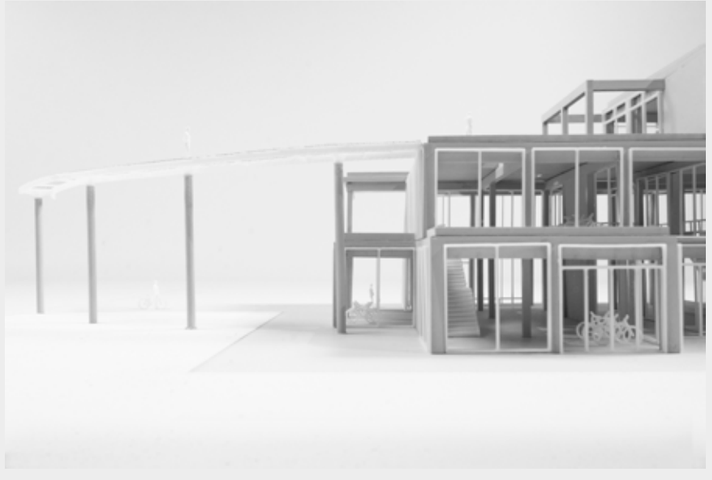
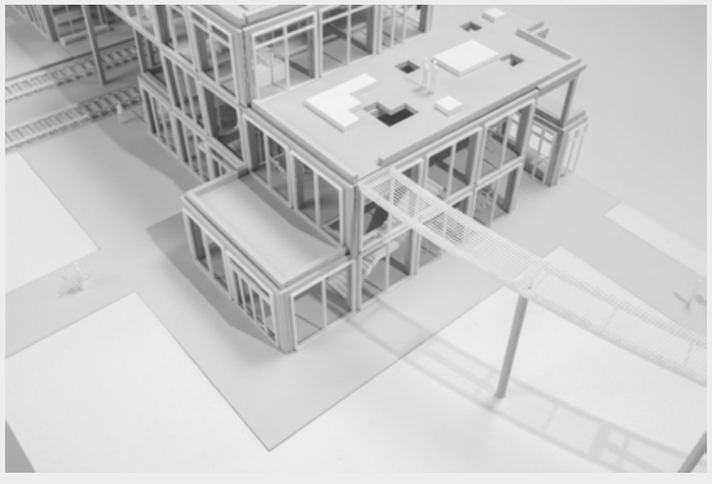
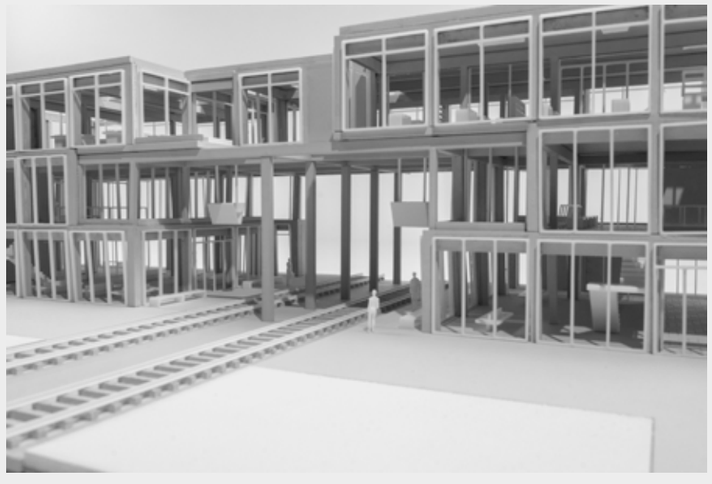
Research-by-Design Journal

P5 | Social infrastructure

Blaise Fouarge | 5944597







Tutors:
dr. Antonio Cantero | Architecture - Project Design
ir. Ger Warries | Technical Building Design
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Introduction

About the journal

The Research-By-Design Journal shows a process in which design has been used as an exploration of possibilities, opportunities and variants. It shows the creative process between ambitions and outcome, and is the result of the interaction between design and research. Design research is used as a method for creating design loops, variants, reiterations, intersections and impressions.

Social Infrastructure

The graduation project focuses on designing a new public infrastructure in Copenhagen, within the theme Public Condenser. It explores the possibility of approaching infrastructure not only as functional, but also as socially and spatially valuable. Hybridising infrastructure and architecture creates a multifunctional space that promotes social interaction and brings together diverse groups.

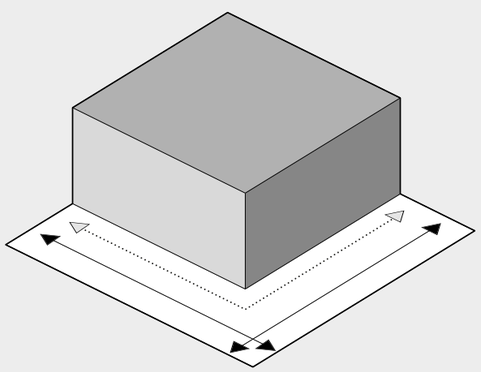
The design reimagines infrastructure as more than a functional necessity, recognising its inherent value in shaping both environments and communities. Its urban approach becomes a catalyst for new opportunities, revitalising the neglected physical context and enhancing neighbourhood quality of life through vibrant circulation. By integrating social and infrastructural elements, the project aims to establish a strong connection with the urban fabric, generating value for both local residents and the wider city. Functioning as a mobility hub, the design fosters social interaction and gathering through its circulation zones, outdoor areas, and multifunctional interior spaces. Embedded within the urban grid, the strategically positioned project promotes spatial connectivity and equal opportunity among communities, taking advantage of its unique location between park and neighbourhood as part of a broader boulevard route

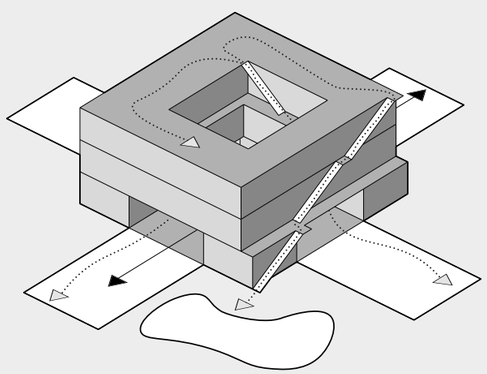
The public realm

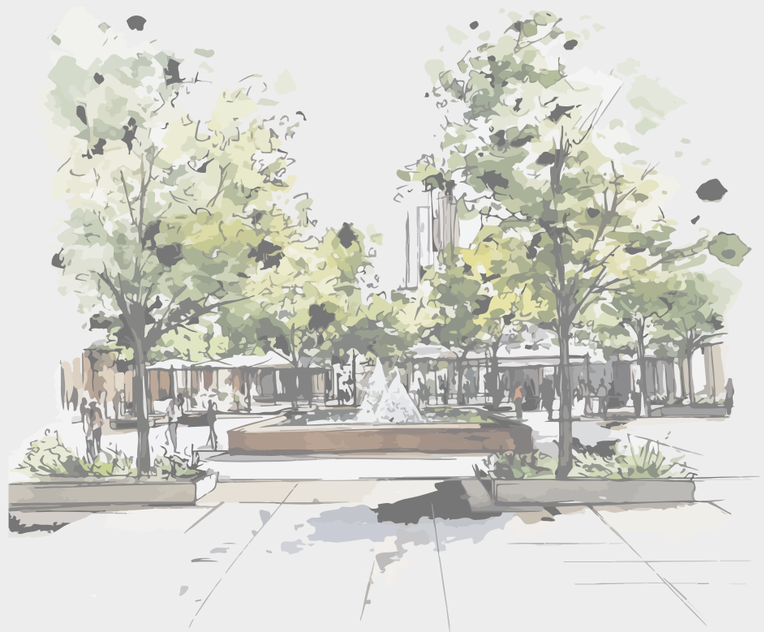
The concept of a public place or building has both a local and an urban scale, contributing to the overall liveability of the city and responding to specific local needs. It leaves room for personal interpretation and recreation, which means it should offer undefined or multi-purpose spaces that encourage flexibility. This allows for spontaneous use and adaptation, ensuring that not every activity is pre-determined, enhancing its potential as a dynamic space for all.

The space is designed to be accessible to all members of society, it plays a visual role in its environment, and it reflects the local and urban culture. Physical accessibility is essential to ensure that everyone can engage with the space. The establishment should create space for cultural, physical, sustainable, and social activities. Public spaces fosters interaction, debate, and the exchange of ideas, promoting meetings where people can share, learn, and gain knowledge. Involvement of local business, industry and education can also contribute to this. Public places encourage special actions that can only take place in these spaces.

Public building and space form each other, there should be a logical relationship between needs in the neighbourhood and form of the space. In coherence, a transition into a partially covered space, an urban courtyard, a gallery, a combination, and so on can be created. The space can be made interesting and dynamic through height differences, stairs and the integration of a dynamic outdoor space.







Introduction

The graduation plan is derived from the research plan and encompasses the problem statement along with research questions, as well as the proposed project's significance and objectives. The research plan acts as a framework and initial incentive to define the interest, problem and direction. The focus here is on developing methods to achieve the desired results, such as employing literature review, analysing case studies and conducting interviews.

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences

Personal information	
Name	Blaise Fouarge
Student number	5944597

Studio		
Name / Theme	AR3AP100 Public Building Graduation Studio "Public Condenser, Copenhagen"	
Main mentor	dr. Antonio Cantero	Architecture - Project Design
Second mentor	ir. Ger Warries	Technical Building Design
Third mentor	dr. Sang Lee	Research - Theory & Delineation
Argumentation of choice of the studio	Public buildings and public places define the identity of a city, acting as a neutral ground and a common foundation. Public buildings, squares, parks or other important shared infrastructures are often the places where life takes place, the public realm. The need for gathering and social interaction is deeply woven into human history and culture and not only creates a greater sense of community but also leads to better physical and mental conditions. The theme of 'public condenser' is not only about bringing together functions within a building, but also the broader meaning of combining different solutions to challenges in public and personal life. The theme pertains to the freedom to decide which aspects of public life and architecture are important to you or the target group.	

Graduation project	
Title of the graduation project	Social infrastructure : physical and social connectivity in Haraldsgade district
Goal	
Location:	North – ydre nørrebro Haraldsgadekvarteret, København Haraldsgade district, Copenhagen
The posed problem,	
The Haraldsgade district is classified as a parallel society, identified by a vulnerable group of people who face problems related to low incomes, unemployment, lack of education and high crime rates. The parallel society exemplifies the experience of	

	living alongside each other, not understanding each other, or insufficient opportunities for low threshold interaction between residents of the district and those in neighbouring areas. The Haraldsgade district reveals a place that is socially and physically disintegrating. In the social aspect, research shows the lowest average incomes in Copenhagen within the Haraldsgade district (Riveiro & Nowak, 2022, p.10). According to the Statistics Bank of Copenhagen, the average disposable income in Haraldsgade district is about 18.7% lower than the city's overall average (Københavns Kommune, 2022). The area contrast sharply with surrounding district causing an unintended sense of isolation. The economic inequality is compounded by the living conditions of Haraldsgade residents, who often live in larger families with less space per household. This situation makes the community more dependent on local public services and infrastructure. However, these essential facilities and services are notably lacking in the neighbourhood, leaving residents with few opportunities to meet other community members or to foster reintegration through interaction with residents from surrounding areas. Residents of different backgrounds live largely alongside each other, without a common space for low-threshold interaction or functions that allow interaction between them and surrounding neighbourhoods. Physically, large, closed building blocks and wide infrastructure create a fragmented spatial structure, leading to an uninviting and impersonal living environment. This isolation may cause people to experience division, ultimately leading to societal problems. There is a lack of a multifunctional social space where residents can meet informally, without specific goals or obligations. Such a place would encourage spontaneous interaction without necessarily incurring costs. It would allow residents to connect with their neighbourhood or community, meet people from other districts, participate in various activities, or receive support for different needs. In the current situation, there is little incentive for residents of surrounding neighbourhoods to visit the district, which limits opportunities for integration or growth. The existing (public) infrastructure is unattractive. There is little attention to cyclists and pedestrians, an absence of pleasant routes, public squares and public buildings create poor appeal. Green spaces in the area are also limited. Research shows that Nørrebro has only 7 m² of green space per inhabitant, while the average in Copenhagen is 32 m² per inhabitant (Visionplan Vingelodden/Rovsinggade, 2023). Social tensions, crime, and insecurity are results of isolated societies, not only affecting the area but all residents. The inaccessibility in urban spaces creates barriers that might prevent people from participating in public life, these include mobility challenges, absence of squares and green and economic limitations.
Research questions	The question centres on how a new design could help unify and enhance the area, both at the city and neighbourhood level. There is need for a design that goes beyond being just a cultural hub. It should help integrate into a larger network, connecting with its surroundings in terms of location, infrastructure, and its role in fulfilling social needs. Approaching infrastructure as a foundation for natural social interaction, to goal is to make the area more lively and attractive creating a reason for circulation, resulting in spontaneous meeting.
	Main question: How might we design social infrastructure to blur physical and social boundaries for Haraldsgade residents and adjacent neighbourhoods, in order to improve integration and unification in a parallel society? The question focuses on creating an incentive that can relieve the identified problems in the area by developing a multifunctional social infrastructure that promotes the physical and social integration of Haraldsgade in the urban context. It approaches infrastructure as a foundation for natural interaction, by making the area more lively and attractive through circulation and movement. By focusing on the building as infrastructure, public circulation is used as an opportunity for people to interact with the building. This avoids making the use solely dependent on functions that do not guarantee activity, therefore it focuses on low-threshold encounters. By creating a sense of shared ownership the infrastructure has the potential of strengthening community resilience. *Sub question: How can the building be part of a connective public infrastructure that increases accessibility and adds value in the neighbourhood?* This question is about designing a thoughtful relationship between public infrastructure and building. It focuses on a connective space creating a multifunctional environment that fosters integration and interaction for different communities. It involves examining poor connections that result in physical and psychological barriers, leading to inaccessibility. It also focuses on how infrastructure, such as footpaths, cycling routes, car traffic and public transport, can increase the social value, promote connectivity and informal interaction. It also looks at how plazas and public green spaces make the environment less hostile and more attractive, creating a more seamless transition between different residential areas, public spaces and buildings. *Sub question: What kind of design that combines building and infrastructure can attract diverse target groups?* The question focuses on understanding the needs of various resident groups within different communities, with the aim of understanding what might motivate them to visit a space or building. It also explores how these needs can be integrated in a multifunctional way to encourage social interaction and engagement, considering convergence of building and infrastructure.
Design assignment in which these result.	
	The design reimagines infrastructure as more than just a functional necessity, recognizing it has an intrinsic value in shaping environments and communities. By improving the overall quality of life, the project's urban approach becomes a catalyst for new opportunities. By combining the social and infrastructure aspect, the design aims to create a strong integration with urban space, benefiting both the neighbourhood and city residents. The project's strong focus on social interaction and

gathering through multifunctionality is central, with the building taking advantage of its unique location and making use of outdoor spaces.

Process

Method description

The methods will focus on developing ideas and concepts, informed by research, literature and case studies, to alleviate the issue of parallel societies in the area seek integration with the city. These relate to approaches to meeting programmatic needs for neighbourhood and city residents, variations in spatial layout and concepts of how the building engages mobility or pedestrians, ultimately developing ideas of multifunctionality that can guide the form, circulation and functions of the building taking into account the use for the neighbourhood and the city.

One method is to use literature to further explore links between public space, spontaneous interaction and enhanced social cohesion across diverse groups, looking for relations to multi-purpose in programming and layout or the consideration of the pedestrian landscape. This transcends façades or buildings. Literature like 'The Social Life of Small Urban Spaces' by Willam H. Whyte, and 'The Death and Life of Great American Cities' by Jane Jacobs will contribute to develop a vision on the use of public green space, plaza and infrastructure and its potential in physically and socially connecting environments and communities. Within this theme, the aim is to connect the concepts of 'social' and 'infrastructure', with the aim of creating a healthy and inspiring living environment. Roe and McCay's book 'Restorative Cities' is very much in line with these ideas and the studio's theme, and can therefore help gain insights on designing for better health and stronger communities.

The exploration also focuses on how to make the building accessible and a connecting factor in the area by analysing existing infrastructure and opportunities to transform barriers into connective nodes. This includes the mapping existing networks or larger networks of slow traffic routes, public transport, greenery and other important infrastructure in the scale of adjacent districts or Copenhagen. Sketch and design variants will be used to explore connection opportunities in the area.

Case studies of buildings which incorporate human-oriented infrastructure like bicycle and pedestrian traffic will be analysed to identify knowledge and opportunity. Projects like New High Speed Station by Estudio Herreros, The Block by is-architects or Ewha Womans University are interesting as social infrastructures that engage public circulation with programmatic need. In addition to this, Case studies will be used to analyse successful projects that have bridged socio-economic devices or projects that have utilized multifunctionality to strengthen social cohesion. The method will focus on programmatic elements that are common through different classes, or events and occasions that could bring different communities together. For this, books can be used that evaluate or analyse a collection of such buildings, like 'This is hybrid' and '50 Hybrid Buildings' by A+T research group or 'Community By Design' by Porterfield.

Individual projects in different contexts will also be analysed like Multifunctional Center Doelum, NDSM Werf and Genossenschaft Kalkbreite,
Forssa Multipurpose Centre Akvarelli and Rebel Kop Zuidas to examine how physical layouts, programmatic combinations and architectural features can facilitate connections between people.

Literature and general practical references

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Case studies:
- Ewha Womans University by Dominique Perrault Architecture
- Forssa Multipurpose Centre Akvarelli by Olla Architecture
- Genossenschaft Kalkbreite by Müller Sigrist Architekten
- MAT building, University of Berlin by Candilis, Josic, Woods and Scheidhelm
- Multifunctional Center Doelum by NOAHH and Studio Nuy Van Noort
- NDSM Werf
- New High Speed Station by Estudio Herreros
- Rebel (Kop Zuidas) by rebel studio ninedots
- Tårnkvartalet by Haptic Architects
- The Block by is-architects
- The High Line, New York

Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

My project focuses on designing social infrastructure as a means of blurring physical and social boundaries in the Haraldsgade district. This ties in with the studio topic Public Condenser, which focuses on buildings that are not only functional, but also act as catalysts for social interaction and urban connection. The concept of a Public Condenser emphasises multifunctionality and interaction between different user groups, which fits well with my goal of designing a building that serves as a meeting place and connecting element within an isolated area and for a vulnerable community.
Within the Architecture MSc master's track, the focus is on integrating architecture with broader social and urban issues. My project explores how architecture not only shapes physical structures, but can also play a vital role in creating a sense of community and promoting social cohesion. By using strategies such as multifunctional spaces and improving accessibility.

2. What is the relevance of your graduation work in the larger social, professional and scientific framework.

My graduation work is relevant in the larger professional framework because it contributes to addressing urban segregation and social exclusion, which are globally problematic issues in many urban areas. Professionally, the project provides insights for architects and urban planners working on social infrastructure and urban renewal, with an emphasis on promoting healthy urban environment, community building and integration. Academically, it contributes to the existing literature on the relation between 'social' and 'infrastructure' by exploring new design methods that can bridge physical and social barriers in vulnerable neighbourhoods and fragmented areas.



Location

Copenhagen

The project area is located in Copenhagen. Copenhagen is the city of hygge, a term that stands for cosiness and comfort. Copenhagen's architecture is characterized by subtle colours, balance and elegance, with many neoclassical influences. Loggia façades, rhythmically placed and repeating window frames and details that come to life when viewed up close are recognizable in the Danish urban landscape. Denmark is known worldwide for its design, with furniture that is functional, timeless and expressive. Danish design ranges from lighting and chairs to door handles, all with an emphasis on simplicity and quality. The country is also loved for its public spaces, where pedestrians and cyclists come together harmoniously in inviting urban environments.

CPH impressions

While walking through the city, I was inspired by the characteristic street scape of Copenhagen. I observed the details and recurring typologies that give the city its coherence and unique character. The sketches I made serve as inspiration and can be used as reference material for my own design.



Images

Copenhagen is a city full of diversity, where traditional and modern elements come together. You will find iconic harbour areas with innovation centres, lively terraces and a rich history that comes alive in its surroundings. The city has car-free shopping streets with a mix of well-known brands and unique boutiques, where the vibrant street life can be felt. In it's core, traces of a defensive past are visible in the star-shaped fortress, now a green haven with walking paths. In this place, the city has a semi-autonomous free state, where its own rules and a unique community formation come together. Copenhagen is an interesting city and truly a collage of culture and history.







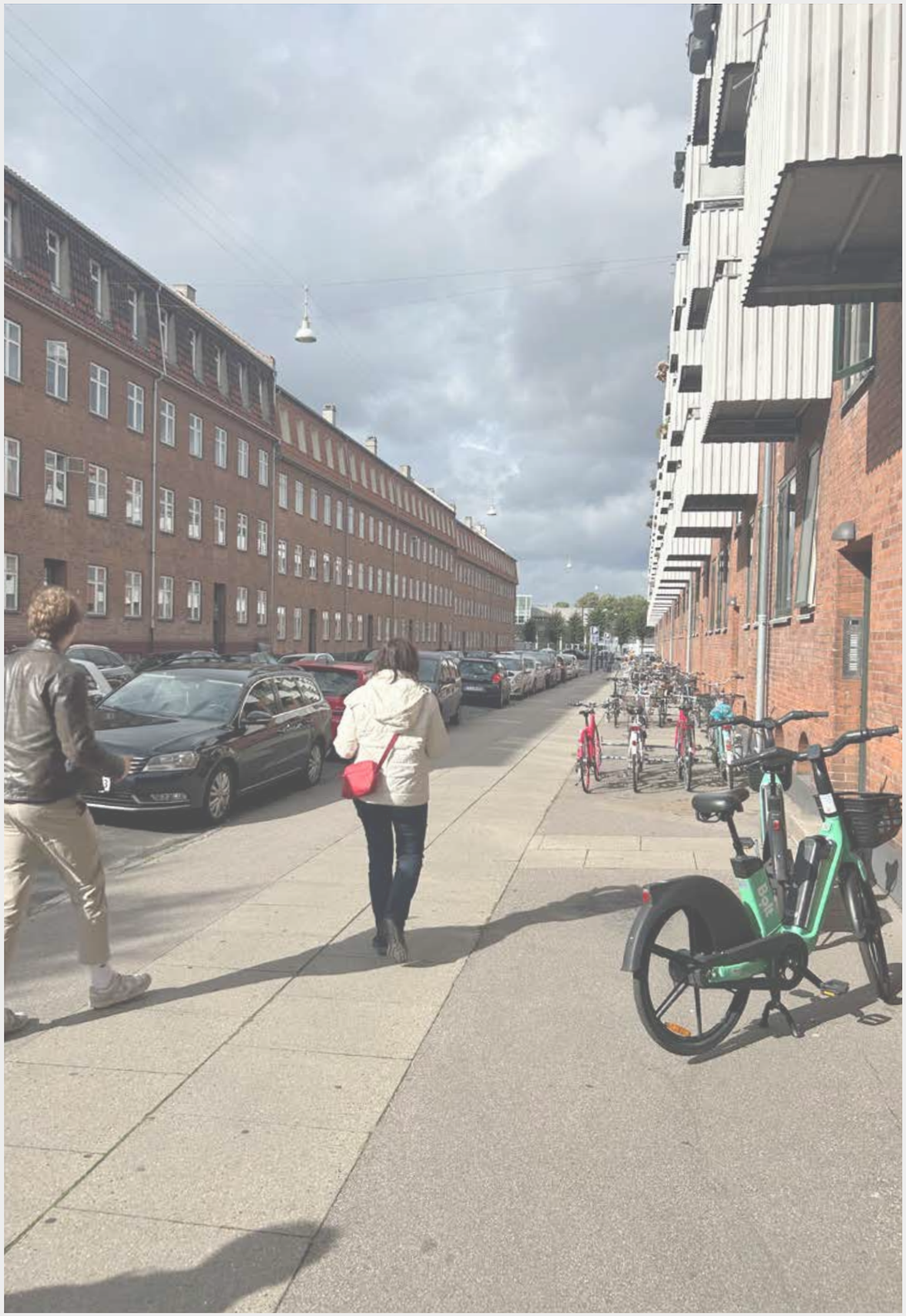


Haraldsgade-kvarteret

Area Haraldsgade District

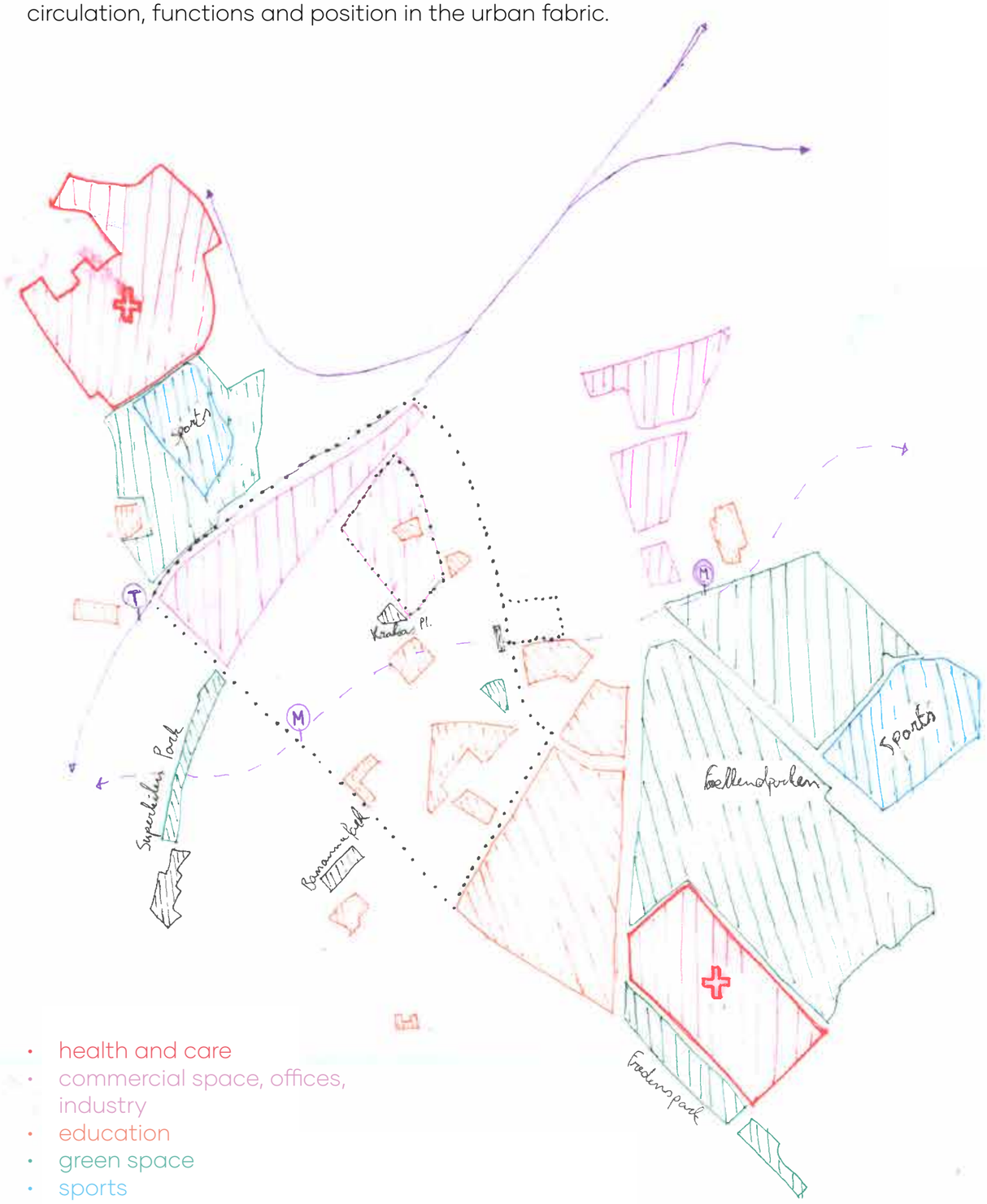
The Haraldsgade district is an unusual and ever-changing neighbourhood in Copenhagen's Nørrebro suburb. The neighbourhood stands out for its wide streets, open space and abundant light. Many houses were built relatively recently and are in moderate condition. The district is bordered by Tagensvej, Jagtvejen, Lersø Parkallé and the railway area of the Danish State Railways.

Originally, Haraldsgade was a country road connecting Tagensvej to Lyngbyvej. In 1880, the street was given its current name. Development of the district began in the late 19th century, when an urban plan was drawn up in 1893. This plan introduced two diagonal streets, Haraldsgade and Vermundsgade, which still define the character of the district. In a short time, Haraldsgade grew into one of Copenhagen's first large, cohesive industrial areas. The construction of the Titan factory in the 1890s marked the beginning of a transformation into a mixed area of industry and housing. This industrial past is still visible in the district, where parts of old factory buildings have now been repurposed for creative businesses.

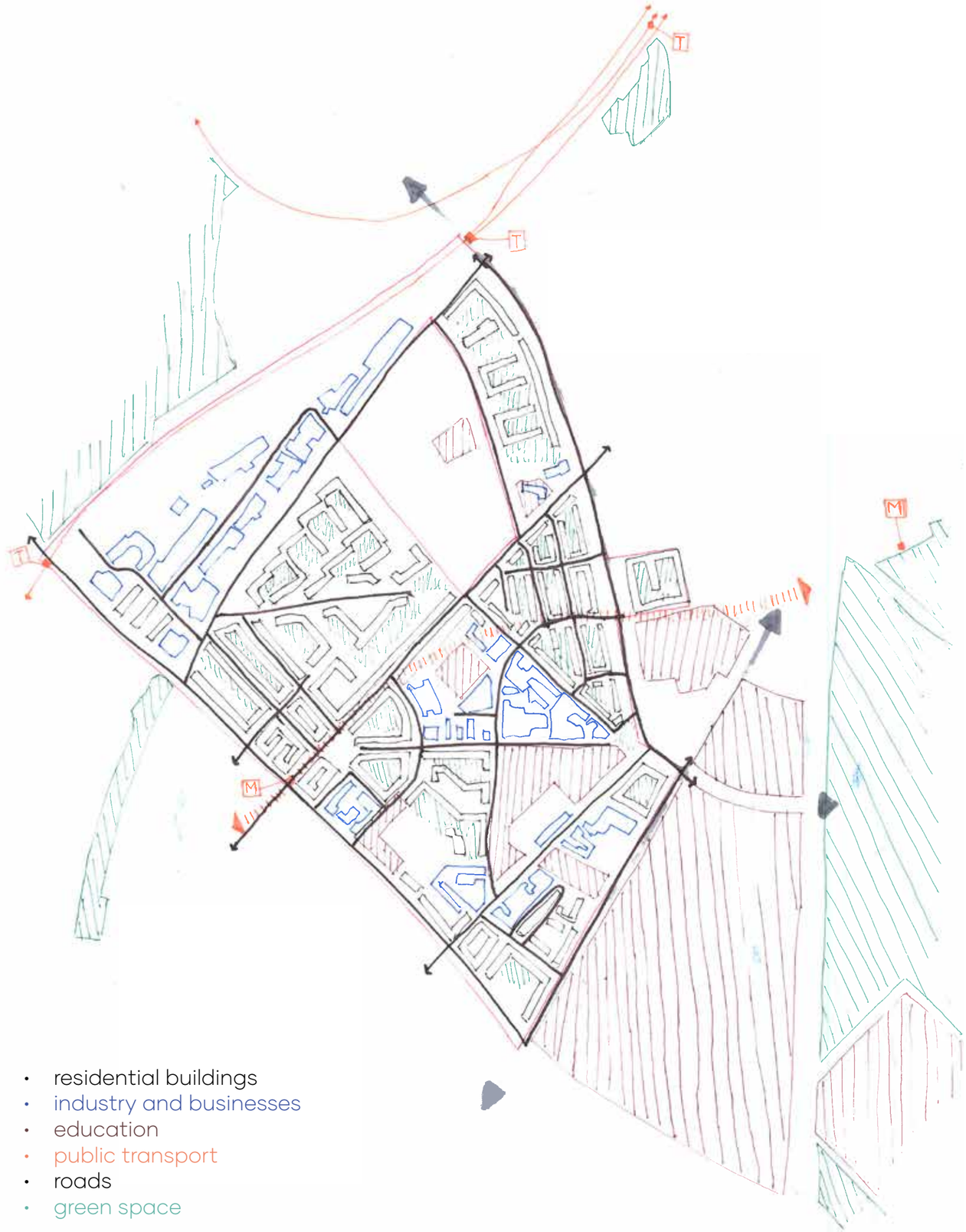


Area analysis

Before visiting the area, I analysed the area through desk research. This involved paying attention to differences themes of interest for further research and when visiting the site. It formed the first steps for understanding the area, its embedding, circulation, functions and position in the urban fabric.



- health and care
- commercial space, offices, industry
- education
- green space
- sports

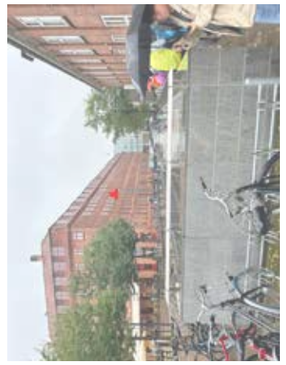


- residential buildings
- industry and businesses
- education
- public transport
- roads
- green space

Site visit

At the site visit we observed and learned about the existing culture in the area, the people, the built environment and the atmosphere. Interviews and talks with residents provided insight into their needs, such as increased safety, a central meeting place, new public spaces and a general boost for the neighbourhood. Documenting, analysing and learning from other buildings in Copenhagen, and how they relate to their surroundings, was interesting as well. Allowing me to find my own position for my design, thinking about coherence and contrast.

The urban structure of the neighbourhood creates a certain division, making it important to strategically position the building where it can have the greatest positive impact. The aim is to act as a unifying element within the neighbourhood. The scale of the area also became clearer through the visit. I paid attention to the layout of the buildings, distances that can be covered on foot, and how the existing public and green spaces are perceived. These insights form the basis for a design that meets the needs of the neighbourhood and enhances the dynamics of the place.










Infrastructure and layout

Greenery and recreation










Activity and initiatives

Culture and character



First inspiration: Building as a physical connector

During the site visit, I became very interested in the existing culture and active businesses of the area, something naturally less visible in desk research. Because the area can make a closed impression, I saw particular potential in making this vibrancy visible. Sketching principles that connect the area and its surroundings drawing more attention to what is already there. Therefore I envisioned that my building would act as a connector in the area, creating circulation in the area and exposing its hidden qualities

Centralise



The building is located in a central place, reconnecting the disjointed urban fabric and occupying a prominent place in the area. It connects to and changes the infrastructure, giving a new pulse to the neighbourhood.

Bridge



The building forms or becomes a bridge over the railway and thus becomes part of a slow-traffic boulevard. It connects to a larger logistics and green strategy.

Distribute



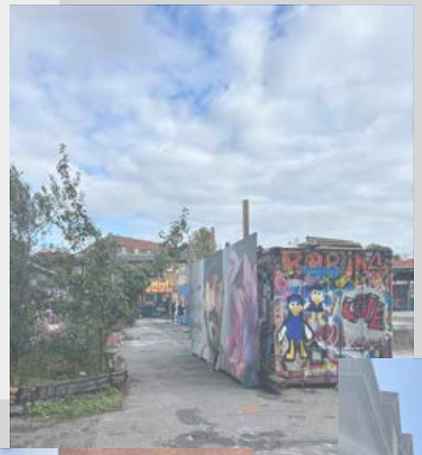
Detached buildings with site-specific functions distribute throughout the neighbourhood and help build an integrated network. This activates different places in the area which is not limited to a specific spot.

Expand



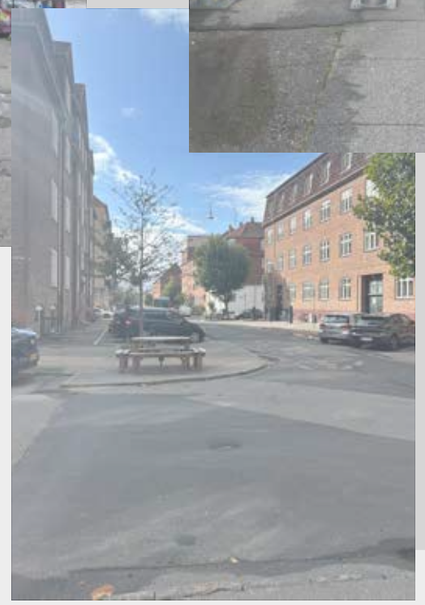
The building expands on an existing cultural hub in the area. It seeks to support and enhance the existing culture and community in a small-scale and subtle way.













Analysis

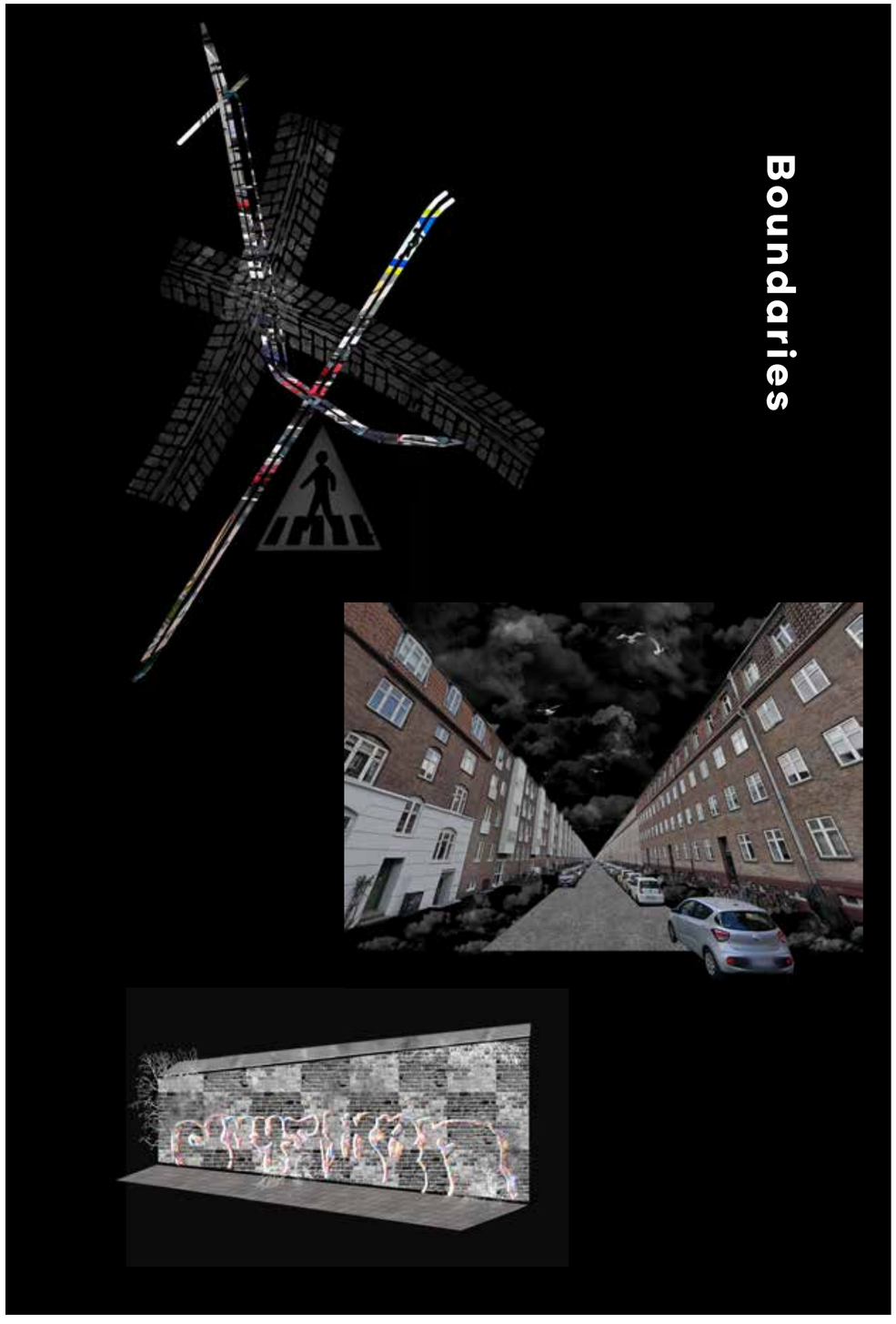
Group: Imaginary map

As a group, we were very interested in the phenomenon of barriers, borders, disconnections and fragmentations. Something that was very recognizable in the desk research, and guided the beginning of setting up the imaginary map.

Fragmentation

In architecture and urban planning, fragmentation refers to the division of coherent urban or architectural spaces into smaller, often disconnected parts. This phenomenon results in a disjointed urban fabric, where spaces and structures are no longer harmoniously connected, often leading to a lack of spatial cohesion and a fragmented sense of community. It can be recognized in disconnected public spaces, infrastructural barriers, architectural obstacles, or problematic zoning

The right side shows some disconnections that can be considered fragmentary, with physical and mental barriers playing a role in preventing participation in public life.



Visual essay

Practical model: 3D diagram

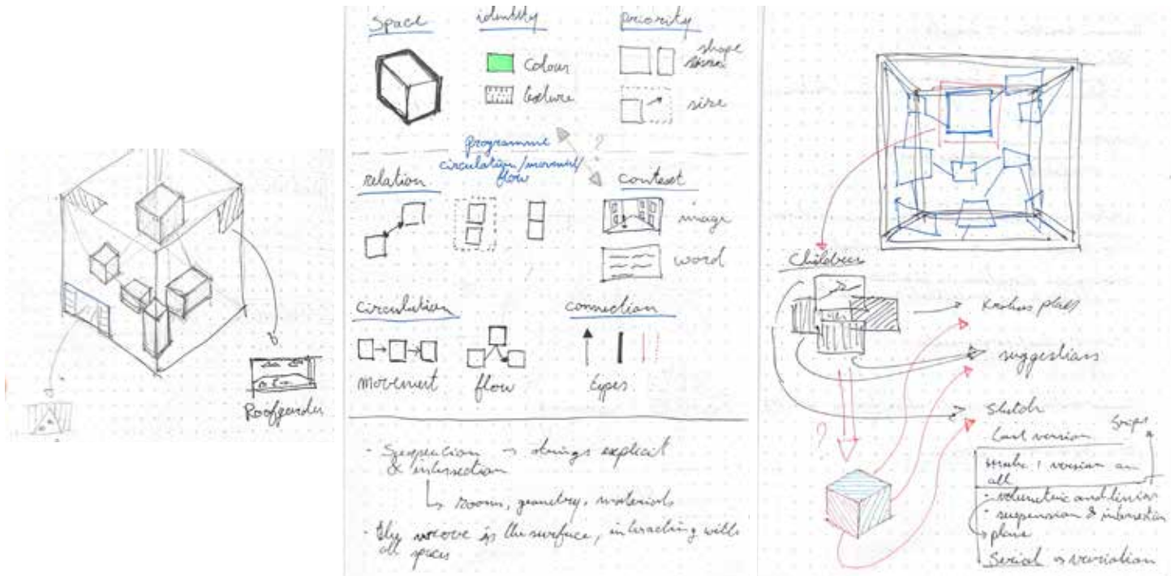
The visual essay shows a composition of floating spaces in a scaffold. Boxes, the spaces, contain collages and colours that reflect the theme of the space. The spaces are positioned both high and low, close to and far from the façade, to create a balance between private and public. The quickly accessible and more difficult to access. This ranges from functions that need to be easily accessible to a specific audience, to those where people are exhibited in a particular way, such as dance or yoga, where less clothing is worn.

Green spaces and outdoor areas form connecting zones between different spaces, giving users access to greenery and fresh air, as well as outdoor activities.

A woven fabric creates connection between all spaces, extending from the front downstairs to the top back. This network acts as a public circulation and interior space where all functions come together. By moving through this space as a user, you discover the different functions as a walk.

At the bottom is a sketch showing how the concept was created. Various materials such as wood, paper, cardboard, rope, canvas and ink were used in the process.

Sketch







Practical model

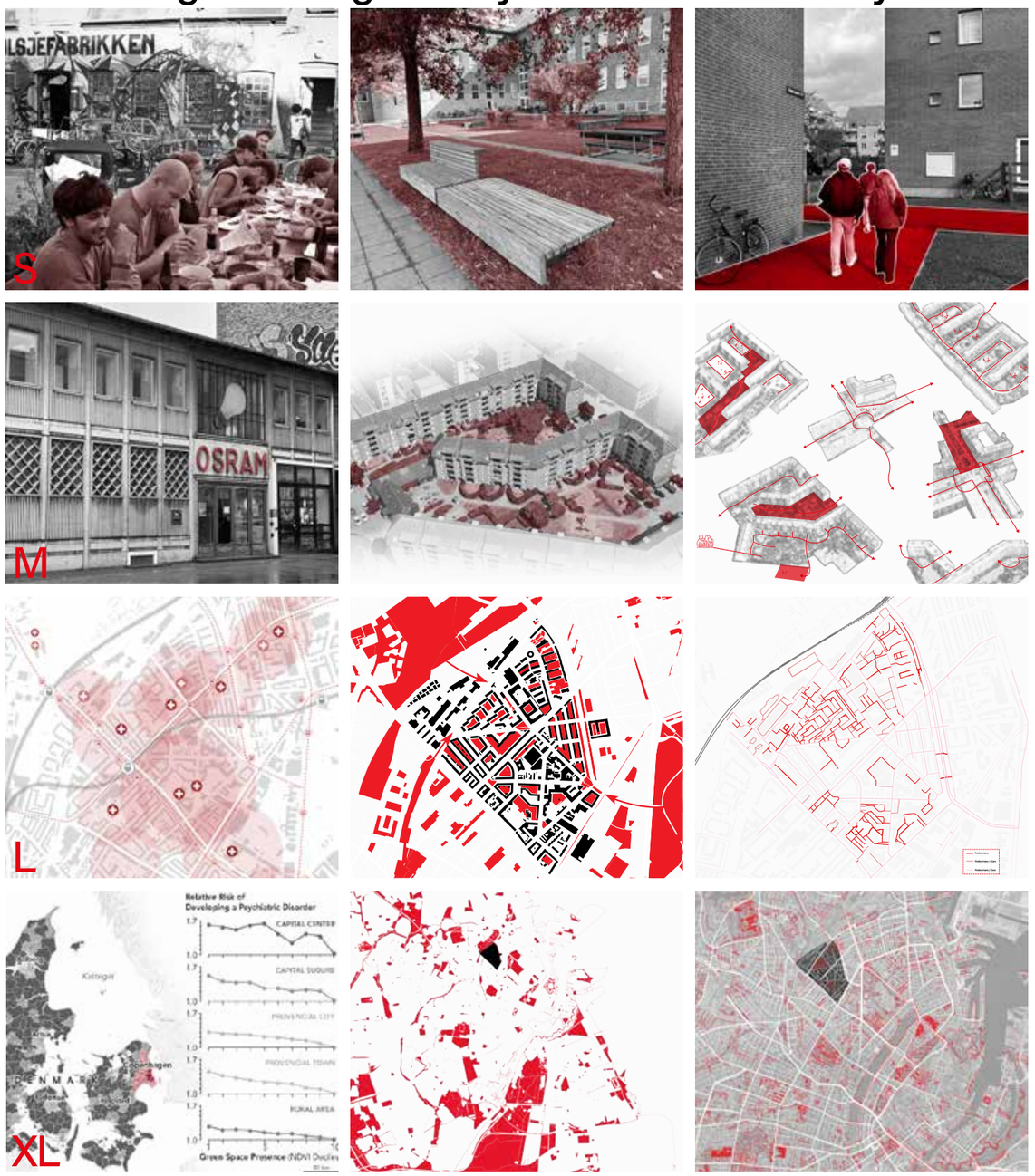
Poster presentation

The poster shows different scales of Copenhagen, from the city, the larger district to the block and building level, and even to smaller, individual places. Combined with the other H-themes, History and Human, a matrix was created to compare or connect information. Red was used as a colour to emphasise the themes to create a coherent whole.

health

site visit pin-up
10.10.24

Blaise Fourage	5944597
Sanjana Rajendra Habde	5983711
Styrk Dirki	4851196
Yu-Heng Cheng	6011403



Conclusion

The group work has produced several conclusions that can serve as starting points for further research of their own. It provided insight into the need for safe and sustainable spaces for residents' leisure activities.

Interesting are the needs for green spaces to promote mental health and the different uses for various groups. In addition, walkability in the neighbourhood is notable: it is high within the building blocks, but low in the post-industrial infrastructure, creating both physical and mental barriers.

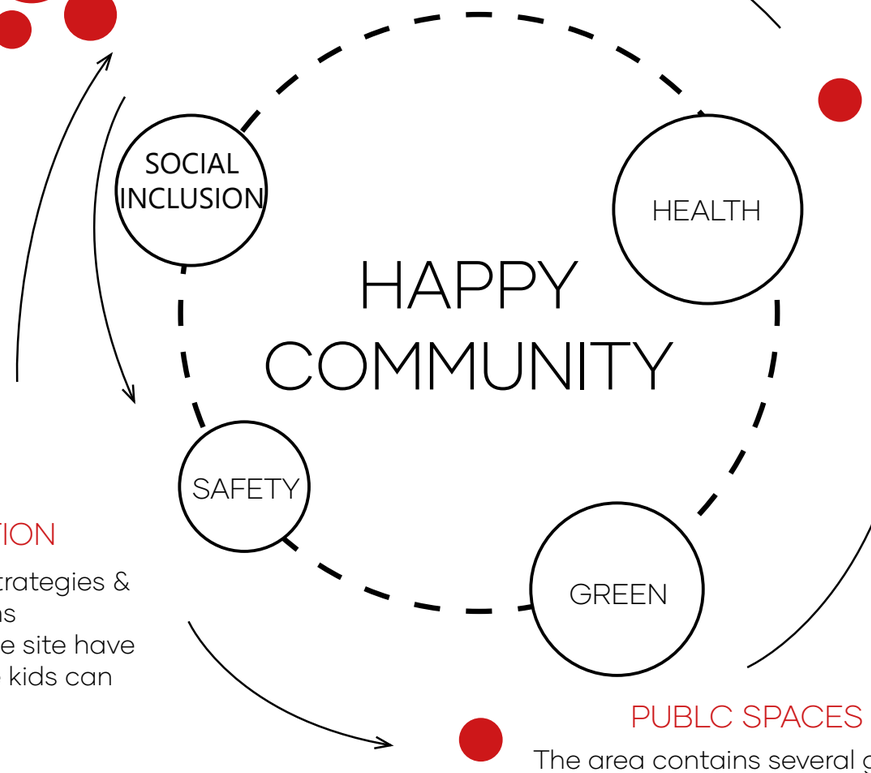
OPPORTUNITIES

The site offers many opportunities for different target groups, though some adjustments are necessary to fully meet their needs. However, the strong sense of community within the area provides the potential to make these changes happen effectively.

HEALTHY-SOCIO-ECOLOGICAL TRANSFORMATION

LOCAL COMMUNITY

A group of people connected by shared experiences, values, or interests, who come together to support and uplift one another, creating a sense of belonging and collective identity



HEALTH CARE

walking distance

EDUCATION

Different educational opportunities due to the presence of facilities

CRIME PREVENTION

Need for targeted prevention strategies & rehabilitation programs
Enclosed spaces throughout the site have camera surveillance to ensure kids can play safely

WALKABILITY

High walkability with pedestrian-priority paths linking green spaces and playgrounds, but heavy traffic on external roads reduces psychological comfort and transparency.

PUBLC SPACES

The area contains several green spaces spread across the neighbourhood, with opportunities for connection. Three surrounding parks have yet to connect to the site. The two arrival points and the central plaza are key public spaces.

Map analysis

Functions and typologies

Urban character

The Haraldsgade district is a densely built-up area with a diverse urban character, similar to the rest of Nørrebro and Copenhagen. In the past, the area had many industrial functions, which is reflected in its layout with wide infrastructure, workers' houses, warehouses and factories. Some of these buildings were given new uses, while others were demolished to make way for a cluster flat blocks.

Social housing and flat blocks

Many of the flat blocks are four to six storeys high, with balconies on one side and flat façades on the other. Older buildings stand out for their more refined detailing, but they all look very closed on the outside. Some of these flat blocks (mostly social housing) have since been renovated, such as the Den Grønne Trekant and nearby building blocks.

North DSB park

On the north side is the DSB business park along the railway, characterised mainly by car parks and car dealers. The spacious layout of the site also provides opportunities for redevelopment, as the existing buildings have little historical or architectural value and the vacant land could be generously greened. The CPH Village at the left corner is a temporary housing structure designed to use minimal resources, it has a 10 year contract.

South campus

On its southern side, the area borders the Copenhagen University Campus, some of whose buildings extend into the area. The site therefore offers interesting opportunities to include educational facilities or programmes, which would fit well with local needs.

Two industrial site

Two of the historical industrial areas are at risk of demolition, both are governmentally owned. For the Bolsjefabrikken there is still hope because there is local initiative. For the other area, no contacts are renewed and a lot is uncertain.



Green as a gather space

Connecting scattered green

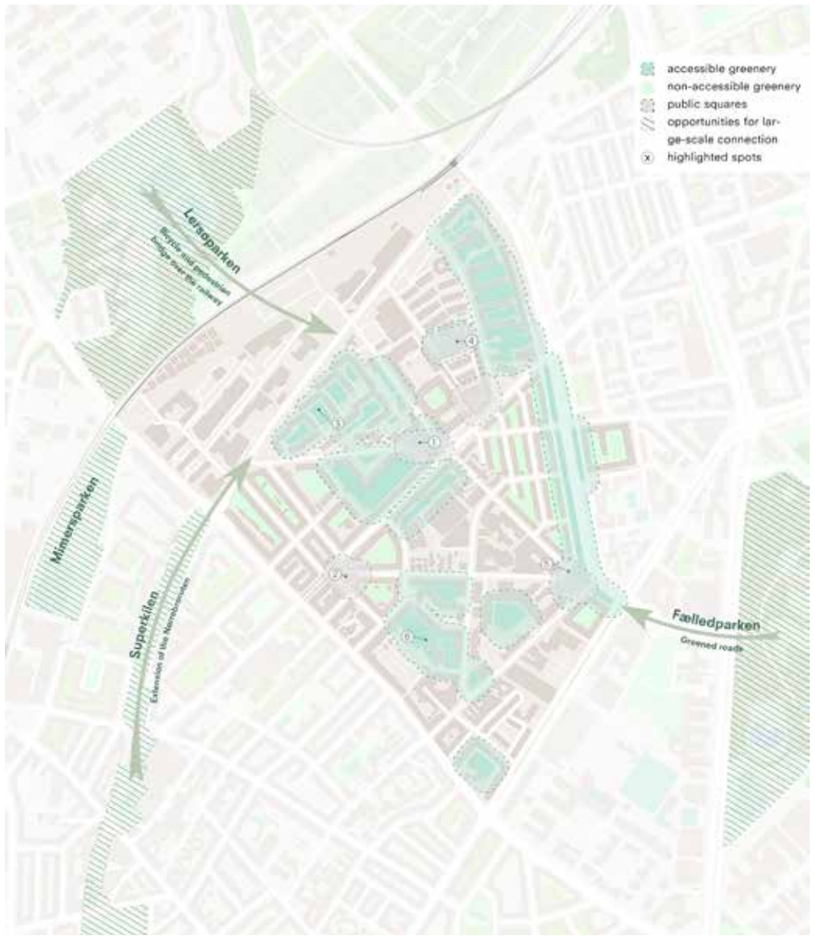
Within the area, we have identified several green spaces spread across the neighbourhood. Many of the green spaces are partly or fully enclosed, previous renewal plans have already attempted to break down these barriers, as visible in ''Den grønne Trekant'' and ''Titanparken''. There is potential to strengthen this network further by using the post-industrial infrastructure as a green connector or by creating new green spaces. This can create a better integrated green link, functioning as a coherent route rather than consisting of separate, less useful green areas.

Larger scale integration

Looking at the potential of a green connection on a larger scale, we see three parks that could potentially be part of a larger network in the form of a park, a route or connecting bridge. Specifically, in the upper left corner of the site, the business park is less densely developed, allowing more freedom in the use of space.

Public squares and spaces

There are four highlighted public squares where community activities are already taking place today. The cultural hub Bolsjefabrikken is unique in its kind as combination of creative and musical expression with an industrial character makes it an interesting place for informal meetings



1



Krakas Plads: renovated with mix of public greenery, seating and play areas

2



Neighbourhood arrival: public stage and gathering plaza for community activities

3



Den grønne Trekant: semi-enclosed courtyards multi-generational amenities

4



Bolsjefabrikken: cultural hub

5



Neighbourhood arrival: soft traffic, greenery and seating

6



Titanparken: park-like courtyards with zoned use facilities

Design proposal P1

Position

Social infrastructure

The building is intended as a multifunctional urban connector that establishes itself as a social infrastructure. A catalyst for change within parallel societies, the project promotes unification and integration within Copenhagen's Haraldsgade district. It addresses both physical accessibility and social needs, linking isolated areas of urban fabric, enhancing public infrastructure, and creating a space where different interests meet, fulfilling programmatic needs of residents and surrounding communities. Acting as catalyst of change for unification and integration of parallel societies in the Copenhagen context, the building aims to create motivation and opportunities for people to understand each other and interact.

The project aims to include and embody a form of human-centred movement, with the goal of motivating people to connect and interact. This design approach aims to create meaningful opportunities for engagement, fostering a sense of community without relying solely on functions that do not guarantee use.

Research questions

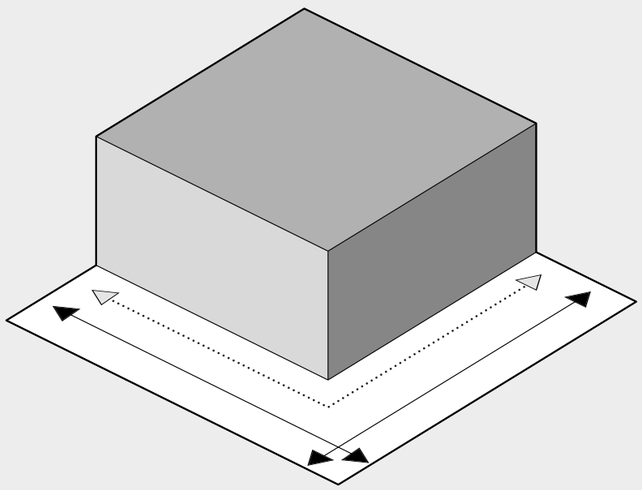
Previous research highlights a need for a design that goes beyond creating a cultural centre. There is needs for a design that is part of a larger network and connects with its surroundings through public space and infrastructure. On the other hand it calls for a program that attracts diverse audiences and meets their different social needs. The approach to developing this social infrastructure is twofold, addressing both the social and physical needs of the area and its residents. It raises two sub-questions.

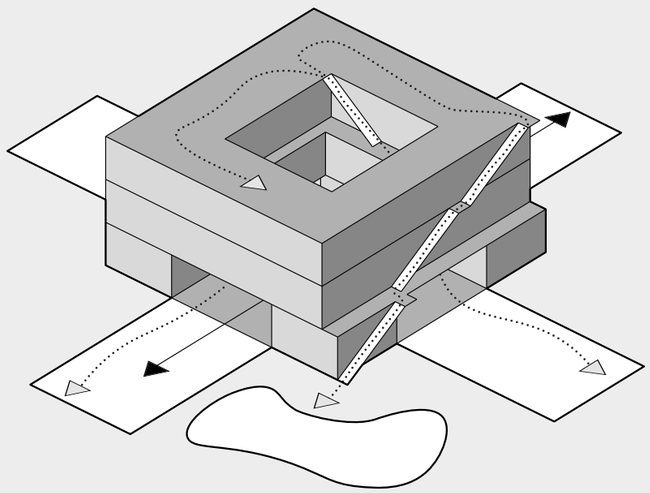
'How might we design **social infrastructure** to blur **physical** and **social boundaries** for Haraldsgade residents and adjacent neighbourhoods, in order to improve **integration** and **unification** in a parallel society?'

Components of **social infrastructure** design

Socially: How can the building attract different audiences through multifunctional programmatic elements that encourage interaction and understanding?

Physically: How can the building be part of connecting public infrastructure that increases accessibility and adds value in the neighbourhood?





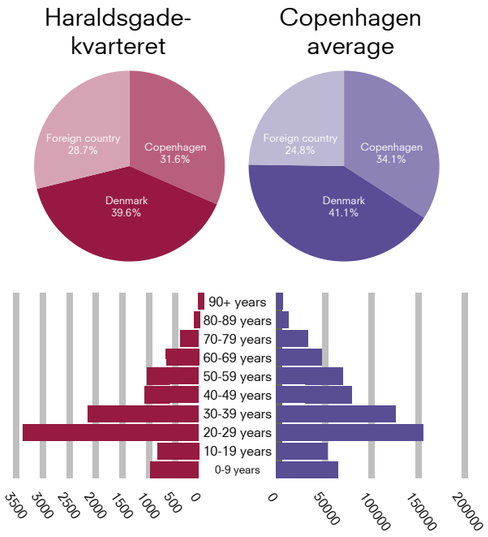
Problem definition

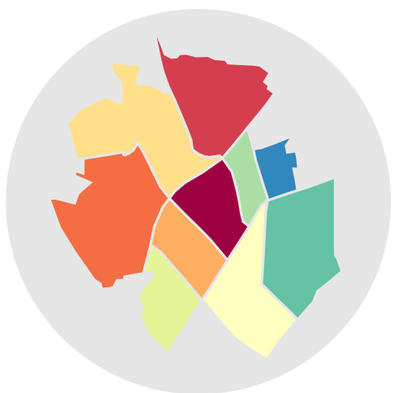
Social isolation

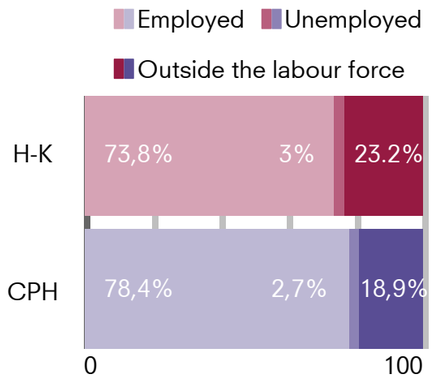
Parallel society problems

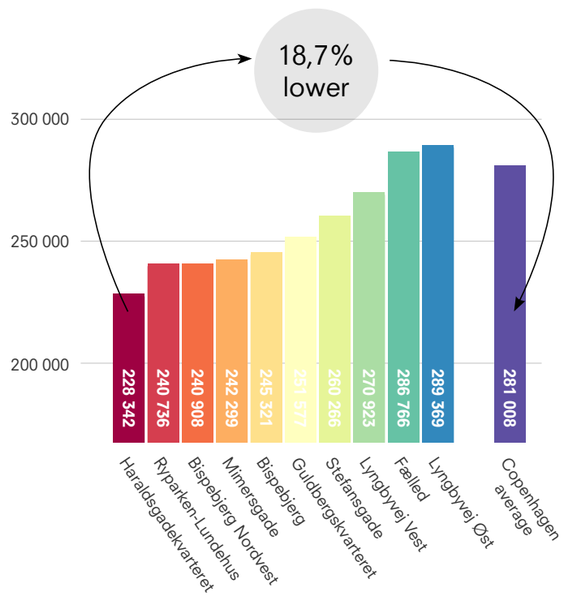
Haraldsgade is classified as a parallel society, a vulnerable area struggling with problems such as low incomes, unemployment, high crime rates and limited educational opportunities. Statistics show that disposable income here is the lowest in the region, 18.7% below the Copenhagen average, which is a sharp contrast to the surrounding areas, leading to a sense of unintended isolation.

The aim of the design is not to address these problems directly, but to create a space that brings people together and provides room for both individual and collective growth. By blending different perspectives and values, the project aims to unite diverse groups. Physically and socially uniting residents to create opportunities in pooling resources among communities.



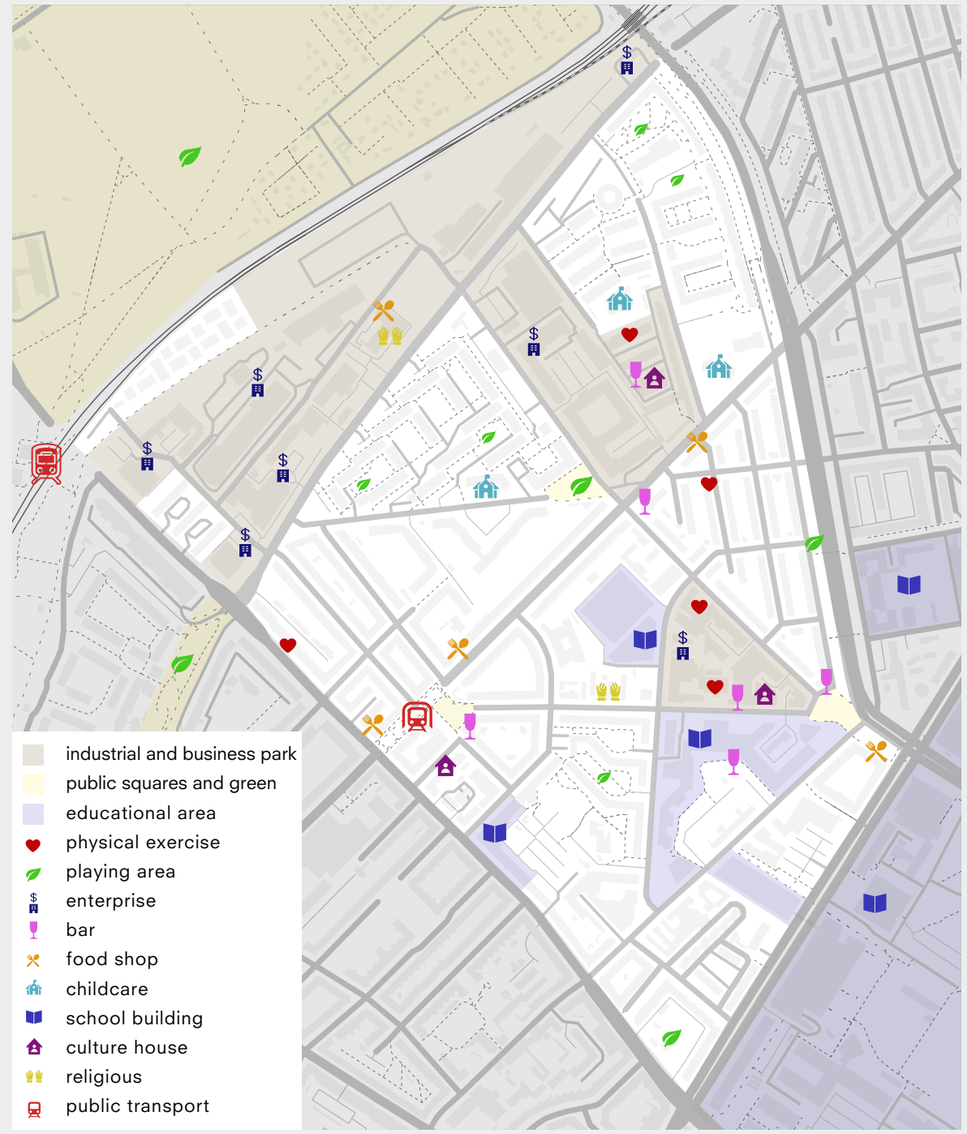






Lack of public space

Looking at the map, it is clear that there are several initiatives and facilities in the area, with the northern region in particular being underdeveloped. Notable is a severe lack of public spaces connecting different functions and activities, limiting the potential for spontaneous interactions and providing a lively atmosphere. Sharing public functions and infrastructure can strengthen community resilience by fostering a sense of shared ownership.



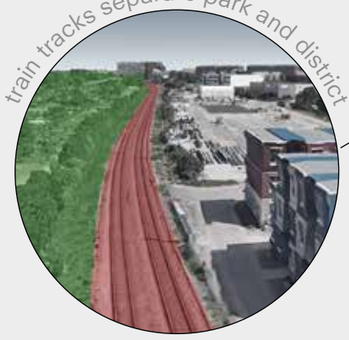
Physical disconnection

The physical layout of Haraldsgade creates a sense of fragmentation, characterised by closed building blocks and vast, car-dominated infrastructure. This lack of accessibility forms both physical and psychological barriers and makes it more difficult for people to participate in public life. As a result, the neighbourhood feels less inviting and there are fewer opportunities for interaction and connection between Haraldsgade and nearby areas.

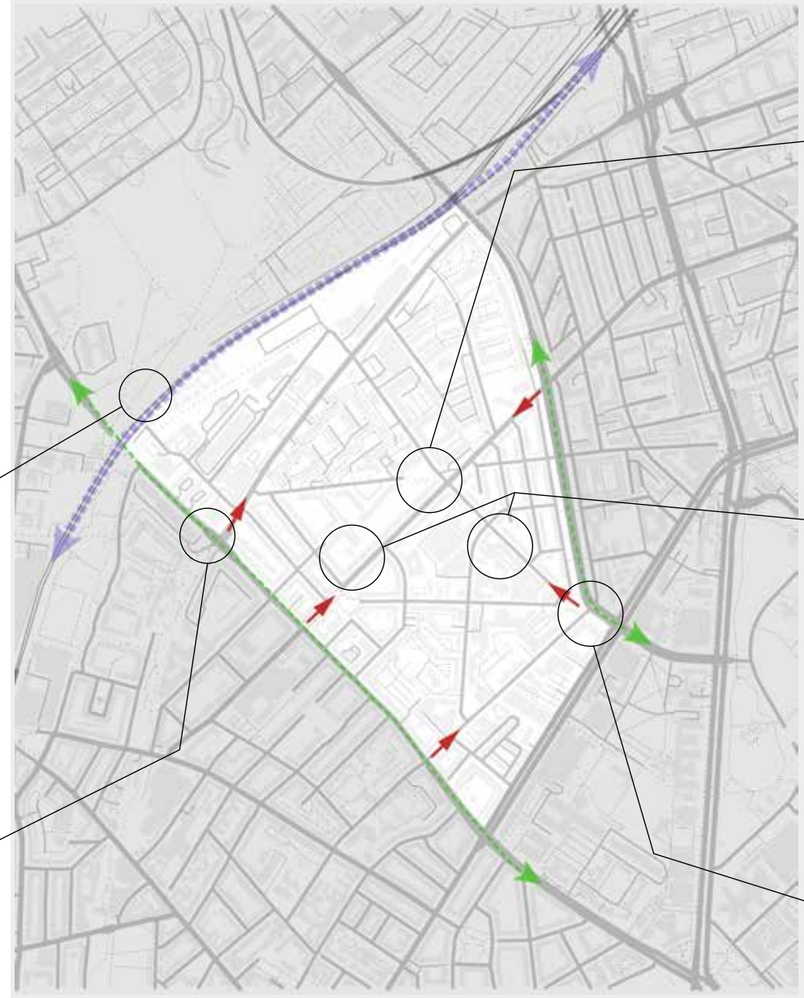
Several elements highlight this disconnection:

- A railway line isolates the northern area and effectively separates the neighbourhood from the adjacent park.
- A multi-lane road cuts through the Norrebroroute, disrupting an important path and preventing the continuation of circulation.
- The central point in the neighbourhood is dominated by a major traffic hub, turning the space into a logistical thoroughfare rather than a unifying area for the community.
- Enclosed street profiles limit pedestrian-friendly spaces and place little emphasis on an inviting walking experience.
- Key neighbourhood arrival points reveal an overwhelming focus on cars and poor connectivity for pedestrians, reinforcing the lack of cohesion in the urban landscape.







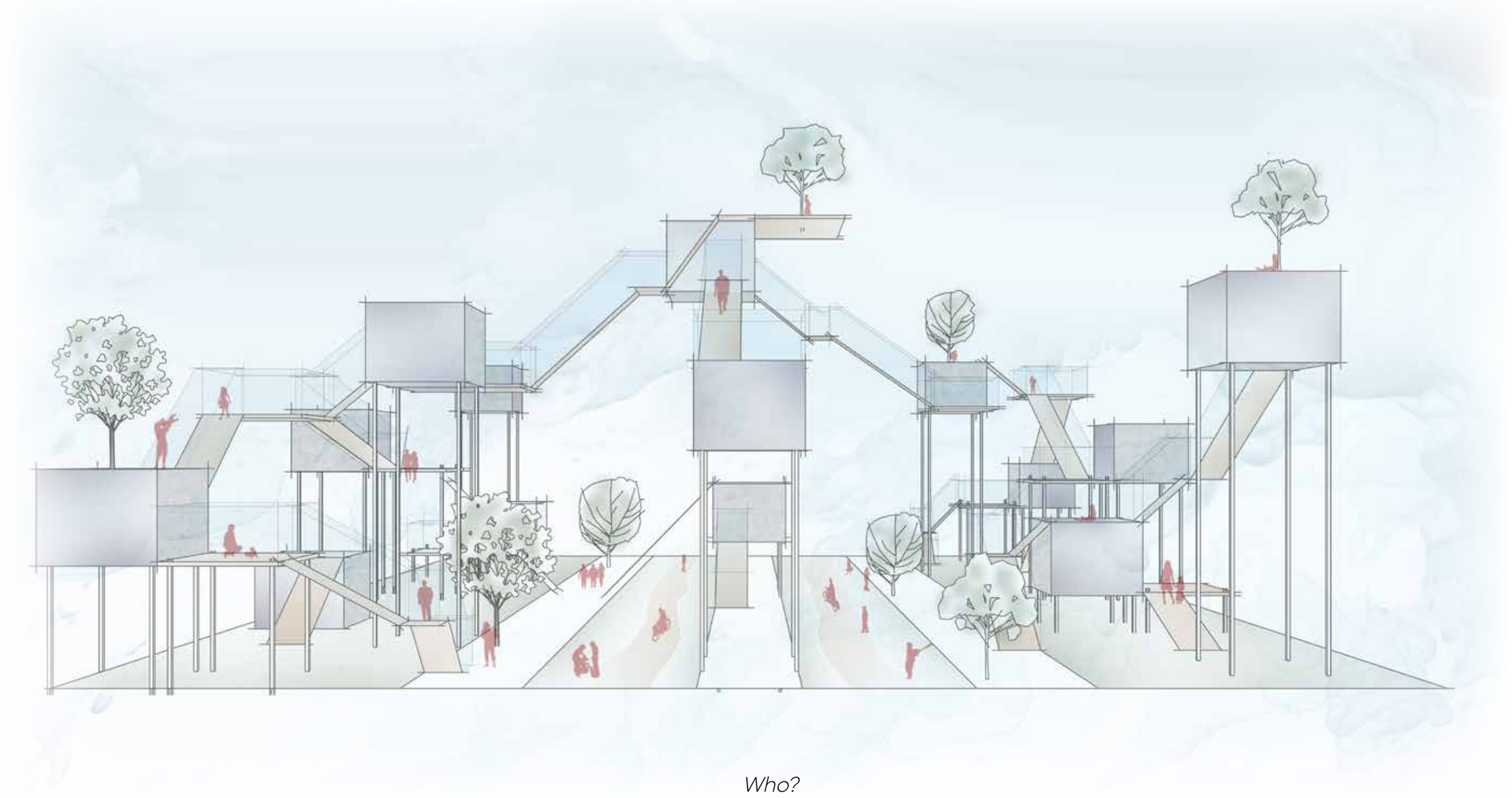








A graphic representation



Who?

The project will be de designed for the residents of Haraldsgade, but will also make the area interesting and attractive for the surrounding neighbourhoods. It is not meant to be a trendy attraction that attracts mass tourism, but its presence may certainly have a stimulating effect which makes the neighbourhood more attractive and lively within the scale of Copenhagen.

What?

The project aims to create a social infrastructure that blurs social and physical boundaries and creates a space that *connects* and *attracts*. By *connecting* isolated areas and bringing different groups together, the design promotes a sense of unity. At the same time, it provides tailored functions for different target groups, *attracting* a wider audience. Eventually, this approach aims to strengthen vulnerable communities by creating a vibrant space for dialogue, interaction and shared growth.

How?

The project will be a hybrid, a place that is literally part of or embodies human-centred circulation and movement. The building acts as a connecting element that intensifies use to promote interaction. By renewing public spaces and infrastructure in isolated and underdeveloped areas, intrinsic value is created.

References

Approach

The San Francisco Bay Bridge is a design that combines a bridge with factories, apartments and offices. A project that was more about functionality and efficiency than experience. The gesture interested me, and made me realise that it was about industrial infrastructure without considering pedestrians and recreational use. Something I am more interested in.

Human-centred

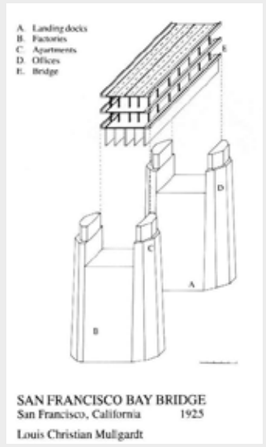
To become a social infrastructure, the project must integrate some form of movement or circulation. Therefore, I have analysed some interesting buildings that show principles that support this dynamic. These principles encourage interaction and liveliness and challenge both indoor and outdoor use.

Functionality and efficiency

San Francisco Bay Bridge

1925

Louis Christian Mullgardt







Linked Hybrid, China, Steven Holl Architects





Market Hall, Rotterdam, MVRDV

Human-centred

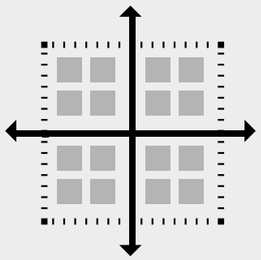
tunnelling



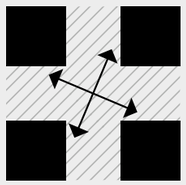
bridging



open floor plan



space connects building







New High-Speed Train Station, Spain, estudio Herreros



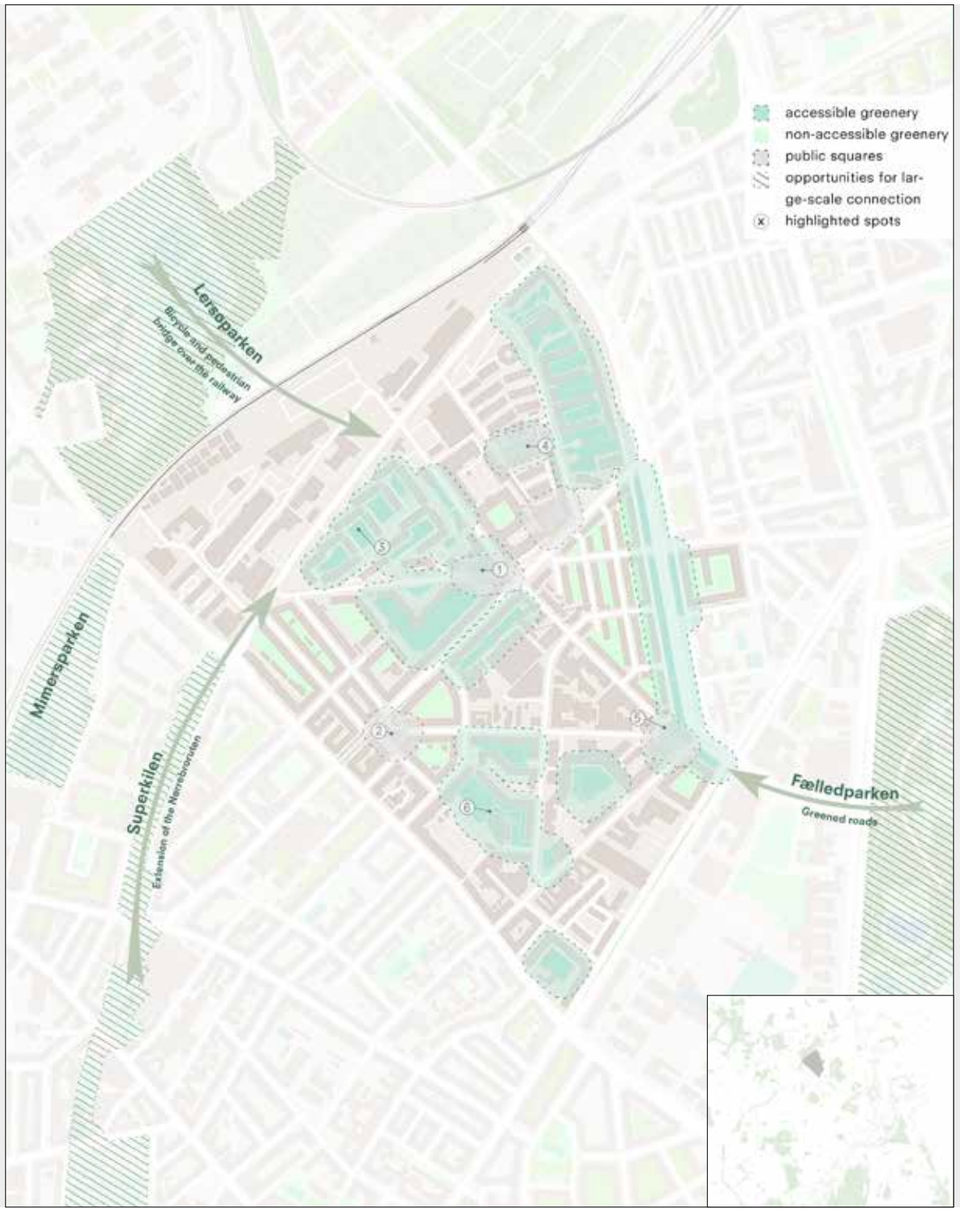


LOW2NO, Finland (competition), REX

Mapping data

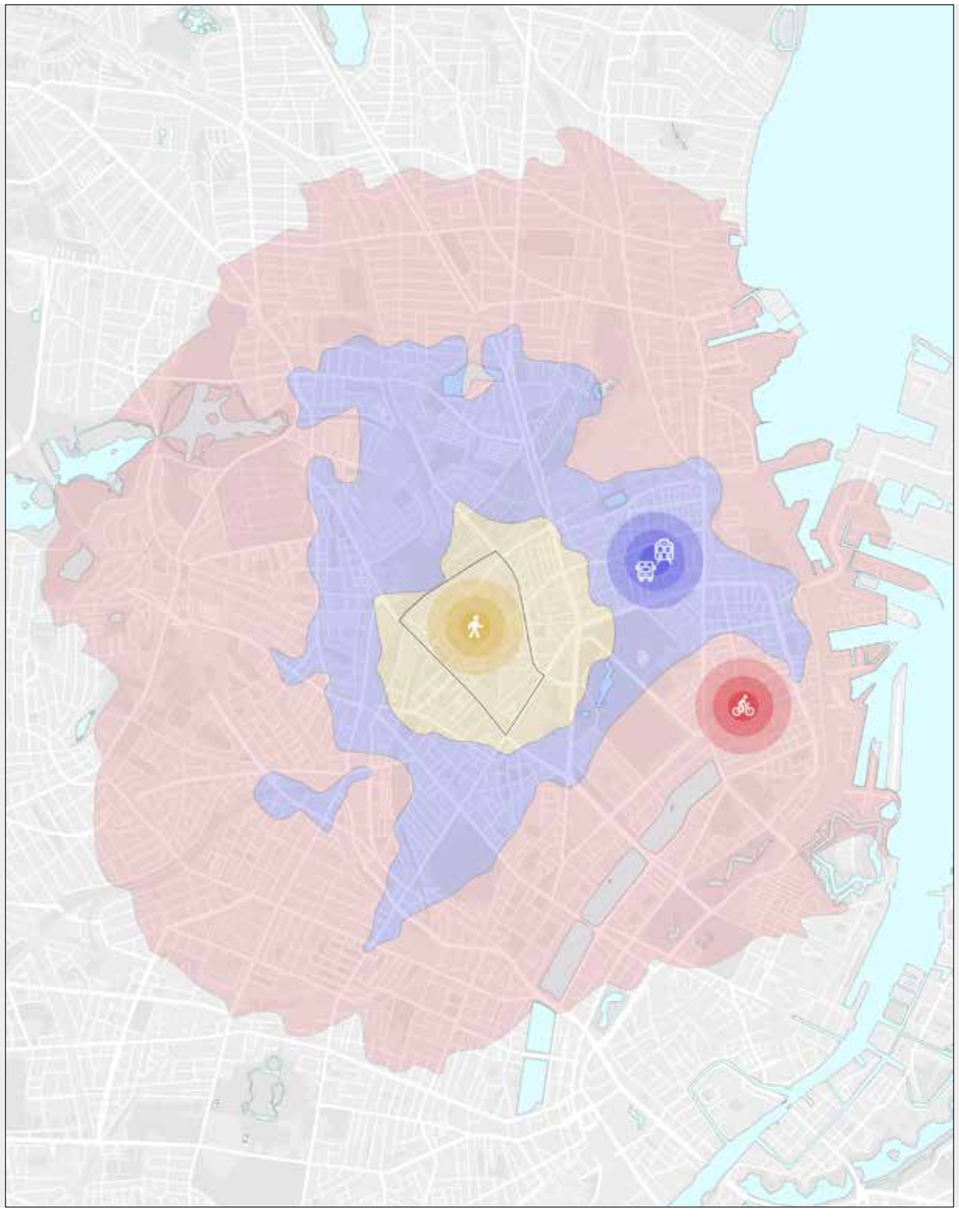
Green connections

Adjacent to the area are three parks, which offer great opportunities for forming connections and adding green, sustainable infrastructure.
The available green space in the area is very limited and consists mainly of remnants of the opened, closed building blocks, with the aim of making the area less hostile. Greenery makes little part of usable public or gather space. Especially when compared to other locations in Copenhagen, this opportunity stands out because of the close proximity of opportunities



15 minutes of movement

Copenhagen is also known as the city of sustainable transport. The map shows how 15 minutes of sustainable transport makes the area accessible and reachable. Accessibility is an important concept, both in terms of findability and the connecting role of a design in coherence between public buildings, places and infrastructure. It highlights the strength of considering the inclusion of infrastructure in my project.



Site proposal

Two sites

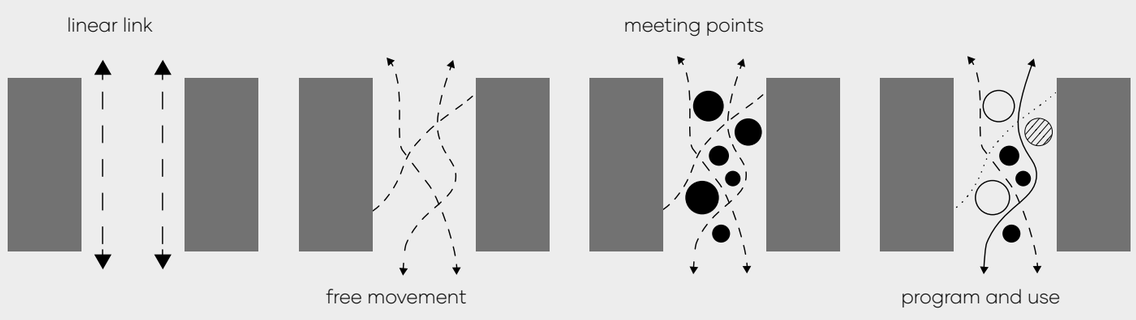
In selecting the site, I was drawn to two locations: one centrally located in the neighbourhood and the other on the northern edge. The first site is anchored in the heart of the area, oriented around central circulation. The second site is along the border and forms a literal bridge between a public green space and the underdeveloped business park.

Site choice

Based on my research plan and with the aim of adding value to the area, the first proposal was chosen. This involves positioning the project site at the edge of the area to connect an underdeveloped northern area with a nearby park. This creates an opportunity to create new infrastructure through the area through redevelopment, with a focus on revitalising the DSM business park and creating space for more public functions. An important aspect of this plan is improving accessibility to green spaces for residents and opening up the neighbourhood to the northern areas beyond the railway. Also connecting two parks will create a lively and attractive route, which fits within the broader Copenhagen vision.

Larger connection strategy

The building is designed to be an integral part of a larger network of connections, so I developed a strategy to define the type of connection needed. This approach shifts from linear links, car-oriented pathways to a flow that prioritizes natural, human-centred movement. It introduces welcoming meeting points where routes intersect and pedestrians and cyclists meet, while creating opportunities to include various functional elements into these connections, such as urban green spaces, public squares, play fields, and sports areas.





Building proposal

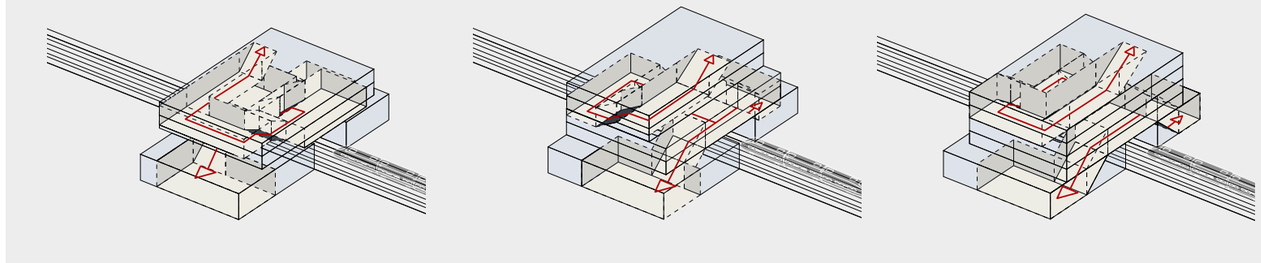
Circulation

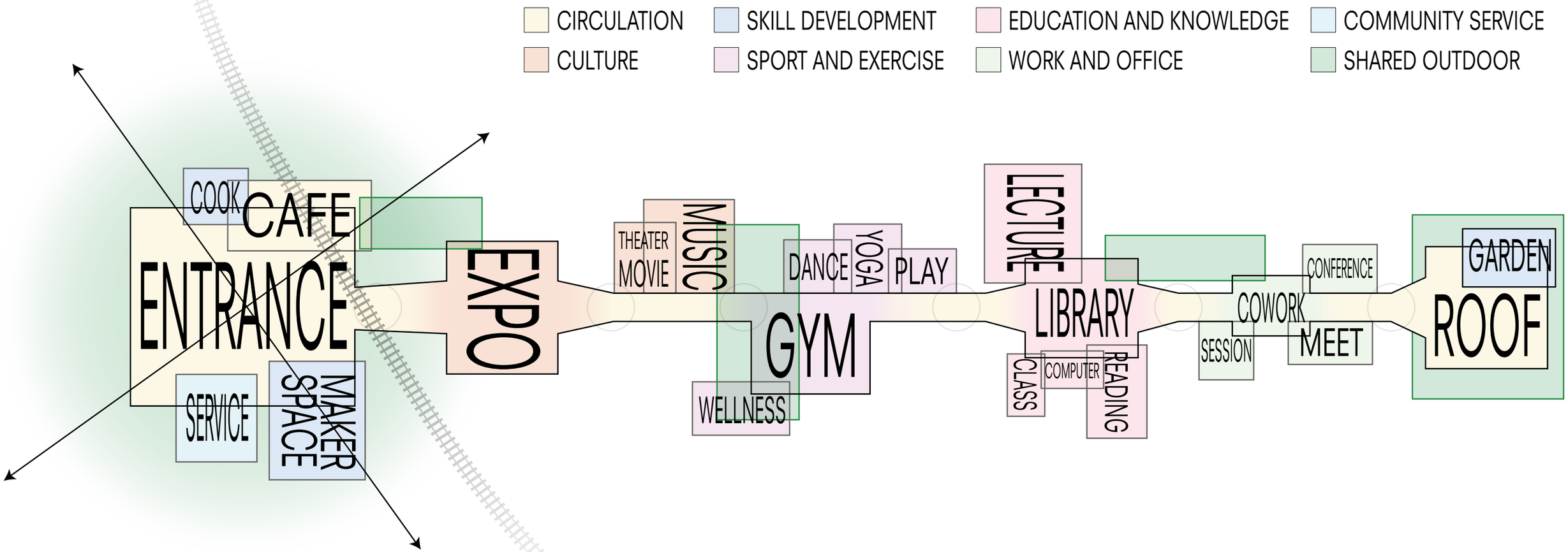
As shown in the site proposal, the building can be seen as a part of the circulation in the city, but it also reverses that relationship, integrating the city's circulation and movement into the building itself.

Inspired by OMA's Dutch Embassy in Berlin, I created a diagram that "unfolds" the circulation within the building. In this diagram, I focused on linking different programmatic themes directly to the interior street, making primary functions an accessible part of the circulation whenever possible, encouraging low-threshold access. Smaller functions are layered onto or overlap with the main functions, adding depth and privacy to the connections. Shared outdoor spaces create opportunities in linking different areas across multiple levels and themes.

Exploring configuration

Three variants give an indication of how the inner street can fold into a building while bridging the track. Here, the exhibition space can act as a connecting space, from which the rest of the building can be accessed. The open spaces (voids) are filled with functions or outdoor spaces, which enhance circulation and interaction in the building.





Functions and use

The programme

(Talents, study and work). The building should allow children and young adults to discover their talents so that they are better prepared for study and work. Contributing to greater social security and helping reduce unemployment and school drop-outs.

(spontaneous meeting). Interaction between visitors is a crucial element, meeting each other without always having specific goals or financial involvement. Free facilities and public squares keep the building lively throughout the day.

(Multifunctional and adaptive). Spaces inside and outside of the building maximize utility and flexibility, blending different needs to attract different residents and create a dynamic environment.

(shared green and squares). The building should serve as a complement and improvement to the existing public spaces, including both paved areas and green spaces.

circulation	m^2	%
entrance hall	100	
reception	20	
ticket counter	20	
café + kitchen	80	
shops/pop-up stores	100	
market	50	
circulation	800	
eventspace	300	
total	1470	32,7%

culture	m^2	%
music venue	150	
café/bar 20		
venue 100		
waiting room 30		
movie and theatre space	150	
café/bar 20		
venue 100		
waiting room 30		
exhibiton hall	200	
multi-fait prayer rooms	40	
total	540	12,0%

skill development	m^2	%
workspaces	200	
makerspaces 180		
toolrooms 20		
cooking	100	
workstations 50		
shared dining room 50		
gardening	110	
tool storage 10		
vegetable garden 100		
digitalisation	50	
total	460	10,2%

sport and exercise	m^2	%
playground	40	
joga	40	
mediation	40	
gym	100	
dance	40	
wellness	55	
sauna 15		
bath 40		
teamsport	70	
dressing rooms	70	
total	455	10,1%

education and knowledge	m^2	%
auditorium	200	
library	200	
classrooms	60	
mathematics 20		
language 20		
sciences 20		
workshops	50	
reading lounges	50	
computerized spaces	30	
total	590	13,1%

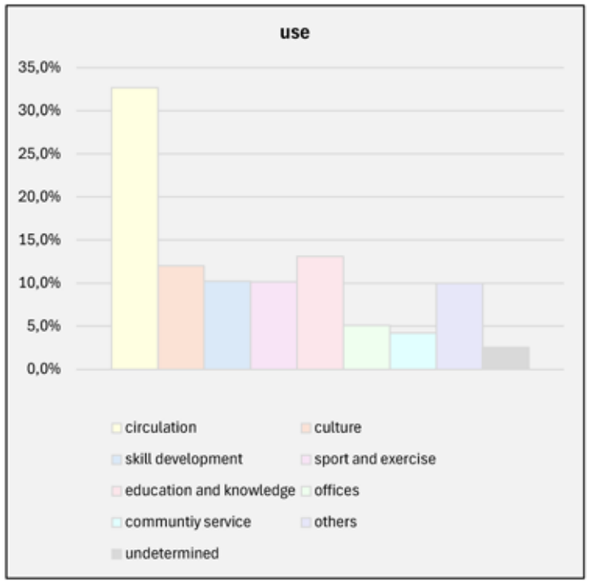
offices	m^2	%
coworking space	70	
meeting spaces	70	
conference room	70	
neighbourhood council	20	
total	230	5,1%

communtiy service	m^2	%
information counter	10	
waiting area	30	
childcare	50	
private meeting rooms	60	
community- advocate 15		
physiotherpist 15		
health coach 15		
legal help 15		
joint session space	40	
total	190	4,2%

others	m^2	%
toilets	200	
storage	50	
mechanical and utilties 5%	200	
parking		
total	450	10,0%

surface m^2 maximum :	4500
total surface m^2:	4385

determined	97,4%
undetermined	2,6%



Approach on multi-functionality

Solid to fluid

The approach is to work with fluid spaces rather than solid structures, to encourage interaction between different groups and individuals as much as possible. Therefore, choices should be made that favour flexibility, adaptability, exchange, cooperation and interaction.

Principles

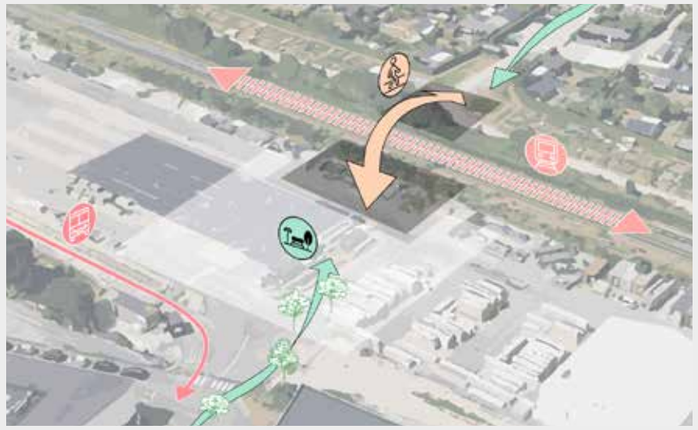
This translates into four principles:
Free movement
Especially on the ground floor to increase accessibility. Dynamic environment that gradually introduces people to different functions.

Use- or time-related relationships
Clustering functions to increase the likelihood of interaction between groups and individuals depending on time and use.

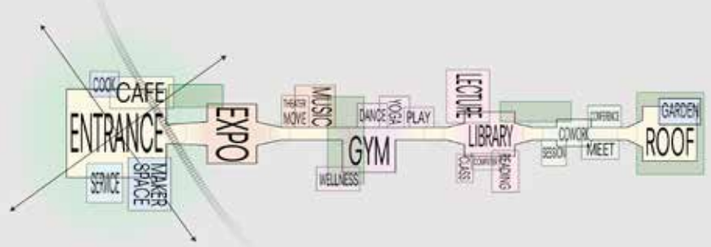
Adaptable and crossing borders
Challenging boundaries inside and outside the façade, promoting flexible use and creating an adaptable environment.

Zoning and undefined boundaries
Overlapping programmes, lower thresholds for interaction and a highly flexible approach to optimise use.

Site



Building



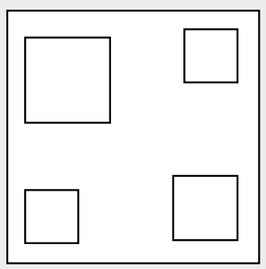
Approach

solid to fluid



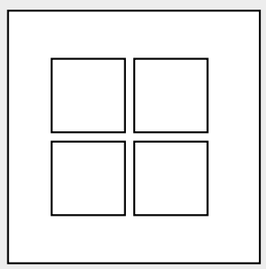
- flexibility
- adaptability
- exchange
- collaboration
- interaction

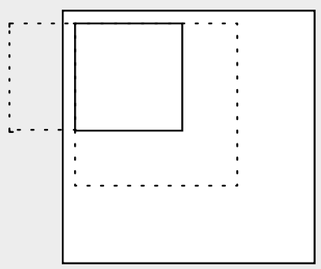
Principles



free movement

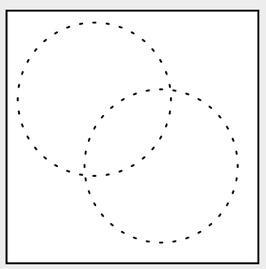
usage or time-related relationship





adaptable and crossing borders

zoning and undefined boundaries





Building as part of a boulevard

CPH References

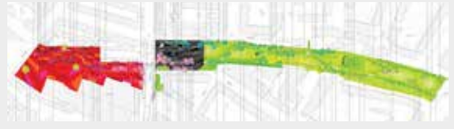
Sønder Boulevard





Superkilen park

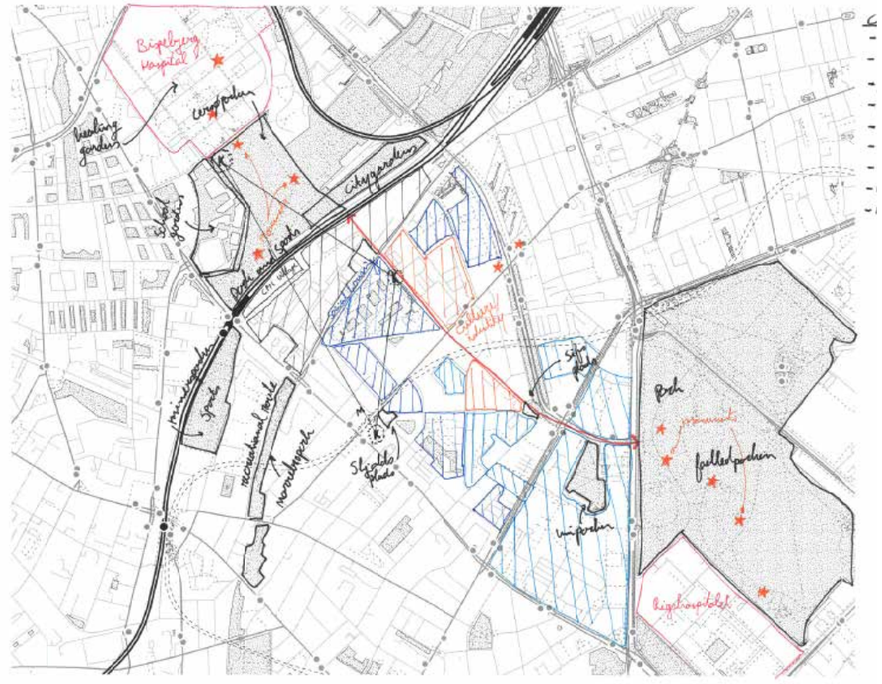




Important themes in the neighbourhood

The neighbourhood has qualities that can be made more visible and more connected through the boulevard. In addition, the boulevard offers the opportunity to introduce new themes and functions that enhance the quality of life, strengthen social ties and promote individual development.

outline analysis of value opportunities



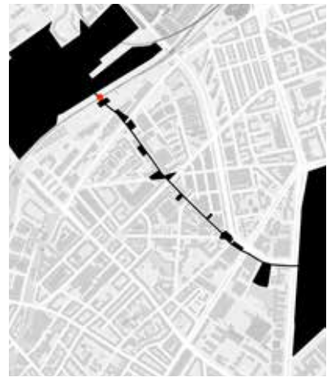
boulevard with public programme



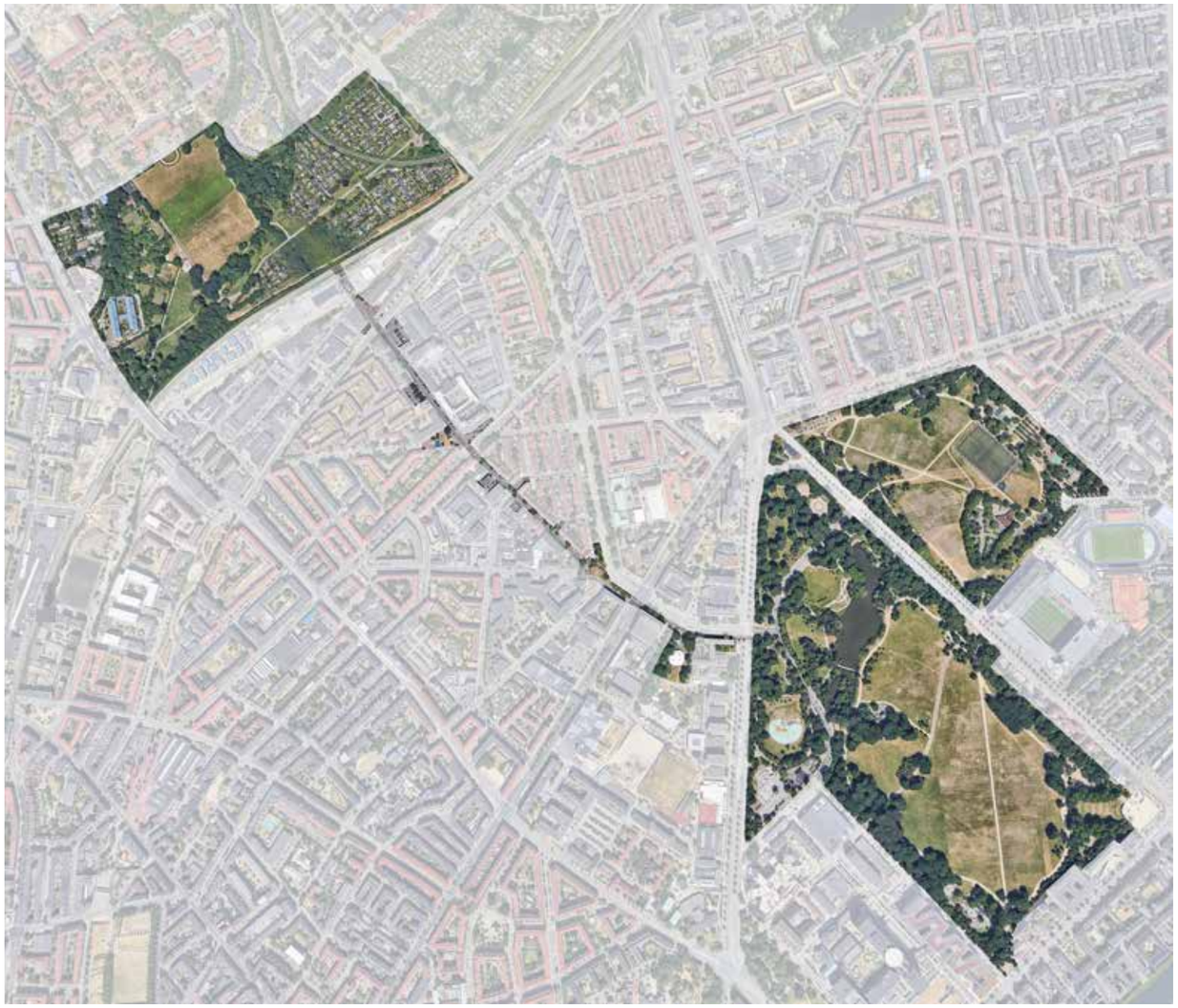
design site



link to be made



space for programme





References

The inspiration for various themes to be further explored for integration into urban design

Sports / recreation



Art installations / monuments / local culture



Urban plaza

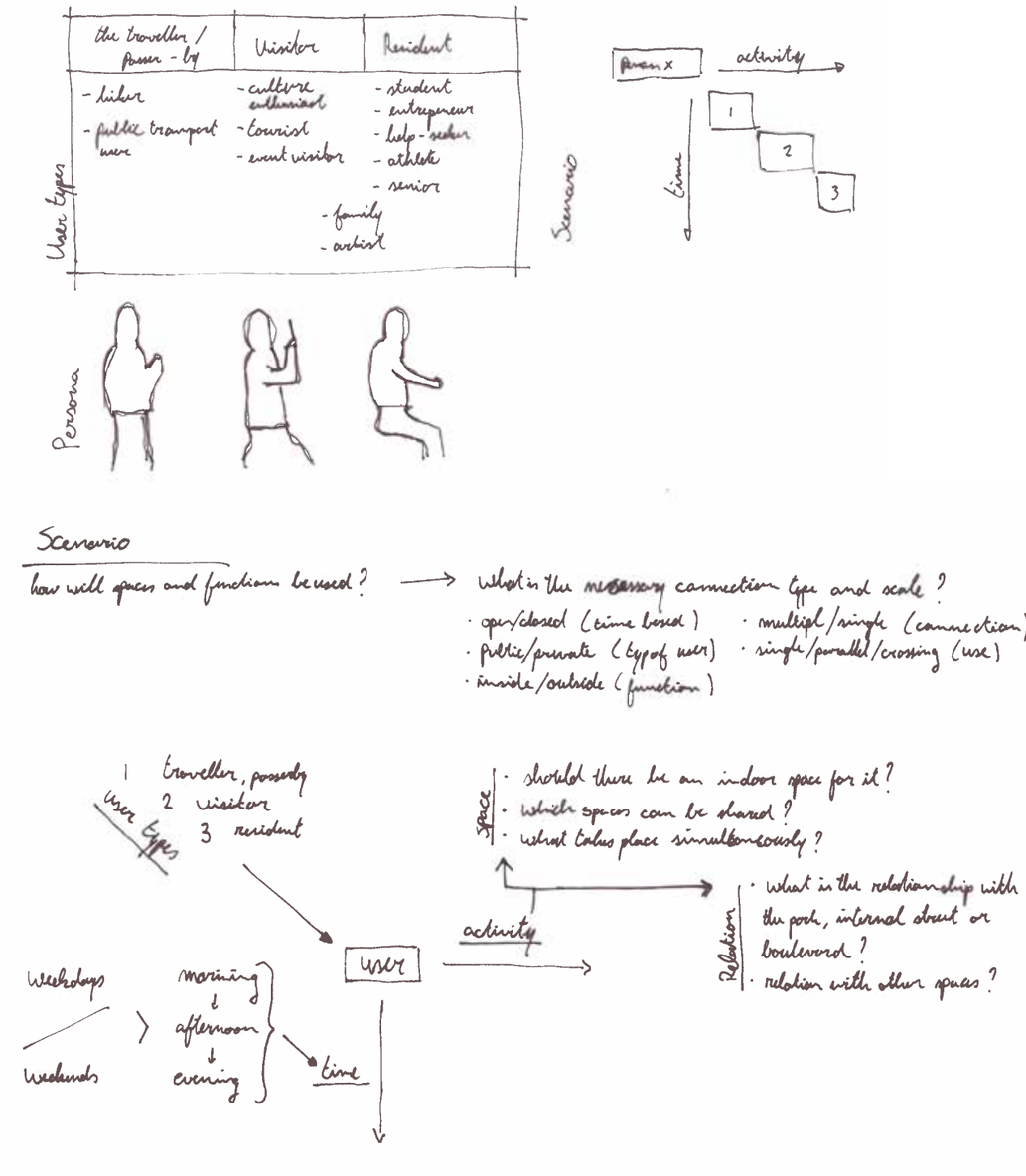


Green spaces



Personas and scenarios

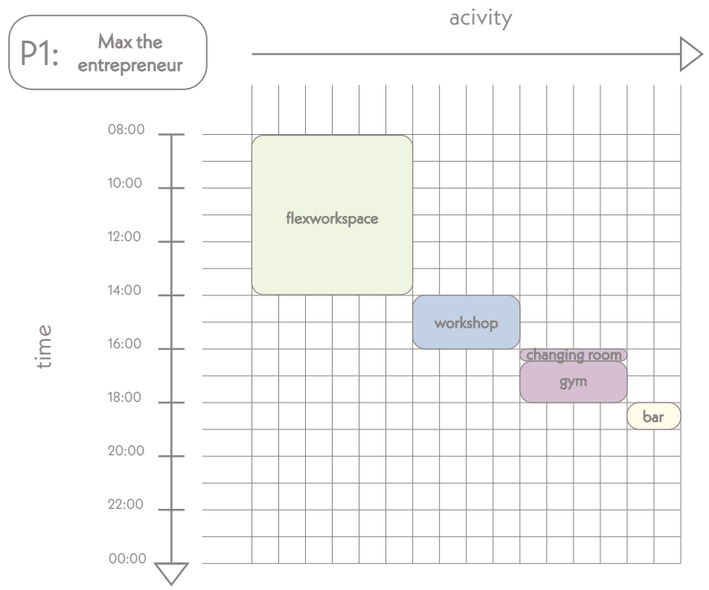
An analysis of the use of the building, the different types of users and the use per part of the day.



1. local residents
2. visitors
3. travellers/passengers

Types of users: personas and scenarios

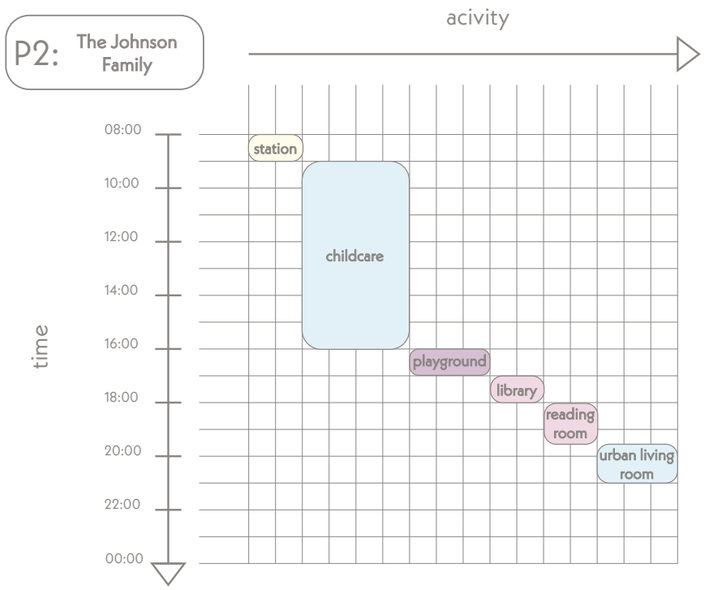
P1: Max the entrepreneur





Max is an entrepreneur who uses the building's flexworkspaces two days a week. Here he finds space to work and get together with other local residents. In the afternoon on these days, Max likes to spend time on his hobby of woodworking, making prototype furniture. He also uses these days to work on his physical fitness in the gym. He always ends the day with a drink with a regular group of local residents.

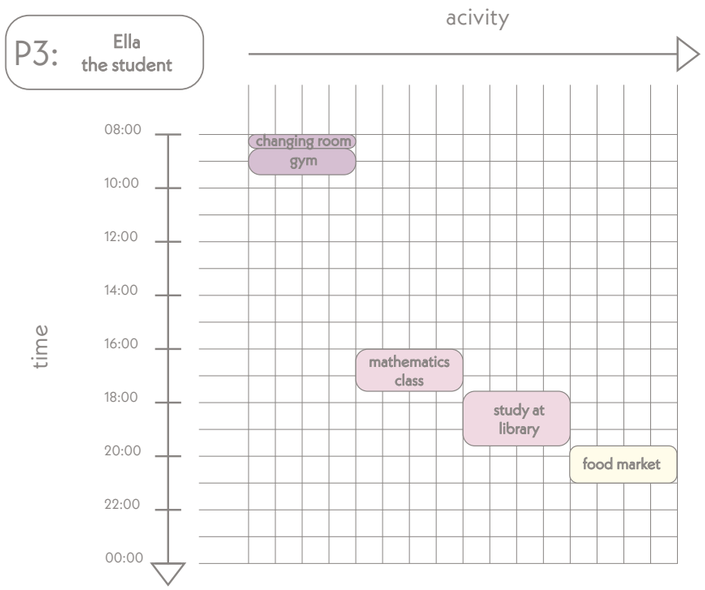
P2: The Johnson Family





The Johnson family uses the building's facilities about five days a week. In the morning, parents bring their child to the daycare centre before taking the train themselves to the centre for work. Around four o'clock, they often return to visit the playground with their child. Afterwards, their child has to read a chapter from her book, as the mother thinks it is important to establish a good literary foundation. Meanwhile, mother can pick out something to read for herself. Tonight they meet other local residents in the urban living room, here they also have the opportunity to eat together

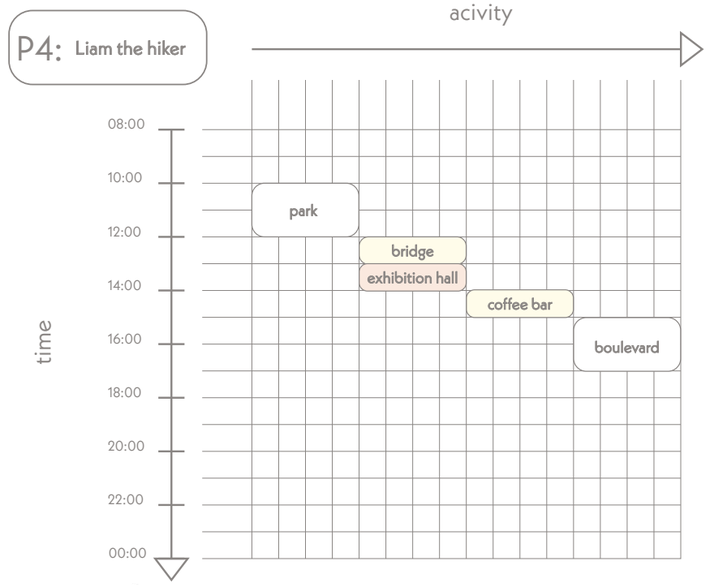
P3: Ella the student





Ella is a student who lives nearby and studies at the university next to Haraldsgade. Her daily routine is sometimes somewhat irregular, but in the morning she often starts with a workout in the building's gym. Then she cycles to the university via the boulevard. After her classes, she regularly attends a maths tutoring session with other students. She then studies for another two hours in the library and ends the day with a nice meal at the foodmarket together with her friends.

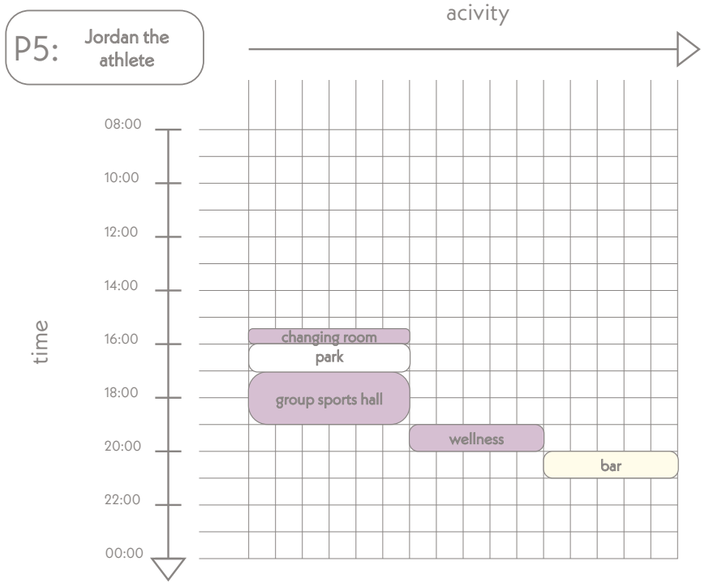
P4: Liam the hiker





Liam is a walker whose destination is not specifically the building. He follows a route along parks and boulevards, enjoying the surroundings, such as buildings, art and nature. From the park, Liam uses the bridge, where he stops to admire the current exhibition and has a chat with other passers-by about the art on display. He then grabs a cup of coffee and continues his walk along the promenade.

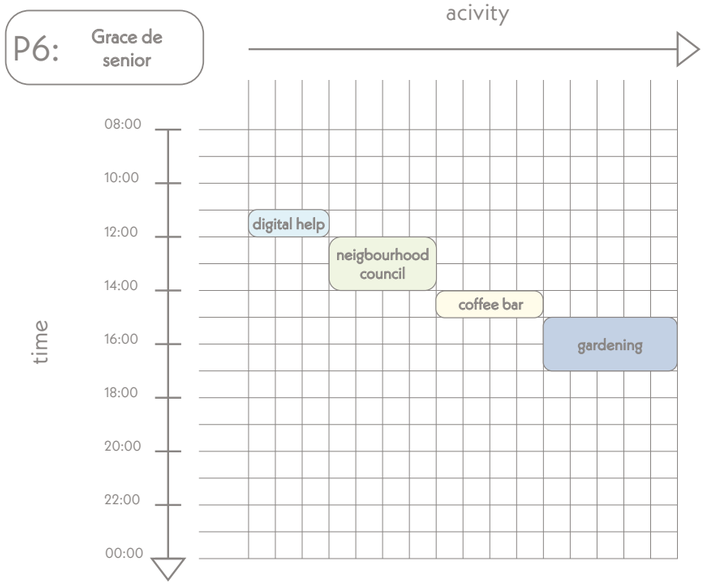
P5: Jordan the athlete





Jordan is a passionate athlete. Together with his friend, he goes into the park after changing to warm up outside, if the weather is right. They then continue their training in the group sports room. After training, they often go to the wellness place to recover the muscles, here they can take a bath or grab a sauna, ending the day with a drink at the bar.

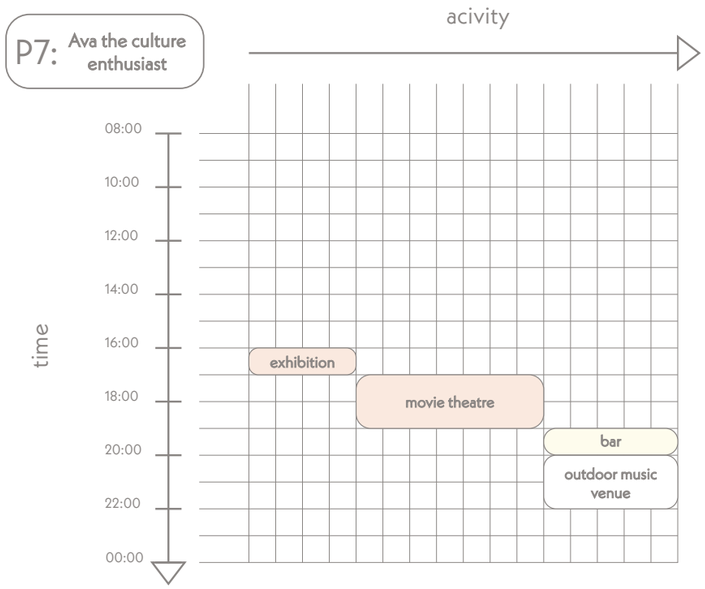
P6: Grace de senior





Grace is a senior who is actively involved in the neighbourhood committee. Once or twice a week, she meets with a group of committed local residents to discuss new topics. Prior to these meetings, Grace receives help with her digital issues, which she greatly benefits from. In the afternoons, she enjoys working in the community garden, as her flat does not have its own garden. This provides her with a nice solution and an enjoyable occupation.

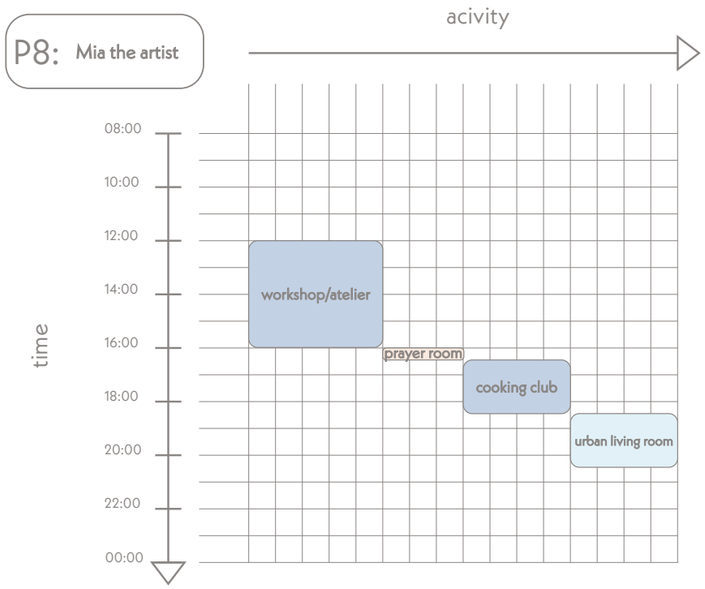
P7: Ava the culture enthusiast





Ava is has a strong interest in cultural activities. She loves attending events and goes to the movies or the theatre with friends every week. She does not like regular cinema visits, as she is more attracted to non-commercial films and shows. Upon arrival, she always goes to the exhibition hall first, where she can quietly enjoy the art. After the film, they have a drink in the public plaza, and coincidentally, there is also an outdoor music event today.

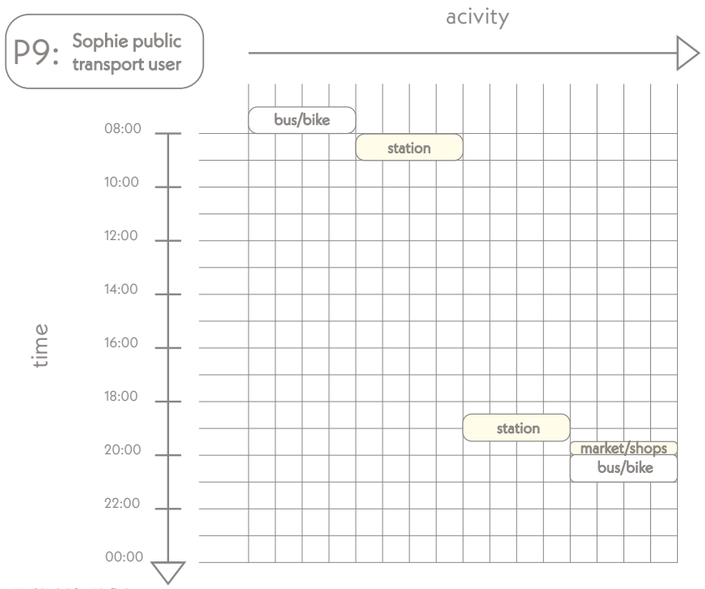
P8: Mia the artist





Mia is an artist who often works in the afternoon in the workspaces' studio. She does not have much space at home, and here she can also borrow materials such as easels and brushes. After her creative session, she goes briefly to the prayer room to come to herself. She then meets her friends in their cooking club, where they prepare healthy meals. Some of the dishes are sold at an attractive price at the food market, and afterwards they can enjoy the food together in the urban living room.

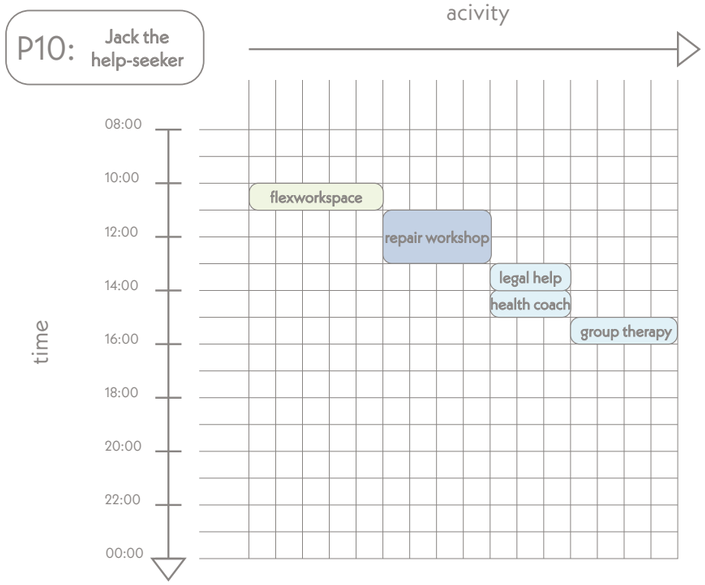
P9: Sophie public transport user





Sophie uses public transport exclusively. She lives nearby, but her work is an hour away by train, so she leaves early and gets home late. When the weather is nice, she cycles, but when it rains, she takes the bus that stops near her house. If necessary, she will run a quick purchase or get something to eat at the food market or shop

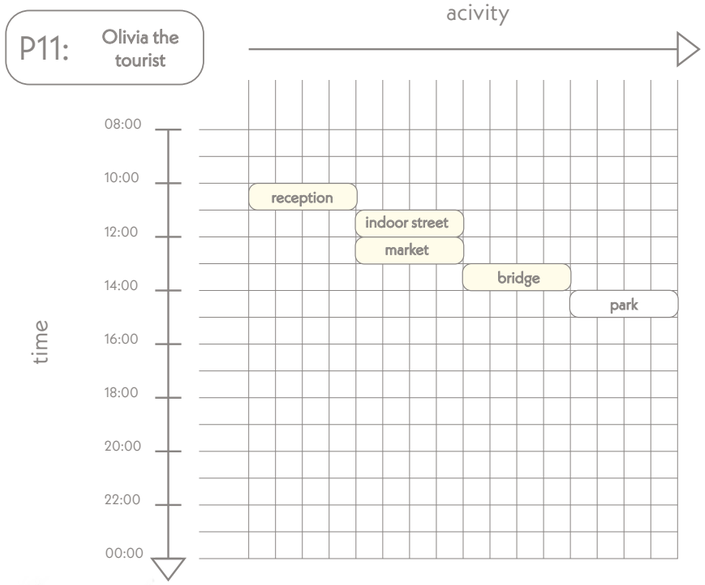
P10: Jack the help-seeker





Jack has experienced a distance from society due to previous addiction problems, but fortunately he finds the help he needs here. In the morning, he works in the flexworkspace on his own stuff. Later in the day, he goes to the workshop, where he does repairs on bicycles, kitchen appliances or electronics. Jack has discovered that he can work well with his hands. In the afternoon, he often receives guidance on legal issues and advice on a healthy lifestyle. Often ending the day with therapy session, which helps him move forward.

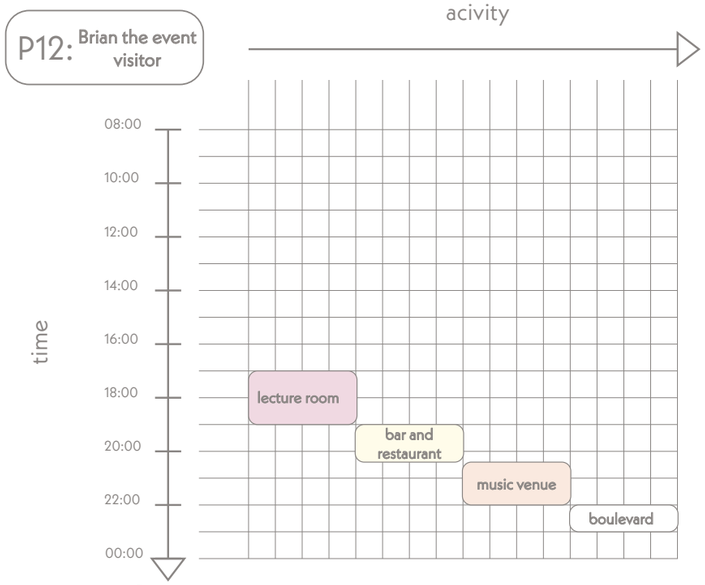
P11: Olivia the tourist





Olivia is a tourist visiting Copenhagen for the first time and has stumbled upon the boulevard by chance. The building arouses her curiosity, and she decides to request some information from the reception. She then wanders through the indoor street and the market. She then follows the route across the bridge, taking a peek at the workplaces along the way to see what is going on. Finally, she continues her walk towards the park. When she gets bored she can return to the city from here by train.

P12: Brian the event visitor





Brian is an enthusiastic attendee of events. Today, he has planned to meet up with a colleague to attend a lecture on AI. After the inspiring session, they decide to have something to eat and drink together in the restaurant near the food market. To end the day, they go to the musicvenue, where a local band is performing that Brian has been following for some time and whose music he regularly listens to. After this, they take a walk around the square and boulevard to talk afterward.

Publicness and circulation

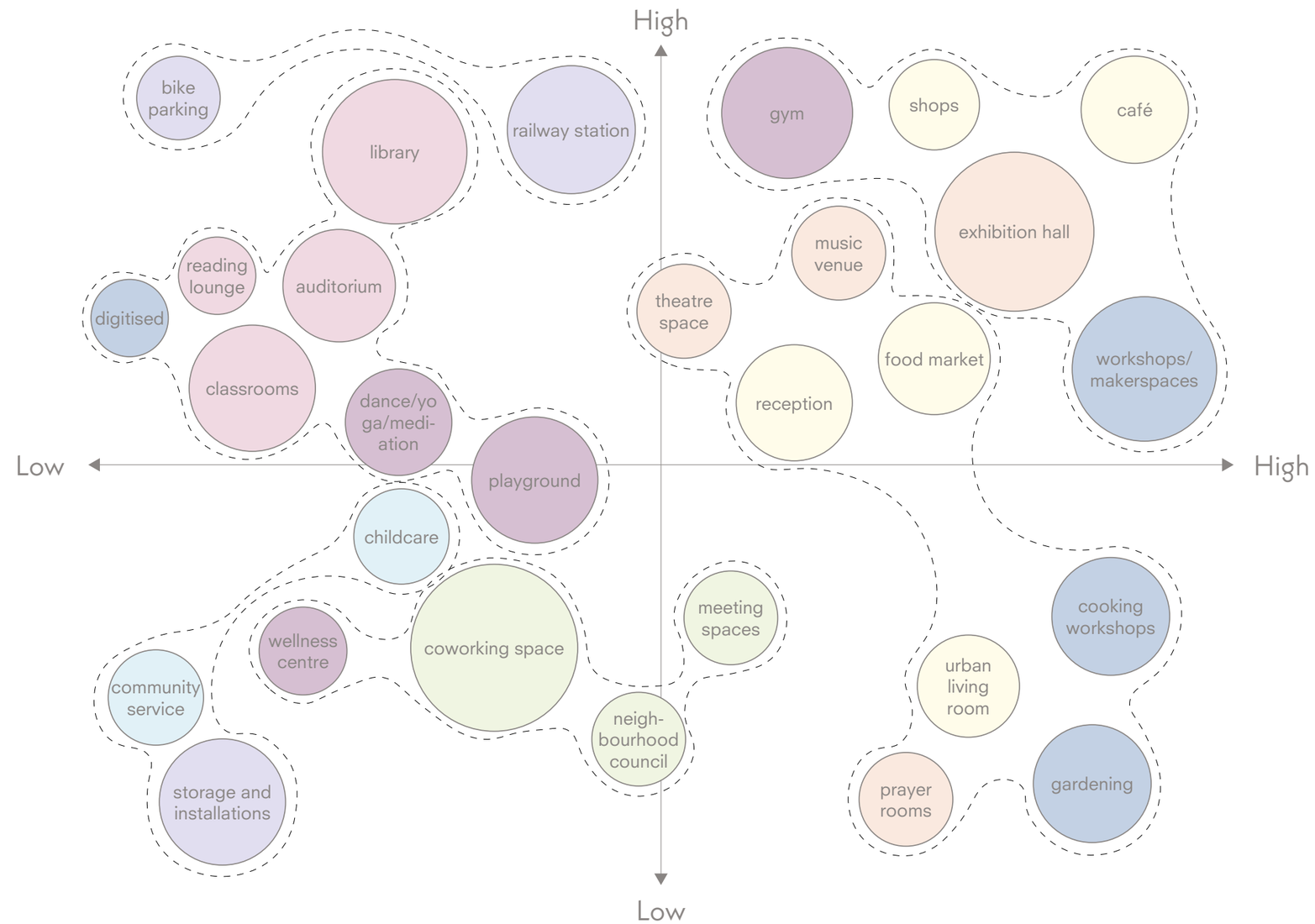
The different programmes and scenarios of use create a distinction about the location and clustering of functions.

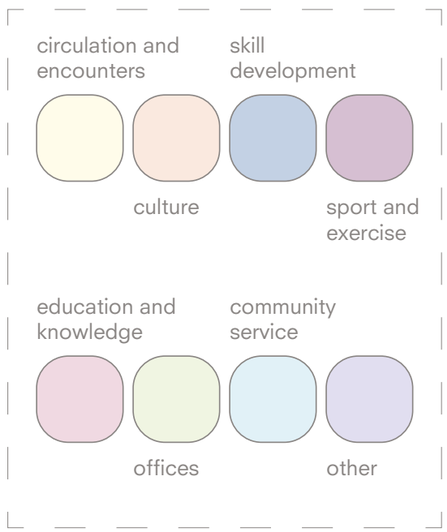
vertical

Level of publicness or privateness: This refers to whether the space is intended for local neighbourhood use or for wider city-wide engagement.

horizontal

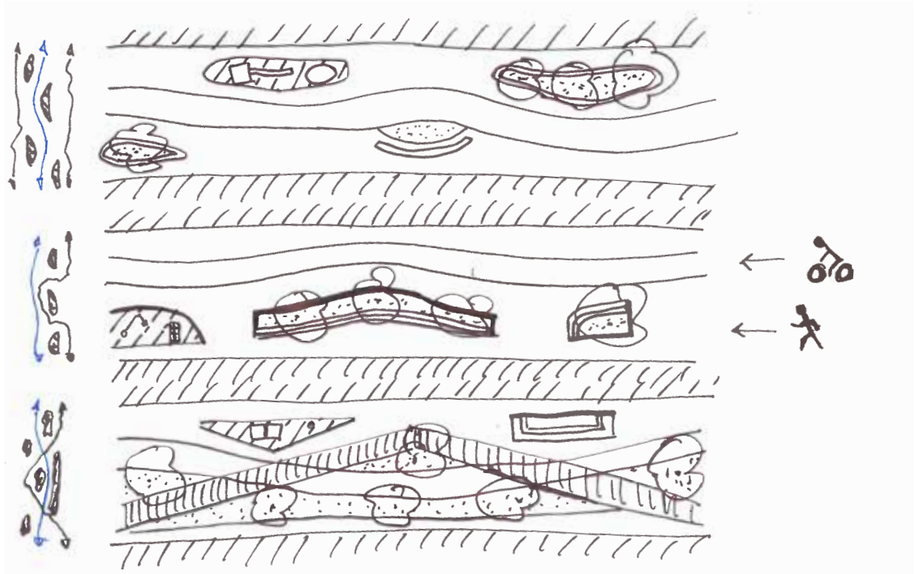
Desire for circulation and interaction: This reflects the intention to allow movement and facilitate interaction, shaping the space as a quiet area or a centre for spontaneous gatherings.



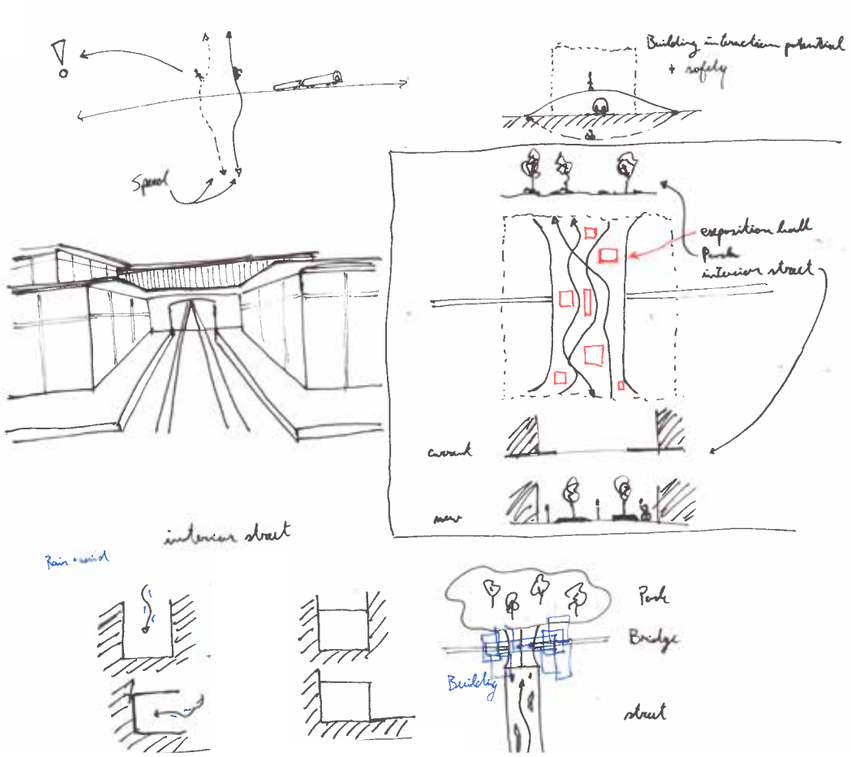


Routing and connection to the urban grid

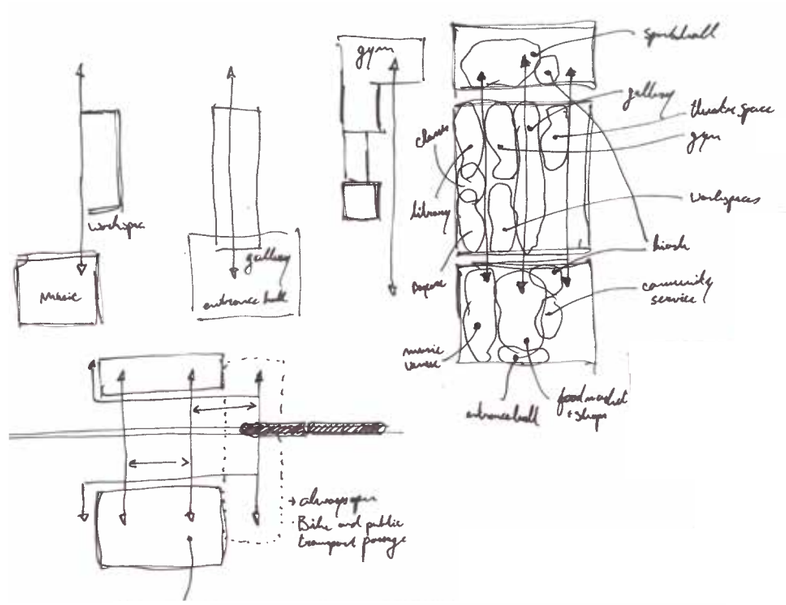
soft road users



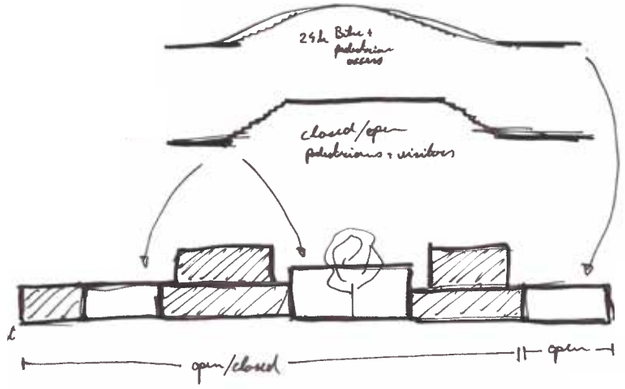
an in-between world and station



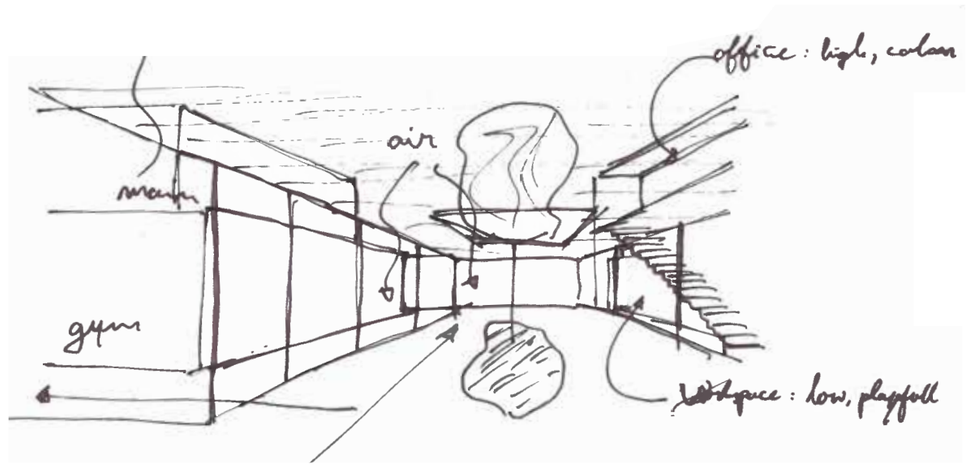
different functions, users and paths



a bridge and street layout

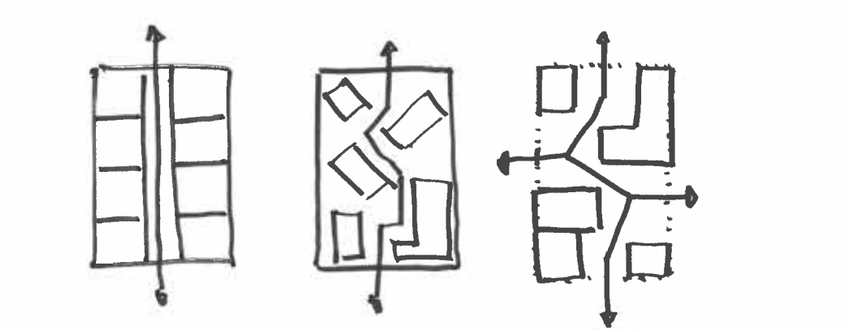


meeting between promenade and park

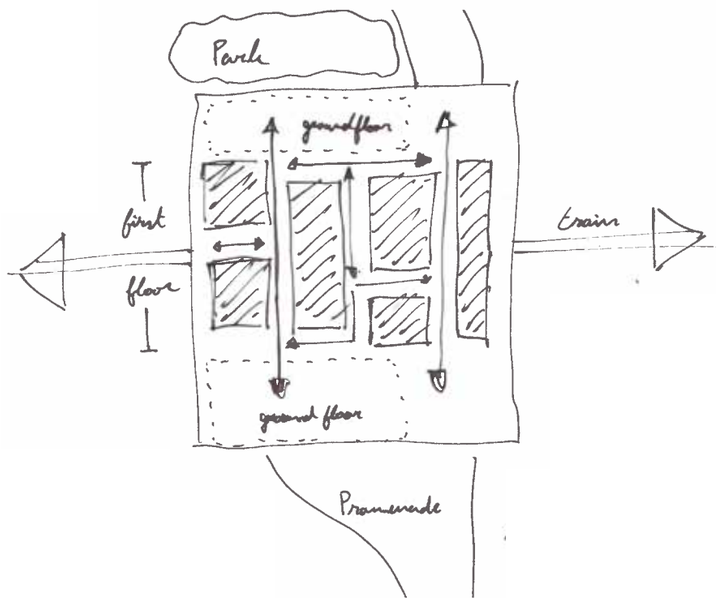


Streets and urban approach

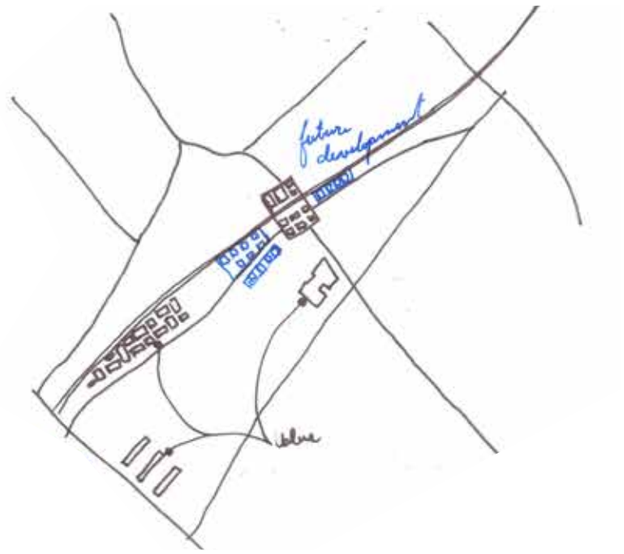
porous street



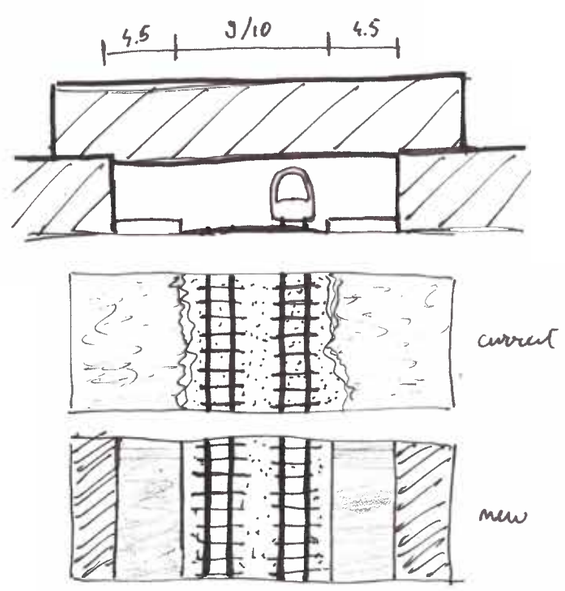
floor plans testing



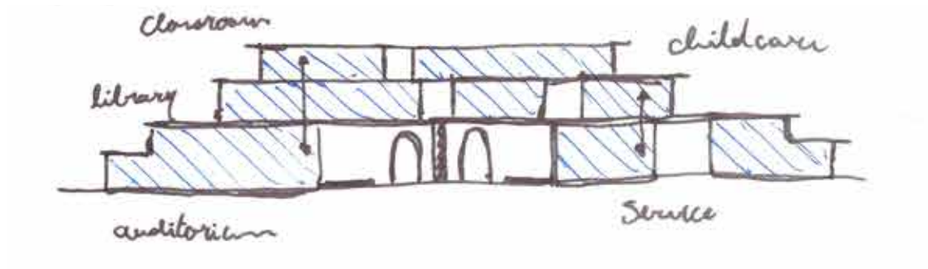
potential for future growth



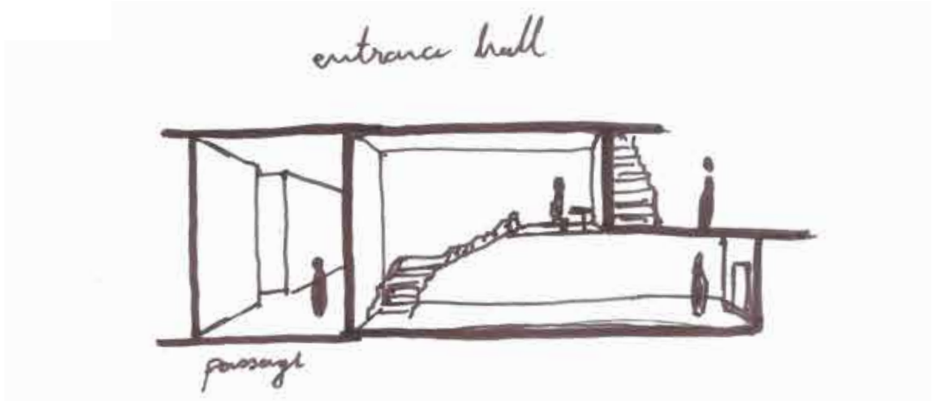
social infrastructure with station function



station and inner streets



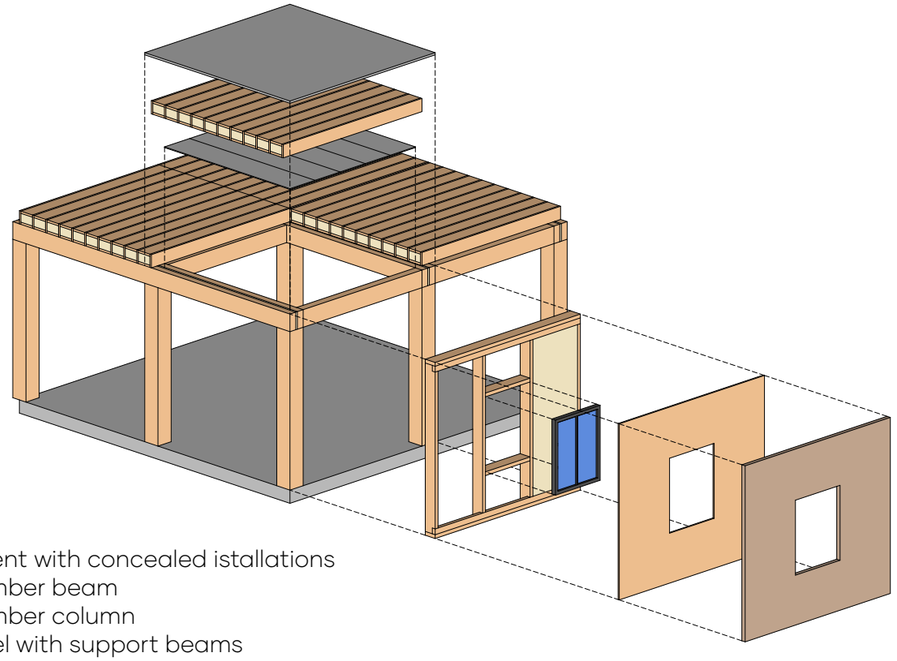
double height



Adaptive system

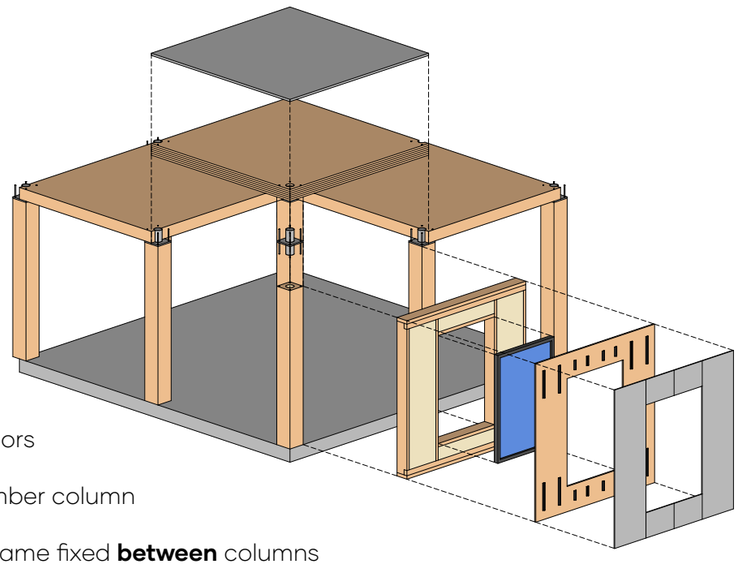
Modular construction and facade

A sustainable system within grid, adaptive approach to opportunities in replacement, exchange, change and growth. Demountable principles are used, not only at the structural level, but also within the façade technology. This ties in with the concept of different façade typologies that can be used in building streets, offering an interesting and flexible approach.



1.

- Lignatur floor element with concealed istallations
- Glued laminated timber beam
- Glued laminated timber column
- Acoustic ceiling level with support beams
-
- Insulated wooden frame fixed **on** columns
- Brick façade finishing
- Industrial façade representation



2.

- Cross-laminated floors
- Steel connector
- Glued laminated timber column

- Insulated wooden frame fixed **between** columns
- Sheet aluminium cladding on demountable hangers
- Modern façade representation

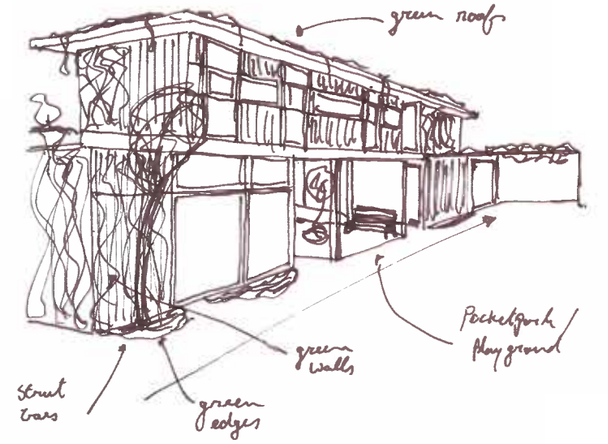
Sketch development

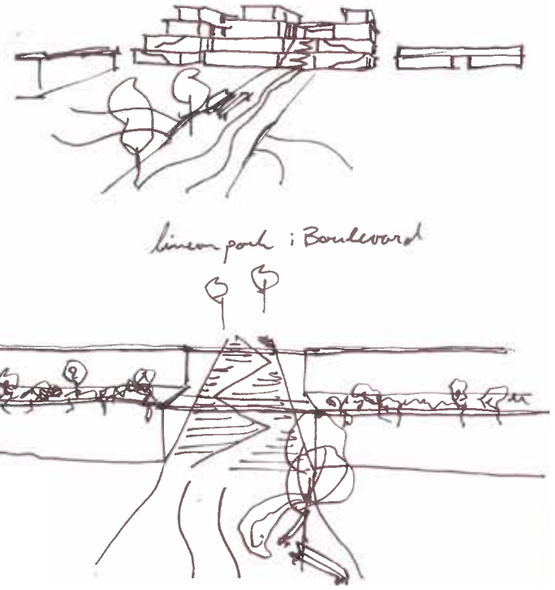
Green strategy

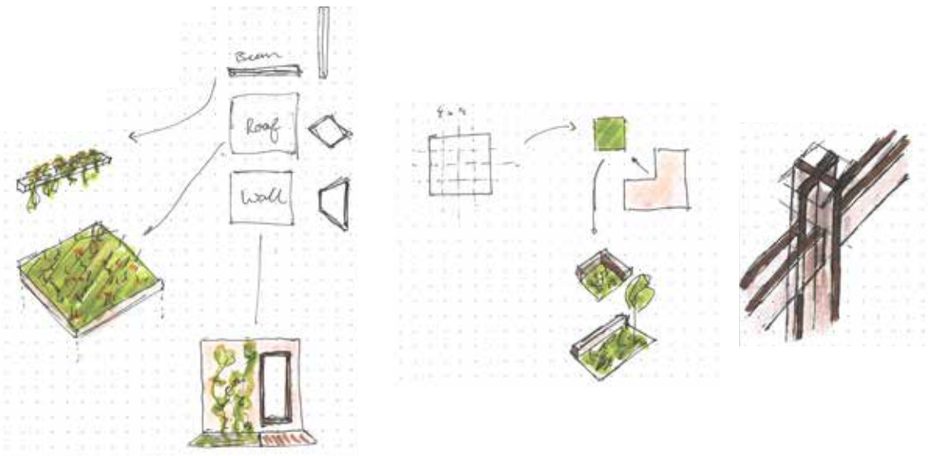
bridge deck and modules

promenade and linear park

double height







Design proposal P2

Site

Haraldsgade district / Vingelodden

Vingelodden is an underdeveloped area with a spacious layout and buildings of limited architectural value. As a result, the area offers considerable development potential. Adding a building with a station function and space for bicycle parking is therefore a logical choice. This project can act as a catalyst for redevelopment, where the bridge connection and the promenade can play a crucial role in creating a renewed and connected urban environment.

- apartments
- residence
- educational
- offices/industrial
- special funcion
- retail
- warehouse

Haraldsgade district



Vingelodden







Urban strategy

Unification and integration of Haraldsgade

A boulevard serves as a new route and provides a physical connection that improves public circulation and vibrancy which enhances the quality of life in the neighbourhood. This promenade integrates the characteristic elements of a post-industrial neighbourhood with recreational functions, creating an attractive public space. It promotes interaction with the neighbourhood by connecting the promenade with surrounding streets and buildings, revealing hidden qualities and features of the neighbourhood. The promenade invites people to linger and offers seating areas, green spaces, water features and art installations. In addition, a bridge improves accessibility to the park, bringing greenery into the neighbourhood and into the building itself, further enriching the urban environment.



A new train schedule

Introducing new connections in this perspective involves a station function that connects to Copenhagen's existing rail network. This station will connect the area to Nordhavn, one of the largest urban development projects in Scandinavia, and to Copenhagen Central Station, among others. In addition, the project will be part of the north-south connection, an integral part of the route between the prestigious suburb of Hellerup and Copenhagen South. The two-way connection opens up opportunities in several areas, such as employment, tourism and economic growth. It strengthens exchanges between urban and surrounding areas and encourages opportunities for dynamic interaction between residents, visitors and businesses.

F	12:19	**Klampenborg** Ryparken , Hellerup , Klampenborg	**3** min
B	12:25	**København H** Ryparken , Svanemøllen , Nordhavn , Østerport, Nørreport , Vesterport , København H	**6** min
F	12:28	**København Syd** Nørrebro , Fuglebakken , Grøndal , Flintholm , KB Hallen , Ålholm , Danshøj , Vigerslev Alle , København Syd	**9** min
B	12:31	**Grøndal** Fuglebakken , Nørrebro , Grøndal	**12** min
F	12:34	**Klampenborg** Ryparken , Hellerup , Klampenborg	**15** min

Program breakdown

849,9 M²

GENERAL PUBLIC AREAS

364,8 M²

CULTURE

300 M²

SKILL DEVELOPMENT

599,5 M²

SPORT AND EXERCISE

617,6 M²

EDUCATION AND KNOWLEDGE

215,2 M²

OFFICE AREAS

461,6 M²

COMMUNITY SERVICE

903,8 M²

OTHER FUNCTIONS

total surface 4312,4 M²

GENERAL PUBLIC AREAS		
information centre	153,3	
	administration room	14,7
	offices	44,1
food market	115,6	
bar/café	60,8	
	kitchen	22,3
	storage	4,4
	adjoining terrace	-
	roof terrace	-
public toilets	59,7	
indoor street	460,5	
bridge deck	-	

CULTURE		
music and theatre venue	364,8	
	balcony	68
	bar	21,8
	storage	14,7
	outdoor event space	-

SKILL DEVELOPMENT		
makerspaces	192,4	
	equipment workspace	14,7
	toilets	14,7
	outdoor space	-
cooking workshops	107,6	
	rinse kitchen	15,1
	cold store	8,9
	toilets	6
greenhouse/garden	-	

SPORT AND EXERCISE		
dressing rooms	95,5	
sports hall	187,6	
	counter	7,4
gym	139,2	
	outdoor space	
yoga/dance	54	
wellness centre	123,2	
	changing/shower room	22,2
	outdoor space	-
playground	-	

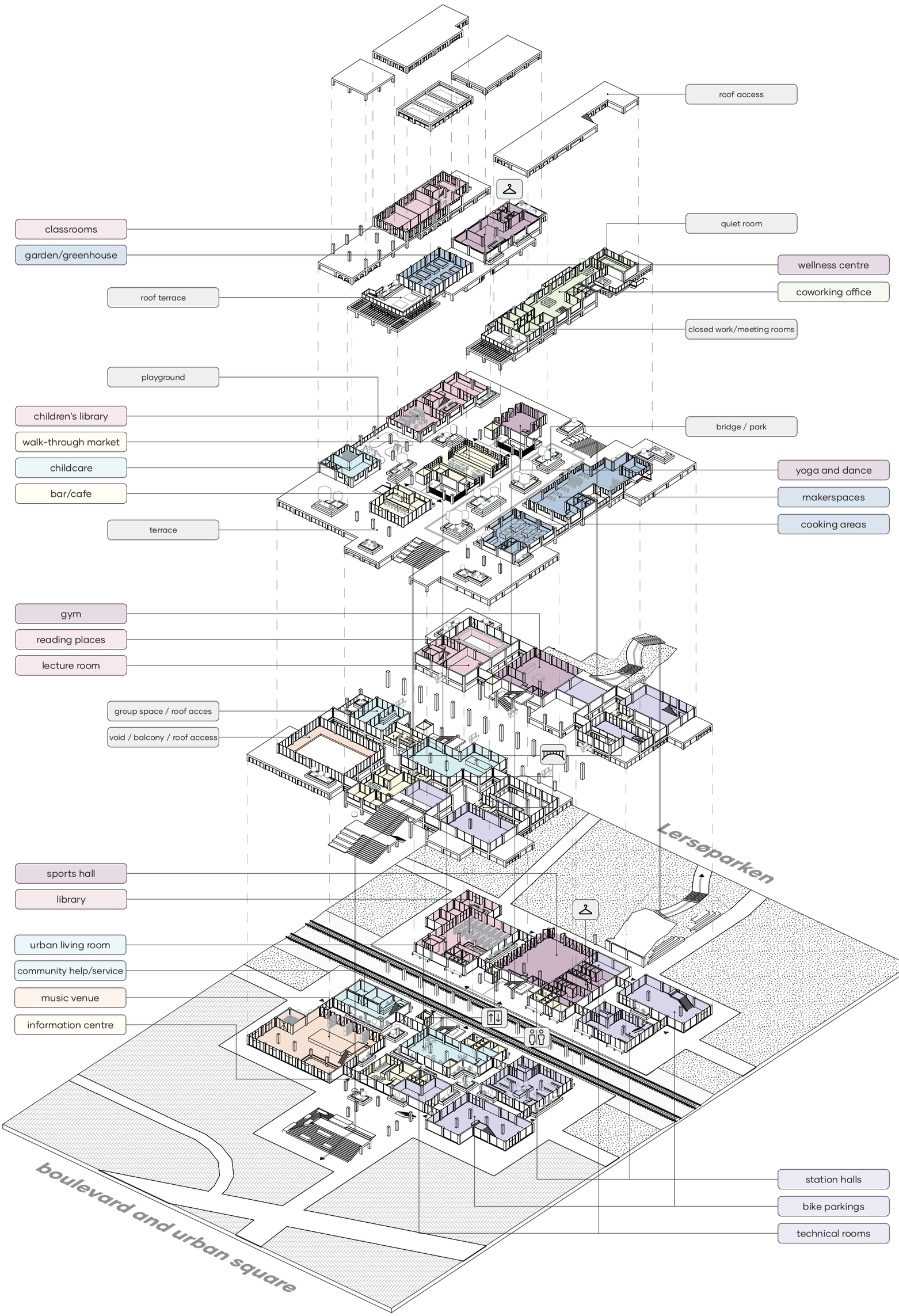
EDUCATION AND KNOWLEDGE		
library	248,8	
	entrance	14,7
	counter	9,9
	storage	9,6
	toilets	23,9
	closed study area	29,4
library reading balcony	61,2	
	outdoor space	-
lecture room	46,4	
reading and study area	92,8	
children's library	61,2	
classrooms	107,2	

OFFICE AREAS		
coworking office	215,2	
	cowork spaces	68,1
	quite room	28,5
	toilets	14,7
	office living room	40,7
	closed office/meeting room	63,2
	outdoor space	-

COMMUNITY SERVICE		
community help and service	154,4	
	offices health and legal coach	29,4
	group space	30,6
	outdoor space	-
urban living room	246,4	
childcare	60,8	
	sleeping area	14,7
	kitchen	4,6
	toilets	5,8

OTHERS		
station hall	302,4	
	kiosk	29,4
	customer service	8,5
bike parking	461,8	
technical room	139,6	

Axonometric overview



Impression and materials

Interior street

The image demonstrates the implementation of greening strategies and how the width and double height of the inner street contribute to a vibrant public atmosphere. The combination of wooden materials and greenery creates a warm, inviting impression. The interior facades are open and transparent, offering a view into the various functions within.







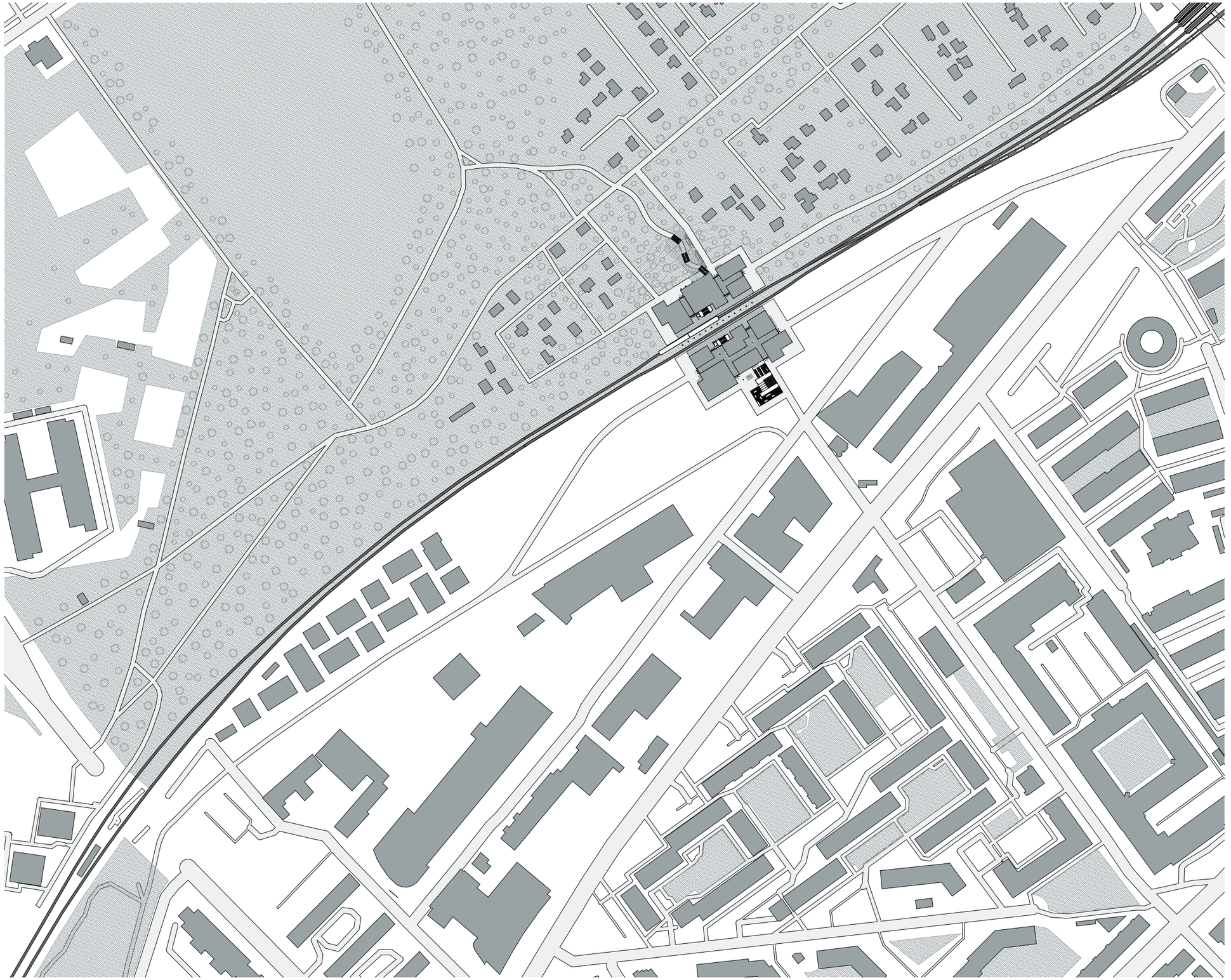






Drawings

Site plan



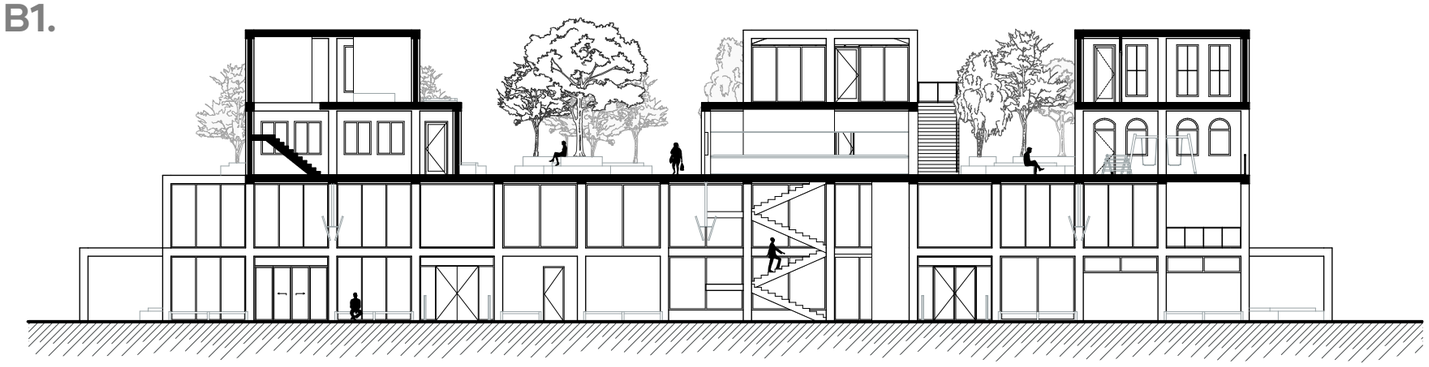
Sections

The first section illustrates how the bridge deck connects to the urban area through a stepped landscape, and to the park with a natural hill, integrating natural elements into the bridge deck.
The second section highlights the exposed stair core, linking the ground floor and second floor. Given the building's width, I aim to enhance natural lighting on the platforms by incorporating a more porous design for the bridge deck.

A1.



B1.



Building in context

An impression



SOCIAL INFRASTRUCTURE

P2 - AR3AP100 Public Building Graduation Studio

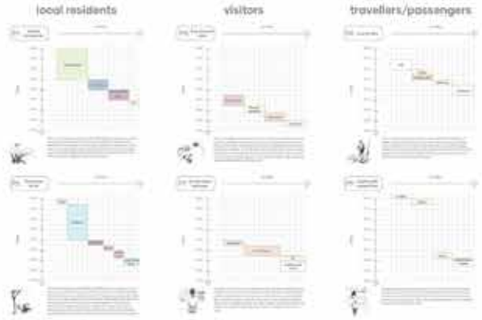
The design reimagines infrastructure as more than just a functional necessity, recognizing it has an intrinsic value in shaping environments and communities. By improving the overall quality of life, the project's urban approach becomes a catalyst for new opportunities. By combining the social and infrastructure aspect, the design aims to create a strong integration with urban space, benefiting both the neighbourhood and city residents. The project's strong focus on social interaction and gathering through multifunctionality is central. The building takes advantage of the unique location between park and promenade and exploits outdoor spaces at ground level as well as the bridge deck.

Sikose Fouarge | 5944097 | 22-01-2025

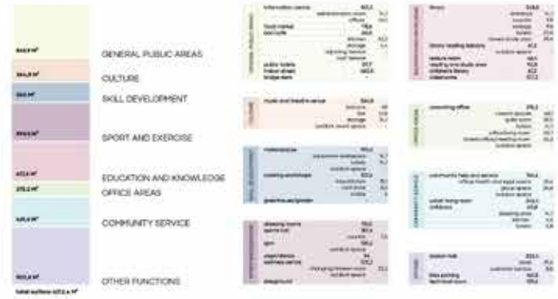
SPACE RELATIONS



TYPES OF USERS: SCENARIOS



BUILDING PROGRAM BREAKDOWN



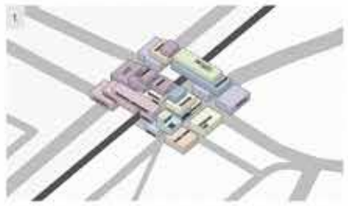
CONNECTING NEIGHBOURHOOD AND CITY

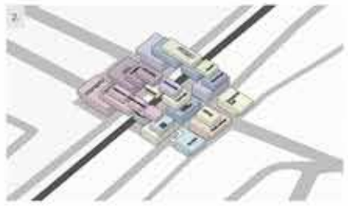


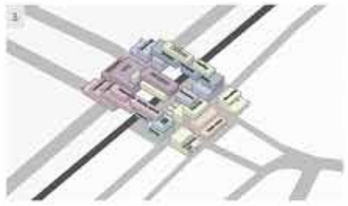
TRAIN DEPARTURE TIMES

F	12:19	Klampenborg Byparken , Hellerup , Klampenborg	3 min
B	12:25	København H Byparken , Svanemøllen , Nordhavn , Østerport, Nørreport , Vesterport , København H	6 min
F	12:28	København Syd Nørrebro , Fuglebakken , Grøndal , Flintholm , KB Hallen , Ålholm , Danshøj , Vigerslev Alle , København Syd	9 min
B	12:31	Grøndal Fuglebakken , Nørrebro , Grøndal	12 min
F	12:34	Klampenborg Byparken , Hellerup , Klampenborg	15 min

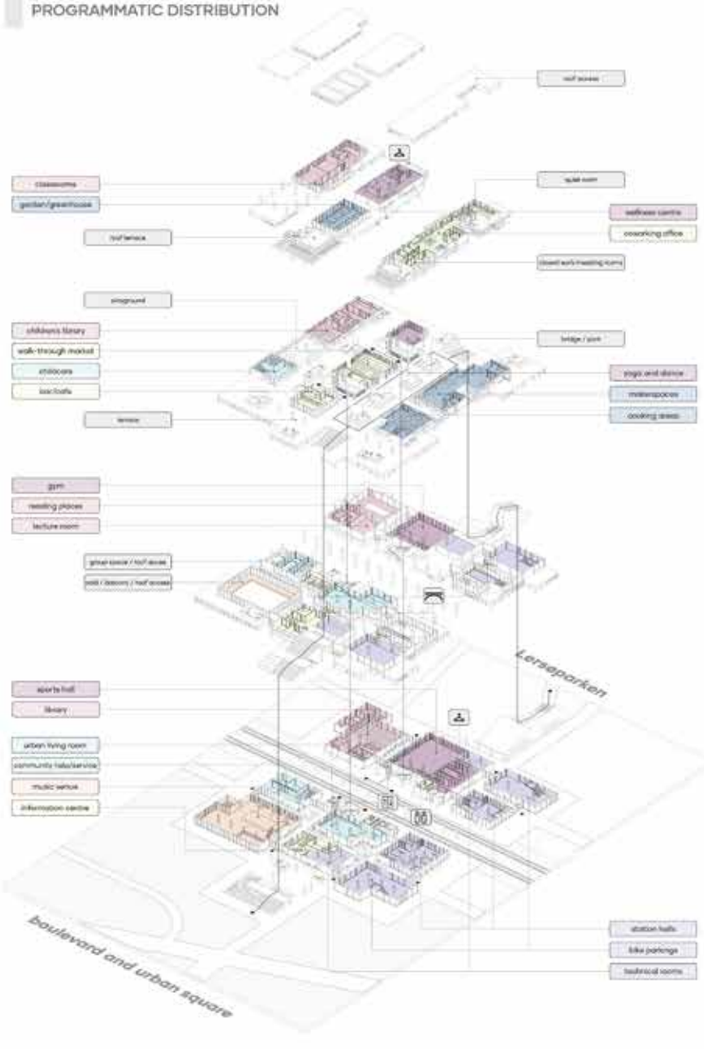
MASSING EXPLORATIONS







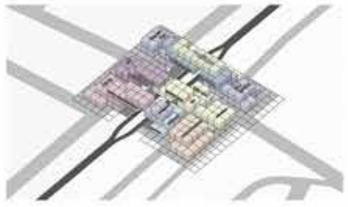
PROGRAMMATIC DISTRIBUTION



BUILDING IN CONTEXT



MERGING OF RESULTS



SOCIAL INFRASTRUCTURE

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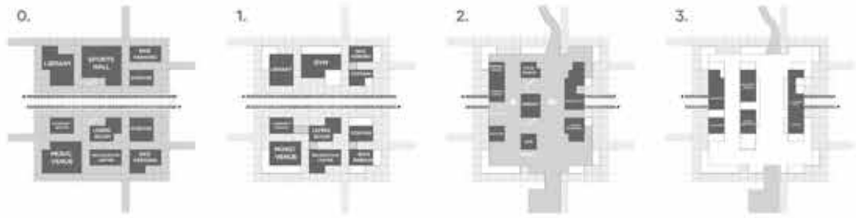
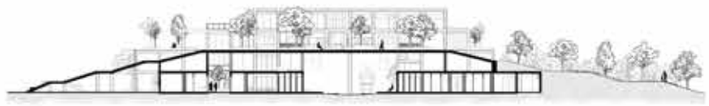


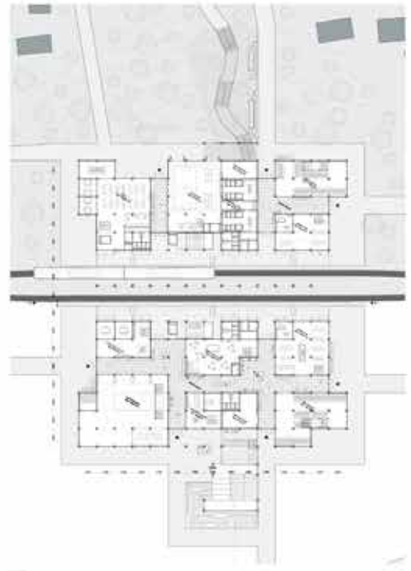
SECTION A1. 1:300



SECTION B1. 1:300



GROUND FLOOR 1:400



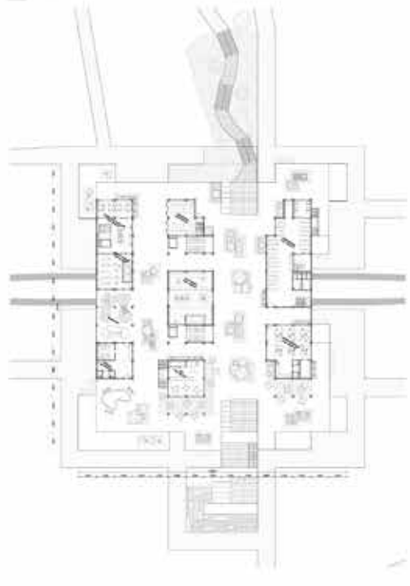
FIRST FLOOR 1:400



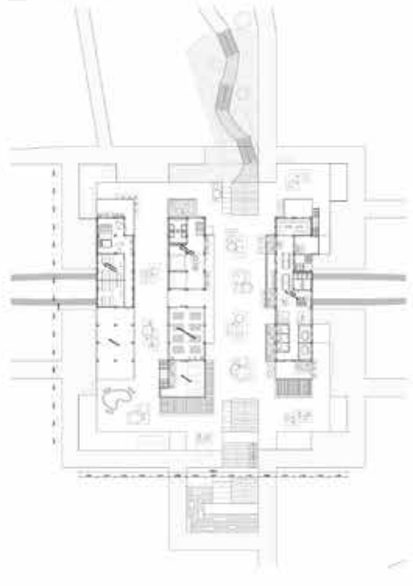
SITE PLAN. 1:1000



SECOND FLOOR 1:400



THIRD FLOOR 1:400



SOCIAL INFRASTRUCTURE

P2 - AR3AP100 Public Building Graduation Studio

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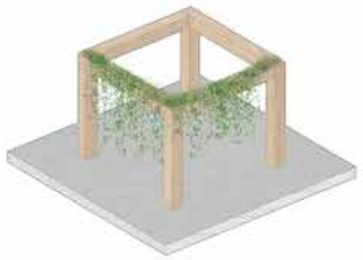
Eloise Fouarge | 5944097 | 22-01-2025

GREENING STRATEGIES FOR WELL-BEING



1. Green walls



2. Green edges



3. Green seating areas



4. Green roofs

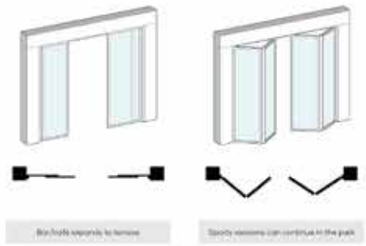




RESTORATIVE URBANISM



SPATIAL FLOW INDOOR-OUTDOOR



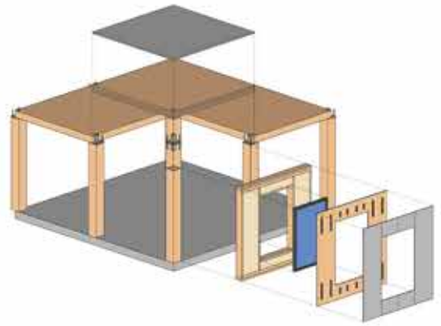
Bicycle expands to terrace

Sports sessions can continue in the park

Sliding windows extend the market to the bridge deck

Event hall opens onto the park on intense days

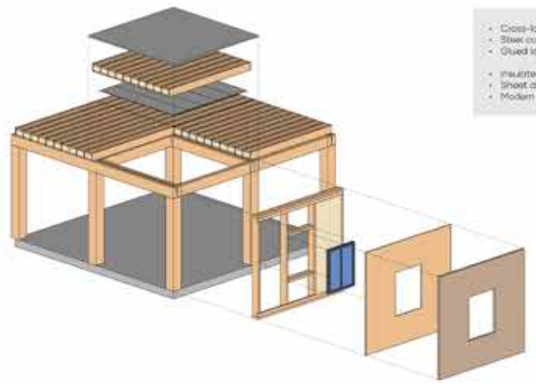
ADAPTIVE AND MODULAR SYSTEM V1.



- Lignatur floor element with concealed installations
- Glued laminated timber beam
- Glued laminated timber column
- Acoustic ceiling level with support beams

- Insulated wooden frame fixed **on** columns
- brick façade finishing
- industrial façade representation

ADAPTIVE AND MODULAR SYSTEM V2.



- Cross-laminated floors
- Steel connector
- Glued laminated timber column

- Insulated wooden frame fixed **between** columns
- Sheet aluminium cladding on demountable hangers
- Modern façade representation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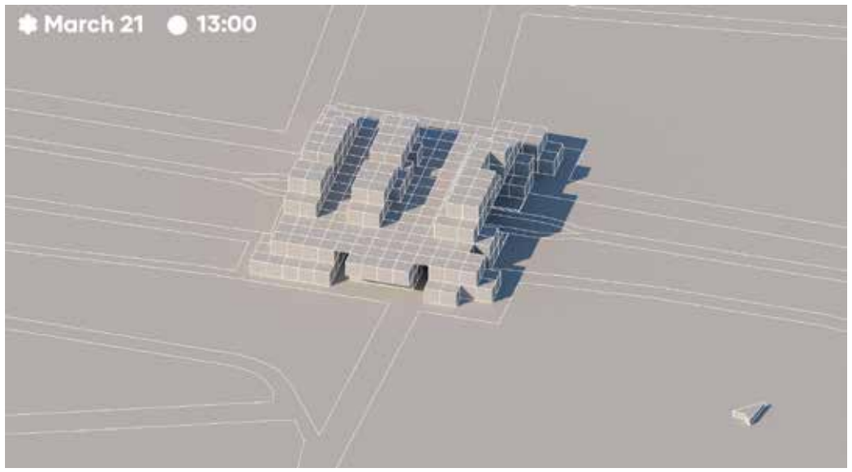
1996-2024

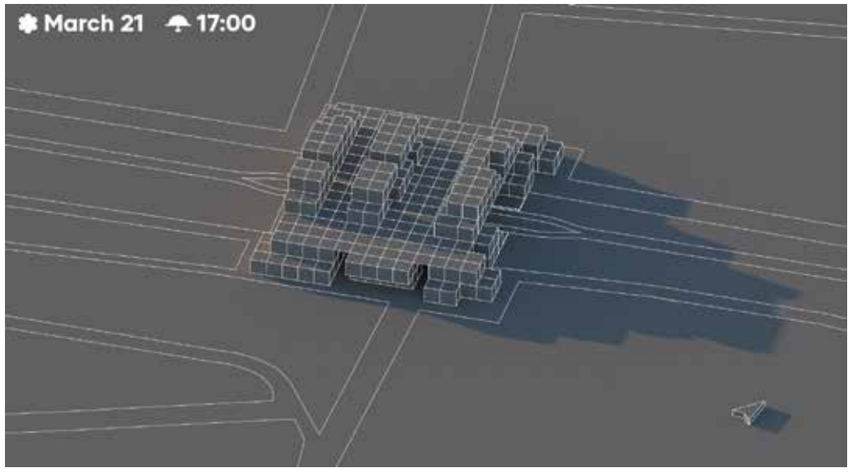
Solar study 3D

The 3D solar study provides insight into the seasonal conditions of the design. In my design process, this analysis helped refine the massing. Especially on the bridge deck, the focus was on maximising sunlight hours with the creation of plains, in line with the vision to create a park-like public realm here that takes full advantage of the environmental qualities.

Spring Equinox

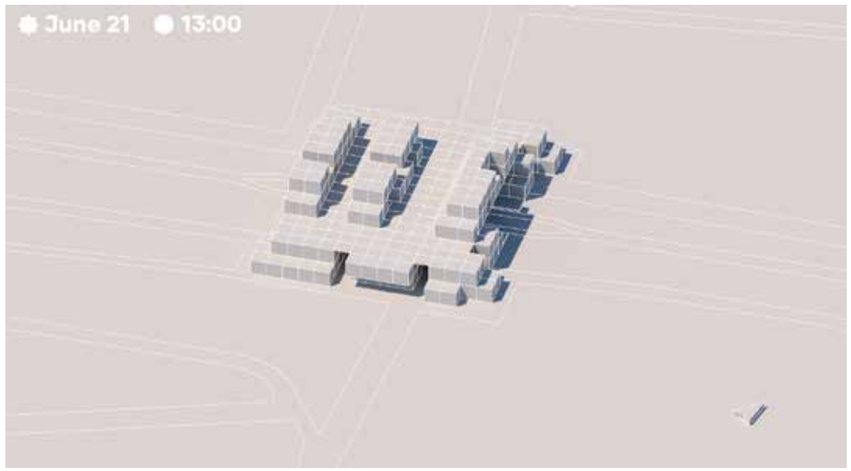






Summer Solstice



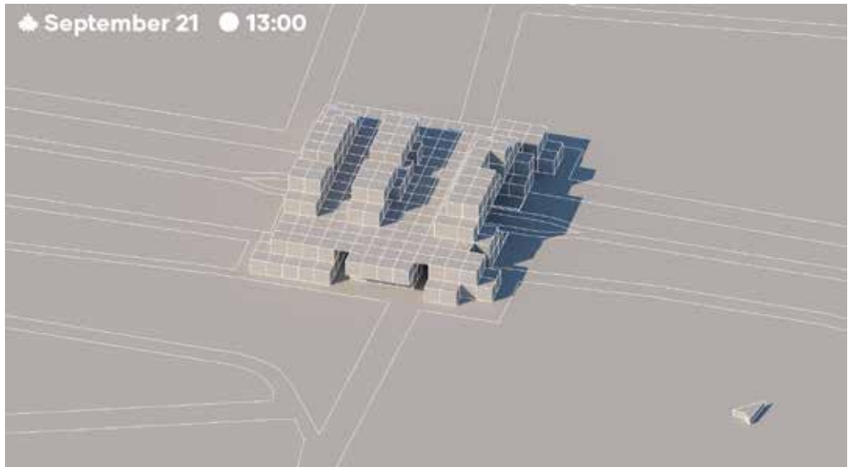


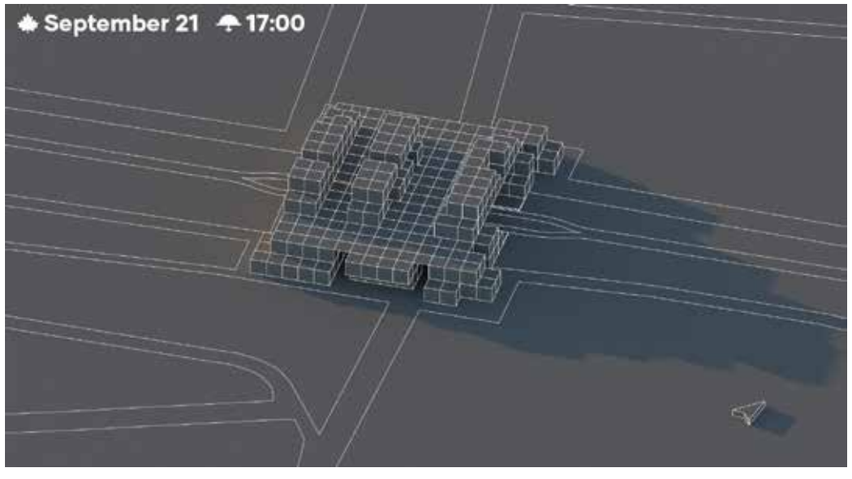


Besides refining the massing, the solar study also proved very valuable in shaping new vertical relationships in the form of voids. These contribute in an integral way to improving ventilation, visual comfort and daylighting within the design. The study was thereby used to sketch possible perforations that improve daylight access at underlying floor levels.

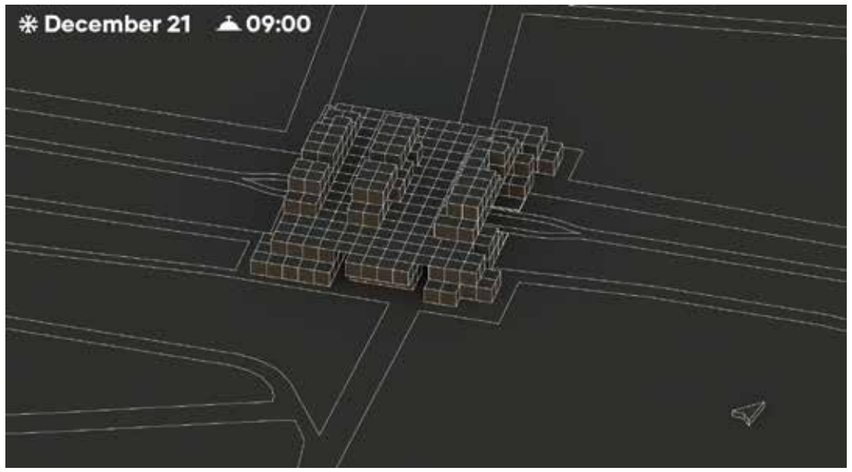
Autumn Equinox

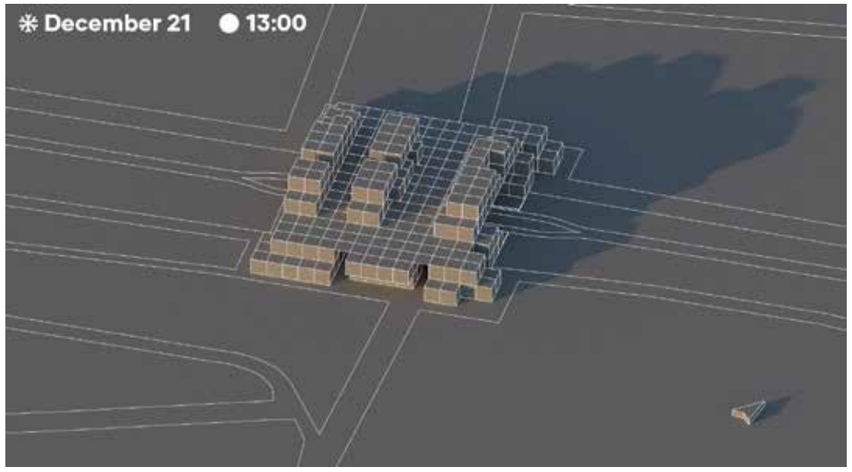


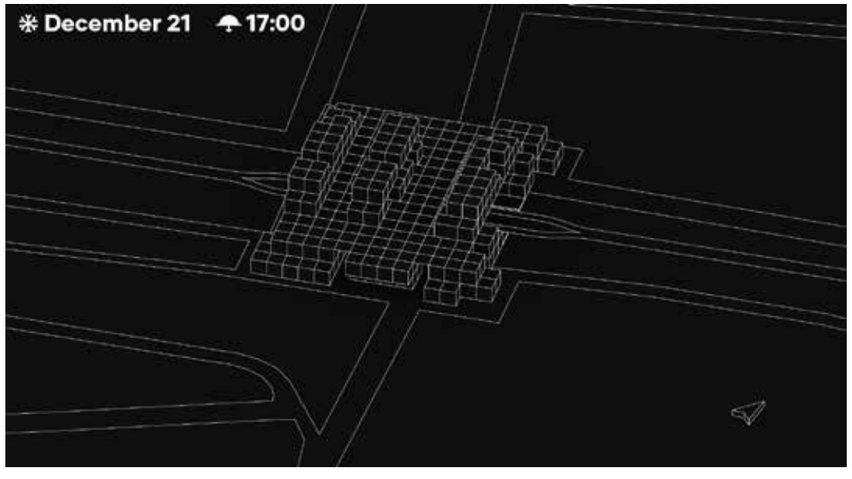




Winter Solstice







Pedestrian track analysis

Within the concept of a social infrastructure aimed at sustainable mobility, pedestrian movement modelling has been applied to better understand the interrelationships between spaces and the use of traffic spaces, with a focus on efficient routing and meeting places. Here, specific attention was paid to the three types of users previously identified. Different routings and entrances to spaces were mapped, examining safety, mobility comfort, efficiency and opportunities in fostering spontaneous interaction or encounters between different types of users.

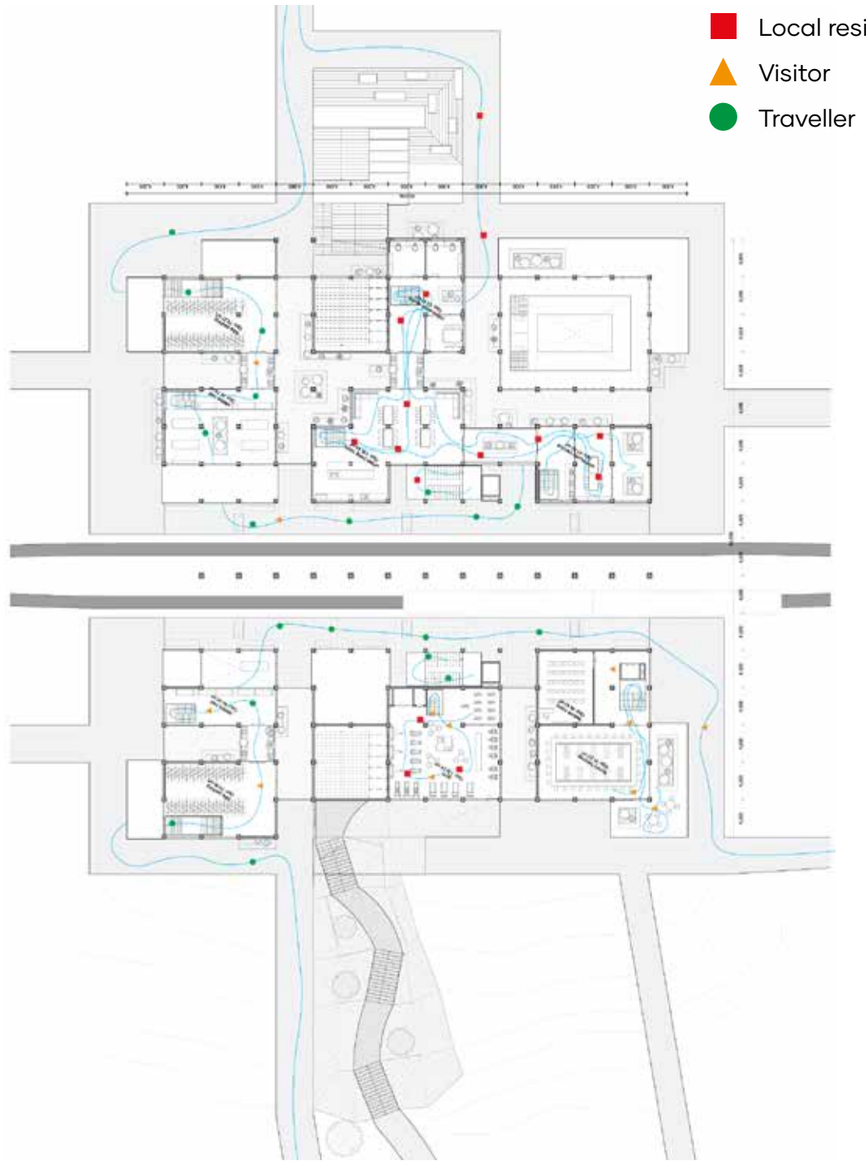
sketches



ground floor

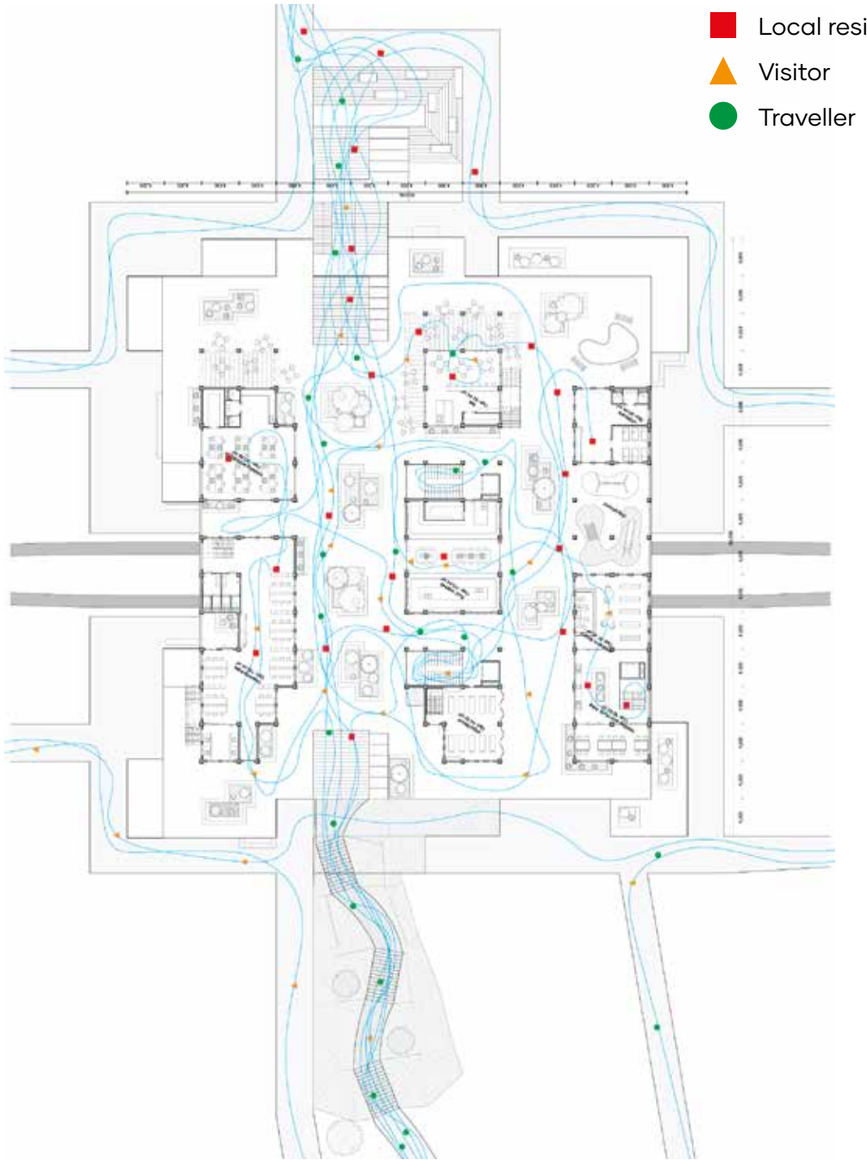


first floor

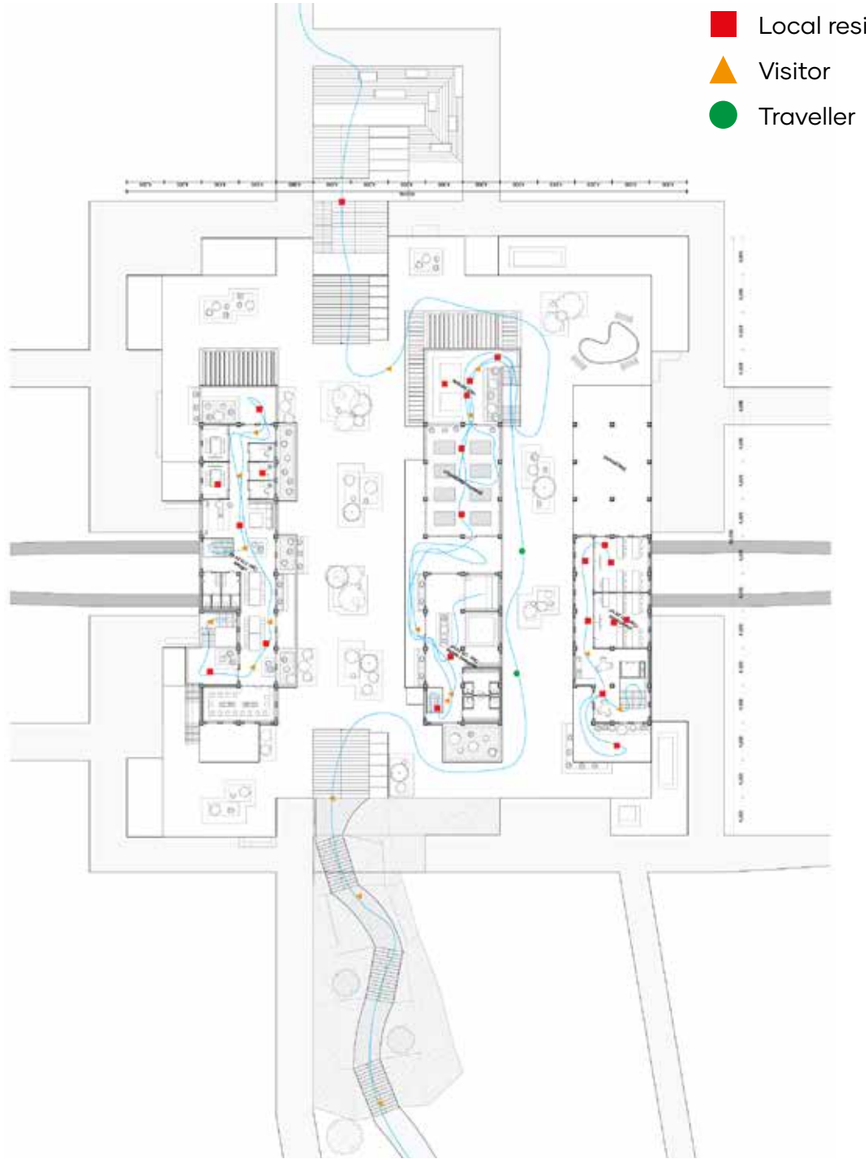


Again, extra attention was required for the bridge deck in relation to the openness of the central middle area, now defined as the market. A flexible, pavilion-like open/closed structure would lend itself better as an element that creates unity within the public realm. In addition, the third floor was critically examined in terms of ease of use and its relationship with the public realm on the bridge deck. Here, it was found that the redundant volume here needed to be redesigned.

second floor



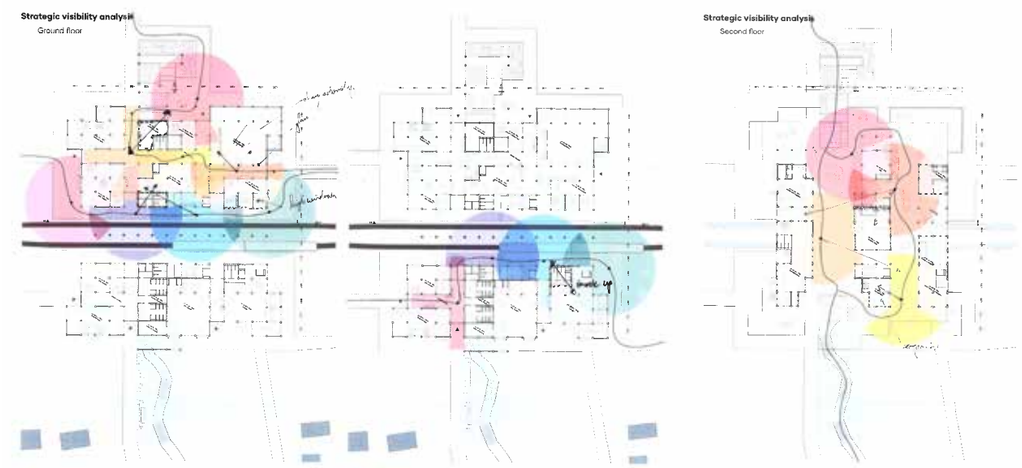
third floor



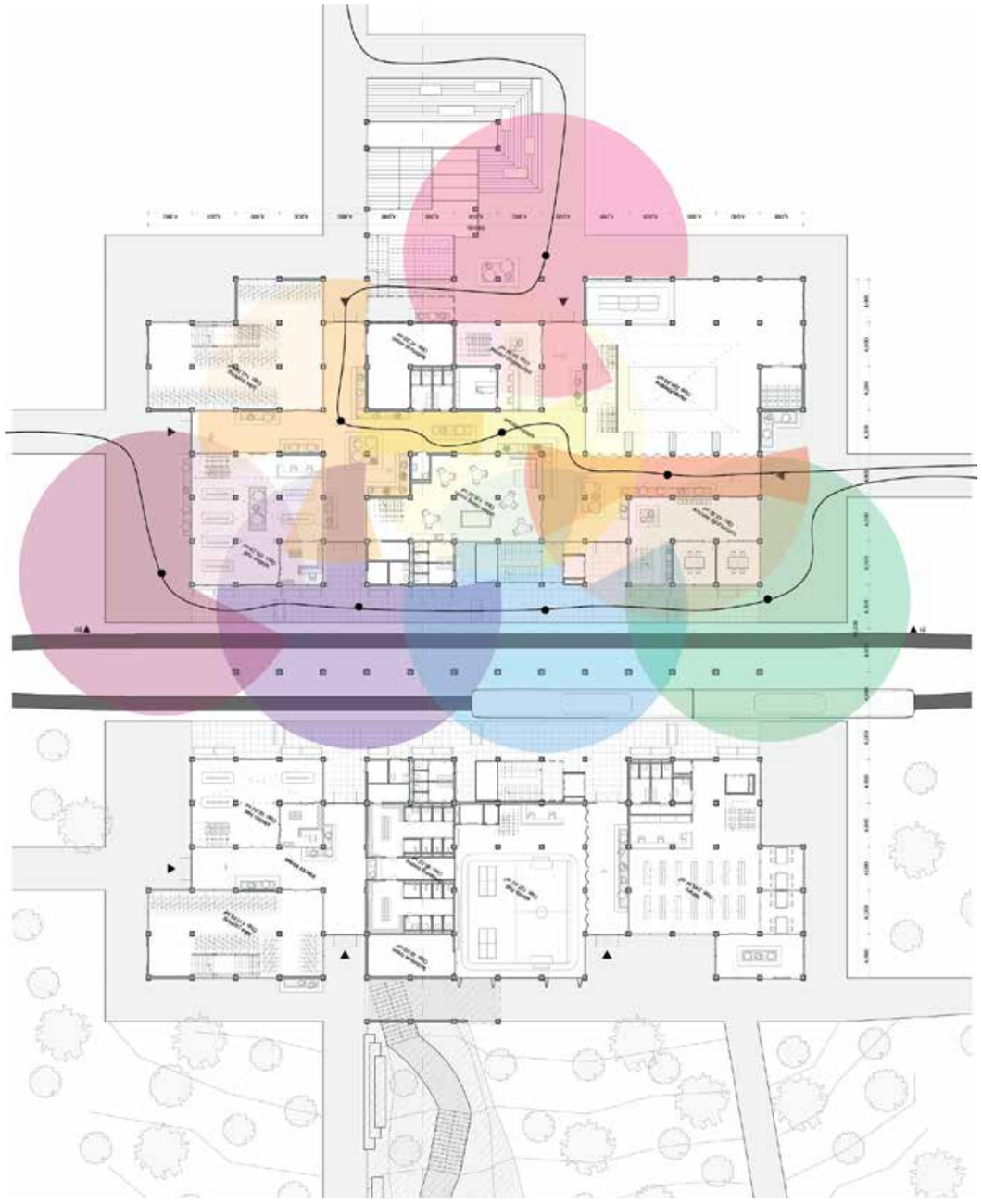
Strategic visibiltity analysis

The strategic visibility analysis focuses on the two main floor levels that make up public circulation. Because the design is integrated with public space and infrastructure, strong visual relationships can contribute to a safer environment. This analysis focuses mainly on safety and visual comfort, with the aim of generating ideas for the open/closed facades, the orientation of cores and toilets, the materialisation of the interior and exterior facades, and the organisation of the programme and related layout.

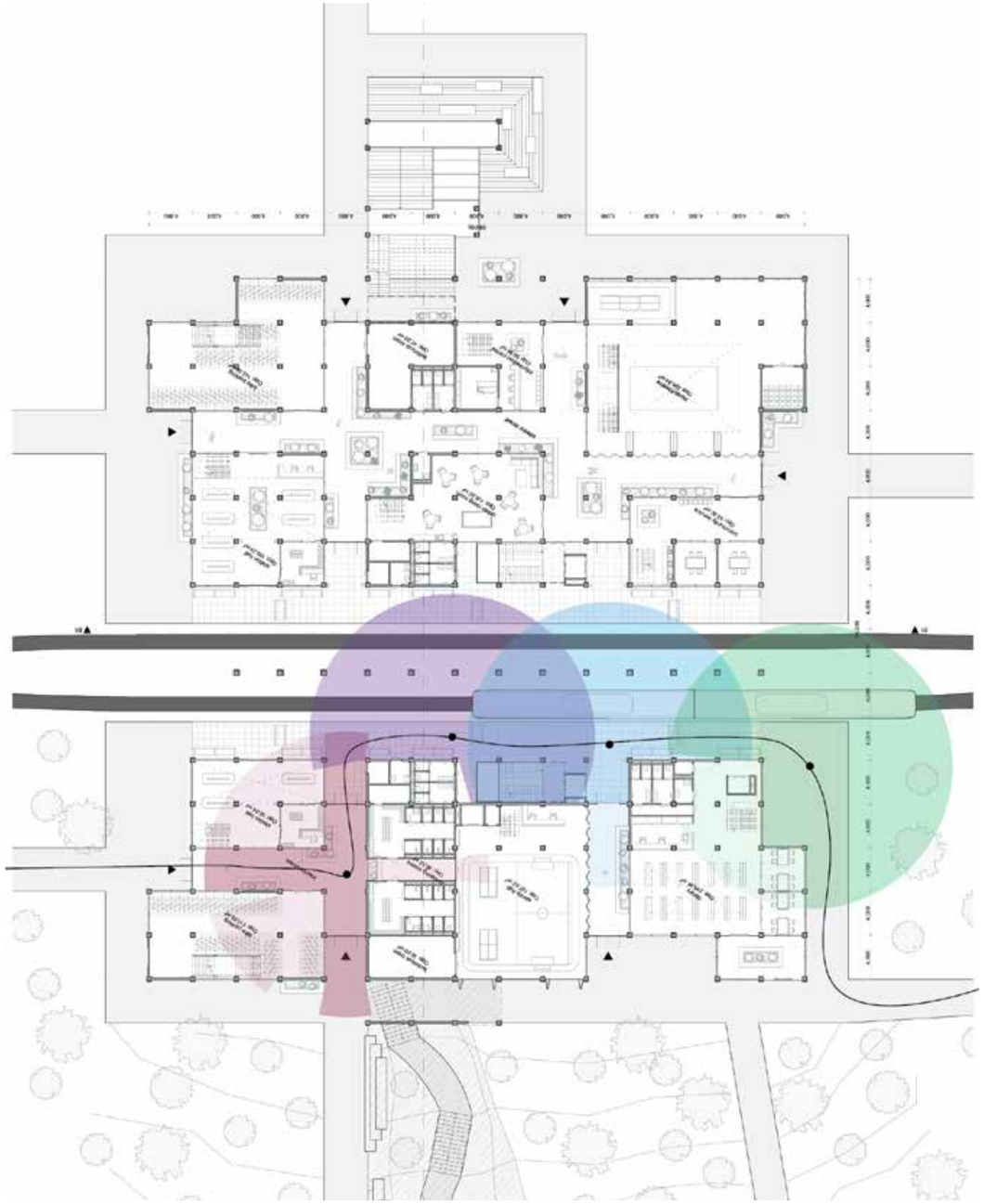
sketches



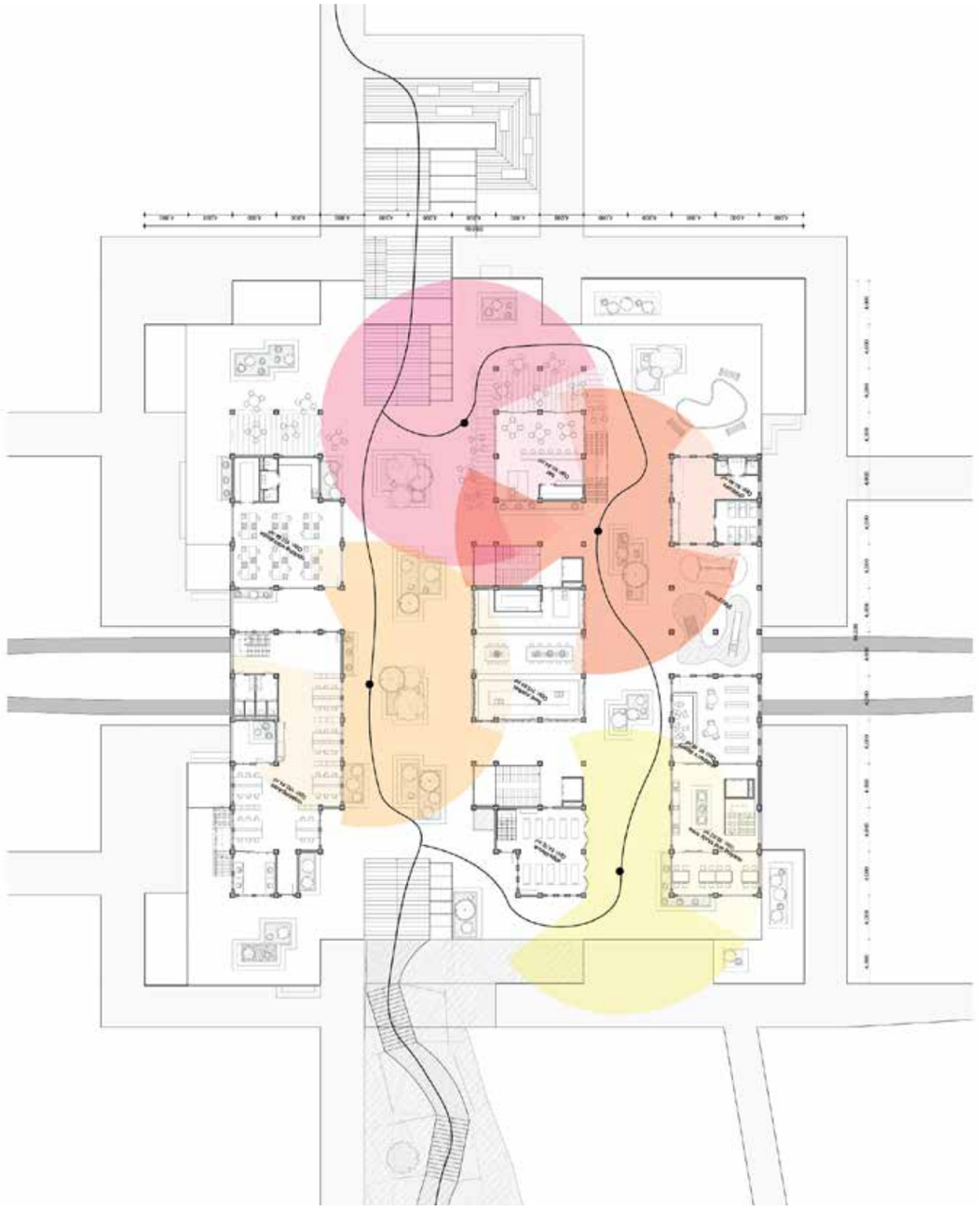
ground floor



ground floor



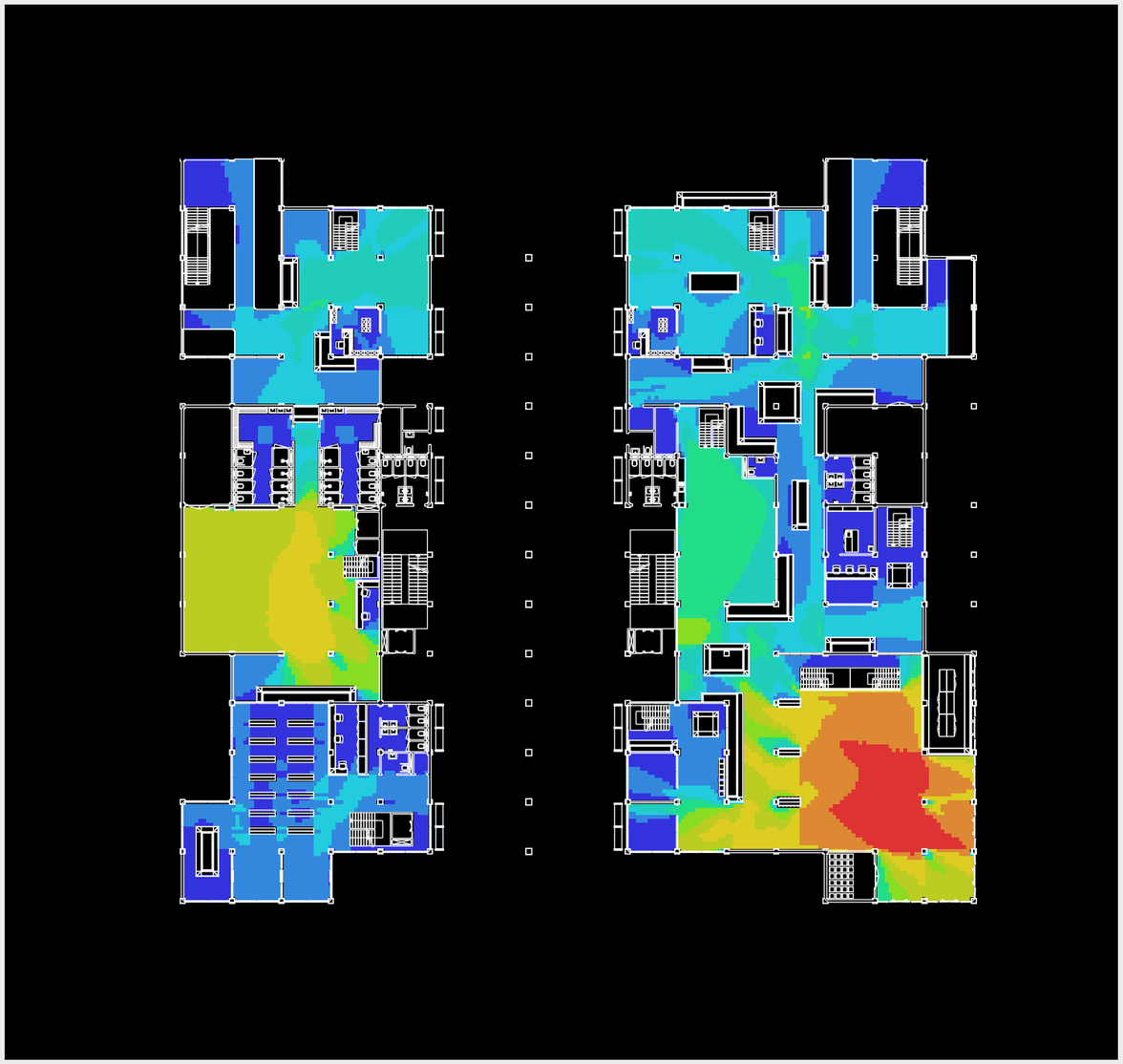
second floor



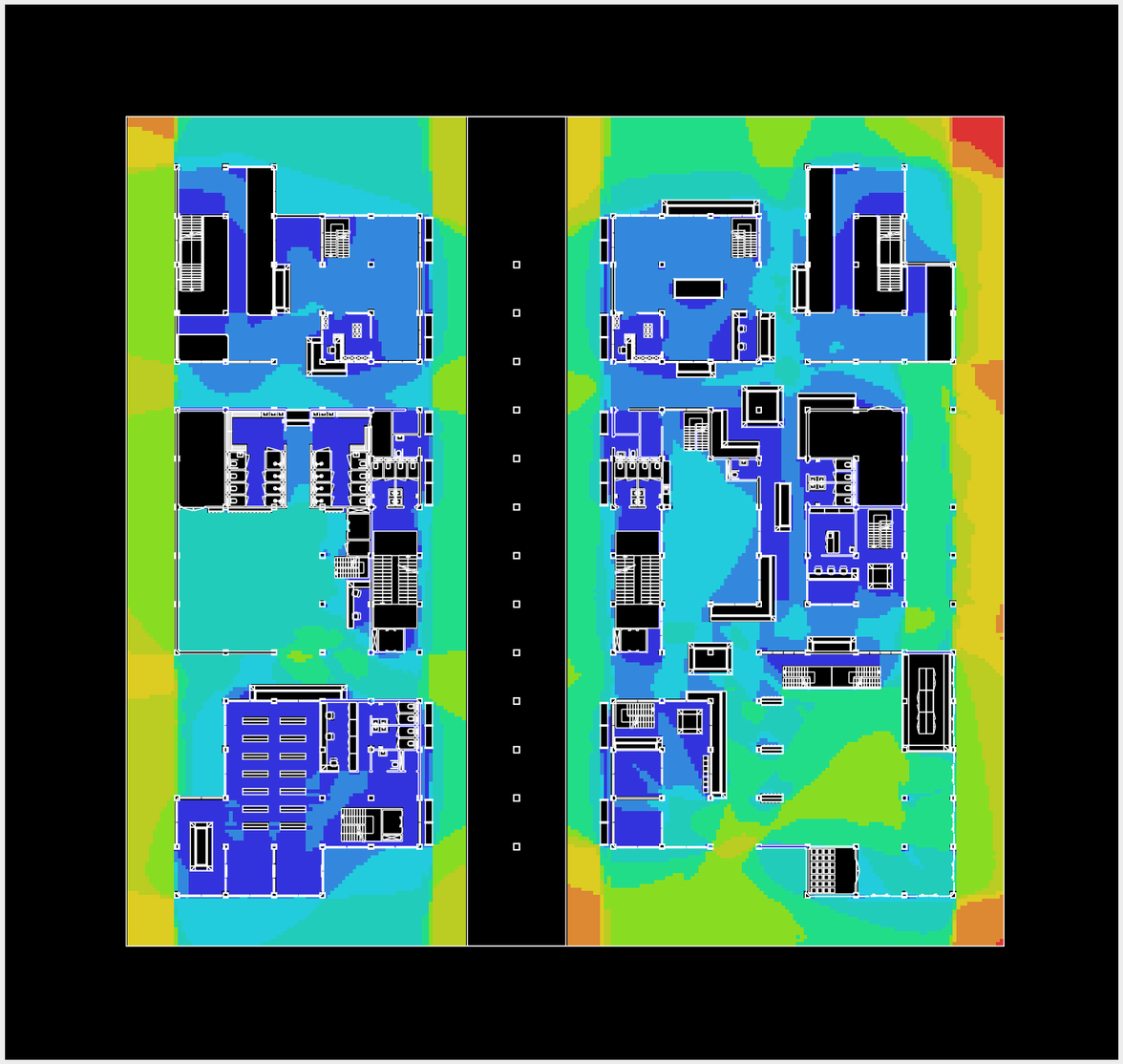
Visibility graph analysis via DepthmapX

The Visibility Graph adds an extra dimension to the study of visual comfort. It enables an understanding of how openings and layout contribute to enhanced visual relationships within the design. This analysis also contributed to a renewed design of spatial arrangements, considering facade materialisations to create continuous sightlines within the building.





ground floor indoors



ground floor outdoors

Spatial accessibility graph via DepthmapX

The spatial accessibility map shows the integration of the design into the existing environment and the accessibility achieved by connecting and extending existing routes. However, the map should be interpreted with some nuance, given the influence of the width of the routes. Nevertheless, it also encourages ideas on the connection with the boulevard and the scale of the roads.

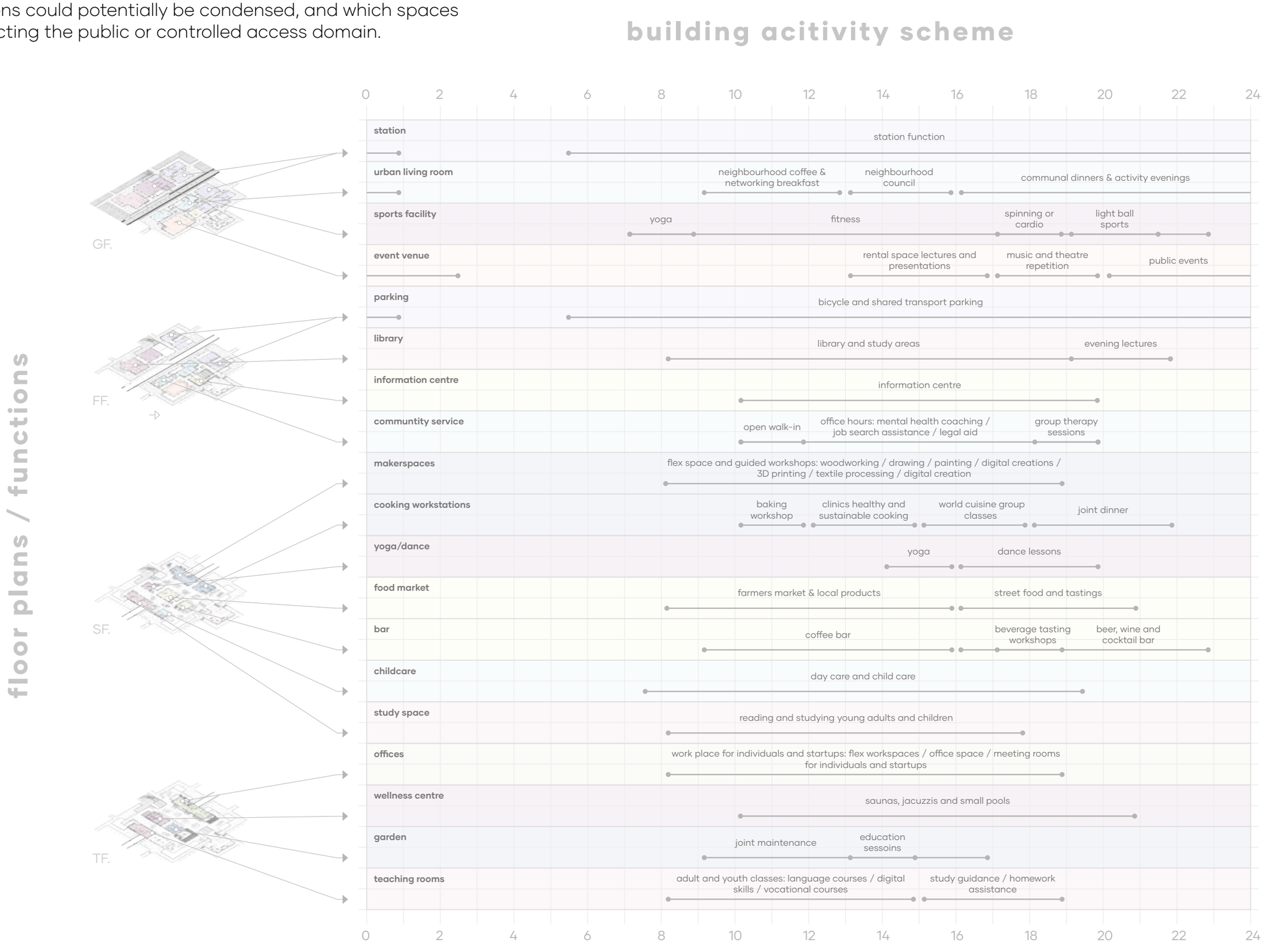






Refining building use and program

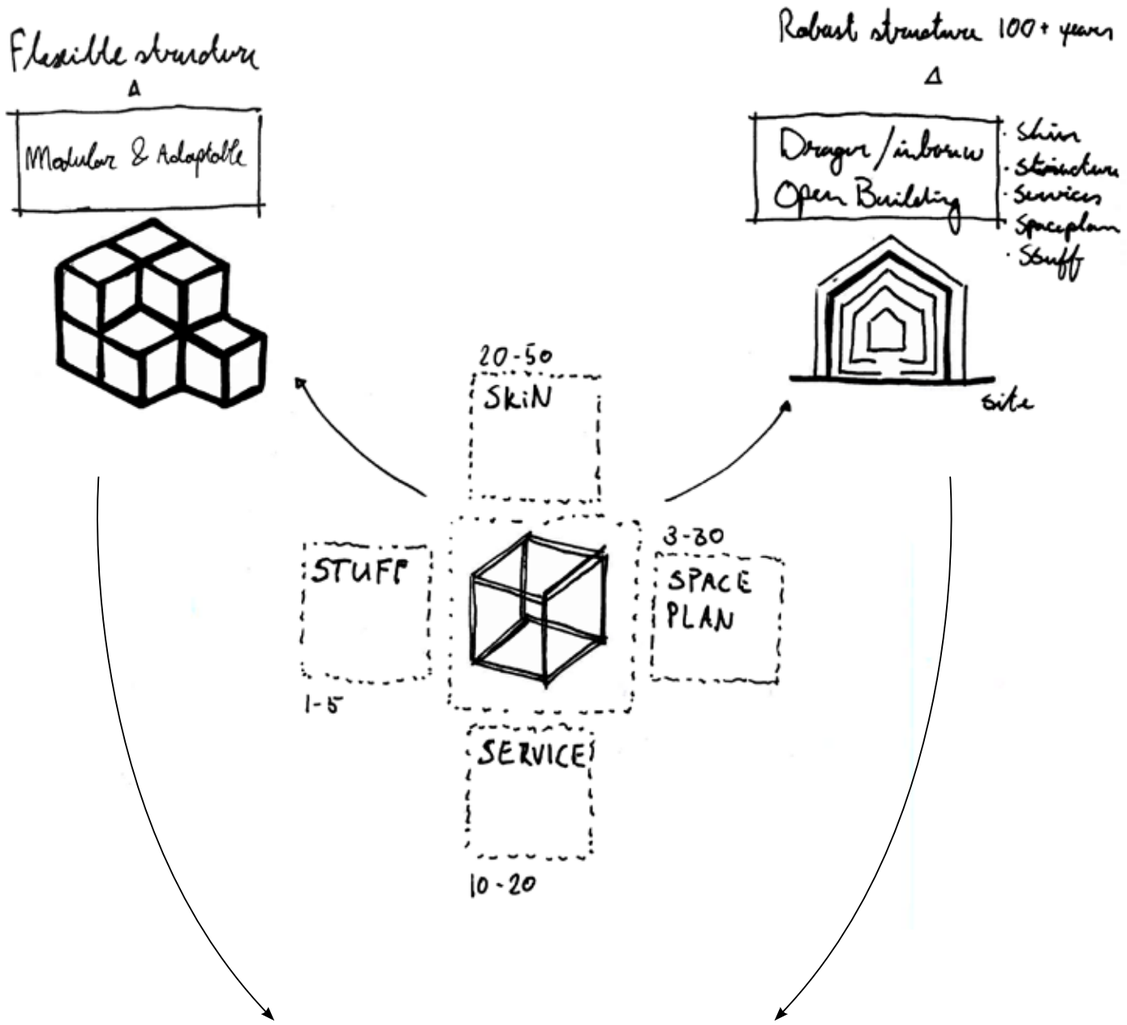
The activity schedule is an analysis of the potential use of the public condenser. It provides insight into the areas where the programme requires extra attention in terms of intensity of use, where functions could potentially be condensed, and which spaces have specific closing times, affecting the public or controlled access domain.



Structure-Infill / Open Building

Strategies

Approach on open structure and shearing layers-theorie



- Future growth or shrinkage
- Adding floors, columns or walls

- Change of function
- Adaptive to user/environmental needs
- Replacement, repair, reuse or recycling

Layers

Skin

- Demountable/dry systems
- Prefabricated modules
- Sustainable and healthy materials, reduce ecological footprint Hempcrete, mycelium, bamboo panels, recycled bricks, solar panel integration, straw panels, scrap aluminium, recycled plastic

Structure

- Demountable, freedom of appearance
- Adjustable, user needs
- Robust and oversized, future-proof
- Flexible floors
- Vertical connections

Service

- Dry systems and adjustable
- Plug-and-play installations Smart installations can be replaced or modified, power and data via a single cable
- IoT / Smart Buildings and building components: Dynamic shading, activity sensors, data-controlled thermostats, smart water management, own power grid/energy management systems, managing temperature/humidity/CO2 levels, smart taps & showers
- Slimbouwen: somewhere in the process there is a moment where all installations are fitted in one process step. Keep installations accessible, flexible, adaptable.

Spaceplan

- Separated from the support
- Prefabricated modules
- Adjustable, move/slide/open

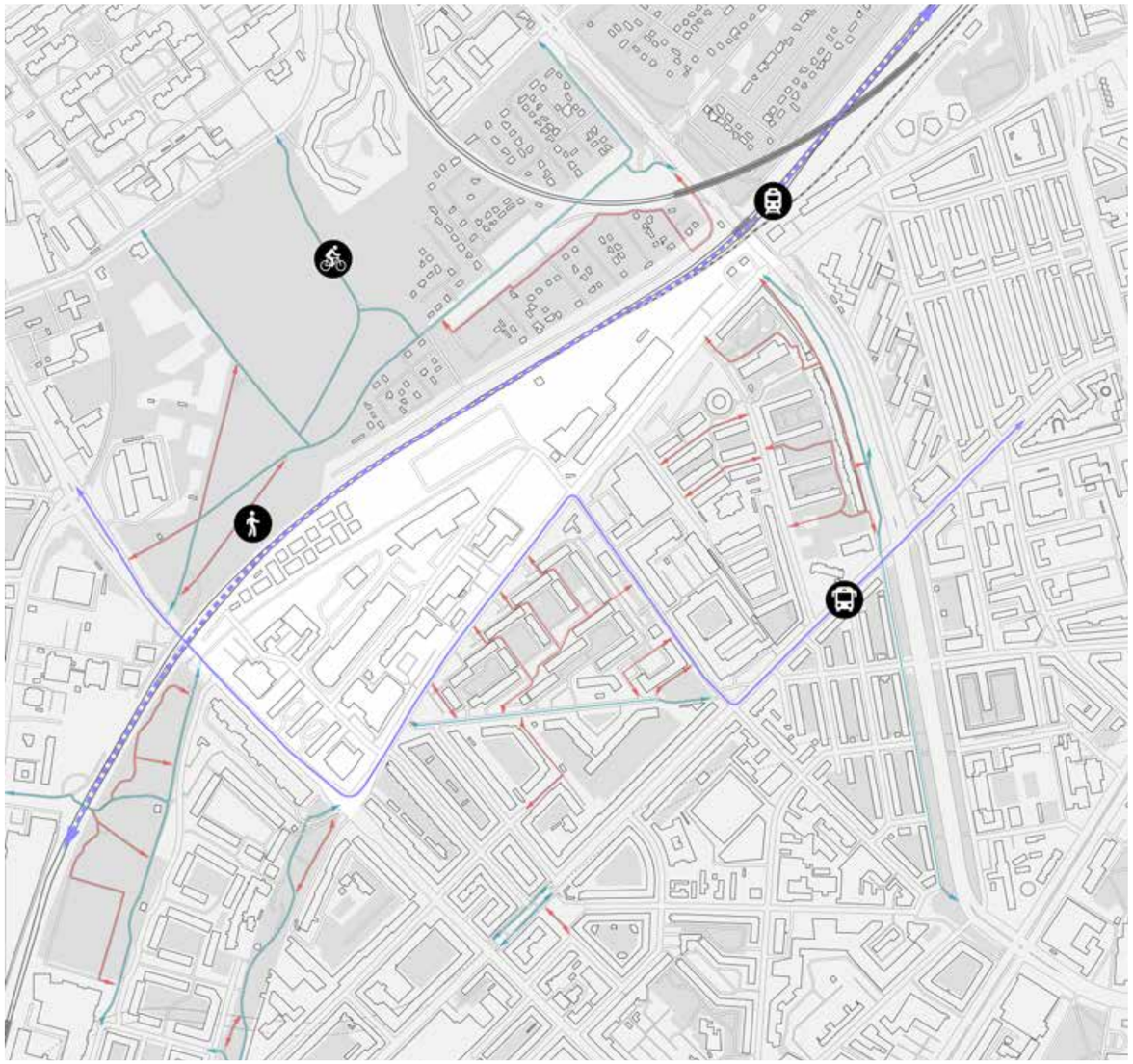
Sources:
https://www.openbuilding.co/academy
http://www.open-building.org/
https://slimbouwen.nl/wat-is-slimbouwen/
https://wwwwattsense.com/blog/building-management/iot-in-smart-buildings/
https://ocw.tudelft.nl/course-lectures/3-1-3-building-layers/.

Urban connections

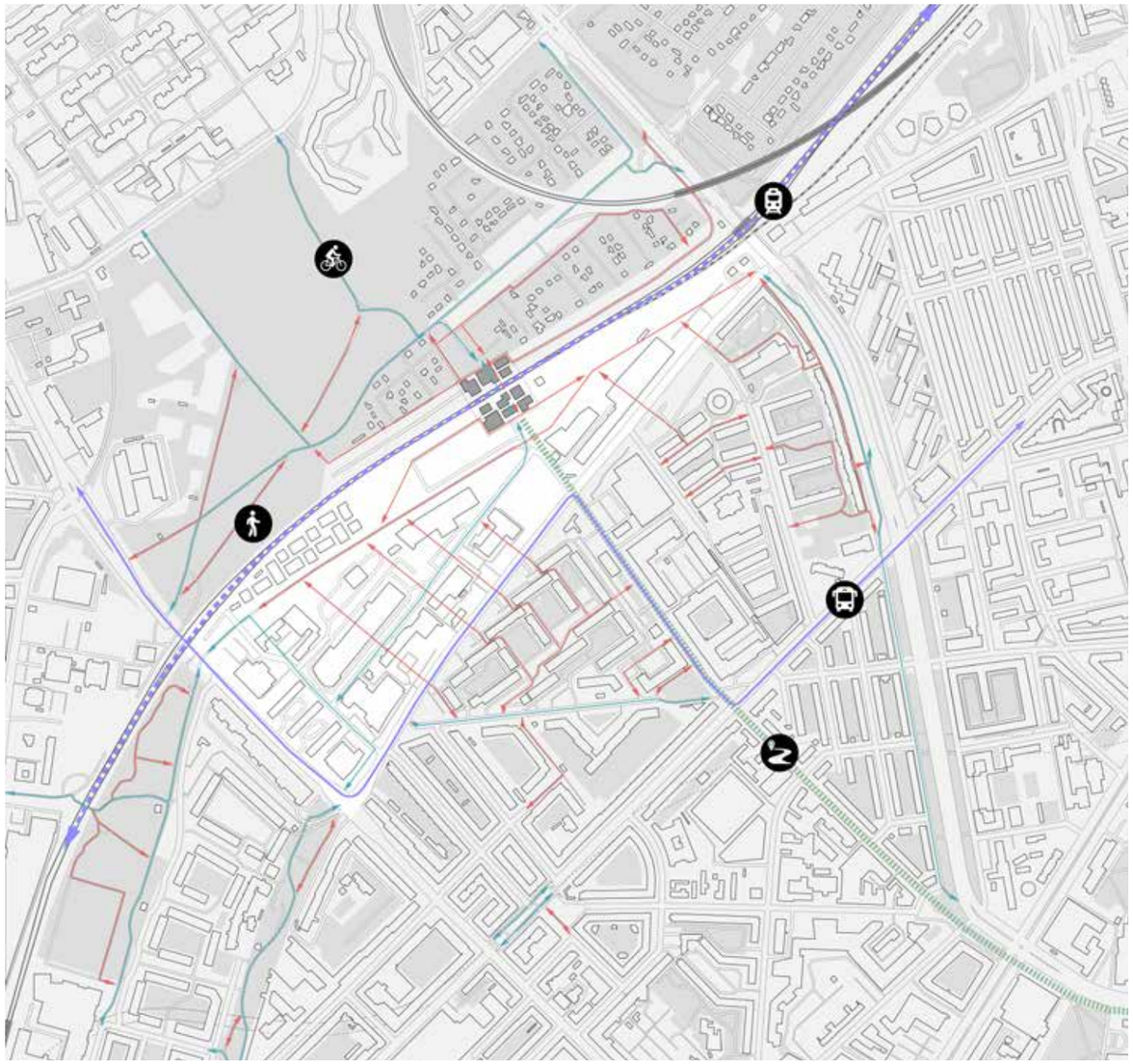
Development of urban integration strategy

In the P3 phase, the focus has been on stronger integration of the building into the urban network and the role of the public condenser as a mobility node within the urban layout of Haraldsgade and Copenhagen. Here, the role of cyclists was again explored as part of the sustainable mobility ambition, with Copenhagen as a cycling city.

existing



desired



Existing railway

Bus connection

Cycling routes

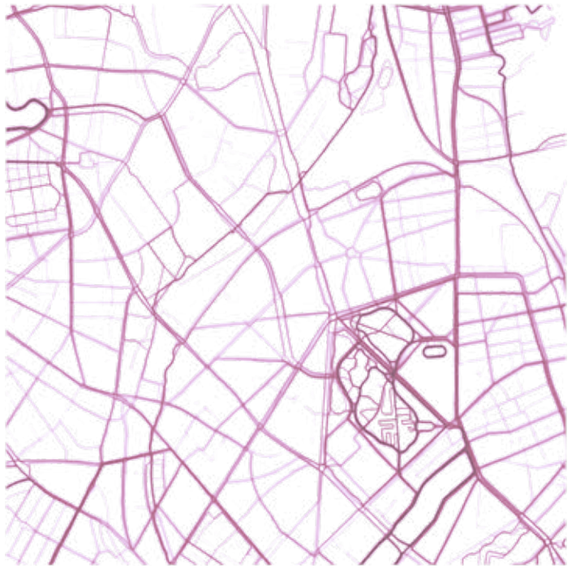
Pedestrian routes

Proposed boulevard

Heatmap current road usage

Within the framework of an urban and infrastructural intervention, the focus during P2 was on integrating existing pedestrian routes within the building. In P3, this principle was taken further by designing a connection at height (bridge), which extends the existing routing and connects to the public circulation already in place, where studying heatmaps provided insight into the topic

HEATMAP FOOT SPORTS



HEATMAP CYCLE SPORTS



COMBINED MAP

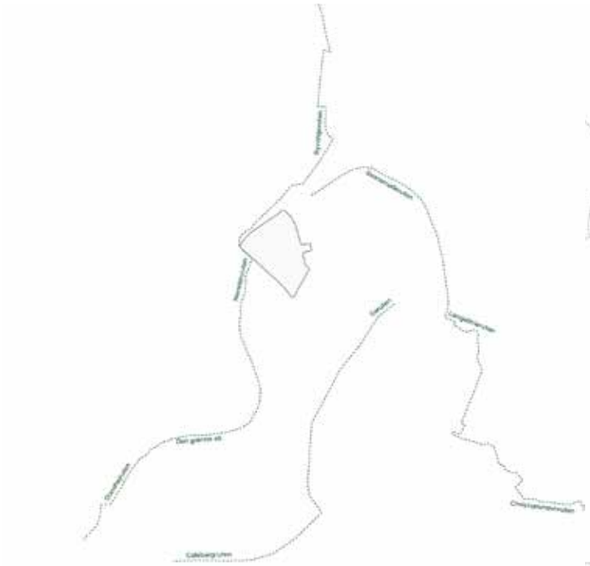


Source strava heat map: https://www.strava.com/maps/create/global-heatmap

Urban cycling connections

The same approach was applied to cyclists, analyzing existing cycling connections to create an effective extension of the cyclist flow, aiming for the best connection in terms of increasing accessibility and use. Becoming part of a larger mobility system is also the ambition here.

GREEN PATHS



NATIONAL CYCLE ROUTES



RING ROUTES



RECREATIONAL ROUTES

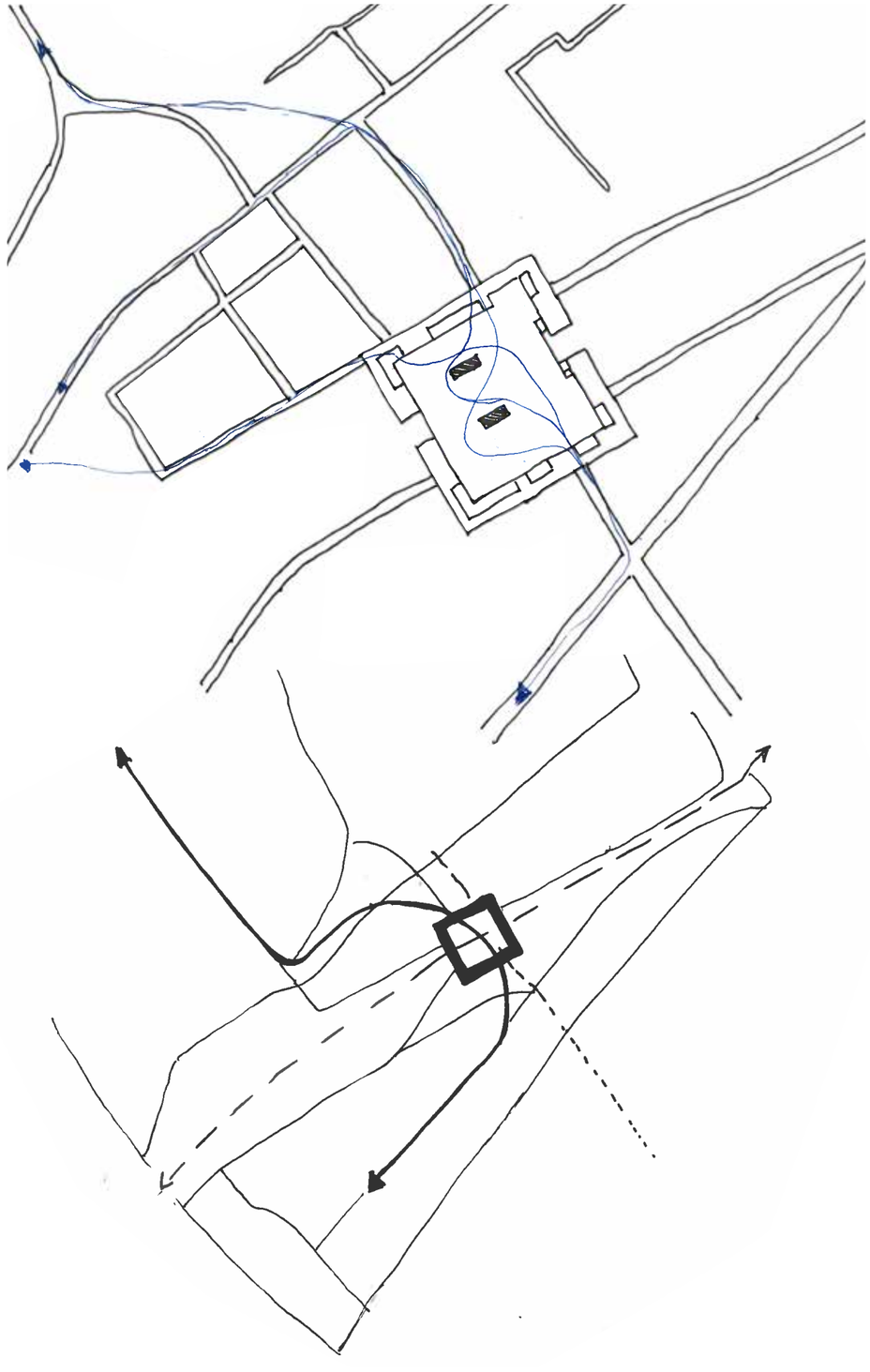


OVERVIEW

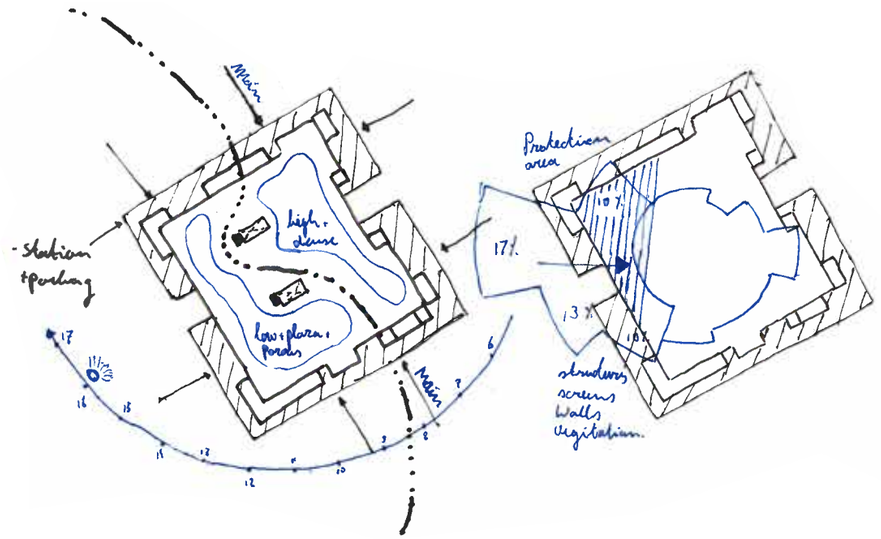


Routing and mass fine-tuning

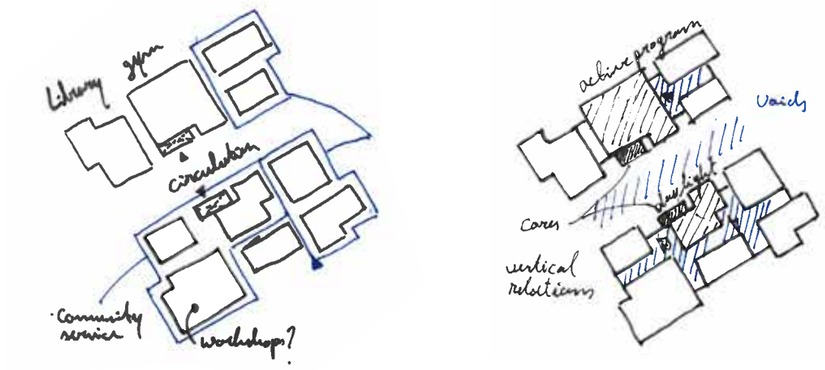
mobility node



mass refinement

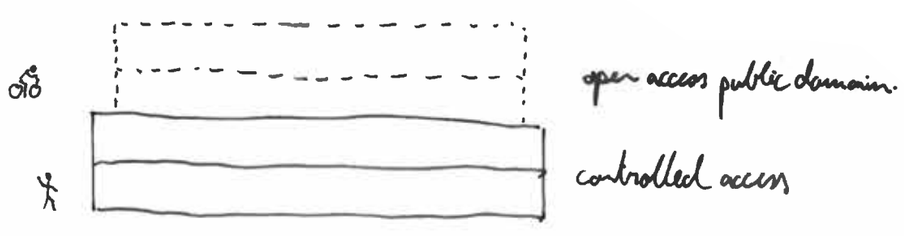


Sun, mass, program *Wind, structure*



Space, function *Voids, vertical relations*

public domains







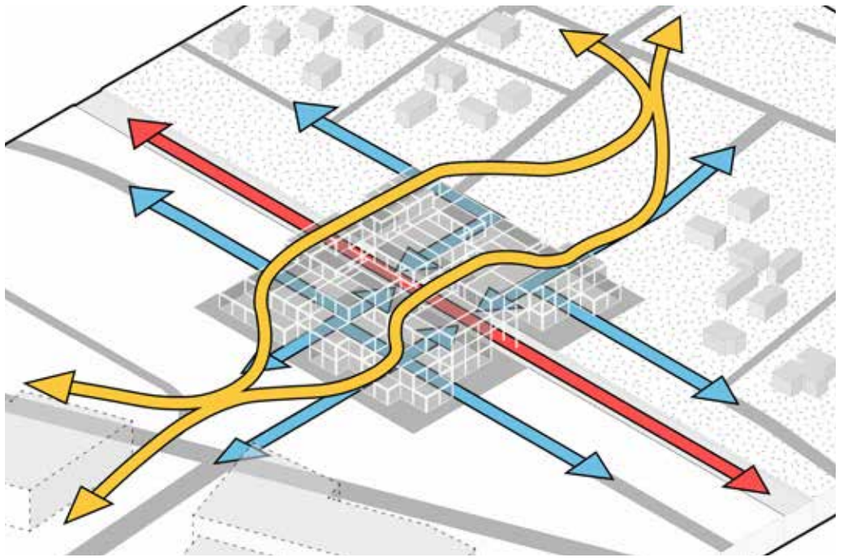
Design proposal P3

Future-proofing

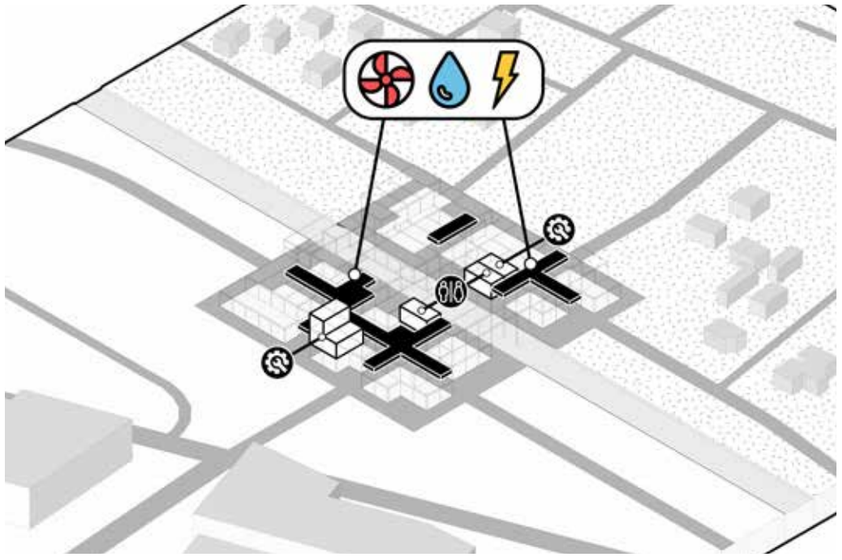
Strategy

A strategy of the ambition of the urban/infrastructural concept. An intervention that is not solely dependent on its current programme, but a facality that occupies a strategic place and embraces function change

The project functions as a mobility node, envisioned as a permanent link within the urban fabric of Copenhagen and Haraldsgade. It hybridizes architecture with infrastructure and actively promotes sustainable modes of transport.



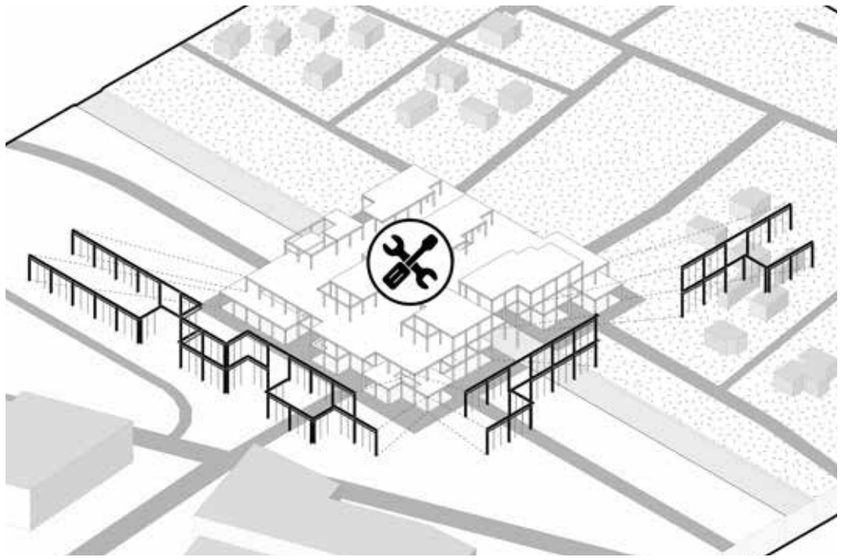
1. Urban intervention, a mobility node



The core organizes the building's services, with two technical rooms connected to the inner streets distributing ventilation, water, and electricity efficiently throughout the spaces.

2. Service core, serving space

The building features a permanent, robust structure designed to span the tracks, absorb train vibrations, and support mass on the bridge deck. It combines concrete construction with demountable façades to ensure future adaptability.



3. Permanent structure, demountable façades



The project is envisioned as a timeless facility shaped by its unique location and infrastructural approach. The infill might change according to needs of users, while the station and bridge remain key elements in future urban connectivity, ensuring continued use of the structure.

4. Timeless facility, future function change

Visualisations

Renders

The renders focus primarily on illustrating circulation spaces rather than interior programs, aligning more closely with the overall design ambition.

The first image depicts the central square on the bridge deck — a partially open space that functions as a market square, while also remaining flexible for various activities. It acts as a pavilion within the public domain, serving as a green extension of the park and enhancing accessibility to the park side via the bridge."

The second image shows the double-height interior street, extending the public realm and continuing the urban grid. This greened space features street furniture and transparent inner façades that offer glimpses into the surrounding programs

IMPRESSION BRIDGE DECK (SF)



IMPRESSION INTERIOR STREET (GF)



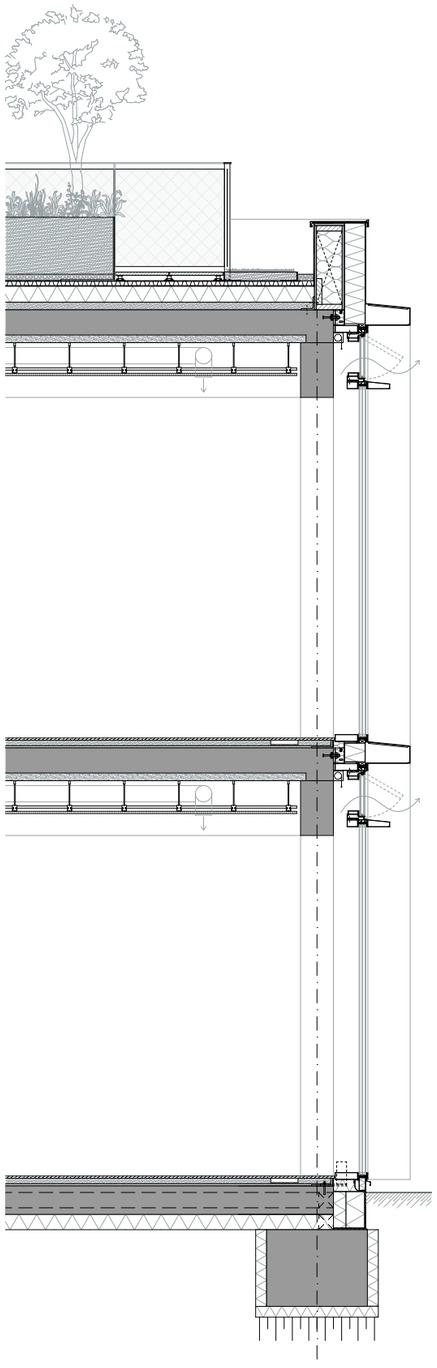
Facade

Fragment

The façade fragment features a roof with varying heights of substrate layers for vegetation, trees, and walkable routes, incorporating concrete tiles and wooden decking. The façade itself consists of a curtain wall with aluminum profiling, giving it an industrial look that complements the surrounding area. A glass ventilation window is included to allow natural air intake and extraction, with a sunshade installed behind it. The design integrates a cable tray within the floor and mechanical ventilation ducts in the suspended ceiling. The detailing of the façade highlights the building's robust structure, visible through the glass, creating a contrast between the permanent structure and the temporary façade.

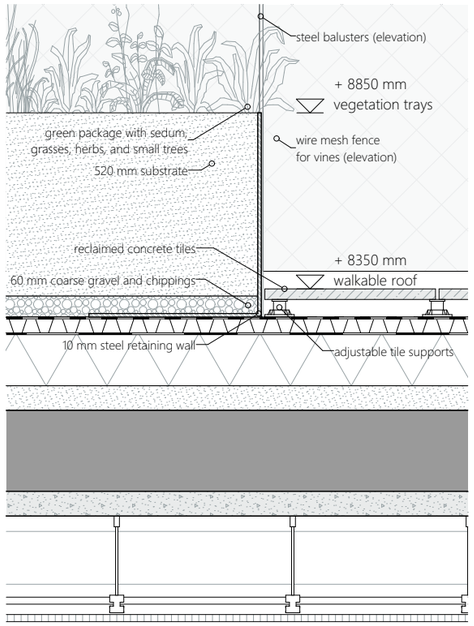


Sketchup, ComfyUI, Photoshop

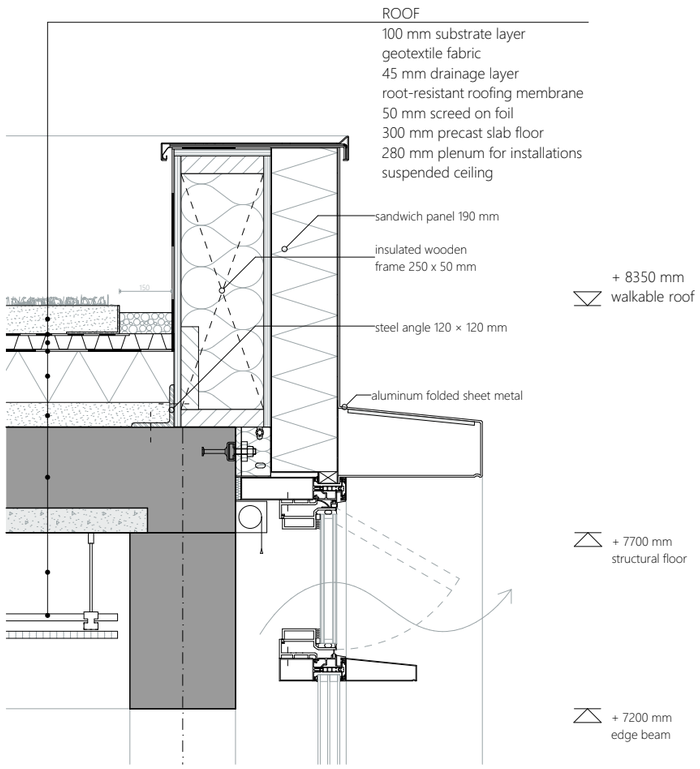


Detailling

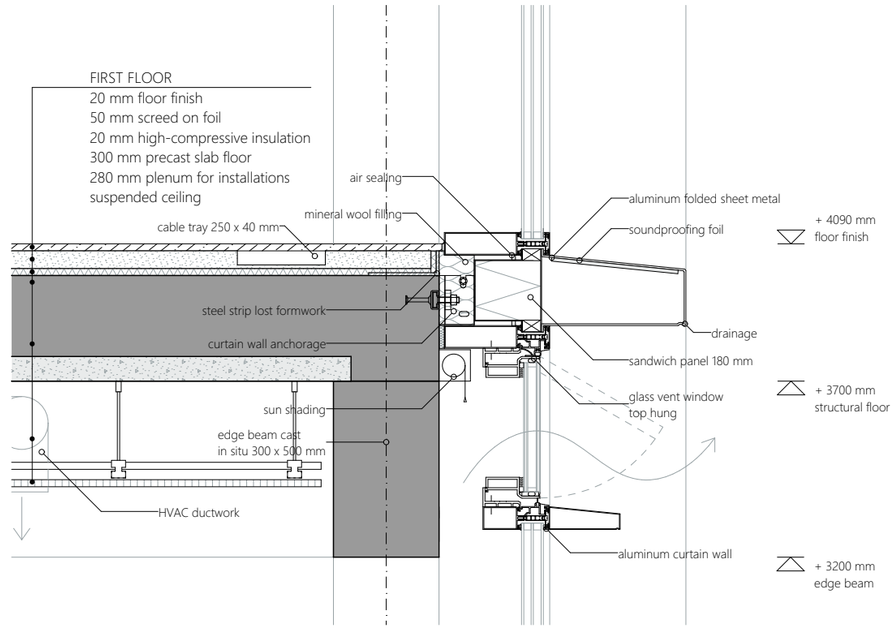
1. roof structure



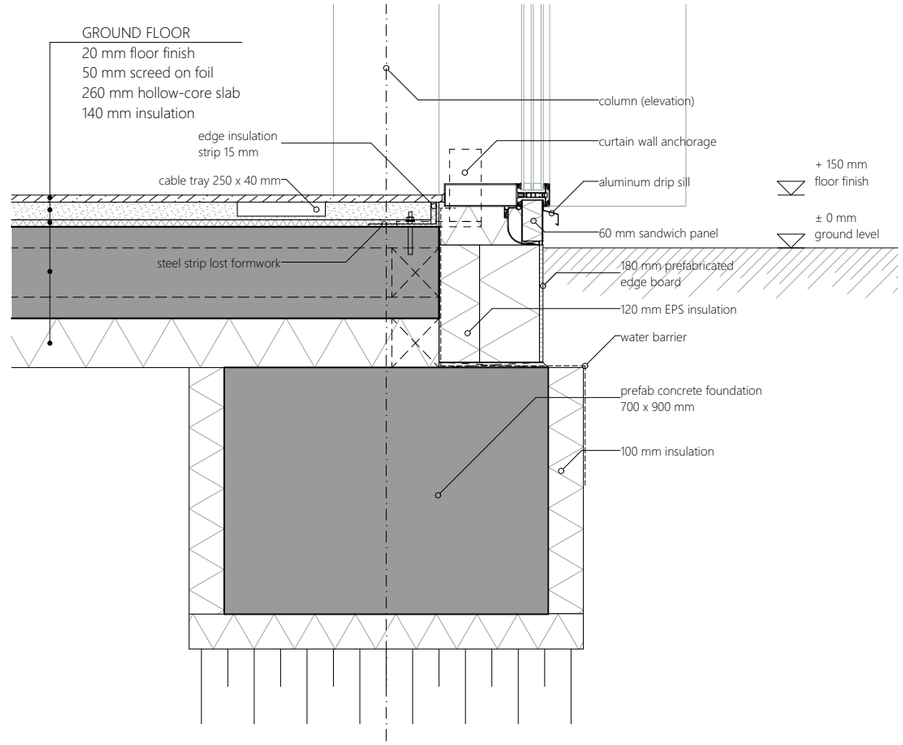
2. roof edge



3. floor

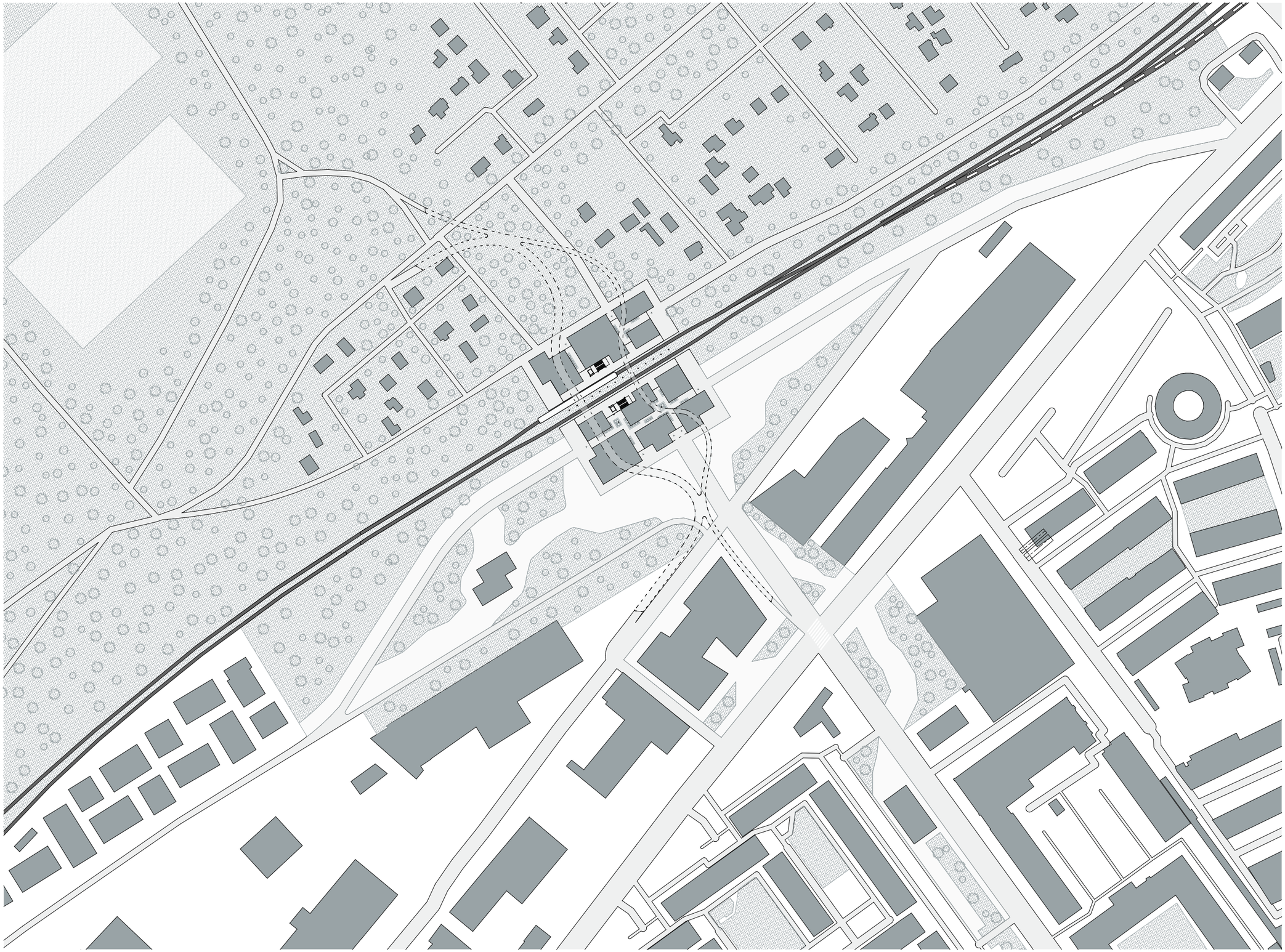


4. foundation



Drawings

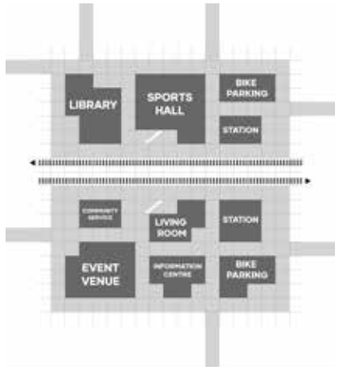
Site plan



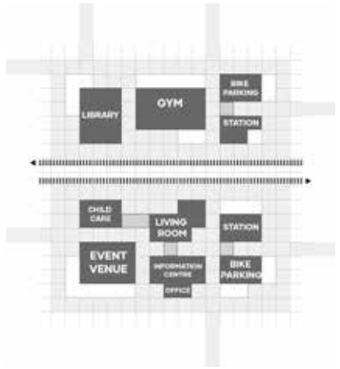
Floorplans

simplified

0.



1.



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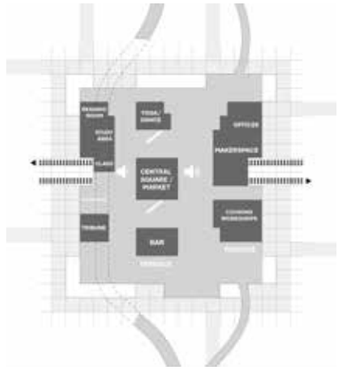
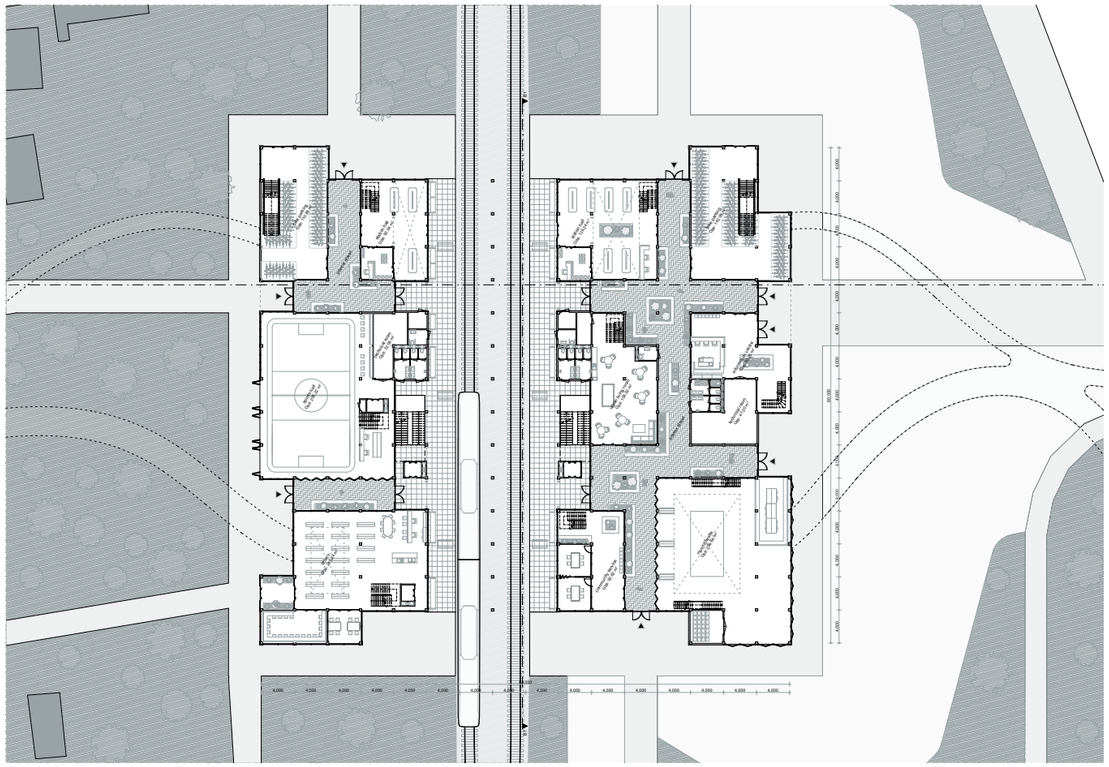
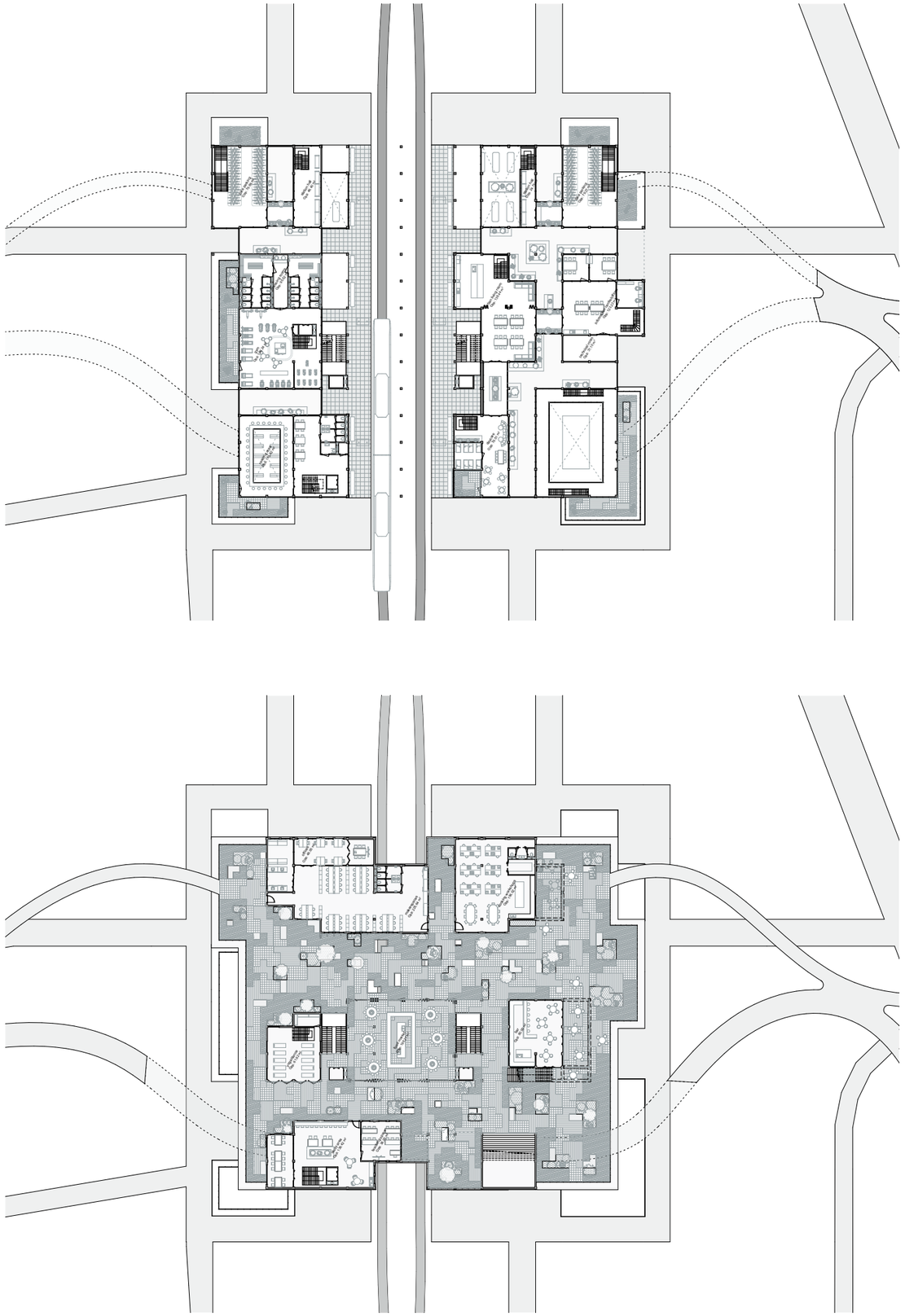


detailed

ground floor



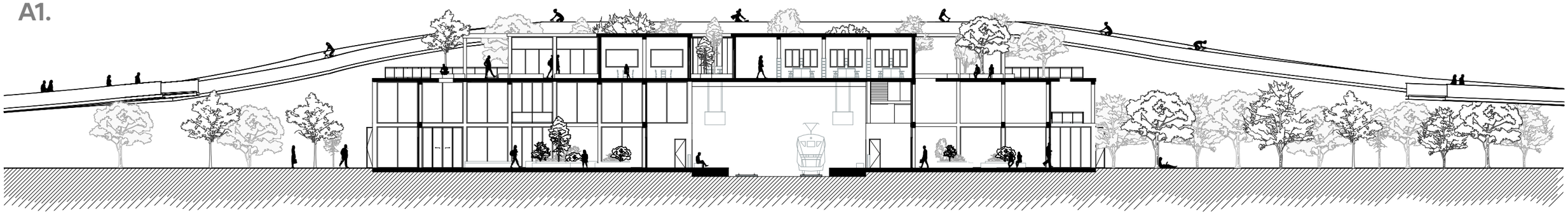
first floor



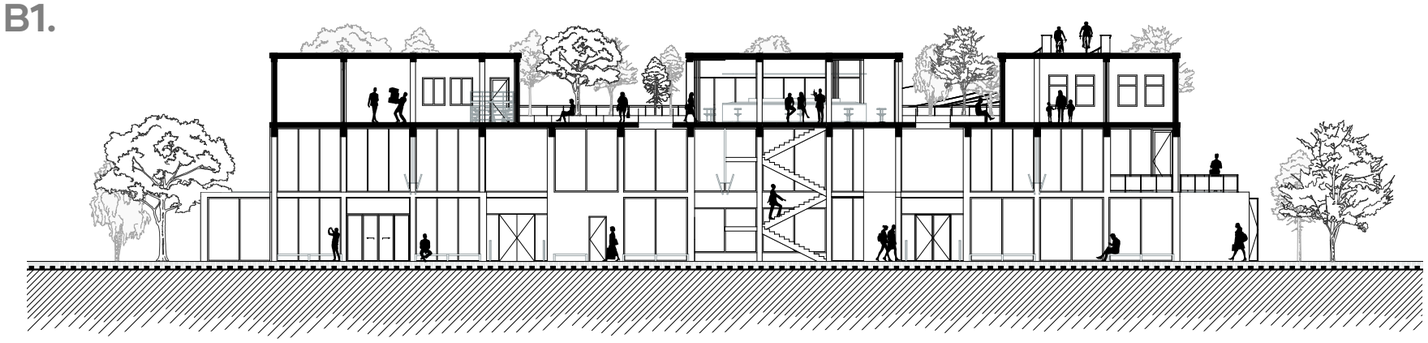
second floor

Sections

A1.



B1.




SOCIAL INFRASTRUCTURE
P3 - AR3AP100 Public Building Graduation Studio
CONNECTIONS OF THE CITY
HEATMAP FOOT SPORTS
CYCLING CONNECTIVITY
TRAIN DEPARTURE SCHEDULE
SECTION A1. 1:300
SECTION B1. 1:300
SITE PLAN. 1:1000
PROGRAM
0.
1.
2.
N
GROUND FLOOR. 1:400
FIRST FLOOR. 1:400
SECOND FLOOR. 1:400

SOCIAL INFRASTRUCTURE

P3 - AR3AP100 Public Building Graduation Studio

The design reimagines infrastructure as more than just a functional necessity, recognizing its intrinsic value in shaping environments and communities. By improving the overall quality of life, the project's urban approach becomes a catalyst for new opportunities. By combining social and infrastructural aspects, the design aims to create a strong integration with urban space, benefiting both the neighborhood and city residents. The project becomes a mobility node in the urban grid, with a strong focus on social interaction and gathering through an infrastructural intervention. The building takes advantage of its unique location between the park and promenade, utilizing outdoor spaces at ground level as well as the bridge deck.

Björke Fouarge | 5994097 | 03-04-2026

IMPRESSION BRIDGE DECK (SF)



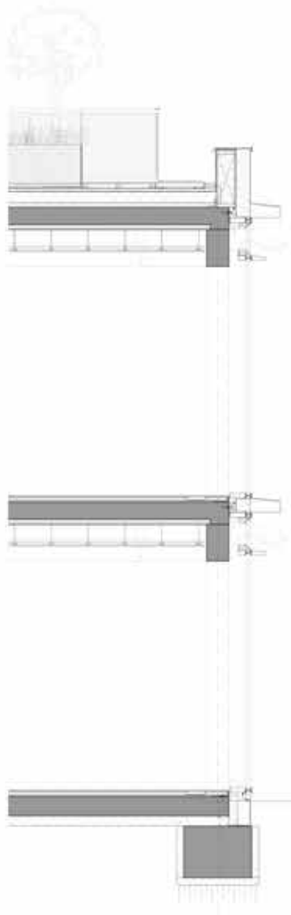
IMPRESSION INTERIOR STREET (GF)



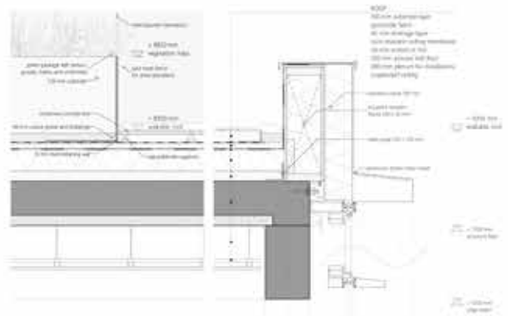
FACADE VIEW

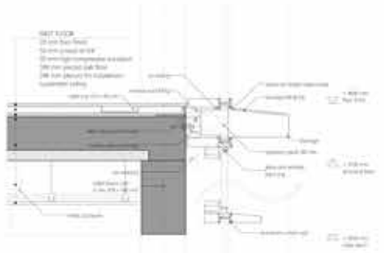


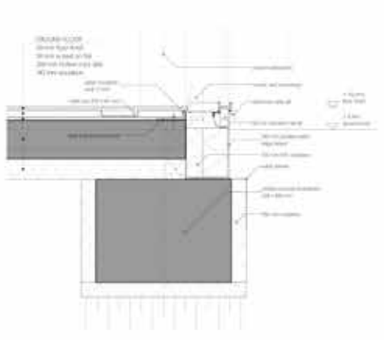
FACADE FRAGMENT. 1:20



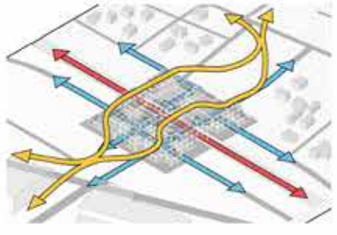
DETAILS. 1:10



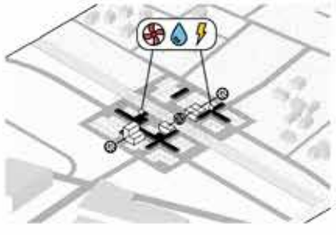




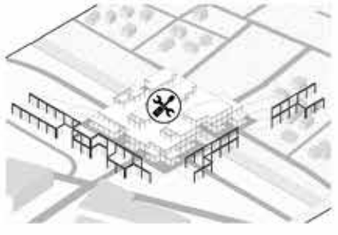
LONG-LASTING INTERVENTION



1. Urban intervention, a mobility node



2. Service core, serving space



3. Permanent structure, demountable façades

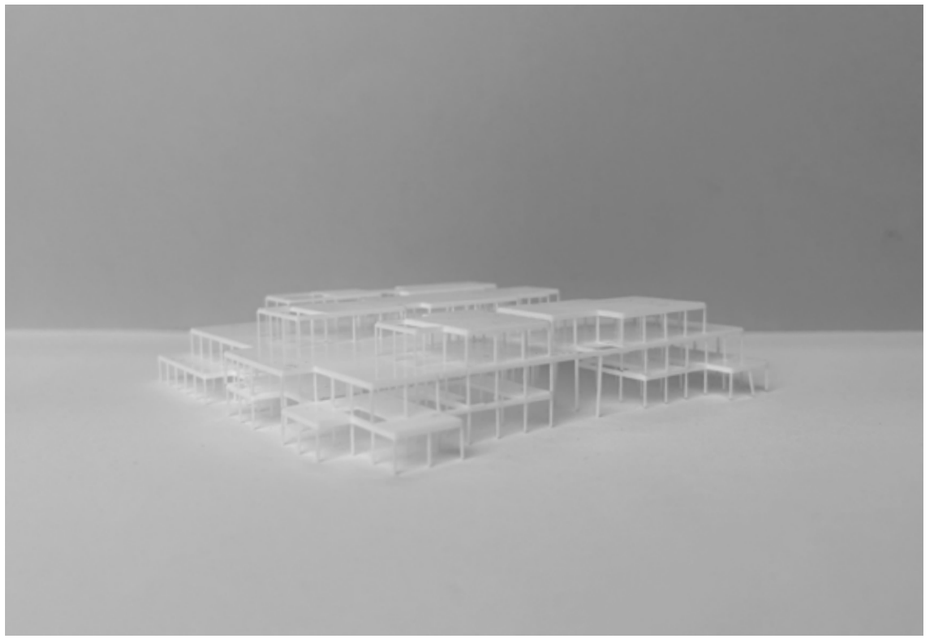


4. Timeless facility, future function change

Physical model 1:500

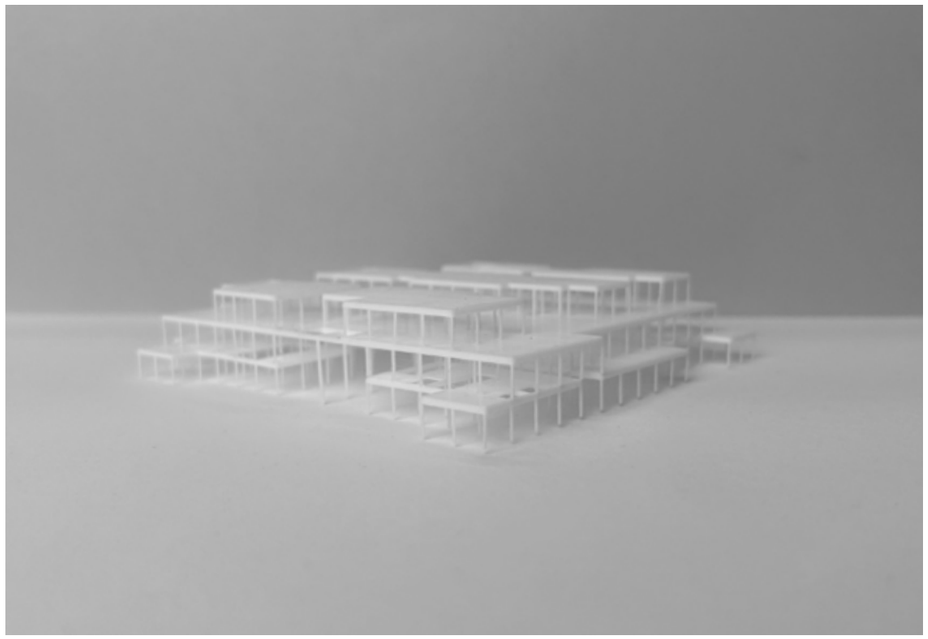
Photos

The model focuses on revealing the main supporting structure of the building. This brings out the modular character and abstractly depicts the hilly grid.









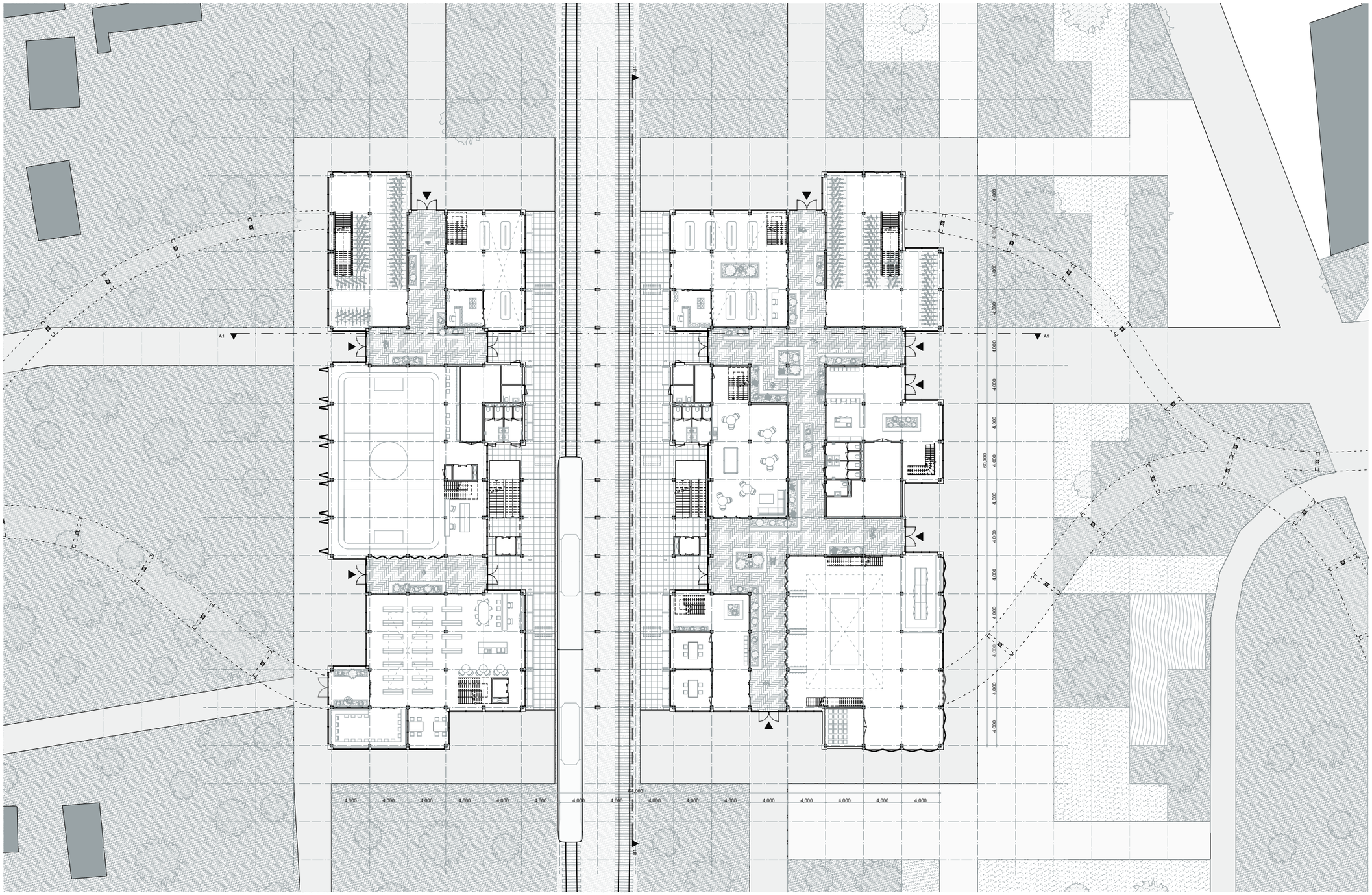
Final Design

Drawings

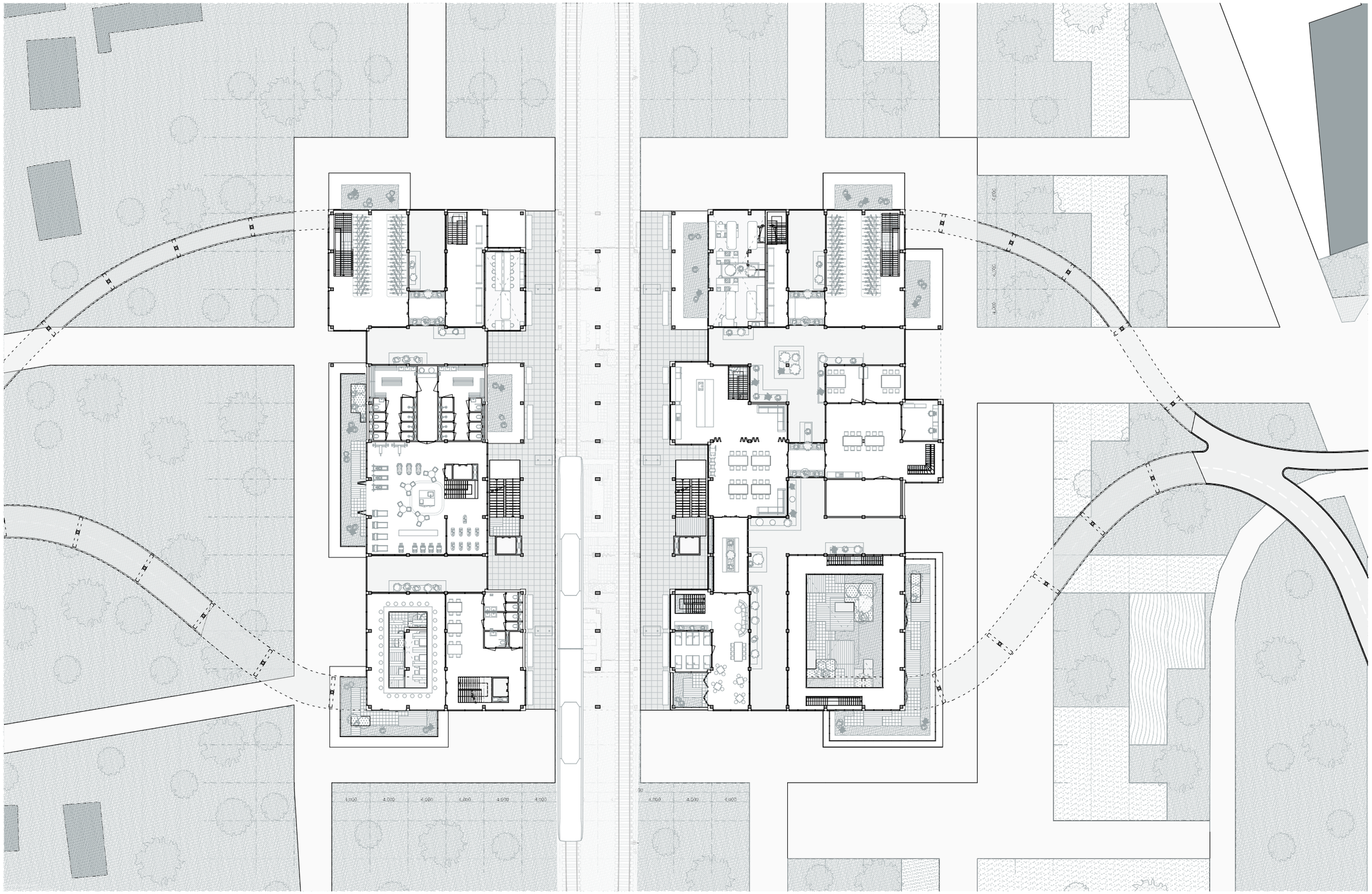
Site plan



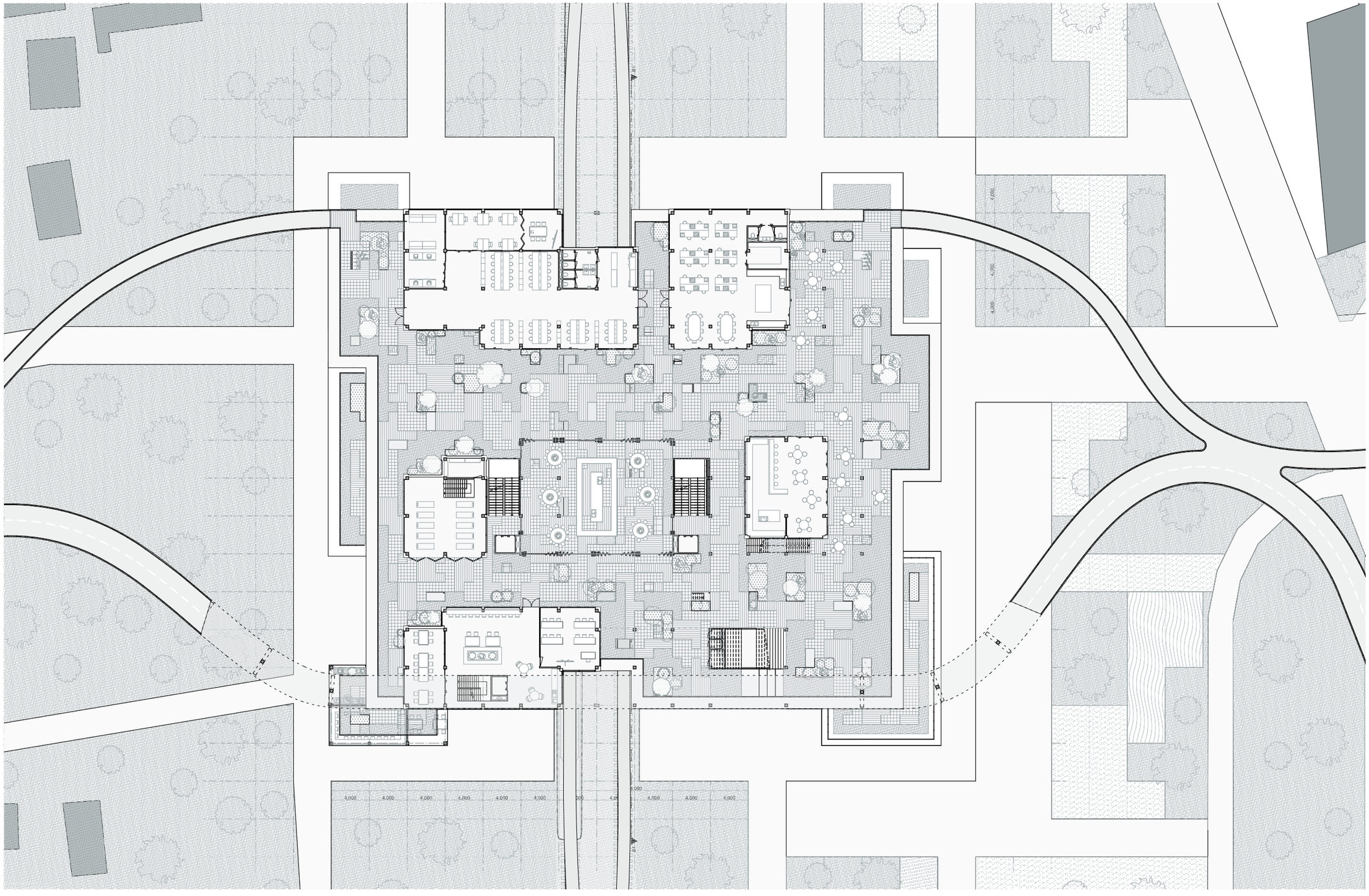
Ground floor



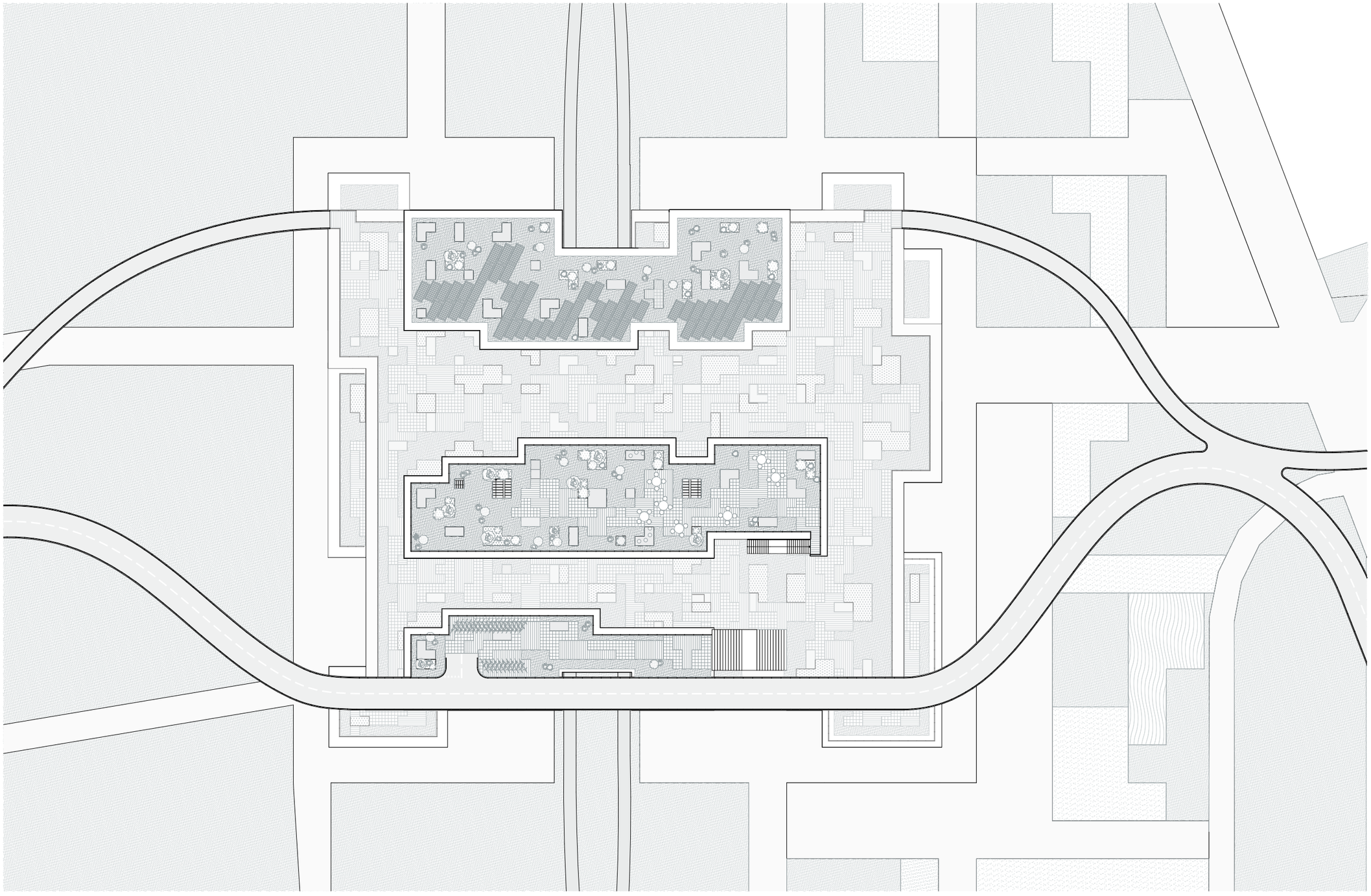
First floor



Second floor



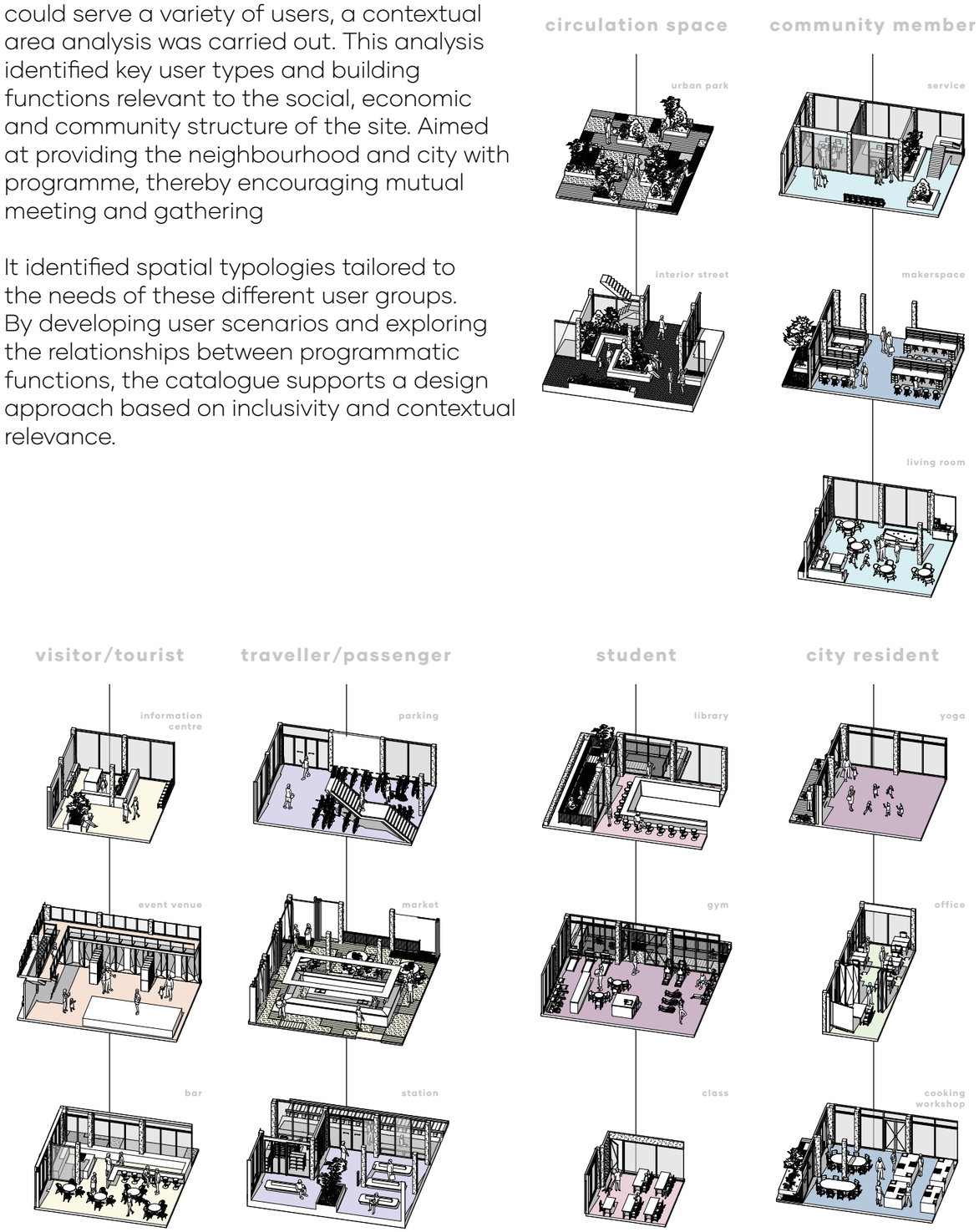
Third floor



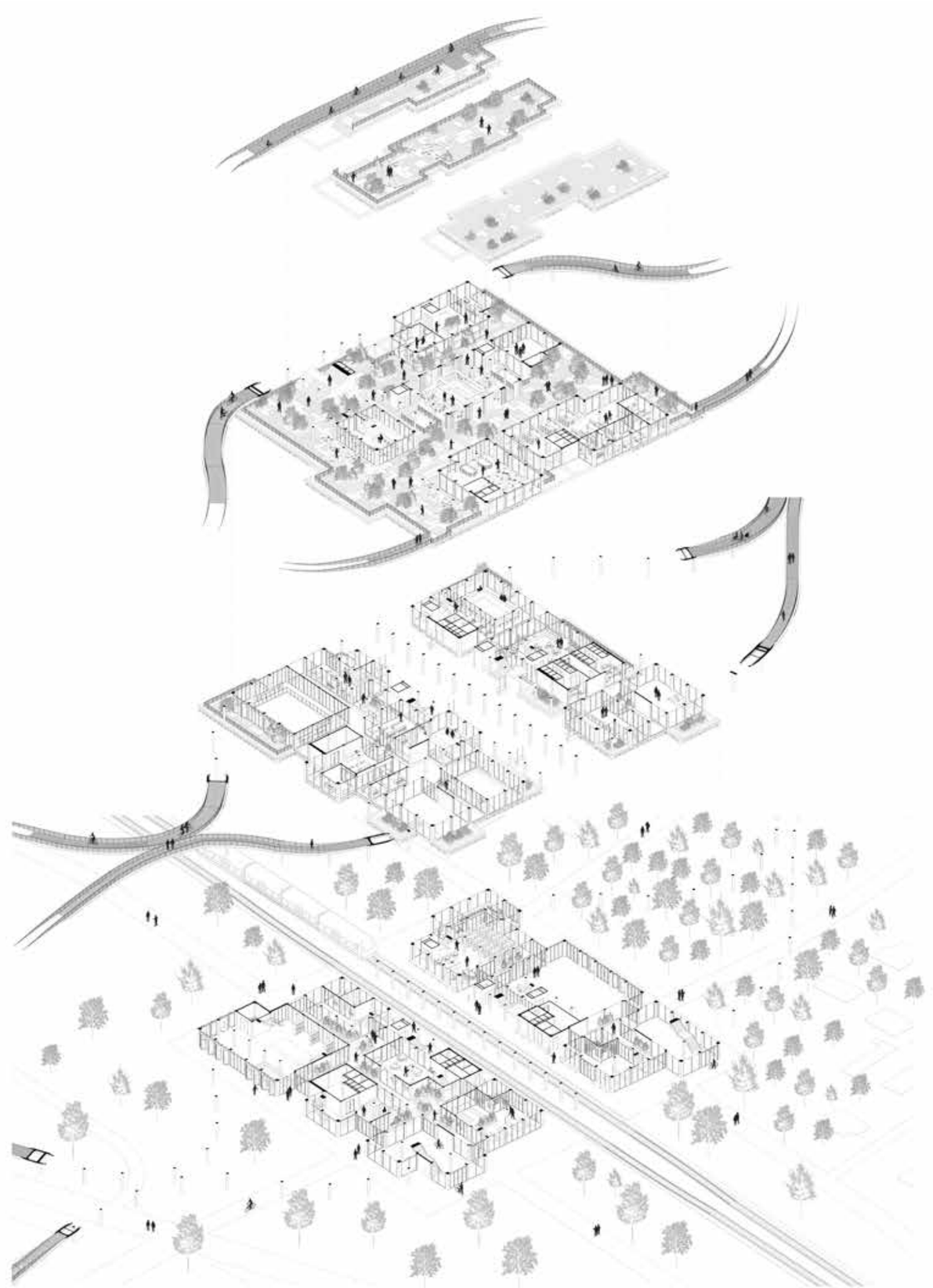
Spaces

To explore how the building programme could serve a variety of users, a contextual area analysis was carried out. This analysis identified key user types and building functions relevant to the social, economic and community structure of the site. Aimed at providing the neighbourhood and city with programme, thereby encouraging mutual meeting and gathering

It identified spatial typologies tailored to the needs of these different user groups. By developing user scenarios and exploring the relationships between programmatic functions, the catalogue supports a design approach based on inclusivity and contextual relevance.



Axonometric overview

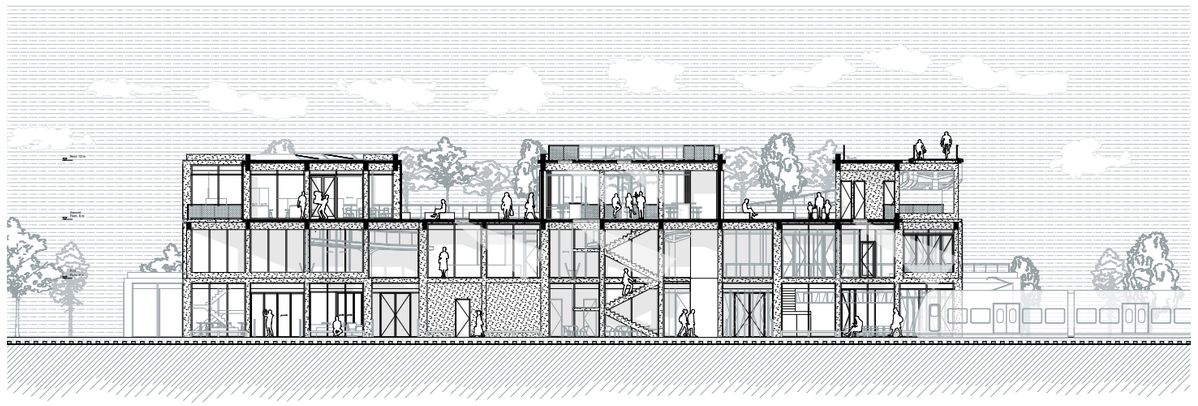


Sections

A1.

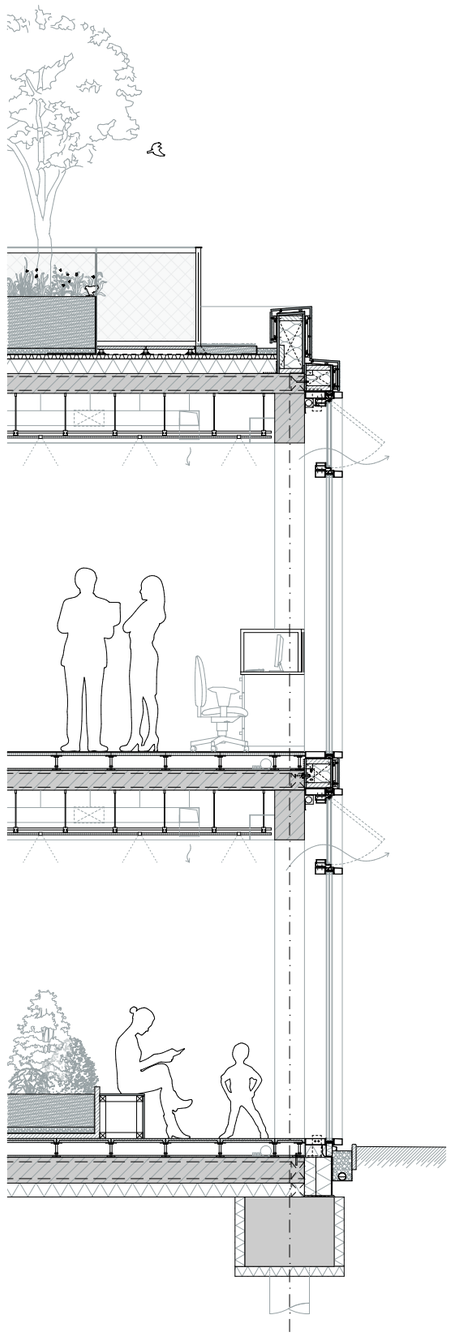


B1.

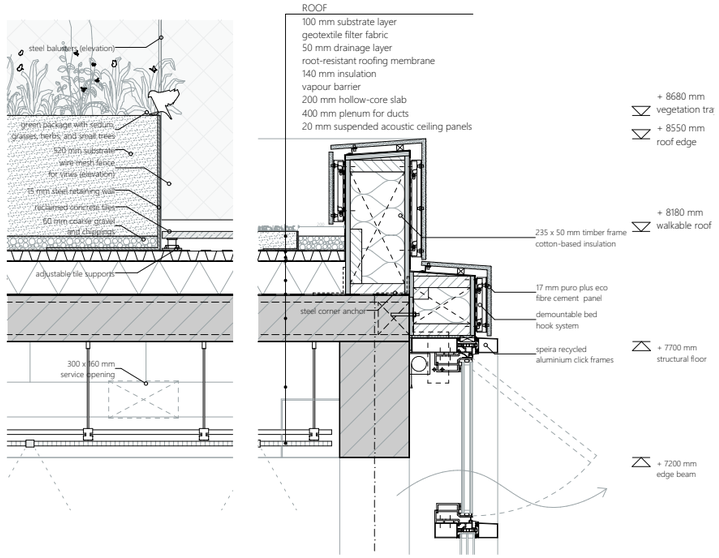


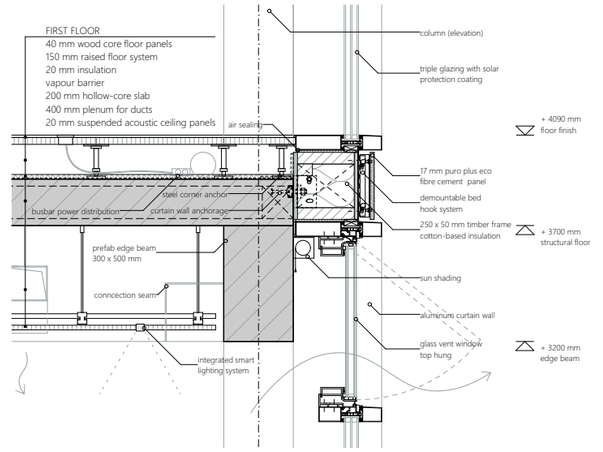
Facade fragment

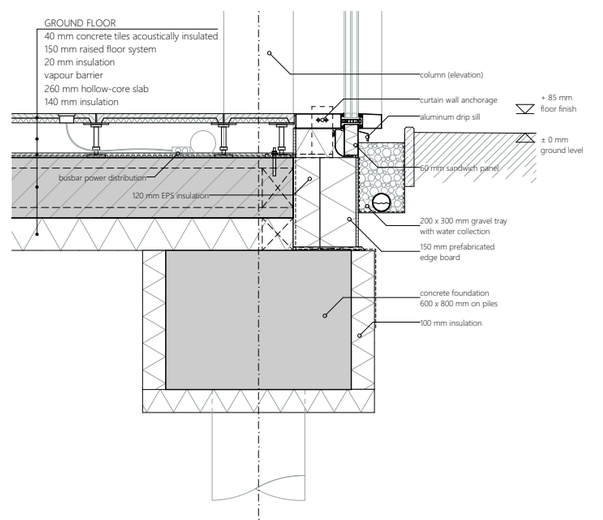




Details







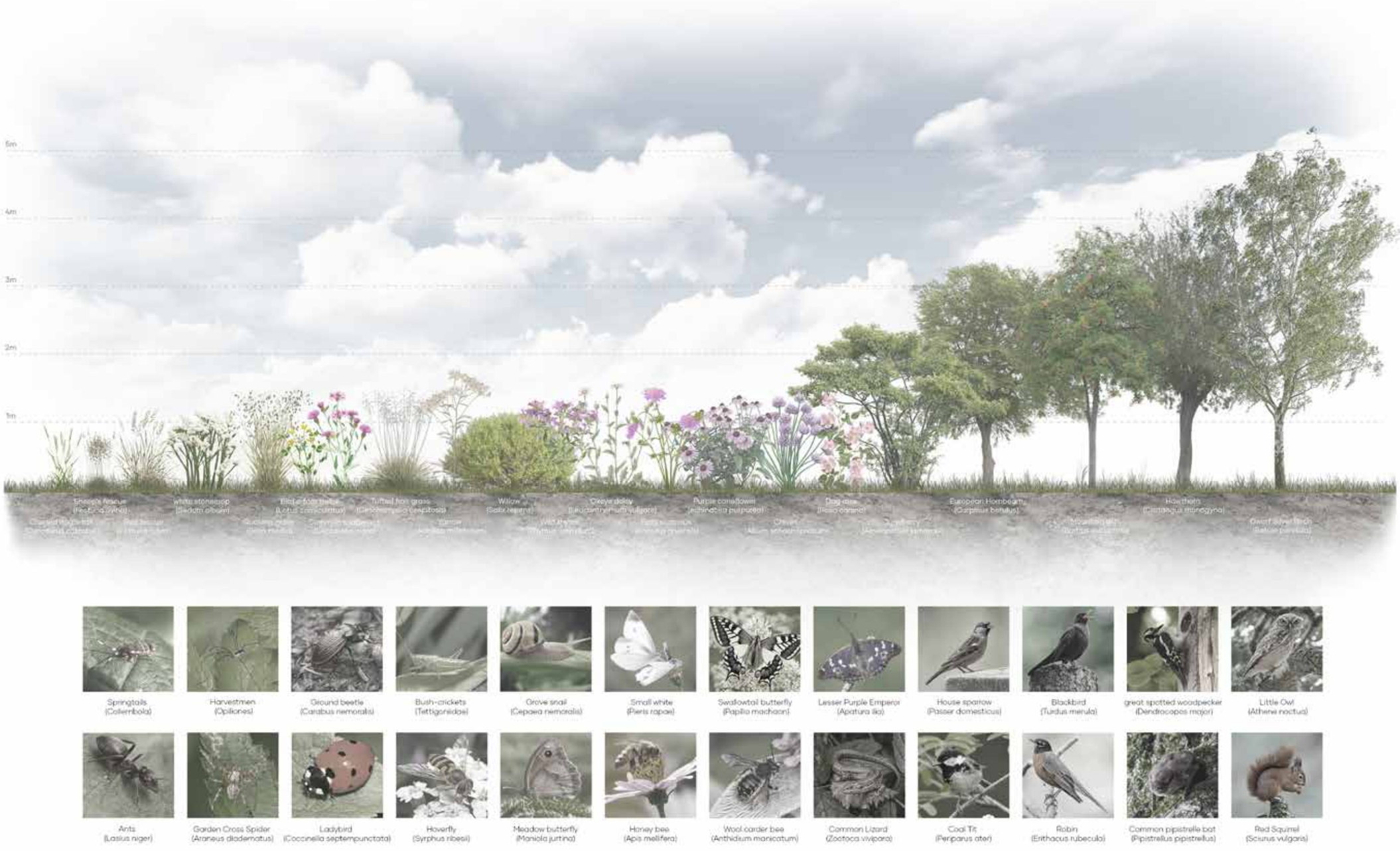
Roof park

The roof as the fifth facade

The rooftop landscape is not a stand-alone garden, but a shared ecosystem in which people are just one of many users. The roof forms not only a park landscape and fifth façade, but also an ecological corridor connecting to the nearby park landscape. This creates a natural transition zone that contributes to strengthening urban biodiversity.

This diagram shows the ecological layering of a green roof landscape, designed with a maximum vegetation height of 5 metres, and a substrate thickness of 600 mm.

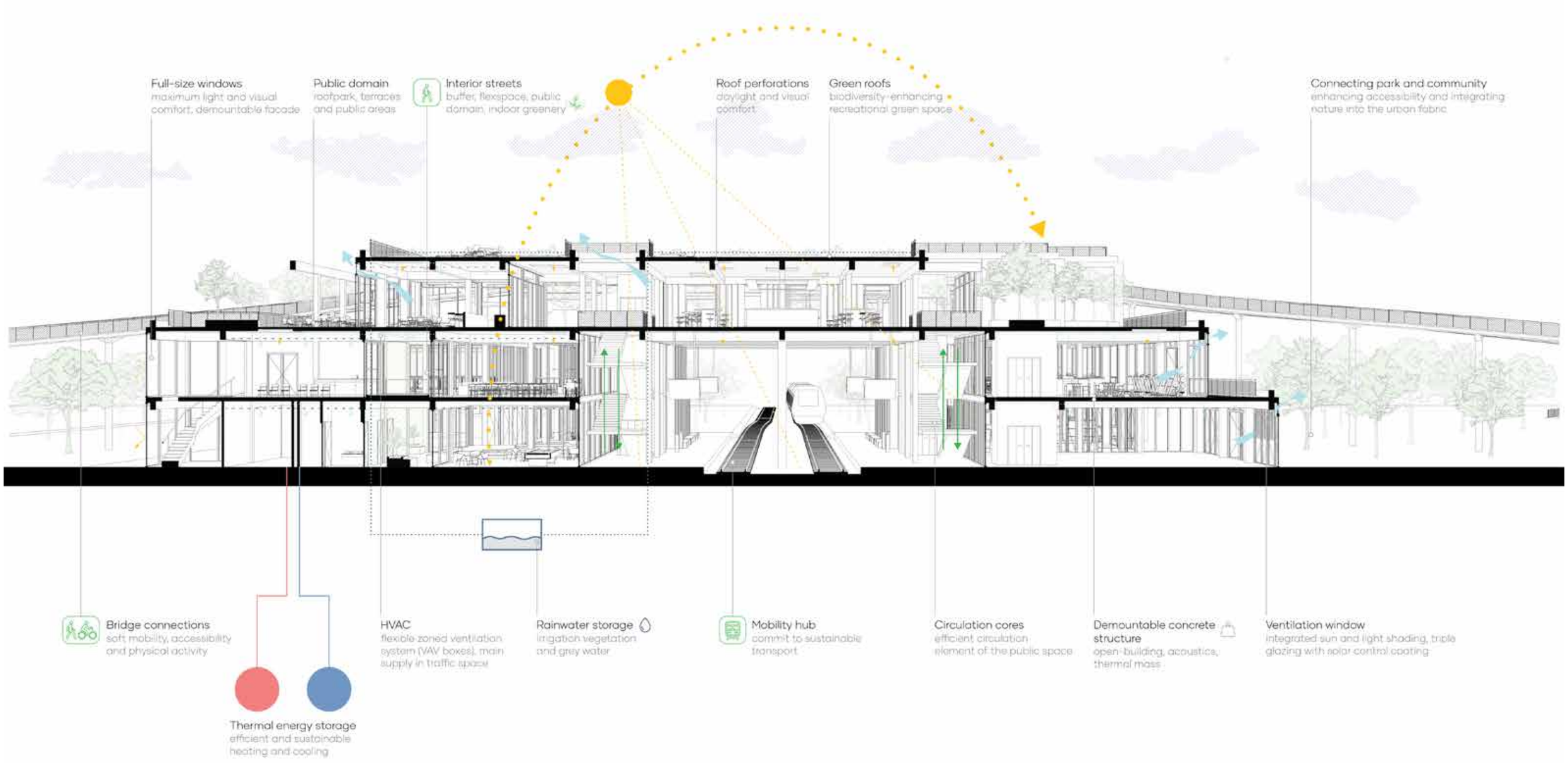
Native flora and fauna are central to the design. Plants are selected based on their ecological value for local insects, birds and small animals. Each vegetation type is linked to specific non-human occupants: pollinators such as hoverflies and honeybees, insectivorous birds such as the great tit and robin, as well as nocturnal visitors such as bats and the red squirrel. Besides its ecological value, the rooftop park also plays a social role: It contributes to people's well-being and mental health and promotes awareness and education about biodiversity in the city



Sources:
https://arter.dk/landing-page
https://www.greenrooforganisation.org/182
https://efb-greenroof.eu/

Sustainability, mobility and comfort

The building aims to make a meaningful contribution to the future development of its surroundings. It acts as a catalyst for improved accessibility, increased equity and stronger integration within the urban fabric. As a mobility hub, the building promotes sustainable forms of transport, encourages physical movement and supports a future-proof urban planning vision. Accessibility is a core value within the design, making diverse facilities accessible to various user groups. It also creates accessible green spaces for the neighbourhood and enhances interaction between the city and Haraldsgade district.



Impressions

Bridge arrival



Roof park



Train platform



Interior street



Night-time use of building



Train arrival at night



Physical model 1:100

Photos







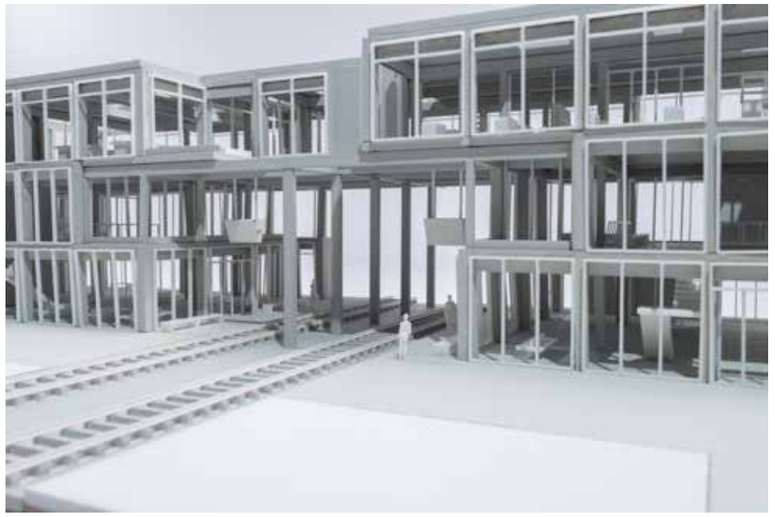


Physical model 1:100

Photos



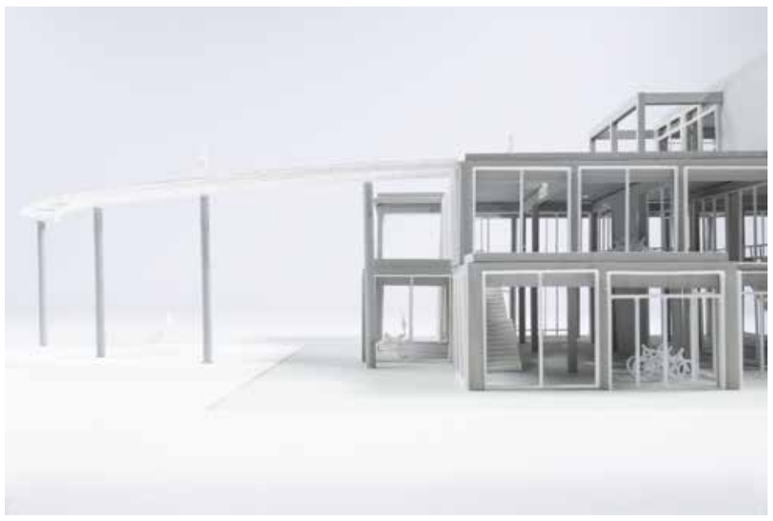




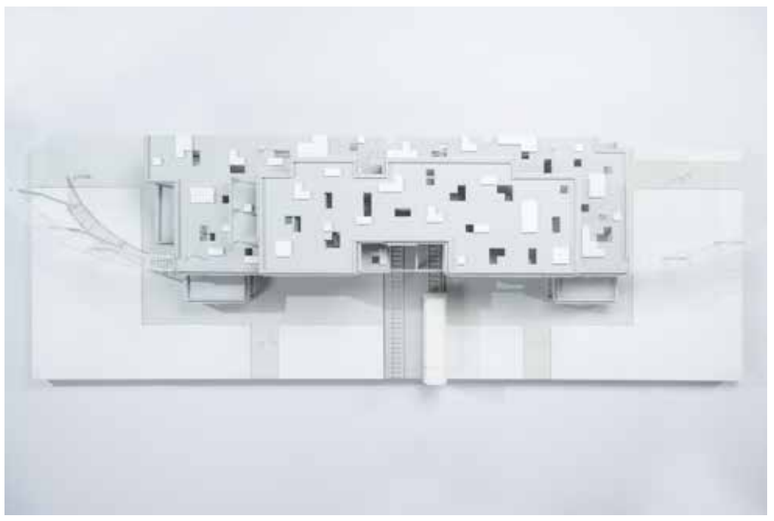












SOCIAL INFRASTRUCTURE

Physical and social connectivitiy in Haraldsgade district

P5 Presentation

Blaise Fouarge
5944597
19-06-2025

Tutors: Antonio Cantero (PD)
Ger Warries (TBD)
Sang Lee (TD)
Delegate: Erik Louw

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PROGRAMME AND ORGANISATION
- BUILDING PROGRAM
- TYPES OF USERS
- SPACE RELATIONS
- MASSING
- PLANS
- SECTIONS
- IMPRESSIONS

TECHNICAL ELABORATION
- MATERIALS
- PRINCIPLES
- STRUCTURE
- SKIN
- CLIMATE

PUBLIC CONDENSER:

A building that concentrates and intensifies public activity

cross-cultural engagement

multifunctionality

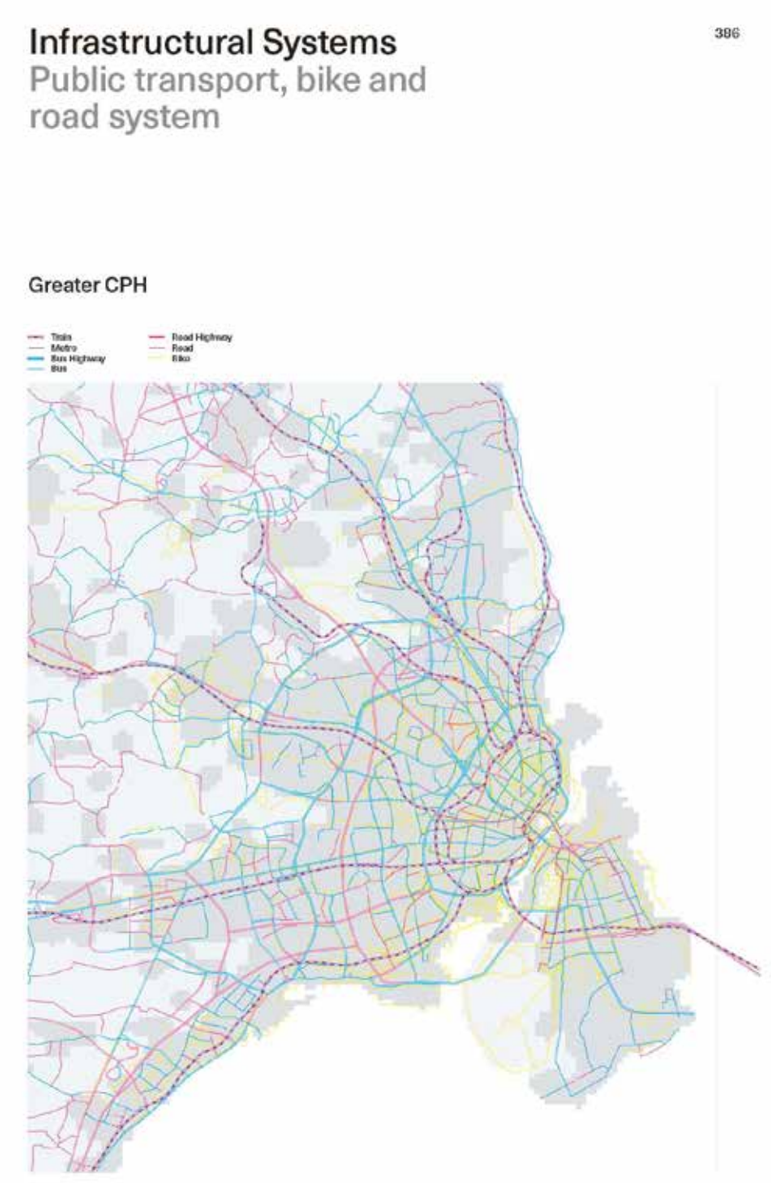
liveability

COPENHAGEN

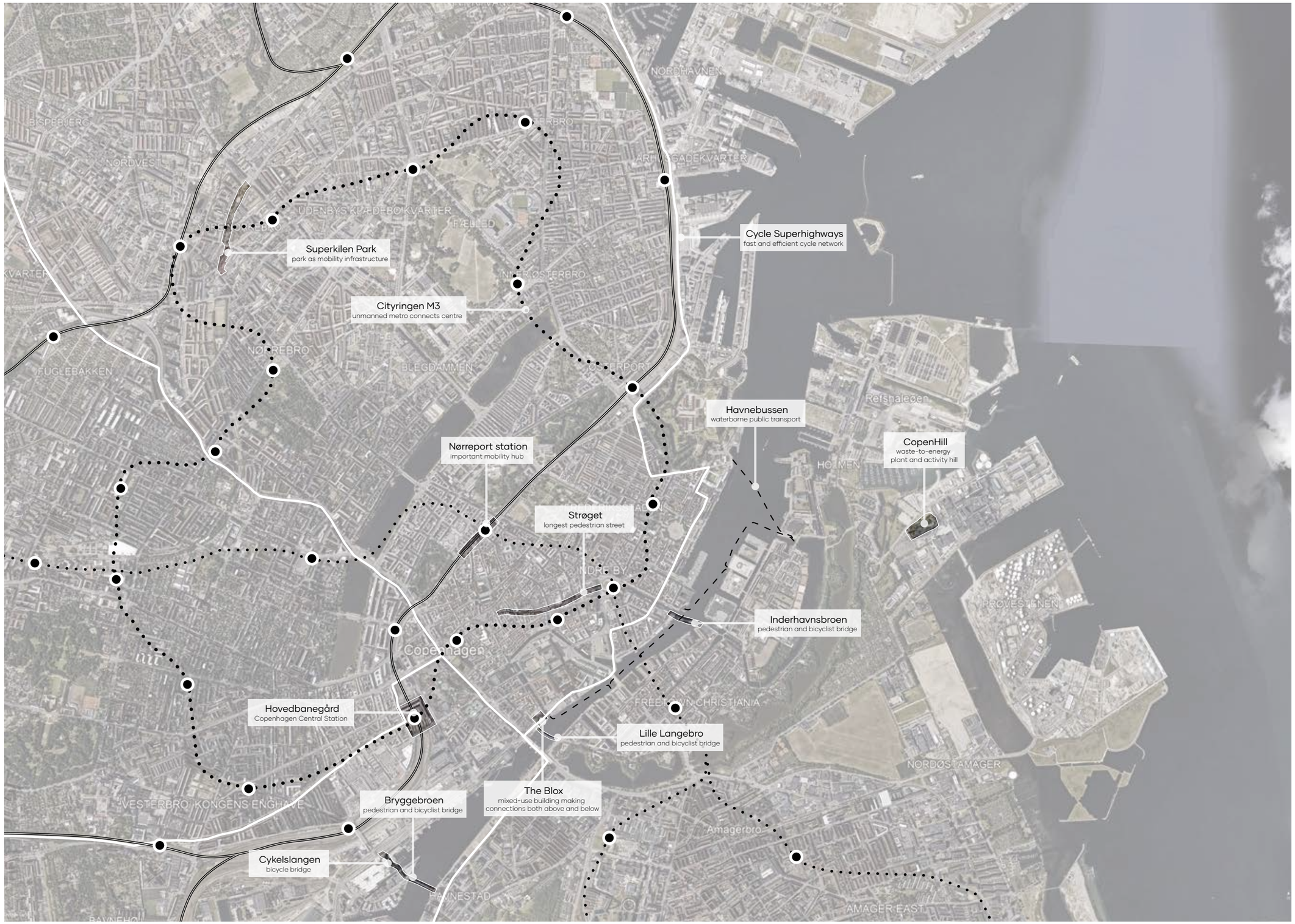
Egnsplankontoret (1947)



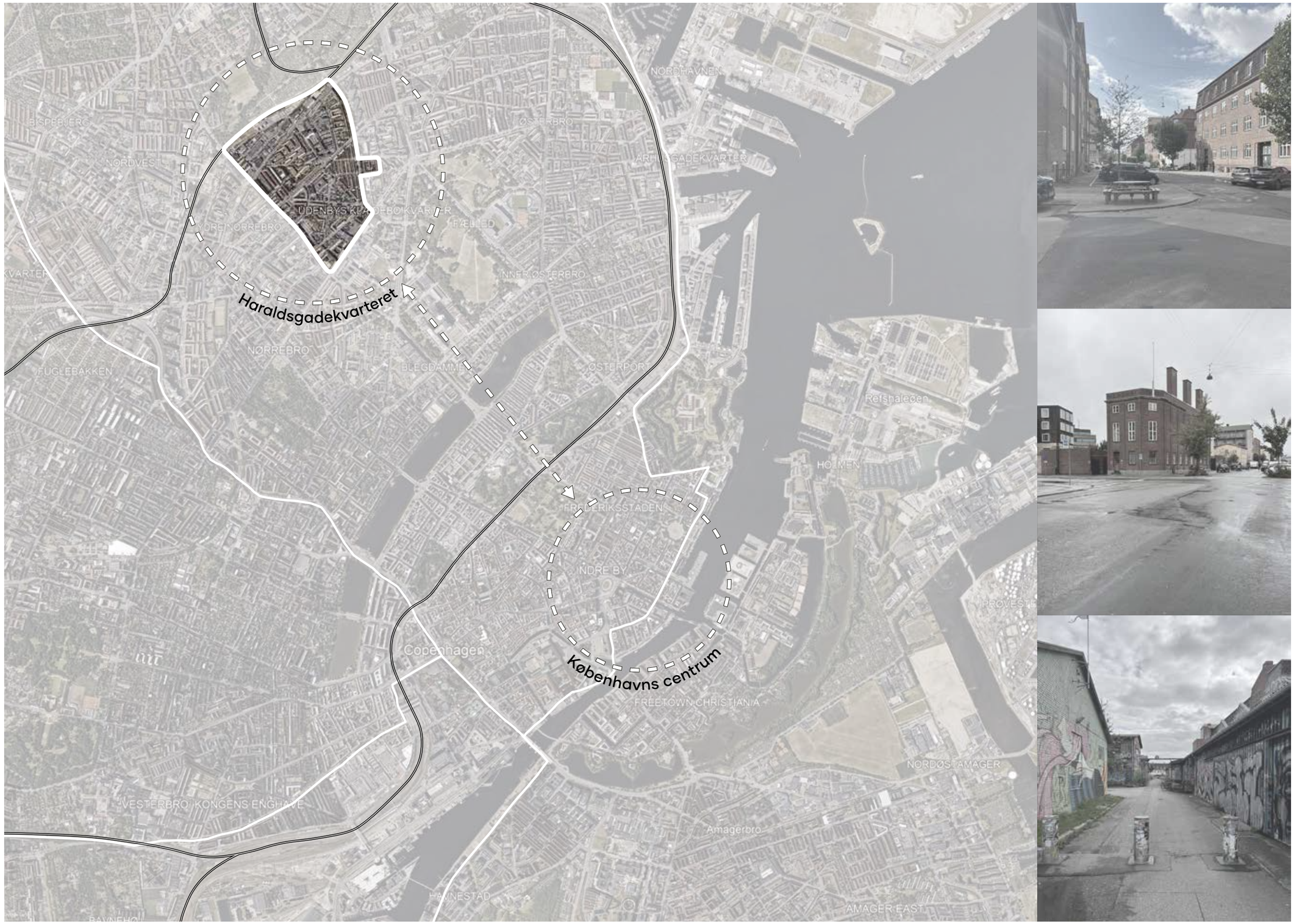
Atlas of the Copenhagens (2018)



COPENHAGEN INFRASTRUCTURES



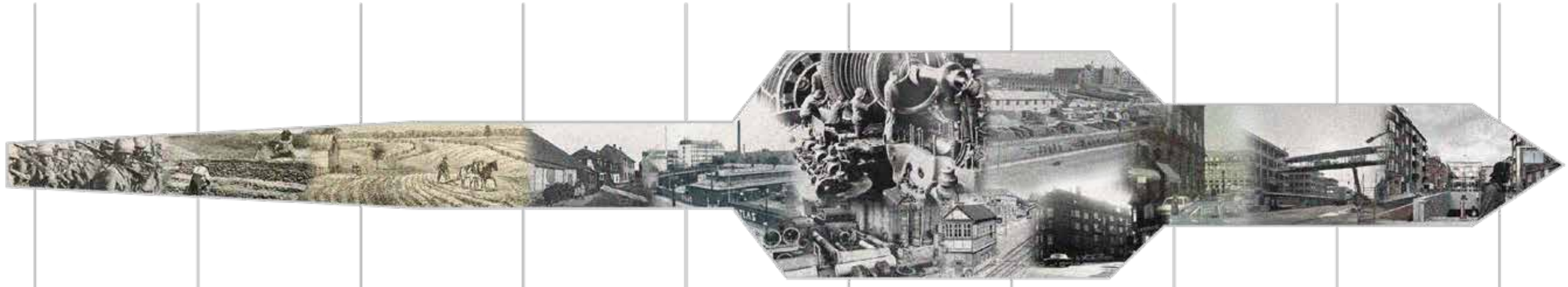
COPENHAGEN HARALDSGADE



HARALDSGADE FARMLAND TO CITY STREET







1800 1825 1850 1875 1900 1925 1950 1975 2000 2025

HARALDSGADE URBAN STRUCTURE

DISTRICT TYPOLOGY



Residential Fabric

Industrial Heritage

Educational Institutions

Commercial/Warehouse

CHARACTER



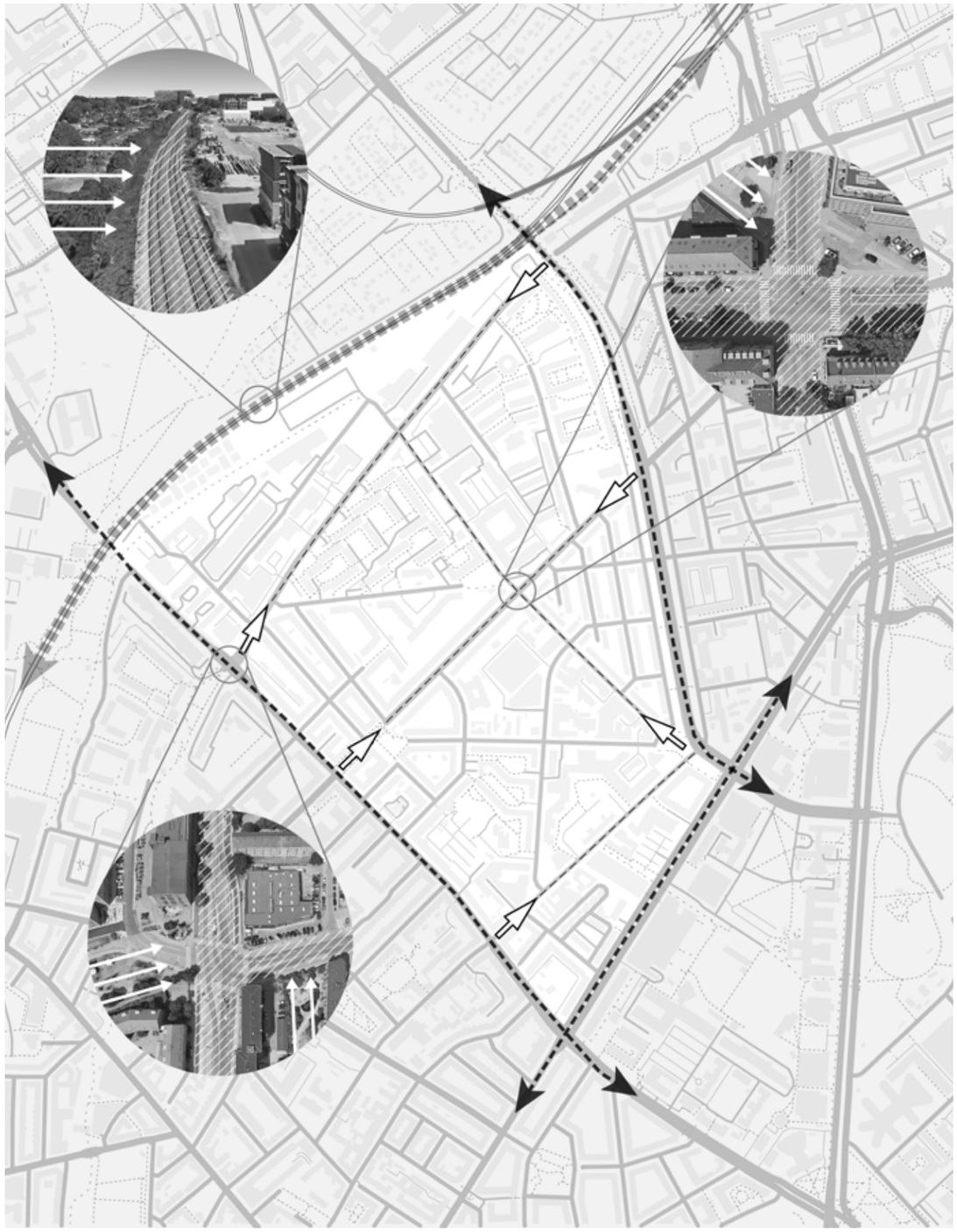




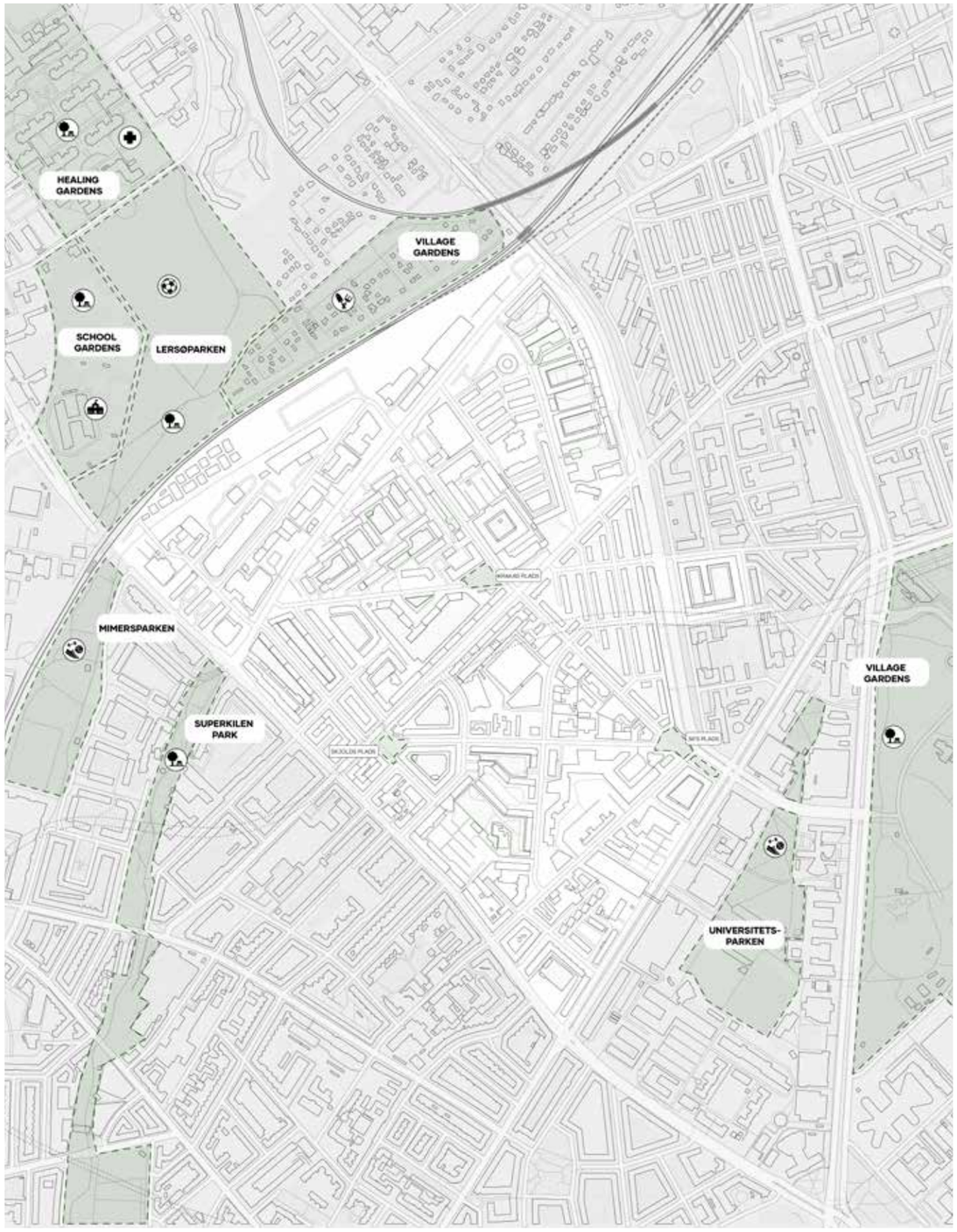


HARALDSGADE FRAGMENTATION

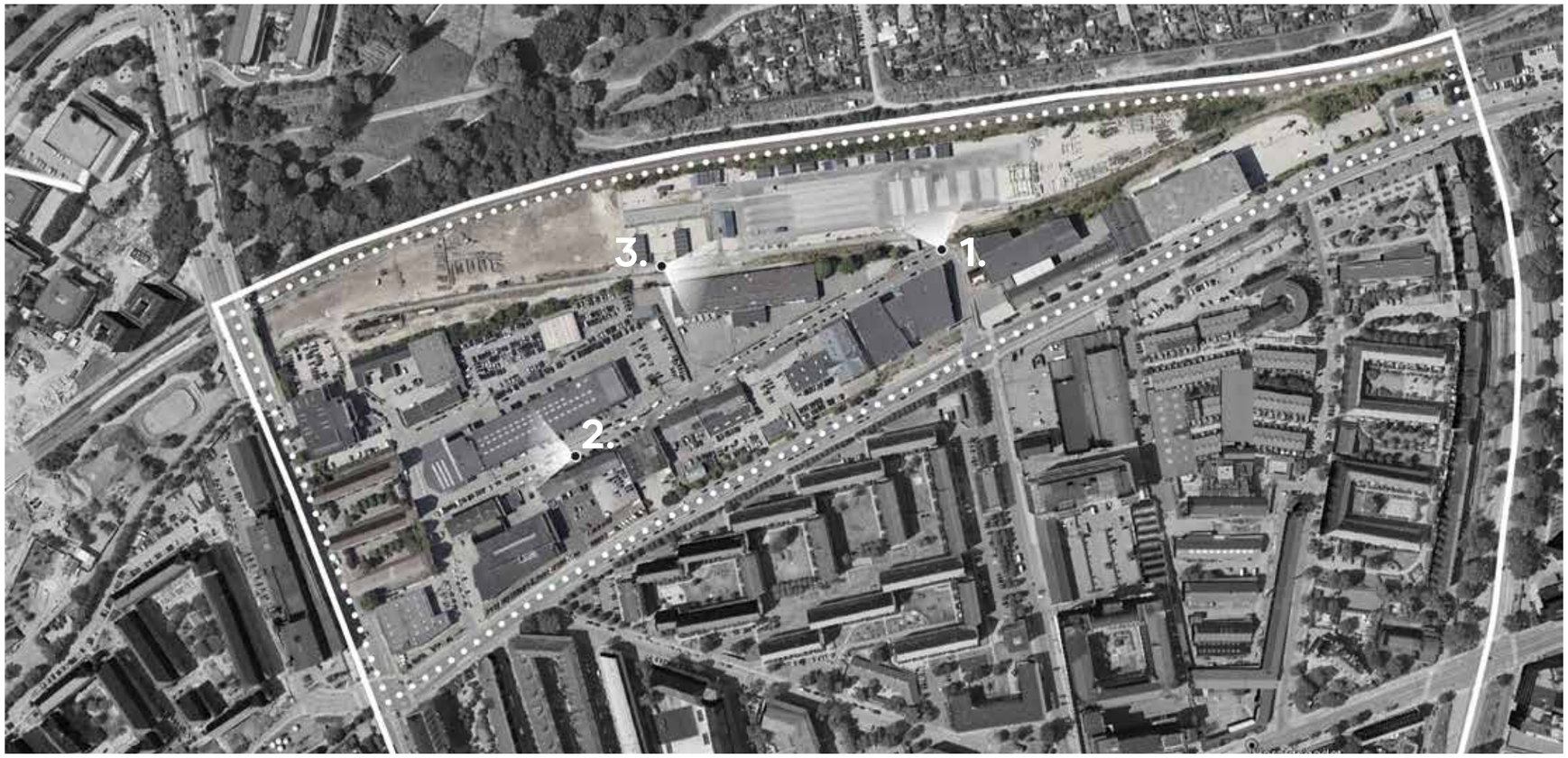
BOUNDARIES



GREEN SPACE



HARALDSGADE VINGELODDEN









RESEARCH QUESTIONS

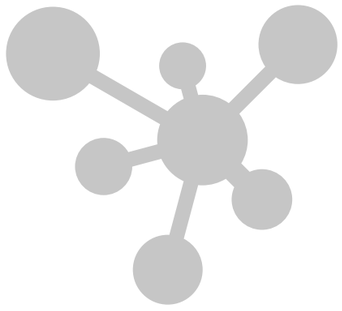
'How might we design **social infrastructure** to blur **physical** and **social boundaries** for Haraldsgade residents and adjacent neighbourhoods, in order to improve **integration** and **unification** in a parallel society?'

Components of **social infrastructure** design

What kind of design that combines building and infrastructure can attract diverse target groups?



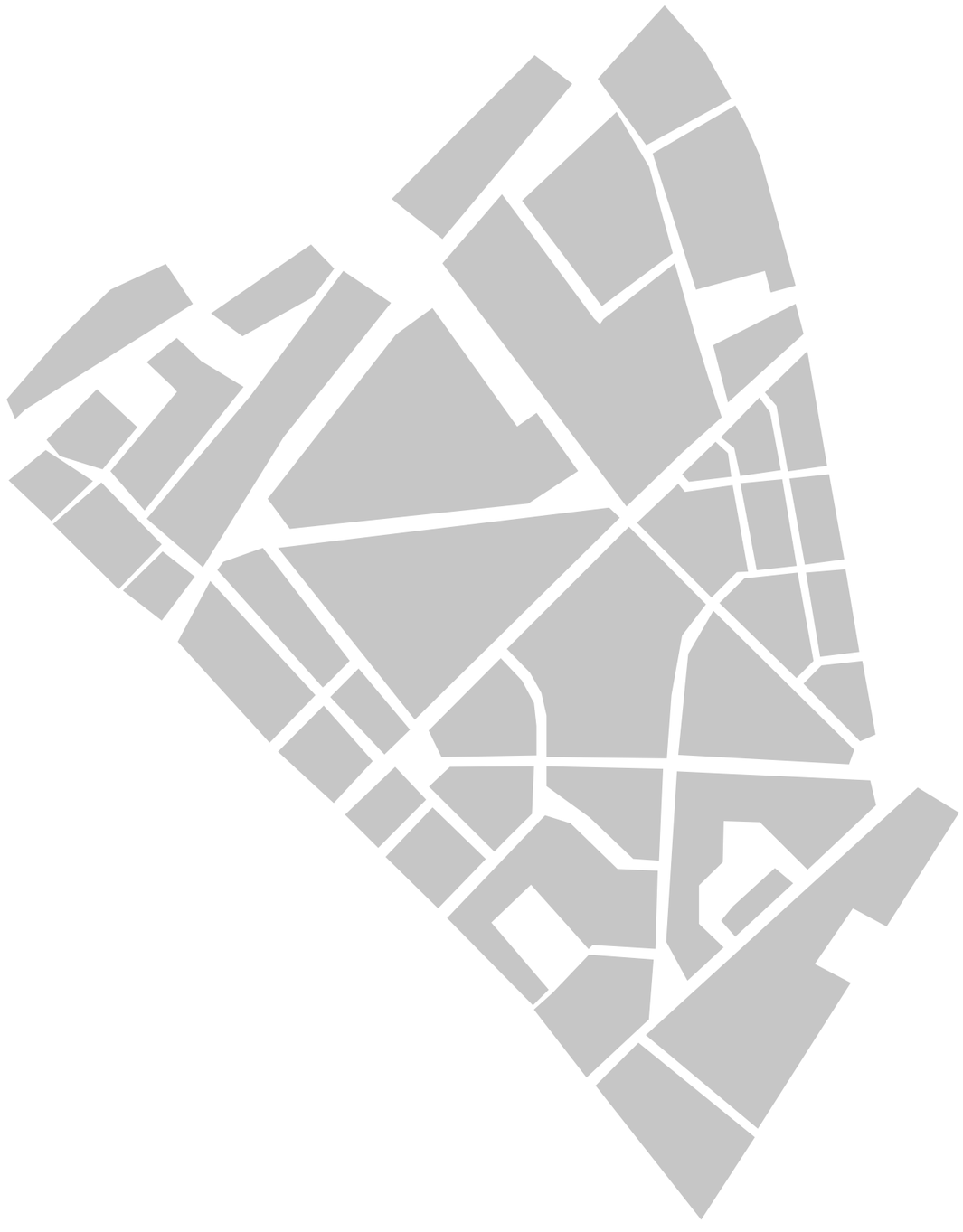
How can the building be part of a connective public infrastructure that increases accessibility and adds value in the neighbourhood?



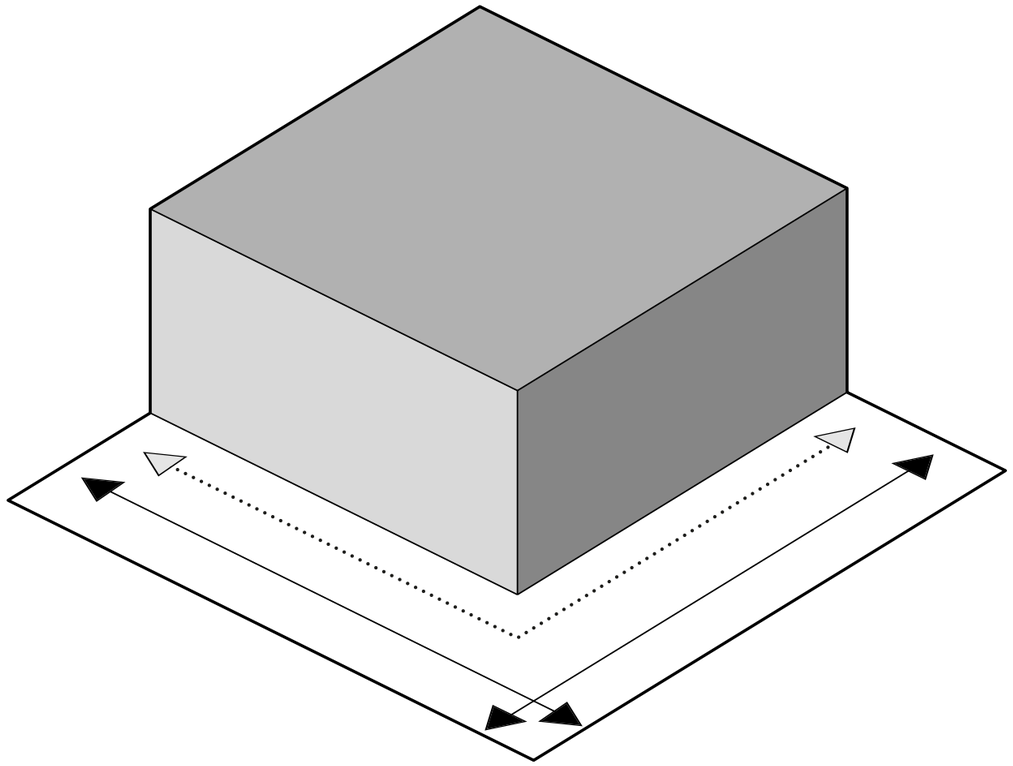
People tend to sit where other people go by.

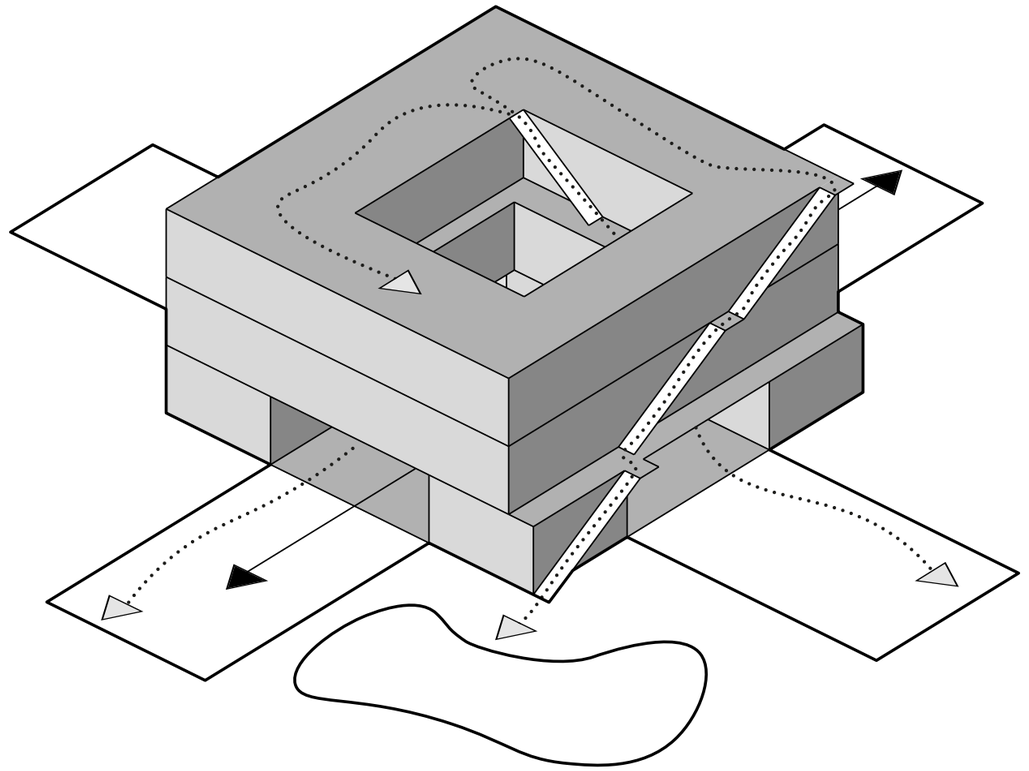
– Jan Gehl

CONCEPT



CONCEPT





CONCEPTUAL FRAMEWORK

RESEARCH

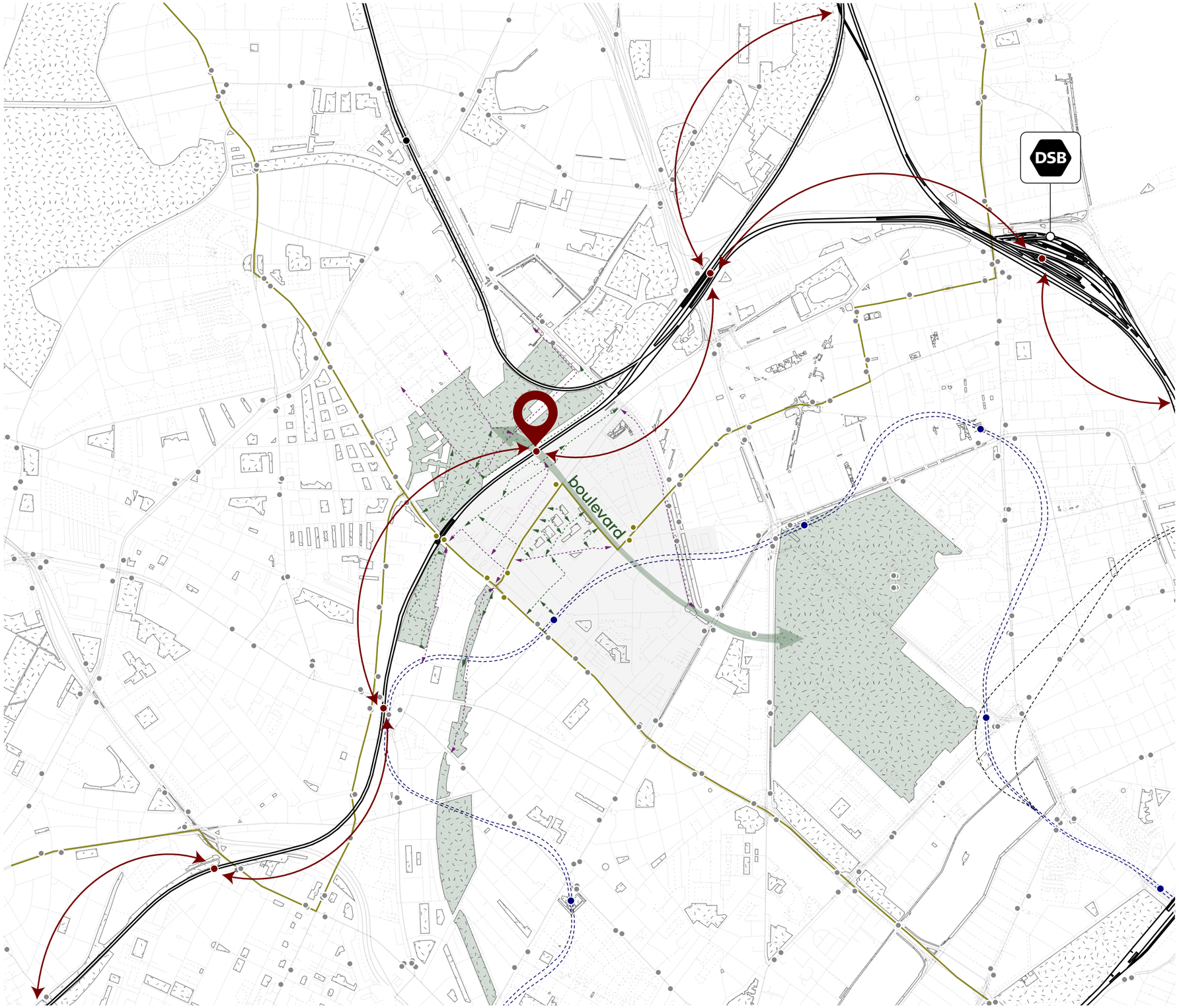
- Social and physical **boundaries** in a **fragmented** urban landscape
- **Neglected** urban spaces hinders meaningful **engagement**
- Designing for **future change**
- A **diverse** population, lack of space to bridge social divides
- Lack of **well-being**, isolated and petrified landscape and low interaction

DESIGN

- **Hybridizing** building and infrastructure, interconnecting social platform
- Promoting **sustainable** movement in a greened environment
- A **resilient** structure strategically positioned as a mobility node
- A **multifuncitonal** public domain enabling low-threshold interaction through diverse uses and open programs.
- Public functions and landscape as drivers of **physical and mental health**.

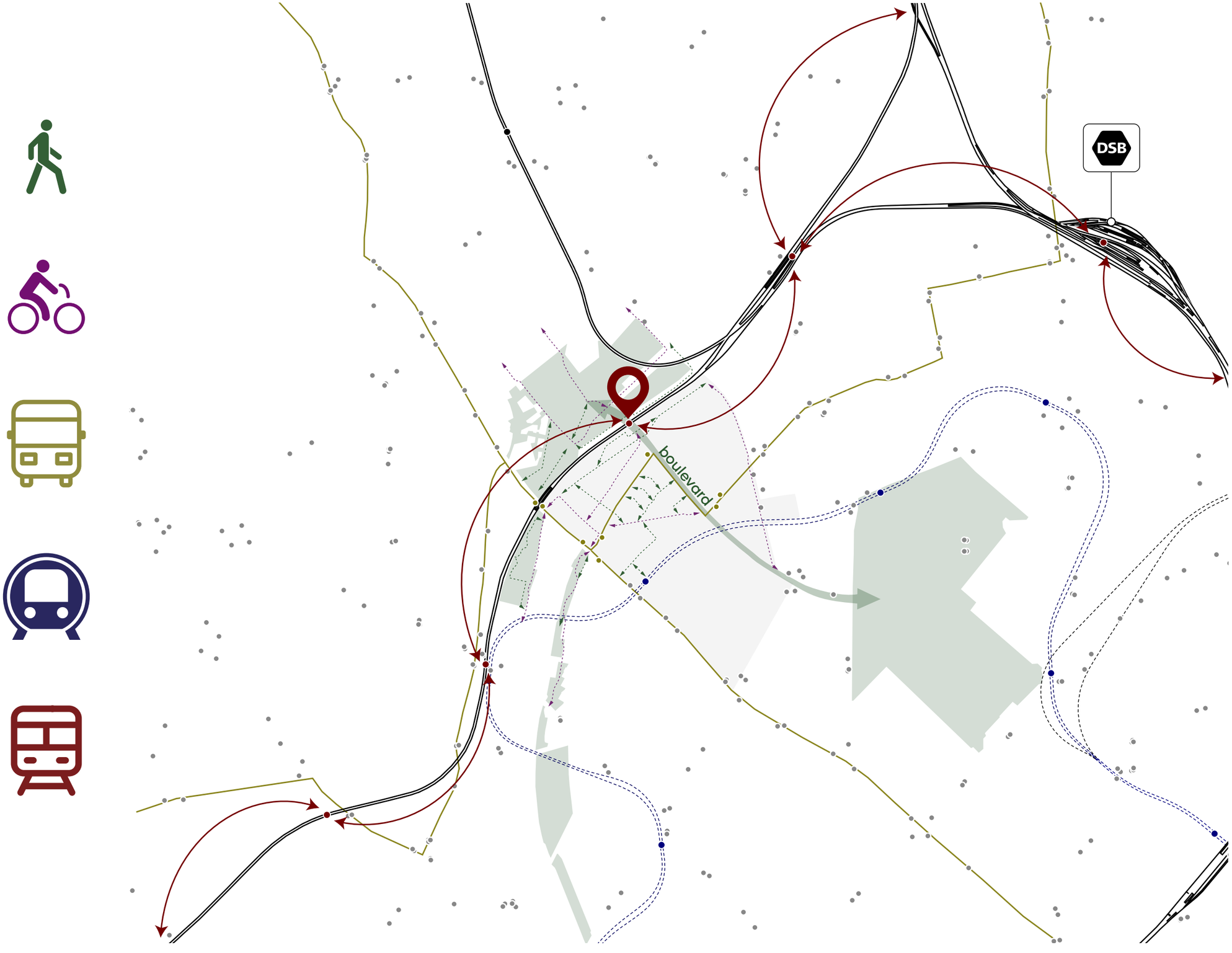
URBAN STRATEGY

CONNCECTIONS OF THE CITY



URBAN STRATEGY

CONNCECTIONS OF THE CITY



URBAN STRATEGY TRAIN DEPARTURE SCHEDULE

F	12:19	**Klampenborg** Ryparken , Hellerup , Klampenborg	**3** min
B	12:25	**København H** Ryparken , Svanemøllen , Nordhavn , Østerport, Nørreport , Vesterport , København H	**6** min
F	12:28	**København Syd** Nørrebro , Fuglebakken , Grøndal , Flintholm , KB Hallen , Ålholm , Danshøj , Vigerslev Alle , København Syd	**9** min
B	12:31	**Grøndal** Fuglebakken , Nørrebro , Grøndal	**12** min
F	12:34	**Klampenborg** Ryparken , Hellerup , Klampenborg	**15** min

URBAN STRATEGY CYCLING TRAFFIC

GREEN PATHS



NATIONAL CYCLE ROUTES



RING ROUTES



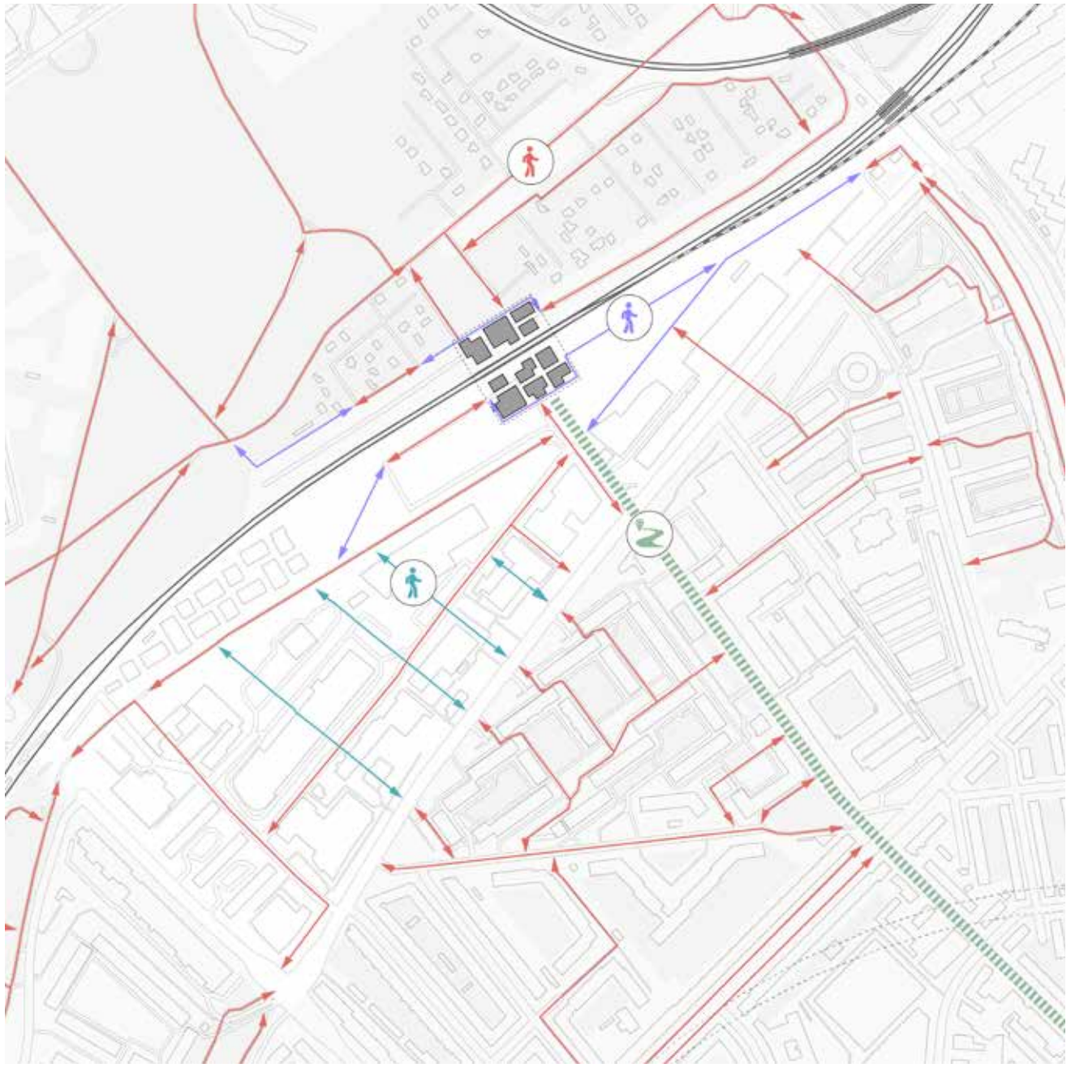
RECREATIONAL ROUTES





URBAN STRATEGY PEDESTRIAN MOVEMENT

pedestrian landscape



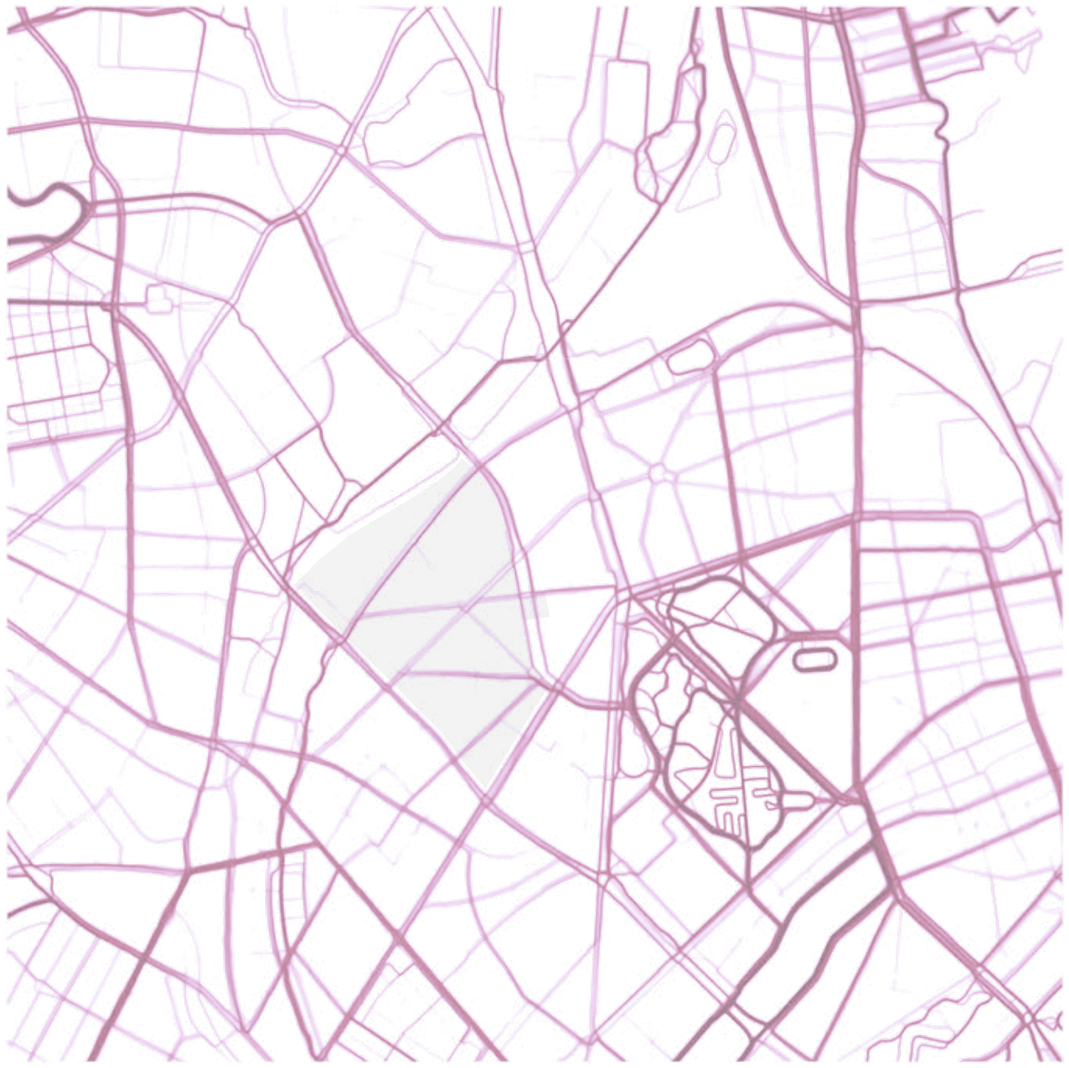
existing paths

proposed by area renewal plan

new connection

new boulevard

heatmap foot sports



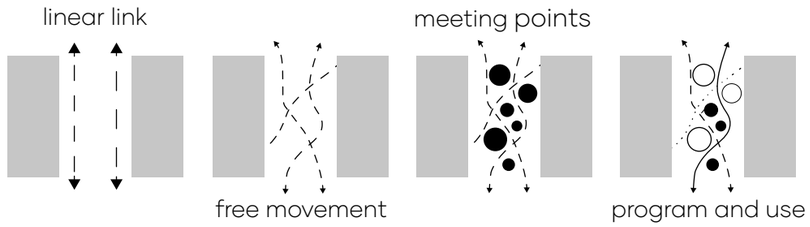
URBAN STRATEGY PEDESTRIAN MOVEMENT



BOULEVARD



STRATEGY



THEMES

Sports / recreation



Art installations / monuments / local culture



Urban plaza

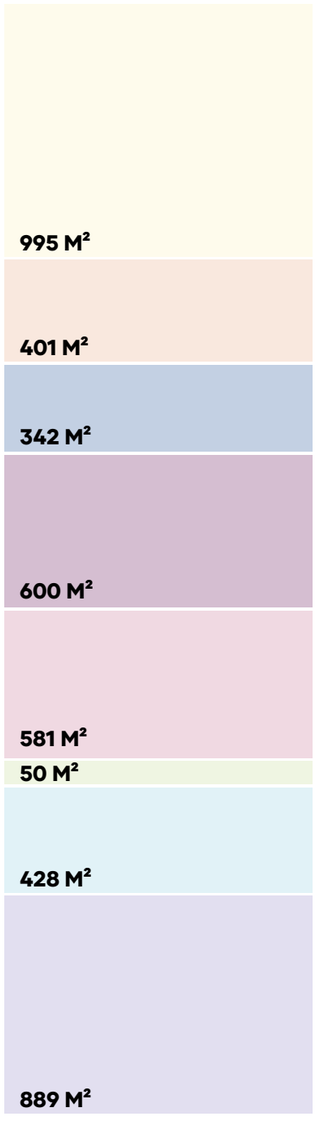


Green spaces





BUILDING PROGRAM



GENERAL PUBLIC AREAS

CULTURE

SKILL DEVELOPMENT

SPORT AND EXERCISE

EDUCATION AND KNOWLEDGE
OFFICE AREAS

COMMUNITY SERVICE

OTHER FUNCTIONS

GENERAL PUBLIC AREAS	information centre	213.6	
	administration room		90.3
	offices		123.3
	market	189.2	
	bar/café	80.2	
	kitchen		25
	storage		4.4
	adjoining terrace		
	roof terrace		
	public toilets	59	
	indoor street	460.5	
	public park		

CULTURE	music and theatre venue	401	
	balcony		97
	bar		32
	storage		16
	outdoor event space		

SKILL DEVELOPMENT	makerspaces	235.2	
	equipment workspace		32
	toilets		16
	cooking workshops	107.6	
	rinse kitchen		15.1
	cold store		8.9
	toilets		11
	garden space		

SPORT AND EXERCISE	dressing rooms	95.5	
	sports hall	295.2	
	counter		7.4
	gym	139.2	
	outdoor space		
	yoga/dance	70	
	outdoor space		

EDUCATION AND KNOWLEDGE	library	248.8	
	entrance		14.7
	counter		9.9
	storage		9.6
	toilets		23.9
	closed study area		29.4
	library reading balcony	155	
	outdoor space		
	reading and study area	138.4	
	classroom	39	

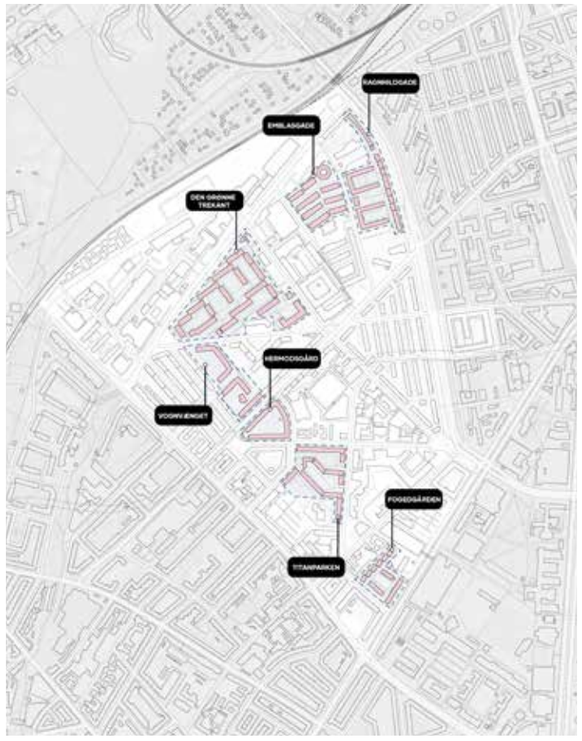
OFFICE	coworking office	50	
	cowork spaces		34
	closed office/meeting room		16
	shared space with workshop		

COMMUNITY SERVICE	community help and service	99	
	offices health and legal coach		29.4
	group space		30.6
	urban living room	246.4	
	childcare	83	
	sleeping area		14.7

OTHERS	station hall	302.4	
	kiosk		29.4
	customer service		8.5
	bike parking	461.8	
	technical room	125	

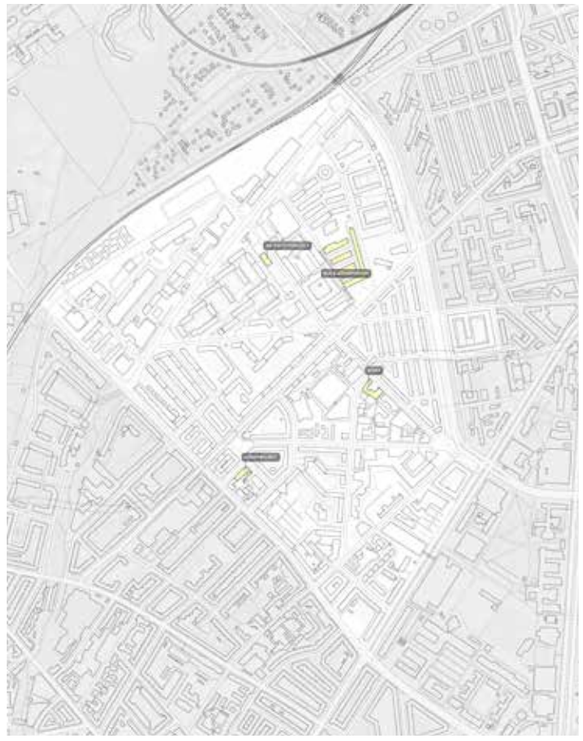
TYPES OF USERS AREA ANALYSIS

Social housing



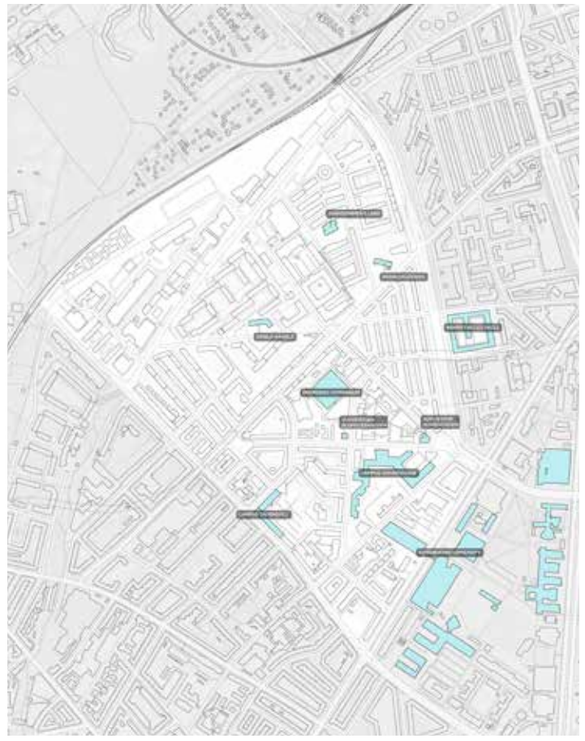
Single residents
Elderly / retirees
(Young) families
Young professionals / starters
Vulnerable groups

Community & creative hubs



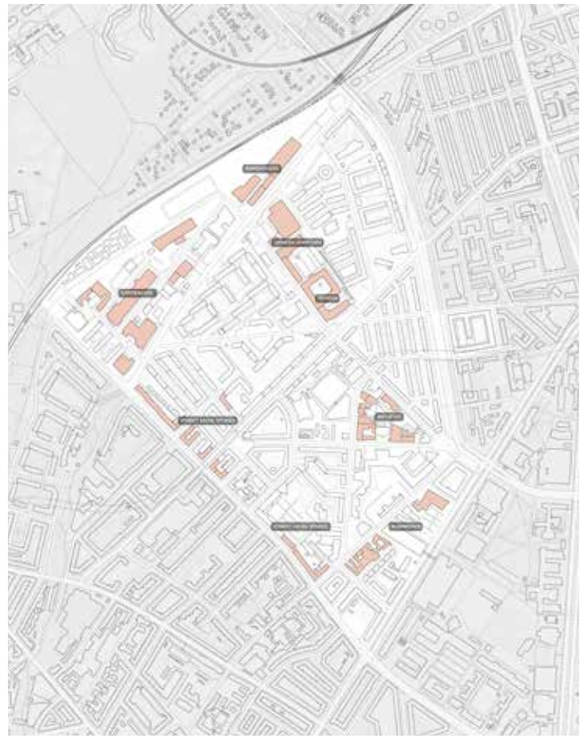
Remote workers
Volunteers
Creatives (makers)
Cultural entrepreneurs
Neighborhood organizations

Knowledge & care infrastructure



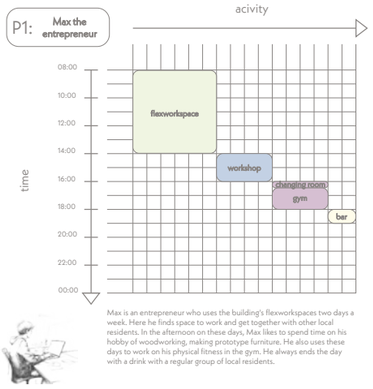
Students and pupils
Healthcare professionals
Researchers
Study coaches / mentors
Guest speakers

Local economy & entrepreneurship

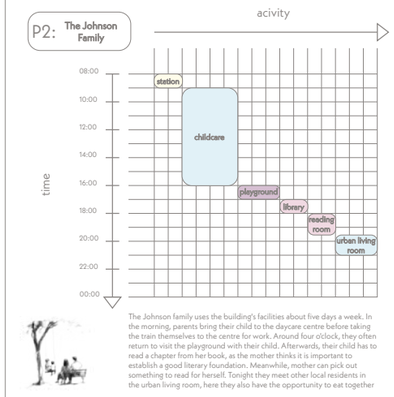


Freelancers
Office staff
Production workers
Retail employees

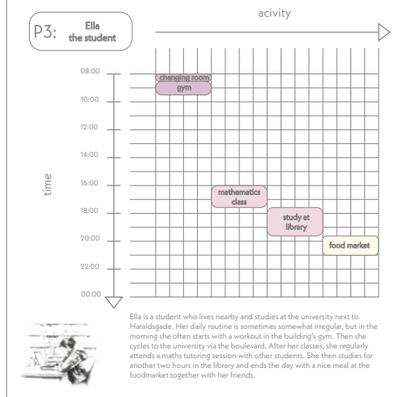
TYPES OF USERS SCENARIOS



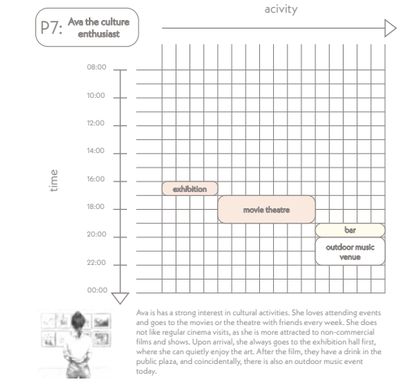
Max is an entrepreneur who uses the building's flexworkspaces two days a week. Here he finds space to work and get together with other local residents. In the afternoon on these days, Max likes to spend time on his hobby of woodworking, making prototype furniture. He also uses these days to work on his physical fitness in the gym. He always ends the day with a drink with a regular group of local residents.



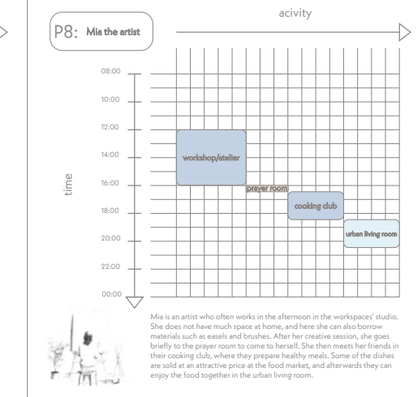
The Johnson family uses the building's facilities about five days a week. In the morning, parents bring their child to the daycare centre before taking the train themselves to the centre for work. Around four o'clock, they often return to visit the playground with their child. Afterwards, their child has to read a chapter from her book, as the mother thinks it is important to establish a good literary foundation. Meanwhile, mother can pick out something to read for herself. Tonight they meet other local residents in the urban living room, here they also have the opportunity to eat together



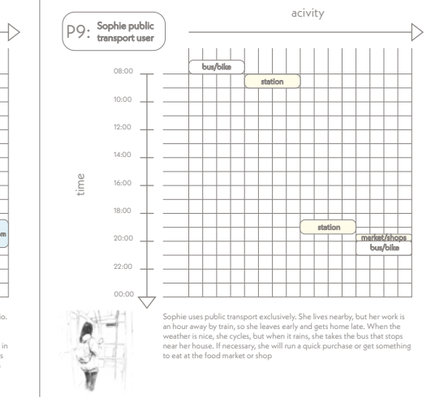
Ella is a student who lives nearby and studies at the university next to Haraldsgade. Her daily routine is sometimes somewhat irregular, but in the morning she often starts with a workout in the building's gym. Then she cycles to the university via the boulevard. After her classes, she regularly attends a maths tutoring session with other students. She then studies for another two hours in the library and ends the day with a nice meal at the foodmarket together with her friends.



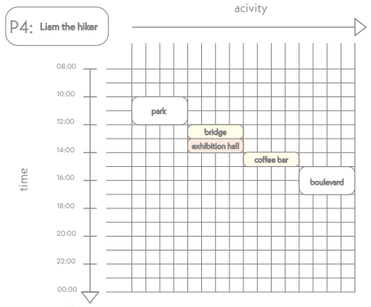
Ava is has a strong interest in cultural activities. She loves attending events and goes to the movies or the theatre with friends every week. She does not like regular cinema visits, as she is more attracted to non-commercial films and shows. Upon arrival, she always goes to the exhibition hall first, where she can quietly enjoy the art. After the film, they have a drink in the public plaza, and coincidentally, there is also an outdoor music event today.



Mia is an artist who often works in the afternoon in the workspaces' studio. She does not have much space at home, and here she can also borrow materials such as easels and brushes. After her creative session, she goes briefly to the prayer room to come to herself. She then meets her friends in their cooking club, where they prepare healthy meals. Some of the dishes are sold at an attractive price at the food market, and afterwards they can enjoy the food together in the urban living room.

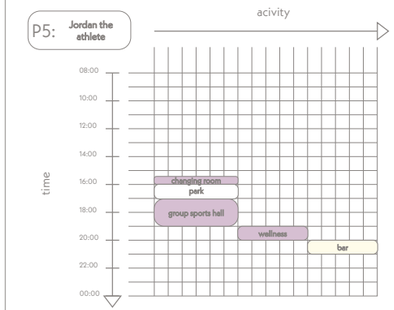


Sophie uses public transport exclusively. She lives nearby, but her work is an hour away by train, so she leaves early and gets home late. When the weather is nice, she cycles, but when it rains, she takes the bus that stops near her house. If necessary, she will run a quick purchase or get something to eat at the food market or shop



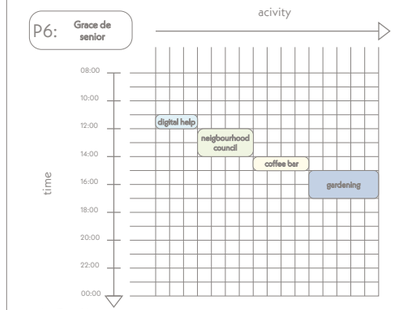
Liam is a walker whose destination is not specifically the building. He follows a route along parks and boulevards, enjoying the surroundings, such as buildings, art and nature. From the park, Liam uses the bridge, where he stops to admire the current exhibition and has a chat with other passers-by about the art on display. He then grabs a cup of coffee and continues his walk along the promenade.





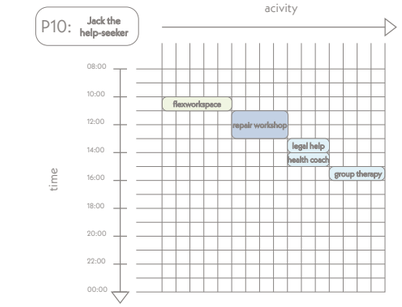
Jordan is a passionate athlete. Together with his friend, he goes into the park after changing to warm up outside, if the weather is right. They then continue their training in the group sports room. After training, they often go to the wellness place to recover the muscles, here they can take a bath or grab a sauna, ending the day with a drink at the bar.





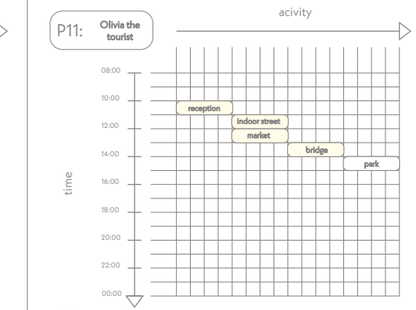
Grace is a senior who is actively involved in the neighbourhood committee. Once or twice a week, she meets with a group of committed local residents to discuss new topics. Prior to these meetings, Grace receives help with her digital issues, which she greatly benefits from. In the afternoons, she enjoys working in the community garden, as her flat does not have its own garden. This provides her with a nice solution and an enjoyable occupation.





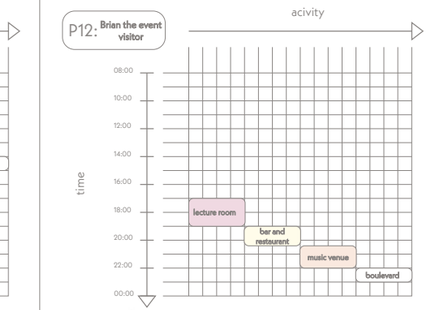
Jack has experienced a distance from society due to previous addiction problems, but fortunately he finds the help he needs here. In the morning, he works in the flexworkspace on his own stuff. Later in the day, he goes to the workshop, where he does repairs on bicycles, kitchen appliances or electronics. Jack has discovered that he can work well with his hands. In the afternoon, he often receives guidance on legal issues and advice on a healthy lifestyle. Often ending the day with therapy session, which helps him move forward.





Olivia is a tourist visiting Copenhagen for the first time and has stumbled upon the boulevard by chance. The building arouses her curiosity, and she decides to request some information from the reception. She then wanders through the indoor street and the market. She then follows the route across the bridge, taking a peek at the workplaces along the way to see what is going on. Finally, she continues her walk towards the park. When she gets bored she can return to the city from here by train.





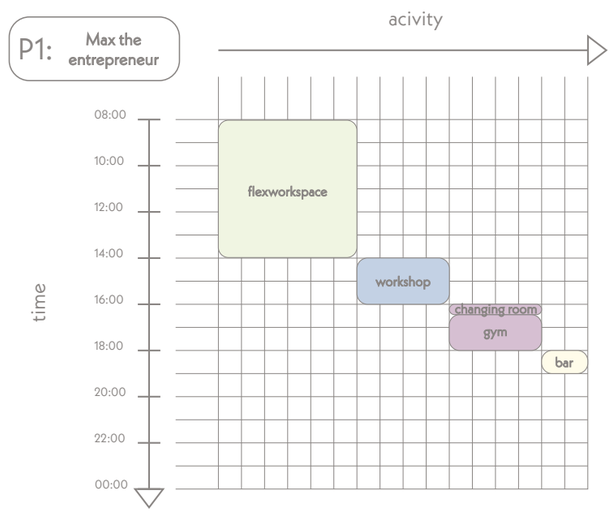
Brian is an enthusiastic attendee of events. Today, he has planned to meet up with a colleague to attend a lecture on AI. After the inspiring session, they decide to have something to eat and drink together in the restaurant near the food market. To end the day, they go to the musicvenue, where a local band is performing that Brian has been following for some time and whose music he regularly listens to. After this, they take a walk around the square and boulevard to talk afterward.



TYPES OF USERS

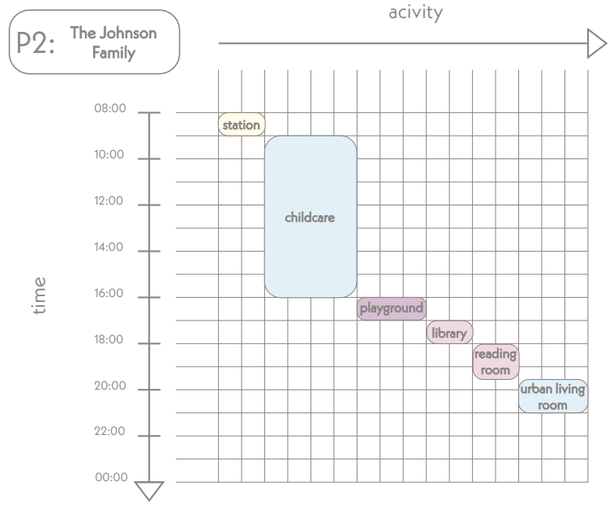
SCENARIOS: INFRASTRUCTURAL INTERVENTION

local residents





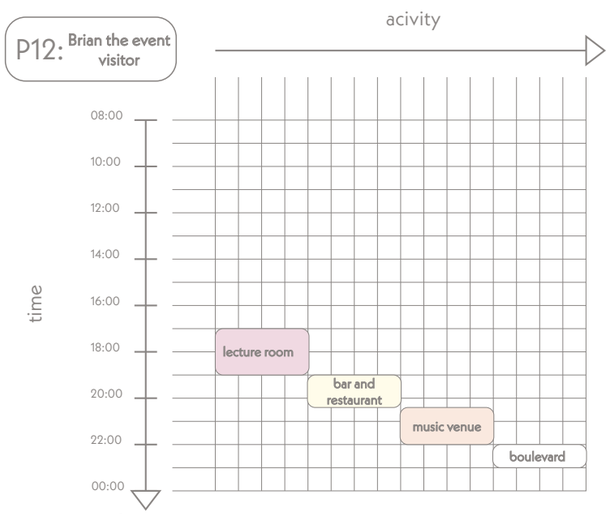
Max is an entrepreneur who uses the building's flexworkspaces two days a week. Here he finds space to work and get together with other local residents. In the afternoon on these days, Max likes to spend time on his hobby of woodworking, making prototype furniture. He also uses these days to work on his physical fitness in the gym. He always ends the day with a drink with a regular group of local residents.





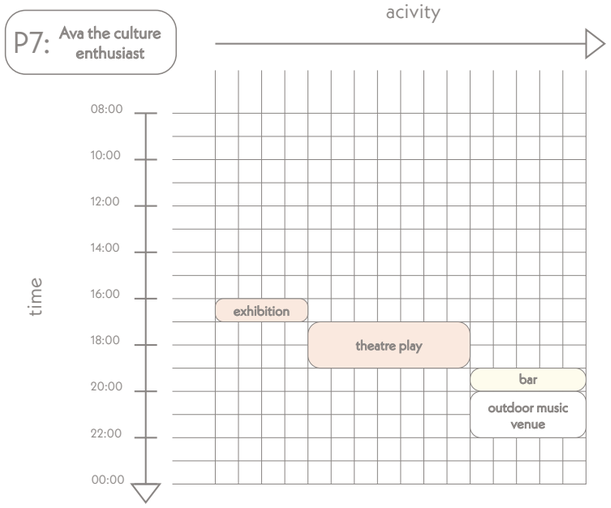
The Johnson family uses the building's facilities about five days a week. In the morning, parents bring their child to the daycare centre before taking the train themselves to the centre for work. Around four o'clock, they often return to visit the playground with their child. Afterwards, their child has to read a chapter from her book, as the mother thinks it is important to establish a good literary foundation. Meanwhile, mother can pick out something to read for herself. Tonight they meet other local residents in the urban living room, here they also have the opportunity to eat together

visitors





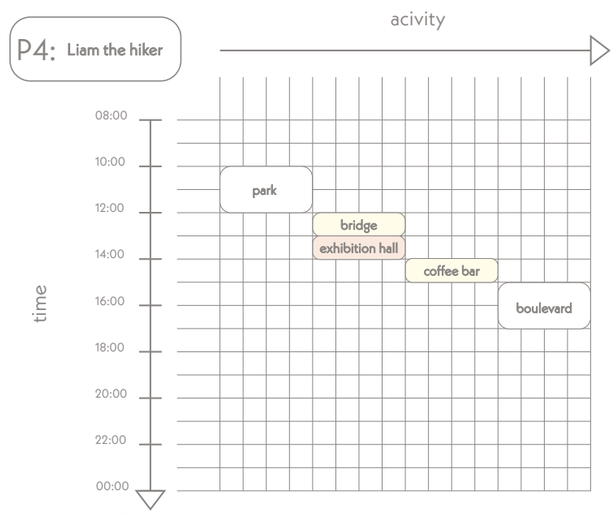
Brian is an enthusiastic attendee of events. Today, he has planned to meet up with a colleague to attend a lecture on AI. After the inspiring session, they decide to have something to eat and drink together in the restaurant near the food market. To end the day, they go to the musicvenue, where a local band is performing that Brian has been following for some time and whose music he regularly listens to. After this, they take a walk around the square and boulevard to talk afterward.





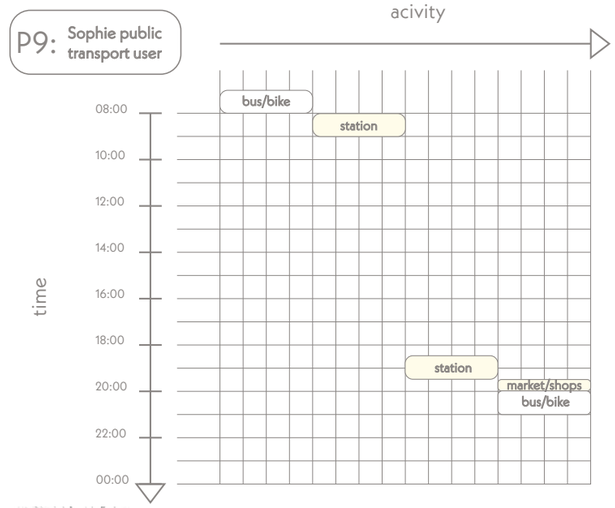
Ava has a strong interest in cultural activities. She loves attending events and goes to the theatre with friends every week. She is especially drawn to live performances and enjoys plays that explore unique or thought-provoking themes. Today, there is a play by the local community. Upon arrival, she always goes to the exhibition hall first, where she can quietly enjoy the art. After the play, they have a drink in the public plaza, and coincidentally, there is also an outdoor music event today.

travellers/passengers





Liam is a walker whose destination is not specifically the building. He follows a route along parks and boulevards, enjoying the surroundings, such as buildings, art and nature. From the park, Liam uses the bridge, where he stops to admire the current exhibition and has a chat with other passers-by about the art on display. He then grabs a cup of coffee and continues his walk along the promenade.





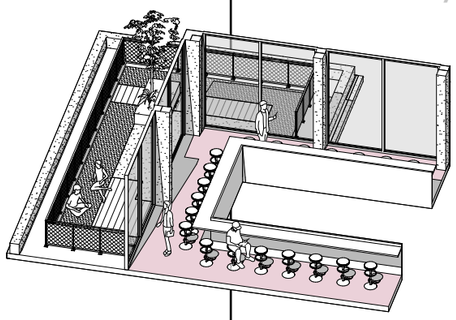
Sophie uses public transport exclusively. She lives nearby, but her work is an hour away by train, so she leaves early and gets home late. When the weather is nice, she cycles, but when it rains, she takes the bus that stops near her house. If necessary, she will run a quick purchase or get something to eat at the food market or shop

TYPES OF USERS

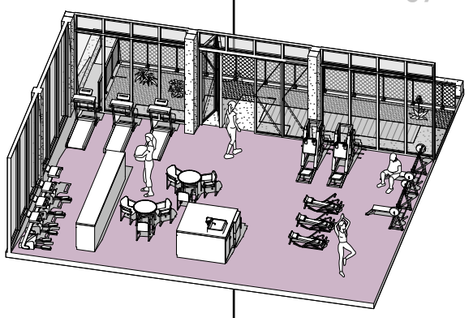
PROGRAMMATIC TYPOLOGIES AND USERS

student

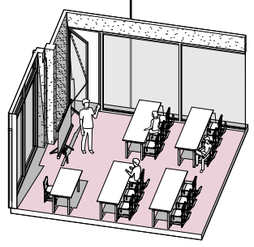
library



gym

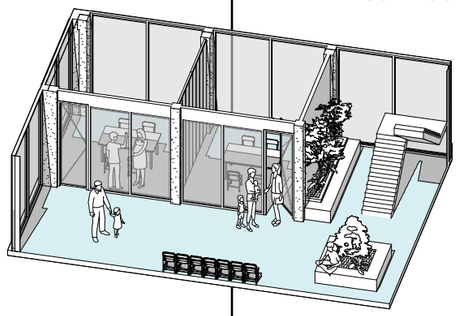


class

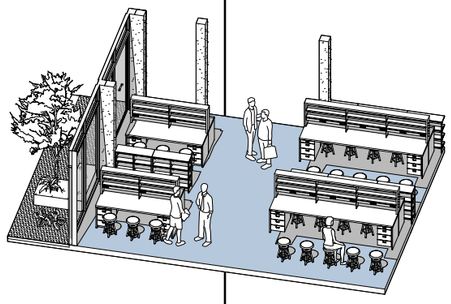


community member

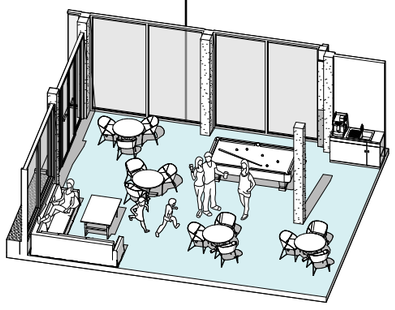
service



makerspace

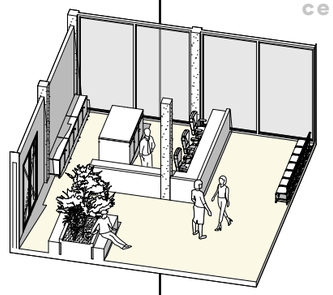


living room

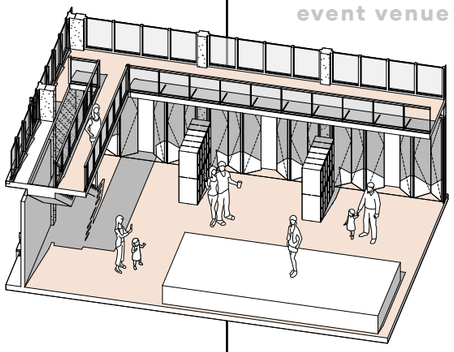


visitor/tourist

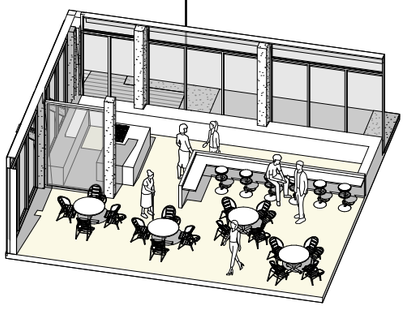
information centre



event venue

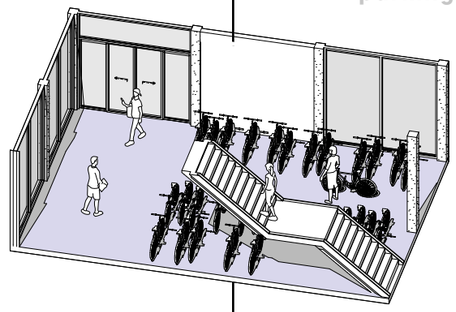


bar

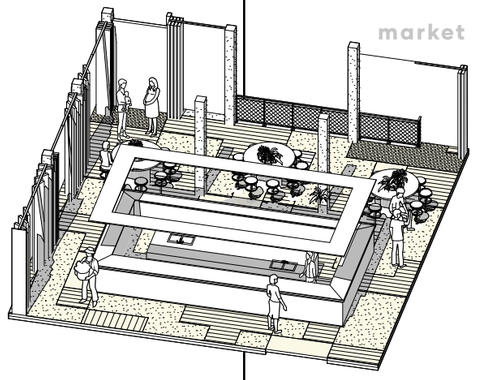


traveller/passenger

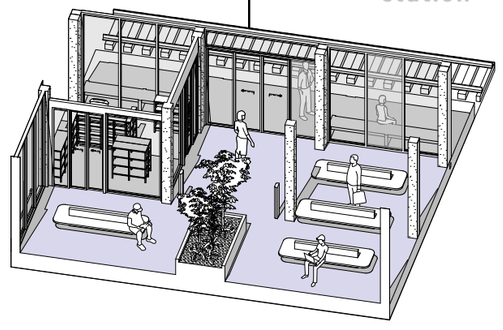
parking



market

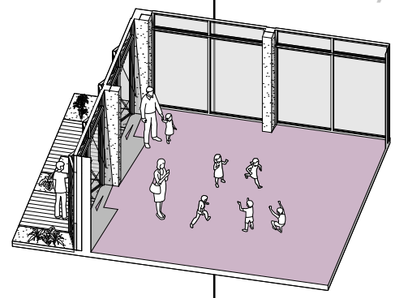


station

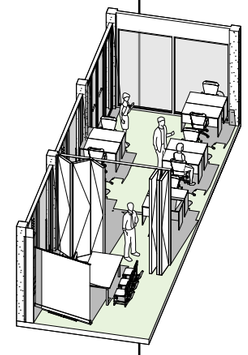


city resident

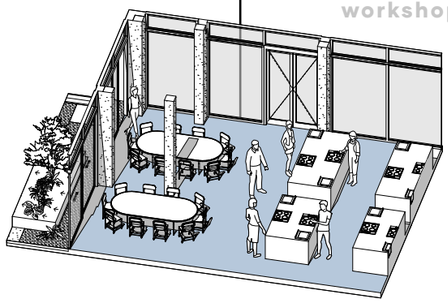
yoga



office

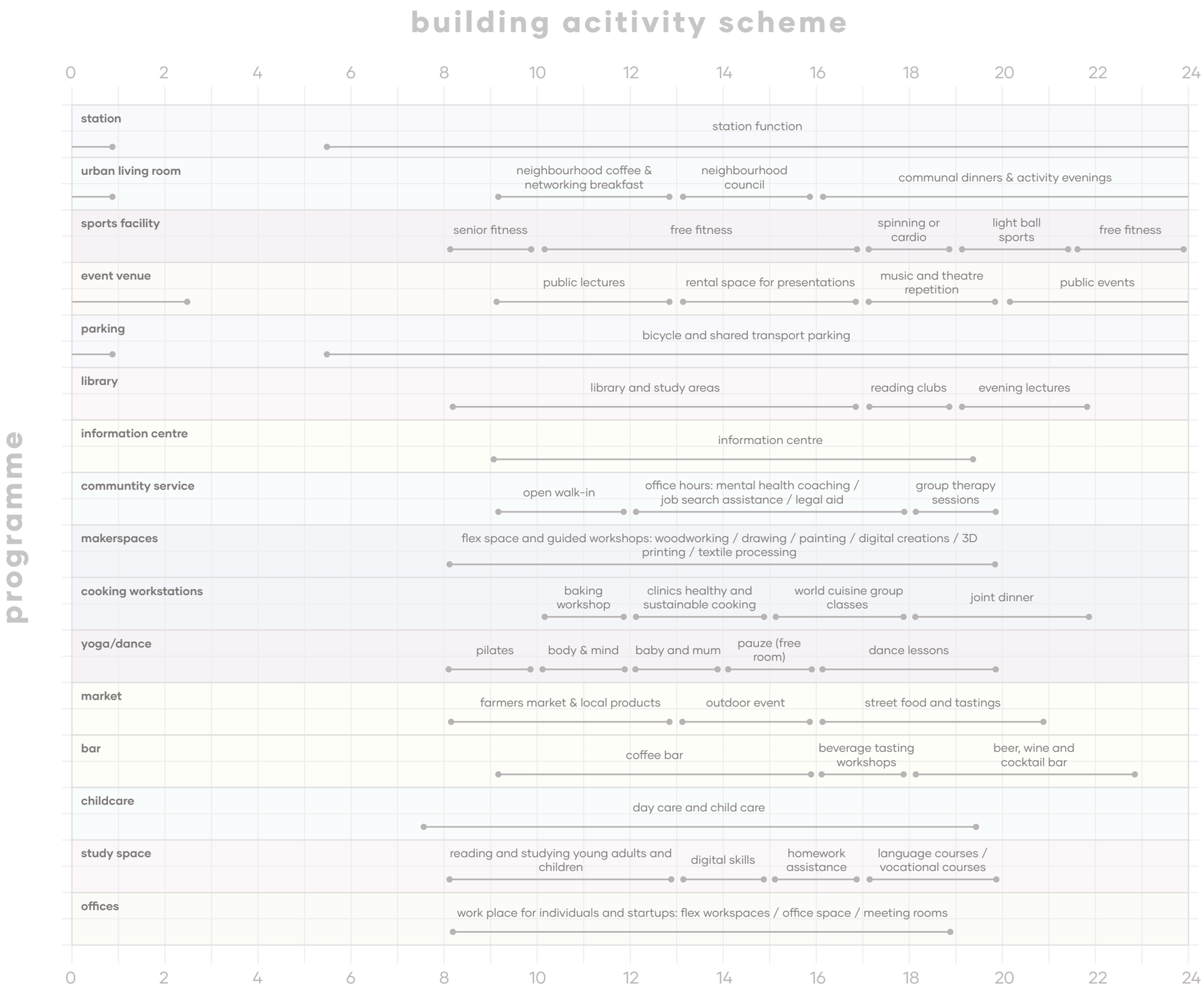


cooking workshop



SPACE USAGE

ACTIVITY PROGRAMME SCHEDULE



TYPES OF USERS

USER INTERACTION

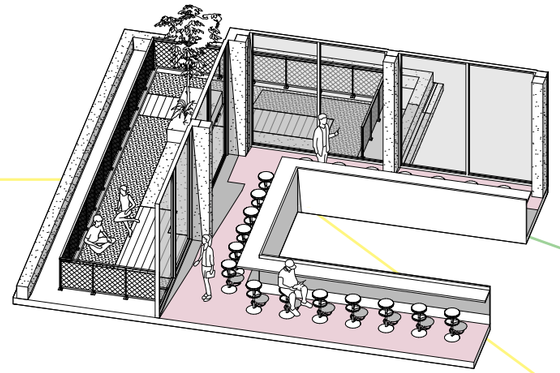
community member

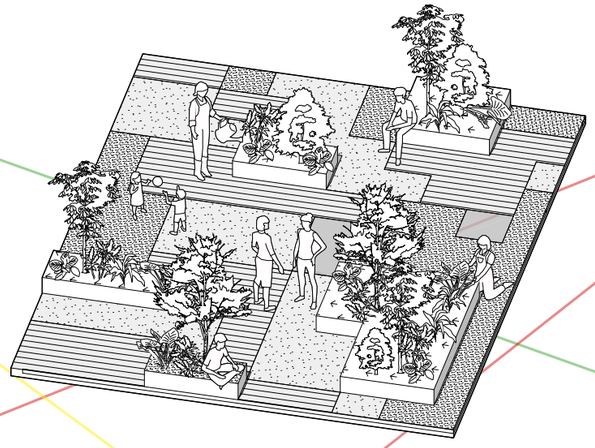
city resident

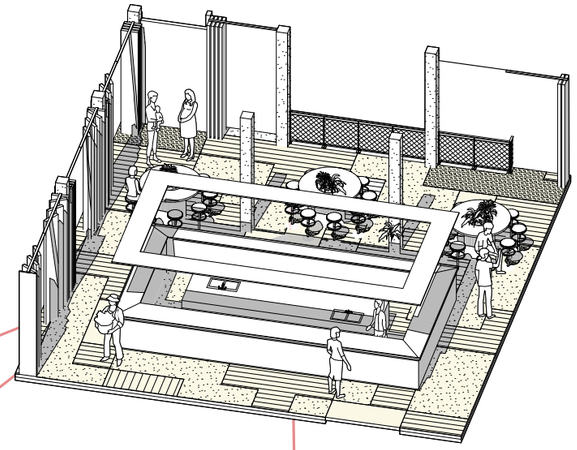
visitor/ tourist

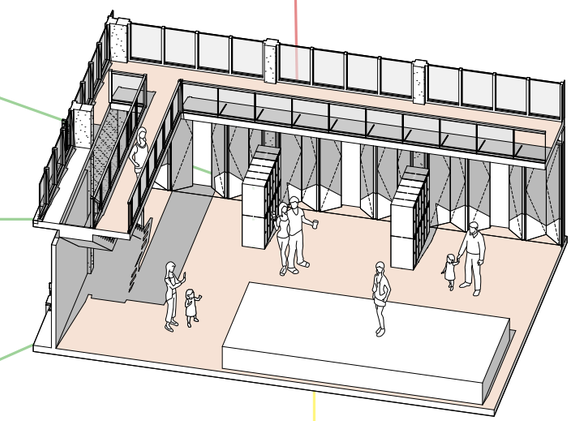
urban park

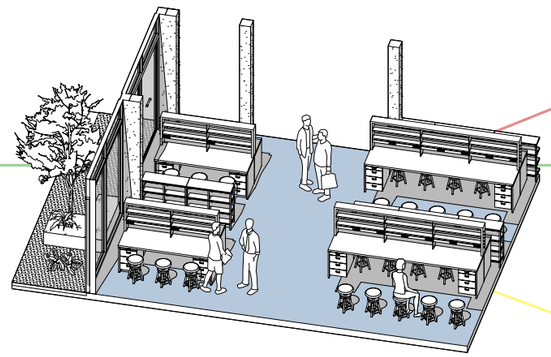
interior street

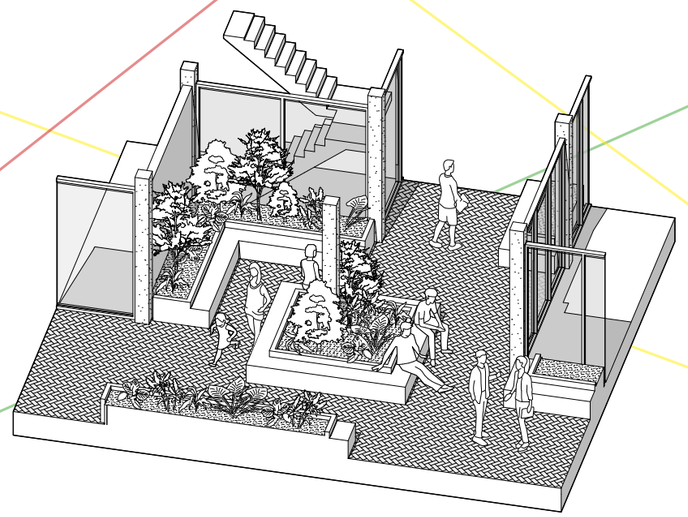


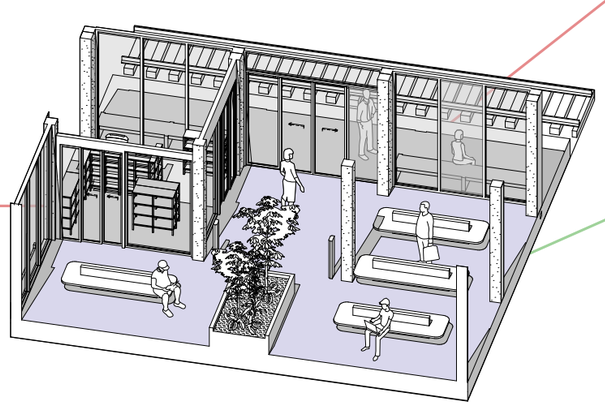


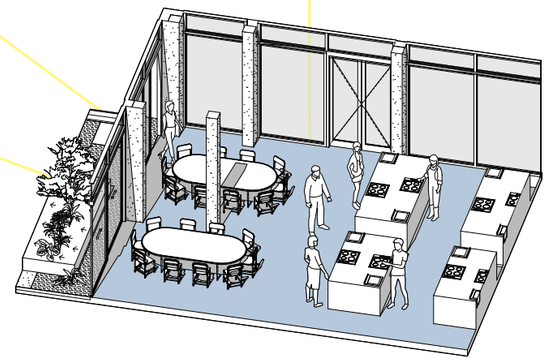












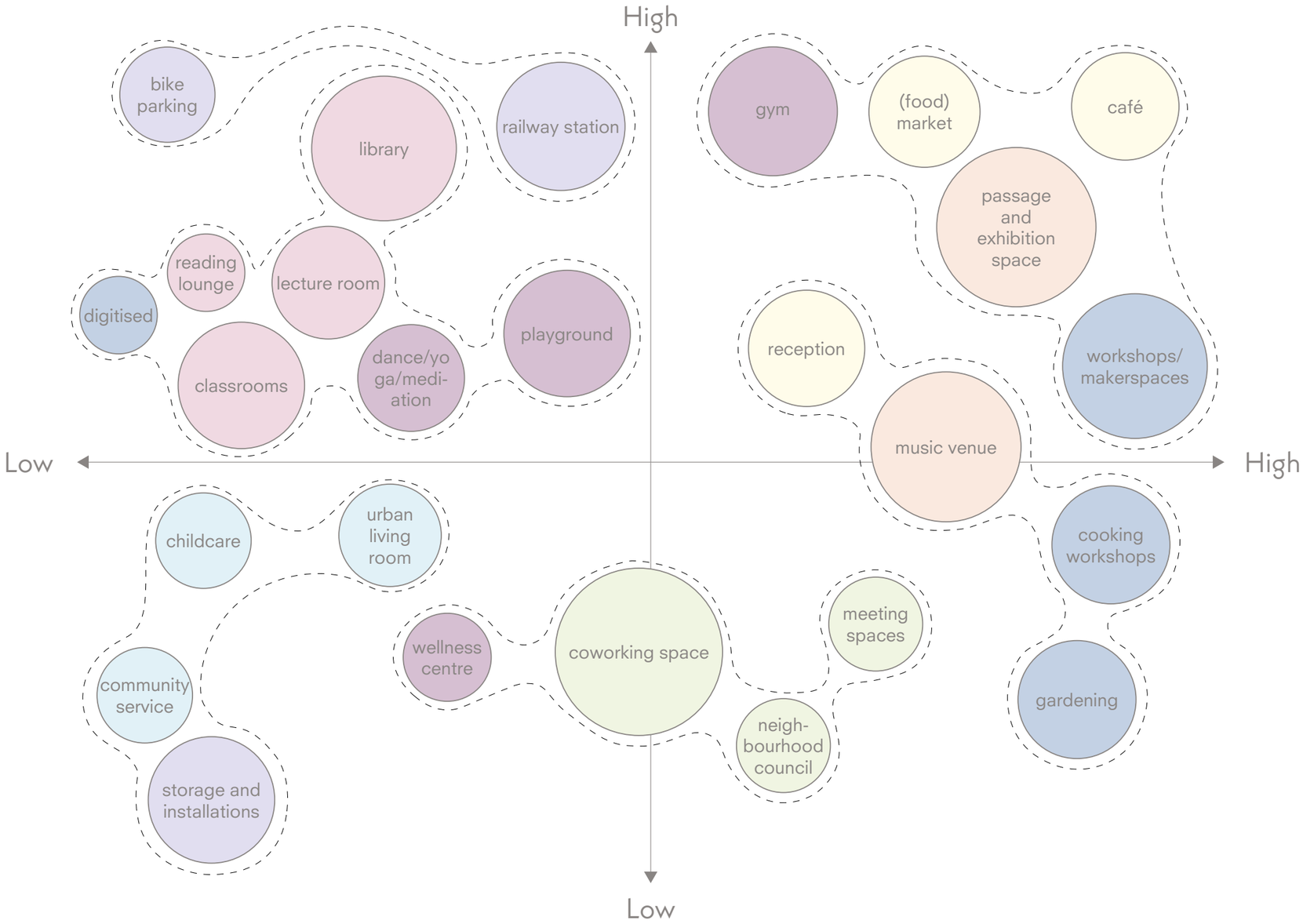
SPACE RELATIONS

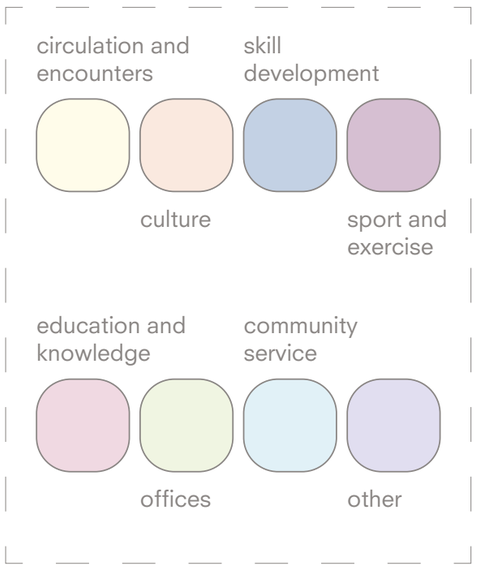
vertical

Level of publicness or privateness: This indicates whether the space is designed for local neighborhood use or broader city-wide engagement.

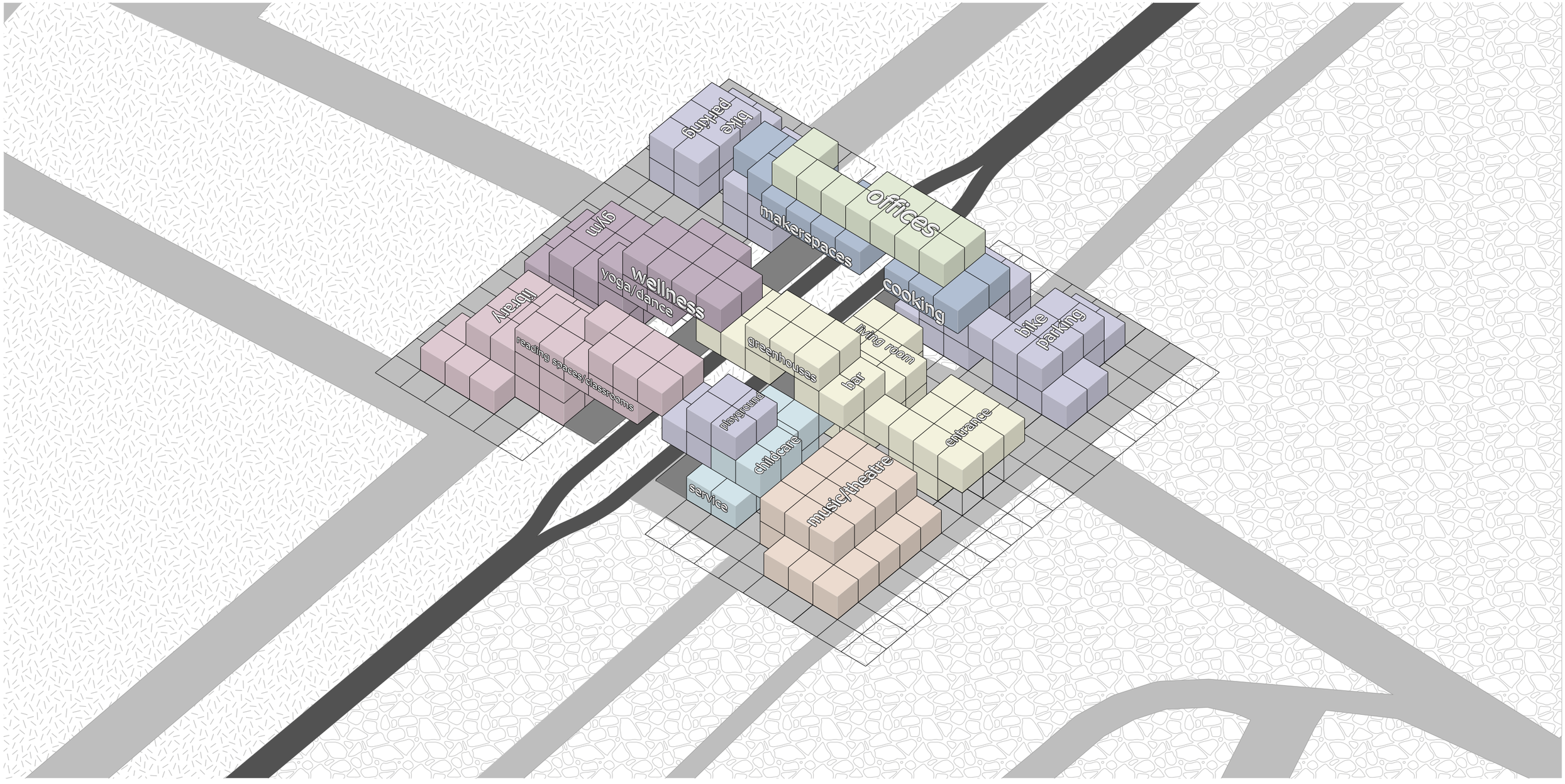
horizontal

Desire for circulation and interaction: This reflects the intention to allow circulation and stimulate interaction, shaping the space as a quiet area or a centre for spontaneous gatherings.



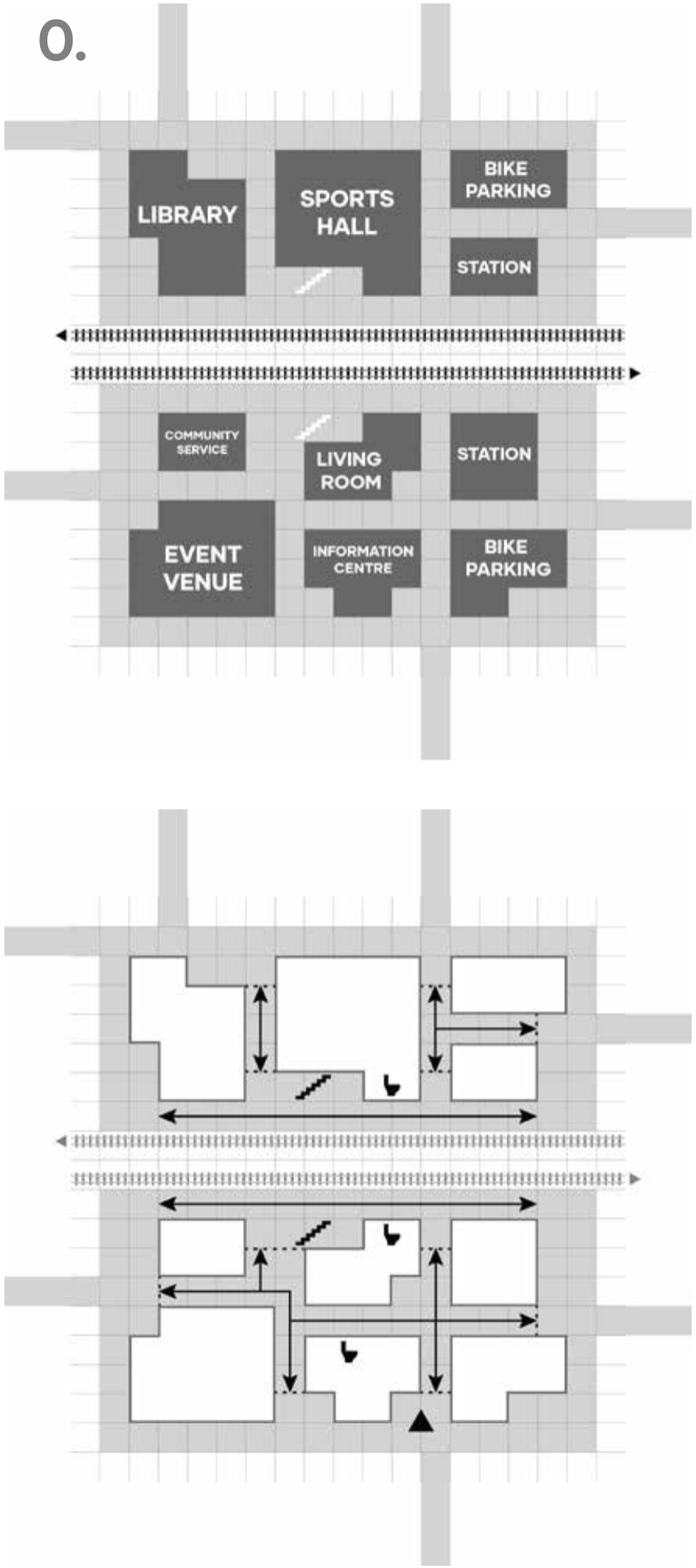


BUILDING MASS EXPLORATION



PLANS SIMPLIFIED

0.



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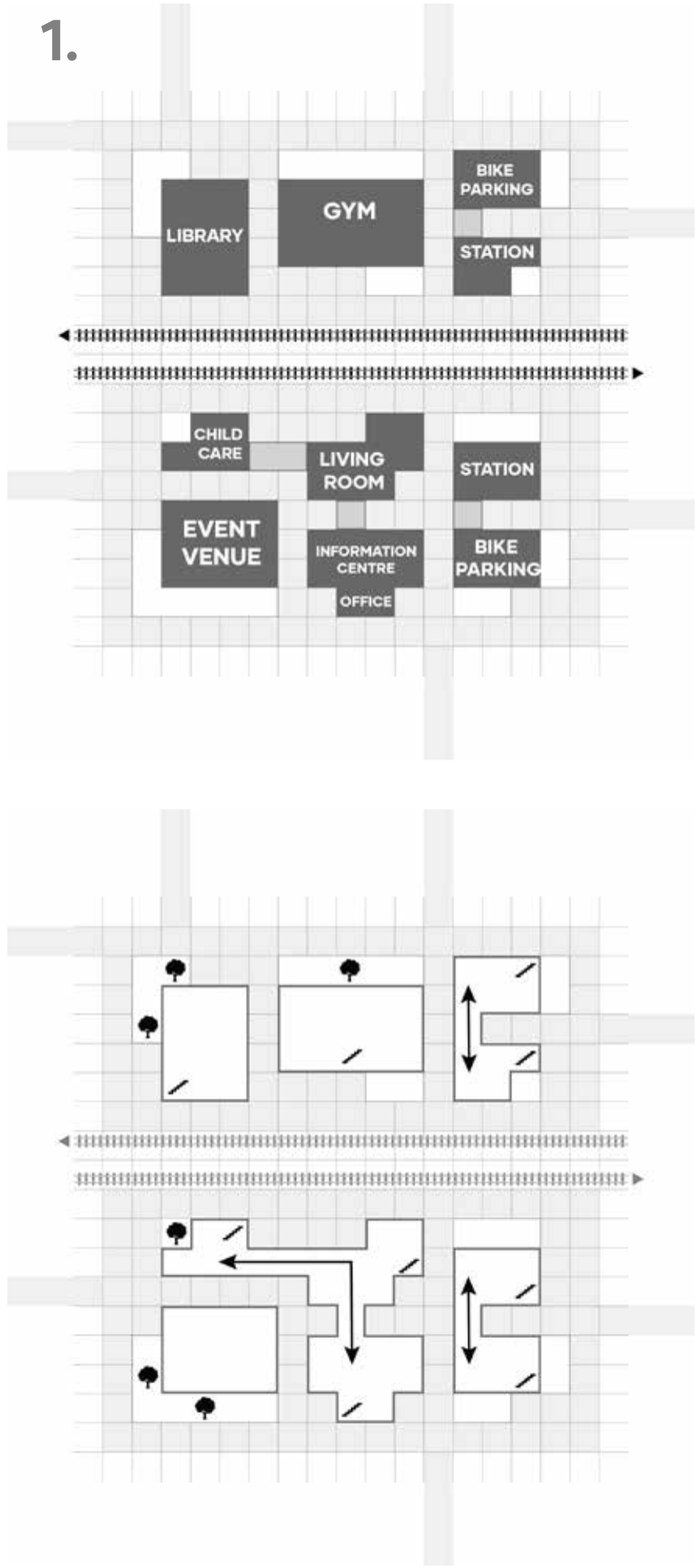

PLANS SIMPLIFIED

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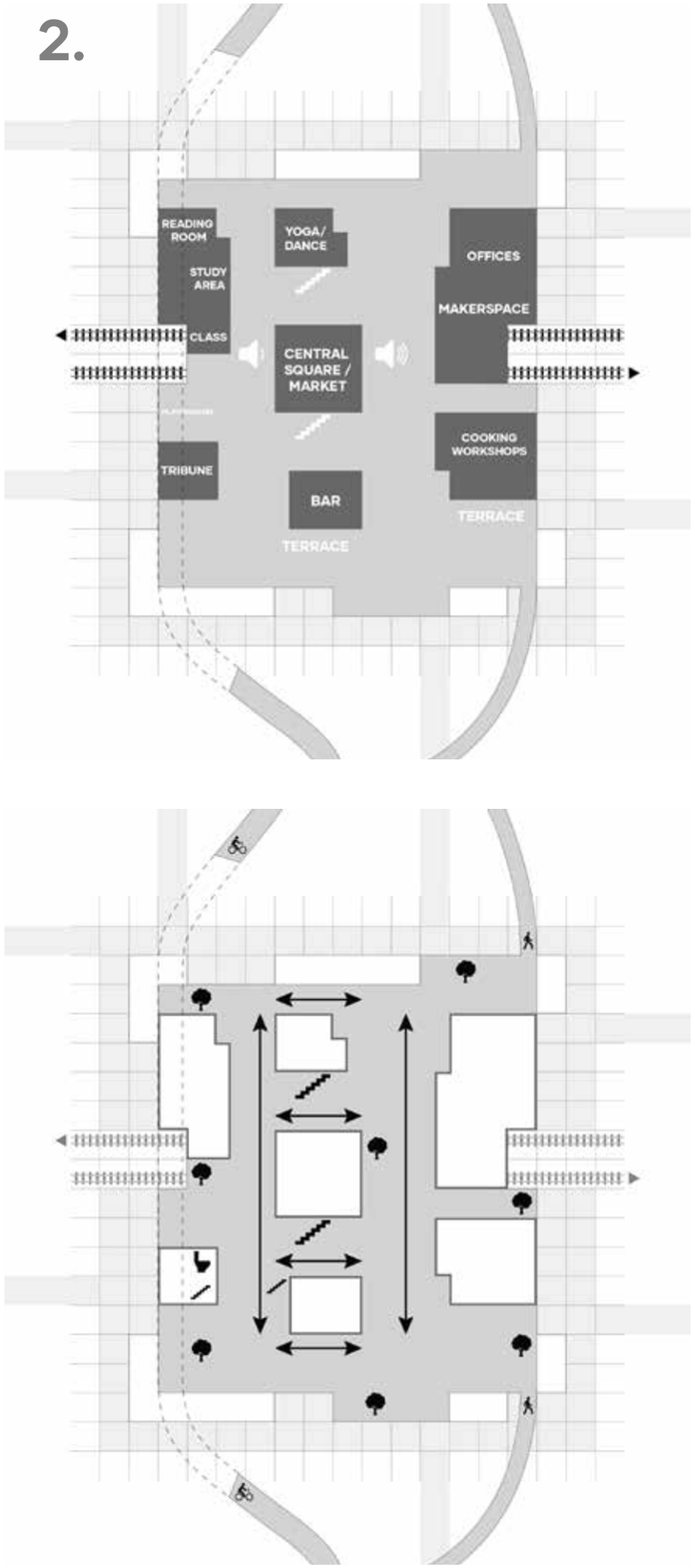

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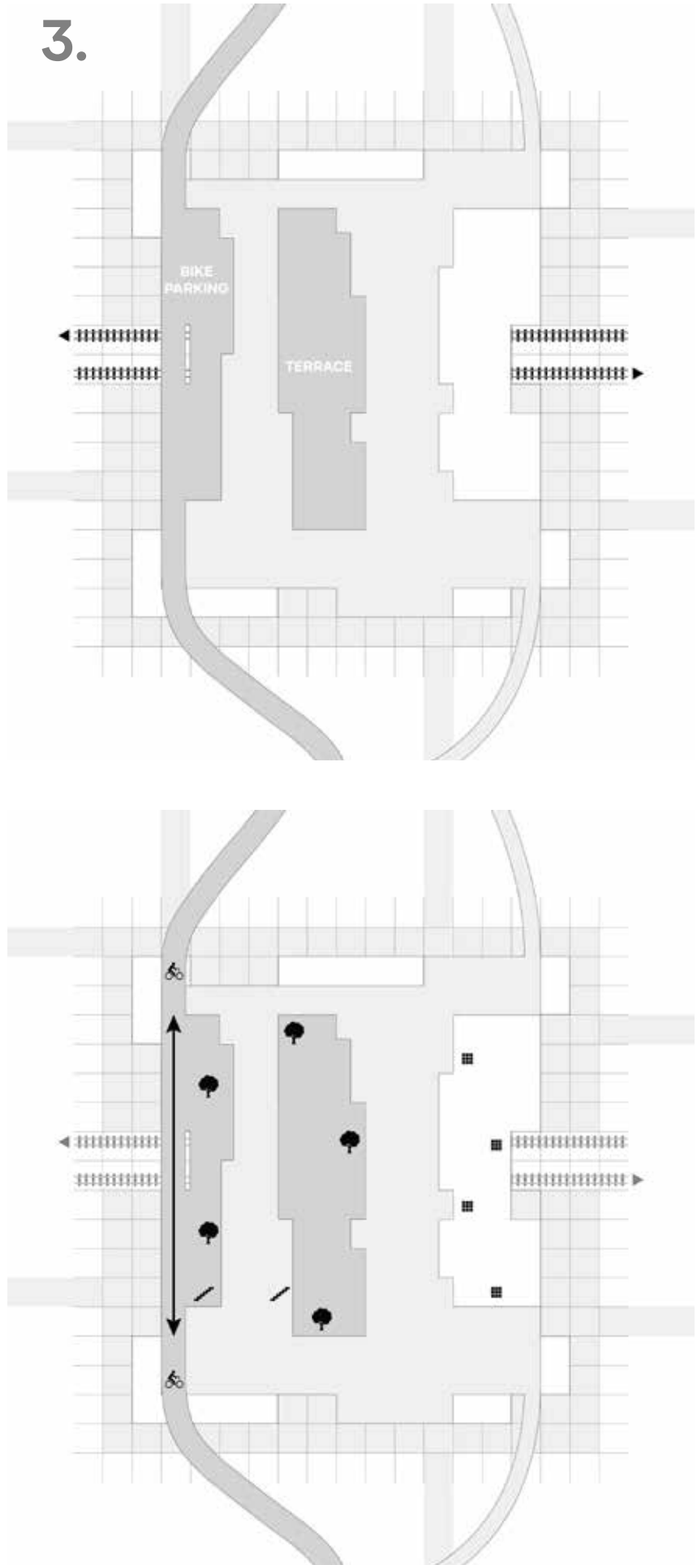
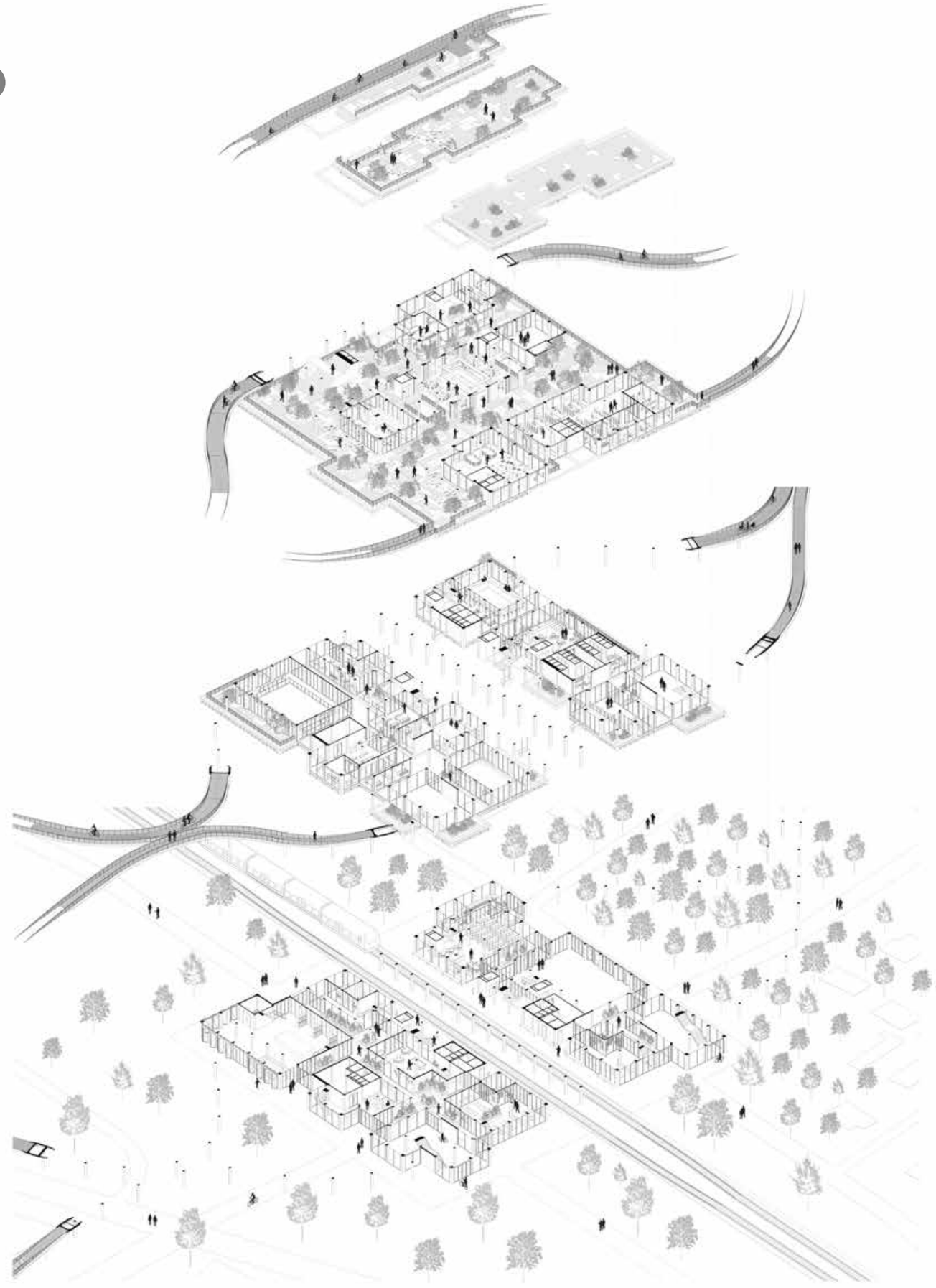


BUILDING AXO

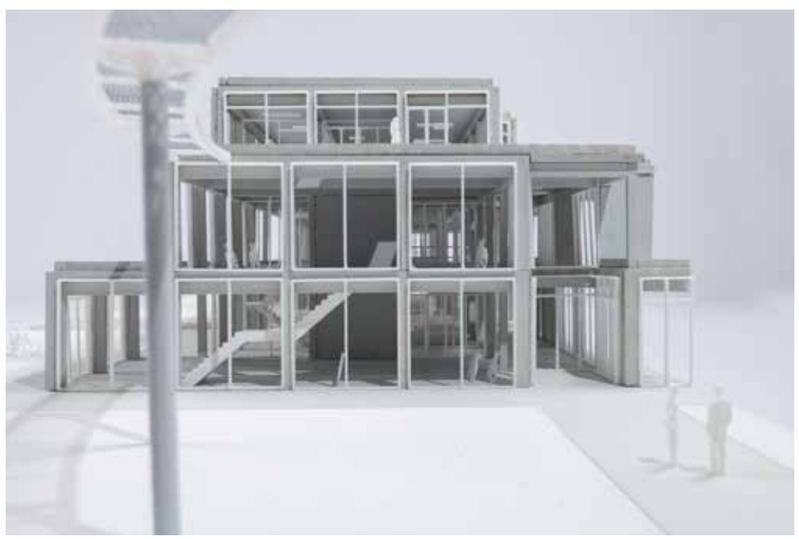


PHYSICAL MODEL

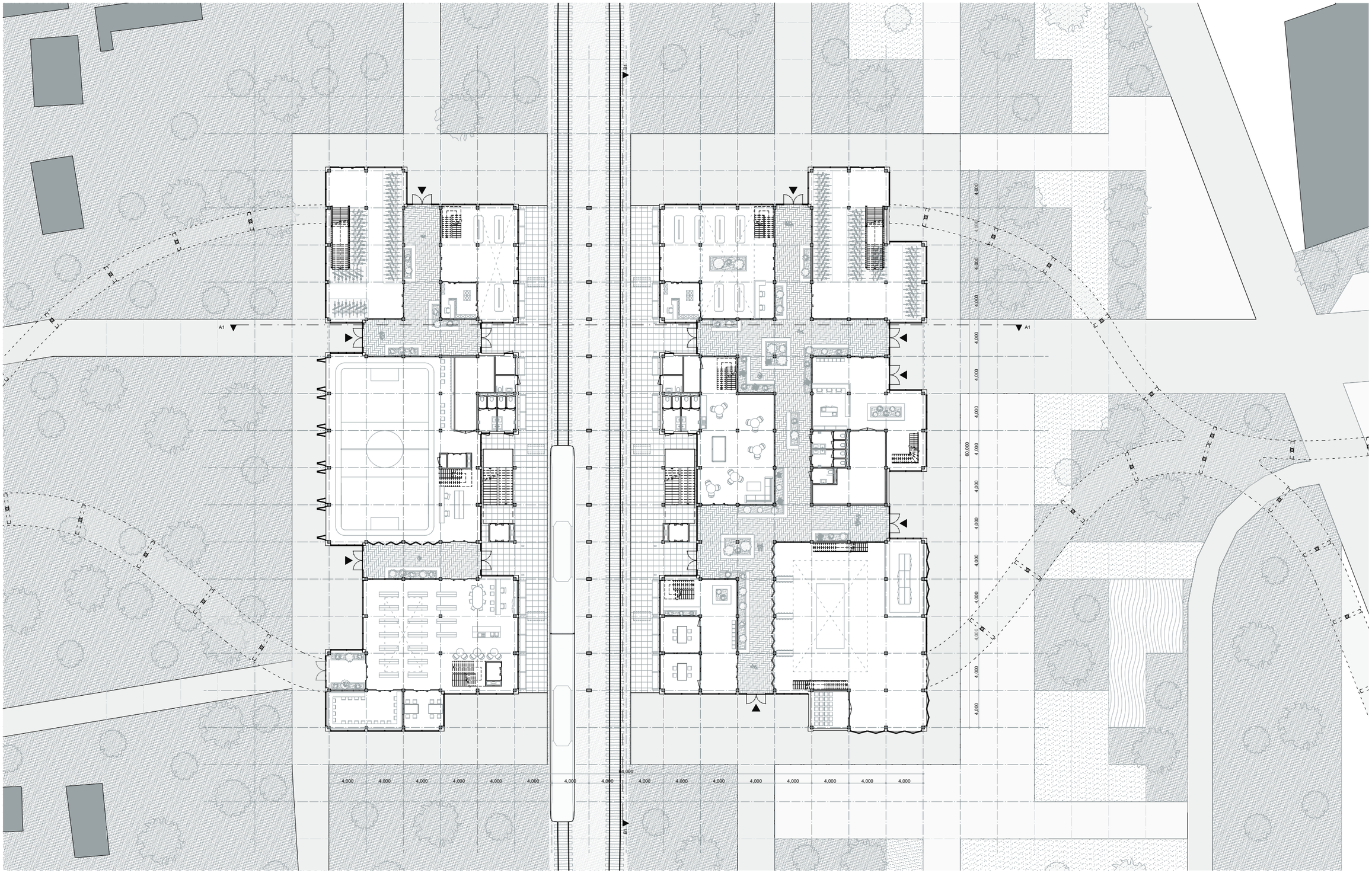








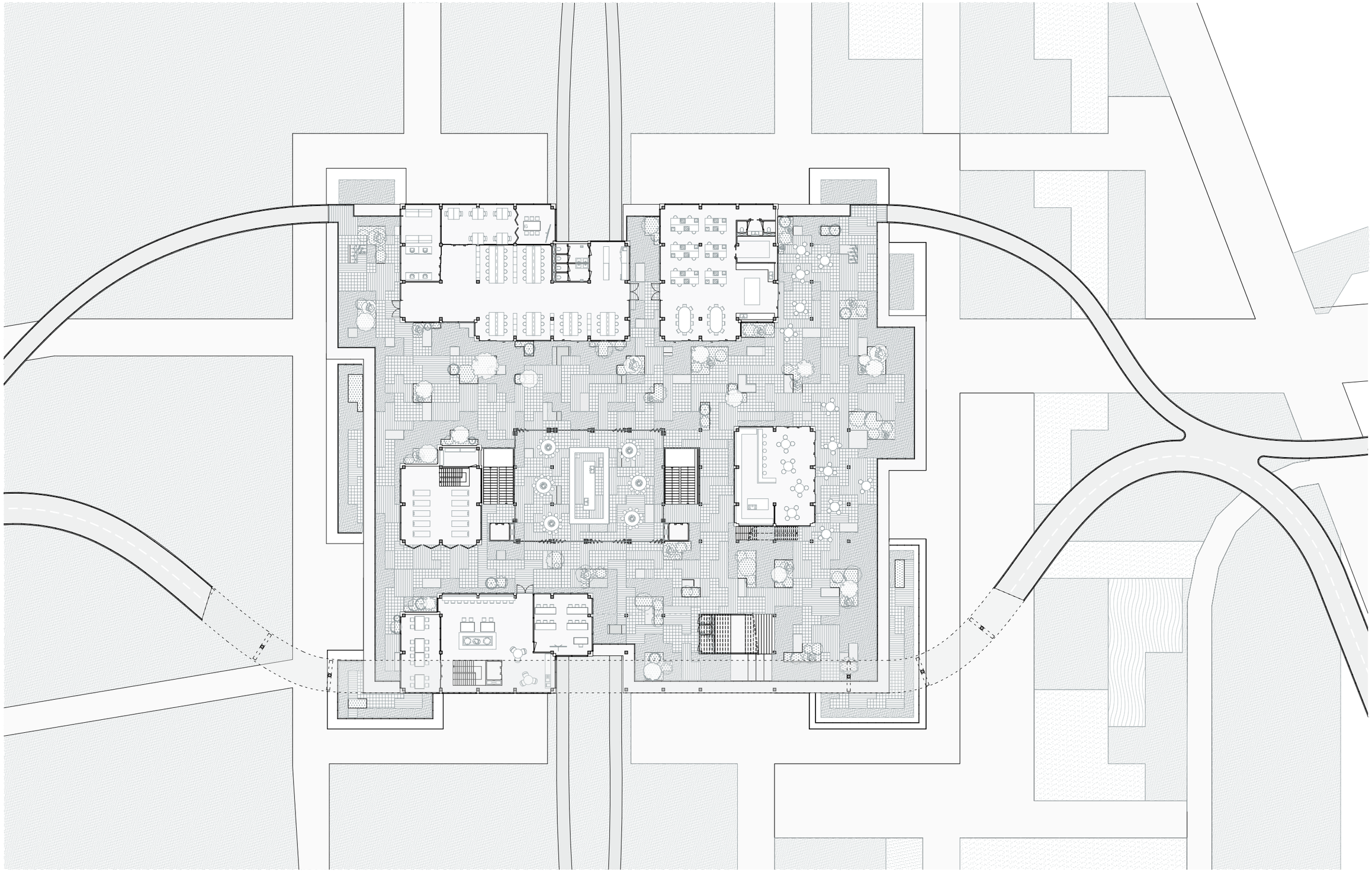
GROUND FLOOR PLAN



GROUND FLOOR IMPRESSION

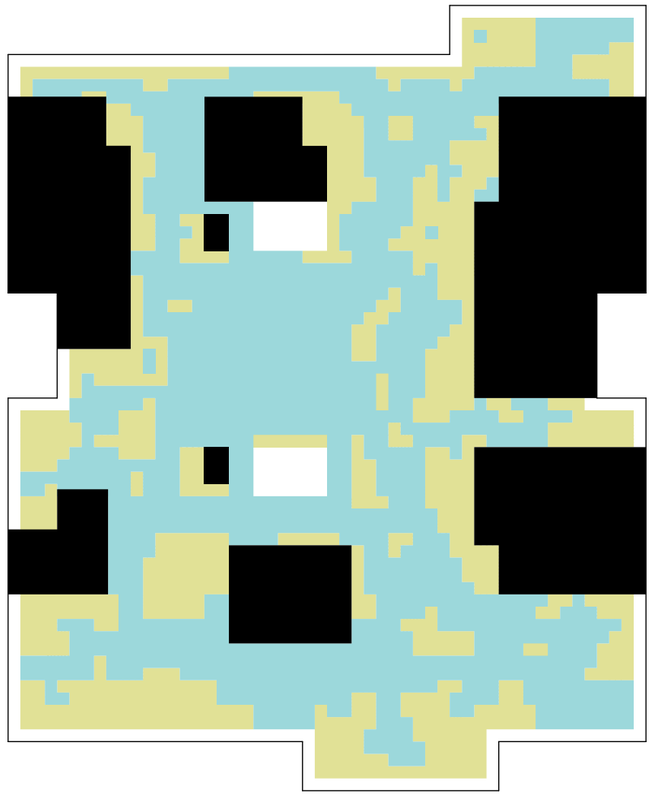


SECOND FLOOR PLAN

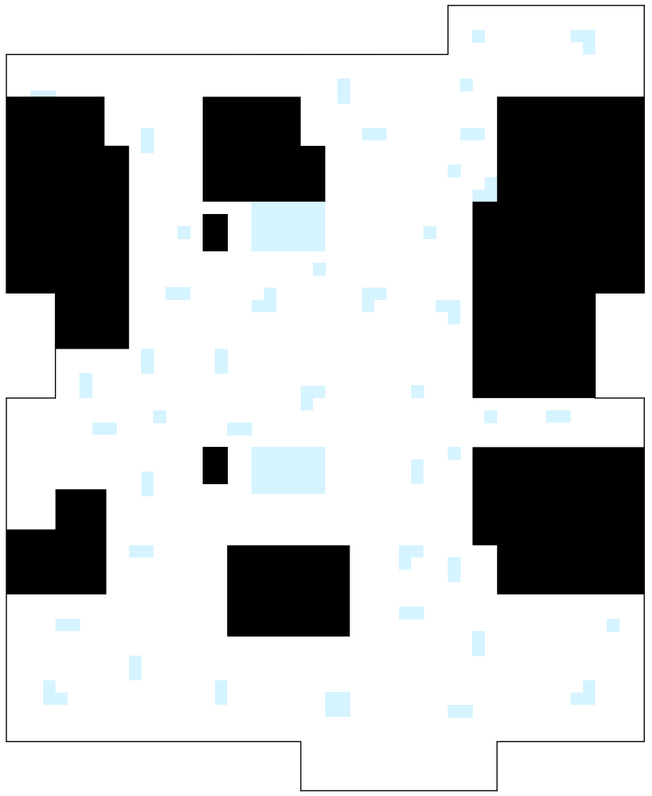


SECOND FLOOR

THE ROOF AS THE FIFTH FACADE







hardened area

soft area

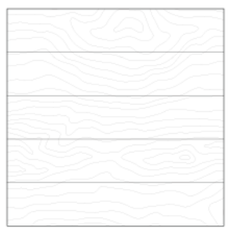
recreational green

vegetation

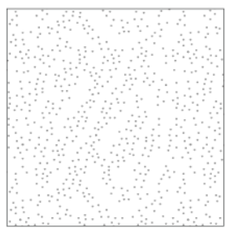
voids for light and visual comfort



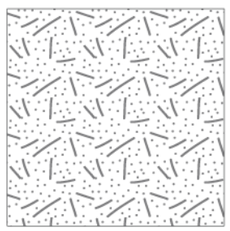
concrete tiles m²



wooden decking m²



green m²



vegetation m²



void m²

FF	34	37	165	10	x
SF	525	593	509	175	128
ROOF	106	95	730	54	82
TOTAL	665	725	1404	239	210

SECOND FLOOR

NON-HUMAN OCCUPANTS & BIODIVERSITY




Springtails (Collembola)


Harvestmen (Opiliones)


Ground beetle (Carabus nemoralis)


Bush-crickets (Tettigoniidae)


Grove snail (Cepaea nemoralis)


Small white (Pieris rapae)


Swallowtail butterfly (Papilio machaon)


Lesser Purple Emperor (Apatura ilia)


House sparrow (Passer domesticus)


Blackbird (Turdus merula)


great spotted woodpecker (Dendrocopos major)


Little Owl (Athene noctua)


Ants (Lasius niger)


Garden Cross Spider (Araneus diadematus)


Ladybird (Coccinella septempunctata)


Hoverfly (Syrphus ribesii)


Meadow butterfly (Maniola jurtina)


Honey bee (Apis mellifera)


Wool carder bee (Anthidium manicatum)


Common Lizard (Zootoca vivipara)


Coal Tit (Periparus ater)


Robin (Erithacus rubecula)


Common pipistrelle bat (Pipistrellus pipistrellus)


Red Squirrel (Sciurus vulgaris)

Sources:
https://arter.dk/landing-page
https://www.greenrooforganisation.org/
https://efb-greenroof.eu/

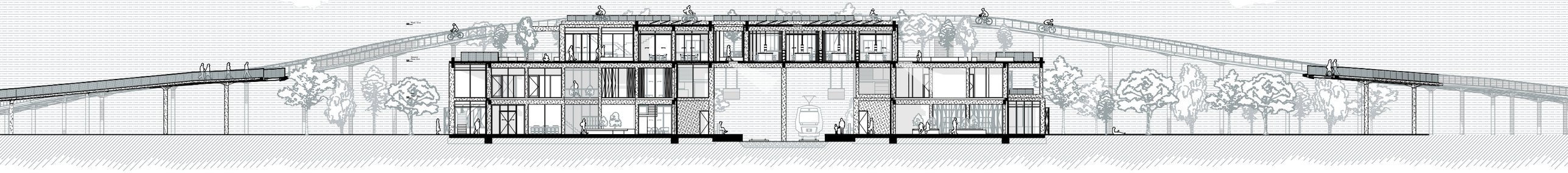
SECOND FLOOR IMPRESSION



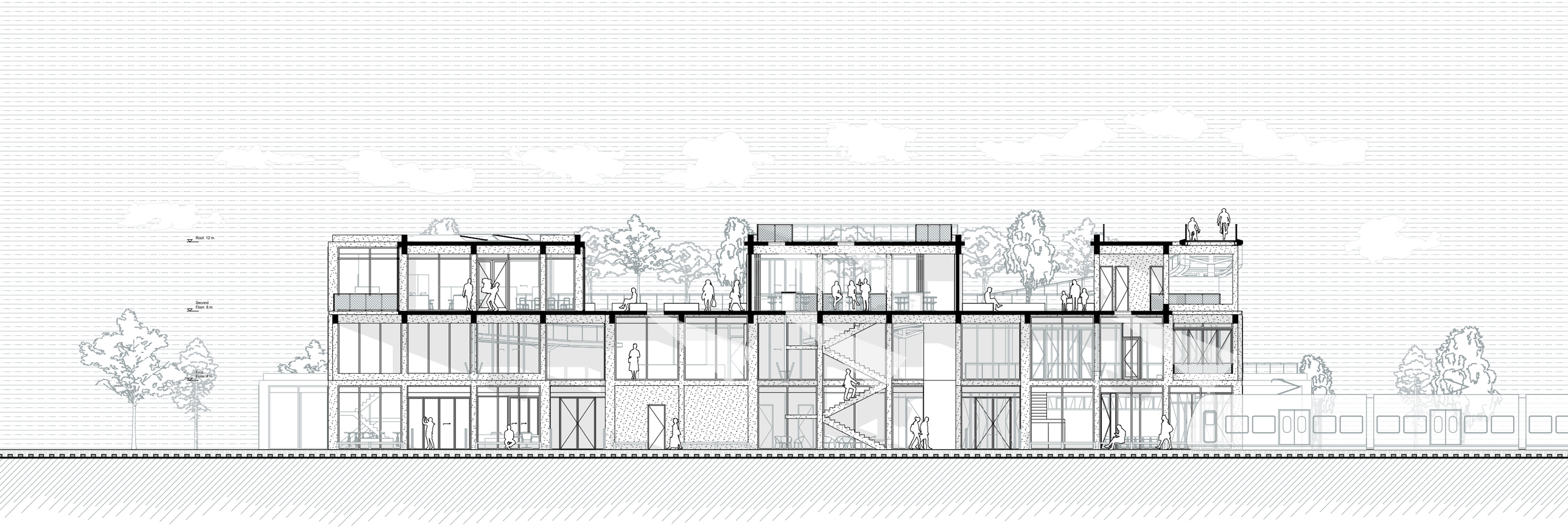
SECOND FLOOR IMPRESSION



SECTION A1



SECTION B1



TRAIN PLATFORM IMPRESSION



TRAIN PLATFORM IMPRESSION



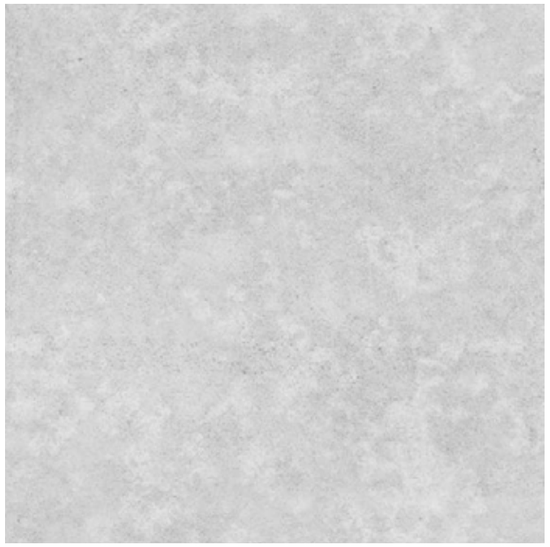
MATERIALS



glass



polycarbonate

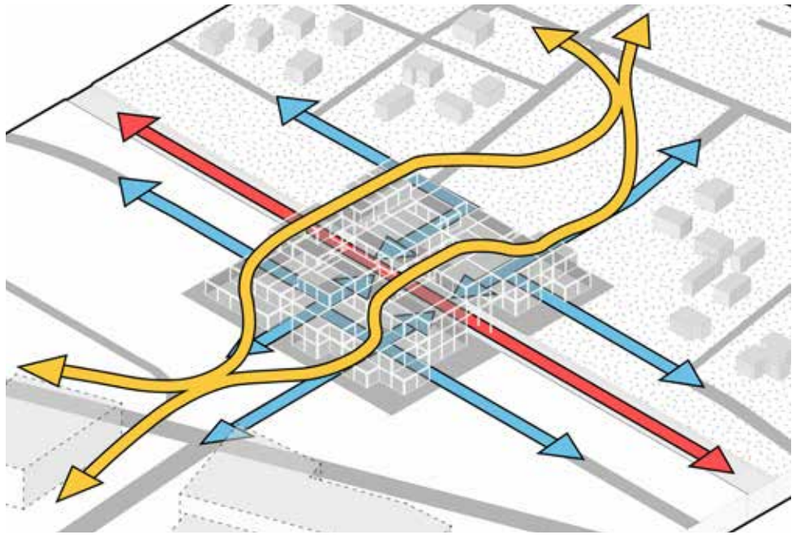


concrete / fiber cement panel

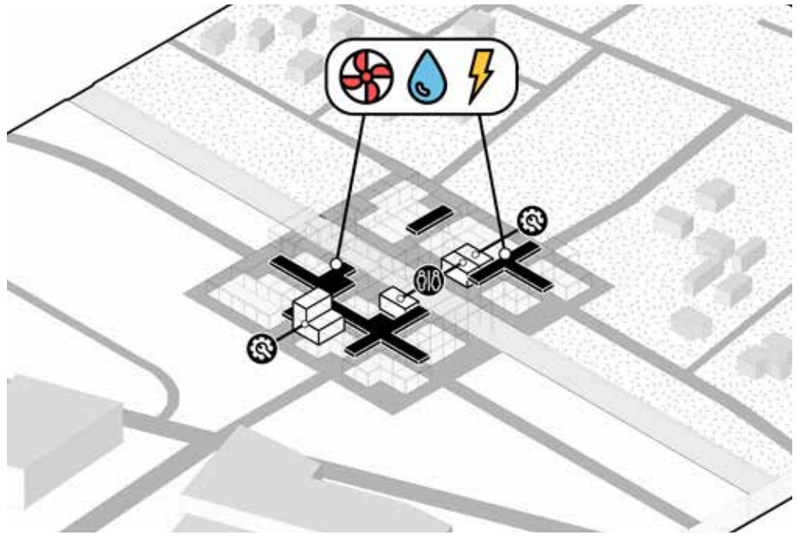


aluminium

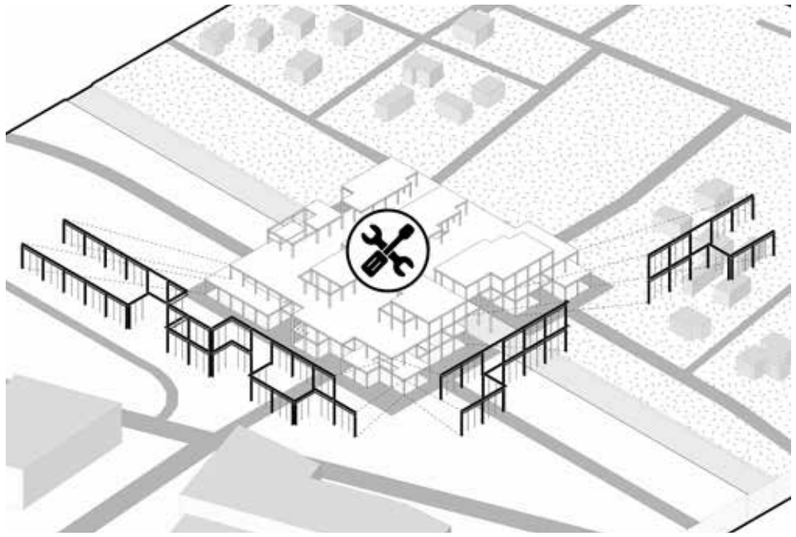
PRINCIPLES



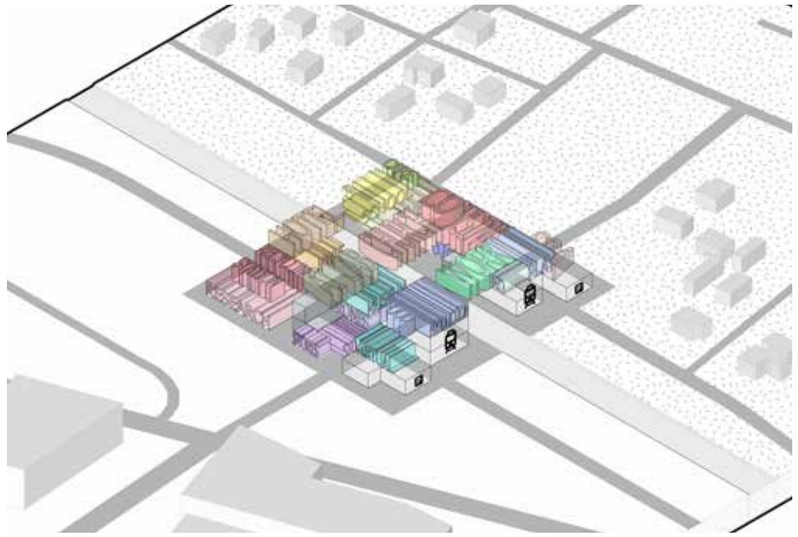
urban intervention, a mobility node



service core, serving space



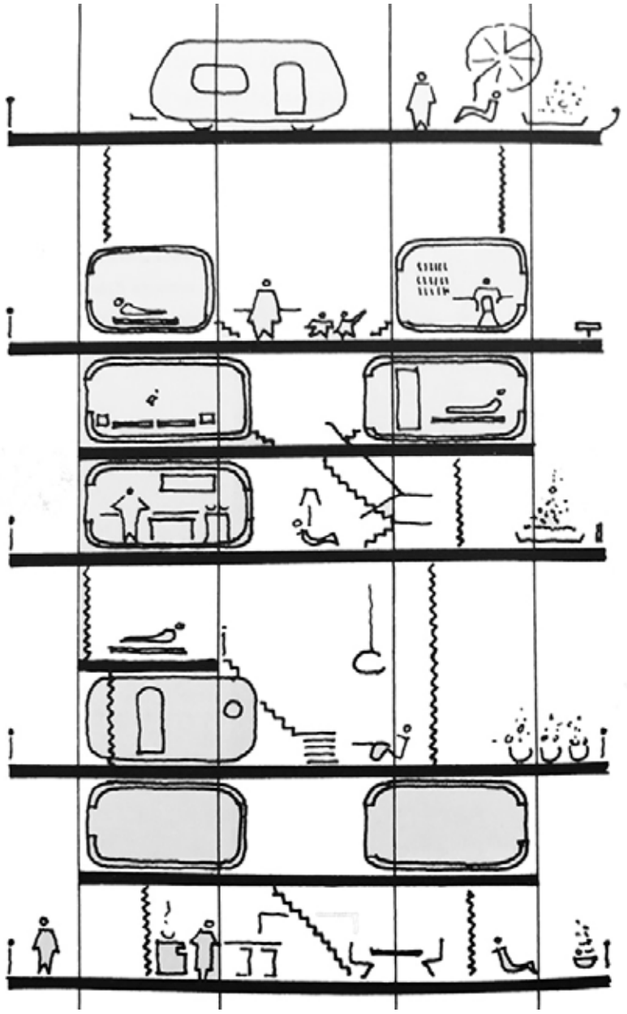
long-term structure, demountable façades



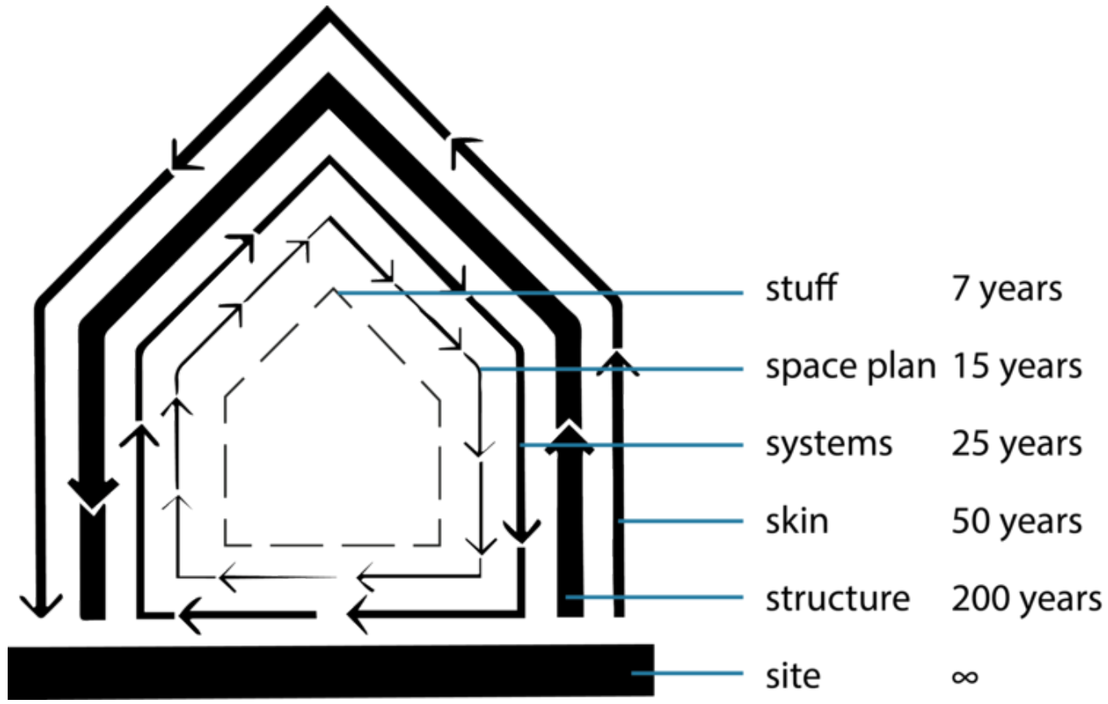
timeless facility, future function change

OPEN BUILDING REFERENCES

Support-infill
(1963) John Habraken

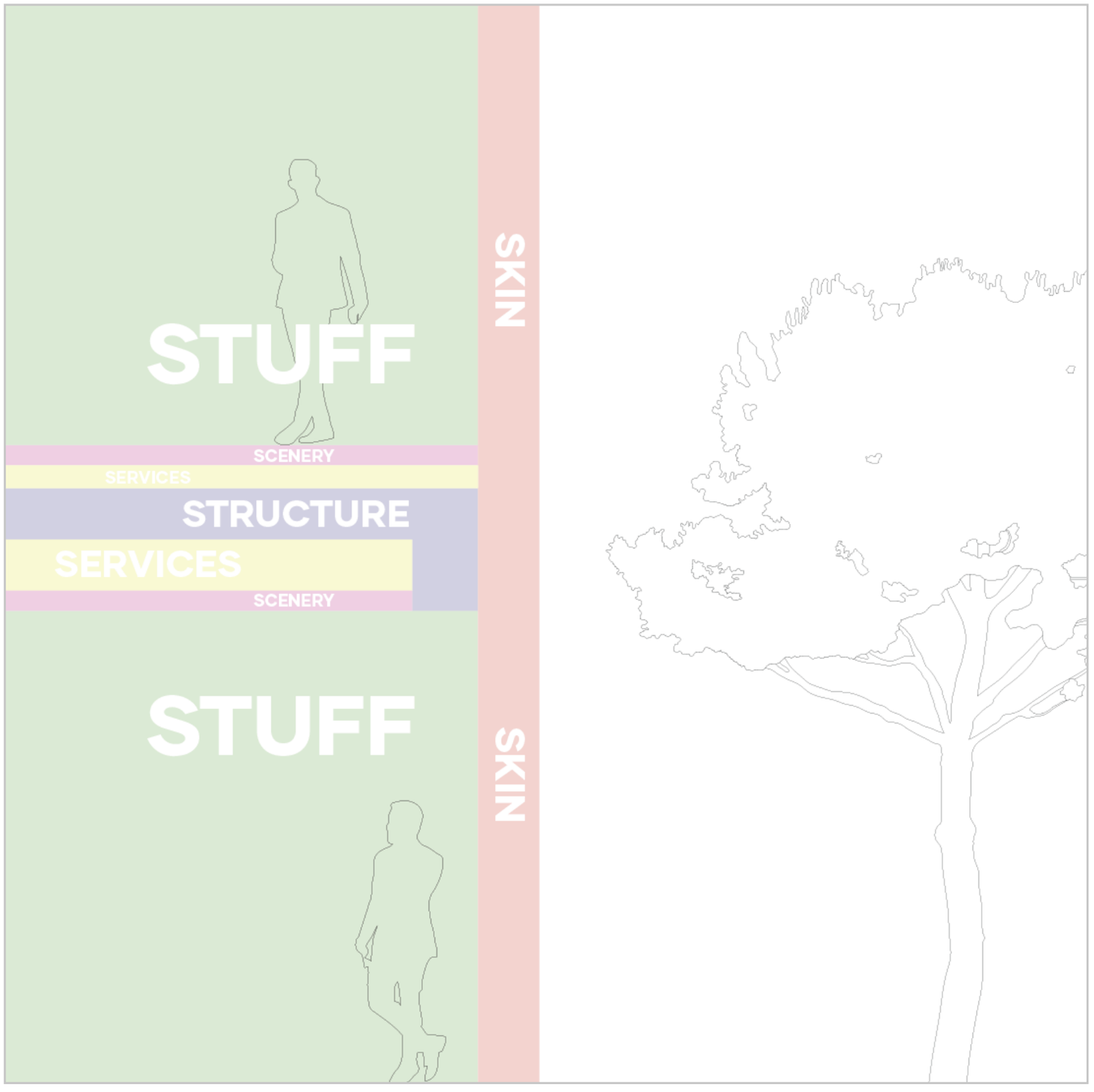


Shearing Layers of Change
(1994) Stewart Brand

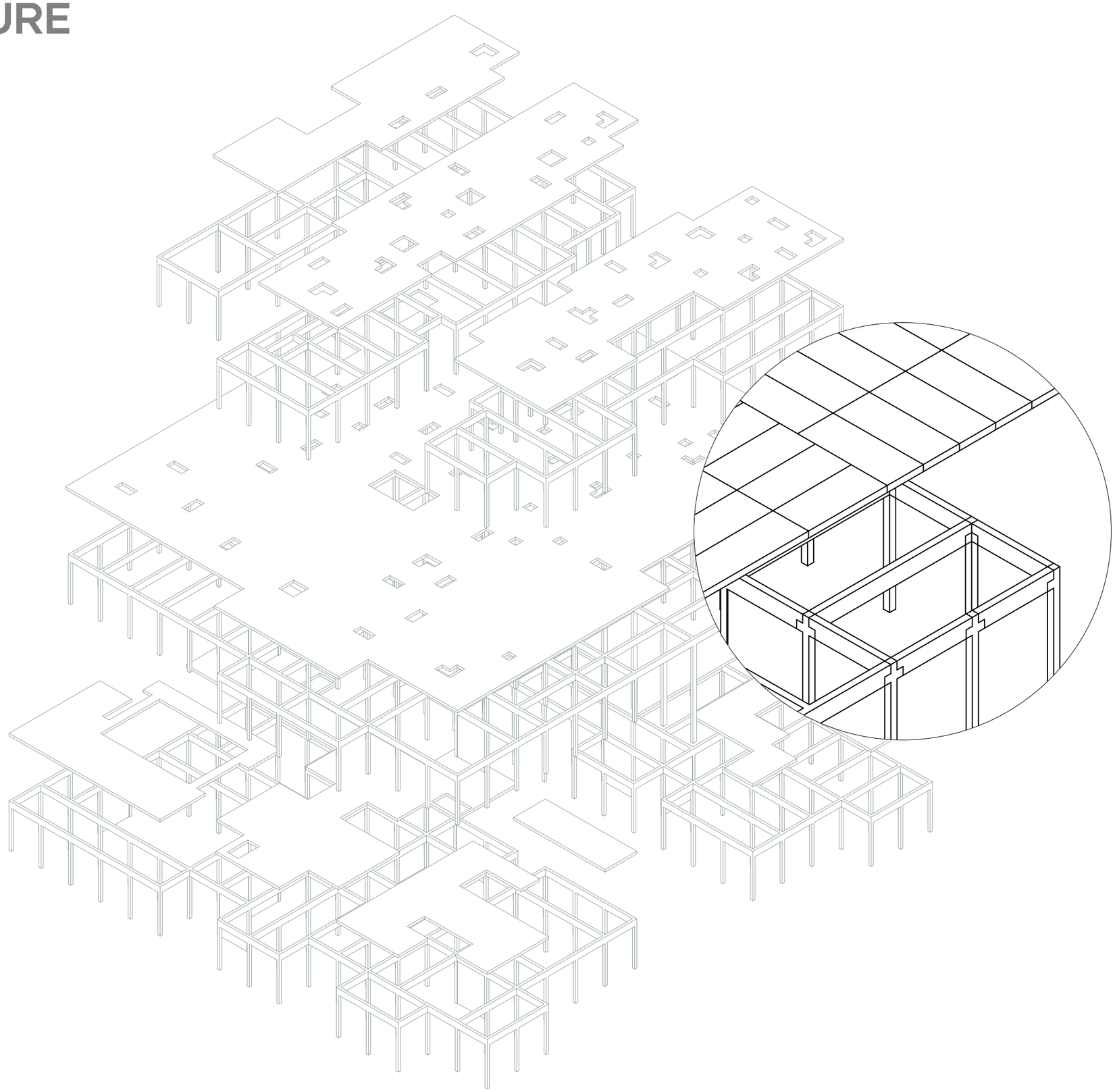


OPEN BUILDING DESIGN APPLICATION

Principles to practice



STRUCTURE



STRUCTURE MATERIAL ORIGIN

Conscious material use

lifespan

structure = finish

thermal mass

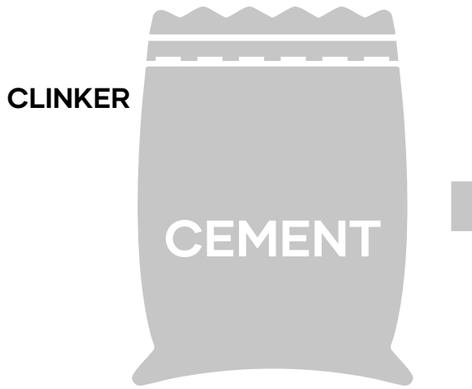
soundproofing

fire safety

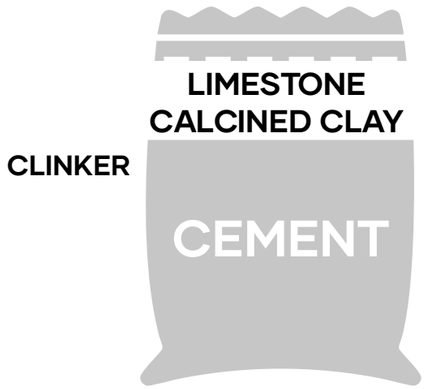
Enhancing the environmental performance

Component	Function	Implementation strategy
Cement	Binder	FUTURECEM, reducing carbon footprint
Sand & Gravel	Aggregates	Local sourcing, avoiding use of virgin materials
Reinforcement	Tensile strength	Recycled steel 90 %
Water	Reaction agent	Local grey water, avoid fresh water

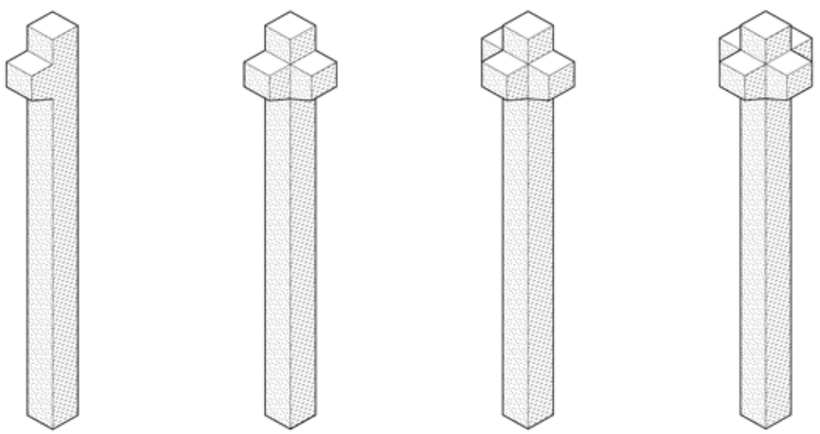
Portland cement



FUTURECEM

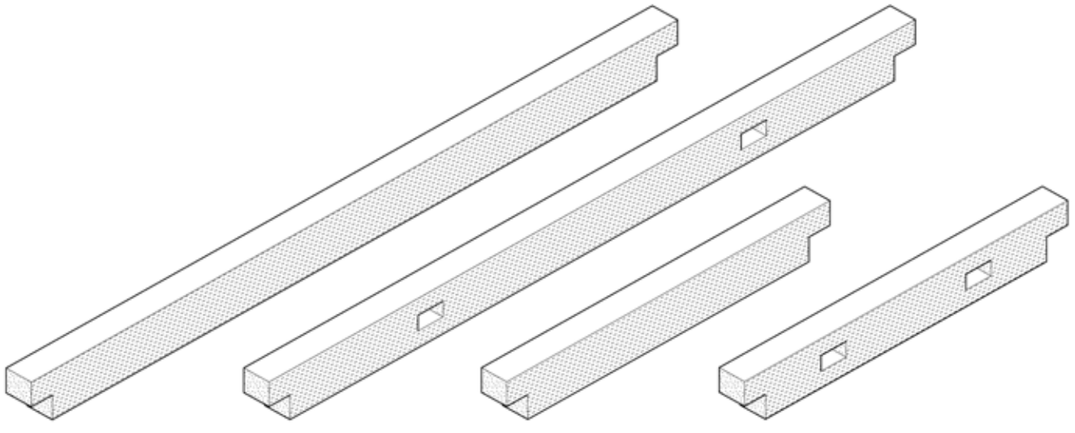


STRUCTURE CATALOGUE OF ELEMENTS

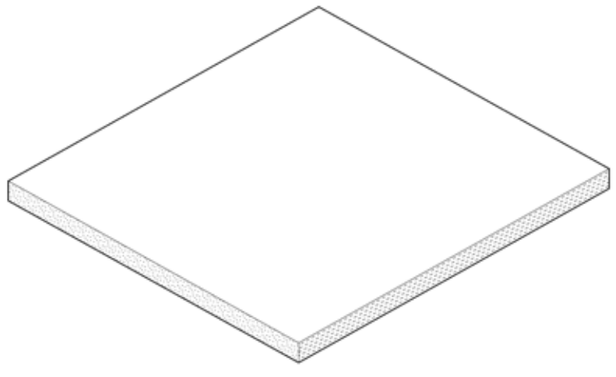


columns with consoles
length 300 mm
width 300 mm
height 4000 mm

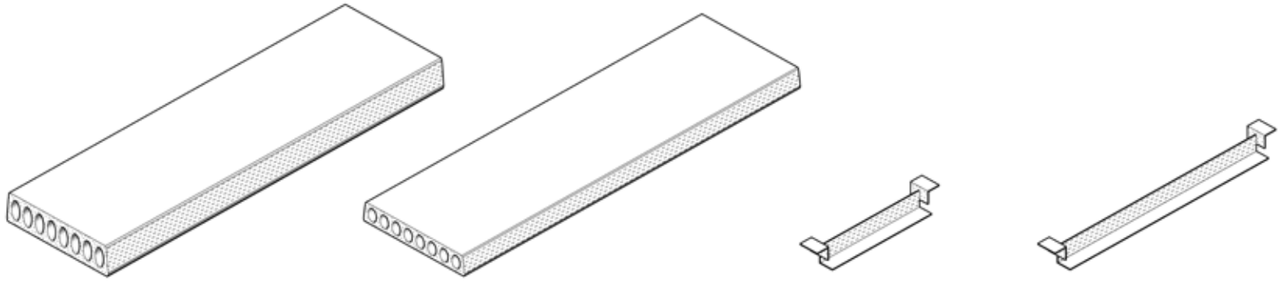




notching beams
(locally with openings for ventilation ducts)
length 4000/8000 mm
width 300 mm
height 500 mm



wall elements
length 3700 mm
width 250 mm
height 3450 mm

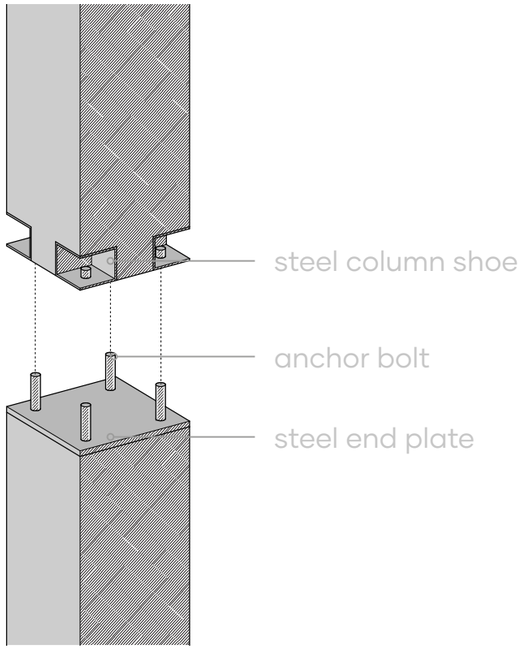


hollow-core slab
length 4000 mm
width 1200 mm
height 200/260 mm

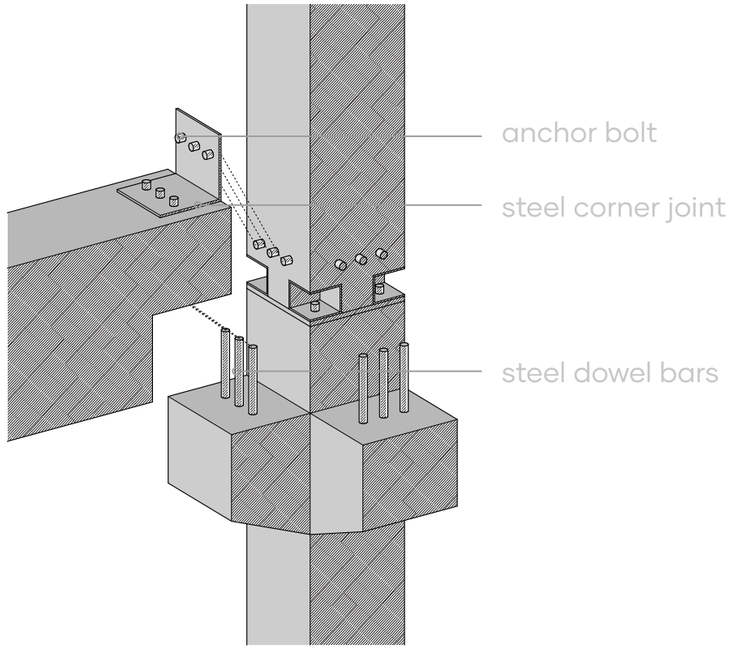
steel trimming beam
length 1200/2400 mm
width 200 mm
height 215 mm

STRUCTURE DRY CONNECTIONS

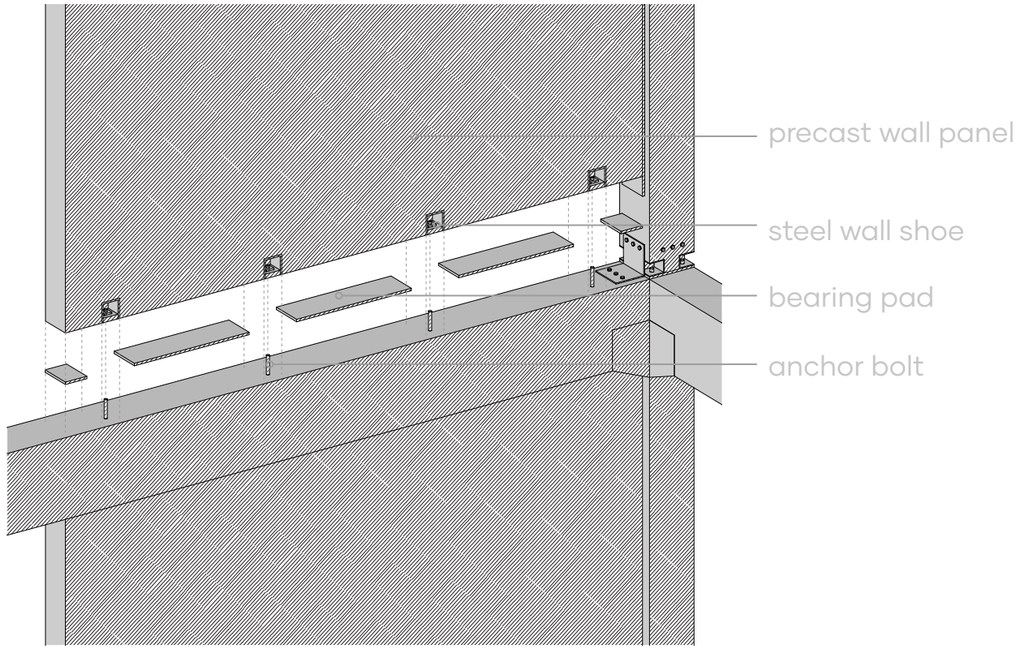
Column to column



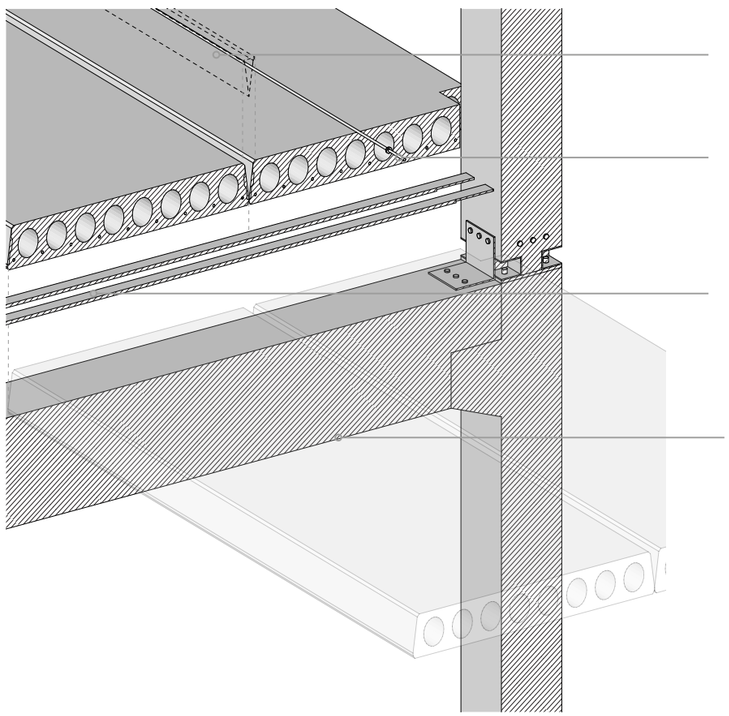
Beam to column



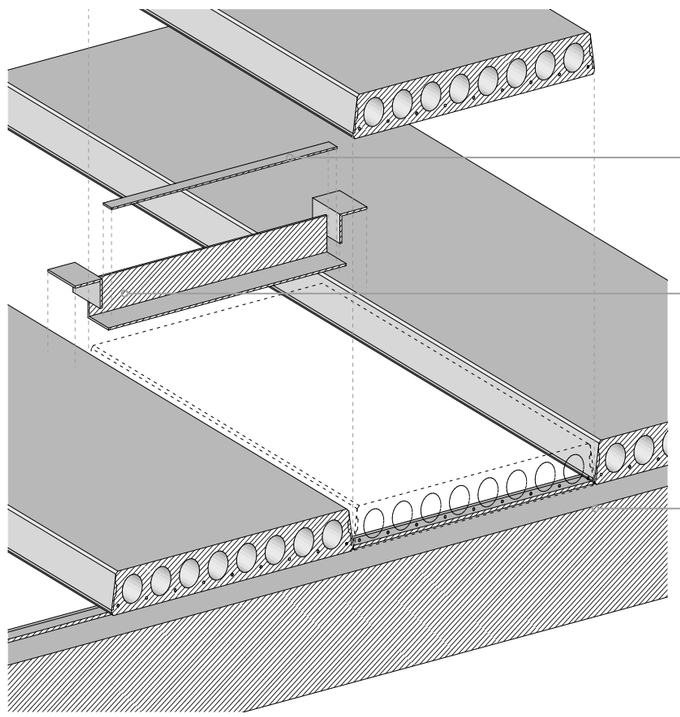
Wall to beam/foundation



Floor to beam



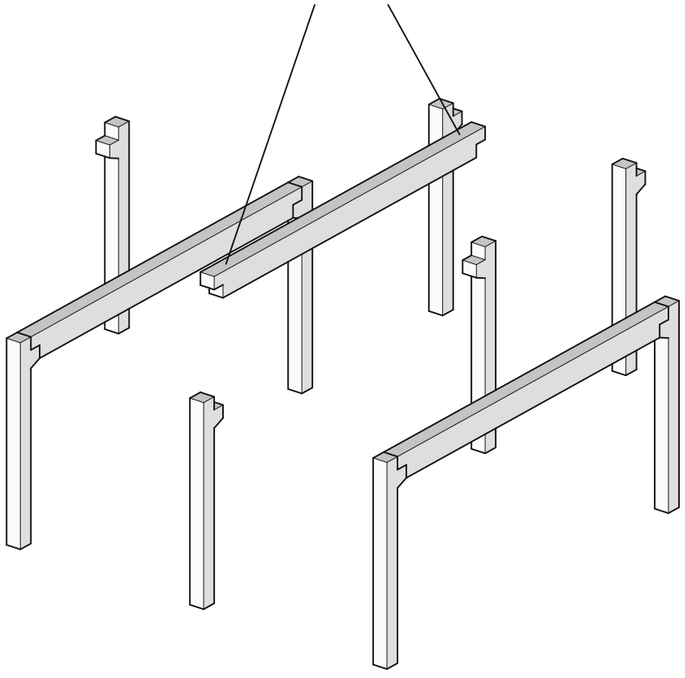
Roof voids



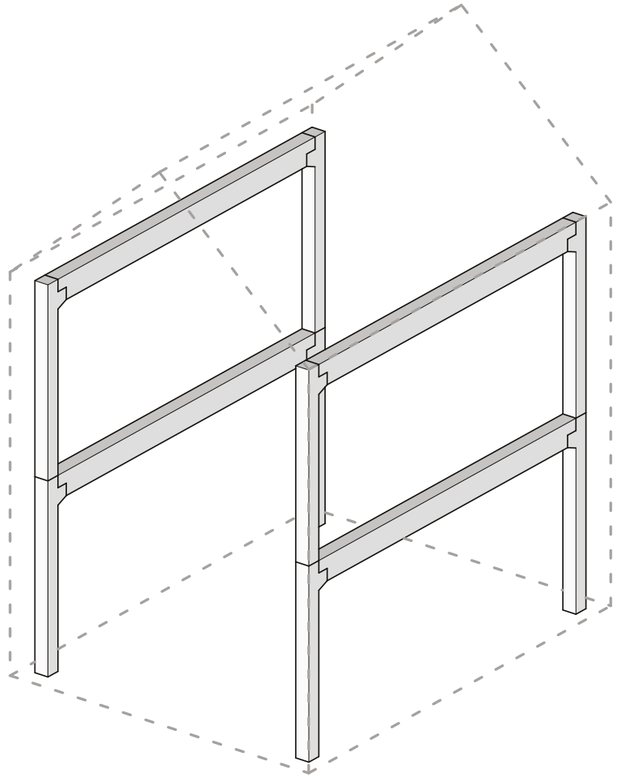
Sources:
Aninthaneni, P. K., & Dhakal, R. P. (2017). Demountable Precast Concrete Frame–Building System for Seismic Regions
Reinhardt, H., & Bouvy, J. (1985). Demountable concrete structures: A challenge for precast concrete.
VBI. (2023). Principedetails remontabel bouwen

STRUCTURE FUTURE SCENARIOS

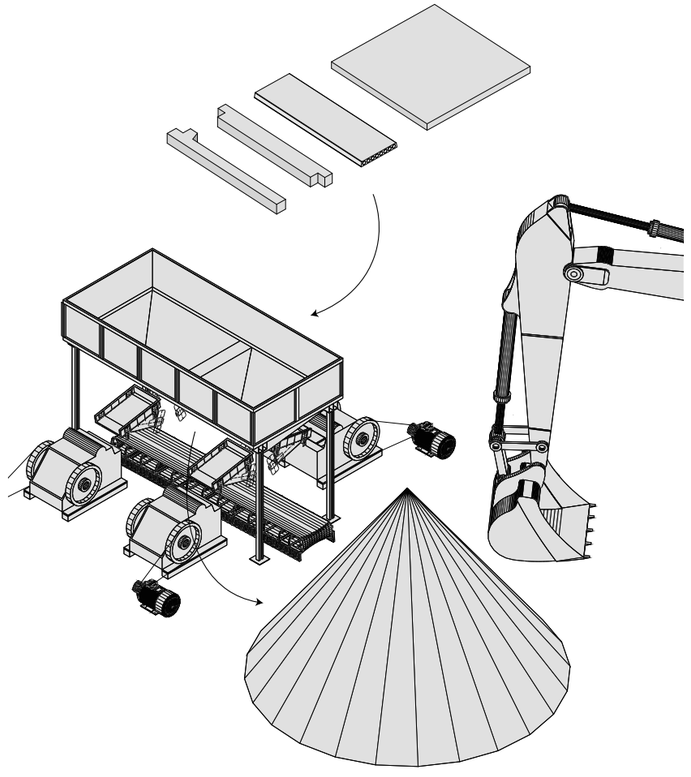
BUILDING MODIFICATION



REUSE OF ELEMENTS

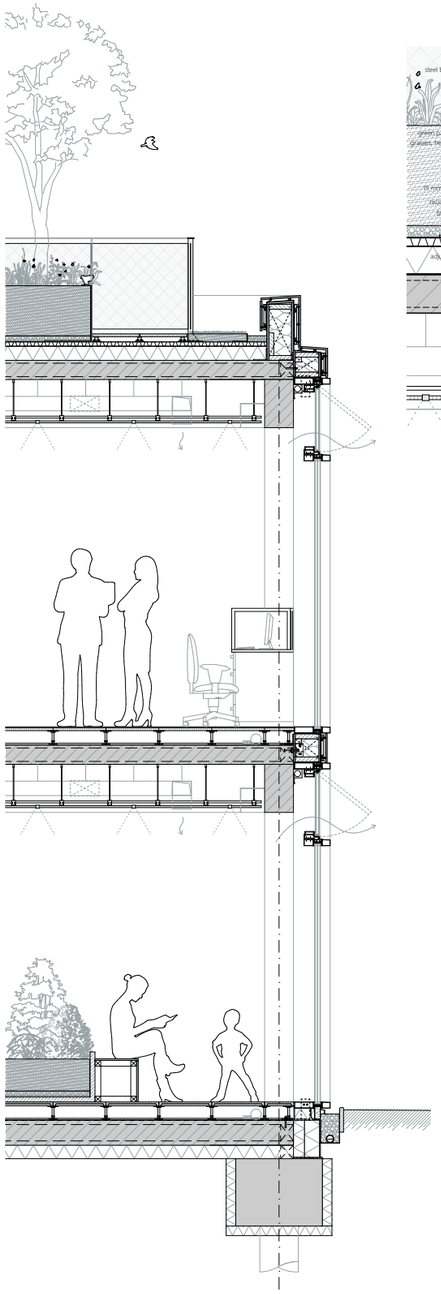


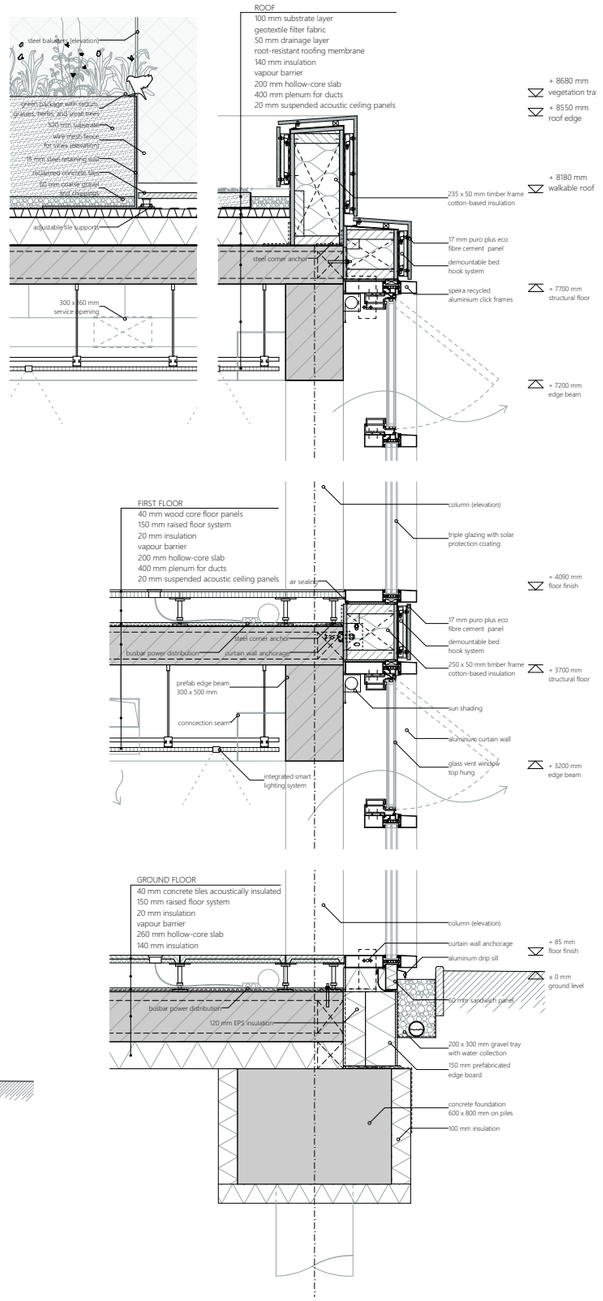
MATERIAL RECYCLING



SKIN



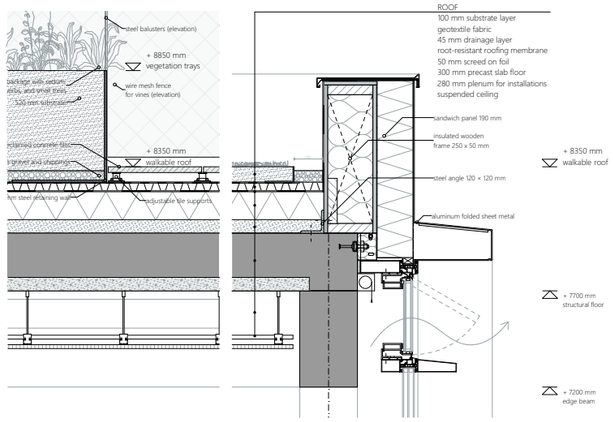


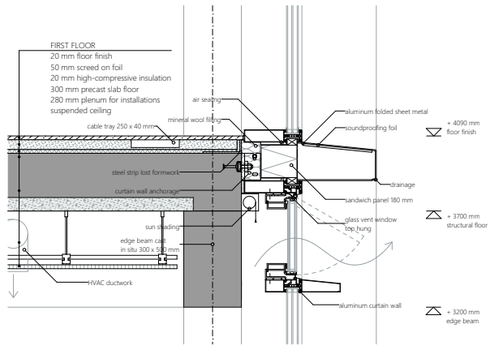


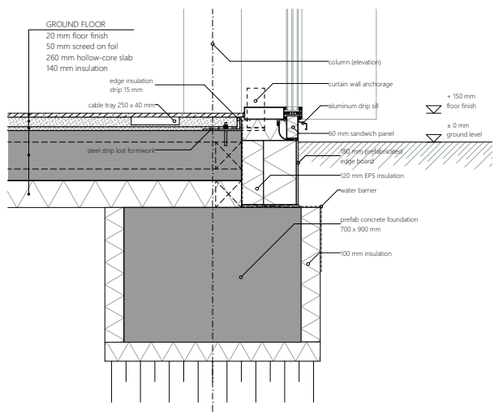
ROOF
100 mm substrate layer
geotextile filter fabric
50 mm drainage layer
root-resistant roofing membrane
140 mm insulation
vapour barrier
200 mm hollow-core slab
400 mm plenum for ducts
20 mm suspended acoustic ceiling panels
+ 8680 mm vegetation tra
+ 8550 mm roof edge
+ 8180 mm walkable roof
235 x 50 mm timber frame cotton-based insulation
17 mm puro plus eco fibre cement panel
demountable bed hook system
speira recycled aluminium click frames
+ 7700 mm structural floor
+ 7200 mm edge beam
FIRST FLOOR
40 mm wood core floor panels
150 mm raised floor system
20 mm insulation
vapour barrier
200 mm hollow-core slab
400 mm plenum for ducts
20 mm suspended acoustic ceiling panels
column (elevation)
triple glazing with solar protection coating
+ 4090 mm floor finish
17 mm puro plus eco fibre cement panel
demountable bed hook system
250 x 50 mm timber frame cotton-based insulation
+ 3700 mm structural floor
sun shading
aluminum curtain wall
glass vent window top hung
+ 3200 mm edge beam
GROUND FLOOR
40 mm concrete tiles acoustically insulated
150 mm raised floor system
20 mm insulation
vapour barrier
260 mm hollow-core slab
140 mm insulation
column (elevation)
curtain wall anchorage
aluminum drip sill
+ 85 mm floor finish
± 0 mm ground level
200 x 300 mm gravel tray with water collection
150 mm prefabricated edge board
concrete foundation 600 x 800 mm on piles
100 mm insulation

SKIN EMBRACE FUTURE CHANGE

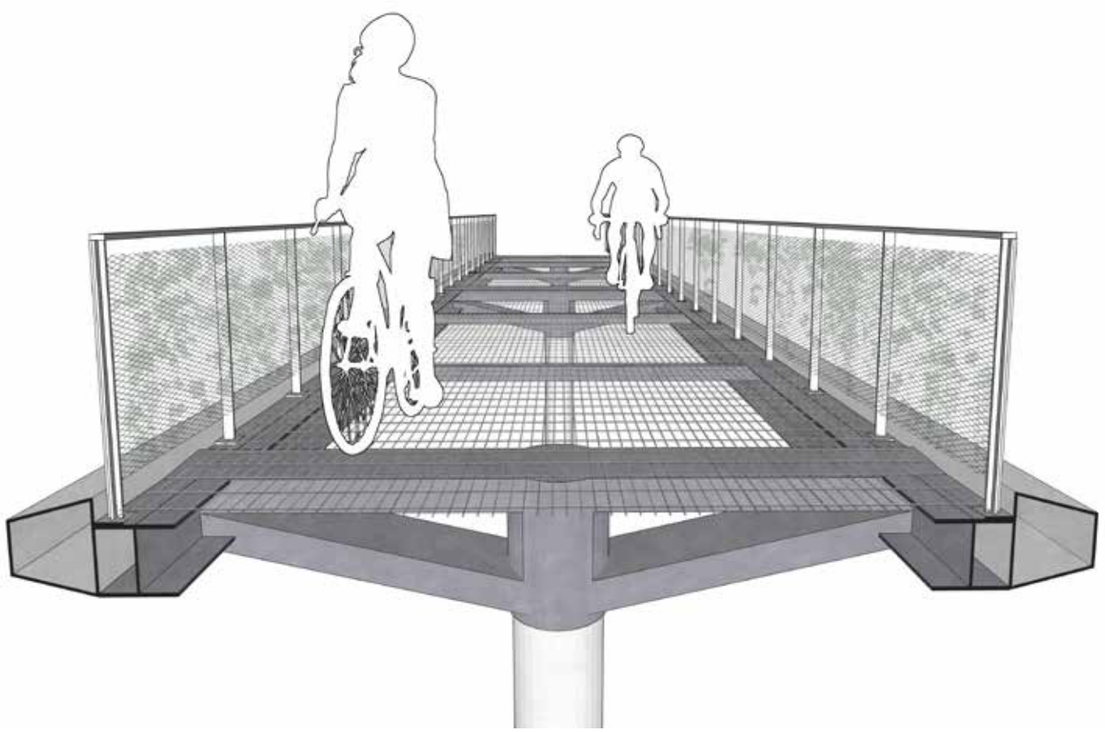




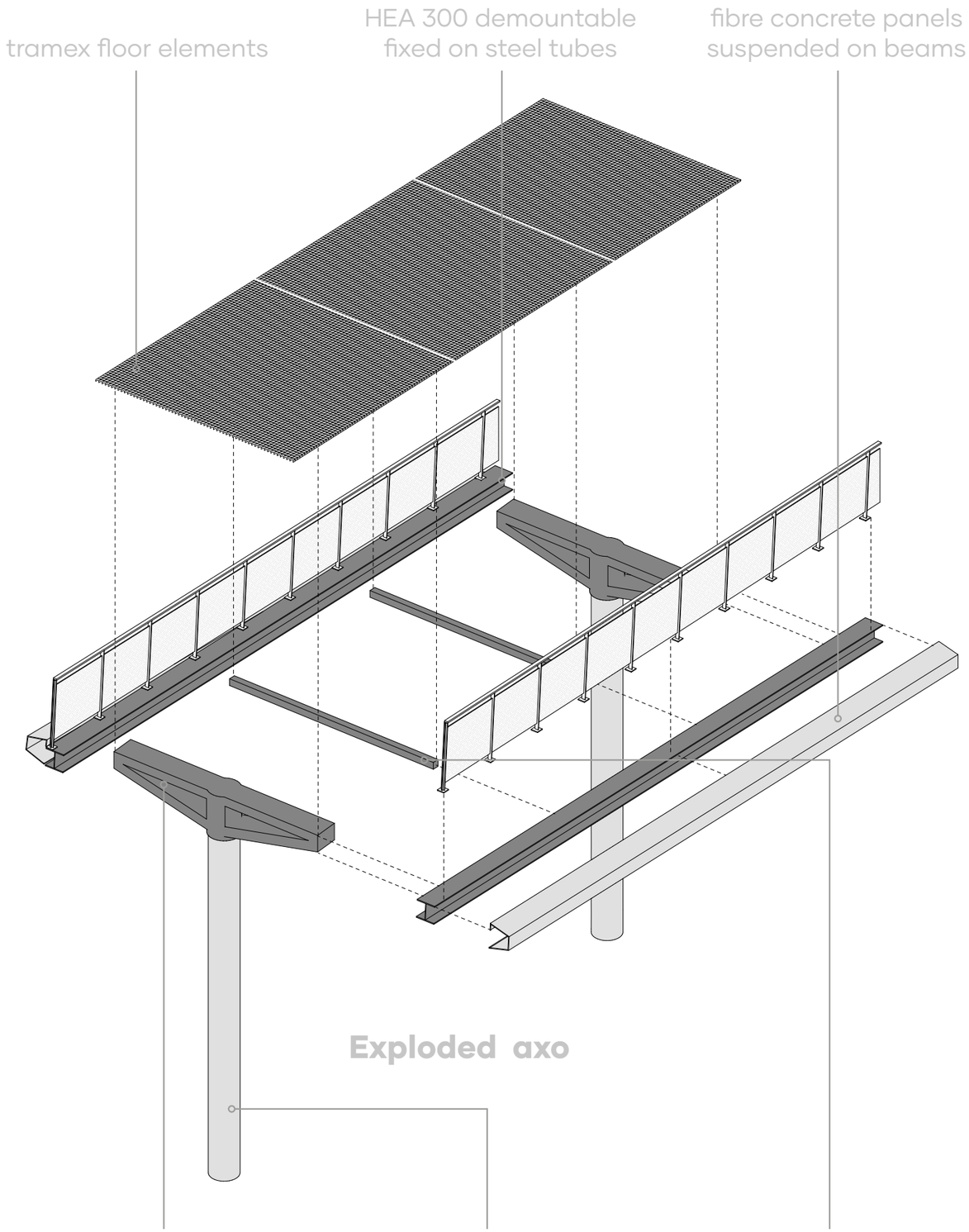




BRIDGES



Impression

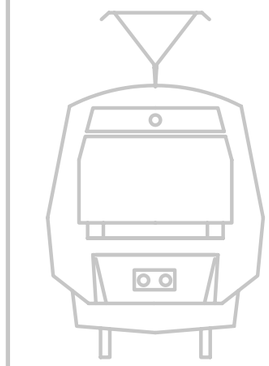


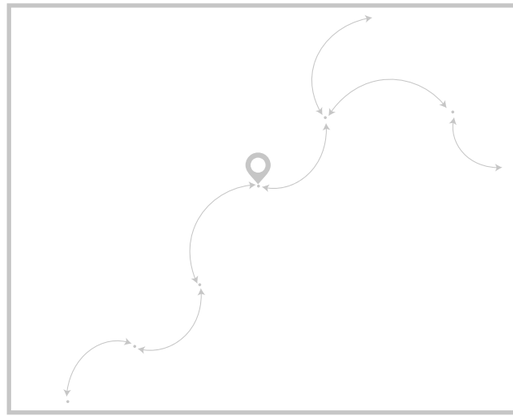
Exploded axo

TRAIN TRACK

comfort

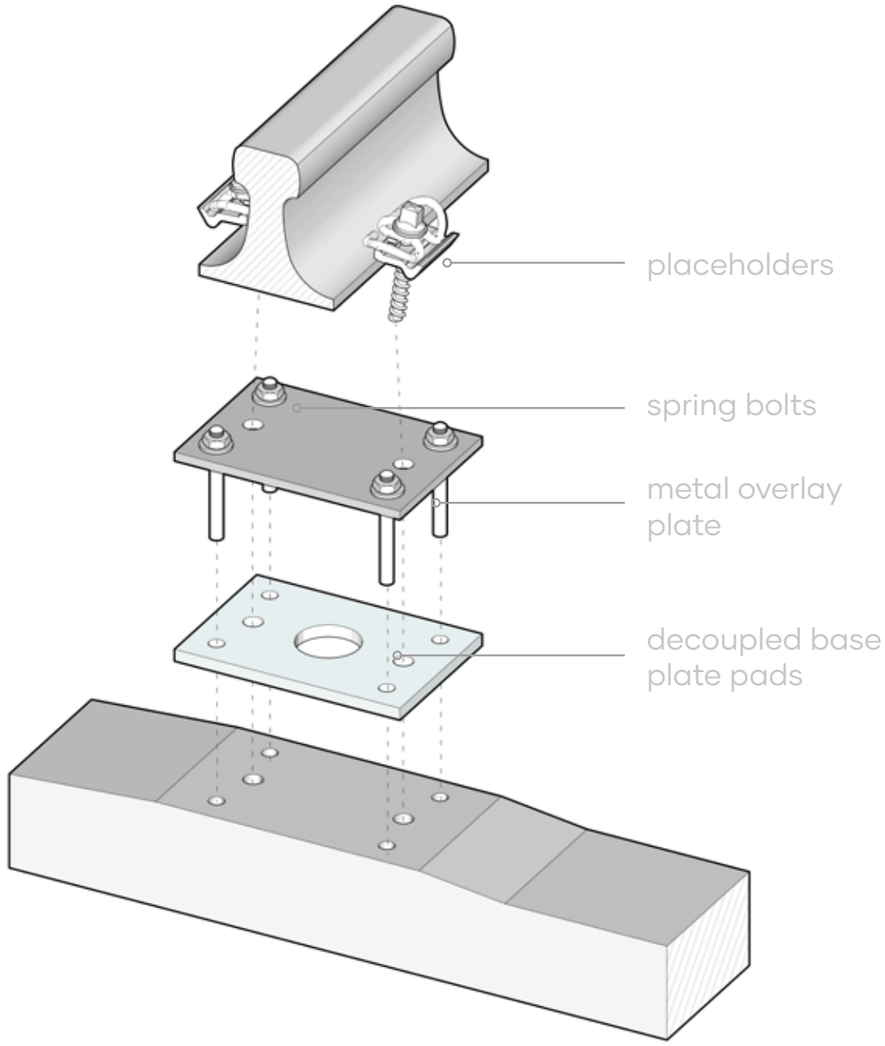
lifespan



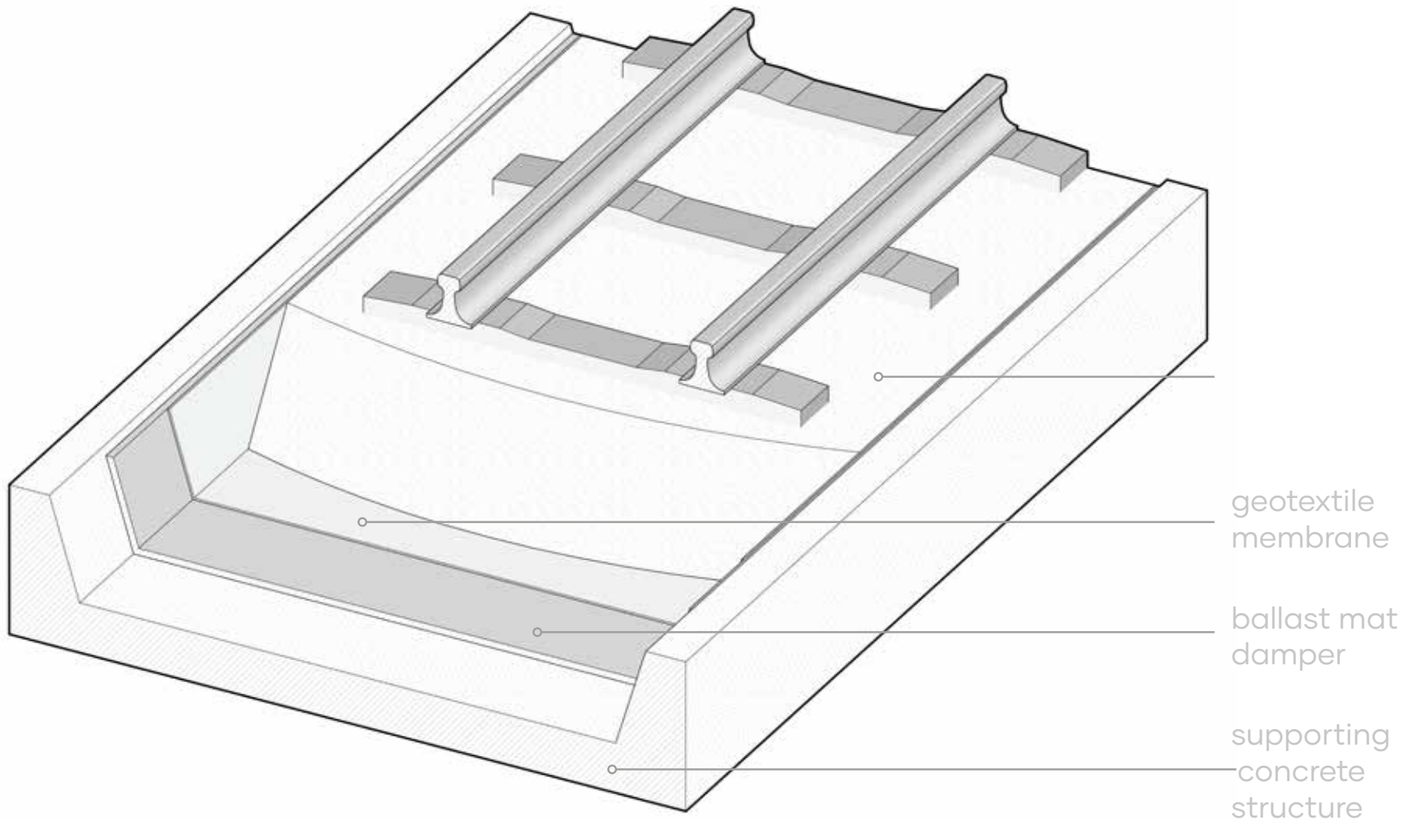


S-tog (s-train)

train line: Ringbanen
max speed 120 km/h
stop frequency 1-2 km
average speed 60-80 km/h



Base pads (-5/10dB)

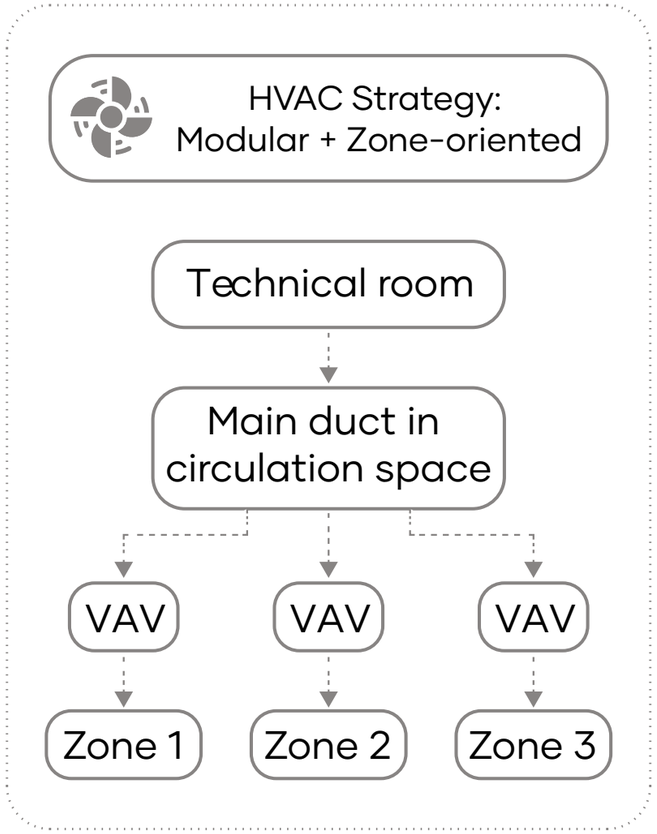


Ballast damper (-20dB)

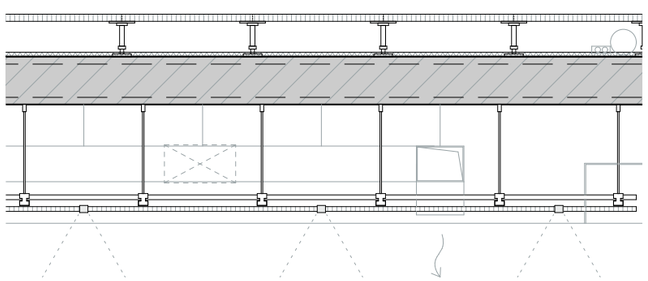
Sources:
Trackelast. Retrieved April 23, 2025, from https://www.trackelast.com/product/rail-seating-pads-turnout
Rubbergreen. Retrieved May 6, 2025, from https://www.rubbergreen.eu/products/railways/ballast-mat-damper
Rail-Pass. Retrieved May 6, 2025, from https://www.rail-pass.com/copenhagen-s-train-rolling-stock

SERVICES VENTILATION

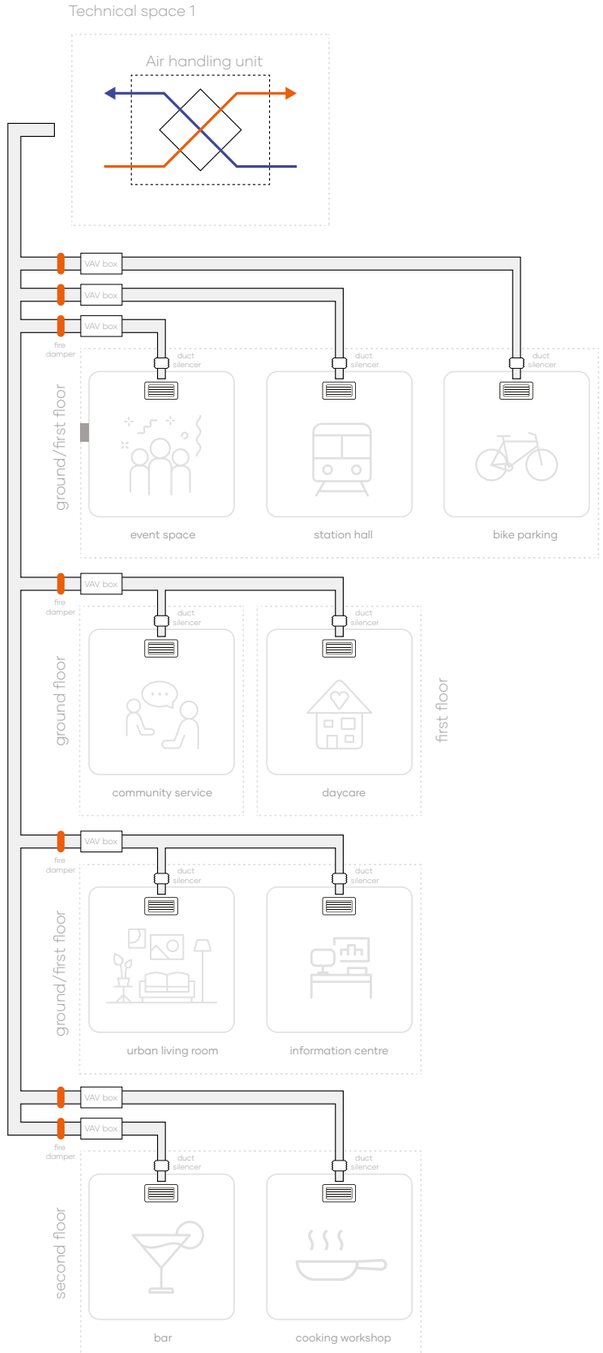
Strategy

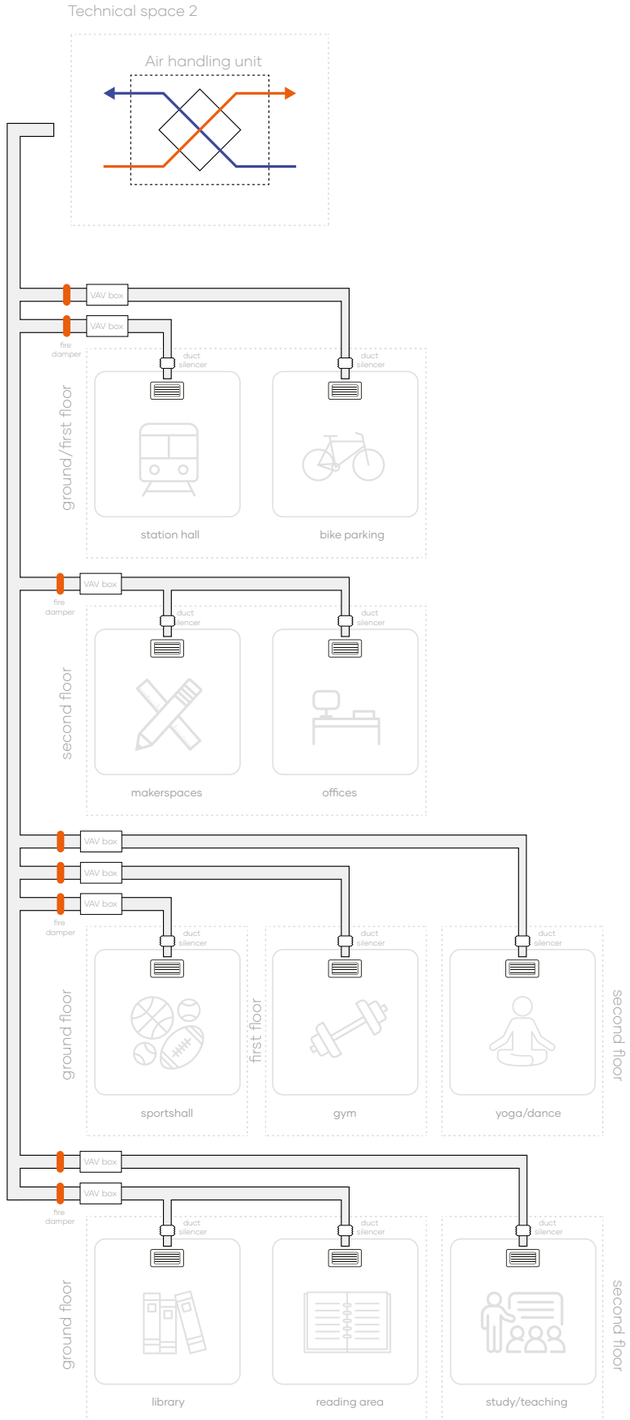


Section

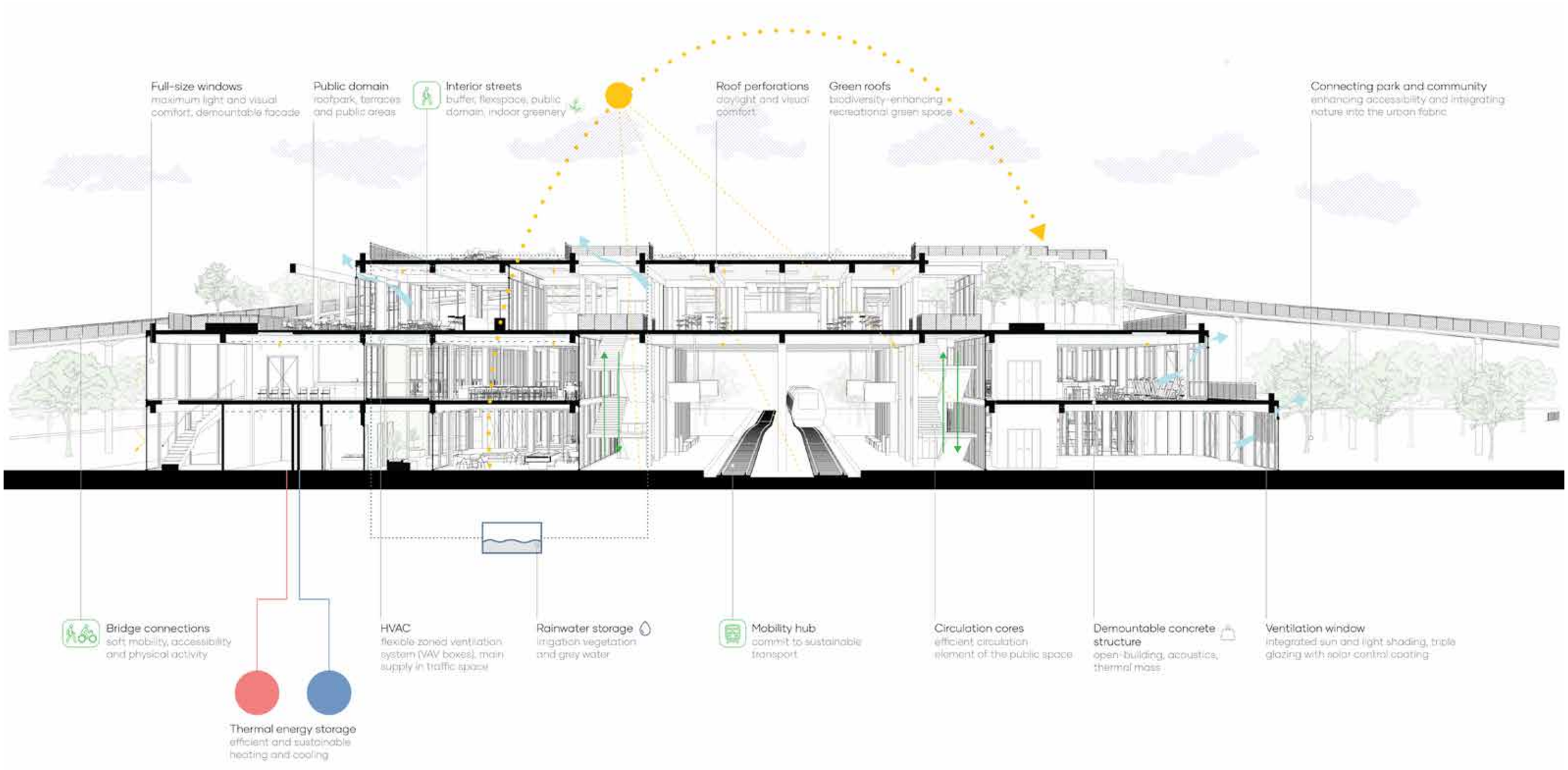


Diagram





CLIMATE DIAGRAM SUSTAINABILITY, MOBILITY AND COMFORT



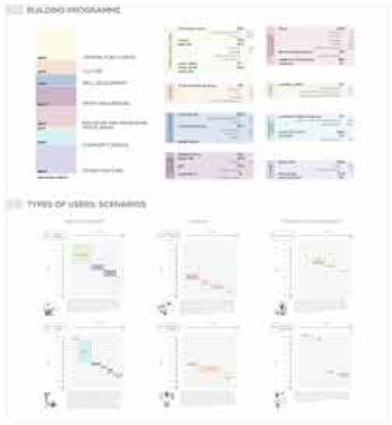

SOCIAL INFRASTRUCTURE

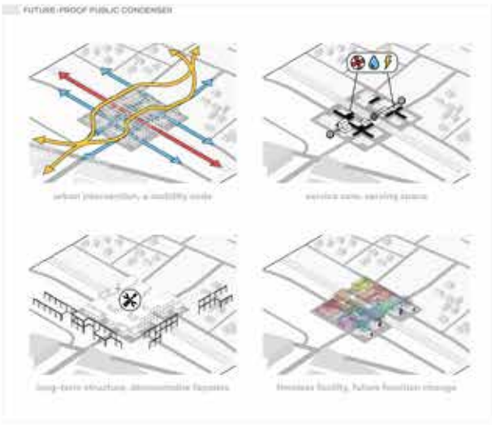

URBAN CONNECTIONS


IMPRESSION ROOF PARK

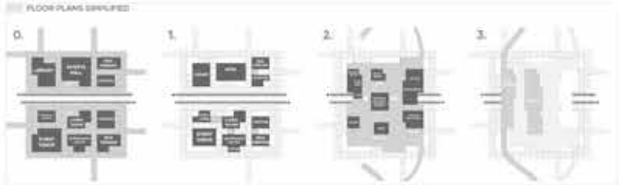

SECTION AS 1:200


SITE PLAN 1:1000


BUILDING PROGRAMME
TYPES OF USERS SCENARIOS

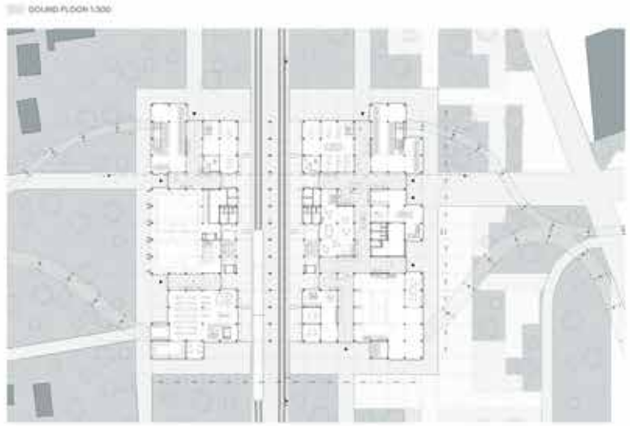

FUTURE-PROOF PUBLIC CONDENSER

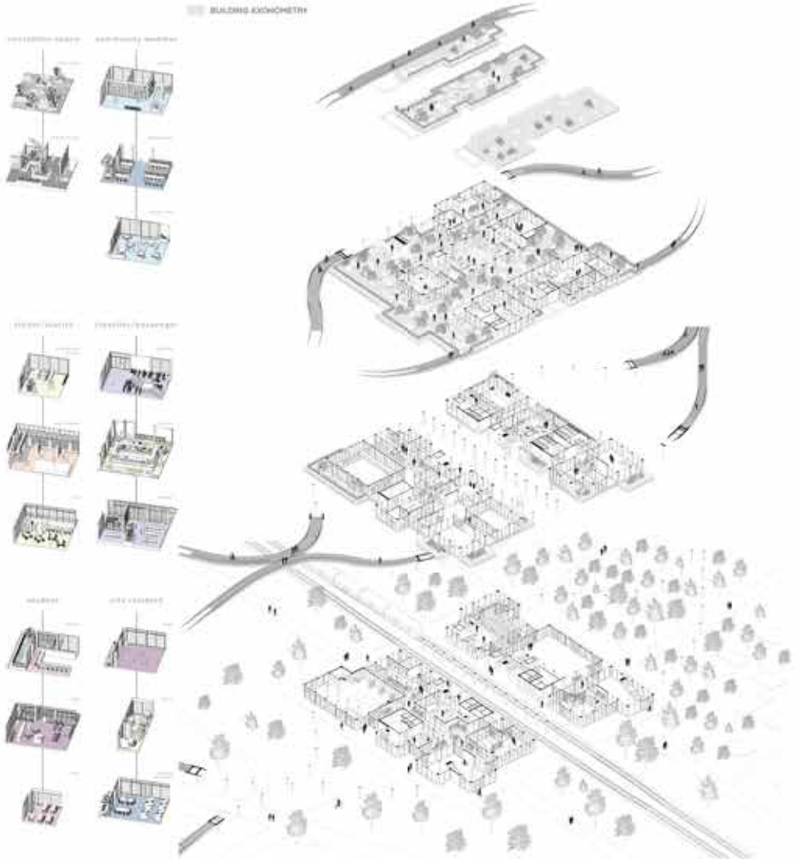

IMPRESSION TRAIN PLATFORM

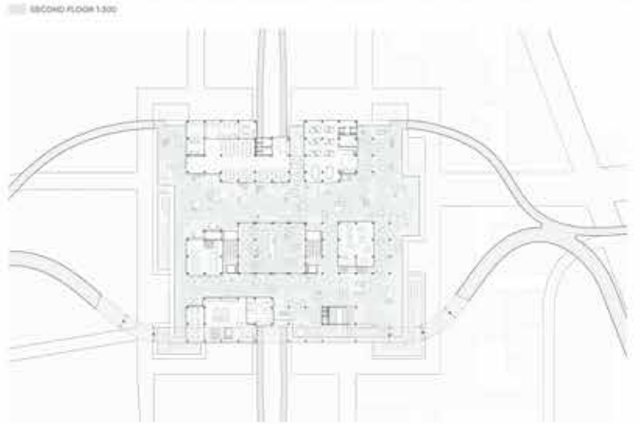

FLOOR PLANS SIMPLIFIED
0.
1.
2.
3.


TRAIN TIMETABLE
F 12:19
B 12:25
F 12:28
B 12:31
F 12:34

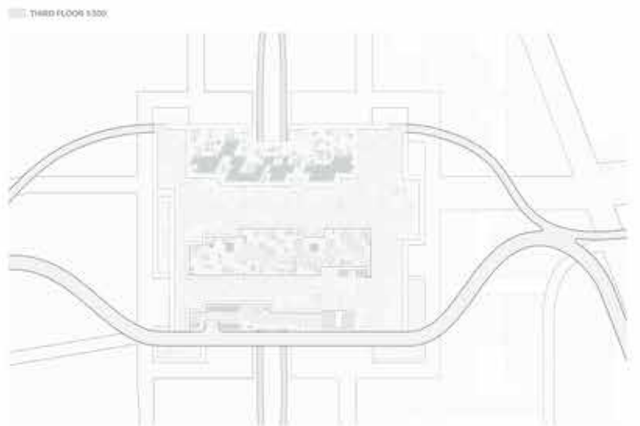

SECTION B1, 1:200


GROUND FLOOR 1:300


BUILDING AXONOMETRY


SECOND FLOOR 1:300


FIRST FLOOR 1:300


THIRD FLOOR 1:300

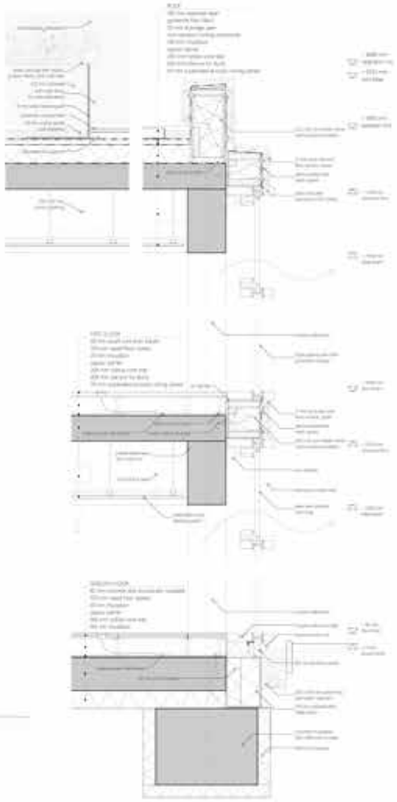
FACADE FRONT VIEW



FACADE FRAGMENT 1:20



DETAILS 1:10

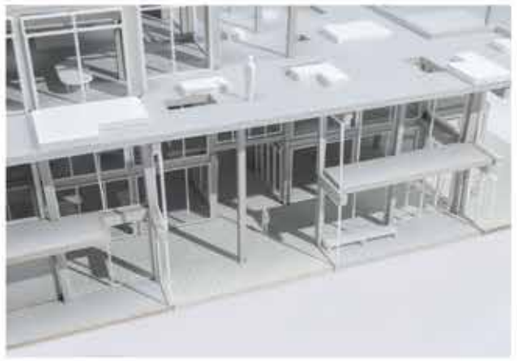


PHYSICAL MODEL 1:100





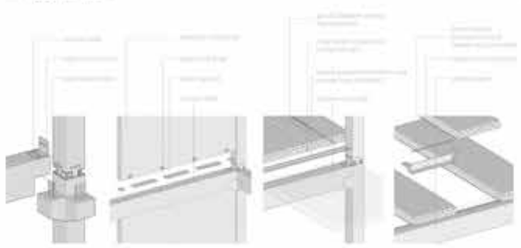




CATALOGUE OF PREFAB ELEMENTS



DRY CONNECTIONS



CLIMATE AND COMFORT



IMPRESSION NIGHT-TIME ACTIVITY

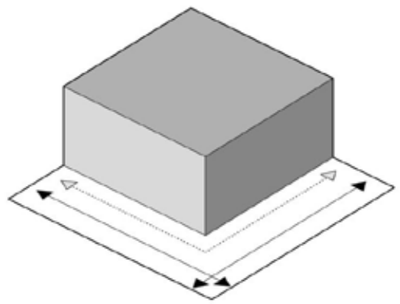


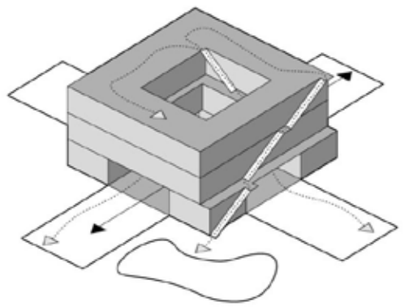
AR3AP100 - Public Building Graduation Studio
TU Delft Architecture, MSc 3/4
19-06-2025

Social Infrastructure – Reflection paper P5

Public Condenser | Haraldsgade, Copenhagen

Blaise Fouarge – 5944597





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1. *The relation between the graduation topic, the studio topic, the master track, and master programme.*

This year's topic in the graduate studio for public buildings is "Public Condenser" and focuses on designing for Copenhagen's communities in a functional and inspiring way. The project aims to reimagine the definition of infrastructure, seeing it not only as a functional element, but also as an intrinsically valuable means of shaping environments and communities. This approach aligns closely with the study theme, focusing on creating multifunctional spaces that promote physical and social interaction. The project explores how infrastructure not only facilitates mobility and connections but also acts as a platform for social cohesion and community building. By hybridizing infrastructure and building, a new type of public space is created that breaks down barriers between different parts of the urban network and its users, enhancing opportunities for gathering between different social groups. The project emphasizes multifunctional use of public space by fusing functions with public movement. Functions are carefully oriented within the "in-between world" in which the building sits as a bridging mass between park and promenade. This strategic placement transforms it into a key connection point in the surrounding environment, serving as a vital mobility hub.



Figure 1 Integration at different scales

The design not only focuses on the local neighbourhood but also engages surrounding neighbourhoods and is an asset to the city, as part of a sustainable public transport network. As a result, the project works at different scales. With this approach, the design engages diverse types of users, not only the local community but also residents of surrounding districts, city dwellers, travellers, passers-by and tourists. In doing so, the design seeks to integrate within various layers of the urban context, linking architecture with both an urban and landscape approach.

The project integrates key principles from the master program, such as equality, multifunctionality and futureproofing. The design responds strongly to the context and embraces future change through its strategic positioning and approach on adaptivity in future scenarios. A structure-infill strategy integrates flexibility and sustainable future use, demountability in materialisation opens up possibilities for circularity and reuse. Conscious

material choices are in harmony with the character of the environment and responding to environmental problems. The project is an example of the combination of functional urban design with multifunctional community spaces, where indoor and outdoor spaces blend seamlessly to allow for multi-purpose use at all levels.

2. *The academic & societal value*

Architecture can play a large role in segregation through imposed policies, physical design choices and their design and location often determine who can access them. Seating, accessibility or target group-specific functions can contribute to this, but building accessibility also plays a major role, especially when it is difficult for people without a car to reach the building. The project addresses these issues and focuses on promoting a socially inclusive and equal community. The urban intervention connects the fragmented neighborhood and breaks the sense of isolation by introducing vibrant circulation. The project offers a new approach to how infrastructure can contribute to the quality of life in urban environments, combining it with architectural and social functions that promote both mobility and social cohesion.

Urbanization worldwide has resulted in many post-industrial areas, where petrification, dense and closed buildings and car dominance create a physically and socially fragmented experience. The research and design offer an alternative different perspective on addressing evolving urban needs. Creating a healthier, better connected living environment is a central theme, focusing on physical movement, strengthening social connections, enhancing recreational green spaces and promoting biodiversity. The result is a building that embodies infrastructure and well-integrated public spaces seamlessly, promoting a more connected and sustainable urban environment. This approach shows a new way of dealing with inclusiveness and hostile urban environments. The public park becomes a gathering place and contributes to the mental well-being of users, promotes biodiversity in the urban area and encourages awareness and education. The park acts as an ecological corridor for native flora and fauna. The planting has been carefully selected to enhance biodiversity and integrate 'non-human occupants' into the design.

3. *Research and design*

Within the process I aimed to switch between research, to user, area analysis and references. Here the focus was on involving the scale of the neighborhood and the city, through the relation of the research theme. The feedback helped

me a lot with staying alert to this integral approach, through the different input from the subject teachers. We were directed to test different conditions quickly, so we had the first variants set up early on. This helped me give clear directions to the project early on, which allowed me to work consistently. At the product level, I made efforts to test research by design in physical and digital products. In which a diversity of products emerged in terms of hand sketches, sketch roll analysis, digital models, collages and visuals. I found it important to use a variety of mediums to strengthen my position as an architect by increasing the independence of mediums. The research-by-design approach offered many opportunities to test or implement design and research in different ways in the process.



Figure 2 Exploring neighbourhood fragmentation

The methods initially chosen seemed somewhat ambitious at first glance, leaving me feeling that I was missing some key sources to guide my design. Nevertheless, the reference research and papers provided a holistic overview of the functions and amenities that can form an attractive hub for various types of users. Moreover, it gave me a better understanding of how the fitment of my project could enhance its role as a mobility node.

The assignments for Theory & Delineation were very inspiring and offered diverse perspectives on neighbourhood issues, with personal interests playing an important role. They formed the initial impetus for my idea to work with an "interconnecting" space. the concept that, partly through my research, further developed into the central theme of my project.



Figure 3 T&D Practical model

Research question 1: How can the building be part of a connective public infrastructure that increases accessibility and adds value in the neighbourhood?

The focus was on embedding the project in its surroundings, a building which does not depend solely on its functions to facilitate use. Studying the different scales of Copenhagen was here not only crucial for the understanding of embedding and situation but also increased the understanding on how to

make optimal connections that extend existing lines of movement of the city, in and on the building.

Analyzing city maps, usage data and infrastructure references were of great value in creating design loops. It provided clear guidance that allowed the program to be accurately structured and tested.

Research question 2: What functional needs can be effectively combined to attract diverse target groups, including residents with varying income levels and backgrounds?



Figure 4 Understanding neighbourhood-specific users

Spatially answering this sub-question did not go as I had initially thought. I had expected to get a more specific picture of the uses that would be relevant to different audiences. However, this turned out not to be feasible, because of the complexity of diversity and challenges of inclusivity where functional needs may contradict each other. Instead of being focused on specific uses for different target groups, common themes were sought, appealing to different groups. Examples include creating a public green space in this petrified area, offering cooking workshops in a culturally rich environment, combining makerspaces and workspaces where practical workers and office workers can meet, and encouraging physical exercise for young and old. It also aims to create a multifunctional central square, a "central square," where a market, bar or event can take place, with the possibility of a partially open pavilion. The focus within the research question shifted to using public space (specifically infrastructure or circulation space) as a connecting element and making use of common themes. Creating a public realm in which use is not dependent on cost or occurs only within enclosed spaces.

The project has the ambition to provide relief for the parallel society problem. The intervention focuses not only on connecting people from the neighborhood with each other, but also on integrating different local communities. Community services are connected in a subtle way, and this is combined with cultural, sports and recreational functions. In this way, the design strives to engage different audiences from different backgrounds and income levels by creating shared spaces that promote an inclusive and inviting atmosphere.

