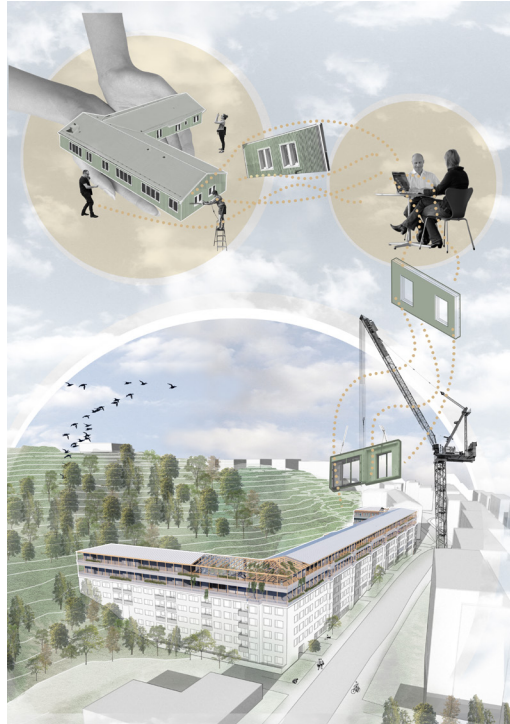


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REUSE IS THE NEW USE

- Towards the industrial reuse process



BUILDING DESIGN FOR SUSTAINABILITY

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Working towards a circular building industry is one of the prerequisites for solving the issues on large amounts of demolition waste and emissions from new construction projects. This includes the circulation and reuse of existing building materials and components. What is lacking are established processes for designing with reused building parts on an industrial scale. The aim of this thesis is therefore to explore how inventories and information management can facilitate a reuse design process on an industrial scale.

The first part of this thesis uses literature studies on current research, reference reuse projects and semi-structured interviews with actors in the building industry to get an understanding of the reuse process of today. It identifies different types of inventories and how they could be used further in the design process through the connection with BIM.

The second part of this thesis is a pilot project in collaboration with an ongoing pre-study by Familjebostäder to add housing on top of an existing apartment building from the 70's in central Gothenburg. The pilot project implements the findings from the first part in a rooftop design proposal with reused timber-frame wall elements. The

elements are sourced from two preschools in Gothenburg set to be demolished within the coming year, through a collaboration with Lokalförvaltningen.

As a conclusion, this thesis proposes an interconnected inventory process to make the information flow more efficient. The key to a successful inventory relies on visibility (how to visualise the content of your inventory) and compatibility (how to connect your inventory data to further usage). The architect's reuse design process would benefit from integrating the inventory data directly into the BIM software. In this thesis, a concept toolchain and workflow for connecting a reuse database to the BIM model was developed and tested. Furthermore, analysis of cost comparisons, carbon emissions and disassembly feasibility in the pilot project showed that element reuse is more feasible than material reuse on an industrial scale, and that element reuse of timber frame buildings provides an interesting business model for prefab factories.

Key words: reuse, circular economy, circular building industry, material inventories, information management, BIM