

Stainless Steel and High-strength Steel Materials in Construction Applications

Abstract

Stainless steel material has been increasingly used in construction, due to its aesthetic shining appearance, high corrosion resistance, ease of maintenance, and excellent ductility. Moreover, stainless steel has a role to play in sustainable development, as it has a long life cycle due to superior corrosion resistance and better fire resistance than carbon steel, and it is 100% recyclable after product life cycle. However, high initial cost of stainless steel materials, which is mainly due to an expensive mineral nickel (Ni), restrains its applications in construction. This provides opportunities for low nickel stainless steel materials, such as lean duplex and ferritic stainless steel, to be applied in construction. In addition to stainless steel materials, there is a recent trend to explore possibility in using high-strength steel materials in offshore construction, mainly driven by factors such as reduced transportation costs, improved resonance characteristics and a reduced project carbon-footprint. However, construction application of stainless steel and high-strength steel is restrained by a knowledge gap on its structural behaviour. Research projects on structural behaviour of lean duplex and ferritic stainless steel as well as high-strength steel will be presented in this seminar. It should be noted that design rules for lean duplex stainless steel will be covered in the next version of European Code.

Biography

Dr. Yuner Huang is a Lecturer at Institute for Infrastructure and Environment, the University of Edinburgh. She obtained her Bachelor and PhD in Civil Engineering from The University of Hong Kong. Her research work has been focusing in developing reliable and cost-effective structural solutions for building and energy infrastructure with advanced steel materials, including stainless steel and high-strength steel. Her research projects involve both experimental testing and numerical analysis. She is currently leading a research project on using high-strength steel in offshore energy applications, and supervising a PhD dissertation in this topic. Dr Huang has published thirteen peer-reviewed academic papers in well-regarded journals, one of which is listed as the most cited article in Elsevier journal *Thin-Walled Structures*. She has successful funding track record from Research Grant Council in Hong Kong, EPSRC Institutional Sponsorship Award, Carnegie Trust, and several industrial funded projects on steel pipeline and offshore steel structures from Oil and Gas Innovation Centre (OGIC).