



香港大學
THE UNIVERSITY OF HONG KONG



Centre for Innovation in Construction & Infrastructure Development (CICID)

The University of Hong Kong

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The University of Hong Kong

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Preface 1

The Centre for Innovation in Construction & Infrastructure Development (CICID) of The University of Hong Kong was originally established under the name Centre for Infrastructure and Construction Industry Development in November 2002. With approval from the Council of The University of Hong Kong the Centre was renamed as its current version in August 2014.



With academic and industry leaders, the CICID aims to address parallel and pressing needs for both construction industry and infrastructure development. The Centre's primary ambition is to achieve excellence and innovation in construction and infrastructure research. It strives to foster continuous improvements, while targeting excellence in the construction industry in general and infrastructure development in particular. Through the development of innovative strategies and techniques, the objectives of the CICID include (a) to develop an internationally recognised 'Centre of Excellence' for research, discourse and dissemination of innovations in infrastructure and construction engineering and management, and construction industry development methodologies; and (b) to encourage and support interdisciplinary research into planning, implementing and evaluating construction projects including mega-project infrastructure programmes.

Driven by rapid technological advancement, future construction will be global in development scope, smart across whole project life cycle, integrated to facilitate collaboration and sustainable with diminishing environmental impact. The forward looking research agenda of the CICID seeks to continuously propel innovative strategies and practices. With strong support to interdisciplinary basic and applied research, and through well-established collaboration with the industry and other research institutions, we have higher hope for, and greater confidence in the Centre to transfer knowledge and research outcomes into power for the advancement of the construction industry in future.

Ir Professor C.F. Lee GBS JP
Chairman

Preface 2

Construction is a highly active industry and one of the largest industrial employer making significant contribution to GDP at both regional and global levels. The sector is now transformed by dynamic forces of sustainable development, technological advancement, and industrialization. Traditional construction activities are associated with solid waste generation, high-energy consumption, greenhouse gas emissions, resource depletion and pollution, which pose severe challenges for sustainable development. The environmental concerns of the industry need be addressed through innovative approaches that balance new technology application, industry strategies and government policies. Meanwhile, the basic nature of construction is gradually changing through rapid technological development, such as automation and expert systems, artificial intelligence, data analytics and modular construction technology. These new advancements are streamlining construction processes, integrating construction supply chain and reshaping building and infrastructure markets. The transformation demands further theoretical progression in the field of construction and engineering management to support necessary managerial innovations.



The CICID has adopted the strategic perspective that low carbon, project delivery and construction informatics represent three pillars of future construction, thus has positioned these to be the Centre's key research focuses. The research outcomes produced by the CICID research teams also demonstrate that the innovations in the three areas indeed have a great potential to form a synergy for achieving sustainable construction through integrated delivery and smart practices. In the future, the themes and topics underpinning the three research focuses will be aligned with the dynamic transformation of the construction sector as well as the Centre's continuous commitment to innovative initiatives in both construction and infrastructure developments.

Ir Professor C.K. Mak GBS JP
Vice Chairman

Introduction

The Centre for Innovation in Construction and Infrastructure Development (CICID) aims to achieve excellence and innovation in construction and infrastructure research. The objectives of the CICID are to develop an internationally recognised 'Centre of Excellence' for research, discourse and dissemination of innovations in infrastructure and construction engineering and management, and construction industry development methodologies, and to encourage and support interdisciplinary research into planning, implementing and evaluating construction projects including mega-project infrastructure programmes.



Since its establishment in 2002 the CICID has successfully undertaken over 75 research projects covering a wide range of themes under the three research task forces, i.e. low carbon, construction informatics, and project delivery, and strategic working groups such as resilient city. The research topics addressed include zero carbon building, carbon labelling, life cycle analysis, building information modeling, virtual reality and visualization, infrastructure procurement innovations and management support systems, performance improvement initiatives, advanced prefabrication and modular construction, productivity and industry development, etc. The research outcomes and knowledge generated have been effectively disseminated in Hong Kong and internationally through over 150 events of forums, seminars, workshops and symposiums, and via both academic and industry publications. The Centre's research works have contributed knowledge to the construction engineering & management literature, inspired innovative industrial practices and informed policies for building a sustainable society.

The CICID seeks to continuously drive innovative strategies and practices in construction and infrastructure development. With strong support from and through well-established collaboration with the industry and other research institutions locally and overseas, the CICID devotes to achieving excellence and innovation of the construction industry into a smart, productive and sustainable future.

Dr Wei Pan
Executive Director

Vision

The Centre for Innovation in Construction and Infrastructure Development (CICID) at The University of Hong Kong strives to achieve excellence and innovation in construction and infrastructure research with a desire to contributing to the advancement of the practice and improvement of performance of the construction and infrastructure sector in Hong Kong and around the world.

Mission

The CICID will endeavour to:

- Develop forward looking research agenda to propel innovation and best practices;
- Establish a conducive environment to support interdisciplinary basic and applied research;
- Collaborate with the industry to develop novel and meaningful research outcomes;
- Fortify better research collaboration between various research institutions;
- Transfer the knowledge and research outcomes to the industry and other stakeholders.

Strategic Research Focuses

Low Carbon

- Zero carbon building
- Low carbon / energy infrastructure
- Sustainable refurbishment
- Carbon auditing and life cycle analysis
- Building and infrastructure energy performance appraisal
- Human behaviour in carbon emissions and energy consumption

Project Delivery

- New Engineering Contract
- Off-site prefabrication, modular construction and industrialization
- Carbon / energy driven project delivery approaches
- Subcontractor management
- Supply chain management and integration
- Productivity and Key performance indicators

Construction Informatics

- Building information modelling (BIM)
- Sustainable information modelling
- Radio frequency identification (RFID) application
- Smart metering and energy monitoring devices
- Integrative BIM-enabled management system
- BIM GIS integrated parametric analysis and diagnosis

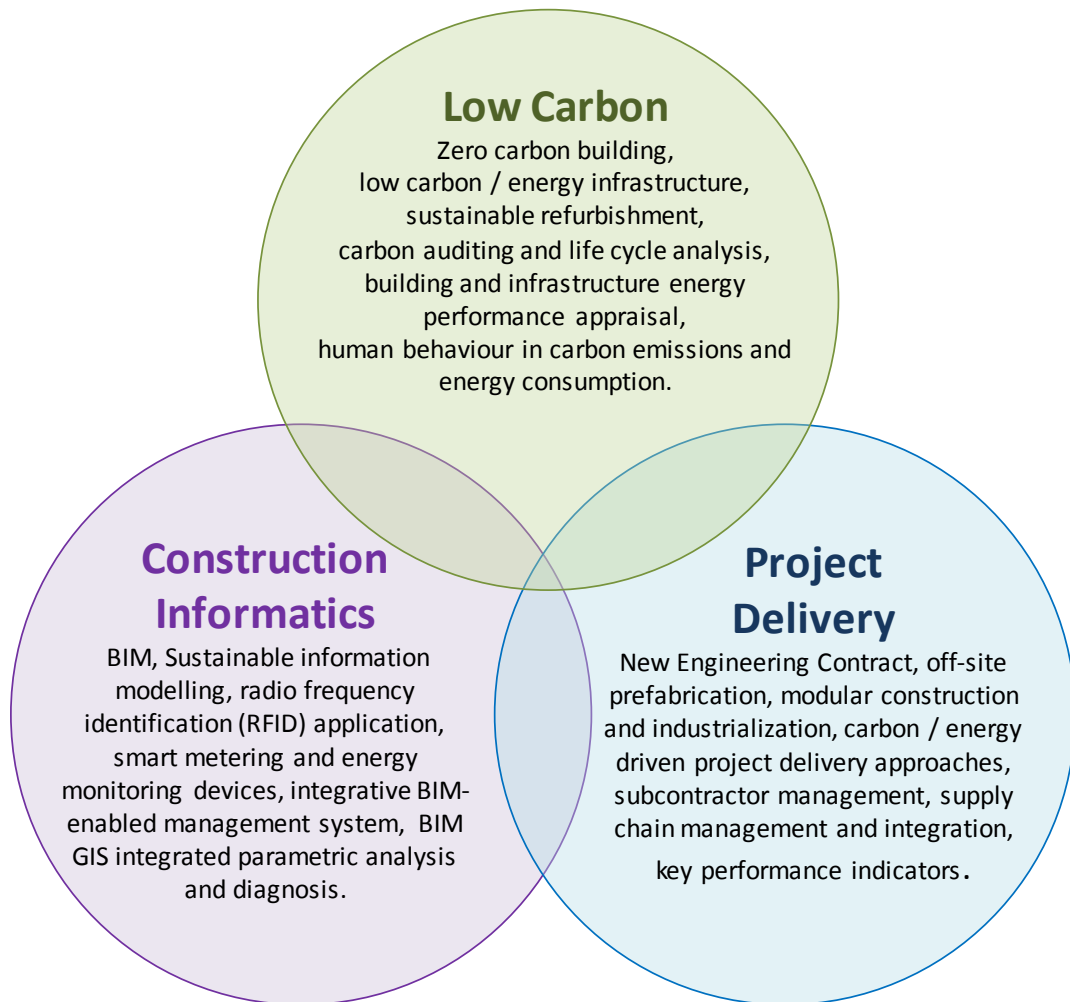
Emerging Topics

- Smart city and resilience
- Digital construction

Research Task Forces

The strategic research focuses are championed by the three corresponding Task Forces namely (i) Low Carbon; (ii) Project Delivery; and (iii) Construction Informatics, each being co-chaired by an academic (or an Associate Director of the CICID) and an expert in the field. Members of the Task Forces are from the CICID and invited experts from the industry and academic institutions, with nominations made by the Chairpersons of the Task Forces and endorsed by the Executive Director of the Centre.

The Chairpersons of the Task Force convene regular meetings to identify relevant research directions and review the research progress according to the research focuses. A report is prepared by the Task Forces for endorsement by the Management Committee.



CICID's Strategic Research Focuses

Management Committee

The Management Committee of CICID as of December 2017:

Chairman	Ir Prof. C.F. Lee
Vice Chairman	Ir Prof. C.K. Mak
Executive Director	Dr. W. Pan
Associate Director	Ir Prof. Sam Y.S. Chan
Founding Director	Ir Prof. M.M. Kumaraswamy
Honorary Advisors	Ir Prof. Thomas S.T. Ng Ir James Blake Ir T.C. Chew Ir Dr. the Hon. W.K. Lo
Industry Members	Prof. Ada Y.S. Fung Ir Dr. Leo K.K. Leung Ir Kevin Poole Ir Prof. Conrad T.C. Wong Ir L.M. Chow Ir Patrick Chan Ir Eva Kong
Industry Members (Co-opted)	Ir Prof. Sam Y.S. Chan Ir Martin K.K. Cheung Ir Dr. Sam C.M. Hui Ir Francis Kung Ms. Marigold Lau Ir Prof. Peter K.K. Lee Ir Henry Liu Ir Prof. C.K. Mak Ir Prof. Gary K.L. Soo
HKU – Civil Engineering	Ir Prof. Albert K.H. Kwan Dr. S.H. Lee Ir Prof. S.C. Wong
HKU – Other Departments	Prof. George Q. Huang Ir Prof. Steve Rowlinson

