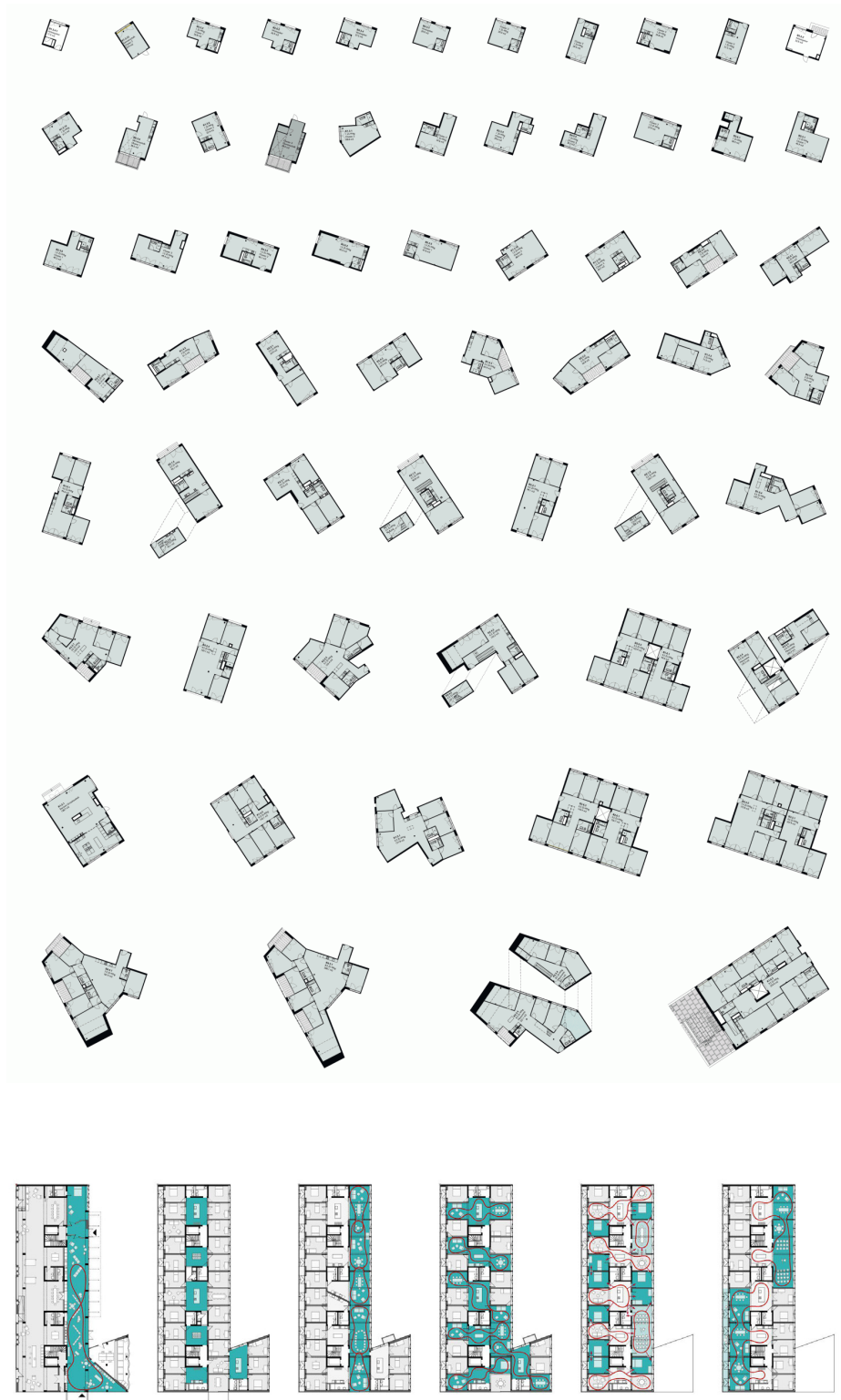


Design Diversity or Achieve Adaptability?

A study on whether to achieve social sustainability in housing design through planned multiplicity within the architecture or by an open-building approach providing options for future adaptations



Research Plan

aE Graduation q1 2023 | 2024

Front page

Top: Kalkbreite, Zürich by Müller Sigrist

Bottom: San Riemo, München by SUMMACUMFEMMER and Büro Juliane Greb

Personal Information

Florian Holtbernd

4714776

Studio

Architectural Engineering studio

Tutors

Thomas Offermans

Pieter Stoutjesdijk

Argumentation for choice of studio

I chose the Architectural Engineering Studio based on an inherent fascination for the characteristic of architecture as discipline that strives to give shape to the complex field of a built environment evolving around social, spatial and technical challenges. Approaching the inevitable task of an environmental just as much as a socially sustain-able built environment in a pragmatic way by connecting technological and systematic solutions to relevant, con-crete design tasks is a quality I am eager to discover through the aE studio. More specifically the stock and second life thematic convinced me to choose this studio for my graduation since I am convinced that using the existing is crucial in times of housing shortage while the building industry has the responsibility to reduce its carbon footprint.

Title

Design Diversity or Achieve Adaptability?

A study on whether to achieve social sustainability in housing design through planned multiplicity within the architecture or by an open-building approach providing options for future adaptations

Research Question

In which way do the two differing design approaches, ensuring adaptability or providing customised diversity, contribute to achieve social sustainable housing by the means of long-term affordability and versatility?

Keywords

social sustainability, flexibility, open building, housing design, adaptability.

General Problem Statement

Sustainable building industry

In the light of the undeniable responsibility of the building industry to reduce its impact on carbon emissions since the construction sector is responsible for 40% of Europe's energy consumption (United Nations Environment Programme, 2022) we seek to accomplish innovative design solutions to realize sustainable buildings. At the same time the statement by Carl Elefante, former president of the American institute of Architects, might be sobering to such honourable ambitions as he states: "The greenest building is the one that already exists" (Adam, 2021). With this profound understanding in mind another layer of a sustainable building future becomes apparent: The need for transformation of the existing building stock.

Mismatch of housing supply and demand

Combined with the persistent critical housing shortage in the Netherlands (van Bokkum, 2023) the task rises to transform buildings that face demolition into housing. KAW (2020) shows how especially post-war neighbourhoods have a great, but yet unused, potential to create housing opportunities within the existing urban fabric. Further investigating the housing situation in those post-war neighbourhoods the modernist efficiency of these tabula-rasa urban plans reveals a vast repetition of the typical home for the 1950's Dutch nuclear family paired with a separation of functions resulting in purely residential areas with closed plinths for storage and increased anonymity and solitude partially due to a lack of mixed use buildings. These post-war structures clash with the current residential use and liveability of such neighbourhoods, since areas like the Boerhavewijk are increasingly multicultural with a large variety of household constellations (Allecijfers.nl, 2022). This multiplicity of demands within a neighborhood with a high level of cultural diversity accompanied by changing housing demands towards 1-2 person households, home-office requirements, the absence of a mid-century *stay-at-home-mom*, upfront elderly proof design etc. results in a mismatch of supply and demand of the housing stock.

This mismatch of supply and demand and the need for improved long-term housing quality does especially concern the group of people with limited financial resources (below modal income) since they are neither in the position to develop their own housing according to their needs nor do they have access to the full spectrum of the private housing market. Yet, social housing has mostly been approached through large scale top-down developments (Dömer et al., 2014) lacking space for personalization, diversity and adaptability to the earlier described complexity and multiplicity of housing demands.

Continuing to rely upon the conventional model of a developer commissioning a design for one specific target group of initial home owners to large-scale developments in this context of housing shortage faces the same threat as the current state of post-war housing estates: to become obsolete and unfit to accommodate future changes and needs. Integrating a set quality open for flexible use like the change of the program of a building or the constellation of dwelling types is a key feature to tackle the risk of the housing market getting stuck again.

Extramuralisering: Shift in real-estate typology of care facilities

On top of the existing challenges of densification in post-war neighbourhoods a rather recent development requires the attention of architects and developers: The national policy to transform elderly care from centralized facilities towards decentralised, independent and smaller institutions accompanied with the concept of upfront elderly-proof dwellings to postpone relocation to care-facilities in the first place, a phenomenon which is described by the Dutch term "Extramuralisering", the common structure of large-scale care homes will become obsolete in the Netherlands. Often built as part of the earlier discussed post-war neighbourhoods these elderly homes now will form a new typology of vacant real estate on the vast scale of up to three-million square meters (van den Elsen, 2016). The corporations owning such buildings lack visions and plans on how to deal with those upcoming transitions of their real-estate. Their current strategy of ad-hoc decision making is in desperate need of long-term sustainable solutions as Kromhout (2018) points out.

Objective

This Graduation Project therefore takes on those challenges of a rigid housing market while achieving sustainability through transformation. In doing so it positions itself through the notion that transforming post-war buildings into dwellings should go beyond extending the alleged inevitable demolition date while maximizing the return on investments (ROI). Instead, solutions to establish a new-found durable quality and appreciation of now vacant buildings should be motivated by the potential to re-use existing building structures in a socially sustainable way by designing resilient dwellings concerning the ever changing diversity of housing demands.

The architectural quality that describes the ability to accommodate a variety of housing demands and functions is often referred to as "flexibility" or "versatility." A versatile architectural design is one that can adapt to different uses and meet the diverse needs of its occupants over time and thus allows buildings to be more resilient and responsive to changing requirements and user preferences. The term "versatility" is preferred in the context of this thematic research since it does not inherently imply the requirement of physical change of the building structure to achieve this objective like the term "flexibility" does. Overall this graduation project therefore commits to the motivation to achieve ecological sustainability by aiming for social sustainability.

Further supporting the aim of long-term relevance of a versatile housing development, a systematic approach to sustain accessibility and affordability for future generations of residents is a crucial part of the design objective.

Regarding versatility and affordability as means to the end of such a social resilience, this research will further investigate the various design approaches on their eligibility for these characteristics by specifically comparing long-term adaptable buildings to housing estates with a upfront variety of functions and floorplans.

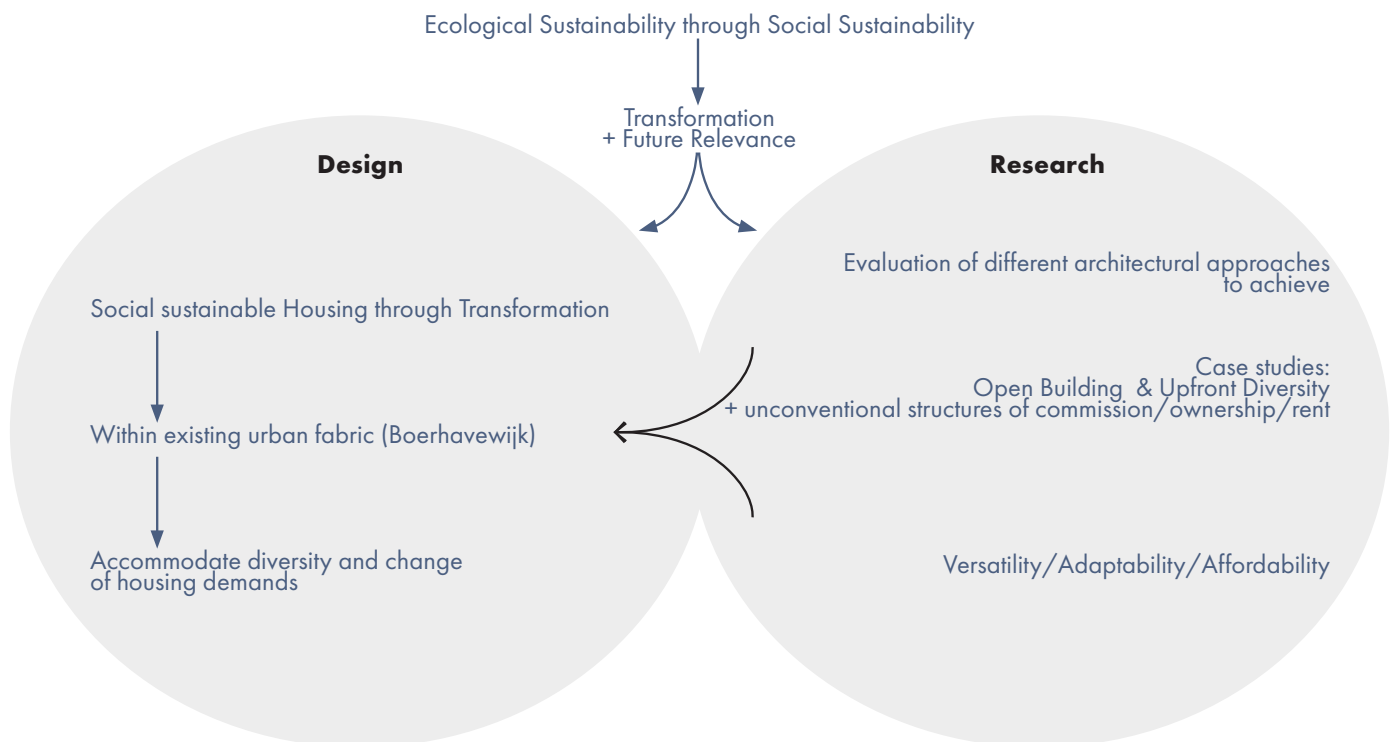


Figure 1: Abstraction of how the overall Research and Design Objective evolves from an initial fascination

Overall design question

A fieldwork study based on combining the posed problems with the design ambition of Dutch post-war neighbourhood transformation has revealed the current Sint Jacob care centre in Boerhavewijk to be a suitable case for a design proposal that addresses the earlier mentioned objective. This building, which is expected to become vacant in the nearby future (Gemeente Haarlem, 2012) due to shifting national requirements around elderly care, incorporates a lot of potential, since the 12-story building on a 10.000m² plot across the former church takes a prominent location at the end of the main axis leading towards the promising green area adjacent to Boerhavewijk.

Facing the challenge of counteracting the housing shortage within the low- to modal income market while intervening in an existing urban context of a multicultural neighbourhood with shifting housing demands, the design question will be as follows:

How could the Sint Jacob care-center in Boerhavewijk be transformed into a socially sustainable housing project by accommodating a multiplicity of housing demands while providing resilience towards changing needs of programme and typologies of future generations?

This design question will ultimately lead to the design proposal of a profound transformation with possible added building volumes of a 1960s high-rise elderly care facility in Boerhavewijk, Haarlem, into a housing development that incorporates multiple dwelling typologies as well as several spaces for public-/commercial-use and shared facilities. This transformation should establish the claim to add a long-term, intergenerational quality to the existing structure by making diversified and layered re-use more appealing than demolition, which is currently fate this high-rise 1960s care-facility is facing.

Thematic Research Question

The ambition of establishing long-term quality for affordable housing on itself is a well-known part of the architectural discourse, with multiple case-studies showcasing various approaches to this issue. More recent projects have also added the earlier discussed layer of achieving ecological sustainability through social sustainability by proposing housing developments which could accommodate a changing variety of housing- and programme demands. Through studying those innovative housing projects aiming to address this challenge, two main ideas become apparent: Designing with a high level of diversity of users, inhabitants and functions in mind on the one hand and the commitment to achieve low-effort adaptability of the initial layout on the other.

While both approaches address the topic of versatility by positioning themselves as providing a solution for the multiplicity of society, the one proposes an initial level of diversity and versatility of users and functions while the other starts with similar plots and target groups since it is the aim to cover evolving demands and changes of programme over time.

Affordability also becomes a key criteria for social sustainability as a smart feasibility concept lowers the bar to actually realize adaptivity (Dömer et al., 2014). An even more relevant factor to incorporate the layer of affordability is the phenomenon that versatility is particularly relevant for a lower income target group since their possibility to adapt their housing conditions to changing circumstances through free access to the housing market is financially limited (Schneider & Till, 2005). The study on the differing qualities and the capability to ensure social sustainability through housing design of these two architectural approaches is led by the overall research question:

In which way do the two differing design approaches, ensuring adaptability or providing customised diversity, contribute to achieve social sustainable housing by the means of long-term affordability and versatility?

The following sub-questions will further elaborate on the relation between quality and affordability of the case-study based research:

- What kind of qualities are gained or lost by the different approaches of organizing interior space?
- How much and to which level of privacy is exterior space provided per dwelling?
- Are other services, facilities or common spaces provided within the building besides the dwelling itself?

To further frame the level of affordability the following sub-question will be posed:

- How do the costs per tenant/owner relative to their income relate to comparable housing projects in the same area?
- What are the total costs of initial investment and later adaptation and maintenance on the long term compared to comparable conventional projects?
- If such total costs of ownership are in fact lower than with conventional building methods: Which architectural or systematic interventions have contributed to this effect?
- In which way are the total costs of ownership distributed amongst the dwellers and/or developer?

The issue of versatility will further be led by these sub-questions:

- What are the different layers of versatility achieved by the case studies?
- How accessible, both financially and practically, is it to change or adapt ones housing circumstances within one housing project?
- What kind of and how many different typologies and functions could be accommodated by each of the selected housing projects?

Methodology

Structure

The research will be evolving around a case-study analysis subdivided into two different approaches to achieve socially sustainable housing through architectural and systematical ingenuity beyond upscaling and repetition. The approach of establishing a general superstructure to provide the possibility for low-effort adaptability of dwellings into other lay-outs or typologies will be labeled by the established term "open building", whereas the concept of tailor-made hyper-diversity to accommodate various types of program and dwelling types upfront will be considered as "designed diversity". Literature review will provide a framework for more established definitions and qualifications of social sustainability in the context of affordable and versatile housing. The broad terminology of affordable housing and versatile housing will also further be elaborated on based on literature review of existing case-studies with a similar objective. A combination of earlier applied systems of such case study literature will be used to establish a new framework of comparable quantitative and qualitative criteria for a comparative analysis. Following a one-by-one analysis of the case-studies similarities and patterns will be extrapolated per category (open building and designed diversity) which will ultimately lead to a conclusion on design elements are crucial for a building to be more resilient and responsive to changing requirements and user preferences while remaining affordable and accessible.

Social Sustainability

The broad term of social sustainability commonly used to address the notion to promote the possible impact of businesses to benefit society and protect people (UN Global Impact, n.d.) regarded as a parallel to ecological sustainable entrepreneurship which considers the impact on the climate. Translated to the built environment this implies architecture that "focuses on creating environments that enable positive human interactions, support diverse needs, and improve the overall quality of life" (Ghisleni, 2023) thus highlighting the long-term social impact of a building. Within the context of this graduation project, Social Sustainability will be regarded as a quality to adapt to the changing demands of society while providing the same quality of life to future generations as to the current one, which also goes along with the objective of the "Cities for Adequate Housing"(2018) initiative.

Versatility

To measure and compare the degree of versatility achieved per case study will be evaluated through a quantitative analysis of the amount of suitable household constellations and the variety of possible non-residential functions. Since flexible housing design could benefit versatile use the indicators Adaptability, Multifunctionality, Variability, Structure&Construction as proposed by Hatipoğlu and İsmail (2020) will guide the evaluation leading to a quantified rating based on measurable subcategories like wall-openings, position of wet-spaces, adjustability of space etc. .

To narrow down and support a stronger definition of versatility related to housing design another extra literature studies next to the listed ones on affordability and flexibility will have to be consulted.

Affordability

The definition of affordable housing as proposed by Dömer, Drexler and Schultz-Granberg (2014) will determine the angle on this evaluation. They distinguish between affordability in the sense of cost-per-area efficiency and the more qualitative relation between costs and benefits of residential qualities. The efficiency will be analysed by mapping the proportional costs in relation to an average income and average housing prices in the same area per project as well as the efficiency of construction costs will be put into relation towards the plot price. To further add the layer of long-term affordability the structure of financial ties between development, ownership, rent and increase in value will be assessed. By researching the differing accessibility towards various income groups at the moment of completion and after a change of residents will further support the evaluation of long-term affordability.

In between the criteria of versatility and affordability lies the analysis about access to shared facilities, to private/semiprivate/shared outdoor space and the personal gain connected to integrated public/commercial space within a project. This last indicator will provide a stronger context on the relation between costs and benefits per dwelling.

Criteria for Choice of Case Studies

The case studies will be selected based on how well their scale and program matches the specific design ambition of transforming the Sint Jacob care facility in Boerhavewijk, and on their capacity to fulfill the general design objective of versatile, affordable and overall socially sustainable housing.

Criteria to determine relevance to the design location are: They must be situated in a urban context. The housing project should be constructed as a whole on one defined plot and accommodate around 50-250 inhabitants and facilitate non-residential functions. The projects must have been completed between 2000 and 2020 in central Europe to ensure similar climate conditions and building standards.

Topics like social relevance for future generations, affordability concepts and accessibility for a large variety of household constellations and housing demands have to be addressed specifically in the initial project description provided by the architect or the developer.

To qualify as a project within the open-building category, the ambition to lower the bar on future adaptability also has to be specifically mentioned and to be proven by the implementations of for example construction techniques, smart positioning of wet-cells and legal structures. The aspired flexibility of those projects has to go beyond interior changes towards an overall reconfiguration of dwelling types, sizes and amounts. These criteria would therefore exclude projects merely focusing on a flexible infill of an open floorplan like it is the case with the Grundbau & Siedler initiative: Even though this approach by BeL Architects for the IBA Hamburg applies in the most radical way Le Corbusiers 'Maison Dom-ino' open floorplan concept, the projected goal was to achieve cost-efficient self-building methods while fulfilling individual housing demands without the aim of future adaptation after completion (Friedrich, 2013).

designed diversity ↑	Project	Location	Architect	Commissioner	Program
	Kalkbreite	Zürich	Müller Sigrist	Genossenschaft Kalkbreite	88 Dwellings: 29m ² - 412m ² . 9 guest rooms 20 spaces for culture, gastronomy, retail
open building ↓	wagisART	München	SHAG Schindler Hable Architekten GbR, bogevischs buero architekten & stadtplaner GmbH	Wohnbaugenossen- schaft Wagnis eG	136 dwellings: 44 - 161m ² . Gastronomy, offices, - meeting rooms, car- park, guest rooms
	Holunderhof	Zürich	Schneider Studer Primas Architekten GmbH	Gemeinnützige Baugenossenschaft Röntgenhof Zürich	95 dwellings: 56m ² - 118m ² . Children daycare, parking-garage.
	Patch 22	Amsterdam	FRANTZEN et al	Lemniskade Projects	16 - 33 dwellings, 600 m ² commercial space, 37 parking spots.
	San Riemo	München	SUMMACUMFEMMER & Büro Juliane Greb	Kooperative Grossstadt eG	29+- dwellings 205m ² common space 320m ² commercial space
	Balance Uster	Uster	Haerle Hubacher Architekten	Streich AG Gener- alunternehmung	35+ dwellings of 195m ² each

Figure 2: Key data of the three selected case studies per category.

It is remarkable that the majority of the projects are located in either Zürich or Munich. This is less a deliberate choice or biased by sources merely focusing on those two cities than it is the unmeant outcome of weighing the criteria for the selection of about 25 different projects. Why especially the larger region of Zürich seems to have such an outstanding number of innovative and unconventional housing projects could be a research question on its own.

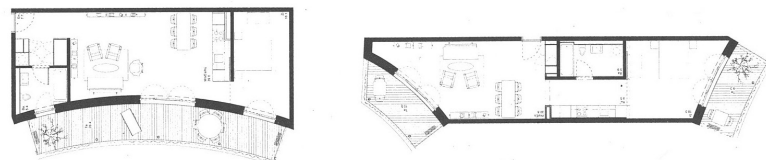


Figure 3: two different yet equally qualitative dwelling layouts of Holunderhof. Retrieved from *Operatie wooncoöperatie*, Lengkeek & Kuenzli, 2022, p. 155.

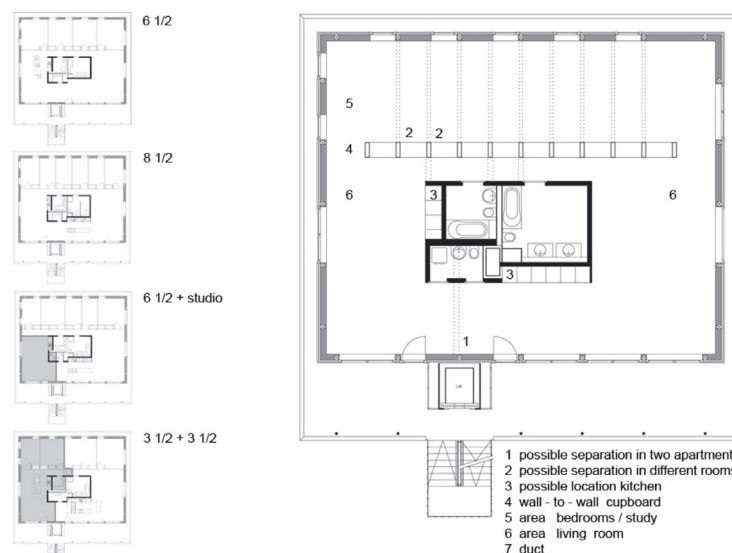


Figure 4: The various possible dwelling layouts and typologies that can be established based on the initially open floorplan of Balance Uster. Retrieved from *Balance Uster*, Haerle Hubacher Partner, 2001, <https://haerlehubacher.ch/balance-uster/>.

Relevance

The bigger picture of the design approach presented in this graduation project is the challenge of overcoming housing shortage while transforming the built environment towards a sustainable practice. Transformation and unconventional structures of housing development are two crucial elements to realize this ambition.

This research will more precisely tackle the issue of a mismatch between varying housing demands and the vast supply of monotonous Dutch post-war dwelling types by introducing approaches from other European countries as well as unconventional exceptions to a conventional Dutch context. By doing so this project strives to establish another angle on of sustainable housing design beyond measures concerning material use and energy efficiency.

At the intersection of housing shortage and the need for a sustainable building industry lies the potential not only for transformation of vacant buildings but also to anticipate on vacancy rising from shifting demands for real estate.

The rather specific relevance of this graduation project lies in revitalising through “Wederombouw” (Bolhuis, 2023) of post-war neighbourhoods with similar challenges and potential as Boerhavewijk. Investigating the potential of the prominent site of the current Sint Jacob care-centre could contribute to gain common insight on the possible future chances of Boerhavewijk.

Even more specific the phenomenon of “Extramuralisering”, the shifting demands towards elderly care, as described in the General Problem Statement directly creates a vacuum of function and use of the Sint Jacob care facility in Boerhave. The municipality of Haarlem already states in a report from 2012 that this specific facility is unfit to accomodate the future requirements for elderly care and in the meantime (2023) plans for a replacement facility are allready in the final stage. Yet a vision for the future role of the site in combination with the vacant church across the street is still lacking. It is the aim of this graduation project to establish a key-position with a new-found relevance of this prominent spot in the neighbourhood.

Connected to the design objective, the research theme will support a well founded argumentation for design choices claiming to achieve such a future relevance with socially sustainable housing. A categorization and evaluation of existing design methods to achieve versatility and affordability will further support the research and design of fellow graduates who pursue a similar approach of qualitative and sustainable (social-) housing. The relevance of this research within the greater architectural discourse does not lie in the analysis and evaluation of exemplary housing projects. Instead this research contributes more generally to a greater understanding of consequences and future impact of unconventional design choices concerning versatile and affordable housing.

Literature

Adam, R. (2021, August 13). ‘The greenest building is the one that already exists.’ *The Architects’ Journal*. <https://www.architectsjournal.co.uk/news/opinion/the-greenest-building-is-the-one-that-already-exists>

Analyse Platform woonopgave. (2023, May 30). Platform Woonopgave. https://platformwoonopgave.nl/sdm_downloads/analyse-platform-woonopgave/

Berg, J. (2008). *Houses in transformation*. Nai010 Publishers.

Brand, S. (1997). *How buildings Learn: What happens after they’re built*. Viking. <http://ci.nii.ac.jp/ncid/BA23638003>

Cities for Adequate Housing. (2018). Cities for Adequate Housing. <https://citiesforhousing.org/#section--0>

Dömer, K., Drexler, H., & Schultz-Granberg, J. (2014). *Affordable living: Housing for Everyone*. Jovis Verlag.

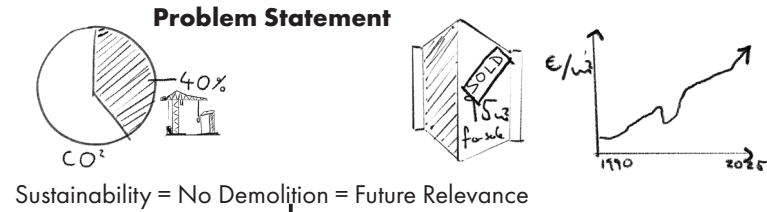
Drooghmans, L. (2019, May). Holunderhof. *architectuurwijzer*. <https://architectuurwijzer.be/holunderhof/>

Ersatzneubau Wohnsiedlung Holunderhof Schneider Studer Primas. (2018). Swiss-Architects. <https://www.swiss-architects.com/de/schneider-studer-primas-zurich/project/ersatzneubau-wohnsiedlung-holunderhof>

Forrest, R., & Kearns, A. (2001). *Social cohesion, social capital and the neighbourhood*. *Urban Studies*, 38(12), 2125–2143. <https://doi.org/10.1080/00420980120087081>

- Friedrich, J. (2013). Learning from Wilhelmsburg: Das Wohnbauprojekt "Grundbau-und-Siedler." *Bauwelt*, 35, 16–21. <https://www.bauwelt.de/themen/bauten/Learning-from-Wilhelmsburg-2153141.html>
- Gemeente Haarlem. (2012). Gebiedsvisie Boerhavewijk. *Gemeente Haarlem*.
- Genossenschaft Kalkbreite. (2019, October 29). Mieten | Genossenschaft Kalkbreite. <https://www.kalkbreite.net/kalkbreite/mieten/>
- Ghisleni, C. (2023, August 1). *Social Sustainability: Participatory design in collective space creation*. ArchDaily. <https://www.archdaily.com/1004448/social-sustainability-participatory-design-in-collective-space-creation#:~:text=Social%20sustainability%20in%20architecture%20aims,%2C%20inclusion%2C%20and%20community%20cohesion.>
- Hatipoğlu, H. K., & İsmail, S. H. (2020). Housing Flexibility: A Framework for a Quantitative Evaluation Method due to Turkish Designers. *Iconarp International Journal Architecture and Planning*, 8(2), 545–566. <https://doi.org/10.15320/iconarp.2020.126>
- Hubacher, S. (2021, January 10). *Balance Uster*. Haerle Hubacher Partner. <https://haerlehubacher.ch/balance-uster/>
- KAW. (2020, June). Ruimte zat in de stad: onderzoek naar beter gebruik van de ruimte die we hebben. www.kaw.nl.
- Kockelkorn, A., & Schindler, S. (2023). *Cooperative Conditions: A Primer on Architecture, Finance and Regulation in Zurich*. Cooperativeconditions. <https://www.cooperativeconditions.net/#>
- Kromhout, J. M. (2018). *De extramuralisering: De effecten op zorgvastgoed bij woningcorporaties in Nederland* [Masterscriptie]. Rijksuniversiteit Groningen.
- Lengkeek, A., & Kuenzli, P. (2022). *Operatie wooncoöperatie: uit de wooncrisis door gemeenschappelijk bezit*. trancity x valiz.
- Remøy, H., & Van Der Voordt, D. (2014). Adaptive reuse of office buildings into housing: opportunities and risks. *Building Research and Information*, 42(3), 381–390. <https://doi.org/10.1080/09613218.2014.865922>
- Schneider, T., & Till, J. (2005). Flexible housing: opportunities and limits. *Arq-architectural Research Quarterly*, 9(2), 157–166. <https://doi.org/10.1017/s1359135505000199>
- Schneider, T. & Till, J. (2005). Flexible housing: the means to the end. *Arq-architectural Research Quarterly*, 9(3–4), 287. <https://doi.org/10.1017/s1359135505000345>
- SUMMACUMFEMMER, Büro Juliane Greb: San Riemo. (2021, June). Divisare. <https://divisare.com/projects/445152-summacumfemmer-buro-juliane-greb-san-riemo>
- UN Global Impact. (n.d.). *Social Sustainability*. Retrieved November 5, 2023, from <https://unglobalcompact.org/what-is-gc/our-work/social>
- United Nations Environment Programme (2022). *2022 Global Status Report for Buildings and Construction: Towards a Zero-emission, Efficient and Resilient Buildings and Construction Sector*. Nairobi.
- Van Bokkum, M. (2023, July 12). Onderzoek: het woningtekort houdt nog jaren aan. NRC. <https://www.nrc.nl/nieuws/2023/07/12/onderzoek-het-woningtekort-houdt-nog-jaren-aan-a4169571>
- Van Den Elsen, W. (2016, May 17). Veel Nederlandse zorg nog niet klaar voor grote veranderingen. Zorgvisie. <https://www.zorgvisie.nl/veel-nederlandse-zorg-nog-niet-klaar-voor-grote-veranderingen/>
- Wassenberg, F., Van Dijken, K., & Institute, N. (2011). *A Practitioner's view on neighbourhood regeneration: Issues, Approaches and Experiences in European Cities*.
- Wijk Boerhaavewijk (gemeente Haarlem) in cijfers en grafieken. (2023). AlleCijfers.nl. Retrieved November 5, 2023, from <https://allecijfers.nl/wijk/boerhaavewijk-haarlem/>

Graphic Research scheme



Socially Sustainable Housing



Case Studies

±100 residents urban context central Europe target various household constellations adaptability/diversity part of brief

Comparative Analysis



Versatility

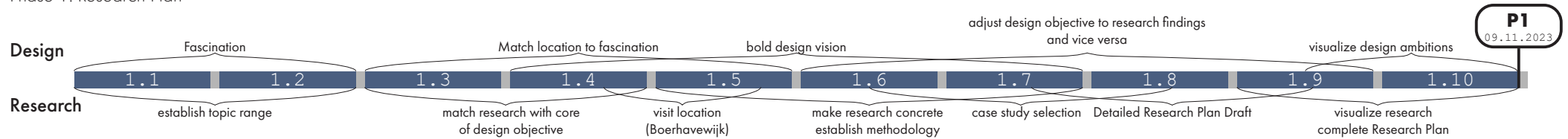


Affordability

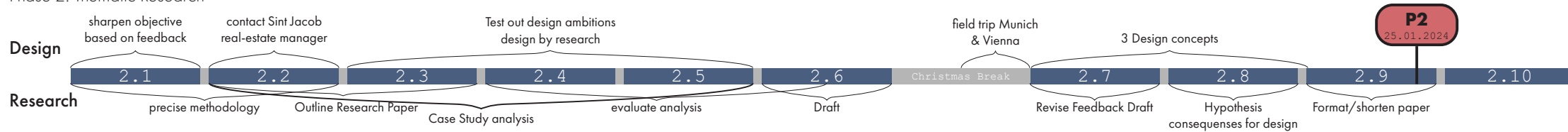
Case Studies	amount & type of dwellings	amount & type of program	flexibility	Costs/income/average	Cost construction/plot	personal gain of facilities	structure of ownership	Financial Accessibility
Kalkbreite	88 Dwellings: 29m ² - 412m ²					€/m ² +		€ & €€ & €€€
WagisART	136 dwellings: 44 - 161m ²							€€ & €€
Holunderhof	95 dwellings: 56m ² - 118m ²							€€ & €€
Patch22	16 - 33 dwellings 42 - 204m ²							€€€€€ ↓ €€ €€€
SanRiemo	± 29 dwellings							€ ↓ € €€
Balance Uster	35 + dwellings 195m ² max							€€€€ ↓ €€ €€€

Planning towards Graduation

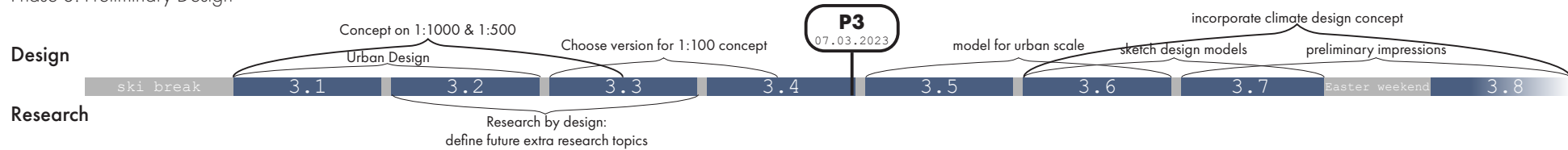
Phase 1: Research Plan



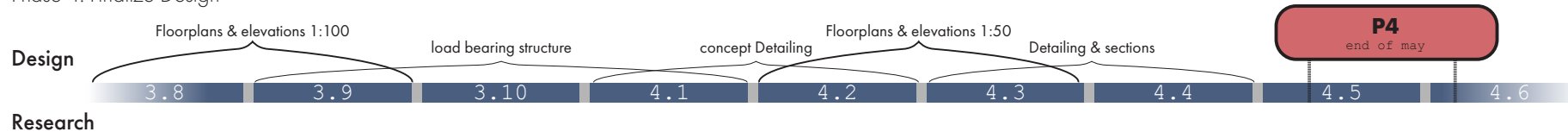
Phase 2: Thematic Research



Phase 3: Preliminary Design



Phase 4: Finalize Design



Phase 5: Present Design & Research

