

FEATURE STORY

Establishment of Guangdong-Hong Kong-Macao Greater Bay Area Construction Technology Alliance

The Guangdong-Hong Kong-Macao Greater Bay Area Construction Technology Alliance was established on 6 January 2024, and Prof. K. F. Chung, Director of CNERC led his delegation team including Dr. H. C. Ho, Deputy Executive Secretary, Dr. Y. F. Hu, Research Assistant Professor, and Dr. B. Li, Postdoctoral Fellow to attend the first meeting of the Alliance.

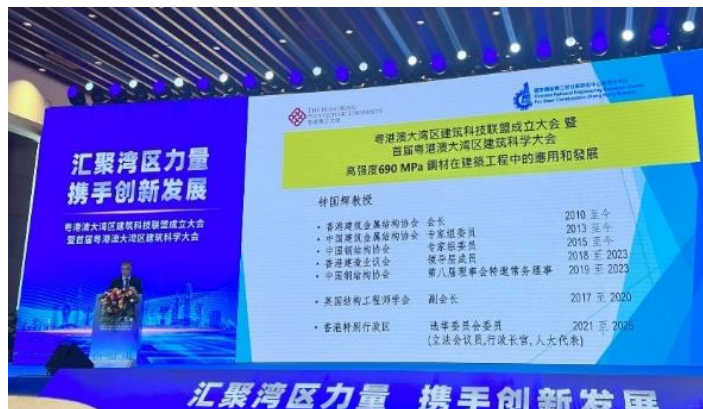


At the meeting, the Alliance's Charter, as well as appointment of Chairman, Vice Chairmen, and Directors were confirmed. Of which, CNERC was unanimously approved as one of the Vice Chairman units, and Prof. K. F. Chung was appointed as Deputy Secretary General of the Alliance.

On 7 January 2024, the Inauguration Ceremony of the Guangdong-Hong Kong-Macao Greater Bay Area Construction Technology Conference was held. Prof. K. F. Chung was invited as a Keynote Speaker and gave a presentation on "Application and Development of High Strength 690MPa Steel in Construction", and other representatives from Guangdong, Hong Kong and Macao had given their respective presentations. The Conference was attended by over 400 delegates.



Prof. Chung gave a detailed presentation starting from mechanical properties and microstructure analysis of Q690 steel, research field was gradually expanded to the welding control, structural response, and standard formulation of high-strength Q690 steel, and finally promoted its application in actual engineering projects in Hong Kong and mainland China, such as the completed Tseung Kwan O Cross-Bay Bridge and the steel dome of the Yuen Long Sports Center, which is still under construction. His presentation was well received by the audience.



NEWS

Technical Seminar on “Effective Use of High Strength S690 Steel in Construction”

A Technical Seminar on “Effective Use of High Strength S690 Steel in Construction” was jointly organized by CNERC and Buildings Department of Government of HKSAR on 12 January 2024 with over a hundred of delegates attended.



NEWS

Visit to China Construction Industrial Engineering and Technology Research Academy Co., Ltd.

On 17 January 2024, Prof. K. F. Chung, Director of CNERC, Dr. H. C. Ho, Deputy Executive Secretary, Dr. Y. F. Hu, Research Assistant Professor, and Dr. B. Li, Postdoctoral Fellow, visited China Construction Industrial Engineering and Technology Research Academy Co., Ltd.. They had an in-depth exchange with Mr J. Q. Sun, Chief Engineer of China Construction Industrial Engineering and Technology Research Academy Co., Ltd., Ms. X. Q. Zhang, General Manager of its testing company, Mr. J. Li, Assistant Manager of the Science and Technology Management Department, Mr. Y. B. Zhang, Deputy Chief Engineer and Manager of the Bridge and Structural Engineering Research Institute on technical collaboration of high-strength S960 steel.



NEWS

CIC Appreciation Lunch

Prof. K. F. Chung attended the CIC Appreciation Lunch as Chairman of the BIM Certification and Accreditation Board from 2018 to 2024 with Members and Accessors of BIMCAB on 24 January 2024.



NEWS

Visit of Civil Engineering and Development Department of the Government of HKSAR

CNERC research team demonstrated the high strength S960 steel experiment to delegates from Civil Engineering and Development Department of the Government of HKSAR at Structural Engineering Research Laboratory of PolyU on 2 February 2024.



NEWS

Council Member's Badge, Construction Industry Council

Prof. K. F. Chung received a Council Member's Badge of the Construction Industry Council at its Annual Cocktail Reception to honour his 6-year service from 2018 to 2024 to CIC. The Badge was presented by Ms. Bernadette Linn, JP, Secretary for Development of the Government of Hong Kong SAR, and Ir Thomas Ho, Chairman of CIC on 21 February 2024.



NEWS

Prof. K. F. Chung, Director of CNERC, was invited by The Chartered Institution of Highways and Transportation (Hong Kong) and the Hong Kong Institution of Engineers to deliver a technical presentation entitled “Effective Use of High Strength S690 Steel in Construction” on 5 April 2024.



NEWS

National University of Singapore – Woh Hup Distinguished Lecture

Prof. K. F. Chung, Director of CNERC, was invited by the National University of Singapore on 27 March 2024 to deliver the **Woh Hup Distinguished Lecture** organized by Prof. Richard Y. J. Liew and Dr. X. D. Qian. Dr. H. C. Ho, Deputy Executive Secretary, Dr. Y. F. Hu, Research Assistant Professor, and both Ms. M. F. Li and Mr. W. Chen were also invited to present their research work. This event registered a close technical collaboration between CNERC and NUS on modern steel construction technology on high strength steel construction.



Prof. Chung taking a photo with Prof. Liew and Dr. Qian together with CNERC delegates

In this event, a total of 5 technical presentations were made to report recent developments on effective use of high strength S690 steel in construction, and key aspects on the structural behaviour of steel members and joints under various actions were reported.



“High strength S690 steel and research into their mechanical properties & structural behaviour”
by Prof. K.F. Chung



WOH HUP DISTINGUISHED LECTURE

High Strength S690 Steel and Research into Their Mechanical Properties & Structural Behaviour

Abstract

High-strength S690 steel offers huge advantages in construction because of reduced use of materials and improved productivity. However, there is a lack of a comprehensive understanding of the mechanical properties of their welded sections, and the also structural behaviour of their members.

This presentation describes several number of research projects conducted at CNERC over the past 7 years, and these include

- i) microstructural evolution within heat-affected zones of welded sections,
- ii) distributions of residual stresses in fabricated sections and within their thicknesses, and
- iii) local plate buckling as well as overall member buckling are examined.

Key findings of these projects contribute to the successful adoption of the high strength S690 steel in construction in both Hong Kong and Macau.

Speaker Biography

Professor Chung is an internationally renowned academic, researcher and structural engineer with established expertise in steel construction. Currently, he is a Professor at the Department of Civil and Environmental Engineering, and Founding Director of the Chinese National Engineering Research Centre for Steel Construction (Hong Kong Branch) at The Hong Kong Polytechnic University. He obtained his first degree from the University of Sheffield, and his doctoral degree from the Imperial College of Science, Technology and Medicine.

Prof. Chung works on a wide range of inter-disciplinary engineering investigations, analyses and simulations, especially on modern steel and steel-concrete composite structures. His research interests include mechanical properties and structural behaviour of high-strength steel, limit state analyses and performance-based design of structural systems, structural fire engineering and fire protection in buildings and tunnels, and design codification. In the recent years, with strong support from the construction industry and various government departments and regulatory agents, Prof. Chung has extended his applied research interests into the effective use of high-performance materials, sustainable infrastructure development, and corrosion protection of structural steelwork.

Prof. Chung serves as a Member of the Construction Industry Council in Hong Kong since 2018, and he was Vice President of the Institution of Structural Engineers in the U.K. from 2017 to 2020.

Professor Chung Kwok-Fai
The Hong Kong Polytechnic University
Hong Kong SAR, China



Host

A/Professor Qian Xudong

Department of Civil and Environment Engineering,
NUS

Date and Time

27 March 2024, Wednesday

10.00 am - 11.00 am

Venue

Lecture Theatre 427, SDE3
National University of Singapore
4 Architecture Drive
Singapore 117566

REGISTER NOW

RSVP by
25-Mar 2024, 2.30 PM

PDU points pending



Ductile fracture properties of high-strength structural steel

Speaker Biography

Dr Ho presently holds the position of Principal Research Fellow within the Department of Civil and Environmental Engineering at the Hong Kong Polytechnic University. Since the inception of the Chinese National Engineering Research Centre for Steel Construction (Hong Kong Branch) in October 2015, he served as its Deputy Secretary General. In 2020, he assumed additional responsibilities as the Deputy Executive Secretary of the CNERC and took charge of the CNERC Laboratory for Mechanics and Steel Materials. His areas of expertise encompass a wide range of fields including steel structures, cold-formed steel structures, bamboo structures, modular integrated construction, and fire-resistant design.

Dr Ho Ho Cheung
The Hong Kong Polytechnic University
Hong Kong SAR, China



Structural Behaviour and Application of Cold-formed High Strength S690 Steel Tubular Joints

Speaker Biography

Dr Hu Yi-Fei is the Deputy Laboratory-in-charge of the CNERC Laboratory for Mechanics and Steel Materials of the Chinese National Engineering Research Centre for Steel Construction (Hong Kong Branch). He is currently a Research Assistant Professor in Structural Engineering at the Hong Kong Polytechnic University. Dr Hu received his BEng degree from Tongji University in 2012, and his MSc degree from the Hong Kong Polytechnic University in 2013. He worked as a graduate structural engineer for an international engineering consulting firm in Hong Kong from 2013 to 2014. After he received his PhD degree from the Hong Kong Polytechnic University in 2019, Dr Hu joined the Chinese National Engineering Research Centre for Steel Construction (Hong Kong Branch) as a Postdoctoral Fellow. Dr Hu's research has been focused on high-performance steel materials and their structural behaviour.

Dr Dr Hu Yi-Fei
The Hong Kong Polytechnic University
Hong Kong SAR, China



Date and Time

27 March 2024, Wednesday

11.00 am - 12.00 pm

Venue

Lecture Theatre 427, SDE3
National University of Singapore
4 Architecture Drive
Singapore 117566

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25 Mar 2024, 2.30 PM
PDU points pending



Department of Civil &
Environmental Engineering
College of Design and Engineering

Buffet lunch will be served after the Q&A session.
Registration is compulsory.

Ductile fracture behaviour of S690 and S960 high-strength steel under monotonic tensile actions

Speaker Biography

Ms Li is a PhD student of the Chinese National Engineering Research Centre for Steel Construction (Hong Kong Branch) at The Hong Kong Polytechnic University. She obtained her master's degree from Tianjin University. Currently, she is working on the research topic of ductile fracture of high-strength steels and its applications on welded connections.

Ms Li Mengfei
The Hong Kong Polytechnic University
Hong Kong SAR, China



Fatigue performance of high-strength S690 steel and their welded sections

Speaker Biography

Mr Chen is a PhD student at the Chinese National Engineering Research Centre for Steel Construction (Hong Kong Branch) at The Hong Kong Polytechnic University. He received his BEng degree in Civil Engineering from Fuzhou University in 2019 and his MSc degree in Civil Engineering from the Hong Kong Polytechnic University in 2020. His research interest is the fatigue behaviour of high-strength S690 steel and its welded sections.

Mr Chen Wei
The Hong Kong Polytechnic University
Hong Kong SAR, China



Date and Time

27 March 2024, Wednesday
11.00 am - 12.00 pm

Venue

Lecture Theatre 427, SDE3
National University of Singapore
4 Architecture Drive
Singapore 117566

REGISTER NOW

RSVP by
25 Mar 2024, 2.30 PM

PDU points pending



Department of Civil &
Environmental Engineering
College of Design and Engineering

**Buffet lunch will be served after the Q&A session.
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NEWS

Third International Symposium on Advances in Steel & Composite Structures

Prof. K. F. Chung, Director of CNERC, was invited to make a plenary presentation in **the Third International Symposium on Advances in Steel & Composite Structures** on 28 March 2024 in Singapore. Dr. H. C. Ho, Deputy Executive Secretary, Dr. Y. F. Hu, Research Assistant Professor, Ms. M. F. Li and Mr. W. Chen were also invited to attend the Symposium.

This International Symposium was jointly organized by the Singapore Structural Steel Society and supported by the Building and Construction Authority of the Government of Singapore, and the National University of Singapore. It serves as a platform for renowned researchers and engineers to disseminate their new findings on advanced design and construction technology of steel and composite structures. Experts from China, Hong Kong, Japan, Korea and Singapore have been invited to share their knowledge and experience in design and construction of steel and composite structures to about 250 delegates.



*“Effective Use of High Strength S690 Steel in Construction - Are We Ready?”
by Prof. K. F. Chung*



Opening address by Er Thanabal Kaliannan,
Group Director and Commission of Building Control Building and Construction Authority



Er Dr. Tran Chi Trung presented a souvenir to Prof. Chung
Dr. Tran is Director of Strategic Engineering Project Department,
Building Engineering Group of the Building and Construction Authority



The Symposium was attended by about 250 design and construction engineers
from both public and private sectors



Prof. Chung presenting to the audience of about 250 design and construction engineers

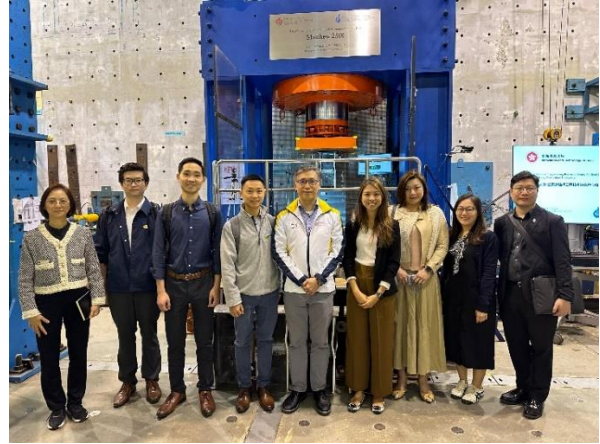


Prof. K. F. Chung and Prof. S. P. Chiew together with CNERC delegates

VISIT



Prof. X. G. Wu, School of Civil Engineering, Harbin Institute of Technology visited CNERC on 14 March 2024.



Delegates of CIC and Hong Kong Green Building Council visited Structural Engineering Research Laboratory at PolyU and CNERC for discussion on Carbon Footprint Assessment on 19 March 2024.



Mr. Alex Kwan, CEO of Asia Infrastructure Solutions led a group of Graduate Engineers visited Structural Engineering Research Laboratory at PolyU on 25 March 2024.



Shenzhen Hetao Cooperation Zone delegation team visited Structural Engineering Research Laboratory at PolyU on 24 April 2024.



CNERC RESEARCH

The CNERC Newsletter incorporates research articles from our researchers in aim to share the latest findings in their research work. Should there be any question or comment in these research works, you may send an email to: cnerc.steel@polyu.edu.hk or contact the researchers directly.

The researchers' contact information is available right at the end of each article.

RESEARCH

Deconstruction, Relocation and Reinstallation of MiC units in Nam Cheong 220

The aim of this study is to investigate and document the technical aspects involved in deconstructing and relocating a Temporary Modular Building (TMB) in Hong Kong. With the increasing demand for affordable and sustainable housing solutions, modular integrated construction (MiC) and temporary modular building (TMB) have emerged as viable options. However, there is limited research on the deconstruction and relocation process of TMBs, particularly in Hong Kong. This study aims to fill this gap by providing a detailed documentation of the technical aspects involved in the deconstruction and relocation of a TMB.

Modular Integrated Construction (MiC) and Temporary Modular Building (TMB) are innovative building techniques that involve the offsite fabrication and assembly of building components. MiC refers to a construction approach that uses factory-produced standardized modules or components, which are then transported to the construction site for assembly. TMB, on the other hand, refers to a type of building that is designed for temporary use and can be easily dismantled and relocated. These construction methods offer several advantages over traditional construction methods, such as reduced construction time, increased efficiency, and improved quality control.

The "Nam Cheong 220" transitional housing deconstruction work commenced on February 18, 2023, and serves as the case study for this project. This building comprises 89 residential units with a total capacity of approximately 160 people, and includes 12 typical TMB units made of structural steel and precast concrete slabs. The entire building was scheduled to be deconstructed within one month. After disassembly, the MiC units were shipped to the Hung Shui Kiu temporary storage yard for inspection, renovation, and maintenance. Then, all MiC units will be relocated and placed in Wong Yue Tan, Tai Po, for reassembly. This case study provides a unique opportunity to investigate the technical aspects involved in the deconstruction and relocation of a TMB, and to identify the challenges and opportunities for the application of these innovative construction techniques in Hong Kong.



Collaboration between: Chinese National Engineering Research Centre for Steel Construction (CNERC), Jockey Club Design Institute for Social Innovation (DISI) and Department of Building & Real Estate (BRE) of The Hong Kong Polytechnic University

Researcher: Mr. Eric YUEN (email: 22037193r@connect.polyu.hk)

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