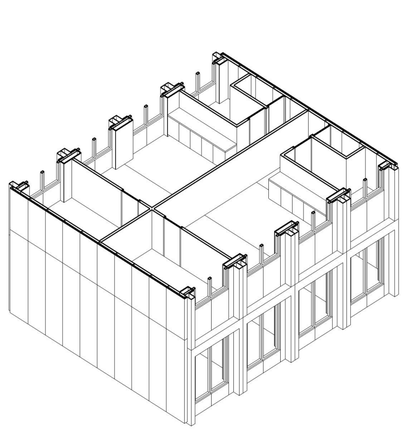
CIRCULAR RETROFIT LAB

VUB Architectural Engineering, Vrije Universiteit Brussel

CIRCULAR RENOVATION OF STUDENT ROOMS

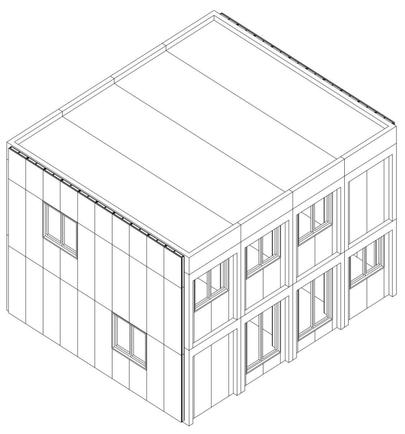
The Circular Retrofit Lab is a circular renovation project of eight student rooms on the campus of the Vrije Universiteit Brussel. The old student houses consist of prefabricated, modular concrete structures. They are stripped completely and reconstructed in a circular way using adaptable and reversible building solutions.

Using an adaptable plan lay-out and reversible building systems, the Circular Retrofit Lab can be transformed in three different ways: interior transformations through the removal or relocation of the demountable wall systems, transformation of the façades thanks to the modular wall system and reconfiguration of the prefabricated concrete modules. As such, the project allows functional changes, for example from plug-in offices to eco guesthouses.



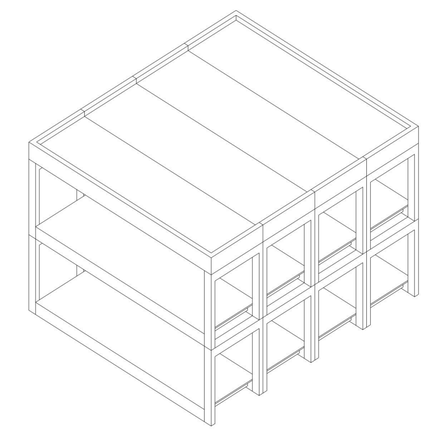
interior

flexible partitioning walls, technical services, insulation, …



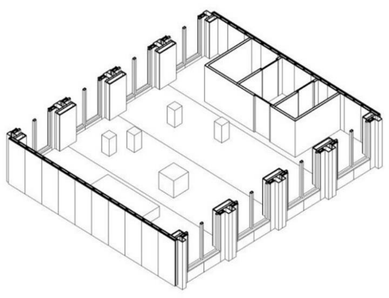
façade system

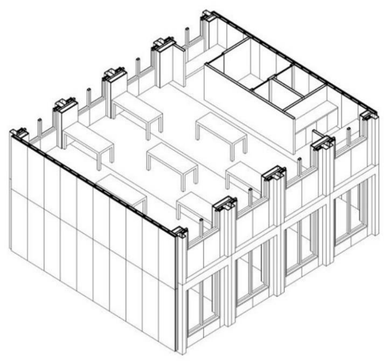
a high performance envelope with reversible connections

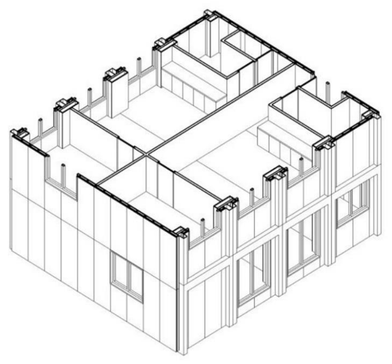


structure

spatial reconfiguration of the prefabricated concrete modules







dissemination space ❯ ***plug-in offices*** ❯ ***eco guesthouses***

public | non-residential | residential

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 642384.

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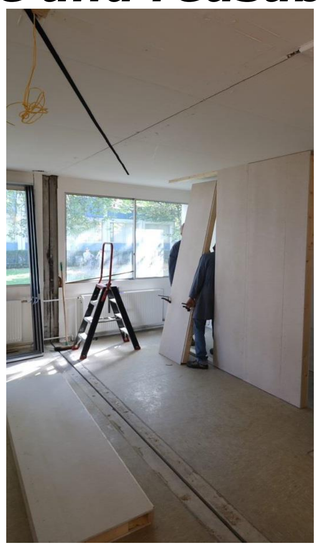
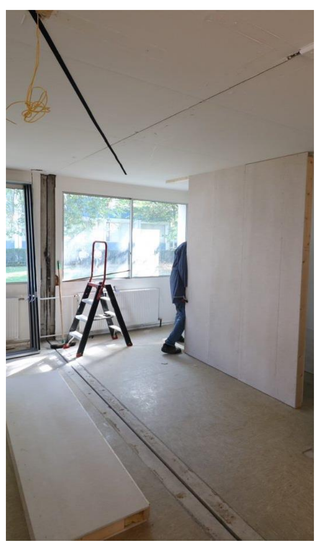
TESTING REVERSIBLE WALL SYSTEMS

In an experimentation lab in four student house modules, we experimented with different demountable wall solutions. All used different types of reversible connections, with different assembly and disassembly times and varying degrees of adaptability. During two student workshops we tested the systems and performed two transformations of the space. This allowed the assessment of the demounting process and the reuse and transformational capacity of the walls.

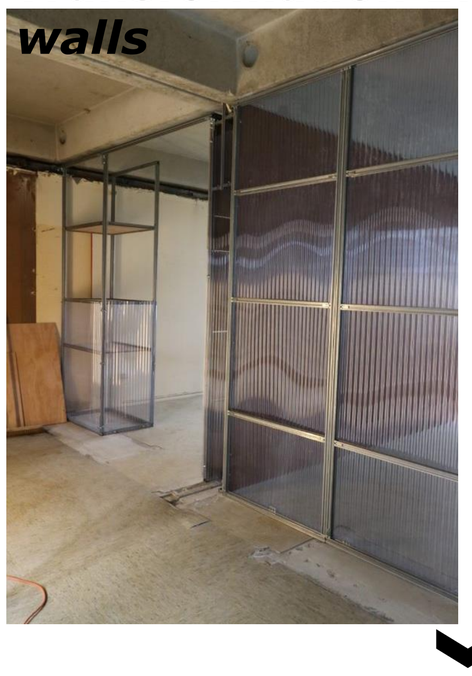
Four student rooms

Demountable and reusable systems



Transformation 1: four walls




Reversible connections



Transformation 2: event space

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A COLLABORATIVE PROJECT

The construction of the Circular Retrofit Lab is a collaborative project. To move towards a circular building industry, we need to involve industrial stakeholders early on. In this project we applied, tested and developed circular building solutions together with our industrial partners. Integrating the principles of circular design and design for change in a practical construction project provided insight into the advantages and opportunities, as well asfeedback on the most important challenges and barriers that we still need to overcome.

project coordination

VUB ae ARCHITECTURAL ENGINEERING

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architecture and engineering

KADERSTUDIO architectural strategies bvba

MK Engineering

internal solutions

GEBERIT

Gyproc SAINT-GOBAIN

JuuNoo.com

Tarkett

ISOVER SAINT-GOBAIN

SYSTIMBER massieve houtbouwkits

façade solutions

REYNAERS aluminium

Beneens Alucon

Jonckheere Projects *building a future in wood today*

SAINT-GOBAIN ISOVER SAINT-GOBAIN

building services

GEBERIT

jaga CLIMATE DESIGNERS

Bao Living

Lumency

zehnder always the best climate

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A HANDS-ON CONSTRUCTION PROJECT

One of the main aims of the Circular Retrofit Lab pilot project was to evaluate how the principles of circular design and design for change, as developed within the BAMB project, could be implemented in a practical renovation process. As such, the project allowed to assess the impact, but also the challenges in introducing reversible building solutions and the implications on the technical, building performance and economical aspects.

Deconstruction

Façades: The façades consist of prefabricated elements that are installed with bolted connections. Their uniformity allows repositioning them. To complete the performance of the envelope, tailored details with insultation and membranes had to be developed.

Insulation, water- and airtightness

Services remain accessible to allow repeated maintenance and replacement thanks to reversible connections.

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