



Sustaining The Garden City

Reflection Paper

AR3AH105 Graduation Studio

Resourceful Housing, Adapting 20th Century Heritage

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Reflection Paper

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Introduction

This thesis explores the topics of housing, heritage, and the climate crisis in the context of urban renewal in post-war mass housing neighbourhoods like Amsterdam Nieuw-West. It identifies three main challenges: growing urban inequality, material waste and the loss of neighbourhood identity. The research uses a variety of methods, including socio-spatial mapping, mapping of resource flows, comparative analysis, and expert interviews, to interrogate the ways in which contemporary urban renewal and refurbishment practices contend with these issues. This provides insight into the present challenges, shortcomings, and areas of latent potential. The project furthers this research by redesigning a post-war multifamily housing flat into a mixed-use collective housing ensemble. It explores ways of diversifying and densifying typologies, reconnecting with the context, and reusing existing materials, with the aim of delivering a project which addresses the issues of heritage, social and ecological sustainability in integral and novel ways.

Relation Project, Studio & Master Track

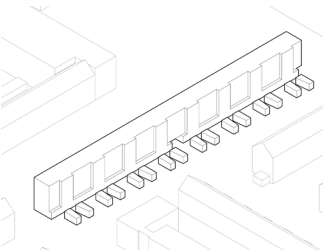
The project explores how cities, neighbourhoods and buildings change and aims to understand how both tangible and intangible resources are used or disused, relating to heritage values, material resources, and social and environmental impacts. This relates to the topic of the studio, 20th century heritage and resourceful housing, which challenges students to think about heritage as a multidimensional phenomenon, encompassing social, historical, ecological aspects. Various methods to map existing values are used, and students are asked to reflect on how their projects impact these values. This project identifies three dimensions: (architectural) heritage, social values, and ecological values which it tries to conserve or expand upon.

Through the design phase the project addresses the topics from the research at various scale levels and disciplines including urbanism, architecture, building technology and structural engineering. The thesis tackles major challenges such as urban inequality, the climate crisis and material scarcity. It considers the relationships between perspectives of sustainable urbanisation and heritage futures. In this way the project addresses broad societal issues which reflect the approach of the faculty.

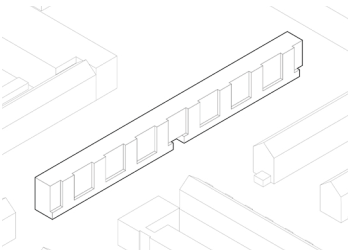
Connection Research and Design

The aim of the research was to understand why, despite broader recognition of value, demolition and new construction remains common in this context, to bridge the gap between theory and practice and proliferate conservation post-war heritage and revitalise deteriorating

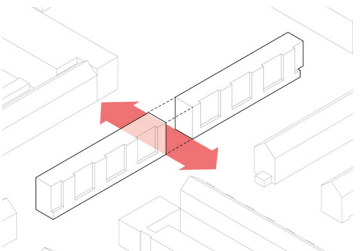
Massing Diagrams



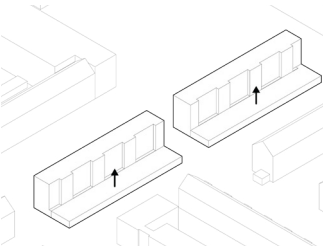
1. Existing Situation



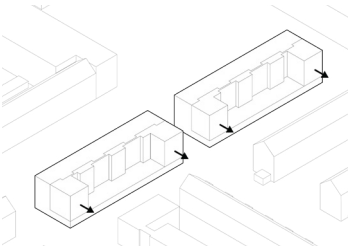
2. Removing Bike Storage



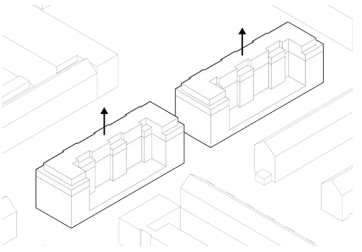
3. Enlarging The Passage



4. Expanding The Plinth

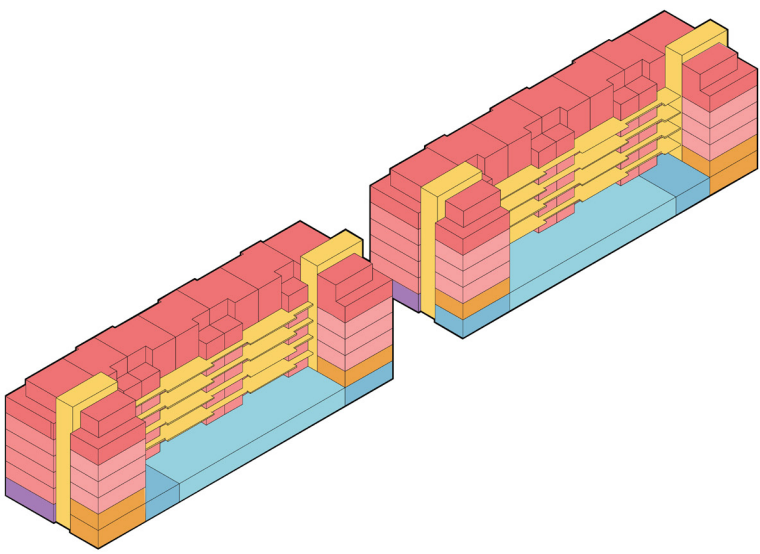


5. Creating a Corner



6. Topping Up

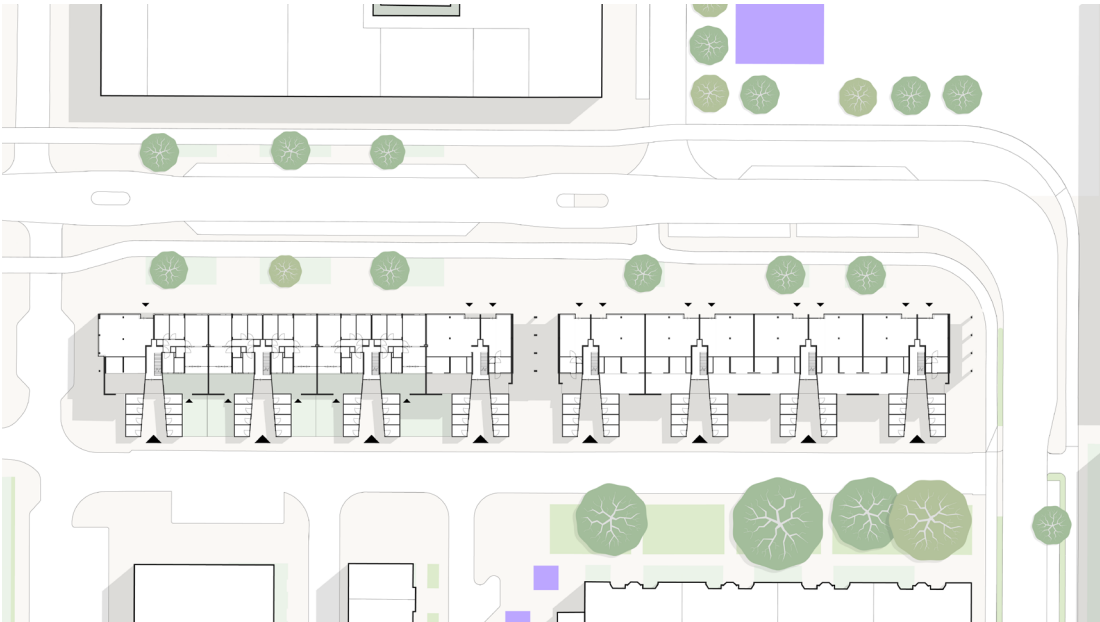
Program Diagram



- Residential
- Circulation
- Communal
- Car/Bike Parking
- Commerical

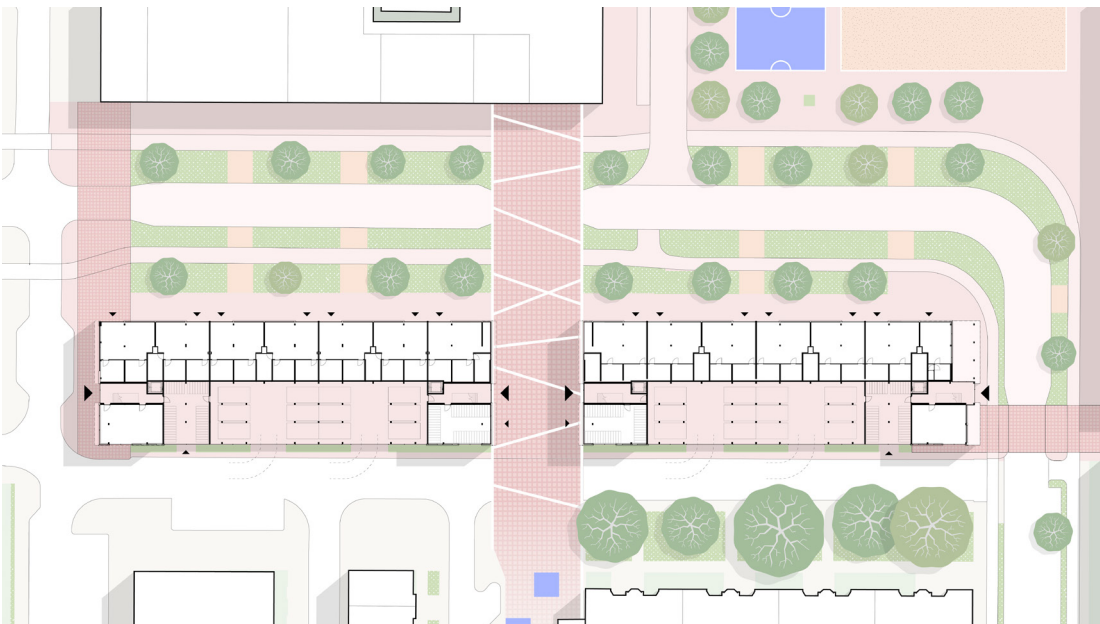
Ground Plan Existing Situation

This plan shows the existing situation and the challenges it poses in regards to the connection with the public space.



Ground Plan Redesign Proposal

This plan shows the improvements made to the public space, and the way the building connects to it as described in the text.



mass housing neighbourhoods. It found that the desire for demolition is driven by a complex interplay between, on one hand, the effects of spatial segregation and associated social problems and, on the other hand, a specific combination of physical attributes that amplify those problems while making addressing them difficult. Some of these attributes include undersized dwellings, poor accessibility, a lack of connection with the public space and the frequent use of inflexible construction systems. Therefore, the challenge of an architectural intervention is not only to improve a building in terms of energetic performance, but to make simultaneous improvements in all dimensions which make this heritage problematic. These findings form the basis for the scope and direction of the design proposal.

The research found that need for diversification and densification is often used to argue for demolition & new construction, in particular there is a lack of dwellings that can accommodate larger families (3-4+ children) in Geuzenveld & Sloterveer. In response the project tries to find ways to add significant density to the existing building while fitting within existing urban structure. The existing apartments are extended and granted generous outdoor spaces. New larger rooftop maisonettes are added which are comparable in size to more traditional row houses and come with significantly more outdoor space than typical apartments of that size. Finally, smaller two-bedroom apartments are added on the corner, all together these provide a broad range of typologies to accommodate a variety of household compositions. As a result, the total floor space in the building is more than doubled, the number of apartments is increased by 23 and the average floor space of each apartment is increased significantly.

Another common issue that was found in the research, is that these post-war flats are disconnected from the street level by storage boxes, garages, and tall fences, which creates an unpleasant atmosphere on the street level. For the building chosen in the design case, this issue is particularly prominent. Storage boxes protrude outwards towards the street, limiting visibility around the entrances and creating many dark corners. A long, low, and narrow passage is the only connection

between the plaza on one side and the neighbourhood on the other. To solve this the exiting passage is enlarged, improving walk-ability at the urban level, and making new openings in the façade letting in more light and creating new connections on to the street. New larger, more clearly legible, and transparent entrances are created at the ends of the, now two, buildings.

One of the main conclusions from the research was that in conventional refurbishments, shearing layers other than the structure are typically not re-used. In response a detailed map of the existing materials was made, much of the exiting building was left in place and ways to re-use the materials that are removed are proposed. This includes all the existing insulated glazing units, as well as a significant portion of the brick and concrete removed from the structure. Compared to conventional demolition and new construction, the project achieves a 54% reduction in carbon emissions. Compared to conventional refurbishment, the project achieves a 16% reduction in carbon emissions. This lower-than-expected result can partially be explained by the fact that a comparatively small amount of material was removed from the building to begin with as an effort was made to retain a part of the space plan.

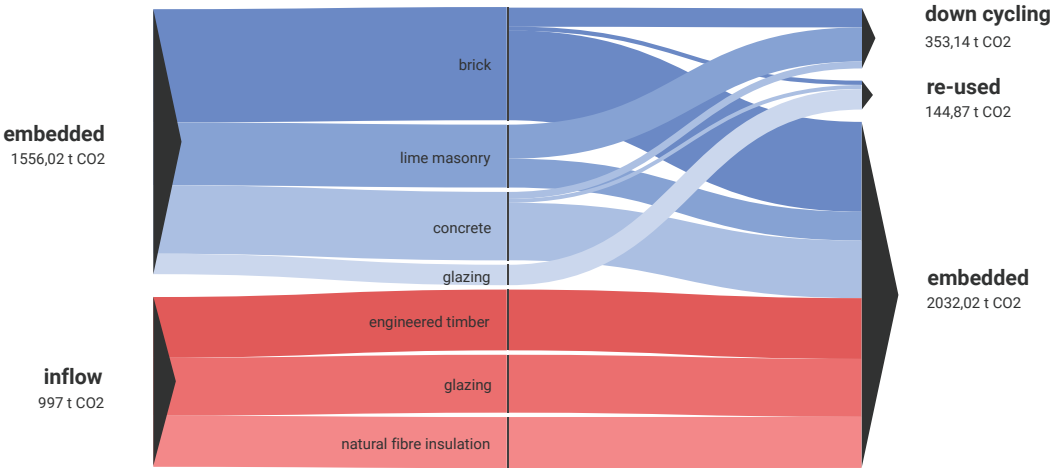
However, there is some unused potential as the brick & concrete re-used in the facade represents only a portion of what is available. The facade could have been designed to have less glazed area, this would have reduced the carbon footprint caused by glazing, and substituted it with re-used materials. However, the glazed area is high in part because there are multiple layers which function a winter garden, significantly reducing operational emissions. Therefore, more detailed analysis is needed to know the environmental impact of the glazing over the entire lifespan of the building and determine the best option.

Reflection on Methodology and Process

Different methods were chosen in each phase of the graduation project. In the first phase of the research the impact of urban renewal in Nieuw-West was studied at a neighbourhood scale using various mapping techniques to reveal relationships between socio-spatial changes

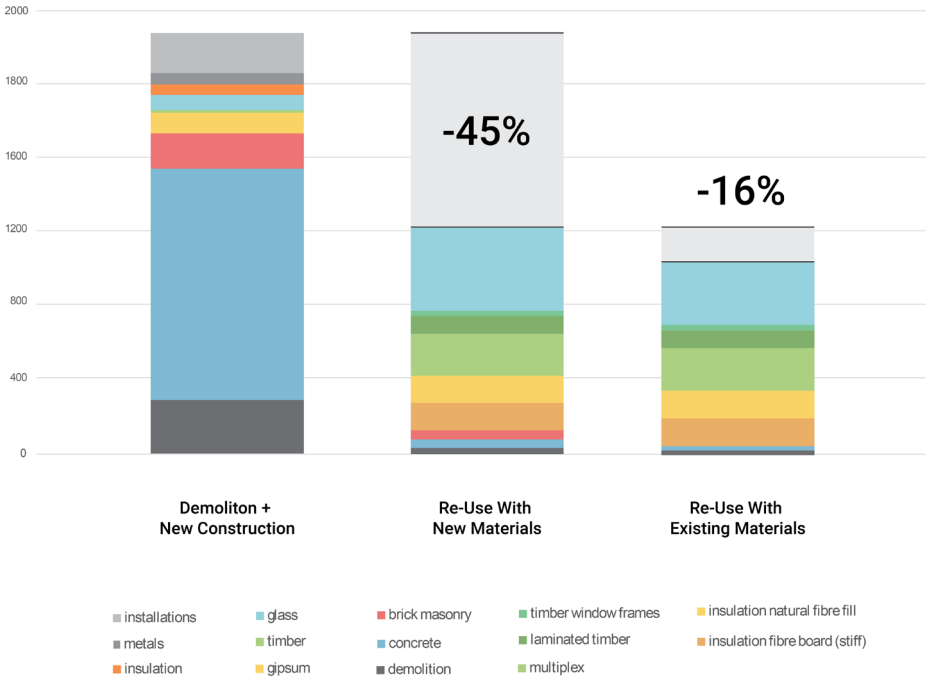
Embodied Carbon Flows

This diagram shows the flows of the main materials in the project, the size of the flows reflect the total embodied carbon in each material.



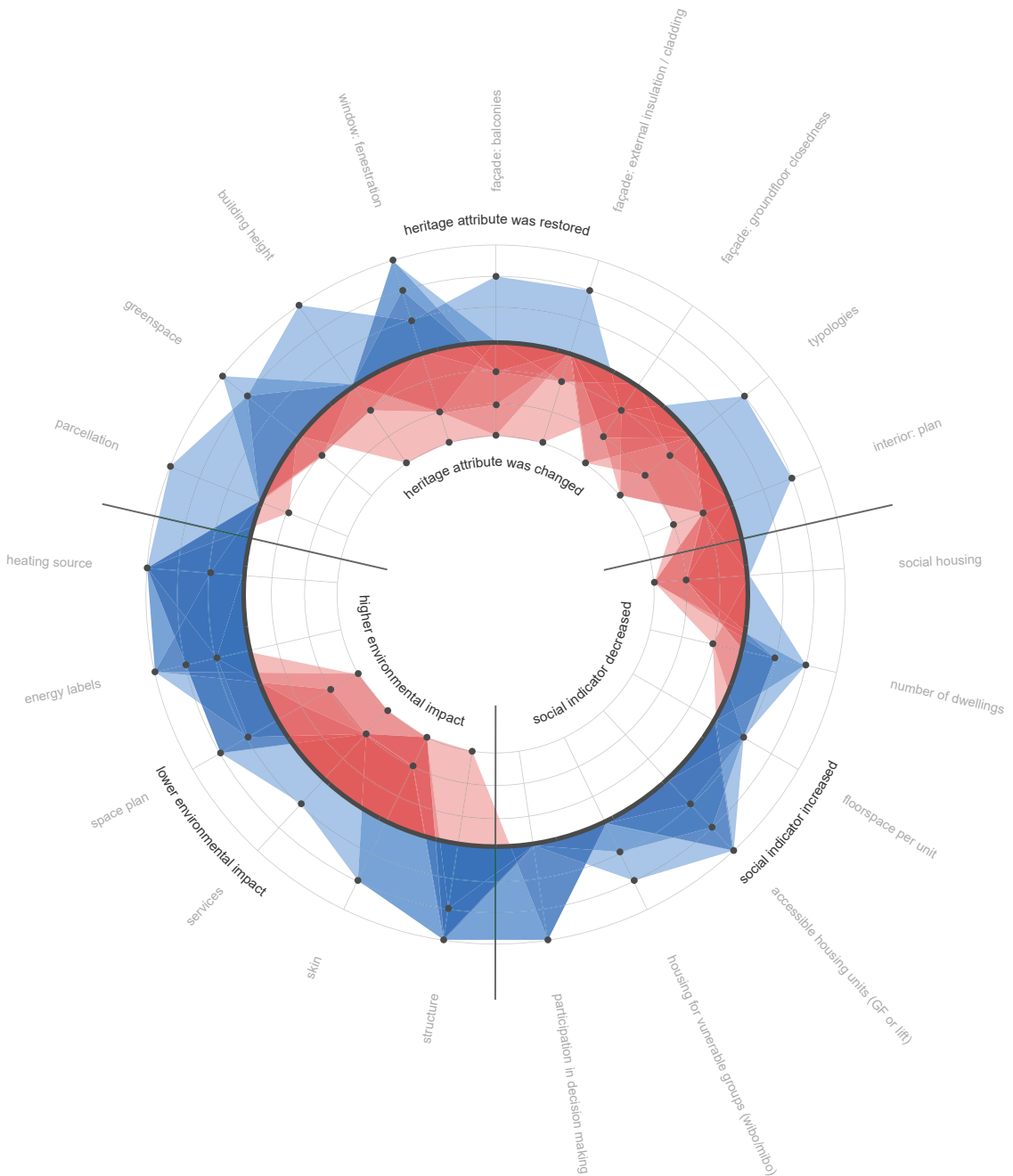
Carbon Footprint of Different Approaches

This diagram shows a comparison between the carbon footprint of demolition + new construction, conventional refurbishment with low carbon materials and refurbishment with reused materials.



Results Comparative Analysis

Radar plot showing how the refurbishment cases analysed in the research perform across heritage, social and ecological dimensions.



and material resource flows. This approach brings to light important lessons of past urban renewal efforts and reveals opportunities to make more efficient use of existing resources. The second phase of the research looked at individual renovations / transformations of multifamily housing flats using comparative analysis to study the impact of these interventions across social, ecological and heritage dimensions. This paints a picture of the most common approaches to renovation / transformation in this context, where they succeed and what areas can still be improved. The design attempts to implement the findings from this research by proposing a transformation for a typical postwar housing flat. In doing so the findings and recommendations from the research are challenged by the realities and specifics of an existing heritage building. This enables the refining of the initial recommendations as well as the development of novel solutions and strategies arising from the constraints of the specific context.

Where other projects might go in depth on one specific topic, such as social challenges, or material re-use, this project attempted to cover multiple topics from a broader perspective, comparing interventions across multiple dimensions. A benefit of this approach is that can help further understanding of how these different issues relate or clash at each of the scale levels that were studied. However, a potential draw back is that it can be easy to lose sight of the end goal, potentially lack the depth of a more focussed approach or end up with too much data to produce useful conclusions. These things were all challenges during the research phase, but ultimately produced some interesting results that could not have been achieved otherwise.

Academic and Societal Value

The current housing crisis in the Netherlands unique in that it is in part driven by a lack of available land. This puts additional pressure on existing urban areas to accommodate more housing density. Post-war multifamily housing flats make up a large portion of the housing stock in the Netherlands. These rapidly ageing and often unpopular typologies are an easy target for demolition and new construction. However, the climate crisis and resource scarcity demand a reconsideration

of the current approach to urban renewal. Re-using and densifying these buildings will thus play a key role in addressing the national housing shortage while making the building sector more sustainable. The research and design are helping to develop a better understanding of the role of heritage conservation in sustainable development and provide novel solutions for adapting post-war housing heritage. In doing so the project aims to contribute to heritage conservation, the mitigation of urban inequality & slowing of climate change.

Transferability

While many parts of the approach to the design are informed by the unique conditions of the building, the site, and its context. The core issues which the project addresses are applicable to most of the original buildings in Nieuw-West and are common in much of the post-war housing stock around the Netherlands and even Europe at large. The need for densification, dwelling diversification, poor physical quality, and socio-economic inequality are common issues with the post-war modernist heritage and are often used as arguments to support large scale demolition efforts. Effectively addressing these challenges through transformation can demonstrate the value of this heritage and bolster the practice of conservation. The solutions the project presents for re-using materials on site are broadly relevant and could be replicated in many different contexts involving existing buildings. In refurbishments careful mapping of existing resources will be a key enabler for this approach. For new construction, design for disassembly the use of material passports will help make material re-use in the future much easier.

The common assumption that it is structurally not possible to add additional floors to buildings from the post war era has been proven wrong repeatedly by practical examples. This project follows that trend by finding opportunities for significant densification. Further demonstrating that it is not possible to make broad statements about buildings from a particular time period, but that these opportunities must be assessed on a case by case basis.

Overcoming Challenges

For the two additional reflection questions, I ask myself: what were the biggest challenges you encountered? and how did you overcome them / how did they change your approach?

One of the earliest challenges I encountered during the research was scope. I had several interests which motivated me to join the heritage studio, and I was not prepared to compromise and focus on only one thing. This initially made formulating a coherent problem statement and research question very challenging. I therefore spent a long time writing and revising this part. However, this paid off as I achieved a good result on the research plan and was able to use it to guide my process going forward.

A second challenge I encountered was that the initial case study neighbourhood did not yield a design case which met my requirements, forcing me to look elsewhere for a more suitable project. Initially this seemed like it would limit the transferability of the research. However, as the research was still ongoing, I was able to adjust the scope accordingly and incorporate refurbishment cases from all around Nieuw-West. This led to a more complete research result overall and provided a good foundation and precedents for the design phase.

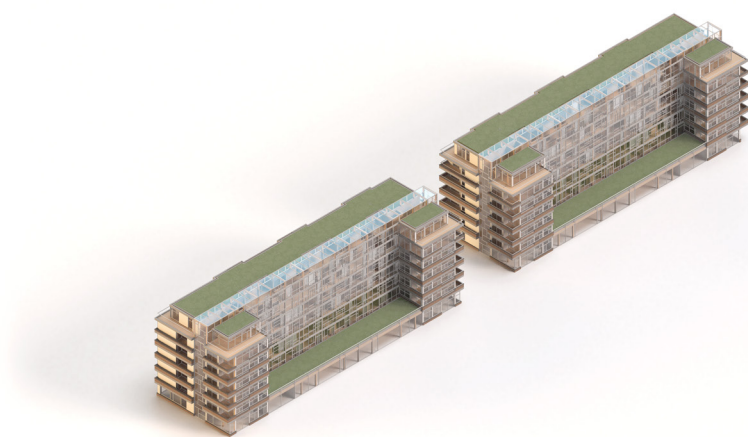
Finally, during the design phase I had nearly the opposite problem, as I initially relied almost too much on precedent that it became restrictive and started to limit the novelty of the project, which is a mistake I have made in the past. Thankfully, my mentors challenged me in this aspect, which I believe helped me to make the right adjustments to elevate the project and produce an overall more coherent and innovative result.

Integration of Disciplines

Diagram showing the integration of various concepts, including material re-use such as the re-used IGU facade and recycled concrete cladding. Climate design; including winter gardens, shading, green space, ventilation, and energy. Structural design using timber post and beam construction with hollow box ceilings. And the resulting spatial quality enjoyed by the apartments.



Exterior Isometric



Exploded view Showing Main Components

