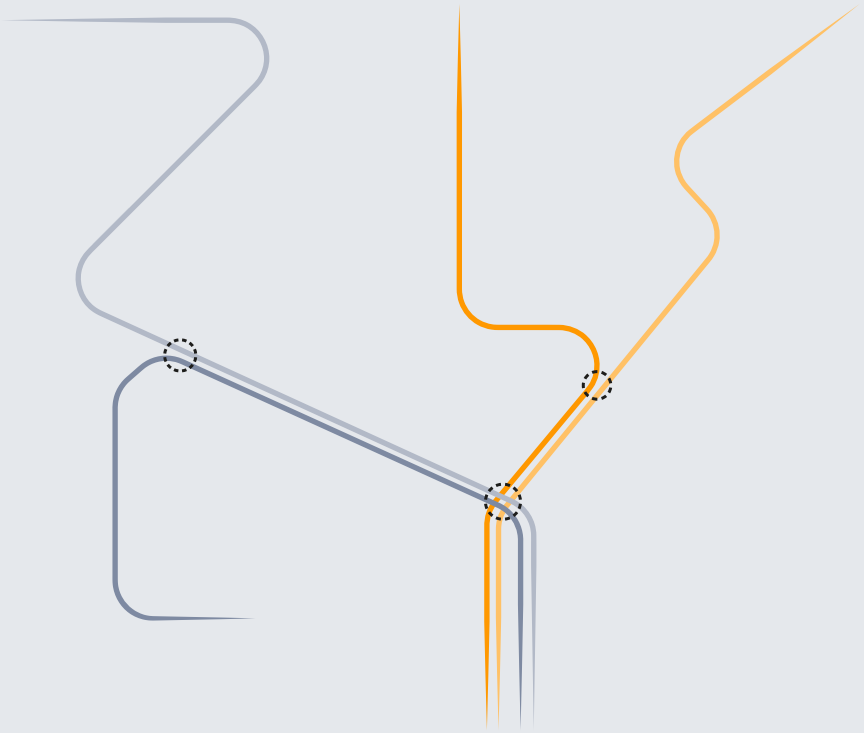

# Dwelling design for solo living

Combating loneliness in modern single-person households using concepts of cohousing and coliving

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# Abstract

With a rise of single-person households both in the Netherlands and worldwide as well as increasing levels of loneliness and social isolation, there is an urgent need to understand the requirements of people living alone. Cohousing and coliving concepts are used as the main focal points of the essay as this building typologies provide the opportunities for social integration. Case study analysis, as well as interviews performed as part of the research, show a direct link between dwelling design and opportunity for being a part of a community. By combining the findings from these sources, the principles for singletons dwelling design are provided on both dwelling unit and building scale.

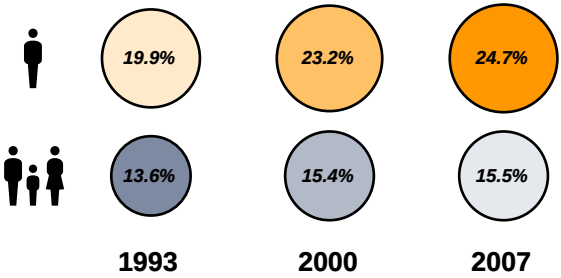
# Problem statement

Due to the rise of globalisation, people got more opportunities to work on personal growth both within the home country and globally. Moreover, due to the notion of individualism, individual needs and career are more respected than family formation (Boseley, 1999). For these reasons, the number of people living alone increased dramatically, starting in the middle of the last century. For example, in the Netherlands in 2019, the percentage of one-person households was 38%, the biggest rate compared to multi-person households with children 33% and multi-person households without children 29% (Kamer, 2020). Moreover, the average household size in the Netherlands decreased from 3,93 to 2.15 people during the period between 1950 and 2019 (Kamer, 2020). Such an increase in people living alone is unprecedented in history and started worldwide in early-industrialised countries. In contrast, the average percentage of people living alone in the 19th century was typically below 10% (Ortiz-Ospina, 2019).

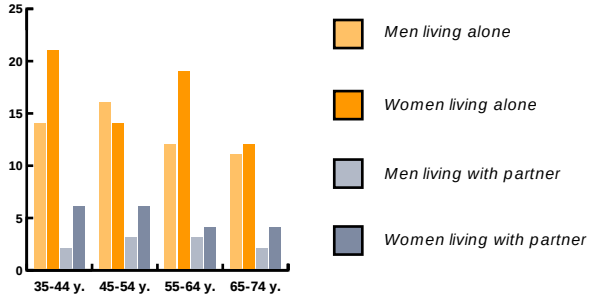
While the number of single-person households is rising, it is crucial to understand issues concerning living alone. The overall percentage of common mental disorders increased 13.6% to 15.5% in multi-person homes from 1993 to 2007, while the percentage is much higher in single-person households with 19.9% and 24.7% in 1993 and 2007 respectively (Jacob et al., 2019). Moreover, people tend to be lonely more often while living alone. For example, in Germany, around 5% of people living with a partner feel lonely, while the average percentage of loneliness for people living solo is 15%. (Beutel et al., 2017). The relation between solo living and loneliness is not questionable, and this requires research into the ways dwelling design could help singletons combat loneliness.

While designing sustainable dwellings, there is a need to consider the overall housing market. Due to the housing crisis and high rental cost in the Netherlands, shared living such as coliving and cohousing will be researched as a part of dwelling design for people living alone. Such a solution can decrease loneliness as well as making housing more affordable while preserving the overall quality of the dwelling. Limited understanding of the needs of people living alone as well the negative impact of solo living on mental health, raises the need to research this topic for dwelling design in M4H. The research aims to explore the design of single-person households for all people, regardless of age, gender or culture. I have researched both coliving and cohousing concepts to meet the requirements of all age groups of singletons.

**Common mental disorders in single and multi-person households**




**Percentage of loneliness depending on type of household in Germany**



# Research question

The research aims to explore the requirements for dwelling design of single-person households. Since loneliness is widespread among singletons, the main focus of the study is the ways to combat it using appropriate dwelling design. I will analyse coliving and cohousing concerning the privacy and well-being of the residents. Such analysis will help to find a balance between the notion of individualisation and being part of the community.

**Main research question :**

***How cohousing and coliving should be designed to help singletons combat loneliness while preserving the required level of privacy?***

**Sub-questions :**

Why does the notion of a single-person household rise?
Who are the people choosing to live alone?
What are the requirements of people living alone and do they differ per subgroup?
Which one of the concepts (cohousing or coliving) suits each subgroup of singletons better?
What is the balance between private and shared areas in buildings designed for singletons?
What are the design principles to stimulate community creation within the dwelling unit (coliving) and on building scale?
What is the balance between being part of a community and preserving the notion of individualisation?

# Relevance and position

## *Worldwide*

The notion of loneliness increased dramatically in recent years with almost 50% of US citizens reporting they feel lonely or sometimes lonely (Novotney, 2020) while around 30 million European adults frequently feel lonely (D'Hombres et al., 2018). This phenomenon is usually associated with people living alone as singletons are 5-10% more lonely than multi-person households (Beutel et al., 2017). Loneliness affects not only mental but also physical health and influences health risks as much as smoking 15 cigarettes a day or alcohol use disorder (Novotney, 2020). Furthermore, Julianne Holt-Lunstad, a professor of psychology and neuroscience found that loneliness and social isolation is twice as harmful to physical and mental health as obesity. (Holt-Lunstad et al., 2015). A recent meta-analysis found that there is a connection between social isolation stroke and heart diseases (Holt-Lunstad et al., 2016) as mental health meets global concerns, WHO now includes "Social support networks" as a determinant of health. (Eating, 2019).

The rise of single-person households is a sign of modern society, and the critical figure of fully developed modernity is the single person (Beck et al., 1992). While the increase of singletons worldwide is associated with evolution and modernity, there is a need to consider this type of household. As the number of singletons expected to rise, it is essential to provide dwellings that both help combat loneliness and provide opportunities to be a part of the community.

## *Netherlands*

Even though the Netherlands has the lowest share of lonely people (all types of households) in Europe with around 3%, this is still a rising concern (D'Hombres et al., 2018 ). Since people living alone have 8% higher risk of being frequently lonely (D'Hombres et al., 2018 ), the total percentage of singletons feeling lonely in the Netherlands is higher. There are 38% of single-person households in the Netherlands in 2019 (SRD, 2019). On the other hand, the average size of households steadily decreased from 2.23 in 2009 to 2.15 in 2019. Therefore, the number of people living alone is rising as well as household size is getting smaller.

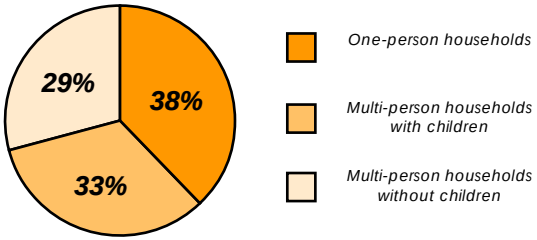
Rotterdam is an attractive city for both expats, young professionals and these people usually live alone as the marriage age in the Netherlands increased from 26.5 (men) and 23.8 (women) to 38.4 (men) and 35.5 (women) from 1975 to 2019. Lots of people live together without officially marrying, but the number of singletons in the Netherlands rose from 2.2 million to 3 million during the last

ten years (Kamer L, 2020). Therefore, design for solo living is appropriate for the Netherlands.

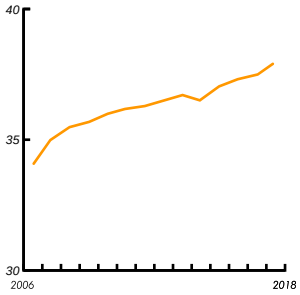
## *Site*

The main focus of M4H is the creation of a vivid and sustainable atmosphere for all types of residents. The building plot I chose is part of quadrant A, which focuses on creatives and providing all kinds of spaces for creative industries while preserving design offices around the site. Such location serves as an attraction for individuals striving for personal growth as well as combining daily life with leisure activities. Therefore, the design goal is to provide solo dwellers with a sense of community on building scale by creating a gradual transition between social activity on building and neighbourhood scale.

**Total number of households in the Netherlands in 2019,by type**




**Percentage of one-person households in the Netherlands from 2006 to 2018**



# Source analysis

There are a few books written on the notion of single-person households in the modern community, one of the most important examples is "Going Solo: The Extraordinary Rise and Surprising Appeal of Living Alone" by Eric Klinenberg. This book covers the historical and modern perspective of living alone, and the way society got to this point. Moreover, such books as "Risk society. Towards a new modernity" by Ulrich Beck uncovers the topic of singletons from a sociological perspective, focusing on individualisation being one of the main properties of modern society.

On the other hand, cohousing and coliving concepts, as well as its theory, were described in several publications such as "Designing Neighbourhoods for Social Interaction: The Case of Cohousing" by Jo Williams where cohousing is used as a concept to analyse the level of collectivity within the building. As said by (Torres-Antonini, 2001), "A study of cohousing allows us to explore the unique phenomenon of communities purposely designed for social connectivity and support". Similarly to cohousing, Bjørn Magnus Mathisen, Anders Kofod-Petersen, Idoia Olalde described coliving and its relation to community creation in the book "Coliving. Social community for Elderly". Nevertheless, there is a lack of discussion on cohousing and coliving and its relation to the well-being of singletons. Therefore, this research aims to analyse the ways to combat loneliness using the concepts of co-living and cohousing.

# Methodology

I conducted research using various sources, such as historical and scientific research, case study research and two types of data I collected myself by questionnaire and interviews. I focused the questionnaire on the connection between loneliness and solo living due to the lack of data regarding this topic, and I have managed to collect 45 replies using google forms. Interestingly enough, the data showed opposite readings to scientific research as the majority of people denied feeling lonely while living alone. Since I have done scientific research beforehand, I made a decision not to base my essay on this questionnaire as the data set was limited. Therefore, I decided to perform interviews with people from my target group via telephone and skype to get a more in-depth understanding of their feedback on living alone. I have interviewed seven people who had and experience of living alone (private apartment or coliving) or those who currently live alone. Each interview took around an hour

which allowed me to discuss various concerns about living alone and ways to improve it. Replies were, therefore, combined in a table and structured per topic to compare the answers and find similarities in responses depending on interviewee's experience.

I have managed to collect both quantitative and qualitative data; both data sets to be used within the research. Even though seven interviewees shared their experience, the data is very subjective and can not be treated as scientific. Therefore, conclusions for dwelling design were done based on the group of replies instead of thoughts of the single interviewee.

# Ethical considerations

There are a variety of sources used in the research, and all of them are referenced using APA style to avoid plagiarism. To prevent privacy concerns regarding questionnaires and interviews, different actions were undertaken. The questionnaire was anonymous; however, at the end of the data collection, people were asked to leave their contacts if they wanted to participate in the interview. I, therefore, had an opportunity to reach people who were willing to share their experience. Before the talks, people were asked for permission to record the discussion as interviews took part online and were transcripted afterwards. Moreover, some interviewees added drawings to their replies and gave permission to use those. Such information as the name, age and city of residence of the interviewees is shown below. I have decided to provide the reader with an overview of respondents without revealing an actual identity. This makes reading more engaging without rising privacy concerns.

## Interviewees

**Anton**

**23**

**IT specialist**

private apartment

KYIV

**Sofia**

**23**

**Analyst**

co-living
flat share
student housing

LANCASTER
LISBON
LONDON

**Stanislav**

**25**

**Enterpreneur**

private apartment
cohousing
student housing

BRIGHTON
LONDON



**Nazar**

**25**

**Enterpreneur**

private apartment
cohousing
student housing

BRIGHTON
BIRMINGHAM
LONDON
KYIV



**Tetiana**

**23**

**Realtor**

private apartment

KYIV

**Nadiya**

**73**

**Retired**

private apartment

BORYSPIL

**Maria**

**25**

**Groomer**

coliving
flat share

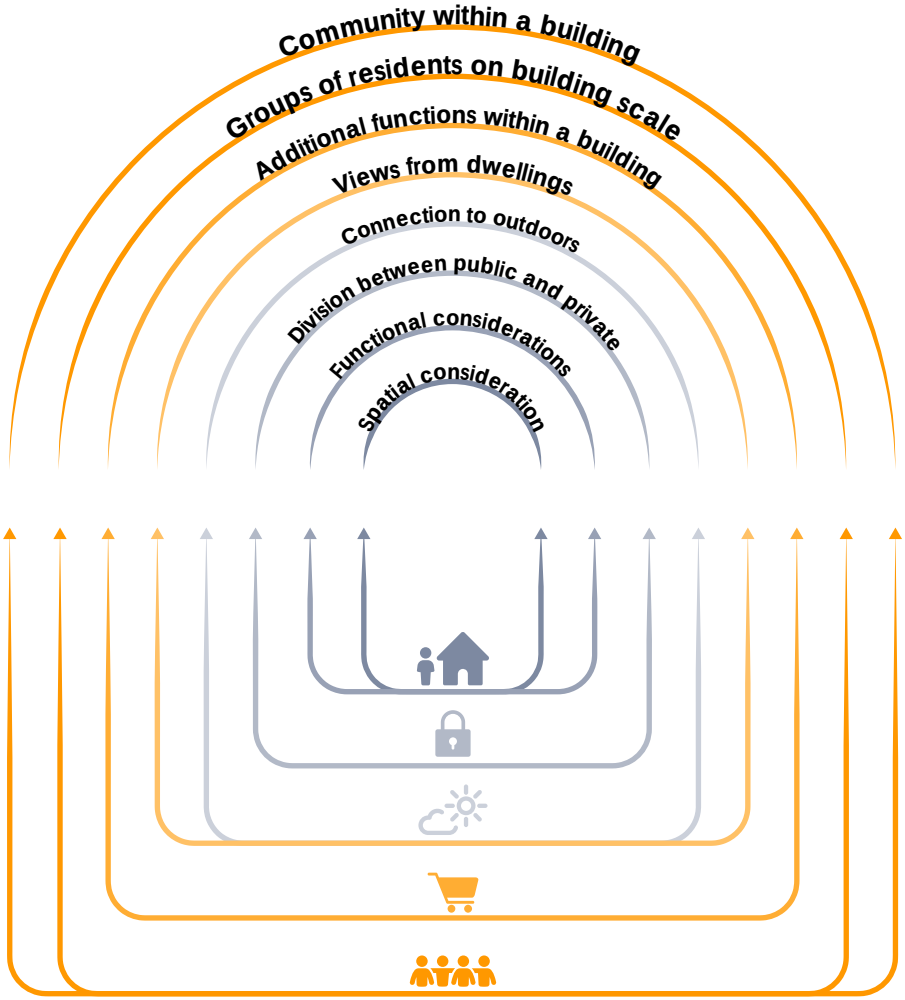
WARSAW

# Introduction

The number of people living alone rose dramatically from the middle of the 20th century. Since this is unprecedented in history (Klinenberg, 2012), there is a need to analyse the requirement of people living alone as well as the differences per subgroup. I split singleton's target group into smaller subgroups, such as students and young professionals, expats and migrants, digital nomads, entrepreneurs, divorced and widowed and elderly. The subgroups cover all ages and the main conditions under which people live alone. By better understanding each subgroup and their life patterns, the dwelling can be designed to address the challenges of living alone for each individual.

The research focuses on the ways to combat loneliness in single-person households as it is a rising concern of those living alone. Cohousing and coliving concepts are used as a general typology for future design. Both concepts are analysed through the historical perspective as well as modern context using 4 case studies: Tietgen Dormitory, Niu coliving, Treehouse coliving apartments and Ourcq Jaures Student & Social Housing. I performed a plan analysis of the projects to define the main design principles used to create successful cohousing and coliving projects. I, therefore, combined the data with seven interviews that I performed during the research to define main design principles for solo living dwelling design. The guidelines are divided per topic: spatial considerations, functional considerations, the division between public and private, connection to outdoors, views from dwellings, additional functions within the building, groups of residents and zoning on building scale and community within a building. The topics cover design principles both on dwelling units and building scales as well as community creation from private apartments to small shared functions to shared areas on building scale.

**Topics to consider for dwelling design for solo living**



# Historical perspective of solo living

## *Single-person households before 20th century*

It is essential to define the reasons for living with others for the whole history of humankind to understand the reason why people started living alone. Living with others was very advantageous in the early times as it increased access to food, provided security as noted by evolutionary biologists (Klinenberg, 2012). However, the rise of modernisation and globalisation sets other priorities for people. Human beings strive to fill self-actualisation, esteem and belongingness need as two steps of Maslow's diagram (physiological and safety needs) are covered.

Throughout the 19th century, single-person households were mostly females between the ages of 60 and 80 who were predominantly widows (Wall, 1978). People lived alone due to the sad or adverse events happening in their lives, not due to the will. Immediately after the industrial revolution that took place between 1760 and 1840, the first movement of resisting the nuclear family arose as a result of denying the old and religious traditions (Cacioppo & Patrick, 2009).

## *The rise of single-person households from 20th century*

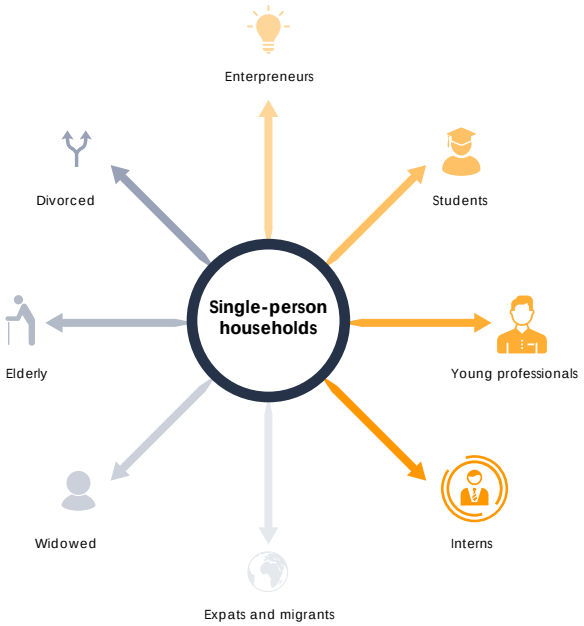
From the early modern period until the 19th century, the percentage of single-person households remained relatively constant at around 10% (Ortiz-Ospina, 2020) of the overall population. However, from the middle of the 20th century, the increase of people living alone was so steady and rapid that in 2012 the percentage of single-person households in Stockholm reached 60% (Ortiz-Ospina, 2020). Such a fast rise of people willing to live alone is a response to various changes in culture, globalisation and family values. In general, the steady increase of individualism arose from a combination of 4 social factors - "The rising status of women (women finally got the rights to become a workforce and be responsible for their lives), the communications revolution, mass urbanisation, and the longevity revolution" (Klinenberg, 2012).


The opportunity to live alone rises from positive reasons, such as economic development and social security (Klinenberg, 2012). More people live solo as they both can afford it. Moreover, they do not undergo social pressure as the views towards being single changed dramatically. In the middle of the 20th century, the word "family" was praised and was even given state protection in West Germany. At the same time, the 1960s and 1970s became a breaking point for the family (as a traditional structure) due to movements fighting for women's rights. These movements changed the cultural constraints of women living alone (Hareven & Tilly, 1981). Such cultural change provokes a steady increase in managerial and professional women living alone (Hall & Ogden, 2003). Not only women got more opportunities, but the notion of the nuclear family also loses its' importance. This can be seen, for example, in the United States where in 1957, more than 50% of respondents considered unmarried people sick, immoral and neurotic while in 1967 this percentage dropped to 33% (Furstenberg et al., 2004). Therefore, people are no longer in fear of being alone for a more extended period.

As stated by the Pew Research Centre, the average age of people entering first marriage increased by five years in the past half-century (Pew Research Centre, 2010). For example, the median age for first marriage in England and Wales rose from 23 and 21 for male and female to 32.1 and 29.9, respectively, from the 1980s to 2009 (McLaren, 2012). This statistics not only show the changed attitude towards marriage but the overall shift in priorities. Market research in the UK found that 20% of young people between 18 and 24 years old prioritised a career or gaining qualification over family life (Boseley, 1999).

# Single-person households in 21st century

## *Modern single-person households*



Percentage of single-person households is the same in the Netherlands, the UK, and Germany with approximately 30% people living alone while this number is higher in Norway (40%) and Sweden (47%) (Klinenberg, 2012). As the number of singletons rises every year; cities fail to adapt to the changing needs of society and new demographics. As noted by Dolores Hyden, the majority of modern cities and especially suburbs are designed for nuclear families, where a wife would stay at home while the husband travels to work (Hayden, 2002).

It could seem that more people live alone as they have no other option, such as divorced, widowed or elderly. However, people aged between 18 and 34 choose to live independently, and the amount of them in the USA increased ten times compared to 1950 (Chodorov, 1952). Nowadays, people choose to "live apart together", this group is about 10% of adults in Britain, which is therefore also included in the solitaries group (Levin, 2004). People have lost the traditional support networks and have options to rely on themselves both within society and the labour market (Berger & Berger, 1975). Labour market forces people to be removed from traditional patterns and arrangements and experience mobility (Beck & Ritter, 1992). Therefore, singletons tend to construct non-local networks while loosening local ones, and this could lead to loneliness and social isolation. However, it gives people living alone an opportunity to form their circle of connections based on interests and ambitions and not necessarily physical proximity.

While looking for new social connections, some singletons choose to be a part of coliving or cohousing communities. There is an upcoming trend of "sharing culture" which makes flexible dwelling arrangements attractive when mixed with the decreased cost for travel as well as an increase in remote work arrangements (Grozdanic, 2016). Therefore, there is a need to consider singletons of different age, occupation and marital status to understand the ways to combat the loneliness of all types of single-person households.

## *Types of single-person households*

The notion of living alone starts as early as studying at university. Expansion of higher education and its availability becomes one of the reasons for the rise of solo living. Young people, in general, tend to live alone more than others (Berrington & Murphy, 1994). Moreover, there is a link between gaining higher education and living alone, 33% of 26 years old with higher education lived alone,

while only 20% of the overall group of this age lived alone. While students tend to share households, young professionals continue this pattern and choose to live as singletons in dwellings with shared facilities even while having a financial opportunity to live alone (Heath & Kenyon, 2001). As the labour market evolves, young professionals are worried not only about finding a great job but also maintaining it, which requires geographical mobility (Hall et al., 1999). For that reason, this subgroup requires short-term housing as well as a long-term one.

Even though the interests and lifestyles of students and young professionals may be similar, their views on housing differ. Second subgroups expect to have "nice" dwellings, and they always describe it as "proper", "decent", "sophisticated" places while describing the student housing as dwellings with poor conditions. (Heath & Kenyon, 1999) Especially in the times of Covid-19 when people work from home and live without the possibility of making new connections, the coliving gives access to ready-made social life. Coliving could, however, bring some negative aspects, and it is usually associates to household members who fail in completing their share of domestic labour. Also, misunderstanding related to privacy issues such as noise, messiness and overall ignorance towards other members of the household may arise (Heath & Kenyon, 2001).
As described above, professionals got the opportunity to change the country of residence easily, and this leads to the notion of being an expat. Since international migrants and expats lose existing social contacts while moving abroad, this subgroup is more vulnerable to loneliness (Ehsan et al., 2020). Relocation to another country can also result "between identities" (Grillo, 2007), meaning that people do not have a sense of fully belonging to a single place.

While for some people, career opportunities lead to the change of residency, others choose to work remotely and frequently change the locations. People choosing to work via telecommunications technologies prefer living in a nomadic manner. As digital nomads strive to find a balance between professional and personal life goals as well as reinforcing their self-identity, coliving typology seems like the right solution for digital nomads (Gandini, 2016). Such dwellings help digital nomads to overcome the challenges of social isolation (Wang et al., 2019) as well as building more sustainable relationships within constrained time at one location. Digital nomads are usually associated with the neo-tribe theory that was first introduced in the 1990s (Bennett, 2015). It is a combination of people with similar interests and lifestyles in one grouping (Hardy et al., 2013). As this subgroup tends to be interested in everything new, digital nomads engage in shared activities within coliving areas as they identify each other as parts of a bigger group and are willing for each other to succeed

(Slavin et al., 2003). Even though digital nomads are interested in being part of the community, work represents an essential part of their lives. To keep financial independence, digital nomads require a clear distinction between work and leisure. (von Zumbusch & Lalicic, 2020)

Require geographical mobility, short term housing



More vulnerable to loneliness due to the loss of existing social contacts

Give priority to the quality of the apartment over privacy



Prefer private dwellings while being vulnerable to loneliness



Tend to share dwellings



Lacking a sense of community

Prefer homogenous community

Similarly to digital nomads, entrepreneurs rarely have a stable way of getting income. Therefore, entrepreneurs tend to be more stressed (45%) than other workers (Hall et al., 1999) as shown in The Gallup Wellbeing Index. Moreover, they also reported having worried more than employees with 34% and 30% respectively (Witters & Agrawal, 2012). Entrepreneurs and freelancers tend to work from home, which makes them more vulnerable to being lonely and lacking the sense of community. Furthermore, the research conducted by Julie Deane, the founder of The Cambridge Satchel Company, showed that isolation was one of the biggest challenges for business owners and sole traders, 30% of respondents noted that it was either "big problem" or "something of a problem" (Deane, 2016).
Even though for some people living alone is a choice, others may get to this

point by unpredictable and usually sad life events. Widowhood and divorce are considered as the two most stressful events experienced in adulthood (Holmes & Rahe, 1967) and can lead to reduced mental health (Stroebe & Stroebe, 1987). Moreover, the older the person, the more severe are the consequences of marital disruption due to death, divorce or separation (Glaser et al., 2006). This subgroup requires an accurate and precise design decision to both provide privacy within the dwellings as well as providing opportunities for social integration.

While facing various problems and opportunities during their lifetime, people are getting older. Elderly prefer to stay independent, while some of them may require special assistance. Senior cohousing recently became more widespread, with around 2100 senior cohousing dwellings in the Netherlands (Jung, 2004). As mentioned above, the feeling of being independent is essential for all ages; the elderly are not an exception. Therefore, senior cohousing stress that they are different from nursing homes as they do not provide intensive care for residents, however, residents tend to look after each other and help with the housework more than in more traditional housing (Singlelensberg, 1993). As living with people of different ages may not seem challenging, it may be more difficult for the elderly to adapt to younger generations; therefore, they prefer to live in cohousing where the community is composed of inhabitants with the age of 55 and older. (Jung, 2004)

# Singletons and relation to loneliness

Enforced loneliness was considered a deathly punishment from the beginning of times. During ancient time, exile was one of the severe penalties (Klinenberg, 2012). Moreover, in the 18th and 19th century, prisons were focused on solitary confinement as it was believed that social isolation deters crime, as noted by William Paley (Haney, Lynch 1997). Loneliness in the 21st century is no longer enforced, but more and more people experience it. Social isolation is a problem still to be solved; it remains harmful to both mental and physical health of the person. For example, loneliness is related to the higher number of anxiety, depression, heart attacks and strokes (Perlman & Peplau, 1984); it is related to unhealthy diets, alcoholism, sleep deprivation, Alzheimer's disease, high blood pressure (Cacioppo & Patrick, 2009). Moreover, loneliness and lack of social integration were argued to be one of the US nation's most serious public health challenges (Putnam, 2000). Therefore, being a healthy person while living alone

requires support, as noted by Emile Durkheim, a French sociologist, singletons can only achieve independence and liberty with support of both family and economy of the state.

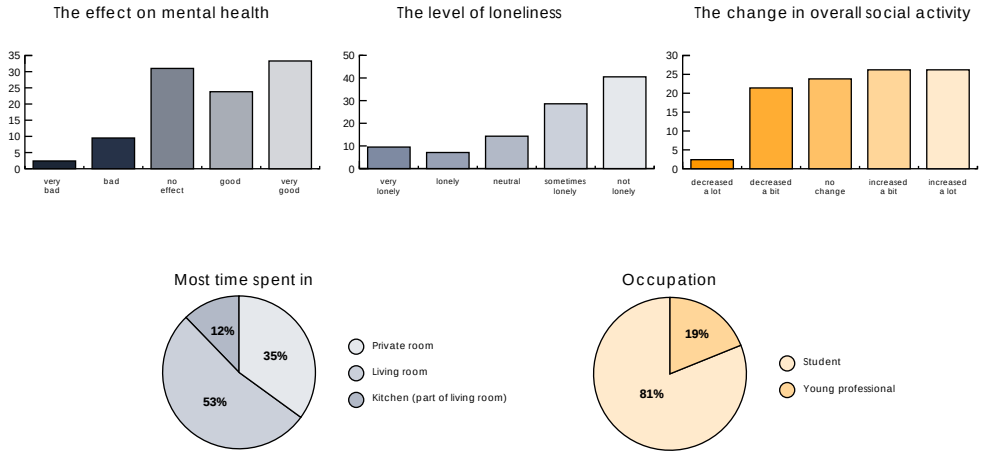
Feeling lonely while living alone is a common problem, not an exception. Between 30% and 50% of people living solo feel lonely, while 10% feel intensely lonely (Victor & Bowling, 2012). It has been proven that human beings require access to social contacts to adapt to changes in life or stress (Lowenthal, 1964). Moreover, living in social isolation can lead to an effect on psychological functioning (Hughes & Gove, 1981). It could seem that living in proximity to family members increases overall well-being; however, it was proven wrong. The research conducted by Arling in 1976 showed that being part of a neighbourhood community or having friends nearby increased overall well being much more than living close to grown-up children.
Interestingly enough, living alone increases social activity as persons living alone have the second most contacts with friends among all living arrangements, followed by women living alone with children (Alwin et al., 1985). In general, people living alone are not more socially isolated relative to others. Hughes and Gove (1981) mentioned the compensation rule where singleton develops a greater community of friends due to the lack of proximate social support. As stated above, one of the reasons for the rise in single-person households is globalisation, and many singletons are living far from hometown or even country of birth, so, architecture design should provide opportunities of creating community.

As there is no expected decline in women rights, globalisation and individualisation, architecture has to be adapted for people living alone while preserving good physical and mental health. Majority of persons living alone tend to seek social integration more than those living with others in more traditional family situations (Alwin et al., 1985). On the other hand, I conducted a questionnaire about the level of loneliness of singletons which showed that there is no tendency of feeling lonely. The reason for that could be that the majority of people are students and young professionals who tend to have a big circle of friends. Moreover, the data shows that there is a perfect effect on mental health that could be connected to the fact that young people strive to live lonely and independently after leaving their parents home. However, the data is not accurate due to the limited range of age and occupation of those taking part in the questionnaire. As scientific research shows that loneliness is an emerging problem and especially in single-person households, the ways to combat loneliness is one of the focal points of design tasks. Therefore, architectural typologies with

shared facilities such as cohousing and coliving meet the requirement of people choosing to live solo. These two concepts will be analysed in-depth in this research in order to find the most appropriate living arrangements for people living alone.

The communal living should be analysed to find a way to overcome loneliness within an individualised society. Therefore, some design principles, such as opportunities for contact, the proximity of dwellings and appropriate place for interaction should be applied to dwelling design in order to encourage the community formation (Festinger et al., 1950). Design methods should be used to increase proximity as it positively affects passive contacts between residents, and this, therefore, helps to form social relations (Kuper, 1953). Circulation also influences the level of communication. Residents living next to stairwells tend to communicate more with neighbours from the floor above or below. At the same time, those living in the middle of the floor communicate more with their immediate neighbours (Homans, 1968). However, social similarity (Kuper, 1953) and homogeneity (Abu-Gazzeh, 1999) influence collectivity more than physical proximity. Therefore, this notion should be used in building design and target group zoning.

**Data collected from questionnaire**



# Introduction to cohousing and coliving

## *Cohousing*

Different scholars defined cohousing: Franck and Ahrentzen (1989) describe it as "housing that features spaces and facilities for joint use by all residents who also maintain their independent living"; McCamant and Durrett (1994) noted that cohousing is based on democratic principles and promotes the ideology of practical and social home environment. On the other hand, cohousing is a combination of private and shared facilities; residents have private apartments or homes and share common facilities such as laundry, additional cooking facilities or meeting spaces (Ruiu, 2016).

The concept started to emerge in Sweden and Netherlands around the 1970s, (Ruiu, 2016) which was followed by a second wave in North America around 1988 by architects Kathryn McCamant and Charles Durret (Williams, 2008). Finally, followed by a third wave (Williams, 2005) around Australia, New Zealand and Japan. The classical notion of cohousing appeared in Sweden in the 1940s as a result of women's liberation movements which were inspired by the Soviet communal housing model in 1920s (Vestbro, 1998). The first notion of cohousing emerged in Denmark between 1962 and 1966 and was called "living communities". This concept was a result of the discussion of Jan Gudmand-Hoyer, Danish architect, and his five friends about new types of living as an antidote to the industrial age. They were looking for opportunities to design dwellings that embrace the needs of human beings as creating thriving communities within the building (McCamant & Durrett, 2011). Jann Gudmand-Hoyer also called the transition to cohousing as "moving from Homo productivos to Homo ludens" (from man the worker to man the player) (McCamant & Durrett, 2011). Moreover, the research conducted by Marcus & Dovey (1991) shows that mutual support networks and social relations are much more robust in cohousing communities.

While being focused on social interactions, cohousing community can vary in size, and it has a particular influence on collectivity within the building as defined by McCamant & Durrett as seen in the diagram below. Therefore, medium-sized communities of 16-25 residents are the best in terms of sharing responsibilities and creation of the community. Even though being part of the community is an essential focus of the cohousing concept, privacy is still an important property to consider. For example, transition space creates a protective barrier that increases the degree of privacy and territorial control (Skjaeveland et al., 1996) while protecting residents from overexposure to the communi

ty. Moreover, the notion of transition spaces increases the feeling of privacy and security within the private dwelling (McCamant & Durrett, 2011). These spaces not only help in dividing private from shared but also usually the place of spontaneous social interactions; this is also a reason why residents typically interact more with those living nearby (Williams, 2005). Interestingly enough, buffer zones not only help to build a community but become places for residents to express their identities. (Abu-Gazzeh, 1999).

### Small 8-15 households

"An advantage of small communities is that they are less complicated and require less hands-on management, however, it is important that residents be highly compatible, which often results in a less diverse community." (McCamant & Durrett, 2011)

### Medium 16-25 households

"A good number of people for sharing responsibilities but small enough that you can know everyone well. Reasonable size for management. This size community is considered the ideal size for cohousing communities." (McCamant & Durrett, 2011)



### Large 26-35 households

"Allows for greater diversity and more flexibility. May require subdivision to keep groups small enough to be familiar and encourage social interaction. (Williams, 2005) Large communities are more difficult to manage, and residents may be less likely to engage with the community due to increased anonymity."



Not only the existence of shared space is valued in cohousing but also its location. Sometimes the typology of cohousing guides the position of the shared facility. For example, in Danish communities, the shared space is located in the centre and is surrounded by low-density housing. In contrast, the shared space is located next to the entrance hall for more comfortable circulation and access in Swedish cases where overall building density is higher (Jung, 2004). Both homogeneity and circulation design leading to shared activity sites

increases communication among residents even further (Abu-Gazzeh, 1999). As an example, locating parking in the periphery, force the residents to move through shared spaces to get to the car while placing parking lots next to dwelling entrances would dramatically decrease the possibility for social interactions (Williams, 2005). As mentioned before, residents of cohousing projects value the opportunity to observe what social interactions are happening. They, therefore, decide whether or not to take part in this act of collectivity and usually, the spaces for collectivity are more successful while being located along shared pathways (Osborne, 2018). As residents tend to use shared spaces among smaller community size, the hierarchy of space provision such as clustering can maximise the use of communal areas (Baum & Valins, 1977). High-density housing is not appropriate for social interactions due to size of the community which is too big and becomes anonymous (Baum & Valins, 1977) and people living on higher floors being distanced from shared spaces (Abu-Gazzeh, 1999). Both distance to private areas and the actual size of the unit matter. Even though in cohousing, private spaces are valued, it should be considered that smaller private spaces result in higher social activity within the shared areas (Williams, 2005). Therefore, there is a need to find a balance between comfort within private dwellings and willingness to spend time in shared spaces.

# Dwelling design for solo living

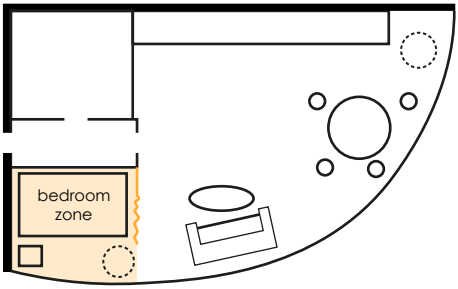
## *Spatial considerations*

While living alone, residents require the correct spatial organisation of the space to use the dwelling with comfort as well as being productive within the residence. Some respondents noted that living in the open space without division can be challenging. For example, Nadiya (73) commented: "Even when being alone, I require a separate corner. I have a separate bedroom right now, and I only go there at night. I believe that such private space should be separated both visually and physically". However, the division can be movable and optional as noted by Nazar (25): "In Birmingham, the bedroom was only separated from the studio by a blind. It was nice that I can create a visual division between spaces. If I had a separate bedroom, I would not spend time there during the day. Visual separation is enough". Such a requirement is connected to the notion of zoning within the dwelling, as noted by Anton (23): "I

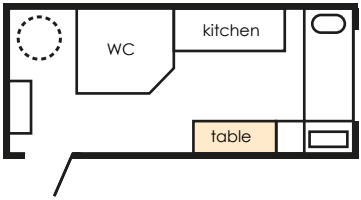
prefer to split zones per function. Even now, I prefer not to eat where I work and vice versa."

Moreover, combining different programmes at one location within the dwelling can be misleading and force residents to find another place outside the building. This was noted by Stanislav (25): "In a studio in London I ate and studied at the same table. So, I still went to the university since it was not enough space to divide tasks". Architectural ways to zone spaces can vary; for example, in Tietgen dormitory, this is done by introducing a round wall where the shower is located. Such a design decision helps to separate the entrance area from the rest of the room. On the other hand, some studios in Treehouse coliving introduce the second floor where the bed is located as a way to zone out spaces.

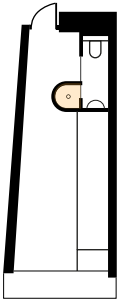
Nazar's apartment in Birmingham



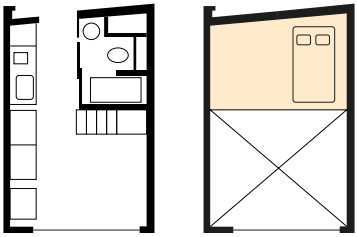

Stanislav's studio in London




Tietgen dormitory



Treehouse coliving



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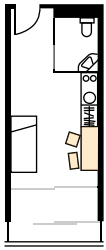
Not only the zoning of function within the space is essential but also the location of a particular programme within the space. The function that was noted by almost all interviewees is a table for work and study. Interestingly enough, the only person not mentioning it was Nadiya (73) as it is not something she uses daily. Such detail should be taken into account while designing for students, young professionals and those spending time at home studying and working. Six out of 7 interviewees mentioned that placing the workplace next to the window is advantageous.

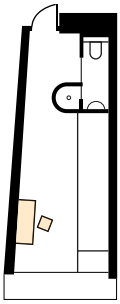
Furthermore, people would even rearrange furniture to approach it, as mentioned by Sofiya (23): "In terms of the workplace, it was usually located next to the window and even if it was not I rearranged my space and placed it next to the window". Moreover, if the furniture is not located correctly from the very beginning or is movable, some residents frequently rearrange their spaces. For example, Anton (23) noted: "I always move furniture in my apartment because

it was not designed for working at home, for example. I moved it like 20 times already. However, when I lived in another apartment when the workspace was deliberately designed, I never moved anything. So, it is a sign of a bad design". While looking at case studies, it becomes clear that the functional characteristics of the dwellings vary a lot. For example, in Tietgen dormitory and Ourcq Jaures student and social housing, study areas located next to the window while Niu coliving and Treehouse coliving introduce bedroom and kitchen next to the window, respectively. However, it is essential to note that the first two projects are deliberately designed for students and young adults, making this spatial arrangement advantageous for the target group.

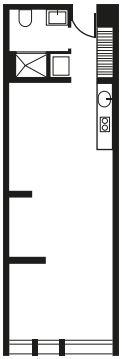
**Ourcq Jaures**



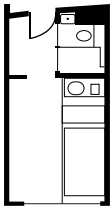
**Tietgen dormitory**



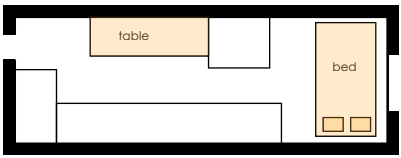
**Niu coliving**



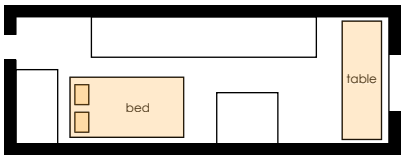
**Treehouse coliving**



**Nazar's studio current situation**



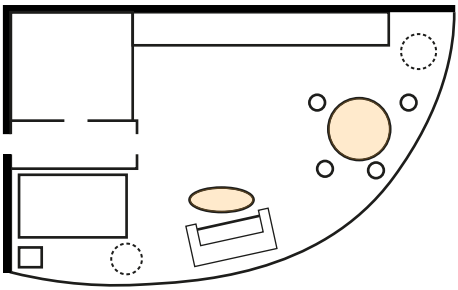

**Nazar's studio preferred plannig**



## *Functional considerations*

Even though for some people large space is essential, as mentioned by Tetiana (23): "Even if all functions are covered in the apartment, it is nice when you have some free space, it brings some air to space". However, for most interviewees, the functionality and quality of the space are more important than the size of the area. As Sofiya (23) mentions: "I think it is important to have a big bed, wardrobe, table and chair even if the room is small. It is more important for furnishings to be of good quality rather than having a big room". Even when the space is significant, and all the functions seem to be covered, the shape of the table, for example, can play a crucial role in using the space. Nazar (25) shares his experience: "In Birmingham, the apartment was big and nice, but both tables were not comfortable to study. One was a coffee table, and the other one was circular". While all case studies provide dwellings with the right furnishing, the size of units vary a lot. For example, Niu coliving offers 48 sq.m. space for singleton while Treehouse coliving introduces dwellings of 24.5 sq.m. while the covered functions are very similar.

**Nazar's apartment in Birmingham**



Interviewees mentioned the location of the table for work and studying as an essential part of spatial requirements as well the size of the regular table was mentioned several times. Furthermore, the second design requirement is connected to the act of collectivity within the dwelling. Nazar experienced loneliness while living in a studio in London and mentions the importance of table size: "There is no need to separate tables for eating and studying. It would be nice if the table is for four people so I can invite guests". Nadiya who is widowed and lives alone also mentions this: "I would prefer having a table with four chairs, I can get less free space, but it will be more comfortable if my daughter and

granddaughter visit me". Such a requirement would be fulfilled only by Niu coliving apartment where a table with four chairs is present. In comparison, student housing by Lacaton Vassal provides a study table with two chairs similarly to the Therese house student accommodation mentioned by Nazar.

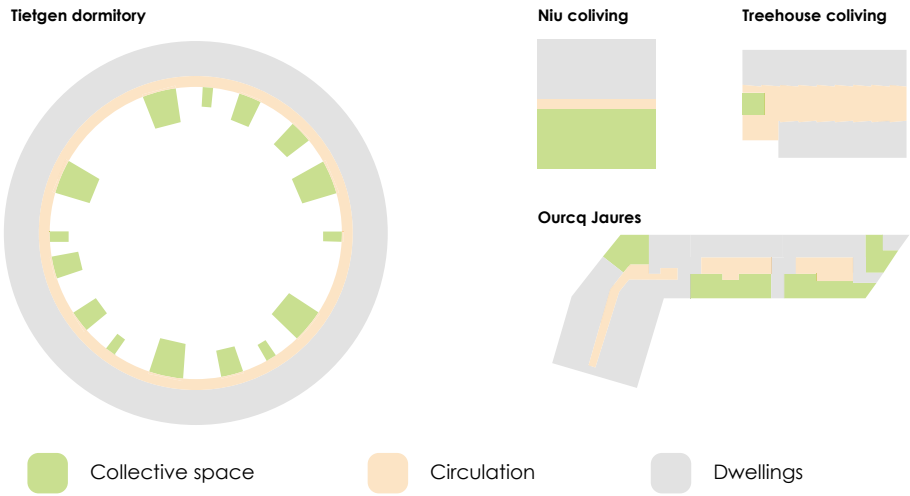
People who live alone in cohousing or private apartments usually expect guests visiting them and consider the comfort of the guests as an essential feature of a dwelling design. Moreover, while meeting people from the same city can happen in the public area like a cafe, park or restaurant, hosting guests from other cities or even countries usually requires the overnight stay. As Nadiya (73) mentions: "I would like to have a sofa that can transform to bed if someone is visiting me", such furniture can be adaptable to the condition or guest visits. Tetiana (23) had a similar remark, so singletons expect guests to come over and carry about their comfort. From the other hand, there is a lack of dedicated space for guests within coliving as mentioned by Sofia (23): "In coliving, there is always a shared kitchen, and sometimes there is no living room at all, so you have no place to socialise with people you live with or with your guest". While the availability of shared space for both guests and socialising with those living in the same unit is crucial, the size of private apartments within cohousing should be appropriate for social interaction is mentioned by Nazar (25): "Having sofa is nice because it is so-called public space within the apartment where I can spend time with guests. Zoning and functionality are important, but also space should be big enough for social interactions". Therefore, the space for social interaction and hosting resident's guests become an essential feature of the building design for singletons.

## *Division between public and private*

Those living alone value their privacy as singletons are used to controlling their space and way of living. Therefore, privacy on both dwelling and building scale is essential for this target group. People value the opportunity to socialise other than being forced to become a part of a community, as Nadiya mentions: "I would like to communicate with others in shared space, so I can always stand up and go to my private apartment. I would like to be independent regarding what to do.". As shared spaces are dedicated to activities that are not private, residents can not complain of being seen by others. For example, Mariia mentions: "I do not mind spending time in the courtyard even when I realise that people may look at me from their apartments. This is made to be seen by

others". As seen in case studies, private and shared spaces are usually separated by circulation, which acts as a buffer zone between dwellings and communal areas.

From the other hand, the spaces should be separated by public and private even on dwelling scale as mentioned by several interviewees. As mentioned in the spatial considerations paragraph, even a blind can be an element of zoning, Nazar mentioned the notion of privacy within the dwelling: "Visual separation between bedroom and the rest of the space is a kind of zoning between private and public. It would be weird if my guests sat on my bed. It is important that it is my private place". For coliving dwellings where units can be too small for separation within the room, privacy should be handled on apartment scale. Sofia lived in coliving various times, and lack of privacy is one of the most significant disadvantages, she mentions: "One of the annoying things of coliving is when the sound insulation is bad, and you hear everything that happens in private rooms. Sometimes it isn't easy to talk on the phone. I deliberately chose my private room further from the shared living room, so I do not hear all the sounds from parties, for example". This issue is well articulated in Ourcq Jaures Student & Social Housing, where in social housing dwelling, all communal areas and dwellings are separated by circulation space.

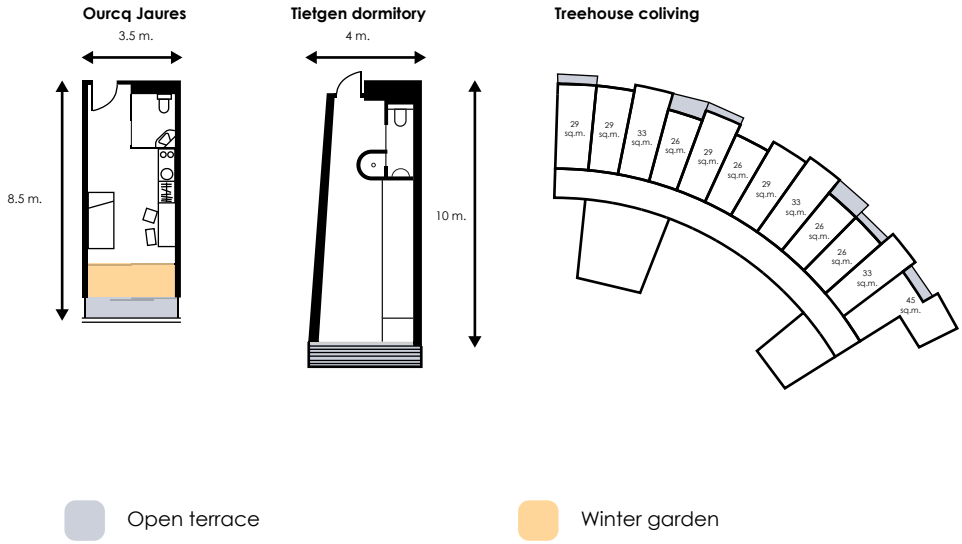


Privacy on the building scale is more connected to security and feeling of safety. As people value additional functions within the building and understand the appropriateness of commercial functions being public, there is a need to separate public and private areas spatially. For example, Anton mentions: "I would not like to have a café or shop in the building because it would attract lots of strangers. I think privacy and security are more important than additional functions. Alternatively, at least for such functions to be separated from the main entrance".
Furthermore, the security of the shared courtyard is fundamental as mentioned by Nazar: "It is important to have a physical separation between the public street and shared courtyard. There could be public functions within the building but with separate entrances". As seen in all case studies, commercial and public programmes are located on the ground floor, so, sometimes with a separate public entrance as seen in Treehouse coliving.

### *Connection to outdoors*

Connection to outdoors is an important design feature for all types of households; however, for singletons, it is crucial as they tend to spend much time by themselves at home and connection to outdoors can be kind of socialising. As most singletons live in apartments other than houses, balconies and loggias are considered as buffer zones between indoors and outdoors. While some interviewees mentioned the functionality of the balcony, others focused on the way it connects to adjacent streets. For example, Nadiya values the comfort of such a space: "I like glazed balconies; I can open the window if I want to breathe some fresh air and look outside". On the other hand, for Anton, the glazed balcony is not a preferable option: "It would be nice to have a balcony, especially an open one. I have a balcony right now, but I never spend time there because I store things there and it is also glazed, so it does not feel like an outdoor space. If I had an open balcony, I would certainly spend more time there. However, it also depends on a view". There is also an in-between option as mentioned by Nazar "I wanted to have a balcony, maybe shielded from sides and top so I can spend time there during bad weather". As Nazar lived in the UK, the comment regarding shielding from the top is very appropriate due to the frequent rainy weather. Such a design requirement is well articulated in Ourcq Jaures Student & Social Housing, where the outdoor area consists of two parts: winter garden and an open terrace. Such a division provides an opportunity to experience outdoors for the whole year.

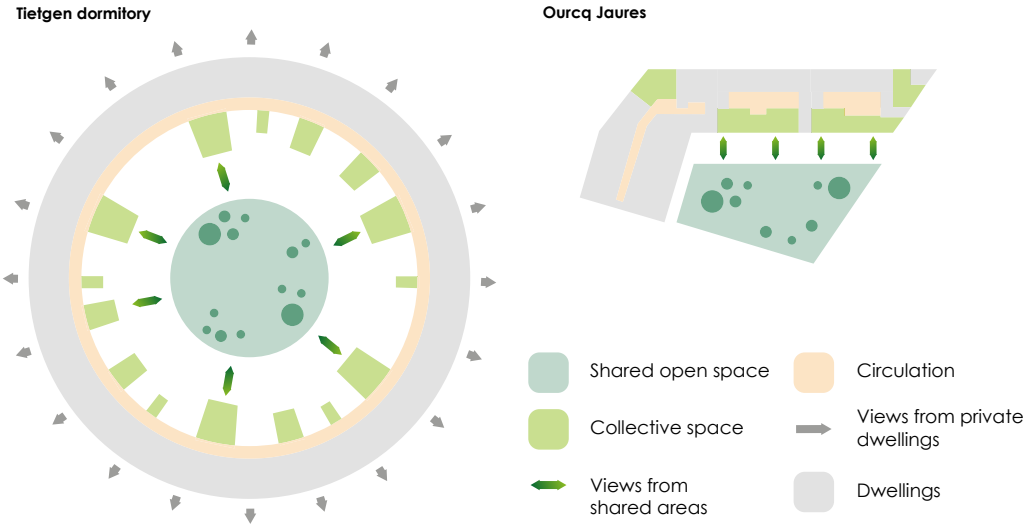
Whether glazed or open, the balcony should be spacious enough to fit some programme, the balcony which is too small most probably will not be used. Mariia lived in the coliving and had precisely this problem: "We had a balcony in our unit, but no one used it except for smoking. It was quite small, and it was impossible to fit any furniture there". Bigger balconies are as crucial for cohousing as for coliving, Tetiana lives alone in the apartment and mentions: "It would be nice to add some furniture there and spend time outdoors". As some people prefer to spend more time on balconies, the variety of balcony sizes could be provided as seen in Tietgen dormitory, where the size of the terrace varies. Moreover, the size of the terrace is not proportional to the room size, which makes balconies financially affordable for all residents.




## *Views from apartments*

While balconies and loggias provide a functional advantage to singleton's apartment, the view from the apartment can improve the overall mood of the resident. It was unexpected that almost all interviewees said that the view towards adjacent streets is better than having the view facing the inner courtyard. The reason was connected to the fact that people and situations along

adjacent streets frequently change while the courtyard activities and people usually remain constant. Furthermore, the choice of windows facing adjacent streets is also connected to levels of privacy as mentioned by Anton: "I would prefer to have a view of the street. It is more important how loud it is, and adjacent streets can be quieter and also more things happening, the image is always changing. When windows face inner space, even if there are blinds over the windows, it is still not private enough; people can still see you across the courtyard. It can also provide some spontaneous visits as people will know when I am at home, I prefer to control my free time myself. So, it is better not to be exposed to a shared courtyard". Nazar also had a similar view on facing the courtyard: "I would like to have a view on an adjacent street. I can see how people move not only seeing my neighbours as in the case of looking into the courtyard. Also, if the window is looking into the courtyard, your neighbours know what you do". To summarise, the main concerns of facing the inner part of the building block is a lack of privacy as well as the repetition of people and programmes within the courtyard. The noise was also mentioned as one of the disadvantages of apartments facing the square, as Stanislav says: "I had windows looking into the courtyard when I lived in student housing, and it was too loud. So it was a negative experience". The requirement of dwellings to face adjacent streets is not necessarily evident as someone could expect solo dwellers to enjoy observing shared spaces. However, case study analysis shows that this is a successful way of placing the dwellings as seen in Tietgen dormitory and Social housing part of the project by Lacaton Vassal.



## *Additional functions within a building*

People spend lots of time on transportation while living in big cities, so, including additional functions within the building can be beneficial both timewise and concerning comfort. Moreover, as dwellings for singletons are usually not spacious enough to fit all the functions, shared spaces within the building can compensate for lack of private space. The requirement of functions is subjective and requires further research on the M4H site to conclude which ones are lacking at this particular site. However, there is a relation between the required functions and a specific person's occupation, age. The analysis of interviewees replies could help to define the appropriateness of a particular function for a particular subgroup of singletons.

In the building with single-person households, the place for socialising is a priority. It was specifically mentioned by Nadiya, who is widowed elderly, and there are not many places to go except for the building where she lives. Nadiya notes: "The hall would be nice to come and talk to other residents or get to know others... just a place for communication". Even though a place for communication seems like a successful design intervention, there are many things that could go wrong. Stanislav reflects on the common room in student housing where he rented a studio: "We had a common room in the building, but it was in the basement, so it was not comfortable at all to study there. I would probably study in such a room if it was designed appropriately". Furthermore, Nazar lived in the same building in another year and also reflected negatively on the location of the common room: "The common room was quite small, and there was both study and play areas. So, it was impossible to study there. It was not spatially separated". As noted by Stanislav and Nazar, the location of such a space can negatively affect the willingness of residents to socialise.
On the other hand, lack of space can also have a negative influence as noted by Maria: "It would be nice to have a large common room per floor for example. If there were only one room for the whole building it would be the same as laundry that you have to queue to use it". The placement of shared areas plays a crucial role in its success. In all 4 case studies, shared spaces are placed next to the building entrances making observable while entering the building. However, small collective areas are introduced per floor in Niu coliving, Treehouse coliving and Student housing part of Ourcq Jaures project. Therefore, locating remote shared areas per floor is essential, especially in cohousing buildings where residents do not share a kitchen or living room.

Furthermore, most of the interviewees mentioned shared terrace or courtyard as something they lacked in the places they lived in. Anton says: "It would be

nice to rent a space for a company of friends for example barbecue where I can spend time not only with the community from the building but also with friends from outside". Following this quote, the conclusion can be made that singletons not only strive to be a part of the community within the building but also to use the facilities to host their circle of friends. The courtyard can also become a nice place to socialise as mentioned by Maria: "We had a lobby on the ground floor where we could have a rest. We also had a courtyard in the middle where we sometimes made picnics". Interestingly, open space without a dedicated function can also be a nice place to spend time following the quote of Tetiana: "Right now, there is a courtyard in the building, and I do not spend time there because it is dedicated for children. If it were bigger with some grass, I would make a picnic there, but right now there is no space which is not covered with a playground". Interestingly enough, all 4 case studies have a terrace or open courtyard, and this mostly depends on building location. Tietgen dormitory is located close to the university campus; there is enough open space to include a large shared courtyard, while Niu coliving and Tree-house dormitory are located in a dense part of the city, therefore, providing rooftop terrace is both pleasant and appropriate design decision.

Such additional functions as barbershop were mentioned by Anton and Nazar, while the cafe is an essential function for Nadiya and Maria. Coworking was also mentioned by several interviewees, but such space should combine both open space and small meeting rooms as privacy is sometimes required while working as mentioned by Anton: "I would not use coworking because I have a lot of calls during the workday and it would be uncomfortable both for other people there and me". Therefore, privacy should be considered within shared areas as lack of it could negatively affect the willingness of residents to use shared spaces.

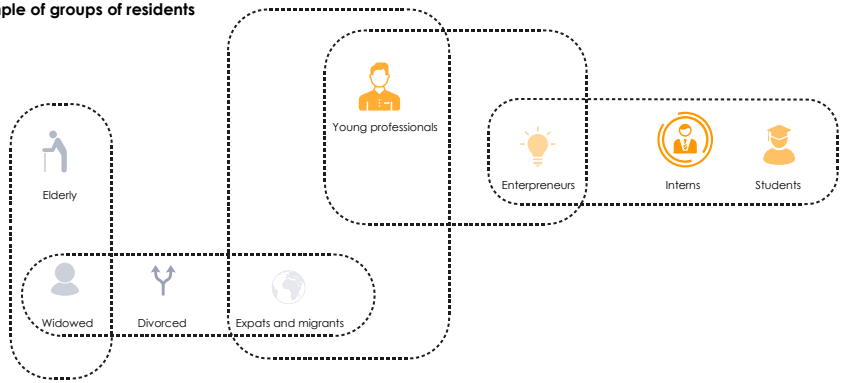
### *Groups of residents on building scale*

Even though singletons seem a constrained target group, it includes people of different ages, interests and occupation. All interviewees noted that they would prefer living in the building with people of similar interests or at least a similar age. This is both applicable for younger generations as well as elderly. Moreo-ver, singletons mentioned that such a community division would positively affect their readiness to communicate with neighbours and become part of the community. On the other hand, they do not exclude the idea of different

**Ourcq Jaures Student & Social Housing**


zoning subgroups within one building, Nazar comments on it: "I would like to live in the building with all types of people, elderly, students and professionals. It would be perfect if all types of people lived in the same building but somehow were zoned by subgroups. Also, there could be an outdoor space where all people can communicate". Such a design decision also suits Nadiya well: "If the building is split into sections per group it is also fine, it is just important to know that if I come to shared space, I know that I can meet people of similar interests". Therefore, locating singletons within one building is not a problem as long as there is a dedicated shared space for different subgroups. Such an intervention is seen in Ourcq Jaures student and social housing project, where subgroups are separated by other entrances as well as introducing separate vertical circulation while being located in the same building. Furthermore, communal green space is provided for both subgroups to communicate, therefore, providing both comfortable division and opportunities to build a community on building scale.

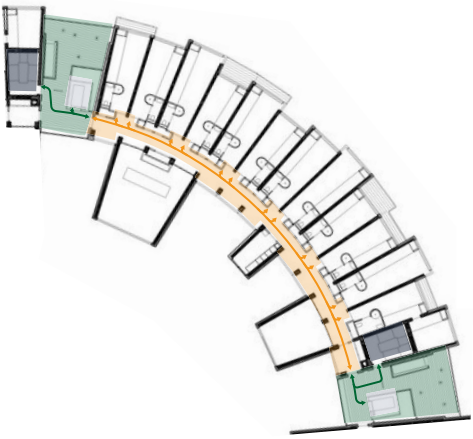
**An example of groups of residents**



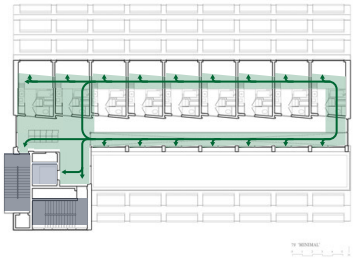
## *Community within the building*

Loneliness is one of the main disadvantages of living alone, so, the design of the building should reflect on the need for socialising and community creation. It could seem that creating proper spaces for socialising with neighbours is enough; however, it was proved wrong during the interviews. Sofia raises an essential condition that could prevent people living alone from socialising: "I only went to shared functions when someone from my unit was there, so I knew that I could talk to someone, not just standing there". People prefer to start building community from the unit scale and move on to building scale. However, this could be more challenging in the case of coliving. Nazar mentions his negative experience of being part of a community while living in cohousing: "I would not go to the event within the building alone, maybe I should know one person to go there. Moreover, the building did not promote social activity. Shared spaces were small, and studios were too small to host guests". Circulation spaces between shared and private areas can become the right place for short talks and getting to know the neighbours as mentioned by Tetiana: "I only talk to my neighbours from the same floor. There is a space next to apartments where we can talk. For example, when I enter or leave the apartment". Creating smaller, less public places with no dedicated function can be an excellent

**Tietgen dormitory**



**Treehouse coliving**



Collecitve zone

Circulation within the unit

Collective circulation

way to introduce neighbours to each other without exposing themselves to the community of the whole building. Such spaces are introduced in Treehouse coliving; it consists of sofas where residents can spend time without a dedicated programme. On the other hand, in Tietgen dormitory residents, of different units can meet while using vertical circulation halls. Such space is also located along the main circulation route, making accidental social interactions possible.

It could seem that coliving residents would not be interested in becoming part of the more significant community. However, Sofia had multiple experiences of coliving. For her, this remains an essential factor: "I would like to build a community on building scale because it is not certain that you will be friends with people from your unit". Maria is also interested in building community on a bigger scale; however, the building where she lived was not appropriately designed for this: "In our block, for example, we arranged mafia games, but because there was no bigger shared space, we did it in the living room in a neighbouring flat, but it was not very comfortable". To summarise, in the example of cohousing, the private unit should be big enough to host guests and initially getting to know people on a smaller scale. The coliving concept is more straightforward as residents of one unit tend to get to know each other quite fast; however, it is crucial to provide adequate space for them to communicate within the unit.

## *Conclusions*

Dwelling design has a significant influence on mental health and well-being. As concluded by interviews, the wish to communicate with neighbours can be both decreased and increased by apartment design. Combating loneliness is the focal point of this research, and several design principles were found to promote social interaction on the unit scale in the case of coliving and on building scale in cohousing design. For example, people prefer to socialise with neighbours of similar age or background; however, they are interested in getting to know others in bigger shared areas. This leads to the conclusion that the community should grow from smaller to bigger scale within the building and neighbourhood.

Nevertheless, private areas for singletons should be designed to fit their requirements as poorly designed personal space decreases the overall well-being of

the resident, and they no longer want to spend time within the community. While combating loneliness is the main focus of dwelling design for living solo, privacy should be taken into account. The notion of singletons arose from individualisation; therefore, these people require the opportunity of being alone and feeling secure about their privacy. The building design should provide opportunities for communication, not necessarily creating various instances of unpredictable social interactions. Providing places for communication within cohousing can be more challenging than in coliving; however, smaller shared spaces per floor can be an excellent place to start building community. To summarise, the same precision should be used while designing private and shared rooms for the solo dwellers. In order for shared spaces to be vibrant and frequently used, the basic needs of the residents should be covered in private dwellings.

**Main principles of successful dwelling design for singletons**

## *Bibliography*


Abu-Gazzeh, T. (1999) Housing layout, social interaction and the place of contact in Abu-nuseir, Journal of Environmental Psychology, 19, pp. 14–73.

Alwin, D., Converse, P., & Martin, S. (1985). Living Arrangements and Social Integration. Journal of Marriage and Family, 47(2), pp. 319-334.

Arling, G. (1976) The elderly widow and her family, neighbours and friends. Journal of Marriage and the Family 38 pp. 757-768.

Arling, G. (1976). Resistance to Isolation among Elderly Widows. The International Journal of Aging and Human Development, 7(1), pp. 67–86.

Baum, A. & Valins, S. (1977) Architecture and Social Behaviour: Psychological Studies of Social Density

Beck, U., & Ritter, M. (1992). Risk society: Towards a new modernity. London: Sage Publications.

Beck, U., & Ritter, M. (2013). Risk society. Los Angeles: SAGE.

Bennett, A. (2005) In defence of neo-tribes: a response to Blackman and Hesmondhalgh. J Youth Stud 8(2): pp. 255–259

Berger, P., . Berger, H. Kellner (1975) Das Unbehagen in der Moderniteit.

Berrington, A. and M. Murphy. (1994). Changes in the living arrangements of young people in Britain during the 1980s. European Sociological Review 10 (3) pp. 235-257

Beutel, M.E., Klein, E.M., Brähler, E. et al. (2017) Loneliness in the general population: prevalence, determinants, and relations to mental health. BMC Psychiatry 17, 97

Boseley S. (1999) Cheating, lying, and sleeping with the boss: is this the young person's route to success, The Guardian, 14 July.

Cacioppo, J., & Patrick, W. (2009). Loneliness (pp. 37-51). New York: Norton.

Chodorov, F. (1952). One is a Crowd: Reflections of an Individualist.

Cox, H., (2016). "Communal Living Moves Upmarket in London, New York and Hong Kong." Retrieved from: http://search.proquest.com.ezproxy.spl.org/-docview/1792238542/citation/8BD11B2BDED34040PQ/28.

Deane, J. (2016). Self-Employment Review.

d'Hombres, B., Schnepf, S., Barjakovà M., & Teixeira Mendonça, F. (2018) Loneliness across Europe,

Eating, H. (2019) Social isolation, loneliness in older people pose health risks. (2019). Retrieved 1 December 2020, from https://www.nia.nih.gov/news/social-isolation-loneliness-older-people-pose-health-risks#:~:text=Health%20effects%20of%20social%20isolation,Alzheimer's%20disease%2C%20and%20even%20death

Ehsan, A., Bolano, D., & Spini, D. (2020). Reducing loneliness in older adults: looking at locals and migrants in a Swiss case study. European Journal Of Ageing.

Festinger, L., Schachter, S. & Back, K. (1950) Social Pressures in Informal Groups, StanfordUniversity Press

Fuller G., (2015). You're Not Alone: A Whopping 64 Percent Of Millennials Are Single. Elite Daily. May 9, 2015. Retrieved from https://www.elitedaily.com/dating/millennials-singlepoll/1060449.

Furstenberg, F., Kennedy, S., Mcloyd, V., Rumbaut, R., & Settersten, R. (2004). Growing Up is Harder to do. Contexts, 3(3), 33-41.

Gandini A. (2016) Coworking: The Freelance Mode of Organisation? The Reputation Economy. Palgrave Macmillan, London

Glaser, K., Tomassini, C., Racioppi, F., & Stuchbury, R. (2006). Marital disruptions and loss of support in later life: A longitudinal study of the United Kingdom. European Journal of Ageing, 3, pp. 207–216.

Grillo, R. (2007) Betwixt and between: trajectories and projects of transmigration. J Ethnic Migrat Stud 33: pp. 199–217

Grozdanic, L. (2016). How Coworking and Coliving Are Redefining Space as a Service. ArchDaily.

Hall R. and Ogden P.E. (2003), The rise of living alone in Inner London: trends among the population of working age, Environment and Planning, A, 35, 875–78, 880–83, 886;

Hall, R., Ogden, P. & Hill, C. (1999) Living alone: evidence from England and Wales and France for the last two decades, Changing Britain: Families and Households in the 1990s

Haney, C., Lynch, M., (1997) Regulating prisons of the future : The psychological consequences of solitary and supermax confinement. New York University Review of Law and Social Change 23 pp. 477-570

Hardy, A., Gretzel, U., Hanson, D. (2013) Travelling neo-tribes: conceptualising recreational vehicle users. J Tour Cult Change 11(1–2): pp. 48–60

HAREVEN, T., & TILLY, L. (1981). SOLITARY WOMEN AND FAMILY MEDIATION IN AMERICA AND FRENCH TEXTILE CITIES. Annales De Démographie Historique, 253-271.

Hayden, D. (2002). Redesigning the American dream (2nd ed.). New York: W.W. Norton & Company.

Heath S. & Kenyon L. (2001) Single Young Professionals and Shared Household Living, Journal of Youth Studies, 4:1, pp. 83-100

Holmes, T. H., & Rahe, R. H. (1967). The social readjustment rating scale. Journal of Psychosomatic Research, 11(2), pp. 213–218.

Holt-Lunstad, J., & Smith, T. B. (2016). Loneliness and social isolation as risk

factors for CVD: implications for evidence-based patient care and scientific inquiry. Heart (British Cardiac Society), 102(13), pp. 987–989.

Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and Social Isolation as Risk Factors for Mortality: A Meta-Analytic Review. Perspectives on Psychological Science, 10(2), pp. 227–237.

Homans, G. (1968) Social Behaviour—Its Elementary Forms

Huet, E. (2017). What Life Is Like Inside WeWork's Communal Housing Project. Retrieved from: https://www.bloomberg.com/news/articles/2017-11-02/what-life-is-like-inside-wework-s-communal-housing-project.

Hughes M., Gove W., (1981) Living Alone, Social Integration, and Mental Health. The University of Chicago Press Journals.

Hughes, M. & Gove, W. R. (1981) Living alone, social contact and psychological well-being. American Journal of Sociology 87 pp. 48-74

Jacob, L., Haro, J.M., Koyanag,i A. (2019) Relationship between living alone and common mental disorders in the 1993, 2000 and 2007 National Psychiatric Morbidity Surveys. PLoS ONE 14(5)

Jung S. (2004) Evaluation of community planning and life of senior cohousing projects in northern European countries, European Planning Studies, 12:8, pp. 1189-1216

Kamer L. (2020) Netherlands: average age at marriage, by gender 1950-2019 | Statista. (2020). Retrieved 1 December 2020, from https://www.statista.com/statistics/520103/average-age-at-marriage-in-the-netherlands-by-gender/

Kamer L. (2020) Netherlands: number of single-person households 2000-2019 | Statista. (2020). Retrieved 1 December 2020, from https://www.statista.com/statistics/888067/number-of-single-person-households-in-the-netherlands/

Katz, N. (2016). The Evolution of Co-Living. Retrieved from https://www.linkedin.com/pulse/evolution-co-living-nick-katz-frics/.

Klinenberg, E. (2012). Going solo (pp. 9,11,15,17).

Kopec, D. (2006). Environmental Psychology for Design. p.127

Kuper, L. (1953) Living in Towns

Levin I, (2004) Living apart together: a new family form, Current Sociology, 52, 2, 223–240

Lowenthal, M. F. (1964) Social isolation and mental illness in old age. American Sociological Review. 29

McCamant, K., & Durrett, C. (2011). Creating Cohousing: Building Sustainable Communities. Canada: New Society Publishers.

McLaren, E., (2012). Marriages in England and Wales - Office for National Statistics. Retrieved 1 December 2020, from https://www.ons.gov.uk/people

populationandcommunity/birthsdeathsandmarriages/marriagecohabitationandcivilpartnerships/bulletins/marriagesinenglandandwalesprovisional/2012-02-29

Mohn, T. (2017). The Digital Nomad Life: Combining Work and Travel. Retrieved from :http://search.proquest.com.ezproxy.spl.org/docview/1883175245/abstract/4D4230ED3E6E4E09PQ/17.

"Netherlands: household size, by number of residents 2009-2019 | Statista. (2020). Retrieved 1 December 2020, from https://www.statista.com/statistics/521792/netherlands-average-household-size-by-number-of-residents/

"Netherlands: Total number of households, by type 2019" | Statista. (2020). Retrieved 1 December 2020, from https://www.statista.com/statistics/519863/total-number-of-households-in-the-netherlands/

Novotney, A. (2020). The risks of social isolation. Retrieved 1 December 2020, from https://www.apa.org/monitor/2019/05/ce-corner-isolation

O'Brien, S. A. (2016). WeWork Gets into Housing. Retrieved from : http://search.proquest.com.ezproxy.spl.org/docview/1778467317/abstract/545B683DE09041A4PQ/21.

Ortiz-Ospina, E. (2019) The rise of living alone: how one-person households are becoming increasingly common around the world. Retrieved from : https://ourworldindata.org/living-alone

Ortiz-Ospina, E. (2020). The rise of living alone: how one-person households are becoming increasingly common around the world. Retrieved 1 December 2020, from https://ourworldindata.org/living-alone

Osborne, R, Best Practices for Urban Coliving Communities (2018). Interior Design Program: Theses

Perlman, D., & Peplau, L. (1984). Loneliness research: A survey of empirical findings. L. A. Peplau & S. E. Goldston, 13–46.

Putnam, R. (2000). Bowling alone (p. 327). New York.

Ruiu, M. L. (2016). The Social Capital of Cohousing Communities. Sociology, 50(2), pp. 400–415.

Semuels A. (2015). Dorms for Grownups: A Solution for Lonely Millennials? The Atlantic, November 6, 2015. Retrieved from: https://www.theatlantic.com/business/archive/2015/11/coliving/414531/.

Singlelensberg, J. (1993) Experience from Co-housing Schemes in The Netherlands, pp. 41–50.

Skjaeveland, O., Garling, T. & Maeland, J. G. (1996) A multi-dimensional measure of neighbouring, American Journal of Community Psychology, 24, pp. 413–435.

Slavin, R.E., Hurley, E.A., Chamberlain, A. (2003) Cooperative learning and achievement: theory and research. Handb Psychol.

Stroebe, W., & Stroebe, M. S. (1987). Bereavement and health: The psychological and physical consequences of partner loss. Cambridge University Press.

The Decline of Marriage and Rise of New Families (2010). Retrieved 1 December 2020, from https://www.pewsocialtrends.org/2010/11/18/ii-overview/

Torres-Antonini, M. (2001). Our common house (p. 17). [Gainesville, Fla.]: University of Florida.

Vestbro, D.U. (1998) The study of collective housing: a Swedish perspective, The Meaning and Use of Housing, pp. 405–424.

Victor C.R., & Bowling A. (2012). A longitudinal analysis of loneliness among older people in Great Britain. Journal of Psychology: Interdisciplinary and Applied. 146(3), 313,320

von Zumbusch, J.S.H., Lalicic, L. (2020) The role of co-living spaces in digital nomads' well-being. Inf Technol Tourism 22, pp. 439–453

Wall, R. (1978). The Age at Leaving Home. Journal of Family History, 3(2), 181–202.

Wang, B., Schlagwein, D., Cecez-Kecmanovic, D., Cahalane, M. (2019) Digital nomadism and the market economy: resistance and compliance.

Williams J. (2005) Designing Neighbourhoods for Social Interaction: The Case of Cohousing, Journal of Urban Design, 10:2, pp. 195-227

Williams, J. (2008) Predicting an American future for cohousing. Futures 40: pp. 268–286.

Witters, D., & Agrawal, S. (2012). Entrepreneurship Comes with Stress, But Also Optimism. Retrieved 1 December 2020, from https://news.gallup.com/-poll/159131/entrepreneurship-comes-stress-optimism.aspx

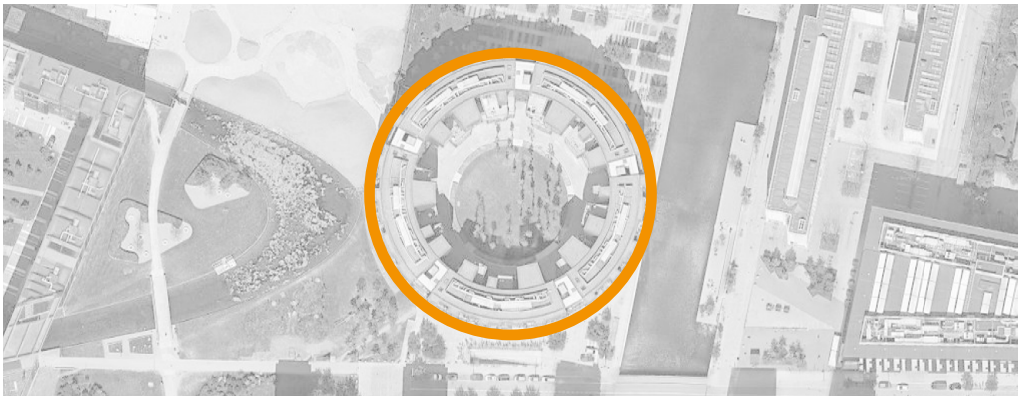
# Plan analysis

**Tietgen dormitory**

**Niu coliving**

**Ourcq Jaures Student & Social Housing**

**Treehouse coliving**



## TIETGEN DORMITORY

**Architects** Lundgaard & Tranberg Architects

**Location** Copenhagen, Denmark

**Year** 2005

**Type of dwellings**

Dwellings with private bathroom and bedroom

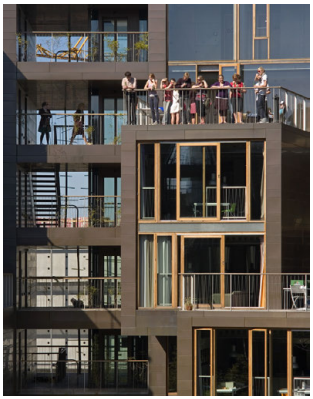
**Number of dwellings** 360

**Dwelling size** 26 - 45 square metres

The shape of the building is inspired by Tulou-buildings that took a reference from the south-east of China. Such building typology was used in China for the dwellings in small villages where both private homes and communal areas were in respect. The project is located in Copenhagen, close to the university and provides residences for 400 students. Tietgen dormitory has a circular form as a reference to equality. The simple shape of the building is contrasted by the smaller offsets that express individual residence from exterior and communal functions from the inner side. Different sizes of homes, as well as balconies, create a vivid rhythm of the facade. The neighbouring buildings are predominantly designed in square shape and with use of steel, while Tietgen dormitory stands out with wooden facade and circular shape.

This building perfectly fits the needs of the target group - the students. Laundry room, party room, computer areas and bike parking are all included in the project. To make such a vast building look home-like, the timber was used as the main facade element. Moreover, smaller offsets from the exterior (residential units) and the bigger ones from the interior (collective functions) bring the facade and the project overall closer to human scale.

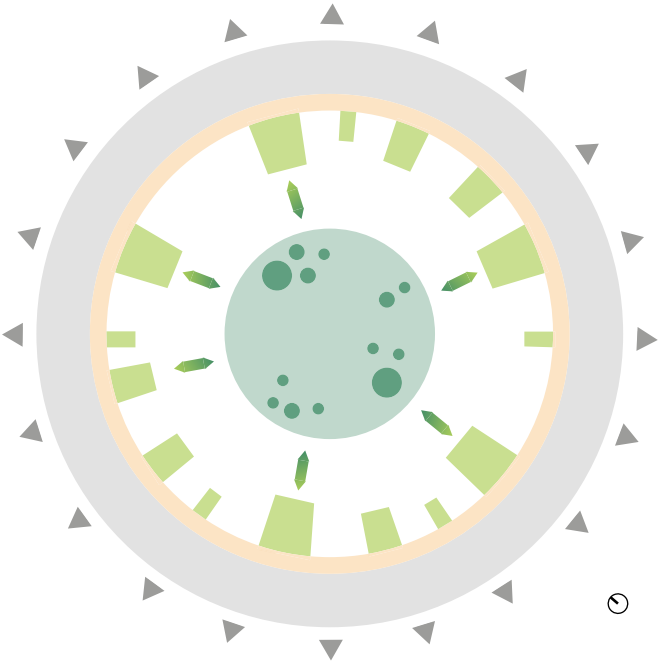
Image 1-6 Retrieved from : https://www.archdaily.com/474237/tietgen-dormitory-lundgaard-and-tranberg-architects



## TIETGEN DORMOTIRY

Zoning

The project has a shape of the circle where 360 (60 dwellings per floor) dwellings are located facing the external site. The primary division between private and public areas is circulation that acts as a buffer zone between dwelling and collective functions facing inner side. Moreover, communal areas are facing the open shared courtyard; this increases collectiveness within the project while preserving privacy within the apartment.



Shared open space

Collective space

Circulation

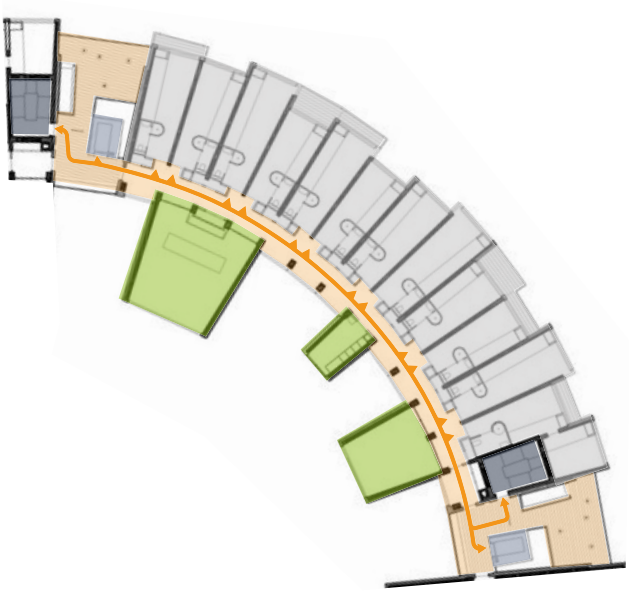
Dwellings

Elevator

Stairs

Each floor consists of 60 dwellings with the division of 5 units with 12 dwellings per unit. The units are separated both visually and physically with vertical circulation hall (elevators and stairs). Such a place provides an opportunity for residents of neighbouring units to meet and build a community on a bigger scale.

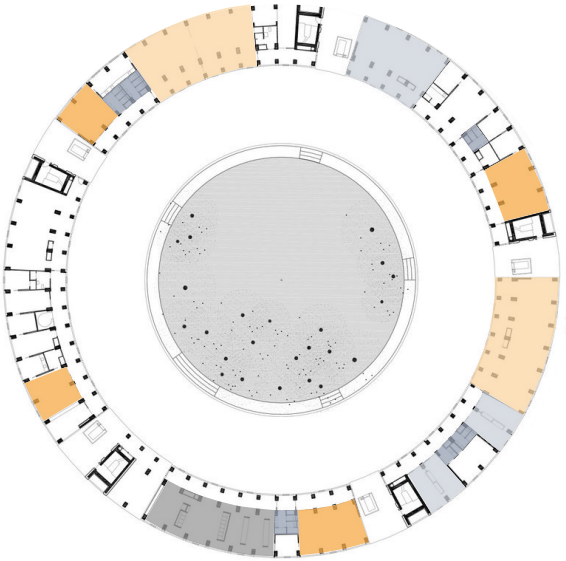
Dwellings are located in a linear manner, similar to gallery typology. Such placement provides enough privacy as the door of the apartment opens towards the circulation route, not open shared space. The corridor acts a buffer between public dwellings and shared amenities (kitchen, storage, living room)



## TIETGEN DORMOTIRY

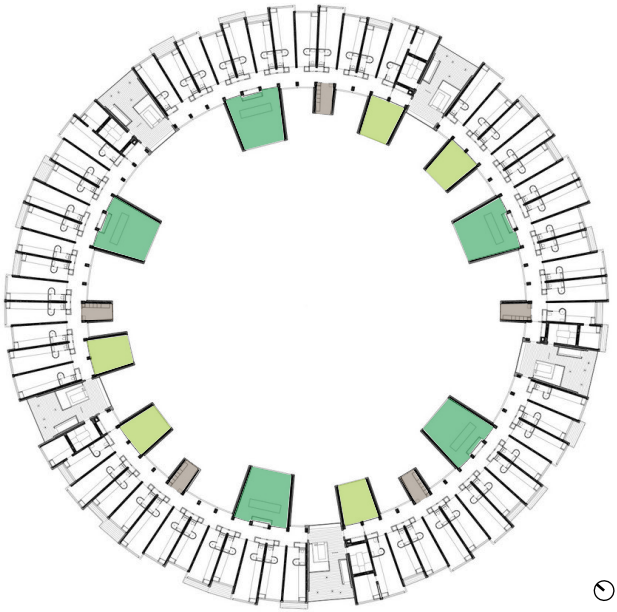
Additional shared/public programme

- Bike garage
- Common area
- Computer lab
- Shared WC
- Laundry
- Shared living room
- Shared kitchen
- Storage



Shared (building)

The ground floor consists of shared functions that meet the requirement of the student target group. Shared laundry, computer lab and bike garage make the daily activities of students more comfortable. Theis also an open courtyard which can be seen from shared functions.
Bike garages are located in various locations for easier access from the garage to elevators and stairs. Similarly, computer labs are placed in multiple spots to zone out shared spaces as well as making the labs less crowded.



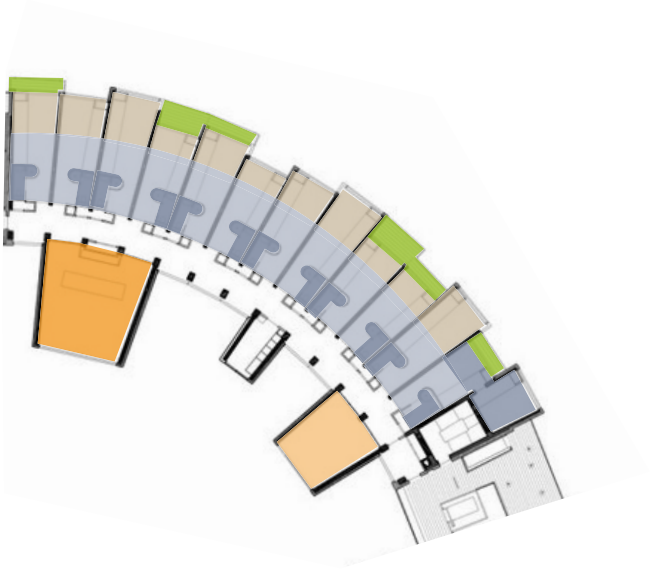
Shared (dwelling unit)

Each dwelling unit consists of 12 apartments and three main shared spaces: kitchen, living room, storage with access to the open terrace. The visual connection between shared functions and collective courtyard increases the feeling of being a part of the community within the building.

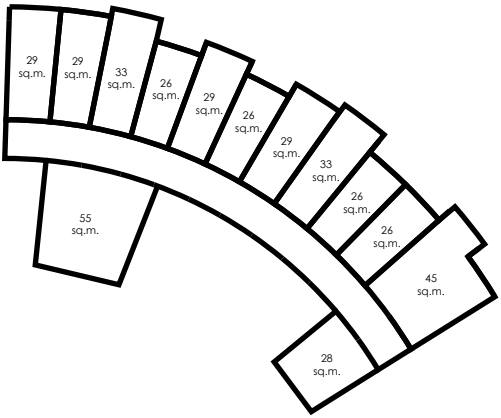
## TIETGEN DORMOTIRY

Residential units

- Kitchen
- Living room
- WC
- Bedroom
- Storage
- Circulation
- Private terrace
- Study space



Each residential units consists of a bed, private WC and study area. Some companies also provide a sofa. The bed is usually located in the middle of the unit and is therefore blocked from the entrance by the shower. Such a design principle allows protecting such private area from visual connection with the hallway while opening the door. Moreover, each room has a french window or terrace. The rooms size and the size of the balcony is not proportional, therefore, giving a chance for students with various financial circumstances to have the balcony.

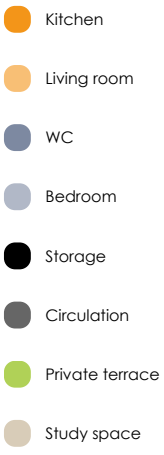


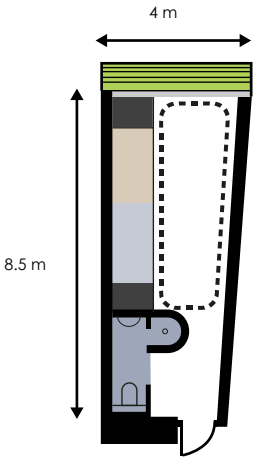

There are nine types of rooms in the project :
26 m.sq. with french window
26 m.sq. with small balcony
26 m.sq. with large balcony
29 m.sq. with french window
29 m.sq. with small balcony
33 m.sq. with french window
45 m.sq. with french window
45 m.sq. with small balcony
45 m.sq. with large balcony

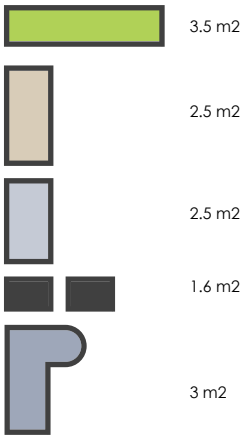
In this project, both interior and exterior private spaces are equally valued. This allows choosing whether to spend time outdoors privately or collectively.

## TIETGEN DORMOTIRY

Dwelling composition



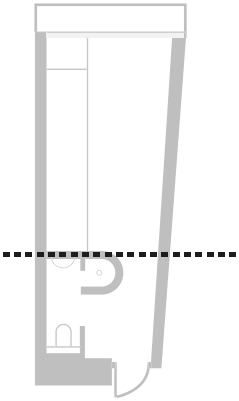



Image 7 Retrieved from : https://www.ltarkitekter.dk/tietgenkollegiet/

This dwelling is an example of coliving project where the living room and kitchen are shared. For this reason, the functions are not included within the residence. There is a large space without a dedicated use which can be customised by the resident for studying, resting or doing sports.
The minimal interior provides opportunities to customise the space. Furniture is designed to store a large number of belongings without decreasing the size of open space. The shower that is designed in circular shape serves as a separation between the entrance zone and private zone. Moreover, the bed is visually blocked by this element.

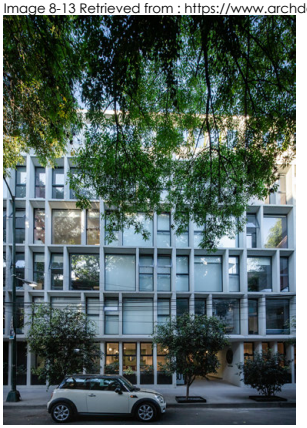
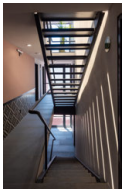
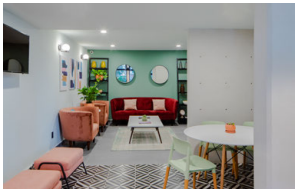
## NIU COLIVING

| | |
|---|---|
| **Architects** | CRAFT Arquitectos |
| **Location** | Mexico city, Mexico |
| **Year** | 2020 |
| **Type of dwellings** | |
| Studios | |
| **Number of dwellings** | 54 |
| **Dwelling size** | 45 square metres |

Niu coliving is an intervention of residential building from the 1960s. Originally the dwellings were about 90 sq. m., however, after redesigning the building for singletons, the size of the dwelling decreased to 45 sq.m.

The main concept of the project is giving a sense of belonging to residents. This is done both architecturally (by providing functional and well furnished private units) and metally ( by providing the resident with opportunities to become a part of the community). Therefore, there are various spaces where residents can communicate and express themselves, such as co-working, gym, playroom, cafeteria and meeting rooms. As the building is targeted on young and intelligent audiences, there are no parking facilities within the project. This is used as a way of promoting the use of public transport or bicycles.

Image 8-13 Retrieved from : https://www.archdaily.com/939081/niu-coliving-craft-arquitectos


## NIU COLIVING

Zoning

The project is designed with corridor typology where the dwellings are located to both sides of the circulation route.
On the ground floor, both shared and private functions are located. These two areas are separated by circulation route where shared functions are facing the street and located next to the entrances.

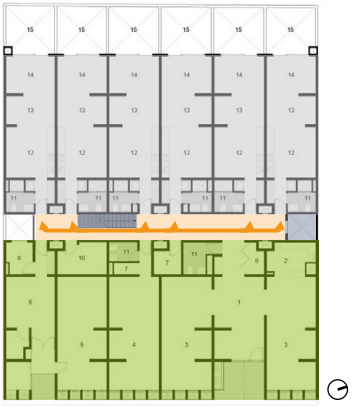




- Shared open space
- Collective space
- Circulation
- Dwellings
- Elevator
- Stairs

Each floor consists of 12 apartments while ground floor combines six apartments and shared spaces.

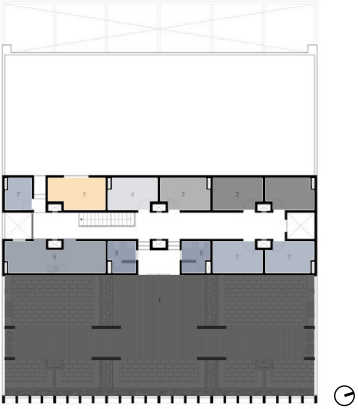
Each dwelling is independent, and several shared areas are provided. Circulation space serves as a buffer zone between private houses. Stairs are located in the middle and elevator is pushed to the side. This distribution promotes the use of stairs as well as bring residents closer for unpredictable social interactions.



## NIU COLIVING

Additional shared/public programme

- Gym
- Reception
- Garbage room
- Machinery room
- Bike storage
- Cafe
- Lobby
- Co-working
- Storage
- Shared WC
- Dressing room
- TV room
- Laundry
- Podcast room
- Meeting room
- Shared terrace



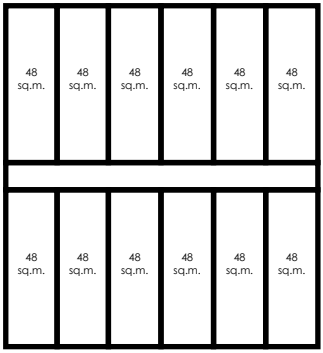
Shared functions are predominantly located on the ground floor with some located on the last floor with entrance to open shared terrace. Bike storage is located next to one of the openings for easier access. The second access is the main one, and residents enter lobby directly from the street. Co-working facilities and cafe are located in close proximity as these functions are programmatically connected. The ground floor also provides two shared WC to minimise circulation between the ground floor and private units for both residents and their guests. By providing shared WC on the ground floor as well as the last floor, the privacy of residents is preserved.
While shard facilities on the ground floor are targeted on both residents and guests, the top floor consists of more private programme. LAundry, podcast room and TV room are located there. Nevertheless, a top floor provides a large open terrace with sitting areas. It is important to note that dwellings are only combined with shared functions on the ground floor to preserve the privacy of the residents.

## NIU COLIVING

Additional shared/public programme

- Kitchen
- Living room
- WC
- Bedroom
- Storage
- Circulation

Dwelling units in Niu Coliving are around 48 square metres which are higher than general studio size. The size is dictated by building structure as the project was refurbished from other function.
The only space physically separated from the general area is WC, where the rest is open space. However, the dwelling is zoned by smaller walls which ct as visual separation without blocking the sunlight from the only window. Due to the depth of the dwelling unit, the window is kept large and space is left open.
Not only the walls make a separation, but also the use of materials. Different tile colours are used in the kitchen and living room area, while the floor in the bedroom area is also covered with a large rug. Such a design decision helps to zone the dwelling activities without making an actual separation.



## NIU COLIVING

Dwelling composition

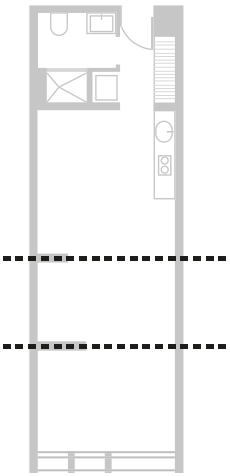



Image 14 Digital image. Retrieved from : https://www.archdaily.com/939081/niu-coliving-craft-arquitectos

The dwelling is larger than the average residence for one person. Therefore, this allows to zone different programme as well as providing the resident with a large table for four people. This will enable the resident to host guests; such a space is essential for cohousing as there are no shared living rooms provided.
By placing the living room between the kitchen and bedroom, the gradual transition between private and "public" is created. This will allow the resident to host guests without exposing the bedroom zone. As seen in the plan, the separation wall between the living room and bedroom is larger than the one separating kitchen and living room. Such spatial arrangement creates two distinct zones: day time activities (living room + kitchen) and night time (bed).

## OURCQ JAURES STUDENT & SOCIAL HOUSING

| | |
|---|---|
| **Architects** | Lacaton & Vassal |
| **Location** | Paris, France |
| **Year** | 2013 |

**Type of dwellings**

Student studios , 2-3 bedroom social housing

| | |
|---|---|
| **Number of dwellings** | 98+30 |
| **Dwelling size** | 19-140 square metres |

The project is separated into two parts - student housing (98) and social dwellings (30). The central concept of the project is the connection of the resident with outdoors. This can be done by using winter garden or balcony. While the south and south-east facade contain extensive winter gardens, the north facade is covered with a continuous terrace. By using thermic and shadow curtains, thermal comfort of the resident is ensured whole year long.

The building does not provide many shared facilities. However, the inner garden is an essential feature of this project. The reason for a small amount of shared programme could be that student housing occupies a smaller part of the building while social housing units are self-sufficient. Therefore, the requirement for shared spaces is lower.

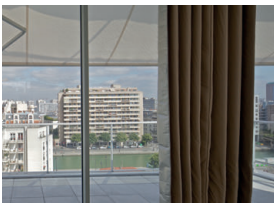
There is not much focus on creating a community within the building. It is focused on providing comfortable and sustainable dwelling conditions for each resident instead.

Image 15-21 Retrieved from: https://www.archdaily.com/476650/ourcq-jaures-student-and-social-housing-lacaton-and-vassal





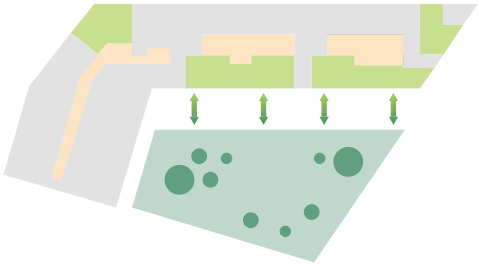




## OURCQ JAURES STUDENT & SOCIAL HOUSING

Zoning

The dwellings are placed in corridor typology in case of student housing while there are only two dwellings per elevator in a social housing case.
Two parts of the building have different target groups of residents as well as typologies. Student housing is therefore located in one wing of the building while social housing in the one with separate vertical circulation.



Shared open space

Collective space

Circulation

Dwellings

Elevator

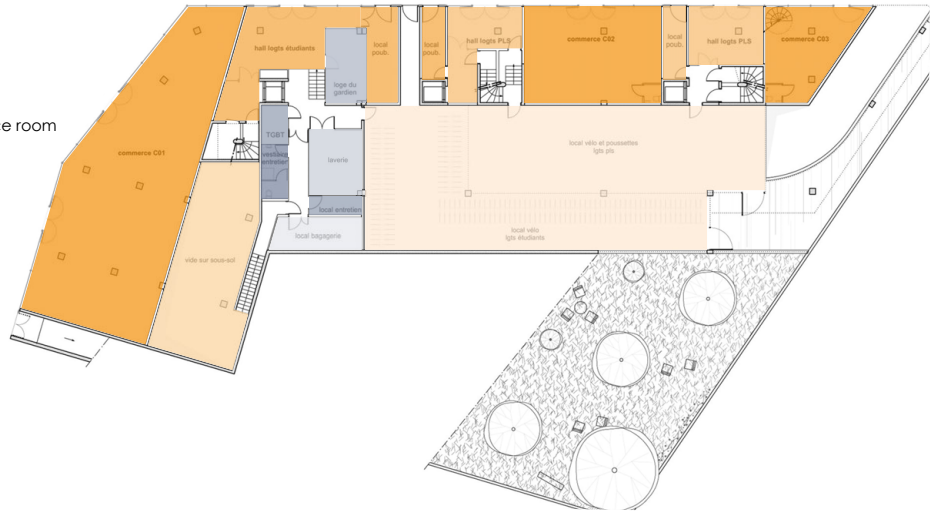
Stairs


Both social housing and student housing are located on each floor of the building. Student housing part consists of 14 private rooms and shared winter garden, separate vertical circulation with elevator and stairs is also located in this part. Social housing part consists of 5 apartments where every 2/3 flats are provided with both elevator and stairs. Apartments vary in size, moreover, there a various types of flats: apartments with two bedrooms, three bedrooms or even four bedrooms. Both students and social housing residents are provided with open balconies, while in some cases both winter garden and terrace are provided within the apartment.

## OURCQ JAURES STUDENT & SOCIAL HOUSING

Additional shared/public programme

- Commercial spaces
- Students entrance
- Social housing entrance
- Basement
- Bike parking
- Luggage room
- Laundry
- Reception
- Maintenance room
- Shared WC



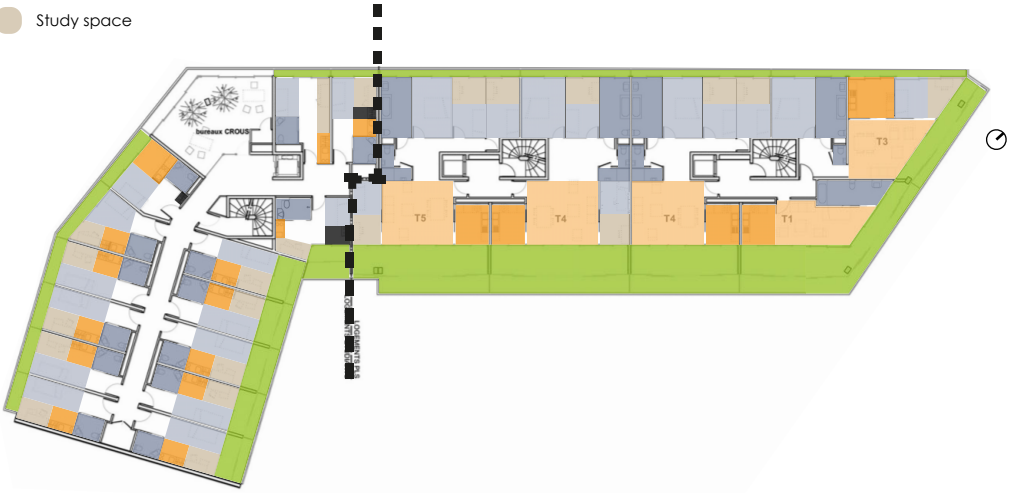

Commercial functions occupy the majority of the ground floor. All of the shops are facing an adjacent street while the inner side consists of bike parking and basement. Along with commercial functions, entrances to both social and student housing are located facing the street. Each access is provided with a small lobby. Moreover, next to the student housing lobby, both luggage and laundry rooms are placed. Luggage room would not be so appropriate for social housing, therefore, locating it in the student wing makes the use of space and circulation more convenient.

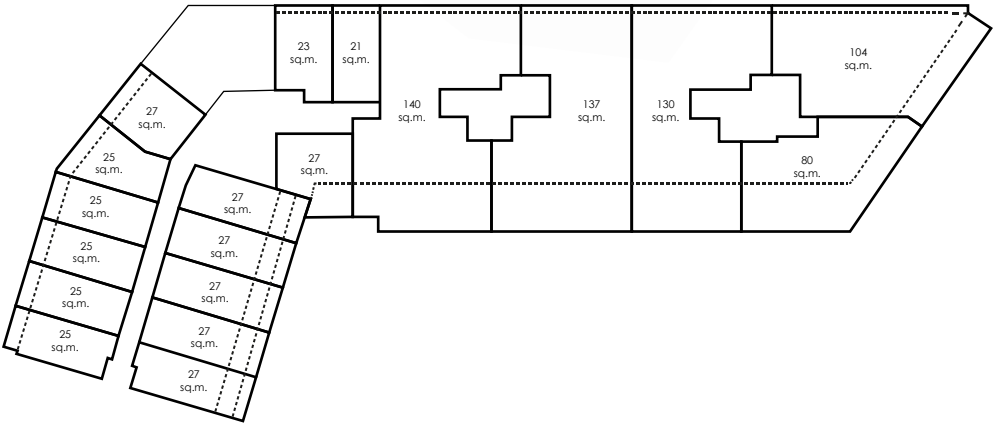
# OURCQ JAURES STUDENT & SOCIAL HOUSING

Residential units

- Kitchen
- Living room
- WC
- Bedroom
- Storage
- Circulation
- Private terrace
- Study space

There is a clear distinction between student and social housing. It is not only separated in the plan, but there is a clear difference in typologies (spatially and in terms of functions). Student housing units are approximately 25-27 square metres. There is also a shared space located close to the elevator and stairs. While student rooms deal with zoning within the apartment, social housing requires zoning within both the apartment and bedrooms. All collective space in the apartment (kitchen, living room) are located on one side of the unit, while bedrooms are pushed to the opposite side. Kitchen and living room are always located next to each other and facing the winter garden. Even though both private and shared areas have access to the balcony, the size of outdoor space varies a lot. Shared spaces mostly face eastern facade with large winter garden and terrace.

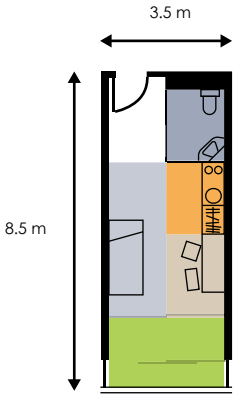


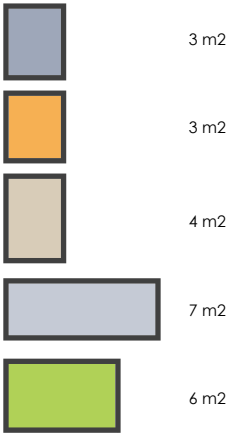



## OURCQ JAURES STUDENT & SOCIAL HOUSING

Dwelling composition

- Kitchen
- Living room
- WC
- Bedroom
- Storage
- Circulation
- Private terrace
- Study space



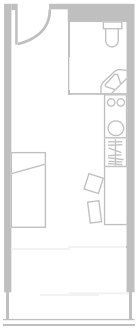



Image 22 Retrieved from: https://www.archdaily.com/476650/ourcq-jaures-student-and-social-housing-lacaton-and-vassal

Study places located closer to the window, and in close proximity to the kitchenette, study table can be used both for working and eating. The bed is located next to the table facing the window. However, such private space as the bed is not visually separated from the entrance as the door opens directly into the open area where the bed is placed.

The size of the dwelling is enlarged by winter garden which can be used around the whole year. This space can be therefore used as a "living room" zone due to the absence of this programme within the dwelling unit.

## TREEHOUSE COLIVING APARTMENTS

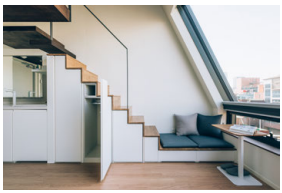
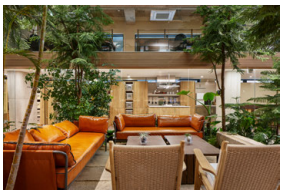
| | |
|---|---|
| **Architects** | Bo-DAA |
| **Location** | Gangnam-Gu, South Korea |
| **Year** | 2018 |
| **Type of dwellings** | |
| Private studios | |
| **Number of dwellings** | 72 |
| **Dwelling size** | 17.5-24.5 square metres |

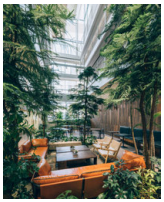
Treehouse coliving is a project that focuses on single-person households and is composed of micro-studios and micro-lofts. It thas a very distinct, mountain-like shape with a large atrium in the middle. The form of the building has a considerable influence on the composition of dwellings as unit type vary floor by floor, from single level apartment to 2-level units and single-level again on the last floor.

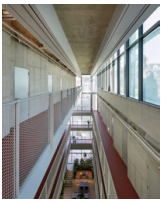
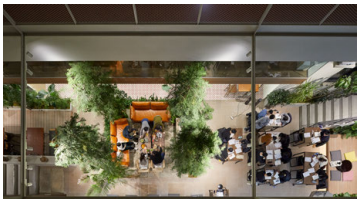
The project is focused on collective functions as there is usually a lack of social contacts in single-person households. There are co-working spaces, large lobby, library and even shared kitchen in the building.

Overall the building is exceedingly filled with sunlight. Large atrium with glazed roof and glazed side facade allows a large amount of the sun into the buildings. Moreover, on dwelling scale, the design principle is similar. Windows take almost the whole area of the facade. Use of large windows and glazed elements allow to balance out small size of dwellings and make the room more spacious.

Image 23-30 Retrieved from: https://www.archdaily.com/932735/treehouse-apartment-building-bo-daa



## TREEHOUSE COLIVING APARTMENTS

Zoning

Treehouse coliving project consists of private apartments for singletons. The size and type of dwellings vary in size depending on the floor. However, the type of flats is the same on a single level.
The dwellings are placed in corridor typology with entrances of the apartments facing the large atrium. The visual connection between apartments is preserved similarly to corridor typology..



Shared open space

Collective space

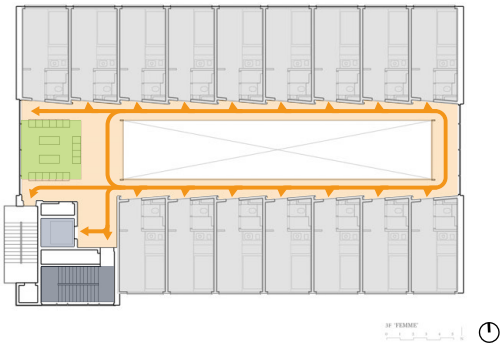
Circulation

Dwellings

Elevator

Stairs

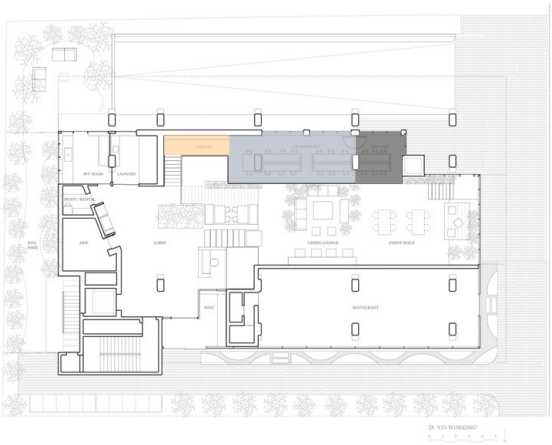
There are 16 apartments per level and one shared space. The shared area with sofas and table is located next to the main circulation route as well as being close to the elevator. Such location makes the potential of social interaction very high.
Even though the atrium physically disconnects apartments on different sides, the visual connection is preserved. This increases both security levels and potential for collectivity.
In most of the floors, circulation is not broken by the atrium and forms a continuous loop around.

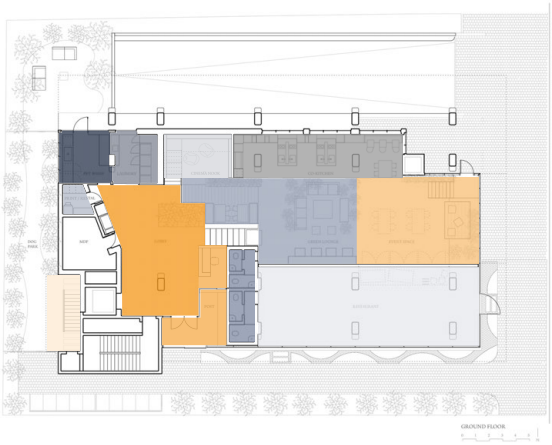


# TREEHOUSE COLIVING APARTMENTS

Shared programme

- Lobby
- Reception
- Event space
- Library
- Bike storage
- Cafe
- Lobby
- Co-working
- Lounge
- Shared WC
- Pet wash
- TV room
- Laundry
- Shared kitchen
- Meeting room
- Shared terrace



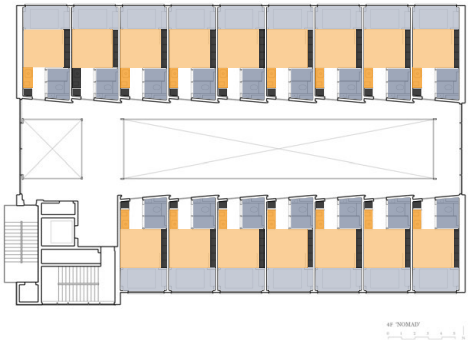


Shared areas in Treehouse coliving are located among three floors: ground, first floor and open shared terrace on the 5th floor. The ground floor provides various shared facilities. Pet wash facilities and laundry are located at the back of the building and are not being exposed to lounger and event space. There is also a shared kitchen on GF that is directly facing the lounge; this creates a visual connection between residents and their guests. As both functions are not private, visual connection increases the possible social interactions. Moreover, the kitchen can be accessed directly from the lounge. While no privacy or concentration os required in the shared kitchen, coworking facilities require at least less noise and concentration. For this reason, coworking is located on the first floor together with a meeting room and library. Therefore, shared functions are split even more by grouping programme per concentration level required.

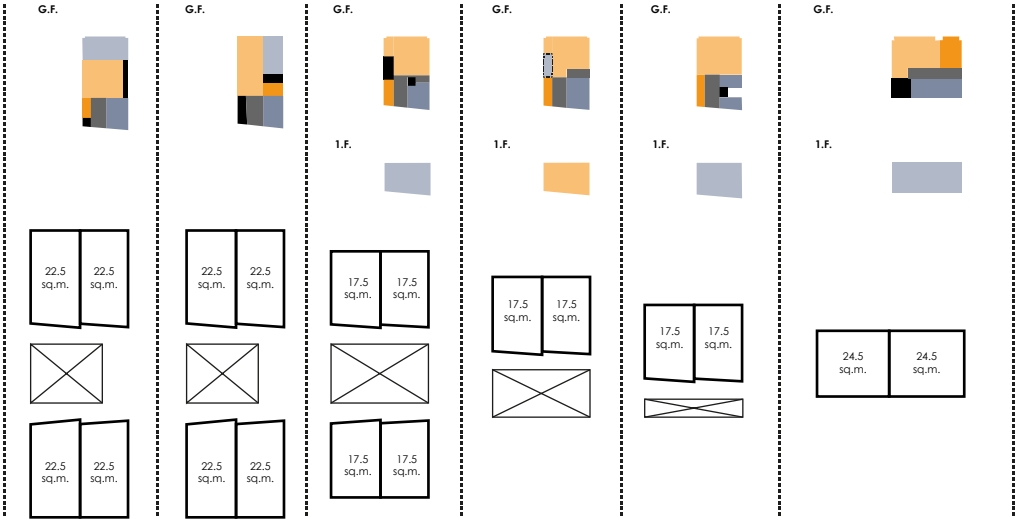
## TREEHOUSE COLIVING APARTMENTS

Residential units

- Kitchen
- Living room
- WC
- Bedroom
- Storage
- Cafe

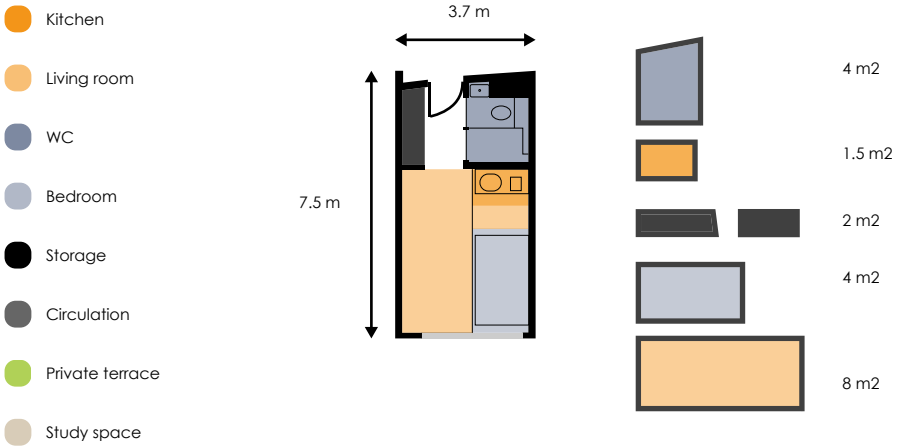


Dwelling units in Treehouse coliving vary in size from 17.5 to 24.5 square metres without taking into account the second level. Apartments with double level are introduced from 5 to 8 floor. On floors 5,6 and 8 bed is located on the second level. On floor seven, the bed is located under the stairs, and the second level is used as a space for storage and acts as a living room. As typology of the dwellings varies per floor, residents with different requirements will be able to choose the unit that suits their needs best.
In the single-level dwellings, the bed is adjacent to the living area and is placed next to the window. The kitchen is either separated from the bedroom with storage or living space. On the other hand, in dwellings with two levels, the division between the bedroom (private zone) and the living room is evident. Even in the case of the 6th floor where the bed is placed on the first level, it is not seen when entering the apartment. Such a design decision respects the privacy of this space. Moreover, the bed is visually enclosed by decorative elements.



## TREEHOUSE COLIVING APARTMENTS

Dwelling composition



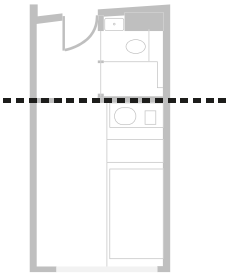
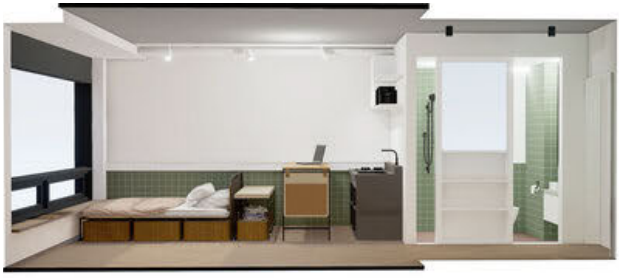
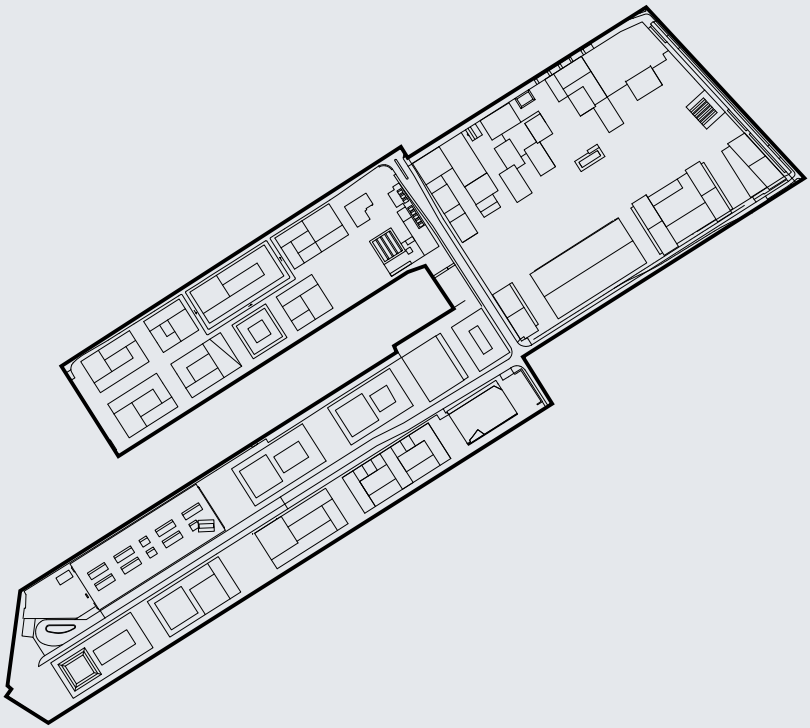



Image 31 http://m.theinvestor.co.kr/view.php?ud=20180807000685



The bed is located facing the window with a living room area being adjacent to it.] from two sides. However, the bed is separated spatially from the kitchen by the table and seating. By placing seating facing the kitchen instead of the bedroom, the visual division between these zones is made.
As coworking facilities are quite extensive in this building, not much space is dedicated to working or studying in the apartment. The most significant focus is on the comfort of the sleeping. This is the reason for placing the bed facing the large window.

# Urban master plan



# Site location

Retrieved from : https://www.google.com/maps/place/Rotterdam,+Netherlands/

Retrieved from : https://brightspace.tudelft.nl/d2l/le/content/278712/viewContent/1962696/View

The site is located in the Rotterdam and is part of the harbour area. M4H has around 80 to 100 years of history and is in use even nowadays. Keilweg surrounds the area from the west and Schiemond district on the east side. While being located in the heart of Rotterdam, the region remains calm and quiet as it is facing the water on south and residential neighbourhoods on the north. Vierhavenstraat and park separate the site from north-east while preserving the visual connection between M4H and surrounding areas. As the times when cargo unloading happened in cities has gone, the area to be redeveloped in the near future.

M4H owes its name to four harbours - Keilehaven, Lekhaven, IJsselhaven and Koushaven. The ports were built in the area for four years from 1912 to 1916. However, in the 1970s due to containerisation, the level of transhipment decreased. Therefore, in 1990 the site was redesigned. The part of Lekhaven was covered to make the space for deep-freeze warehouses where fruits were stored.

Retrieved from : https://brightspace.tudelft.nl/d2l/le/content/278712/viewContent/1962698/View

# M4H and Keilekwartier

The vision for M4H is Rotterdam Makers District where the living becomes a central point as well as creative industries, housing and cultural facilities. The area to become the magnet for individuals striving for personal development as well as a sustainable lifestyle. M4H to become the place for 3500 to 5000 homes in 2035 with a plan to bring 50 000 new homes to Rotterdam housing stock. Therefore, the design assignment is to create dwellings for modern-households with focus on sustainable lifestyle vivid lifestyle.

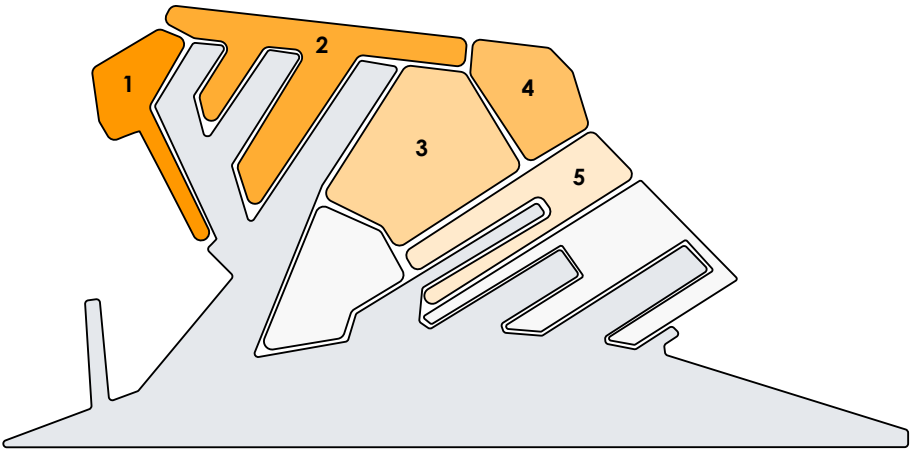
Retrieved from : https://delva.la/projecten/m4h/

While M4H to become the area with a focus on collectivity and circularity, it will also become the place where the future happens. Smart mobility, innovative work environments and new types of dwellings to emerge here. However, the area is split into 5 parts where each of those has its focus.

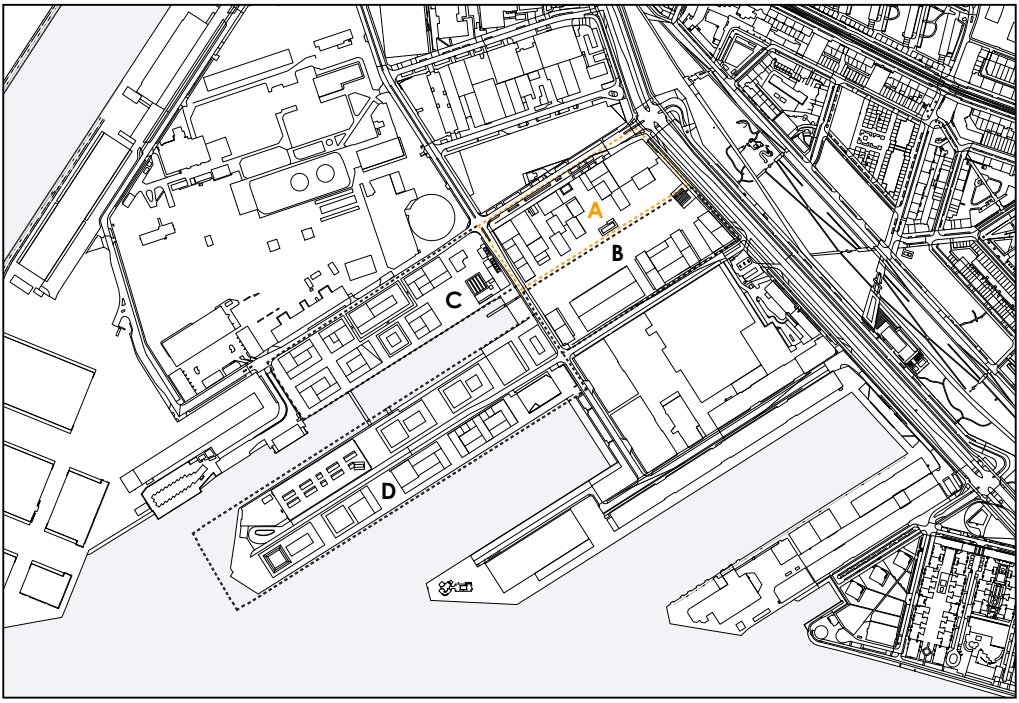
**1. Galileipark** does not provide space for dwellings it is instead focused on large manufacturing companies. The programme will include educational, sports and culture facilities.
**2. Marconikwartier** provides various working and living environments with the highest density among the five areas.
**3. Merwehaven** is mostly focused on houses while providing space for smaller businesses.
**4. Gustoweg** is a place with a focus on traditional manufacturing and creative companies with an area for housing.
**5. Keilekwartier** is an area with a focus on creatives with a focus on live-work environments and creative industries.

Retrieved from : https://delva.la/projecten/m4h/

Retrieved from : https://delva.la/projecten/m4h/



# Urban plan




M4H is divided into four quadrants for the design submission. The image above is an overall impression of an urban masterplan designed within our studio. Even though the area is split in 4, each group tried to design in a way to communicate with neighbouring quadrants.

As seen in the diagram on the right, the area is designed with various parks and squares to increase the vividness of the area as well as collectiveness in open shared spaces. There are various building preserved within the masterplan. Moreover, not only monumental buildings are kept but also the ones that add the value to the site with either creative appearance or future hub for creativity.

Between quadrants A and B, the park continues the shape of the canal, which is also guided by history. The park was previously part of the canal and was filled in as a part of area redesign. Therefore the park is a reference to history.

Orange colour indicates the tall spots (towers) within the masterplan. It is clear that quadrant C and D are the space with most of the elevated points due to its' visibility to another shore. At the same time, building heights in quadrant A and B are kept relatively low at most places to respect the human scale within the park.

# Quadrant A (vision)

The urban plan of Quadrant A is very much focused on preserving the historical values on site. Six buildings are preserved in order to keep the creative appearance as well as a reference to history. Soundport building in the middle of the park is visually exposed from Keileweg street by pushing the volumes out as it gets closer to the monumental building.

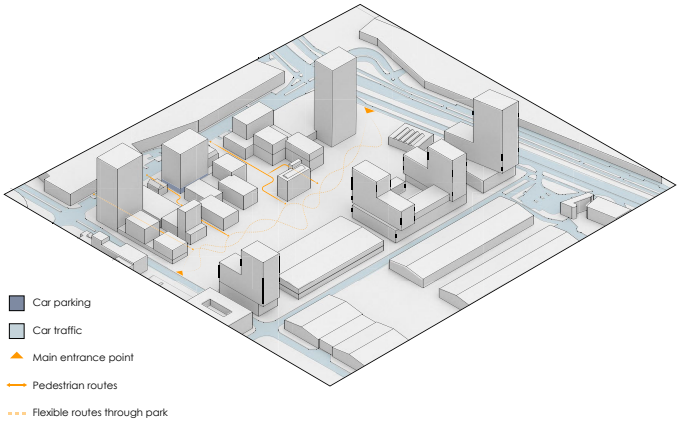
The main idea is a contrast between the urban plan facing the park and the adjacent street. The building faces the Keileweg with straight urban facades while opening in a fragmented and playful manner towards the park. The urban plan suggests various shared green spaces on roofs and pedestrian-only traffic within the quadrant to increase collectivity within the space.

We have worked in a group of 4 on this master plan as part of the graduation project. We, as a group, made a typology transfer exercise to get to the final proposal. During this experiment, we used Strijp S as a reference point and tried to update our quadrant using the principles from the project. We have used such urban design principles as an open green area with exhibition spaces, the tower placed on the warehouse (as seen on the north side of the plot) and preserving maximum buildings for future renovation.

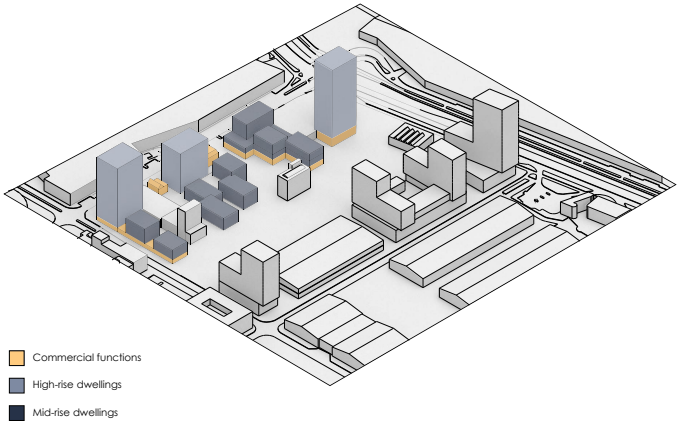
The urban plan is to be used as a suggestion. Therefore, the proposed shape of the building plot does not have to be followed strictly. The way I change the proposed form is seen in the conceptual design chapter.

# Concept diagrams Quadrant A

## Circulation (pedestrian and car)

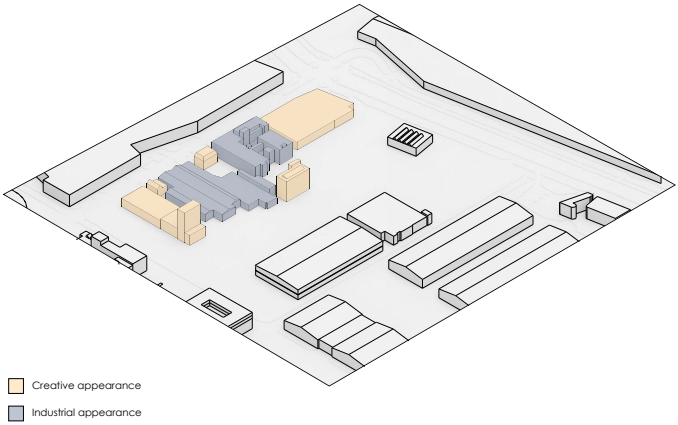



## Dwelling vs commercial

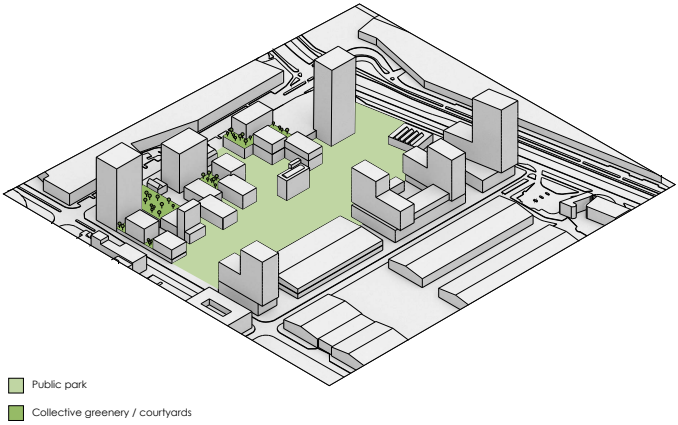


# Concept diagrams Quadrant A

## Appearance

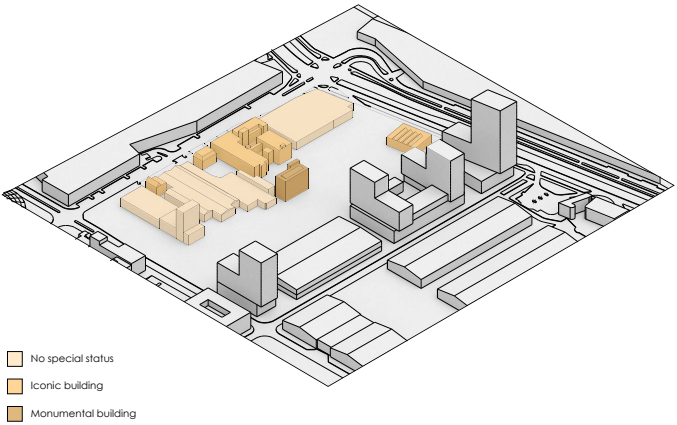



## Greenery (public and shared)

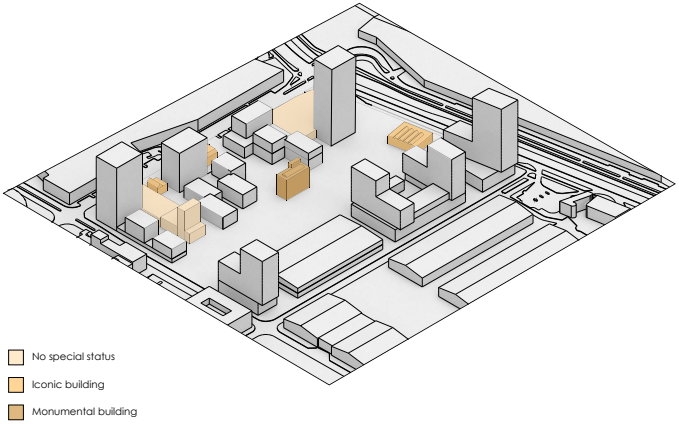


# Concept diagrams Quadrant A

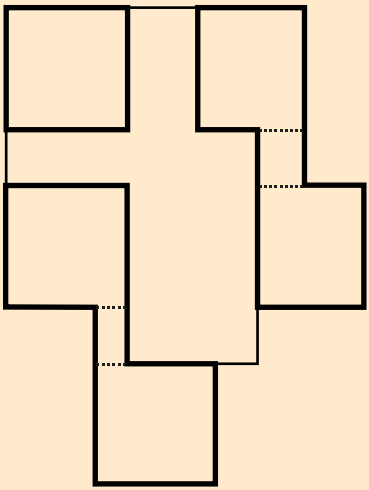
## Initial situation




## Updated urban plan



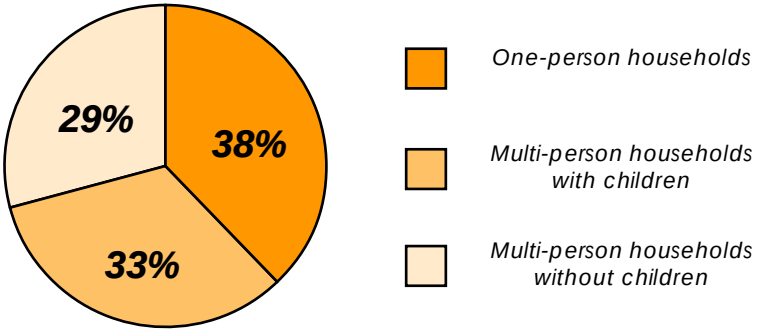
# Design



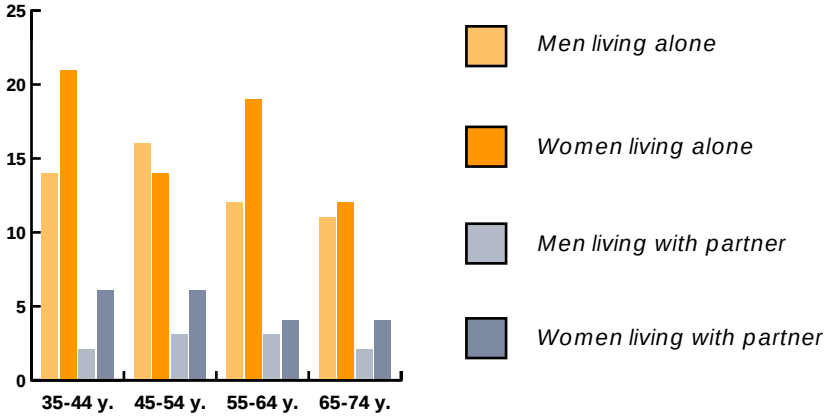
# Single-person household

## Relevance

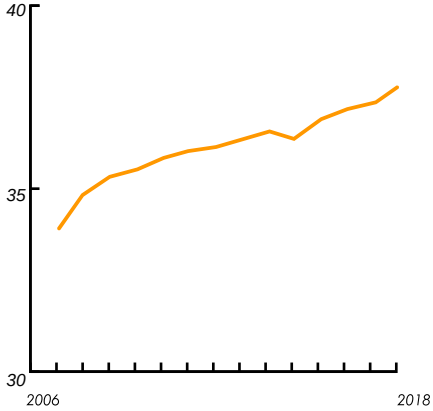
**Total number of households in the Netherlands in 2019,by type**



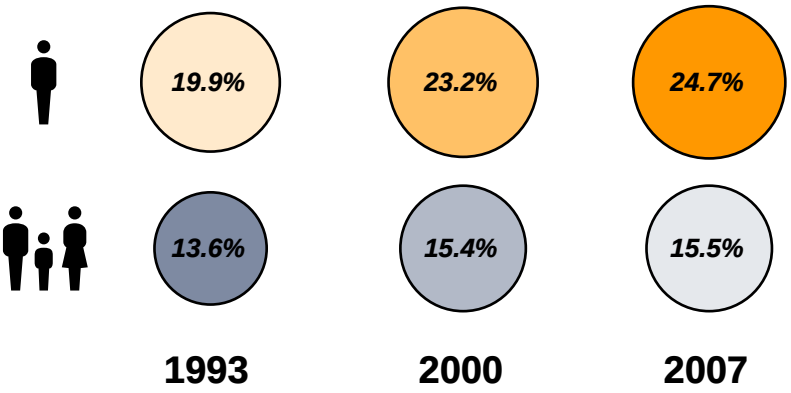

**Percentage of loneliness depending on type of household in Germany**



**Percentage of one-person households in the Netherlands from 2006 to 2018**




**Common mental disorders in single and multi-person households**



# Research

**Main research question :**

***How cohousing and coliving should be designed to help singletons combat loneliness while preserving the required level of privacy?***

**Sub-questions :**

Why does the notion of a single-person household rise?
Who are the people choosing to live alone?
What are the requirements of people living alone and do they differ per subgroup?
Which one of the concepts (cohousing or coliving) suits each subgroup of singletons better?
What is the balance between private and shared areas in buildings designed for singletons?
What are the design principles to stimulate community creation within the dwelling unit (coliving) and on building scale?
What is the balance between being part of a community and preserving the notion of individualisation?

**Interviewees**

**Anton**
23
IT specialist
private apartment
KYIV

**Sofia**
23
Analyst
co-living
flat share
student housing
LANCASTER
LISBON
LONDON

**Stanislav**
25
Enterpreneur
private apartment
cohousing
student housing
BRIGHTON
LONDON



**Nazar**
25
Enterpreneur
private apartment
cohousing
student housing
BRIGHTON
BIRMINGHAM
LONDON
KYIV

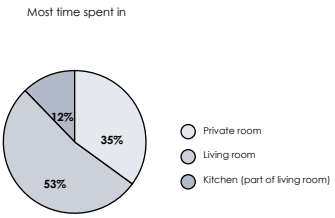


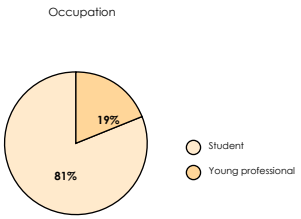
**Tetiana**
23
Realtor
private apartment
KYIV

**Nadiya**
73
Retired
private apartment
BORYSPIL

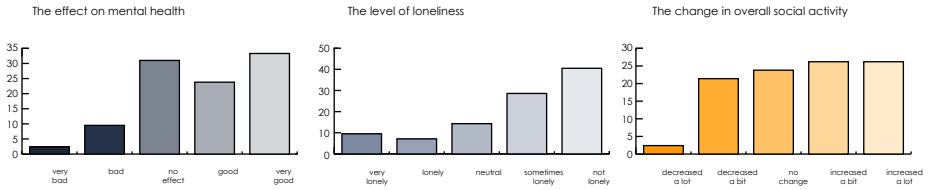
**Maria**
25
Groomer
coliving
flat share
WARSAW

**Questionnaire**



## Data collected from questionnaire




## Main principles of successful dwelling design for singletons

Private dwellings with high level of comfort

High levels of privacy and security

Homogenous community on smaller scale

VIbrant community of singletons on building scale

The notion of choice

Constantly changing views (Not only facing inner courtyard)

Private outdoor space (balcony/terrace)

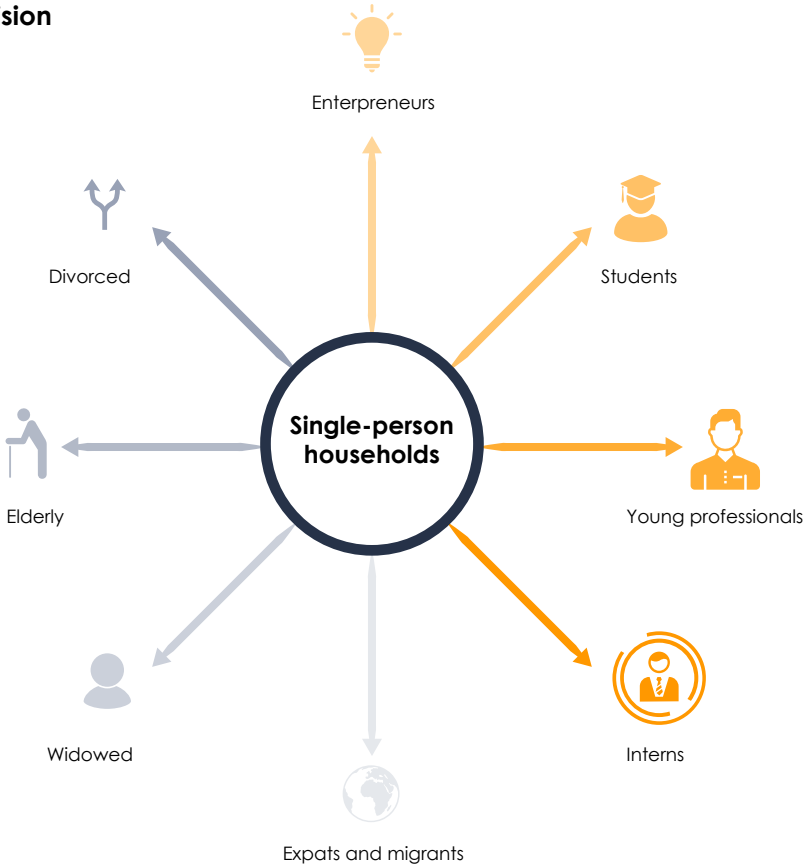
Division between private area and area accessible by guests

Zoning per programme within the dwelling

Small communal area per floor

# Target group

## Sub-division




**Require geographical mobility, short term housing**

**Give priority to the quality of the apartment over privacy**

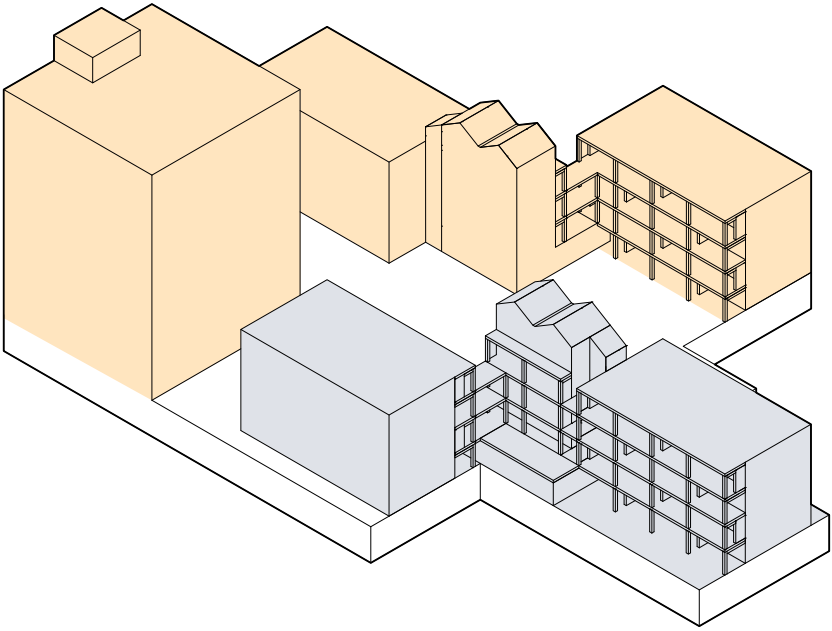
**Tend to share dwellings**

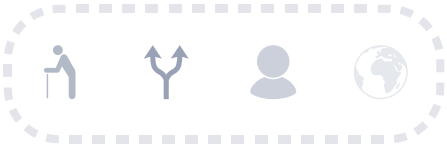
**Lacking a sense of community**

**More vulnerable to loneliness due to the loss of existing social contacts**

**Prefer private dwellings while being vulnerable to loneliness**

**Prefer homogenous community**



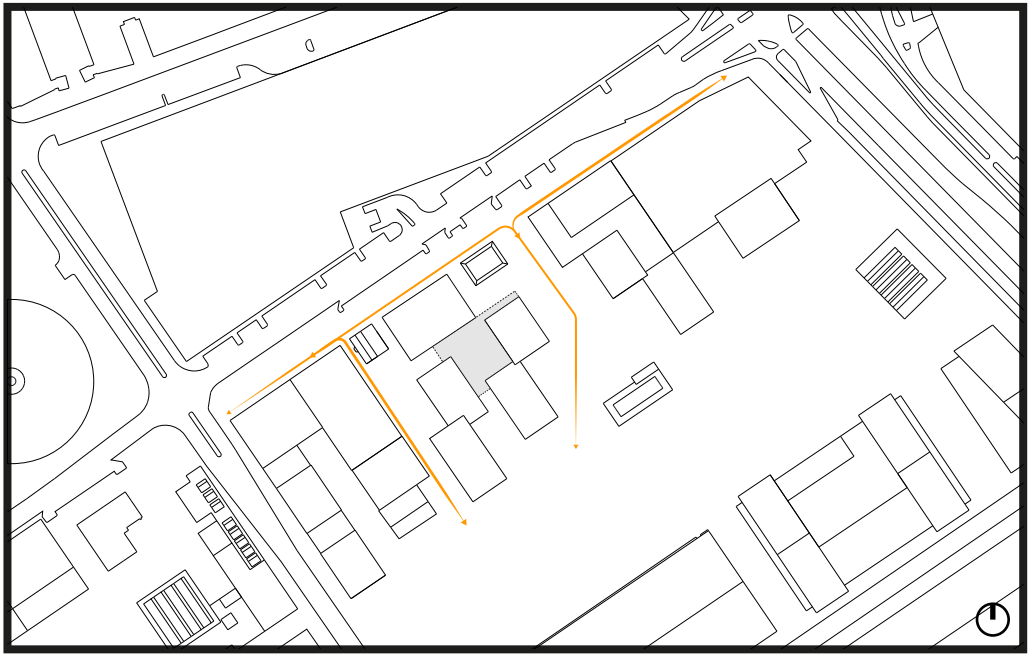


The project is sub-divided into two bigger sub-groups of solo dwellers. Such division is based o the similarities and differences of smaller groups shown on the left. In general, the two groups differ in age. Younger people (interns, students and young professionals) are gathered in one group due to the fact that they prefer sharing apartments with good conditions over privacy. On the other hand, the second sub-group of older solo dwellers value privacy more.

# Urban plan

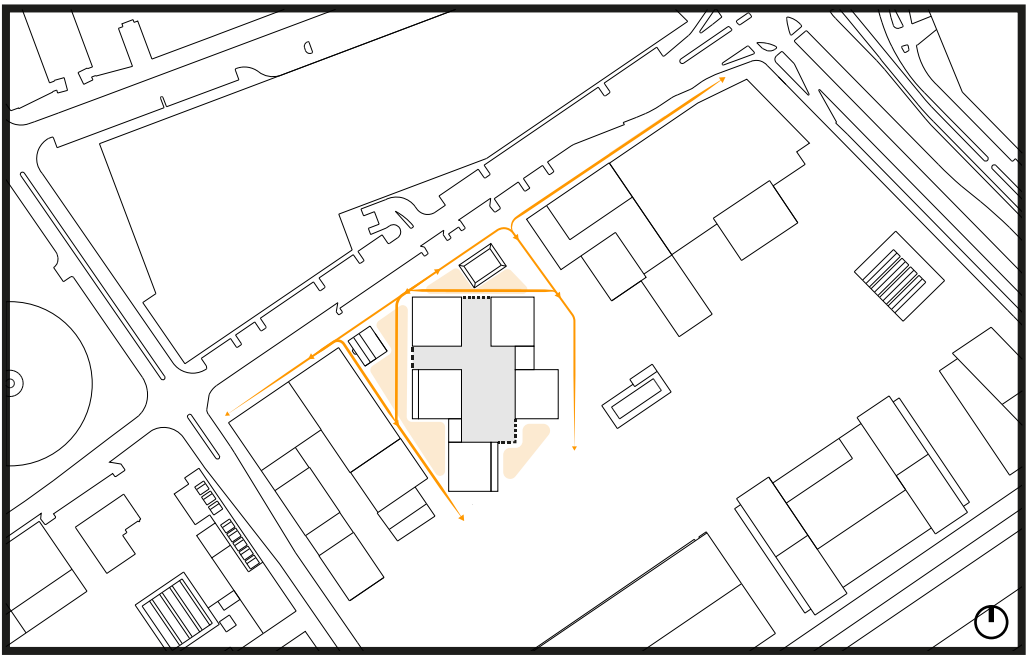
## Concept

### Initial urban concept



The initial urban concept provides a plot of 5 separate building shaped on a raised commercial plinth. While the facade facing the street on the NW is straight and calm, the plot reach the park in various volumes.

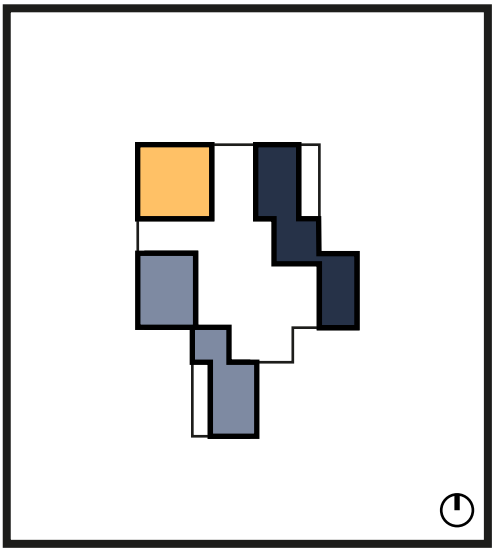
**Proposed urban concept**

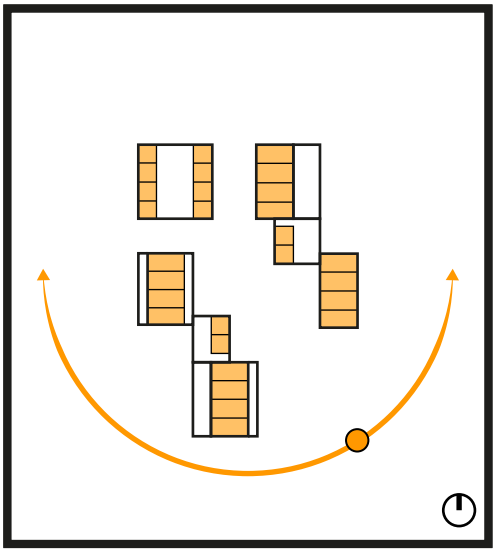


The urban concept is changed by aligning volumes on the NS axis in order to reduce dwellings facing south to 0.
Such change also gives more space for public squares around the building as well as facing Keileweg in a porous manner.

# Diagrams

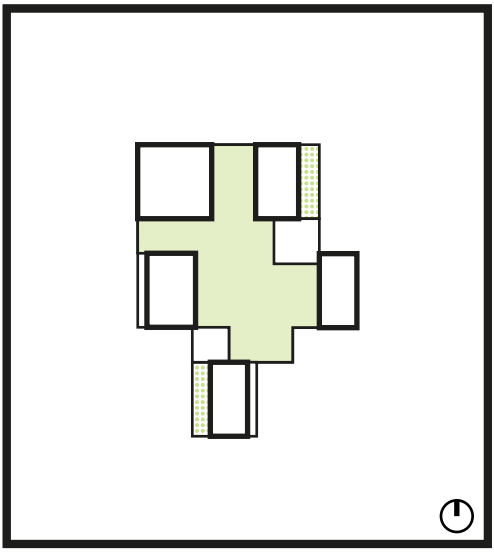
## Concept overview

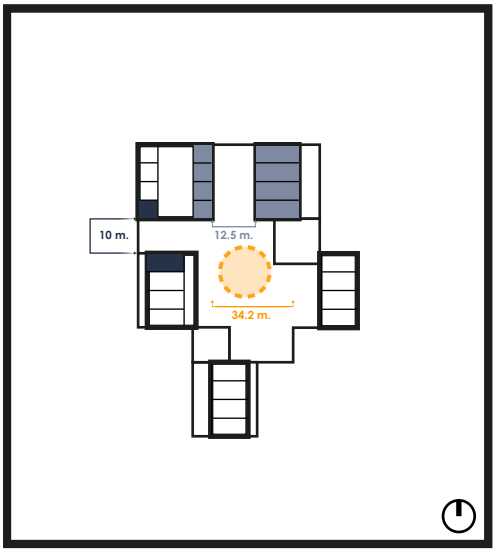




The project is divided into three main volumes: coliving tower and cohousing volumes. The difference in cohousing is in target groups; the one on the right is dedicated to younger singletons and provided with large shared areas and study spaces.

The volumes are turned to face east and west from the dwellings. This will allow good sun exposure for all houses within the complex as well as providing good conditions for open terraces in left bottom volume.



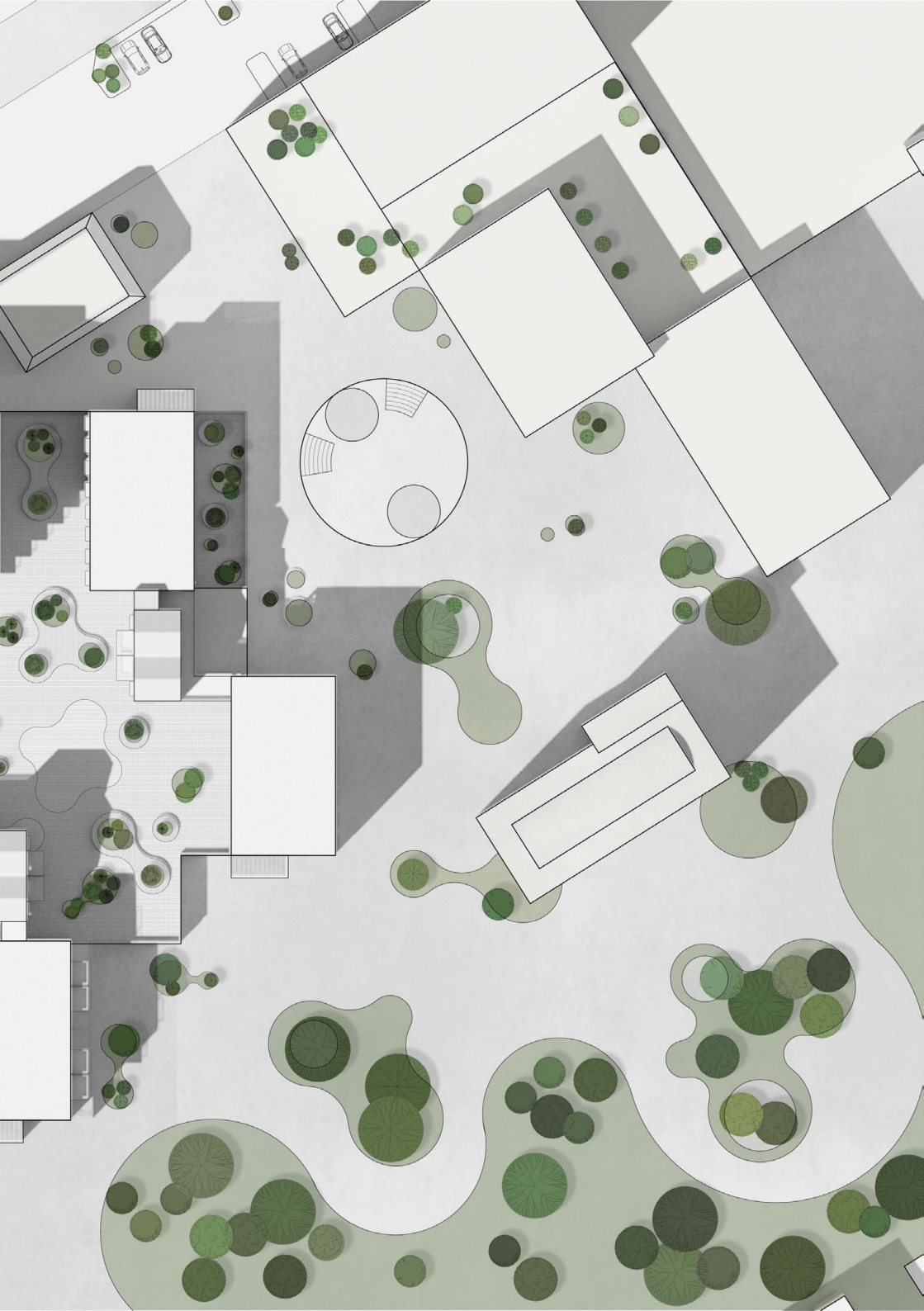



There are two types of green areas in the project. The public green space on the plinth for residents of all buildings within the plot. The shared green spaces per building. The green roofs are placed facing the park to connect with the neighbourhood visually.

The minimum distances between the buildings are 9.7 metres; however, there are no dwellings facing this space. On the north, the distance is 12.2 metres that are enough for sun exposure of houses on both east and west.

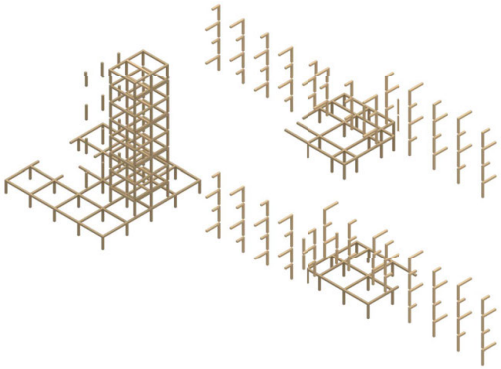
# Overview plan

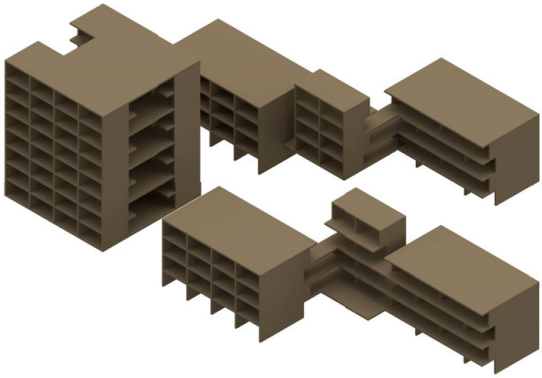
**1/500**

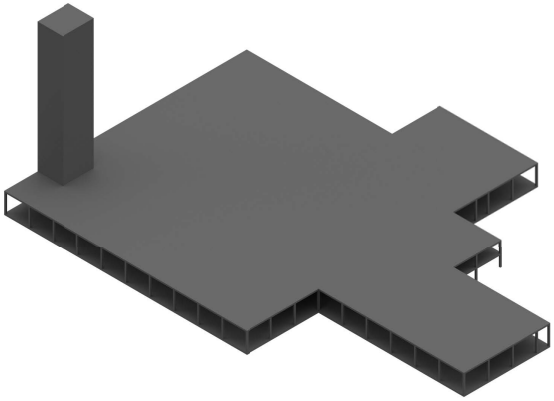


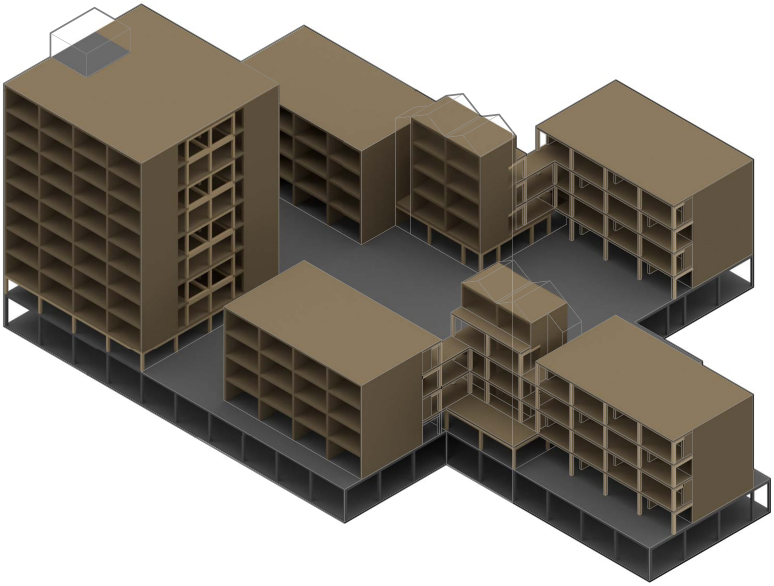
# Diagrams

## Load-bearing structure









concrete

CLT walls and floors

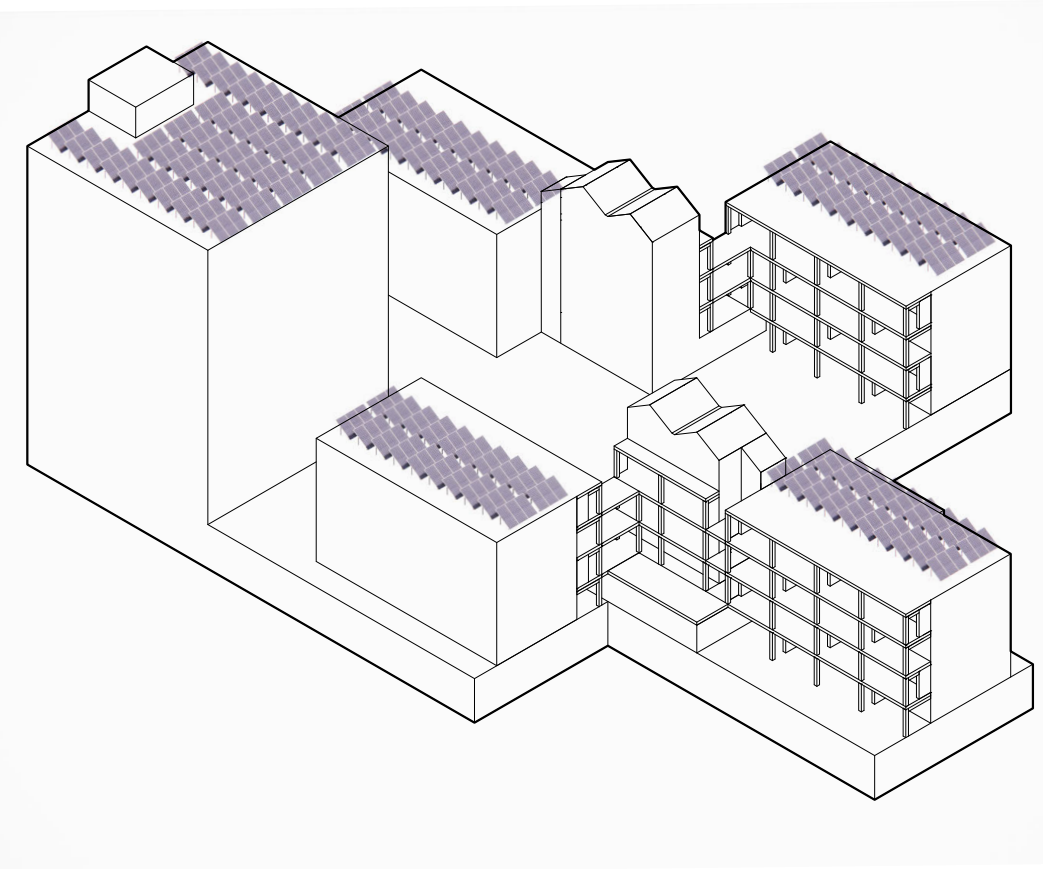
CLT columns and beams

The building is constructed using a hybrid system with a combination of concrete and CLT structure. Due to the high possibility of flooding, the ground floor is constructed from concrete with a concrete floor that acts as a base for the collective courtyard. The greenery on top of the plinth is designed in pots which reduces the overall weight of soil required to provide the raised courtyard with greenery.

Upper floors are constructed using CLT walls and floors as well as columns and beams. CLT walls and floors are load-bearing and act as a primary structure while CLT columns and beams act more as a connection between apartments and outdoors, creating the substructure for circulation (pathway).

# Energy production

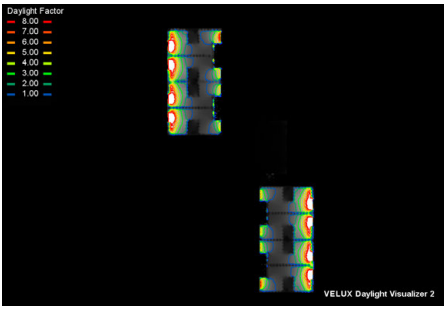
## PV cells



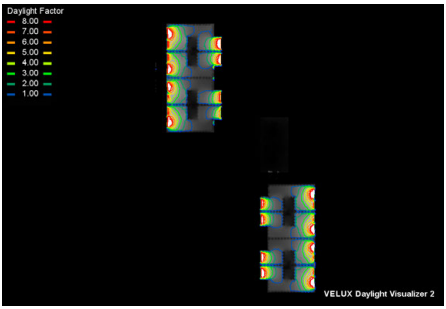
Even though natural lighting is considered an important feature of the design, energy production is still considered within the project. Because the building is rotated to face south and a large amount of roof space, the amount of energy produced can be sufficient.

# Diagrams

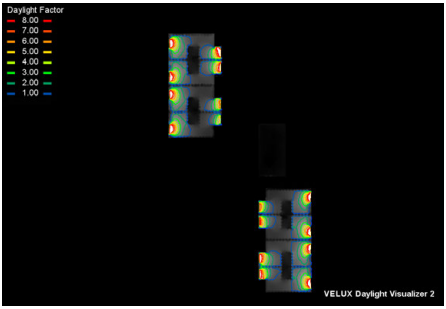
## Dwelling orientation and natural lighting



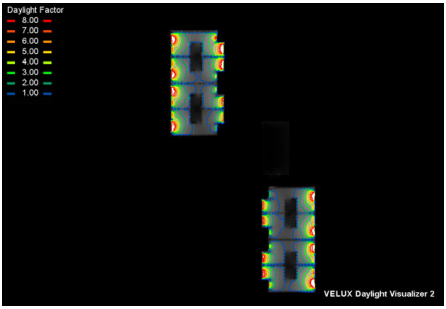

**Initial building typology with 2.5 m. wide pathway**



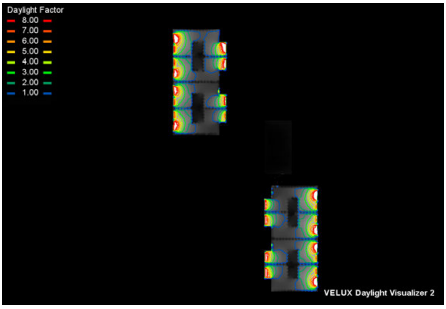

**Initial building typology with 1.3 m. wide pathway and enlarged windows on both sides**



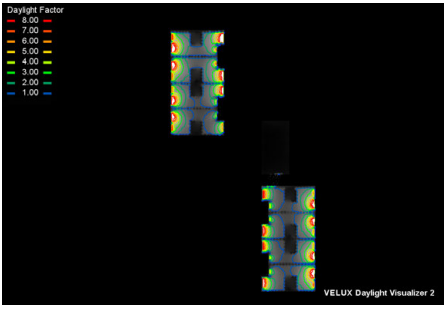

**Initial building typology with 1.3 m. wide pathway**




**Initial building typology with 1.3 m. wide pathway and enlarged windows on both sides and kitchen window**



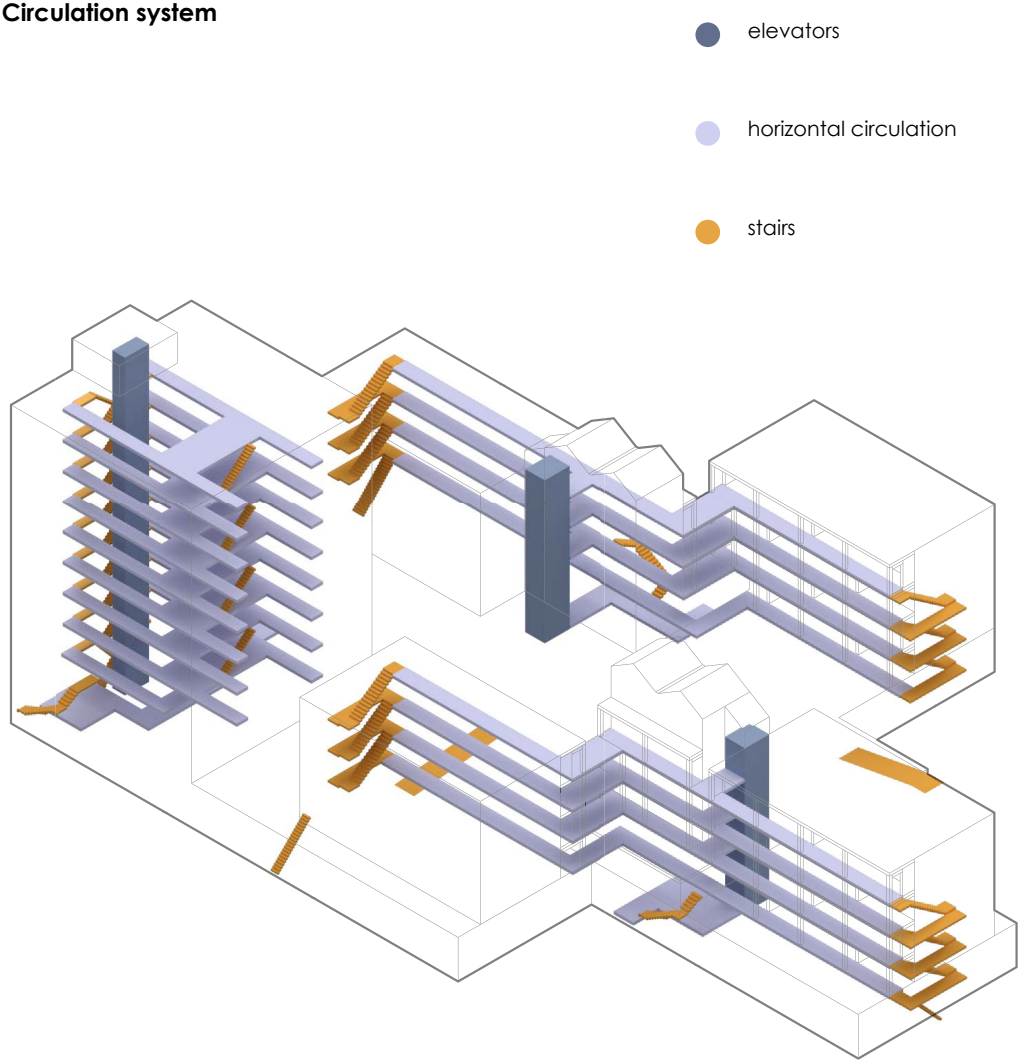

**Initial building typology with 1.3 m. wide pathway and enlarged windows**




**Initial building typology with 1.3 m. wide pathway and enlarged windows on both sides and kitchen window (other level)**

# Diagrams

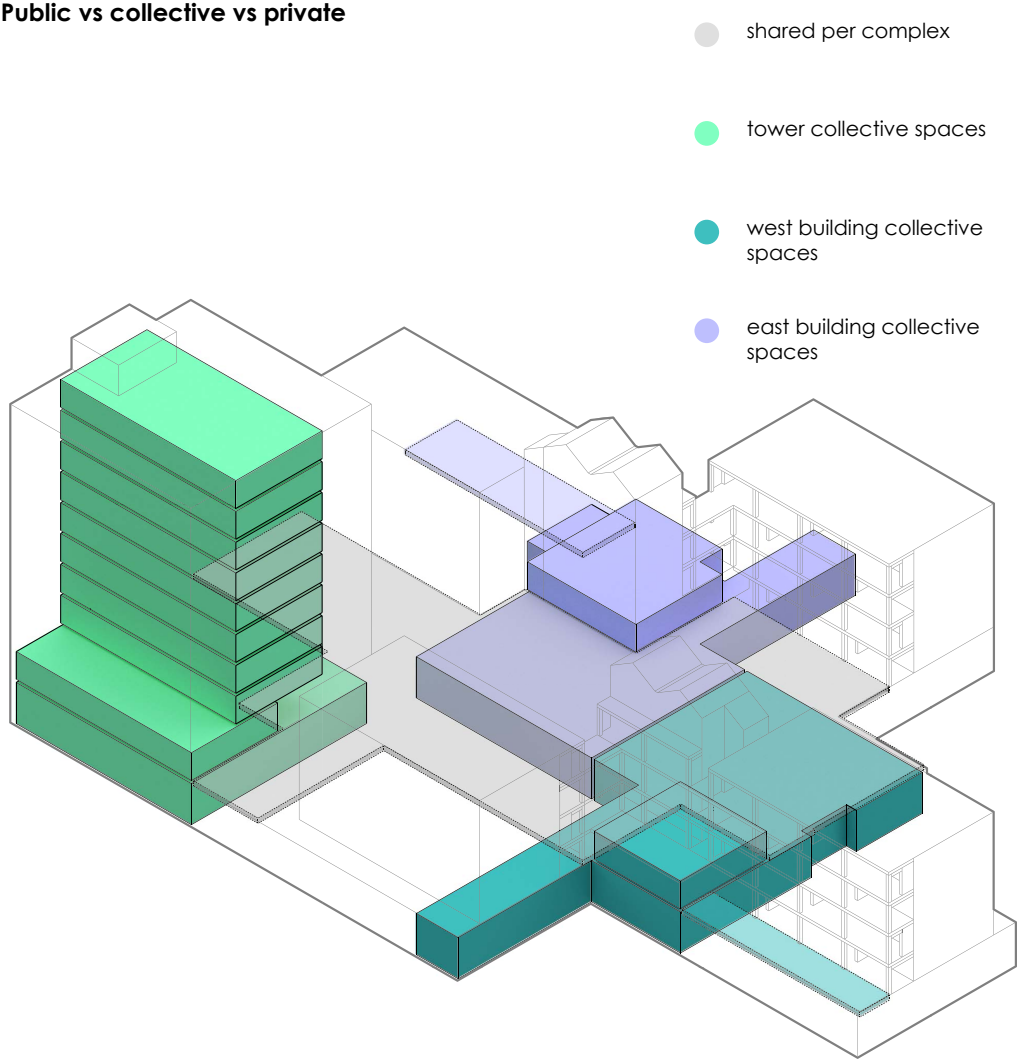
### Circulation system




There are two circulation systems within the project: tower typology and gallery typology. For the tower typology, scissor stairs are provided for fire exits as well as the elevator shaft. Similarly, there are 2 elevators in smaller volumes since volumes exceed 4 floors and an elevator is required. There are two sets of stairs located on edges of lower volumes to make sure there are no dead ends and each apartment is provided with safe fire escape route.

# Diagrams

**Public vs collective vs private**



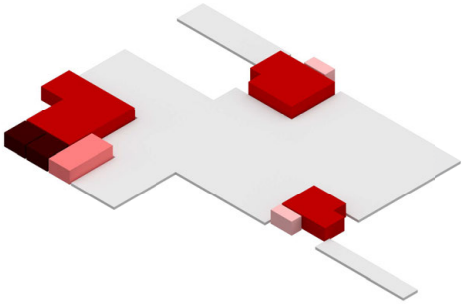

There are a variety of shared spaces provided within the building. The largest area of collective spaces is located within the tower because the tower provides coliving typology. Moreover, there are spaces on the first floor of the tower that can be shared among all three building volumes. The first floor is facing a collective plinth where the community is built on a project scale. There are also both interior and exterior collective spaces within each of the lower volumes.

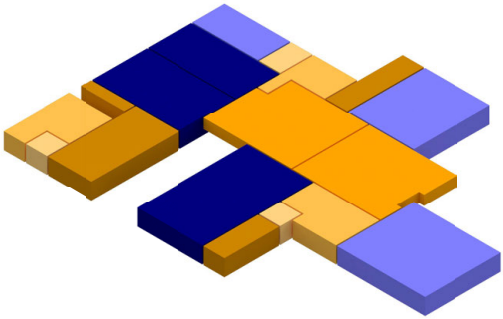

Collective plinth

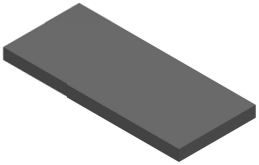
# Diagrams

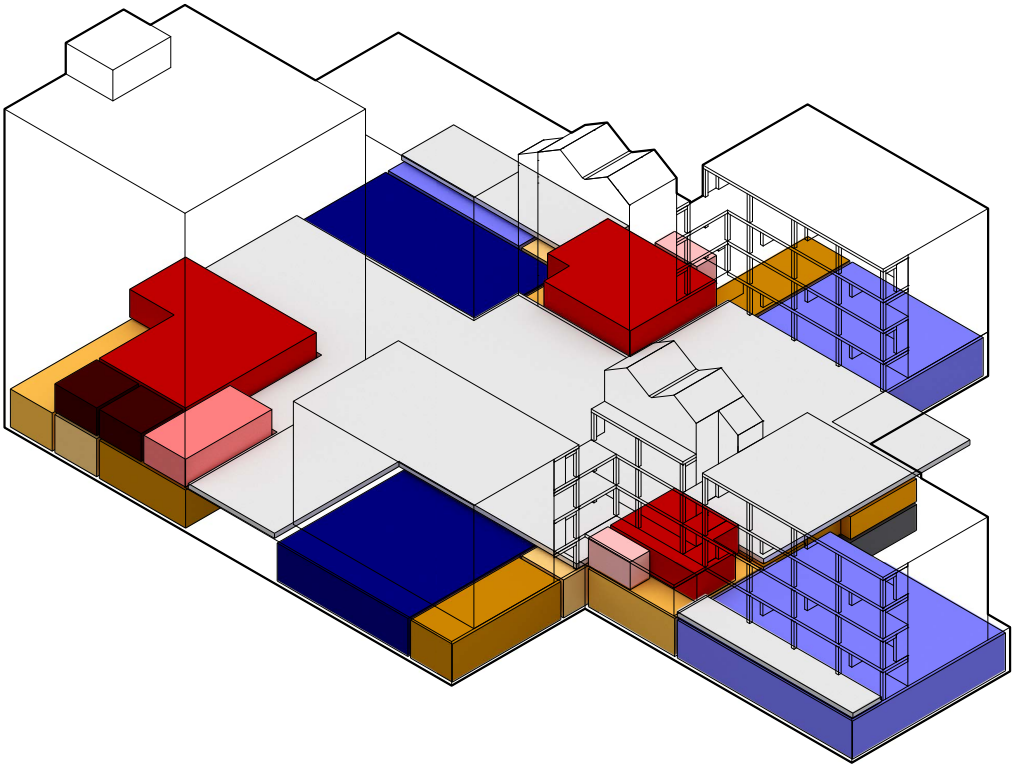
## Additional functions

- shared open space
- laundry
- library
- flexible work/study space
- sport/lecture rooms
- garbage room
- reception
- storage space
- bicycle parking
- public cafe/restaurant
- public shops
- parking garage









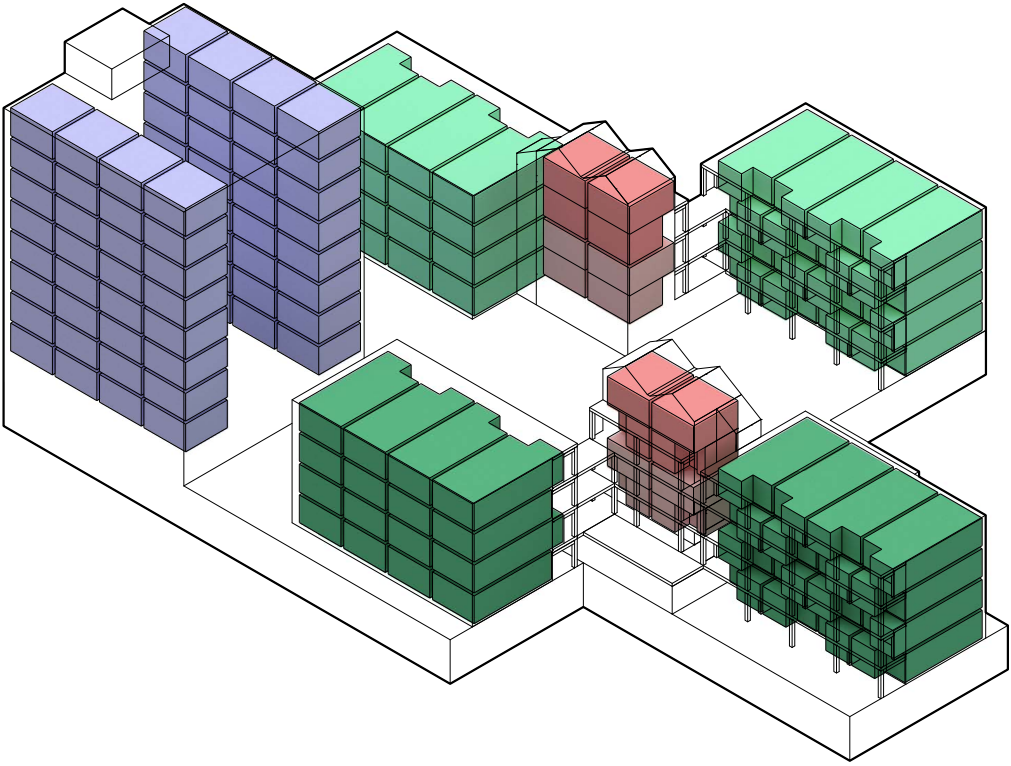
The plot is located in quite a vibrant location between Keilewek and the park. Therefore, the ground floor part which is facing the park is filled with cafes and restaurants while facades along the main circulation routes locate the shops.

There are 3 entrances, each for a particular building volume. Each entrance spaces combine reception, bike parking, garbage area and connection to storages spaces.


View from park

# Diagrams

## Dwelling typologies



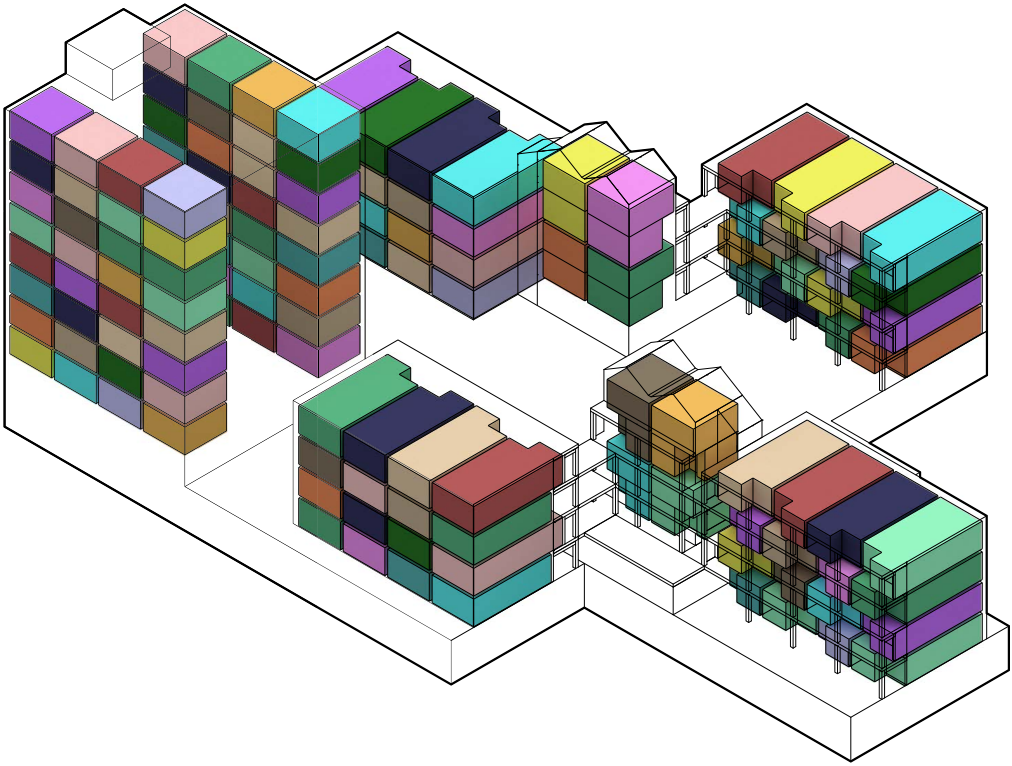
25 sq.m. coliving apartment

50 sq.m. apartment without balcony

50 sq.m. apatment with balcony

50 sq.m. 2-storey apartment

50 sq.m. 2-storey apartment with window on second floor

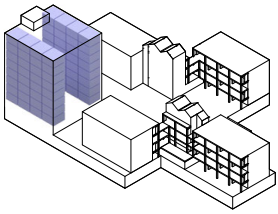


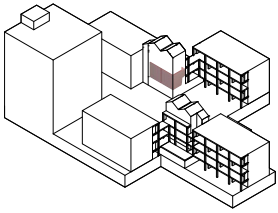
Even though there are 5 fixed typologies within the project, it is important to consider personality while designing for solo dweller. For that reason, different types of furnishing and functions within the apartment were considered for each typology.

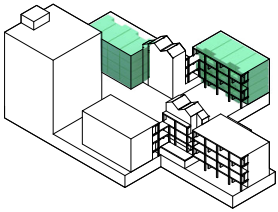
# Dwelling types

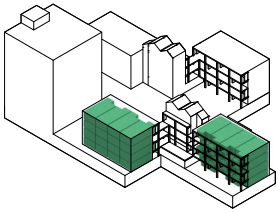
## Programme

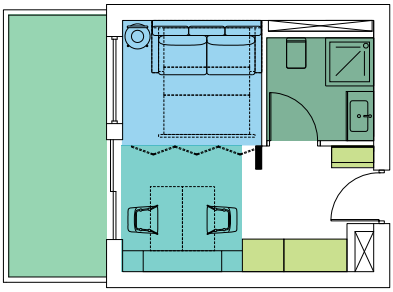
- bedroom
- dining room
- kitchen
- living room
- study space
- private terrace
- WC
- storage
- transition space

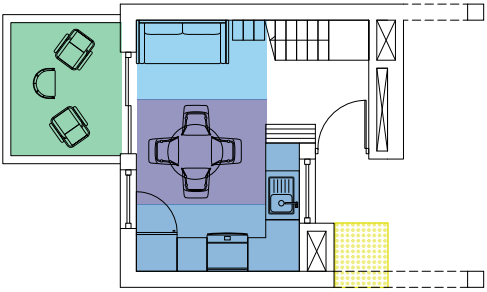


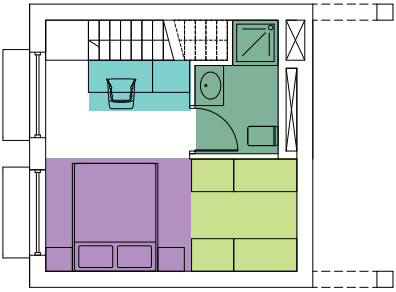


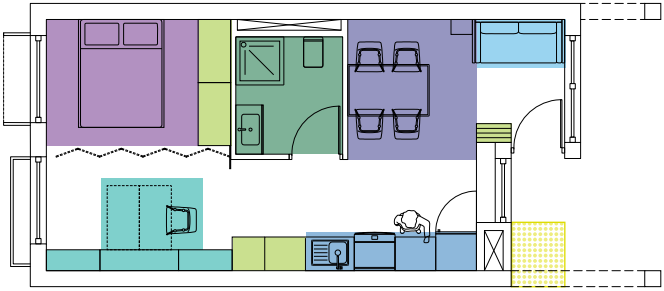


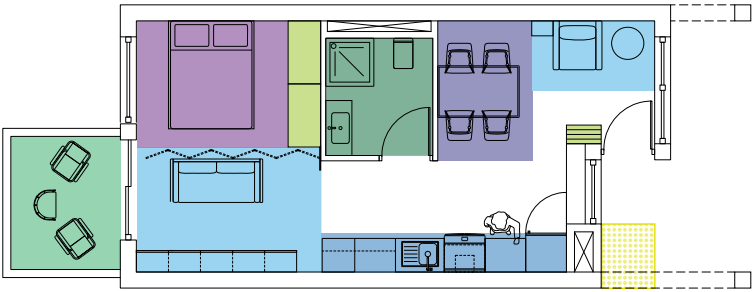






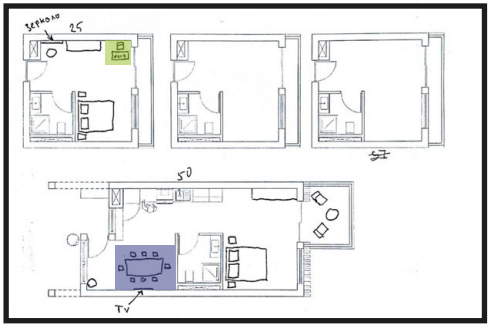


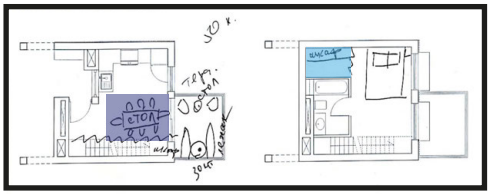


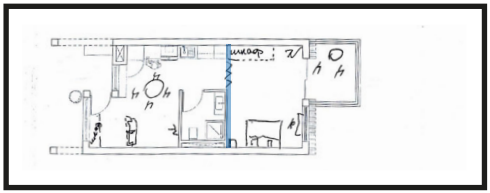


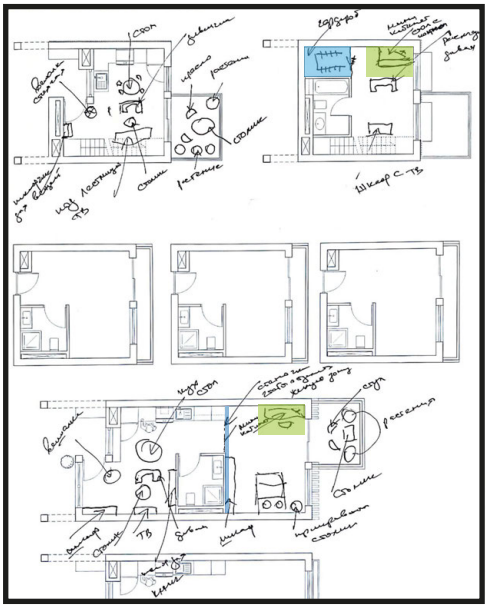
# Conclusions

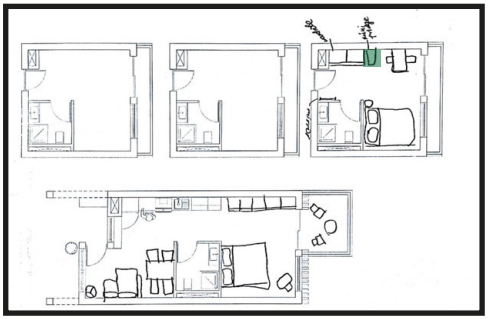
## Plan interviews

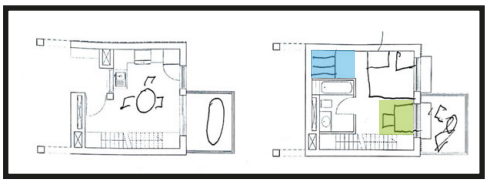












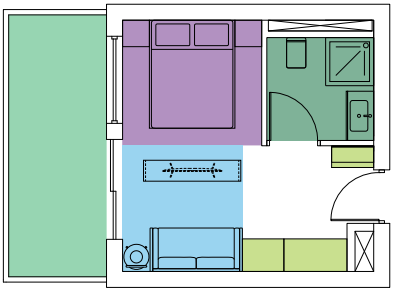
- Table for more than 4 people in the apartment for one person
- Splitting the apartment along the WC wall into private and collective zones
- Placement of wardrobe on 2nd floor of a 2-storey apartment
- Introduction of workspace in the apartment
- Small fridge in the coliving apartment

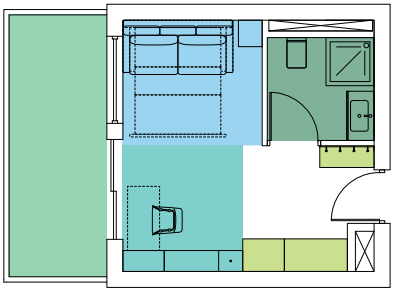
Plan interviewees are performed to understand the needs of people who lived or live alone now. I have provided the interviewees with empty dwelling typologies that were designed for this project. Interviewees were asked to fill the dwelling with preferred furniture. I have not provided a particular set of furniture to use in the interview. Therefore, the questionnaire showed interesting results in patterns.

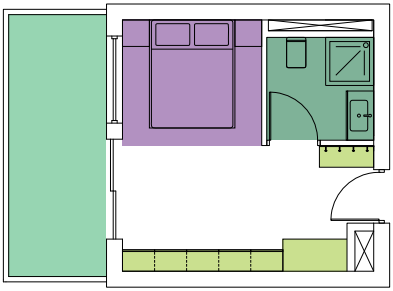
Even though the dwelling is designed for one person, 3 drawings showed a plan with a table with 6 or even 8 chairs. While living alone, people still consider meeting with friends and family, especially during the time of the corona crisis. Moreover, there is a need to separate living area accessible for quests and more private space such as a bedroom. Another important pattern is providing a study or workspace within the apartment. Interestingly enough, all interviewees locate it next to the window (access to natural light and views).

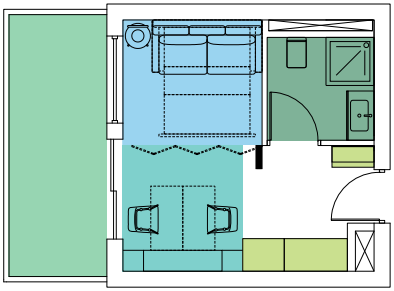
# Typologies

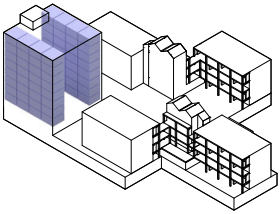
## Various functions











- bedroom
- dining room
- kitchen
- living room
- study space
- private terrace
- WC
- storage
- transition space

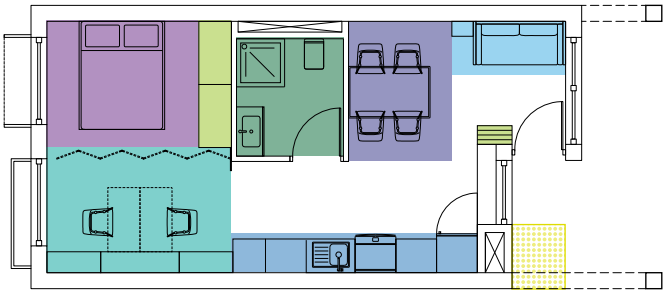
The location of WC in the corner of 25 sq.m. room as well as provision of both window and movable door leading to balcony, provides a good opportunity for different iterations of interior design. The room can be spacious as in the left bottom option with the minimal amount of furniture for people who prefer to study in shared coliving spaces. At the same time, there is enough space to locate a table for studying for two people or living room area with sofa and TV. Such an open dwelling plan provide an opportunity for personalisation which solely depends on the resident of a particular apartment.

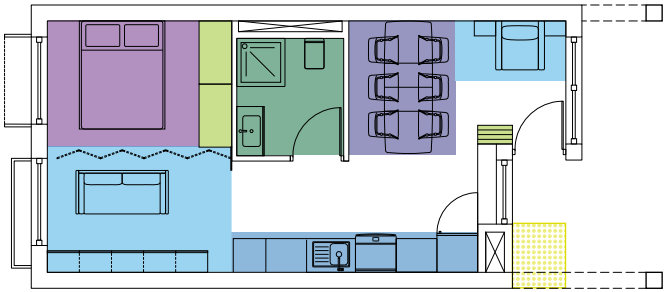

Interior 25 sq.m.

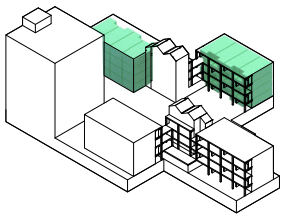

THINK
OUTSIDE
THE BOX

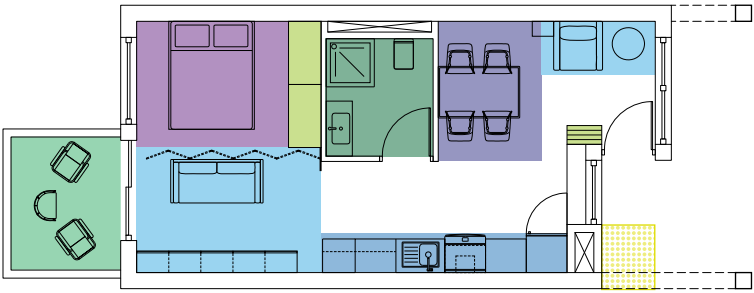
# Typologies

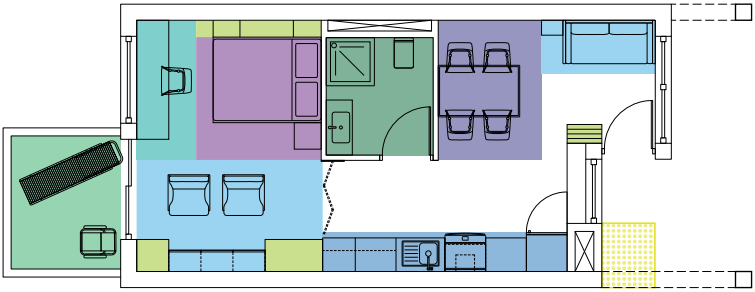
## Various functions

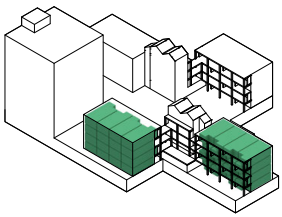








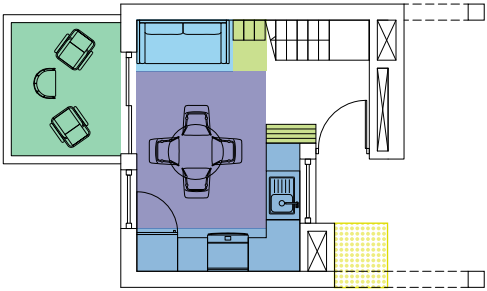


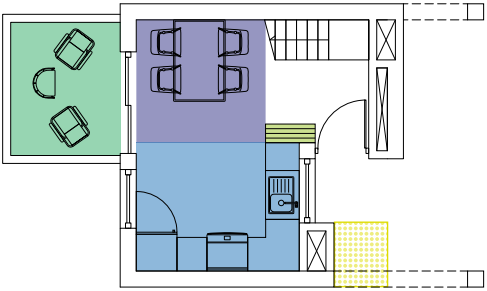


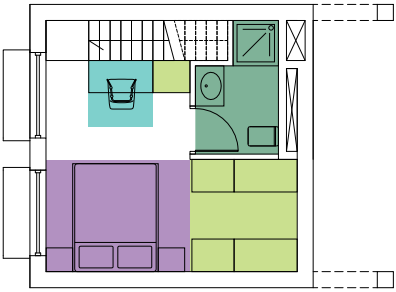
# Render Interior

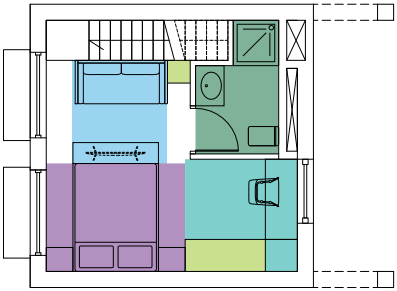
# Typologies

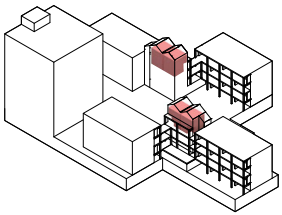
## Various functions

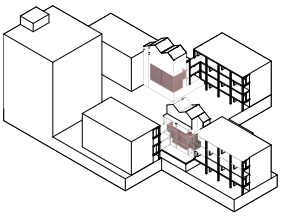












- bedroom
- dining room
- kitchen
- living room
- study space
- private terrace
- WC
- storage
- transition space

4 typologies of 50 sq.m. provide various options in terms of functions within the apartments. Even though 50 sq.m. typologies with balcony are mostly focused on older people living alone who do not necessarily require a study space, there is still an option of furnishing the apartment with a workspace facing the window. For 2 level dwellings, there are 2 options on the second floor: one with a window and the other one without a window which influences the location of functions a lot. For the one with a window, the study space is located next to it with a large amount of natural lighting while the one without the window provides a large space for storage.

# Basement

## 1/250



Loss of space in the private unit supported by the provision of communal spaces



Private units to be smaller than average unit size (with limited kitchen and laundry facilities)



Positioning of key facilities (activity sites) and access points on shared walkways



Provision of semi-private outdoor spaces close to private units for socializing



Gradual transition between public and private spaces

Car parking outside the community or car-free communities



Good visibility into all communal spaces



The provision of indoor and outdoor communal facilities

**Principles for cohousing design that provoke social contacts** (Frank & Ahrentzen, 1989)



Private outdoor space (balcony/terrace)



Small communal area per floor



Constantly changing views (Not only facing inner courtyard)



Vibrant community of singletons on building scale



Homogenous community on smaller scale



High levels of privacy and security

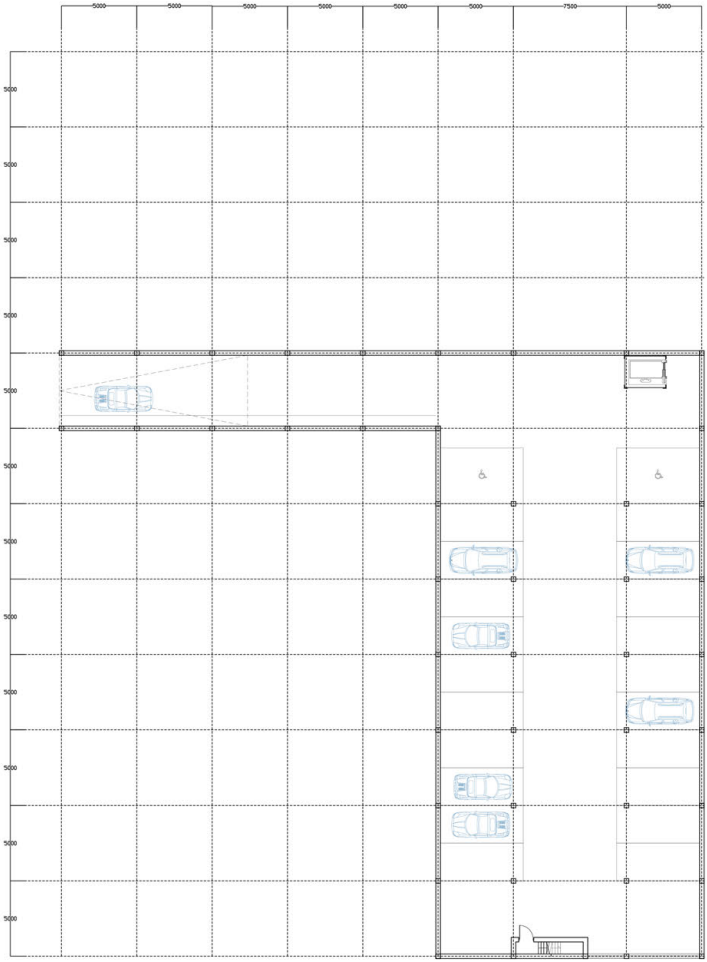


Private dwellings with high level of comfort



The notion of choice

**P2 research conculsions**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# Ground floor

## 1/250



Loss of space in the private unit supported by the provision of communal spaces



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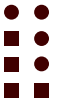

VIbrant community of singletons on building scale



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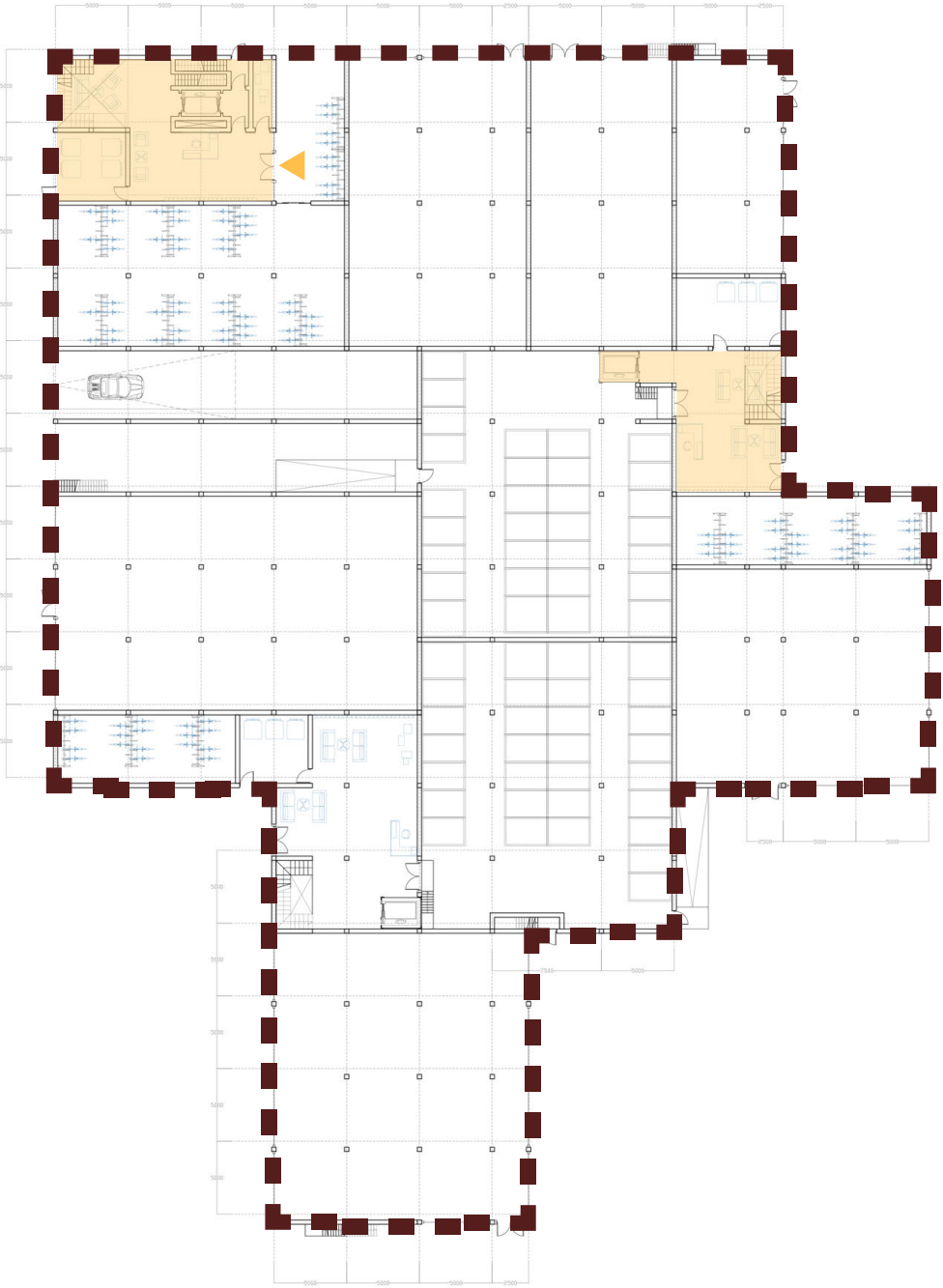

# First floor

## 1/250



Loss of space in the private unit supported by the provision of communal spaces



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Private dwellings with high level of comfort

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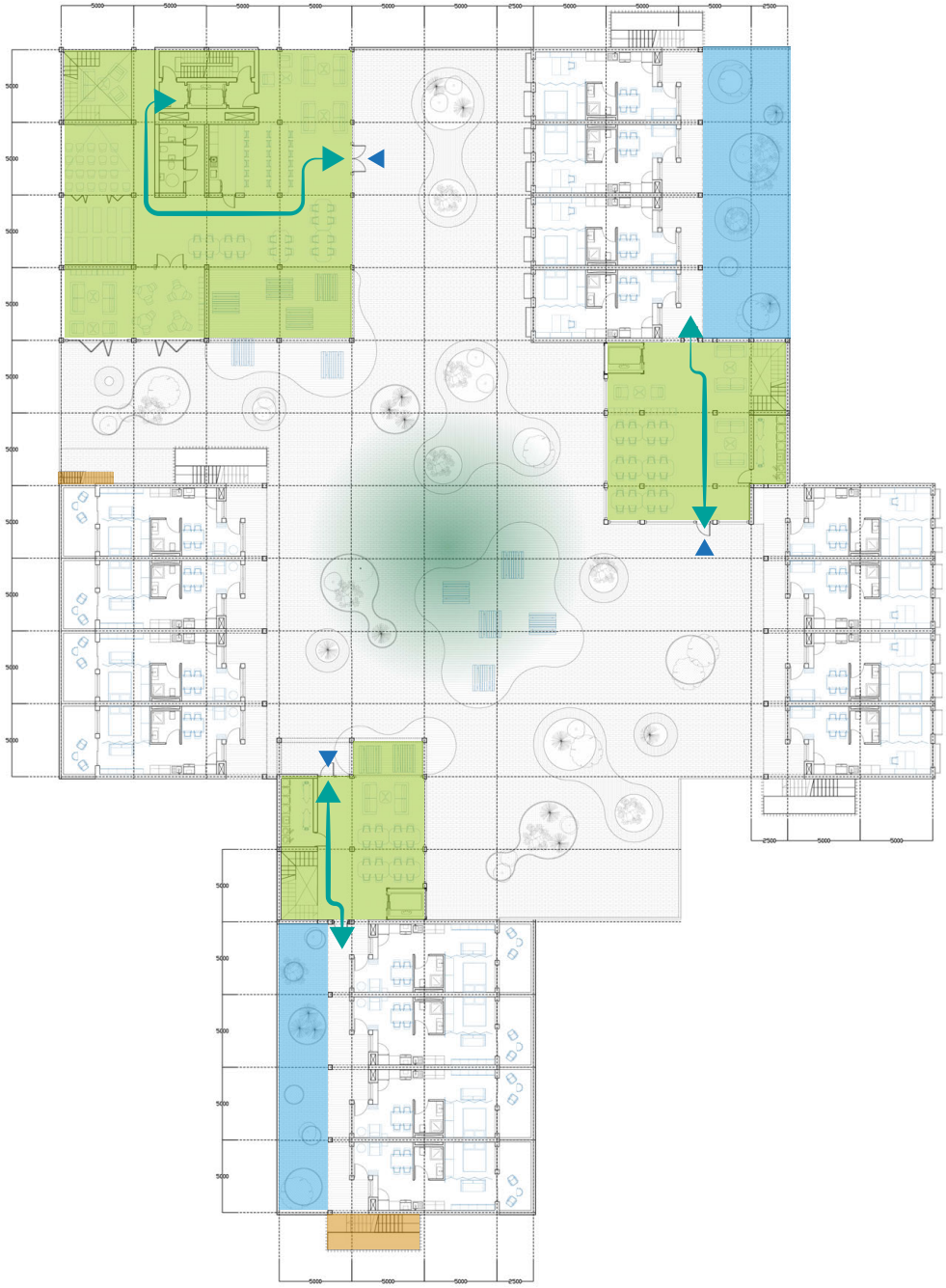

# Second floor

## 1/250

Loss of space in the private unit supported by the provision of communal spaces



Private units to be smaller than average unit size (with limited kitchen and laundry facilities)



Positioning of key facilities (activity sites) and access points on shared walkways



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Gradual transition between public and private spaces



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Private dwellings with high level of comfort



The notion of choice

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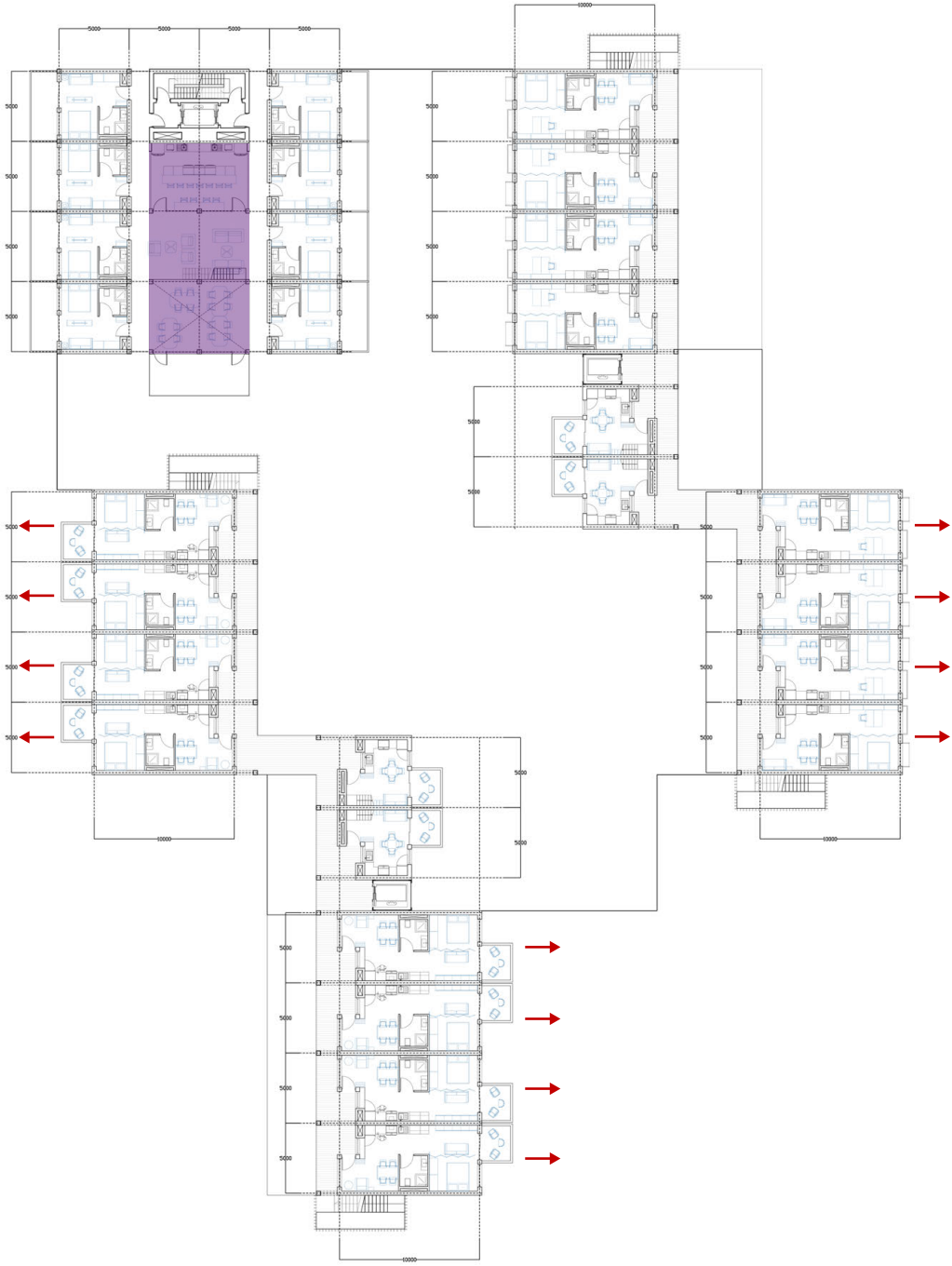
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# Third floor

## 1/250



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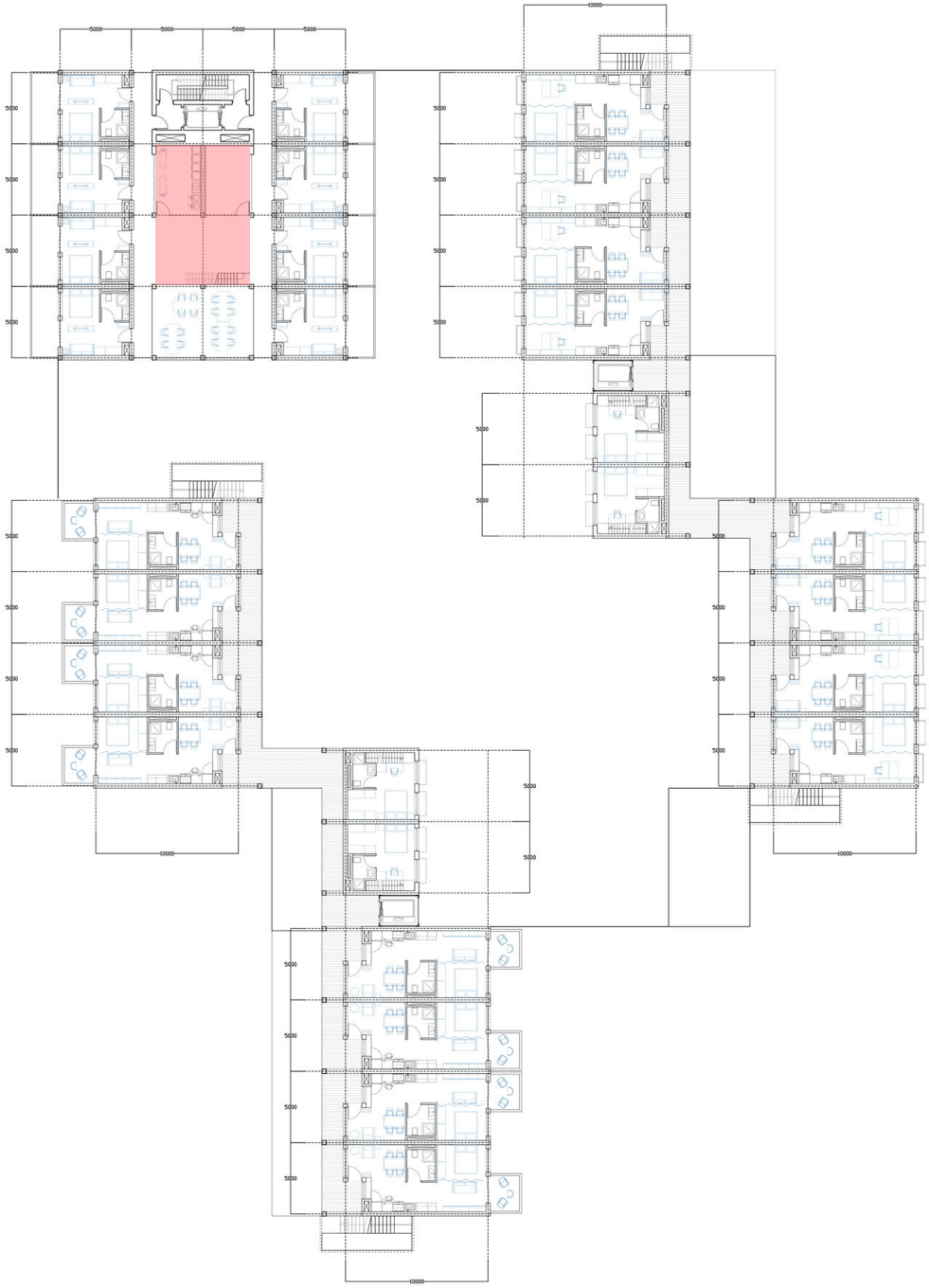
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# Fourth floor

## 1/250



Loss of space in the private unit supported by the provision of communal spaces



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Private dwellings with high level of comfort



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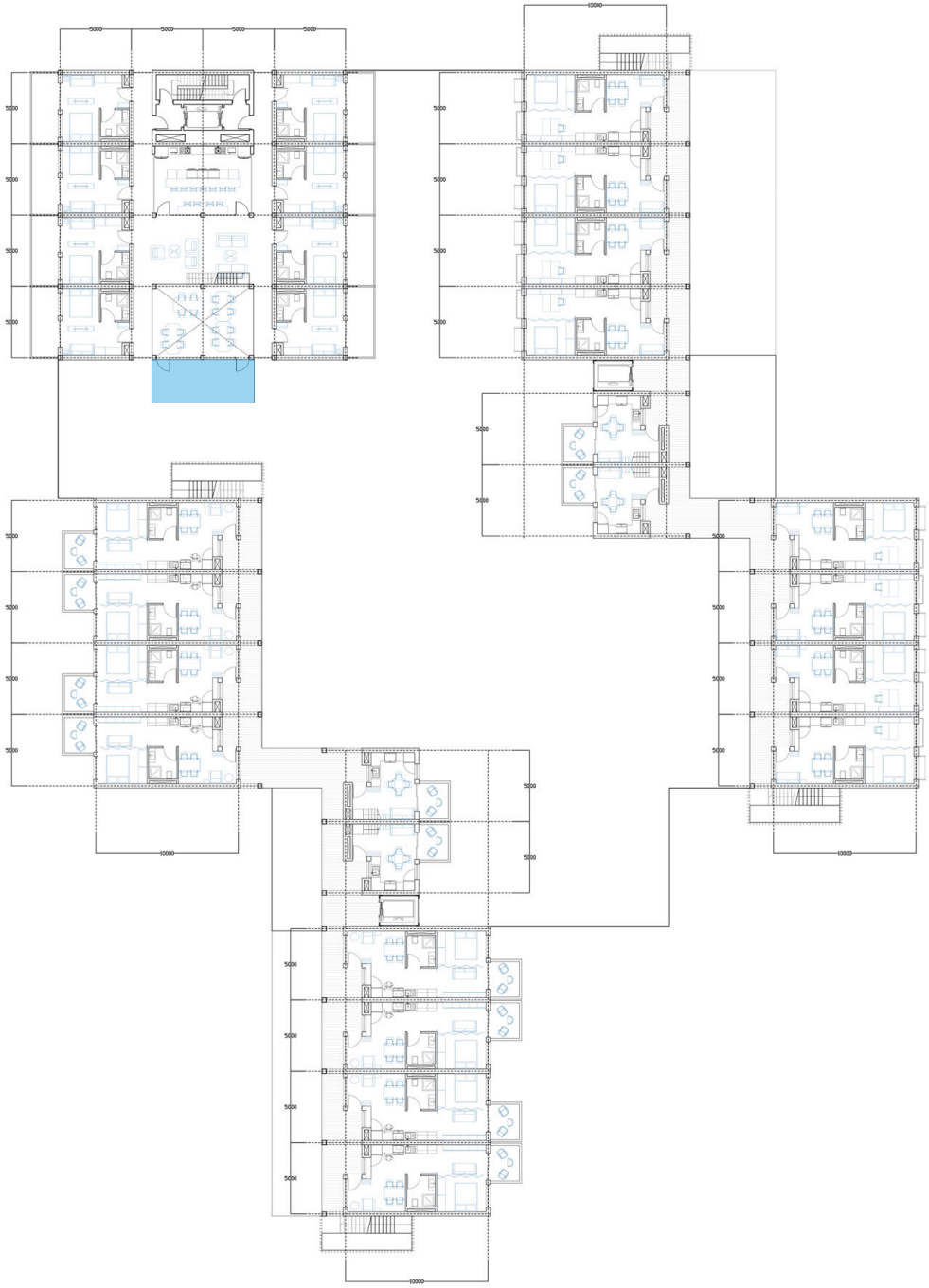
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# Fifth floor

## 1/250



Loss of space in the private unit supported by the provision of communal spaces

Private units to be smaller than average unit size (with limited kitchen and laundry facilities)



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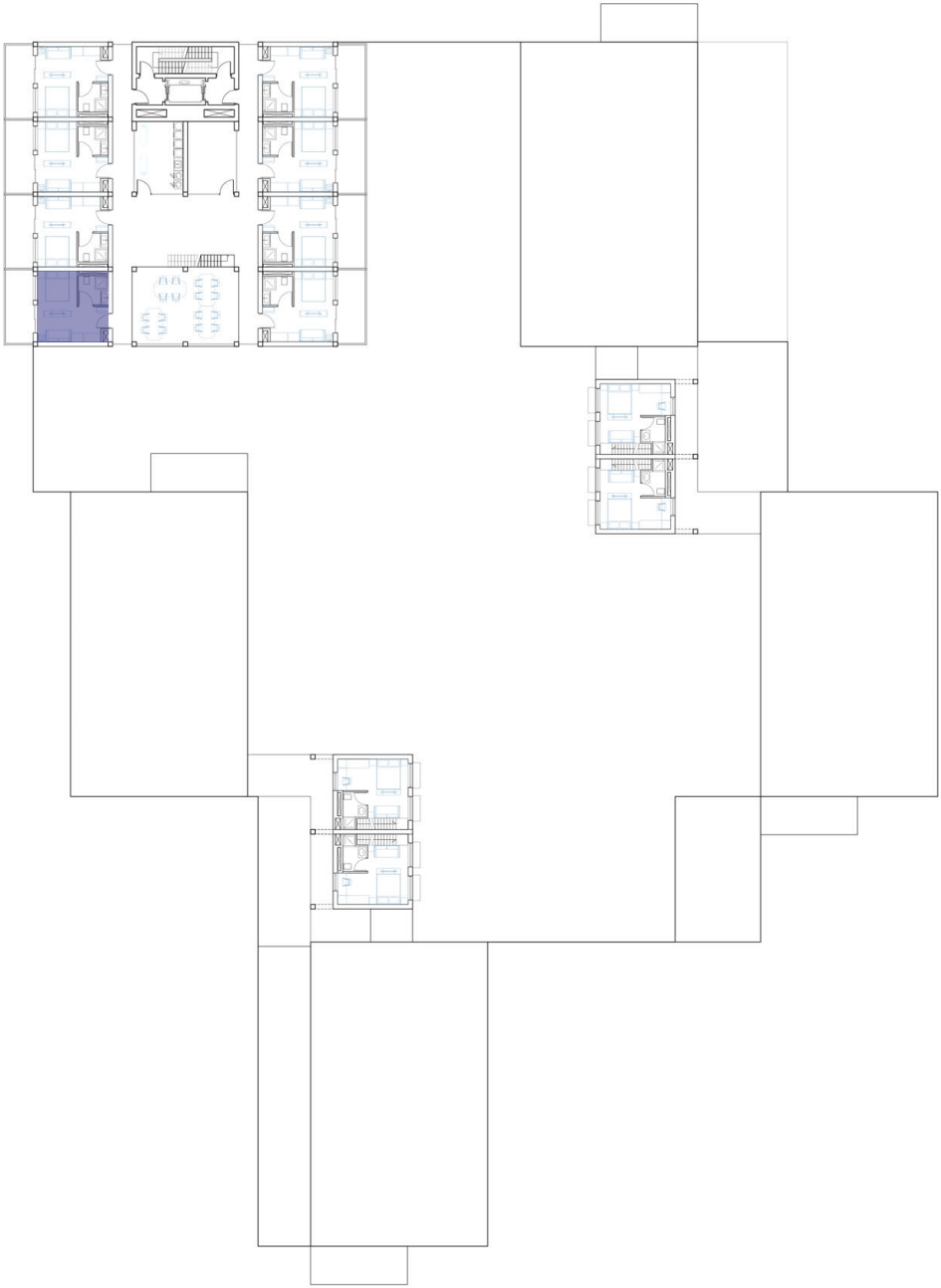

# Sixth floor

## 1/250



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Private outdoor space (balcony/terrace)



Small communal area per floor



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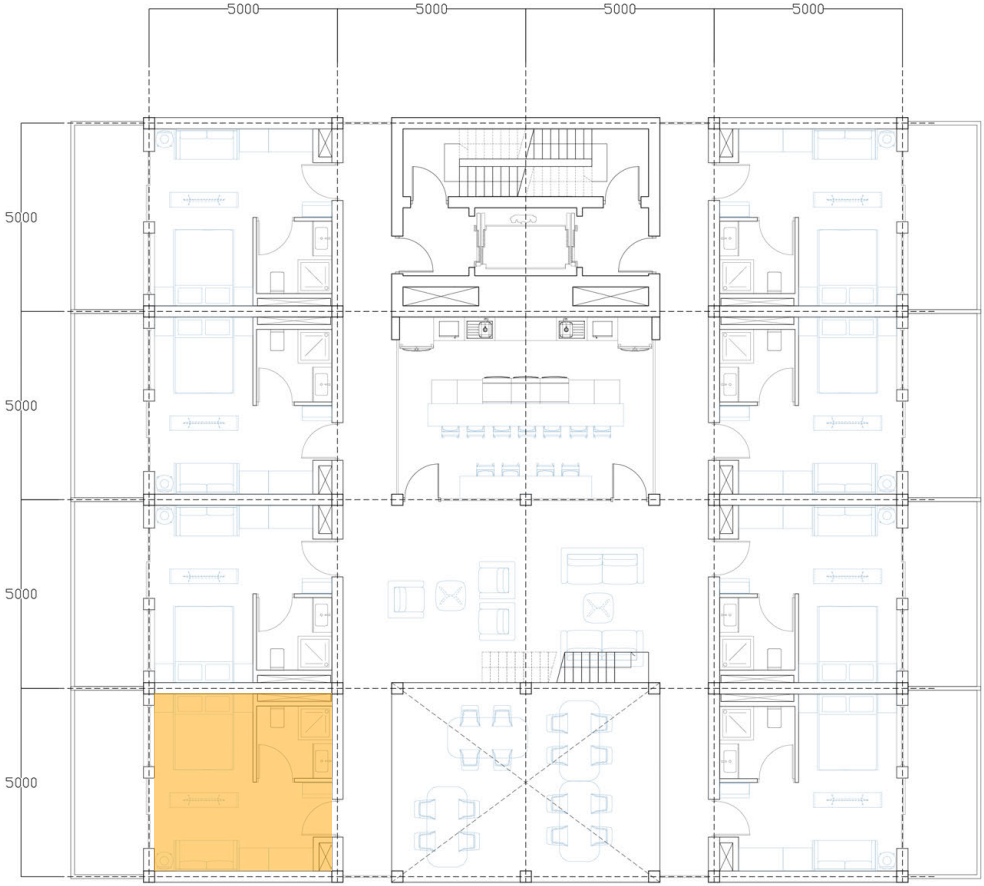
Private dwellings with high level of comfort



The notion of choice

**P2 research conculsions**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# Seventh floor

## 1/250



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Gradual transition between public and private spaces



Car parking outside the community or car-free communities



Good visibility into all communal spaces



The provision of indoor and outdoor communal facilities

**Principles for cohousing design that provoke social contacts** (Frank & Ahrentzen, 1989)



Private outdoor space (balcony/terrace)



Small communal area per floor



Constantly changing views (Not only facing inner courtyard)

Vibrant community of singletons on building scale



Homogenous community on smaller scale



High levels of privacy and security

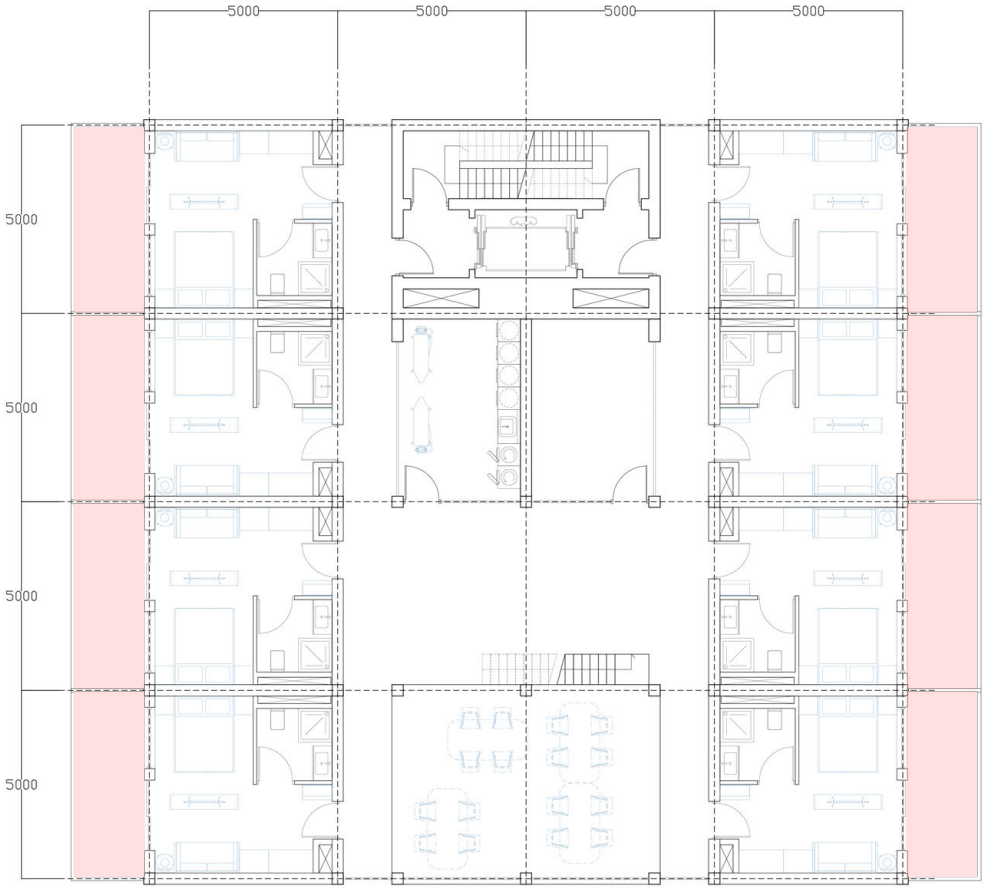


Private dwellings with high level of comfort



The notion of choice

**P2 research conculsions**


5000
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# Eighth floor

## 1/250



Loss of space in the private unit supported by the provision of communal spaces



Private units to be smaller than average unit size (with limited kitchen and laundry facilities)



Positioning of key facilities (activity sites) and access points on shared walkways



Provision of semi-private outdoor spaces close to private units for socializing



Gradual transition between public and private spaces



Car parking outside the community or car-free communities



Good visibility into all communal spaces



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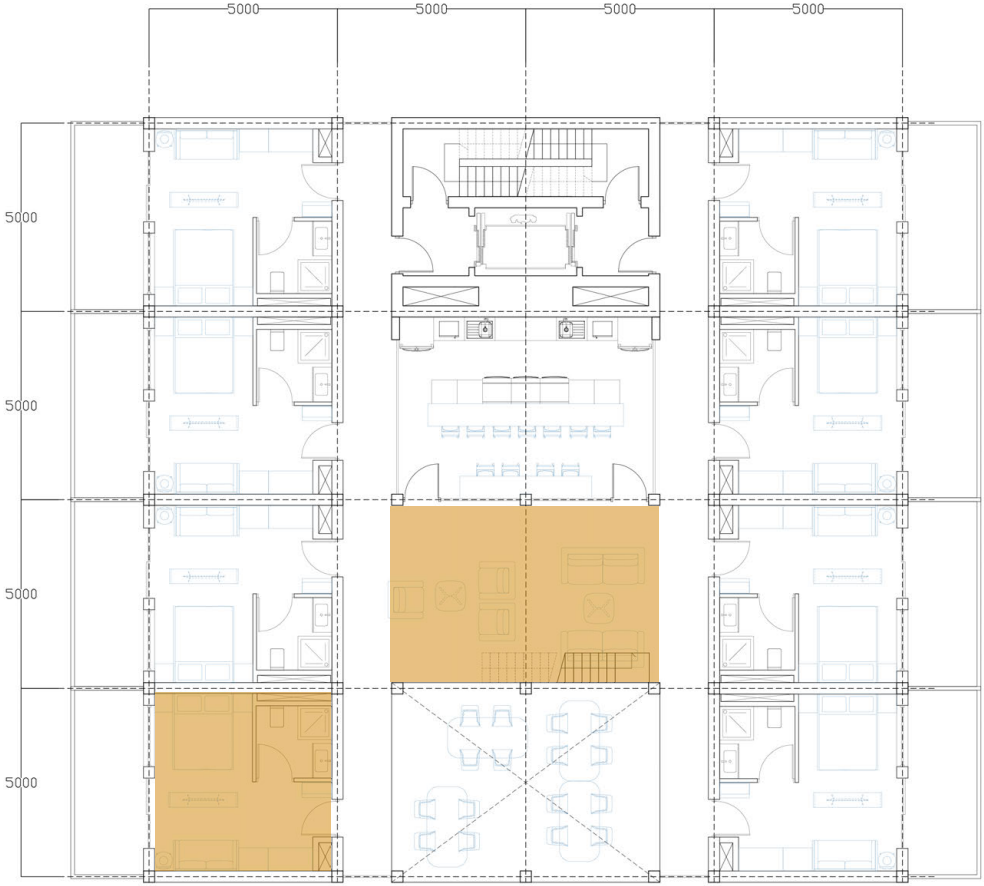
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# Ninth floor

## 1/250



Loss of space in the private unit supported by the provision of communal spaces



Private units to be smaller than average unit size (with limited kitchen and laundry facilities)

Positioning of key facilities (activity sites) and access points on shared walkways



Provision of semi-private outdoor spaces close to private units for socializing



Gradual transition between public and private spaces



Car parking outside the community or car-free communities



Good visibility into all communal spaces



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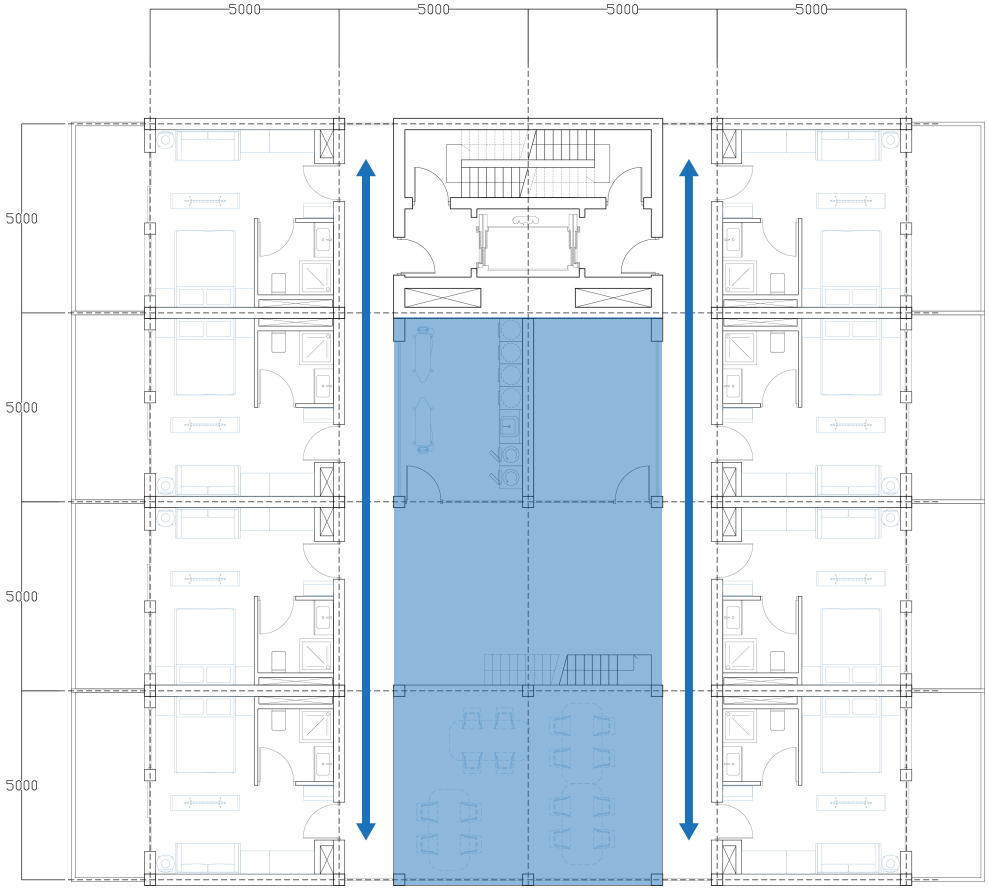
Private dwellings with high level of comfort



The notion of choice

**P2 research conculsions**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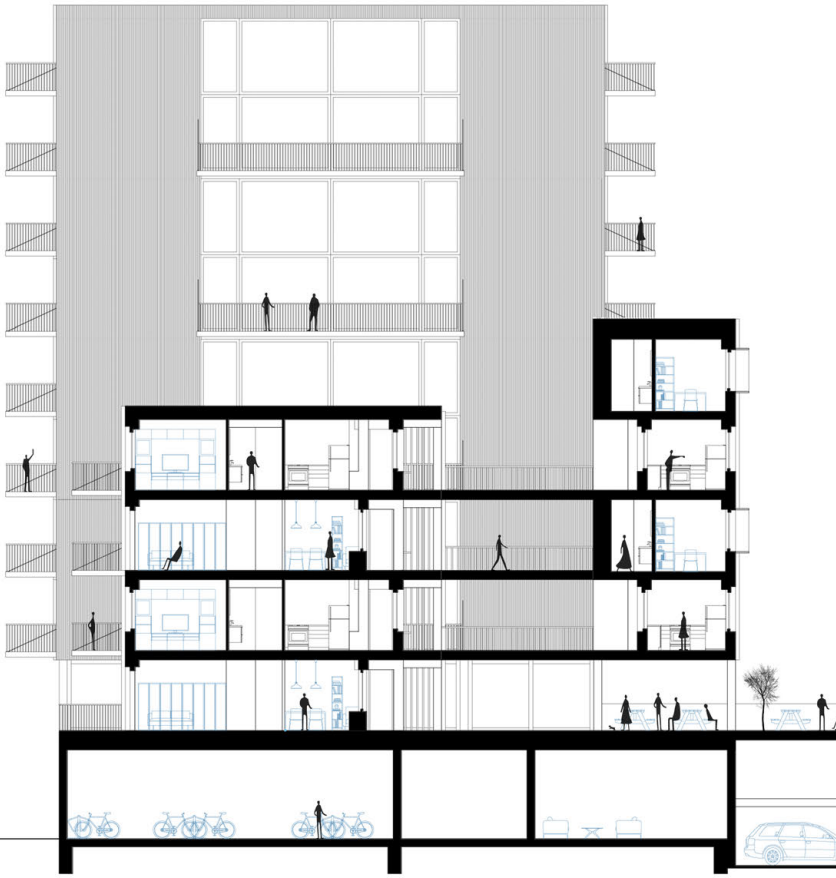
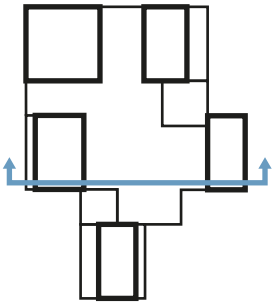
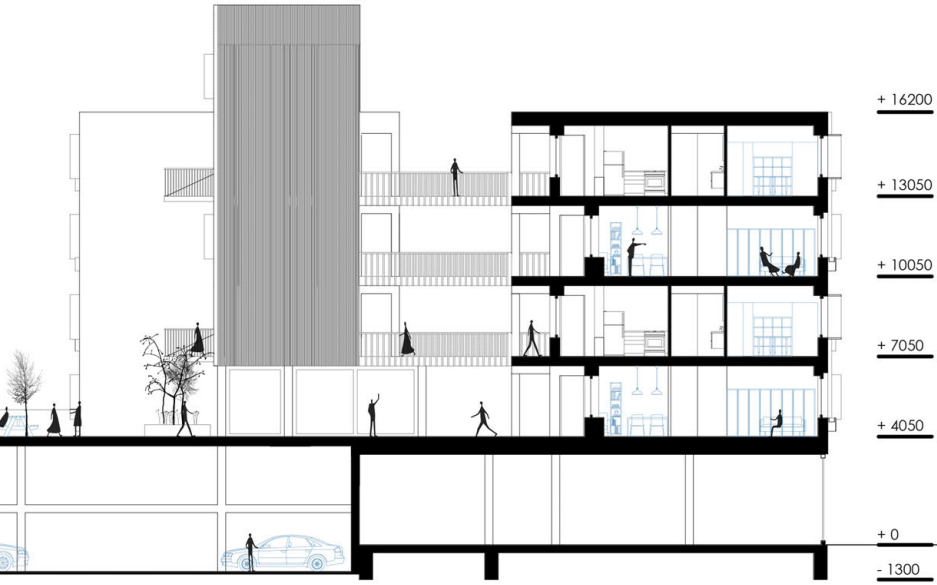
# Section AA

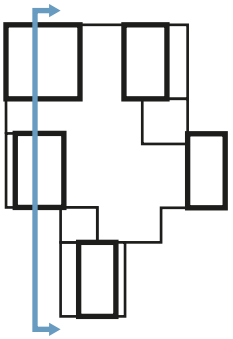





+ 16200
+ 13050
+ 10050
+ 7050
+ 4050
+ 0
- 1300

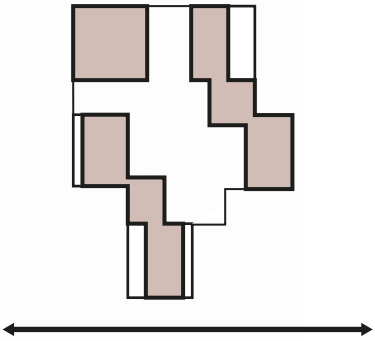
# Section BB

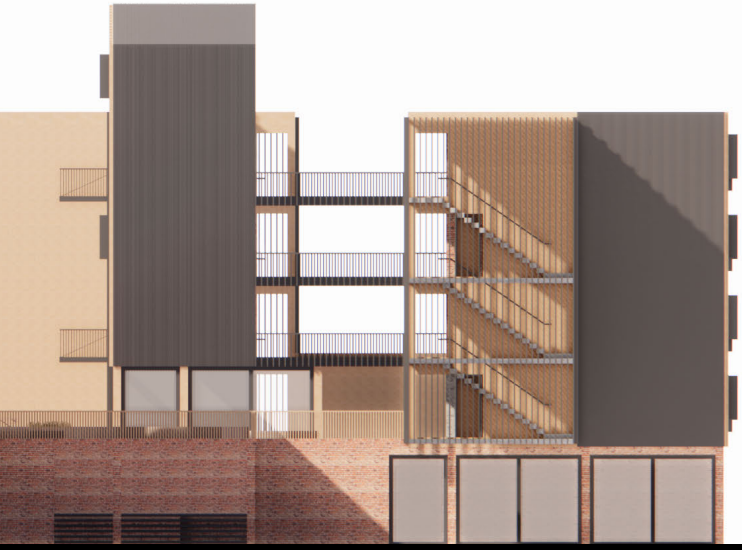

+ 31200
+ 28050
+ 25050
+ 22050
+ 19050
+ 16050
+ 13050
+ 10050
+ 7050
+ 4050
+ 0
- 1300



# South elevation

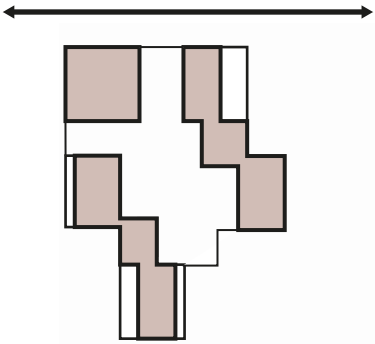
**1/200**



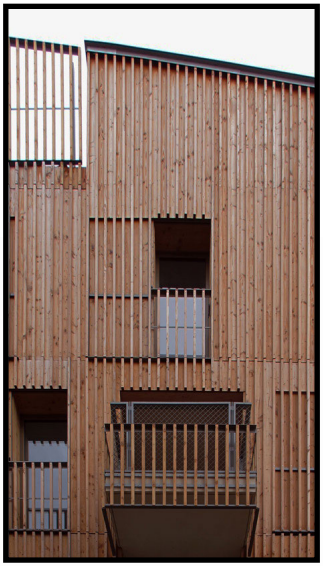


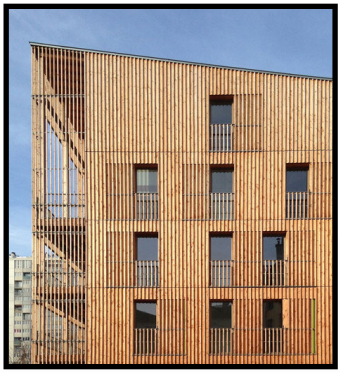
# North elevation

**1/200**



# West elevation



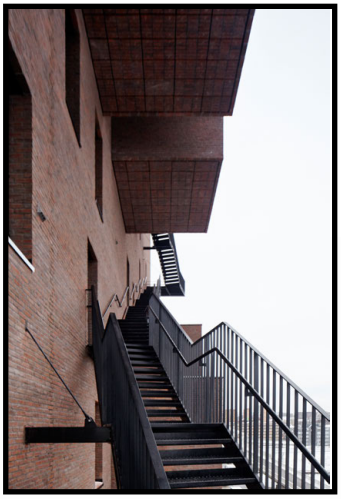


***Material - untreated pine***

*Paris housing blocks by Tectône Architectes*

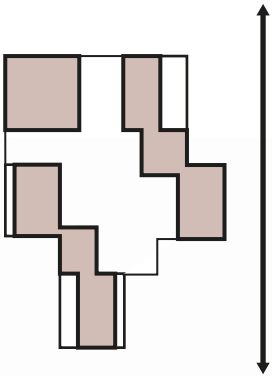
***Material - brick facade***

*The Wedge by A-LAB architects*

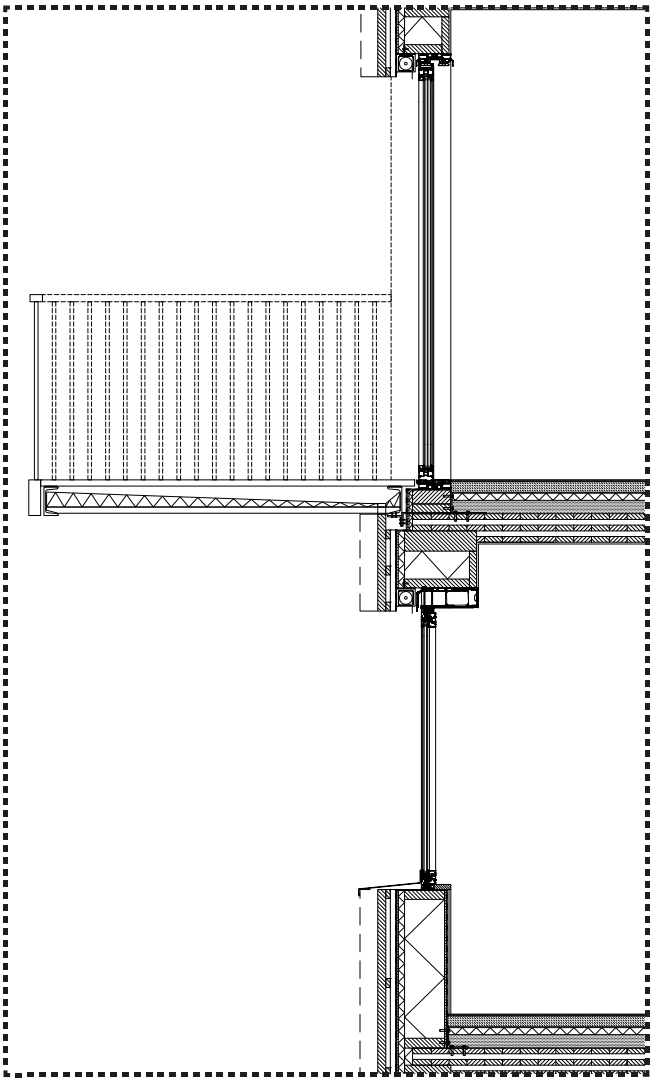


***Material - dark pre-patinated zinc***
*PROJECT BY PASEL.KUENZEL ARCHITECTS*
*ROTTERDAM, NETHERLANDS*

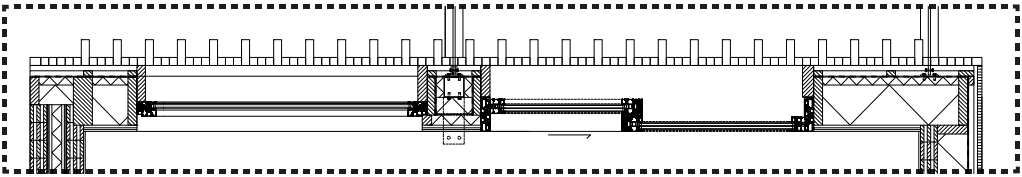
# East elevation



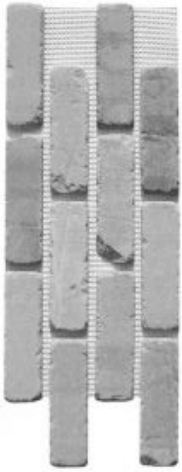
**Facade fragment**

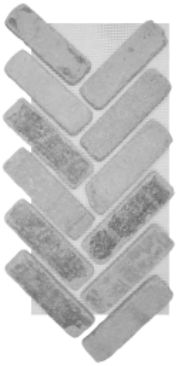


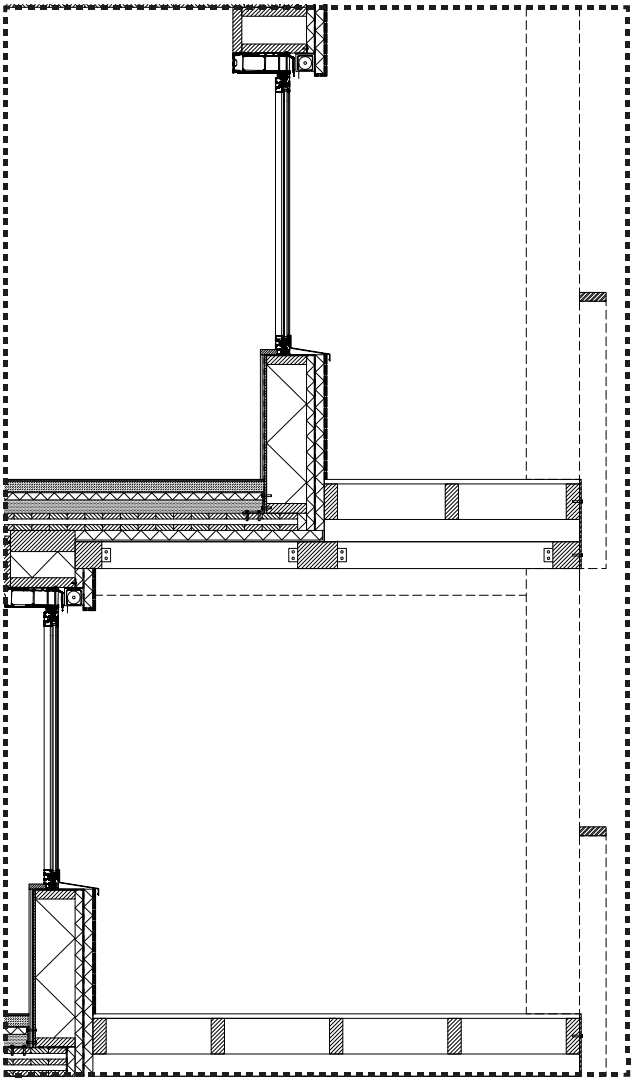
The facade of the apartments that face the exterior (not circulation space) is covered with timber lamellas of standard size that makes the cost lower and the availability of the material is high. This facade also provides a metal balcony which is suspended from the structure.



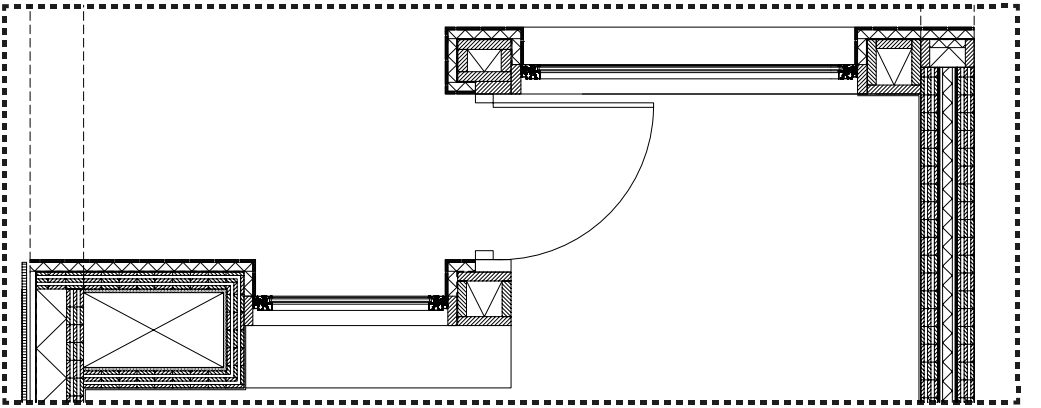
## Facade fragment





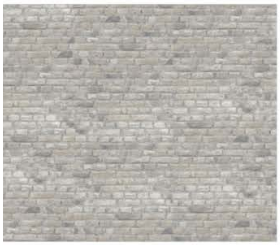


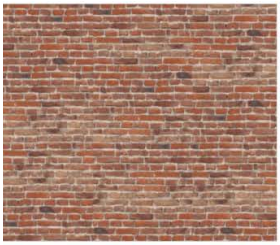
The front facade of the dwelling is covered with brick which was inspired by traditional dutch architecture. However, the brick used in the facade is thin brick by Old Mill manufacturer. This system allows for the structure to be light and also insulate the interior of the dwelling.

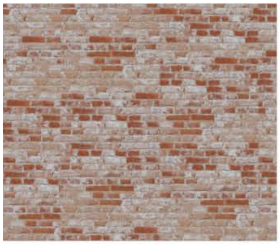


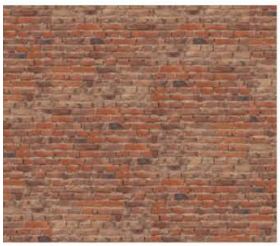
# Diagrams

## Materials

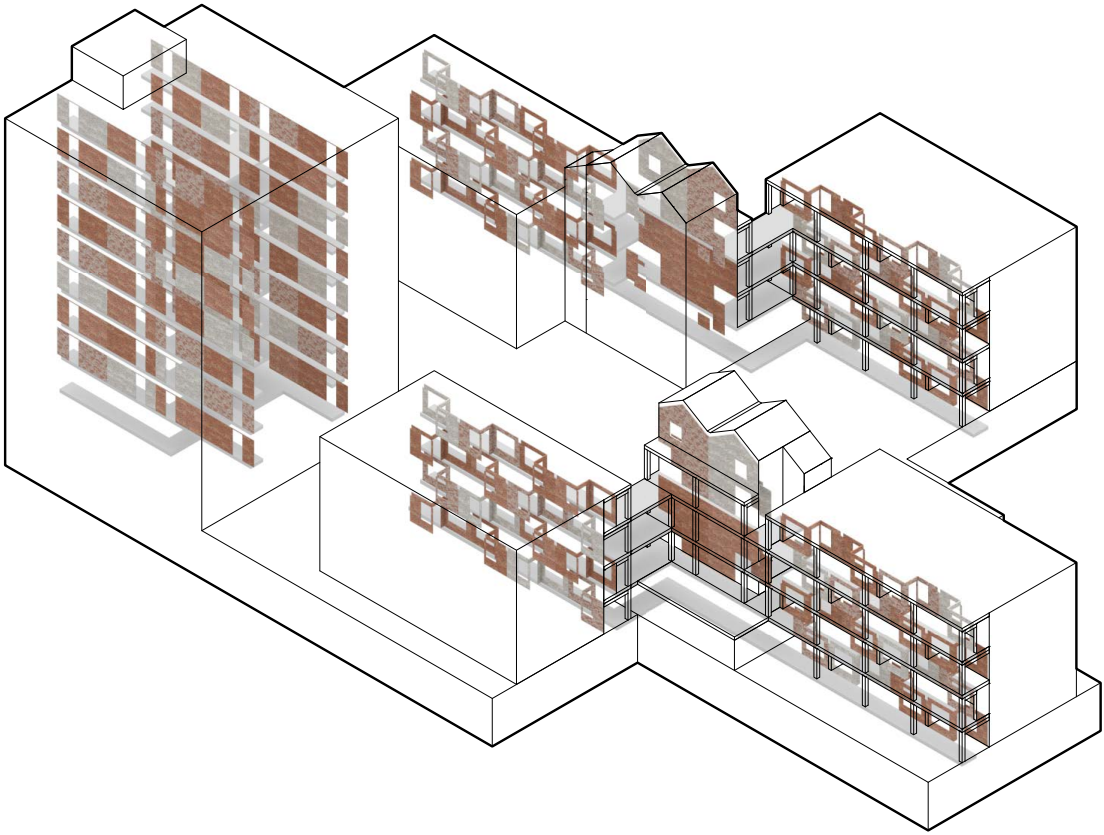








Brick is an important material for this project not only in the way it looks but the storey it tells. The brick is used along the circulation routes and marks the front side of the dwelling. This choice of material is inspired by traditional Dutch architecture and Dutch cities. The idea was to make the circulation space in the project look like the route along the street in the city. The brick is deliberately chosen in various colours to create the division between specific apartments and reduce the anonymity of the entrance space.

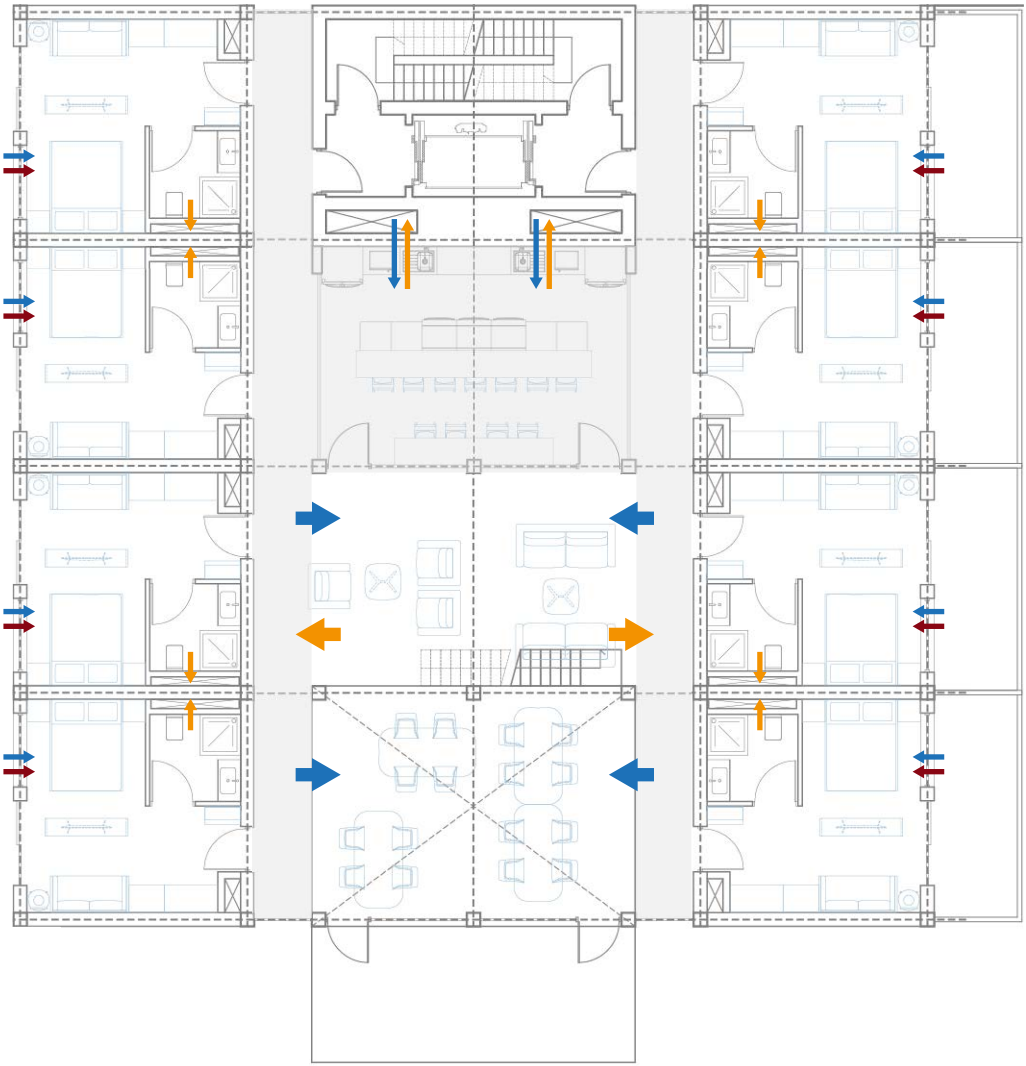



View from Keilewek

# Diagrams

## Climate design and sustainability principles

## Tower climate system : centralised, semi-decentralised



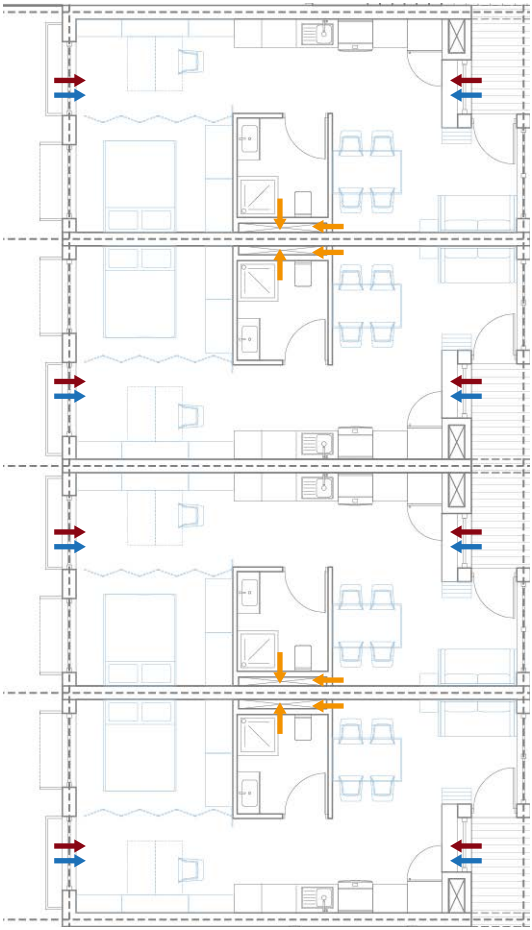
## Mid-rise climate system : semi-decentralised

Fresh air inlet

Exhaust air outlet

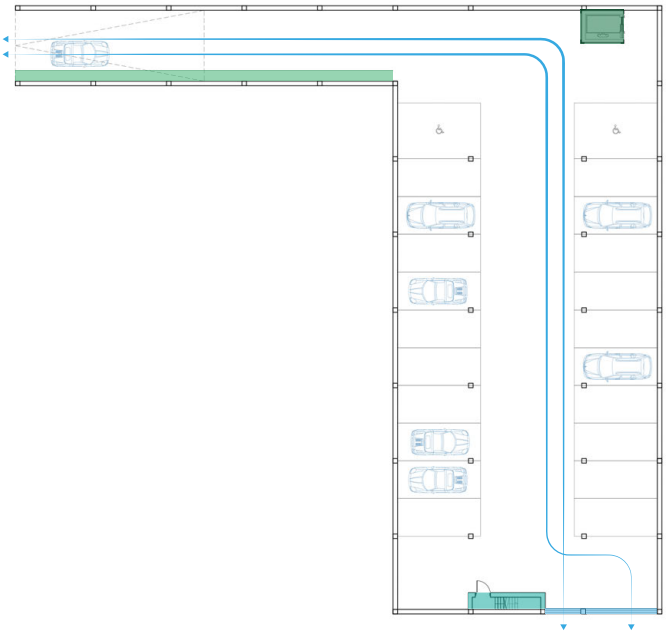
Pre-heated air inlet

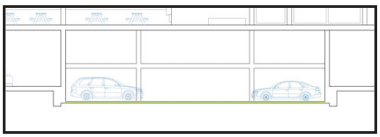
Area with suspended ceiling

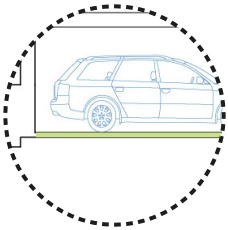


# Basement

## Parking solution



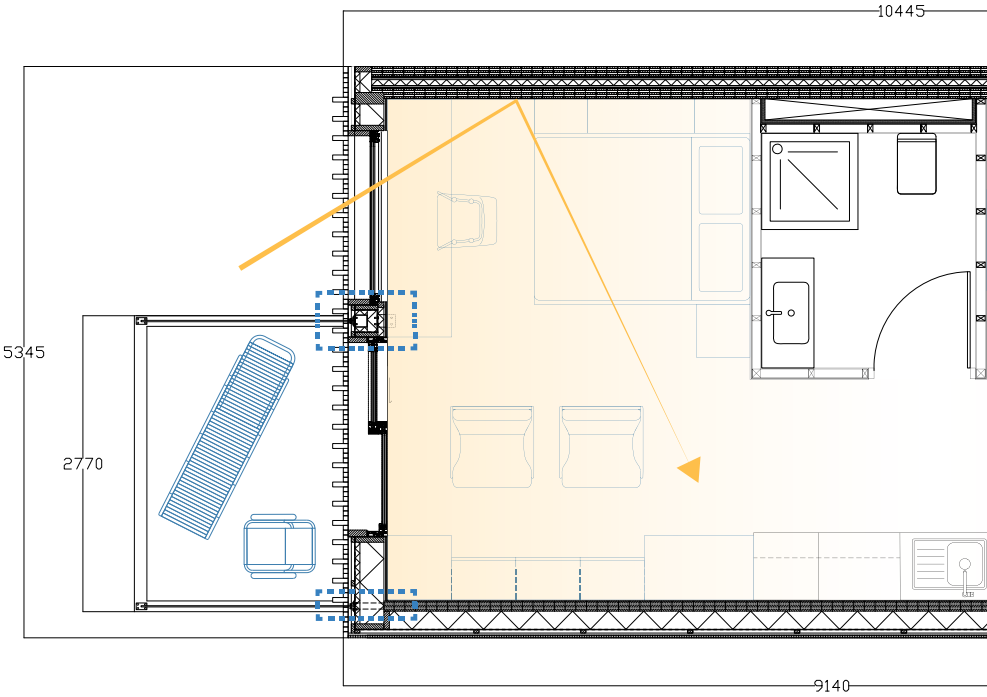


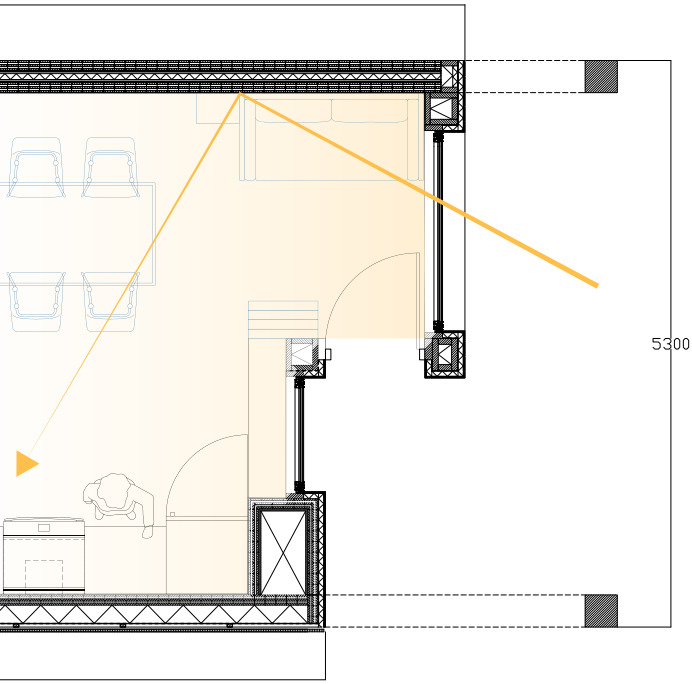


- air circulation
- fire escape stairs
- pedestrian entrance via ramp
- elevator
- paved surface

The parking is designed half-level below the ground, which is above the ground water level. This allows designing the floor of the parking as a pavement, without additional support or structure below the parking. Moreover, the ventilation is considered within the parking. Metal grills are placed opposite to the location of entrance ramp which allows for air circulation. Fire exit is also considered within the parking, the additional stairs are located on the south while people can escape using a ramp on the north side of the building.

# Dwelling plan





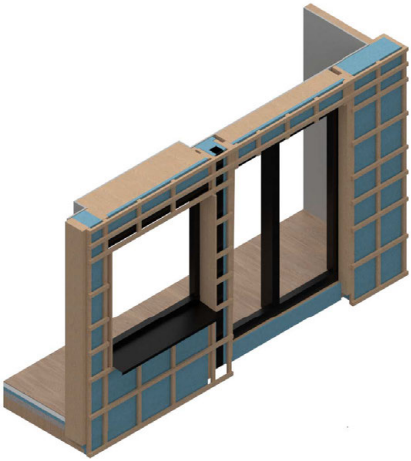

The walls and ceiling are covered with light paint to make sure that the light is reflected deeper into space. The dwelling is quite long of approximately 10.5 meters, for this reason, the windows are located on both sides of the dwelling. This will provide a maximum amount of natural lighting as well as allow natural ventilation.

# Facade assembly

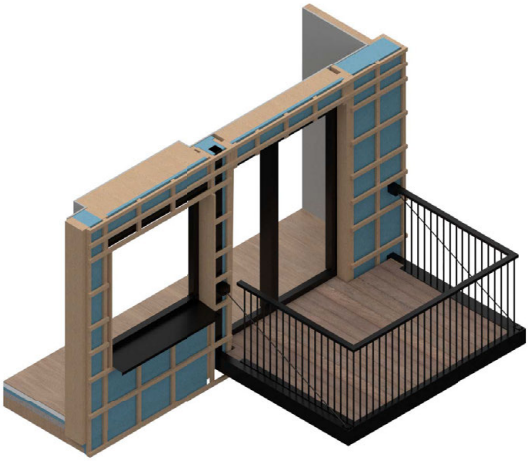
## Step by step process

Assembly of CLT floors

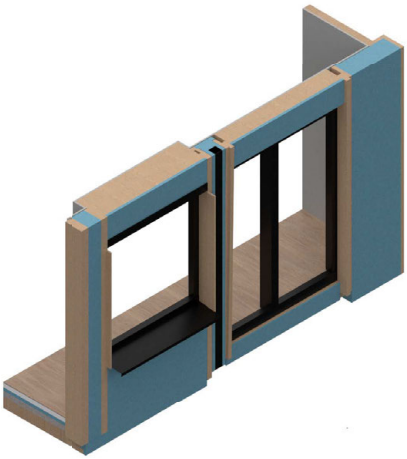
Assembly of load-bearing CLT walls



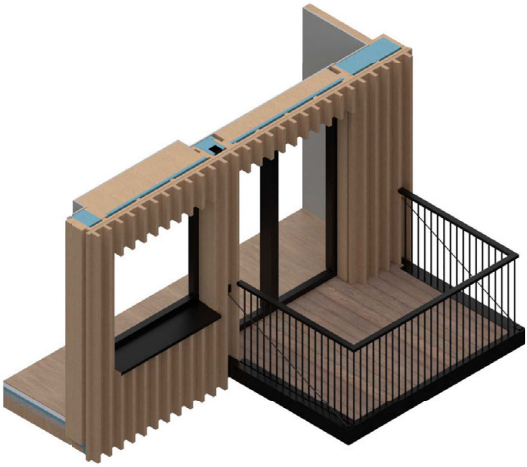
Assembly of timber frame



Assembly of preabricated balcony and attachment to steel column integrated into facade



Assembly of prefabricated window frames with insulation layer



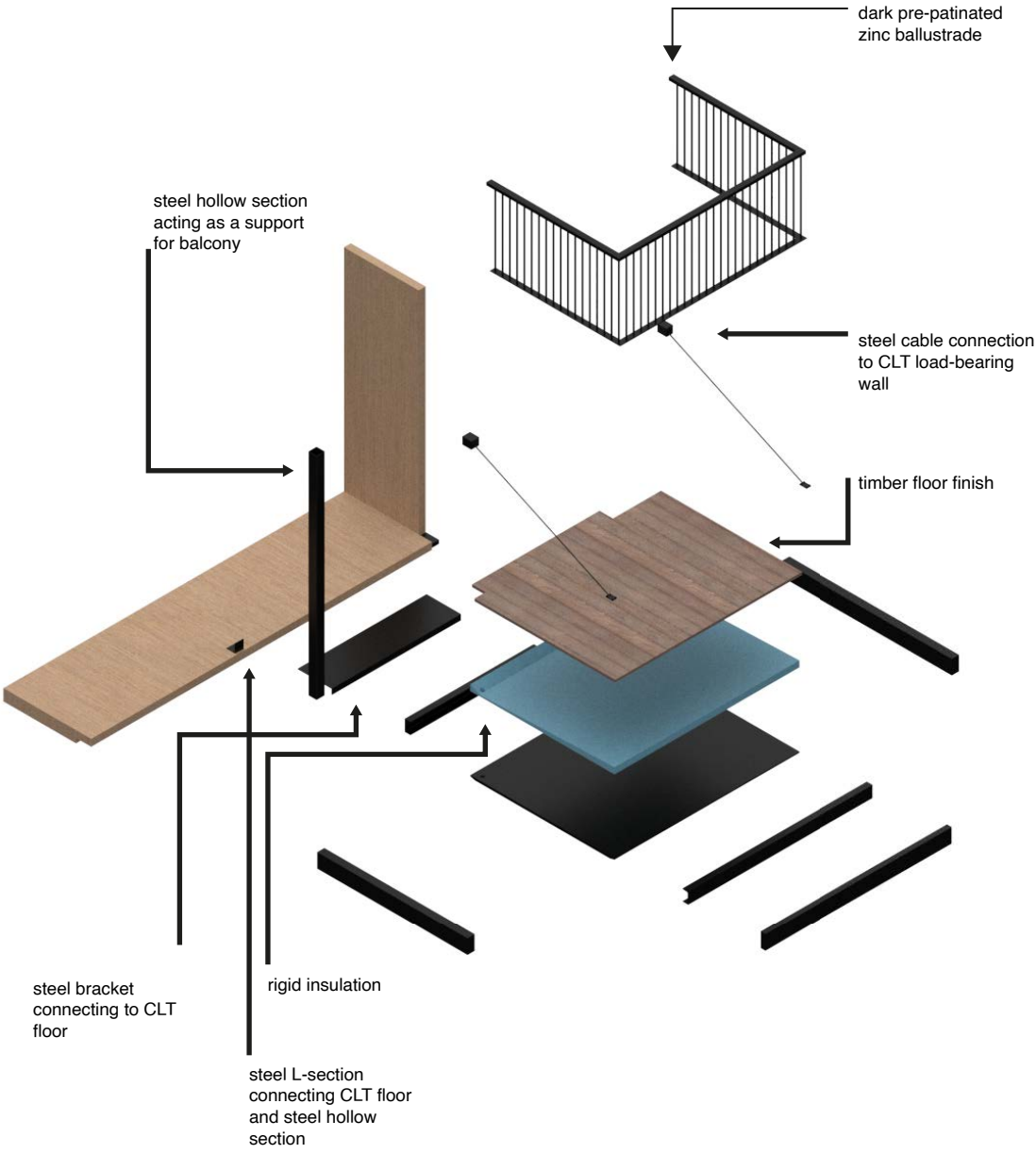
Assembly of timber cladding

The facade is attached to the primary structure which is constructed from CLT floor and CLT walls. The balcony is attached to the CLT wall on one side and the steel secondary structure on another side.

The facade is finished with wooden lamellas which are attached to timber substructure which acts as a support between insulation and facade cladding.

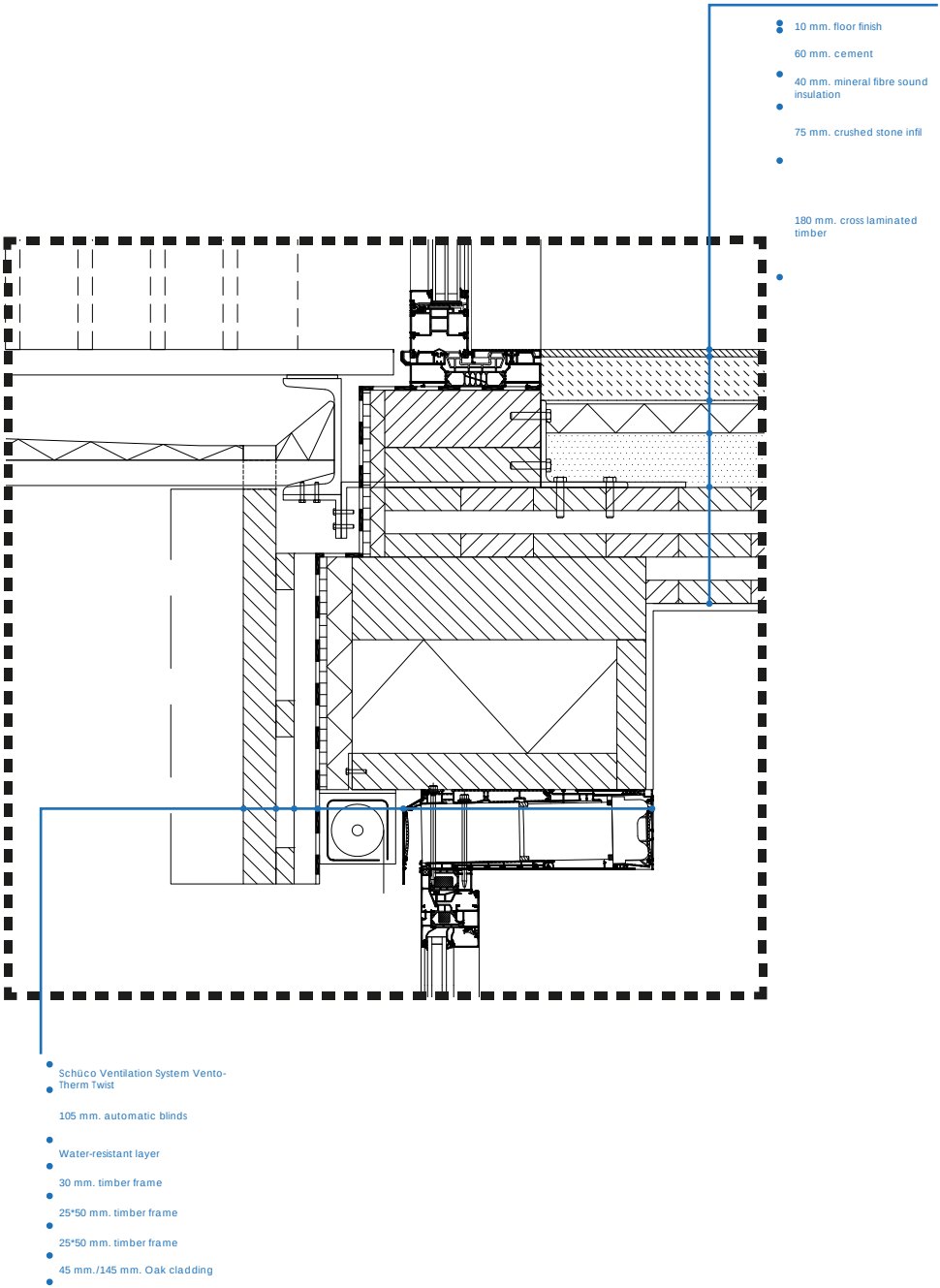
# Balcony assembly

## Exploded view


dark pre-patinated zinc ballustrade
steel hollow section acting as a support for balcony
steel cable connection to CLT load-bearing wall
timber floor finish
steel bracket connecting to CLT floor
rigid insulation
steel L-section connecting CLT floor and steel hollow section

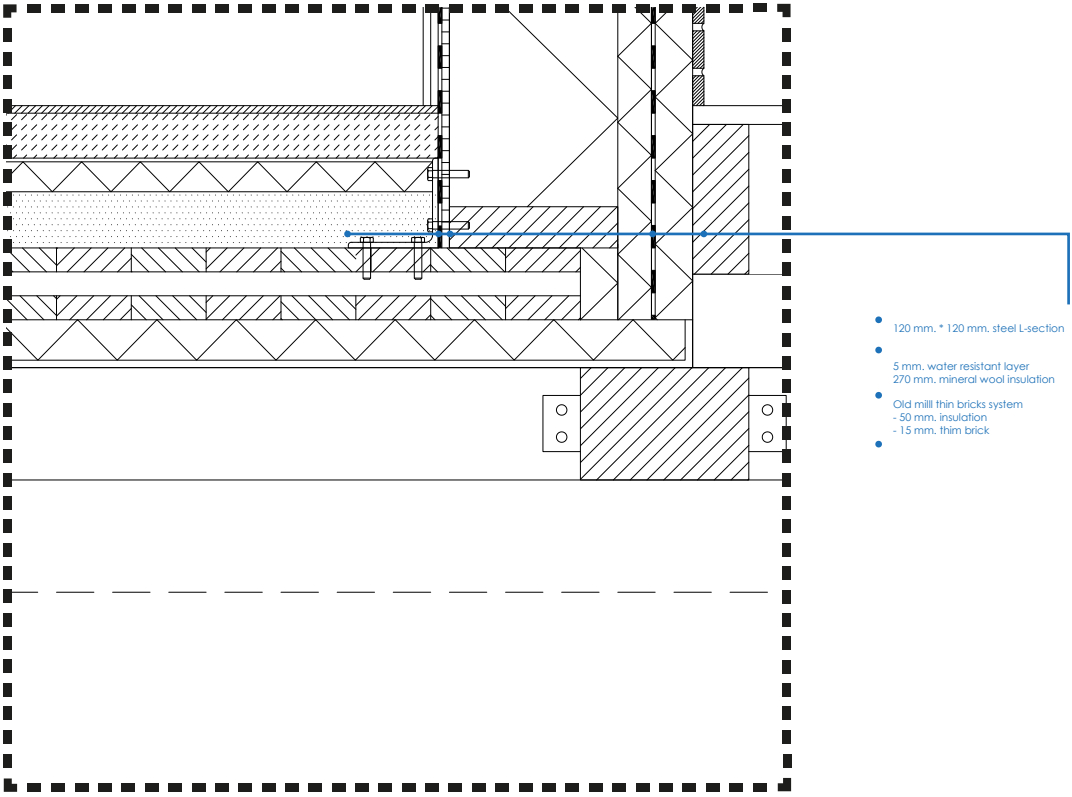
# Detail A

## 1/5

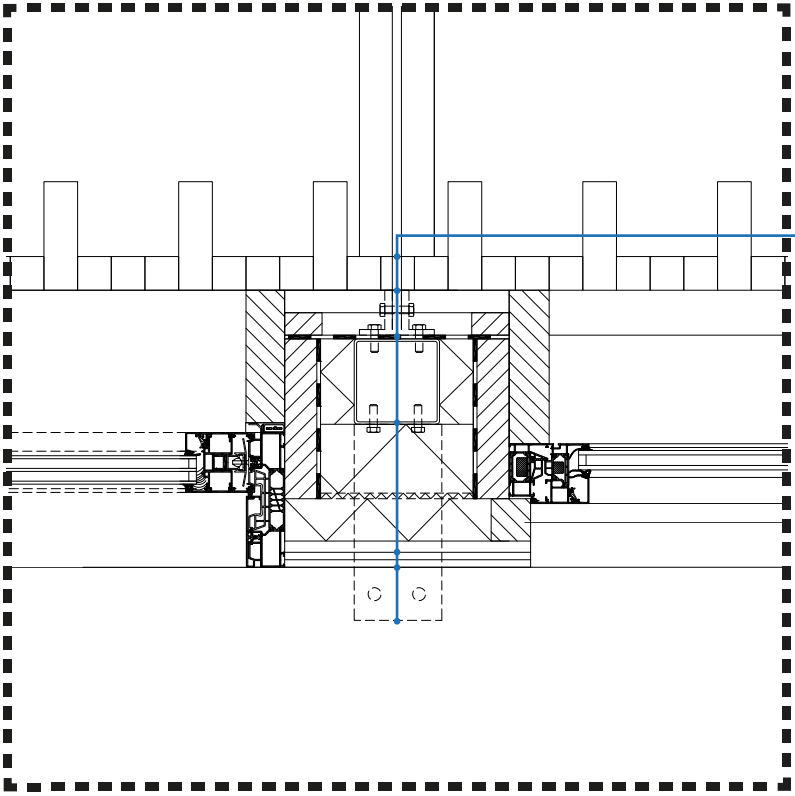

10 mm. floor finish
60 mm. cement
40 mm. mineral fibre sound insulation
75 mm. crushed stone infil
180 mm. cross laminated timber
Schüco Ventilation System Vento-Therm Twist
105 mm. automatic blinds
Water-resistant layer
30 mm. timber frame
25*50 mm. timber frame
25*50 mm. timber frame
45 mm./145 mm. Oak cladding

# Detail B

## 1/5


120 mm. * 120 mm. steel L-section
5 mm. water resistant layer
270 mm. mineral wool insulation
Old milll thin bricks system
- 50 mm. insulation
- 15 mm. thim brick

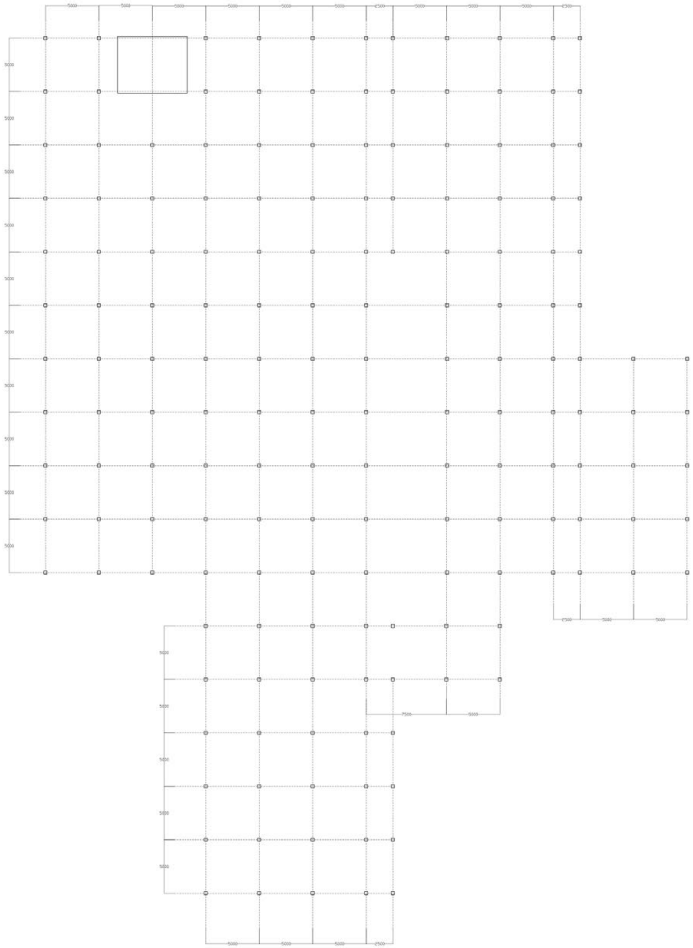
# Detail C

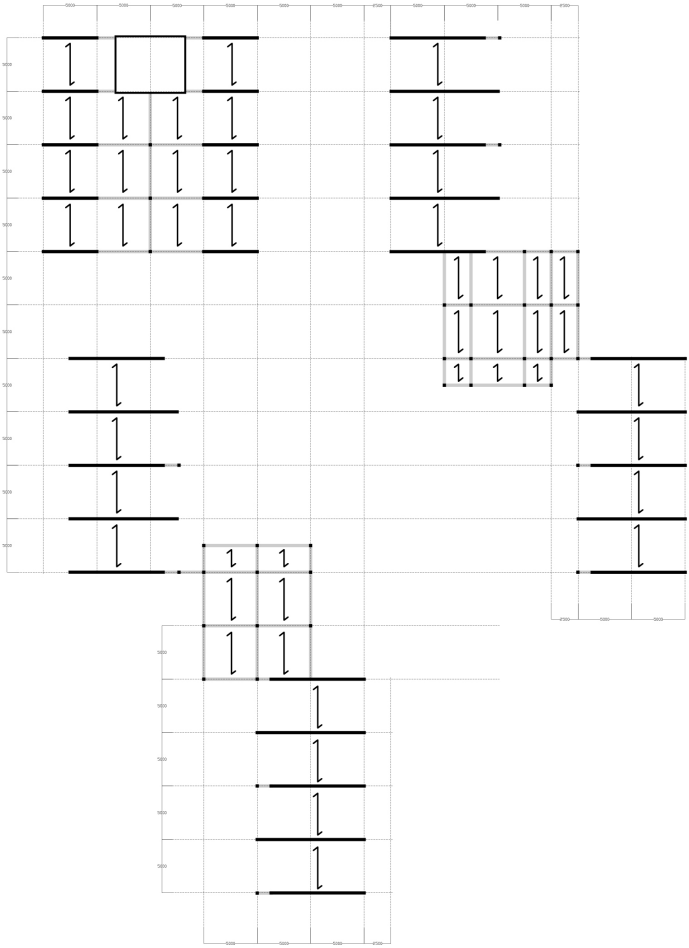


- 45 mm. timber cladding
- 60 mm. * 50 mm. steel brackets
- 115 mm. steel rectangular hollow section
- 170 mm. mineral wool insulation
- 20 mm. gypsum panels
- 170 mm. * 115 mm. steel bracket

# Structure

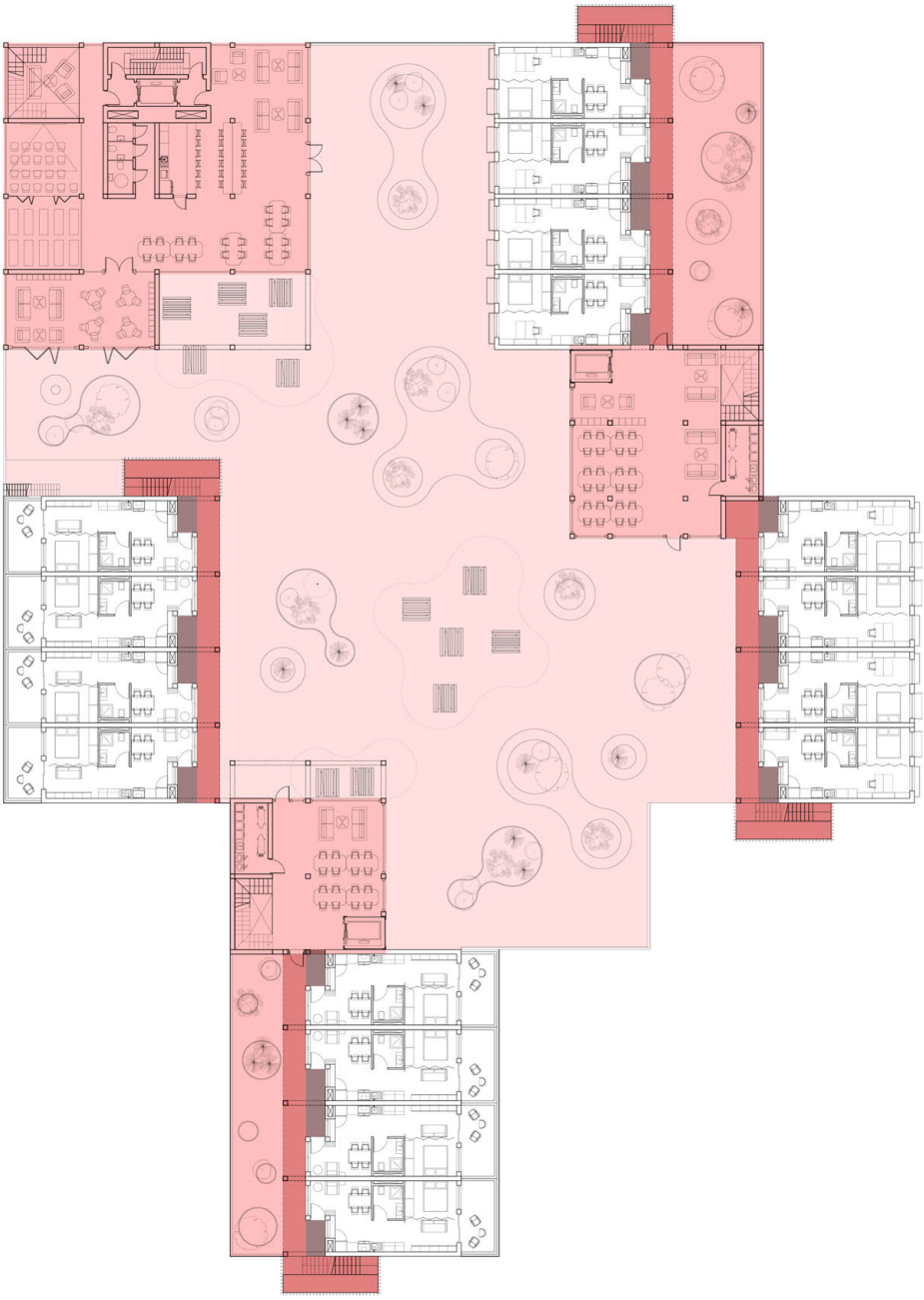
## Span direction





# Community creation

## From pubic to private



The project is focused a lot on collectivity and community creation. For this reason, the gradual transition between public and private is created. As research showed, solo dwellers admire the private space while willing to be a part of the community. Therefore, there are two additional steps between private and shared.

shared per complex

shared per building

circulation space along dwellings

personal transitional space

The first step from the dwelling is “personal transitional space”. This space is located next to the dwelling and is owned by the resident, however, there is a visual connection between the space and the neighbours as well as shared areas.

The next step from the private apartment is “circulation space”, where the resident has not only a visual connection with the rest of the dwellers but also physical. People can meet here? have a chat and walk together towards a shared space. This last step *shared space) is where collectivity on a bigger scale happens. However, it is important to note that the resident is not pushed towards this large space unconsciously. There two steps to make from a private apartment before physically entering the large shared space.

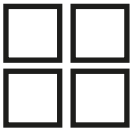
## Transitional space

# Collective functions

## Tower coliving

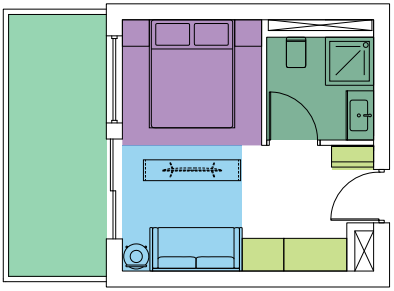
Small 8-15 households

"An advantage of small communities is that they are less complicated and require less hands-on management, however, it is important that residents be highly compatible, which often results in a less diverse community."
(McCamant & Durrett, 2011)

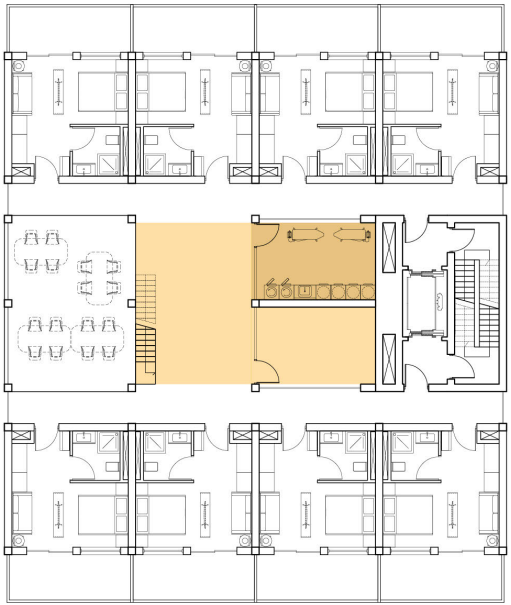


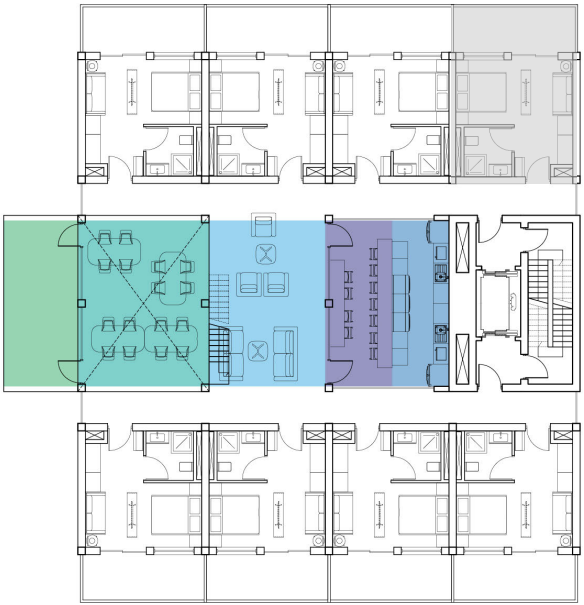
4 coliving units in the tower

16 people per unit



- bedroom
- dining room
- kitchen
- living room
- study space
- private terrace
- WC
- storage
- flexible space
- shared laundry






Tower coliving