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Technical Visit to Shanghai
2019.06.03-04

The CNERC paid a visit to Shanghai for technical exchange, and the delegation team consisted of:

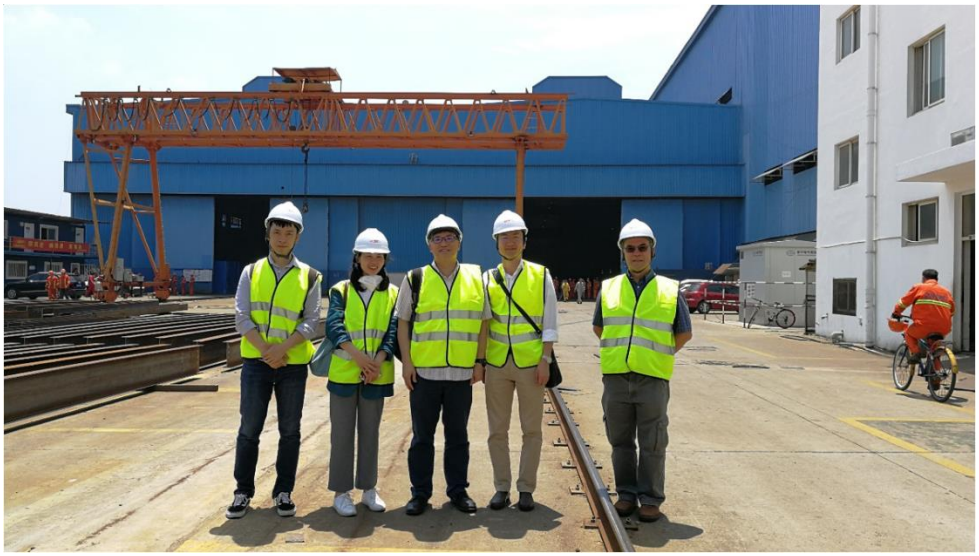
- Ir Prof. K. F. Chung Director of CNERC
- Dr. M. H. Shen Secretary of Composite Structures Committee, CNERC
  Lecturer of Shanghai Institute of Technology
- Mr. H. Jin Research student of CNERC

During the two-day visit, the delegates of the CNERC visited the leaders and technicians of the following units:

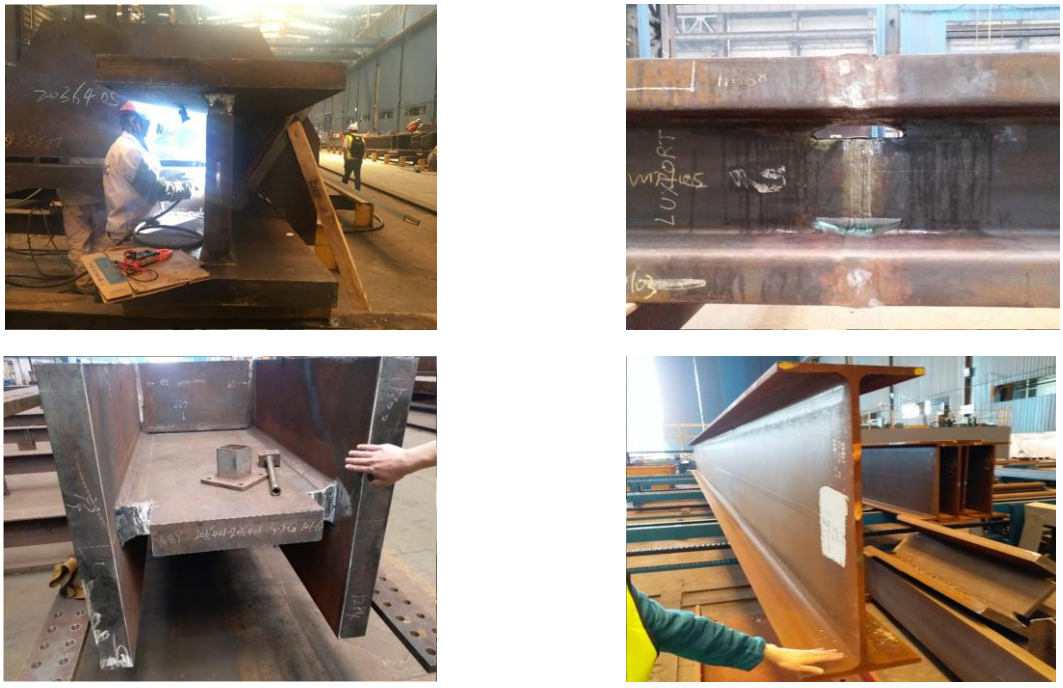
- Mr. H. L. Liu, Assistant General Manager, and Mr. R. S. Li of China Road and Bridge Corporation (Hong Kong)
- Mr. L. F. Ma, Deputy General Manager, and Mr. C. S. Yang of Shanghai Zhenghua Heavy Industries Company Limited
- Mr. J. Y. Xu, Chairman and Ms. Y. H. Zhang, General Manager of Shanghai Beststeel (Holdings) Limited

The itinerary of this trip included:

1. Visited the Headquarters of Shanghai Zhenghua Heavy Industries Company Limited, and China Roads and Bridges (Hong Kong), and also discussed with the leaders and technicians of Zhenhua Heavy Industries Company Limited about the S690 high-strength steel plate welding research project for the Tseung Kwan O Cross Bay Link Project in Hong Kong;
2. Visited the Changxing Branch Factory of Shanghai Zhenhua Heavy Industries Company Limited to inspect the thick plate welding process;
3. Visited the laboratories and factory production line of Shanghai Beststeel (Holdings) Limited, and discussed about research collaboration on thin-walled cold-formed steel.



From left: Mr. H. Jin, Dr. M. H. Shen, Prof. K. F. Chung, Mr. H. L. Liu, and Mr. R. S. Li



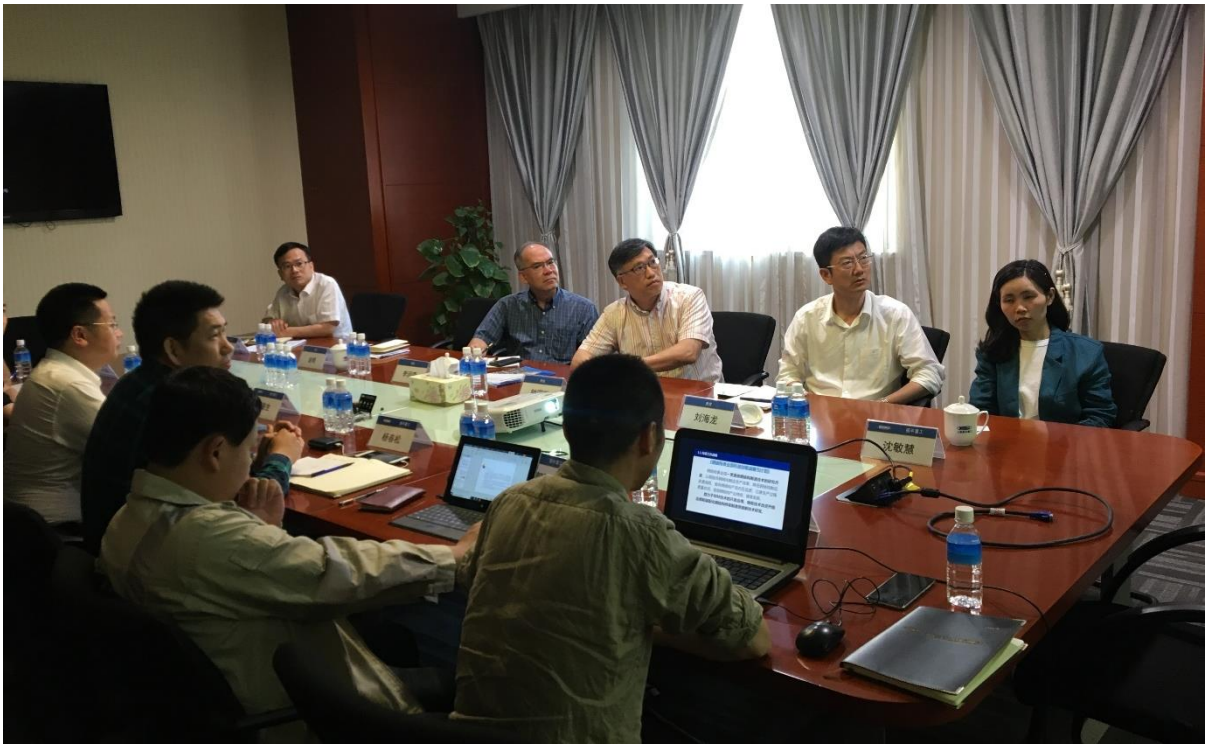
Welding process at the Changxing Branch Factory of
Shanghai Zhenhua Heavy Industries Company Limited

On the afternoon of 3 June 2019, Prof. K. F. Chung and his delegation team visited the Shanghai Zhenhua Heavy Industries Company Limited, and seen the product exhibition hall of Zhenhua Heavy Industries. Together with the China Road and Bridge Corporation (Hong Kong), the three parties had discussed about the board welding matters of the research collaboration in the S690 high-strength steel thickened of the Tseung Kwan O Cross Bay Link Project.

The meeting was hosted by Mr. H. L. Liu, China Road and Bridge Corporation (Hong Kong). At the beginning of the meeting, Mr. Q. Guo, Zhenhua Heavy Industries Co., Ltd. introduced their completed and ongoing research projects, scientific research team personnel, and experimental capabilities of Zhenhua, and then focused on the steel structure of the Tseung Kwan O project. The project made detailed explanations on the production situation, time schedule of Zhenhua Heavy Industries and the major problems in the production of heavy plate welding, and the current standard of thick plate welding technology of Zhenhua was also explained in detail.

Prof. K. F. Chung first introduced the background of the CNERC, as well as exhibited the past research progress in high-strength steel materials, structural parts and welded parts. In response to Zhenhua's current thick plate welding process standards, Prof. K. F. Chung fully affirmed the detailed standardization process, and pointed out that the uniqueness of the project is the application of S690 high-strength steel. Unlike previous thick plate welding, high-strength steel may have softening characteristics in the heat-affected zone after welding. Therefore, the heat input should be strictly controlled during the welding process. This is a technical problem that does not need to be dealt with when welding common steel structures. The research collaboration of the three parties can be launched, and the following three collaboration agenda were proposed:

- High-strength steel welding process and evaluation standards
- Improve the quality assessment standard for high-strength steel welding
- Develop high-strength steel welding real-time monitoring system

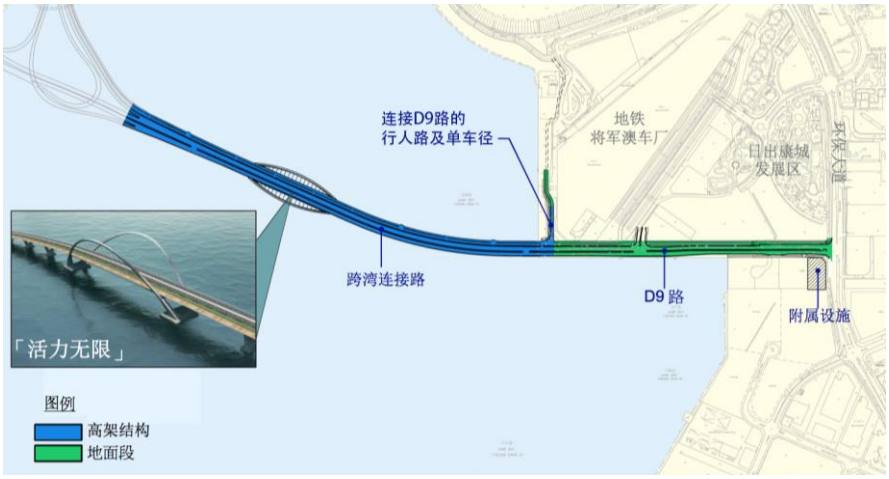


Discussion among Zhenhua, China Road and Bridge, and CNERC.

Subsequently, the three parties discussed the feasibility of the collaboration, listed further research and development directions for the details of the project implementation and major problems, and improved the details of high-strength steel welding monitoring. At the same time, after the welding of the factory is completed, real-time data analysis would be carried out on the welding work at the construction site, and the feasible schemes and details of the monitoring were discussed.

- Project background

The Tseung Kwan O Cross Bay Link Project will link the Tseung Kwan O - Lam Tin Tunnel and the Environmental Protection Road in Area 86 of Tseung Kwan O. The main bridge will be built by the China Road and Bridge Corporation (Hong Kong), the associated elevated road and related works. Total cost of the project is about HK$2.5 billion. Construction of a two-lane carriageway with a length of about 1.8 km and a cycle track and footpath. Zhenhua Heavy Industries produced nearly 12,000 tons of steel structure and transported it to Hong Kong. The main bridge is a medium-duty steel arch bridge with a span of 210 meters. Its box arch ring uses 4,400 tons of S690 high-strength steel.



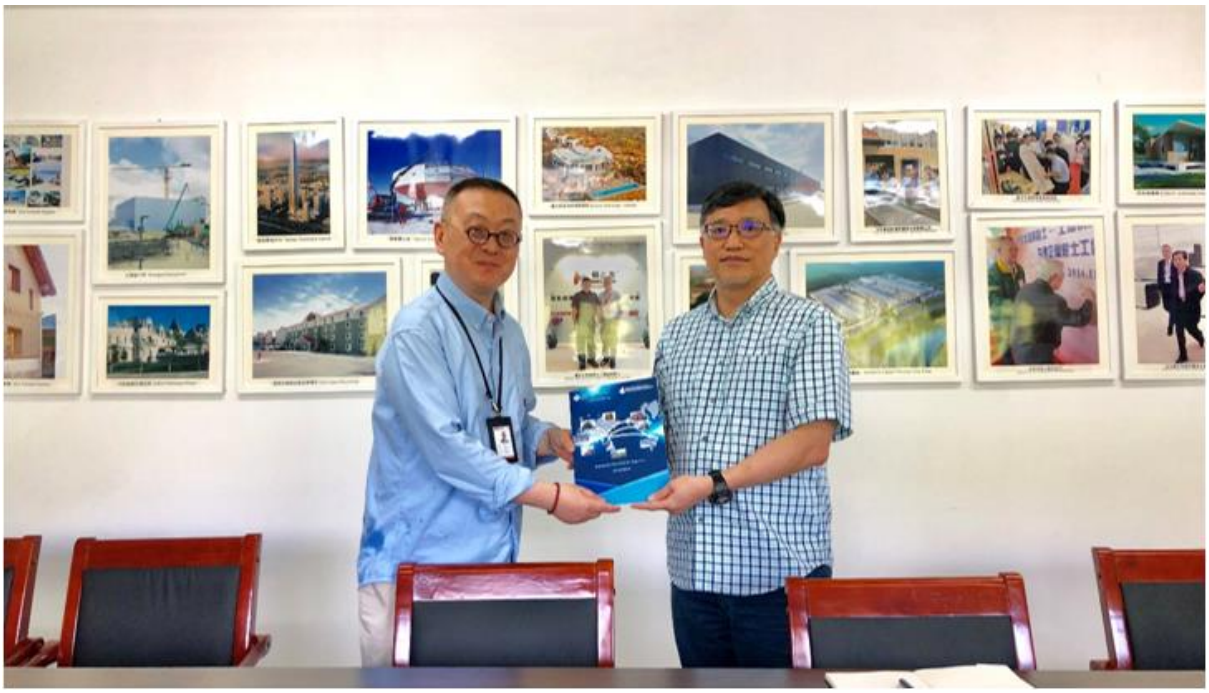
Project summary of the Tseung Kwan O Cross Bay Link Project: www.cbltko.hk

Visit of Shanghai Beststeel (Holdings) Limited

On 4 June 2019, Prof. K. F. Chung visited Shanghai Beststeel (Holdings) Limited, and discussed about the application and development work of cold-formed thin-walled steel maintenance system and the cold-formed thin-walled light steel building system with Mr. J. Y. Xu, Chairman and Mr. Y. F. Qin, Deputy General Manager.

The Chairman, Mr. J. Y. Xu introduced the history and recent development of Shanghai Beststeel (Holdings) Limited, and also made a detailed presentation on the five major product series, namely: prefabricated metal roof wall and floor slab system, ZIP-LOCK system, metal composite insulation board system, thin-walled light steel residential system, art board systems and welded roofing systems, and listed the advanced technology applied. At the same time, Beststeel has the ability to research and innovate, and there are laboratories suitable for cold-formed thin-walled steel components.

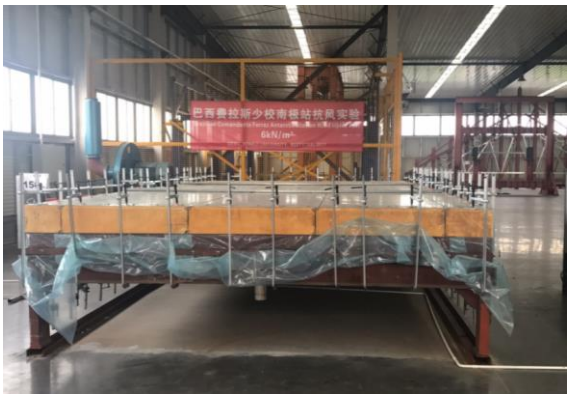
After that, Prof. K. F. Chung introduced the background and development of the CNERC and its research achievements, and presented the CNERC Annual Report 2018 to Chairman J. Y. Xu. Regarding the cold-formed thin-walled steel structure system, Prof. K. F. Chung and Chairman J. Y. Xu further discussed on the similarities and differences between the local and overseas standards and design provisions at present for guiding the product development in future.



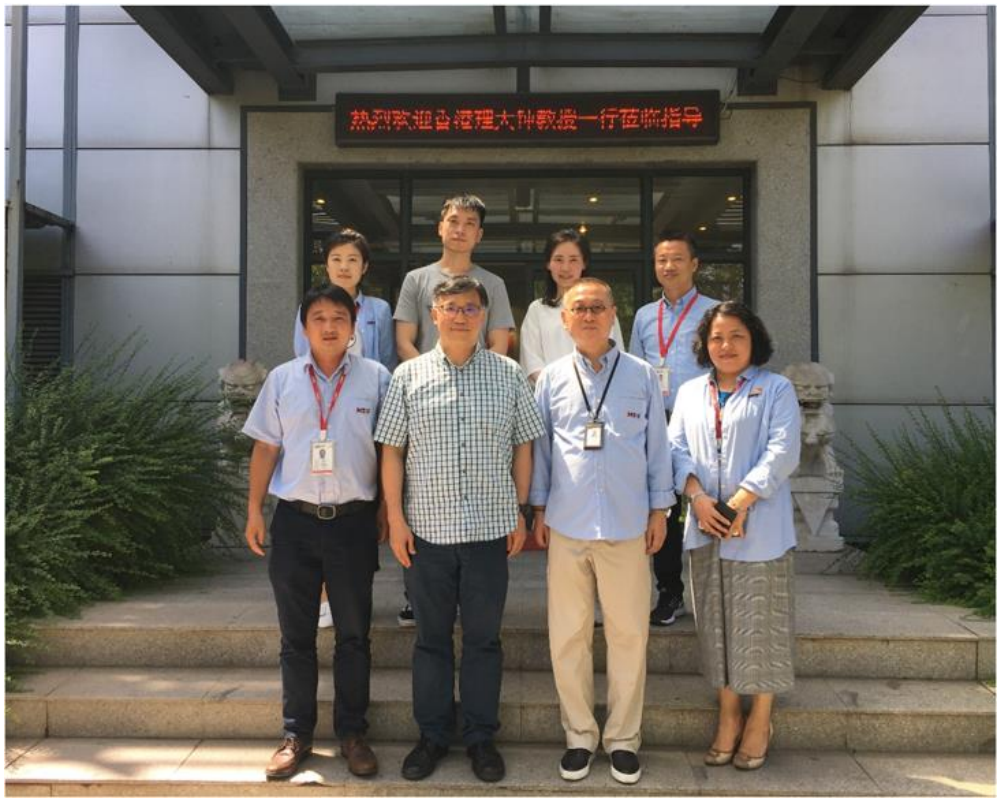
Prof. K. F. Chung presented the CNERC Annual Report to Mr. J. Y. Xu, Chairman of Shanghai Beststeel (Holdings) Limited.

Accompanied by Chairman J. Y. Xu, Prof. K. F. Chung and his team visited the automated production line, innovation laboratory and saw the demonstration of cold-formed thin-walled steel sample hall of The Beststeel. The cold-formed thin-walled light steel building system is derived from the architectural form of North American wood structure, the main load-bearing structure is a cold-formed steel of 0.8 to 1.6 mm, and the bearing capacity of the structural parts,

the wind resistance of the roof, the seismic level have gone through strict experimental verification. The Beststeel's innovation laboratory has the ability to load structural and wind-resistant experiments and meet the US FM certification test standards.



Innovation Laboratory of Shanghai Beststeel (Holdings) Limited



A group photo at Shanghai Beststeel (Holdings) Limited (first row from left): Mr. Y. F. Qin, Deputy General Manager; Prof. K. F. Chung, Mr. J. Y. Xu, Chairman; and Ms. Y. H. Zhang, General Manager.