

Keynote Paper

Development of composite floor system for a circular economy

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ABSTRACT

Circular economy is an economic system aimed at minimizing wastes and making the most of the current resources. This regenerative approach is in contrast to the traditional linear economy, which has been adopted by the construction industry. Developing new construction technologies for sustainable built environment is a top priority for the construction industry throughout the world. Much of the environmental impact from the construction industry is associated with the consumption of resources and generation of waste. The construction industry in Europe consumes over 70,000 million tonnes of materials each year and generates over 250 million tonnes of waste. Composite flooring formed by connecting the concrete slabs to the supporting steel beams has been widely used for many years and is well established as one of the most efficient floor systems in multi-storey steel frame building structures. However, shear connectors are welded through the steel decking to the steel beams and cast into the concrete; this made deconstruction and reuse of these components almost impossible. A new composite flooring system which allows for the reuse of the steel beams and composite floor slabs is developed and tested to assess its potential and suitability for reuse. This paper presents the results of a series of full-scale beam tests and demonstrates the reusability of this new form of composite flooring systems.

REFERENCES

Dai, X.H., Lam, D. and Saveri, E. (2015), "Effect of concrete strength and stud collar size to shear capacity of demountable shear connectors", *Journal of Structural Engineering*, American Society of Civil Engineers, 141(11), 04015025.

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