UNIVERSITY OF CAMBRIDGE
Department of Engineering

CONSTRUCTION ENGINEERING MASTERS DISSERTATION ABSTRACT

Assessment of the Potential for Structural Steel Reuse in the UK Construction Industry

Steel is one of the most widely used materials today with the global annual production of approximately 1,500 Mt or 215 kg per capita in 2011, making steel one of the largest contributors to global CO2 emissions. Given the significance of steel manufacturing on global CO2 emissions and the estimated increase in demand, this sector has to make some radical changes both at the production/supply side and end-use/demand side to meet the global CO2 emissions reduction targets.

Reuse of steel components requires very little energy required for deconstruction, cleaning and fabrication, and it is a direct substitute for new steel. This measure has already been identified as potentially significant contributor for reducing steel industry emissions. However, the reuse steel market is currently underutilised with 22 kt of steel reused annual and it could potentially increase more than 10-fold to approximately 300 kt. This would not only offer significant environmental benefits but also potential financial and social incentives if fully utilised.

Literature suggests that there are a number of barriers restricting steel reuse on a larger sale including construction/demolition cost and programme, health and safety issues, quality assurance, liability and logistics. The aim of this study is to assess the potential for the wider spread of steel reuse in the UK construction industry, by exploring why the steel reuse market in the UK construction industry is underutilised, and how can the steel reuse market be stimulated to grow in the future.

Firstly, a case study of an attempt to reuse steel on a real project is explored - examining the process behind reusing steel in the building industry including reclamation, logistics and reuse phases. This is then followed by a review of three supporting case studies to compare and contrast the issues that professionals experienced on projects where reused steel was considered.

The information obtained from literature review and case studies is then analysed to identify real barriers for steel reuse and find the potential ways to create a reliable reuse steel market. The focus of the discussion is on the immediate future and whether a web based exchange portal can be successfully developed to facilitate the initial uptake of reused steel in the UK.

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