

The Cultural Value of Reuse

*Towards a reuse based architecture as a tactile archive of cultural value
A site specific research in the context of Liège, Belgium*

*P1 Research Plan
11 November 2022*

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Introduction & Research Goal

Liège is well known for its industrial history of mining and making, established by its many physical memorials; like abandoned factories, blast furnaces and slagheaps. The post-industrial era however also left intangible traces in the city, in both an economic and a demographic way. Many immigrants seek refuge in Liège, mainly due to the abundance of affordable places to live in and the cultural mix of inhabitants allowing for quick integration. A lot of people however leave the city just as easily, as they come, when they are provided with the opportunity.

As a result, many houses and small industrial buildings are left abandoned, sometimes even for years, leaving only empty carcasses of lost activities behind. These buildings carry with them a memory. This memory can sometimes leave traces of what was there, but it sometimes lets its history for the imagination of the spectator. Either way, the materials of the structures often resemble the era in which they were built, inseparable with the *genius loci* and thus cultural value of the place. Even though the potential of the site might encourage the demolition of the existing structures and make space for gentrifying modern structures as large apartment blocks. In this context, modern looking buildings would probably not fit the historical context of the site and serve the potential of the resources the existing structure was built out of.

Apart from discarding the cultural value of the materials, demolition of such existing structures also ensures a negative contribution to environmental issues. According to the European Commission (2016, p. 1), construction and demolition waste was even qualified as the number one waste stream in the European Union in terms of volume, making up a third of the total waste contribution. A reason for this is that the dominant model for resource consumption in the field of architecture, engineering and construction is still linear, and therefore a lot of waste is created when buildings reach the end of their perceived functionality (Crowther, 2005). In the alternative model, a closed loop system, this waste would provide resources for new buildings, while prolonging the life of natural resource stocks, lowering construction costs and decreasing negative environmental contributions in the construction sector (Cruz Rios, Chong & Grau, 2015).

In my research, I therefore aim to investigate the possibilities to preserve both cultural and technical values of materials and to use this as an argument and tool to create architecture based on reclaimed resources. Hereby, I will answer the question: *'How to maximize the use of reclaimed resources from the direct context of Liège in the construction of sustainable architecture, while adding cultural value to the site?'* Within this research, I follow the definition of reuse as defined by Josefsson and Thuvander (2020, p. 2): *"to reapply or reinstall a material (post-consumer, by-product, waste) in the same manner as originally intended or for a useful new application"*. Following this definition, it is implied that reuse is not usually possible for materials which are destroyed during the demolition process, but rather for components that can be deconstructed undamaged and used in a similar state (Gorgolewsky, 2008).

Relevance & Position

The overarching theme of the Urban Architecture Graduation Studio 2022 is 'Scar', referring to the notion of something that once was healed, but somehow still shows marks of its wounded history. In some occasions, a healing process even demands additional donor tissue to be used, leaving behind even more traces of the past and the process of healing. By trying to revive an abandoned site, while creating new architecture with locally reclaimed materials, the aim is to create a positive scar; a place that is healed through reintroducing activity and cultural value, created by its own tissue and donor tissue from other 'wounded' sites nearby.

In the context of Liège, I strongly think that there is a lot of potential, in both vacant sites, the existing abandoned structures and the materials they are constructed with. Taking into account the major environmental and economic disadvantages of constructing with virgin resources. I am really eager to investigate the possibilities of using reclaimed materials to create a typology that fits the context of Liège.

Structure & Methodology

1. Inventory

For my research, I first want to investigate the current sources for reclaiming materials, to get a grip on the scale of the final inventory. Subsequently, these sites and buildings will be evaluated through comprising a material catalogue of all available resources that are found and their most important characteristics. The inventory and evaluation of sources and materials will mainly be done by field research and thick mapping.

2. Cultural value

The second step is to assess these buildings and materials on their cultural value, by comparing each building in building typology, construction period and location in search for material culture and aesthetic value. The evaluation assessment will probably be a product of extensive fieldwork, including conducting interviews on the perception of cultural value in buildings, together with archival and literary research on the typologies.

3. Reuse methods

In order to understand what possibilities lay within the scope of reusing reclaimed materials, the third step will be to investigate different methods and processes needed to recover, repurpose or upcycle the available resources. Since this topic requires knowledge beyond the field of architecture, this research will mainly be done by consulting literature. Possibly, small scale tests will be executed to put specific knowledge into practice.

4. Design methods

Finally, a methodological research towards the possibilities of designing with reclaimed resources will be done. Additionally, an investigation of strategies regarding Design for Disassembly might be included to ensure future reuse of the recovered, repurposed or upcycled materials. Both the research of designing with reclaimed resources and the research into Design for Disassembly will mainly be conducted by consulting literature and executing design practice.

1. Inventory

In order to know which materials are available and usable within the context of Liège, an inventory of vacant buildings and sites should be executed. Subsequently, each of these buildings and sites should be analysed during extensive field research in order to create a combined material inventory of all available resources. The expectation that a lot of the potential buildings and sites will not be accessible, the status and previous function of the complexes, as well as the quality of the found materials, might have to be based on assumptions, rather than exact knowledge will be taken into consideration. Within this theoretical framework, it is also assumed the buildings and their materials are available for use, even if the intention might be to repurpose them.

As a result of the inventory, the source catalogue will be a map of Liège, highlighting the abandoned or in other way vacant buildings in the direct context that might form a source for reclaiming material (Figure 1).

The material catalogue will be comprised of all individual sources, displayed in exploded view and showing the available material types, together with their dimensions, quantity and other main characteristics (Figures 2). A detailed picture of every material type will be added to suggest its aesthetical quality. Since the technical quality of the resources will be hard to assess due to the lack of accessibility, this will not be taken into account for this research. Finally, a Material Flow Analysis (Figure 3) will be done to provide insight into the total inventory of materials and their distribution among the sources.



Figure 1: Inventory of vacant buildings and sites in Bressoux (author, 2022)

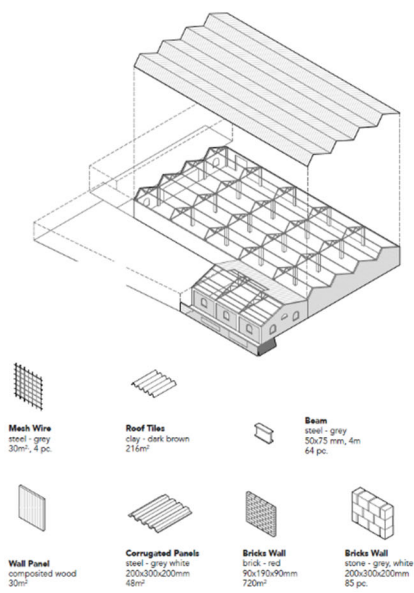


Figure 2: Inventory of building components in an abandoned industry building (Alice Chau, 2022)

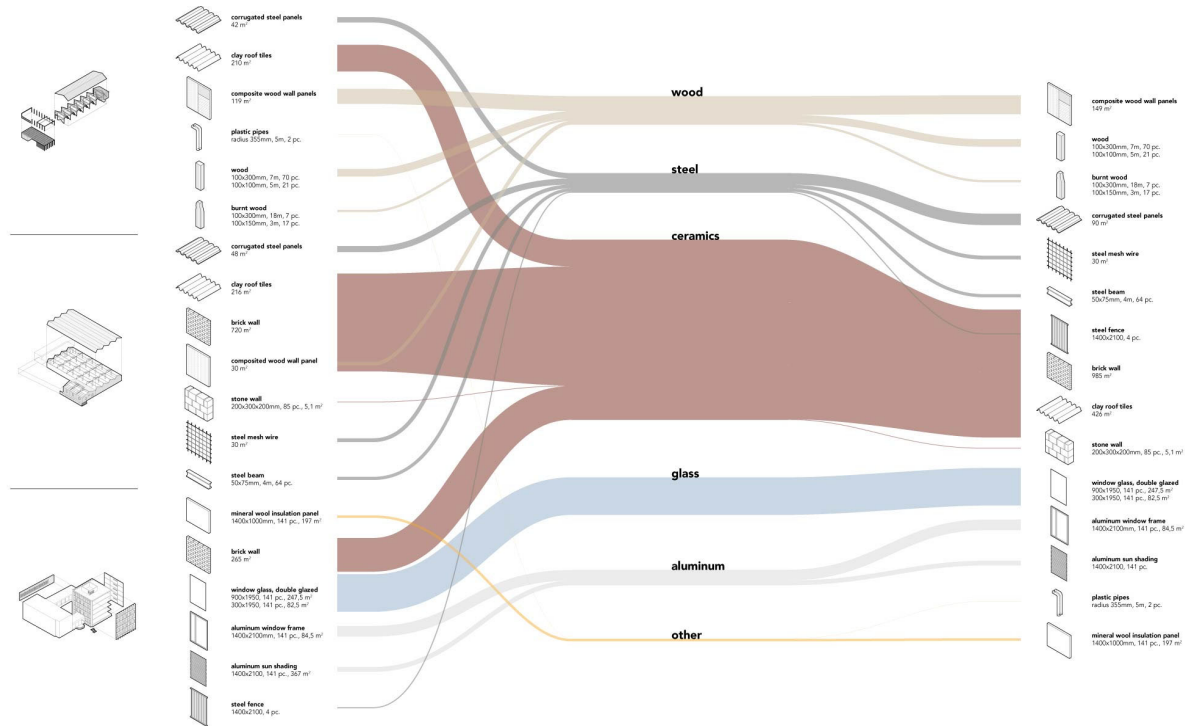


Figure 3: Material Flow Analysis diagram of 3 case studies in Bressoux (author, 2022)

2. Cultural value

In order to evaluate which materials should be preserved and used, the cultural value of the buildings and materials will be assessed. According to Arlotta (2019) this consideration of heritage values is an integral part of preservation decision making. This way, places and objects whose fabric is not inherently valuable, but rather valued for its associations, can be preserved, adding to the cultural value of the city (Arlotta, 2019).

Manelius, Nielsen and Kauschen (2019b) add to this the notion of increased cultural value through the aging of materials. They state that transformed buildings may carry a strong identity based on previous usage or the weathering of materials. Thus old buildings, and in particular in their unique tangible form of historic industrial buildings, are considered important for preserving the local collective memory. This has formed the working hypothesis that reused buildings, materials and components represent a potential value in terms of culture to be preserved and enhanced (Alias, Zyed, & Chai, 2016; Manelius, Nielsen & Kauschen, 2019b; Mısırlısoy & Günçe, 2016).

This part of the research therefore aims to investigate the importance of the cultural value of the buildings and elements in the direct context of Liège. This might be associated with the perceived local cultural heritage. The latter will be done by looking into different typologies, periods of construction and locations of the different buildings. These will then be assessed on their similarities or differences, in order to distinguish different material cultures and their values. Additionally, historic research and conducting interviews might give more insight into the perception of cultural value in buildings.

3. Reuse methods

According to Kohler and Hassler (2002) and Sassi (2008) existing buildings should be considered as huge reservoirs of materials and components that can, if dismantled, potentially be mined to provide much more needed resources (Figure 4). Three ways of reusing these reclaimed materials in a project can be distinguished. The first one, often referred to as 'adaptive reuse', concerns the reuse of an existing structure on site, possibly adding to it or extending it. Secondly, the reuse of components extracted from one, usually deconstructed, project into a new building is referred to as 'component reuse'. Thirdly, the reuse method of 'relocation' refers to moving entire buildings to a new location. (Gorgolewski, 2008). Since this third method is however mainly suitable for pre-engineered or temporary buildings, which is less likely to occur in the context of Liège, the main focus within this research will be on investigating possible methods of adaptive reuse and component reuse, as well as the processes demanded to facilitate them.

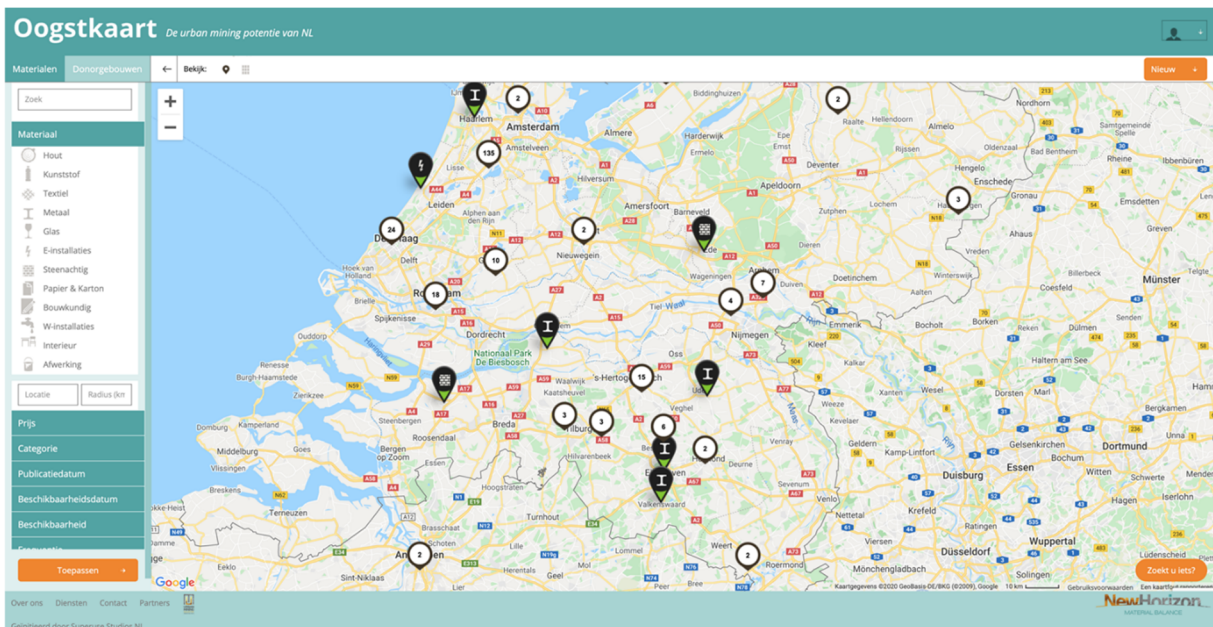


Figure 4: Oogstkaart.nl (Architectenweb, 2020)

4. Design methods

According to Addis (2006), designing to incorporate reclaimed materials is fundamentally different compared to conventional design methods. As opposed to designing with reclaimed materials, conventional design requires the designer to conceive the elements and system of a building before specifying the materials and components. Through the design with reclaimed materials, the starting point may instead be an inventory of the available materials. As a result, the size and length of the available material will determine the spans and spacing of the structure. Thus maximizing structural efficiency from the available components (Addis, 2006; Gorgolewski, 2008). In a similar way, the building's form, aesthetics and details are also directly influenced by the available materials (Josefsson & Thuvander, 2020).

The aim is therefore to reevaluate the inventoried resources and order them based on possible function, based on the principles of Design for Deconstruction. Subsequently, the potential program of the building should be evaluated on the demanded resources. Accordingly, the most convenient site in terms of availability can be chosen, functioning as the basis for further completion of materials from other sources. Finally, the building can be designed by defining the existing structure on site and limitations of available reclaimed materials (Figure 5).

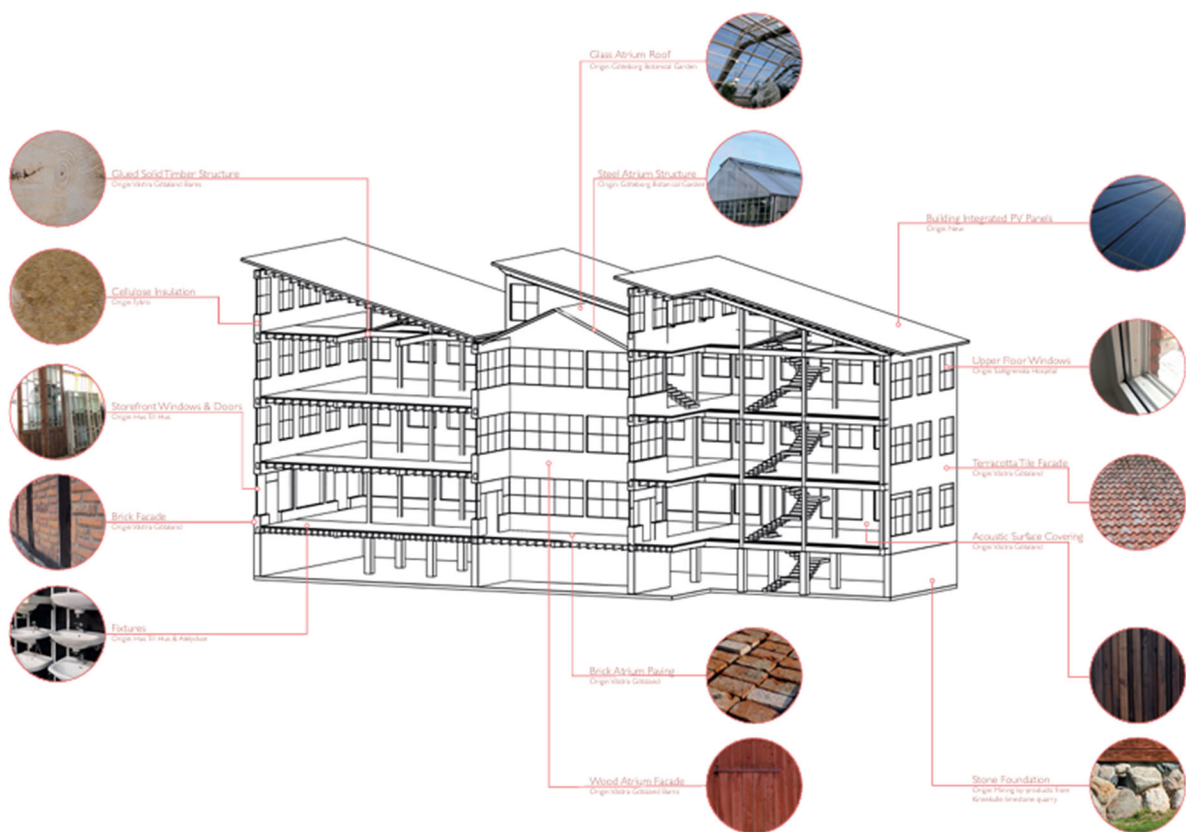


Figure 5: Section with local reused materials (Josefsson & Thuvander, 2020, p. 4)

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