



LABORATORY FOR GREEN TRANSFORMABLE BUILDINGS

www.gtb-lab.com

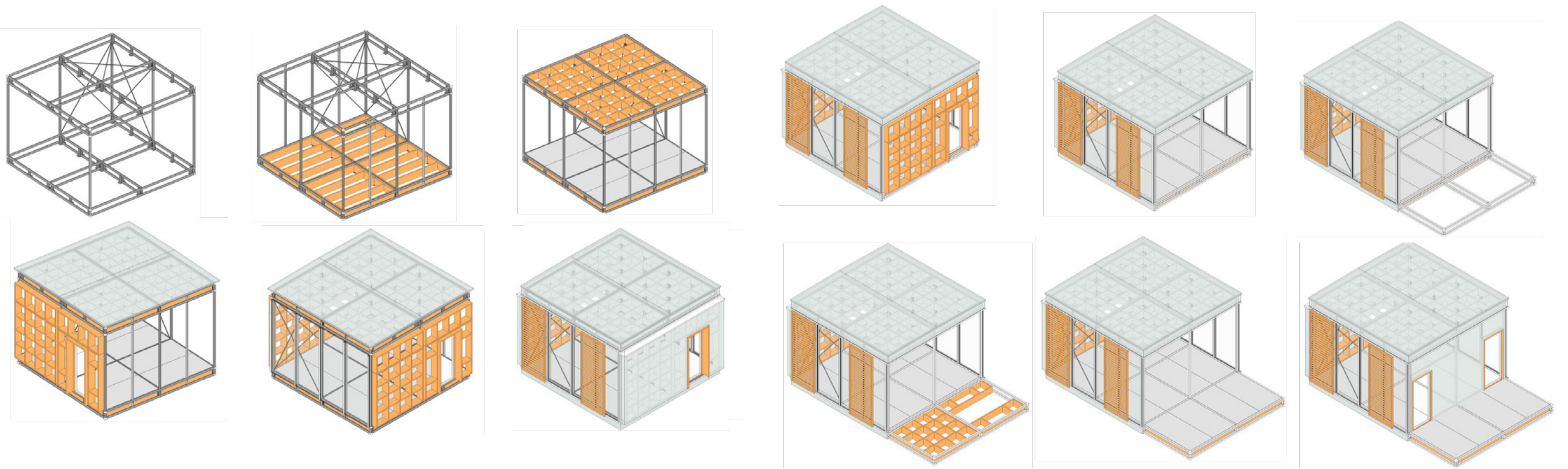
GTB LAB CIRCULAR MODULE WAS DEVELOPED WITH FULL REVERSIBILITY IN MIND AND FOCUSED ON HIGH REUSE POTENTIAL OF ALL BUILDING PARTS.

FOUR REVERSIBILITY SCENARIOS HAVE BEEN FULLY INVESTIGATED AND APPLIED.

- 1. REVERSIBILITY ON MODULE LEVEL** INCLUDING REPLACEABILITY OF FAÇADE, ROOF, FLOOR; SUCH AS, FOR EXAMPLE, THE USE OF THE FAÇADE CASSETTES TO CREATE A FLOOR/TERRACE WHICH WAS TAKING PLACE DURING THE MODULES EXTENDABILITY TEST OF THE MODULES TRANSFORMATION.
- 2. REVERSIBILITY ON COMPONENT LEVEL**, INCLUDING RECONFIGURATION OF FLOOR, ROOF OR FACADE CASSETTE BY TRANSFORMING THE DOOR INTO A WINDOW OR A SHELF.
- 3. DESIGN - PRODUCTION MEASUREMENT** COORDINATION TO ELIMINATE 98% OF PRODUCTION WASTE.
- 4. REPLICABILITY/TRANSPORTATION OF 3D MODULE** AND EXTENDABILITY OF THE MODULES.

Production Location:
Kloekner Metals ODS, Ridderkerk, The Netherlands

Architect: Elma Durmisevic, 4D architects
Industry Circular Building Innovation _ GTB Lab consortium :
Kloekner Metals ODS, Ron Jacobs en Paul Penners
Pilkington, Parcel Ribberink
TheNewMakers, Pieter Stoutjesdijk
Rodeca, Peter Lindeman
Ammanu, Niels Leijten





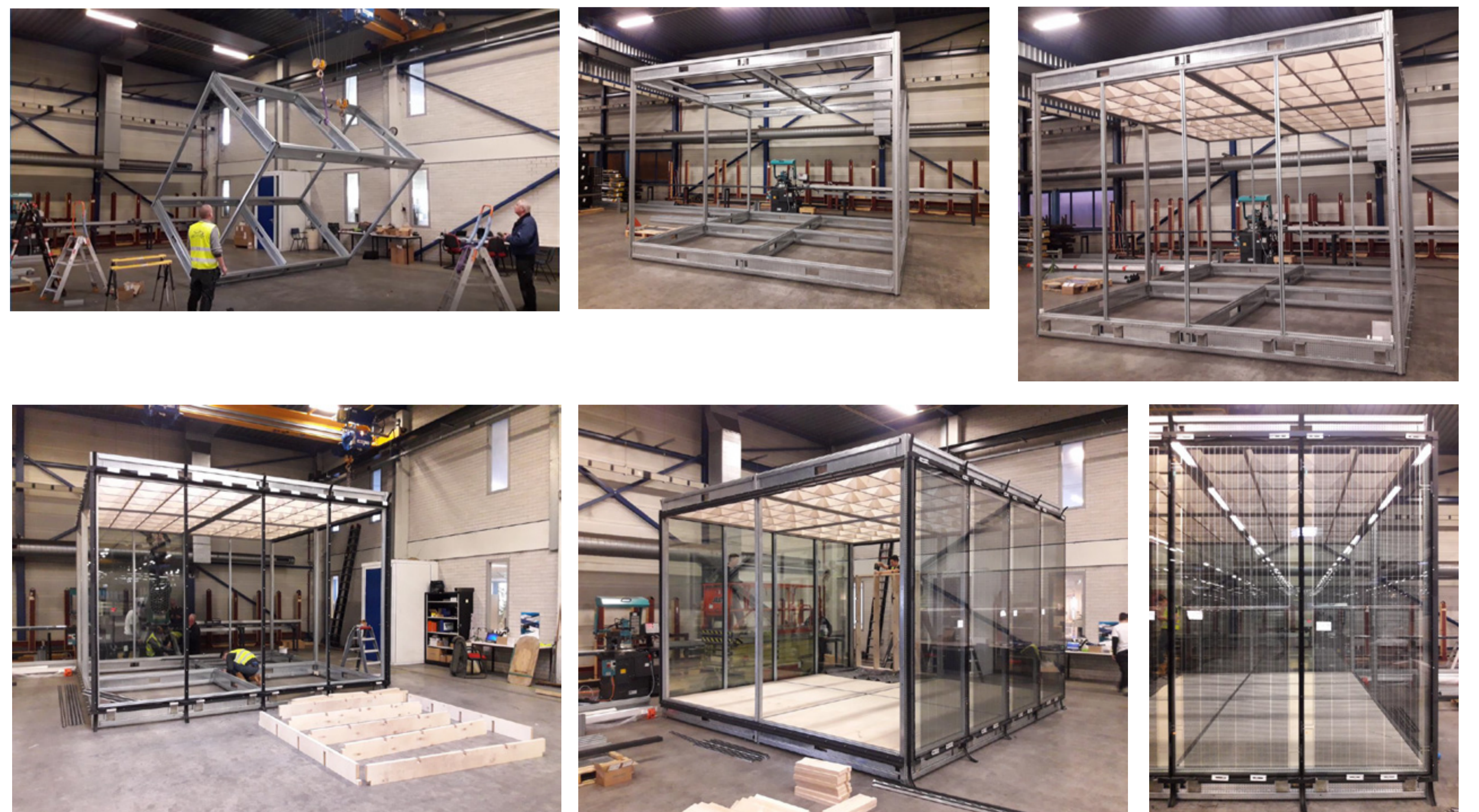
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LABORATORY FOR GREEN TRANSFORMABLE BUILDINGS

Elma Durmisevic 4D architects/GTB lab, Kloeckner Metals ODS, Jansen, Skellet, Pilkington Nederland, TheNewMakers, Rodeca, Ammanu

REVERSIBLE ASSEMBLY SEQUENCES

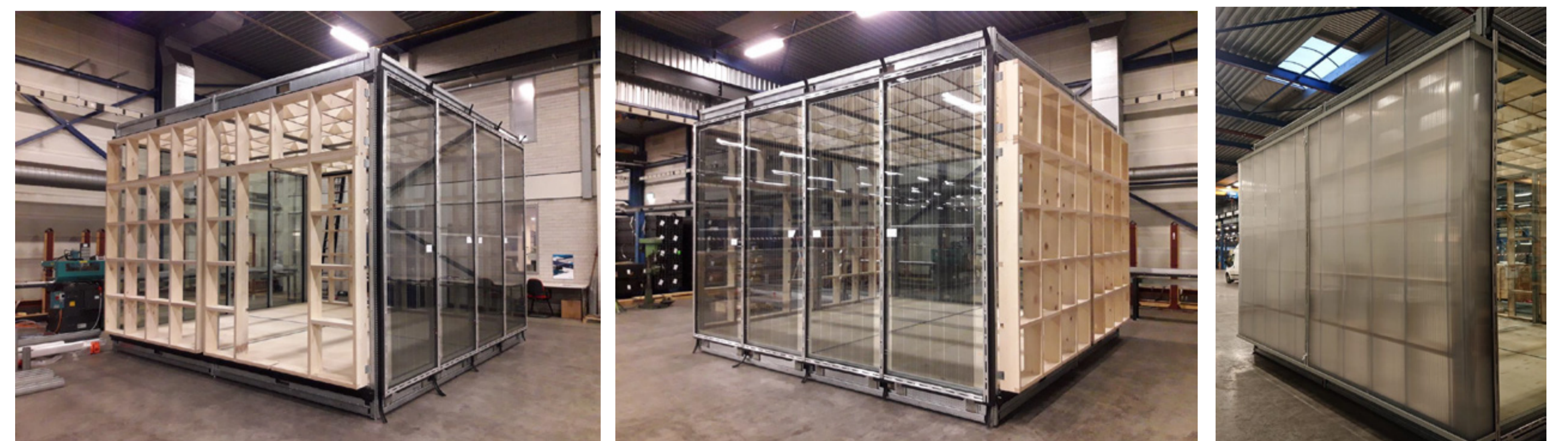


Production Location:

Kloeckner Metals ODS, Ridderkerk, The Netherlands

Architect: Elma Durmisevic, 4D architects

Technical support: Jelle de Klerk 4D architects, Bas Hennes, 4D architects



Industry Circular Building _ GTB Lab consortium :

Kloeckner Metals ODS Netherlands: Ron Jacobs and Paul Penners, Michiel van Dooren
Skellet: Ivo Swenters
Pilkington Nederland B.V.: Marcel Ribberink
TheNewMakers: Pieter Stoutjesdijk
Rodeca: Peter Lindeman
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consortium :

ODS Kloekner Metals B.V.: Ron Jacobs and Paul

Penners, Michiel van Dooren

Skellet: Ivo Swenters

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REVERSIBLE CONNECTIONS

GTB LAB CIRCULAR MODULE WAS MADE POSSIBLE BY CAREFUL DESIGN OF REVERSIBLE CONNECTION TYPES THAT ALLOW **DISASSEMBLY AND REPLACEABILITY WITHOUT DAMAGING THE ELEMENT OR CONNECTION ITSELF.**

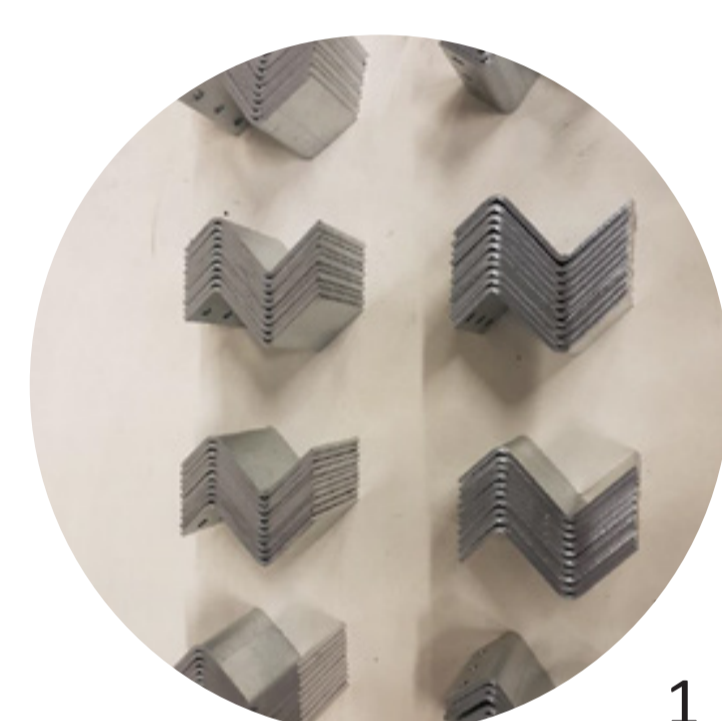
IN THAT RESPECT ALL CONNECTIONS ARE COMBINATIONS OF:

1. **INTERLOCK CONNECTIONS** (5, 8, 9 & 12)

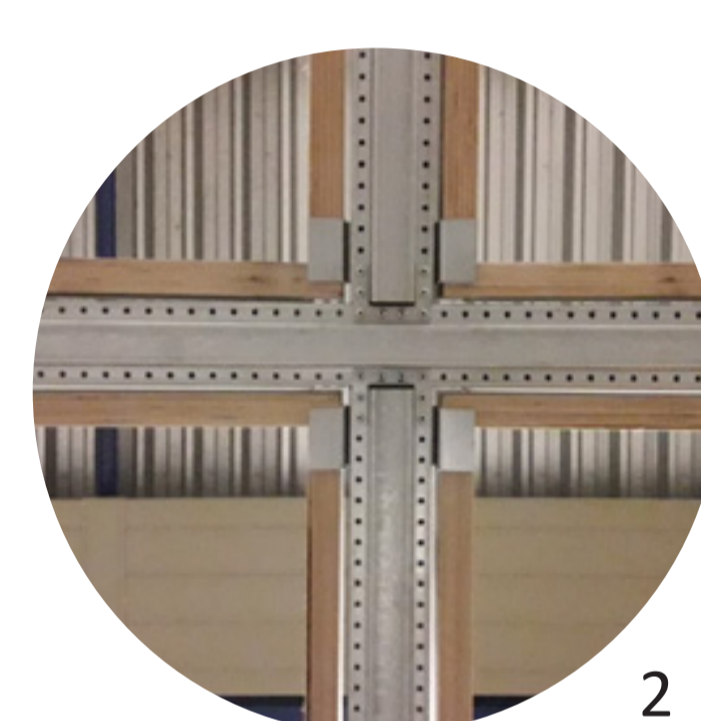
2. **CONNECTIONS WITH INTERMEDIARY ELEMENT** USING INTERLOCK PRINCIPLES CONNECTING TWO FACADE COMPONENTS (4)

3. DESIGN OF INDEPENDENT **INTERMEDIARY BETWEEN TWO DIFFERENT FUNCTIONAL CLUSTERS** TO ENABLE EXCHANGEABILITY OF INDEPENDENT PRODUCTS WITHOUT DAMAGING COMPONENTS (1, 2, 3, 10 & 11)

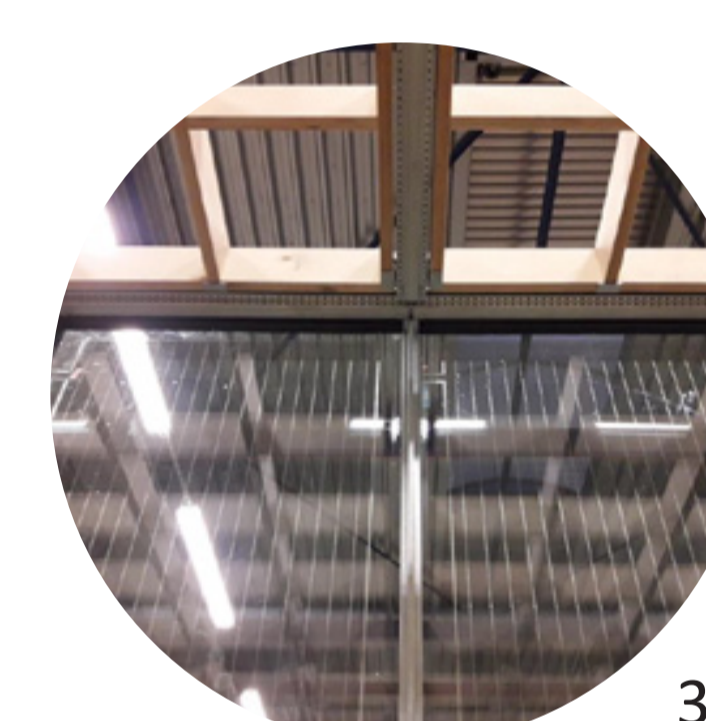
4. ONLY LOAD BEARING STRUCTURE HAS BEEN ASSEMBLED USING **DIRECT CONNECTIONS** WITH MECHANICAL DEVICES USING PRE-MADE PERFORATIONS (6 & 7)



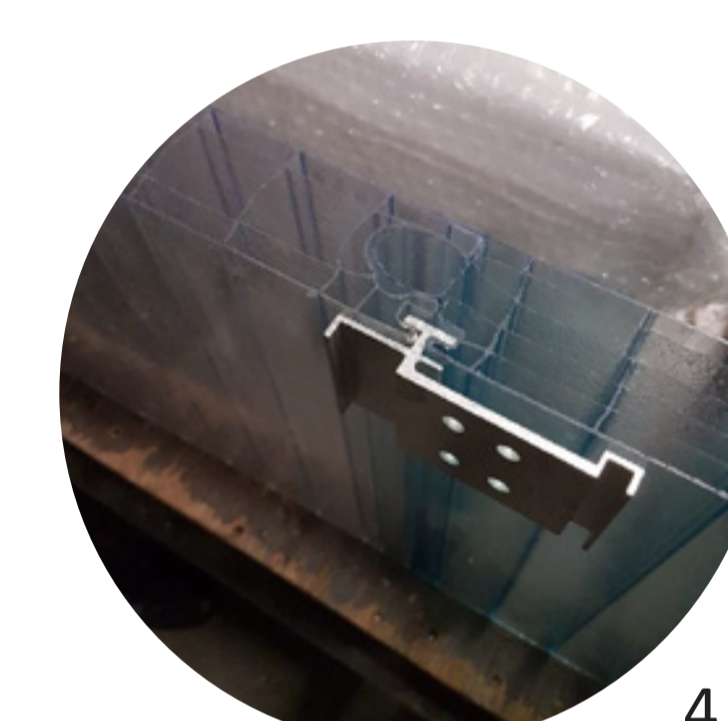
1



2



3



4



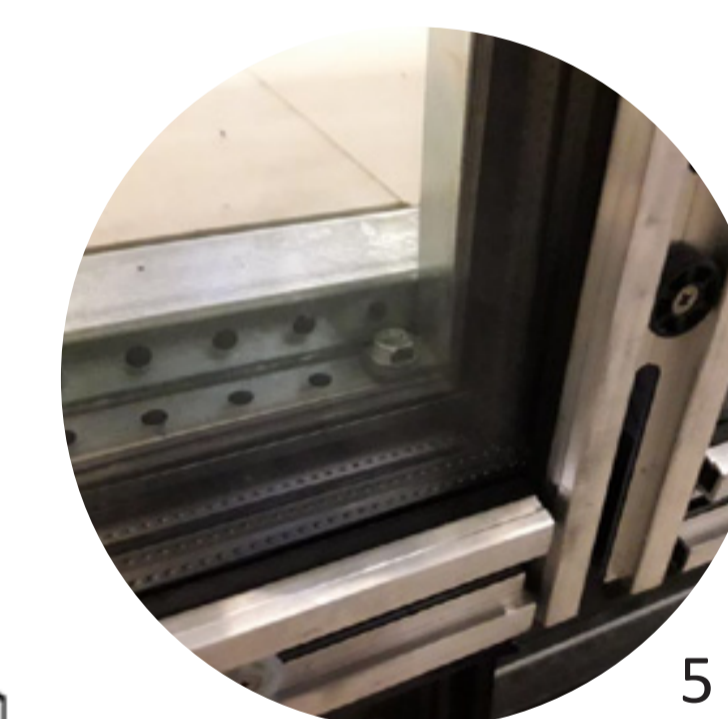
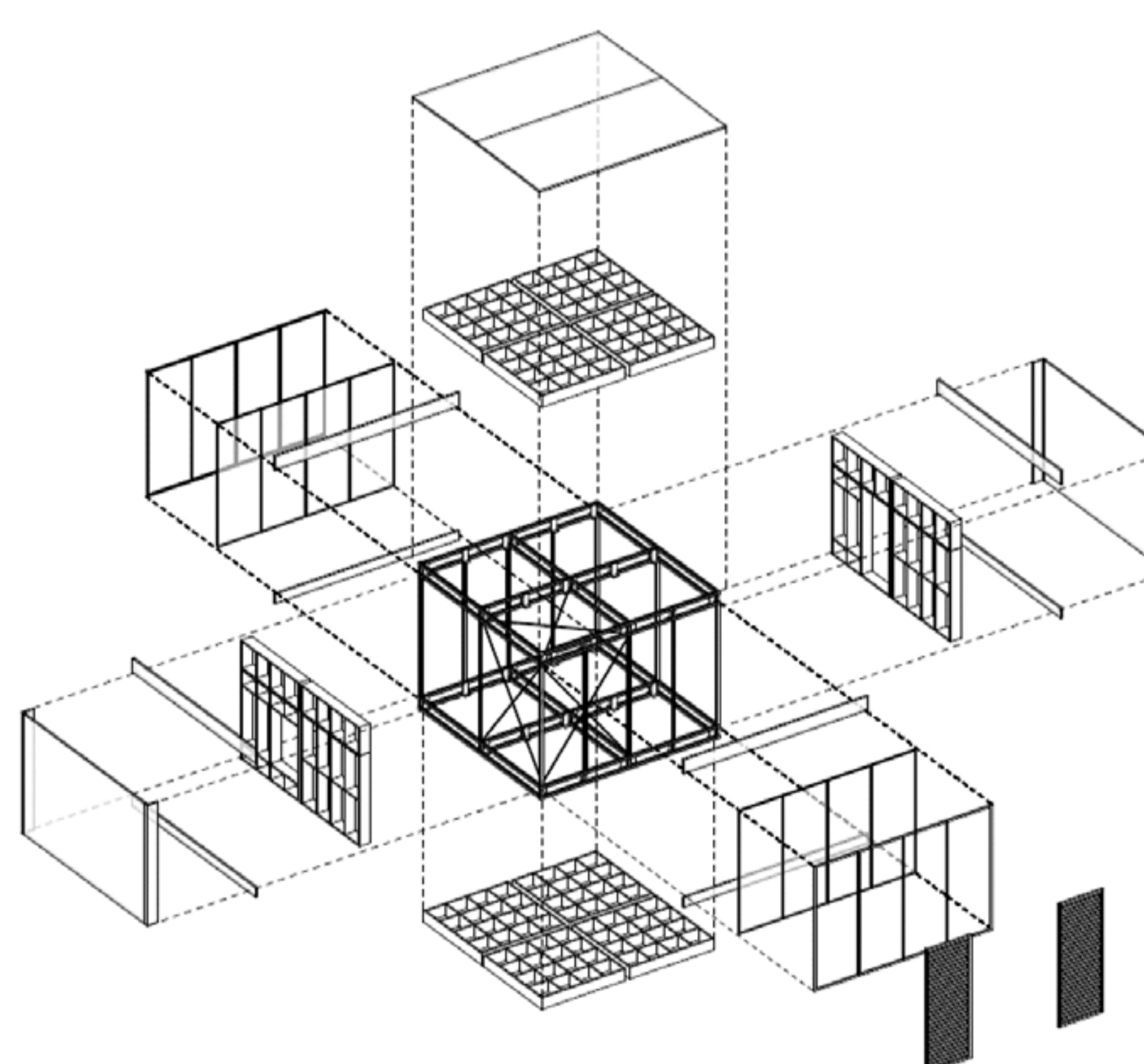
5



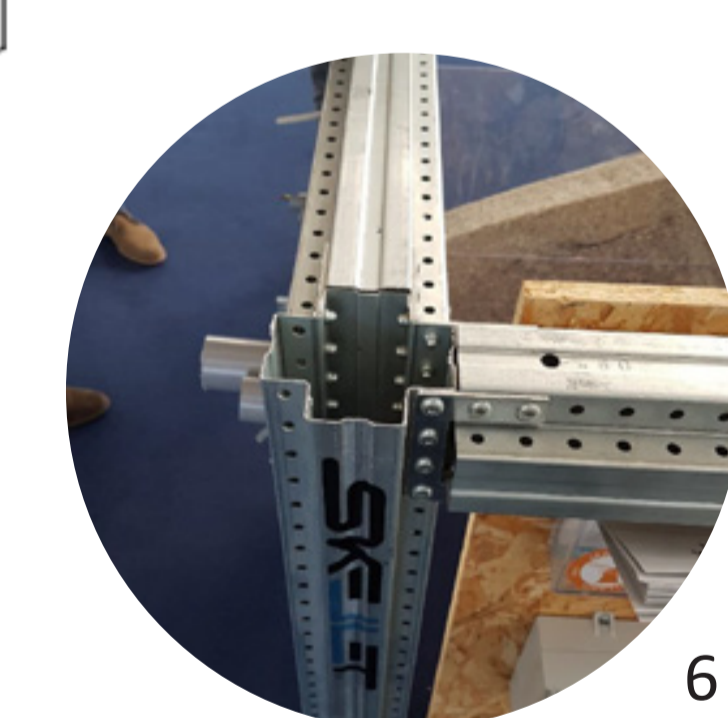
6



7



8



9



10



11



12

Reversible connections

between systems

Reversible connections

Interlock connections

Reversible connections

within system



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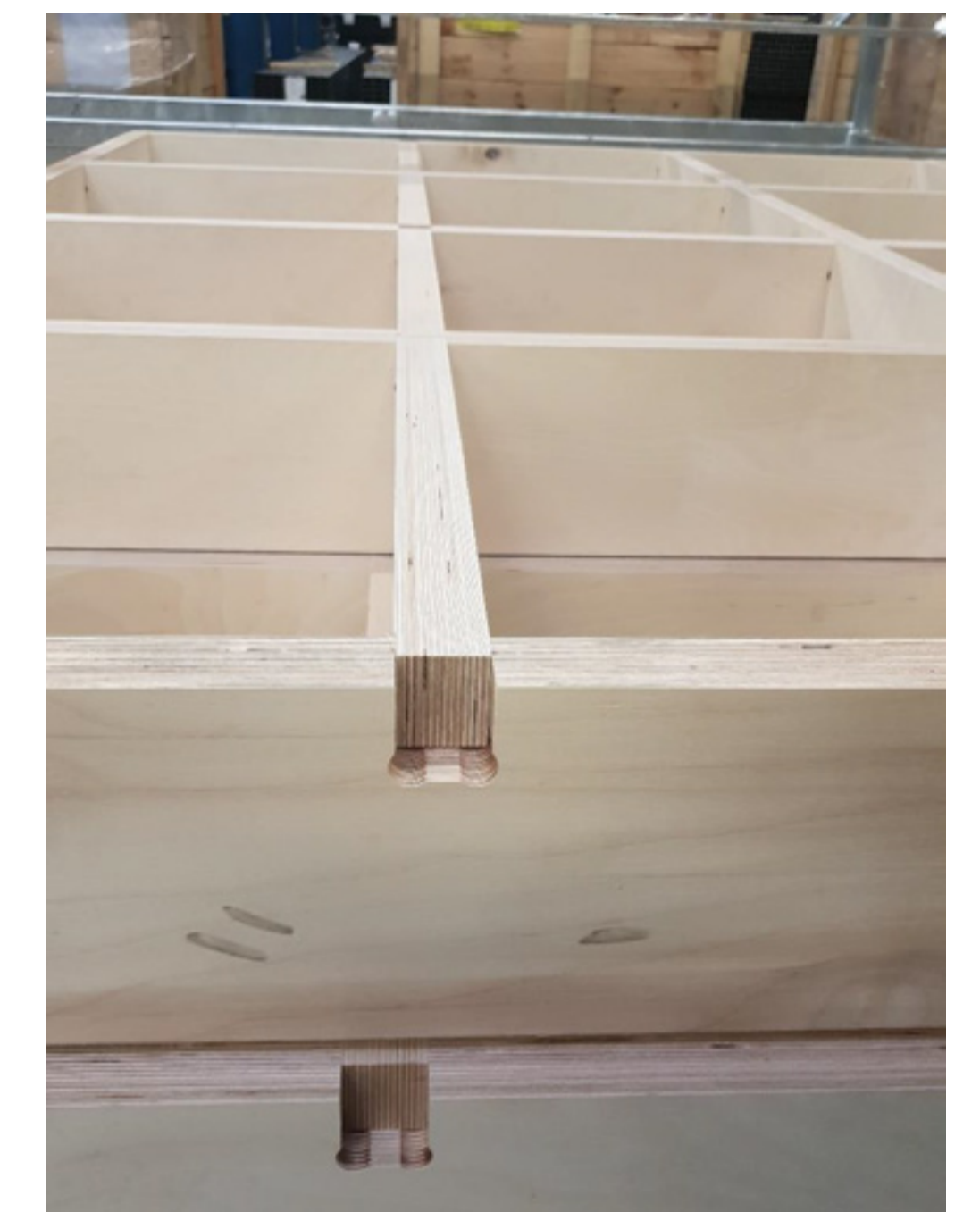


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ASSEMBLY & DISASSEMBLY

ZOOM IN



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