ICE Pocket Guide to Steels in the Built Environment

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Stephen J Hall

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Cover photo: Bridge structure painted bright colours, blue sky,
abstract pattern, old structure steel frame.

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Foreword

All too often, engineers limit their steel specifications to the strength of the material (e.g., S355) and omit to include the other important properties, such as the product standard, the steel's subgrade (or quality) and the delivery conditions. These additional properties can have a significant effect on the performance of the structure and, in the case of the delivery conditions, the steel's suitability for further processing and heat treatment. This practical ICE Pocket Guide explains why it is necessary for engineers to provide the complete steel specification and uses the failure of the Clyde Arc in January 2008 to highlight problems that can occur when both the product standard and the subgrade are not specified.

The guide explains the steel naming and steel number conventions used, together with the subgrade system and the convention used to specify steels with different impact energies.

The guide includes specifications for over 150 different steel grades, from S275JR to HX460LAD. Each specification contains a simple explanation of the letters and numbers used to describe the steel, a series of icons indicating the section types available and information on the minimum yield strength, tension strength, elongation at fracture and the carbon equivalent value (CEV). This information is followed by the full specification for the steel grade and the key product, design and execution standards.

Similar information is included for structural fasteners, shear connectors, concrete reinforcement and other less familiar steels used in construction.

Engineers will find this guide helpful in both specifying steels and identifying their properties.

Dr David Moore, CEO of the British Constructional Steelwork Association (BCSA)

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About the author

Stephen J Hall MEng (Hons) CEng MICE MIMechE MISME has spent his career immersed in the design and application of steel construction products and building systems. Studying in the Steel City, he graduated from the University of Sheffield with a master's degree in mechanical engineering in 2012. As a chartered civil engineer and chartered mechanical engineer, he has worked as both structural designer and product manufacturer, designing and developing a range of steel solutions for use within building infrastructure and has applied them to live designs on a variety of schemes in the UK and abroad. He has significant experience in product regulatory compliance and is a specialist in cold-formed steel, light-gauge steel framing and offsite construction technology.