REMCO

BENOIT SERAPHIN
SCIENTIFIC ASSISTANT HES-HEPIA
Contact : benoit.seraphin@hesge.ch

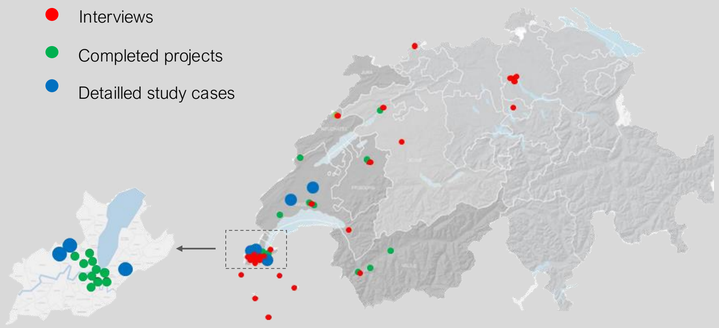
hepia
Haute école du paysage, d'ingénierie et d'architecture de Genève

REUSE OF CONSTRUCTION MATERIALS ? EVERYBODY TALKS ABOUT IT, BUT NOBODY'S DOING IT

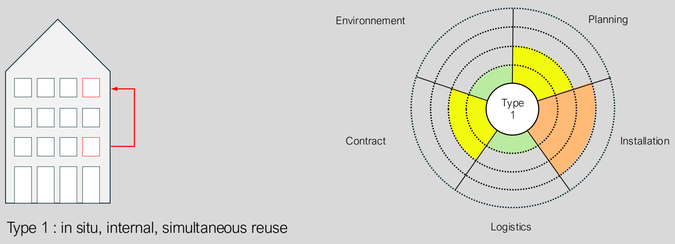
Reuse (disassembly, reconditioning and reassembly of a component) has the potential to shift practices towards greater circularity and environmental sustainability within the construction industry. However, supply and demand for reuse materials are still in their infancy in the vast majority of developed countries.

REMCO (reuse of construction materials) provides an overview of the reuse of construction materials in French-speaking Switzerland over the past five years. It has identified around twenty-one construction sites where reused materials has been significantly implemented and has analysed in detail five case studies from a multi-criteria perspective of implementation, logistics, cost and environmental impact.

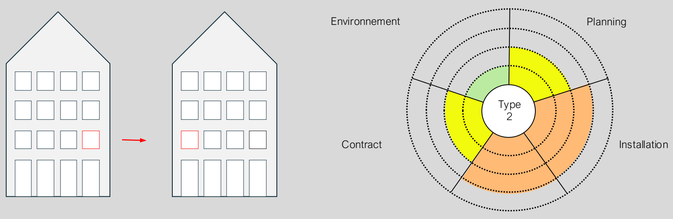
Reuse in the construction industry : an opportunity to boost circularity or a sweet illusion ?



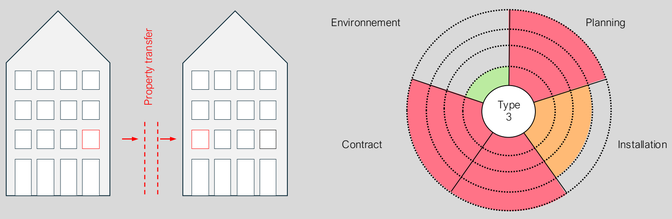
Logistics schemes



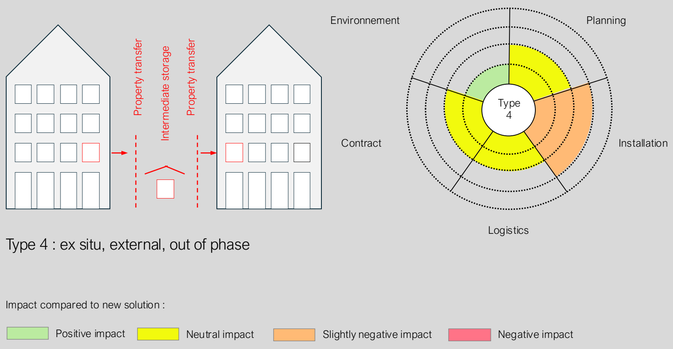
Type 1 : in situ, internal, simultaneous reuse



Type 2 : ex situ, internal, simultaneous reuse



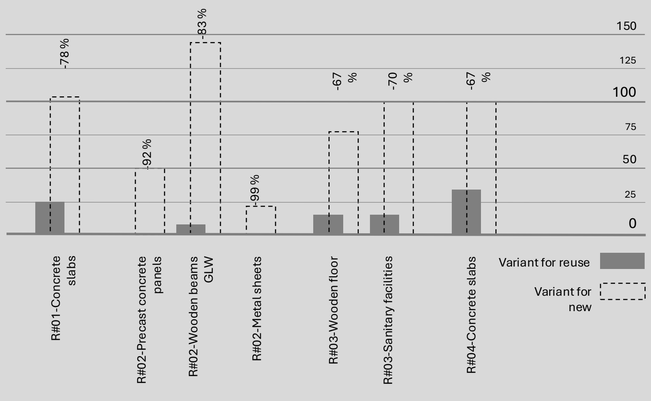
Type 3 : ex situ, external, simultaneous reuse



Type 4 : ex situ, external, out of phase

Impact compared to new solution :

Positive impact | Neutral impact | Slightly negative impact | Negative impact



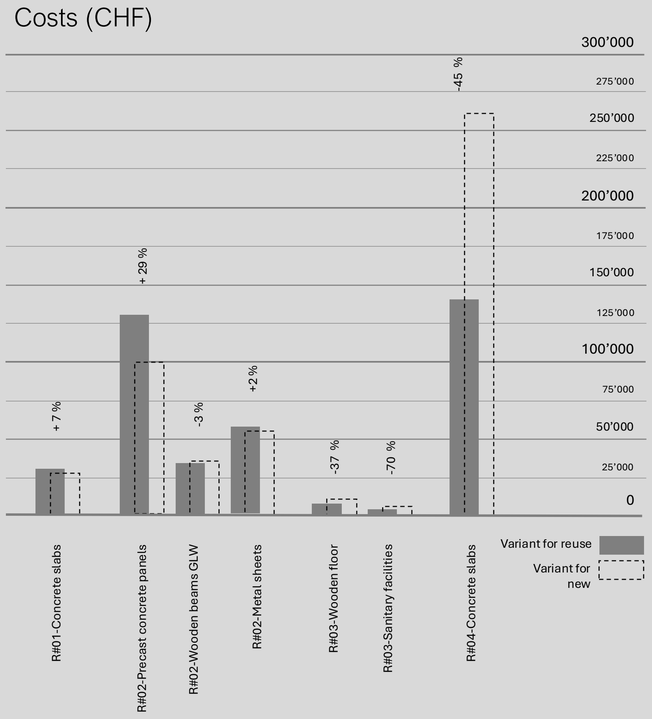


Image : Benoît Séraphin

21 building sites with significant reuse over the last 5 years in Western Switzerland have been identified.

Since there are no GHG emission requirements in force in Switzerland, significant reuse currently concerns only a tiny fraction of buildings relative to all the construction activity in the territory and period concerned (24,682 building permit applications submitted in the canton of Vaud alone between 2019 and 2023). In many of the projects surveyed, the architects were at the origin of the approach

Four types of reuse logistics have been highlighed. Out of the 21 projects identified in the survey, 9 (43%) implemented type n°1, 3 (14%) type n°2, 8 (38%) type n°3 and 7 (33%) type n°4. Some projects implemented two types of reuses and one project three types.

The absence of organized channels, know-how and proven processes, resulted in each project being experimental.

The diversity of possible types and combinations illustrates the complexity of the reuse process in buildings. The lack of homogeneity between different materials (from sawn concrete to sanitaryware) and the absence of organized channels, know-how and proven processes, resulted in each project being experimental.

Image : Paolo Corsini

Leisure center Maison Vaudagne, Meyrin, BCR architectes

The life cycle assessments results show a reduction in greenhouse gas (CO_2) emissions between 70% and 99% compared with a new product.

Logically, it's those components that combine a high impact on production with a low need for reconditioning before reuse (sheet metal, for example) that show the greatest reduction.

The life cycle assessments results show a reduction of CO_2 emissions between 70% and 99% compared with a new product.

The percentage of reuse in relation to the total cost of the project is varying from 0.6% to 1.6%, which shows that there is still a very long way to go to achieve mass reuse.

The spread of costs, from -70% (supply only of sanitary appliances) to +29% (reuse of prefabricated concrete walls elements) between the reuse and the new solutions variants is significant and does not show any clear trend.

Image : cooperative d'architecture

Community housing, Denens, cooperative d'architecture

Reuse represents only 0.6% to 1.6% of the total cost of the projects. Price differences between reuse and new do not show any clear trend.

REUSE ? FOR THE TIME BEING NOT MANY ARE DOING IT AND WHEN THEY DO IT'S AS BEST THEY CAN, BUT IT'S MAKING PROGRESS !

Academic team :

hepia Haute école du paysage, d'ingénierie et d'architecture de Genève

Prof. Lionel Rinquet, Benoît Séraphin, Grit Fowler, Luca Cardinale, Almir Delfieu

HEIG-VD

Prof. Stéphane Citherlet
Mija Frossard, Hamidouche Ryme

Field partners :

ÉCO21 SIG SOREVA matériuum

Financing :

Hes·so