

## **Makers Mix Workhome**

A return of dwelling and fabrication within the city



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Advanced Housing Design Studio  
Graduation Report

**TU DELFT**

Faculty of Architecture & Build Environment  
 Master of Architecture  
 Dwelling Graduation Studio  
 Advanced Housing Design M4H Rotterdam

**January 2021**

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## 01. Research Overview

## 1.1 Research Introduction

Over the previous two decades people all over the world have been increasingly working from home or living at their workplace with the global North especially seeing a resurgence in this form of living. With the restrictions imposed on travel and social distancing at work brought about by the current COVID-19 pandemic, however, this trend has been drastically accelerated, and in doing so has highlighted failings with the quality and availability of workspaces within the current housing stock. Based on this growing need and the predicted future demands it's time to re-examine our relationship with working and living in monofunctioning determinate dwellings.

Therefore in this forthcoming research project I aimed to explore what Frances Hollis states to be a 'workhome' (Hollis, 2015, p2), a building that combines both dwelling and working, focusing on examining this archetypes spatial strategy in addressing

current problems facing a work force increasingly working from their home. This report will thus advocate a return of this typology to the building stock in the Netherlands, highlighting its historical relevance and the benefits a building of this nature can bring in its duality. This research will further examine the municipality of Rotterdam's ambitions for the project site in Keilekwartier, and how a workhome can achieve these goals while also alleviating current workspace shortage facing the city. A spatial framework will then be delineated in association with case study plan analysis to form the basis point for the following graduation design assignment.



Target Group: Creatives



Workspace shortage

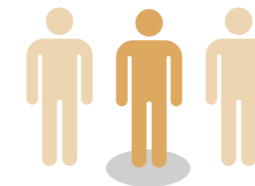
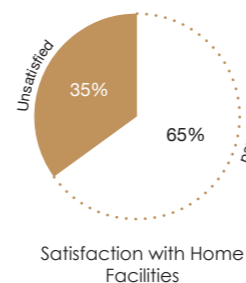
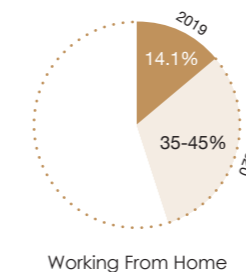
## 1.2 Trend in Working from Home

### The Netherlands - 2019

Prior to the national restrictions imposed by the COVID-19 virus the Netherlands was Europe's leading nation in people working remotely from home. In 2019, it represented 14.1% of the workforce putting it in the top position in front of Luxembourg at 12.7% and Finland at 12.3% (Bishop, 2020). A further 34% of the workforce have had the opportunity to work occasionally from home, representing roughly 1 in every 3 Dutch workers, with almost 6% of this group doing so exclusively at home (Hamersma, 2020, p35). In 2019 the predicted annual growth in the trend of working remotely was 7% (Hamersma, 2020, p37).

The reasons for this high rate of working from home compared to other European nations can be linked to the Netherlands also having the number one position in the Remote Workers Index. This index judge's countries on a range of criteria such as number of co-working

spaces available, number of WiFi spots as well the happiness index score etc. with all factors contributing to the accessibility and happiness of remote workers (Luthra, 2020). In addition, since January 1st 2016, The Flexible Working Act has been in force in the Netherlands (Korthals, 2016). Within this act, which also covers a range of employment conditions, it states that an employee who has been employed for more than 26 weeks can request that their place of work or working hours be adjusted (Luthra, 2020) allowing for a flexible work home based lifestyle.



1 in 3 worked from home occasionally in 2019



10% want to work from home full-time post COVID-19

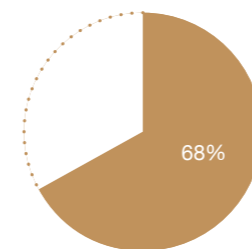
### The Current Trend

In 2020 with the imposed national restrictions to work from home where possible in order to counter the spread of the virus KiM has estimated that between 35-45% of the total Dutch workforce is currently working from home full-time as of September (Hamersma, 2020, p33). The report noted from this group 59% felt productive and 55-70% have had a positive experience (2020, p27). The future forecast of this trend is that a significant portion of home workers, roughly 67% expect to go or work from home more often after the corona crisis than before (Hamersma, 2020, p35). The largest group of these workers expects to work from home between 1 and 3 days after the corona crisis (2020, p35). A maximum of 10% of home workers expect to work from home full-time or almost full-time after the corona crisis (2020, p35). Other nations such as Germany anticipate this shift to

home-based work by providing employees the legal right to request to work from home (Solomon, 2020).

As Lord Norman Foster stated in an address to the United Nations that instead of change being brought about in the built environment from the effects of COVID 19, it has merely hastened and accelerated trends that were already apparent before the pandemic (United Nations, 2020).

To understand how a future workhome can thus be developed it is important to first understand the history of working from home.



Predicted Future Increase in Working from Home



**7% Growth annually working from home**



**Remote Workers Index**



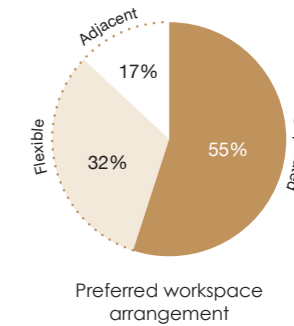
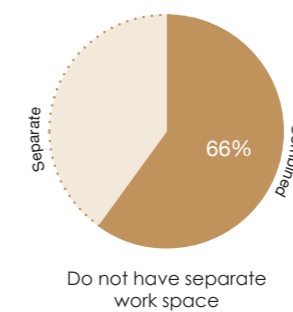
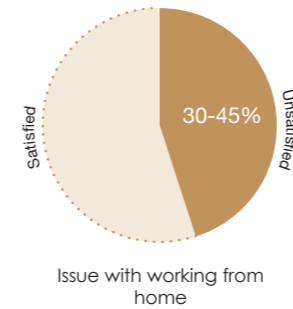
**2016 Flexible Work Act**

### 1.3 Issues with working from home

#### General Issues

As mentioned in the Netherlands KiM have been monitoring the effects of working from home and although 55-70% of Dutch people have had positive experiences, 30-45% have not (Hamersma, 2020, p27). In addition, a further 35% have stated they are currently unsatisfied with their current work from home facilities (2020, p27). The main problems highlighted from working from home have been the disruption of their work-life balance, brought about by the lack of defined boundaries, as well as social isolation (2020, p17). This is particular the case for younger adults and single dwellers who do not have a family unit to interact with. The spatial quality and standard of the dwelling has also been 'associated with increased risk of depressive symptoms' (Amerio, 2020, p1), during this time period. In particular, living in apartments that have poor

views and scarce indoor quality (2020, p1). In general, studies into these matters have shown differences in advantages and disadvantages based on individual characteristics dependent on gender, age, education, work experience, and experience in working from home (Raisiene, 2020).



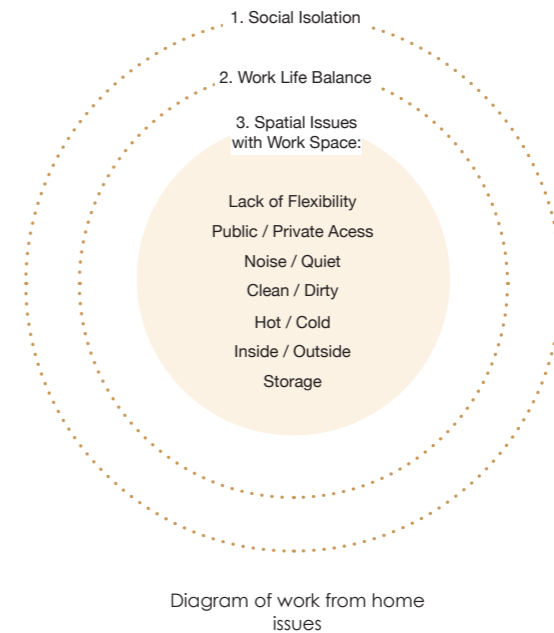
### Creatives

Particular issues that arise for creators and entrepreneurs tend to be spatially-orientated, confirmed by an online survey (conducted on the 26 November, 2020). Of the 18 respondents, all were associated with the creative industry and worked from home, with the average work experience being 14 years.

The results from this survey showed that 72% required only a desk for work with 17% and 11% usually needing a studio and workshop. Currently 66% did not have a separate work space in their dwelling for work with 64% of this group having issues with this arrangement. The main issue highlighted by the survey was 77% were unsatisfied with their current work storage needs in their home and 52% finding noise and odours to be a distraction while working. Furthermore, a large 84% would also find it difficult to invite clients to their home workspace.

Other nuisances mentioned were an increase in energy costs, irritation brought about by clutter and work-related fatigue due to the imbalance of separating home from work.

Finally, the respondents were asked if given the choice in the future what their work arrangement preference would be; If they prefer a flexible space in their home that can be used for both working and living at no additional costs; A workspace in separate building at additional costs; Or a dedicated workspace in their dwelling with separate access at no additional costs but reduced unit GFA. The results from this were 55%, 32%, 17% respectively.



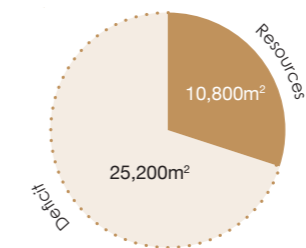
#### 1.4 Workspaces issues in Rotterdam

As mentioned previously Stichting Kunstaccommodatie Rotterdam (SKAR) is the main distributor of affordable workspace for creators and artists throughout the city. The organisation currently forecasts that an additional 36,000 m<sup>2</sup> net studio space will be required by 2025 to keep up with the current demand (SKAR, 2020, p6). However, based on their resources they project they will only be able to meet 30% of this demand by 2024 (2020, p.12), leaving a deficit of 25,200 m<sup>2</sup> of required studio space equating to roughly 560 creators not having a place to work in the future.

The organization further notes issues with the current workshop facilities on offer, in particular, that they all suffer from a lack of traffic flow and dynamism. This is due in part to the vast majority of current creators renewing their leases making it difficult for young creators to find a workplace and

has therefore retained the ingrained patterns of the buildings current users leading to stagnation (2020, p.12).

Furthermore, the organisation along with the Rotterdam Council for Art and Culture, have identified the disadvantage of having numerous workshops catering to similar areas of creative focus spread out throughout the city. They have therefore identified that need to create a clustered approach to accommodate an ecology of creativity, in which, in addition to artists and designers, and also makers, entrepreneurs and more, have a place to interact and collaborate and thus become more commercially sustainable (SKAR, 2020, p17). This ecology makes it easier to bundle investments particularly working on a focused one per cluster program, for example around experimental research and innovation (2020, p17).



2025: Required Studio Space

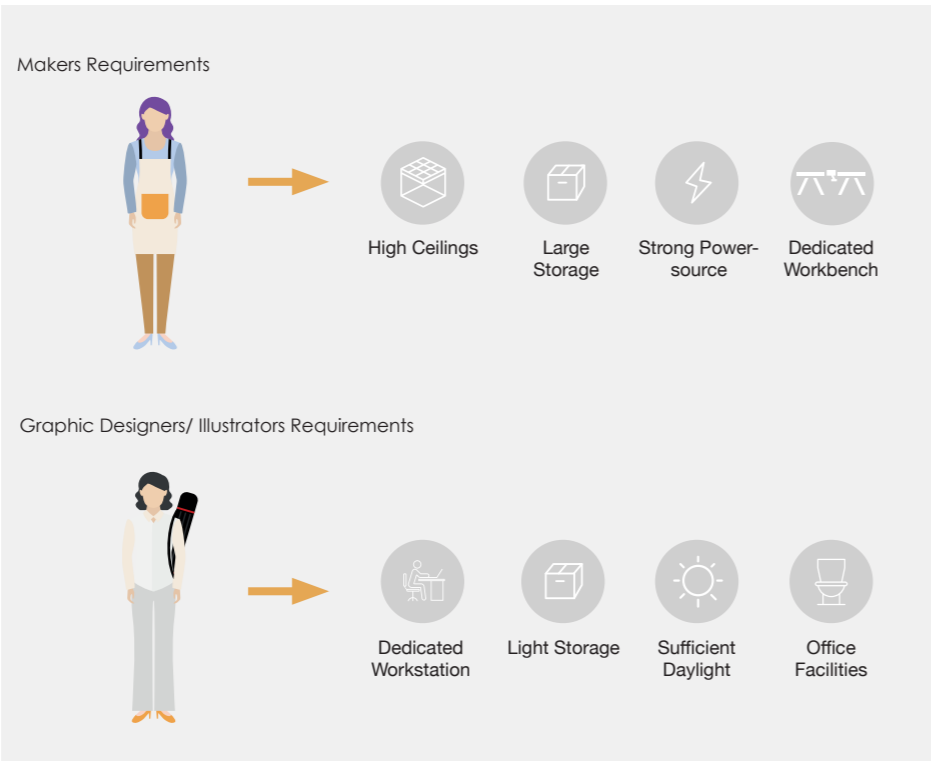


2025: Creators Needing Workspace

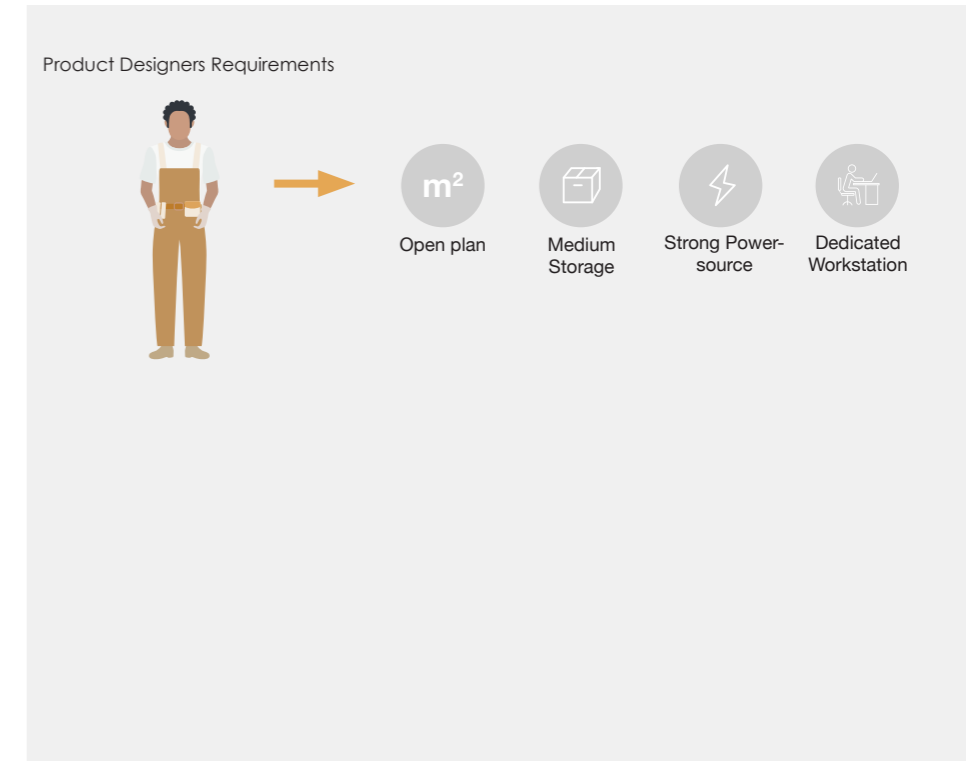
**36,000m<sup>2</sup>**

**x 560**

### 1.5 Creative Workspace Requirements



The following information has been distilled from spatial requirements conducted by SKAR (2017, p11) and RRKC (2020, P5)



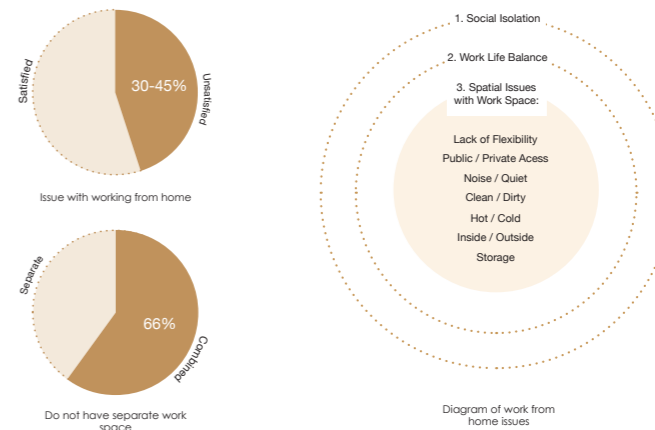
### 1.6 Research Conclusion

This research aimed to focus on the need for a workhome typology to address the global shift in required work-related space within housing as well as alleviating workspace shortages in Rotterdam. Based on quantitative and qualitative analysis it has identified that large portions of the workforce want to continue partially or full time in working from home in the future. However, through praxeology, spatial issues have been analysed that inhibit creators and entrepreneurs in this regard. Through identifying spatial strategies and the needs of creators, this research has thus generated a framework that can be used to design a workhome with a variety of workspaces to help alleviate this shortage in the workspace. This framework achieves the municipalities goal of creating a circular and sustainable built environment in Keilekwartier.

Although this research focused on this particular site area, the framework suggested and the following design hypothesis can be adapted and built upon for other locations and target groups. Furthermore, in contrast to Holliss Beyond Live/Work and Dolans Live-Work Planning and Design that only identify small scale examples or retrofit workhomes, a clear strategy is formulated to allow for designing workhomes on a medium density and scale to be achieved.

In identifying the anthropic and environmental advantages for this typology to be reestablished in our modern cities, the ongoing uncertainty in achieving a sustainable future for not just Rotterdam, but all of the Netherlands, is delineated more clearly through the prospect of this development.

### Issues with Workspaces in Dwellings

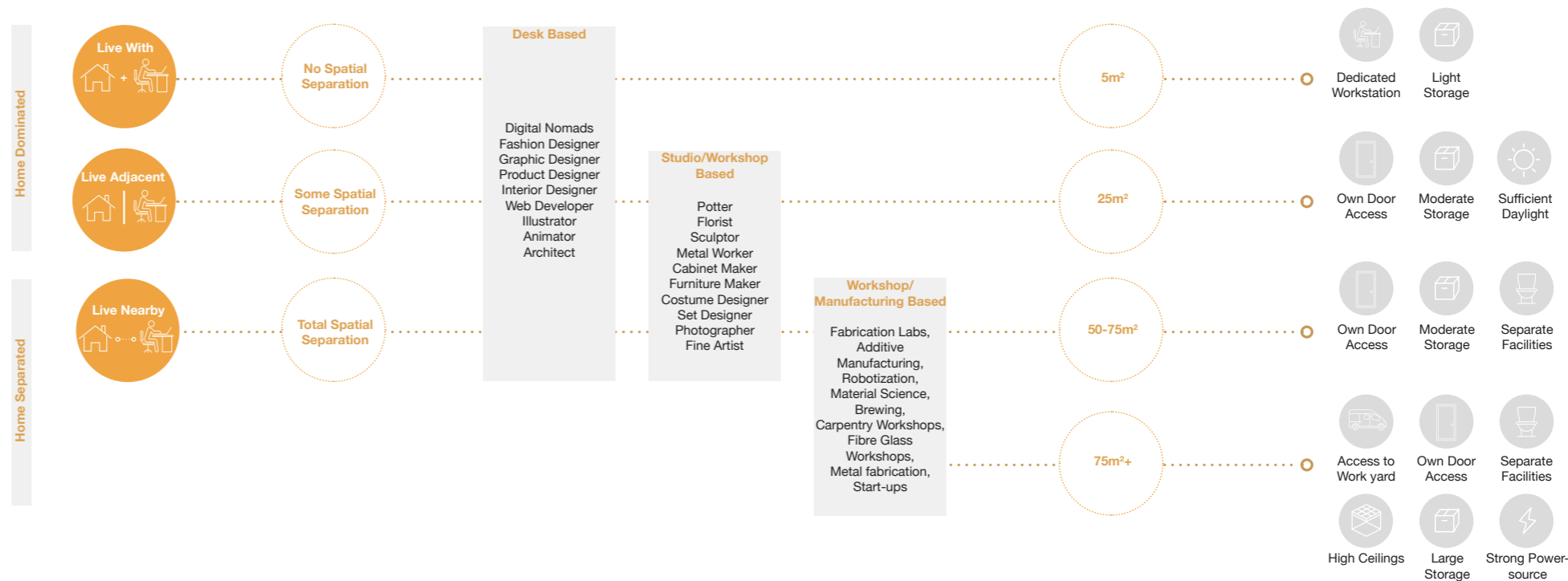


### Workspace shortage



### 1.7 Research Framework

The adjacent diagram has been created by the author to distil the spatial design strategies of workhomes for creative professionals and their desired workspace size and spatial requirements as indicated previously. Professions have been condensed to desk-based, studio/workshop-based and workshop/manufacturing-based workspaces. This framework will thus form the base for spatial needs of work related space in the design of a workhome in Keilekwartier.



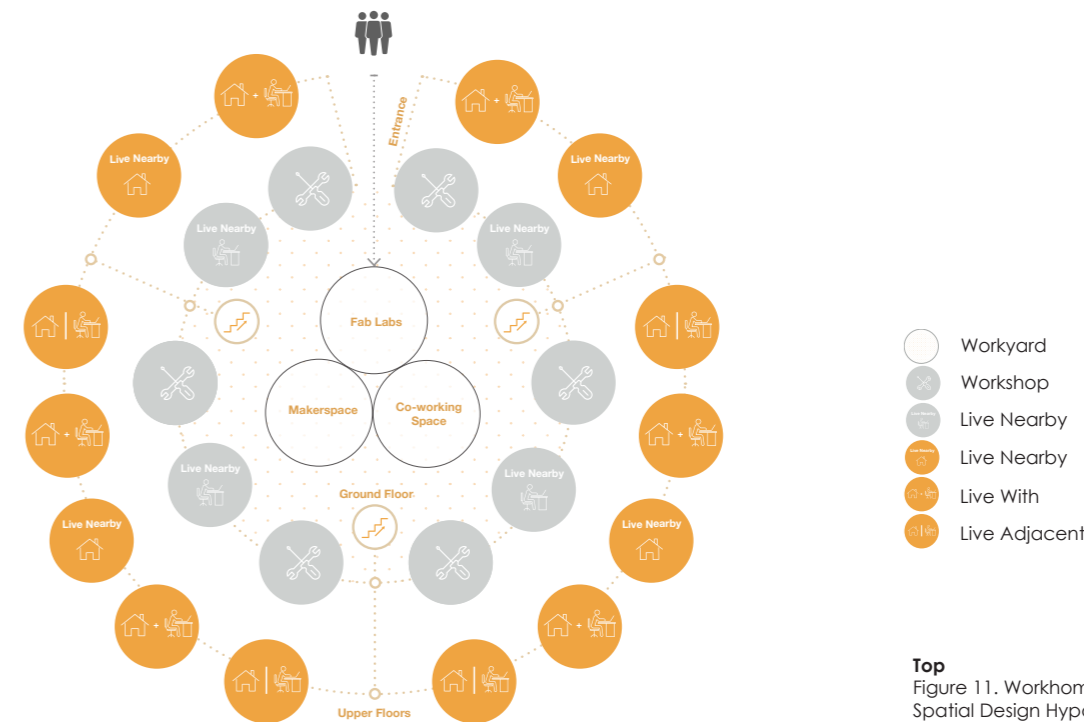
### 1.8 Design Hypothesis

Informed through research the following design hypothesis has been produced to provide a basic strategy in approaching the layout of a workhome within Keilekwartier.

Within the adjacent diagram collectivity forms the basis of circularity with all independent workspace facilities located on the ground floor clustered into forming a 'work yard' where visual sightlines on activity can be maintained and collaborations formed. The public and non-residents are able to freely enter this space to view activity and engage in business and trade. Community workspaces such as the Fab Lab provide a draw for the creative community allowing for social cohesion and peer networking. Circulation cores are accessed of this space contributing to a sense of a connected community while residential dwellings are reserved for the upper levels catering for live-with and

adjacent spatial work strategies. Public access to these upper levels and residential amenity space will be further investigated in the conceptual design.

This diagram helped form the beginning design moves at the start of my design process.



**Top**  
Figure 11. Workhome Spatial Design Hypothesis Diagram.

## 02. Plan Analysis

## 2.1 Introduction

Part of the research towards readdressing workspaces within dwellings is examining existing modern dual-functioning residential buildings that attempt to accomplish this issue. The four projects selected have been chosen due to their different spatial strategies to achieve this goal being analysed through their typology and morphology.

## Research Question

What spatial strategies are used to separate workspaces from dwellings and how are these spaces then accessed by the public?

## Relevance

This research gives insight into how residential buildings can operate with dual functions and its findings will support design decisions in creating a workhome in Keilekwartier

## Hypothesis

Workspaces are clustered together to limit encounters with non-residents when accessing private dwellings.

## Method

Visual qualitative research was used in analysing four case study floor plans to investigate correlation data in their workspace spatial separation strategy, the public circulation to access these workspaces and the dwelling features of combined living and working units.



**The Doors**

Architects:	Space Encounters
Location:	Amsterdam, The Netherlands
Completed:	2021
Typology:	Mixed-Use Housing
Dwelling Units:	12
Commercial Space:	12 studio spaces



**Haus A**

Architects:	Duplex Architekten
Location:	Zurich, Switzerland
Completed:	2015
Typology:	Co-Living
Dwelling Units:	11 Clustered Flats
Commercial Space:	415 m <sup>2</sup>



**Former Berlin Flower Market**

Architects:	Heide & von Beckerath, ifau
Location:	Berlin, Germany
Completed:	2018
Typology:	Mixed-Use Housing
Dwelling Units:	66
Commercial Space:	17 independent studios and 3 commercial units



**Houtsma Live / Work Factory**

Architects:	Architectenbureau Marlies Rohmer
Location:	Amsterdam, The Netherlands
Completed:	2010
Typology:	Mixed-Use Housing
Dwelling Units:	24
Commercial Space:	10 studios and workshops

## 2.2 Spatial Strategy

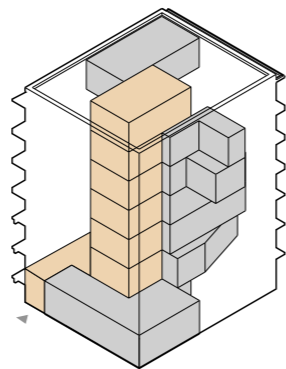
### The Doors

Work spaces are located adjacent to each of the two dwellings per floor with dedicated own door access.

### Spatial Strategy



- Offices (Live-Adjacent)
- Circulation Cores



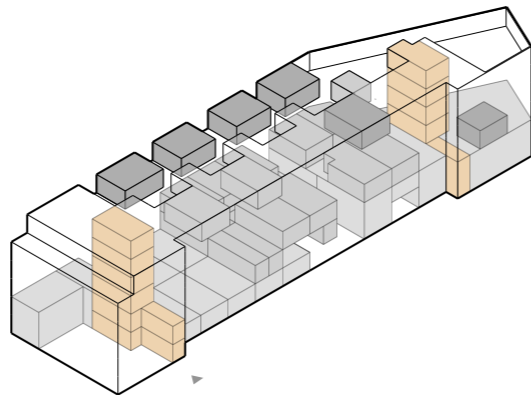
### Former Berlin Flower Market

All workshop spaces are located on the ground floor with front door access. Dedicated ateliers are located on top floor with integrated studios located adjacent to their dwellings offering own door access.

### Spatial Strategy



- Atelier (Live-Nearby)
- Studios (Live-Adjacent)
- Workshops (Live-Nearby)
- Circulation Cores



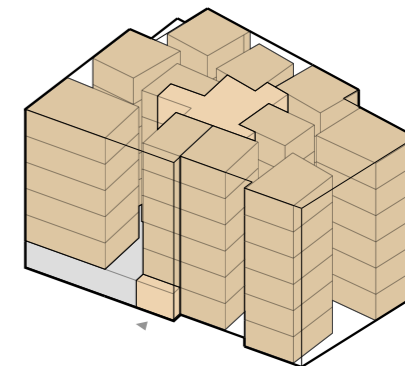
### Haus A

Although designed as a co-living scheme the separate clustered living spaces are ideal for flexible work spaces within the dwellings.

### Spatial Strategy



- Flexible space (Live-With)
- Offices (Live-Nearby)
- Circulation Cores



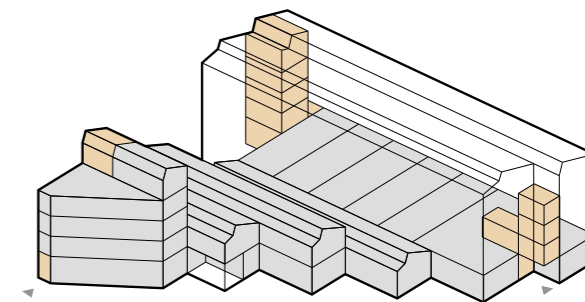
### Houtsma Live / Work Factory

Work spaces are separated in this building with all workshops located on the ground floor or in a dedicated block with separate circulation.

### Spatial Strategy



- Workshops (Live-Nearby)
- Circulation Cores

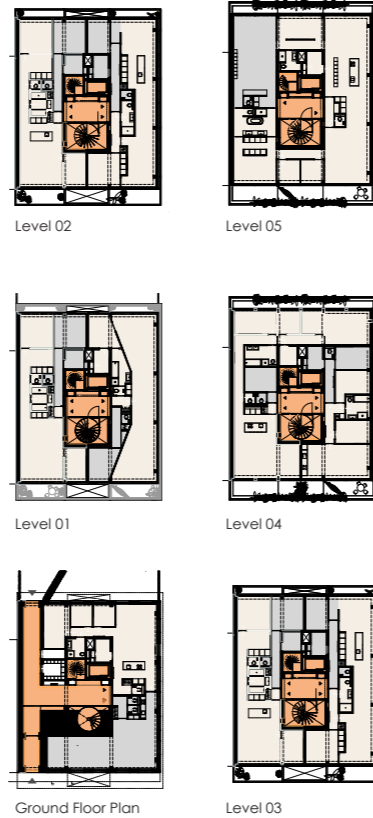


### 2.3 Circulation

- Workspaces
- Dwellings
- Circulation

#### The Doors

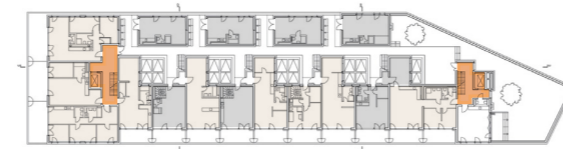
A centralised circulation core that is shared by both residents and the public is used to provide access to the two workspaces and the dwellings at each level.



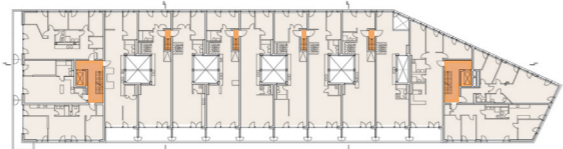
#### Haus A

A centralised circulation atrium is used to provide access to each of the two apartments on each level. The clustered rooms that surround each of the apartments would be ideal for a live-with typology meaning the public would have to be guided through the shared living space.

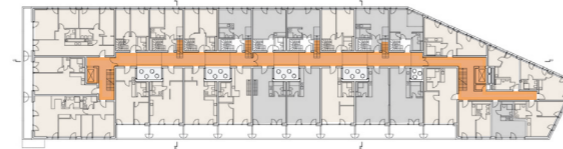
- Workspaces
- Flexible Workspaces
- Dwellings
- Circulation



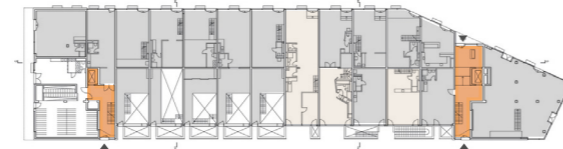
Level 04



Level 03



Level 02

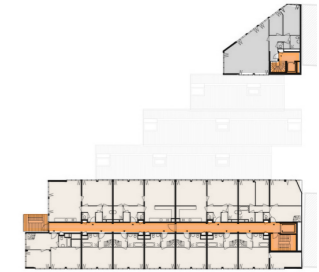


Ground Floor Plan

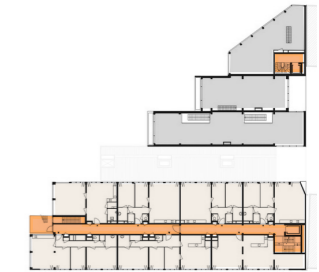
- Workspaces
- Dwellings
- Circulation

### Former Berlin Flower Market

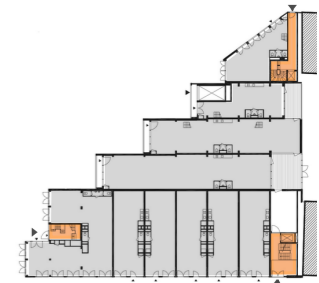
All ground floor units have direct access to the street. The upper floors are accessed by both public and residents by circulation cores at either end. The main live adjacent work units are clustered together and accessed at level 02 while separate ateliers are located on the top floor by roof access all of which are public access.



Level 02



Level 01



Ground Floor Plan

- Workspaces
- Dwellings
- Circulation

### Houtsma Live / Work Factory

The ground floor is solely dedicated to workspaces with direct public access. The building is separated into separate blocks with one dedicated to residential with its own private circulation located and accessed on the south and west façade. The north-east core provides dedicated circulation for workspaces.



### 2.4 Dwelling Layout

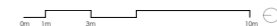
- 1 Kitchen
- 2 Living Room
- 3 Bedroom
- 4 Bathroom
- 5 W.C
- 6 Master Bedroom
- 7 Study
- 8 Office
- 9 Storage
- Work-zone



Former Berlin Flower Market



- 1 Kitchen
- 2 Living Room
- 3 Private Living Room
- 4 Bedroom
- 5 Bathroom
- 6 W.C
- 7 Ensuite Bedroom
- 8 Study
- 9 Storage
- Adapatable Work-zones



Haus A



- 1 Kitchen
- 2 Living Room
- 3 Bedroom
- 4 Bathroom
- 5 Master Bedroom
- 6 Study
- 7 Office
- 8 Storage
- Work-zone



Former Berlin Flower Market



- 1 Kitchen
- 2 Living Room
- 3 Bedroom
- 4 Bathroom
- 5 W.C
- 6 Master Bedroom
- 7 Office
- 8 Storage
- Adaptable Work-zones



Houtsma Live / Work Factory



03. Site Location

### 3.1 Keilekwartier

The site location for the Advanced Housing Design Graduation Studio is the M4H-area in Rotterdam, on the north bank of the Maas river. The municipality's objective with regard to this soon to be transformed harbour area is to create an innovative live-work environment, intended to bring creativity, innovation and making together.

This studio is focusing on the Keilekwartier area within M4H, which is characterised by industrial buildings, commercial warehouses and brown fields sites. As such the first task was to design a masterplan for this area that can facilities dwellings and provide space for creativity and innovation. To accomplish this the studio was divided into four quadrants on the site, each with its own references projects to be infused with the overall design of the area. The following pages illustrate the outcomes of this process.

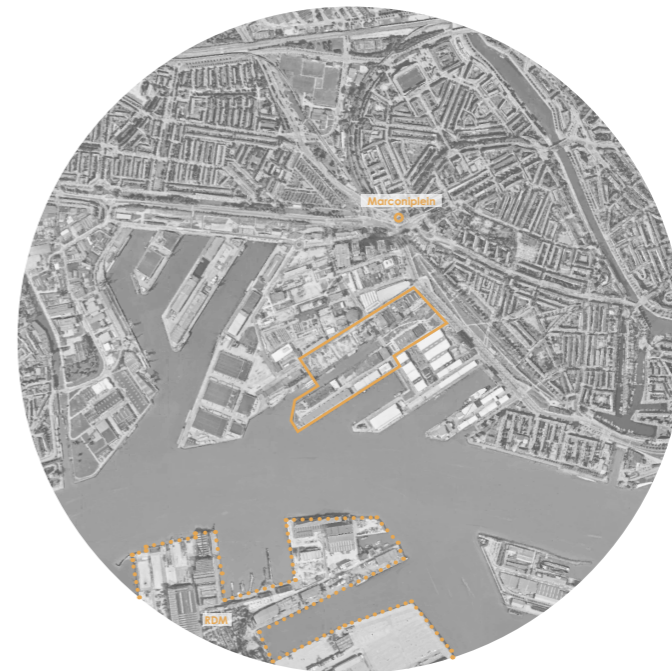


**Right**  
Dock cranes loading cargo  
in M4H

Site Location

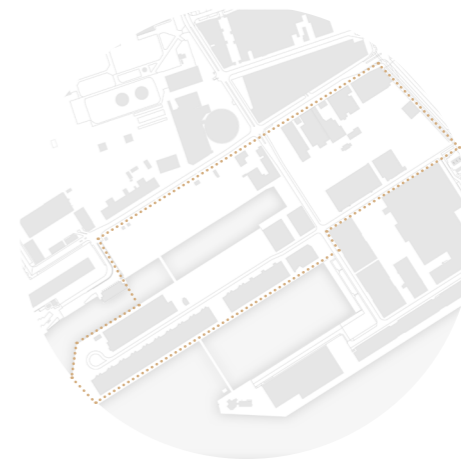


Site Location



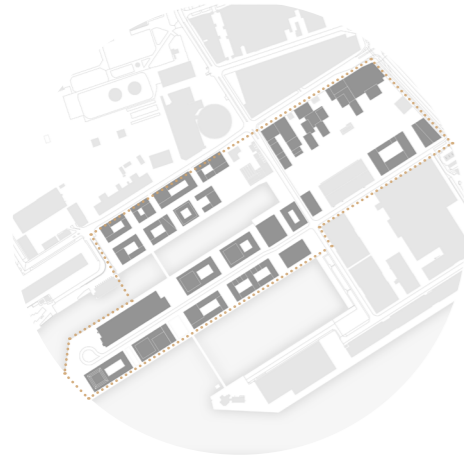


Area Location



○  
..... Keilekwarier Boundary

Area Location



- ⓪
- Kellekwarier Boundary

Site Location



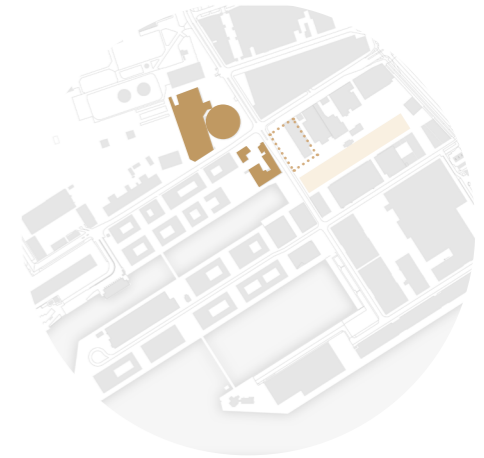
- ⓪
- Site Boundary

Road & Pedestrian Networks



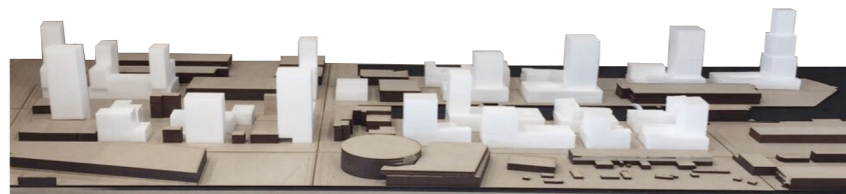
- ⓪
- Vehicular routes
- Pedestrian routes
- Site Boundary

Site Features



- ⓪
- Park
- Monument Buildings
- Site Boundary

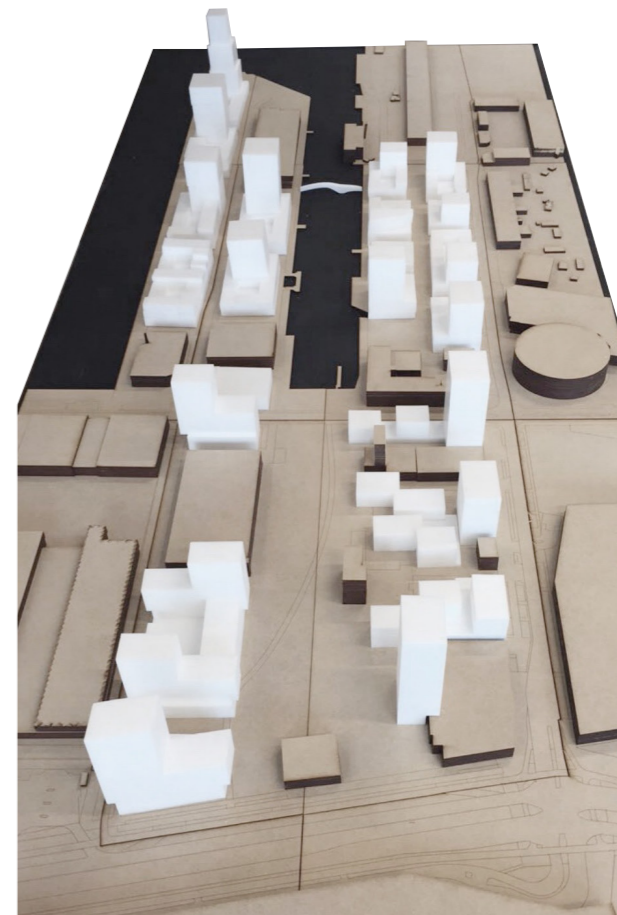
3.2 Model Masterplan Photos



View 01



View 02



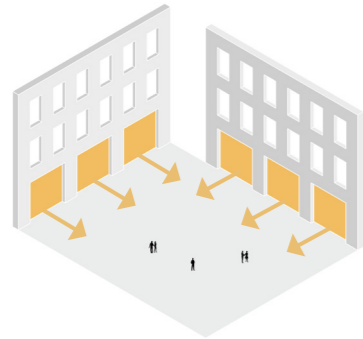
View 03



## 04. Concept Design

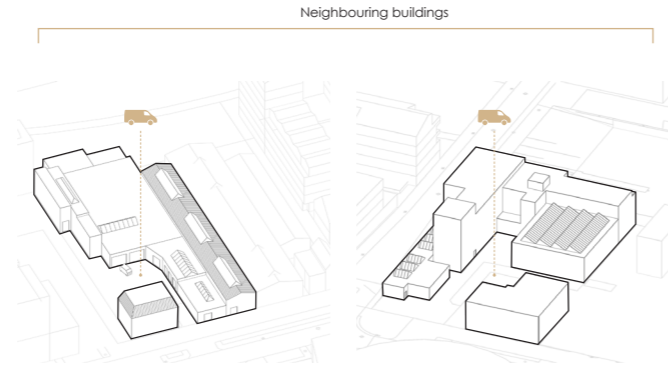
### 4.0 Concept Design

Makers Mix Workhome



Create an active workyard space

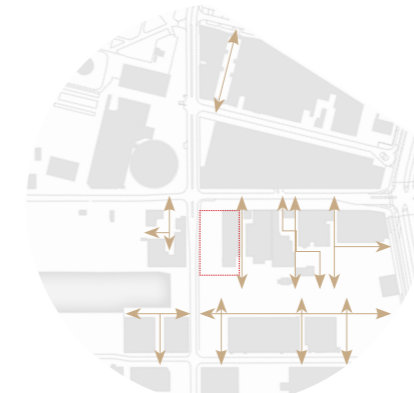
### Concept: The Workyard



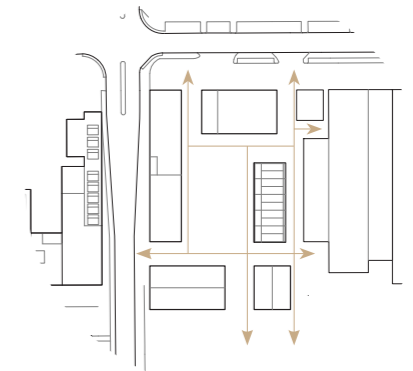
12 Keileweg, Keilekwartier

Kunst & Complex, Keilekwartier

### Re-establish the Urban Grain



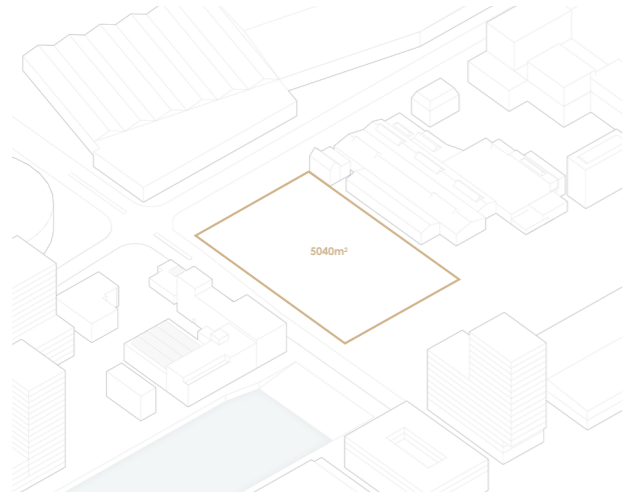
Keilekwartier Site Plan



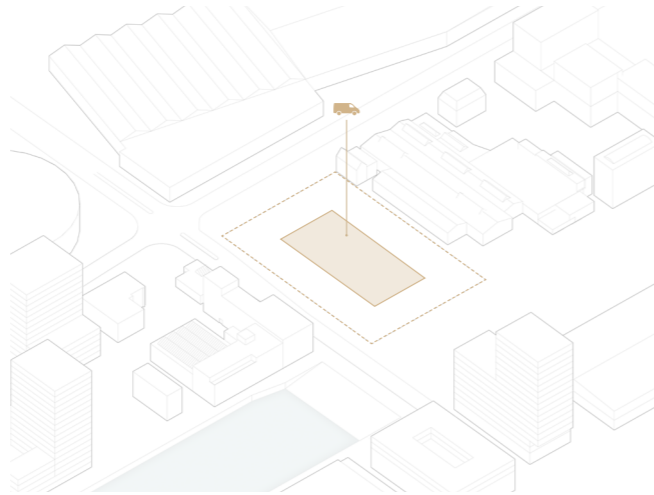
Proposed Block Location

Makers Mix Workhome

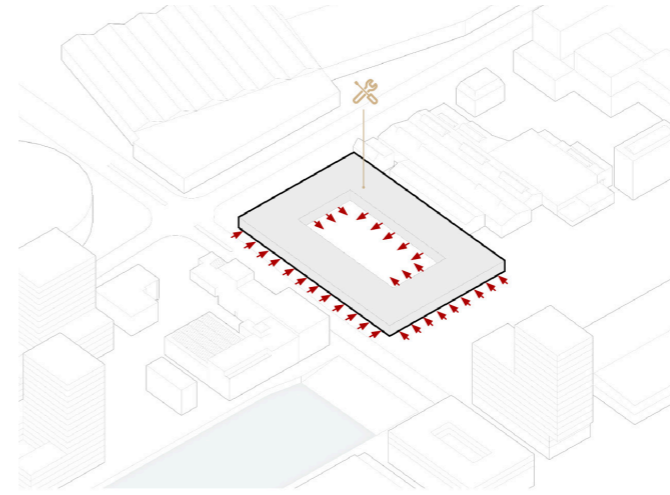
### 4.1 Massing Sequence



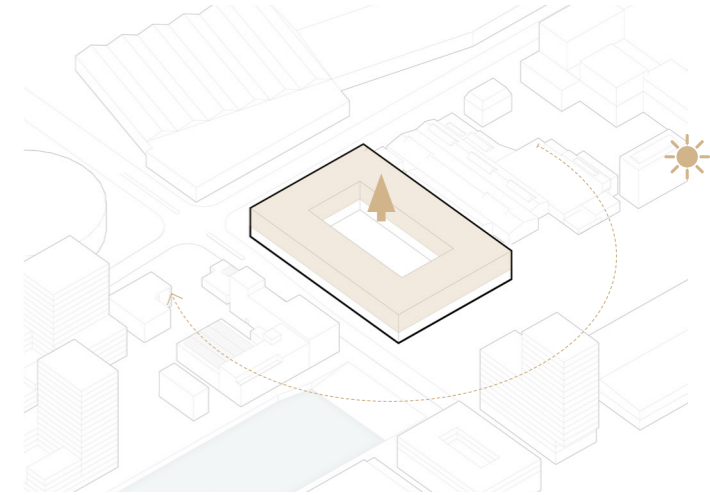
Site Area



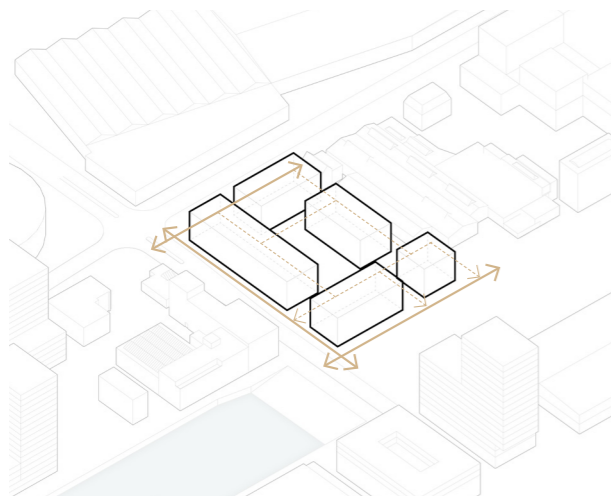
Establish a workyard



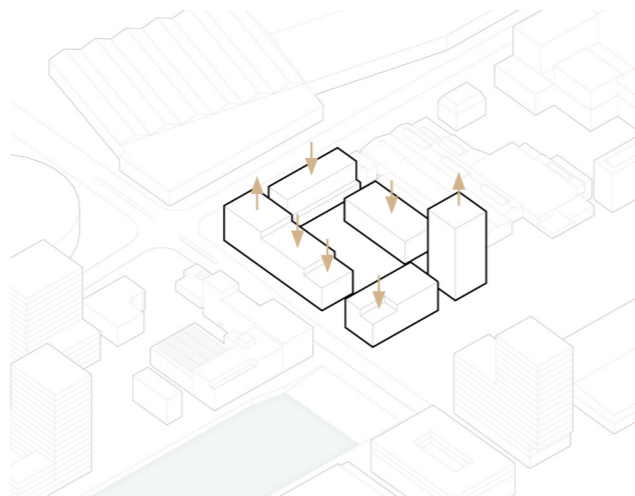
Raise dual aspect workspaces



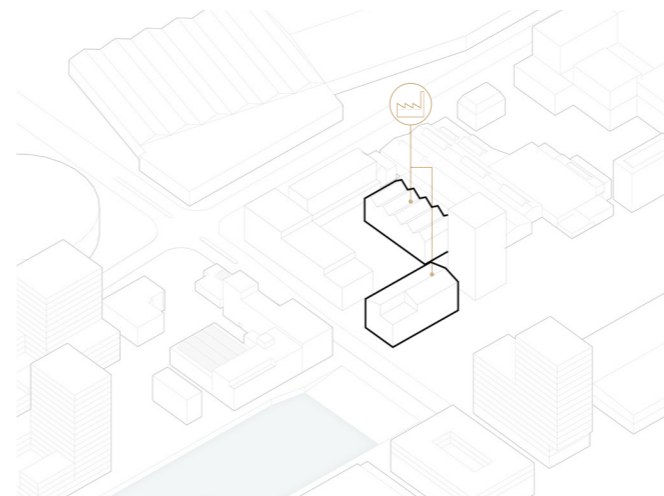
Living spaces placed above to make optimum use of solar orientation



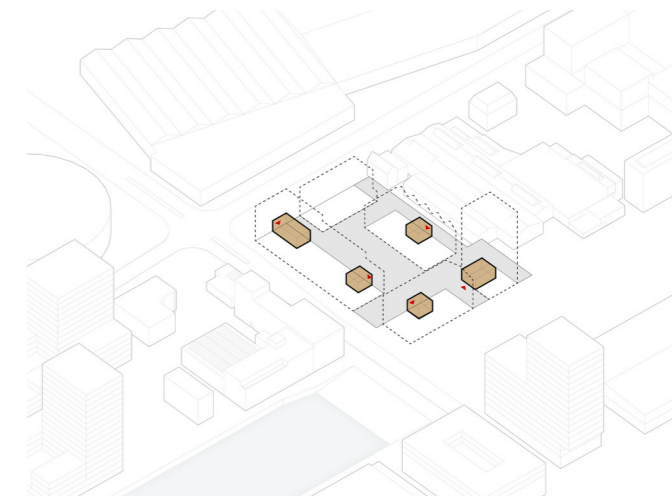
Alleyways are created separating blocks



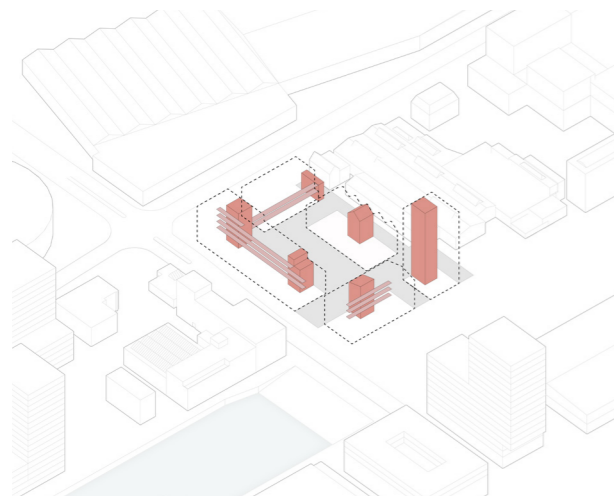
Massing is raised and lowered to avoid over-shading



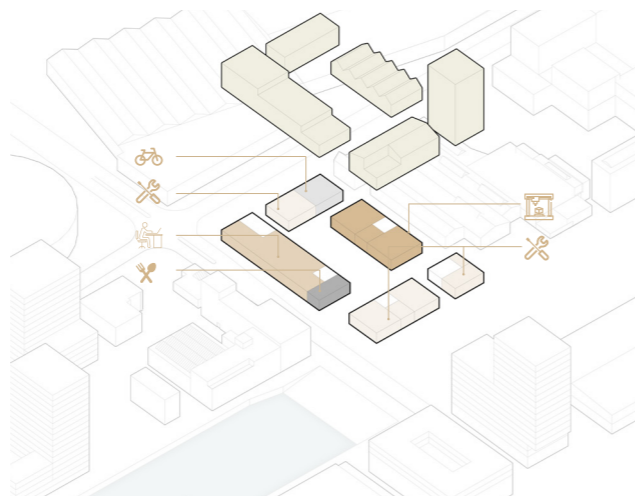
Pitched roofs are added to keep with the aesthetics of the area



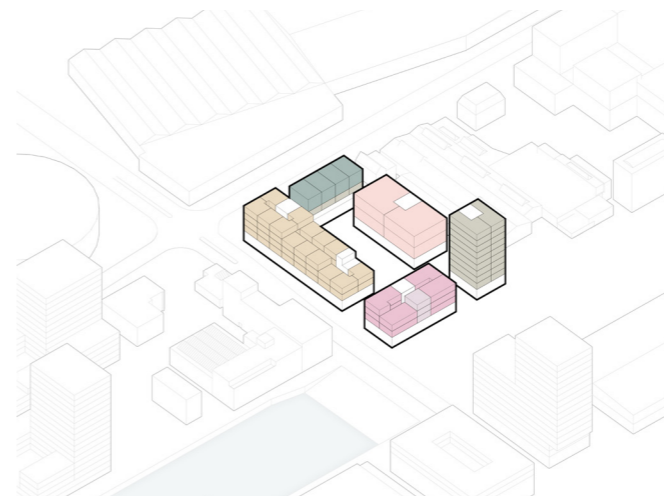
Entrances spaces are located on separate streets to help activate the ground floor space



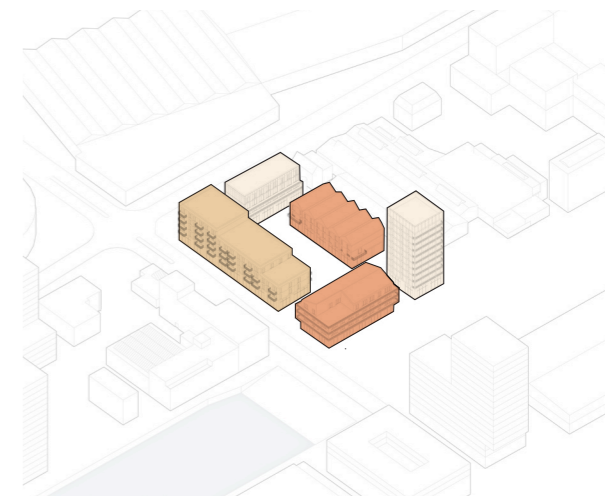
Circulation Systems



Ground floor workspaces



Variation of unit types



Live/work spatial strategies

**Contextual Materiality**



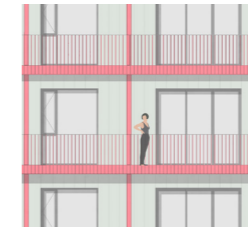
**Building Materiality**



Light Brick & Steel



Standard Brick & Steel



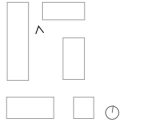
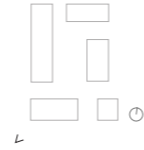
Green Aluminium Panelling



Light Pink Aluminium Panelling



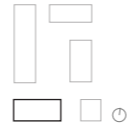
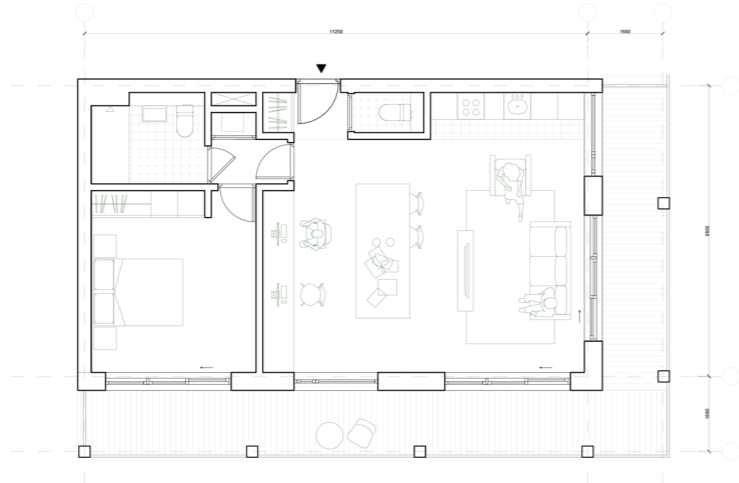
Corrugated Steel Sheetting



An aerial, sepia-toned photograph of an industrial waterfront area. The scene is dominated by a large body of water on the left and center, with numerous industrial buildings, warehouses, and docks along the shoreline. Several large ships are docked at the piers. In the background, a dense urban area with residential buildings and a few taller commercial structures is visible. The overall atmosphere is that of a busy industrial port.

## 05. Unit Types

**Live-With**  
Unit Type 01  
70sqm



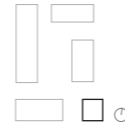
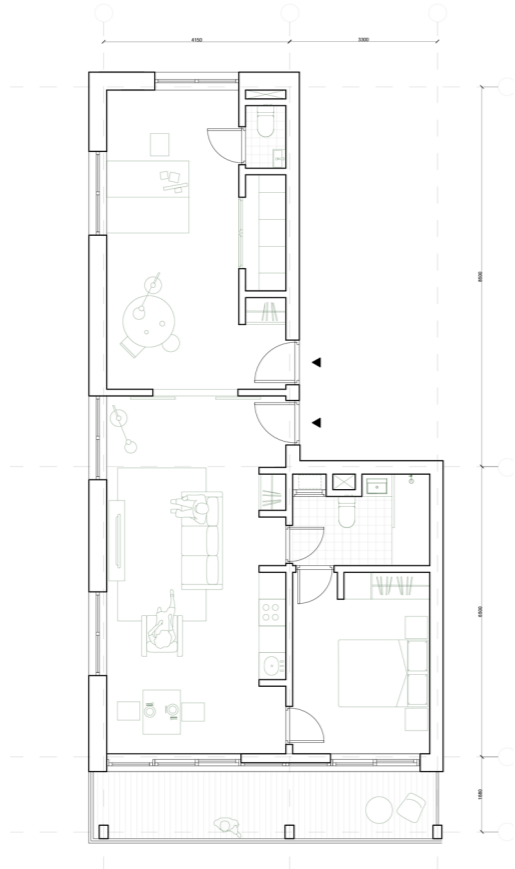
0m .5m 1m 2m 1:150

Makers Mix Workhome



Makers Mix Workhome

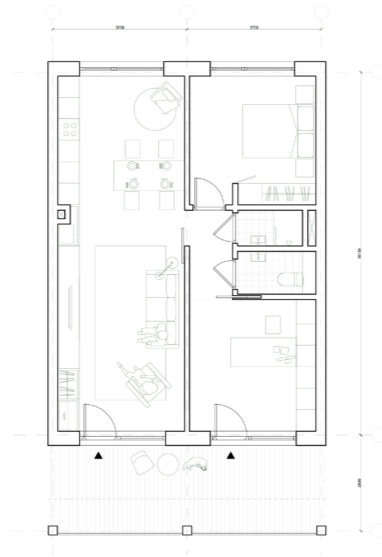
**Live-Adjacent**  
Unit Type 03  
52sqm - Dwelling  
25sqm - Workspace



0m .5m 1m 2m 1:150



**Live-Adjacent**  
Unit Type 04  
57sqm - Dwelling  
20sqm - Workspace



0m .5m 1m 2m 1:150

Makers Mix Workhome



Makers Mix Workhome

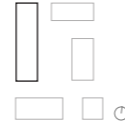
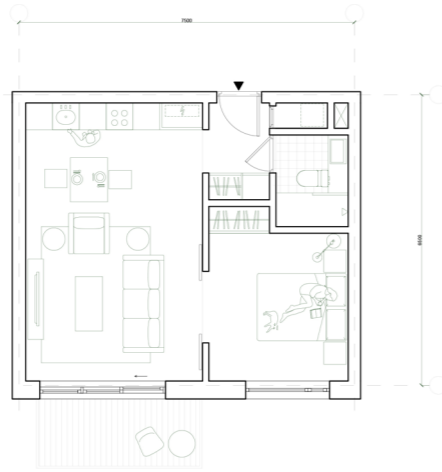
**Live-Nearby**

Unit Type 06  
48sqm - Dwelling

Communal Workspaces located  
on the ground floor

Makers Mix Workhome

**Unit Types**

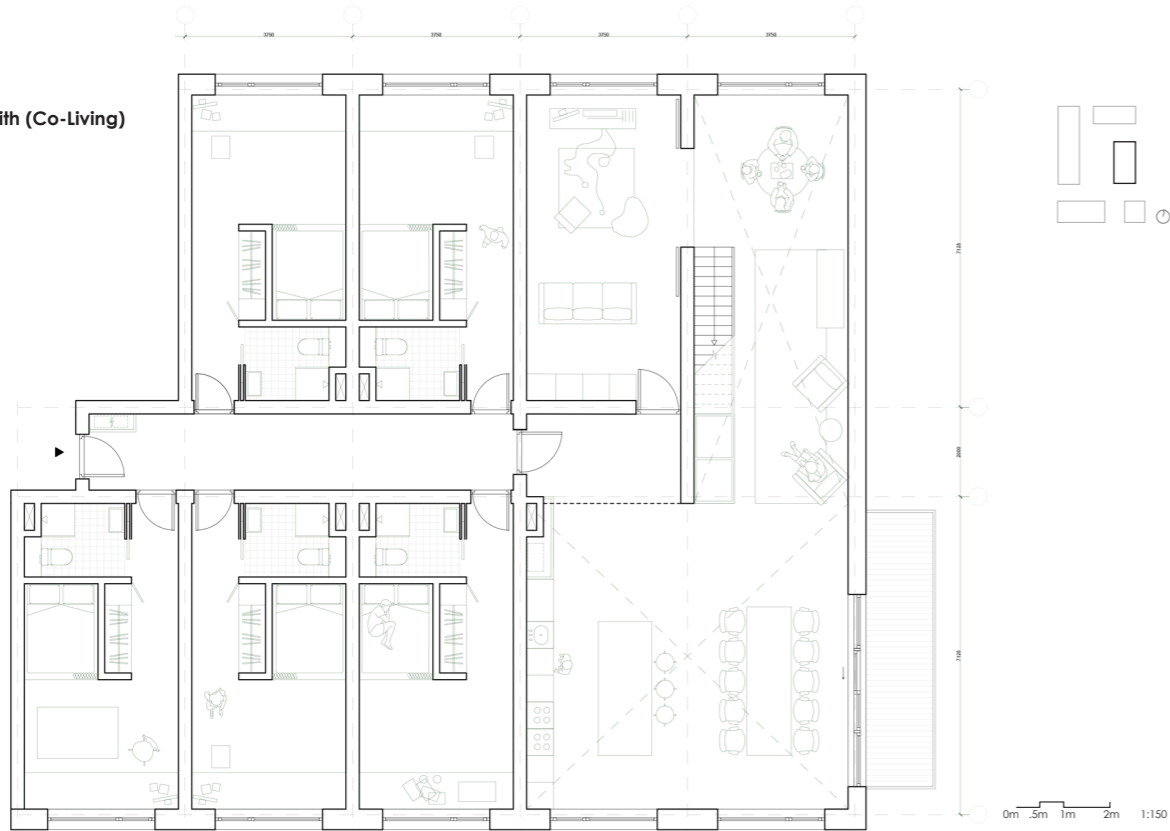


0m .5m 1m 2m 1:150



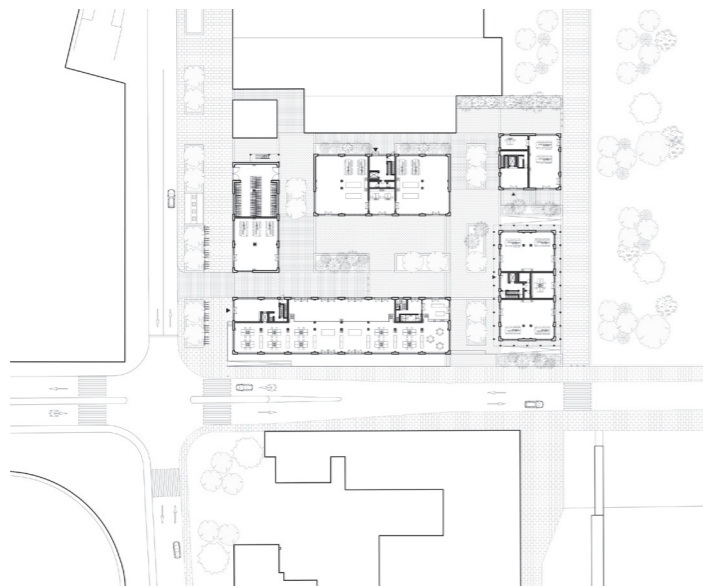
Makers Mix Workhome

**Live-Nearby/ With (Co-Living)**  
Unit Type 07  
420sqm  
10 Bedrooms per unit  
Level 01

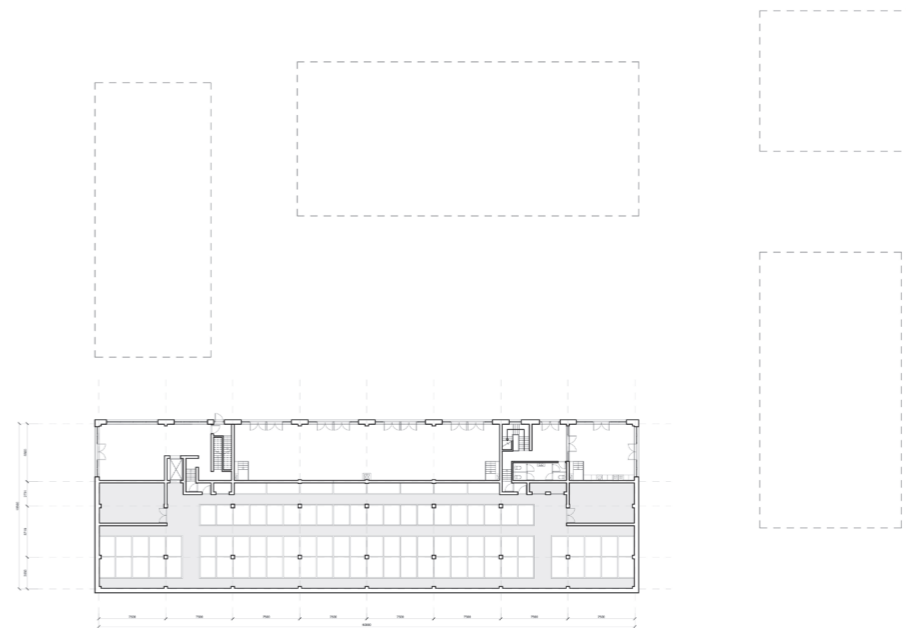




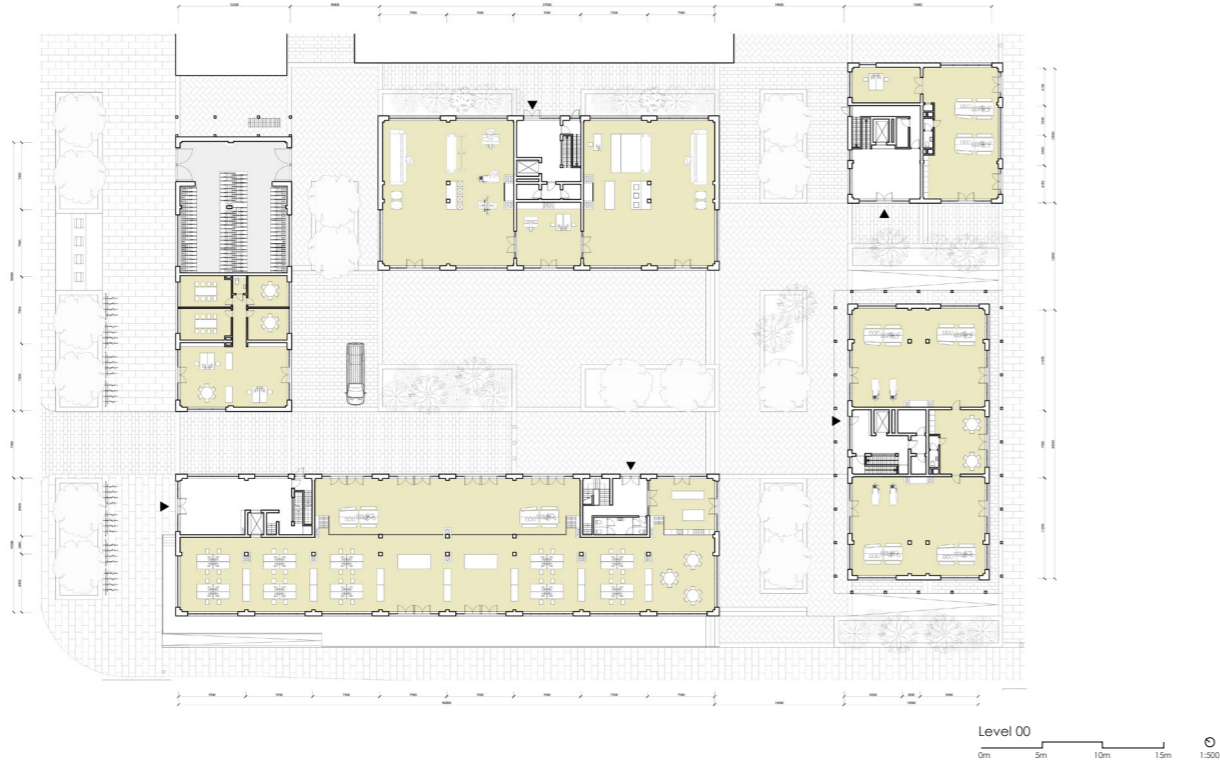
## 06. Floor Plans



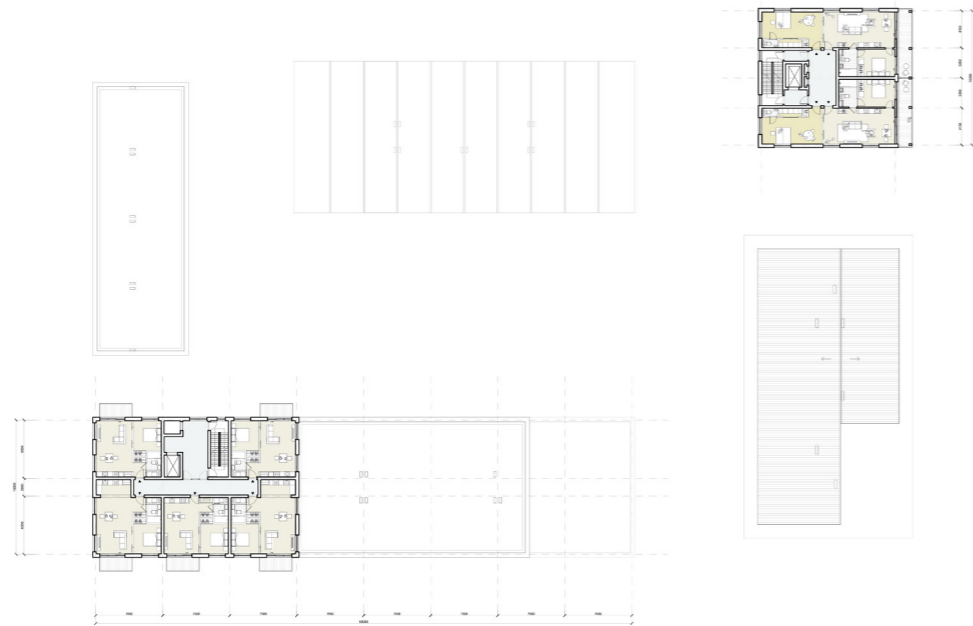
Level 00  
0m 5m 10m 15m 1:500



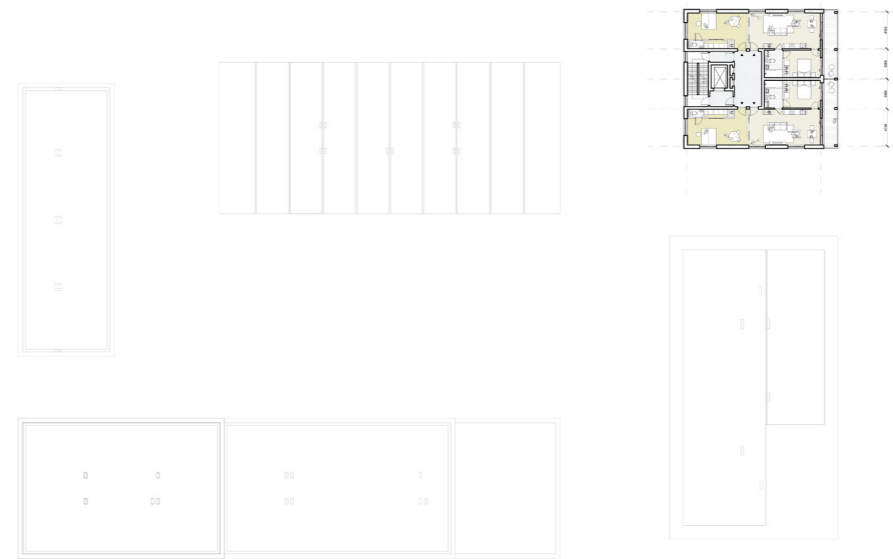
Level 01  
0m 5m 10m 15m 1:500



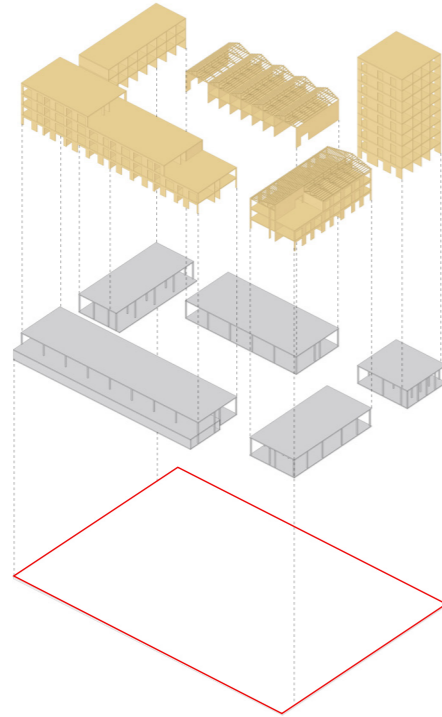




Level 04  
0m 5m 10m 15m 1:500



Level 05-9  
0m 5m 10m 15m 1:500



**Structure Lvl 01-09**

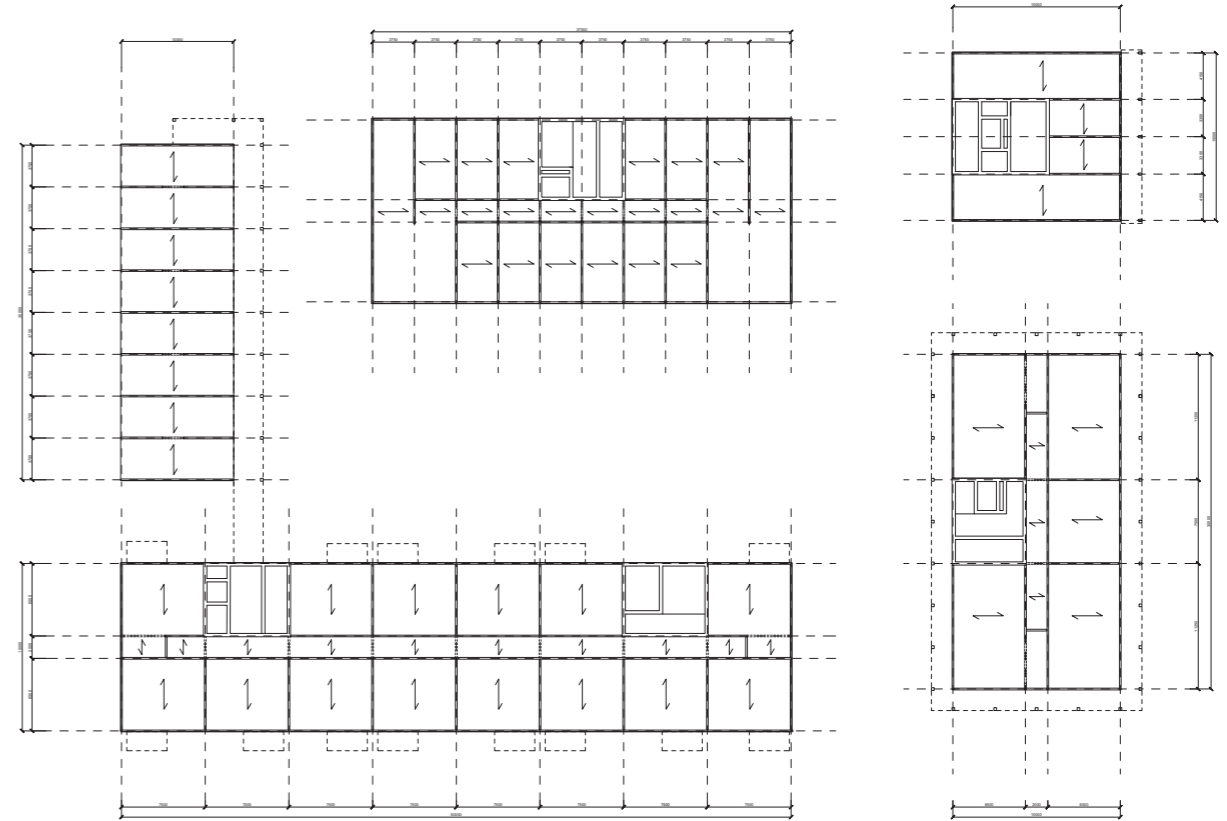
CLT Floors & Walls  
Timber Portal Frame Truss  
Reinforced Concrete Cores

**Structure Lvl -01-00**

Reinforced Concrete Columns  
and Floors

**Site**

+3m Above sea level





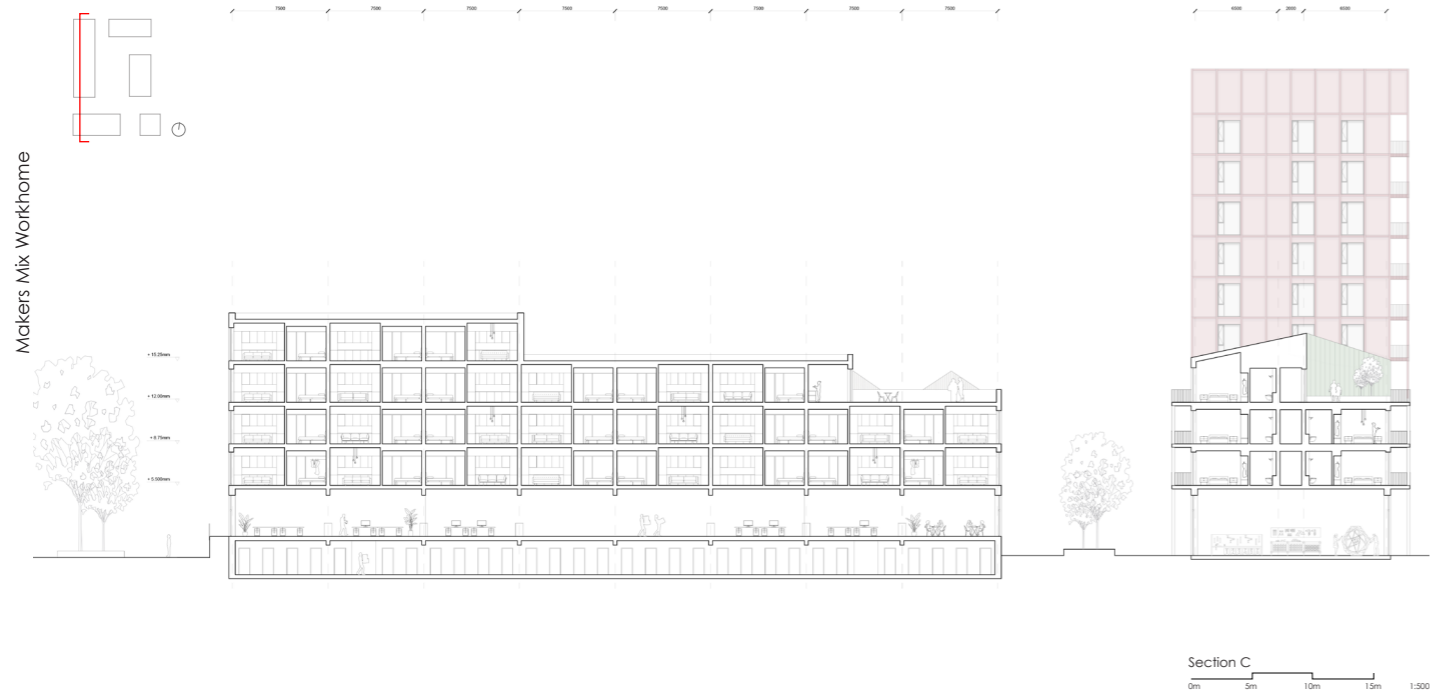
## 07. Sections & Elevations



Section A  
0m 5m 10m 15m 1:500



Section B  
0m 5m 10m 15m 1:500



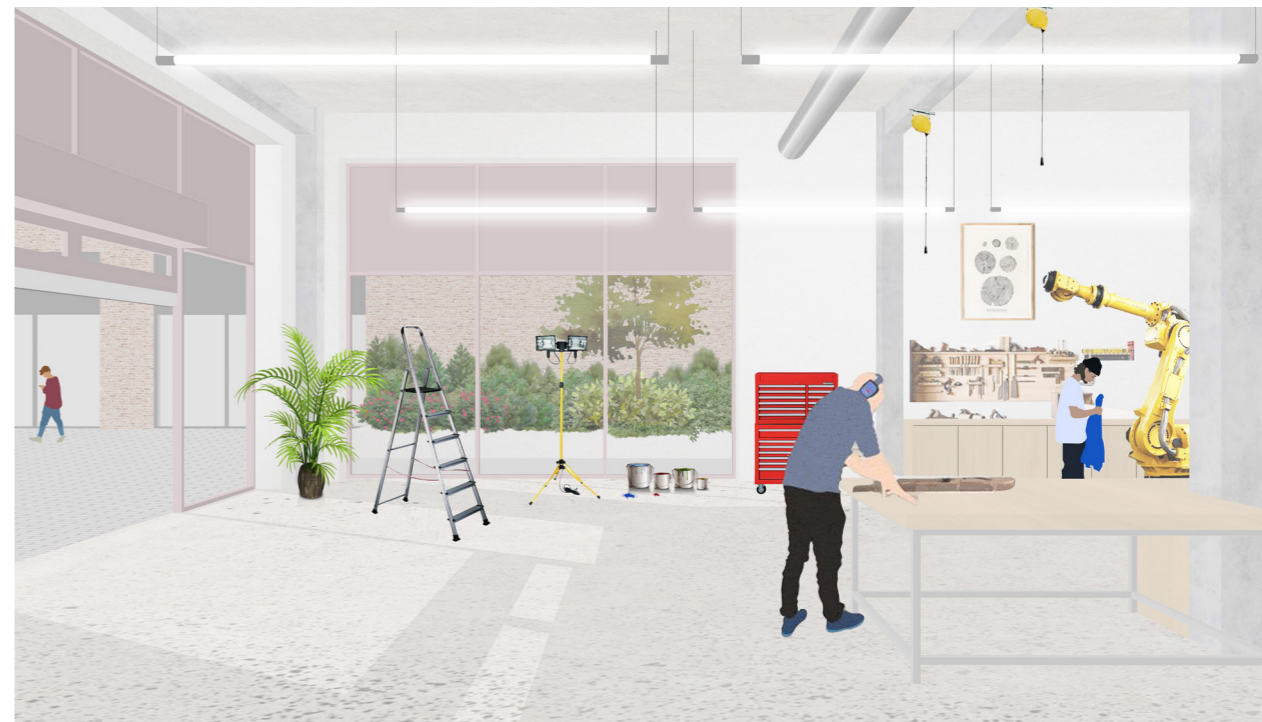




North Elevation  
0m 5m 10m 15m 1:500



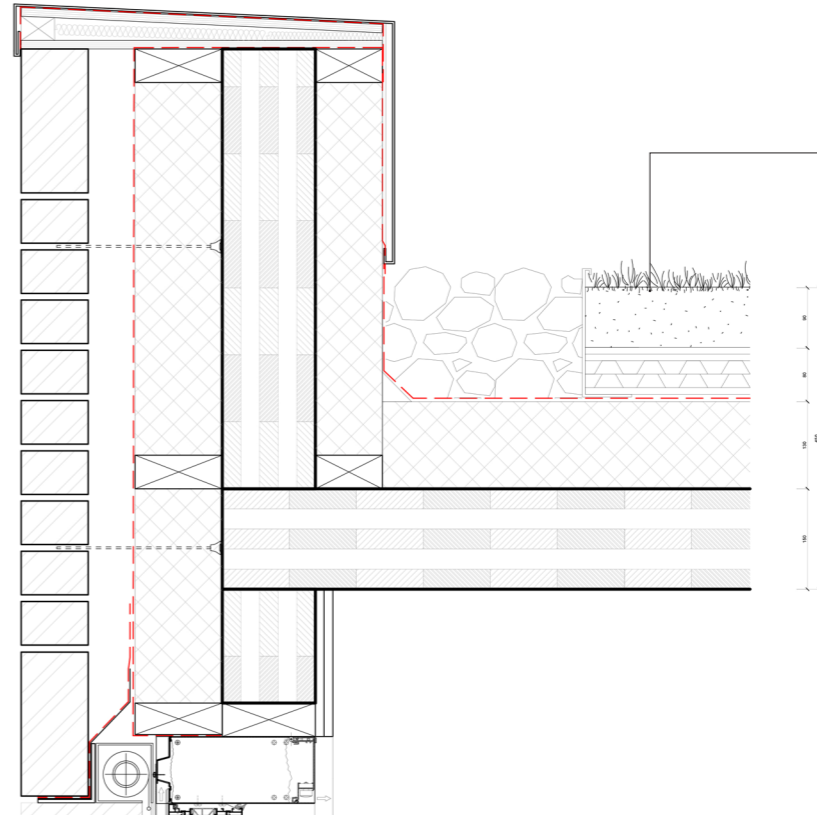
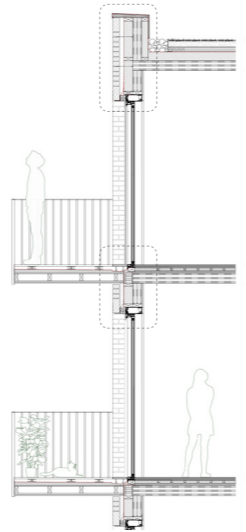
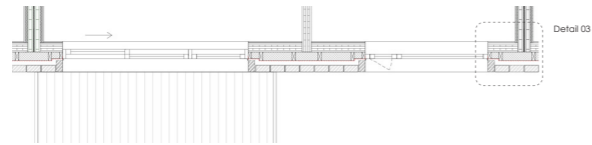
East Elevation  
0m 5m 10m 15m 1:500





## 08. Building Technology

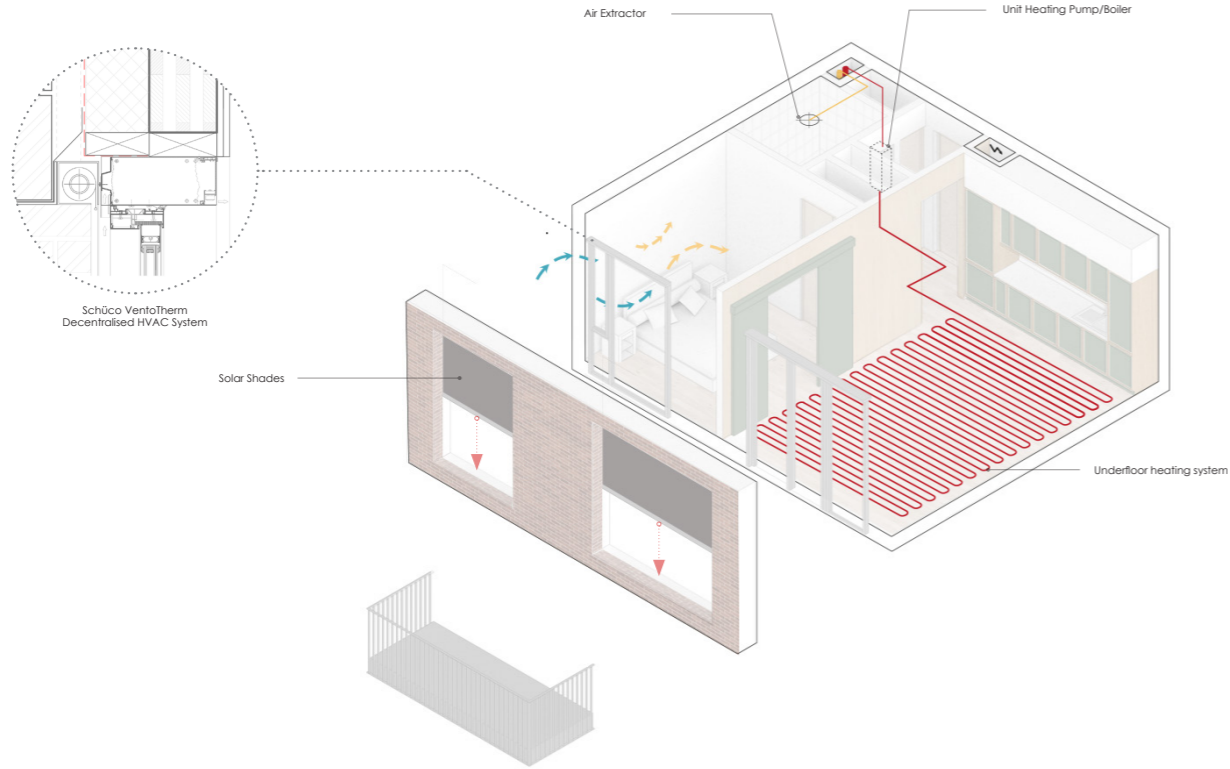
### 8.1 Facade Framement



- Floor Structure**
- Vegetation
- 90mm Substrate
- Filtering Foil
- 80mm Drainage and buffer system
- EPDM Roofing
- 140mm Rigid Insulation
- 130mm CLT Floorslab



### 8.3 Climate Design



### 8.4 Solar Orientation

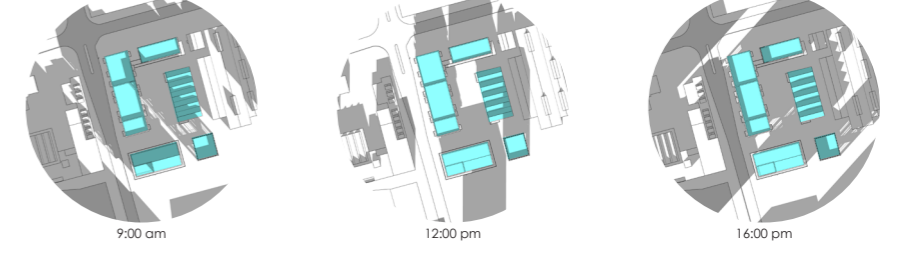
**Spring Equinox**  
20th March



**Summer Solstice**  
21th June

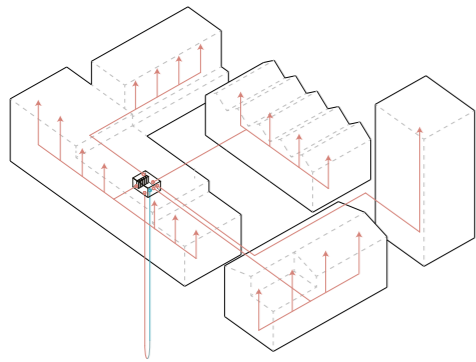


**Winter Equinox**  
20th December

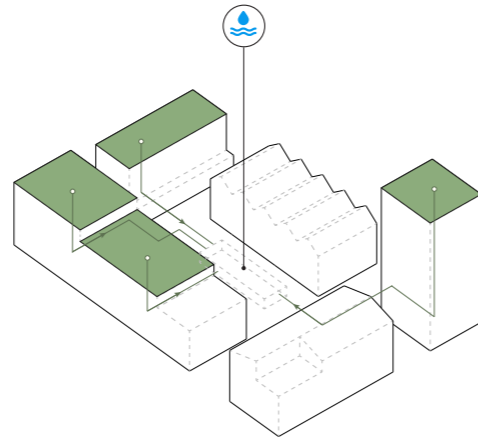


### 8.5 Sustainability

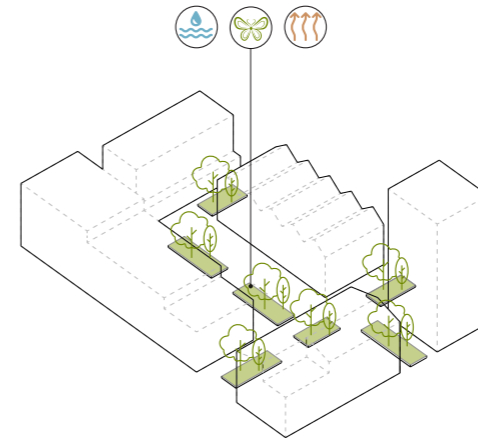
Makers Mix Workhome



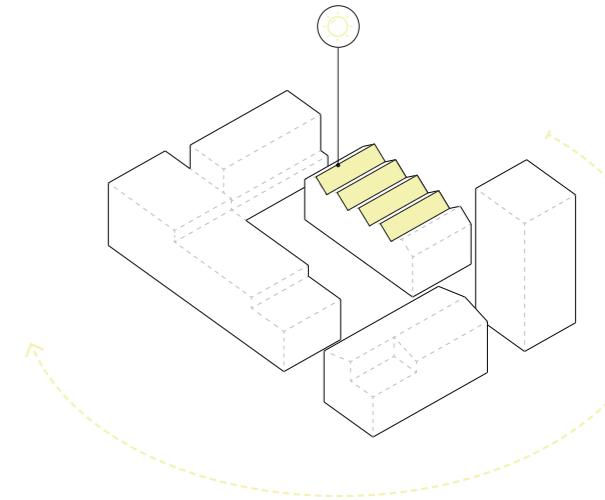
**Strategy 01**  
Centralised Ground Source Heat Pump



**Strategy 02**  
Green Roof & Rainwater Harvesting



**Strategy 03**  
Reduced Heat Stress & Water Infiltration



**Strategy 04**  
Solar Panels on pitched roofs

Makers Mix Workhome



## 09. Reflection

### Introduction

Over the previous two decades people all over the world have been increasingly working from home or living at their workplace with the global North especially seeing a resurgence in this form of living. With the restrictions imposed on travel and social distancing at work brought about by the current COVID-19 pandemic, this trend has been drastically accelerated, and in doing so has highlighted failings with the quality and availability of workspaces within the current housing stock. Based on this growing need and the predicted future demands it's time to re-examine our relationship with working and living in monofunctioning determinate dwellings. Therefore, in my research project, I focused on exploring what Frances Hollis states to be a 'workhome' (Hollis, 2015, p2), a building that combines space for both dwelling and working, focusing on examining this archetype spatial strategy in addressing current problems facing

a work force increasingly working from their home. My research thus advocated a return of this typology to the building stock in the Netherlands, highlighting its historical relevance and the benefits a building of this nature can bring in its duality.

The purpose of this report is to illustrate the relationship between research and design undertaken during my graduation project. I will try to demonstrate the various methods and process used giving insight into each. All parts of this document are to comply with the five aspects contained within the Graduation Manual 2020-2021.

### Right

External Perspective submitted at P3.



## Aspect 01

### The relationship between research and design

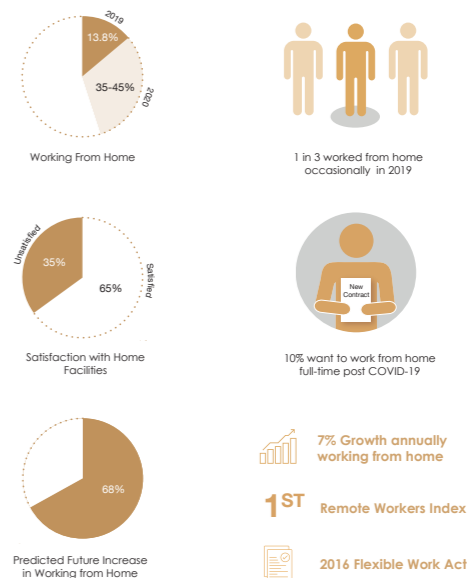
#### Theoretical Research

In MSC3 I used my research report to search for answers to how to spatially separate dwelling space from work based activities and how such dwellings can alleviate workspaces shortages effecting the city and benefit the public. My research followed the prescribed methodical line of inquiry of the graduation studio comprising of a literature inquiry, location analysis and a plan analysis of 4 case study projects. I viewed this research as the foundations for my eventual design allowing me to understand what was required of the space or what was not. This process allowed me to eventually formulate a design hypothesis along with a brief based on those findings. The results of which would then become the pillars of my design.

In this section of the report I have written about the individual research methods I have employed throughout my graduation project with the first five methods being majoritively used during the research phases and the final 3 being predominantly used during the design stage.

#### 1.1 Literature Research.

The most obvious form of research I undertook was of course literature research comprised of quantitative and qualitative data that helped form the basis of my report. This research method helped me understand the current situation as well as intertwined history of work activities within dwellings. Of particular help to me was reading *The Workhome* by Frances Holliss and *The life and death of great American Cities* by Jane Jacobs. Both these books allowed me to understand the relationship that dwellings and the built environments has when there is a diversity of workplaces and how each can then enhance the other. Governmental reports published by the Ministry of Infrastructure and Water Management also provided current up to date data on how people are struggling working from homes that were not designed for adaptable work environments. Along

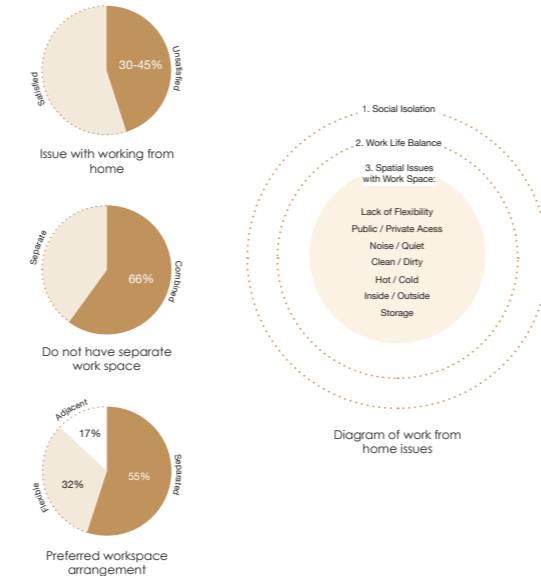


**Top**  
Infographics of data collected through literature research.

with this, publications and action plans produced by the organisation SKAR helped me understanding shortcomings and issues creators have when trying to find workspaces and accommodation in Rotterdam and principles to try to elevate this problem.

### 1.2 Praxeology Research.

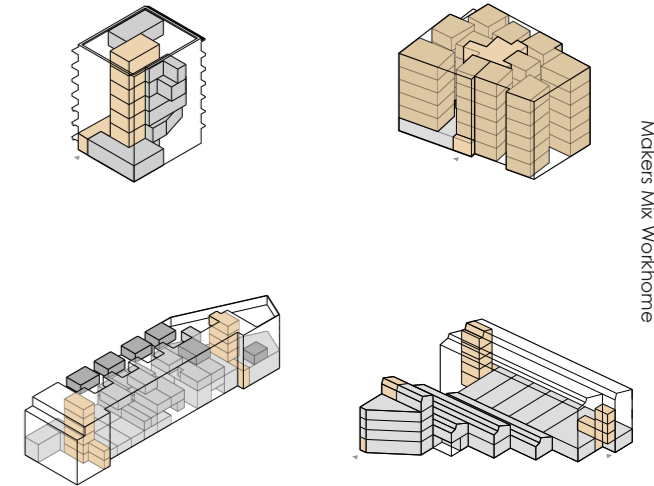
I used Praxeology in the form of online questionnaires to determine the needs facing my current user group, the results from which allowed me to base design decisions upon further into my design process. This research provided me with solid grounding to understand the current needs and requirements for people wanting to work from home and allowed me to create a hierarchy of requirements. However as this was reserved to an online survey due to covid restrictions the findings have to be looked at empirically.



Top  
Infographics of data collected through praxeology research.

### 1.3 Case study Research

The case study research was of great benefit when doing my report as it provides real world examples that demonstrated how design can solve issues and capitalize on niches in the housing market. By looking and analysing four separate projects it allowed me to understand strategies for instance in dealing with circulation, such as how to combine or separate public and private circulation. By looking in depth at unit floor plans it provide an understanding of the square meterage and quality expected for combined live-work units. However, at this stage analysing these individual projects was quite broad and superficial, especially when using a different construction system such as CLT that in effect limited spans. This process however encouraged me to research other projects along the way when my design started to develop further in depth.



Top  
Massing illustration of chosen case studies.

#### 1.4 Site Research

At the start of MSC3 we were given a lecture about Keilekwartier by the chief planner from the municipality of Rotterdam. He outlined the city's goals and ambitions for the M4H area in which he termed The New Makers Quarter and explained its importance in future growth of the city. After doing personal research and translating the M4H Spatial Framework (2019) it provided me an outline of the types of dwellings and character and residents this new quarter of city was aiming to draw. The document provided a guide for future car routes, bicycles paths and circulation through the area and provided great starting point for our urban framework proposal. After analytically studying historic maps of the area I could tell how the city moved away from the harbour with vast majority of buildings from 1900 maps now missing and sprawled out commercial shed now

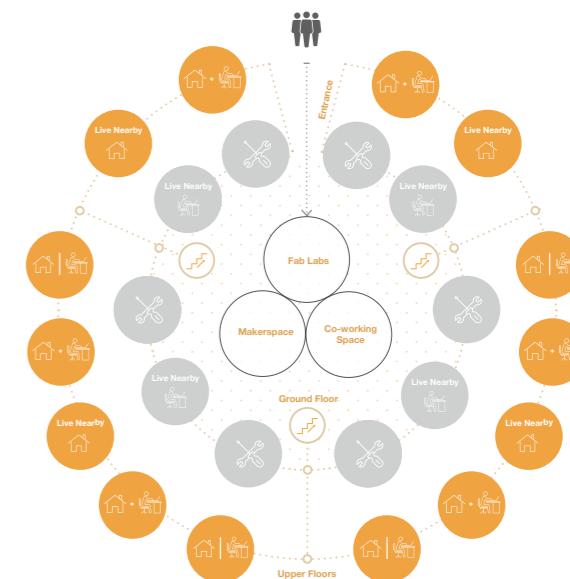


Top  
Site Location Plan

take up their place. I found this character of solid and void interesting and used it as part of theme for creating an engaging space through multiple buildings.

#### 1.5 Diagrams as a Research Method

After collecting a wide variety of data, I was finding it difficult to summarise conclusions clearly and therefore employed the use of diagrams as graphical representation to analyse and summarise my results. I found this very beneficial as it allowed me visually to show relationships and connections when it came to workspaces variation that certain creators wanted. This allowed me to use inductive reasoning when analysing my data. From this I was then able to create a graphical framework to aid in my design process and from this I was then able to create a diagram (right) to summarize my design hypothesis for the forthcoming project.



Top  
Workhome Spatial Design Hypothesis Diagram.

## Design Methods

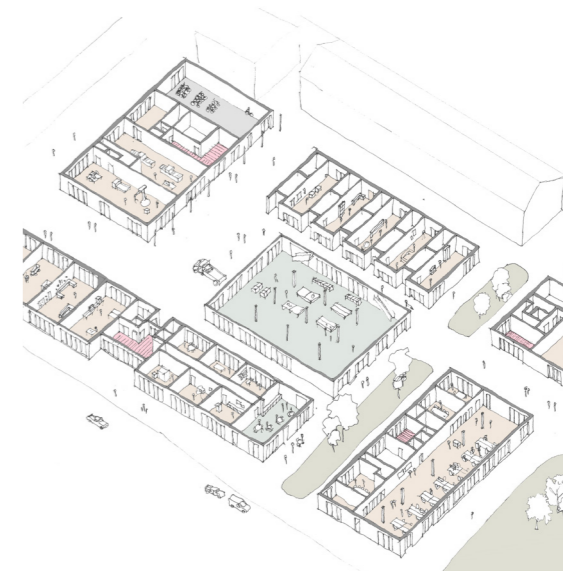
In design stage research gathered and learnt develops into another form, one that is less rigid and scientific and more creative and physical. The traditional methods of sketching, massing and using visualisation all are key in this stage of project. The following methods I have found to be the most personally useful.



**Top**  
Courtyard render submitted at P3.

## 1.6 Sketching

Sketching is a vital method during this stage of design. Being able to quickly draw variations of floor plans and unit types, trace over them, and build on your original ideas helps to develop simple concepts into more complex ones. It allows you to test out ideas being free from the constraints of structure and detail allowing you to simplify to better understand the spaces you are creating. Once I had a plan I liked I would then move into autocad and develop it more precisely as designing dwelling the square meterage becomes very important and its difficult and time consuming to sketch this way by hand. Therefore, using autocad scale prints and then tracing over it by hand at different scales greatly helped me in developing my design.

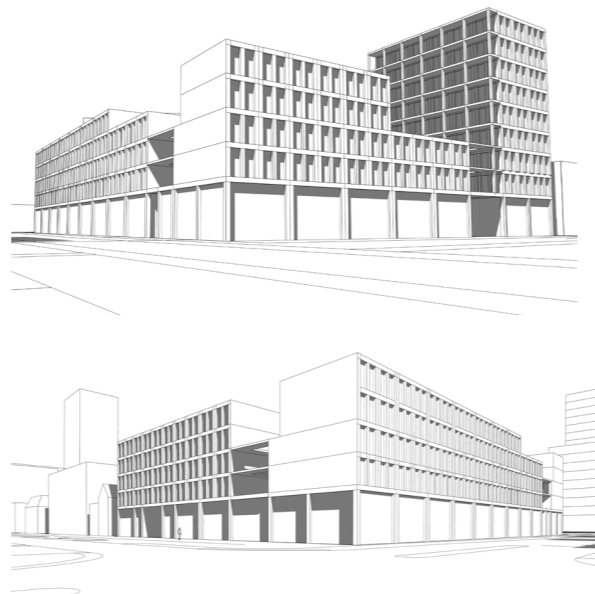


**Top**  
P2 sketch of proposed scheme.

### 1.7 Design Variations as Research Method

From the beginning of the concept design stage multiple decisions were made through the process of design and elimination using hand drawings, sketches and models.

Through massing and sketching both physically and electronically it allowed me to determine to create separate buildings based on principles of access and lighting for instances. This in turn allowed me to create multiple massing variations based on this decision to create what I felt to be the strongest and most efficient layout. I must admit I found this process quiet challenging especially trying to fit multiple staircases in confined floors plans over 5 separate buildings. However, through this process it further allowed me to questions was this in fact the right decision for the site? This allowed me to re-evaluate my position and thus spend time investigating a more tradition podium and courtyard typology. Upon discussion with my tutors I decided to however return to my original design with



**Top**  
Alternative design proposed after P2.

more confidence from their support and through this process go into more detail on my design.

### 1.8 Digital Modelling as a Research Method

Digital Modelling was of great significance during the entire process of my gradation. I primarily used Google Sketchup to quickly mock up relevant options and from this built up several variations of each. This allowed me to easily test lighting conditions and determine shadow coverage over specific times throughout the year. This was vital when it came to placing the tower element of my project on the site as I could be sure it had minimal impact to the surrounding buildings and adjacent neighbours. Furthermore, using this method, I could then build upon it by adding façade and material treatments to investigate how my project would look from street level. This allowed me to quickly review design options and the quality of spaces to determine the most appropriate solutions.



**Top**  
Developing the design through Sketchup.

### Conclusion

In reflecting back over the last number of months of this research and design process I have become aware that designing is constant research and development at all times with the two being closely linked to each other.

I however did personally find it became challenging in the way the course itself is actually structured. As once you finish your research at P2 the topic is mentioned very little in the design review process which can be challenging. As one must personally reflect on the research itself and review if its outcomes are primary drivers for a theoretical market driven residential design. This can be rather conflicting at times.

I also found the education structure of the masters to be quite different to what I was expecting. As coming from a UK university in which you receive a Master of Arts degree as compared to the Netherlands where it

is a Master of Science. The architecture themes of research in the UK tend to be more exploratory in nature investigating topics such phenomenology, materiality, light and shadow or massing and voids within the built environment. Whereas the Masters of Science is more analytical being data driven with grounded facts and expected outcomes and results. I found this to be rather challenging especially as Architecture itself is categorised as an Art rather than science. However, this does rather make sense in light of obtaining a science based degree.

All in all, I am happy with the research that I have produced for this assignment and view it as rather complete with the methods and tools that I have used. This knowledge in design based researched will no doubt benefit me when dealing with projects in the future.

**Aspect 02**

*The relationship between the graduation (project) topic, the studio topic, the master track, and the master programme.*

This year's graduation studio focuses on creating innovative live work environments in the M4H area of Rotterdam with particular focus on the themes of collectiveness, affordability, quality diversity and sustainability. My graduation project focuses on addressing the need for providing work spaces in dwellings in light of current work from home restrictions brought about by the COVID-19 pandemic. This was of particular interest to me as it demonstrated the evolving role dwellings play within the built environment and further ties in with subject of the master's track that of being Advanced Housing Design. The research report conducted prior to commencing the design provided a framework to accommodate

these works required spaces for my chosen target group of creatives and entrepreneurs. The design process that followed then allowed me to build upon these findings architecturally.

**Aspect 03**

*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 prescribed methodical line of inquiry of the studio comprising of a literature inquiry, location analysis and a plan analysis of 4 case study projects. The literature inquiry comprised of quantitative and qualitative data and formed the bases of the report, helping me understand the current situation as

well as intertwined history of working in homes. Praxeology research was further employed in the form of online questionnaires to determine the needs facing my current user group the results from which allowed me to base design decisions upon further in my design process.

It is difficult to say how scientifically relevant this research is as it was conducted as more of a reflection and line of enquiry into the current zeitgeist surrounding dwelling in the current climate. However, the aim of the research was to conclude with a design brief for the graduation project and based upon that, the research contributed significantly to understanding the history, trends and current situation of my topic and further helped me to understand why and what I needed to produce architecturally.

**Aspect 04**

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

The municipality of Rotterdam aim to redevelop M4H into a vibrant live-work environment. In their framework, they state that living among the makers will appeal to a certain target group that likes to experiment, thus, the setting will be reflected in special housing typologies (collectives) and architecture (Municipality of Rotterdam, 2019, p52). The entire area will also be a testing ground and showcase for the circular future of the city and port.

With my graduation project, I've researched how we can design integrated live-work environments for creatives by providing a variation of dwellings with workspaces separation strategies that combines co-living

space, compact design and integrated social work environments such as public accessible fab labs and maker spaces. This accessibility is intended to benefit the wider social context that suffers from a lack of investment and access to STEM activities. The ideals of this integration coupled with housing residents who work in the sectors, aims to contribute to form collectiveness which in turn is the basis of circularity and thus could be replicated in other areas.

### Chapter 05

*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.*

For architects, there is always a dilemma for designing for a specific target group, be it age, class or lifestyle and due to this you always have to approach it ethically.

Having to categorise people based on arbitrary aspects is difficult and feels ingenious. Of particular note is that of their financial prospects. It raises moral questions such as how can you provide value for money without increasing build costs? Or how can you justify a level of quality for a group that may be out of its price range?. Are there for instance amenities you can give back in exchange for floor area? It further adds to the debate is it fair to expect this newer generations to live in less compared to the previous generation.

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June 2021

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