

Reflection

A test case for a circular woonerf

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Studio introduction

This graduation project is set in the wider context of the Graduation Studio Revitalising Heritage. The studio centres around two case studies, the Bijlmerplein neighbourhood in the expansion area Amsterdam Zuid-Oost and the neighbourhood Goedewerf in the new town Almere-Haven, with the assumption that they will be regarded as future heritage. The residential stock built between 1965 and 1985 requires a design solution that deals with the technical and social problems that are generally found in these residential areas. The students are asked to explore the potential of the existing urban structure and buildings in the case studies and find design solutions to create future-proof neighbourhoods while harbouring potential heritage. In short, the studio aims to “discover the qualities of what could be new heritage and to use these qualities in a sustainable redesign” (New Heritage Studio Text, 2022, pp.2).

Project description

A large portion of my generation, including myself, have grown up in a woonerf neighbourhood. The labyrinthic layout and the green area were the perfect environment to grow up in. Now almost 50 years old, the woonerf is challenged with social and technical deterioration, poor energy performance, misalignment of demographics and typology and an overall negative image. Because the housing stock consists of 20% of woonerf residents, there is considerable reason to seek for a solution to make this type of neighbourhood future-proof. In this national task to renovate and adapt entire neighbourhoods, there is a bigger issue to consider: our linear consumption. In 1972 it was concluded in the report for the club of Rome that the unlimited growth of the world population, the economy and the associated use of energy and materials would ultimately lead to a catastrophe (Meadows, et al., 1972). The report awakened the world, leading to increased awareness of environmental pollution and sustainable energy consumption. Meanwhile, resource consumption stayed mostly linear, meaning that it follows a

‘take-make-dispose’ pattern (Ellen MacArthur Foundation, 2013). This pattern not only further depletes natural resources, but also leads to emissions of pollutants and disposal of waste into water, air and soil. To address these issues, the concept of circular economy (CE) has gained increasing attention in business models as well as in political agendas (Ellen MacArthur Foundation, 2013). On the Dutch political agenda, the government aspires to make the Dutch economy completely circular by 2050, meaning that only renewable resources are used and the waste sum is brought back to zero (Rijksoverheid, 2016). Especially the construction industry plays a big role in resource consumption and waste. The sector is responsible for 50% of raw material consumption, 40% of the total energy consumption and 30% of the total water consumption in the Netherlands. In addition, 40% of all waste in the Netherlands comes from construction and demolition, and the sector is responsible for approximately 35% of CO2 emissions (PBL, 2021; Rijksoverheid, 2016).

This project combines the challenge of future-proofing the woonerf and the transition to circular consumption into a test case that aims to experiment with the woonerf as a circular neighbourhood. The final product is a research-informed design for the neighbourhood Goedewerf in Almere Haven, for which a circular strategy is developed and values and characteristics of potential heritage are conserved. The objectives that lead the research have been formulated into the following main question.

How can the woonerf, such as Goedewerf, be redesigned to create a circular neighbourhood, while still maintaining potential heritage?

Research

During the first phase of the studio the students had the work in a group to design renovation models aimed to improve certain values of the case studies. The impact of the interventions in these models was then shown in an adjusted version of the Kamari wheel, which is a holistic sustainability decision-making support framework for building renovations. I took this same approach in the design of my graduation project, so that I could improve certain values in the project. Instead of using the Kamari wheel to assess the results of the project, the value assessment diagrams from the publication 'waardevolle wijken' are used. This value assessment diagram, called the Circular Value Flower method, developed by Els Leclercq and Mo Smit, helps bring insight into the added value of circular interventions on a neighbourhood scale. With the circular strategy matrix that resulted from the research, I was able to make a design test case that tested whether redesigning the woonerf into a circular neighbourhood is a viable option for the renovation challenge of other woonerf neighbourhoods.

Design process

The design for Goedewerf is a research-informed design. For the design process this meant that, as the research developed, I could make more design choices. Within the theme of a circular neighbourhood, there are many aspects to be considered. Not only is there the technical side of water systems and material cycles, but there were also financial and management aspects to be considered. This made the design process very complicated, and often overwhelming. There were times when I felt I lost oversight on the design and the goal. This is when I had to go back and remember the essence of the project: making a future-proof woonerf.

Relationship between the graduation project and the wider social, professional and scientific framework

The problems of the woonerf are well described in various publications, and often the conclusion is

that a solution needs to be sought to revitalize and make the woonerf future-proof. Yet, no renovation approach exists for the woonerf that addresses sustainability and the values of a woonerf. Therefore I approached this graduation project as a test case for a circular renovation strategy that can be applied to other woonerf neighbourhoods.

Ethical issues and dilemmas

The neighbourhood of Goedewerf consists of private homeowners and corporate-owned housing, this combination is what is called 'gespikkeld bezit'. Many examples exist in which the main difficulty of this situation becomes visible: a fragmented renovation. The consequence of homeowners not participating in the renovation is a fragmented façade image and the loss of aesthetical cohesion, but it also creates construction problems as the thermic line is interrupted. I choose to design for a scenario in which the renovation would be conducted in phases so that this fragmentation could be avoided. To renovate a complete housing block, house owners would have to participate, swap houses with private house owners willing to participate, or houses would have to be bought out by Ymere. Of course, a scenario is possible, in which this fragmented renovation does take place, and I recognize that this is a weak spot in my project.

Another dilemma that I encountered repeatedly during this project was on the one hand trying to follow the hierarchy of the R-ladder and on the other hand, finding a solution or intervention that adds the most value. This sometimes led to a deviation from the hierarchy of the R-ladder, in which it proved to be more profitable to choose an action lower on the scale. The choice to add an extra layer of insulation, and thus more material, is driven by the benefits of creating a passive house. But in the long term, the benefits of energy performance outweigh the ecological footprint of using extra materials.

In the search for a solution that applies to all woonerf neighbourhoods I often needed to take a step back and ask myself if the intervention I was

working on is realistic. Often, factors that had to be taken into consideration were the financial feasibility and the practicality of the intervention. For example, one of the more controversial interventions in the project is the removal and recycling of an external brick wall. The procedure requires the transportation of brick rubble to a factory, where brick and mortar need to be separated, ground up and formed into new dry-stack bricks. While the benefit of this method is that the brickwork comes back in a reusable form, and less raw material is needed to produce these bricks, the financial costs of this procedure are higher than with a conventional brick wall. Realistically, more conventional systems might be chosen in the renovation of these neighbourhoods.

Sources

Ellen MacArthur Foundation. (2013). Towards the circular economy.

Kamari, A., Corrao, R., & Kirkegaard, P.H. (2017). Sustainability focused decision-making in building renovation. *International Journal of Sustainable Built Environment* 6, 330-350.

Meadows, D.H., & Meadows, D.L., & Randers, J., & Behrens III, W.W. (1972). The limits to growth. A report for the club of Rome's project on the predicament of mankind.

PBL. (2021). *Integrale Circulaire Economie Rapportage 2021*.

Rijksoverheid. (2016). *Nederland circulair in 2050*.