



## **VERTICAL DENSIFICATION**

*The Development of a Central Gothenburg Carpark*

*Harry Fox Russell  
Chalmers School of Architecture  
Department of Architecture & Civil Engineering  
2026*

*Examiner: Walter Unterrainer  
Supervisor: Filip Rem*



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*The development of a Central Gothenburg Carpark.*

*Chalmers School of Architecture  
Department of Architecture & Civil Engineering  
Architecture & Planning Beyond Sustainability (MPDSD)*

*Harry Fox Russell  
Building Design & Transformation for Sustainability  
Master Thesis 2026*

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*Globally, the population is rising. Cities are growing with the becoming of a more urban population. We are thus presented with challenges albeit opportunities to house an increased number of people in a sustainable manner.*

*The City of Gothenburg shares a vision of a more 'compact city' that focuses on the development of existing areas and networks for sustainable urbanisation and densification.*

*My thesis 'Vertical Densification' intends to be a small part into achieving the city's goals by questioning the mono-functional use of an existing carpark by building housing above it. The site has been chosen due to its central location, unique architectural qualities and a type of infrastructural niche that has untapped potential in contemporary society.*

*The key considerations of the thesis are the insertion and design of new housing into the historical urban fabric as well as the site's contribution towards urban regeneration in the context of a changing climate.*

*The project will be investigated through a 'research by' design approach where the design will progress through models and sketches into a series of refined technical drawings. The beginning of the thesis will also include a 'research for' approach that utilises relevant literature, built projects and the city plan to support the direction of the thesis.*

*The aim is to contribute to a body of research that concerns vertical extension as a suitable solution for urban densification. The thesis intends to be an example on how densification can be done sustainably as well as showcasing a design process that highlights the carpark as a niche for urban development.*

*Keywords: Vertical Extension, Regeneration, Carpark, Housing, Heritage*

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## Problem Description

The global population today sits at 8.15 billion people. This number is expected to rise for the next 55 years peaking at roughly 10.3 billion people. The urban population is also increasing from 55% in 2019 and expected to reach 60% by 2030 and 68% by 2050. (United Nations, World Population Prospects, 2024)

On a more local scale the City of Gothenburg is expected to have 50,000 more residents in the next 10 years. (Sweco, "Scandinavia's Largest Development Programme, 2016). Sweco a leading european consultancy agency predict that 6000 new housing units need to be built each year in the greater Gothenburg region to keep up with demand. The general consensus is that Gothenburg like many cities across the world, has an increasing population and thus an increased demand for housing and new infrastructure. The City of Gothenburg acknowledge this growth and are responding to it through their vision of a more 'Compact City'.

The City of Gothenburg have two documents which outline a clear vision. Gothenburg's '2035 Development Strategy' and the 'Rivercity' focus on the intermediate and inner-city. The main idea extracted from both strategies is the need to build on already existing areas with good transport networks and access to services. Their approach to sustainable urbanisation is through a compact city rather than a urban sprawl. Alvstaden Development, Fixfabriken in Majorna, and Backaplan are recent examples of Gothenburg's vision of future development with an emphasis on urban gaps or existing spaces that could be used better.



Figure 1: Alvstaden Development (Central), Kanozi Arkitekter



Figure 2: FixFabriken Majorna (Inner-City), Göteborgs Stads



Figure 3: Visions of Backaplan (Intermediate City), White Arkitekter



"Göteborg shall grow within the already built-up area. This is an aim that is included in the Comprehensive Plan for Göteborg and it means that new construction should first of all be in central Göteborg, particularly the central renewal areas, and with supplements in the intermediate city and at strategic nodes."

(City of Gothenburg, Development Strategy, 2014)

"A closely-connected residential building structure is an important step towards a simpler day-to-day life for the inhabitants of the city. Proximity and access to the different functions of the city are self-evident in this type of structure. Having service and social meeting-places close by makes day-to-day life easier and reduces the need for transport. To attain this, it is necessary to have greater density. A more compact city provides a number of opportunities for social interaction, better access to services and efficient use of public transport and infrastructure."

(City of Gothenburg, Development Strategy, 2014)

## Reflecting on Urban Densification

While I am fairly positive on Gothenburg's compact city strategy I also believe it is important to acknowledge that urban densification can also carry negative consequences as well. The recent examples shared such as Alvstaden and FixFabriken create a completely new building demographic in relation to its context. Some of the individual buildings rising up to 19 floors are pushing a more extreme level of densification where certain qualities are lost. Darker courtyards or no courtyards, lack of semi-private/ social spaces, uninviting ground floor spaces and small balconies that provide little compensation for such development. These buildings also require a high load-bearing capacity of steel and concrete which contribute to an increased embodied carbon in comparison to a low-rise timber construction.

New developments in cities should have a more seamless integration into the existing urban fabric. On the following pages I have selected three housing projects that create great living conditions and balance density with spatial quality.

Some key qualities these projects share:

- Ground Floor apartments should be raised 70cm from a public street and/or have an adequate buffer zone between street and apartment
- Courtyards should get at least 5 hours of sunlight on the spring and autumn equinox
- Semi-private spaces and communal social areas should be included in all projects. Even better if the space can be used 365 days a year.
- Adequate space for bike parking
- All apartments should receive sun at some point of the day
- Daylight from two directions
- An open entry space and in-between spaces and circulation space is thought about.
- Opportunity for deep views and variety of views
- Each apartment should have some connection with nature
- Every apartment should have at least 15sqm of private outdoor space



Figure 4: FixFabriken Majorna, Authors Photograph



Figure 5: Alvstaden, Authors Photograph

### TorpedoHallen, Vandkunsten Architects, 2003 New Homes in the Old Boat Workshop - Copenhagen, Denmark



Figure 6: Rasmus Hjortshøj, 2023



Figure 7: Rasmus Hjortshøj, 2023



Figure 8: Authors Photograph

Torpedohallen is an old Navy boat workshop built in the 50s. It is a large reinforced concrete and steel structure that spans 160 metres. The area was abandoned in 1990 by the Danish Navy and selected for redevelopment by a major Danish builder. The site offered a lot of potential to be transformed into residential housing with its close proximity to the city and connection with the water. The raw structure was preserved with housing split into two sides with an elevated public street running inbetween where the units are accessed from. There are 67 units in total ranging from 75sqm to 275sqm. All flats include a large living space with kitchen. The complex also includes lifts and parking is also available beneath the structure.

Inspiring project that I have had the privilege to visit. The varying sizes of units or townhouses is great to be able to accommodate a diversity of different people and needs. The emphasis on views and embracing a unique setting by the water was also a really nice element to the project. It is also something I would like to imbue within my project as it has a fairly unique setting as well with nice views over the city and a connection with Skansen Krona.

- Housing volumes divided by a public street where you access all the units
- Neighbourhood feeling with a shared communal street and an array of footbridges
- Very strict, repetitive and linear structure that opens up to access ways allows for easy orientation
- Carpark beneath the structure has a strong relevance to my specific site



Figure 9: Authors Photograph

**Brf Ohoj, Siegel Architects, 2014**  
Stacked Townhouses - Malmö, Sweden



Figure 10, Siegel Architects

Siegel Architects have created 10 stacked rowhouses within the urban context of Malmö as a continuation of some of their other recent projects where they have worked with the concept of 'Urban Villas'. I like the idea of a rowhouse within an urban setting as a niche that works between the ideas of an apartment and a terraced house. The 2 storey rowhouses feature an access balcony as well as private and social terraces. On the ground floor they receive a garden while the upper floor has a terrace with views. The integration of greenery to articulate and divide space is well thought. Adequate space is provided for bicycles which support the idea of sustainable urban mobility. Kitchen, dining and a bedroom are provided on the ground floor with the upper floor containing a smaller living space and an additional bedroom. The project also features glazed walls that open up to the outdoors and strengthen that indoor/outdoor relationship.



Figure 11, Siegel Architects



Figure 12, Siegel Architects

**Landshovdingehus (County Governor House)**  
Built between 1880 and 1935 as 'Worker Homes' - Gothenburg, Sweden



1. Figure 13, Google Maps

The Landshovdingehus were built from the 1880s to 1930s in Gothenburg during a period of housing shortages in Sweden. They are three-storey dwellings characterised by one floor in a brick or stone and 2 floors clad in timber above. In spite of the mass-demolition of them in the 1970s and having lived in one myself I believe the buildings have so many great qualities. They are typically double-sided apartments with windows on both sides for daylight and cross ventilation. Apartments are usually accessed via the semi-private courtyard which is well proportioned in relation to the buildings heights ensuring it receives a few hours of sunlight during all times of the year. The courtyards offer a variety of different landscaping as well as children spaces and casual meeting spaces. All apartments open up to the courtyard providing a great connection with nature. Space efficient apartments with large communal areas create a very welcoming environment making it a great option for young couples and young families.



2. Figure 14, Authors Photograph

1. Distribution of Landshovdingehus in Majorna
2. Public footpath meets semi-private gated courtyard where residents enter to a from there apartment for residents. The two lamellas style landshovdingehus share a green courtyard.
3. Light filled courtyard - good amount of green space for water retention and biodiversity
4. Green threshold/buffer zone between public street and house as well as a raised ground floor.



3. Figure 15, Authors Photograph



4. Figure 16, Authors Photograph

## Site Selection & Sustainable Development

The private carpark was found using google maps satellite view where a large concrete surface was spotted below the Skansen Kronan park in Central Gothenburg. I then visited the carpark and scoped it out. Walking up the hill behind the site I was able to look into the carpark and back over the roofs of the city. The roofspace was presumably nearly empty. The site was well located, underused and had views both to the park and the city.

The key relevance for sustainable development is the identification of a large carpark in Central Gothenburg that offers plenty of opportunities for urban development. 2000sqm of roofspace with great southern aspect light. The roofspace is currently underused and being an industrial structure has the potential to support additional floors without the need for added structural reinforcement. By providing housing and green space above the carpark it hopes to support Gothenburg's densification goals and also support urban regeneration in the context of a changing climate. It thus has a strong connection to environmental and social sustainability by providing greater access to amenities and transport as well as reducing biodiversity loss by developing an existing brownfield.



Figure 17, Authors Photograph



Figure 19, Authors Photograph

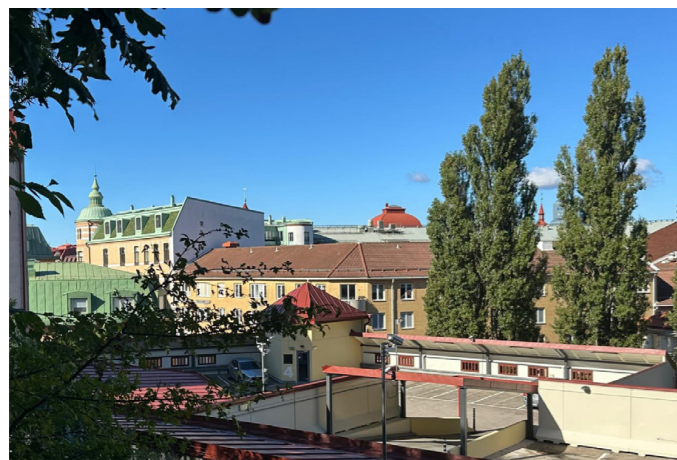


Figure 18, Authors Photograph

**6 CLEAN WATER AND SANITATION**



How can the project integrate a rainwater collection system?

**7 AFFORDABLE AND CLEAN ENERGY**



How can the project integrate a sufficient amount of Solar Panels?



**Upgrade all Industries and Infrastructures for Sustainability:**  
 "A functioning and resilient infrastructure is the foundation of every successful community. To meet future challenges, our industries and infrastructure must be upgraded."

Upgrading carpark by adding additional functions will improve the market value of the building. Industrial building with high structural capacity allows for new spaces without extra structural reinforcement. Thus reduces co2 emissions and allows for reduction in costs compared to new build.



**Safe and Affordable Housing, Inclusive and Sustainable Urbanisation, Reduce the Environmental impact of Cities:**  
 "The world's population is constantly increasing. To accommodate everyone, we need to build modern, sustainable cities"

New accessible housing centrally located reduces housing shortage and social segregation. Through densification there is an improved public realm and increased safety. Promotes the use of public transport and reduces travel time. More opportunity with workplaces.



**Strengthen resilience and adaptive capacity to climate related disasters:**  
 "Climate change is a real and undeniable threat to our entire civilization. The effects are already visible and will be catastrophic unless we act now"

Upgrade the Carpark roof to be a robust and climate resilient structure. Future flood risk and urban heat islands should be considered. Also large potential for solar energy gain and storage could be connected with electric vehicles in the existing carpark.



**Protect biodiversity and natural habitats:** "We are all part of the planet's ecosystem and we have caused severe damage to it through deforestation, loss of natural habitats and land degradation"

By building upon an existing carpark to serve a second purpose we preserve precious land and promote biodiversity. Prioritising building vertically rather than horizontally reduces the cost of acquiring new land and more importantly lowers the ecological footprint. A reduced reliance on cars also means less emissions for a better ecosystem.

- 1. How can a vertical extension of a Gothenburg carpark support urban densification and regeneration while preserving car spaces?*
- 2. How is a design forged in respect of the site's history, unique programmatic character as well as the context's historical fabric?*

## Theory

The following literature and built references have been selected under the following key themes: Vertical Extension, Cultural Heritage, Carpark Housing, Climate Resilience. All references have been included to support the feasibility and vision of my thesis.

### ***"Up on the roof: a review of design, construction, and technology trends in vertical extensions"***

*By Eunike Kristi Julistiono, Philip Oldfield & Luciano Cardellicchio*

*A positive study that concludes vertical extensions are a necessary contemporary solution to manage a growing urban population. It outlines the sustainability benefits as well analysing the recent trends of vertical extensions and characteristics of the base building. It showed that vertical extensions are a growing tool to accommodate more people within cities.*

*Of the 180 buildings studied 128 vertical extensions were built between 2010-2025. The most typical base building's were usually between 50-100 years old, with 3-4 floors and had an industrial function (32%). The most typical amount of storeys added were 1-2 and usually involved steel at 57% compared to timber at 19%. Creating a distinct facade that was different to the existing building was most common with 123 projects (72%). Most projects also tried to make full use of the existing footprint. However heritage status, functional requirements and building regulations restricted this. So the average footprint ratio of the vertical extension above the base building was 91%. Most buildings were also transformed for residential purposes. A flat roof as well as a simple grid and plan were also recommended.*

*The authors final note is that industrial buildings have the best ability to allow for vertical extensions to occur as the structural load usually goes from a heavy to light. This is particularly relevant for my specific building (carpark) where the flat roof is built to accommodate 50 cars parked.*

### ***"A development process for extending buildings vertically – based on a case study of four extended buildings"*** By Rikard Sundling

*A local study within the Swedish context however the focus is on vertical extensions on existing residential apartment buildings and thus some of the findings may not be suitably applied to my specific building. Either way it attests to the fact that Swedish cities such as Gothenburg and Malmo are actively promoting Urban Densification. The literature provides more of a technical overview that outlines challenges with vertical extensions in a Swedish context. It ends with a set of steps or framework to consider for property managers, clients, engineers when assessing the feasibility or value of a vertical extension. It provides more of a holistic point of view when approaching the design phase.*

*In one of the case studies a new layout was planned which adjusted the existing structures capacity to support the extra load. It thus required additional structural reinforcement. This paired with a new elevator and service installations was quite costly and didn't prove to be sufficient with the size of extensions. 2 of the 4 case studies were not completed due to costs and lack of contractor appeal (Not profitable and complex). Author concludes that vertical extensions can be costly and challenging and it is thus important to ensure a vertical extension is well planned and evaluated. Some key considerations involve a high demand for apartments in the area, neighbouring buildings being higher and the local municipality supporting densification projects. Also that the existing structure is capable of supporting the extra load and that the service shafts allow for additional service installations.*

**"Rooftop architecture and urban roofscape: designing the new vertical city"**

By Oscar Eugenio Bellini, Martino Mocchi

One of only a few literature readings that consider the new facade expression of vertical extensions on existing buildings. The reading doesn't include too much text but visual imagery that references different strategies or methods of intervention on an existing building. It is particularly relevant for my site situated in a historic core with its own unique architectural qualities that defy the typical expression of the carpark building type. The reading is thus dedicated to architects as it considers the 'genius loci' and highlights the need of a contextual frame when creating new forms of urban identity in what the author terms the 'fifth facade.' It references the roof of buildings as a 'new soil' that has untapped potential for urban development and new ways of living. The visual imagery is a system approach that categorises ways of intervening by integrating 1. topological, 2. functional, 3. structural, 4. technological, 5. Morphological aspects in the relationship between the old and the new.

The morphological considerations regarding form are categorised below:

<b>Assonant:</b> Continue the form of the existing	<b>Mediate:</b> Partial Continuity with the existing form	<b>Dissonant:</b> Clear contrast with the existing in terms of form & aesthetic	<b>Radical:</b> Redefines the whole building creating a 'new unified whole'	<b>Neutral:</b> Lacks visibility in form or visual interference
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Style of Vertical Extension:

<b>Replacement:</b> The removal of the existing roof for new elements	<b>Interference:</b> Conflict with context aiming to have high visibility & impact	<b>Integration:</b> Shares a positive attitude towards context to establish connection	<b>Dissimulation:</b> Concerns new architecture that doesn't consider context & tries to hide itself from the outside
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Figure 20: David Chipperfield Architects, 2004, Berlin



Figure 21: Duggan Morris Architects, 2013, London

Both projects have been extracted from the reading due to their interesting way of working between the old and the new. They fall under the category of 'Integration' and 'Mediate.' I like the ability to create a new language with new materials and design elements however still have a nice balance and relationship with the existing. In both examples the proportions and composition have a seamless flow.

**Wohnanlage Magnus 31, Wilkin & Hanrath Bauphasen, 2018**  
Housing Complex above an Existing Carpark - Cologne, Germany



Figure 22: Wilkin & Hanrath Bauphasen,

A multi-storey carpark in Germany that was underused with many available parking spaces. The solution was to remove 2 floors of parking to add 3 additional floors of residential housing. 31 new apartments were created ranging from 70m<sup>2</sup> to 200m<sup>2</sup> as well as 43 private parking spaces that were built above the existing 250 space garage. The site now has 4 floors of parking with 3 additional residential floors above. The site shares similar area and vertical height to the carpark I am working with. In total there is 3750m<sup>2</sup> of living and 8930m<sup>2</sup> of parking. More land that was deemed a traffic area had to be bought at the front of the parking lot to create a new entry way. This was required as regulations did not permit the use of the existing stairway and the car ramp did not allow for more vertical circulation.



Figure 23: Wilkin & Hanrath Bauphasen,

A flat surface above the carpark was created through a lightweight hollow concrete slab which seals the parking levels for the new residential complex above. The cross-walls of the apartments follow the existing buildings 7.5m column grid structure. And the apartments which are 10m deep are located along the side of the parking lot where the structural load is at its highest capacity. For these structural reasons the courtyard was created. A grid of girders supports the housing above with a longitudinal curved beam on the courtyard north facade.

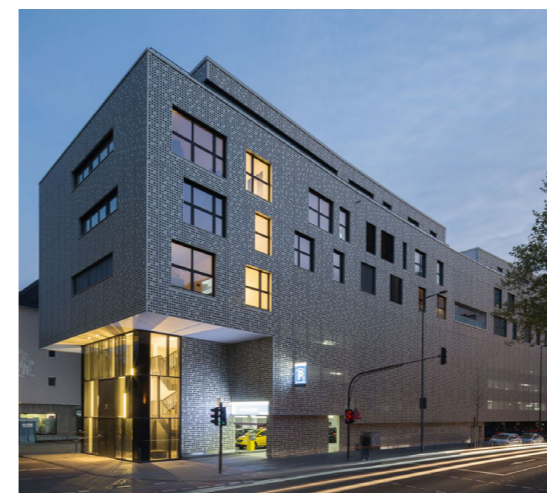


Figure 24: Wilkin & Hanrath Bauphasen,

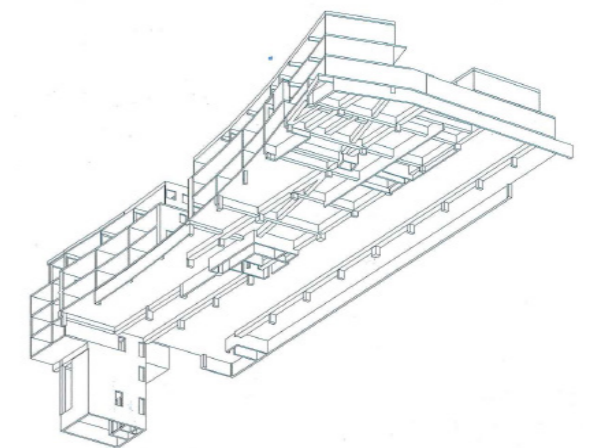
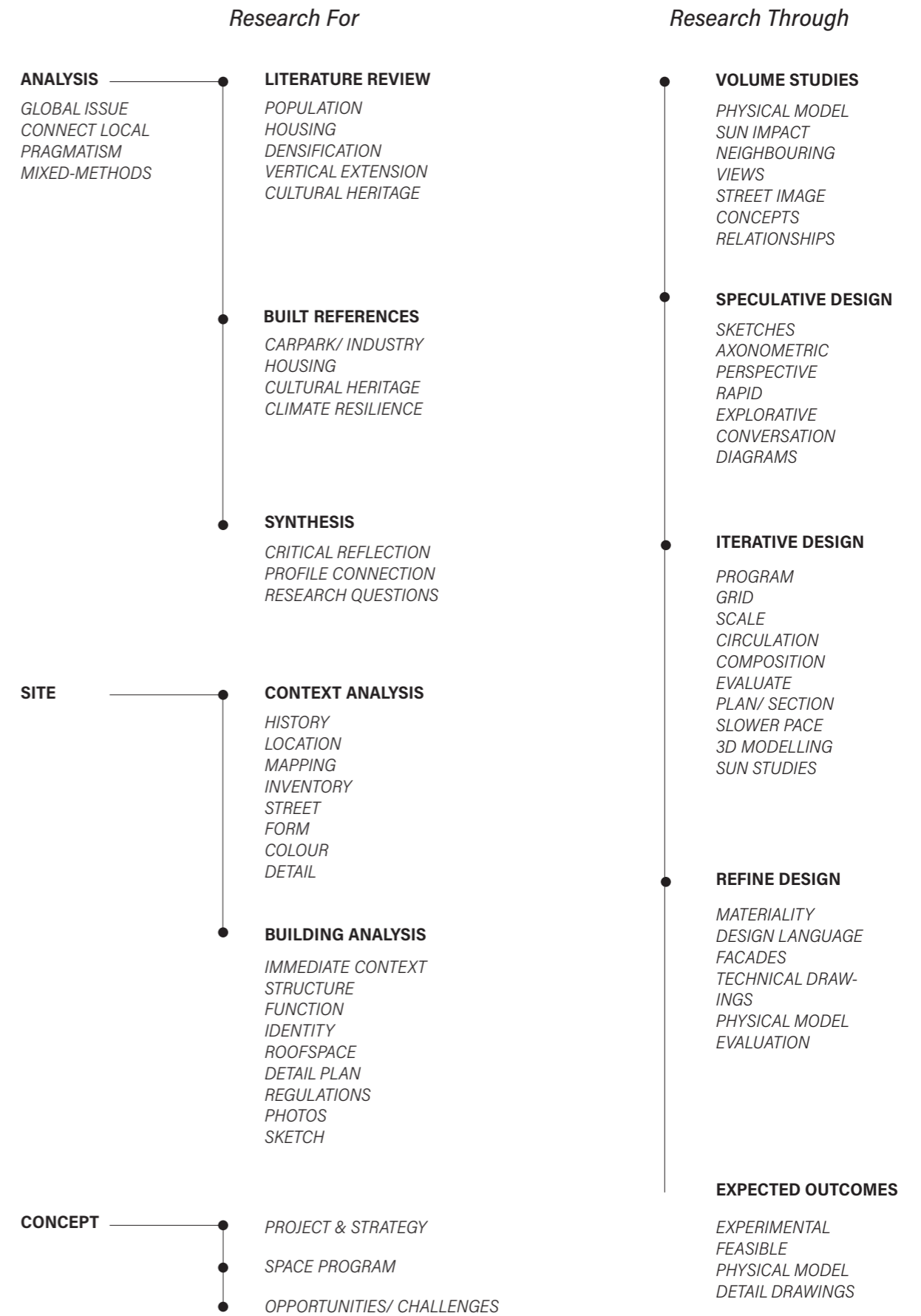


Figure 25: Wilkin & Hanrath Bauphasen,

## Methods & Tools

The thesis utilises a 'Research For' and a 'Research Through' design approach. The Research for has been undertaken during the thesis preparation course. This has involved gathering relevant literature and built references that support different facets of my project and the direction through the development of the thesis research questions. I have also evaluated the key relationship between my thesis and the Sustainable development goals to evidence a strong relation to the profile 'Building Design & Transformation for Sustainability'. The 'Research Through' design has been undertaken through different design stages. It has started with model making and sketching that has explored and experimented with different ideas. Followed by stages that incrementally increase more detail and ground the project. A large portion of the time has been spent on the 'iterative' and 'refine' stages working with floor plans, technical drawings and materiality.



## Delimitations

*The thesis will aim to uncover and explore the potentials of an existing built carpark in central Gothenburg. With the main focus on a vertical extension for housing above the carpark structure to support urban densification and regeneration.*

*The thesis project intends to be grounded and feasible however does not intend to be a legally and technically binded proposal. Service shafts will be considered but not dealt with.*

*The project will not consult with relevant stakeholders of the carpark however there will be consideration for different stakeholders.*

*The project does not intend to transform the carpark. However it shall be noted that the vertical extension will require interventions to the existing building that will result in some car spaces being lost.*

*The detail plan from 1984 outlines new buildings should be designed with consideration for the existing buildings. It also says that parking spaces were limited in the garage due to consideration of adjacent housing and play area. Volumes studies have been undertaken with neighbouring views and daylight a key factor in the final form.*

*The thesis recognises that pedestrian access to the building may limit people with mobility issues due to a cobblestone footpath in front of the structure. On site visits many people preferred to walk on the bike path along Landsvagsgatan which is paved with asphalt. The provision of new all accessible apartments hopes to create more conversation about urban mobility issues in Haga and older districts of Gothenburg.*

*The thesis deals with a specific carpark and specific circumstances and thus does not suggest that the result could be replicated or applied on another carpark.*

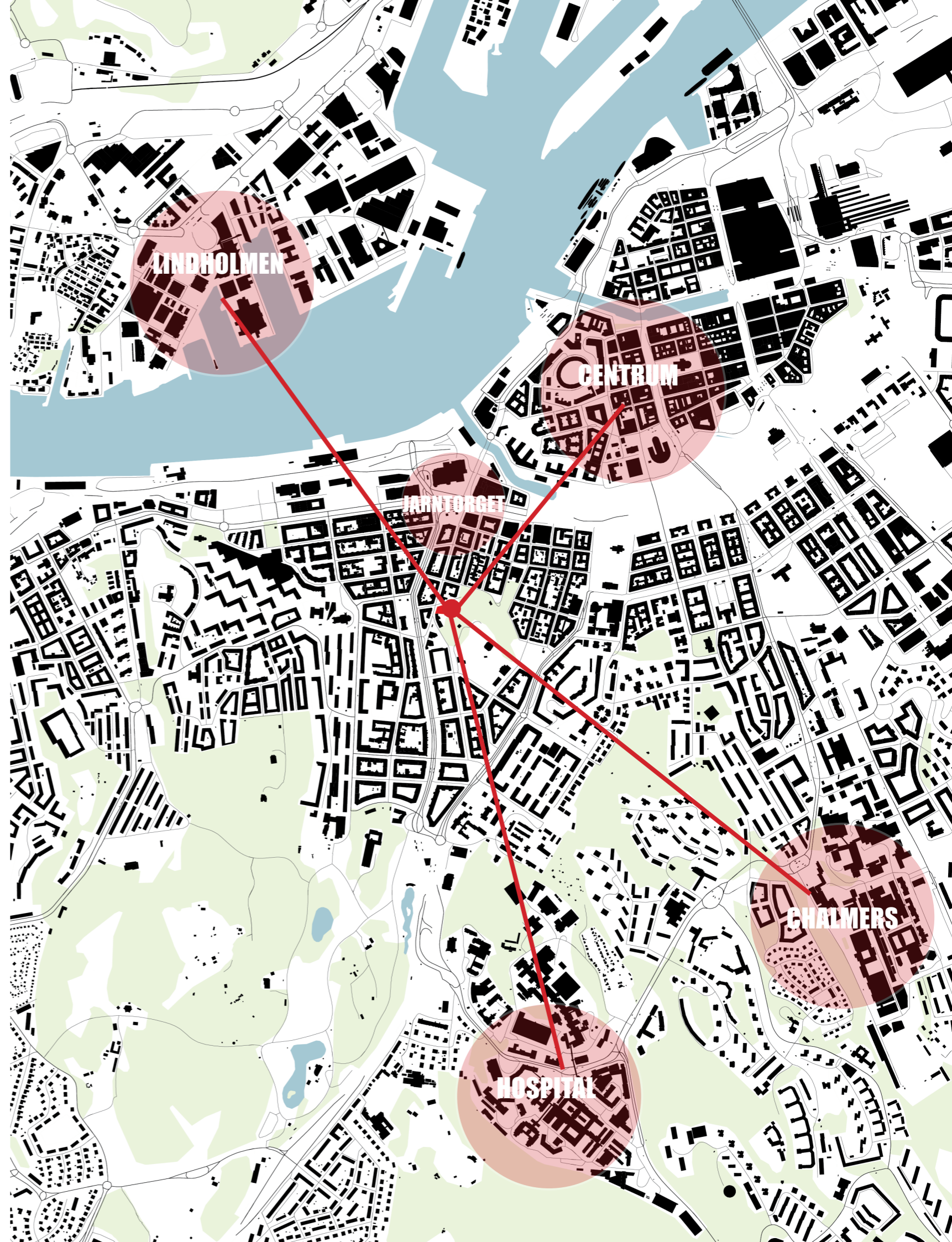
## Expected Results

*The scope of this thesis is to respond to growing population pressures through the urban densification strategy of 'vertical extension'. A short and fairly simple 'research for' is posed at the beginning that references population growth, housing demand and city documents that outline Gothenburg's development strategy towards tackling urbanisation issues. The academic deliveries also include an analysis of relevant literature and built projects that support the direction of my thesis 'Vertical Densification'. The thesis is however to be largely explored through a 'research through' design approach that will delve deep into the process and insertion of new housing into a historical urban fabric. It will iterate and work with the building additions and identity of the whole site as well as integrating urban regeneration strategies. This will include the investigation of specific opportunities and challenges of the unique carpark site. A physical site model with the final building volume will accompany a complete set of drawings that clearly show how and what has been developed. The design deliveries hope to contribute to research involving how a vertical extension can take place above an existing building in a historical context. Specifically the carpark as a niche for future urban development and sustainable urbanisation.*

## CONTEXT ANALYSIS

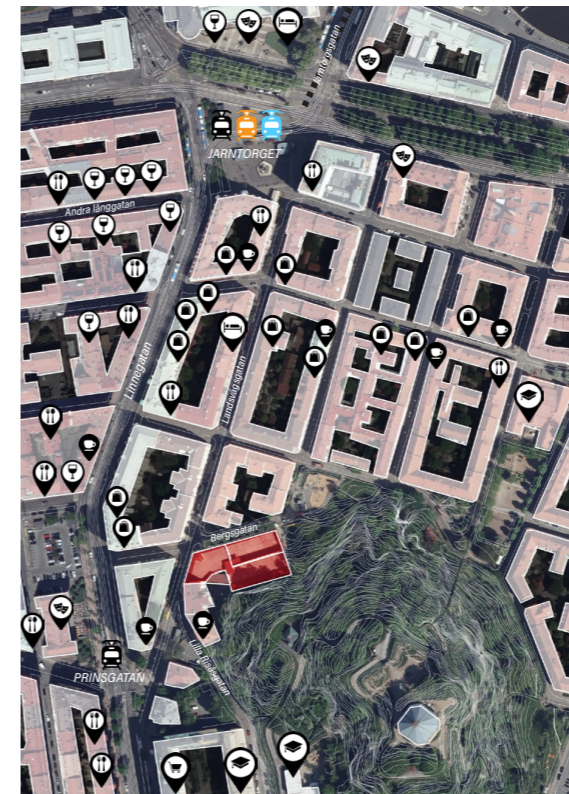
Site in Red, Map of Gothenburg

The site is located in the Haga district of central Gothenburg. It was one of the first suburbs in Gothenburg that now forms a key part of the city centre. It is a highly attractive area characterised by the most expensive rent per sqm in Gothenburg. It has great proximity to Lindholmen (A new tech Hub), Sahlgrenska (Hospital), Chalmers (University) and the Centrum. All locations can be reached within 20 minutes on public transport. I believe this makes the site and the interest of new housing in such an area very appealing to a variety of people. This may include but not limited to doctors, professors and tech employees.





Site Context Map, Bergsgatan 3



Surrounding Amenity



Paths & Activity

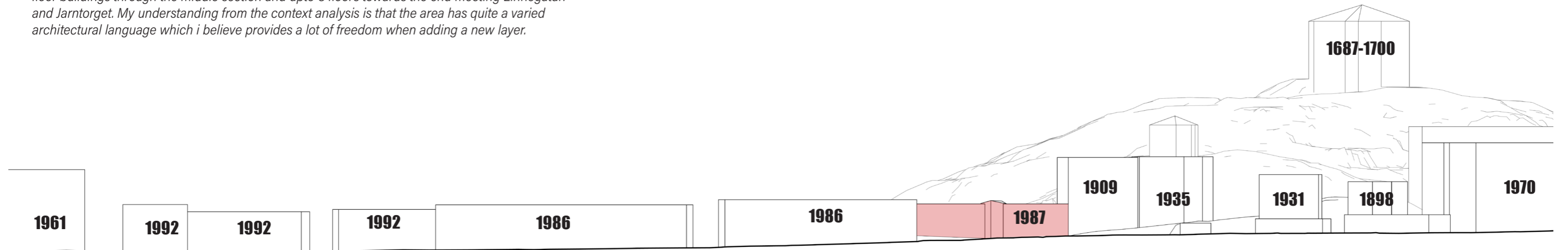
The specific site location is Bergsgatan 3 which is situated near the border between Linne and Haga. Both areas bring a lot of activity to the area. On the Linne side many restaurants and bars create a lively night time scene while the cafes and boutique shops of the Haga district bring the activity in the morning to early afternoon. The site is a short 100 metre walk to the closest tram stop and 350m to the Jarntorget Square which is a major transport hub filled with activity. Two maps above describe nearby amenity and my interpretation of the traffic within the area. A preschool, highschool and supermarket are also situated in good proximity to the site. The site backs on to the historical landmark and old fortress Skansen Kronan which sits atop a hill. A sloping topography and large trees make this a popular public spot for walks and views back over the city. A street section has been cut through the site street (Landsvagsgatan) depicting the overall scale of the street and can be seen in more detail on the following page.



Landsvagsgatan Street Section, Site in Red

## STREET CHARACTER

The area has a diverse character of buildings in terms of style and age. From grand buildings of a national romantic style situated along Linne to 80s functionalism on Landsvagsgatan. The two buildings beside the parking garage were built in 1909 and 1935. Many of the buildings have a shopfront on the ground floor with residential apartments above. This does not include the stripped down and patchy 80s functionalist buildings built in 1986 which feature unappealing ground floor residential apartments. The typical offering along the street is two and three room apartments with a few four room apartments as well. Building heights vary with a stretch of 4 floor buildings through the middle section and upto 8 floors towards the end meeting Linnegatan and Jarntorget. My understanding from the context analysis is that the area has quite a varied architectural language which i believe provides a lot of freedom when adding a new layer.



Landsvagsgatan Street Section, Scale 1:1250



1961  
Modern, Tall, Glazed Office Building  
Pub on Ground Floor

Built in 1992  
Landshovdingehus style  
Boutique Shop Corner

1986  
Ground floor Residential  
Long Stretch of Wall

1986  
Ground floor Residential  
Garden & Balcony to the South

1987  
Carpark  
(The Site)

1909  
Wealthy Facade Expression  
Beauty & Hairdresser Ground Floor

1935  
Modern  
Shopfront Ground Floor

1931  
Modern  
Barber, Gelato, Cafe, Boutique Store

1898  
Neo-Gothic Style  
Bar, Flowers, Pizza shop on ground floor

1970  
Modern, Glazed Residential Building  
West-facing Balconies  
Hemkop Supermarket

## SITE HISTORY

*In the 1980s major redevelopment occurred to improve the residential environment with many of the symbolic Gothenburg workers homes (Landshovdingehus) demolished. This also included three Landshovdingehus and a cinema that were situated on the site of the existing parking garage. About a fifth of the old original buildings remain in Haga. Landsvågsgatan receives a lot of foot and bike traffic both ways as well as one way car traffic running North. Due to the cobblestoned footpath many older people and parents with prams for children use the bikepath to walk down the street.*

*The two street views captured from the same location looking down Landsvågsgatan describe some key differences in how the buildings meet the street. The street view from 2025 with the existing carpark communicates a very solid surface with an almost prison like feeling. The openings in the facade are closed with wooden slats and there is not much space around the building to stop. This stretch of the street is very much a circulation route. From 1907 I get a much more open impression of the street. Semi-private green front yards as well as the buildings on this corner point all containing ground floor shops create a much more welcoming atmosphere. It leaves me with the impression that the existing carpark could also give back to the street in some way.*



Figure 26: Street View 1907, Landsvågsgatan - Looking North



Figure 27: Street View 2025, Landsvågsgatan - Looking North



Figure 28: Robert Garellick, Bergsgatan 3

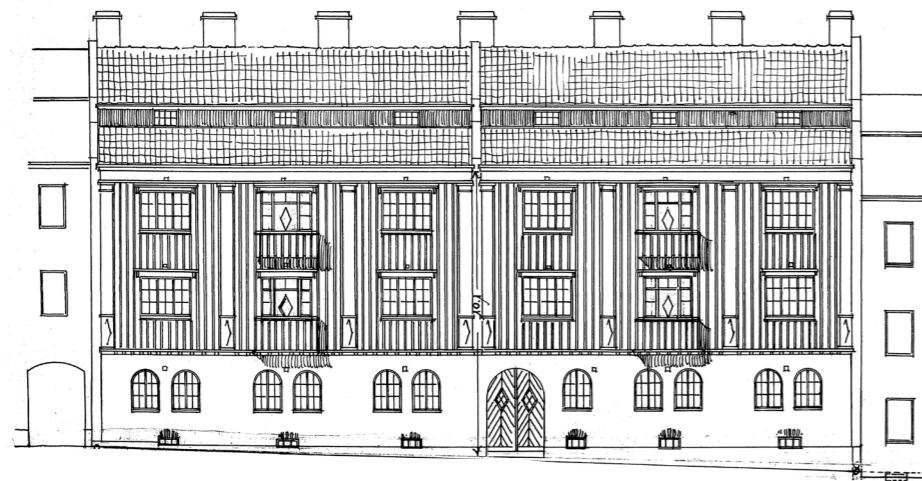


Figure 29: Original Building Drawing, 1915 - Bergsgatan 3, Brown Landshovdingehus (Middle)



Figure 30: Authors Image - Street View 2025: Bergsgatan 3

Three Landshovdingehus were situated on the site before the Carpark. They were demolished in the 80s along with many others in central Gothenburg during this time. The detail plan faults this to poor builds with water leakage issues causing rot and affecting the structure. Rebuilding them would have been an economic deficit. The ones situated on this site were built in 1915 and of the national romantic style. The middle brown house has been identified for its special and unusual 'Manor' roof which was designed by Carl Hjalmar Zetterström who was a student at Chalmers and taught by the well-known Swedish architect Hans Hedlund. As seen in Figure 19 both buildings situated on the corner of Landsvagsgatan/ Bergsgatan had a shopfront on ground floor which gives a more welcoming appearance when compared to today.



Figure 31: Robert Garellick, Landsvagsgatan North



Figure 32: Original Building Drawing, 1940 - Bergsgatan 3, Rio Cinema



Figure 33: Street View 2020 - Bergsgatan 3 & Lilla risåsgatan 25

Beside the county governor houses was the Rio Cinema built in 1940. Designed by architect Nils Olsson who was quite a prominent architect at the time designing many buildings in central Gothenburg including the Valhalla swimming hall. The building is representative of the stripped down functionalist style rising a few metres above the 3 floor County Governor Houses beside it. It was also demolished in the 80s after many failed attempts at running the cinema and its criminal and gambling ties. I quite enjoy the elevation in Figure 23 with the building heights gradually stepping down as Lilla Risagatan sweeps down onto Landsvagsgatan. The Cinema being 4 floors adds to my idea that there is an opportunity to use more of this vertical space beside the neighbouring building.

CONTEXT PHOTOS



Figure 34: Cafe & Boutique Strip - A short walk from the Site



Figure 35: Back Streets of HAGA - Looking up towards the rear side of the site



Figure 38: Prinsgatan Tram Station - Afternoon sun hitting the corner tower of Site



Figure 39: Where HAGA meets Linne - A Block down from the site



Figure 36: Family Park - Directly beside the rear side of the site



Figure 37: City Meets Park - Captured from the back of the site



Figure 40: Afterwork rush hour - In front of the Site



Figure 41: Peeling in to the HAGA district - A Block down from the site

## BUILDING ANALYSIS

Figure 42: Google Maps, 2025, Aerial Perspective

*The aim for the building analysis was to get a deeper understanding of the existing carpark and to start to explore the opportunities that its current state presents. Please note that the thesis direction is a vertical extension and thus I do not intend to change its current use as a private carpark.*

*The method for the Building analysis has involved site visits, city archive documents, photography, drawings, physical site model and the use of online tools and tutor consultation for understanding structural possibilities.*



# 1. IDENTITY

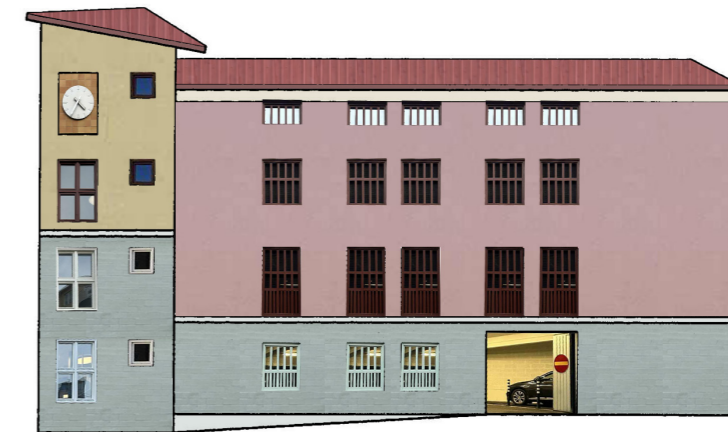
Overall the carpark has a patchy language as it attempts to blend in and appear like its neighbouring functionalist buildings that were also built in the 80s. The facade features a stripped down grey cement block that wraps along the base of the building. Pink, yellow and sanded tones are pasted on to the rest of the walls and it is my understanding the colour scheme has changed in the last 10 years. A red roof is also incorporated and tied together with the contexts red roof expression. The openings in the facade are guarded with wooden slats that give this impression of a fortress or prison by essentially shutting of any visibility into the inside. Many people dont understand that is in fact just a parking garage. Ultimately the building isnt that well recieved with public comments on a Gothenburg facebook group labelling it an 'ugly parking building' while also reminiscing about their own history of the site when they lived in in the past landshovdingehus that were demolished in 1987. The corner which doesnt sit on a complete right angle rises up as the highest point and features two clocks with a brown brick tile. The side facade is tree lined and lacks the visual impact during summer days when the trees hold their leaves. Not much activity occurs around the the rear and side of the building as it is a no through road for cars. I have observed many people walking their dogs along the perimeter of the building between the trees. The rear facade recieves morning sunlight, the front facade recieving sunlight during the early and late afternoon and the north facing side facade gets a bit of late afternoon sun depending on the time of year.



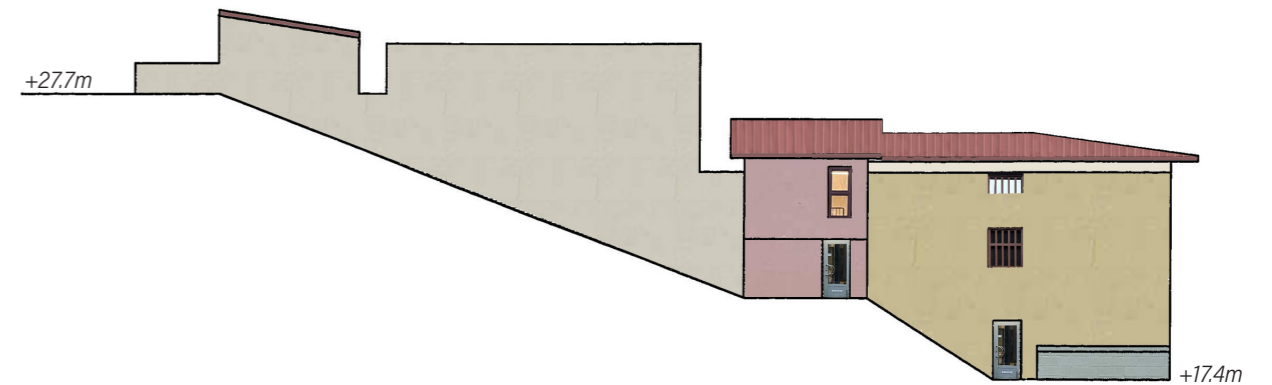
Figure 43: Authors Image



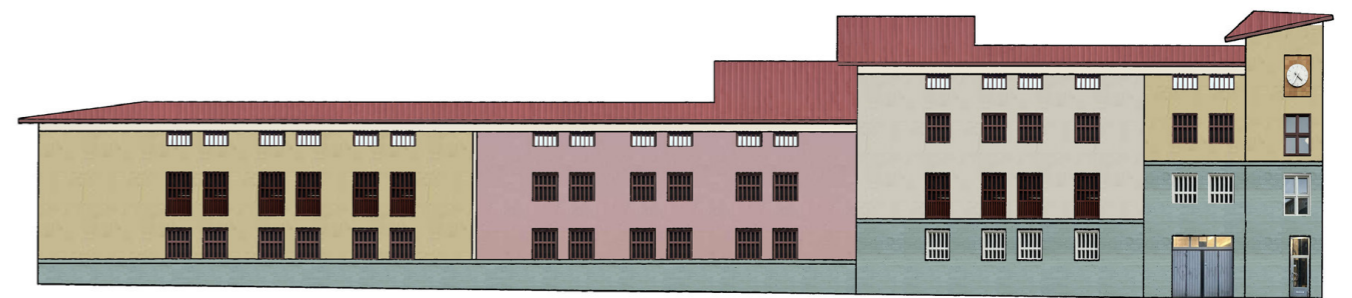
Figure 44: Authors Image



Front Elevation



Rear Elevation



Side Elevation

## 2. FUNCTION

A 4 floor Private Carpark owned by the City of Gothenburg. Detail plan sets out that the carpark was largely to accommodate nearby residents of the apartment buildings. In total there are 300 parking spaces available and many of the clients I assume are nearby residents. Both visits at 1pm and 6:30pm had a similar amount of car spaces used. Floor 1 and 2 were mostly full while floor 3 was roughly half full and floor 4 had little to no cars. It is estimated that there is about 90 free parking spaces currently available. The city of Gothenburg advertise on the carpark page that parking is available. The 4 floors are subdivided into 1a, 1b etc with a series of ramps for car circulation between the levels. The monthly cost of parking is 1500 sek. Access to the private carpark involves a mobile key pass to enter and lots of cameras inside and above the carpark. The carpark is entered via car from landsvagsgatan and exited through the no through road Bergsgatan street. Entrance for pedestrians occurs on the corner of Bergsgatan/Landsvagsgatan and also 2 fire escape exits occur on the rear side of the site to the east.

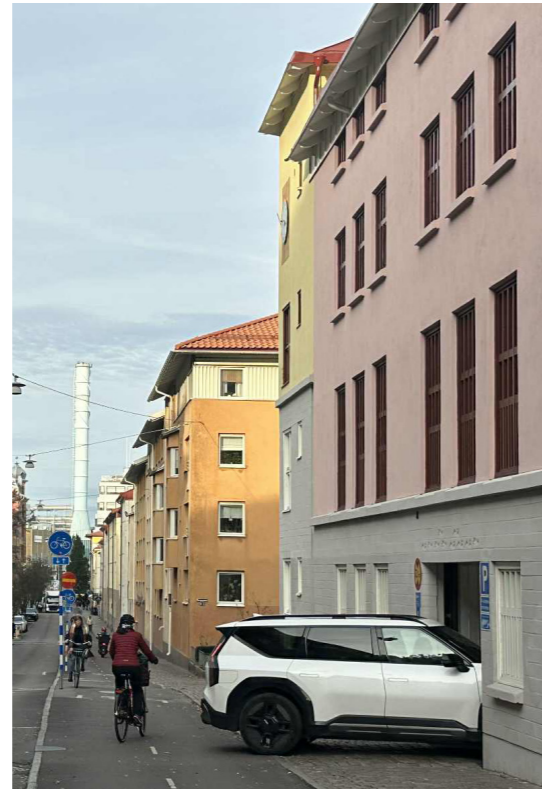


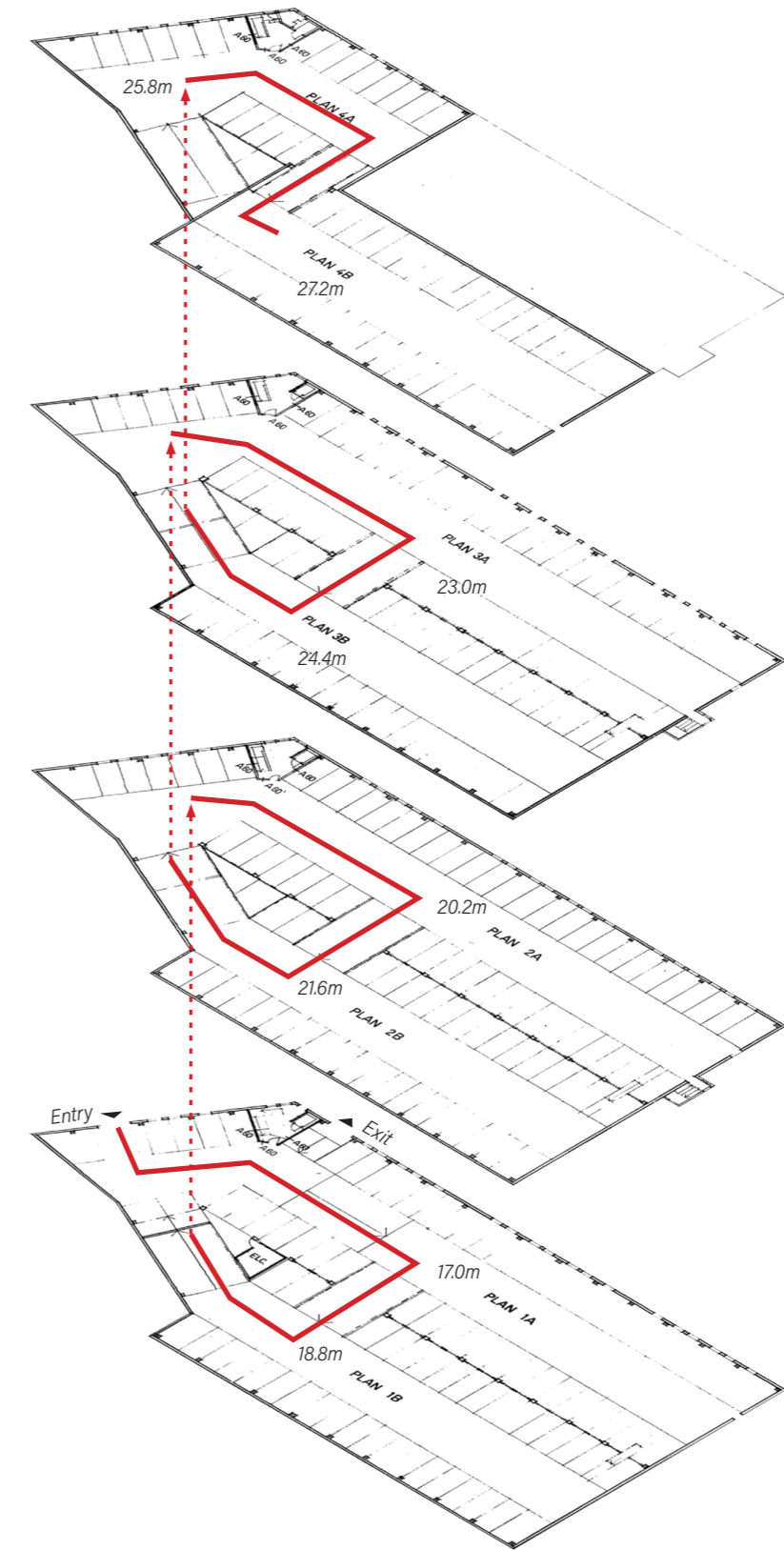
Figure 45: Car Entry



Figure 46: The Carpark



Figure 47: Car Exit, Pedestrian Entry



Car Circulation Axonometric

### 3. STRUCTURE

Concrete footings with large columns and beams support the concrete floor slab. Columns are set at 4 to 5m intervals with the beams spanning 16m across to the middle of the structure. Figure 26 seen below shows the existing structural layout. Dutch website Optoppen has been utilised to get a rough estimate of how much additional load the existing structure can support. It specifies 2 additional floors can be added. However inputs into the website are fairly limited and dont account for the fact that the current roof has 57 car parking spaces. Through a proposed timber construction the structural load would thus being going from heavy to light. As per the theory section of my thesis the carpark also presents the ideal and most common conditions for a vertical extension to occur. An industrial structure built of concrete with an existing structural base of 3 floors. In consultance with my tutor and examiner we have determined 3 additional floors is structurally feasible

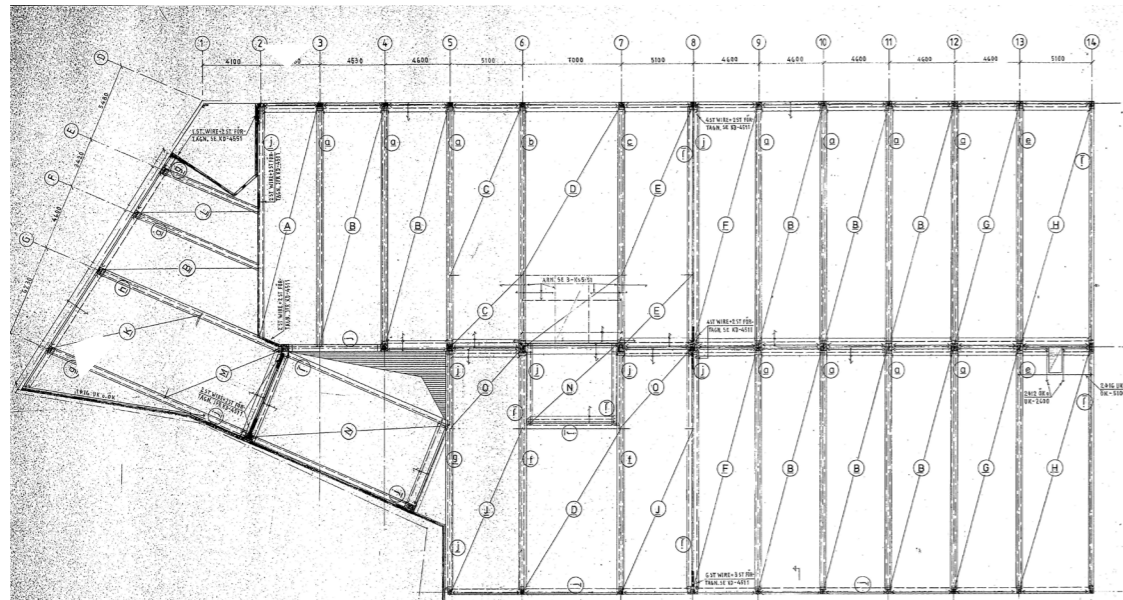


Figure 48: Original Building Drawing, 1987

The following drawings and interpretations of the structure show a fairly workable grid structure. The corner where the building meets the public street involves a more obscure shape. Column and beam intervals at roughly 5m can inform the layout and size of the housing. Quite thin apartments or duplexes are an option aswell as the possibility of wider double width apartments.

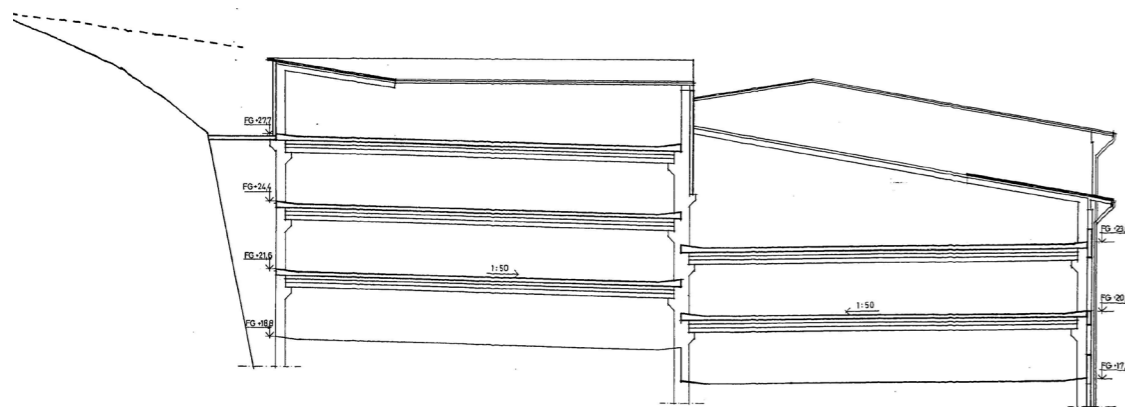


Figure 49: Original Building Drawing, 1987

The existing slab and beams are set at a 1:50 slope towards the middle of the structure for water runoff. Given the slope a new floating floor fixed must be built to support the housing and could be fixed to the existing concrete through steel and anchor bolts.

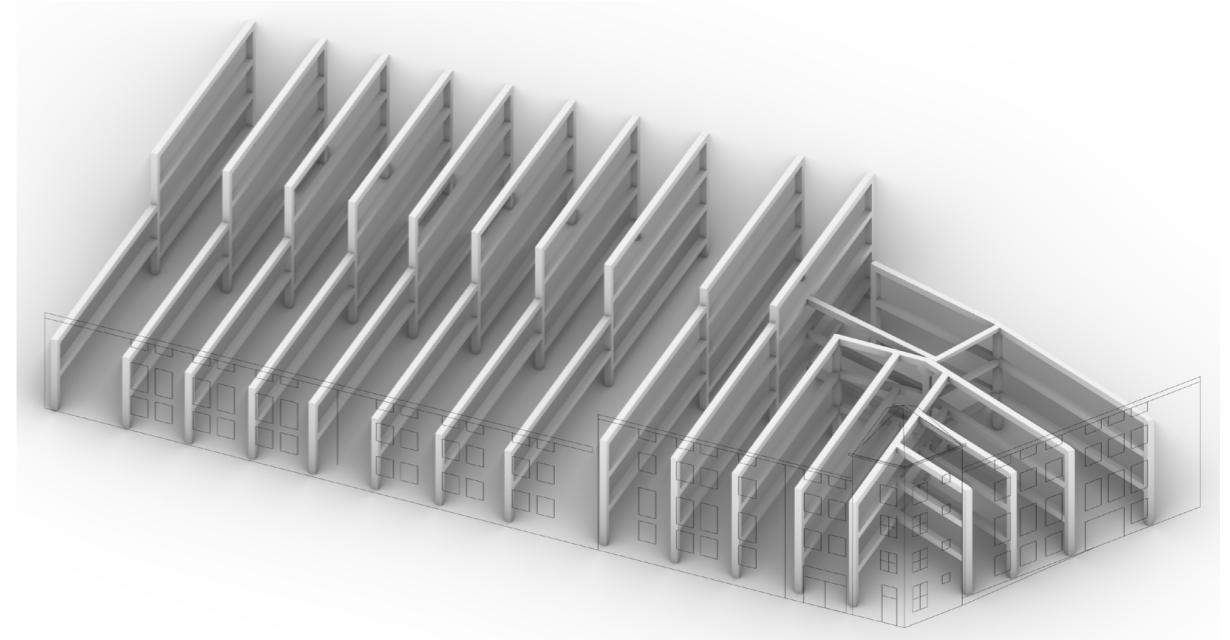


Figure 50: 3D Structural Interpretation - Authors Image

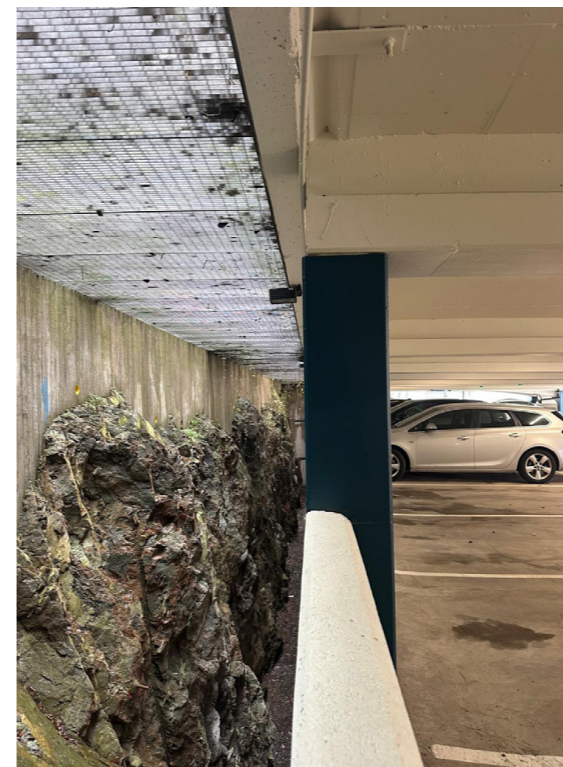


Figure 51: Site Photo - Authors Image

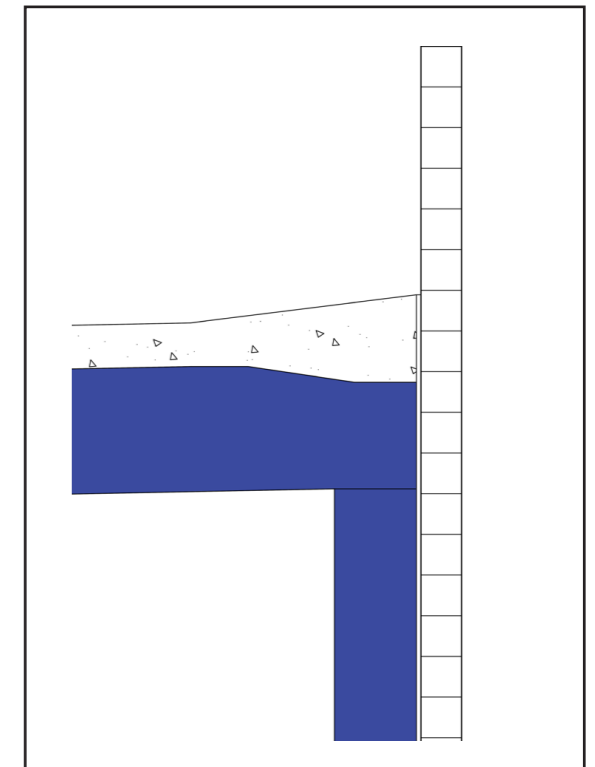
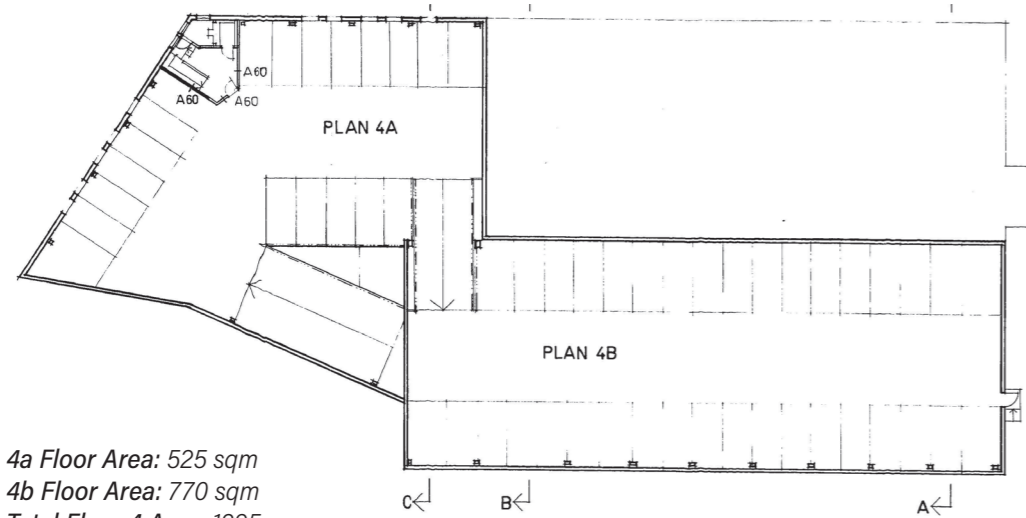


Figure 52: Facade Detail - Authors Image

Concrete Column - 500x500mm, Beams - 600x16m, Concrete Slabs are laid horizontally ontop, Cement Block - 180x180mm as Facade.

## 4. ROOFSPACE

After Contacting the City of Gothenburg I was able to gain access to the private carpark and to the roofspace where my interest lies. I visited both at midday and later that night at 18:30. There were little to no changes in the amount of car spaces used at both times. Many residents of the nearby apartment buildings as suggested in the detail plan park there cars there overnight. Floor 1a, 1b, 2a and 2b were full while 3a, 3b were 33% full. 4a and 4b had a total of 5 cars parked out of a total of 57. This confirmed my early assumption that the roofspace was nearly empty and that any existing cars that use the roofspace could be accommodated in the floors below. An educated assumption has been that 90 car spaces are free in the carpark with most being in the open-air roof space where the car is unprotected from the weather.

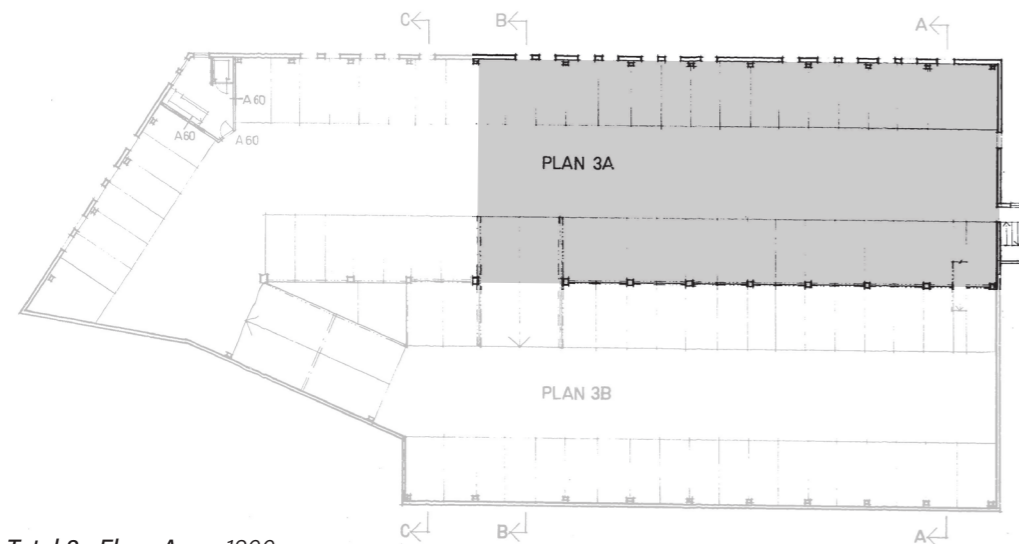


4a Floor Area: 525 sqm  
 4b Floor Area: 770 sqm  
 Total Floor 4 Area: 1295 sqm  
 Total Car Spaces: 57

Figure 53: Original Building Drawing

### Car Spaces used:

1pm 23/09/25: 4 spaces, 12pm 6/10/25: 5 spaces, 6:30pm 6/10/25: 4 spaces, 4:30pm 20/10/25: 7 spaces



Total 3a Floor Area: 1200 sqm  
 Highlighted 3a Floor Area: 640 sqm  
 Highlighted Area Car Spaces: 31

Figure 54: Original Building Drawing

### Car Spaces used:

12pm 6/10/25: 6 spaces, 6:30pm 6/10/25: 8 spaces



Figure 55: 4A - Looking West



Figure 56: 4B - Looking South East

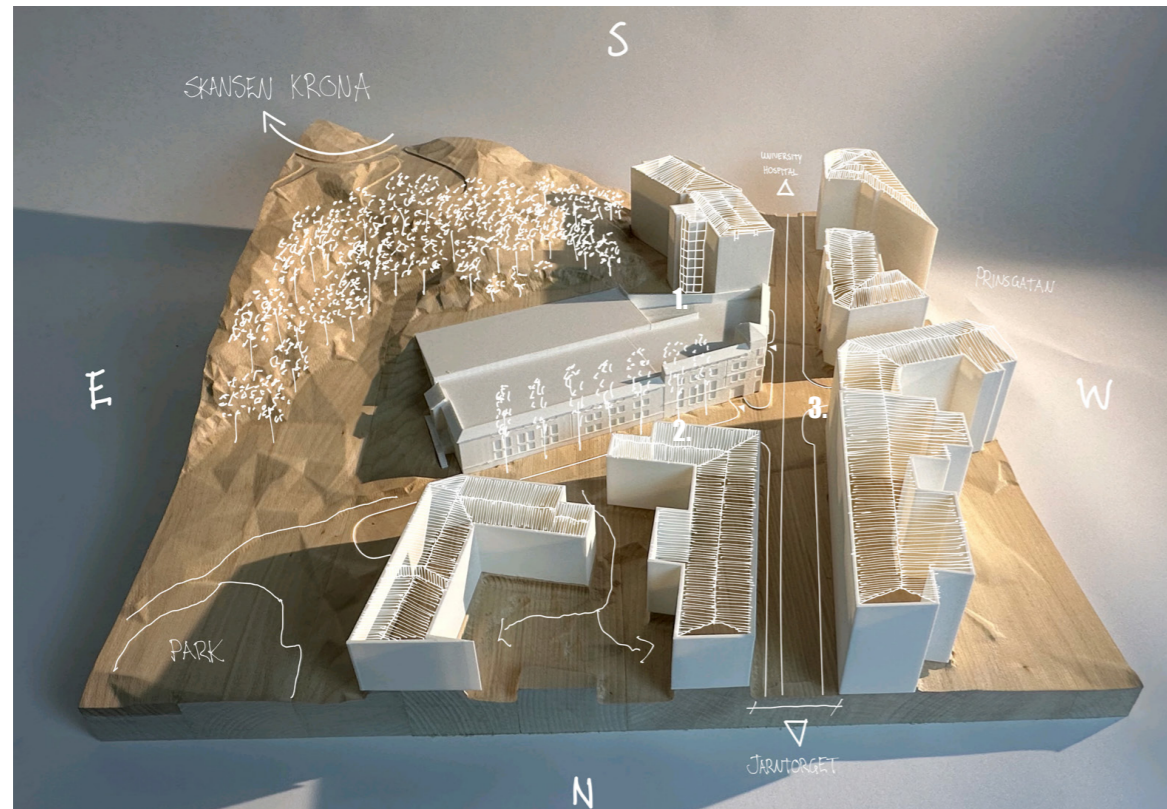


Figure 57: 4B - Looking North



Figure 58: 3A - Looking East

## 5. IMMEDIATE CONTEXT

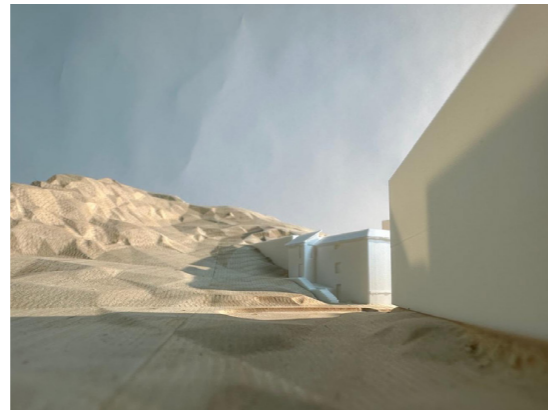


Site Model - scale 1:250

### Access:



Approach from Prinsgatan (West)



Approach from Park (East)



Approach from Jarntorget (North)



Approach from Lilla Risagatan (South)

**Sun:** The site receives fairly good sunlight with great southern aspect. On the Spring Equinox (21st March) 63% of the roof space receives 5 hours of direct sun between 10:00-16:00. Dark spots occur along the middle of the site due to the lower level roof space and the corner next to the direct neighbour. Images below evidence the analysis on the 21st of March.

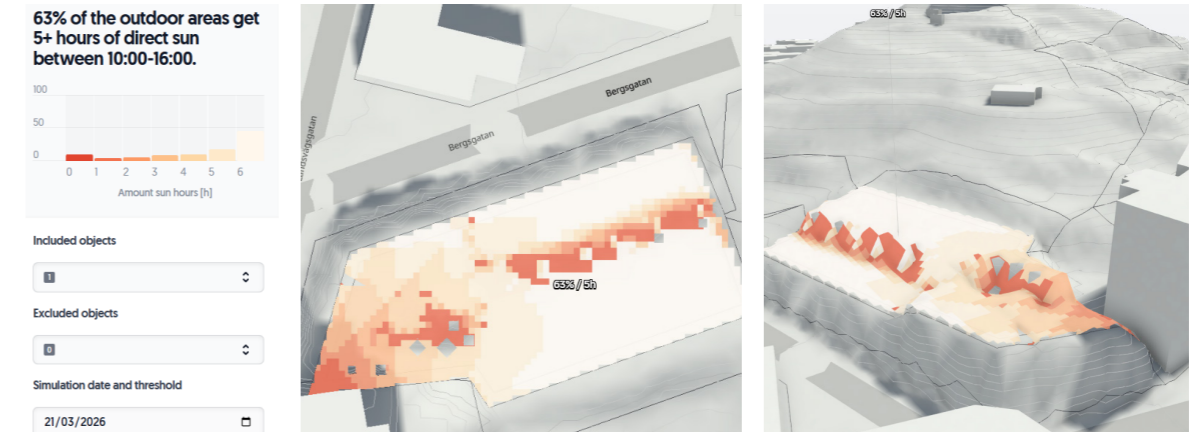


Figure 59: Spacio Ai Analysis

**Wind:** South/ South-Westerly winds are the main direction in Gothenburg and are not expected to cause an issue on this site as it is sheltered by neighbouring buildings.

**Direct Neighbours:** Image 1 shows Lilla Risagatan 25 morning sun room that faces east. Care should be given to not disrupt that sunlight and view to the park. Image 2 Neighbour has south facing balconies and garden which should be acknowledged. Image 3 building sits directly opposite side of street on the corner with balconies that have a great view of Skansen Kronan. All direct Neighbours are taller than the carpark.

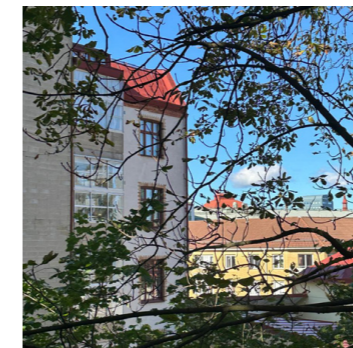


Figure 60: Image 1



Figure 61: Image 2



Figure 62: Image 3

**Circulation:** Landsvagsgatan is an important artery for public circulation with a footpath, bike path and a one way road. The nearby Haga district, Jarntorget Square, Supermarket, Shops and a tram station make the street fairly busy throughout all parts of the day. The current cobblestone footpath immediately outside the site can disrupt the flow of traffic already as people divert onto the bike path to avoid the cobblestone. A new entrance to the site should be mindful of where the entrance is situated and the impact it may have.

**Views:** Tall tree lined facade to the North with the opportunity to look back towards the city over the roofs towards Draken Hotel and Stenpiren. Views back to Skansen Kronan and the trees on the south/East. During the colder months the deciduous trees allow for views up to Skansen Kronan Fortress while in the summer a wall of tall and green trees provide a unique urban quality. To the West you get views of the National Romantic Buildings along Linnegatan and Oskar Fredrik Church rising above with an afternoon sunset. The street is situated at 17.4m above sea level and the roofspace at 27.7m.

## DESIGN

*Sketches and physical models have been used as a tool to explore form and atmospheres with technical drawings used to accurately refine the architectural proposal.*



## Project Description

The project questions the mono-functional use of a private carpark built in 1987 by designing housing above it. The area of interest is the roofspace of the carpark which has been deemed underused and largely empty. The project also intends to create a more welcoming street environment by opening up the ground floor facade along Landsvagsgatan to make way for a cafe. The housing proposal is a 3-storey medium-density project with the intention to balance quality with density given the specific site of a carpark. Thus space has been made for vegetation, social meeting places, bike parking and private terraces. The project offers a variety of housing options which have largely been informed by the existing structural grid and site dimensions. 3 and 4-room apartments aswell as duplexes stretch around the perimeter of the site facing the street while Villas have been offered towards the back of the site as a housing niche within an urban environment. A common laundry aswell social spaces, green spaces, bike parking and a private terrace or garden have been included in the project. A total of 82 car spaces have been removed from 300. 57 of them from the roof space with the additional spaces removed for the entry space and the cafe occuring on the other floors.

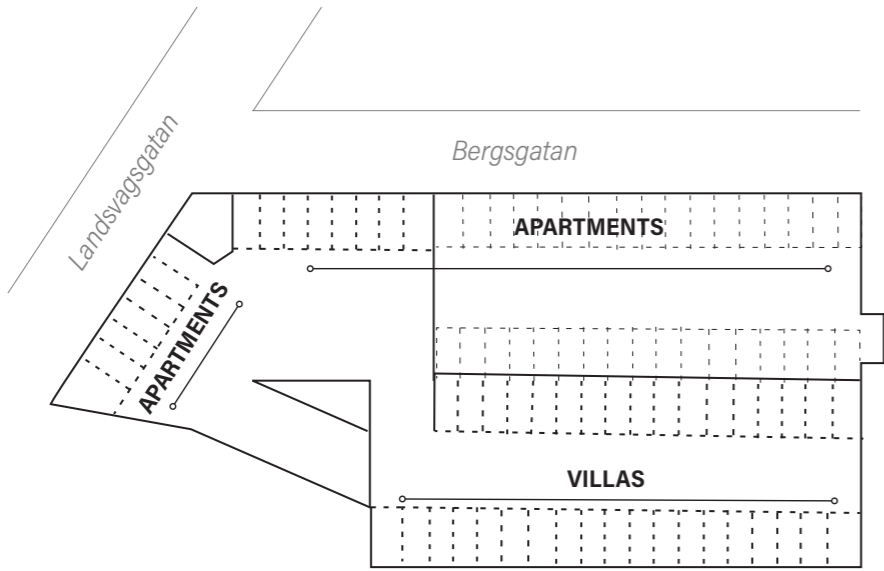
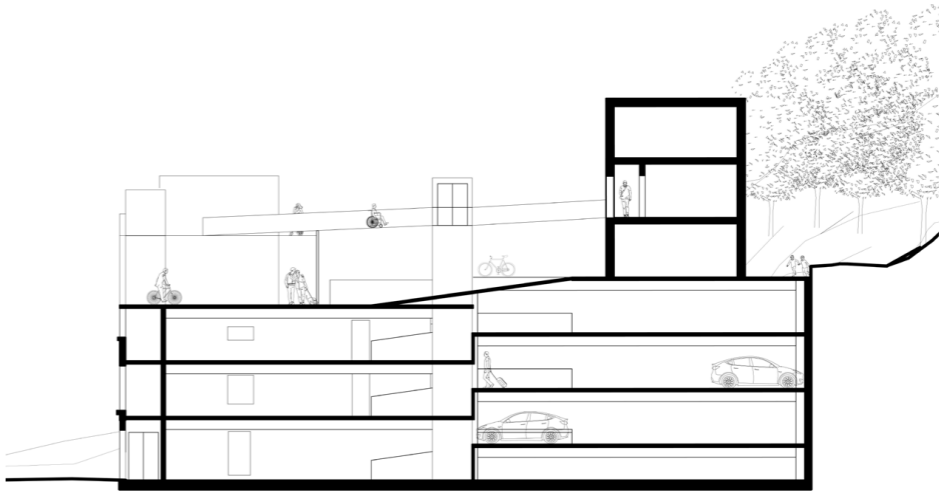


Diagram:  
Roofspace Housing Layout

## Concept

The project intends to activate an underused and empty roof space bringing a new sense of life and movement to a previously quite shut off and unknown building. The access balcony has been employed as a density feature but also as this spine that wraps around the perimeter of the site connecting the variety of housing. The building takes on a setback form allowing the access balcony to become a prominent architectural gesture where movement and life are visible. The project hopes to form a new identity of housing, cars, bicycles.



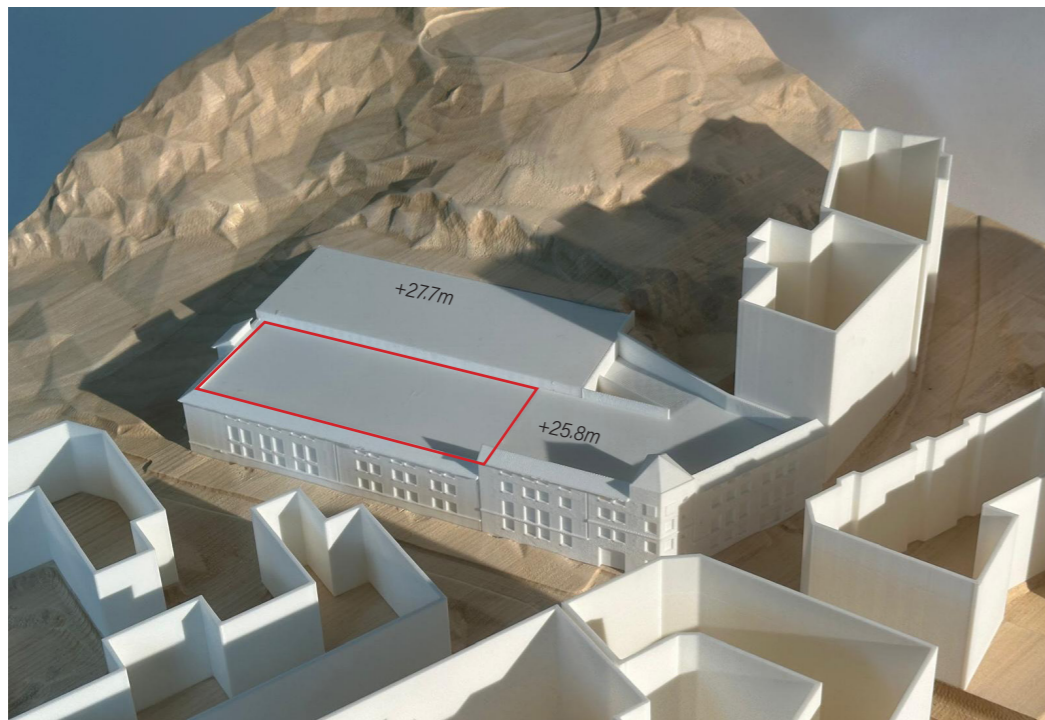
Early Concept Section:  
Housing, Cars & Bicycles

When iterating with the volumes i explored different concepts and typologies on the existing roof. These series of iterations were ran through a filter that considered circulation, sunlight, acoustics, views and density. Three final concepts are pictured beside with Idea 1 selected for further investigation.

## Design Development

In the beginning weeks of the thesis a large cnc milled site model was created at scale 1:250. The immediate buildings within the vicinity were 3d printed as a representation to understand the scale and proportion of the site in relation to its context. The intention for the physical model was to capture the park and steep sloping topography towards Skansen kronan on one side and the urban fabric on the other. The specific carpark site situated in this inbetween space with qualities of both the park and the street.

Early Interventions to the existing roof space involved removing the walls at the back of the site to open up to the Skansen park and beyond. I also sealed off the existing 3a parking level which had an open roof space. See Red outline below for the new floor that was built. The new floor allowed me to start working with two floor levels on this roof space. The back platform that meets the park at +27.7m and the floor below that faces the street at +25.8m. I then was able to begin testing different volumes and configurations with foam.

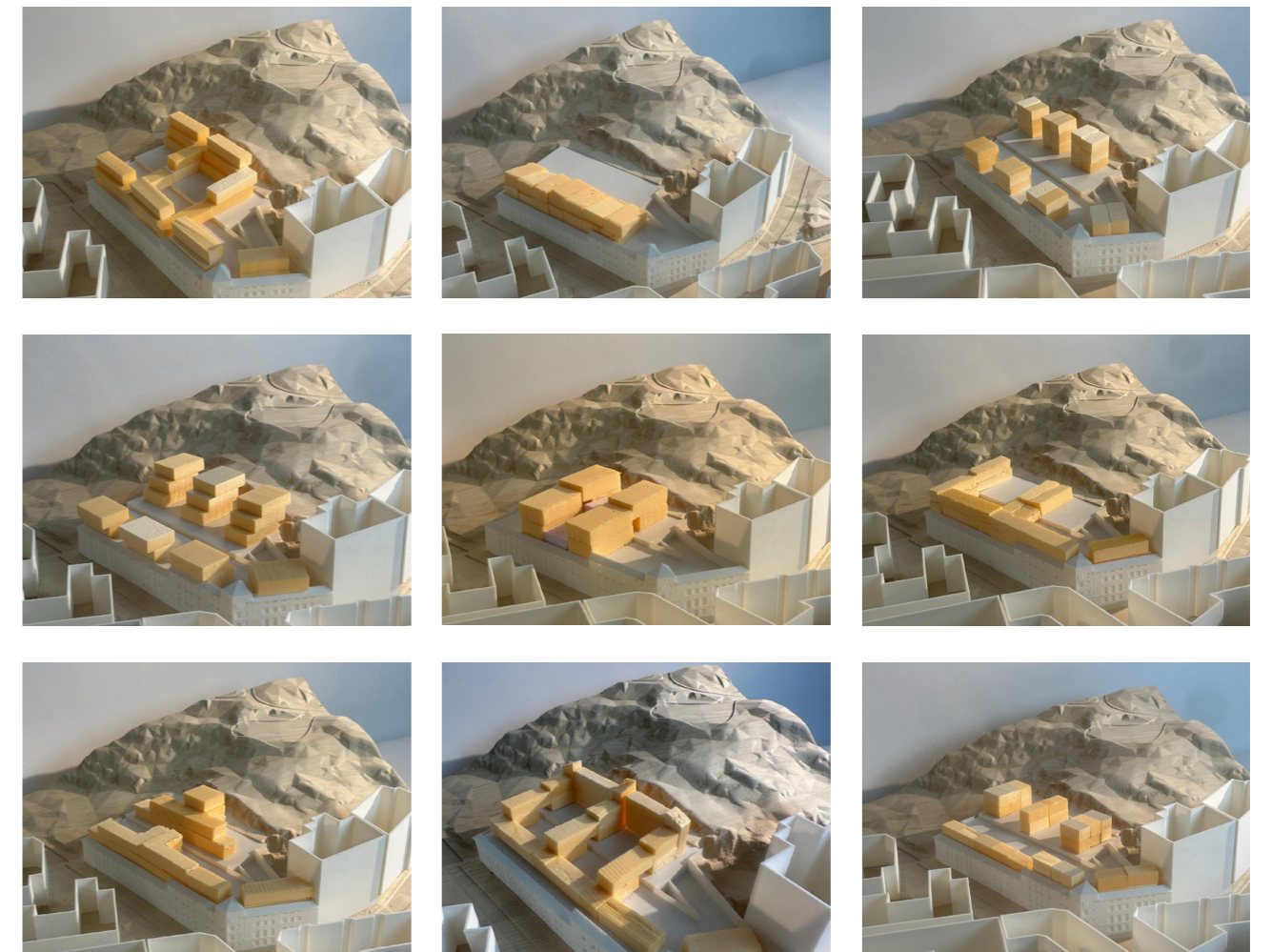


1. The first one explored the idea of a central spine that orients you from west to east providing access to apartments facing the street and villas with gardens towards the park. The villas at the back allowed for openings in the upper floor to create views for the street facing apartments

2. The second concept explored the idea of building strips that stretch from the urban street to the park creating shared courtyards inbetween the volumes. The building gradually growing as you deeper into the site aligning with the rise of the topography.

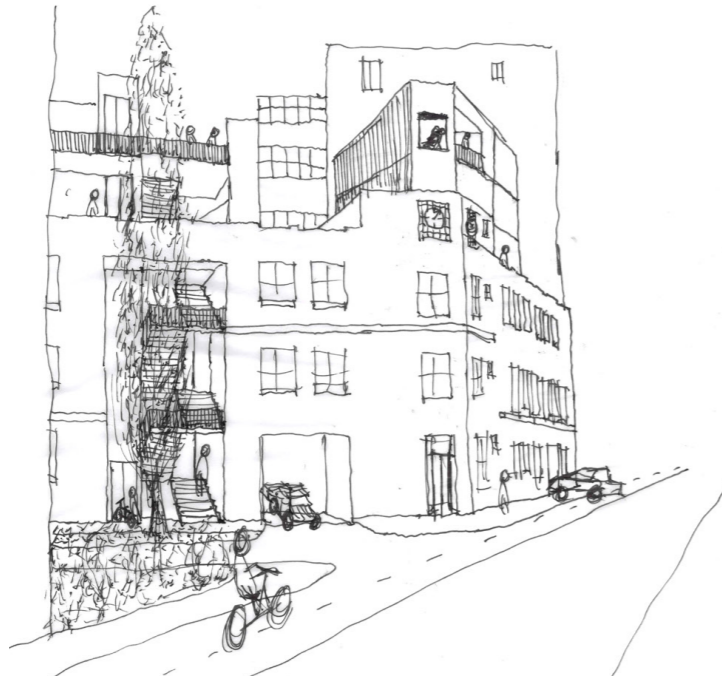
3. The third concept explored the idea of a journey from the urban street into a large shared green courtyard where each apartment is accessed from. To the other side each unit then was able to receive a private terrace.

### Additional Testing

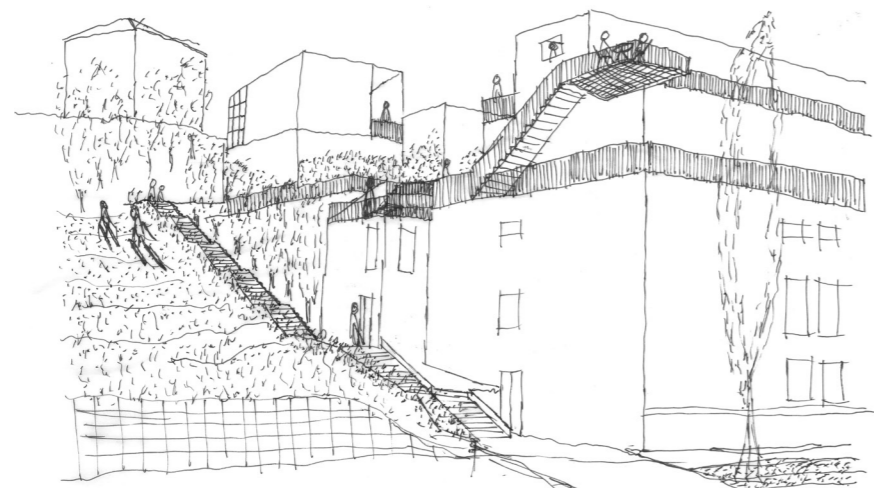


## Sketching

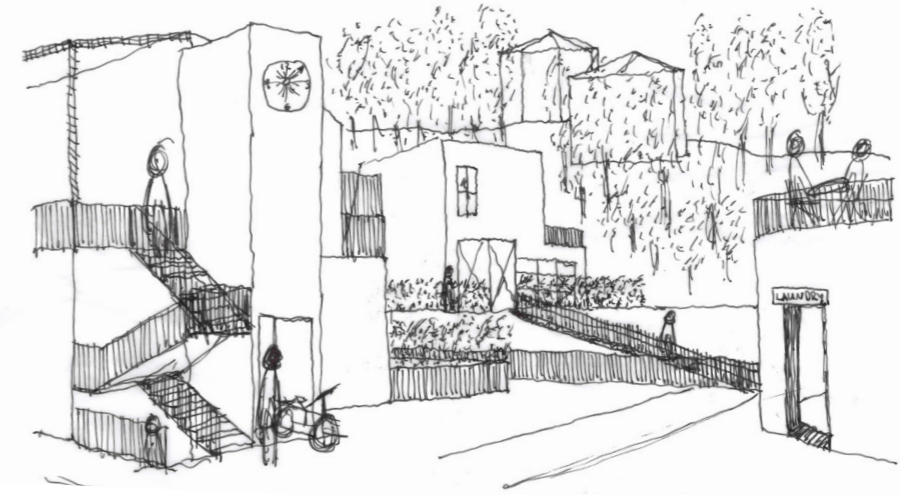
Sketching was then utilised as a tool to start to explore and materialise some of the ideas that were present in my mind when working with the selected idea from the volume investigation. The following sketches start to explore qualities of green, views, sun to create an atmosphere and life in the selected volume. The circulation in and between spaces starts to play a pivotal role in my project. The journey and spatial sequence from the urban street to the park is also imagined. Please note these are process sketches that have been instilled into the floor plan however do not accurately represent the design outcomes on the following pages.



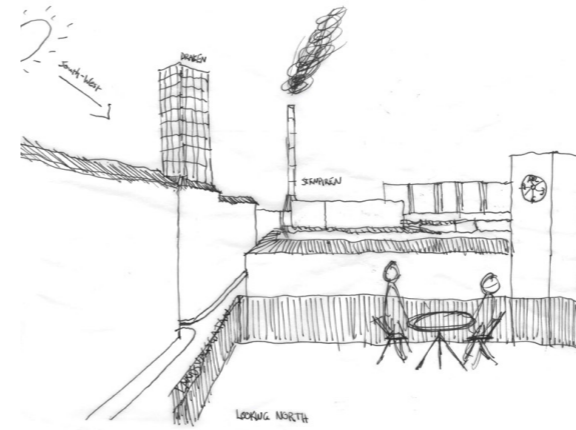
1. Main entrance positioned just off the main street, beside the car exit and the first tree that lines the side facade.



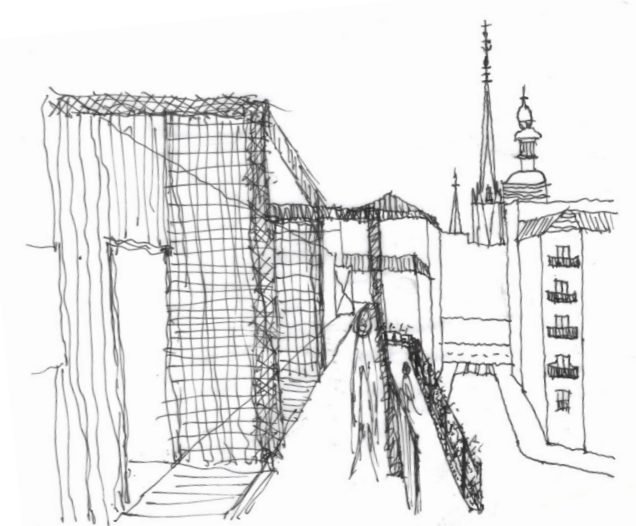
2. Existing side entrance stair has been extended up providing rear access for the villas and side access for the apartments



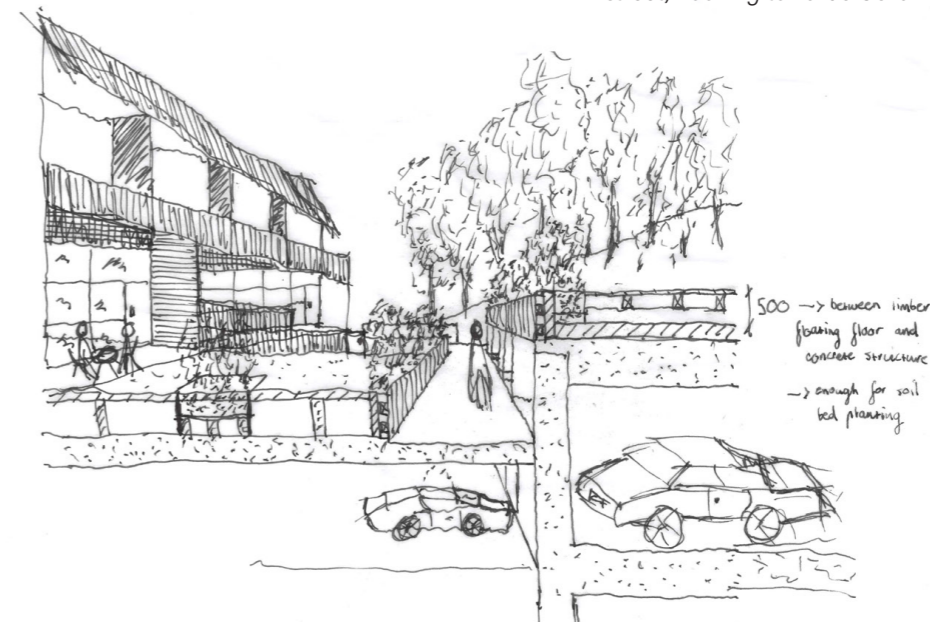
3. Entering roof space from the main entrance, Openness and axiality facing south to Skansen kronan, A series of different paths shooting off.



2. Social Terraces looking North back over the roofs of the City - Draken and Energy station pictured in the back, Afternoon Sun



3. Access Balcony looking West, Open towards the street, Looking towards Oskar Fredrik Church



4. Path looking east dividing the two floor levels of the site, a new floating floor above the existing concrete structure, south facing terraces, cars & housing

Roof Space: 2100sqm

Number of Units: 20

Type of Units:

3 x 4 room Apartments: 94-100sqm

3 x 3 room Apartments: 2x72sqm, 87sqm

7 x 3 room Duplex: 6x75sqm, 70sqm

2 x 4 room Duplex: 115sqm

4 x Villa: 104sqm

4 Bedroom Duplex/ Co-living: 175sqm

Additional People expected on site: 72

South facing Roof Solar Panels: 188

Bike spaces: 55 Official Bike Spaces

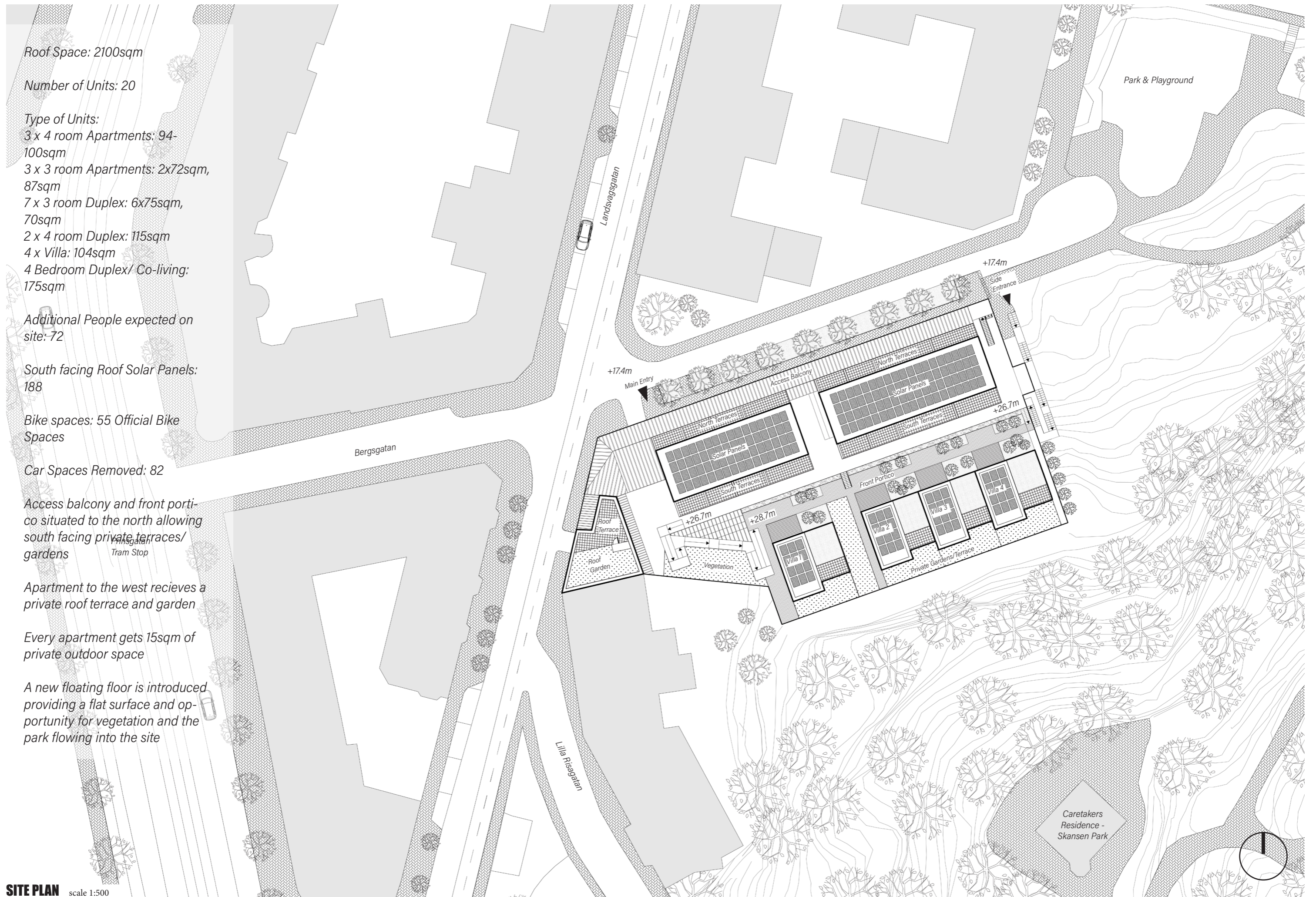
Car Spaces Removed: 82

Access balcony and front portico situated to the north allowing south facing private terraces/gardens

Apartment to the west receives a private roof terrace and garden

Every apartment gets 15sqm of private outdoor space

A new floating floor is introduced providing a flat surface and opportunity for vegetation and the park flowing into the site



- 1. New Housing Entrance
- 2. Garbage Room
- 3. Bike Storage
- 4. Cafe & Bike Station
- 5. Car Entry
- 6. Car Exit
- 7. Parking Entrance Core

New  
 Existing

Main entrance situated just off the main road (Landsvagsgatan) and becomes part of this larger core where you have the existing car exit and pedestrian entry for the carpark.

A Cafe & bike repair opens up towards the street with a double height glazed wall system. Seating is situated along the glazing with views out. A small kitchen and service area situated just beneath the stairs which lead you into an additional seating space.

38 Bike parking spaces are provided on the ground floor for residents.

+17.4m



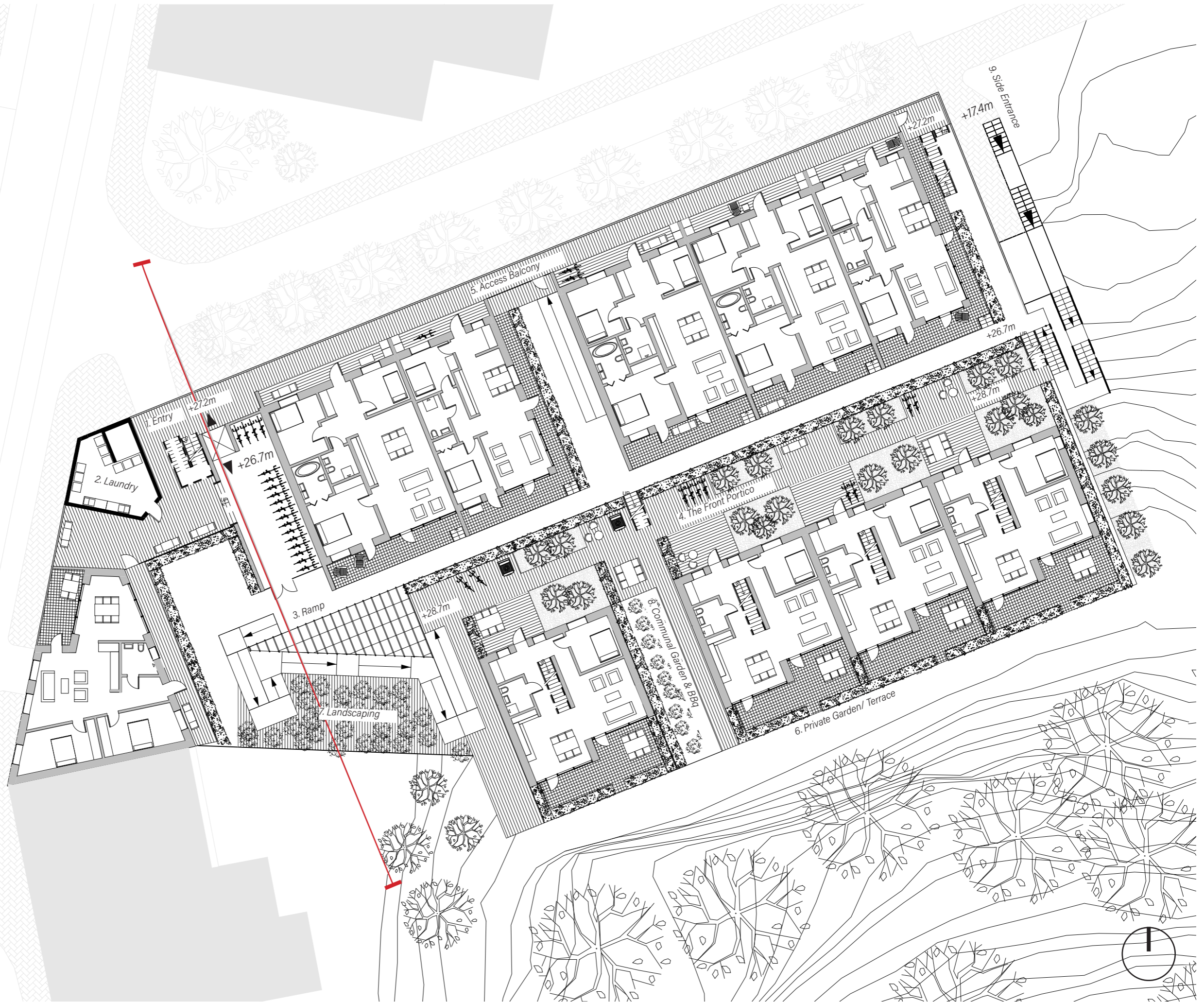
1. Entry
2. Laundry
3. Ramp
4. The Front Portico
5. Access Balcony
6. Private Garden/ Terrace
7. Landscaping
8. Communal Garden & Bbq
9. Side Entrance

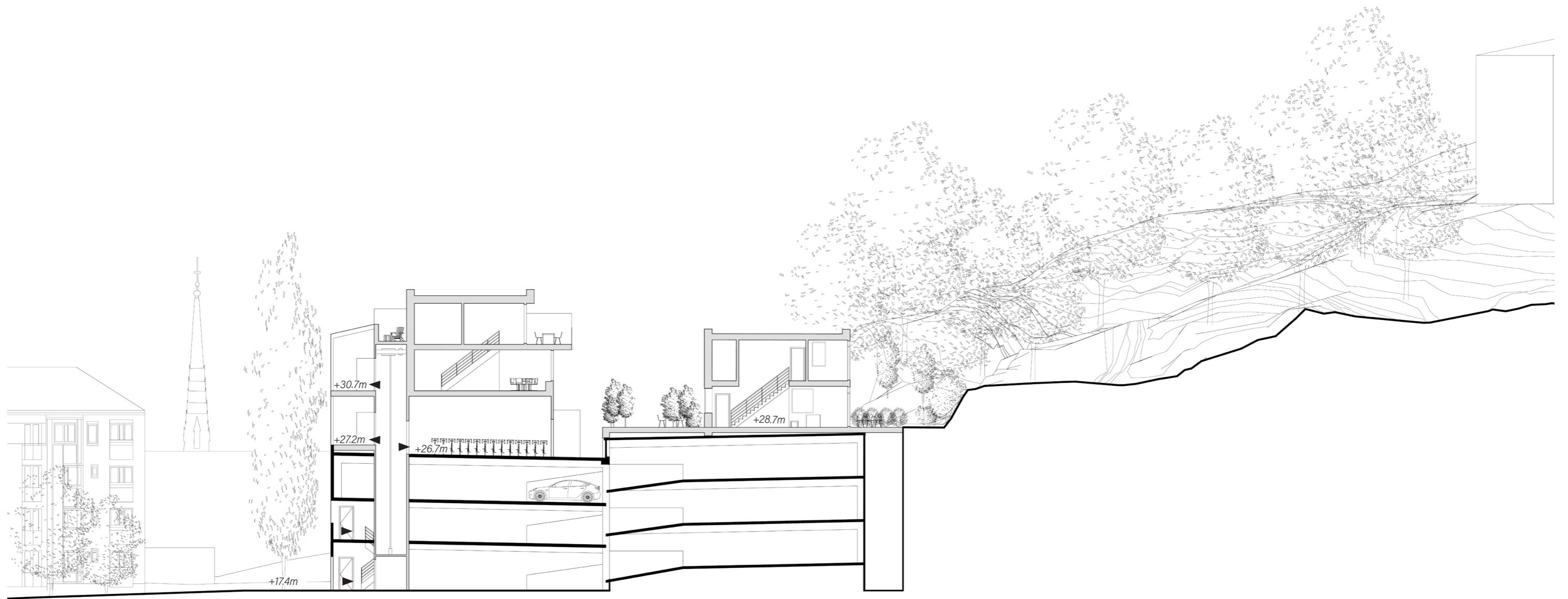
Entry: Laundry situated in the old parking entrance to the 4th floor, Casual seating, Bike Parking

Apartments: 3 & 4 room apartments are served via the north facing access balcony, large living spaces open up onto a private terrace, Autonomy in apartments with bedroom and bathroom situated immediately upon entry.

Villas at the back of site accessed via ramp or stairs. 1:12 Minimum required wheelchair accessible ramp situated above the old car ramp. A new floor with landscaping is offered here hoping to create a green corridor where the park behind can flow in.

Villas have private terrace/ garden to the south which is shared between the kitchen and living space. The front portico acts as a buffer between the two volumes on either side and has great qualities when the afternoon sun finds its way inbetween both volumes.





- New
- Existing

*Enter at Street level or the first floor of the carpark where a lift and stair provide the vertical circulation to the roofspace. First exit on the roofspace is onto the existing concrete floor with bike storage and circulation to the villas. The old car ramp meets the new wheelchair ramp. Section is cut through the lightwell to the carpark which is now sealed with a new wall and fire rated glass on top. A new floor above the old car ramp intends to provide rough landscaping where the park can start to flow and overgrow into the site.*

*At the additional floor levels (27.2m, 30.7m) the apartments can be accessed via an enclosed northern access balcony.*

1. Social Space

2. Access Balcony

3. Private Terraces

4. Roof Landscaping

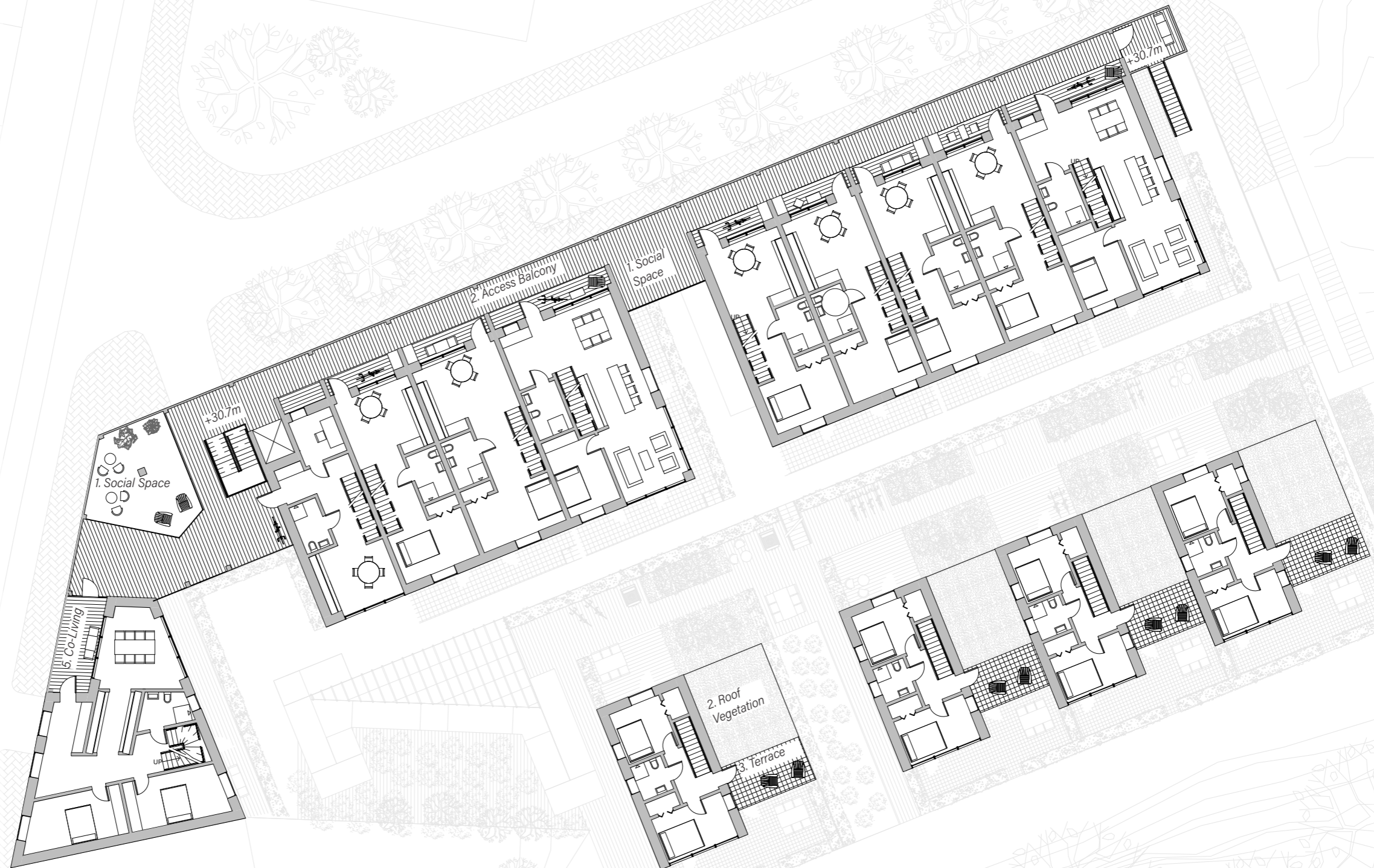
5. Co-Living

Arrival on the second floor occurs in the same where you look north and over the roofs of the city. A social space is also situated here on the corner above the laundry on the first floor. The space itself is fairly open and with double sided views of the park and towards the street. It receives great afternoon sun and could host a variety of activities.

Duplexes are accessed via the 2.6m wide corridor which contain threshold spaces giving each apartment a sense of ownership to decorate the front of their apartment. The duplexes are either 3 or 4-room apartments that are largely based off the floor below. Essentially one 4-room apartment from below creates 2 duplexes. Bathrooms and kitchens are positioned together and also connected with the below floor. They are all set up to contain a kitchen, bathroom and bedroom on the entry floor a part from the one positioned next to the lift which is a discrepancy.

On the west you have a Co-living or for a large family with 4 general bedrooms.

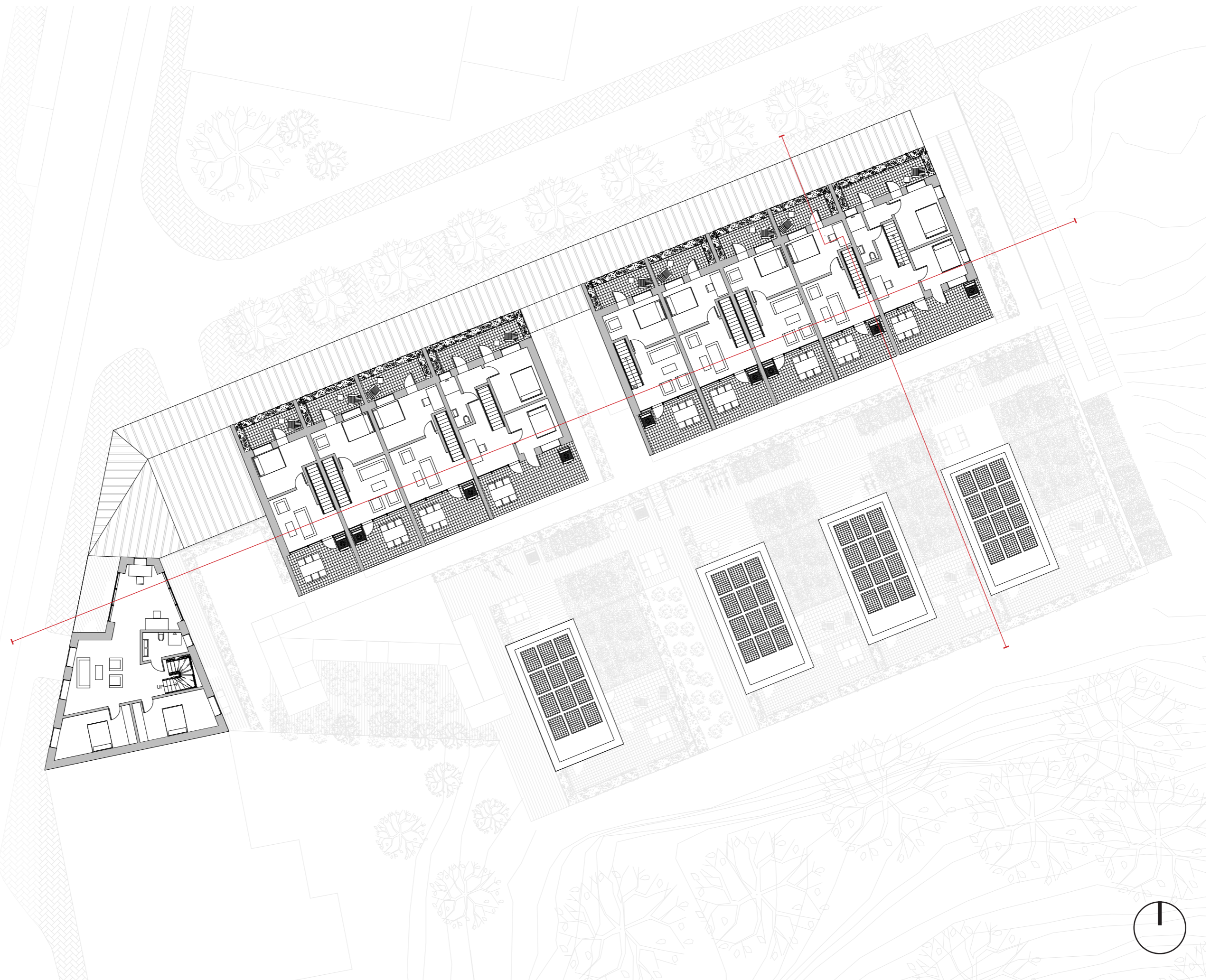
The villas second floor contain 2 bedrooms and then a opening in-between volumes which make way for a private double-sided terrace with roof vegetation and openings for views and sunlight.

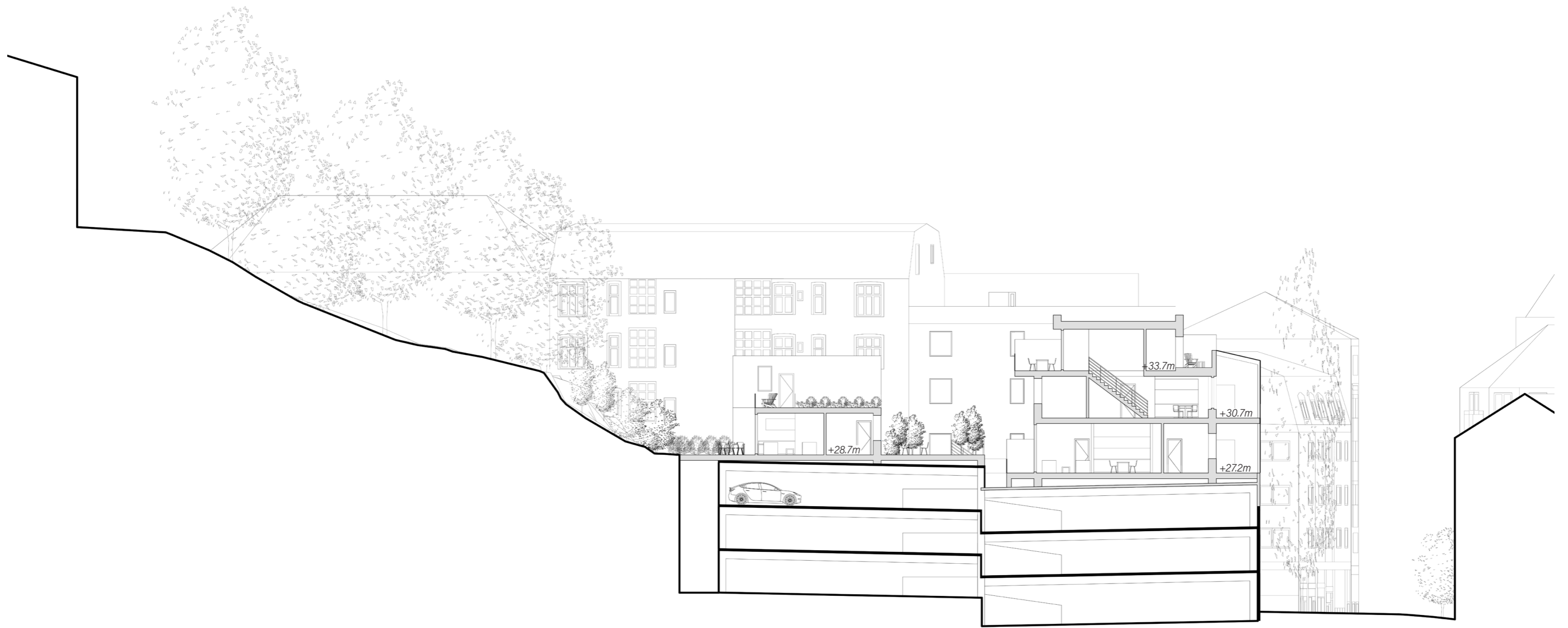


Up to the second floor of the duplexes you receive a bedroom or two, living space, large social balconies with room for a 6 seat table and bbq. The axiality and openness between both sides was a big factor when designing this floor. Allowing for deep views between city and the Skansen park. The larger duplex gets another bedroom and a bathroom which includes a shower with a view.

The Co-living has 2 more mirrored bedrooms, a living space and a separate space that could be used as a work space. Glazed on both sides with great afternoon and morning light. The stair also continues to the roof terrace and garden.

12 south facing solar panels at 1.7x1m are situated on the roof of each villa.





New  
 Existing

The overall life is displayed here. Beginning at the access balcony which is enclosed with polycarbonate where you walk beside the large trees that line the facade. A partition wall divides the balcony space allowing each apartment to decorate. Into the apartments where the first floor apartment has a large kitchen and living space that opens up onto a terrace with 3m floor to ceiling glazing that faces south. Dividing the two new timber floors that extend out towards the middle is the existing concrete floor which provides an extra circulation path throughout the site. The spacing between the two masses for sunlight and views is used as a front portico space that combines semi-private settings with more social and communal facilities. An opening is created above the first floor of each villa and occurs so that each living space of the ground floor apartments get uninterrupted views to the park. That line of sight has integrated planting and vegetation inbetween for privacy and atmosphere. The villas also receive floor to ceiling glazing that opens up towards a wall of green and sloping topography. The top form of the duplex facing the street is setback to respect neighbouring views and sunlight while they get their own double sided private and social terraces with deep views.

A zoom in of the access balcony which acts as the core of my project. Here we have the meeting between the existing concrete structure of the carpark represented black and the new structure in grey.

1. Concrete Column
2. Reinforced Concrete Beam
3. Horizontal Concrete Floor Slabs
4. Cement Blocks as facade material

And the new lightweight timber frame structure of 3 floors. Due to the 1:50 slope of the existing concrete slab a new timber floating floor was built to create a flat surface. This added a layer of complexity as I was now working with these two first floor levels of sloping concrete at at +26.7m and the timber floor at +27.2m.

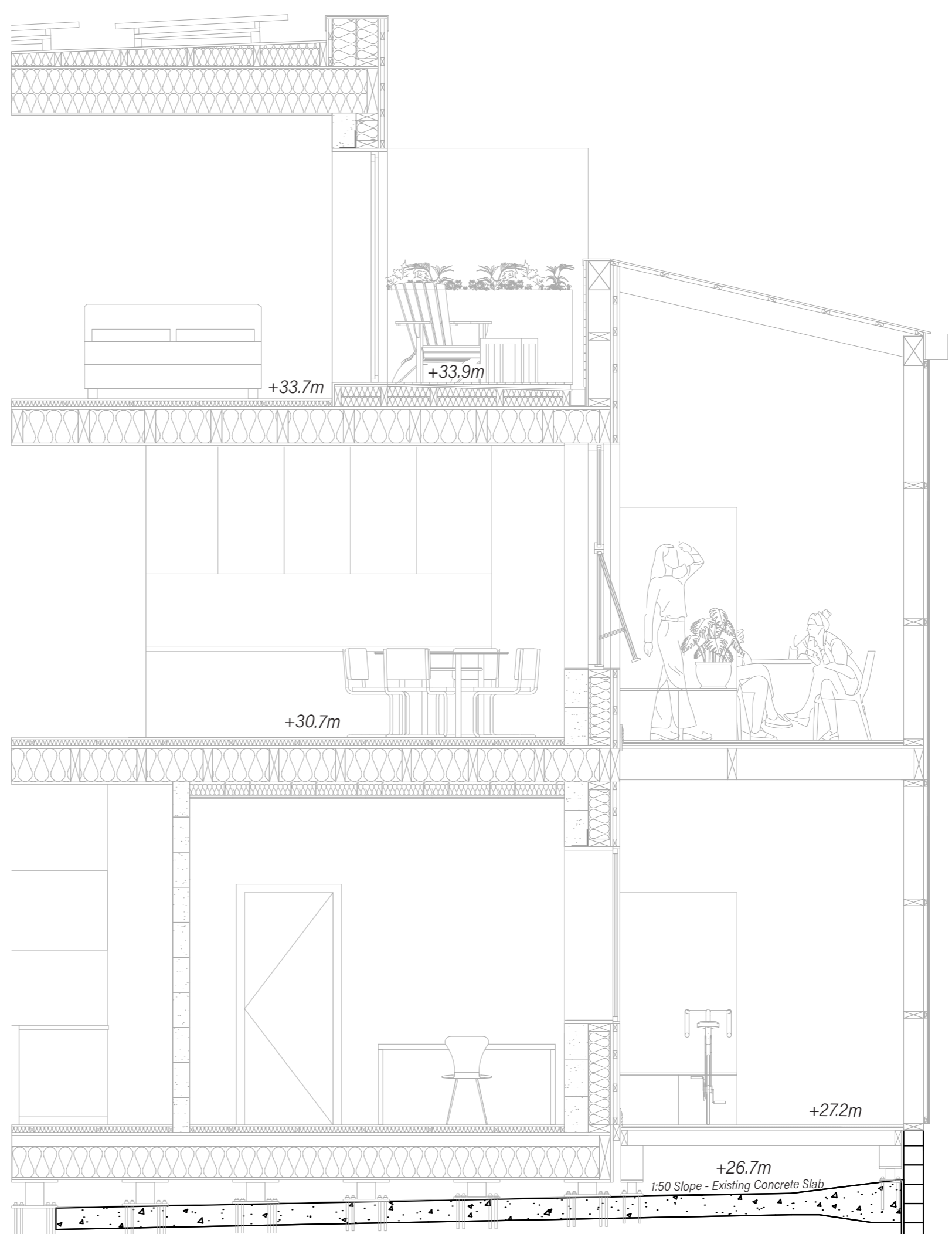
The intention was to enclose the north facing access balcony from the windy and rainy Gothenburg due to the overall distance travelled between staircase and apartment. A level of generosity has been provided to this space and thus the requirement of good daylight conditions informed the choice of polycarbonate as a good way to illuminate the space. The polycarbonate meets the cement block at the bottom through a timber bottom plate and is broken up in the middle by a timber weatherboard siding that is fixed horizontally to the battens behind. A cavity for ventilation at those ends is also accounted for.

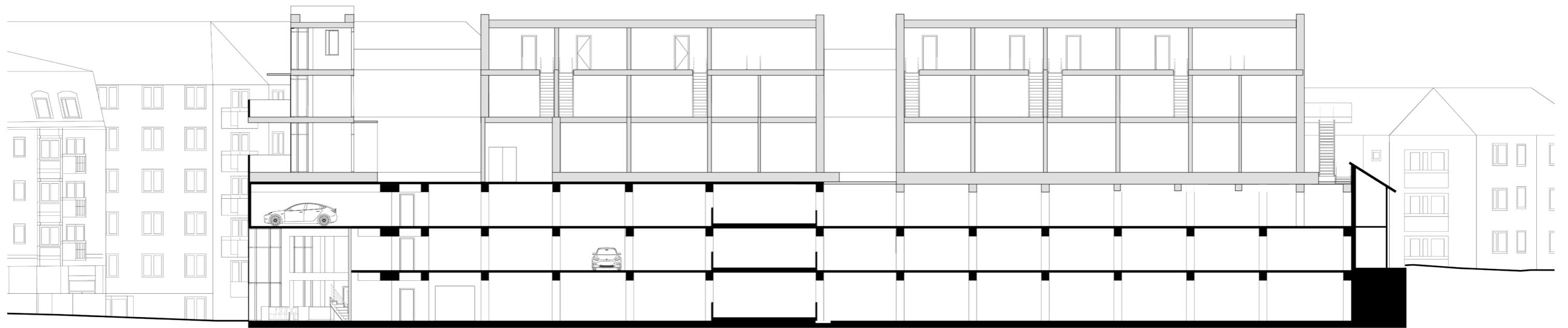
A gutter is fixed onto the top beam for water collection with the beam meeting the posts at the interval of each apartment. This varies between 4 to 6.5m. Timber rafters support the polycarbonate roof which wraps over into the balcony railing for the duplex apartments private terrace.

In the walls Hemp block insulation has been used as a durable, sustainable and breathable type of insulation that can help regulate any moisture that is created by the polycarbonate enclosure. An acoustic flooring system is introduced to help combat any noise or vibration disturbance from the access balcony. Additional sound absorbing insulation through a floating ceiling is provided for in the bedroom beneath the access balcony and on the ground floor the access balcony is seperated from the main structure to reduce flanking.

The connection between the concrete and timber flooring system involves steel footings that are anchor bolted into the concrete. These are set at 1m Intervals with the main timber GLT beam resting and fixed to those footings. 300m of EPS insulation sits within the cavity.

On the top of these south facing roofs 188 solar panels sized a 1.7x1m solar panel sits on a 3 degree pitch to maximise solar gain.





New  
 Existing

This section provides a general overview of the project cutting through every apartment looking north. The use of the existing grid structure has informed the apartment type and size. Along the first floor of the roof space are 3 and 4 room apartments. On the floor above the 4-room apartment creates two tighter duplexes with a roughly 4.5m width. To the east a new floor was built that sealed off the open air parking space from before. Using the existing foundations of the carpark structure reduces cost and CO2 emissions. On the west the double height space for the cafe is cut through with the large beams and columns extending back out through the space into the carpark.

## Facade Strategy

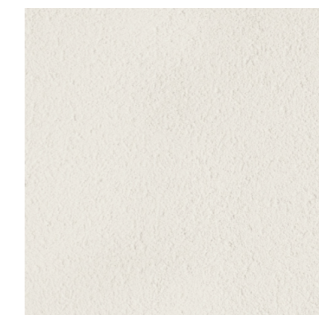
The facade strategy involves a new contemporary addition of housing. It will rise up an additional 3 floors from the existing carpark creating a well balanced structure of parking and housing. The form will be set back from the street facing perimeter to respect existing views and sunlight. An exception to this is made in the corner of the site where the carpark meets its 7 storey neighbour. Here there is an opportunity for solid building mass to directly meet the neighbour on Lilla Risagatan and the carpark below to forge a direct relationship between the new and the old. Then the form sets back allowing the access balcony to be pushed to the front where it sweeps all the way around the edge where you get people, movement and activity to tie into the concept of enlivening this structure. This is emphasised through a large double height incision into the facade facing the public street with a new cafe set for this space so the project can give back to the public. The material selection intends to distinguish itself but also have a soft integration into the streetscape.



Figure 63: Existing Facade - Authors Image



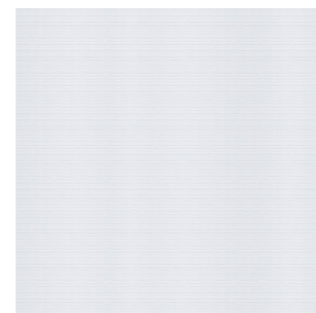
1. The existing carpark has been stripped back to the basic grey cement block removing the current patchy language.



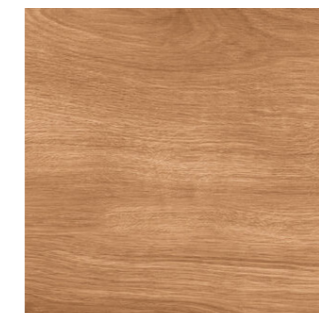
2. This excludes the existing corner point with the clock. The cement blocks will be painted in a sand tone. This sand tone stretching along the facade and forming the first floor balcony railings.



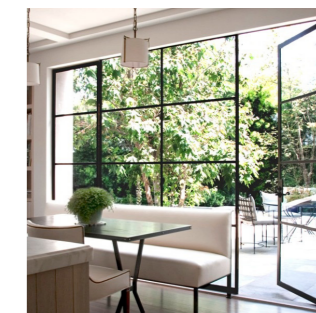
3. Timber weatherboard that is cladded vertically on the building envelope and horizontally for the access balcony. Lightweight material, Light tone, clean aesthetic that works well with the grey cement block.



4. Polycarbonate as a lightweight illuminating material - contemporary aesthetic with this light transparency also ties into the concept of movement and people becoming visible inside and out.



5. Timber frame situated behind the polycarbonate as a lightweight structural element. This will involve timber posts, rafters and battens which will add some warmth to the lighter tones.



6. Thin steel framed glazed walls for the cafe openings that provide a contemporary uplift to the existing closed off facade. Seating inside cafe will be situated along glazed wall for views to the street.







## Discussion

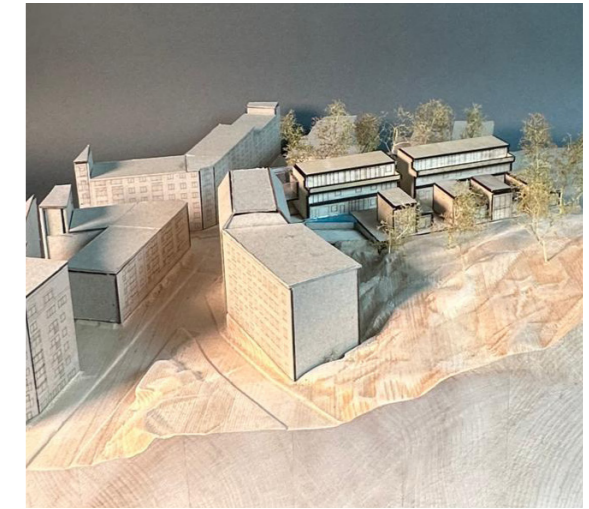
The carpark stands at this meeting point in contemporary urban design; once celebrated as a symbol of mid-century mobility, it is now being increasingly questioned about its role in the future of our cities. My thesis, 'Vertical Densification', positions itself within this shift, treating this specific carpark not as an obsolete structure to be demolished, but as a valuable, centrally located asset with opportunity for urban development. By focusing on an underused carpark in Gothenburg, Sweden, my design intends to make use of the roof and vertical space above the carpark. My process of finding and selecting a site and project has varied; the main idea has however remain unchanged. I wanted to challenge and explore the potentials of built space by working with an existing building that was still functioning and providing a program. A building that may be deemed good, unquestioned or just doing its job. Questioning the idea of whether a building can give more than its intended purpose? Or has it reached its full potential? I believe the existing urban fabric hides a lot of potential, and their is the possibility to uncover or reveal that potential

The major interest and area for intervention in this thesis was the roofspace where a housing proposal has been developed. The project required an ability to mediate between urban density and residential livability. This introduced a core tension of the project that intended to create an urban form that had an appropriate density to address the housing demand in Gothenburg while ensuring a good quality of life for both existing and future residents. Without repeating the typical vertical extrusion of an existing sites footprint, the final massing includes a perimeter setback that preserves neighbouring views and daylight factor. The circulation path has been pushed to the perimeter with an enclosed polycarbonate access balcony that intertwines functionality and a social deck that negotiates the threshold between the public urban realm and private residential life.

Ultimately, this thesis has turned a valuable and underused carpark roof space into a multi-generational living environment with a diverse housing offering. A total of 20 new units are added and include duplexes, urban villas, and 3-4 room apartments with an additional 72 people expected on site. The variety of housing caters for a more family oriented demographic by challenging the stereotypical infill projects that usally result in small units of student apartments or alike. A primary finding is that while adding housing above a carpark is feasible, the success of the project is highly contingent on unique, site-specific characteristics. This carpark carries a workable structural grid allowing for a natural transition into housing, a high load-bearing capacity that can support an additional 3 floors without structural reinforcement, and an immediate context that could tolerate vertical growth. This thesis 'Vertical Densification' demonstrates that the urban fabric holds a lot of potential for cities to grow vertically rather than horizontally.



Model Photo 1: Looking South



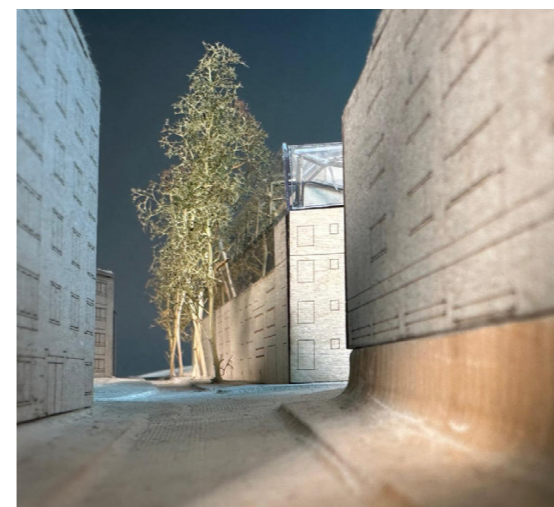
Model Photo 2: Looking North



Model Photo 3: Side Facade Access Balcony



Model Photo 4: Looking West



Model Photo 5: Street View Main Access



Model Photo 6: Street View Rear Access

## Bibliography

### Literature:

Julistiono, E. K., Oldfield, P., & Cardelicchio, L. (2024). Up on the roof: A review of design, construction, and technology trends in vertical extensions. *Architectural Science Review*, 67(1), 63–77. <https://doi.org/10.1080/00038628.2023.2240289>

Sundling, R. (2019). A development process for extending buildings vertically – based on a case study of four extended buildings. *Construction Innovation*, 19(3), 367–385. <https://doi.org/10.1108/CI-05-2018-0040>

Bellini, O., & Mocchi, M. (2019). Rooftop architecture and urban roofscape: Designing the new vertical city. *TECHNE - Journal of Technology for Architecture and Environment*, 264–277. <https://doi.org/10.13128/Techne-24021>

City of Gothenburg (2014). Development strategy Göteborg 2035. Göteborgs Stad, 1-60. <chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://costtu1203gothenburg.wordpress.com/wp-content/uploads/2015/09/gothenburg-development-strategy-2035-planning-and-building-committee-city-of-gothenburg.pdf>

Nations, U. (n.d.). RiverCity Gothenburg: A City Built On Inclusion. United Nations; United Nations. Retrieved 24 October 2025, from <https://www.un.org/en/academic-impact/rivercity-gothenburg-city-built-inclusion>

The new Gothenburg | City development | Independent Guide. (n.d.). This Is Gothenburg. Retrieved 24 October 2025, from <https://www.thisisgothenburg.com/development-in-gothenburg>

### Built References:

Refurbishment and extension Friedrichstraße. (n.d.). Retrieved 24 October 2025, from <https://davidchipperfield.com/projects/refurbishment-and-extension-friedrichstrasse-126>

Griffiths, A. (2014, March 24). Duggan Morris contrasts mesh with brickwork at Shoreditch office block. *Dezeen*. <https://www.dezeen.com/2014/03/24/curtain-road-office-renovation-extension-duggan-morris-architects/>

Magnus 31 |. (n.d.). Retrieved 24 October 2025, from [https://www.bauphasen.de/mies\\_portfolio/magnus-31/](https://www.bauphasen.de/mies_portfolio/magnus-31/)

New homes in the old torpedo boat workshop. (n.d.). Vandkunsten. Retrieved 24 October 2025, from <https://cms.vandkunsten.com/en/projects/motortorpedohallen>

De Karel Doorman / Ibelings van Tilburg Architecten | ArchDaily. (n.d.). Retrieved 24 October 2025, from <https://www.archdaily.com/331477/de-karel-doorman-ibelings-van-tilburg-architecten>

### Images:

Figure 1: Kanozi Arkitekter, (n.d.). Alvstaden 'River City' Gothenburg, (Photograph). 21CD. <https://www.21stcenturydevelopment.org/case-studies/rivercity-gothenburg/>

Figure 2: Göteborgs Stads, (n.d.). Fixfabriken, (Photograph). Göteborgs Stads. <https://goteborg.se/wps/portal/start/goteborg-vaxer/hitta-projekt/stadsomrade-centrum/majorna-linnestaden-Haga/fixfabriken>

Figure 3: White Arkitekter, (2021). Förvandlingen av Backaplan, (Render). White Arkitekter. <https://whitearkitekter.com/se/projekt/backaplan/>

Figure 4,5: Authors Image

Figure 6,7: Rasmus Hjortshøj, (2023). TORPEDOHALLEN, (Photograph). RASMUS HJORTSHØJ STUDIO. <https://www.rasmushjortshoj.com/architectural-photo-01/torpedohallen>

Figure 8,9: Authors Image

Figure 10,11,12: Siegel Architects

Figure 13: Google Maps

Figure 14-19: Authors Image

Figure 20: Jörg von Bruchhausen, Ute Zscharnt, (2004). Refurbishment & Extension Friedrichstraße, (Photograph). David Chipperfield Architects. <https://davidchipperfield.com/projects/refurbishment-and-extension-friedrichstrasse-126>

Figure 21: Morris + Company (n.d.). Curtain Road, (Photograph). Morris + Company. <https://www.morrisandcompany/work/curtain-rd>

Figure 22,23,24: Wilkin & Hanrath Bauphasen, (2016). Parkhausaufstockung Magnus 31, (Photograph). Wilkin Hanrath Bauphasen. [chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.v-architekten.com/files/images/publikationen/181005\\_DETAIL\\_CPK.pdf](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.v-architekten.com/files/images/publikationen/181005_DETAIL_CPK.pdf)

Figure 25: Wilkin & Hanrath Bauphasen, (2016). Parkhausaufstockung Magnus 31, (Drawing). Wilkin Hanrath Bauphasen. [chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.v-architekten.com/files/images/publikationen/181005\\_DETAIL\\_CPK.pdf](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.v-architekten.com/files/images/publikationen/181005_DETAIL_CPK.pdf)

Figure 26: Gothenburg Archives

Figure 27: Authors Image

Figure 28: Robert Garellick, (2003). Bilden av Göteborg - Färgfotografier 1910- 1970, (Photograph). Robert Garellick Publisher. Retrieved from Facebook - <https://www.facebook.com/groups/7081806098/posts/10156772721906099/>

Figure 29: Gothenburg Archives

Figure 30: Göteborgs Stads, (1987). Bergsgatan 3, (Drawings). Göteborgs Stads. Retrieved from Göteborgs Stads 'Beställ arkiverade bygglovhandlingar'

Figure 31: Göran Bjelkental, (2012). Rio, (Photograph). Gothenburg cinemas: 100 years at the cinema. [https://sv.wikipedia.org/wiki/Rio,\\_G%C3%B6teborg](https://sv.wikipedia.org/wiki/Rio,_G%C3%B6teborg)

Figure 32: Göteborgs Stads, (1987). Bergsgatan 3, (Drawings). Göteborgs Stads. Retrieved from Göteborgs Stads 'Beställ arkiverade bygglovhandlingar'

Figure 33: Göteborgs historia, (n.d.). Lilla Risåsgatan 25 idag, (Photograph). Det Gamla Göteborg. Retrieved from <https://gamlagoteborg.se/2018/06/16/kvarteret-trumslagaren/>

Figure 34-41: Authors Image

Figure 42: Google, (2025). Aerial Views, (Photograph). Google Maps. <https://www.google.com/maps>

Figure 43-47: Authors Image

Figure 48,49: Göteborgs Stads, (1940). Bergsgatan 3, (Drawings). Göteborgs Stads. Retrieved from Göteborgs Stads 'Beställ arkiverade bygglovhandlingar'

Figure 50-52: Authors Image

Figure 53,54: Göteborgs Stads, (1987). Bergsgatan 3, (Drawings). Göteborgs Stads. Retrieved from Göteborgs Stads 'Beställ arkiverade bygglovhandlingar'

Figure 55-58: Authors Image

Figure 59: Spacio Ai Tool

Figure 60-63: Authors Image

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