Challenges in the Prefabrication Process of the Wood Innovation Research Laboratory

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ABSTRACT
The University of Northern British Columbia has built a new laboratory building in Prince George. The Wood Innovation Research Laboratory (WIRL) was requested as a certified Passive House, and the owner and the design team have supported an off-site construction approach for the design-build project. Given the very short construction phase, the demanded energy performance and the required air-tightness, prefabrication seemed to be the logical choice. Throughout the design and construction process, several obstacles in the form of space requirements for the prefabrication process and sequencing issues which led to only a partial off-site construction with large portions remaining to be finished on-site were encountered. The current limitations of the local construction industry led to walls shipped to site, closed on only one side and then filled with insulation on-site and finally closed. The roof was, besides the trusses, entirely manufactured on site. This resulted in demanding working conditions for construction workers at very low exterior temperatures and slowed the construction process further by the frequent need for snow removal. The study will explore the obstacles of off-site construction and the typical challenges faced by the design team and the builder, based on the at the end very successful construction of the WIRL. This building is the first certified Passive House with institutional and industrial use and is the current record holder for air tightness in North America following the International Passive House Standard with 0.07 air changes at 50 Pascal.

KEYWORDS
passive house; prefabrication; offsite construction; air-tightness; challenges; institutional building