering, HKU. The course provides a comprehensive introduction and detailed explanation of modular construction methods and technologies. It also demonstrates the benefits of modular construction through project case studies and compares different modular construction design codes and regulations across multiple jurisdictions.

AGENDA

Time	Topic	Speaker
9:00 – 9:05	Welcome Remarks	Ir Professor C.K. Mak Vice Chairman, CICID, HKU
9:05 – 9:20	MiC Overview and Success Strategies	Dr Wei Pan Executive Director, CICID, HKU
9:20 – 10:50	Prefabricated Prefinished Volumetric Construction (PPVC) Project Planning, Design and Delivery (Part 1)	Er Siew Hoong Kit Director (Projects), NTU, Singapore
10:50 – 11:05	Tea Break	
11:05 – 12:30	Prefabricated Prefinished Volumetric Construction (PPVC) Project Planning, Design and Delivery (Part 2)	Er Siew Hoong Kit Director (Projects), NTU, Singapore
12:30 – 13:30	Networking Lunch	
13:30 – 15:30	Modular Construction Design and Codes	Mr Andrew Lian Director, Alda Consultants, Australia
15:30 – 15:45	Tea Break	
15:45 – 16:55	Design for Manufacturing and Assembly (DfMA) and Modular Construction	Professor Tuan Ngo Melbourne University, Australia
16:55 – 17:00	Closing Remarks	Ir Professor Sam Chan Associate Director, CICID, HKU

SPEAKER PROFILE & TRAINING CONTENTS



Ir Professor C.K. Mak, Vice Chairman, HKU Centre for Innovation in Construction and Infrastructure Development (CICID)

Ir Professor C.K. Mak joined the Hong Kong Government as an Assistant Engineer in 1976 and since then his career has been closely associated with the development of Hong Kong's railway system. As an engineer, he was in charge of a number of projects for the electrification and modernization of the Kowloon-Canton Railway. In 1990, he initiated and organized planning studies for Hong Kong's railway development. He then took part in the formulation of Hong Kong's Railway Development Strategies, which were published in 1994 and 2000. Ir Professor Mak is a Member of the Institution of Civil Engineers, a Fellow of the Hong Kong Institution of Engineers, a Fellow of the Hong Kong Institution of Highways and Transportation, a Fellow of the Chartered Institute of

Logistics and Transport, and a Senior Member of the China Railway Society.

Welcome Remarks



Dr Wei Pan, Executive Director, HKU Centre for Innovation in Construction and Infrastructure Development (CICID)

Dr Wei Pan is Associate Professor and Executive Director of Centre for Innovation in Construction and Infrastructure Development (CICID), Department of Civil Engineering of The University of Hong Kong (HKU). Dr Pan received his BSc (Distinction) in Civil Engineering from Hunan University and MSc (Distinction) and PhD in Construction Management from Loughborough University. He is a renowned academic in sustainable construction engineering and management, with expertise covering modular construction, MiC, productivity, offsite prefabrication, zero carbon building, technological innovation. Dr Pan has secured over HK\$45million research fund and authored over 160 publications. He has 23 years of professional experience in

building engineering, construction and innovation management. He is a Chartered Builder, a Chartered Environmentalist, and a Fellow of the Higher Education Academy.

Training contents: MiC Overview and Success Strategies

- Concept and worldwide development of modular construction
- Policy and regulations, codes and guidance
- Coexisting benefits and challenges
- Feasibilities of MiC for high-rise buildings
- Success strategies



Er Siew Hoong Kit, Director (Projects), Office for Development and Facilities Management, NTU, Singapore

Er Siew is the Project Director for construction of the Residential Halls at North Hill and Nanyang Crescent in NTU – both developments adopting PPVC – since 2014 to present. Prior to this portfolio, he was Divisional Director heading the building management division in ODFM-NTU. He has more than 30 years of experience in the local construction industry covering design consultancy, building management and project management of development projects, including wafer fabrication factories, commercial complexes, condominium, Changi Naval Base (Phase 1), underground cavern, marine deck of cruise center at Marina South and extensive experience in design/detailing of precast concrete.

For the past 3 years, Er Siew has been sharing ODFM-NTU's hands-on practical experiences in the adoption of PPVC with government agencies, major developers, architects, engineering

consultants and contractors in Singapore including construction industry leaders from Hong Kong and Japan. Major talks/seminars conducted include BCA's SCPW in Oct 2015, IES' Moving into the Next Era in Jan 2016 and BCA's Experiential Workshop on Prefabricating the Future in Oct 2016.

Training contents: Adoption of Prefabricated Pre-finished Volumetric Construction (PPVC)

This training session will provide a comprehensive and illustrated project-wide case study of the successful adoption and completion of PPVC-based projects in NTU's development of residential halls. The various aspects of PPVC will be discussed in-depth. This short course, through real-life case studies of Singapore projects in NTU, which successfully adopted PPVC, will provide participants a clear understanding and appreciation of the concepts of PPVC and the issues faced in the local context. With the knowledge learnt, the participants will be able to apply them in their development project planning, design, construction, production and supervision.

Session Outline

Introduction

PPVC

Facts and Figures in Case Studies – NTU1 and NTU2

Design Stage

Regulatory Requirements

Architectural Design

Structural Design

M&E Incorporation

Site Constraints and Interface between CIS and PPVC

Procurement Stage

Procurement Methodology

Contract Provision

Cost Estimates

Construction Stage

Site Planning

PPVC Specialist and Production Location

Shop Drawings Preparation

Pre-production verification

Production, Delivery, Installation

Post-Installation

Construction Supervision

Provision of Independent Third Party Inspectors

Provision of RE / RTO

Production Supervision / Tracking

Installation Supervision

Further Development and Improvements

Other recent completed projects in Singapore

Conclusion



Mr. Andrew Lian, Director, Alda Consultants, Australia

Mr Lian has over 28 years of architectural experience and is sought after expert in Modular Design and Construction. Alda Consultants is an International Modular Design advisory offering independent, vendor-neutral Modular integrated Construction design services to Owners, Contractors, Manufacturers and Architects. Alda has consulted to modular projects in Singapore, Malaysia, Maldives and Australia.

Mr Lian holds an MBA and is a registered Architect in Western Australia. In his role as an Adjunct Associate Professor at the University of Western Australia he is involved in writing a Code for High-rise Modular Timber Structures led by Monash University's Professor James Murray Parkes and Professor Yu Bai. He was previously a Principal of

Woods Bagot, a leading international Architecture Firm. Today, he is a sought after speaker and educator in Modular Construction, lecturing in DfMA at the BCA Academy Singapore and University of WA. He has also been a speaker at the Singapore Institute of Architects, World of Modular (USA) and UK OFFsite Conference. He is currently

advising on 40-storey high-rise development in Kuala Lumpur adopting Modular Construction. Andrew previously served as Board Member of Prefabaus, Australia's peak body promoting offsite construction.

Training contents: Modular Construction Design and Codes

Session 1 Modular Construction Design

Learning outcome : Understand the Design process for manufactured buildings

- Key differences between Modular and traditional design process
- Key risks for Developers/Designers undertaking this Modular process
- Early Contractor Involvement in the Modular design process
- Drawing set out for Modular Construction Design
- When to integrate BIM in the design process

Session 2 Modular Code Compliance

Learning outcome : Principles of Modular Code Compliance

- Key Principles from Handbook for the Design of Modular Structures (Published by Professor James Murray Parkes and Professor Yu Ba Monash University, Australia)
- Application of the principles to Hong Kong's context



Professor Tuan Ngo, Research Director, ARC Centre for Advanced Manufacturing of Prefabricated Housing, The University of Melbourne, Australia

Professor Ngo is the Research Director of the ARC Training Centre for Advanced Manufacturing of Prefabricated Housing (CAMPH) at the University of Melbourne. He is also the Director of the Asia Pacific Research Network for Resilient and Affordable Housing. He has carried out significant research collaborations with industry to develop new building products and perform R&D experiments of prefabricated modular building structures. Professor Ngo has won a number of prestigious scientific awards, including the prestigious Eureka Science Prize for Outstanding Science in Safeguarding Australia. He has received more than \$16 million in R&D funding from Australian government agencies and industry. He has published more than 300 journal and conference papers. He has been working as an expert on many projects to protect critical buildings against extreme events (blasts, impacts, fires and earthquakes). He is one of the pioneers in Australia in the areas of off-site construction, design for manufacturing and assembly, and sustainable and high performance modular building systems. Professor Ngo has also been leading the research and development of advanced protective materials and systems for a number of companies in the civil and defense industries.

Training contents: Design for Manufacturing and Assembly (DfMA), and Modular Construction

Professor Ngo will present the underpinning processes for selecting materials and designing integrated systems that holistically consider functionality, structural adequacy, energy consumption and reusability into tools that can help design professionals achieve high-quality designs satisfying end-user requirements. His presentation will cover the principles of Design for Manufacturing and Assembly (DfMA). He will provide examples of government initiatives in Australia for adopting modular construction for schools, hospitals and public buildings, and new innovations in high performance composite materials, building systems, and construction techniques for resilient and sustainable buildings.

Session Outline

- Lightweight prefabricated modular floor, frame, facade, wall and building service systems, which are lighter, reusable, durable, quicker to manufacture and assemble, have greater energy efficiency and reduced costs
- Design for manufacturing and assembly using BIM
- Novel composite materials specifically designed for prefabricated high rise buildings
- Standards and regulations for modular buildings



Ir Professor Sam Chan, Associate Director, HKU Centre for Innovation in Construction and Infrastructure Development (CICID)

Ir Professor Chan has over 40 years' experience working with clients, consultants and contractors in Hong Kong and the Mainland since graduation from the University of Hong Kong in 1973. He joined the civil service in May 1992 and was appointed Assistant Secretary in the Works Policy Unit of the Works Bureau in August 2001 on implementation of the CIRC recommendations relating to alternative procurement approaches, sustainable construction, life cycle costing, partnering, security of project payment, site supervision and project delivery. Ir Chan was posted to the Highways Department in August 2004, responsible for the planning, design and implementation of capital works projects. He served as a volunteer at the Development Bureau and provided professional advice and support to the HKSAR-funded reconstruction projects in Sichuan from January 2011 to April 2012.

As a Director of the Chinese YMCA of Hong Kong and Chairman of its Property Development and Management Committee, Ir Chan provides guidance on development projects and monitors the procurement system in facilitating the delivery of the Association's services. He also provides professional advice to church organizations and NGOs in the implementation of development projects. Ir Chan is a Member of the HKIE ADR Committee and Assessor for the HKIE Civil Discipline Professional Assessment. He also serves as a member of the Appointment Advisory Board of the Hong Kong International Arbitration Centre.

Closing Remarks

TRAINING COURSE FEE

The registration fee covers a lunch, two tea/coffee refreshments, a copy of CPD certificate, and relevant training materials; and is payable by cheque only. All payments are non-refundable. The official receipt for the registration fee will be distributed on the training day. Regular and late registration fees apply as shown in the table below.

Registration type	Registration fee	Registration date
Regular registration	\$1,500.00/person	Before 18 April 2018
Late registration	\$1,800.00/person	On or after 18 April 2018

If you are interested in the training course, please complete the registration form and return it together with a crossed cheque made payable to "The University of Hong Kong" by post to

Training Coordinator, Dr Le Chen
Department of Civil Engineering, The University of Hong Kong, Pokfulam Road, Hong Kong.

In the meantime, please email the scanned copy of the registration form to Dr Le Chen (lchen103@hku.hk) to reserve your registration.

Information on the MiC Training Course is available at (http://www.civil.hku.hk/cicid/3_events.htm). For enquiry on this course, please contact Dr Le Chen (lchen103@hku.hk , 9709 1091) or Ms. Ruby Kwok (ppps@hku.hk, 2219 4986) of Department of Civil Engineering, The University of Hong Kong.

- ALL ARE WELCOME -

Free parking is available at HKU. To be eligible for free Parking, please bring along your parking ticket to the Training Venue for validation.

WP/plt



Registration Form

Modular Integrated Construction Technical Training Course

Organised by **CICID**, HKU

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Registration Deadline: 20 April 2018 (Friday)

Please complete in ENGLISH (in BLOCK LETTERS)

	Surname	Given name	Company	Telephone	Email Address	Profession e.g. Architect, Engineer etc.
1						
2						
3						
4						

Registration type	Registration fee	Number of Persons	Total
Regular registration (Before 18 April 2018)	\$1,500.00/person		HK\$
Late registration (On or after 18 April 2018)	\$1,800.00/person		HK\$

Enclosed Cheque No.: _____ Bank: _____

The registration fee covers a lunch, two tea/coffee refreshments, a copy of CPD certificate, and relevant training materials. All payments are non-refundable. The official receipt for the registration fee will be distributed on the training day.

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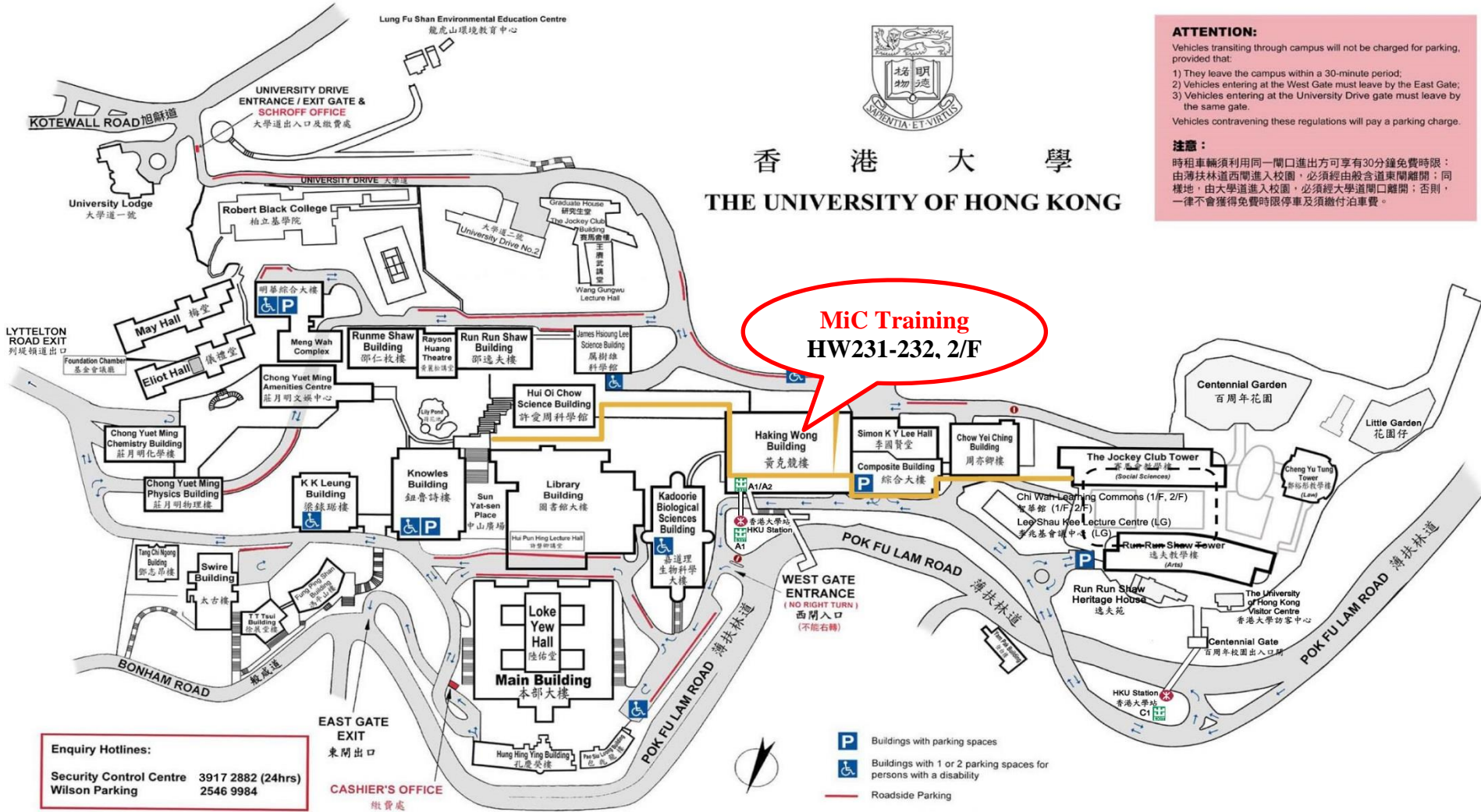
Please do not send any cash in the post.

TRAINING VENUE



ATTENTION:
Vehicles transiting through campus will not be charged for parking, provided that:
1) They leave the campus within a 30-minute period;
2) Vehicles entering at the West Gate must leave by the East Gate;
3) Vehicles entering at the University Drive gate must leave by the same gate.
Vehicles contravening these regulations will pay a parking charge.

注意:
時租車輛須利用同一閘口進出方可享有30分鐘免費時限：
由薄扶林道西閘進入校園，必須經由般含道東閘離開；同
樣地，由大學道進入校園，必須經大學道閘口離開；否則，
一律不會獲得免費時限停車及須繳付泊車費。



Enquiry Hotlines:
Security Control Centre 3917 2882 (24hrs)
Wilson Parking 2546 9984