A Holistic Approach for Industrializing Timber Construction

https://research.thinkwood.com/en/permalink/catalogue2378

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Year of Publication:	2019
Country of Publication:	Austria
Format:	Conference Paper
Application:	Wood Building Systems
Topic:	Site Construction Management
	Design and Systems
Keywords:	Prefabrication
	Off-site Construction
	BIM
	Mass Timber
	Construction
	Carbon
Language:	English
Conference:	Sustainable Built Environment D-A-CH Conference
Research Status:	Complete

Summary:

Many strategies have been investigated seeking for efficiency in construction sector, since it has been pointed out as the largest consumer of raw materials worldwide and responsible of about 1/3 of the global CO2 emissions. While operational carbon has been strongly reduced due to building regulations, embodied carbon is becoming dominating. Resources and processes involved from material extraction to building erection should be carefully optimized aiming to reduce the emissions from the cradle to service. New advancements in timber engineering have shown the capabilities of this renewable and CO2 neutral material in multi-storey buildings. Since their erection is based on prefabrication, an accurate construction management is eased where variations and waste are sensible to be minimized. Through this paper, the factors constraining the use of wood as main material for multi-storey buildings will be explored and the potential benefits of using Lean Construction principles in the timber industry are highlighted aiming to achieve a standardized workflow from design to execution. Hence, a holistic approach towards industrialization is proposed from an integrated BIM model, through an optimized supply chain of off-site production, and to a precise aligned scheduled on-site assembly.

Online Access: Free

Resource Link

https://iopscience.iop.org/article/10.1088/1755-1315/323/1/012015/meta