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Editorial

Modelling, Test and Practice of Steel Structures

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1. Introduction and Scope

Steel structures have been widely used in civil engineering in recent decades across applications such as large spatial structures, high-rise buildings, and bridges. With the development of techniques and economy, steel structures are increasingly popular in fabricated industry and residential buildings. Modelling and tests are the main methods for realizing the behaviors of steel structures, including the bearing capacity, the ductility, the seismic performance, etc. The behaviors of entire structures can be realized, and the construction method can be proposed in practical engineering.

This Special Issue on the Modelling, Testing, and Practice of Steel Structures provides an international forum for the presentation and discussion of the latest developments in structural steel research and their applications. The topics of this issue include the modelling, testing, and practice of steel structures and steel-based composite structures.

2. Contributions

In this Special Issue, 17 high-quality papers covering a wide range of steel structure research including modelling, testing, and construction research on material properties, components, assemblages, connection, and structural behaviors have been published.

Three papers focused on the material properties of structural steel, which presented investigations on the chemical composition of weld metals [1]; the fracture performances of SBHS500, SM570, and SM490 steel [2]; and the cyclic performance of structural steels after exposure to various heating–cooling treatments [3].

Nine papers focused on the mechanical properties of the components and joints of steel and steel-based composite structures, which presented investigations on shear square section steel tube dampers [4], diagonally stiffened steel plate walls [5], offshore platform deck structures [6], ship local structures [7], an L-shaped column composed of RAC-filled steel tubes [8], corrugated steel plate shear walls [9], partially connected steel plate shear walls [10], pipe-in-pipe systems [11], and bolted ball-cylinder joints [12].

Four papers focused on the structural behaviors, which presented investigations on the stability behaviors of a large-span spatial grid arch structure [13], the fatigue performance of a long-span steel truss arched bridge [14,15], and the structural safety performance of prestressed steel structures [16].

One paper focused on the planning method for a material-allocation path and the construction of prestressed steel structures [17].

3. Conclusions and Outlook

Topics such as material properties, the mechanical properties of components and joints, construction methods, and structural behaviors are covered by this Special Issue, presenting the latest developments in structural steel research and their applications. As Guest Editors of this Special Issue, we hope that the reported studies will be useful to researchers in advancing their respective research.

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