THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

國家鋼結構工程技術研究中心香港分中心
Chinese National Engineering Research Centre For Steel Construction (Hong Kong Branch)

CNERC NEWSLETTER

APRIL 2021 ISSUE
JAN - APR 2021

FEATURE STORY

Visit of Development Bureau, Civil Engineering and Development Department and Buildings Department of The Government of HKSAR

Under the coordination of Ir John Kwong, Head of Project Strategy and Governance Office (PSGO), Development Bureau, Ir Ricky Lau, Director of Civil Engineering and Development Department (CEDD), and Mr. T. C. Yu, Director of Buildings Department (BD) visited CNERC in the afternoon of Friday 12 March 2021. The delegation team consisted of:

- Ir Ricky Chun Kit LAU, Director of CEDD
- Mr. Tak Cheung YU, Director of BD
- Ir John Ka Shing KWONG, Head of PSGO
- Ir Frankie Yiu Man FUNG, Chief Assistant Secretary of PSGO
- Ir Victor Wai-Tong CHAN, Assistant Secretary of PSGO
- Ir Tommy Fu Keung CHEUNG, Assistant Secretary of PSGO
- Ir Hon Shing KAN, Government Engineer / East of CEDD
- Ir Chi Keung LAM, Project Team Leader of CEDD
- Ir Humphrey Hon Kit HO, Assistant Director of BD
- Ir Alvin Ho Cheong LAI, Chief Structural Engineer of BD

The delegation team visited the Structural Engineering Research Laboratory, Laboratory Y001, of the PolyU, and inspected the research and testing capabilities of the CNERC for large scale structural tests. The delegation team was also introduced on a number of research and development projects on high strength S690 and S960 steels.

From left: Ir Ricky Lau, Prof. K. F. Chung, Mr. T.C. Yu, and Ir John Kwong

Visit of Beijing-Hong Kong Exchange of Personnel Centre

Mr. Zhiming LIU, General Manager of Beijing-Hong Kong Exchange of Personnel Centre led his team to visit CNERC on 24 March 2021. The delegation team consisted of:

- Mr. Z.M. LIU, General Manager
- Mr. J. JI, Deputy General Manager
- Ms. X. R. WANG, Deputy General Manager
- Ms. X. WU, Manager

From left: Prof. Michael Yam, Ms. X. R. Wang, Dr. H. C. Ho, Mr. Z. M. Liu, Prof. K. F. Chung, Mr. J. Jia, and Ms. X. Wu

Webinar series on Modular Integrated Construction

CNERC and Hong Kong Constructional Metal Structures Association jointly organized a series of webinar on Modular Integrated Construction (MiC). The first MiC webinar was held in November 2020, and starting from January 2021 the webinars series on MiC Technology will be held weekly to provide the latest information on research findings and engineering applications in MiC technology.

On 7 January 2021, we were privileged to have Dr. Amos Darko, Research Assistant Professor of the Department of Building and Real Estate at The Hong Kong Polytechnic University to share his research findings and the engineering applications. His presentation title was "MiC: The Construction Industry's COVID-19 Pandemic Breakthrough". Over 300 engineers had attended the webinar, and the participants actively participated in the Q&A session.

Dr. Amos Darko, speaker of the webinar (left), and Dr. Andy Leung, host of the webinar (right).

The third CNERC and Hong Kong Constructional Metal Structures Association jointly organized webinar on MiC Technology was held on 14 January 2021. We were privileged to have Dr. T. M. Chan, Associate Professor of the Department of Civil and Environmental Engineering at The Hong Kong Polytechnic University to share his research findings and the engineering applications. His presentation title was "Application of steel tubular sections in MiC". Over 270 engineers had attended the webinar, and the participants actively participated in the Q&A session.

Dr. T. M. Chan, speaker of the webinar (right), and Dr. H. C. Ho, host of the webinar (left).

The fourth CNERC and Hong Kong Constructional Metal Structures Association jointly organized webinar on MiC Technology was held on 21 January 2021. We were privileged to have Ms. Michele Lui, Project Manager of Hip Hing Construction Co. Ltd to share her experiences and the engineering applications. Her presentation title was "HKSTP, InnoCell – 1st Hybrid MiC Pilot Project in Hong Kong". Over 280 engineers had attended the webinar, and the participants actively participated in the Q&A session.

Ms. Michele Lui, speaker of the webinar (right), and Prof. Michael Yam, host of the webinar (left).

Visit of Representatives of Construction Innovation and Technology Fund

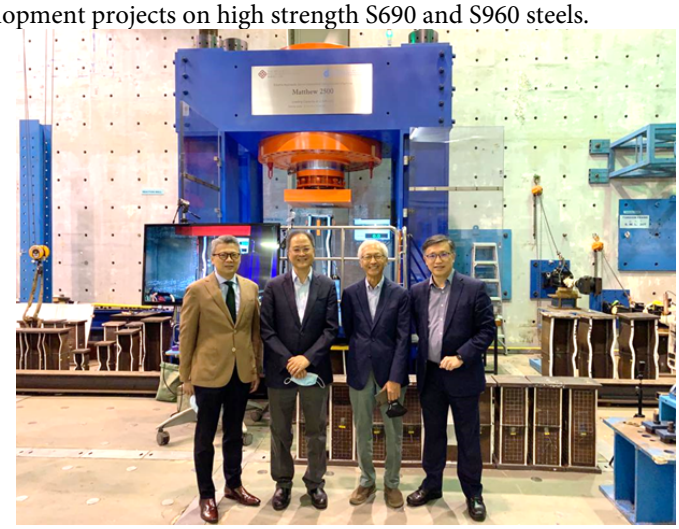
Mr. Frankie Tai of Development Bureau and Ms. Oi Yen Lee of Construction Industry Council visited the CNERC on 25 January 2021, and the delegation team consisted of:

- Mr. Frankie TAI, Assistant Secretary, DEVB
- Ms. Oi Yen LEE, Assistant Director, CIC
- Mr. Sam CHAN, Manager of CITF, CIC
- Ms. Michelle Cheung, Executive Officer, DEVB
- Mr. Raymond CHAN, Director, Nielsen
- Ms. Serene CHAN, Senior Manager, Nielsen

From left: Dr. T. M. Chan, Ms. Serene Chan, Ms. Michelle Cheung, Dr. Andy Leung, Mr. Raymond Chan, Mr. Frankie Tai, Prof. K. F. Chung, Ms. O. Y. Lee, and Mr. Sam Chan

Visit of Goldwave Steel Structures Engineering Limited

Mr. Victor So and Mr. Alan Li Goldwave Steel Structures Engineering Limited visited CNERC on 7 April 2021. They visited the Structural Engineering Research Laboratory, Laboratory Y001, of the PolyU, and inspected the research and testing capabilities of CNERC for large scale structural tests. Both of them were introduced on a number of research and development projects on high strength S690 and S960 steels.

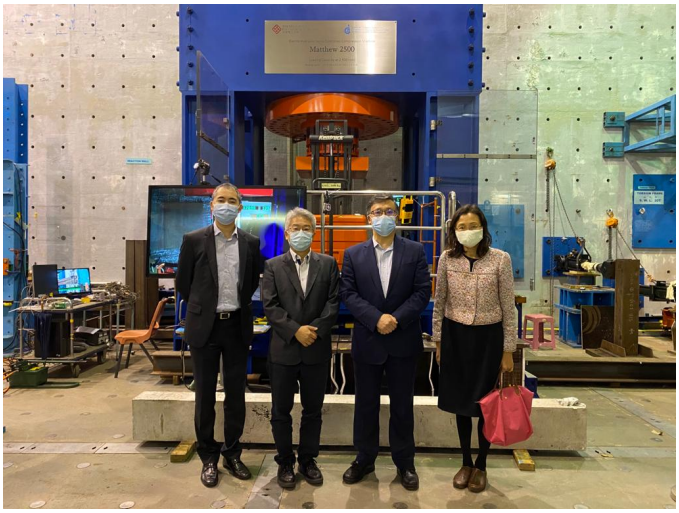


From left: Prof. Michael Yam, Mr. Alan Li, Mr. Victor So, and Prof. K. F. Chung

Visit of Housing Department

Ir Rayson Wong, Chief Structural Engineer of Housing Department and his team visited CNERC on 9 April 2021.

Visit of Hong Kong-Shenzhen Innovation and Technology Park Ltd.



Mr. Patrick Siu, CEO of Hong Kong-Shenzhen Innovation and Technology Park Limited and his team visited CNERC on 19 April 2021.

Optimum Construction Procedure, Sequence, and Assembly of MiC Modules

Hong Kong is facing ageing and shortage of skilled labours in construction industry resulting in high construction cost and reduced productivity thereby increasing the gap between supply and demand in housing units. Modular Integrated Construction (MIC) is an innovative method where modules manufactured in factory are transported to construction site for installation and has potential to improve productivity, safety and quality while minimizing environmental impact and reduce construction time. However, adoption of MIC in Hong Kong faces challenges of dynamic weather conditions and congested construction site. To address the need for optimum construction procedure, sequence and assembly of modules, a hybrid simulation model composed of Discrete Event Simulation (DES) and System Dynamics (SD) is developed to assess the productivity of MIC. Manpower and construction equipment data was used to develop DES model while dynamic factors such as productivity and weather data of Hong Kong was used in SD model. To test and validate the developed model sensitivity analysis was carried out followed by 4D visualization using Building Information Modelling (BIM). 4D visualization can help in verification of planning of module assembly sequence and provide timely warnings to take corrective steps in planning and optimization.

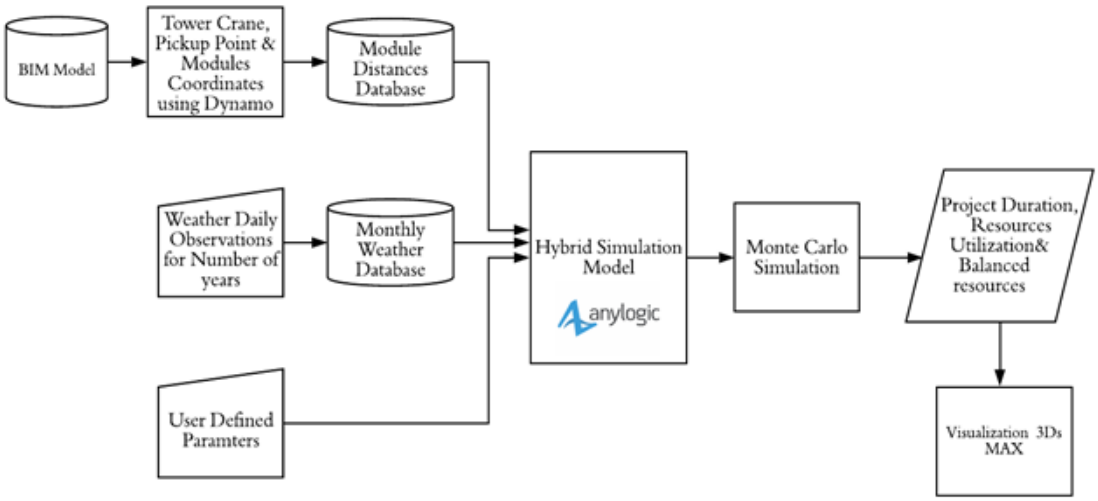
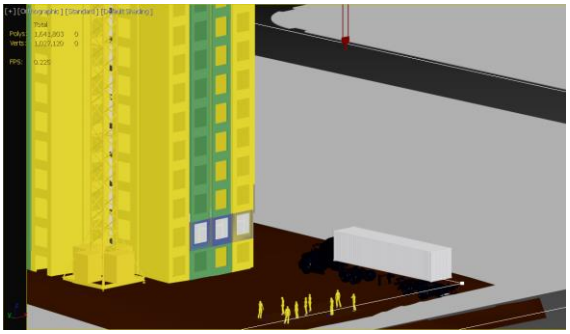
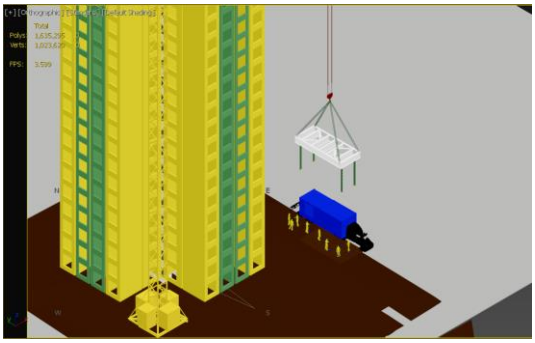


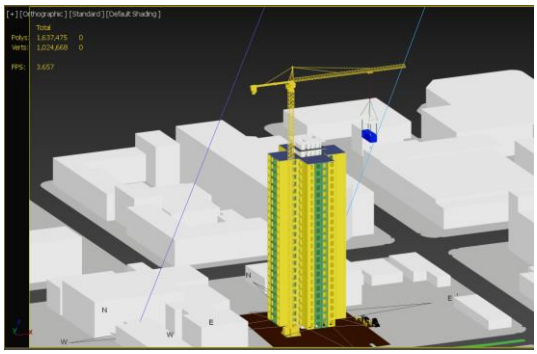
Figure 1: Hybrid simulation model implementation



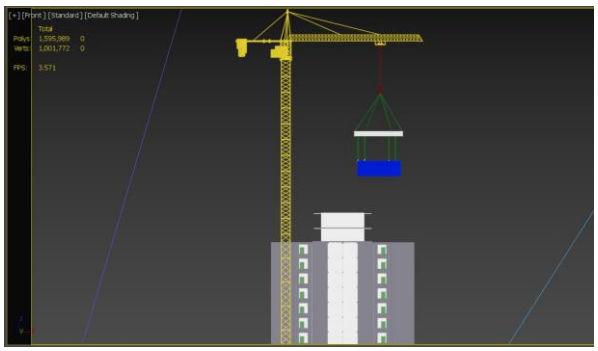
(a) Truck bringing module at site



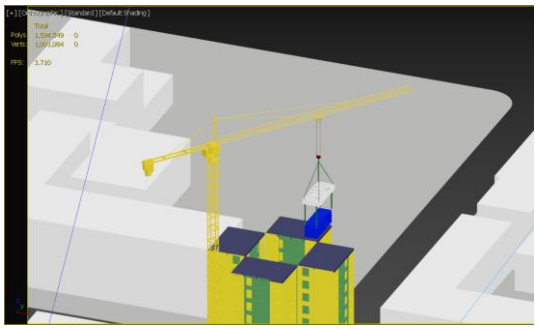
(b) Tying of modules to lifting hoist



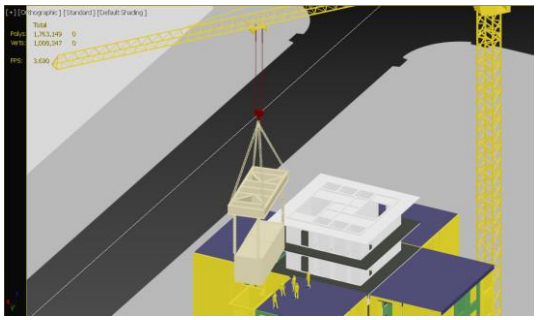
(c) Lifting of modules



(d) Rotation of crane jib



(e) Alignment of module



(f) Final placement of the module

Figure 2: 4D Visualization of construction sequence assembly of MIC modules

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