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## Chinese National Engineering Research Centre for Steel Construction (Hong Kong Branch) Newsletter – Special Issue (February 2025)

### Cover Story of “The Structural Engineers” (February 2025 issue) Institution of Structural Engineers, U.K.

We have pleasure in disseminating our article on “Effective use of high-strength S690 steel in construction”, being the cover story of February 2025 issue of The Structural Engineers of The Institution of Structural Engineers, U.K.

The Institution of  
StructuralEngineers

February 2025  
Volume 103 | Issue 2

# TheStructuralEngineer

Reusing steel  
for a footbridge

President's  
Inaugural Address

Industry CPD:  
LVL beams



## Applications for high-strength steel

What are the advantages and potential use  
cases for S690 steel in construction?

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Originally, viewing of our article is charged at a price of £9.95. With the consent of The Institution of Structural Engineers, it is now *free* to be downloaded at:

<https://doi.org/10.56330/WJHB1752>

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# Effective use of high-strength S690 steel in construction

## Effective use of high-strength S690 steel in construction

**Abstract**  
S690 construction is an emerging and steel-making technology, structural steel with yield strengths up to 690N/mm<sup>2</sup> is produced regularly by many modern steel mills in different countries, such as China, France, Germany, India and Japan. The yield strength of S690 steel is almost twice that of the commonly used structural S235 steel. High-strength steels are used in a wide range of structures, such as heavy-duty lifting equipment in mines and ports, frames and members in wind turbines, as well as containers, bridges and passenger trains. Use of high-strength steels is highly advantageous for their weight efficiency. For steel structures and building structures, the use of S690 steel allows a significant reduction in the self-weight of an element and gives a reduction in the loads to be imposed on supporting structures and foundations. In recent years, the cost per tonne of S690 steel in many parts of the world has decreased steadily, which has improved its competitive position with respect to S235 steel. In China, the unit cost of S690 steel has varied between 1.22 to 1.26 times that of S235 steel over the past five years. It may be argued that owing to the increased strength of S690 steel, only half the steel tonnage is needed, compared with S235 steel, which is a significant saving in material costs. Research work by the author and other researchers has shown that the beneficial behaviour of welded members made from S690 steel combined with the Chinese National Engineering Research Centre for Steel Construction (Hong Kong Branch) has shown that providing the welding procedures are properly controlled, it is possible to realise or even eliminate any reduction in strength and ductility which might occur due to increased slenderness. Extensive research and development work has also been conducted to promote application of high-strength steel for construction. A case to study with two arches using S690 steel in construction, with steel design, will be presented. 1425 tonnes of S690 steel is being used, with steel design, will be presented. 1425 tonnes of S690 steel in Marau is briefly described. In addition, the initiative of the Development Bureau of the Government of Hong Kong SAR in promoting the use of high-strength S690 steel is highlighted.

### The Structural Engineer

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#### Date published

3 February 2025

#### Price

Free

#### Citation

The Structural Engineer, Volume 103, Issue 2, 2025, Page(s) 18-23

<https://doi.org/10.56330/WJHB1752>

