



# LIJNBAANPARK

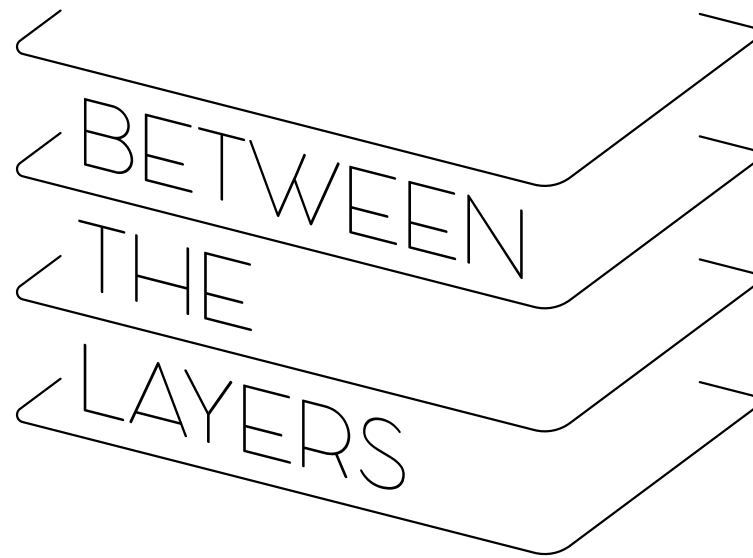
Transforming the roofs of the Lijnbaan into a sizable park in order to bring the city into balance

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The graduation assignment for the Master of Architecture at Fontys University of Applied Science, by Paul Bernards

# Essay

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## Lijnbaanpark

**The roofs of the Lijnbaan must be used as large city park in order to bring the city into balance.**

**The Center of Rotterdam is colored grey due to the amount of bitumen roofing, hard paving and lack of greenery. The Lijnbaan has a large share in this. In addition, the Lijnbaan has undergone many changes over the years, due to renovations and individual adjustments. The charm that it had in its early years is therefore partly lost and quality in space decreased. The lack of greenery and loss of quality in public space puts a strain on the relevance of the use of the Lijnbaan in the present day.**

**Cities are adapting for the future. The relocation of people to the cities places enormous pressure on the space in the cities. Approximately 50,000 new homes will be added in the center of Rotterdam. This amount of housing will put enormous pressure on the existing public space of the city. For this reason, the municipality is going to invest in the city to expand and improve public space. But where can we find the space for a qualitative city park? The roofs of the Lijnbaan offer opportunities to be transformed into a sizable city park. Therefore, the Lijnbaan should become part of this movement towards the future to regain its relevance.**

## Rooftop Discovery

More and more people seem to be becoming aware of the potential of the unused space on roofs. This development is very clear in Rotterdam, with the Rotterdamse Dakendagen and numerous projects in which roofs are multifunctional. Projects such as the Dakpark and the Luchtpark Hofbogen show that there are possibilities to make use of the unused space on roofs.

During the lockdowns in the 2019-2020 pandemic, more people discovered rooftop space for recreational purposes when it was not possible in public space. This previously undiscovered space remained hidden or was uninteresting due to the limited visibility and difficult accessibility. It is therefore important for the transformation of the roofs of the Lijnbaan to make the space more visible and accessible from lower levels.

## The Lijnbaan

The national monumental ensemble, opened in 1953, is almost 70 years old. Due to changes to the facades, the removal of elements, such as the aviary, and the demolition of elements, the Lijnbaan has lost part of its charm it had in its early years and the concept of a living room feeling of Van den Broek & Bakema disappeared. Later additions have been made that have detracted from the design of the Lijnbaan, such as the Burger King and the two pavilions on the shopping promenade. In addition, installations such as air conditioning have been installed on the rear facades and roof of the Lijnbaan. Fortunately, there are also new buildings that are more in line with the Lijnbaan, such as the Dreamhouse and the Forum. On 19 februari 2010 the Lijnbaan received as a national monument due to its innovative design at

the time. Currently, the Lijnbaan is slowly being restored in parts. The canopies have recently been restored, the black-painted rear facades are being restored to their original color scheme and rules have been drawn for the installations and advertising.

The Lijnbaan ensemble currently offers space for shops, living, working and greenery. The modernist design idea of the Lijnbaan has ensured that these functions are separated from each other. The same design idea also resulted in the car-free shopping promenade, one of the most important features of the Lijnbaan.

## Between the Parks

The Greenery in the Lijnbaan ensemble is mostly limited to two hidden parks; the Jan evertsenplaats and the Joost Banckertsplaats. The quality of stay of the two parks is limited and the plinths of the surrounding buildings have no openness towards the parks. The parks therefore mainly serve as visible greenery for the residents of the Lijnbaan flats. In this project, the parks are connected. By making connections to the parks, these for shoppers' hidden places can be discovered and activity in the parks will increase and a network of greenery is created. In order to increase the liveliness in the parks, plinths of adjacent buildings can be assigned more attractive functions.

## Environmental Disaster

Other than the two parks, few other public green spaces are currently available within a 500-meter radius. Apart from some trees, the view from above is mainly gray roofs and stone pavement. The lack of greenery, the amount of gray bitumen roofing and hard paving cause the environment to heat up. The handful of trees on the

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Lijnbaan provide too little shade on sunny days and too little water storage during heavy rainfall. Although the canopies offer visitors to the Lijnbaan protection against the weather, they do not actively cool the environment through evaporation like plants do. To make the Lijnbaan resistant to future climates, more greenery has to be added.

## Quality of Stay

Not as it originally was designed at least. Back then De Lijnbaan was more of an experience center than the shopping mall it has become over time. Currently, there are few places, such as benches and terraces, where one can sit in between shopping. The available seats are located in the middle of the two traffic flows on the Lijnbaan and therefore offer little comfort. The Lijnbaan also barely offers evening program, which means that the area empties after the shops have closed. Adding quality of stay and evening program will make the Lijnbaan more attractive to consumers, meaning they will stay in the city longer. Quality of stay is therefore one of the pillars for this project and is added by offering sitting in the green, catering, terraces, shaded areas and sports facilities. The whole should feel like a green oasis in the heart of Rotterdam.

## The Eighth City Project

The municipality of Rotterdam is currently investing heavily in the city. The municipality is investing 233 million euros in the creation of high-quality public space in the seven urban projects, like the renovation of the former Hofpleinlijn. The seven urban projects must become attractive public spaces where residents and visitors meet, move and recreate, while at the same time contributing to biodiversity, water storage

and combating heat stress in the city. In order to make Rotterdam greener, the Municipality of Rotterdam awards subsidies for the construction of green roofs and climate adaptation.

The new city park on the Lijnbaan could be the eighth city project in which the municipality wants to invest. The project concerns the transformation of the roofs of the Lijnbaan into high-quality public space, in which greening and recreation are central.

## The Benefits

The economic value generated by qualitative public space can be up to 20 times the invested value. By offering sports facilities, for example, the physical health of visitors increases, which reduces healthcare costs. There are numerous indirect economic values and direct environmental benefits including; reduction of heat stress, increase of the WOZ value, water storage, reduction of the noise level, etc.

In addition to these values, the project also has a social value. Visitors and residents of the city can meet and engage in activities together, strengthening social cohesion in the city and improving mental health.

**The intervention above the Lijnbaan preserves the national monument and its values. The project is a good addition to the deficiencies of the Lijnbaan and be in balance with the existing design. It is therefore not to affect the original buildings of the Lijnbaan. Both in form and detailing, the park on the roofs is designed with the Lijnbaan as its starting point. By adding high-quality public space on the roofs of the Lijnbaan, it will become part of the ensemble.**

**The aim of the project is to build a qualitative public space full of greenery, a space with a recreational function where visitors and residents can spend their free time. The original quality of the Lijnbaan, that got lost over the years, will be brought back, making the Lijnbaan relevant for the future once more.**

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# The Project

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**The project concerns the transformation of the roofs of the two-storey shops of the Lijnbaanensemble on the shopping promenade into a high-quality public park. In addition, interventions can be made in the immediate vicinity of these buildings to improve overall quality.**

**Rotterdam has the ambition to add approximately 50,000 new homes to the city center in the coming years. This amount of new homes will put enormous pressure on the existing public space and will therefore have to be increased in order to bring the city into balance. The roofs of the Lijnbaan offer the possibility of being transformed into a large park and will therefore make a major contribution to the balance of housing versus amenities in the center.**

*More homes*  
=  
*More amenities*

## Location

The location of the project is the Lijnbaan in the center of Rotterdam. Due to the central location of the project location, there are many links with the environment. Existing buildings, including shops, residential flats, offices and catering should be taken into account. Furthermore, attention must also be paid to routings through the city and existing places to stay, such as squares and parks.

The total area related to this project covers more than 30,000 m<sup>2</sup>, of which approximately 12,000 m<sup>2</sup> concerns the roofs of the Lijnbaan. The remaining space mainly concerns the shopping promenade and the Lijnbaanhoven.

*+ 12.000 m<sup>2</sup> public space*  
=  
*Two Football fields*

## Personal Motivation

Visiting cities and climbing towers where I got a good view of the city, I saw the desert-like landscape of the Dutch city. The view of the gray bitumen roofs, filled with installations, made me want to focus the subject for my graduation assignment on greening and take these desolate spaces into use.

During the preliminary research I went in search of a suitable project and location. The choice for the city fell on Rotterdam. The post-war character and the many flat roofs in the city make this the most suitable choice for transforming existing roofs.

## Motivation

The topics related to this project are very versatile and fall within the current trends of the field, including redevelopment/transformation, densification of the city, greening and the use of roof space.

The project also has future significance for the survival of the monumental Lijnbaan ensemble. This project can tackle problems that come with the monumental Lijnbaan ensemble, such as the heat island effect, water storage and a decline of quality of stay.

## Goal

The aim of the project is to transform the roofs of the Lijnbaan into a park with high quality of stay to facilitate the future needs of the city. Problems such as heat stress and water storage are tackled and the shopping promenade is given a future perspective during a time when the way of shopping changes drastically.

## Investment

The investment for the project will mainly come from the association of owners of the Lijnbaan. Additionally, possible subsidies that are available from the government can be examined.

The municipality of Rotterdam is investing €233 million in creating high-quality public space in seven urban projects. The seven urban projects should become attractive public spaces where residents and visitors

*The municipality invests in greenery*

meet, move and recreate, while also contributing to biodiversity, water storage and combating heat stress in the city.

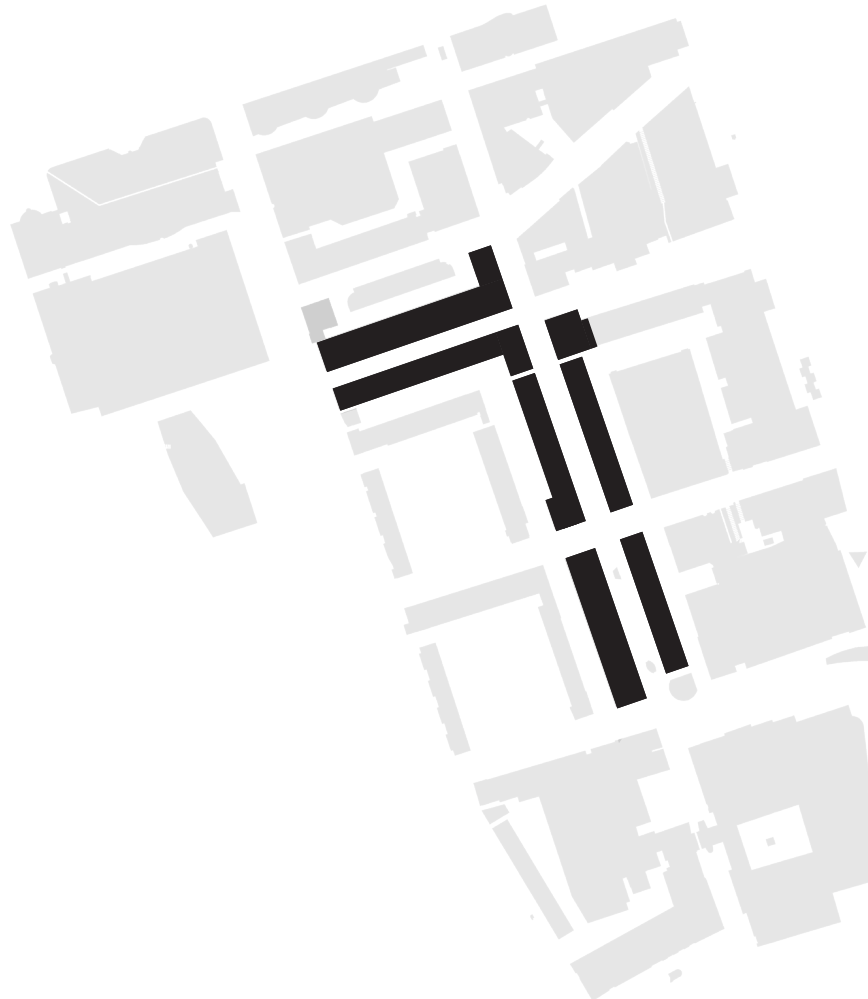
In order to make Rotterdam more green, the Municipality of Rotterdam also awards subsidies for the construction of green roofs and climate adaptation. Since public space is being added for the city and roofs are being transformed, it is likely that the municipality will invest in this project.<sup>1</sup>

### Profit

The economic value generated by quality public space is up to 20 times the invested value. For example, by offering sports facilities, the physical health of the inhabitants will increase, which reduces healthcare costs. There are numerous indirect economic value and direct benefits for the environment, including; decrease of heat stress, increase of the WOZ value, water storage, reduction of noise level, etc.

Along with these values, the project has a social value. Visitors and residents can meet and engage in activities together, strengthening social cohesion in the city and improving mental health.<sup>2</sup>

*“Investment can lead to 20 times worth in economic value” -NRPA (2018)*



## Function

The Lijnbaan currently offers space for shops, living and working, with these functions being strictly separated. Behind the residential blocks are two parks that are the only public green areas within a 500-metre radius. Apart from a few trees, the view from above is mainly gray roofs and stone paving. For the center of the city it is important to make it more green in order to solve problems related to heat stress and water storage. Transforming the space on the roofs of the Lijnbaan into a park can contribute to solutions for these problems.

## Connecting the city

In the future, the project can be connected to Luchtsingel on the north side and Beurstraverse on the south side, creating a network park through Rotterdam. This links Luchtpark Hofbogen to the Lijnbaanpark and creates a 3,5 km pedestrian route on a level separate from ground level, from Hilleegersberg to Beursplein. This new pedestrian route should promote walking in the city and can act as a catalyst to connect more parts of the city in a similar way.

*Hiking from Hilleegersberg to the Center*

## Stakeholders

Transforming the roofs of the Lijnbaan brings many benefits to various parties.

### Municipality of Rotterdam

The municipality has an interest in economic upgrading of the environment and improvement of the living environment by combating heat stress and water storage.

### Residents

Residents have an interest in a view of greenery, an increase in the WOZ value of their home and space for recreation.

### Retailers

Retailers have an interest in creating a unique shopping experience and quality of stay, so that more potential shoppers visit the Lijnbaan and stay longer.

### Tourists

Tourists have an interest in a unique experience.

### Recreationists

Recreational users include all users of the space. The importance for recreationists is qualitative space for numerous activities related to exercise and meeting. Recreationists also include working people in nearby offices who use the park during breaks.

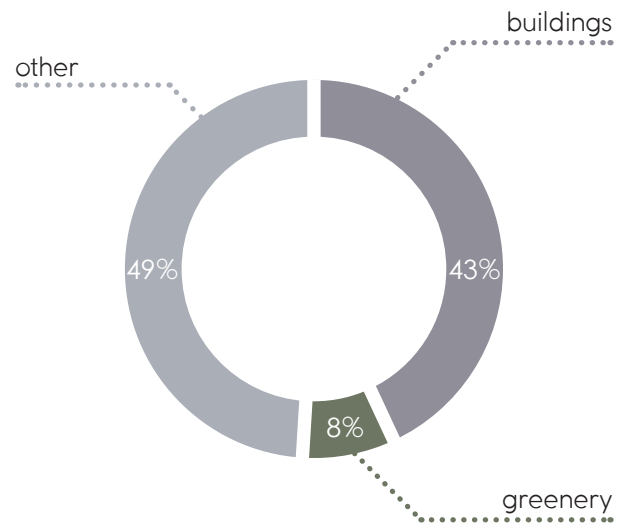
*A park for everyone*

**By adding 50,000 new homes in the center of Rotterdam, it is necessary to add more public space to bring the city into balance. This space can be found on the roofs of the two-story shopping promenade of the Lijnbaan.**

**The subsidies and investments in green projects show that the municipality is keen to invest in transforming the roofs and adding qualitative public space. The transformation of the Lijnbaan roofs has many social and economic benefits for the city of Rotterdam. NPRA's research shows that the economic value can lead to as much as 20 times the invested value.**

**The total space added by transforming the roofs of the Lijnbaan is more than 12,000m<sup>2</sup>, a space the size of almost two football fields. This space offers space for numerous activities related to recreation, including sports, games, catering and greenery.**

# Little green islands in a sea of grey



the gray landscape of the center of Rotterdam, consisting of pavement and bitumen roofing with only a few green spaces



Satellite view center of Rotterdam (2021)







The Lijnbaan from a different perspective sheds light on the gray and installation-strewn landscape



View of the Lijnbaan to the North (2021)



# Lijnbaan, past

## Urban design

The Lijnbaan, built between 1949 and 1953 and designed by Van den Broek & Bakema, was a revolution in post war urban planning. Instead of shops with houses above them on either side of a traffic street, the shops were located on the pedestrian promenade. Behind the stores were the supply streets or Lijnbaanhoven from which the stores could be supplied. On the other side of the courtyards, the Lijnbaan flats were built that overlook two parks, Joost Banckertsplaats and Jan Evertsenplaats (designed by Jan Rahder in 1957).

The Lijnbaanhoven makes it possible for the shopping promenade to be completely car-free. The design of the Lijnbaan was revolutionary at the time and means that the Lijnbaan is seen as an innovative highlight of the reconstruction of Rotterdam.

The concept of the Lijnbaan stems from the American model of which Architect Victor Gruen was the inventor, and the temporary emergency shops that were built in the bombed city. The emergency shops were built in 1940 in the bare plain that had been created after clearing the rubble. On the Coolsingel, Goudsesingel and in the Land van Hoboken, the low, detached shop buildings made of wood, plaster and broken bricks rose from the rubble. The temporary emergency shops turned out to work excellently. The shops were small, but thanks to the large windows there was a lot of contact with the street. These shops were also supplied in the rear.

The Lijnbaan is the opposite of the then traditional shopping street, consisting of narrow, cramped streets with high street walls. The traditional street gave way to a dynamic landscape in which air, light, space and functionality form the basis. The result is the opposite of the street-like ravine, the Lijnbaan is a street-like valley.<sup>3</sup>

The houses are concentrated in flats adjacent to the pedestrian shopping street. Therefore, the buildings are relatively low and the shopping center has a more horizontal appearance. This is reinforced by the canopies, as protection against sun and rain, in front of the shops.

Great care was taken in furnishing the space with plants, sculptures, island windows and initially also aviaries, which gave the Lijnbaan its "living room" feeling.

## Architecture

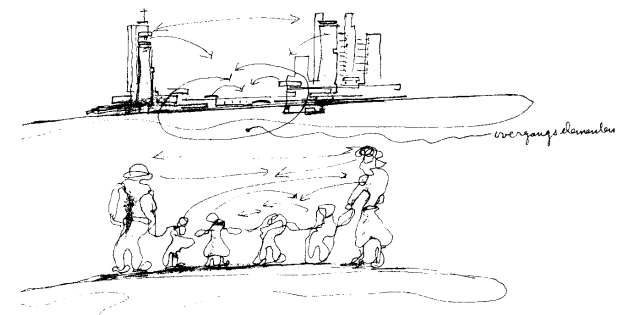
The Lijnbaan is an example of modernism, the architectural movement that strived for a clear, rationally designed city.

The starting point for the design of the shops is a flexible layout and a uniform, neutral architecture. The entire plan is based on a 1.1m measurement system. The paving was also carried out in this size system.

The facades are constructed from prefabricated concrete styles and parapet elements. The ground floor consists of large glass fronts and shop windows.



The Lijnbaan, top010.nl. (2014)





Lijnbaancentrum, Lijnbaancentrum. (sd)



Empty center by night, Groeneveld, A. (1964)

### Expansion

Between 1967 and 1970, the Lijnbaan was extended to the department stores on Binnenwegplein. At the end of the Lijnbaan came the Lijnbaanplein, which was separated from the Binnenwegplein by means of a bridge building. The Lijnbaancentrum was located in the bridge building, an accessible exhibition space. A cinema was built in the basement below, which was later converted into a jazz club.<sup>4</sup>

### Evaluation

The reserved architecture and continuity in the design bring peace and unity to the area. The layout of the outdoor space and the human scale of the buildings created the 'living room feeling' of the Lijnbaan and gave the promenade charm. The canopies give a sense of security and bring comfort to the shopping promenade. This feeling is well described in the following quote from Lewis Mumford:

*The effect of the Lijnbaan is warm, lively, almost gay: the daylight, the waving flags, the delicate acacia trees, the rectangular flower beds, the occasional benches, even a glass-enclosed café area plump in the middle of the mall -and, not least, the human figures, moving in and out between the shadows of the covered way and the open sunlight, in an area that is entirely their own. The unity and harmony of all this delight the eye, with just the right combination of the artful and the natural, the intimate detail and the clear over-all pattern.*

*Lewis Mumford - A Walk Through Rotterdam, The New Yorker, 12 oktober 1957*

Relatively few people lived in the center and, because almost only apartments were built, even fewer children. The only primary schools in the center were not given their own building on Nieuwemarkt until 1965. There were also hardly any medical and socio-cultural facilities.

Despite the presence of shops, restaurants and houses, many people felt that the center of Rotterdam mainly consisted of office buildings. Coolsingel and Blaak were dominated by large bank buildings and office buildings were built on Westblaak and Weena. In the 1968 study by sociologist Prof. Wentholt, *De Binnenstadsexperience en Rotterdam*, it is stated: "Modern architecture here is terrible; the city is inhospitable, monotonous, rectangular; the city is fragmented by the constructed arteries; the fun life has disappeared."

A photo report from 1964 by Ary Groeneveld also shows a characteristic image of the bare, uninviting city center, especially in the evening. The center of Rotterdam lacked evening programs and recreational functions that brought excitement and liveliness to the center.<sup>5</sup>

# Lijnbaan, present

Around 2005 there were plans to largely demolish the Lijnbaan and the Lijnbaanflats. Because the ensemble was designated a national monument on 19 February 2010 by Minister Plasterk, the demolition was averted. However, the second part of the Lijnbaan from 1970, which is not protected, has recently made way for the Forum complex of OMA & De Jonge. The Jungerhans shop building also had to give way, but has been semi-rebuilt.

The Lijnbaancentrum was a Rotterdam exhibition space from 1970 to 1984 for experimental exhibitions and mass culture. In 1984 the Lijnbaancentrum was closed and was demolished in 2018. On the other side of the Lijnbaan, near the Schouwburgplein, a building was replaced by the Dreamhouse by Kaan architects.

Since 1953, the Lijnbaan has undergone many changes. The appearance of the promenade has changed considerably, with elements such as the aviary and flowerbeds having disappeared. In addition, two pavilions have been placed in the middle of the promenade and the Burger King has been built on the corner. These later extensions deviated strongly from the original design of the Lijnbaan, in which the promenade was designed with repetition and was free of built obstructions.

Due to the change in shopping, the changing shop windows have completely disappeared and been replaced by continuous glass fronts. These changes have detracted from the 'living room feeling' and the charm that the Lijnbaan had in the beginning. The result is a two-lane shopping highway, where quiet shopping has been replaced by focused shopping.

The backs of the Lijnbaan have also changed significantly. The entire facade is painted black and installations such as air conditioning have been installed on the outside.

Mei-architects are currently attempting to restore some of the lost glory to the promenade. The canopies have recently been replaced, the black-painted back facades are being restored and rules have been drawn up for the placement of installations and advertising.<sup>6</sup>



Forum Rotterdam, Wonen in Rotterdam. (sd)



Pavilion on the Lijnbaan (2021)



The Lijnbaan was the highlight of the current traditional retail model and was the cathedral for consumption in Rotterdam. However, online retail has completely changed the game. By freeing itself from the constraints of space, retail was able to expand its activities. Assortments of online platforms are unlimited and the way they are displayed to consumers can be updated at any time to reflect current trends.<sup>7</sup>

Due to the growing online retail, physical retail is under pressure. The appeal of shopping centers and city centers is therefore diminishing, partly due to high parking costs and no distinctive retail offer compared to online. In order to prevent vacancy and to maintain an attractive city center, the Lijnbaan will also have to adapt to the wishes of consumers in the future.

The future of shopping will be a mix between online and offline, blurring the lines between entertainment, communication and shopping. Online platforms will use physical locations to support purchasing behavior. Online is leading in this, such as with Coolblue or Amazon, and the physical stores focus on buying support. Large experience centers such as in Leidschendam are therefore becoming increasingly important. Shops need to become more intimate, turning into cornerstones of the community and places to gather. It then comes down to time spent in centers, where shops are just one element, next to culture, museums, events, living and meeting places.

The changes that the Lijnbaan has undergone in recent decades seem to have made the Lijnbaan less suitable for this future development. Quality of stay on the Lijnbaan is hard to find and the space is exclusively intended for shopping. Introducing a varied range of functions and increasing the quality of stay will therefore be important for the survival of the Lijnbaan.<sup>8</sup>





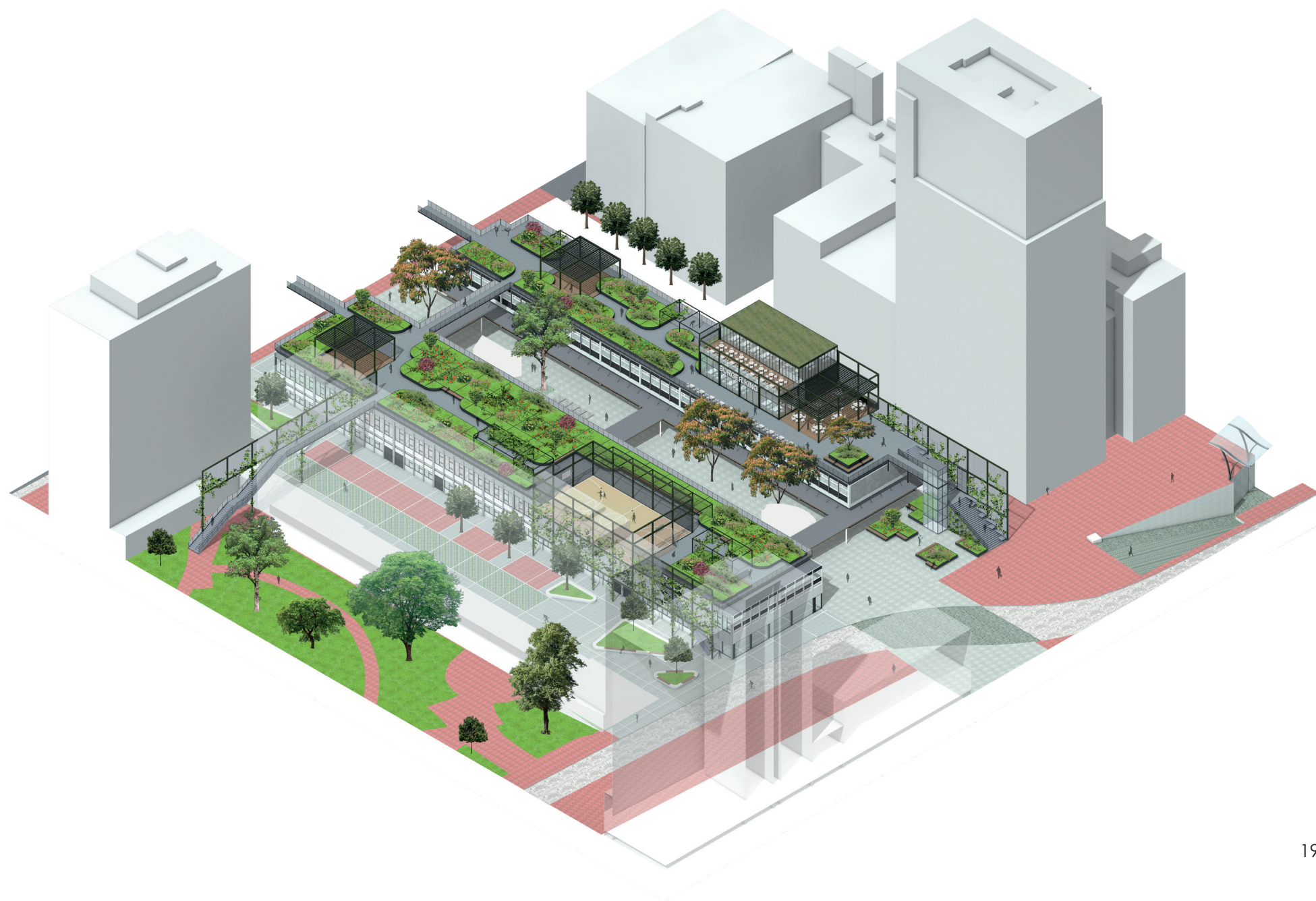
# Lijnbaanpark

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The Lijnbaan Park brings the 'living room feeling' and thus the quality of stay back to the Lijnbaan. In addition, the park introduces evening programs, programs for children and space for events to create a lively city center throughout the whole day. Residential amenities will serve the 50.000 new homes that will be added to the center of Rotterdam. This is achieved by placing terraces, footpaths and pavilions aimed at recreational functions in a park-like landscape on the roofs of the Lijnbaan.

The design of the Lijnbaan Park responds to the principles for the design of the existing Lijnbaan. The concept of 'the city valley' is enhanced by adding alternating volumes and greenery. The grid of the Lijnbaan forms the basis for the entire design of the Lijnbaanpark. Repetition of the grid creates continuity in the design and cohesion with the existing buildings.

By making connections with the ground level at important junctions, the city functions, such as shopping, culture and meeting places, will form a network. As a result, the center of Rotterdam can be transformed into an experience center in which all functions are connected. Visitors will therefore spend more time here and thus create a lively city center both during the day and in the evening.





## My Rooftop Experience

*Climbing a roof is like going on an adventure. In this adventure you will climb a building, a City Mountain, and will discover new perspectives which you have never experienced before. It gives you a feeling of secrecy, seeing people unaware of your presence. From the roof*

*you can gaze over the roofs of the adjacent buildings, further than you would ever have imagined you could see in the city. Slowly you move towards the edge to take a peek, sounds from below begin to emerge. You notice the hustle and bustle at the bottom far below, the*

*time on the roof seems to slow down. On the roof you start to feel the space around you, the air, the wind and the sun. This gives you a feeling that sets you at ease and you forget the world beneath your feet.*





Photo from the roof  
of my apartment  
complex (2021)









# 2.1

## RESEARCH

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The research consists of three parts; research on the art project New Babylon by C. Nieuwenhuys, the discovery of roofs in the present time and case studies of projects in which the space on roofs is used.

# New Babylon

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New Babylon is an art project by visual artist Constant Nieuwenhuys on which he worked between 1956 and 1974. New Babylon is a model for a new form of society that took shape in an enormous flow of paintings, drawings, light representations, texts and models.

The welfare machine that gained momentum after the war, with its accelerating industrialization and automation, made Constant suspect that human labor was no longer needed in the long term. The homo faber, the working person, would make way for the homo ludens, the playing person. No longer bound by place and time to work, he could spend his excess free time as a nomad in his living environment.

For these homo ludens, Constant designed megastructures lifted far above the existing world of city and landscape, which, with movable walls, stairs and bridges, would form his permanent and continuously changing play space. A radically different “city” made up of sectors that match the psycho-emotional state of its wanderers - the sad sector, the blue sector. The city would no longer know property, everyone was free to use and change the space. New Babylon was a delirium of public space.<sup>9</sup>

## Inspiration

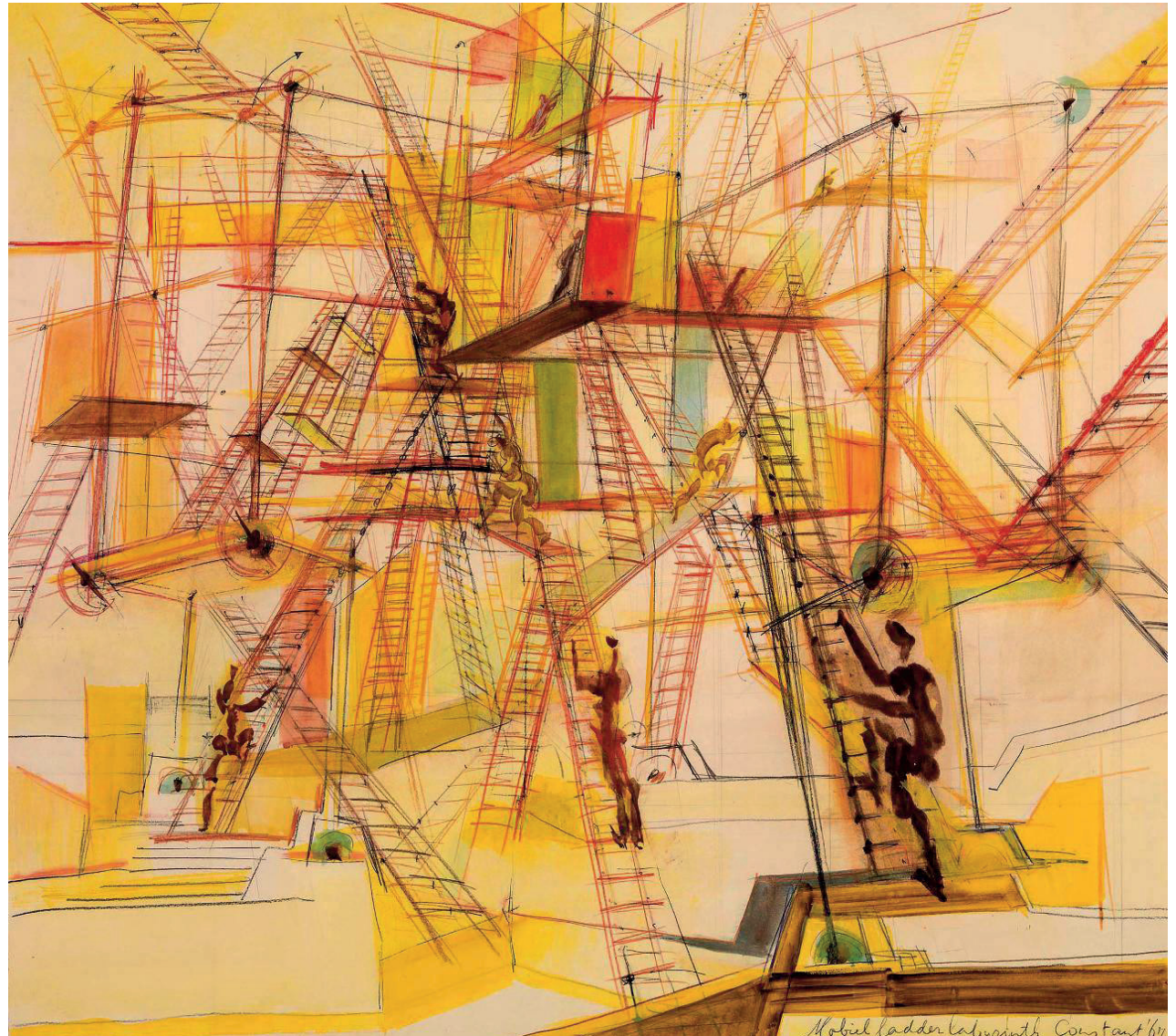
What inspires me greatly in Constant’s works is that in his art project New Babylon, he prefers to preserve the existing fabric of the world and creates a new world above. By keeping the existing fabric he shows that he does not reject it, but accepts that it is the past of the new man and was a necessity of achieving his utopia.

The existing fabric of the city is also very important in my project. Although roofs are used on top of the city, a strong connection must be made with the city below.

What also inspired me in Constant’s vision is that he thinks that people will change, from working man to playing man. Also when using roofs, it is necessary to change how people view this space. An example of a first step towards this change is the renting out of the roofs of stables by farmers to install solar panels. This creates a shared interest of the farmer, the tenant and the user of the energy. The change in human behaviour is a change from individual interest to a more collective interest.

*“The homo faber, the working person will change into the homo ludens, the playing person”. -C. Nieuwenhuys*

*"Everything must remain possible, everything must be able to happen, the environment is created by the activities of life and not the other way around". -C. Nieuwenhuys*



# Rooftop Culture

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The 2020 crisis, caused by Covid-19, has resulted in many people in cities being unable to use public places such as parks. For this reason, residents of different cities over the world looked for alternatives. An alternative space that was found was on roofs. The use of these roofs was captured by several photographers during the lockdowns, including Josh Katz and Max Intrisano.

Josh Katz filmed and photographed people on and from rooftops during the lockdown in New York City. He saw people use the rooftops to relax, hang laundry, socialize, walk the dog, and watch the sunset. He also noticed that more people were incorporating 'going to the roof' into their daily routine.

In New York City, the roof can often be reached by climbing an escape staircase on the facade of the building or via a ladder with a shutter. Entering these roofs is described by Josh Katz as "rising from a submarine".<sup>5</sup>

Josh Katz describes four phases in which people start using the roofs during lockdown:

1. Exploration
2. Sharing
3. Experimenting
4. Normalization



## Phase 1

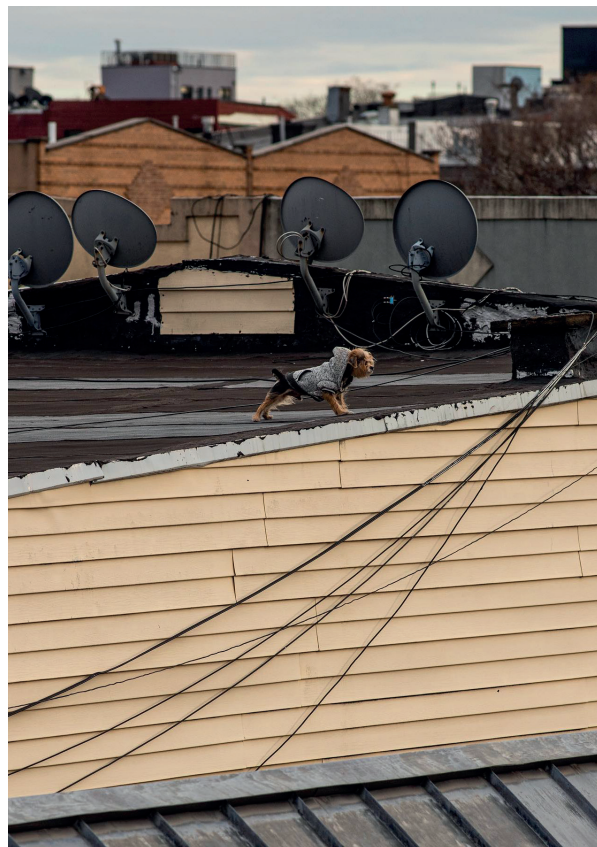
Exploration of the roof. In search of space, the residents of buildings climb escape stairs and ladders and look at the space on the roof.





## Phase 2

Sharing the roof. After finding a suitable space, users take friends and family on the roofs, so that they can share this space.



## Phase 3

Experimenting. After exploring and sharing the space on the roof, users will experiment with the space. They are going to undertake multiple activities on the roof and are going to look for the edges.



## Phase 4

Normalization. Ultimately, it becomes more and more common to undertake activities on the roof and becomes part of the daily routine.

# Case Studies

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In this case study, eight projects will be analysed using images, text, sketches and models that explain the concept of the project. The projects were chosen because of their function, connection with their environment and diversity. Furthermore, the projects show a creative solution to the problems at that location. The eight projects that are analyzed are:

1. Terraced village Masuleh
2. Unité d'Habitation, by Le Corbusier
3. Lingotto Factory, by Giacomo Matté-Trucco
4. Nantes School of Architecture, by World-Architects
5. Suburb in the Sky
6. Public Park Hofbogen, by ZUS
7. Stairs Groot Handelsgebouw, by MVRDV
8. Klarastaden, by Anders Berensson

Everywhere in the world we see that roof use is becoming increasingly important. Flat roofs are not only used as a living environment in warm countries where it rains less, but are also increasingly being used in countries such as the Netherlands. The lockdowns during the Covid crisis have led to an accelerated rate of roof use. Residents of cities in lockdown started looking for space to relax and have found it on the roofs of the buildings in which they live. The use of roofs started to be included in the daily lives of its visitors.

The examples show that roof use is nothing new. In the previous century, various modernists already designed functions for the roofs, such as Le Corbusier with his roof gardens. Contemporary architects are also increasingly designing roofs with a function.

Many roofs in the examples have a public function, where connecting the roof to ground level is of great importance. New routes are being formed over these roofs in order to achieve a connection with ground level and other buildings. These new connections have the advantage of separating different traffic flows which now exist only at the ground, improving safety. However, this roof interpretation requires a different way of dealing with roofs, based on collective thinking. A good example of this is the village of Masuleh where the roofs are the roads and can therefore be used by anyone.

In the Netherlands, representations of collective thinking are already visible in the Hofbogen and Luchtsingel project. Another example towards this collective thinking are the roofs of stables that are rented out by farmers for the installation of solar panels. Although this is a first step in the right direction, there is still a big step to be taken towards a city where the vacant space in cities is effectively being used. The result will ultimately be somewhere towards the vision of Constant. New roof developments will be built on top of the existing fabric of the city, but contrary to Constant's view, this new world will be strongly linked to the old world.

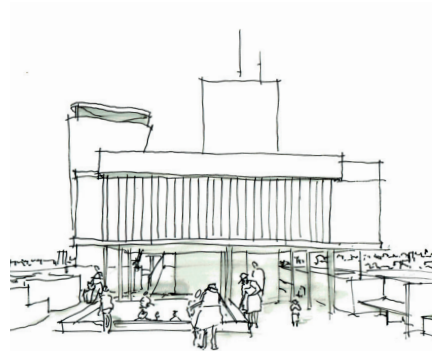
*"One green roof is one green roof, but a series of green roofs can become a park." -Marit Haaksma*

**The ground level in the Dutch cities is fully packed, every square meter has a use. However, there is still a lot of unused space left on the roofs. The value of this space is increasingly recognized. However, the space on roofs is often difficult to reach. By connecting the roofs with each other and with the ground level, new traffic flows are created in the city. This creates new connections in cities and allows new developments to take place along these connections. These developments can be multifarious functions that are in demand in the city. Preferably, the connections are publicly accessible so that both public and private functions can be located along them. This implementation requires a different view of real estate, one in which roofs, similar to roads, become collective interest.**

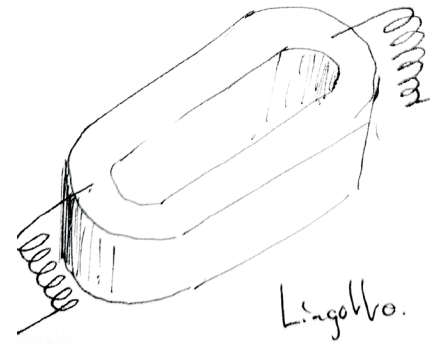




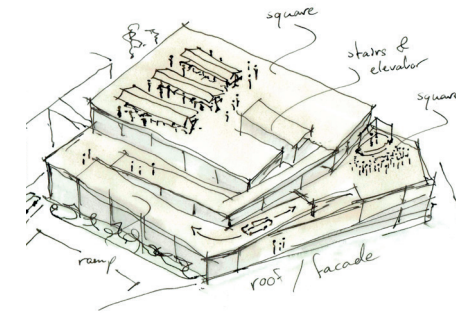
**Masuleh**  
The roofs and the ground level are one, inextricably connected.



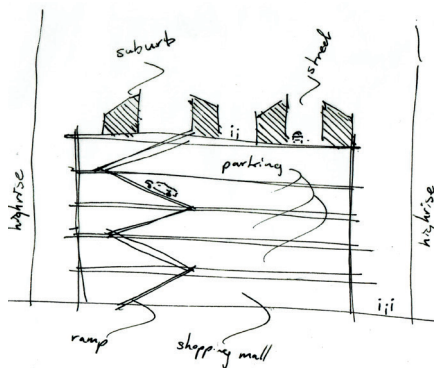
**Unité d'Habitation**  
by Le Corbusier (1952)  
Roof use for recreational use is nothing new.



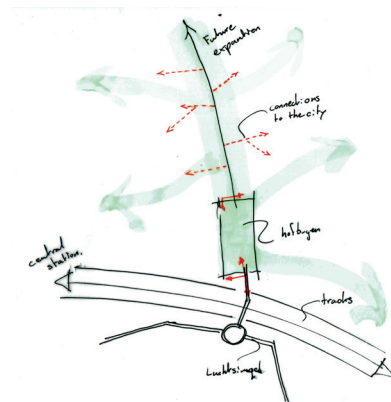
**Lingotto Factory**  
by Giacomo Matté Trucco (1923)  
On top of a factory in the middle of the city, the roof can even be used as a racecar track.



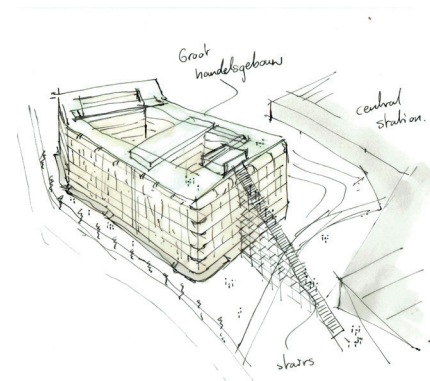
**Nantes school of Architecture**  
by Lacaton & Vassal (2009)  
The entire plot surface back on the roof, accessible to everyone and connected by a ramp.



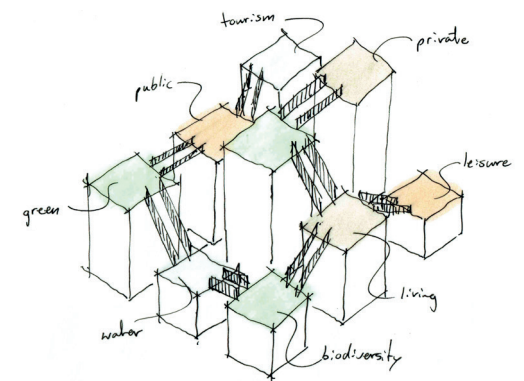
**Suburb in the Sky**  
by Airmas Asri (2005)  
A city oasis liberated from the busy and full ground level in the city.



**Hofbogen**  
by de Urbanisten (2019-ongoing)  
The longest roof transformed into a green line that connects the city places.



**Stairs Groot Handelsgebouw,**  
by MVRDV (2016)  
A temporary staircase that makes a hidden roof accessible to the general public.



**Klarastaden**  
by Anders Berensson Architects (2016-ongoing)  
A new city concept in which buildings are connected via both ground level and roof.





# 2.2

## URBAN ANALYSIS

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In this chapter the urban situation is analyzed. This analysis provides a better insight into the Lijnbaan and its surroundings. The insights from this analysis will serve as starting points for the design of this project.

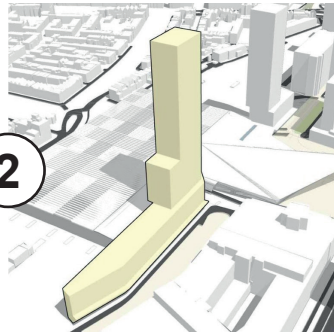
The urban planning analysis consists of seven parts; developments in the area, public space, squares and junctions, building heights, sunspots, views of surrounding buildings and forgotten zones.

# Developments



1

Hofplein, by Juurlink + Geluk



2

Conradstraat



3

Delftseplein, by Provast



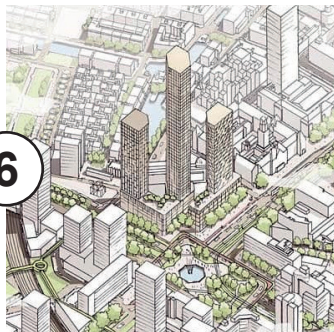
4

Weenapoint, by MVRDV



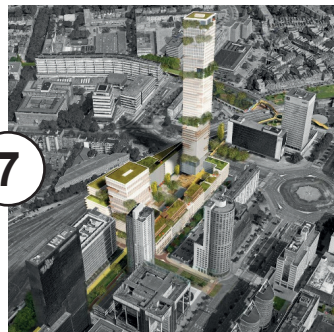
5

Nieuw Pompenburg, by Delva



6

Rise, by RED company



7

Schiekadeblok, by ZUS



8

Lumieretoren, by KAAAN



9

Forum Rotterdam, by O.M.A.



10

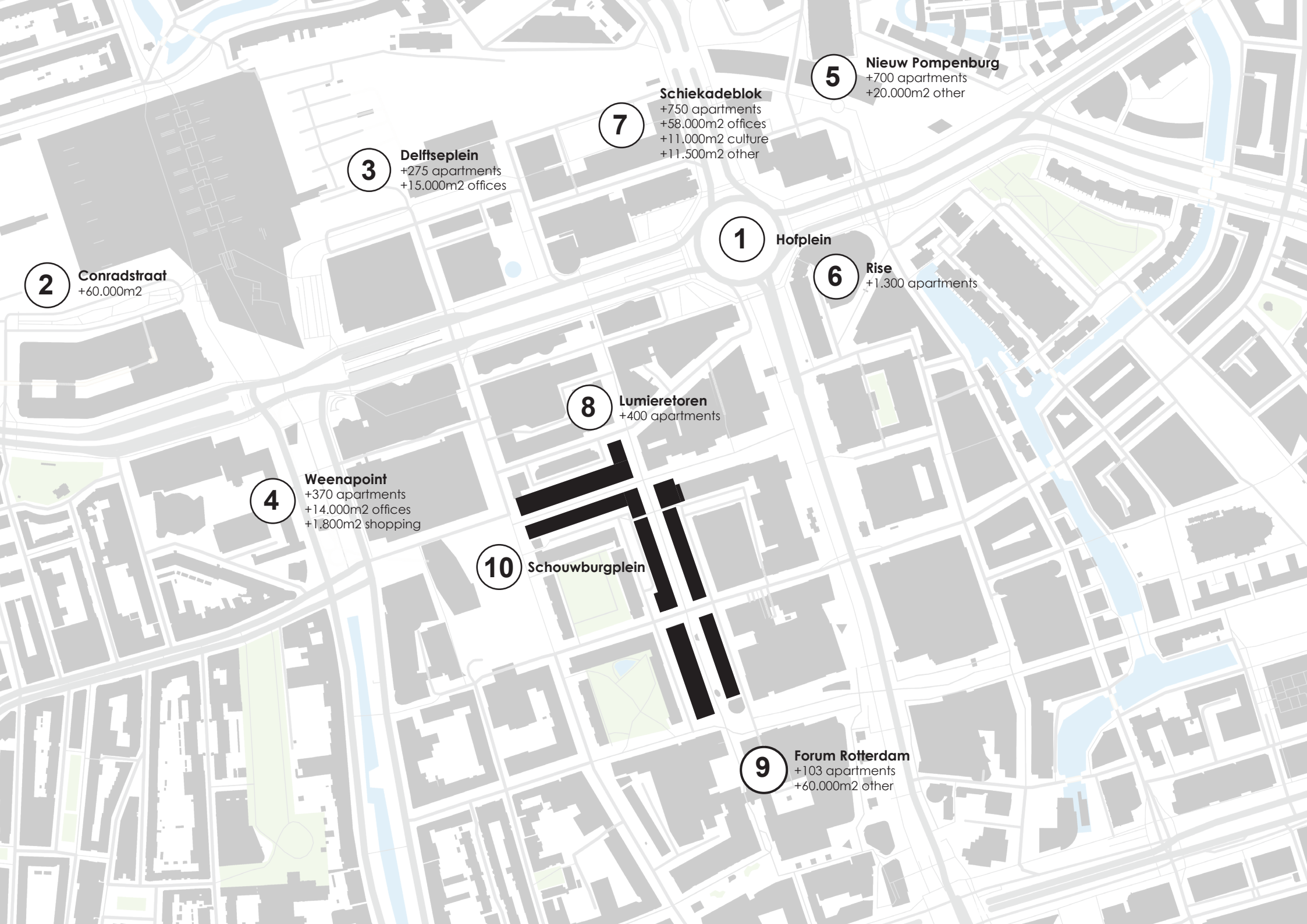
Schouwburgplein

Many major new developments are currently taking place in the center of Rotterdam. The focus of these developments is on adding homes to the center of Rotterdam. Rotterdam's vision is to build 50,000 new homes to meet the ever-increasing demand for housing.

It is striking that high-rise buildings are often chosen in these developments. Also, there is a lot of room for greenery in these plans.

**The new developments and associated functionalities will put pressure on the existing public space, increasing the need to expand this space.**

*More than 4.000 new homes in the vicinity of the Lijnbaan*



**2** Conradstraat  
+60.000m<sup>2</sup>

**3** Delftseplein  
+275 apartments  
+15.000m<sup>2</sup> offices

**7** Schiekadeblok  
+750 apartments  
+58.000m<sup>2</sup> offices  
+11.000m<sup>2</sup> culture  
+11.500m<sup>2</sup> other

**5** Nieuw Pompenburg  
+700 apartments  
+20.000m<sup>2</sup> other

**1** Hofplein

**6** Rise  
+1.300 apartments

**8** Lumieretoren  
+400 apartments

**4** Weenapoint  
+370 apartments  
+14.000m<sup>2</sup> offices  
+1.800m<sup>2</sup> shopping

**10** Schouwburgplein

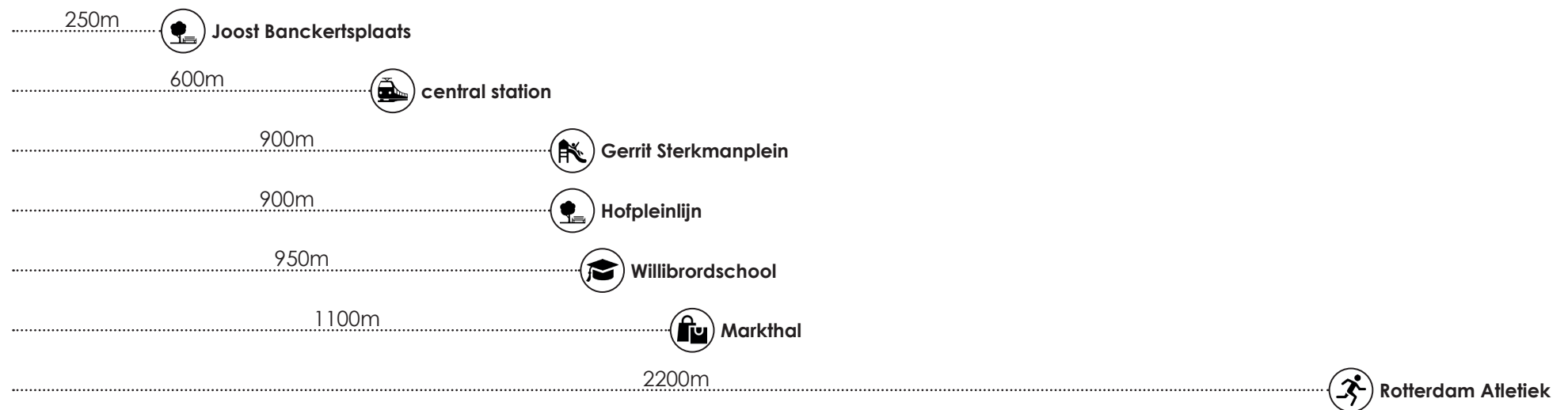
**9** Forum Rotterdam  
+103 apartments  
+60.000m<sup>2</sup> other



# Public space

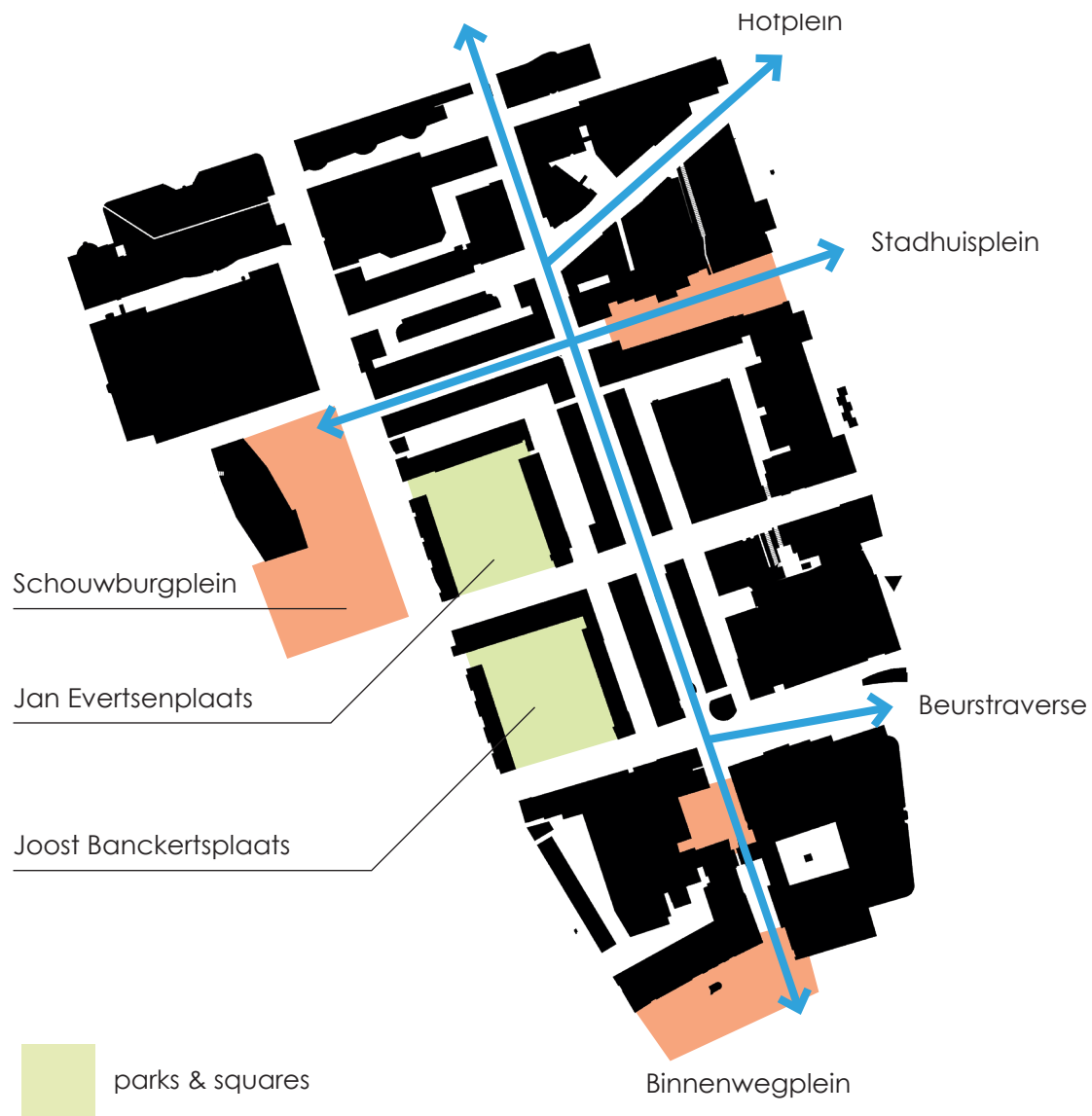
Public spaces are marked on the illustration where there is some quality of stay. What is striking is that there are no playgrounds or sports fields within a 500m radius , and with the exception of Joost Banckertsplaats and Jan Evertsenplaats, there is little green space. Moreover, relatively few paved parts are used for terraces.

**Due to a lack amenities in the surroundings, the project must be provided with play and sports facilities, recreational greenery and terraces for catering and recreation.**





# Squares & Junctions

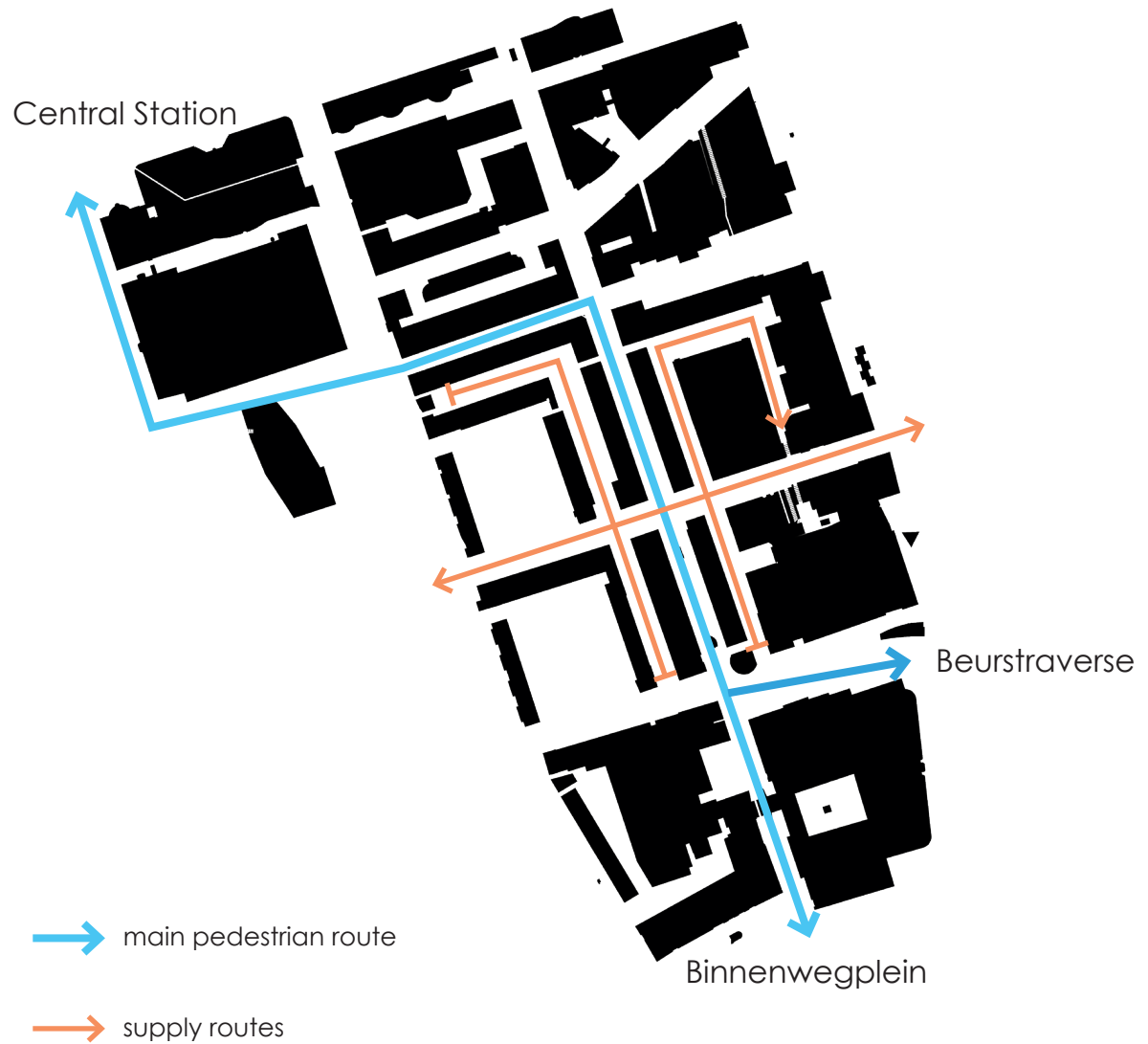


This map shows the squares and junctions that are in the vicinity of the Lijnbaan. The urban zone in which the Lijnbaan is located is enclosed by four major roads; on the North side the Weena, on the South side the Westblaak, on the West side the Mauritsweg and on the East side the Coolingsingel. Several squares are located near the Lijnbaan. The most important squares here are Schouwburgplein, Stadhuisplein, Beurstraverse and Binnenwegplein. These four squares are directly connected to the Lijnbaan in its corners and ends and will therefore play a major role in the connections of this project.

**The squares and intersections are important starting points for the design of the project, especially the routing and placement of connections with the ground level.**



The main route through the Lijnbaan is indicated by the blue line. This route starts at the central station and then runs through the Kruisplein and Schouwburgplein. Subsequently, you arrive at the Korte Lijnbaan and then the Lijnbaan. The route ends at the Binnenwegplein.

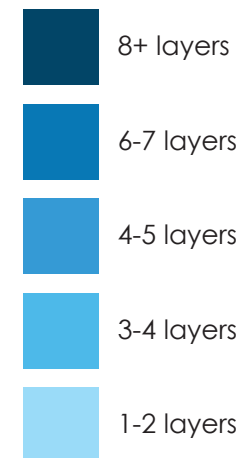


# Building Heights

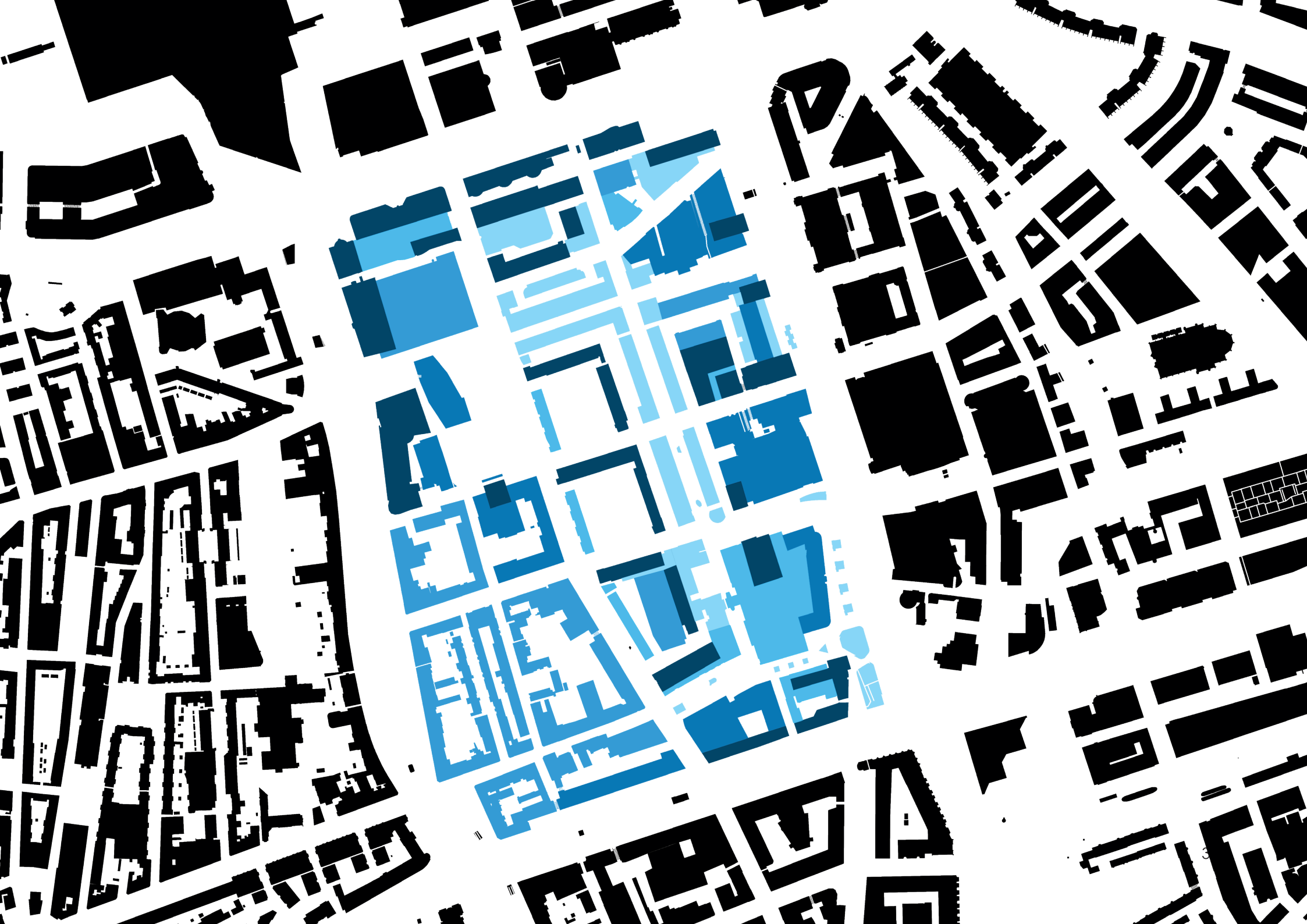


The colored area represents a wide variety of building heights. The shops around the Lijnbaan consist of two layers and the Lijnbaan flats are 10 to 14 layers high. Furthermore, high-rise buildings can be found throughout almost all of the center of Rotterdam. Most high-rise buildings consist of offices on the Weena near the central station. On the south-west side of the area the buildings consist of mostly the same building height of approximately four storeys.

**Due to the varying building heights, a lot seems to be possible in the center of Rotterdam. For this project, however, it is important not to build too high in order to preserve the amount of light and air on the shopping promenade. The maximum building height is therefore approximately two floors.**







# Sunspots & View



In the high-rise vision of Rotterdam, two types of spaces are defined around the Lijnbaan, the sunspots and representative spaces. In the areas designated as a sunspot, no reduction in hours of sunshine may occur within the designated times. The locations that are labeled as a sunspot consist of squares with terraces and the parks.

In the representative spaces some reduction in hours of sunshine may occur. For the representative spaces, June 21 and September 21 are taken as measuring points. There must be a minimum of 3 hours of sunshine on the Lijnbaan on 21 June and at least 1.5 hours on 21 September. The locations consist of squares with terraces and the parks.<sup>10</sup>

**The ambition is to create an increase of area with daylight on the Lijnbaan. The reduction on existing sunlit areas is limited as much as possible and the area with sunlight will be expanded with the roofs of the Lijnbaan.**

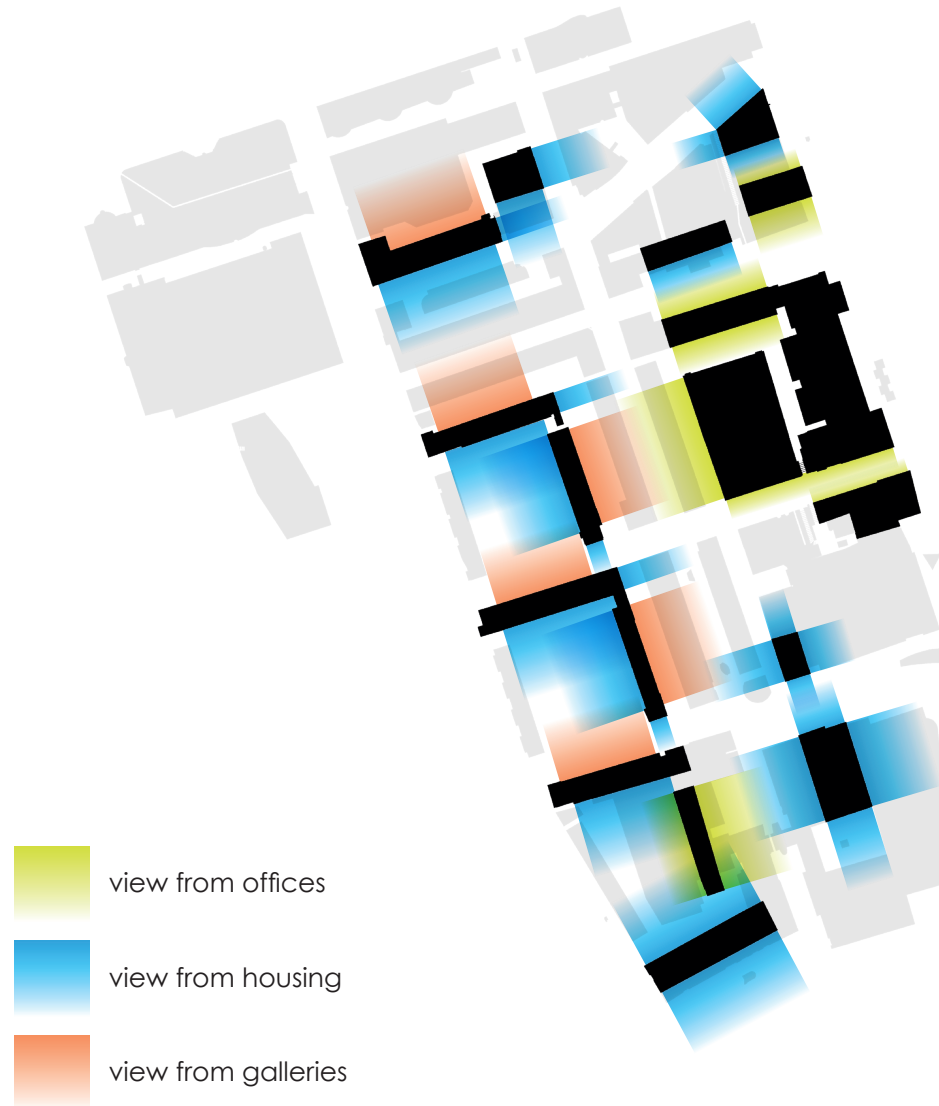


There are several high-rise buildings around the Lijnbaan, including offices, the Lijnbaanflats and other residential complexes. For example, the Lumiere flat will be built on the north side and the Forum Rotterdam on the south side. Many of these buildings have a view over the shopping promenade, the roofs of the shops and the supply streets. Apart from the shopping promenade, the view quality on the roofs and shipping streets is very low. With the exception of a few trees, there is little greenery, so the view mainly consists of paving, cars, backs of buildings, bitumen and installations.

Most gallery flats have an orientation towards the courts of Joost Bankertsplaats and Jan Evertsenplaats, so that the galleries are oriented towards the Lijnbaan. The exception is the gallery flat "City House" on the north side of the Lijnbaan Ensemble.

Building on top of the Lijnbaan is quite possible, as little visibility is reduced and more visual quality is added. By building the new volumes in the right place, the existing view from the surrounding buildings can be preserved as much as possible.

**By adding greenery and eliminating installations, the project will greatly improve the visual quality from surrounding buildings. New volumes must be placed in such a way that the view is minimally restricted.**





# Neglected zones





The Lijnbaan ensemble has several places that can be significantly improved. These places are the Expedition streets and the two parks behind the Lijnbaanflats.

## Expedition streets

The expedition streets are an important part of the Lijnbaan from where the stores are supplied. This makes it possible for the shopping promenade to be completely free of car traffic. However, these hidden places for shoppers have deteriorated over the years. The rear facades of the shops are dilapidated due to poor maintenance, are painted black and covered with installations. The pavement is outdated and there is little space for greenery or other functionalities besides parking. Delivery with smaller means of transport and the exclusion of large trucks would make it possible to organize the space more efficiently and to make it more friendly to pedestrians and residents of the Lijnbaanflats, whose entrances are on these streets.

## Parks

The parks, designed by Jan Rahder in 1967, are also hidden places for shoppers and currently serve as purely visible greenery for the Lijnbaan flats and are surrounded by closed plinths and backs of buildings.

The value of the parks lies not so much in the quality of the green design, but rather in the presence of two green 'pocket parks' in the middle of the city and the value they could have as green oases amid the bustle of the center.

There are currently no other functions included in the parks, such as terraces or places for children. The parks therefore lack quality of stay. By making the parks more

visible and accessible and by realizing functions in the plinths of surrounding buildings and in the parks, the parks will become more lively.

When the parks were designed in the 1950s, there was a discussion about whether or not to close the parks and there was even the idea about installing a fence. This leaves the parks with some ambiguity about their status; are they collective gardens, owned by the residents of the flats around? Or are they city parks, public areas accessible to everyone? This ambiguity has led to competition between different groups of users, resulting in a large number of annoyances and general degradation of the parks. The residents regard the courtyards as their collective garden, but mainly use them as dog walking places; vagabonds and junkies take refuge there and pollute the parks; shoppers rest there, but also use the trees as public toilets.

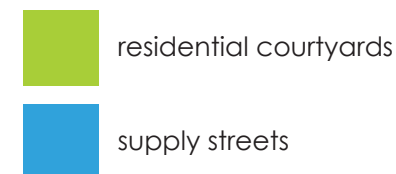
The report by Crimson (2004) recommends the following measures to improve the parks and guarantee publicity:

- The presence of the entrances to the offices and companies, which are already located on the courtyards, could be made more visible and attractive.
- The catering companies on Karel Doormanstraat could be allowed to open a small terrace in the park, making use more diverse and lively.
- The blind plinths of the medium-high residential flats lend themselves well to the addition of a small-scale program. One can think of the conversion into housing, which would promote social safety and liveness. Another possibility lies in allowing small shops or seasonal stands.

- To prevent nuisance, it is necessary to add some facilities. One can think of a dog walking area for the residents' dogs, a public toilet for shoppers and benches.

- The quality of the park-like greenery can be improved by introducing a rich and varied planting, thereby making both parks more attractive and beautiful.

- The original entrances to the houses at the parks must be reopened. The relocation of the entrances to the expedition street, which is unattractive to residents and makes the courtyards less lively, is thus undone.<sup>11</sup>



11. Dorman, E., Provoost, M., Rots, S., Vanstiphout, W., & Wilkins, C. (2004)

# Functions



The diagram on this page shows the functions in the buildings. The buildings have been given a color that expresses the main function in the buildings. Often other functions such as shopping and catering are located in plinths.

The diagram clearly shows that catering is mainly located to the north of the Lijnbaan. In addition, shopping is mainly located on the route between Schouwburgplein, Binnenwegplein and Beurstraverse.

For the future of shopping on the Lijnbaan, it is necessary that cultural functions and catering facilities are better distributed throughout the area. It is therefore important for this project to give these functions a place.

In the early years of the Lijnbaan, the center mainly consisted of offices and shops, only the Lijnbaan flats were used for housing. More houses have been added to the center in the later years up to now, such as in the Forum and the Karel Doorman. The lack of housing and evening programs on the Lijnbaan means that the Lijnbaan is completely empty after the shops have closed.



### Conclusion

The central location, monumental value and the connection that the Lijnbaan has with its environment means that the Lijnbaan has an important status in Rotterdam. The design of this project needs to be designed carefully and find a connection within all the layers of the location.

Many new developments are taking place in the vicinity of the Lijnbaan. New residential towers, such as the Lumiere tower, will be built in the future and squares, including Schouwburgplein and Hofplein, will be redesigned. In total, more than 4.000 new homes will be added to the vicinity of the Lijnbaan.

However, limited qualitative public space is available within a radius of 500m and during shopping on the Lijnbaan there are few recreational facilities such as restaurants with terraces. In particular, the greenery for the general public is lacking in both quality and quantity. In order to provide the new homes and the future of shopping on the Lijnbaan with high-quality public space, it will therefore have to be expanded considerably.

The greenery that is already in the area, the parks Jan Evertsenplaats and Joost Banckertsplaats, function purely as a green view for the residents of the Lijnbaanflats and are practically invisible to shoppers. The Lijnbaanhoven are also of lesser quality. Although these places function well for the car and the delivery of goods to the Lijnbaan, they are unpleasant places. Connecting and upgrading both the parks and the Lijnbaanhoven is therefore of vital importance.

### Base for Design

In order to preserve the qualities of light and air in the shopping promenade, buildings should not be built too high. By maintaining the same height as the existing two-storey building and placing the new volumes to the rear, the Lijnbaan will not be shaded and as much sunlight as possible is retained on the shopping promenade.





# 2.3

## ARCHITECTURAL ANALYSIS

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In this chapter the architecture of the Lijnbaan is analyzed and recently developed projects are studied. First of all, the Lijnbaan is specified in its architectural qualities. This research focuses on the facades of the Lijnbaan in particular.

Subsequently, four projects are analyzed that have been realized near the Lijnbaan ensemble. The three projects are; Dreamhouse by Kaan architects, Restoration of the Canopies by Mei-architects, the Forum Rotterdam by OMA and the G-Star store by OMA. This research examines the design and its relationship to the design of the Lijnbaan and provide principles for the design of this project.

# The Lijnbaan

---

Opened in 1953, the Lijnbaan is world famous as Europe's first pedestrian shopping promenade. Together with the surrounding flats, parks and expedition streets, the Lijnbaan ensemble is a revolutionary way to design the city. Architectural firm Van den Broek en Bakema designed a completely new neighborhood in which living, working, traffic and recreation are strictly separated.<sup>12</sup>

Instead of shops with houses above them on both sides of the traffic street, the shops were located on pedestrian walkways. The shops are supplied from forwarding streets at the rear and the houses are located in separate blocks, the Lijnbaanflats, designed by Hugh Maaskant, Arie Krijgsman and Herman Bakker.<sup>13</sup>

## Concept

The Lijnbaan is an example of modernism, the architectural movement that strived for a clear, rationally designed city. The concept of the Lijnbaan stems from the temporary emergency shops that were built in the bombed city. The emergency shops were built in 1940 in the bare plain that had arisen after the clearing of the rubble. On Coolensingel, Goudsesingel and in the Land van Hoboken, low, detached shop buildings made of wood, plaster and chipped bricks rose from the rubble.

The Lijnbaan is the opposite of a traditional shopping street consisting of narrow, cramped streets with high street walls. The traditional street is replaced by a dynamic landscape in which air, light, space and functionality are the basis. In an open space, the gallery flats and retail units are separate from each other and there are several streets exclusive to pedestrians, traffic or logistics. The result is the opposite of a "street like ravine", the Lijnbaan is a street like a "valley".<sup>12</sup>

## Setup

The base for the design of the stores are a flexible set-up and a uniform, neutral architecture. There are two basic types; the normal type and the mezzanine type. the normal type has two store floors. The mezzanine type has two layers at the front and three at the rear in a split-level design. All kinds of layout variants are possible by using or not using the cellar.

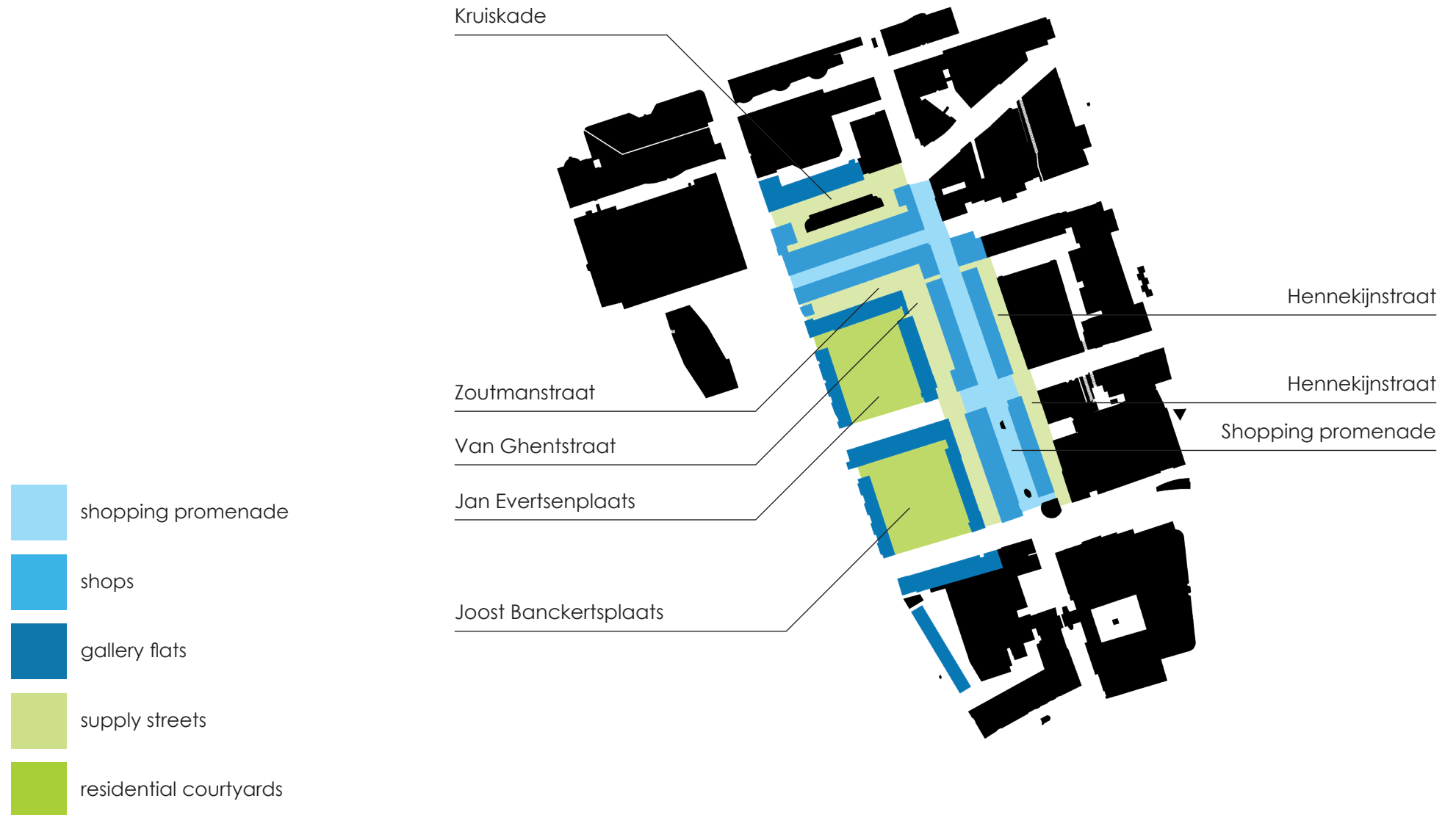
The entire plan is based on a sizing system of 1.10 meters. This 1.10-meter module was also implemented in the paving. The facades are constructed from prefabricated concrete posts and parapet elements. The ground floor is dominated by large glass fronts and shop windows. The facades above are neutral and unobtrusive.

## Facade

The facades of the Lijnbaan are made up of a few elements; the large glass shop windows, the canopies, the recessed fronts, the concrete beam and the steel windows in the 2.20 meter grid. The elements are repeated with some variation over the entire Lijnbaan. The canopies visually bind the repeating facade together in continuous facade.

The entire Lijnbaan is made up of a clear and simple grid. The repetition of elements and the grid provide continuity and uniformity through the design. In some places, diversity is introduced by minimally breaking the repetition. The continuous concrete beam binds the recessed and side-lying facades together. The awning and the recessed windows separate the two floors.

The shop facade on the ground floor offers transparency to the shoppers. In contrast to the facade on the ground floor, the facade on the first floor offers more privacy to private parts of the shops. In addition, more variation in window distribution is possible on the first floor facade. The facades have a sleek and thin detailing that alternates between concrete, steel and wood.





visible load bearing walls

grid of 2,20 meters

renovated canopies

visible shopping grid

steel windows

recessed continuous facade  
& continuous concrete beam

large glass storefront  
windows

*Slim detailing  
in framing*

*Transparency*



front facade (2021)

existing facade has been  
painted black

variation in openings

*Repetition*



back facade (2021)

variation in facade, recessed facade  
and interruption of the awning

public sitting elements



*Clear and  
simple grid*

greenery in public space

variation in front facade (2021)

*Uniformity through  
diversity*



variation in the design  
at the corners

split-level floors

corner building (2021)



# The Lijnbaan, facade

The facade of the shopping promenade previously consisted of a wide variety of shapes. The entrances to the shops were set back in the facade and there was more space for shop windows. This allowed the shops on the promenade to display more products to passers-by. The set back entrances and shop windows tempted passers-by to take a few steps towards the store and 'sucked' the customers in.

Today, the meandering shop windows have been replaced by sleek straight fronts, maximizing the interior area. As a result, the charm and slowing effect of the meandering shop windows is lost and by that create the shopping highway as it is today.

The windows on the floor of the Lijnbaan all have the same shape with the same proportions. Within this form there is variation in the division of the frames. Throughout the Lijnbaan there is uniformity in the division of the frames in both height and width.

**In contrast to the current shopping promenade, the new project at height should slow down the visitor and entice him to stay.**

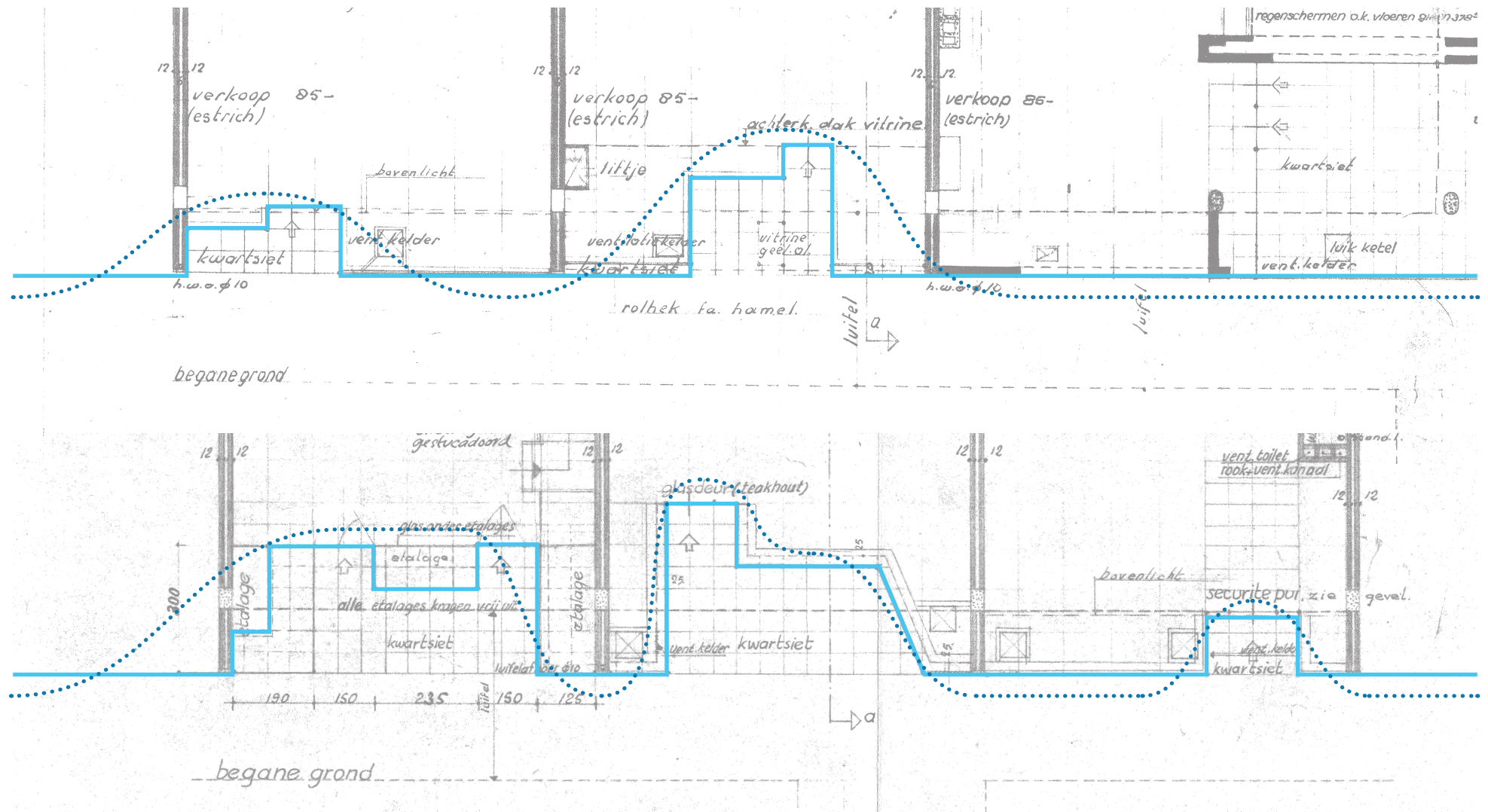


Current shopping promenade (2021)



Shopping promenade in the past, Behrens, H. (1957)





# Dreamhouse, by Kaan architects

## Architectural Analysis

### Design

The Dreamhouse is a renovation of one of the monumental buildings in the Lijnbaan area. Retaining the existing concrete structure, rectangular volumes are stacked in balanced proportions and masses comparable to the original plan. The three stacked volumes are characterized by glazed surfaces, sleek transparency and sharp expressiveness and are a contemporary interpretation of the typical 1960s angularity of the Lijnbaan.

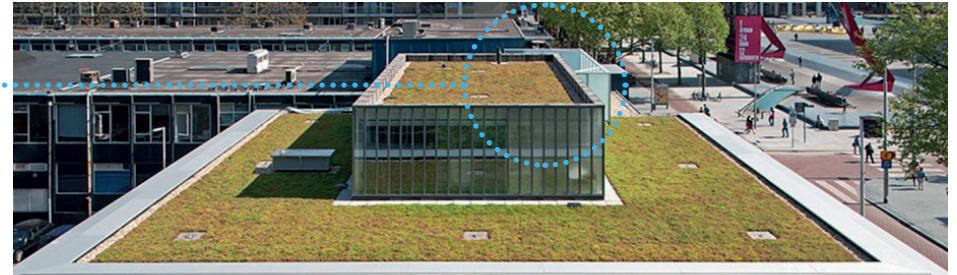
### Materials

The volumes show a subtle differentiation of materials, window openings, colors and details that give a contemporary look to the traditional post-war architectural identity of the Lijnbaan. The facade of the cantilevered floor is accentuated by a series of sharp aluminum slats for large glass plate windows. The building itself is simple with strong edges.<sup>14</sup>





glass facade to hide  
installations



deep aluminium slats  
in strong grid



smaller grid behind  
glass facade





# Restoring the Canopies, by mei-architects

## Architectural Analysis

### Design

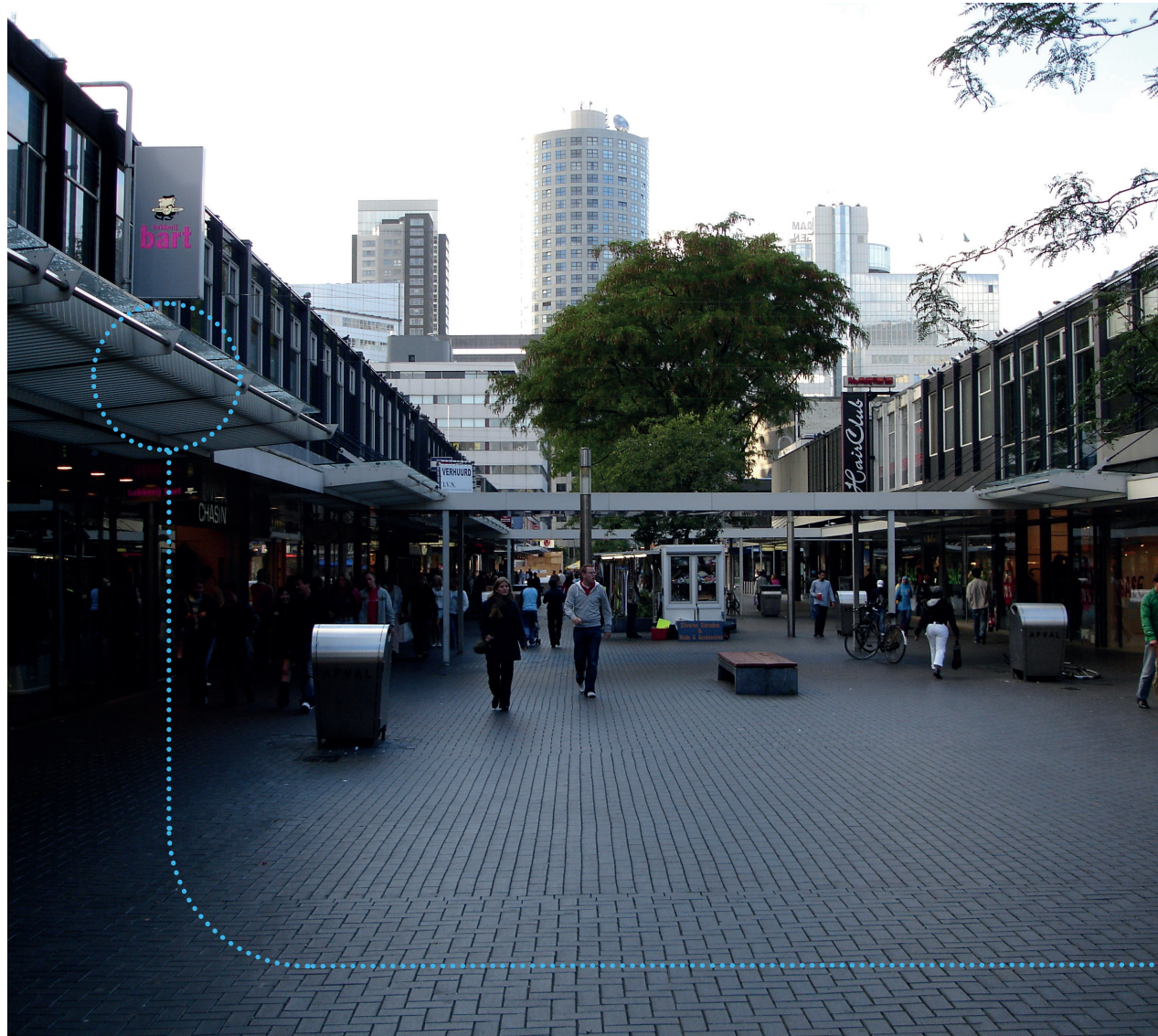
The canopies that interconnect the shop premises form the most characteristic part of the design for the Lijnbaan. With the 'crossing canopies' they connect the shopping area and frame the public space, creating a pleasant outdoor space, like a living room in the city. Since its construction in 1953, things had changed and the unity in the ensemble had disappeared. With Mei's design, the living room feeling is back on De Lijnbaan. Later elements have been removed, the old canopies are restored and the original quality has been revived using wood and warm materials.

### Materials

The glass canopies that were added around 1966 were removed again during the renovation. The original canopies are covered on the bottom and front with parts of sustainable Accoya wood. To limit the inconvenience for shopkeepers, the wood was mounted in prefabricated panels.

In addition to the canopies, the existing concrete piers have also been cleaned and restored and façade piers that were missing have been returned. The concrete facade beam has been restored by cleaning it, removing paint and repairing concrete damage. The niche is covered by mesh over its entire length, serving as a pigeon screen to prevent pollution in the future.<sup>15</sup>

previous glass canopies





wood changes direction, perpendicular to long side



Accoya wood cladding and aluminium roof edge



# Forum Rotterdam, by OMA

## Architectural Analysis

### Design

The Forum Rotterdam concerns the renovation of the ABN AMRO building, the transformation of a former office tower from the 1970s into a residential building, and the renovation of the end of the Lijnbaan. The buildings that are being demolished for this project do not belong to the part of the Lijnbaan that has the status of national monument.

The Forum Rotterdam consists of approximately 64,000 square meters of space for shops, catering, offices and living. The project consists of five sub-projects: the renovated national monument on the Coolsingel, the redevelopment and extension of the Lijnbaan shops, the Primark new building, the redevelopment of the old office tower into 103 apartments and the realization of a completely new underground expedition cellar, which connects all project components.

### Materials

The new facade on the Lijnbaan is designed as a transparent screen that retains its uniform character, regardless of any changes in the layouts of the shops behind it. The glass facade is divided by a grid of concrete, based on the design of the Lijnbaan.

Before 2008 there were plans to build an 80 meter high, wide and long “super cube” on this site. A residential and shopping paradise that would connect the Koopgoot, the Lijnbaan and the Coolsingel, intended for exclusive shops and chic catering establishments. The development costs were estimated at half a billion euros. Due to the crisis, tenants dropped out and the project had to shrink.<sup>16</sup>





curved balconies with strip  
steel balustrade, clouds in  
the sky

strong grid made of  
concrete

round white collums

minimal detailing, frame hid-  
den behind facade

minimal glass balustrade and floor  
behind glass facade



Forum Rotterdam (2021)



Forum Rotterdam (2021)



Previous design, Multi Vastgoed. (2008)



### Design

The old G-Star, designed by Linea Architecten, with its rounded shape, has an alienated shape in relation to the orthogonal grid of the Lijnbaan. In the new design, the shape has been reduced to a suitable shape that matches the shape of the Lijnbaan.

The very simple design seems to have been made from two materials, namely a glass box with an anthracite aluminum grid that matches the grid of the Lijnbaan and the Forum. The roof and the canopies on both sides are both made of glass and thus provide maximum light.

The canopies on either side of the pavilion connect both sides of the Lijnbaan and thus end the shopping area of the Lijnbaan, after which a transition takes place to the Binnenwegplein. Both in design and materialization, the canopies differ strongly from the renovated canopies of the Lijnbaan.



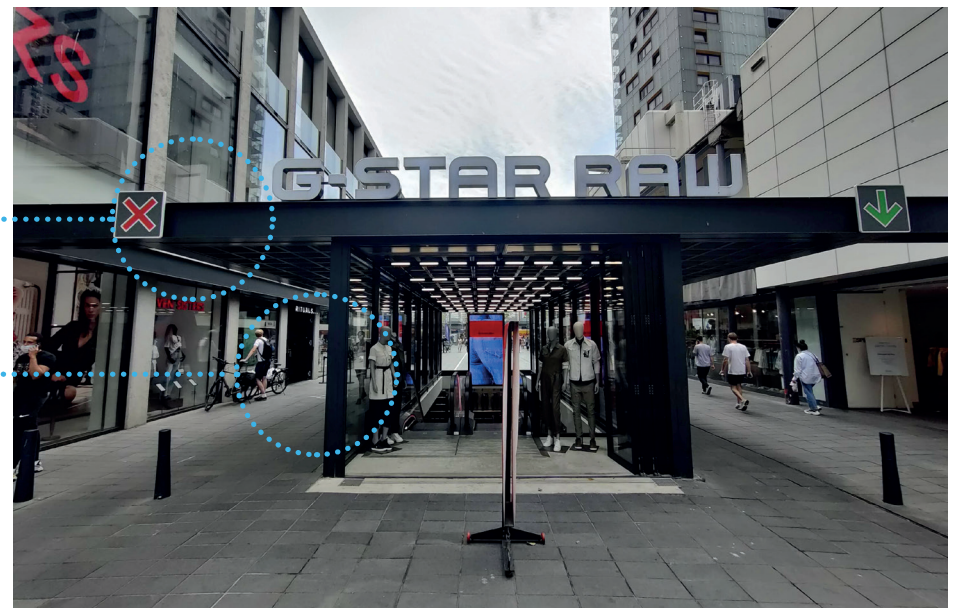
glass box for maximal light



Interior G-Star, van den Broek, W. (2019)

canopies connects both sides of the Lijnbaan and thus forms a termination and transition between two squares

transparent layer, shopping



Exterior G-Star (2021)



## Conclusion

The basis for the design of the Lijnbaan shops is a flexible layout and a uniform, neutral architecture. The entire plan is based on a 1.10 meter grid. The repetition of elements in the grid ensures continuity and uniformity throughout the design. In some places, diversity is introduced recessed facades and thus minimally breaking repetition. The elements in the facades are connected to each other by horizontal lines.

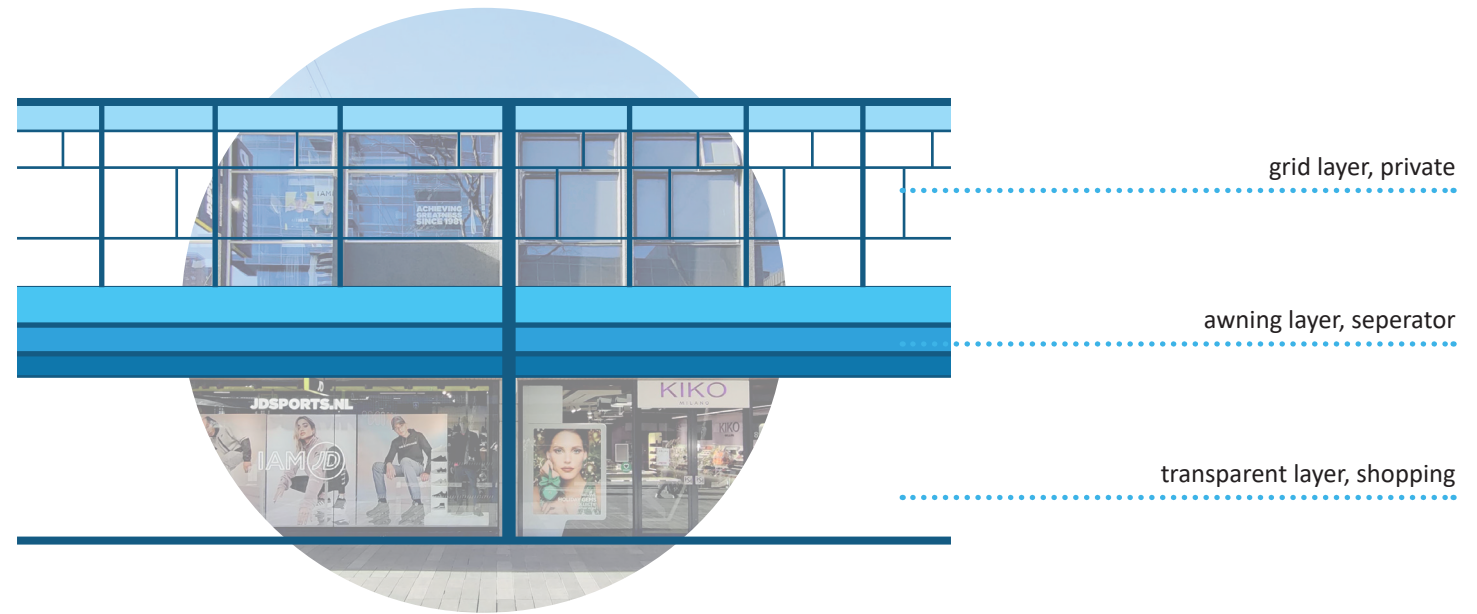
## Two Domains

The design principles of the Lijnbaan have been applied in the design of the nearby projects. In these projects, two layers are distinguished from each other, the plinth and the top. The plinth is the domain of the shopping promenade, new designs in this domain must therefore be in line with the design of the Lijnbaan. Continuity and repetition of elements are central to this layer.

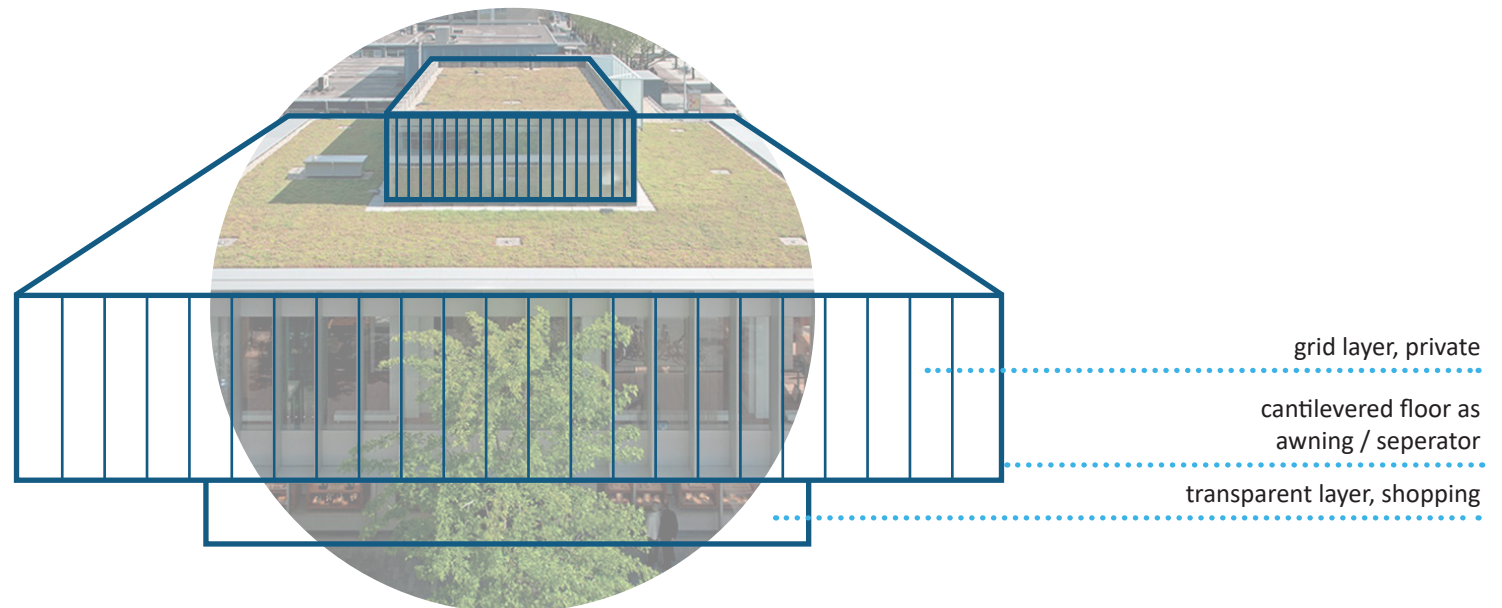
The top layer seems to be breaking free from these rules. This is clearly visible in the design of the Forum where round shapes are introduced. The elements are repeated vertically in this layer instead of horizontally.

## Detailing

The materialization and detailing of both the Lijnbaan and the other projects is modern, luxurious and minimalist. The most common materials in the facades are concrete, steel, aluminum and glass. The large glass surfaces in the facades give a lot of openness to the shopping promenade and light within the buildings.



Lijnbaan



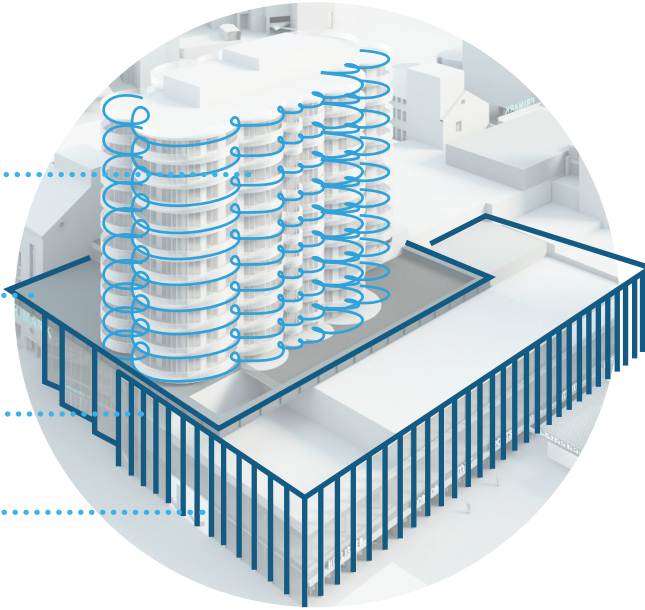
Dreamhouse

transformed volume with clear visible  
floors in repeating pattern

plateau as separator

transparent layer, shopping

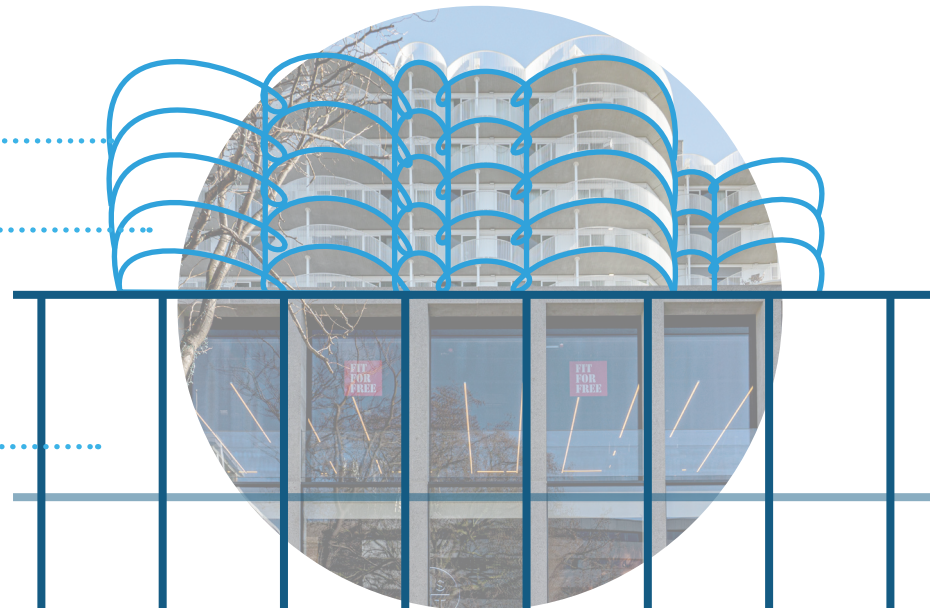
clear concrete grid



curved balconies,  
clouds in the sky

volume in layers, living

transparent layer, shopping



Forum Rotterdam

## Base for Design

This project falls within the transition layer between the Lijnbaan and the higher city (like the Forum). The design will therefore have to conform to the size of the Lijnbaan, and will therefore be constructed from the 1.1m grid of the Lijnbaan.

Elements are repeated throughout the design, creating a continuous and recognizable design. In order to achieve this, rules are drawn which will guide the design. The rules should include; the proportions of elements, the minimum and maximum dimensions and an image quality plan in which the color of elements and the layout of the outdoor space is determined. In the grid, minimal deviations remain possible and divisions in windows can have some freedom within the rules.

The whole must contain a lot of glass and openness, so that light and air also remain an important concept in the new design. The materialization of the project is luxurious and will mainly consist of steel, aluminum and glass, supported by a light construction. The detailing is minimalistic and self-evident, so that it does not require any attention from the visitor.





# 3 DESIGN LOGBOOK

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In this chapter the architecture of the Lijnbaan is analyzed and recently developed projects are studied. First of all, the Lijnbaan is specified in its architectural qualities. This research focuses on the facades of the Lijnbaan in particular.

Subsequently, three projects are analyzed that have been realized near the Lijnbaan ensemble. The three projects are; Dreamhouse by Kaan architects, Restoration of the Canopies by Mei-architects and the Forum Rotterdam by OMA. This research examines the design and its relationship to the design of the Lijnbaan.

# Three Concepts

Prior to the design, three concepts are devised. Each concept has to do with connecting different layers in the city. The first concept is linked to the Hofplein line and the other two concepts to the Lijnbaan. During the concept development, both locations were examined for suitability for the final design.

The connection with the Hofplein line is interesting because here the Urbanists have already made a design for a park at an elevated level. This development can be a reason to review the surrounding area and possibly realize new developments. Given the location, homes with small amenities seem to be the most suitable function.

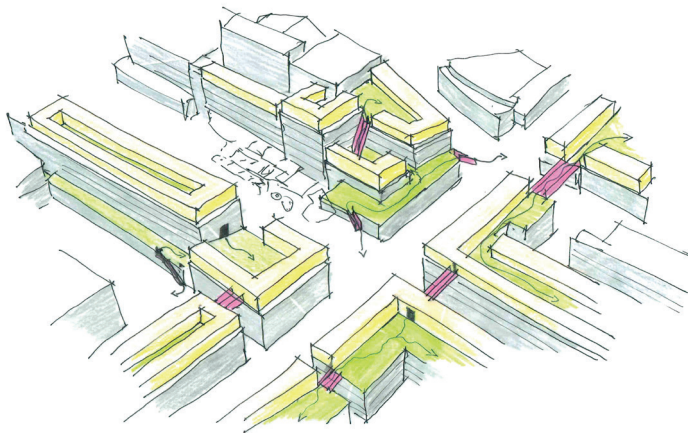
The location for the other two concepts, the Lijnbaan, is also an interesting location due to its monumental status and the associated limitations. In addition, a number of qualities are lacking at this location, including green areas. A public function seems most appropriate at this location. A public function fits well with the public nature of the Lijnbaan. In addition, the Lijnbaan is already equipped with many other functions, such as shops, offices and homes.



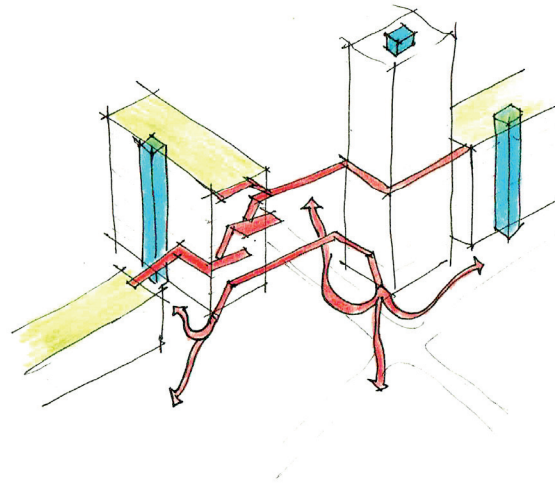
Luchtpark Hofbogen, by De Urbanisten (2020)



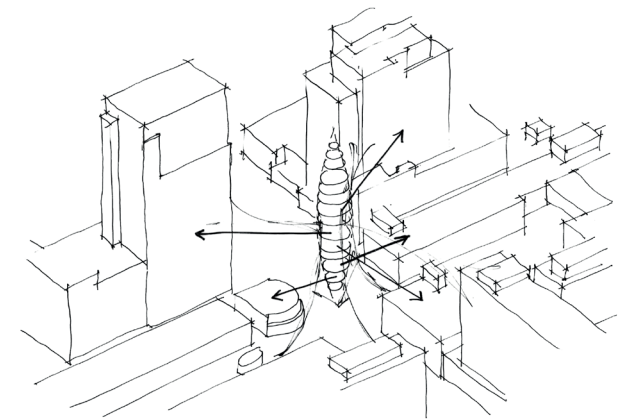
Lijnbaan, by Broek & Bakema (2021)



Sky Village



Bridging the Layers



Unite Escalier



# Concepts



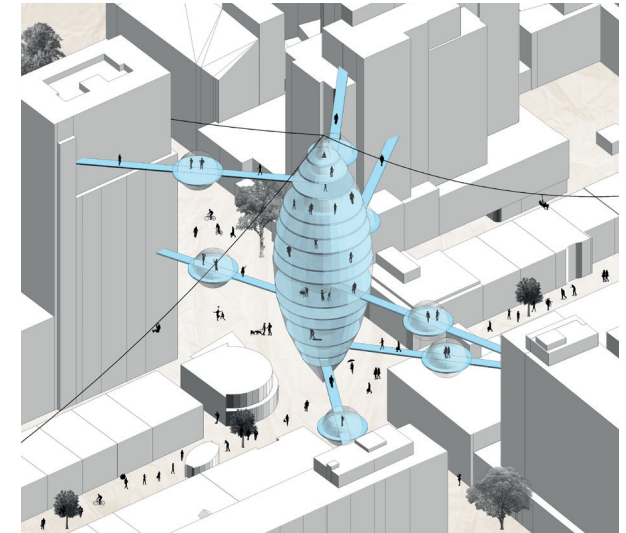
Sky village

Connections are made from the park to the adjacent roofs to which an extra layer is added. Besides housing, depicted in blue, other functions can also be placed in this layer. In the further elaboration of this concept, one of the clusters can be further developed. In this presentation, an elaboration of cluster 3 will be shown. The layers that are connected in this concept are, the ground floor, the Luchtpark and the existing roofs on which a new layer can be built. By making the roofs accessible, the space in the city is considerably enlarged and the city can be densified. The raised park is used as a stepping stone to the space on the roofs. New routes are created from the park to connect this new layer. The park will be used as a public square for residents. The various clusters will also have facilities where residents can meet.



Bridging the Layers

The Second Concept can start practically anywhere. Next too or between buildings, it spreads like a virus to connect more and more buildings. The second concept increases the flexibility of the city. The layers in the city are connected by bridges, stairs, ramps and elevators. The new routes that are being created as a result make higher layers in the city more accessible and thus unused space in the city is utilized. Social spaces can be created along these routes. These spaces can be both public and semi-public spaces, such as communal space, terraces and gardens. In addition to connecting layers, it is also possible to offer solutions for problems of the city. For example, greenery can be added and water can be stored along the connections. It is also possible to cool the environment and nearby buildings in a natural way. This technical approach to the concept promotes the health of the city.



Unite Escalier

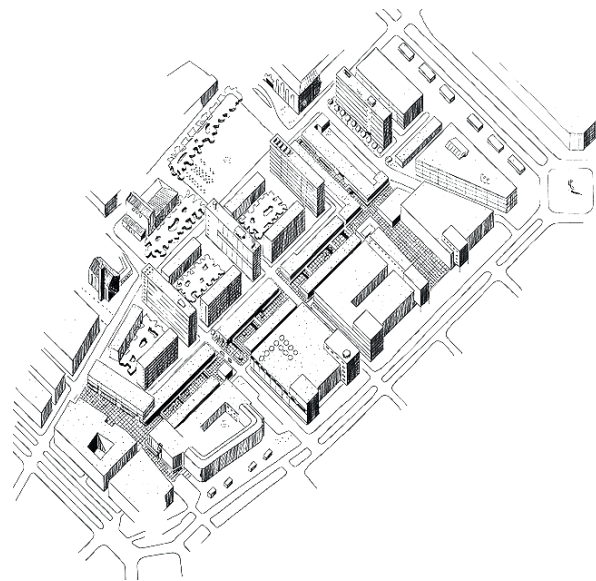
For the location of the Third Concept, it preferably starts at a center location, where multiple traffic flows intersect. It starts at one point, and connects a few buildings. From there it connects other buildings, creating a network. In this concept, the layers in the city are horizontally connected by bridges and vertically connected in a tower. User functions can arise on both the horizontal and vertical connections. The tower connects existing high-rise buildings in the city. Alternative connections such as cable systems, referring to het kabelbaantje, are also possible. The tower serves as both an eye-catcher for Rotterdam and a connector of the city. The space that is added functions as a square, where many social functions can take place.

# Project Location

**Two locations for the project were considered at the end of the concept fase; near the Hofpleinlijn or the Lijnbaan.**

## Hofpleinlijn

The first location is near the Hofpleinlijn, which is being developed into Luchtpark Hofbogen. This park will be built on top of the existing track, creating a two kilometer long park on an elevated level.



The raised park can serve as a starting point for a new development around the Hofpleinlijn. By making connections to surrounding buildings and roofs, the park will function as a street. In order to densify Rotterdam, adding homes seems to be the most logical choice. The advantage of housing is that social control is increased and thus the park becomes safer. In addition to housing, other support functions are also conceivable.

## Lijnbaan

The second location is on the Lijnbaan. The Lijnbaan is a national monumental ensemble of buildings and functions. This ensemble consists of a shopping promenade with shops, consisting of two floors, gallery flats and various courtyards. The flat roof of the Lijnbaan shops and the varying construction height of the surrounding buildings make this location suitable for creating something new at an elevated level.

It does not seem necessary to add homes on the Lijnbaan, because there are already many homes in the Lijnbaan flats. In addition, increasing the amount of homes can further reduce the quality of existing homes. The new function at this location should rather improve the existing qualities.

A public function seems to be the most suitable function on the Lijnbaan. The advantage of building on top of the existing structures is that the old can be preserved underneath, which is of course a requirement for a national monument such as the Lijnbaan.

Greenery will also play a major role in this new function. Greenery significantly improves the quality of stay on the Lijnbaan. In addition to visual quality, solutions can be offered for the heat island effect and water storage.

**The Hofpleinlijn location has the advantage that an elevated level is already being built. A new development can link up with this. The disadvantage is that a design has already been made for this elevated park. In this design, certain choices have already been made that the park will not be accessible at night and that no connections may be made on the entire east side of the park to maintain one continuous line in the design. The design freedoms are therefore strongly limited in new development.**

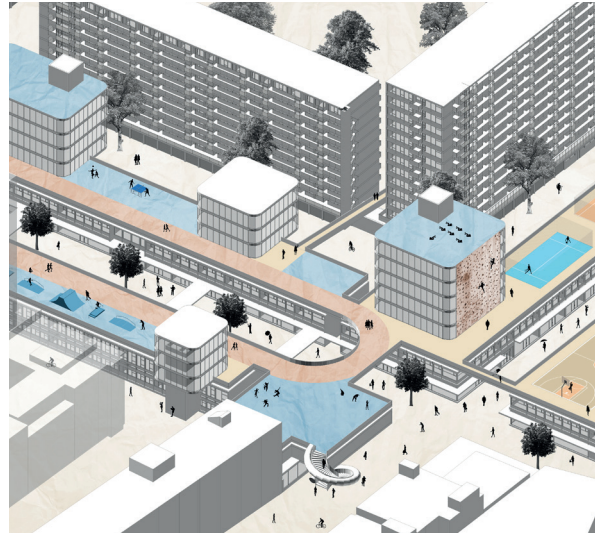
**The Lijnbaan also has limitations because it is a national monumental status. This means that interventions are limited to parts that are of less value. However, this also increases the need for intervention, as a monument should, after all, remain relevant in use in the present time and in the future. This also makes the limitation a challenge and an interesting assignment for a design. The need to improve quality of stay in and around the Lijnbaan seems to be high. The choice for the project therefore goes to the Lijnbaan.**

# New Concepts



## Lijnbaan Park

The main activity in this concept is biodiversity and hiking. So there is not a good balance in activities and little flexibility. The amount of greenery is strongly beneficial for the climate on the Lijnbaan.



## Sport Center Rotterdam

The sports fields are often too large for the roofs of the Lijnbaan and take up too much space that can be used for other activities. In addition, many parks already exercise by joggers or sports groups without the emphasis on sports in the design.



## Social City

The balance in usable space and greenery is the best in this concept. The outdoor space should be flexible in use, there should be shade to stay under and pavilions for indoor space.

The balance between functional space and greenery is about 50/50. The elevated level becomes a park-like setting in which various recreational functions are distributed. In terms of volumes and architecture, a good integration in the greenery as in the first concept, and proportions of volumes as in the second concept, seems to be the most appropriate.





## Grid

The various park functions, sports, catering and greenery are distributed throughout the area on the basis of a grid.



## Sliced

Functions are repeated throughout the area by means of slices varying in size and aligned with the underlying grid of the Lijnbaan.

Although the Sliced Model has a good connection with the Lijnbaan, the placement of volumes and functions becomes less flexible. The flexibility in the Grid model is therefore preferable, also because the total area will form more as a whole.

# Previous Designs

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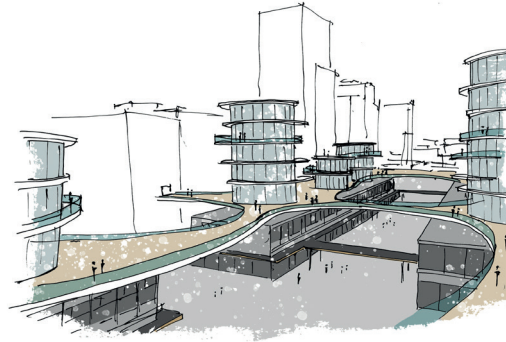


## Design I

In the first design, the assumption arose that sufficient rentable area must be created to make the plan feasible. The starting point was about 50% rentable area compared to 50% public space. Part of the funding can come from the municipality.

The first design consists of prefabricated modular volumes that are stackable and expandable, making it easy to remove or add volumes according to the city's wishes.

Although flexibility has a major advantage, the temporariness and lack of order in the design are less suitable for the Lijnbaan.



## Design II

In this design, the volumes are stacked in buildings of varying heights, geared to the building heights in the area. Stacking the volumes leaves more room for greenery and public space.

The volumes were given contrasting shapes compared to Lijnbaan. The buildings were provided with balconies to increase the outdoor space and make visual connections with the environment.



## Design III

In the subsequent design, the volumes were lowered and rounded to emphasize the contrasting shape. The rounded shape could be used to place greenery on, reinforcing the idea of the Valley. The buildings were placed backwards so that the construction could land in the Lijnbaanhoven.

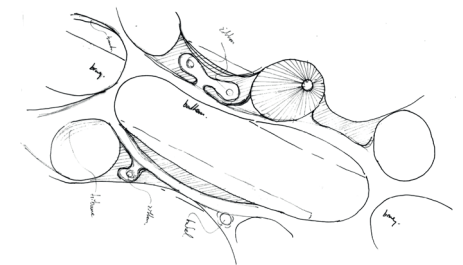
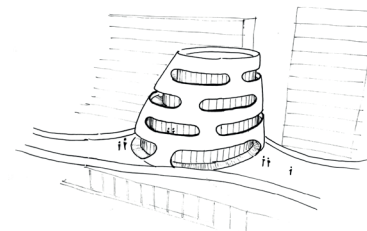
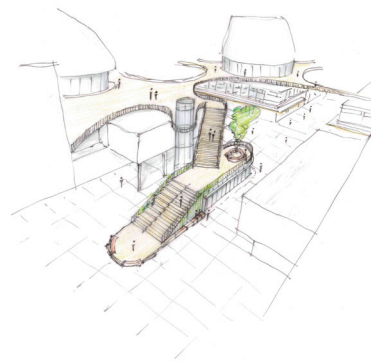
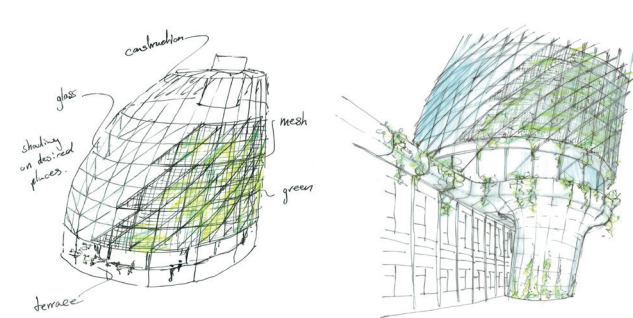
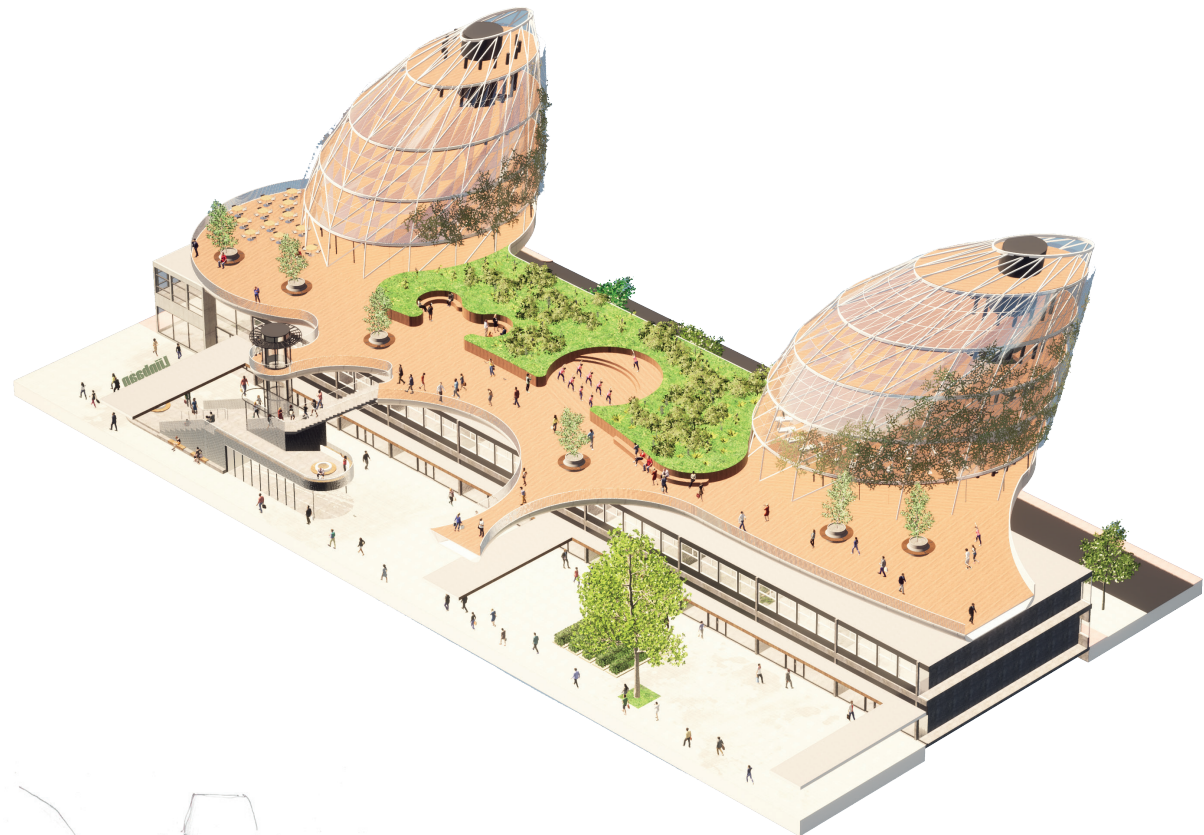
## Design IV

The construction of the buildings resemble a willow tree, a large trunk from which the branches hang down and support the floors. This unique construction form relieved the existing construction of the Lijnbaan as much as possible.

The placement, orientation and height of the buildings are tailored to the environment. The park level responds to the buildings, the environment and underlying structures of the Lijnbaan.

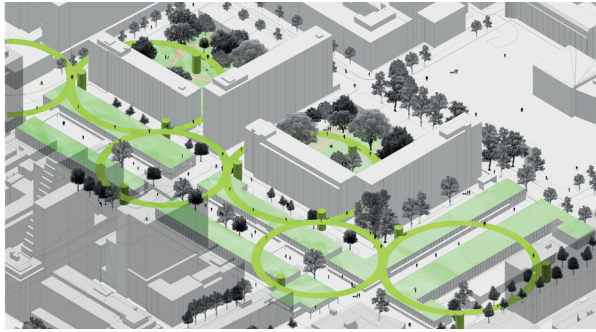
However, the round shapes lacked flexibility in design and use. The contrasting form for the design served to create a new world that hovered above the old one and to avoid conflict with the Lijnbaan. However, the result was the opposite. The massive volumes and contrasting shapes oppressed the Lijnbaan, thereby detracting from the monumental importance of the Lijnbaan.

The relief of the existing construction, the placement of volumes and integration with the environment essentially fit. The implementation should be more in line with the design of the Lijnbaan.

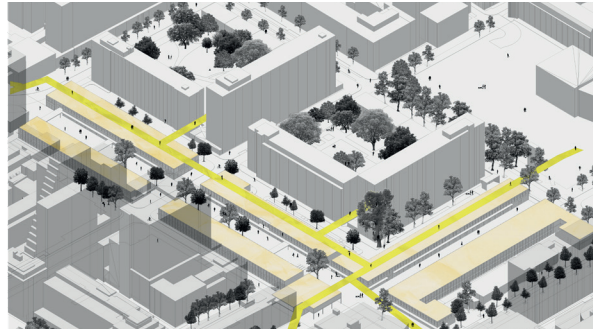




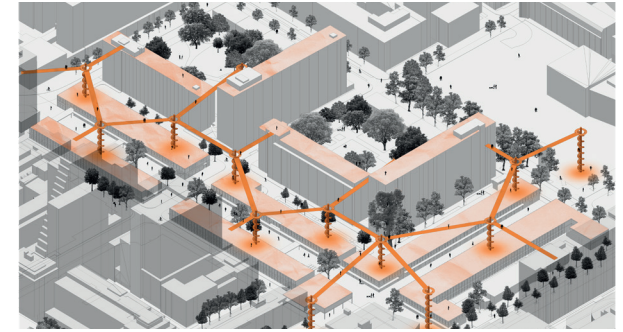
# Connections



Chain

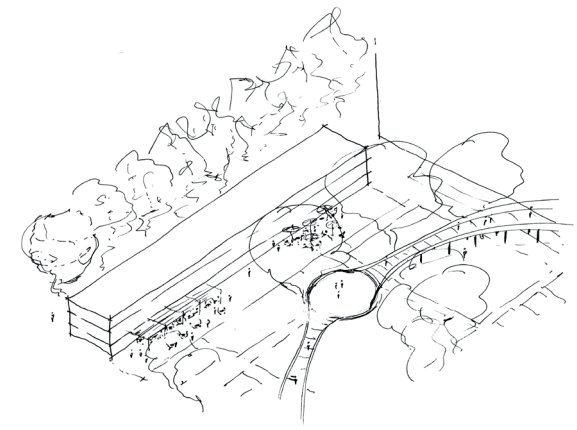


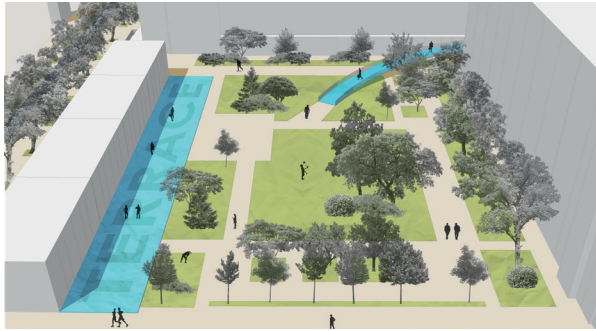
Straight



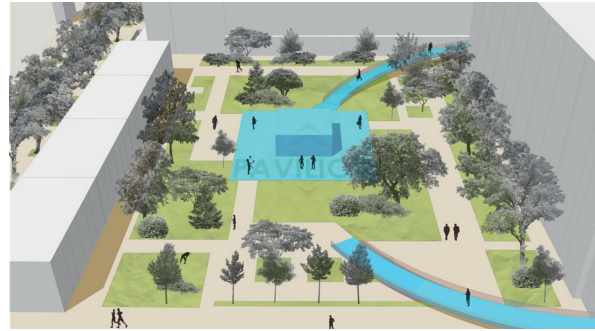
Elevated

Here it was investigated how the parks, Jan Evertsenplaats and Joost Banckertsplaats, can be connected to the project and what is needed to establish this connection. The most suitable connection is between the Lijnbaanflats, which is currently a dead end, so that the entire park will participate in the larger network of the area. By giving the catering industry in the plinth of the lower buildings terraces on the park side, the park will be used more and therefore be more lively.

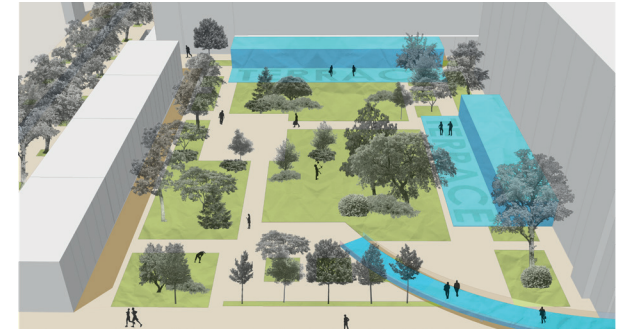




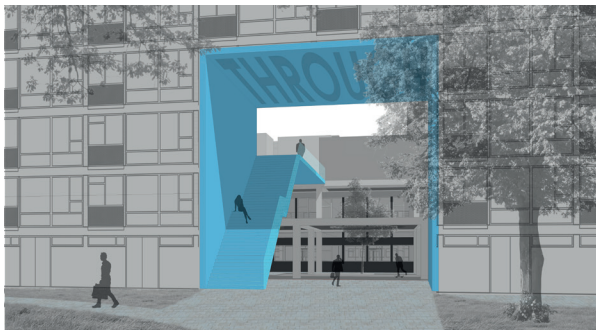
Between the flats



Dubble connection



Side connection



Through

Here it was investigated how the parks, Jan Evertsen-plaats and Joost Banckertsplaats, can be connected to the project and what is needed to establish this connection. The most suitable connection is between the Lijnbaanflats, which is currently a dead end, so that the entire park will participate in the larger network of the area. By giving the catering industry in the plinth of the lower buildings terraces on the park side, the park will be used more and therefore be more lively.

Breakthroughs in the Lijnbaan flats and the removal of the transformers between the Lijnbaan flats have also been investigated. However, this does not do justice to the monumental value of buildings. The routing to the parks would become more complex and traffic flows would intersect in the Lijnbaanhoven.

# Construction

The construction of the Lijnbaan consists of concrete columns and beams, and has a concrete box basement. In the research of Maruchin (2011) it is stated that approximately 10% of the existing building mass can be added on top of the existing structure. According to the calculation, this amounts to about 40,000 kg extra building mass, which comes down to about 300 kg/m<sup>2</sup>.

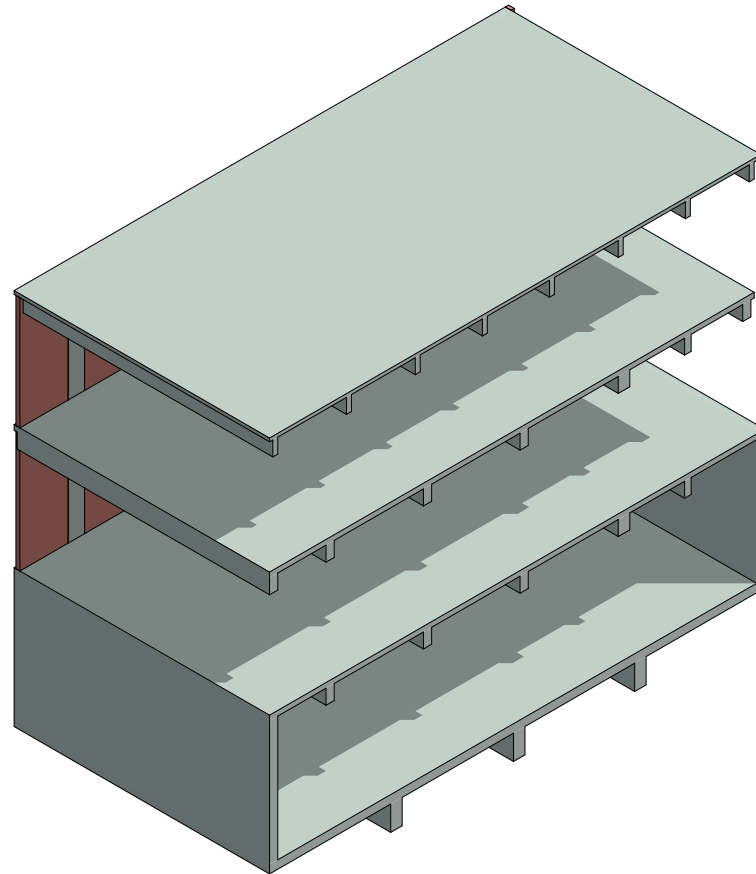
## Calculation

For the calculation of mass of the building the grid of 8,8 meters is used as reference. In the grid of 8,8 meters the biggest span between columns is used.

Concrete:	$144\text{m}^3 \times 2400\text{kg/m}^3 =$	345.600kg
Brick:	$23\text{m}^3 \times 2000\text{kg/m}^3 =$	<u>46.000kg +</u>
Total weight:		391.600kg

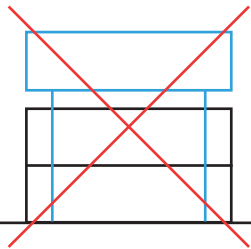
10% of 391.600  $\approx$  40.000kg

Roof area:	$15\text{m} \times 8,8\text{m} =$	132m <sup>2</sup>
Load per m	$40.000 / 132 \approx$	300kg/m <sup>2</sup>





Four construction methods are possible for a construction above the Lijnbaan; Penetrating, Optop Bridging and Hybrid. The choice of method depends on the size of the new load.



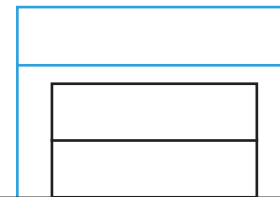
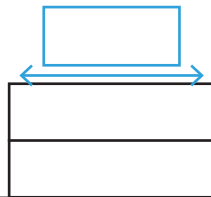
## Penetrating

In this method, new columns are placed within the existing buildings of the Lijnbaan through which roofs and floors are pierced. It is with this method that the monumental buildings are affected. This method is not a desirable option, mainly due to the damage to the monumental value of the Lijnbaan.

## Optop

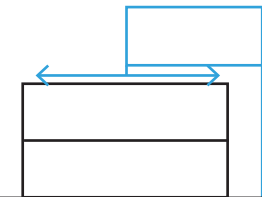
In this method, volumes are placed on top of the existing Lijnbaan construction. In order to minimize the load on the existing construction, this method is only suitable for volumes that are not a building, such as a square, sports field or greenery.

**If it eventually turns out that the existing construction has insufficient bearing capacity, the penetrating method will still have to be used. The importance of using this valuable space outweighs the monumental value of the existing structure of the Lijnbaan. Besides, the facades and the view of the promenade, which in my opinion have the highest monumental value, will be preserved.**



## Bridge

In this method, a new construction is placed next to the Lijnbaan that can support the new volume. This method is suitable for larger volumes with a relatively large building mass and consisting of several floors.

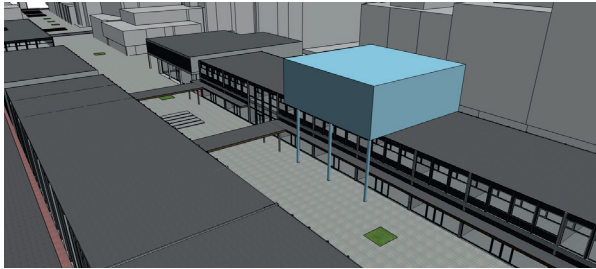


## Hybrid

This hybrid method combines the properties of the two previous methods. New columns will be placed on one side of the Lijnbaan to which half the weight of the volume will be transferred. The other half of the weight will be distributed over the existing construction of the Lijnbaan. This method is suitable for medium-sized volumes with limited building mass and consisting of one layer.

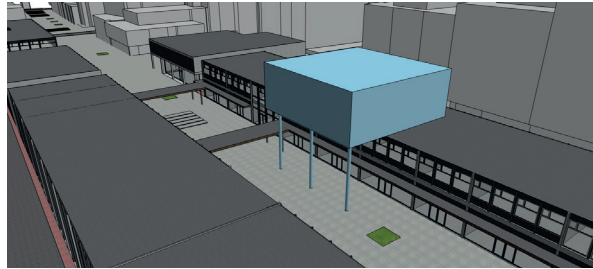
# Architecture

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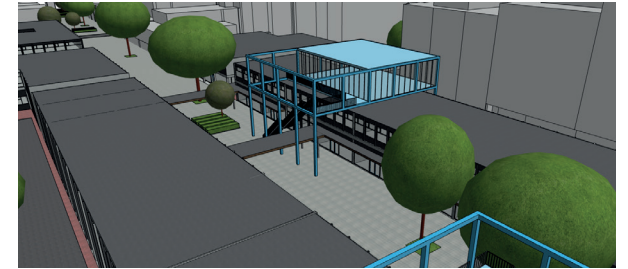
## Volume

A simple table construction in which the ratio between the thickness and the number of columns is important, fewer columns means more columns. The columns are placed in line with the existing columns under the canopies.



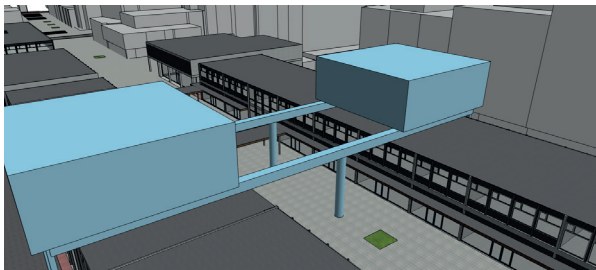
## Positioning

The table construction is placed further forward in the line of the trees on the Lijnbaan, creating more space between the Lijnbaan and the columns. Both in this variant and the previous one, the volume is very much on top of the Lijnbaan.



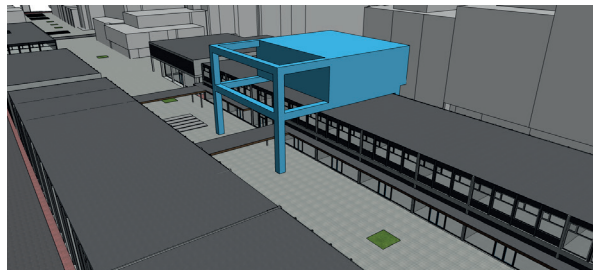
## Thinning

In this variant, the thickness of the frame is limited, so that more columns are needed. In this variant it would be quite possible that the number of columns could be reduced from five to three. The volumes are placed to the rear, so that light and air are preserved on the Lijnbaan. The placement of the columns is in line with the trees on the Lijnbaan, so that the width of the passage is not limited. The frame can also serve to facilitate advertising, greenery or stairs.



## Double table

The volume has been moved to the back and the number of columns has been reduced. However, the thickness of the columns has increased as a result and is no longer in proportion to the Lijnbaan. In addition, this variant loses flexibility because volumes have to be placed opposite each other.



## Framing

The volume is also placed back in this variant. The construction is collected by means of a frame that retains light and air on the Lijnbaan. However, the thickness of the construction is not yet in proportion to the Lijnbaan.



### Frame

A simple and flexible frame in the proportions of the Lijnbaan within which various volumes can be placed. The frame serves as a construction within which volumes of any shape can arise. The frame can also be used to hang various ornaments such as greenery and advertising.



### Shape

A minimalistic semi-transparent volume that does not relate to the Lijnbaan in detail. The closed volume reduces flexibility in the design and impairs throughput at the elevated level.



### Line

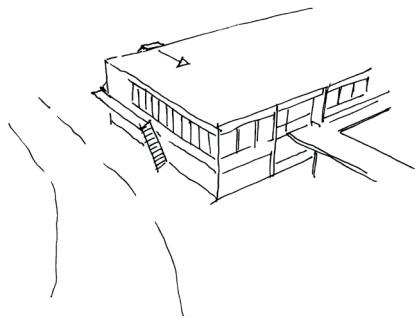
Derived from the design of the Dreamhouse, this volume is designed with horizontal and vertical lines. This design has the same drawbacks as the Shape variant and is related in detail to the Lijnbaan.

**In all variants, the new volume puts a lot of pressure on the Lijnbaan. The connection with the existing Lijnbaan will have to be further designed. One possibility is to make holes in the volume so that the volume detaches from the Lijnbaan and light and air return, or to replace the volumes completely. The frame is preferred for its flexibility.**

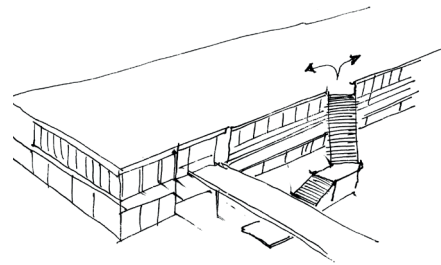


# Stairs

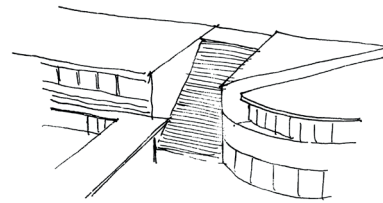
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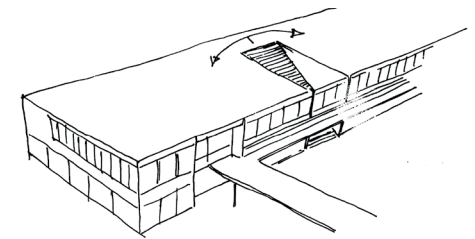
Mounted



Center



Between

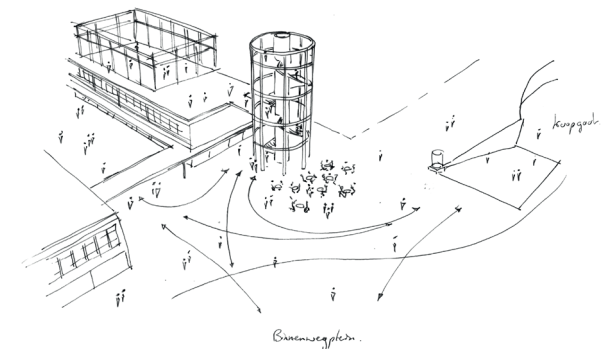
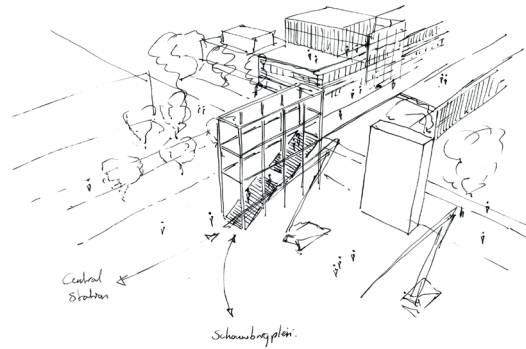
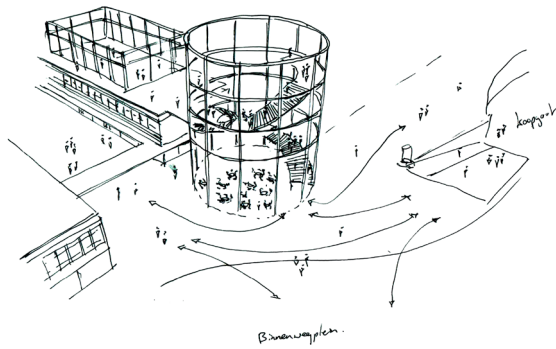


Through

Various ways of connecting the Lijnbaan roofs to the ground level were investigated for the project. The connections were assessed for accessibility, capacity and freedom in design. The four means of transport; stairs, elevators, escalators and ramps have been tested against these criteria. After considering these criteria, a combination of elevators and stairs is the best solution to connect the layers. Stairs have a high degree of freedom in design, are compact and have a high capacity. The elevators provide access to less mobile people.

Several locations have been considered for the location of the connections, mounted on the side, in the center of the Lijnbaan, between buildings or through the buildings. In an earlier design, the connection in the middle of the Lijnbaan seemed to be the best solution, because of its patent location and distance to the monumental facades of the Lijnbaan.

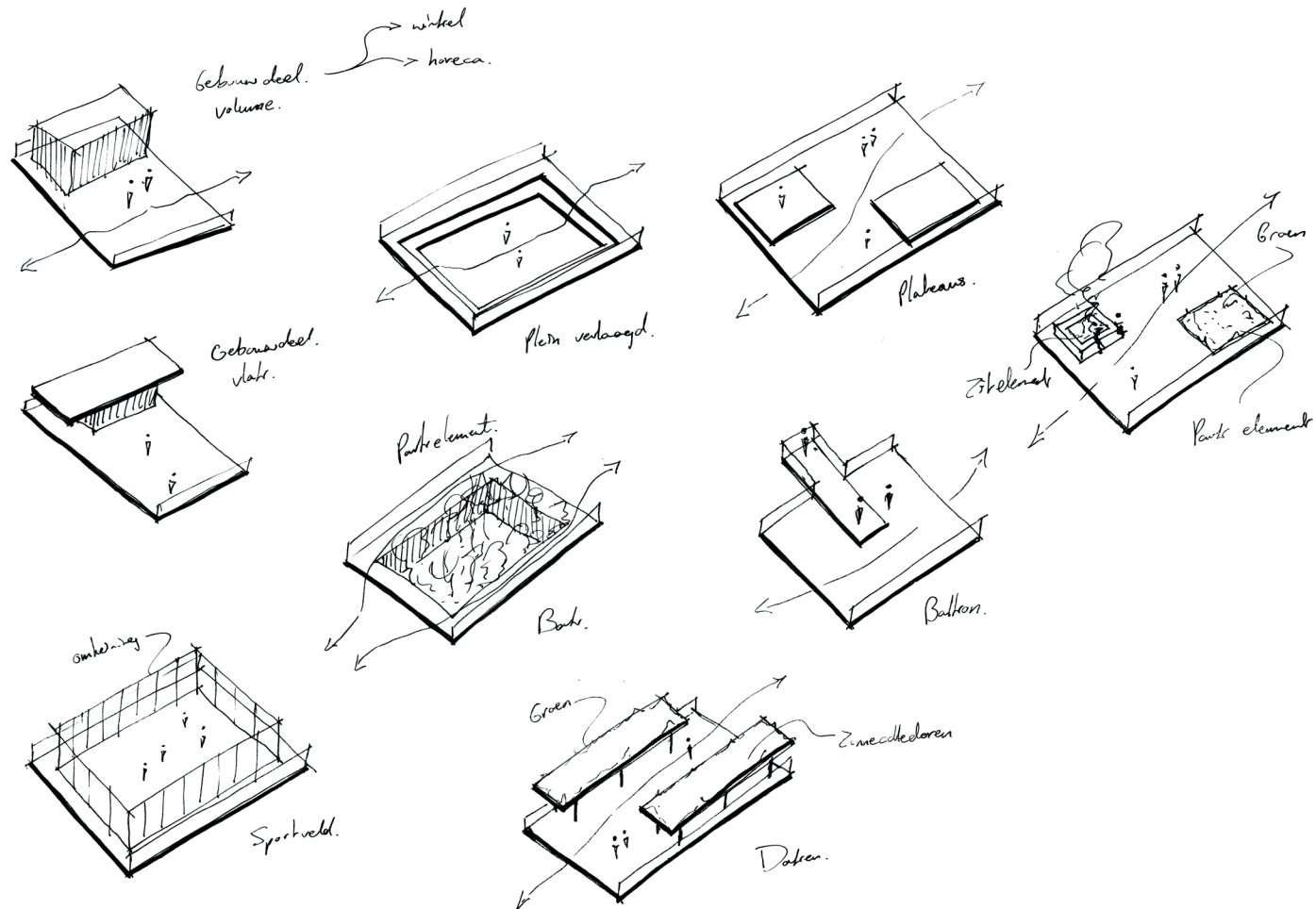
In the current design, a distinction is made between main connections and subordinate connections, and other locations have been found for the connections. The main connections are located on both sides of the Lijnbaan on squares. The subordinate connections are placed in the expedition streets.



The project has two main connections, on the Schouwburgplein and on the Koopgoot. Different variants have been designed for both connections. It was tested whether the stairs could be combined with pavilions or with a viewing platform. Although the combination with pavilions and viewing platform had some good qualities, it was decided to simplify the design and reduce it to the essence, a staircase with elevator on a square. The shape of the stairs has been kept simple, a straight stairway, so that the connection to ground level is as strong as possible.

The first designs for the stairs are made from the same frame as the rest of the design. For the towers it was tested to see whether round shapes were possible. In the final design, the staircase is suspended from one simple frame, so that the staircase is open to the square and at the same time the square is emphasized by the frame.

# Elements







Bench



Exhibition



Picnic



Water



Workspace



Meeting

The project will be equipped with several park elements that will be repeated throughout the park. The park elements mainly consist of elements aimed at accommodation, such as seating and picnic elements

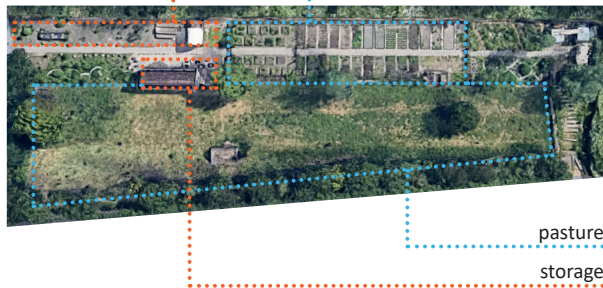
For an earlier design, park elements were designed that matched the style of the overall design. The same park elements are used in the current design and adapted to an orthogonal layout.

# Functions



meeting place

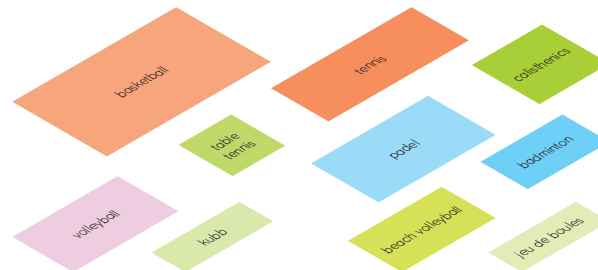
kitchen garden



pasture

storage

For the functions in the park, various examples were examined within the topics of sports, greenery, social and economic. By making connections between these topics, functions are created that could possibly be given a place in the park.



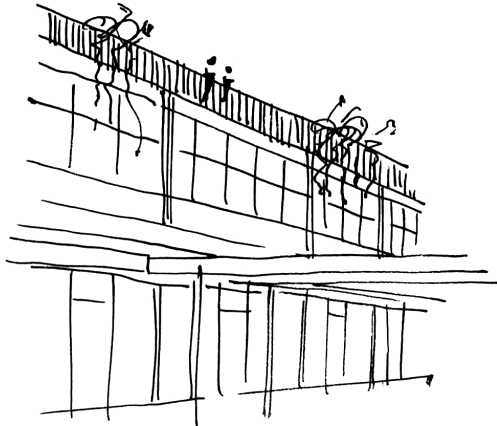
The main function of the park is to stay and walk between greenery. The majority of the park will therefore be dedicated to this function. Other functions can be placed within the park.



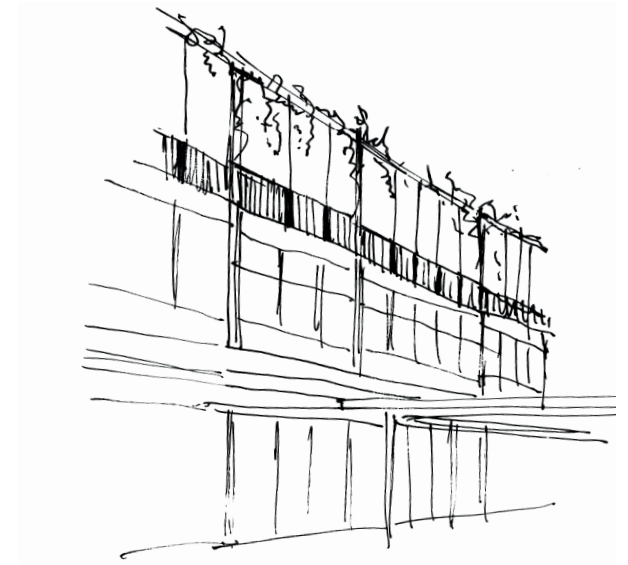
The functions that have been studied are; gardening, sports, playgrounds, catering, urban scouting and camping. All these functions, except for urban scouting and camping, have been given a place in the project to a greater or lesser extent.



Awning



Even



Frame

Multiple options have been considered for the balustrade of the park. In the first option, the balustrade is designed as a second awning and thus crosses the roof edge of the Lijnbaan. The second option is the simplest solution where the balustrade is even with the facade of the Lijnbaan. The third option consists of a frame that is placed around the roofs. Planters can be hung on the frame to make more green.

The choice for the balustrade falls on the second option. Due to the simple design, the existing Lijnbaan is not overshadowed. Between the balustrade and the roof edge of the Lijnbaan is some space and a recessed part, creating a shadow edge and separation between new and old.



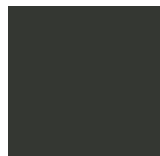
# Colors

Three basic colors have been tested for the color of the frame and the frames; white, gray and green. The white frame has been used extensively during the design process. Although white emphasizes the frame well, the color contrasts too much with the color scheme of the Lijnbaan. A dark color scheme gives a luxurious look, but is still very much in contrast with the greenery. A gray-green color gives both the right appearance and forms a unity with the greenery.

The color that best matches the frame is Olive Green (RAL 6003). The windows are subordinate to the frame and therefore have a darker color, Black Olive (RAL 6015). The park elements such as the green boxes are executed in the same dark color.



**Olive green** RAL 6003  
Frame of pavilions  
& main construction  
elements



**Black olive** RAL 6015  
Window frames, park  
elements & pergolas



RAL 7043 (too gray)



RAL 6003



RAL 6011 (too green)

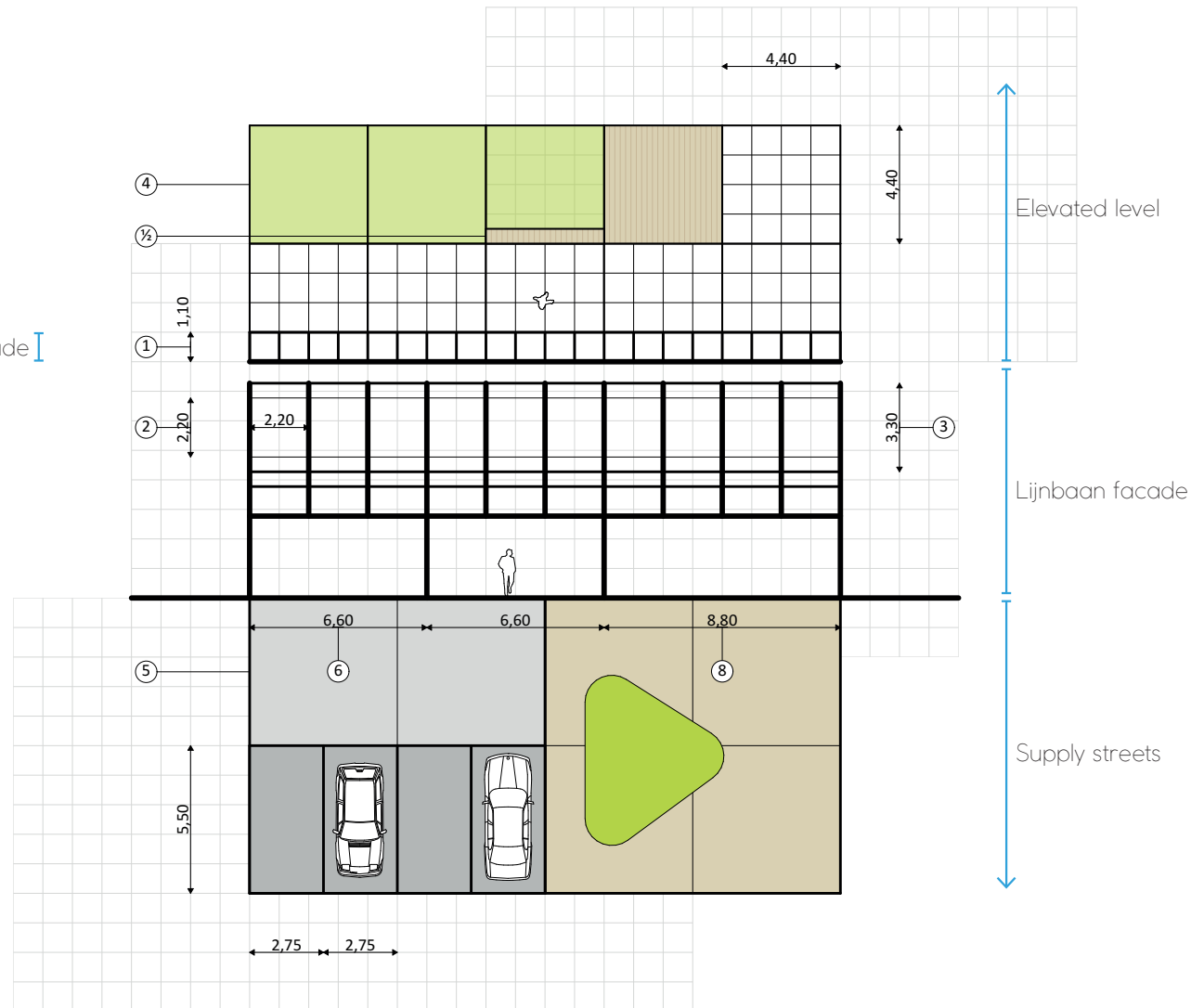


# Grid

A system has been drawn for the new architecture within which the pavilions, park elements and area layout can be designed. This system promotes cohesion within the plan and connection with the existing Lijnbaan.

The grid of the system is derived from the existing grid of the Lijnbaan of 1.1m. The main dimensions in new buildings are 4.4 m, half of the most common grid size within the Lijnbaan of 8.8 m and appropriate to the height of the existing buildings. The pavilions are therefore constructed from blocks of 4.4m x 4.4m x 4.4m. In the supply streets, the grid is geared to the car and therefore has a standard size of 5.5 m.

Balustrade I



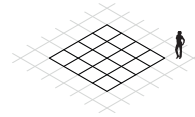
# Architecture System

A system has been drawn for the new architecture within which the pavilions, park elements and area layout can be designed. This system promotes cohesion within the plan and connection with the existing Lijnbaan.

The grid of the system is derived from the existing grid of the Lijnbaan of 1.1m. The main dimensions in new buildings are 4.4 m, half of the most common grid size within the Lijnbaan of 8.8 m and appropriate to the height of the existing buildings. The pavilions are therefore constructed from blocks of 4.4m x 4.4m x 4.4m. In the supply streets, the grid is geared to the car and therefore has a standard size of 5.5 m.

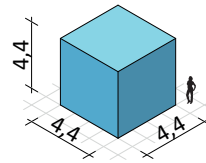
The system distinguishes two pavilions, the large and the small pavilion. The grid of the large pavilion consists of a maximum of 30 blocks and has maximum dimensions of 26.4m wide, 17.6m deep and 8.8m high. The large pavilion should be placed parallel to the shopping promenade.

The grid of the small pavilion consists of a maximum of 6 blocks and has maximum dimensions of 13.2m wide, 8.8m deep and 4.4m high. The small pavilion can be placed both transversely and parallel to the shopping promenade.



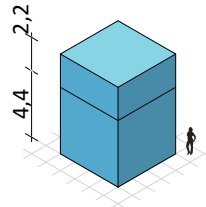
## Base grid

Grid of 1,1m x 1,1m  
Align with the Lijnbaan



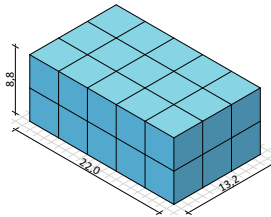
## Main Dimensions

4,4m x 4,4m 4,4m  
Align with the Lijnbaan



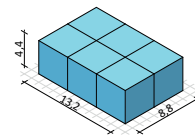
## Diversification in height

2,2m



## Maximum dimensions, big pavilion

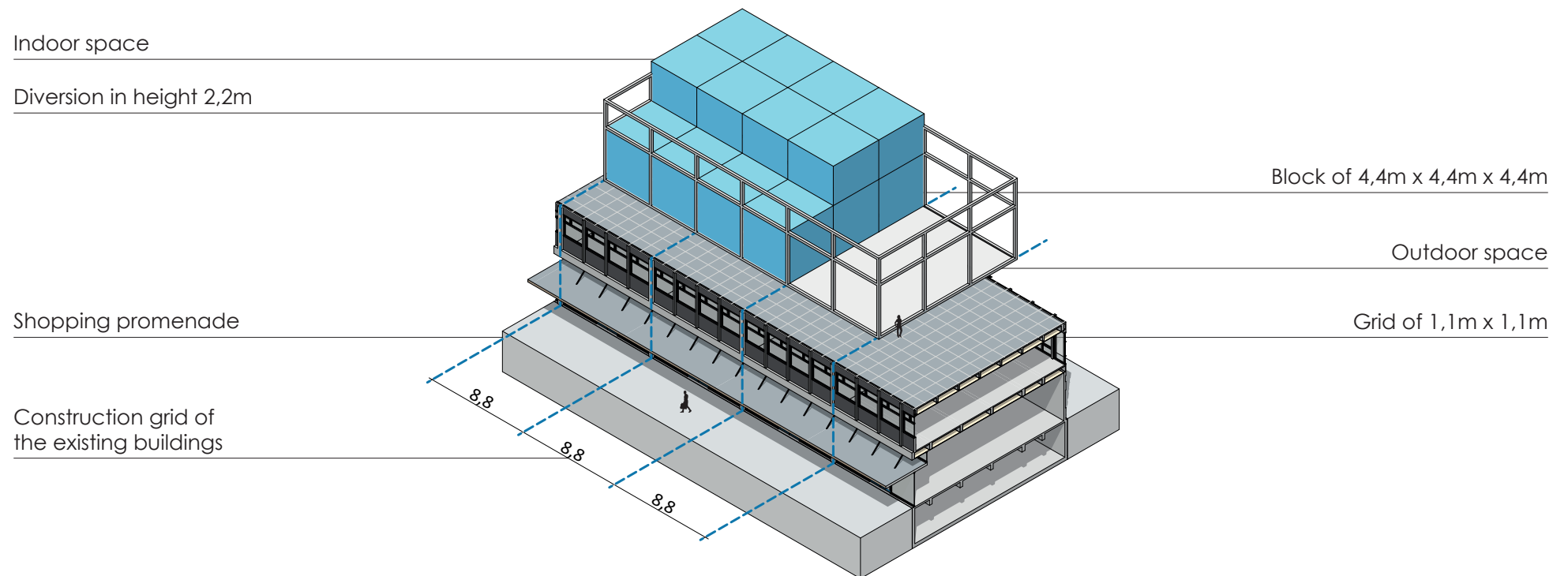
30 blocks, with a maximum of  
26,4m x 17,6m x 8,8m



## Maximum dimensions, small pavilion

6 blocks, with a maximum of  
13,2m x 8,8m x 4,4m

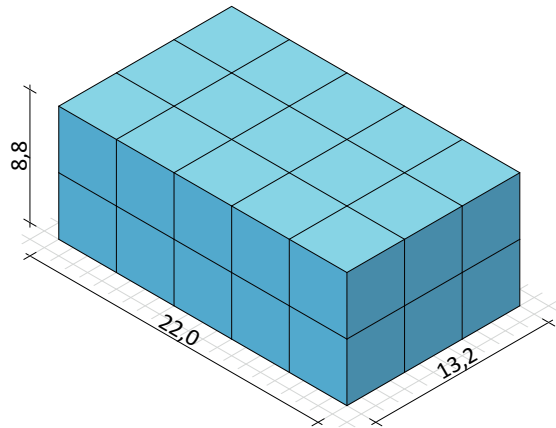




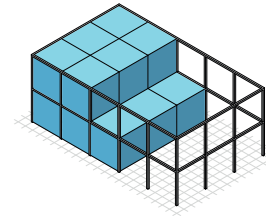
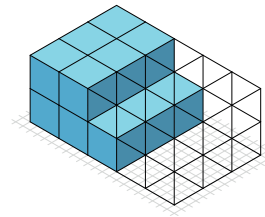
# Architecture System

## Big Pavilion

- The total volume can be a maximum of 30 block
- The maximum dimensions are 26,4m x 13,2m x 8,8m
- Maximum of  $\frac{2}{3}$  of the area can be used as indoor space
- Maximum of  $\frac{1}{2}$  of the first floor can be used as indoor space
- The indoor space on the first floor can only be build above the indoor space of the ground floor
- The outdoor space must be connected to the promenade side

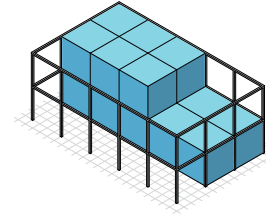
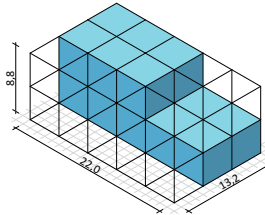


## Variations in design with examples



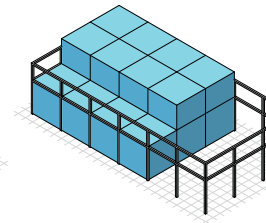
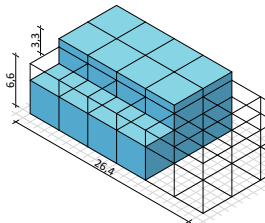
### Side terrace

- 30 blocks
- 22,0m x 13,2m x 8,8m
- double grid height



### Front terrace

- 30 blocks
- 22,0m x 13,2m x 8,8m
- double grid height



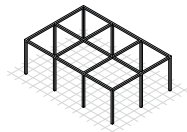
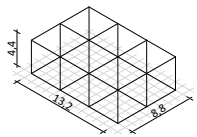
### Bigger floorplan

- 29 blocks
- 26,4m x 13,2m x 7,7m
- $1\frac{1}{2}$  grid height
- $\frac{3}{4}$  upper layer

## Small Pavilion

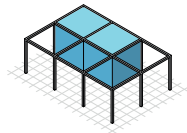
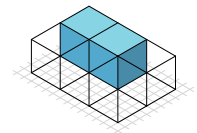
- The total volume can be a maximum of 6 blocks
- The maximum dimensions are 13,2m x 8,8m x 4,4m
- Maximum of  $\frac{2}{3}$  of the area can be used as indoor space
- The outdoor space must be located directly on the promenade side

## Variations in design with examples



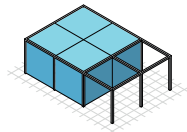
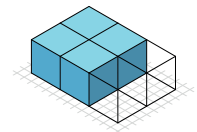
### Pergola

- garden room
- shadow space



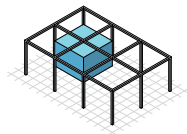
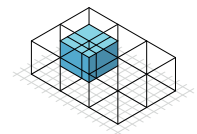
### Cabin

- public toilets
- outdoor bar
- storage



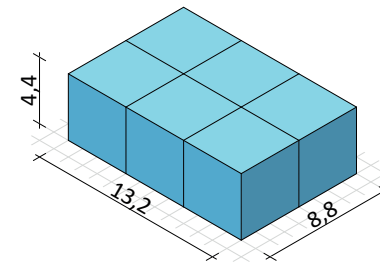
### Block

- café
- shop
- community center



### Kiosk

- kiosk
- stand





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# Consulted Experts

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Project leader structural designer at  
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Esther Kruit  
Partner at KruitKok Landschapsar-  
chitecten in Eindhoven



Ronnie Theeuwes  
Consultant installation technology  
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Marit Haaksma  
Writer graduation research  
Roofstructure Rotterdam at TU Delft



Dominique van Elsacker  
Director at the Urban Department  
Store Rotterdam



Jolien Hermans  
Urban designer at CB5  
in Oosterhout