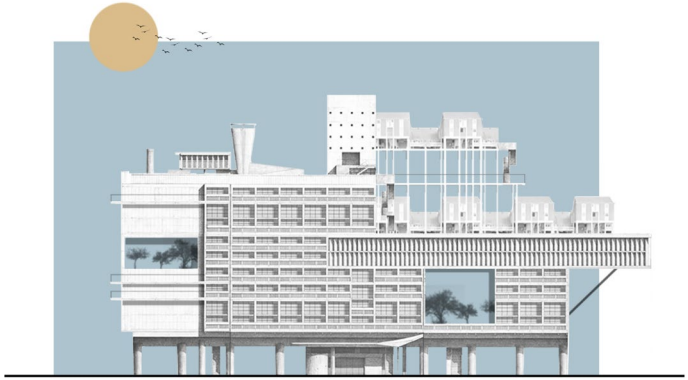
Revisiting the Emmahuis

Designing liveable architecture in a rapidly densifying Rotterdam



Christoforos- Christos Roungeris

Advanced Housing Design
Graduation Report
June 2022

TU Delft
Faculty of Architecture and Built Environment
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Tutors: Olv Klijn, Ferry Adema, Anne Kockelkorn
Student: Christoforos- Christos Roungeris

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1. RESEARCH OVERVIEW

PERSONAL MOTIVATION

Since the beginning of my studies, I was fascinated by architecture aimed towards housing. The ability an architect possesses to think about, predict and design for the dwellers' needs is something I always found almost magical. As a soon-to-be young professional, I was also observing the housing market. As Greece recovered from a 10 year recession, housing prices -especially in cities like Athens and Thessaloniki- kept going up, something that in the beginning, I found logical; The western world lives in an era of mass urban densification. Countries and cities around the world are going through massive housing crises, where demand drastically overcomes the supply for adequate housing, driving the housing market prices to extremes. At the same time, especially in Europe, land is scarce. That, in addition to other factors such as aggressive market policies and inflation means that plot prices are also rising dramatically. Then I saw the raw consequence of this seemingly never-ending price increase; people forced to move because they were unable to afford the sharply rising rent prices.

Through the advanced housing graduation studio, I seek answers to a question that had arose while observing the ongoing housing trends in the modern western world ; How can architecture stand opposed gentrification and provide viable and productive answers whilst coexisting with the financial landscape? A possible solution that was proposed within the wings of the studio was co-operative housing, an economic and governmental concept I was not familiar with.

Co-operative housing is a form of collective ownership. Interested buyers purchase a stake of the co-operative and then pay a monthly fee, also referred to as "cost rent". In a collective housing scheme, housing prices are guaranteed to not increase. This is ensured by the government, with politicians passing regulations specified for non-profit housing. This lack of housing price speculation means that dwelling units cannot be seen as a commodity. This in turn allows architects to freely experiment, detached from capital that restrains them and forces them to profit- making oriented design decisions. Architectural discourse within a collective housing scheme is allowed to go from research and theory, organically into practice. The idea of co-operative housing is highly democratic.

Kalkbreite housing complex,Müller Sigrist Architekten

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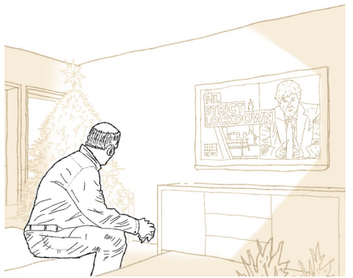
PROBLEM STATEMENT

Within the umbrella of co-operative housing, and through my research and design proposal, I want to focus on two main user groups, both heavily affected by the ongoing housing market trend, both in Rotterdam and globally, each for different reasons.

Through a multitude of reports, higher education -i.e. master's- students appear to be one of the most privileged social groups; in the vast majority of cases, this group of people comes from wealth, and has the opportunity and can afford to spend -in some cases- up to 8 years on their education, without needing to work to sustain themselves. Based on data published by the European Union, 68% of students currently attending higher education programs have parents who have degrees . At the same time, this group is largely dependent on their parents, with most students not working to support themselves, making them vulnerable to increases in living costs. In conversations with fellow students, there have been numerous cases of people reducing their day-to-day costs to cover for increasing rent prices or municipal taxes.

The elderly is another group that I'd like to focus on. People that live alone, in houses that are usually too big for them. Loneliness and social isolation in older adults are serious public health risks affecting a significant number of people in the United States and putting them at risk for dementia and other serious medical conditions. I believe it is very important for humans to be part of a community in the later stages of their life, and my ambition through my research and design proposal, is to provide the elderly with the much needed sense of belonging, a sense of community.



RESEARCH QUESTION

Taking the aforementioned problems into consideration, and the possible solution found in intergenerational co-operative housing, a new question arose;

How do we design affordable, high quality co-operative housing units in a rapidly densifying urban Rotterdam?

As the research feeds into, and aims to provide a solid theoretical base for the design discourse of this studio, the following sub-questions will be assessed;

How can we translate the Dutch row house typology into a dense high-rise context?

What should the minimum "architectural standard" for a functional private space be? How does this abstract standard compare to the European legislation on minimal room requirements?

How do we design social cohesion between students and elderly? How does the in-between space affect quality of life within a collective living model?

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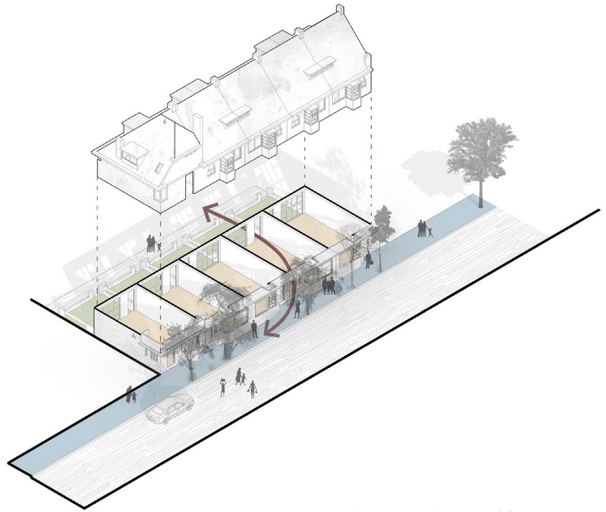
DUTCH ROW HOUSE

My main goal through this research is to design resilient, high quality intergenerational co-operative housing within a dense urban context such as the Blijdorp area. “Verticalizing” the Dutch row typology has been a key aspect to my design since the early days of spatial exploration.

While some might find this typology mundane, in his book “Kleine filosofie van het rijtjeshuis”, Pieter Hoexum signifies the importance of it. He describes it as the depiction of the Dutch mixture of conformity and individualism, of community and isolation. He also presents the row houses as the “golden mean” between freestanding houses and the -also very typical in the Dutch context- gallery apartments; by providing each unit with its own entrance -and more often than not its own garden or terrace-, the residents live “together alone”, in practically identical houses. Hoexum’s ideas on the Dutch row house typology are echoed by the 1998 “Das Niederländische Reihenhaus” , where the authors also see the row house as the golden mean of medium rise housing, depicting the typology as part of an “ideology of coziness, normality and harmony in Dutch society”.

The key element that piqued my interest in this typology, is the highly permeable transition from “public” (sidewalk) to “private” (house) to “garden” (semi-permeable, private outside space). Walking on a sidewalk in a Dutch neighborhood, I clearly know that I’m in a public place, bordered by the very solid walls of each row house. But at the same time I can peek inside through the large windows -architectural curiosity seems to almost always beat good manners- and see the living room and garden at the back. It is this permeability that intrigues me.

By placing this traditional typology of living within a dense high rise building context, I intend to create a diverse design, both in plan and facade. But what are the challenges of placing this typology in a high rise context? How can I mix Le Corbusier’s idea of a modern way of living, with this traditional form of housing?



Transition from "public" to "private" to "garden" diagram
Personal work

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GAP BETWEEN CONSEPTUALIZATION AND APPLIED DESIGN

By examining and comparing theorists' opinions on co-operative housing, and architectural projects/ buildings designed for collective housing, owned by developers (capital), we see that the two have very different approaches to living.

Frei Otto, "The Baumhauser"

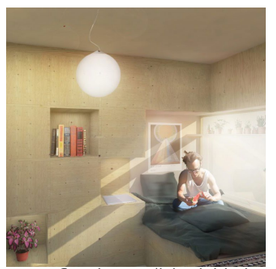
The Baumhauser, also known as "the Eco house", was designed as part of the IBA initiative in 1987. The main idea was unifying building and nature. It was built according to social housing standards and costs, therefore it was initially deemed affordable, while still being in the center of Berlin. The design was based on Otto's "tree house" idea, initially born in a form of a housing tower in New York.

While Otto Frei was the idea initiator, he willingly stepped down from the final design process of each individual apartment and let the future dwellers design their homes the way they wanted with almost complete freedom. This eventually led to a building looking essentially like a patchwork, composed of multiple smaller "buildings" within a larger structure. When the project came to its building stage, a billboard was placed outside the construction site to attract customers through an application form. The idea was to get families to co-build the site, and that is why a building collective was created. The process of meeting and collaborating to reach a finalized design, almost automatically dubbed the Baumhauser as a building with a communal identity.

"Conscious co living"

"The Conscious Co living initiative" is a prime example of collective architecture working to serve the capital, ready to profit on "the trend of co-living" . It is led by real estate venture TechFarm and architecture office CoDesign, both Stockholm-based. The project is deemed to become a "Flagship building", and includes a "conscious living" initiative. The so-called 'micro-apartments' designed for long-stay are between 10 and 30 m2, while short-stay capsules, described as cells, even drop to sizes ranging between 4 to 26 m2. The short term apartments are separated by a 'border' wellness floor, above which the floors are only accessible with the right keycards, corresponding only to long-term stay apartment residents.

Baumhauser, Otto Frei



Concious co living initiative

In extreme cases, what is currently being sold as “collective living”, -i.e. a living capsule bordered by forced and segregating communal areas- is highly dysfunctional and dystopian, European legislation seems to be favor the business part of architecture, that treats space as a product, a commodity. Except for Italy, Europe seems to be heading towards deregulation when it comes to minimum usable and livable spaces. While analyzing housing typologies in Europe, in his paper about European housing standards, Alessandro Rigolon writes; “...This trend has been curbed to some extent, but only because of the introduction of accessibility regulations. Minimum standards, when present, vary to a large extent from one country to another. For example, in Italy, the minimum area for a room defined as habitable is 9 square meters; in France, it drops to 7 square meters (and until 2006 it was 6 square meters) . In the Netherlands, according to “Het Praktijkboek Bouwbesluit” of 2012 -the most updated version of Dutch building regulations-, a bedroom “ has to be 1,80 meters wide to accommodate a single bed and a door that can open inside the room” .

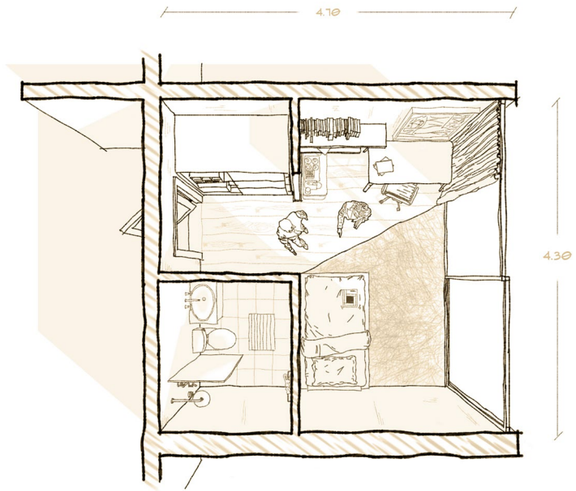
By looking at the European minimum housing standards, it becomes evident that the response to the growing housing crisis provided by many member countries, Netherlands included, is overcrowding and deregulating. This gives way for the growing trend of micro apartments like “conscious co-living”, which are marketed as a supposed modern way of life for modern day entrepreneurs. But, when we look at the raw numbers -rooms as small as 4 square meters-, we can easily compare them to a situation far less marketable or desirable. A globally considered “extreme” form of micro-apartments are the ones in Hong Kong, often -ominously- referred to as coffin homes. Hong Kong is a great example of a city unprepared for a housing crisis. About 7% of land in Hong Kong is allocated towards housing, most of it enjoyed by wealthy families. This tremendous housing shortage has led to young starters, the elderly, and sometimes even families sharing a private space smaller than 6 square meters. This number is even more shocking when we take into account Neufert’s minimum room sizing, measuring at 3,6*3,6 meters, or 12,96 square meters .

Hong Kong "coffin home"

No matter how much we sugar coat the idea of tiny living, overcrowding and minimizing private space to such extremes unquestionably has negative side effects. Effects on quality of life due to crowding may include increased physical contact, lack of sleep, lack of privacy and poor hygiene practices . Susan Saegert, professor of environmental psychology at the CUNY Graduate Center and director of the Housing Environments Research Group, warns that tiny living conditions can be detrimental for a large portion of residents. To further emphasize her point, she mentions children and teenagers as an example; "I've studied children in crowded apartments and low-income housing… and they can end up becoming withdrawn, and have trouble studying and concentrating." In extreme conditions like these, over designed details and luxuries such as floor to ceiling windows, extra storage and the addition of overly marketed communal areas don't make up for a fundamental lack of every day privacy in a dwellers' home. As an example, the degree to which teenagers grow up in crowded housing is an important aspect of social inequality. Poor living conditions can serve as a mechanism of social stratification, affecting their wellbeing and resulting in the intergenerational transmission of social inequality.

The integration of the standard of tiny living in the design norm bears dangers for normalizing gentrification; if micro-apartments are indeed the housing typology of the future, Saegert argues, they increase the base rent, or euro per square meter that a developer gains and foresees from their investment. So gradually, dwellers may actually experience a significant bump in housing prices, paying the same amount to rent a studio in the neighborhood where they used to be able to afford a one-bedroom. With the gradual disintegration of zoning rules, the micro-apartment could become the only viable choice for a large number of social groups, like starters and lower income households. Just like Hong Kong.

Taking into account the driving trend of Rotterdam's -and the worlds'- rapidly densifying urban fabric, I believe it is vital to find a balance between profit maximization and high quality of life within a collective living context. What we define as "minimum" space for a room to be functional is of course highly subjective and debatable. And especially when economics are put into play, balancing between profit margins and square meter allocation per capita is tricky. Even though my design interests aren't geared towards tiny living, it is vital that architects hold a critical view towards this pan European deregulation in minimums of functional private space that force people to a confined, capsularised life.



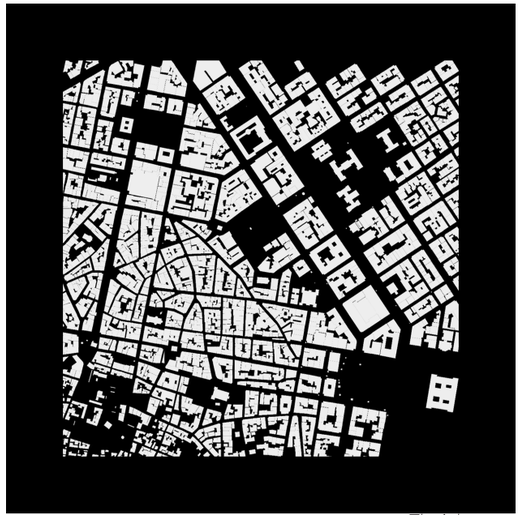
A livable space
Personal work

IN- BETWEEN SPACES IN COLLECTIVE HOUSING

Many theorists have talked about liminal spaces. In the book “Architecture from the outside”, Elizabeth Grosz describes them as paradoxical since they can acquire meaning, a position, in relation to something that is not and can never exactly be, that is, the two spaces surrounding the in-between. And the in-between spaces are always differentiated from them since they are the Intermediate, the third space. These spaces, she claims, are strange, as they are always placed in relation to two other spaces, one inside and one outside, one here and one there, one closed and one open, one covered and one not, one public and one private and so on. Doreen Massey, in her book “A global sense of place”, mentions that the in-between is the space we consider to depict, amid all these modern flows of movement and communication, the desperate seek of peace and quiet.

As mentioned in the previous chapter, there seems to be a driving trend in newly built, profit driven collective initiatives; Communal areas are a selling point, as the interweaving of liminal spaces with a co-living model of design can provide a productive answer to both densification and the market’s demands. However in most cases, this -selling of communal areas- is done almost in an effort to reconcile for the lack of private space. Even in the densest forms of living, be them collective or not, we find liminal spaces, spaces that exist between two others. These spaces can come in the form of a balcony, a corridor or, in the case of collective living, a shared public space. Why do modern collectives upsell these spaces so intensively? How do these liminal spaces act upon their users?

Before I jump to the definition of the word itself, it is of value to underline that the in-between space, its size, form and use depends entirely on its context. On a city scale, it consists of all the roads, pavements, and bicycle lanes, all the spaces that help us get from point A to point B. It is highly permeable and ever-changing, much like the city itself. As it is a place of interaction, it is highly affected by its inhabitants. It is formed through a series of social interactions, that met and coexisted in said given place. In a public building context, the in-between space consists of all the corridors, escalators, and common areas. It also is affected and in fact formed by its users, although it is a bit less permeable, as it’s intended for in-building use. In a housing context, the in-between space is the buffer between the inside and outside, the social and the private.



The inbetween space within a city’s context
Personal work

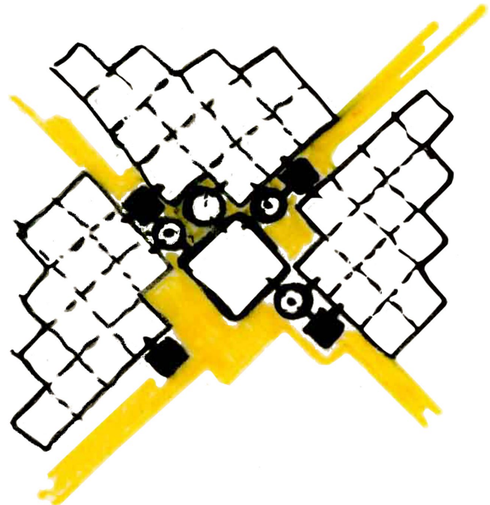
Revisiting the Emmahuis

It is, therefore, in its original sense, the space that each time "borrows" its character(public / private / semi-private / semi-public) but also its size and form (boundary / skin / strip of land / large area etc.) depending on its position, its use and its historical, social and spatial significance.

As I understand it, the in-between space is highly affected by its context. It acts as a buffer between two distinct spaces, both in terms of limit and use. To try and densify the meaning of this space, we could use Herman Herzberger's definition. So, the in-between could be identified as "An intermediate space between opposite elements, such as a whole and parts, inside and outside, open and close, central and decentral". A space that is defined by its position, its use, and its historic, social, and spatial importance.

Taking into consideration the site of the studio (a fully urban, dense neighborhood near the center of Rotterdam), the studio's main focus (densification of housing), and to further narrow down the concept of an in-between space to help my research, I will be focusing on the "public building" and "housing" contexts I aforementioned. Therefore, I can try to form a definition of the in-between space, within the context of my research as:

An intermediate space between a private area -room/ apartment- and the outside urban environment. A space characterized by its orientation towards collective use, its inclusivity, permeability, and versatility.



The inbetween space within a public building context
Herman Hertzberger

To further contextualize the scope of the research, and to further connect it to the design aspect of the studio, it is worth mentioning who these inbetween spaces will be created for; My selected user groups for the graduation design are elders and students. In chapter one, I analyzed how elders benefit from social contact, and students from contact with their elders. So, how can we design the in-between space to function ideally and to avoid possible frictions in the everyday contact for these two specific user groups?

To help with this question, I visited Abtswoude Bloeit, to perform interviews and gain insights on multi generational collective space use.

A situation to be avoided
Personal work

INTERVIEWS

Abtswoude Bloeit is a former nursing home located in Buitenhof, Delft. It was initiated by SHS Delft , Pieter van Foreest and the Perspektief foundation . In this repurposed building, residents of the Perspektief foundation, students and elderly live together under one roof. Abtswoude is a place where the neighborhood comes together in “The Living Room of the Neighborhood”, a communal area located on the ground floor of Abtswoude Bloeit. There, dwellers and adjacent neighbors get together and organize a multitude of events. Residents support each other and take care of the communal gardens and surrounding facilities.

Abtswoude Bloeit is selected to be part of the case studies, both because it is a form of collective housing, but also because it contains the exact mix of user groups I want to incorporate in my graduation design -i.e. Students sharing communal spaces with elderly-

The mixing of students and elderly brings a multitude of advantages, for both age groups involved. Students who are living on their own for the first time can benefit from the close contact with older, experienced co-residents. For clients of the Perspektief Foundation, who have often gone through a difficult period, Abtswoude Bloeit is a place that offers them the chance of gradually regaining control of their life. For the elderly, this redevelopment contributes to combating loneliness, by offering the residents to be part of a community. The Dutch National Fund for the Elderly estimates that 900,000 of the more than 2.9 million over-65s feel lonely, an immediate result of too little social contact . Daily social contact with people from a younger generation can make a big difference.

To further understand the significance of communal areas, the positives as well as the challenges that come with co- operative intergenerational housing, a series of interviews were conducted, both with administrative staff, as well as with residents of the establishment . The choice of participants was made in an effort to gather information from different points of interest. The interviewees varied in age, cultural background, occupation and ethnic group, in order to diversify the sources of input. The identities of the interview participants will remain anonymous in respect of their privacy. To keep the setup simple, only the initial letter of their given name will be used. From now on, “Abtswoude Bloeit” will be referred to as “A.B.”.

Abtswoude Bloeit activities in the communal areas

W: Administration of A.B., cultural program maker.
C: Masters students in TU Delft, living in A.B. in a student housing unit.
P: Elder resident, living in A.B. in an individual apartment.

The initial two questions were focused around communal living, and the participants' choice to join this type of living. The answers varied;

W was initially invited as an artist, to write a poem for the neighborhood that could contribute to the cultural sphere and connect people in the neighborhood. While they were working on the project, they were invited to take over the role of cultural program maker for A.B.

C found out about A.B. through an ad. They really liked their potential roommates, so they mostly moved in for the student "sub house", more than A.B. itself.

P was spending half the year in the Netherlands and half in Indonesia, their home country. Since all of their family is now located in the Netherlands, they decided to move back permanently. Due to their financial situation, they applied for social housing, and were given a spot in A.B.

The next two questions revolved around the main communal area -the living room of the neighborhood-, and the experience the participants have had while using it.

W described some challenges A.B. faces when it comes to the common area; They mentioned that sometimes, people can be noisy -the quiet hours in the common area start at 22:00, but some residents do not always respect that rule-. For instances like these, a solution in a form of a WhatsApp group has been utilized, where residents of the building can message and alarm each other when there is a disturbance.

C recognizes positive aspects about the communal living room. They find that the communal living room has a positive effect on the elderly, as "a small interaction or a chat with a younger person during the day can cheer them up". They also mention that some students enjoy spending time with the elderly as they can exchange ideas. However, C also recognizes some challenges in the way the living room is shared; They mentioned that elders prefer to keep the living room warm. But, since the heating costs are evenly spread across the residents, this desire affects the students, who prefer to keep monthly costs at a minimum. They also mention

that some students might throw parties in the common living room, which causes tension, especially when the students fail to clean up after the parties.

P doesn't see the common living room as a "game changer". They appreciate its' existence, as they actively take part in events or happenings that are organized there, but do not use it daily as a tool for socializing.

The next questions were focused around the daily lives of the interviewees, their favorite spots and time of day spent in A.B.

Evidently, residents do not spend a lot of time in the shared spaces. Both for C and P, their favorite spot in A.B. was their private room or apartment, with both of them stating that due to the COVID regulations proposed by the government, residents mostly spend their time at home. This in turn means that the communal areas remain mostly empty, with the exemption of an event, where a small number of dwellers get together. C also mentioned that, due to their very different time schedules, only a few students -if at all- attend the aforementioned events.

It is evident that communal areas in living establishments such as A.B. have been heavily affected by the COVID-19 pandemic, limiting their use to a minimum. In A.B.'s case, administrative staff have been doing efforts to work around the restraints of COVID.

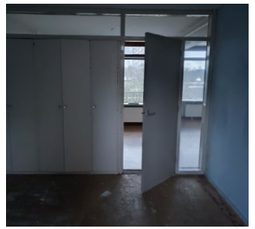
W talked about the situation; "During COVID, and the most recent lockdown, we were closed. People could use the living room for themselves, but no events were held. We had to be very creative, less people, more distant, that sort of thing. With Christmas we did this very awesome thing I think; We wanted to do a big Christmas market with food and music -in the common living room-, but that obviously couldn't happen, so instead of doing it in one place, we turned it around; We asked a couple of artists to make a "mini Christmas cart", and made two groups of performers, in one of which I was part of as a poet, and we went around to all the homes and greeted the residents. We had some Chocomel, some gluhwein, homemade cookies and we had mini performances along the houses. That was the most recent effort to deal with COVID and bring people together while keeping them as safe as possible."

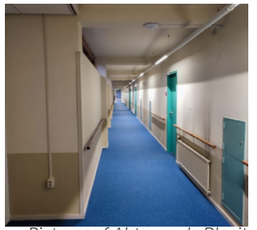
Finally, when asked about what the residents would like to see as an extra addition to A.B., answers varied between the age groups.

C thought an addition of communal workshops where elders and students come together to do hobbies such as woodworking and other activities would be beneficial. He informed me that A.B. has a basement that would be a great space for those activities, but the foundation has closed this area off due to water damage scares.

On the other hand, P mentioned the lack of security in the building. During the evening, the rear entrance is very dark and doesn't have any camera surveillance, rendering it an easy spot for unwanted visitors to enter from.

- The building's exterior is highly dated and shows evident signs of wear.
- The setup of the building is different than what I imagined; Instead of students and the elderly living together, for example sharing a corridor, they are completely separate. Student houses occupy different sections of the building, and are therefore completely separated from the elderly. They use a different entrance, making the occasional intergenerational "meet and greet" even less likely to happen.
-Giant corridors, covered in blue carpeting lead the dwellers to their housing units. Reminds me of a hospital.
- A striking number of apartments lay empty. Even though the Netherlands is going through an unforeseen housing crisis, more than 70% of the apartments in A.B. remain uninhabited, although in perfect condition. P's apartment was the only occupied one in the entire floor, with the floors below and above it being completely vacant.
- The communal living room is huge, and utterly empty. There was a small group of people having dinner in a corner. I was informed that this was the first day the communal kitchen had reopened after the COVID lockdown.
- The mere existence of a communal space does not guarantee its success. A shared space should have functions embeded within it, with human contact appearing as a natural outcome of the provided functions. Human interaction is the ultimate goal of a communal area, but that goal can only be achieved by the precise and accurate placement of appropriate functions within it.





Pictures of Abtswoude Bloeit

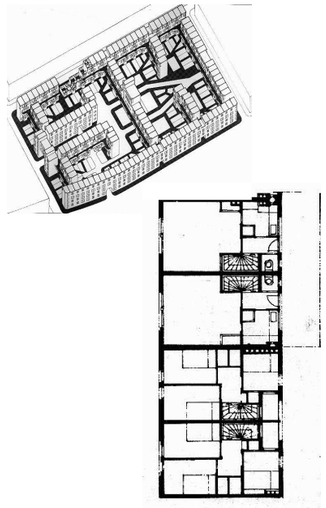
CASE STUDIES

To help with the research and to see how architects have tried to solve or express the aforementioned goals through their designs, I have selected a pool of case studies, based around three main axis of interest; User groups and intergenerational dwelling -which was addressed above with Abswoude Bloeit-, accessibility and circulation, and apartment layout.

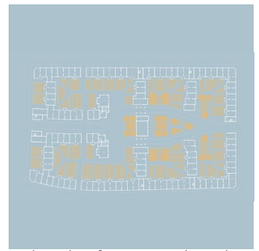
/ Accessibility_ Circulation

"Spangen social housing", Michiel Brinkman, Rotterdam, 1919

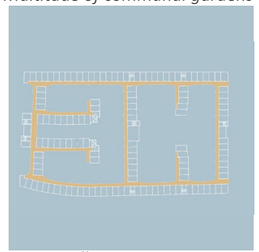
The Spangen Quarter is located in Rotterdam and designed by Michiel Brinkman. It's a rectangular four-story brick urban block, centered around two large courtyards. It is the first social housing project where the concept of "Streets in the sky" is carried out. Although the relation between housing and neighborhood (private and public) already appeared in the history of traditional architecture, "Spangen quarter" materializes this concept in an original way. Access to the duplex apartments on the top floors is achieved through a one kilometer long gallery. The gallery is located in the interior courtyard of the building, so it is considered a private space and there is no visual connection with the neighborhood. However, it is the first time in a built project where a transitional -in between- space between the public street and the private flats makes an appearance. Upon completion in 1919, the project offered many shared amenities, amplifying its communal character, like a public bathhouse situated between the two courtyards. The Concept of "streets in the sky" had tremendous influence in Dutch architecture, now being part of traditional dense housing design. It also influenced architects such as Le Corbusier, who further developed the idea in L' Unite d' Habitation. Spangen Quarter is part of the selected case studies as it provides vital insights to the history of the Dutch gallery housing typology (something that will be part of my graduation design), but also to the transition between the public and the private area within a dense housing model.



Spangen social housing isometric view and plan



Multitude of communal gardens



Gallery apartment access

/ Built block_ Apartment layout

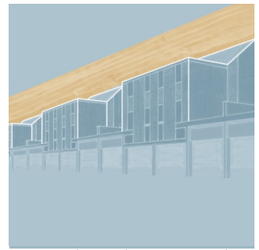
"Kasbah", Piet Blom, Hengelo, 1972

The kasbah housing project was designed and built by Piet Blom in Hengelo, a town in the Netherlands in 1972. Blom's goal was to create an urban roof, something he had conceptualized the years prior. The municipality of Hengelo issued an assignment, asking the architect to deviate from the usual forms of housing and housing types so that the unmet housing needs within the existing market can be met.

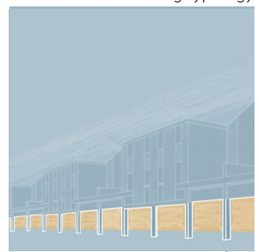
The project initially contained 128 dwelling units, although that number later grew to 184. Blom, wishing to transfer the Dutch row typology into a new, experimental context, designed four different housing types, each corresponding to a different sizing need; The dwellings ranged from a single space studio to a 4 bedroom house. All units have an open floor plan, with an inside staircase connecting the different rooms. Almost all units have a private roof terrace. The four different housing typologies were meant to offer space for a varied society in which there would be room for singles, families, employees, self-employed entrepreneurs, students and professors.

One of the key elements of the Kasbah design, and the reason it is part of my case studies, is the peculiar pilotis area; Blom does not design or fill out the space under the urban roof, providing only a sketch with illustrations of social public life. According to him, the space is suitable for parking, shops, greenery, play areas and meeting places. In 1976, a communal area for residents was created on the ground floor, named "De Tempel". In Hengelo, Blom had the opportunity to materialize his ideas about societal structures and communal living. Despite the creative design approach, the project ultimately failed to meet the architect's vision. Due to high rent prices, the initially desired societal diversity was never achieved. High income households and young dual earners moved into the Kasbah, while working class families still opted for the familiar terraced house. The project resulted in a lonely version of the complex urbanity that Blom had in mind. Despite its failure, the Kasbah complex, with its unique shape and spatial setup, challenges a traditional housing typology and offers a creative approach to it.

Kasbah Pilotis view



Dutch row housing typology

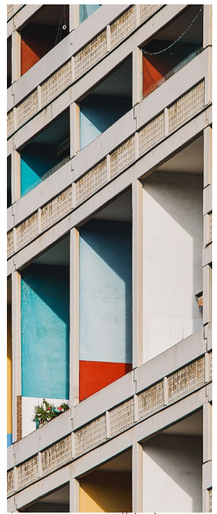


Pilotis

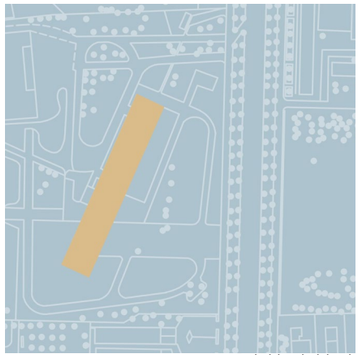
“Unite d’ habitation”, Le Corbusier, Marseille, 1952

Unite d’Habitation is an apartment building block, located in Marseille, France. Designed by Le Corbusier in 1947, Unite is one of his most important projects, as well as one of the most innovative architectural responses to a residential building.

The built block is massive, measuring 165m long, 24m wide and 56m high. Each floor contains 58 duplex apartments, capable of housing 1.600 dwellers. The design, often referenced as a “vertical garden city”, focuses on communal living for all the dwellers, with shops, pharmacies, and even a small hotel accompanying the apartments in the complex. My existing building is also a solid block, with gallery access, so studying this typology can help me re-imagine, redesign and transform the existing structure, maximizing space allocation, improving circulation and housing quality, while respecting the existing buildings’ structural limitations.



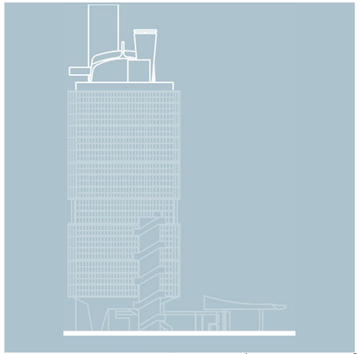
Unite d’ habitation
view of balconies



Solid built block

The “Vertical garden city” was based on Corbusier’s idea of incorporating the typical villa typology into a large high-rise structure. An idea that allowed the dwellers their own private space, outside of which they would engage in social activities, such as shopping, exercising, and gathering together. The end design essentially gives the feeling of a “city within a city”, with public functions carefully distributed throughout the floors of Unite. However, the majority of the communal functions are situated on its roof, which doubles as a garden, containing a running track, a kindergarten, a pool, a gym, and a running track. The typological transfer element in Corbusier’s design is one of the main reasons I chose the building as a case study. As aforementioned, one of my design goals is transferring the Dutch row house typology in a dense high rise structure. By examining Corbusier’s design, I can draw conclusions upon the positive and negative aspects of his approach and therefore provide some guidelines for the design process.

Children playing in Unite's rooftop



Communal areas on roof

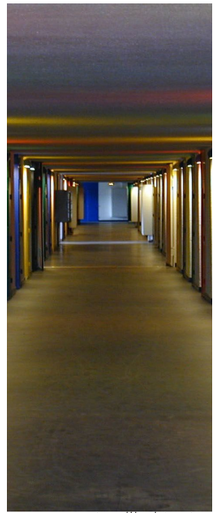
One of the building's characteristic traits is the ground floor. The entire structure rests on top of a pilotis, supported by 34 massive pillars. This provides an -almost- total permeability at the ground level, allowing for communication between the interior and the exterior, while at the same time providing access to the vertical communications. However, as seen in the two figures below, there seems to be a contrast between Corbusier's vision of this space and its actual use; While he meant it to be an inviting meeting place for the community -as seen in his sketch-, the reality is something very different. Due to the enormity of scale and the materiality of the space -exposed concrete-, the pilotis area seems rather cold and uninviting. In addition, and again due to the scale of the pilotis, the space does not protect the visitor from the elements. This is especially prevalent in the winter months, when the cold northern winds make the area practically inaccessible. As I plan on introducing a public plinth on the ground floor of my building, and wanting to make said floor highly permeable to emphasize the public sense of it, I think that drawing these conclusions about Unite's pilotis will help me when designing it.

Unite d'habitation
View of pilotis

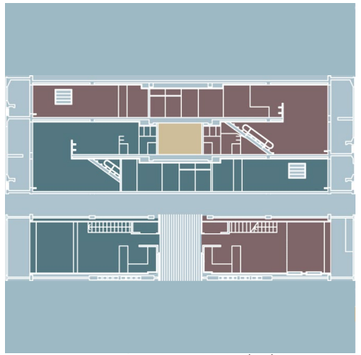
pilotis sketch - permeability
Le Corbusier

Another defining characteristic of Unite is its residential unit layout. Instead of using a double-stacked corridor system, Le Corbusier decided to span the units on each side of the building. He also gave them a two-story height, thus reducing the corridors to one every 3 floors. By doing so, he managed to place more units in the building. Unite d'Habitation is one of Le Corbusier's most important designs, having deeply influenced the brutalist style through the use of exposed concrete. Since its completion, Unite has been a source of inspiration for public housing across the world. This is an inspiring element in the design; It minimizes the need for corridors, or non-places -i.e. places with no identity, history or social interaction- and maximizes the space that can be allocated to apartments. This is an element that can be used in my design, especially in the southern part of the Emmahuis where the corridor is found in the core of the built block.

L' Unite d' habitation is chosen as part of the selected case studies due to its innovative apartment layout and the liberal use of communal spaces within a dense built block.



Unite d'habitation
Corridor



Apartment interlock in section

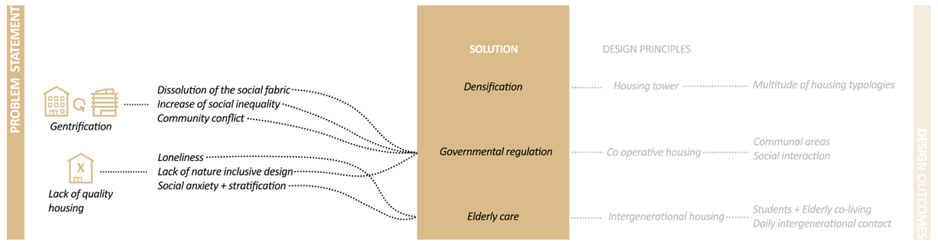
CONCLUSIONS

The current issues of gentrification and over crowdedness lead to a multitude of pressing problems, such as the dissolution of the social fabric, community conflict, loneliness and others. Rotterdam is suffering from dramatically increasing rent prices. The integration of the new and highly marketed standard of tiny living in the design norm bears dangers for normalizing gentrification; Two social groups that suffer the consequences of the price rise and its consequences are higher education students and the elderly. A possible solution, that gives an answer to the problem of gentrification, while at the same time bringing the two very different age groups together, is intergenerational co-operative housing; A housing solution backed by governmental regulation, protecting housing prices from unreasonable spikes, while at the same time allowing architects to design and experiment, creating resilient, environmentally friendly buildings, while always keeping the dwellers' well- being their upmost priority.

Taking into account the driving trend of Rotterdam's -and the worlds'- rapidly densifying urban fabric, I believe it is vital to find a balance between profit maximization and high quality of life within a collective living context. What we define as "minimum" space for a room to be functional is of course highly subjective and debatable. And especially when economics are put into play, balancing between profit margins and square meter allocation per capita is tricky. However, it is vital that architects hold a critical view towards this pan European deregulation in minimums of functional private space that force people to a confined, capsularised life.

By examining the selected pool of case studies, I gathered useful information on a multitude of focus points and understood the thought process behind each design. How each architect envisioned his idea of communal housing. Every design interpretation differs, but all have a common goal; Creating a diverse, lively community within an innovative urban fabric. A community formed and characterized by its inclusive character, and not by the dwellers' wallets size.

With this theoretical background acting essentially as a guide to designing resilient housing, I began experimenting, to give my own interpretation and solution to the problems stated above.



Reseach diagram

2. SITE LOCATION

BLIJDORP

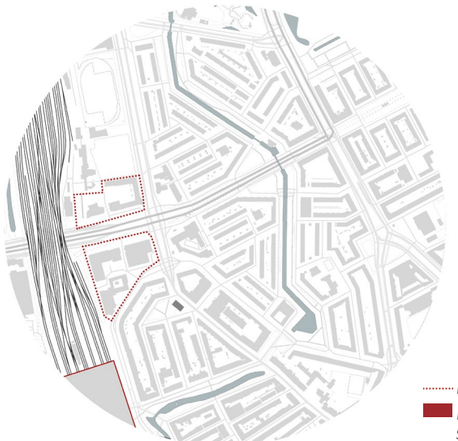
The municipality has the end goal of making Rotterdam a more affordable, inclusive, and sustainable city. Initiatives such as the neighboring Zomerhofkwartier show the municipality's will to provide accessible housing, retain creative businesses, and address environmental issues through large-scale architectural interventions in the urban fabric.Our studio, in line with the municipality, uses the co-operative housing scheme to tackle societal and environmental issues in Rotterdam's Blijdorp district. Our group was called to focus on a nature inclusive solution for our site, located near Rotterdam central. Our goal was to introduce species and biodiversity within a solid architectural concept. We firmly believe that neighborhoods and large scale urban interventions should strive to be welcoming and inviting to their users, while at the same time aiding and pushing for further biodiversity. The following chapter shows the process and outcome of our design intervention.

Statenweg, view from above, 1960s

AREA LOCATION

AREA LOCATION

SITE LOCATION

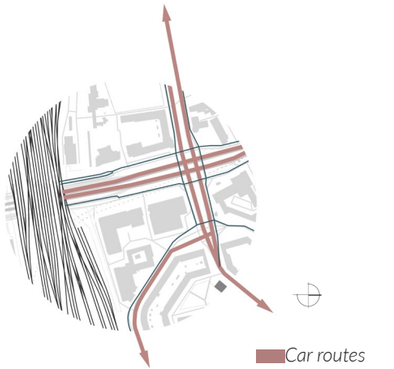


Provided plot
Rotterdam central station

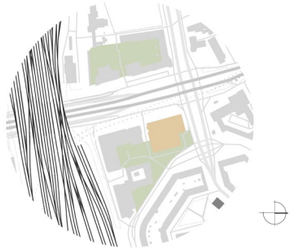
SITE LOCATION

Provided plot
Rotterdam central station

URBAN ANALYSIS KEY TAKEAWAYS

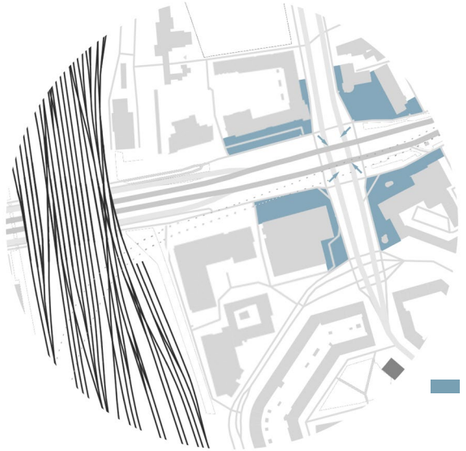


Car routes
Bicycle routes



Monument
Green areas

URBAN ANALYSIS KEY TAKEAWAYS



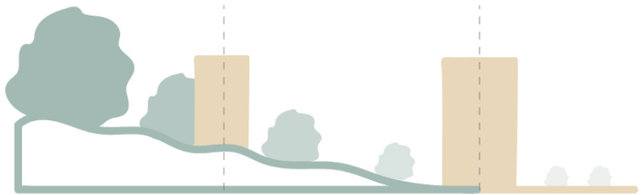
Unifying the corners

URBAN PLANNING

Species and humans

Blijdorp center

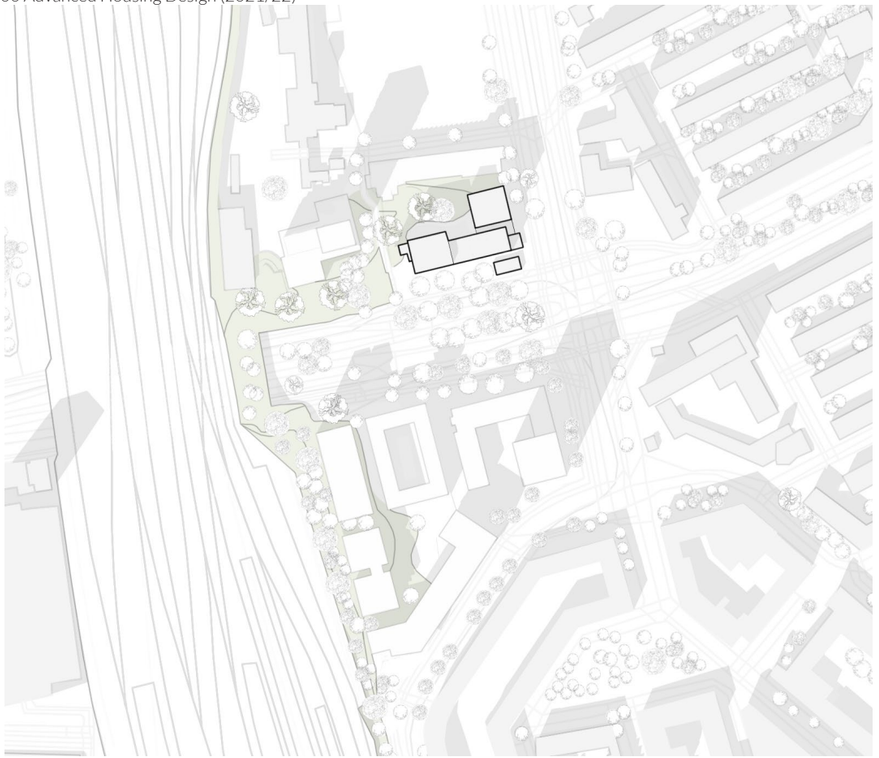
Campus area



Masterplan

0 10 20 50m

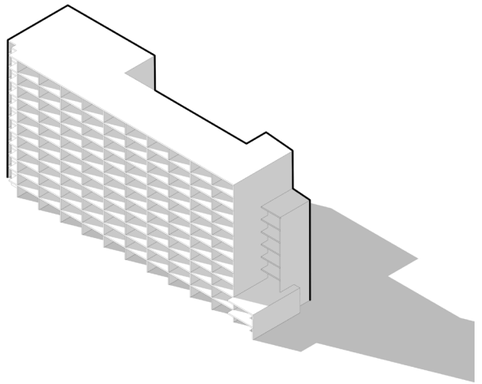
3. DESIGN PROCESS

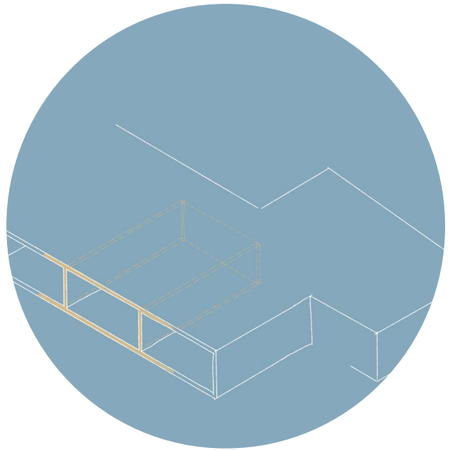


Building selection

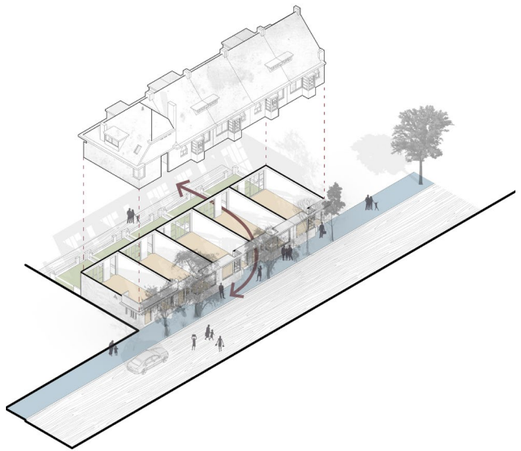
0 10 20 50m

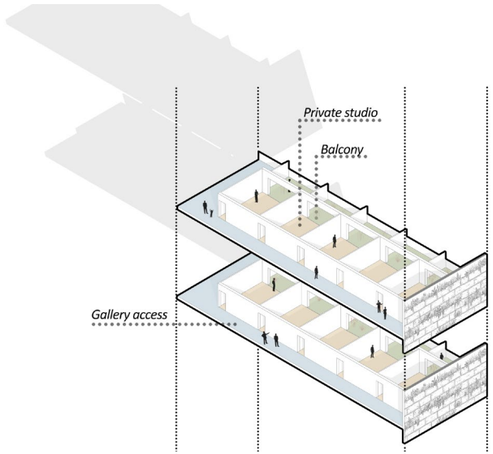
EXISTING STRUCTURE





CONCEPT



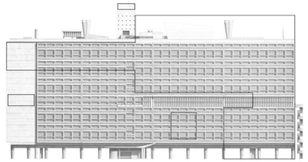


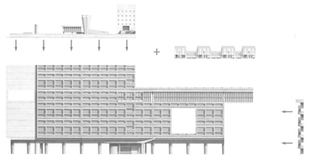
DESIGN CORE VALUES IN THE URBAN FABRIC

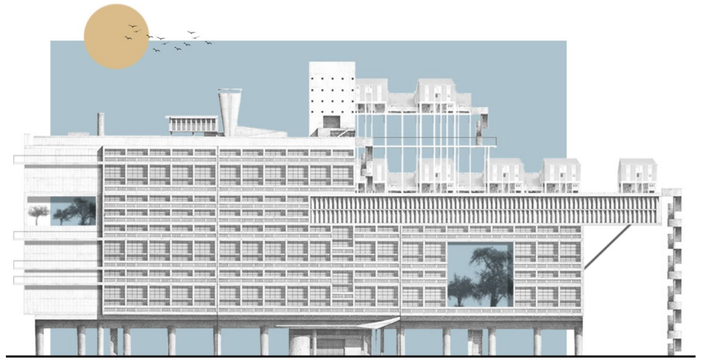
Permeable, public ground floor

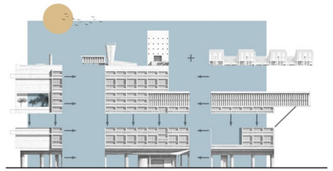
Green areas

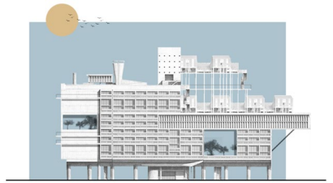
Selected building

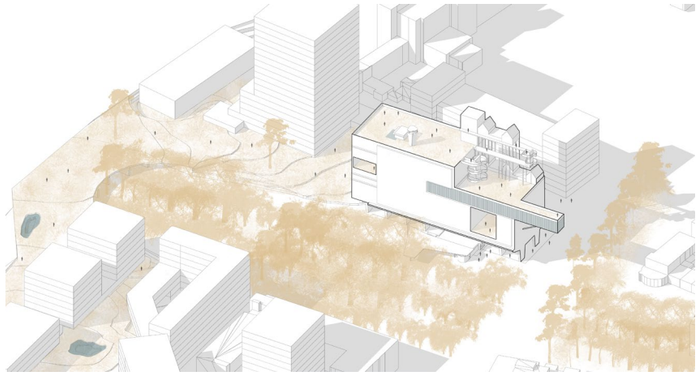




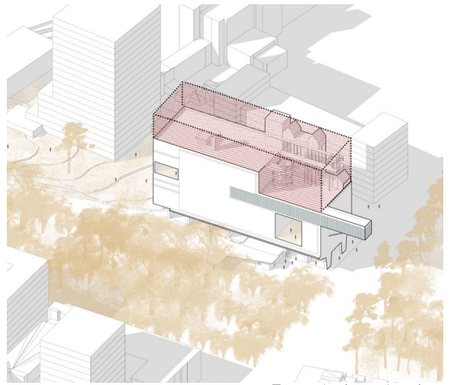








TYPOLOGICAL TRANSFER REFLECTION

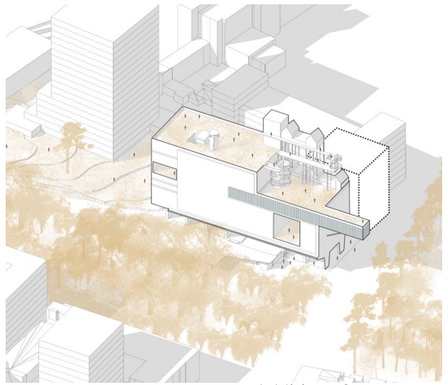


Emmahuis reduction

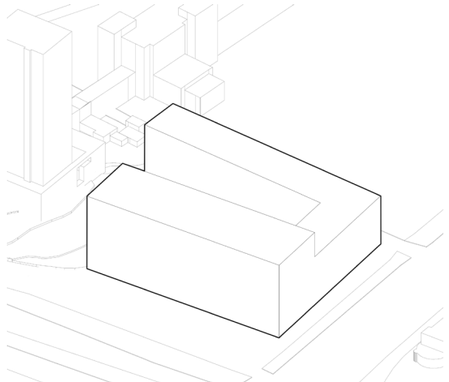
Reaction to tower

TYPOLOGICAL TRANSFER REFLECTION

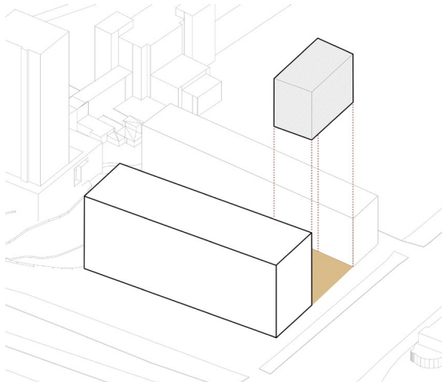
Green roofs



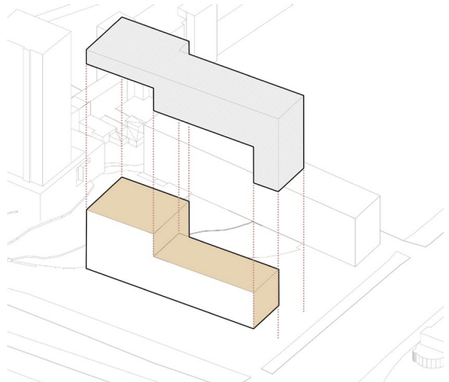
Addition of new tower



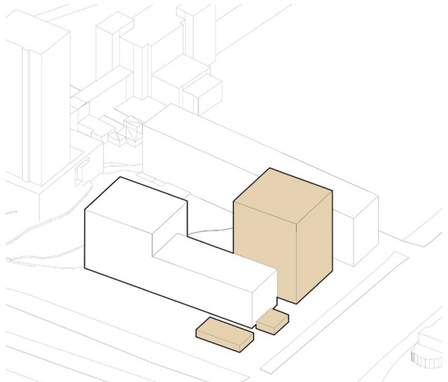
Existing situation



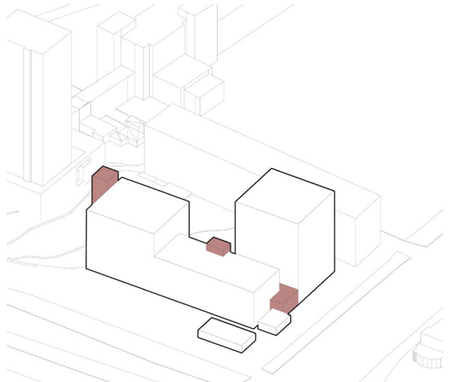
Emmahuis Fragmentation



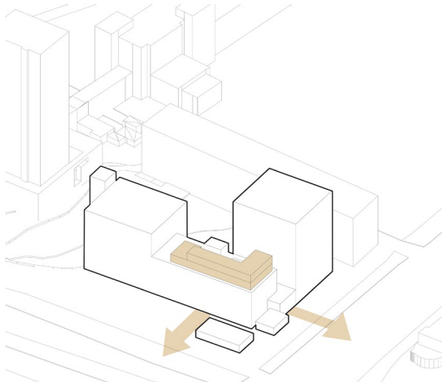
Emmahuis block reduction



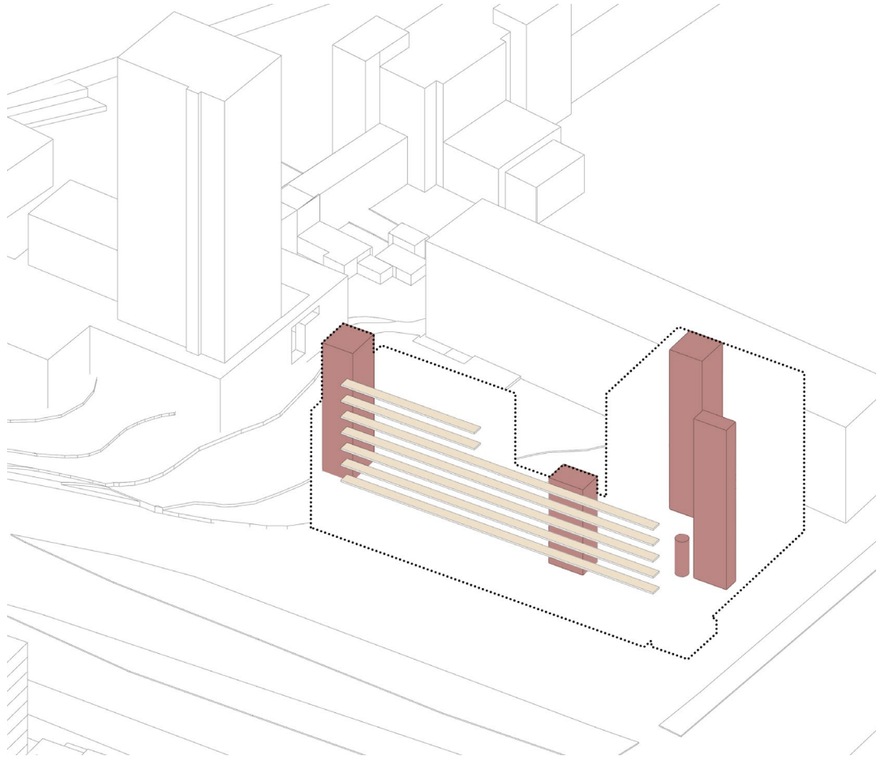
Addition of new tower



Updated circulation

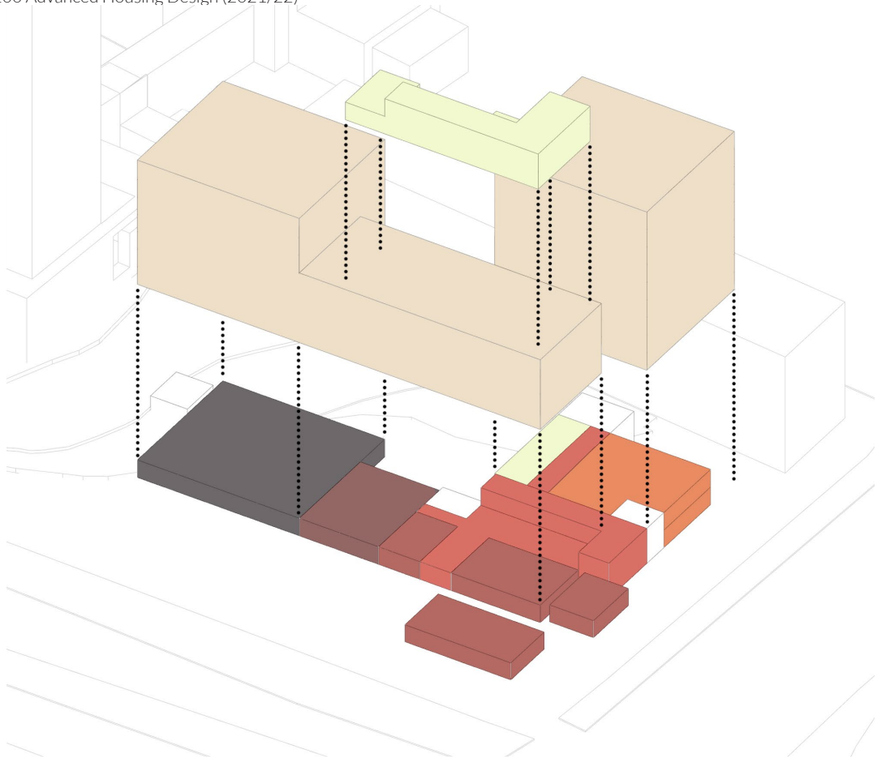


Permeable ground floor



Circulation

Elevators/ stairs
Gallery access

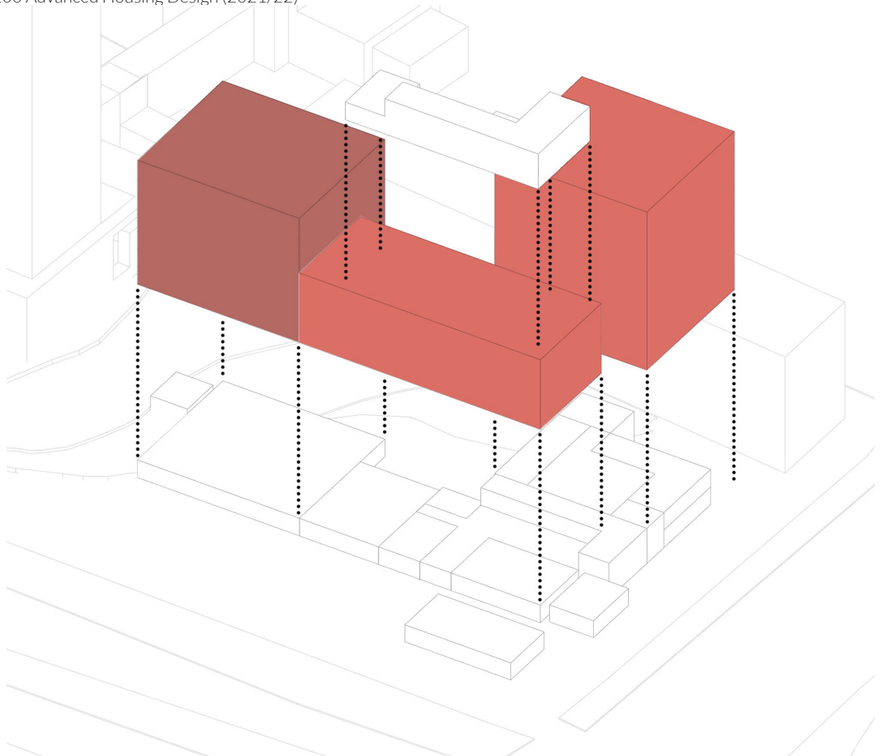


Usages / Functions

Workshops
Housing
Library
Lobby
Stores
Cafeteria
Storage/waste

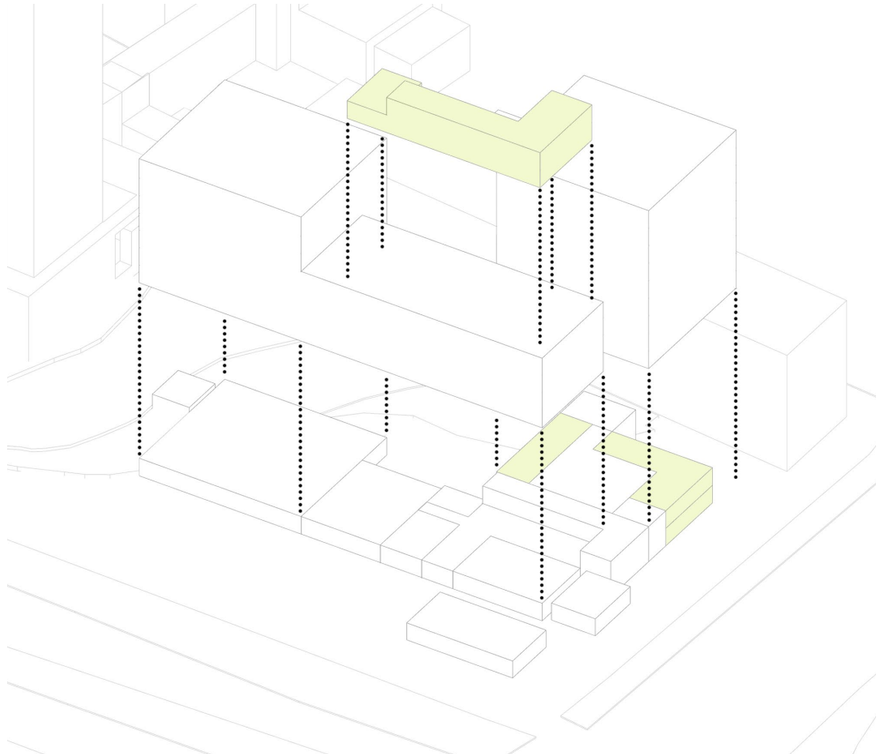
BUILDING PROGRAM

96 *8* *185* *30 (off site)* *~14.000m²*



Housing tenures

Co- operative
Private



Space dedicated
to co- operatives

CONTEXTUAL MATERIALITY

Brick Facades

Concrete cladding

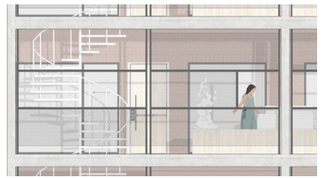
Metal Cladding

Glass facades

FACADE TREATMENT

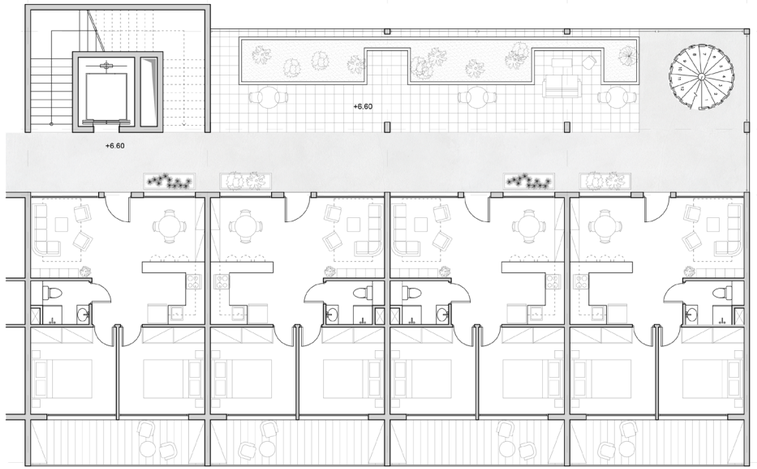
Stucco and wood

Concrete and brick



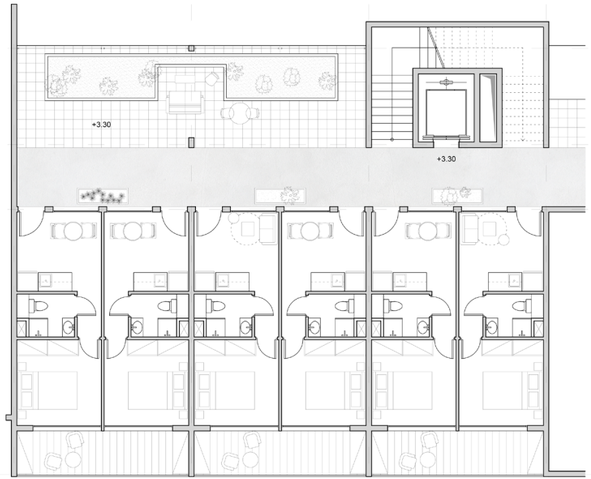
Concrete and brick, steel mesh

4. DWELLING TYPOLOGIES



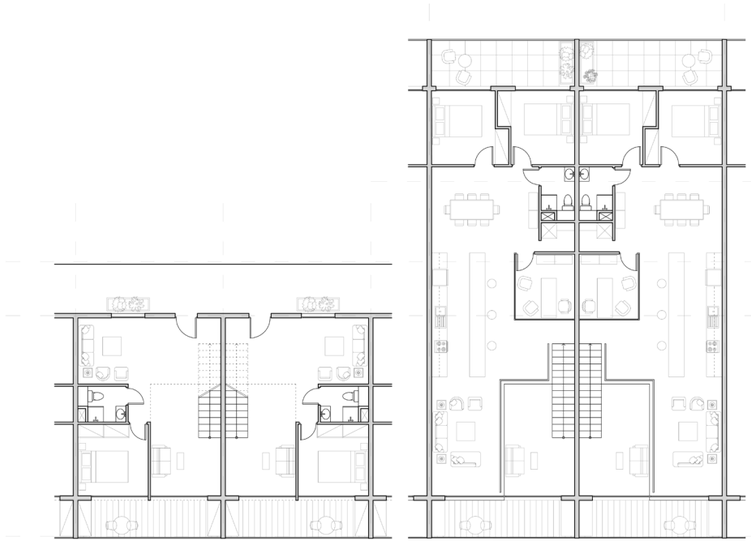
"Dutch row" typology
Emmahuis A

1 Gardens
2 Gallery access
3 Apartment module
4 Balcony
5 Elevator/ stairs



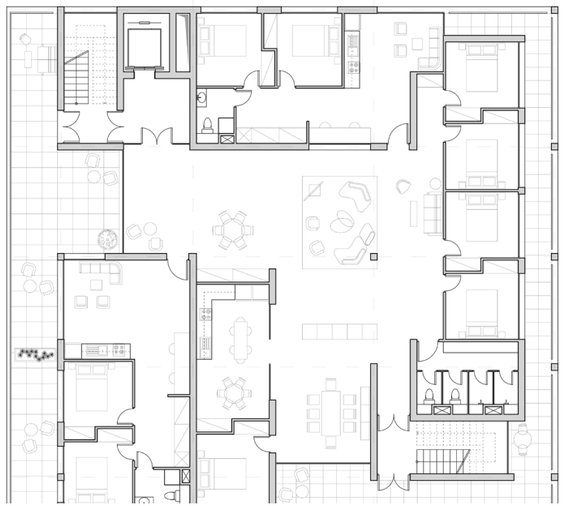
"Dutch row" typology
Emmahuis B

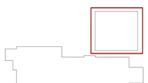
1 Gardens
2 Gallery access
3 Apartment module
4 Balcony
5 Elevator/ stairs



Interlock typology

1 Gallery access
2 Loft 1st floor
3 Loft 2nd floor
4 Balcony 1st floor
5 Balcony 2nd floor

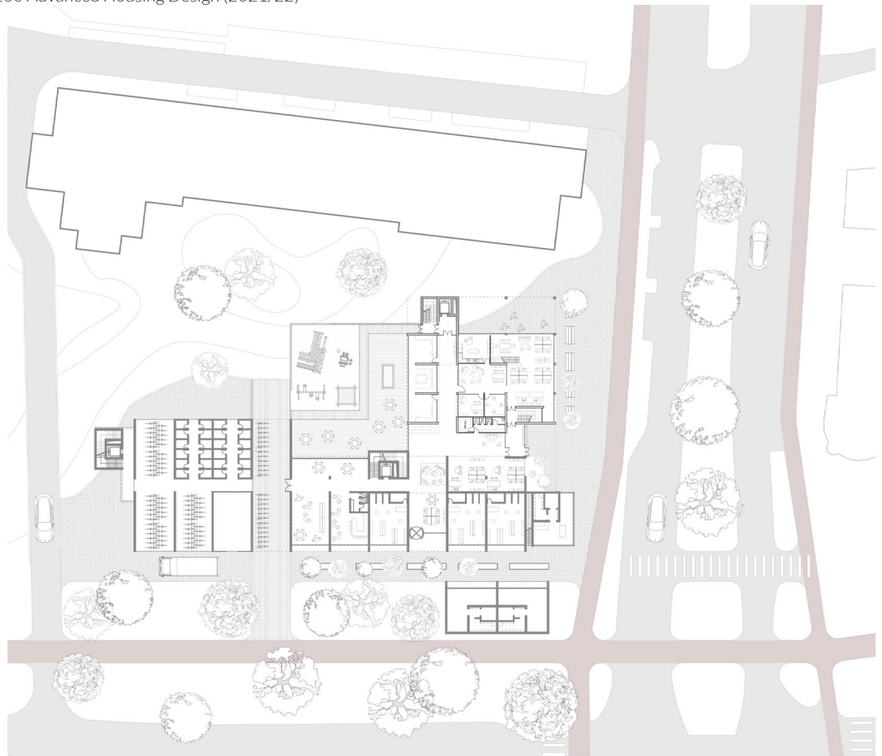




New tower typology

1 Transfer zone
2 Private apartment
3 Collective kitchen
4 Collective living room
5 Room
6 Shared bathroom
7 Balcony
8 Elevator/ stairs

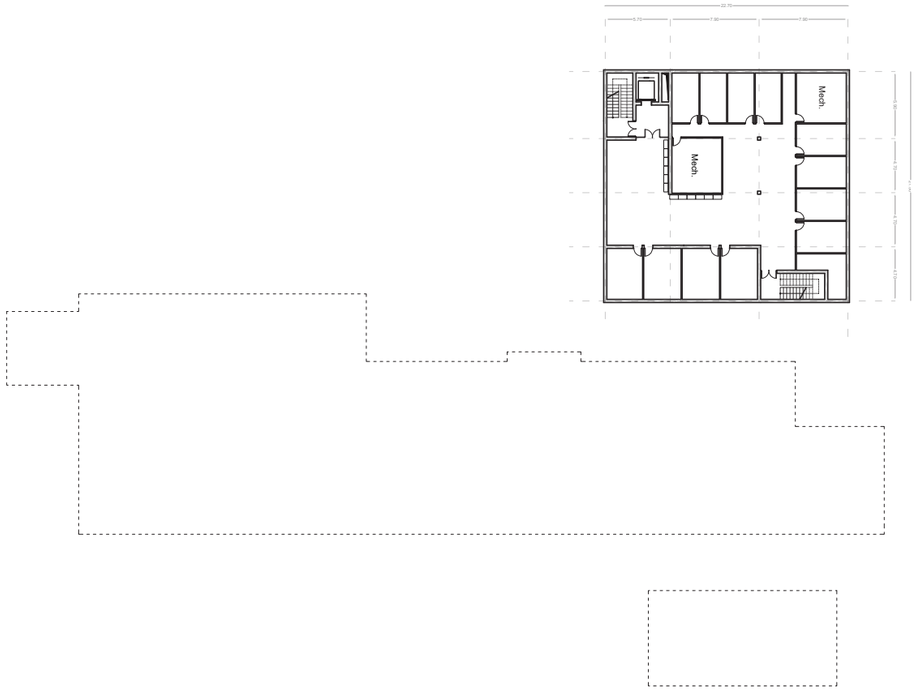
0 1 2m



Site plan

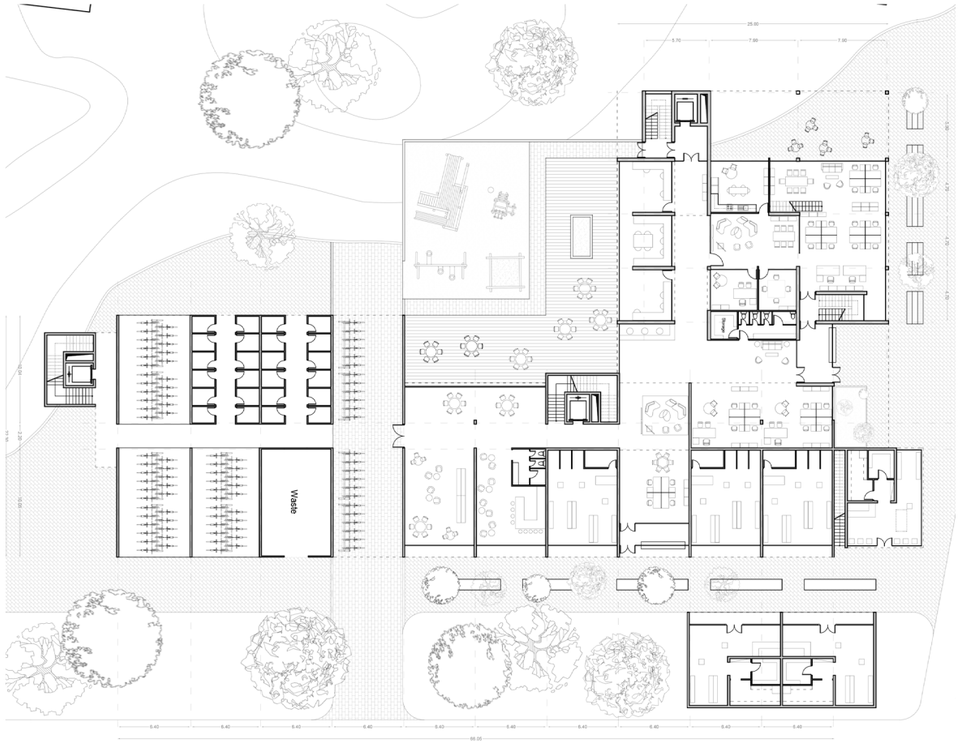
0 5 10 20m

5. FLOOR PLANS



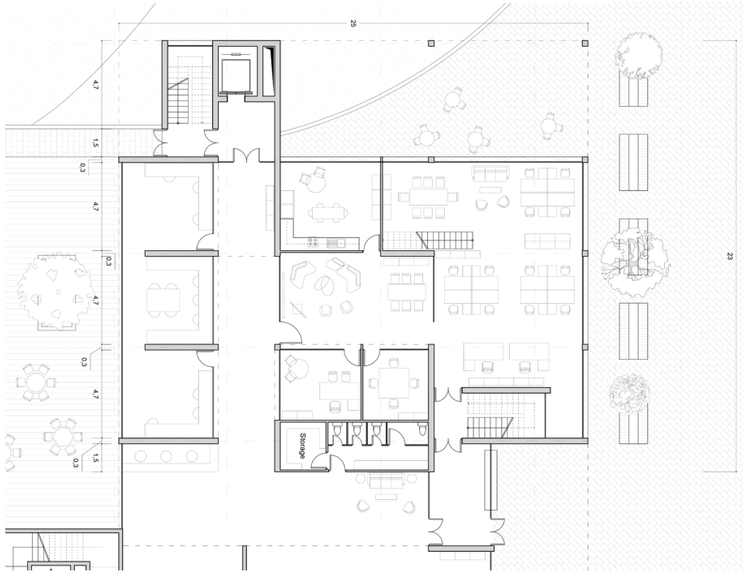
Basement plan

0 2 5m

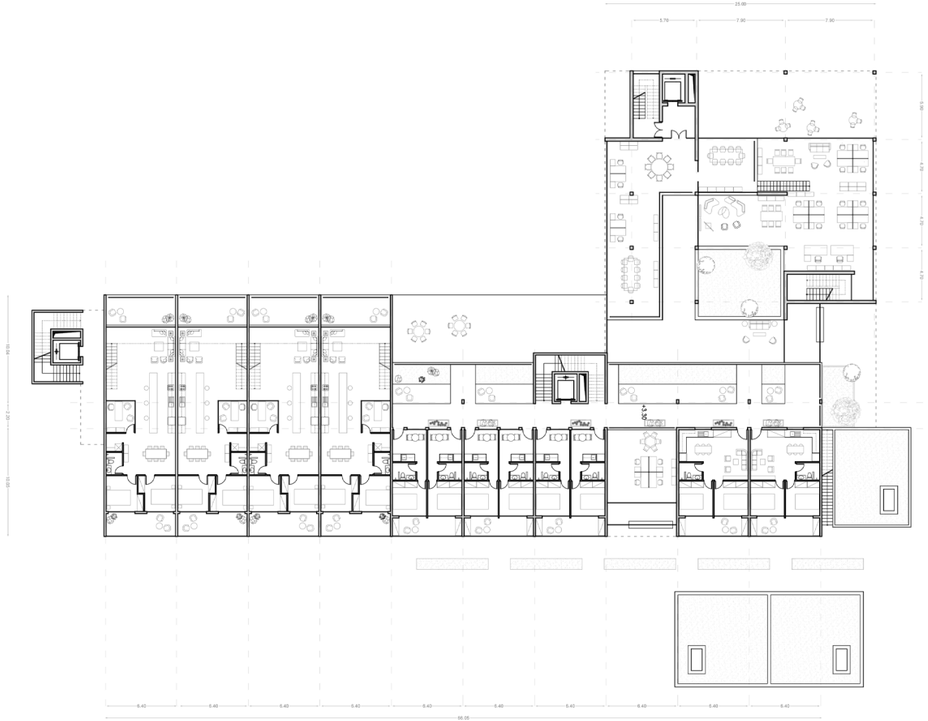


Ground floor plan

0 2 5m

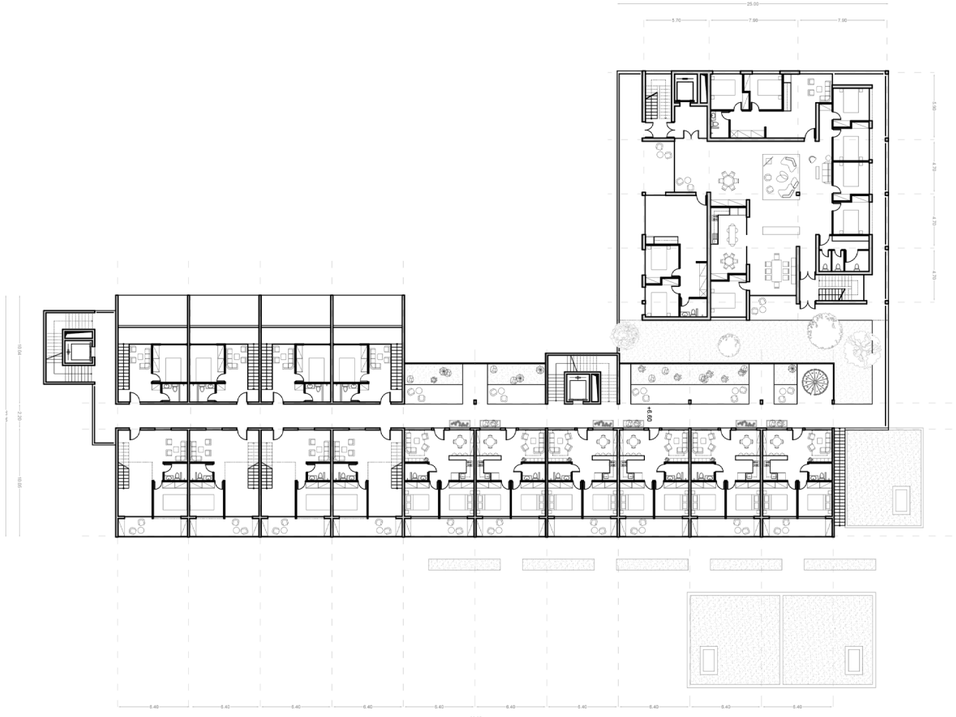


Dedicated
co-operative space
Ground floor



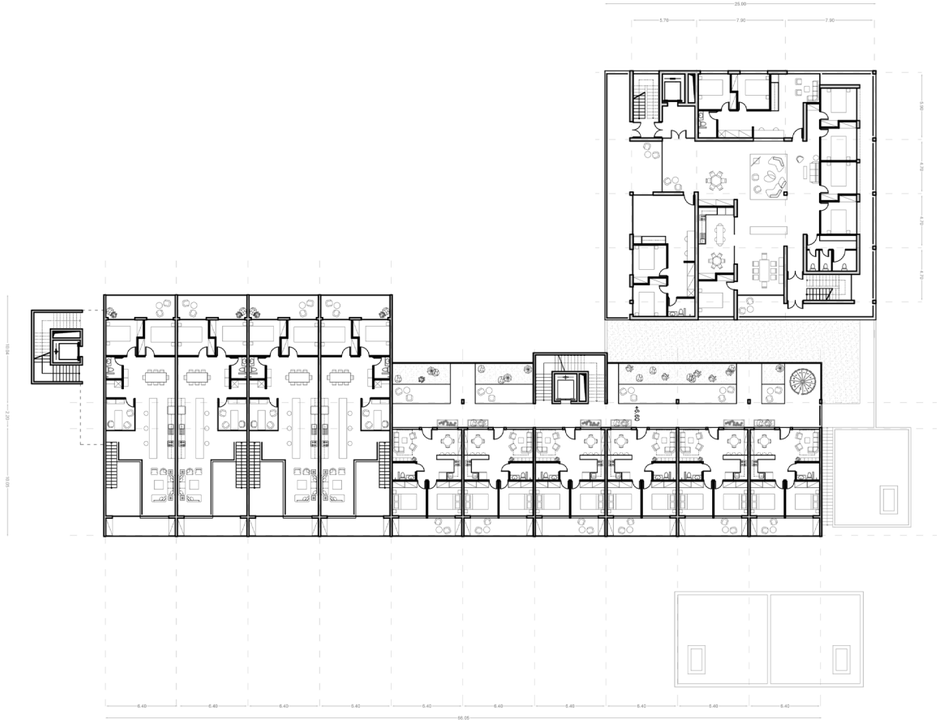
First floor plan

0 2 5m



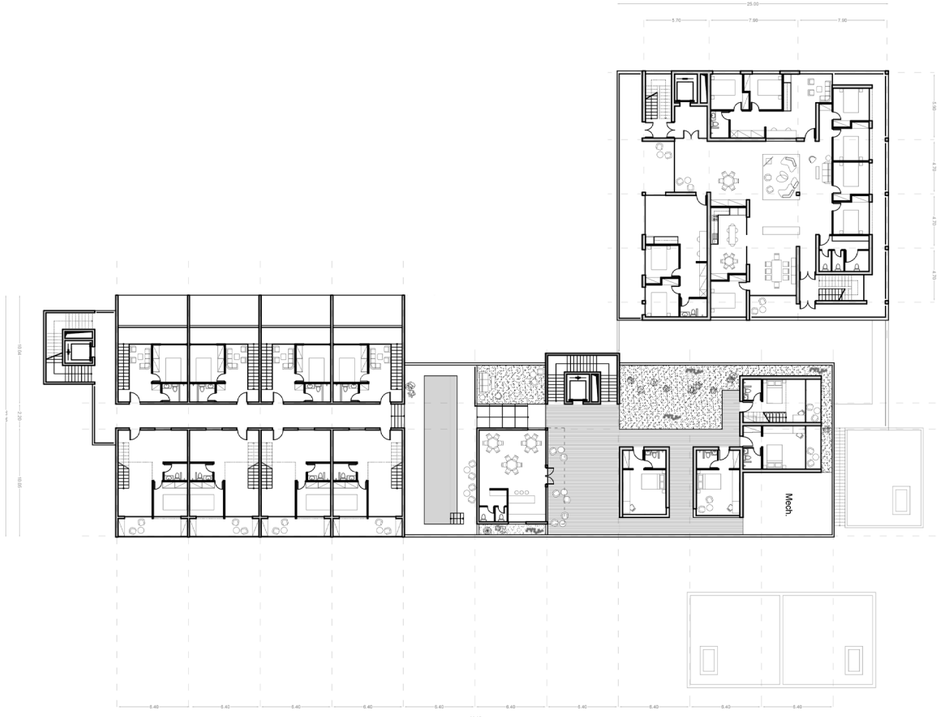
Second floor plan

0 2 5m



Third floor plan

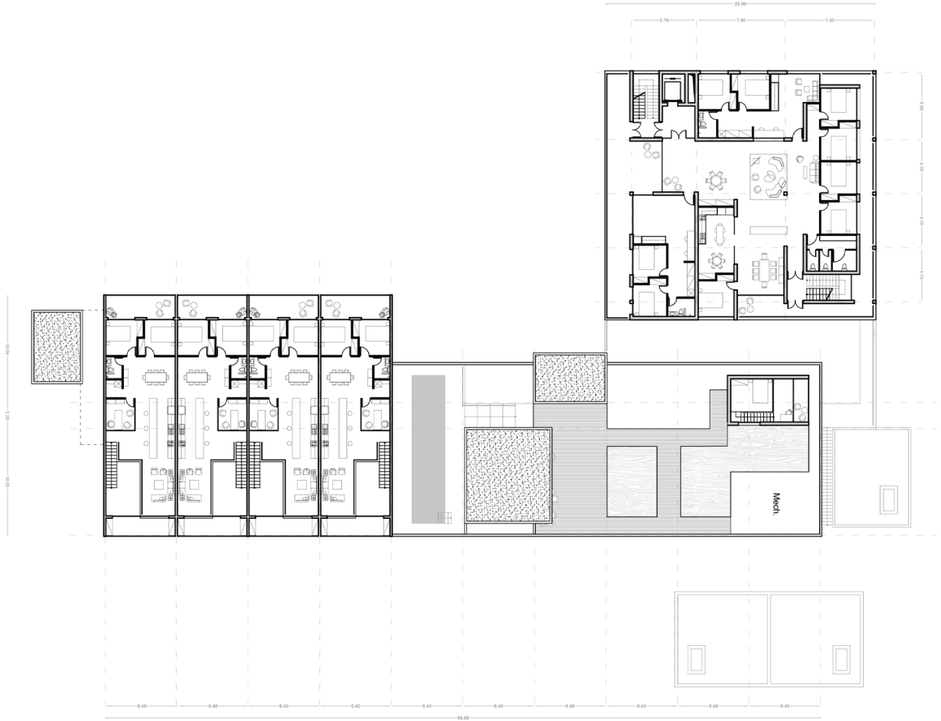
0 2 5m



Fifth floor plan

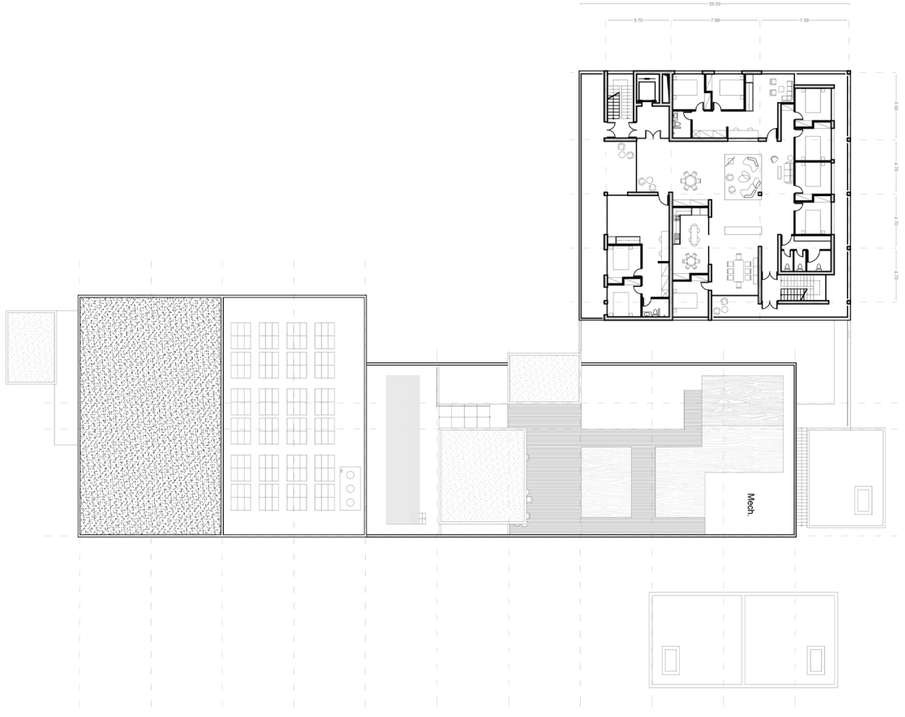
0 2 5m

Dedicated
co-operative space
Fifth floor



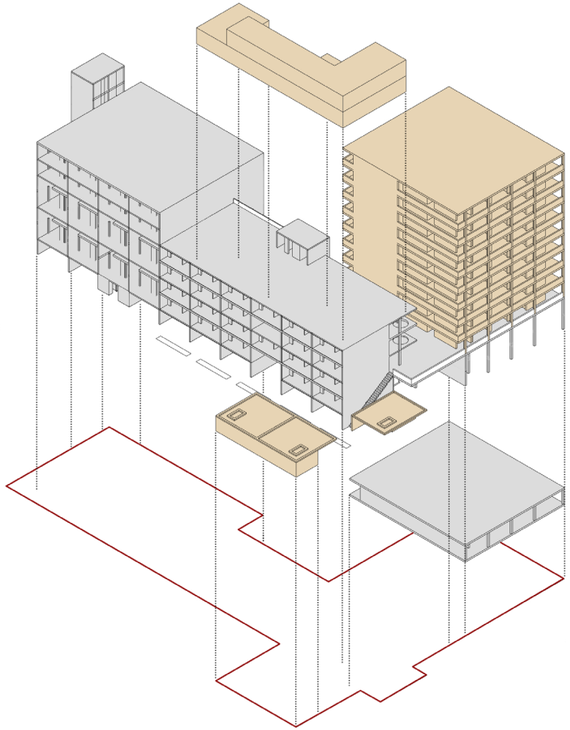
Sixth floor plan

0 2 5m



Seventh- ninth floor plan

0 2 5m



Existing structure

Reinforced concrete envelopes

Structure Lv. 03-09

Metal structure

Reinforced concrete cores

Structure Lv. -01-02

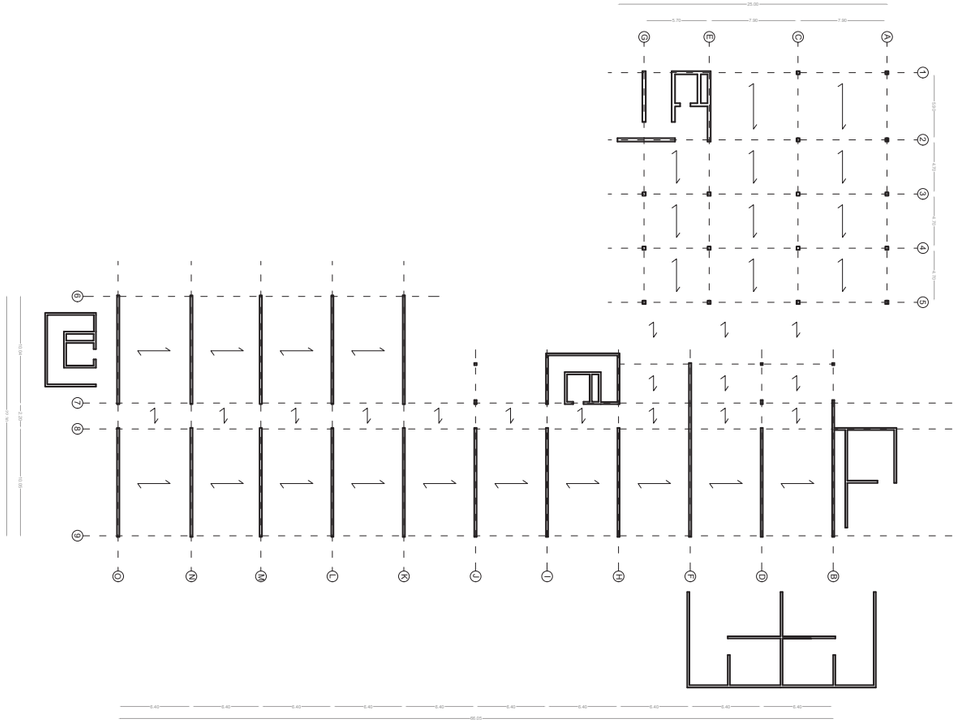
Reinforced concrete floors

and columns

Site

-1.5 meters from sea level

Structure scheme



Structure diagram

6. SECTIONS AND FACADES

Section 1

0 2 5m

Section 2

0 2 5m

Section 3

0 2 5m

Section 4

0 2 5m

East elevation

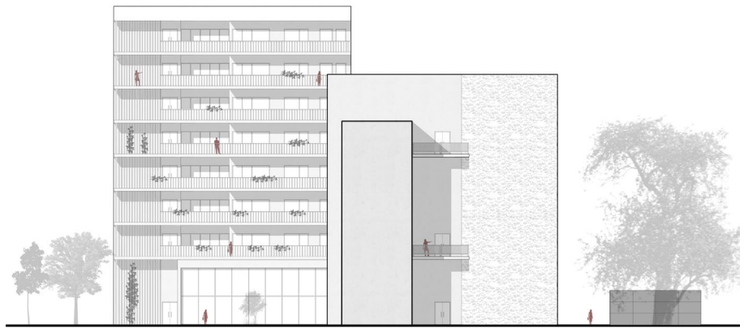
0 2 5m

West elevation

0 2 5m

North elevation

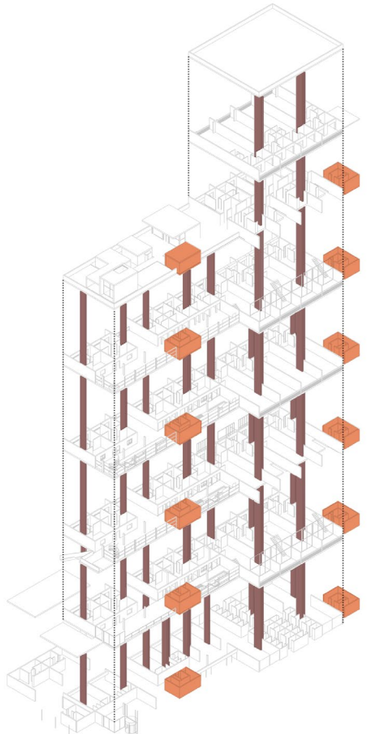
0 2 5m



South elevation

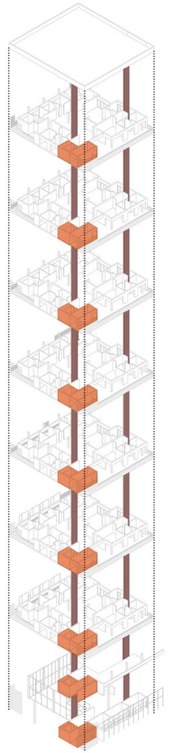
0 2 5m

7. BUILDING TECHNOLOGY



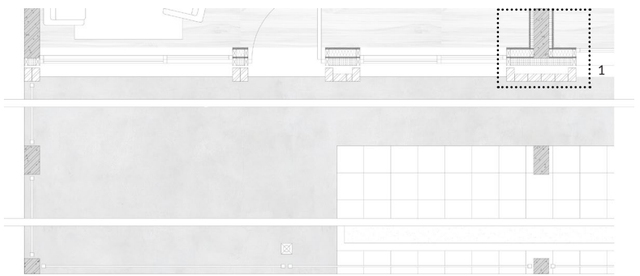
Shafts diagram
Emmahuis

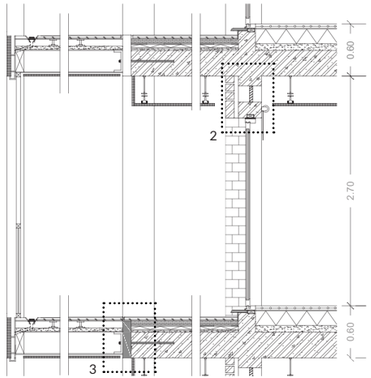
Circulation
Shafts



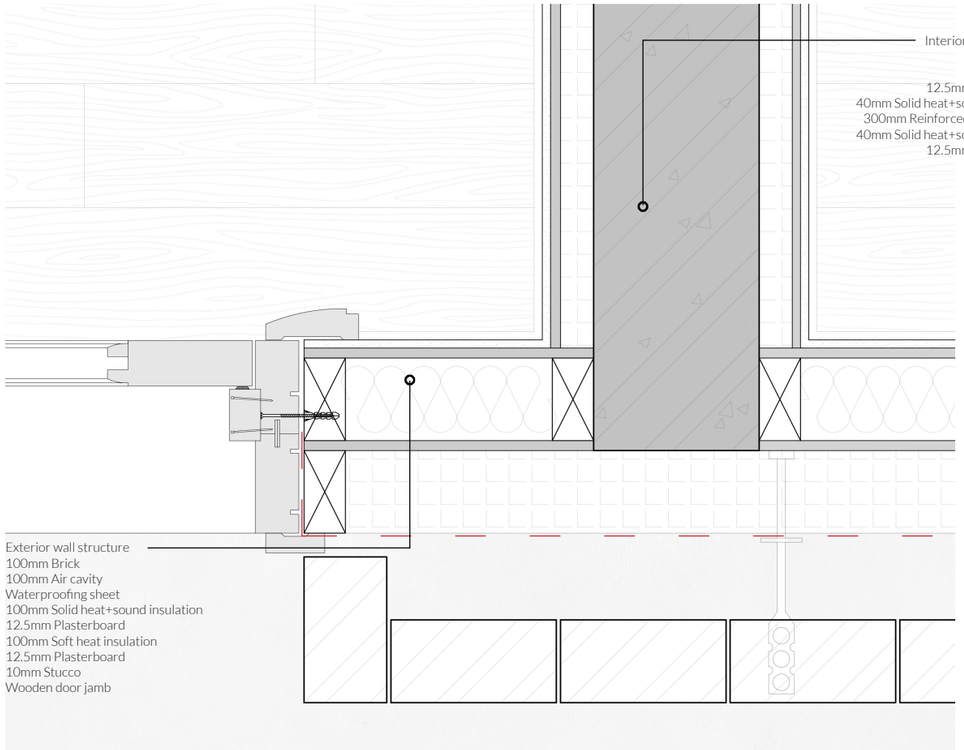
Shafts diagram
Tower

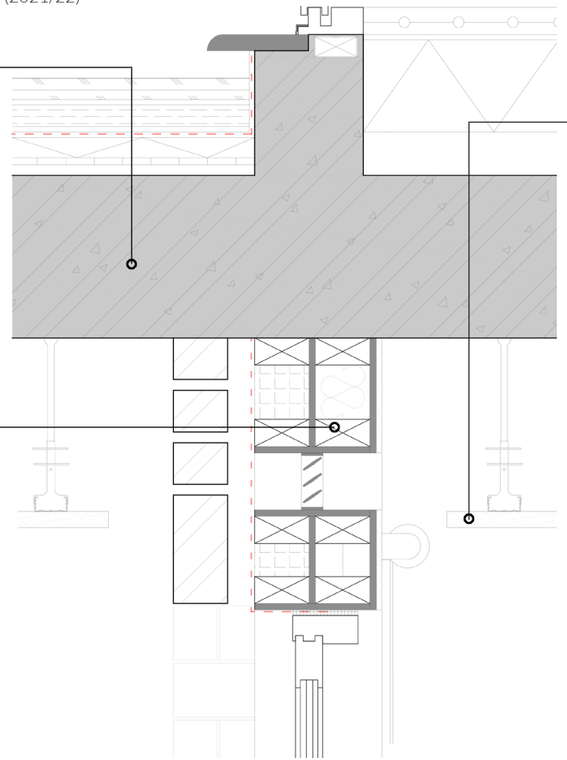
Circulation
Shafts





Emmahuis fragment





Exterior structure

Final floor surface
Drainage- Water storage
Waterproofing layer
40mm Solid thermal insulation
Vapor barrier
Screed concrete - leveling
300mm Reinforced concrete structure

Interior wall structure

Final flooring
Heated floor installation
Moisture seal
170mm Solid heat insulation
Screed concrete/ leveling
300mm Reinforced concrete structure
320mm Air gap/ HVAC space
30mm False ceiling

Wall structure

100mm Brick
50mm Air gap
Waterproofing sheet
100mm Solid heat+sound insulation
12.5mm Plasterboard
100mm Soft heat insulation
12.5mm Plasterboard
10mm Stucco

HVAC Air filtration / Circulation
Aluminum double glazed sliding door

L Finishing bracket

Existing structure

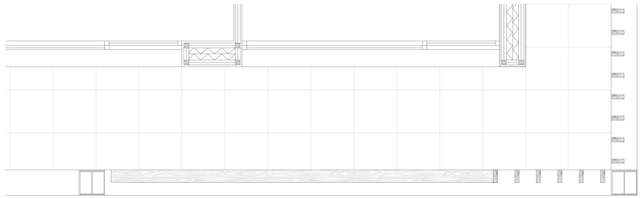
Final floor surface
Drainage- Water storage
Waterproofing layer
40mm Solid thermal insulation
Vapor barrier
Screed concrete - leveling
300mm Reinforced concrete structure

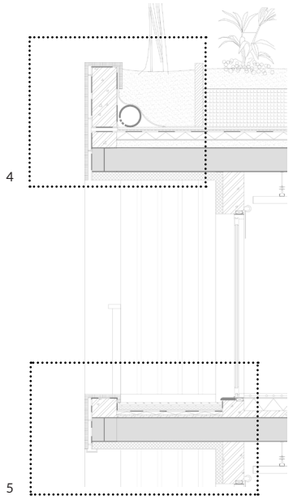
Steel-to-concrete
"Double L" connecting joint

Balcony structure

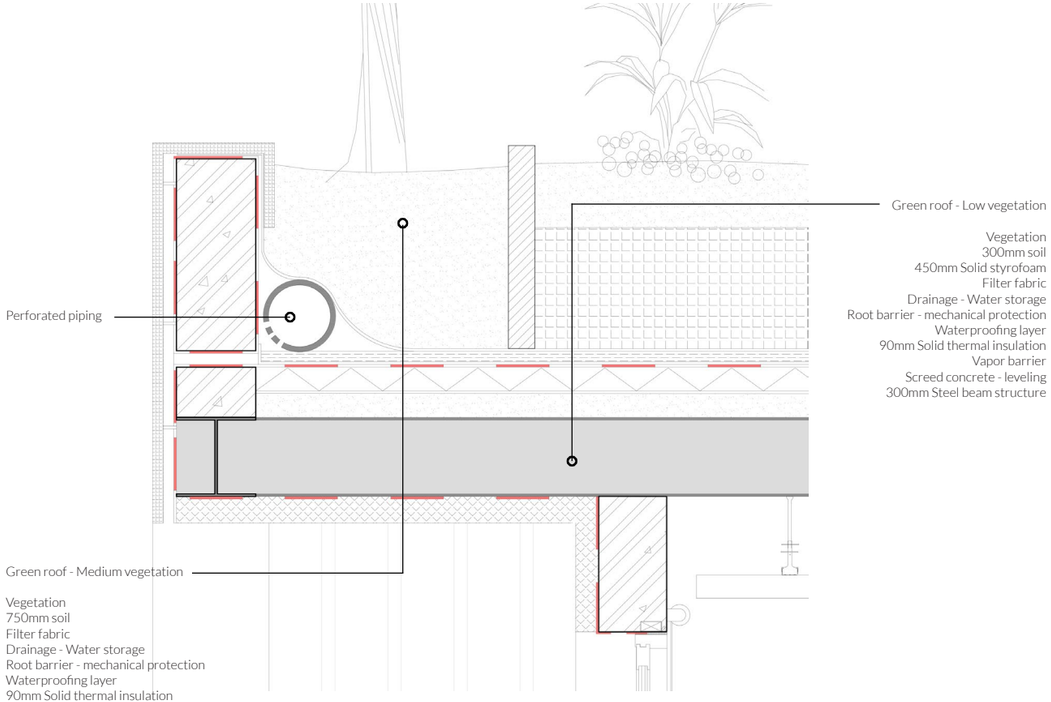
Wooden flooring
Shock absorbing layer
80mm Spacers
Screed concrete - Leveling
300mm Metal structure
25mm Air cavity
20mm False ceiling

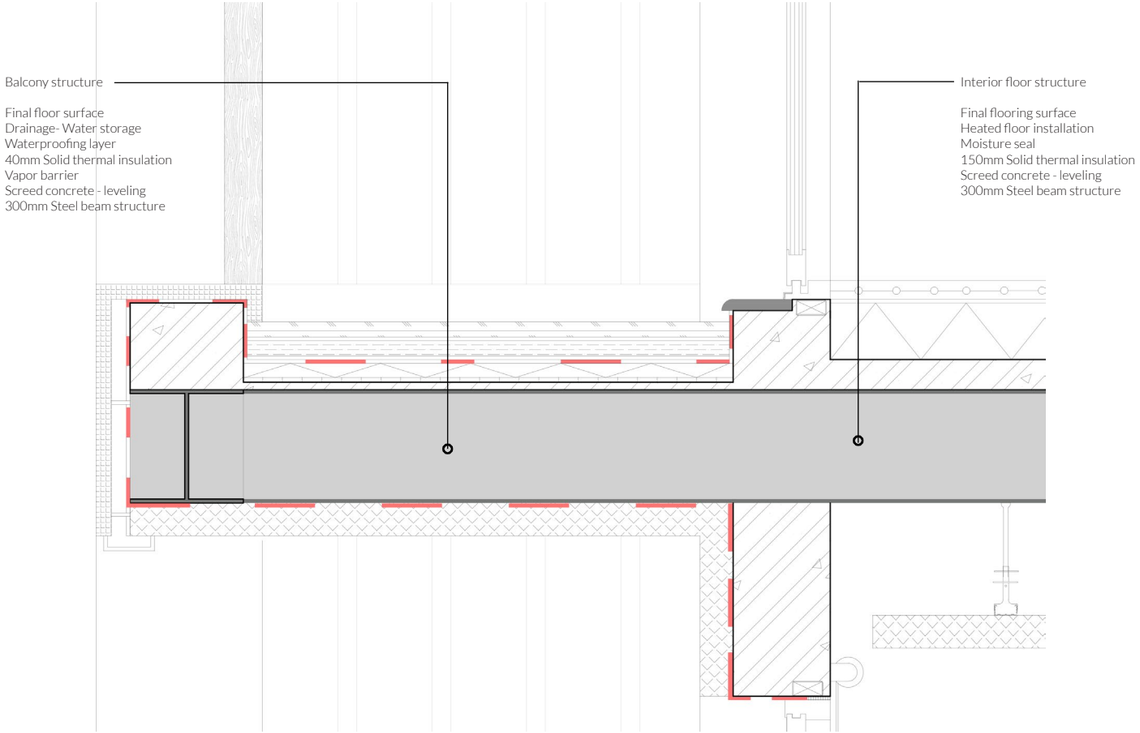
50mm Hard silicone buffer



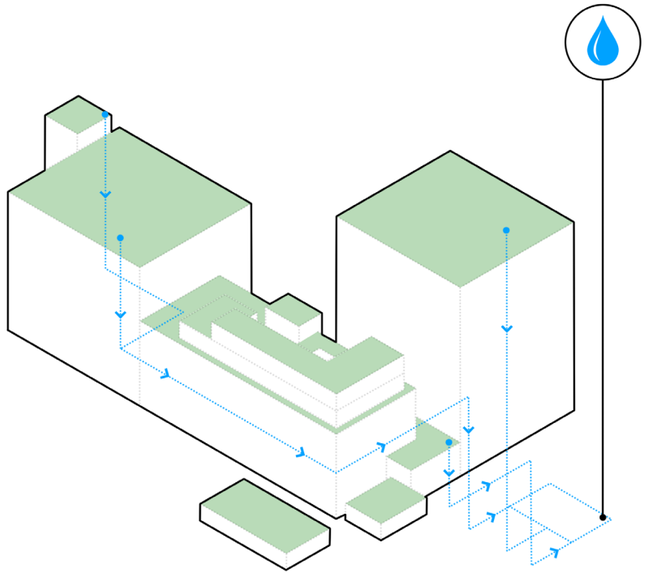


Tower fragment



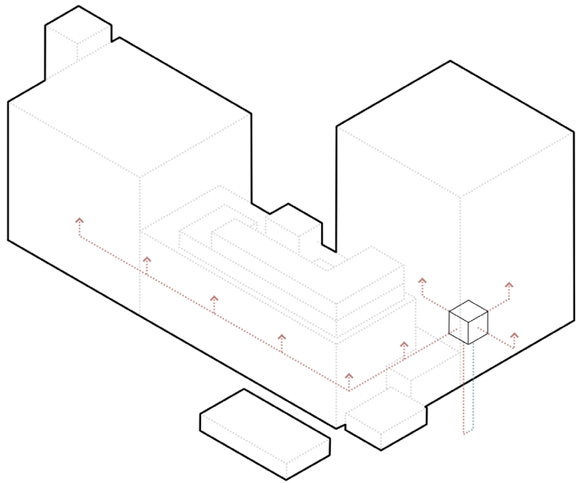


CLIMATE STRATEGY



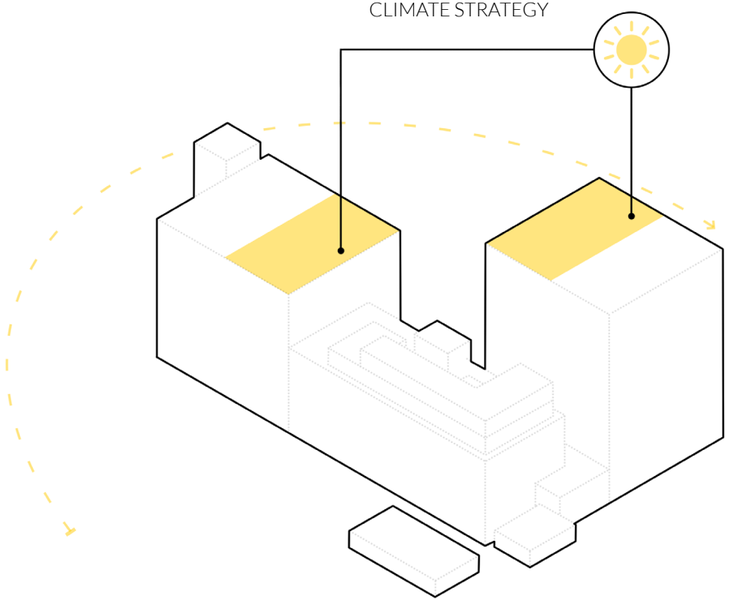
Green roofs
rainwater collection

CLIMATE STRATEGY



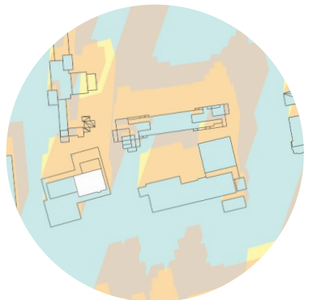
Centralized
underground heat pump

CLIMATE STRATEGY



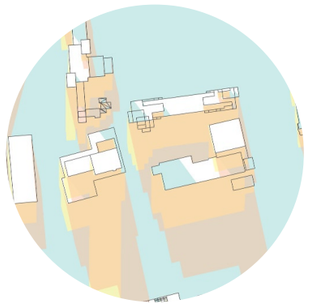
Solar panels

SUN STUDY



09:00

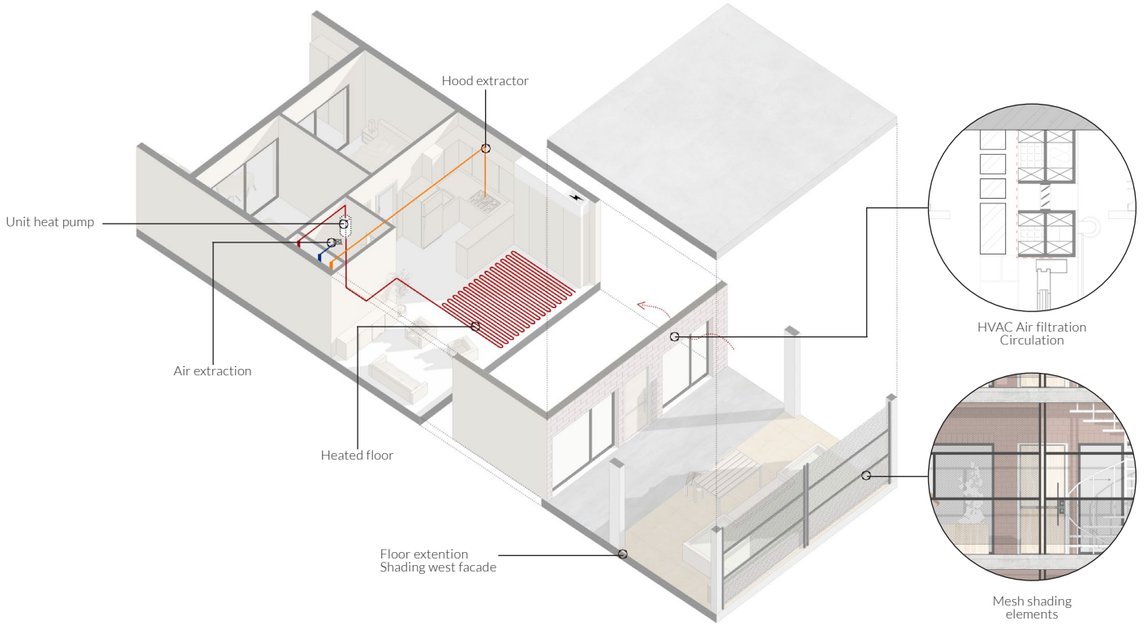
12:00



18:00

January
June
September

CLIMATE DIAGRAM - INDIVIDUAL DWELLING



8. REFLECTION

INTRODUCTION

Looking back at the past challenging year, the intensive research and immediately following design discourse, I've realized how a design should be driven by, and closely tied to ethical values and ideals that sprout from elaborate and vigorous research.

The first half of the year -up to P2- was dedicated to research, which in the beginning seemed to be an insurmountable mountain. However, with proper guidance I managed to narrow down my ambitions and themes of interest, with my research providing a theoretical background, a framework I later used in the design process.

After P2 and during the transition towards the design discourse is when this intensity of research bore its fruit; Every line, and every design decision was made and planned out with the knowledge I had acquired through the research. The transition from theoretical data gathering and analysis to practical application and design was effortless and fluid.

The design phase was challenging, as the end result needed to be something realistic and pragmatic, «an almost ready to build project». Fire regulations, construction detailing, building management and efficiency were aspects I wasn't expecting to tackle, but having a hollistic overview of what it takes to design a realistic concept within the Dutch housing market was a new and exciting task.

Overall I am content with the research and design I have produced during the past year, and this research-based design process is something I will take with me when dealing with future projects.

8.1.

The relationship between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS).

This year's studio uses the cooperative housing scheme to tackle societal and environmental issues in Rotterdam's Blijdorp district, with a particular focus on the themes of affordability, sustainability, and collectiveness. The end goal is a sustainable project, that contributes to Rotterdam's affordable housing stock. My project utilizes this cooperative initiative, to bring together two very different social groups, students and elders. This was of particular personal interest, as these polar populations are for me the most affected by the implications of gentrification. The research report acted as a pool of knowledge to enrich the toolkit implemented in the subsequent design.

Statenweg impression

8.2.
The relationship between research and design

Theoretical research
In this graduation studio, my research report was carried out to understand how to design an intergenerational co-operative housing unit, co-housing two polar societal groups, students and elders, and how this design will help alleviate the pressures of gentrification, social fabric dissolution, and environmental issues that Rotterdam is suffering from. The research was meant to create a theoretical framework I could use later in the design process. Described below are the main axis of research carried out throughout the graduation studio; the first five were predominantly used during the research phase, while the latter three were used during the design phase of the studio.

8.2.1 Literature research

The first and most apparent method of research used was literature research. This method helped me in analyzing and developing the theoretical background of my research questions. Based on pragmatical data provided by the EU concerning existing housing regulations and critical studies done on today's co-operative housing models in books such as "Architecture and feminisms-Ecologies, economies, technologies" by Helene Frichot, Catharina Gabrielsson, and Helen Runting, I started with analyzing and developing the theoretical background of my research questions.

8.2.2 Qualitative research

One of the most revealing methods of research was the interviews conducted with dwellers and members of administration in an intergenerational association in Delft. The findings on the communal spaces integrated within the case study were vastly different from the theory behind them, which made me rethink their relevance, importance, and identity within a collective housing scheme.

Scenes of a communal area

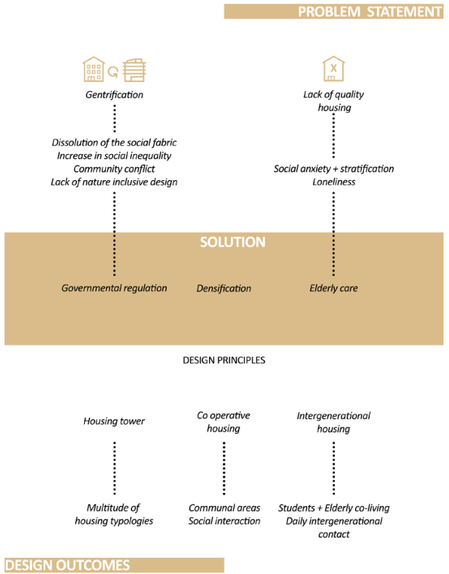
8.2.3 Case study Research + Analysis

The case study analysis, carried out in the early stages of the research discourse was of particular importance for me, as it provided real-world examples that showed how architects dealt with a variety of issues. By examining the selected pool of case studies, I gathered useful information based on three main axes of interest; User groups and intergenerational dwelling, accessibility and circulation, and apartment layout. Through this research and analysis, I understood the thought process behind each design, and how each architect envisioned their idea of communal housing. Every design interpretation differed, but all had a common goal; Creating a diverse, lively community within an innovative urban fabric. This initial case study analysis encouraged me to further research a variety of projects throughout the studio's duration, to further develop my design.

Illustrations of chosen case studies

8.2.4 Diagrams as a Research Method

Looking back on my time at TU Delft, one of the most significant personal skills I've improved is reducing my thought process and sticking to what's important. While doing literature research it was very hard for me to compile and summarize the results of said research. The visualization of my thought process (seen below) helped me determine the issues the studio was seeking to amend, connect them with my research and identify the tools I could use for my graduation design to provide solutions to the problems.



Research diagram

8.2.5 Site research

At the start of the MSC3, we had a studio field trip to our site and the adjacent Zoho area, where representatives of the municipality talked us through the new development taking place in the Zomerhofkwartier, giving us useful insight into the municipality's intentions to provide accessible housing, retain creative businesses and address environmental issues through large scale architectural interventions in the urban fabric. After rigorous group site analysis my problematization was informed by the ever-growing documentation and analyses of various themes. Car and bike routes, pedestrian paths, political economy, species integration, and water infrastructure, as well as personal reflection and identification of the societal and environmental issues testing the Blijdorp area, enabled me to further narrow down my research interests and form a problematique for my research report.

Site location plan

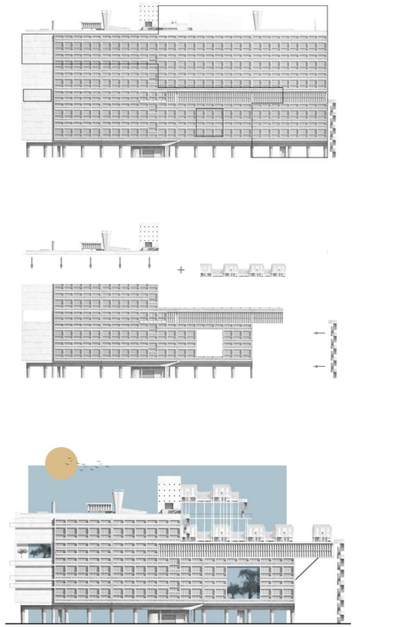
Design methods

During the design stage of the studio, the gathered research acted as a framework and a basis upon which architectural exploration began. Alongside the traditional methods of sketching, massing, and planning, the following design methods proved to be most beneficial for my design work.

External impression

8.2.6 Typological transfer exercise as a research method

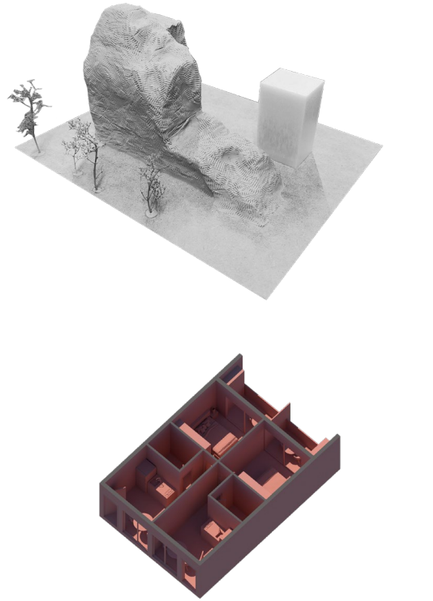
Based on the case study analysis, the graduation design began with a typological transfer. We were called to superimpose a selection of our case studies to our selected plot, triggering spatial exploration. The results of this exercise (which you see below), however conceptual or dystopian, provided a series of starting ambitions for my actual design, with the challenge being "How can I, through a consistent and realistic housing project, realize the ambitions raised through this exercise?"



Typological transfer

8.2.7 Digital + Physical modeling as a research method

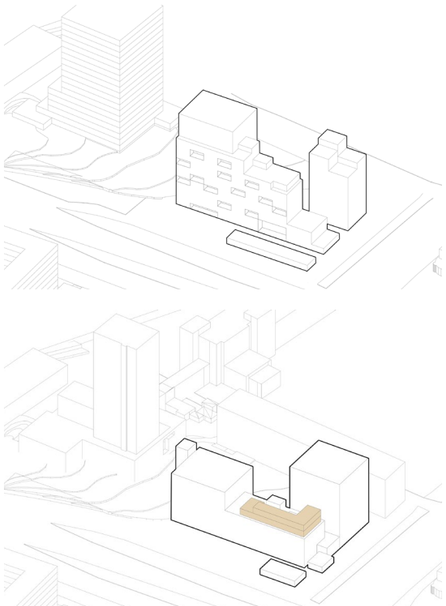
Digital and physical modeling have always been important tools for me when it comes to designing. While physical models are a great way to figure out massing and how a block reacts to its surroundings, digital modeling is a fast and agile tool, used to quickly come up with alterations of a design solution. This ease of "mock-up production" proved vital during all stages of design, as it helped with sun shading studies, façade treatment, materialization, and other aspects, such as the inherent quality of the designed spaces throughout the design, allowing me to determine the most appropriate solutions.



Physical and digital modeling

8.2.8 Design variations as a research method

From the very beginning of the design discourse before P2 until the late stages between P3 and P4, my concept went through various iterations, through hand sketches, digital and physical models. This allowed me to reach what I felt was the strongest and most realistic solution for the provided plot. This process was quite rigorous, especially in the later stages of design, where fire safety and various other regulations came into play. However, this intense scrutiny proved to be a mechanism for me to reinforce my reasoning behind every design decision throughout the project, and produce a more detailed solution for my graduation design.



Design variations

8.3.
Elaboration on research method and approach chosen by the student in relation to the graduation studio methodical line of inquiry, reflecting thereby upon the scientific relevance of the work.

My research report followed the studio's methodological approach to research, composed of literary investigation, case study analysis, and qualitative research through interviews. Based on pragmatical data provided by the EU concerning existing housing regulations and critical studies done on today's co-operative housing models in books such as "Architecture and feminisms-Ecologies, economies, technologies" by Helene Frichot, Catharina Gabrielsson, and Helen Runting, I started with analyzing and developing the theoretical background of my research questions. I then continued with an examination of case studies; studying the buildings and the thought process behind them, to draw certain qualities to incorporate into my final graduation design, such as apartment size, existence, sizing of communal spaces, etc. This analysis was based on three main axes of interest; User groups and intergenerational dwelling, accessibility and circulation, and apartment layout. I also gathered data from qualitative interviews with dwellers and administration members of a selected case study. The result of the research was a framework, a series of guidelines that helped me plan out an intergenerational co-operative housing design proposal that can serve as an example for similar future developments. It is hard to judge the scientific relevance of the research report, as it mostly served as a point of departure for the design discourse, exploring elements of personal interest. The end goal was the setting of a theoretical background, a framework I could use later in the design process. And with the research concluding with the aforementioned design project, I can say the research proved to be a vital tool for me to deeply understand my user groups, their needs, and the challenges

that involved placing the two groups under the same roof. In every conversation I had with my peers throughout the academic year, I mentioned how intriguing this connection between research and design was. During the design phase of the studio in Q3 and Q4, every line, and every design decision was made and planned out with the knowledge I had acquired through the research. The transition from theoretical data gathering and analysis to practical application and design was effortless and fluid.

8.4.
The relationship between the graduation project and the wider social, professional, and scientific framework, and the transferability of the project results.

This studio, in line with the municipality, has the end goal of making Rotterdam a more affordable, inclusive, and sustainable city. Initiatives such as the neighboring Zomerhofkwartier in the Agniesebuurt district show the municipality's will to provide accessible housing, retain creative businesses, and address environmental issues through large-scale architectural interventions in the urban fabric. Through my graduation project, I've researched how one can design an inclusive inter-generational cooperative housing unit, by providing a multitude of housing typologies, filled with common areas for boosting social interaction, combined with various social work environments, such as community workshops, open office areas, a public library, and commercial shops. This design is intended to benefit the immediate user groups of the building, but also the wider social context of the Blijdorp district, by providing a meeting point, and boosting communal identity and social interaction. The ideals of this design approach, which could dynamically be adapted for and implemented in other areas, aspire to create and amplify a sense of collectiveness within the Blijdorp district.

8.5.
The ethical issues and dilemmas encountered in (i) doing the research, (ii, if applicable) elaborating the design and (iii) potential applications of the results in practice.

An architect's life is a dilemma in itself. Every time you approach a design, you must do so ethically. Every social target group has its own needs and givens, and categorizing them is a difficult task on its own, especially when financial aspects come into play. For this year's studio, designing was especially challenging, since for me it was the first time that I truly researched and understood the needs and -financial- givens of my selected user groups. The main moral dilemma that was raised since early on in the research phase was finding a balance between profit maximization and high quality of life within a collective living context. How do we justify the reduction of square meter allocation per capita? Are supplementary common areas enough? Is the new social generation entitled to "less" compared to the previous one?

And if so, how do we make the most out of "less"?

Christoforos- Christos Roungeris
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