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## Chinese National Engineering Research Centre for Steel Construction (Hong Kong Branch) Newsletter – Special Issue (March 2023)

A project entitled “*Innovative construction technology and application of high strength S690 steel in construction*”, led by Prof. K. F. Chung, Director of Chinese National Engineering Research Centre for Steel Construction (Hong Kong Branch) [CNERC] received a Grand Prize on Innovative Application of the Hong Kong Institution of Engineers (HKIE) Grand Award 2023 (<https://hkengineersweek.com/engineers-week/#HKIE-Grand-award>). The prize presentation was held at the Convention Hall of Hong Kong Convention and Exhibition Centre, Wan Chai on 9 March 2023.

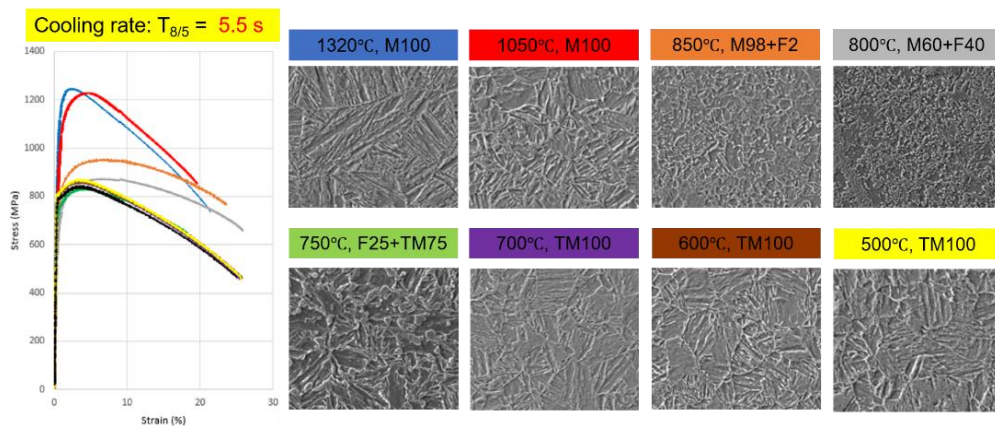


The HKIE Grand Award was presented by  
The Honourable Winnie W.Y. Ho, Secretary for Housing of the Government of Hong Kong SAR,  
and Ir Aaron K.M. Bok, President of the Hong Kong Institution of Engineers.

The award-winning project was an innovation that enables a modern construction technology using the high strength S690 steel to achieve significant savings in construction materials, manpower demand, and carbon footprints. Typical applications include long span roof structures and footbridges, large scale noise closure, piles supporting heavily loaded structures and buildings, and supporting members in road bridges.

Owing to its structural and economical advantage over normal strength steel, high strength S690 steel offers attractive structural solutions in building and civil engineering construction. In order to improve productivity of the construction industry in Hong Kong, CNERC conducted an extensive programme of research and technology transfer on innovative applications of the high strength S690 steel over the past seven years to achieve:

- an innovative construction technology using the high strength S690 steel with proven structural adequacy and established structural economy for construction;
- development of effective welding on sections of the high strength S690 steel through the use of a robotic welding system which ensures little or virtually no reduction in mechanical properties of 10 to 70 mm thick steel plates after welding;
- verification on structural adequacy of welded sections of the high strength S690 steel under typical applications in practice through systematic experimental investigations;
- a rational integrated and coordinated advanced numerical simulation method on structural behaviour of welded sections, connections and joints of the high strength S690 steel;
- rationalized methods for structural design of welded sections, connections and joints of the high strength S690 steel which are in line with current engineering practice in Hong Kong;
- technical guidance on selection of high quality Chinese steel, design and construction of the high strength S690 steel, relevant welding procedures specifications, and complementary procedures on quality assurance; and
- innovative applications of the high strength S690 steel in building and civil engineering projects.



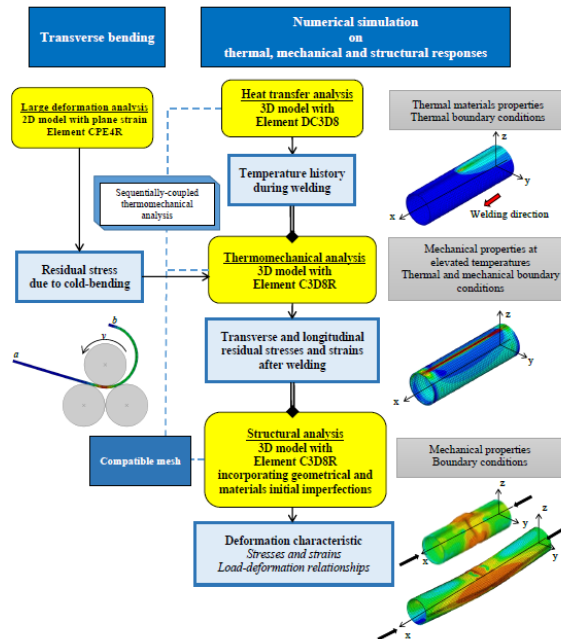
Mechanical properties and microstructures of S690 steel after physical welding simulation



Use of a robotic welding system to develop effective welding procedures



Compression tests on stocky columns of high strength S690 and S960 steel with welded splices



Integrated and coordinated advanced numerical simulation for high strength S690 steel sections and joints