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Milan Veljkovic

Delft University of Technlogy, Netherlands

Demountable and reusable composite floor systems

Innovation in the field of reusable buildings is gaining growing attention in the Netherlands and other EU countries. This is driven by a policy documents for European economy unil 2020 and after adoption of a circular economy package in 2015. One of very competitive solutions for buildings is a composite structure consisting of a steel frame and concrete decks. The steel skeleton frame is rather obvious choice for structural system that satisfies all criteria for design for deconstruction (DfD). However, a composite floor system consisting of steel beams and concrete decks connected by welded shear studs is time consuming for demounting, and impossible to re-use. Large potential of achieving a completely reusable composite floor system is illustrated on a practical example using rather large concrete prefabricated decks and long span beams. The key component is a new type of shear connectors embedded in the concrete and *in-situ* connected to a steel beams with a flexible execution tolerances. Analysis is performed using advanced FE models to predict behaviour of the connectors and propose a design that complies with structural requirements of ductility and strength according to Eurocode for composite structures. Engineering FE models based on elastic analysis are used to validate structural performance of the new system during the execution and at the service load.

Biography

Milan Veljkovic is a full Professor of Steel and Composite Structures at Delft University of Technology where he moved from Lulea University of Technology in Sweden from a similar position, in October 2015. He has published more than 100 peer reviewed papers and has been serving as a Member of Editorial Boards of four international journals. He is the Chairman of Technical Management Board of the European Convention for Constructional Steelwork. He has delivered invited lectures on various occasions in USA, Europe, Asia and Africa. He is Member of European Standardization Committee CEN250/SC3 Steel Structures.

m.veljkovic@tudelft.nl

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