



Circularity for Educators

04. An Interdisciplinary Approach to Circularity

Maximising reuse potential

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How can we maximise re-use of materials from demolished buildings through smart cooperation between demolition contactors and architects? And how could this inspire our teaching?

High-quality reuse of building materials is becoming increasingly important. On the one hand, it is important to avoid the environmental hazards of having to produce materials for new construction. On the other, it is important to reduce the waste that is generated by demolition of obsolete buildings.

In current policies and research, a lot of emphasis is placed on the potential of material passports, and physical and virtual marketplaces to facilitate reuse of building materials. Nevertheless, these instruments are often not mature enough to be applied in practice. Also, although the intentions are good, they might actually overcomplicate things, because we have to build a whole new infrastructure to enable the material exchange.

So, is there a simpler and more effective way to maximise reuse of building materials? Our project, *Intrinsically Circular*, studies an approach that indicates there is.

In the project, we observe the *innovative cooperation between a demolition contractor and an architect*. In the current building life cycle, these companies operate as far apart as can be; with the

architect at the very beginning of the life cycle and the demolition company at the end. Our project partners have begun a cooperation in which the demolition company involves the architect as soon as it knows it will have a building to disassemble. The architect is then asked to make a new design for a future client, using the elements coming out of the old building. Hence the loop is closed at the moment we know that materials will become available, and the demolition company and the architect are suddenly as close to each other as possible in the building's multiple life cycles. The demolition company does not actually want to be called that anymore, but instead calls itself a reconstruction or reassembly company.

The benefits and the challenges of this approach

This approach has many benefits over the often-advocated marketplace approach. There is *clear information in advance about the amount and quality of materials that will become available for new buildings*, so the architect can start the design in a timely manner. Consequently, also *the temporary storage after the disassembly is minimized*. And *clients can be offered a building that is made up to 95% out of reclaimed materials*, which can be economically competitive to and much better for the environment than a building created from raw materials.



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Is it as simple as that? Of course not. Even within the pragmatic partnership there are challenges to overcome. For some components, such as concrete floor slabs, testing is necessary to check if they are safe to reuse. Other components, such as façade elements might need to be adapted to meet current requirements for comfort, insulation and health. Some elements might just be obsolete, so unfortunately must be recycled instead of reused. The designer has to work with more constraints than usual and may find it challenging to compose something that works from a contemporary aesthetic, functional, and technical perspective. Fortunately, the architects in our project see this challenge in a positive light.

Recommendations for educators

For us as educators, the project leads to various recommendations. First and foremost, *we need to enable our students to practice designing with re-used materials*. For example, through an exercise in which they come up with designs to reconfigure an old building into a new one. Around such an exercise we can stimulate students to think about *how to manage the process, logistics, stakeholders, information flows* and so forth, and have them think about *how to assess the quality and technical risks* involved in building with re-used materials. From an urban planning point of view, we could have them think about *how to identify the potential supply of obsolete buildings and reclaimable materials in the region*. In short, the pragmatic partnership between the reassembly contractor and architect inspires an educational challenge that all our departments can contribute to. It also unveils the complex character of circularity and the inherent need for systemic thinking.