

PROJECT Elementa

YEAR

2028

LOCATION

Basel, Switzerland

USE

Multi-Family Residential

CONSTRUCTION

New Construction

ARCHITECT

Parabase

ENGINEER

Monotti Ingegneri Consulenti
SA: Mario Monotti

DEVELOPER

Immobilien Basel-Stadt

BUILDER

SUPPLIER

SPECIALISTS

Sustainability consultant: Senn
Technology AG – Sandro
Infanger

GROSS AREA

215,000 sq-ft

MEAN ROOF HEIGHT

43 ft

STORIES ABOVE GRADE

4

STORIES BELOW GRADE

2

RISK CATEGORY

II (all buildings and other
structures)

COST INFORMATION

Partially available

LCA INFORMATION

Partially available



Credit: Credit: Parabase

MATERIALS

Precast concrete

SYSTEMS

Columns, Floors, Walls,
Envelope

SCALE

Elemental

DfD

Design for
Disassembly

SCR

Structural
Component Reuse

DECON

Deconstruction

SUMMARY

A new affordable housing and migrant center development is built using precast concrete columns and floor plates from local deconstructed properties.

SUSTAINABILITY GOALS

The project aimed to be built in an environmentally friendly manner through the use of environmentally friendly, local, renewable materials with minimal embodied carbon emissions, and also designing for floor plan flexibility and adaptability.

CIRCULAR ECONOMY STRATEGIES

The project sources deconstructed precast concrete columns and floor slabs from local buildings, including the Lysbüchel parking garage. Some elements are reused as load-bearing walls (concrete columns and beams), and some make up the load-bearing structure of the façade (ribbed concrete slabs as walls). The project will reuse a total of 2,680 building components from locally deconstructed structures. To lower the embodied carbon of the construction further, the project prioritizes low embodied carbon materials such as wood walls, clay boards, clay plaster, and cellulose insulation. The units are designed as compact floor plans, maximizing programmatic use without excess space reducing material demand. Finally, the building is designed to have a flexible floor plan which can adapt to different future layouts and uses. The primary structure, envelope, and interior elements are designed as three independent systems which facilitates future separation of components for adaptive reuse.

KEY FINDINGS, RECOMMENDATIONS, AND LESSONS LEARNT

Since the construction of the building is not yet complete, many of the lessons learned are related to the design and planning of the building. A large challenge facing the design team is the logistics of transporting the components from the deconstructed source to the final position in the new structure. This required precisely tracing the journey of each element which involved QR codes for tracking, considering the element's weight for stacking purposes at the storage site, and knowing exactly where the construction cranes will be positioned. Additionally, the reuse of concrete slabs as walls required special consideration to the position of the rebar which was closer to the surface than it would normally be for a load-bearing wall condition.

FURTHER INFORMATION AND RESOURCES

<https://www.concretecentre.com/TCC/media/TCCMediaLibrary/Concrete%20Quarterly%20Archive/2023/CQ285-Winter-2023-digital-edition.pdf>

https://katharina-marchal.ch/fileadmin/generic_lib/Resources/Public/Downloads/TEC21_21-22_2023.pdf

<https://www.espazium.ch/it/attualita/il-riuso-come-norma>

<https://www.designboom.com/architecture/parabase-elementa-reuse-housing-switzerland-basel-08-30-2023/>

<https://www.archdaily.com/1008183/parabase-reuses-prefabricated-concrete-elements-for-a-radical-housing-development-in-basel-switzerland>

<https://www.beta-architecture.com/elementa-parabase/>

AVAILABLE QUANTITATIVE DATA

An LCA was conducted using the EcoTool, and estimated a carbon savings of about 1,088,082 kg CO₂e. The budget of the project is 70.000.000 € (3.500 €/sqm). The project reuses 2,680 building components.

ABOUT THE DATABASE

This case study has been prepared by the Structural Engineering Institute Sustainability Committee Circular Economy Work Group with the goal of sharing and promoting the excellent circular economy work that project teams are working on throughout North America and the world. Often it is hard to find information on how circular economy principles are implemented in practice; these circular economy case studies aim to better share information amongst the industry.

Some case studies have been prepared directly by a project team member, while others have been prepared based on available texts and publications. In the second case, the text descriptions are a summary of information available from other sources. These sources are referenced in the *Further information and resources* section.

While reasonable efforts have been made to ensure the information is representative and accurate, we cannot guarantee there are no errors. [Please contact the case study team](#) to provide additional information, suggest updates and amendments, or with any other questions. To submit a new case study to the database, [please use this submission form](#). Thank you!