NEW HERITAGE

GRADUATION STUDIO

IDencity

ADAPTIVE REUSE OF CAR PARK HAKFORT
“NEW HERITAGE”

The studio New Heritage focuses on the existing housing stock within Amsterdam Zuidoost:

“Many neighbourhoods face social problems of liveability and demographic changes. Moreover, this housing, like all of our stock, should meet the future standards of energy performance, which leads to an urgent need for energy upgrading. The question arises if keeping this housing is feasible, when taking into account the complexity of technical, social, economic and aesthetic issues.” (New Heritage, 2020)

During this studio the aim has been to develop an answer on the housing stock of H-Buurt, an area within Bijlmermeer, and if it is suitable for further use or not?

To make decisions on this, value-based design shall help to extract existing values as well as challenges to get a good understanding of the needs of H-Buurt.

**MOTIVATION**

Ever since I am doing architecture, my aim is to develop spaces where people want to meet and connect. Several other topics within the field of architecture have been deepened over time.

The focus on sustainability has become an important part of architecture. Especially the focus on passive climate systems triggered my interest. Furthermore, I believe in the (maybe idealistic) idea that existing buildings can mostly be re-used for developments and that integrated projects can offer feasible solutions for most of the existing buildings, if carefully developed.

With those general interests, the studio has been started with following aims:

1. Develop a solution to add housing to existing dwellings, to provide a solution to the housing shortage.
2. To develop a solution that is truly sustainable. This was, in my opinion, mainly two things: timber and energy positive.
3. Provide an answer for the re-use of large-scale buildings and how they can be made future proof.

The studio “New Heritage” offered the right combination of topics to achieve these two goals. Bijlmermeer, as the area of intervention, needs an update of the existing housing stock and can provide extra densification.

**THE PROJECT**

IDencity is located in Hakfort as part of H-Buurt in Amsterdam Zuidoost. The project addresses the non-used car park Hakfort. The car park has been built as part of the expansion plan of Amsterdam in the mid 70’s and was originally connected to the high-rise dwelling Hakfort. The once facilitating function to society is nowadays not given anymore, since the car park finds itself empty and faces demolition in 2022 in order to make space for a new development driven by the municipality of Amsterdam. As original part of Bijlmer’s master plan, the car park incorporates the characteristics of the functional city approach, which puts the car into the centre of the city and gives Bijlmer part of its identity.

Therefore, IDencity aims to draw an alternative solution to the demolition by analysing its value from an environmental, social and economic perspective. Programmatically, the project proposes an adaptive, low-carbon transformation of the existing structure into a social hub, while offering an answer to the national housing shortage by adding 120 dwellings.

In summary, IDencity aims to push circularity on both a building and a society level by creating places and spaces where the existing is complemented by additions to serve both environment and society.
RESEARCH QUESTION
How can the adaptive reuse of car park Hakfort offer solutions to current challenges while strengthen the genius loci?
Sub question 1: How can the transformation provide an answer to the national goal of carbon neutrality by 2050?
Sub question 2: What possibilities of serving the one million homes challenge can be achieved while keeping the existing car park's structure?
Sub question 3: How can the adaptive reuse enhance the buildings' value to society?

THE PROCESS
The project questions the municipal proposal of demolishing car park Hakfort to develop a new area along the Karspeldreef (see Figure 2). It focuses on current characteristics of the area, challenges and opportunities to understand the buildings heritage value in its whole. Combined with a personal fascination towards adaptive reuse and circular construction, several research methods have been conducted.

PHASE 1: H-BUURT
What values can be found in H-Buurt? What do stakeholder value in the neighbourhood? What are challenges and what characteristics show opportunities? What does the area offer architecturally on both urban and building level?
These questions are just a few out of many we, as a group, took as opportunity to research qualities, challenges and opportunities of H-Buurt. Next to research into history, buildings and quantitative data (i.e., demographics), we approached our value-based analysis out of the stakeholders perspective. Therefore, several focus groups (Makers, Government, Owner, User) approached the analysis with several tools that were most effective to analyse qualities and challenges of the neighbourhood.
All this with the collective goal of defining codes that show results of both quantitative and qualitative methods and result in multiple specific characteristics of the neighbourhood (see Figure 3). Value matrices exposed strengths and weaknesses of the neighbourhood and gave a first understanding of the area we would be dealing with during our individual projects.
Overall, this first research phase gave us a deeper understanding of elements that need attention as well as parts that offer high value we can build up on.
Furthermore, a couple of important characteristics could be extracted that have direct influence on the project site of car park Hakfort.

PHASE 2: CAR PARK HAKFORT - RESEARCH
P2 and critical feedback helped to streamline the project towards specific topics and to do in-depth research into a problem and provide a detailed solution that is not only logical but also
needed. Therefore, a manifesto has been set up with goals and aims on basis of the previously analysed needs of the neighbourhood and society.

Design values shall help to reflect on the design and if the design solves the introduced challenges sufficiently. These values are Adaptability, to make the building adaptable to changing needs; Circularity, to shift towards a circular economy; and Affordability, to develop an intervention that makes it affordable for both owners and residents as well as for the environment.

To get a better understanding of both the buildings and urban history and characteristics, research has been made into the building and the surrounding neighbourhood, ultimately resulting in a Project ID, which takes Brand’s six S’s as a basis to define important elements of building and surroundings (see Figure 4).

A value assessment on basis of the combined Heritage value table by Clarke and Kuipers (2017) of mentioned elements defined the significance of the building within the scope of several values.

Studies on society as well as into cultural habits helped to understand the needs of society and how the current urban tissue serves those needs. However, it was difficult to do a socio-cultural analysis on a theoretical level without having a feeling for the “real” society on site, which has been difficult due to Covid-19.

Furthermore, theories on city planning down to a building scale like A Pattern Language by Christopher Alexander (1977) as well as Jan Gehl’s Life between buildings (2011) provided a theoretical framework for intervention so it becomes not only socially compatible but also gives something back to society and surroundings. Also, on an urban level, a spatio-functional analysis revealed spatial use and urban characteristics over time (see Figure 5). Here, the future developments of Amstel Ill and A9 were taken into account to research the relevance of connections within the area.

On a building level, a material inventory lists existing materials and their quantity as well as their embodied carbon that can be reused during the design process.

Simultaneously, on a building scale, research into circular and low-carbon construction like Sustainable Building Adaption (2014) written by Sara J. Wilkinson et al. offered insight into ways of dealing with existing buildings. Additionally, a load ca-
Pacity calculation of the existing structure in combination with the building application documents defined the maximum possible addition on top of the existing structure. The large scale of the existing building made it necessary to set limits, i.e., in form of load capacity, to set a framework and limit the scope to a reasonable level.

The Heritage research and design process accounts for quite some time, while it can help to not only streamline but also limit the later design intervention to needs rather than wants. There is no strict separation between research and design which allows the project to adapt to changed circumstances or needs. Further research has been conducted during the design phase.

**PHASE 3: CAR PARK HAKFORT: DESIGN**

The analyses of building, its surroundings and the cultural value assessment result in multiple design aims and positions on materiality as well as parts of the building that are crucial to its identity. Considering the previously mentioned design values, design strategies can be formulated to streamline the design phase:

- Creating a social node to revive the facilitating function of the former garage.
- Embracing the communal culture of society to create social inclusiveness.
- Pushing circularity and low-carbon construction to respond ad-

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Figure 5: spatio-functional analysis (conclusions)

better connectivity within the area. The plinth will be opened up to allow interaction between residents and user.

2. The Helling – The existing circulation space of the garage is being transformed to a large public indoor space. The high environmental value of the structural elements and the flexibility of the large space can offer multiple functions i.e., for events or exhibitions. The materiality intends to showcase the reuse of the existing concrete frames and is complemented by a low-carbon timber structure. The former function as a connective transition space is revived by creating the main connection between the different entrance levels of Karspeldreef and Bullewijkpad. The ramp becomes the central space of the new community centre and connects all other facilitating spaces, like the knowledge and office hub.

3. The Existing – The existing 5000m² footprint car park embodies not only 900t carbon within the load bearing structure, but also several other materials that have been added over time. To extend their life-cycle, most of the materials will be kept in place or re-purposed to stay in service of the building. An example are the single glazing sheets that are currently covering the staircases and some areas of the existing façade of the car park. By integrating them into a new double façade element, they extend their value by becoming part of the climate concept of the building. In this way, both demolition waste and raw material use can be minimised for the design intervention. This de-
sign approach experiments with the possibilities of transitioning towards a circular economy while respecting the environmental (and characteristic) values of existing materials.

4. The Addition – The municipal goal is to add between 200-500 new homes to the area of the two car parks Hakfort and Huigenbos (demolished). By reusing the existing structure of car park Hakfort, 900t of embodied carbon are kept in place and function as the new “foundation” of the added dwellings. A strong focus on bio-based materials – aiming for carbon neutral construction – are combined with design elements that refer to characteristic elements of the area to strengthen the identity of both building and surrounding. Around 150 light weight timber modules offer space for around 120 units in various sizes. Some units are inter-connectible to be adaptable to changes within the societal needs.

THE BULLEVARD - opening up the plinth allows a vibrant connection between shops and street, which transforms the currently enclosed car park into a social hub.

THE HELLING - extending the height of the circulation space allows the function as extended public space for events or other communal functions.

THE EXISTING - reusing existing materials in the new development extends their lifespans, lowers the interventions carbon footprint and raw material use.

THE ADDITION - developing around 120 adequate housing units provides an answer to the housing shortage as well as the need for flexible homes.

figure 6: main interventions - Bullevard, Helling, Existing, Addition
Chosen design values were always considered during the design process to find the solution that fulfills at least one and fits into the overall concept. Some decisions were less clear than others and resulted in dilemmas. The yellow garage doors, for example, have a strong visual identity, but are not suitable for creating a vibrant connection between building and surroundings. Furthermore, circularity and carbon neutrality aspects were researched in depth to provide answers to current environmental challenges. Both subjects revealed themselves to be very loosely defined. Therefore, the scope of both themes has been defined. Aiming for a circular and carbon neutral intervention resulted in design limitations along the process. Low-carbon materials or materials with a high reuse potential have been chosen with priority, while recycled materials, like aluminium and polycarbonate, aimed for reduced raw material use and lower environmental impact. The contrast between the surrounding buildings, mainly made of concrete and steel, and the proposed intervention, made of timber and reused/recycled materials, challenged the aim of enhancing the genius loci and blending into the neighbourhood. This challenge pushed the design to become a hybrid between bio-based and low-carbon materials and uses the opportunity to showcase the transition to a highly sustainable building. In general, it can be said that the large scale of the building brings advantages as well as disadvantages with it. The flexibility of spaces offer opportunities to develop attractive and highly usable areas, which, on the other hand, bear the risk of being spatially unattractive due to their size. This dilemma has to be dealt with in the way of a design that takes the large scale of the building and breaks it down to the human scale. Additionally, flexibility of spaces allows the adaptation to changed needs and can offer higher value to both user and owner. Nevertheless, the size of the building with its 5000m² footprint, challenges the balance between detailed spatial design and a holistic approach, which tackles major elements while providing flexibility to its solutions.

RELEVANCE
The existing housing stock – rental and owned – counts around 8.000.000 homes in 2020 (CBS, 2020). Around 70.000 new homes have been built in 2019 (CBS, 2020), but space for new housing is getting rare. Almost 1.000.000 homes are needed until 2030 in the Netherlands (Government, 2020). The solution for the housing shortage, especially in metropolitan areas, cannot be to rely on new built homes only. Change to the existing building stock is unavoidable to be able to house the increasing number of citizens. Both redevelopment and renovations can offer a sustainable solution to tackle the short-term housing shortage and improve both social and spatial quality (Van den Dobbelsteen, 2004 and Ungers, 1977), while offering a solution to minimise demolition waste, which has a major environmental impact. Nowadays, we know that the construction of anonymous high-rise buildings, like the Bijlmermeer, was only the solution to the extreme housing shortage but resulted in other – also severe social – problems (Wassenberg, 2003). On the other hand, the innovative (contrasting) approach of the 80’s part of H-Buurt didn’t solve all problems at once but introduced new problems to the area that needed to be solved and changed the intended use and function of buildings (Wassenberg, 2003). Therefore, the current topic of new housing needs to be addressed on basis of mistakes that have been made in the past, while using the past’s identity to build up on.
The history of the Bijlmer derives mainly from ideology of "the functional city" that has been defined during the 4th CIAM convention in 1933 (Mumford, 2002 and Wassenberg, 2003), which put the car as the central element of a city and strives for a strict separation of functions within the city (Gemeente Amsterdam, 2007 and Wassenberg, 2003). This functional approach on city planning is still visible in the current layout of the Bijlmer. Elevated streets and the huge housing complexes still define today's urban tissue, which gives the district identity on the one hand, but lacks in today's relevance of multi-functional buildings and an integrated urban plan, which connects various elements of the city on different levels (Alexander, 1977). Identification plays a major role in the development of new housing, since the genius loci needs to be taken into account to merge old and new (Moore, 2003). The placement of new buildings can enhance identity but can also result in disorder. Therefore, it is key to define a clear identity of an area before intervening in the existing or non-existing building stock to make sure that redevelopment projects unite areas instead of dividing them.

Density takes this approach and proposes a value-based solution to respond to environmental challenges (carbon neutrality and circularity) as well as social challenges (lack of social inclusiveness and housing shortage). With a holistic approach, the project takes the existing as an opportunity to enhance values and solve challenges. The project analyses specific needs through in-depth research and responds to them on both an urban and building level in a way that serves the initial goals. The developed functions and uses are based on this executed research and indicate what functions could work within the framework of introductory aims. Nevertheless, the design understands itself as a proposal, since it is impossible to predict how space is actually used over time. Proposing one solution shall showcase on how to deal with existing structures to react to current needs on various levels while preserving heritage values.

CONCLUSION

During the process, environmental challenges as well as societal needs have been extracted as key elements of the proposed project. To deal with an existing structure, which is currently not used and to re-dedicate it to society can show value in keeping existing buildings rather than demolishing them. Additionally, environmental goals, like carbon neutrality and circularity can give impulses to confront oneself with the building in depth. In the framework of "New Heritage", this results in a value based design that extracts values, enhances them and can result in valuable proposals that helps to transition towards a more sustainable built environment.

In the case of car park Hakfort, high environmental value of its structure, historical value as part of original Bijlmer, as a functional city, can be used to develop a highly connective building, which interacts with society and surroundings. With its holistic approach, the building tackles relevant themes while offering flexibility to its solution.
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LITERATURE


