

A PLAYGROUND OF URBAN TYPOLOGIES AND SOCIAL EXPERIMENTS

MIGRATION OF THE GARDEN CITY MOVEMENT

Hannah J. Baghuis - 4599977

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MSc Architecture, Technical University Delft
January 2021
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ABSTRACT

The design principles of the original garden city can be used to create a sustainable approach regarding the design of (sub-)urban areas. Its strong green character and social communities can contribute to the existing urban typology, while maintaining the efficiency and density of the contemporary city. In this article, the current situation of what is left of garden city model used in Vreewijk and Bloemhof, in Rotterdam, is evaluated and the future development of the site is predicted

“How can the experimental urban model of the Southern Garden Suburbs of Rotterdam be transformed in order to adapt and contribute to the expanding high rise city center?”

Through an analytical research of the Garden City concept and the case study, a SWOT-analysis is made. The outcome of this research is a new narrative for the Garden Suburbs of today and a design proposal for the case study.

KEYWORDS

Garden City - urban model - Southern Garden Suburbs - migration - Rotterdam South - urban typology.

INTRODUCTION

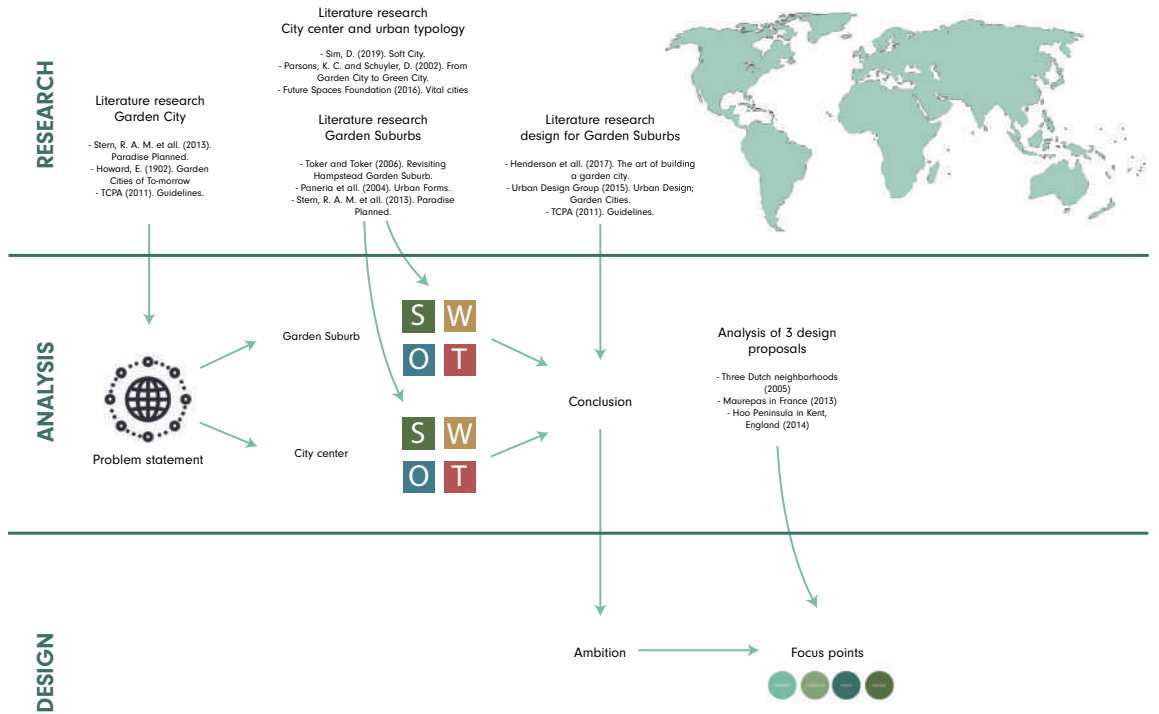
The Garden City concept, created by Ebenezer Howard, started in the United Kingdom and migrated all over the world (Urban Design Group, 2015). The migration of ideas is the exchange of thoughts through international connections in order to inspire followed by the act of transporting, reshaping and integrating those thoughts into new ideas.

Now, the old and outdated Garden Suburbs from the beginning of the 20th century are slowly becoming part of the expanding city center and create a contrast with the current and future needs (Coste and Vernet, 2017; Smith and Lucy, 2017; The Garden Cities Institute, 2018). However, the tide is changing and an exciting time for urban studies is coming up (Urban Design Group, 2015; Smith and Lucy, 2017). In 2014, the Wolfson Economics Prize project has shown the possible revival of the Garden City model and the opportunities its gives to build a new type of high-quality communities (Shelter, 2014; TCPA, 2013). The design principles of the original garden city can be used to create an experimental approach regarding the design of (sub-)urban areas. Within this approach, three neighborhoods of the case study have been analyzed: Vreewijk, a true garden village, and Bloemhof, which has a garden character and the expanding central district Zuidplein.

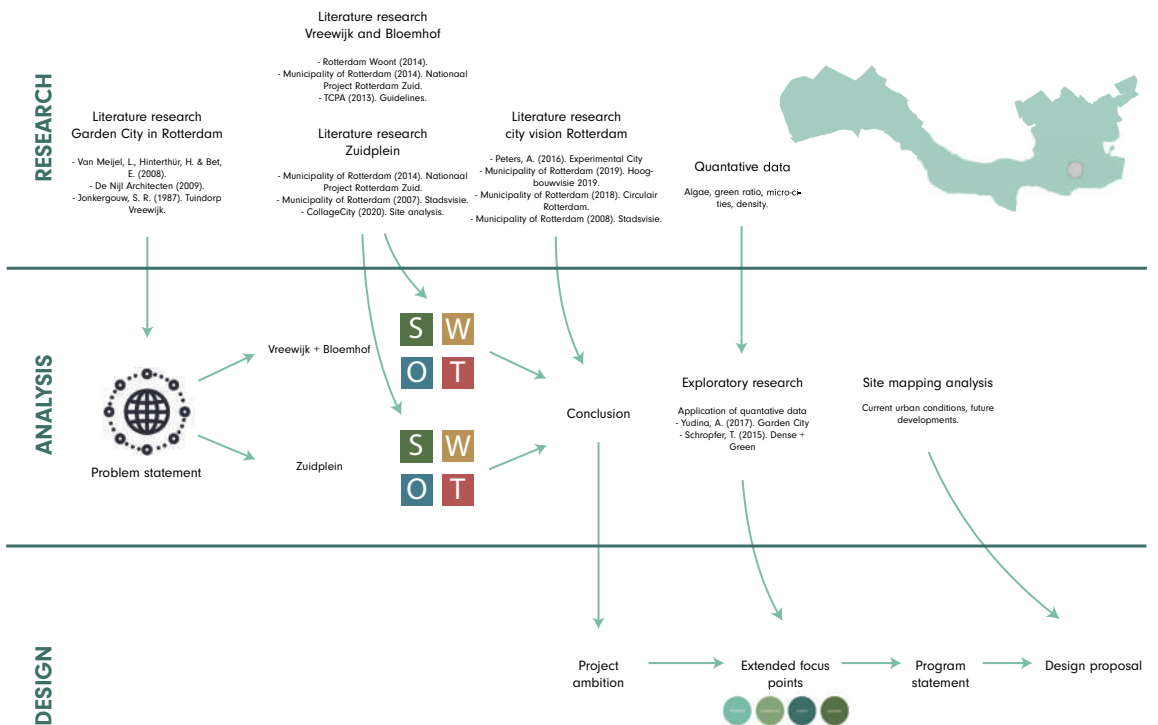
“How can the urban model of the Southern Garden Suburbs of Rotterdam be transformed in order to adapt and contribute to the expanding high rise city center?”.

This question will be answered through an analytical research of the Garden City model, and its influence over the world. Based on relevant literature, two SWOT-analysis of the current situations are made, one for the Garden Suburbs and one for the city centers. These analysis will form the base for a new urban typology with an additional diagram of focus points. After, the current situation of the case study Rotterdam Zuid is analyzed. The results of this analysis will expand the general SWOT-analysis into a site specific SWOT. In addition, the diagram of focus points will be extended and specified. The result will be a new green typology for urban districts, that will transform cities into green social places without losing the benefits of the contemporary city.

¹The Garden City is a decentralized urban model designed by Ebenezer Howard in 1889.



METHOD SCHEME GLOBAL SCALE



METHOD SCHEME PROJECT SCALE

THE GARDEN CITY MOVEMENT

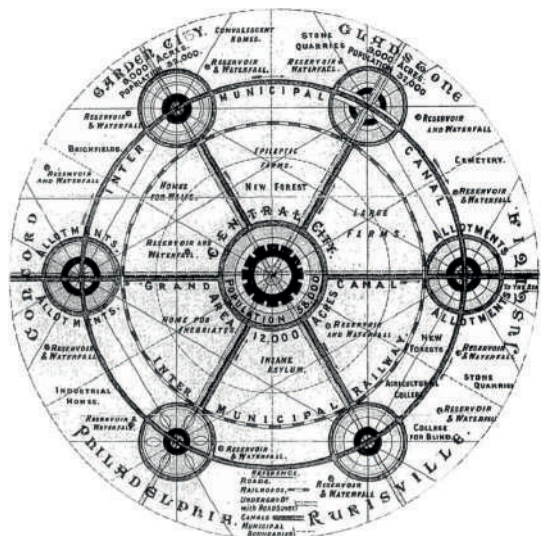
The concept of the Garden City was founded in 1889 by the British journalist Ebenezer Howard (Jonkergouw, 1987). Due to the industrialization at the end of the 18th century, the economy grew tremendously. As a result, cities became work-factories and the workers moved from the rural areas to the city, which we call the urbanization. This migration into the city caused the cities to be a chaotic place with awful living conditions (Van Meijel et al, 2008; Urban Design Group, 2015). An example is the city London, that had an immense population number of more than six million at the end of the 19th century (Jonkergouw, 1987; Urban Design Group, 2015).

"Crazy wooden galleries ... with holes from which to look upon the slime beneath; windows, broken and patched ... rooms so small, so filthy, so confined ... dirt-besmeared walls and decaying foundations" - Charles Dickens (1838; Oliver Twist).

As a journalist, Howard saw the horrible circumstances in which the lower class lived at the end of the 19th century. Not only in the United Kingdom, but also in the United States (Urban Design Group, 2015). As a reaction, Howard invented a new social experiment and urban model: the Garden City. The conceptual model was strongly influenced by the Arts and Crafts movement and resulted into a decentralized city model with an inner center and surrounding rural communities (Jonkergouw, 1987; Henderson et al., 2017). The Garden City was a combination of town and country and provided a healthy green environment for all inhabitants. Howard used greenery as a multi-tool within his design, that resulted in a social and engaged community. These communities were meant to house the lower class workers of the city. On the outside, a belt of agricultural land was designed to provide food for the population (Henderson et al., 2017). Together with the integrated transport system, the Garden City was designed to be a self-sufficient and independent city. In order to realize his idea, he created the Garden City Pioneer Company together with the architects Barry Parker and Raymond Unwin (Urban Design Group, 2015; Henderson et al., 2017). The two architects designed the first Garden City called Letchworth (Stern, 2013). The socially inclusive city was designed with high quality social housing for 32.000 people (Henderson et al., 2017). Letchworth became such a success that the houses raised in price and weren't affordable anymore for the lower class. Eventually, its success became its own downfall.



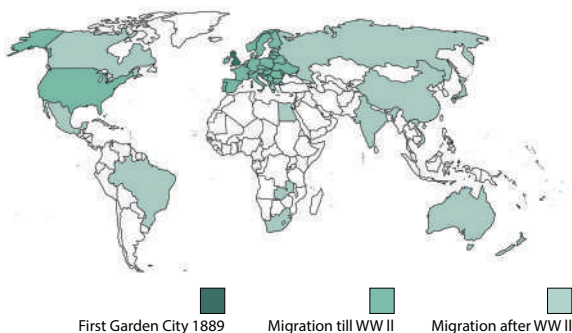
Judith Flanders (2014, May 15). 'Slums' in British Library. (Flanders, 2014)



Ebenezer Howard (1902). 'Garden-City' in Garden Cities of To-morrow. (Howard, 1902)

MIGRATION OF THE GARDEN CITY

According to Howard's reports, he had seen similar living conditions in the United States as in the United Kingdom (Urban Design Group, 2015). As a matter of fact, these conditions due to the urbanization were visible in cities all over the world. Till the year of 1940, the 'self-sufficient' Garden City migrated into Europe and North America, and shortly after the World War II, the concept spread all over the world to countries, such as Brazil, Australia, Russia, and Japan (see world map image) (Stern et al., 2013). The concept reshaped and transformed as it travelled through the world to adjusted to the local conditions. While the Garden City migrated, a new interpretation 'the garden suburb' arose and found its destiny all over the world. In the 50's, the Garden City concept evolved into the so called New Towns (Henderson et al., 2017). Later in the '80's, the focus shifting toward regenerating the central urban areas (Henderson et al., 2017). This was followed by the new idea of 'Eco-Towns' and 'Eco-Cities' in the '00's: a variation on the New Towns with a focus on sustainability.



Migration of the Garden City world map, based on Stern (2013). (own image)

MIGRATION OF THE GARDEN CITY INTO THE 21ST CENTURY

After more than 100 years, the Garden Suburbs have changed significantly. Their original purpose has been lost and their current state is outdated. Along with the Garden Suburbs, the city centers have changed as well into dense economic and cultural HUBs. They are facing new problems, relating climate change and growing population. The Wolfson Economics Prize project (Shelter, 2014) and Future Spaces Foundation (2016) are searching for potentials of the Garden Suburbs of today and conclude that the design principles are still there and could play an important role in new urban designs. To investigate this, a SWOT-analysis is made of the Garden Suburbs and the city centers as they are today. The aim of this analysis is to see if and how the principles of the Garden Cities can adapt and contribute to the demands of the current and future city centers.

THE CITY CENTERS OF TODAY

Air pollution, soil degradation, urban heat island effect, biodiversity decrease and many more climate related problems are caused by the current situation in the cities, so is stated in the book 'From Garden City to Green City' (Parsons and Schuyler, 2002). These climate problems create again new issues such as respiratory diseases due to air pollution (Henderson et al., 2017). Moreover, obesity, loneliness and depression is caused by a lack of green and open public space (Sim, 2019). The social interactions and overall quality of life within city centers is at risk. Furthermore, there is a chronic undersupply of houses (Henderson et al., 2017). The world's population is growing fast and more than 80% in Europe and the US lives in cities (Glatron and L. Granchamp (eds.)). This creates an opportunity for cities to expand and find new ways to densify (Urban Design Group, 2015; TCPA, 2013). Having all functions mixed in one place, city centers are very efficient (Sim, 2019). They provide fast transitions and connections at a large scale.



SWOT-analysis city centers, based on literature and reference projects. (own image)

GARDEN SUBURBS OF TODAY

Over time, city centers grew and the Garden Suburbs have become monotonous isolated islands inside the city (Urban Design Group, 2015). They are lacking connection with surrounding areas and depend on provisions outside the suburb.

Moreover, the Garden Suburbs have relatively low housing quality, which do not meet the current needs (Shelter, 2014). The suburbs are accused of being unsustainable, not dense enough and anti-urban (Henderson et al., 2017).

However, their strong green character has an effect on both environmental and societal aspects. Dutch scientists have researched the value of 'societal greenery' and the effect on health, well-being and safety (Future Spaces Foundation, 2016). Moreover, trees, planting and urban agriculture reduces the urban heat island effect, flooding and air pollution, and increases biodiversity and facilitates local food production (TCPA, 2011). The characteristic green and open spaces create opportunities for green urban living and a socially engaged community (Henderson et al., 2017).



SWOT-analysis Garden Suburbs, based on literature and reference projects. (own image)

A NEW NARRATIVE FOR THE CENTRAL URBAN TYPOLOGY

It is clear that the demands of urban design has changed tremendously and cities are in need for an evolution (Yudina, 2017). URBED's design for the transformation of the Garden Suburbs in Oxford showed that we don't need to create alternatives for the city (Shelter, 2014).

We need to reform the existing urban typology and allow cities to expand. Therefore, a strong vision for cities of the 21st century is needed that leads the way to a future proof city. While restoring unsustainable systems in inner cities, a number of urban problems can be solved regarding social and climate issues without losing the benefits of the contemporary city (Urban Design Group, 2015; Parsons and Schuyler, 2002; Yudina, 2017; Schropfer, 2015; TCPA, 2013). This is where the Garden City concept comes in and takes its responsibility. The imaginative garden design has a great potential and can play a crucial role in the development of modern cities to meet the current and future requirements (Henderson et al., 2017, The Garden Cities Institute, 2018; Urban Design Group, 2015).

"... integrate everything we do and make in our built environment with the natural environment."

- Ken Yeang (Yudina, 2017).

THE GREEN SOCIAL CITY

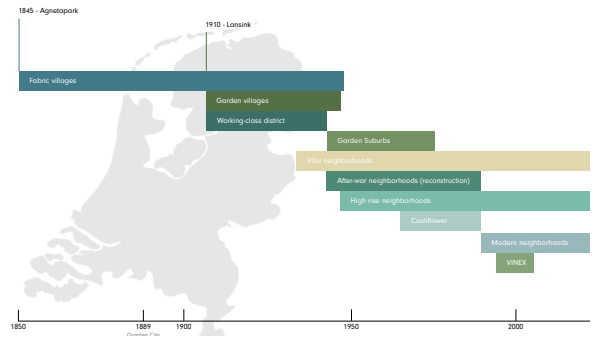
In the book 'From Garden City to Green City', Parsons and Schuyler (2002) envision a recreation of Howard's original concept adjusted to the current city situations. The base of this concept consists of qualitative design and healthy living conditions. Providing high qualitative public spaces is an essential tool in creating an engaged community. Implementing green infrastructures inside the cities is vital for a strong social infrastructure (Glatron and Granchamp, n.d.) and when doing so, a new urban typology can be created. In that way, we can turn our concrete exclusive cities into green inclusive cities, while maintaining its efficient and dense character. In order to make this happen, we need to find new ways of integrating green and providing public space inside the dense city blocks.

FOCUS POINTS

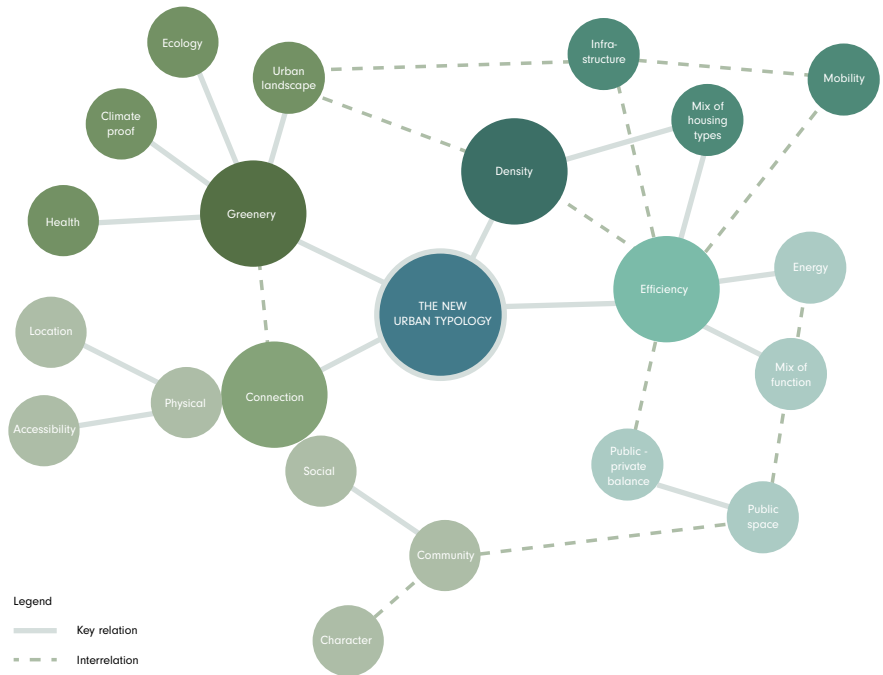
To implement the new narrative in case studies, we need strategical focus points. Based on the SWOT-analysis and three designs for reference projects, four focus points are established. The new cities will focus on strengthening the social structure through livable densification with greenery integrated in architectural designs, while maintaining their efficiency. Since the principles are all interwoven with each other, a diagram with key- and interrelations between the principles is made (see image). A more in dept description of the key design principles can be found in the appendix.

MIGRATION OF THE GARDEN CITY TO THE NETHERLANDS

Already existing since 1774 in several parts of the world, was the Industrial Garden Village (Stern, 2013). These were little villages built next to factories to house the workers of the factory. In the Netherlands, these Industrial Garden Villages were the first types of suburbs with a garden character. At the beginning of the 20th century, the living conditions for the workers became very bad due to the urbanization and the emancipation of the worker started. During this period, the first real Garden Villages arose (Jonkergouw, 1987). It's hard to tell which Garden Village was the first one, although it seems that the first Garden Village was Lansink, built in 1910 (Jonkergouw, 1987).



Urban model types of The Netherlands through time, based on Klimaateffectatlas (n.d.). (own image)



General focus points (own image).

² Three designs for three Dutch neighborhoods within the cities Hengelo, Delft and Nijmegen from the book 'De tuinstad is dood, Leve de tuinstad!' (Ploeg et al., 2005). Three proposals for the area Maurepas, France by Pauline Szwed, Nicolas Ziesel and Adelaida Uribe Lemarie (IAU idF, 2013). The winning design for the Hoo Peninsula in Kent from the document 'The Wolfson Economics Prize MMXIV: Stoke Harbour Garden City on the Hoo Peninsula in Kent' (Shelter, 2014).

CASE STUDY ROTTERDAM

In Rotterdam, the urbanization started after 1870 (Van Meijel et al, 2008). A lot of jobs, especially in the harbor, became available. The city grew and expanded its self with a lot of small, densely built houses (Van Meijel et al, 2008). In the beginning of the 20th century, the city started extending towards the South since the North was already fully built. At the same time, the living conditions inside the city worsened and there was a great need for healthy residential areas.

VREEWIJK

In 1913, Rotterdam commissioned the architects Kok, Granpré Molière and Verhagen to design a true Garden Suburb, Vreewijk (image 5: number 1) (Rotterdam Woont, 2014). De Nijl architecten reconstructed the urban plan of Vreewijk as it was in all probability in 1919 (see image). Greenery and trees formed the base of the street plan and two main roads are widened with a water stream (Bleeker and Nauta, 2014). The street plan is hierarchic and follows the characteristics of the former polder landscape (Van Meijel et al, 2008). On the West, a park strip leads towards the Zuiderpark and on the South, the neighborhood is closed off with another park strip. In the whole area, community yards are implemented, that encourage the village character (Bleeker and Nauta, 2014). The public and communal spaces created a sense of community and in a way increased the quality of life. It was only until 2007 that the area was declared to have a monumental character, which means that the character can never be changed (De Nijl Architecten, 2009). This makes it especially hard to renovate the site.



Reconstruction of the historical situation of Vreewijk (Bleeker and Nauta (2014)).

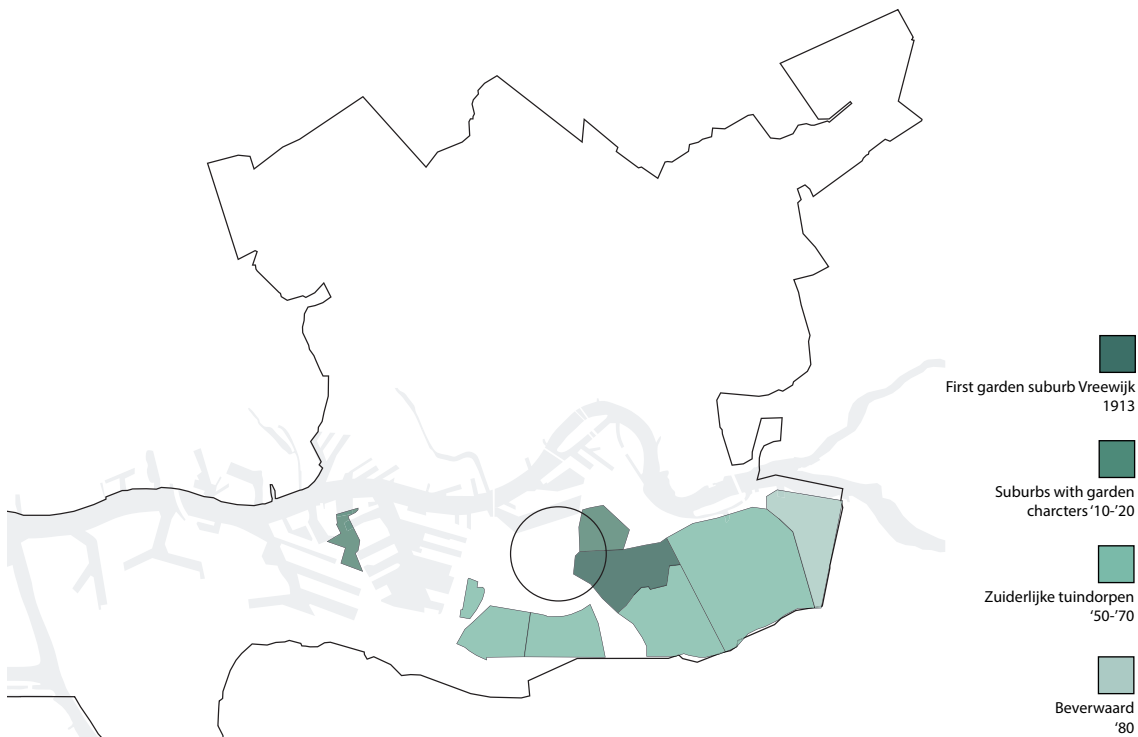
BLOEMHOF

Short after, two other suburbs with a garden character were built: Heijplaat 1914-1918, a neighborhood inbetween the harbors, and Bloemhof 1918 (Wijkprofiel Rotterdam, 2016). Due to the lack of material and the great need for houses after the World War I, the municipality of Rotterdam allowed some urban experiments to be built (Van Meijel et al, 2008). One experiment that influenced Bloemhof was the concrete project, which resulted in the Kossel I and II (number 3 and 4). These two areas make a great contrast in colour with their surroundings (Van Meijel et al, 2008). The model of the Stulemeijer I (number 5) combines the garden village layout with an urban typology and density (Van Meijel et al., 2008). The Gemeentelijk Tuindorp (number 2) has the garden city concept implemented in their experimental urban plan. As a whole, Vreewijk and Bloemhof can be seen as a playground of overlapping urban experiments.

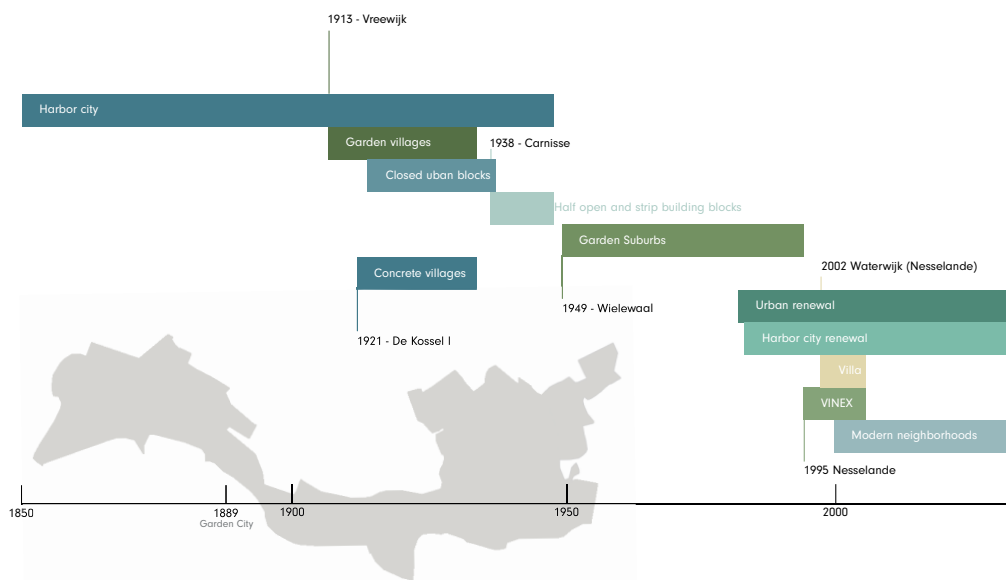


The garden characters of the case study, based on (Van Meijel et al., 2008). (own image)

After the World War 2, an enormous amount of new houses were needed, especially in Rotterdam. This is when the Southern Garden Cities were built: Wielewaal 1949, Pendrecht 1953, Zuidwijk 1950-1959, Lombardijen 1960-1967, Groot-IJsselmonde 1960-1970, and later Beverwaard 1978-1990 (Wijkprofiel Rotterdam, 2016). In the North of Rotterdam, a similar type of residential neighborhoods were built, but these do not belong to the official garden city type according to the municipality (Wijkprofiel Rotterdam, 2016). Later in the '80's, the city started with renewing the existing neighborhoods and expanding with modern residential areas. In 1995, so called Vinex-neighborhoods, such as Nesseland, were built according to a national policy (Van Meijel et al, 2008).



The Southern Garden Suburbs of Rotterdam, based on (Wijkprofiel Rotterdam, 2016). (own image)



Urban model types of Rotterdam through time, based on (Van Meijel et al., 2008). (own image)

CASE STUDY ANALYSIS

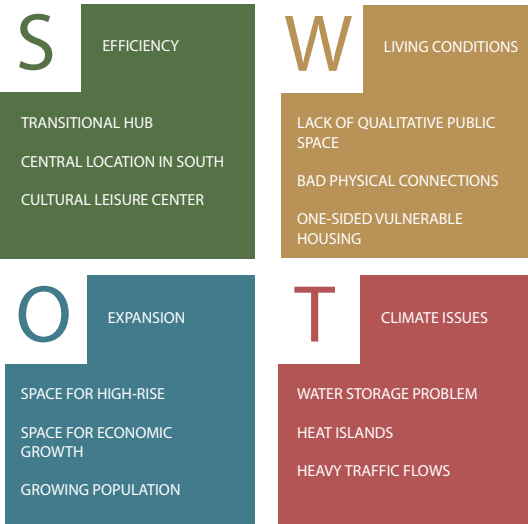
According to the analysis of the research group (CollageCity, 2020), the South of Rotterdam has an immense potential for the future of the city as a central district, but is also facing a number of challenges. The current potentials and challenges of the site are asking for a strong future vision. The municipality of Rotterdam has created its own vision for the site, in which they envision Zuidplein to become a center of skyscrapers and assigned a specific high-rise zone (image). As a result, the Garden Suburbs, Vreewijk and parts of Bloemhof, will be located right next to the urban high-rises of Zuidplein. To investigate the value of the Garden Suburb's design principles, a site-specific SWOT-analysis is made of the Garden Suburbs Vreewijk and Bloemhof and of Zuidplein as future high rise center.

SWOT-ANALYSIS

Based on the previously discussed general SWOT-analysis, the two are expanded into site specific SWOT's for the case study.

The first SWOT-analysis is made of the area Zuidplein, taking into consideration that this area will become a high-rise central district. The analysis is based on: CollageCity (2020), Municipality of Rotterdam (2008), Municipality of Rotterdam (2014), Municipality of Rotterdam (2019), Municipality of Rotterdam (2007) and Urban Design Group (2015). From the analysis, it becomes clear that the main problem is the urban landscape that is silting up. The dense and concrete district is lacking in providing qualitative and sustainable spaces. As a result, a weak and vulnerable social structure is created. On the other hand, Zuidplein has a great accessibility and central location. It is connected through several modes of transport and works highly efficient due to the great variety of functions.

The second SWOT-analysis is made of the Garden Suburbs within Vreewijk and Bloemhof. This SWOT-analysis is based on: CollageCity (2020), COM wonen and Sub-municipality of Feijenoord (2008), TCPA (2011), TCPA (2013), Municipality of Rotterdam (2014); Folder Vreewijk, and Municipality of Rotterdam (2014); Folder Bloemhof. Immediately, it becomes clear that the garden districts make a huge contrast with the expanding high-rise center Zuidplein. The rural and green character is in danger and the houses are old and outdated. The mainly residential districts lack in providing diverse provisions and becoming closed off islands. However, their location and the great amount of open space provides new opportunities. The garden districts have the ability to use their strength for a new way of densification with greenery.



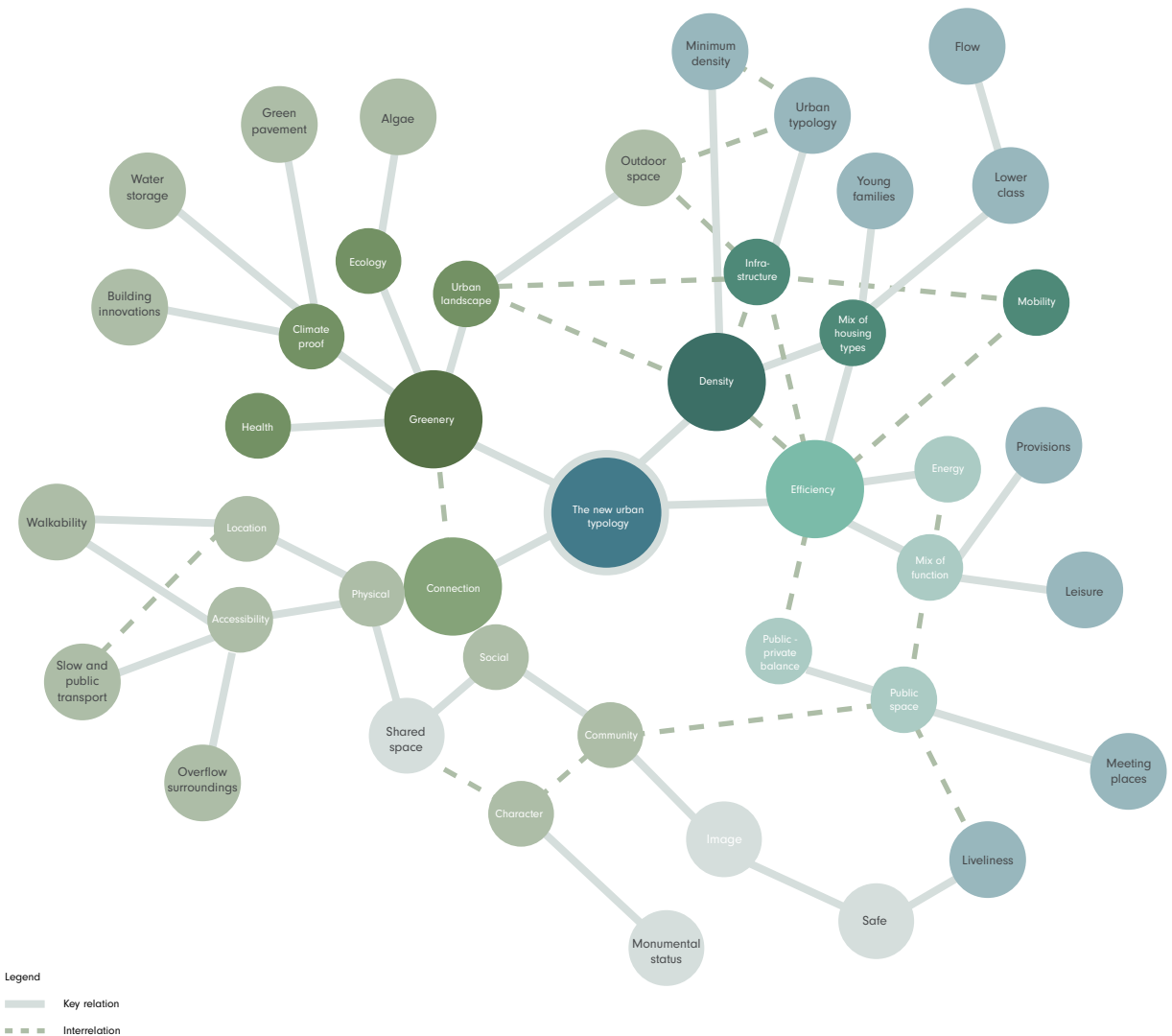
SWOT-analysis Zuidplein (own image).



SWOT-analysis Vreewijk and Bloemhof (own image).

PROJECT FOCUS POINTS

To create a strategy for the new narrative, the four focus points are extended into more specific principles. Based on the SWOT-analysis and exploratory research on the four focus points, the specific principles involve elements such as vertical composition, algae, a combination of urban blocks and outdoor space, and shared meeting spaces.



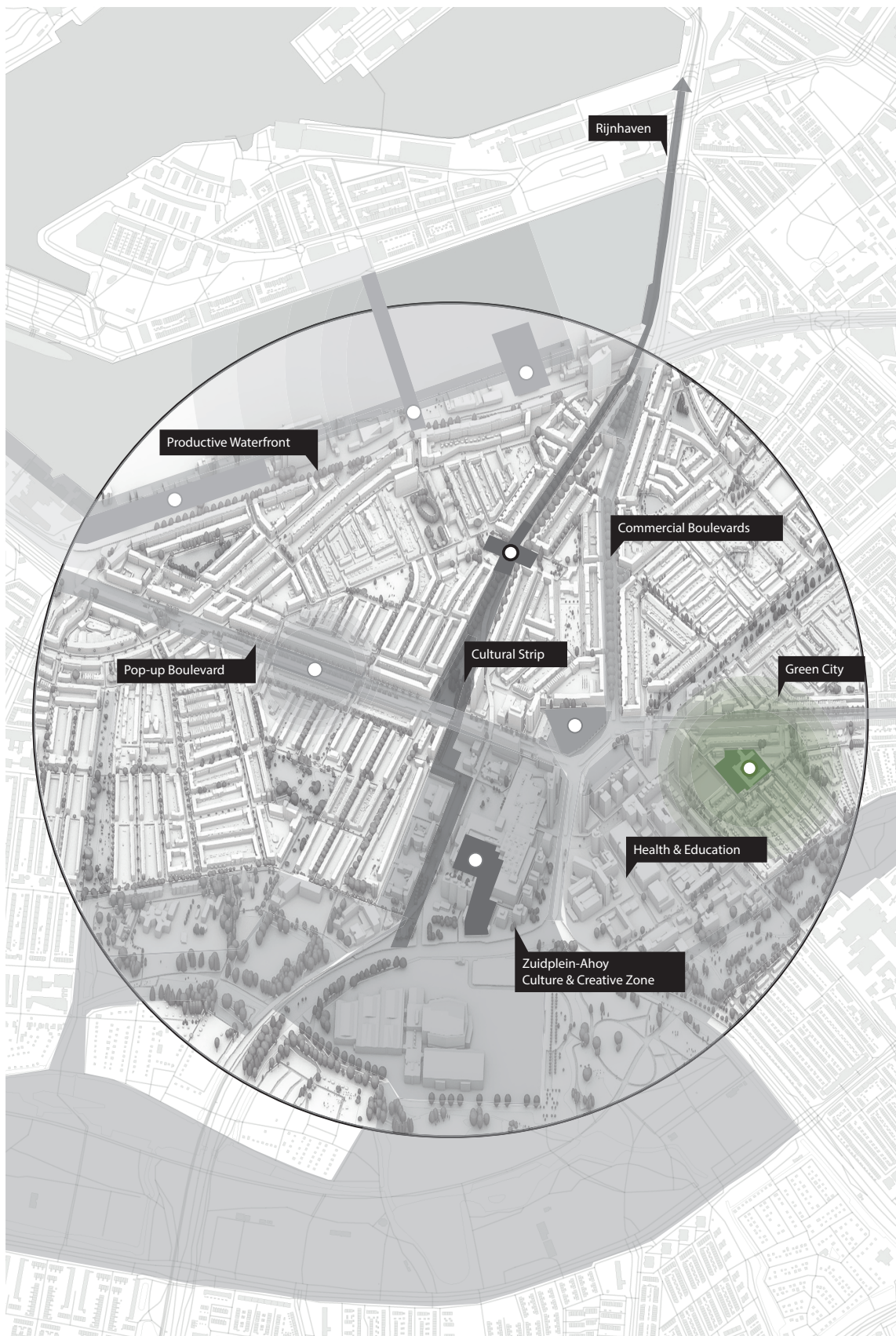
Extended focus points (own image).

GROUP VISION

As becomes clear from the analysis, Rotterdam does not exist of only one center. It is a polycentric city, of which each center consists of several districts with a different character. As a result, the composition of the city can be compared to a collage. Every intervention made within the city is an addition to this collage. Taking the new interventions of the municipality into consideration, the research group has created an ambitious vision for the site. The existing residential districts will be the base layer of the vision. On top of that, new districts with different central characters are added. Every districts uses the existing program and strengthens their character by emphasizing the valuable parts. Moreover, each intervention contributes to the character of the district in which they are placed and work as a catalyst. In this way, the site will develop as one of the poly-centers of the city and becomes part of the collage.

INDIVIDUAL CONTRIBUTION

The Garden Suburb Vreewijk will be turned into the Green City district with a more urban character, while the future high-rise center Zuidplein will be more focused on culture and creative functions. On the border of these two districts, The Living City is located. The project will function as a new tool for Rotterdam towards a green and social inclusive city. The focus points are implemented in the design of the Living City, that results in a new type of city block in which public space is interwoven throughout. The Living City aims to densify the urban area with housing and public green spaces and becoming a pioneer in developing new means of integrated green in the city. It will contribute to the research on algae, specifically for architectural use. Algae is a relatively underdeveloped type of greenery within the field of architecture. Through experimental exploring, the algae lab will test new sustainable initiatives and products. Eventually, the gained research and knowledge will be applied into the ecological restoration of Rotterdam and the project sets and example for climate proof building. The algae lab is combined with a public campus, that provides new means of public green for locals and aims for an engaged community. Local inhabitants and interested visitors will be invited to participate. In addition, the Living City provides three types of housing to create a flow in the housing market. All three program elements are vertically composed inside the building. With the use of algae, the building block aims to be circular and self-sufficient.



CONCLUSION

The project anticipates on the existing context and current problems world-wide. The design principles of the Garden City and Suburbs are relevant for this period of time we are living in. While cities are facing large problems, we can envision a new urban typology, which is an essential task to be done to make our cities survive the upcoming century.

The final outcome of this research is a reinterpretation of the principles of the Garden Suburbs and a vision for the urban typology of the future. By taking all fields of architecture into consideration, a complex well-functioning design is created for the site of the case study: The Living City. It reacts on the migrated and evolved Garden Suburbs within the site and implements the created vision and typology in an architectural design.



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APPENDIX

KEY DESIGN PRINCIPLES

The key design principles derived from relevant literature research and the SWOT-analysis, and include the analysis of the following design proposals:

- o Three designs for three Dutch neighborhoods within the cities Hengelo, Delft and Nijmegen from the book 'De tuinstad is dood, Leve de tuinstad!' (Ploeg et al., 2005).

- o Three proposals for the area Maurepas, France by Pauline Szwed, Nicolas Ziesel and Adelaida Uribe Lemarie (IAU idF, 2013).

- o The winning design for the Hoo Peninsula in Kent from the document the 'Wolfson Economics Prize MMXIV: Stoke Harbour Garden City on the Hoo Peninsula in Kent' (Shelter, 2014).

These projects had a similar character and status within the city as the former explained Garden Suburbs of today and have now been renovated through different approaches. Per project, multiple designs have been created for the renovation of the site. For this analysis, the vision and strategy of one design per project have been chosen to be analyzed in dept. Combined with a literature research, this analysis resulted in focus elements for the design and implementation of the new narrative. These elements are greenery, community, density and efficiency.

The first and most important focus point is greenery. Within a design, greenery can have multiple functions. Not only is it essential for biodiversity, eco-systems and a climate-proof environment, greenery also works as a connection tool, both physically and socially (Schropfer, 2015). In addition, greenery has a positive effect on health and happiness and creates cultural value (Yudina, 2017). The designers of the proposal for Maurepas, France, used greenery to create such a cultural value. By placing agriculture at the heart of the area, they emphasized the values of collective goods and sharing these (IAU idF, 2013). Their ecological project stands out like a landmark and connects with its surroundings through green paths.

The second focus point 'community' is strongly interwoven with greenery. It includes many means, such as physical and social connection. These can be established by increasing the physical accessibility or creating a social community. According to David Sim (Sim, 2019), in relation to the term connection, a city should be focused on the smaller scale and walkability. This is exactly what the design team of the project The Hoo Peninsula in Kent, United Kingdom, did (Shelter, 2014). By creating districts with each 800 meters in diameter, which increases the walkability tremendously. The base layer of green and blue grids provides a movement route through the densely built houses (Shelter, 2014).

The third focus point is efficiency. The balance between public and private spaces is important to consider when creating an efficient city. Individual, collective

and public spaces have different means of communication and effect the liveliness of an area (Schropfer, 2015). Moreover, facilitating meeting spots creates social connections and reduces loneliness. The design for the Poptahof in Delft, The Netherlands, includes all kinds of public and private spaces (Ploeg et al., 2005). By creating a green landscape with 'mountains' and 'valleys', all types of public and private means get their own spaces. In the valleys, mostly public functions can be found and on the mountains mostly private functions. Another design from the same book is made for Kleine Driele in Hengelo, The Netherlands. In this design, the focus was placed on the borders of the neighborhood. The private character of Kleine Driele clashed with the public character of the surrounding area. Therefore, the borders of the neighborhood were assigned to be public to reduce the isolation-effect it had within the site (Ploeg et al., 2005).

Density, the last focus point, is becoming more and more important due to the growing population (Schropfer, 2015). "Space has become a luxury, the city is getting more compact." (IAU idF, 2013, p. 76). The densely built concrete blocks are expanding and force urbanists and architects to find new ways of creating green spaces in the city (Yudina, 2017). The design proposal for the Hoo Peninsula, United Kingdom, goes even more extreme and aims to densify the area with 100% (Shelter, 2014). 60.000 new homes are planned to be built to create a more vibrant, efficient and mixed-use center. At the same time, greenery is implemented throughout the area in several ways. New meanings of public and private green are compensating for the added building blocks. When densifying urban models, several functions can be mixed together. Mixing functions, such as residential, recreational, commercial, agricultural and infrastructural, makes a building system very efficient (Wong et al., 2016). Also, it creates affordable housing that leads to socially inclusive cities (Urban Design Group, 2015). The design proposal for Maurepas, France, uses multi-purpose facilities and places to bring several functions together (IAU idF, 2013). The communal working place leads to the exchange of ideas and creates what they call 'the ideas farm': a place where agriculture meets development and inventions. When thinking of the character of the Garden City, the dense modern cities seem to be the enemy. However, this does not have to be true. Densification can be used as a tool to preserve the character and at the same time allow the city to survive and expand (Future Spaces Foundation, 2016). The winning proposal for the Hoo Peninsula in Kent, United Kingdom, actively promotes densification while boosting the character of the neighborhood (Shelter, 2014). By using self-build models and offering new typologies, the inhabitants are actively involved in creating the character for the neighborhood.

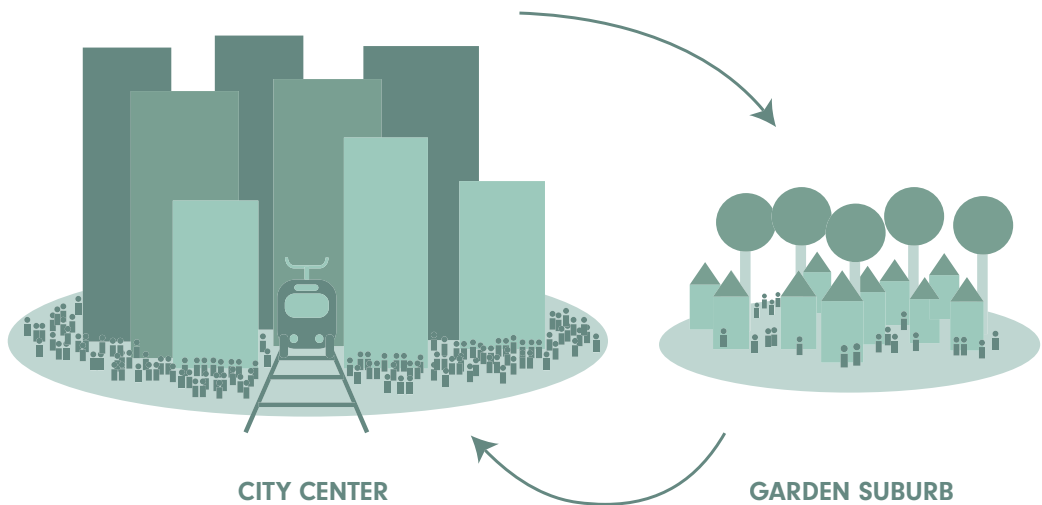
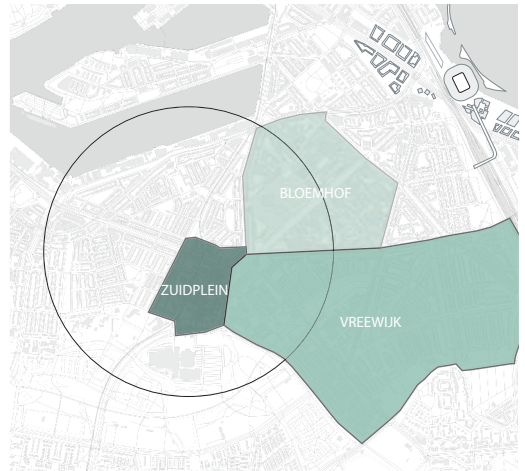
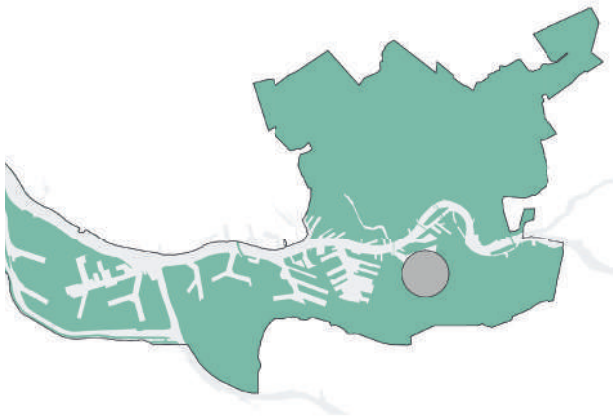
DESIGN BRIEF

THE LIVING CITY

H. J. BAGHUIS

DESIGN BRIEF COMPLEX PROJECTS 20/21





INTRODUCTION

The Garden City concept was created as a response to the rapidly industrializing cities. The concept evolved into Garden Suburbs and now, due to the current city typologies, the valuable design principles are in danger. Migration of the concept occurs within the researched site, which resulted in Garden Suburbs with a healthy green environment and an engaged community. Now, the assigned high-rise district Zuidplein is expanding and the character of the Garden Suburbs is endangered.

“How can the experimental urban model of the Southern Garden Suburbs of Rotterdam be transformed

in order to adapt and contribute to the expanding high rise city center?”

The design principles of the original concept are still of value and the new central location of the Garden Suburbs offers opportunities to new ways of densification. To meet the new requirements for our future cities, we need to renovate the inner city in a sustainable way. To do so, we can use the valuable design principles of the original Garden Suburbs and combine these with the existing urban typology without losing the benefits of the contemporary city.



REFORM THE CITY

PROJECT AMBITION

To transform Rotterdam into a green and social city, we need to renovate the inner city in a sustainable way. To do so, we combine the principles of the Garden Suburbs that occur within the city and with the existing dense and efficient urban typology. Within this perspective, a new urban block is designed, that will set an example aiming towards a green and social city.



CITY VISION



A NEW URBAN BLOCK

URBAN AMBITION

The Living City will function as a new tool for Rotterdam towards a green and social inclusive city. When combining the principles of the Garden Suburbs and the city center typology into the design of the Living City, the result is a new type of city block in which green public space is interwoven throughout. The Living City aims to densify the urban area with housing and public green spaces and becoming a pioneer in developing new means of integrated green in the city. It will provide innovative solutions that can be implemented in the ecological restoration of the city.



INNOVATIVE SOLUTIONS



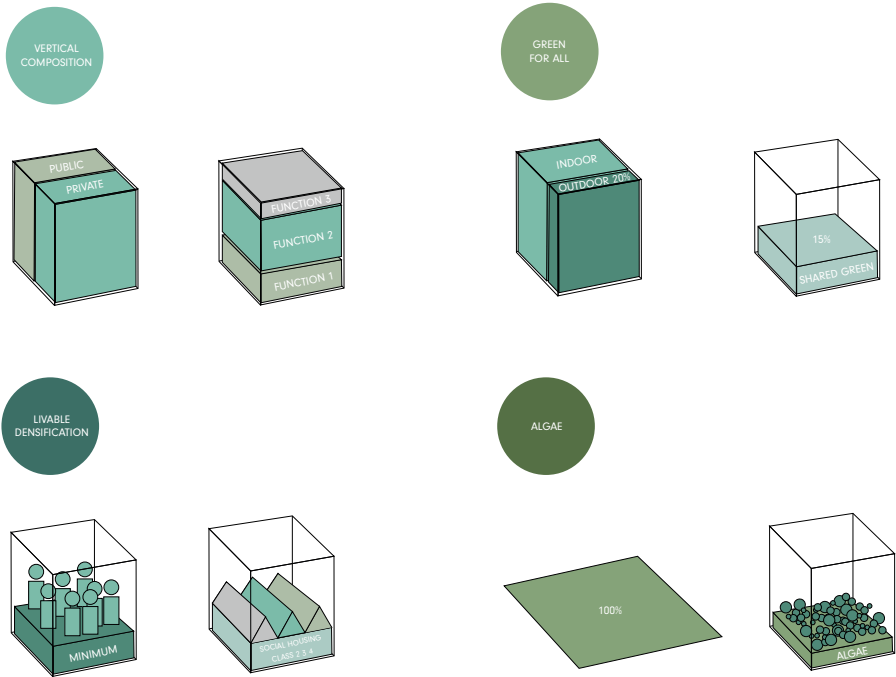
LIVABLE DENSIFICATION



INTEGRATED PUBLIC GREEN

PROJECT AMBITION

When developing on the four focus points that derived from the research, four new topics are created that define the Living City. The first one is algae, a relatively underdeveloped type of greenery within the field of architecture. Through experimental exploring, the algae lab will test new sustainable initiatives and products and at the same time, it will contribute to the research on algae, specifically for architectural use. The algae lab is combined with a public campus, that provides new means of public green for all and aims for an engaged community. In addition, the Living City provides three types of housing to create a flow in the housing market. All three program elements are vertically composed inside the building.



FOCUS POINTS

PROJECT AMBITION

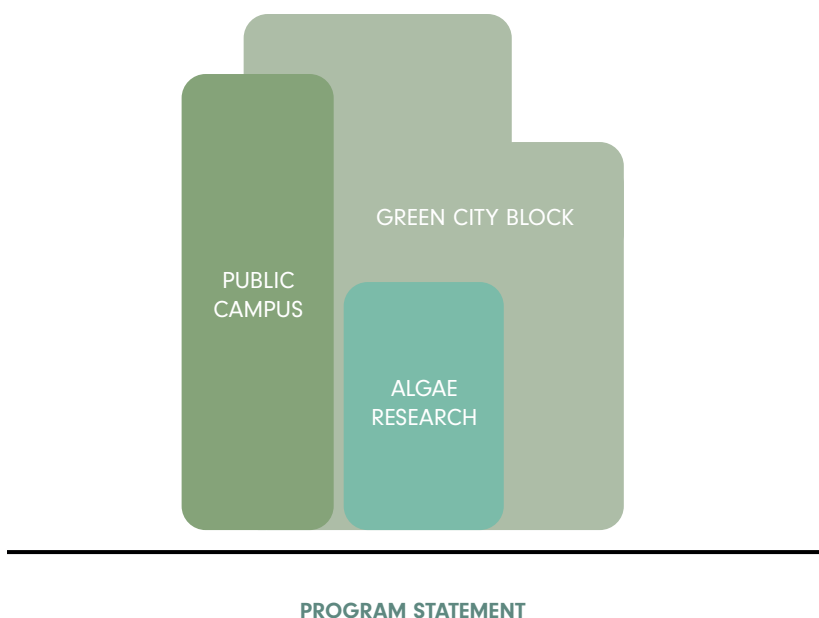
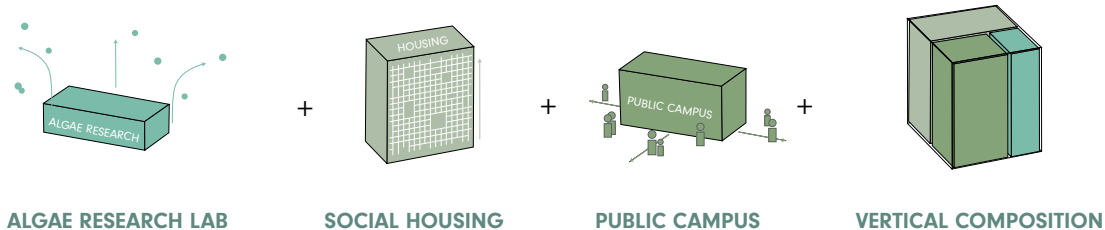
The Living City combines an algae research lab with a public green campus and livable densification.



CONCEPT SKETCH



TYPOLGY WITH FOCUS POINTS



RESEARCH

Research institutes focused on algae.

Students from several disciplines.

Interested parties.

LIVING

Regional (future) inhabitants climbing the (social) housing market.

CULTURE

Local, regional and international visitors.

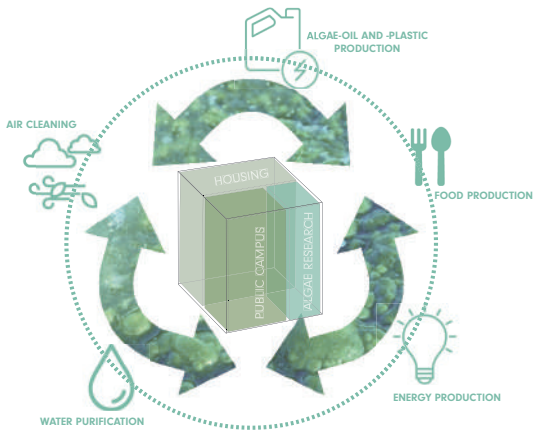
USERS

The users can be divided into three categories. The research center will focus on researchers from several disciplines. The living part of the building is meant to create a housing flow within the neighborhood and therefore focuses on the lower class. The public campus will be open for local inhabitants and interested visitors.

CLIENT

On the image right, potential partners of the algae lab are shown, of which most importantly the Municipality of the city.





BUILDING AMBITION

With the use of algae, the building block aims to be circular and self-sufficient. Algae can be used as a building component to mitigate CO₂ and produce energy with the aim for a circular building. It will be integrated throughout the building in different ways. It's important to take technical aspects regarding the optimum growing conditions into consideration, such as temperature, sunlight, PH and CO₂.

“Algae have the potential to be produced in unconventional ways. In an increasingly busy world, this is a major factor in the growth of industries.”

Wageningen University and Research (2015)

SITE

To assign the location of the project, the SWOT-analysis is projected on the site. The location with the most threats and opportunities is assigned as the location of intervention. On this site, a former school building from 1923 is located. (Designed by city-architect Ad van der Steur.)



City center



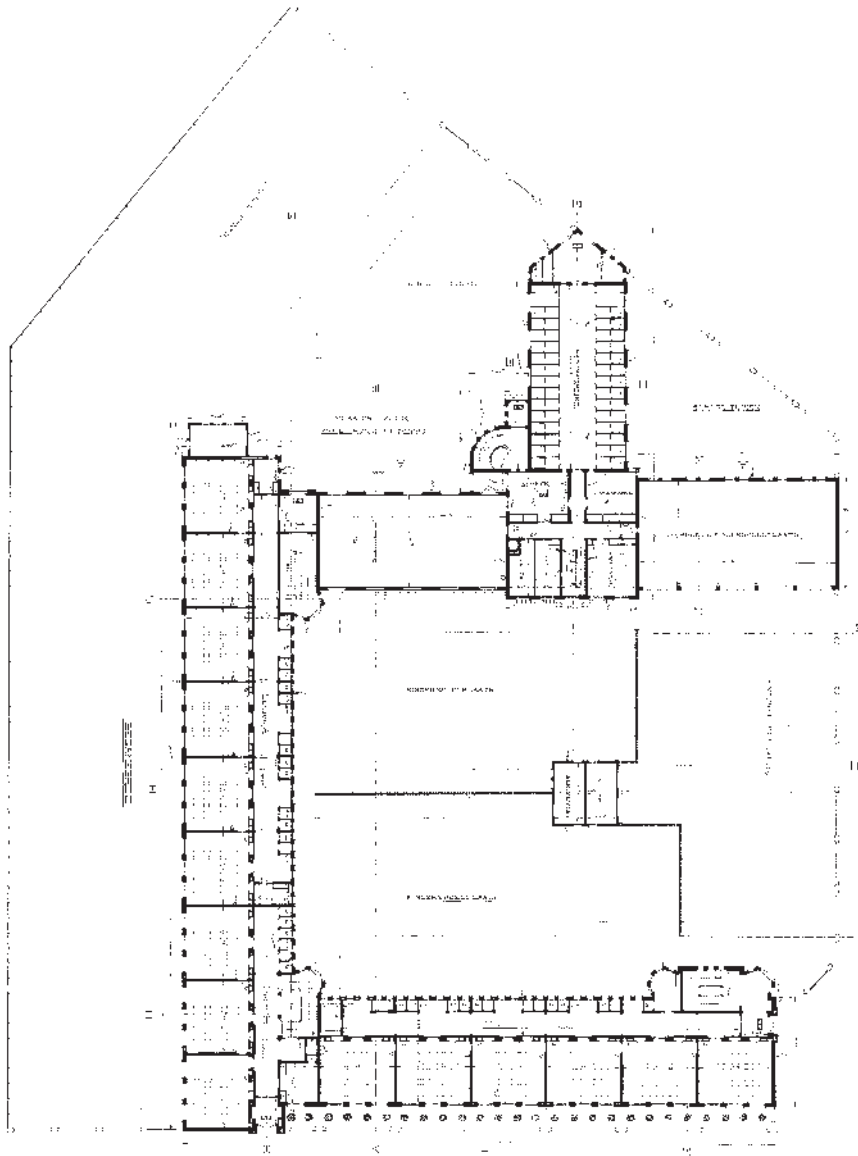
SWOT-MAP



Garden suburb

PROJECT LOCATION

The existing building on the site contains classrooms, gyms, multi-use rooms and bathrooms. The Living City aims to create a new destination through sustainable and innovative ideas while maintaining the character built by one of Rotterdam's city architects.

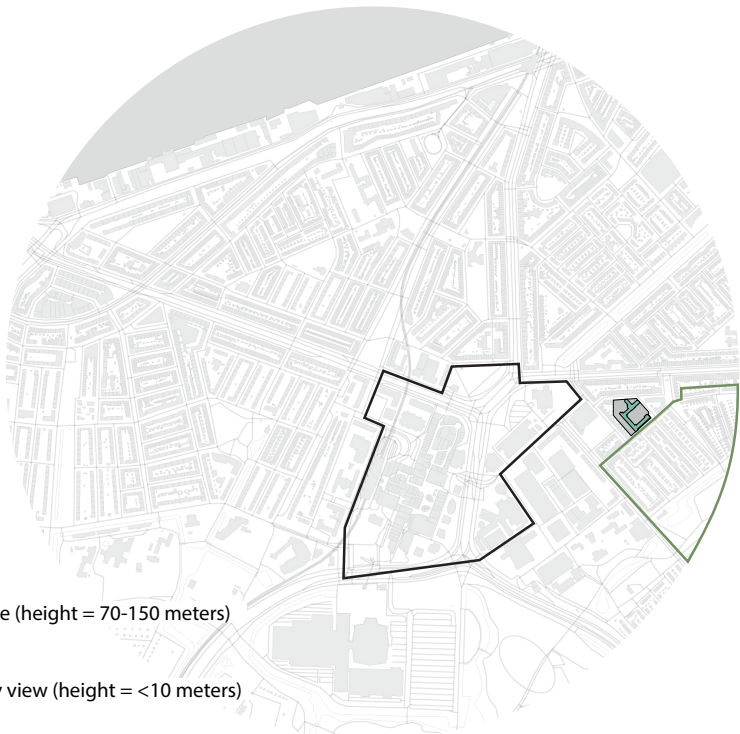


ORIGINAL PLAN GROUND FLOOR (1923)

BIG SCALE MAPPING



GREENERY

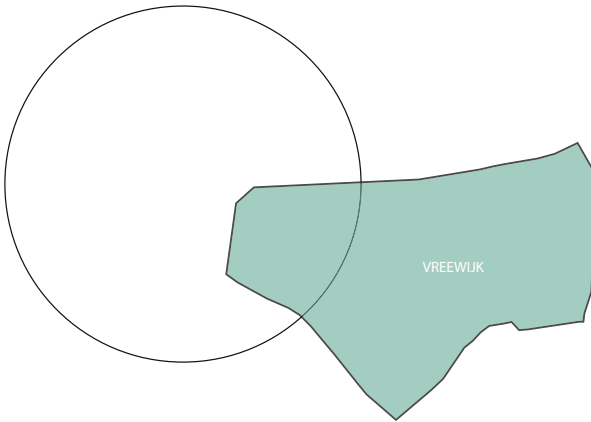


High-rise zone (height = 70-150 meters)



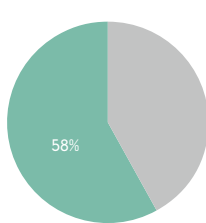
Protected city view (height = <10 meters)

BORDERS AND ZONES



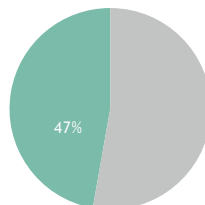
CONTEXT VREEWIJK

One of the three neighborhoods of the research article is Vreewijk. This mainly residential neighborhood is the first Garden Village of Rotterdam, built in 1913. Vreewijk was originally built for the lower working class. The design of the urban layout provides a good base for a strongly connected community. The inhabitants are provided with a lot of open green public space and in addition shared gardens.



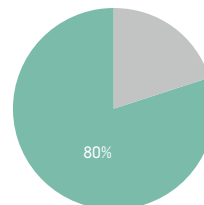
Rotterdam

Social rent
Other



City vision

Social rent
Other



Vreewijk

Social rent
Other

Vreewijk contributes the most of all neighborhoods of Rotterdam to the social housing stock. In total, 80% of all the houses in Vreewijk are social rent. The average house has 3 to 4 rooms and costs around €400 euros per month. Originally, 25% of the total territory of Vreewijk consists of green spaces, of which 60% public and 5% shared.

Average Vreewijk

44 - 67 m²

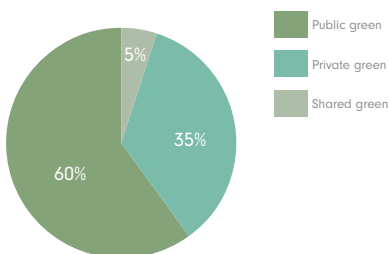
Square meters

3 - 4

Rooms

€350 - €450

Price

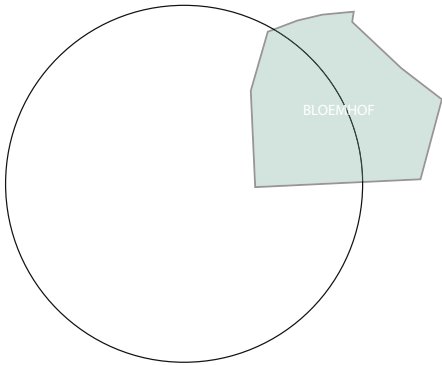


Vreewijk

Public green
Private green
Shared green



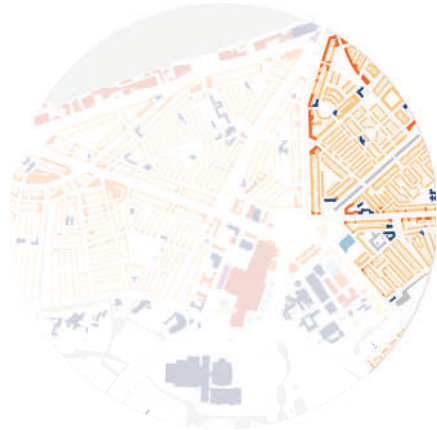
Image: De Nijlarchitecten (2009).



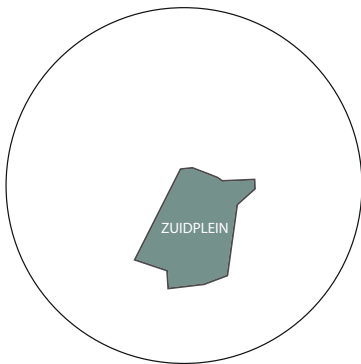
CONTEXT BLOEMHOF

One of the neighborhoods, that has been influenced by the design of Vreewijk, is Bloemhof. It has a strong garden character and has a mainly residential program. It is therefore strongly dependent on the provisions of surrounding neighborhoods.

Image: CollageCity Analysis (2020)



MAINLY RESIDENTIAL PROGRAM



CONTEXT ZUIDPLEIN

Zuidplein was almost built in one go in the '70's. The shopping center and Ahoy were placed like satellites in the neighborhood. As a result, there are a lot of physical barriers with poor qualitative public space. However, Zuidplein is highly connected through public transport. The neighborhood is assigned by the Municipality of Rotterdam to become a high-rise center in the future.

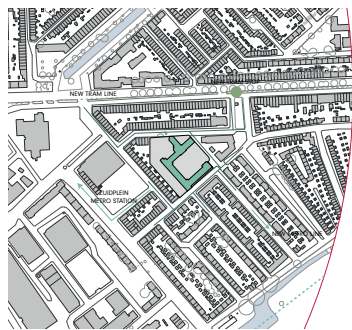
Image: CollageCity Analysis (2020)



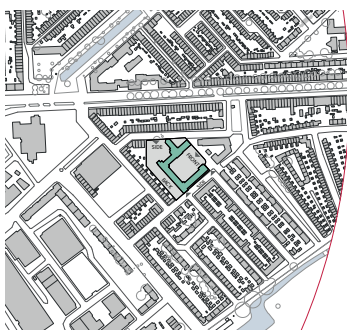
METROLINES D AND E

SITE MAPPING

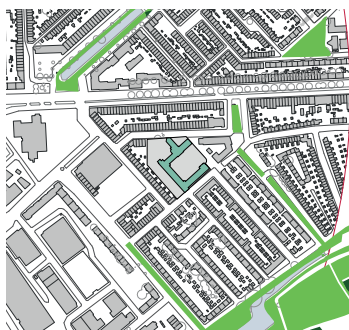
Zooming in on the project location, a more extended site analysis is made. The most important aspects for the assigned program are mapped below.



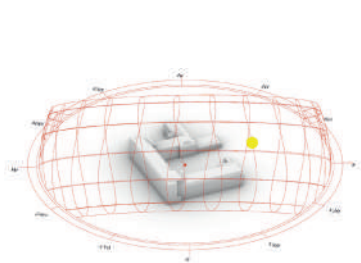
NETWORK



APPROACH



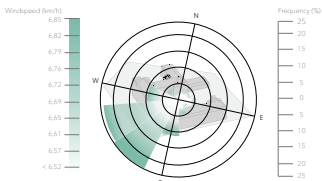
GREENERY



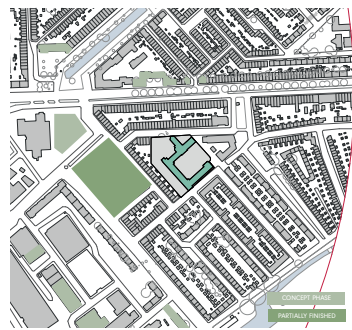
SUN ROTATION



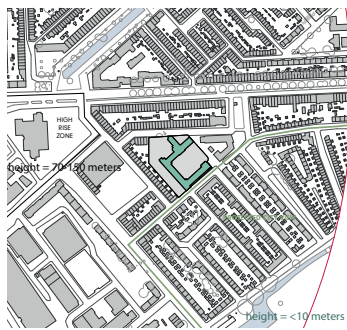
SHADE



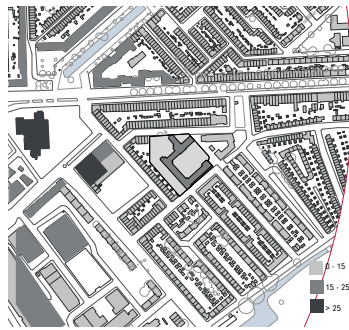
WINDROSE



NEW DEVELOPMENTS



BORDERS

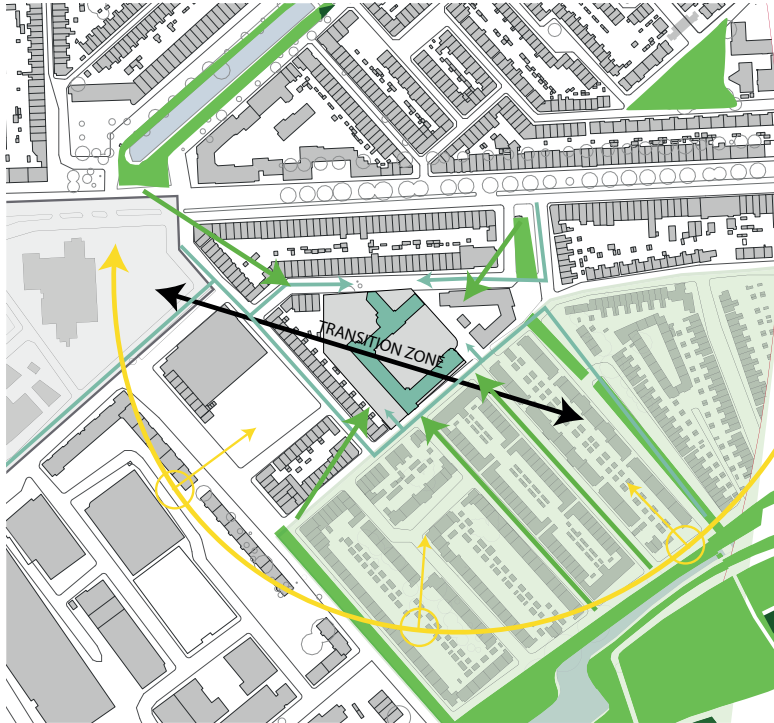


BUILDING HEIGHTS



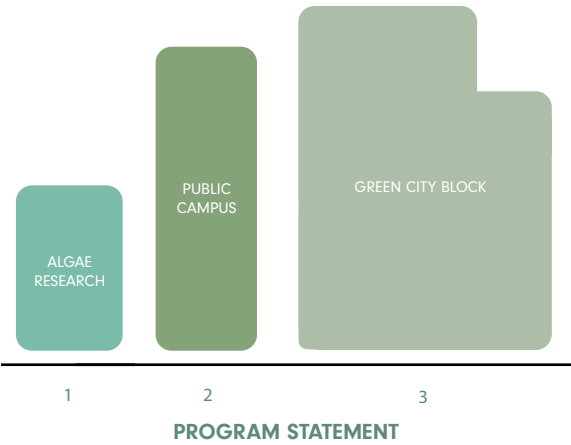
SITE GOALS

When taking the site analysis into consideration, an urban vision for the location is made. The green network of the surroundings will be connected through the Living City as well as the physical network. The building will be approachable from all sides. Since the research lab needs a lot of sunlight, it will be oriented towards the South to gain maximum exposure to the sun. At last, the Living City will be a transition zone between the high-rise center Zuidplein and the protected Garden Suburb Vreewijk.



PROGRAM

The program can be divided into three typologies: the algae research lab, the public campus and the green city block. These three typologies are intensively research through a reference analysis.



ALGAE RESEARCH CENTER

For the research facility, it is necessary to find the ratio between labs and office rooms. The aquadock in Rotterdam is added to the selection of references to find this ratio. The two analyzed algae research labs will focus on the ratio between outdoor and indoor and the sun analysis.

RDM DOCK - 10.000 M²



Practical research center

Ratio between labs and research rooms

ALGOSOLIS - 1.840 M²



Algae research lab

Ratio between outdoor and indoor labs

ALGAEPARC - 720 M²



Algae research lab

Orientation towards the sun

RDM INNOVATION DOCK - ROTTERDAM, THE NETHERLANDS



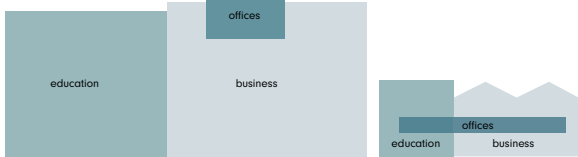
A location to test, demonstrate en produce innovations with focus on water.

> 10.000 m²

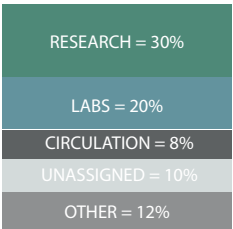
Groosman Partners Architecten

FLOORPLAN

SECTION



Storage	5%
Lab	12%
Workshop	8%
Business	35%
Municipality	5%
Conference room	3%
Office	3%
Unassigned	5%
Reception room	5%
Other	4%
Circulation space	15%



OLD VS NEW

DEGREE OF CREATIVITY

CIRCULATION SPACE

GENERAL PROGRAM



ALGOSOLIS - NANTES, FRANCE



A complete infrastructure for algae research and cultivation including culture and analysis rooms, biomass production areas (outdoor and indoor), downstream processing unit for algal biomass harvesting and biorefining.

1840 m²

Université Nantes

FLOORPLAN

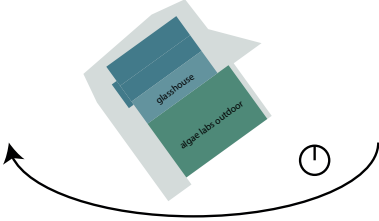
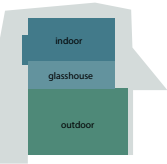
SECTION



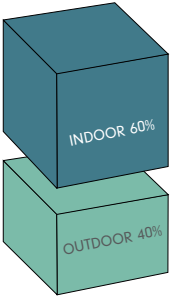
NO DATA

INDOOR VS OUTDOOR

SUNLIGHT



Storage and conditioning	14%
Algae labs outdoor	16%
Research and data	23%
Implementation space	5%
Unassigned outdoor	24%
Circulation space	18%



RATIO INDOOR - OUTDOOR

ALGAEPARC FACILITY - WAGENINGEN, THE NETHERLANDS



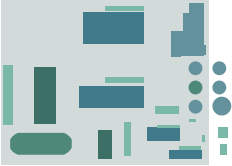
Compare and improve photobioreactors and operational strategies under outdoor conditions.

720 m²

Wageningen University

FLOORPLAN

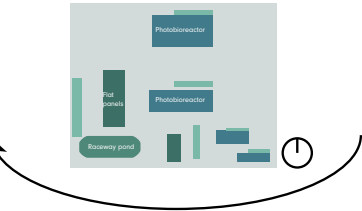
SECTION



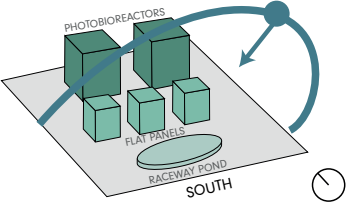
NO DATA

SUNLIGHT

UNASSIGNED SPACE FOR CIRCULATION



Unassigned	55%
Photobioreactor	15%
Water treatment	9%
Raceway pond	8%
Technical installations	8%
Flat Panels	5%



LIGHT AND INSTALLATIONS

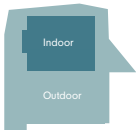
BENCHMARKING OF THE ALGAE RESEARCH REFERENCES

RDM DOCK - 10.000 M²



Storage	5%
Lab	12%
Workshop	8%
Business	35%
Municipality	5%
Conference room	3%
Office	3%
Unassigned	5%
Technical room	5%
Other	4%
Circulation space	15%

ALGOSOLIS - 1.840 M²



Storage and conditioning	14%
Algae labs outdoor	16%
Research and data	23%
Implementation space	5%
Unassigned outdoor	24%
Circulation space	18%

ALGAEPARC - 720 M²

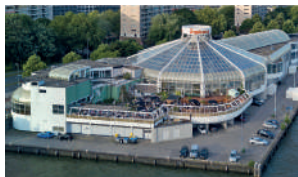


Unassigned	55%
Photobioreactor	15%
Water treatment	9%
Raceway pond	8%
Technical installations	8%
Flat Panels	5%

PUBLIC CAMPUS

For the public campus, a total of four references are chosen, since there is a big difference in size. Important aspects are the public route, indoor and outdoor ratio, circulation and ratio between public space and research rooms.

BLUE CITY - 11.500 M²



Public research center

Public circulation

SIU SIU - 270 M²



Research center in the nature

Circulation through outdoor and indoor

RLC - 20.000 M²



Public research facility

Ratio outdoor and indoor

CAS - 37.000 M²



Large public research lab

Ratio public and research

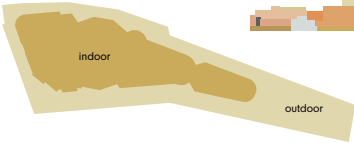
BLUE CITY - ROTTERDAM, THE NETHERLANDS



A playground for circular business.
11.500 m²
Superuse Studios

FLOORPLAN

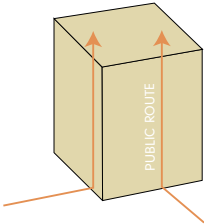
SECTION



Farm	5%
Lounge	10%
Lab	14%
Conference room	18%
Retail	8%
Horeca	8%
Residing	4%
Storage	5%
Unassigned	5%
Other	10%
Circulation space	15%

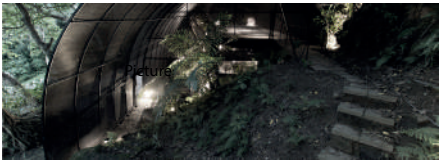
PUBLIC ROUTE

PUBLIC - SEMI PRIVATE



PUBLIC ROUTE THROUGH THE VERTICAL COMPOSITION

SIU SIU, LAB OF PRIMITIVE SENSES - TAIPEI, TAIWAN



A workshop set to explore the environmental transition between urban space and natural forest.
270 m²
DIVOOE ZEIN Architects

FLOORPLAN

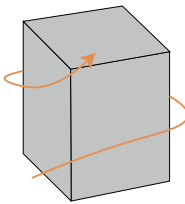
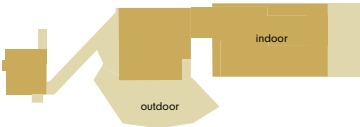
SECTION



Kitchen	5%
Meditation mezzanine	12%
Lab	14%
Showroom	12%
Reception area	5%
Agriculture facilities	9%
Workshop	15%
Unassigned	15%
Other	5%
Circulation space	10%

INDOOR VS OUTDOOR

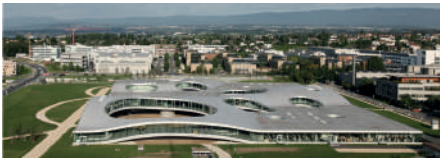
PUBLIC ROUTE AND RECEPTION



CIRCULATION = 10%

CIRCULATION THROUGHOUT

ROLEX LEARNING CENTER - LAUSANNE, SWITZERLAND



A laboratory for learning with library and an international cultural hub for EPFL, open to both students and the public.

20.000 m²

SANAA

FLOORPLAN

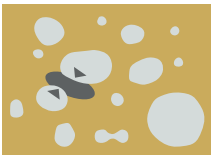


SECTION



Workarea	9%
Offices	11%
Collections	15%
Retail	3%
Hotels	10%
Bank	2%
Library	9%
Multipurpose hall	11%
Circulation space	30%

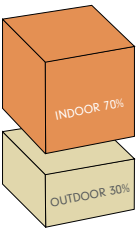
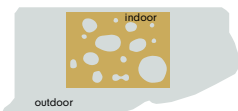
MAIN ENTRANCE



UNASSIGNED SPACE FOR CIRCULATION



INDOOR VS OUTDOOR



RATIO INDOOR - OUTDOOR

CALIFORNIA ACADEMY OF SCIENCES - SAN FRANCISCO, UNITED STATES



An institute of natural sciences in which public experience and scientific research occur at the same location.

37.000m²

Renzo Piano Building Workshop and Stantec Architecture

FLOORPLAN

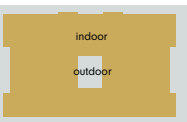


SECTION



Research	14%
Exhibition	18%
Rainforest	10%
Planetarium	10%
Retail	5%
Hotels	8%
Collection	10%
Piazza	7%
Other	15%

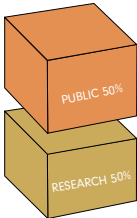
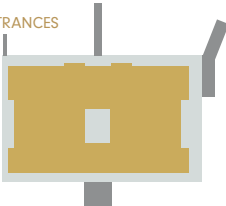
INDOOR VS OUTDOOR



RESEARCH VS PUBLIC



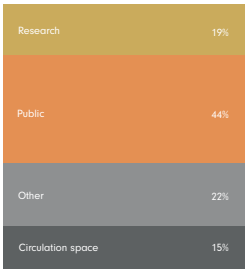
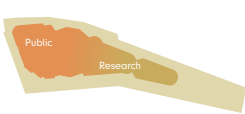
MAIN ENTRANCES



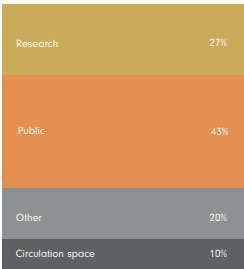
RATIO PUBLIC - RESEARCH

BENCHMARKING OF THE PUBLIC CAMPUS REFERENCES

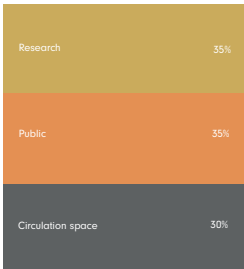
BLUE CITY - 11.500 M²



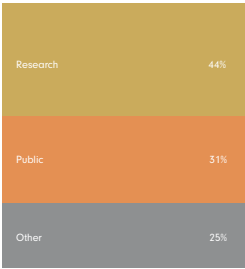
SIU SIU - 270 M²



RLC - 20.000 M²



CAS - 37.000 M²



GREEN CITY BLOCK

For the green city block, two references are chosen that contain a significant amount of greenery. In addition, the BLOX will provide information on a wired-with-the-city block program and the percentage of housing. Also, all three residential complexes are integrated with public functions that differ from each other.

STONE GARDENS - 6.413 M²



Residential complex

Division of greenery

INTERLACE - 169.600 M²



Superblock

Ratio private - shared - public space

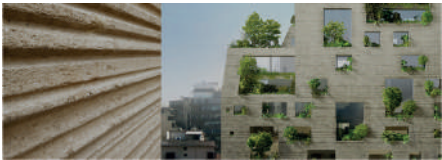
BLOX - 28.000 M²



Wired-with-the-city block

Program

STONE GARDENS - BEIRUT, LEBANON



Residential complex with a public plinth.

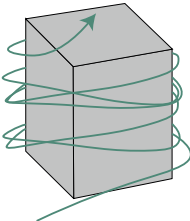
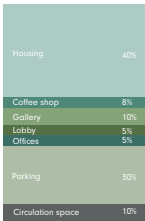
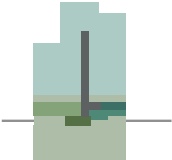
6413 m²

Lina Ghotmeh Architecture

GROUND FLOORPLAN

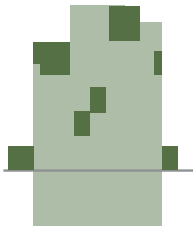


SECTION



GREENERY THROUGHOUT

DIVISION OF GREEN



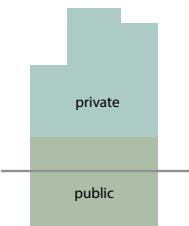
6th floor



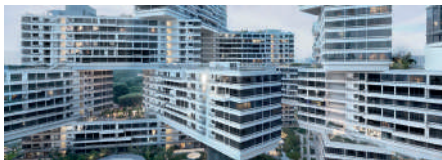
12th floor



PUBLIC VS PRIVATE



THE INTERLACE - SINGAPORE

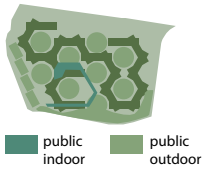


1040 apartments with extensive outdoor space and leisure facilities.

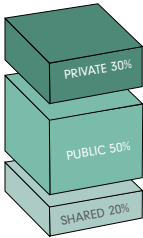
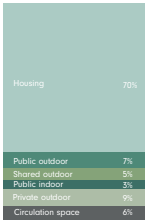
169,600 m²

OMA, Ole Scheeren

GROUND FLOORPLAN

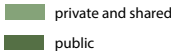


SECTION

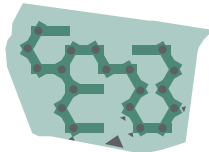


OUTDOOR SPACE

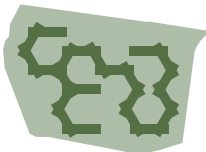
PUBLIC VS PRIVATE GREEN



MAIN ENTRANCES AND CIRCULATION



AMOUNT OF GREENERY SQM



112% greenery of total footprint square meters

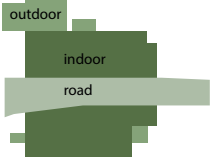


A mixed-use block with the Danish Architecture Center (DAC), public facilities and twenty-two apartments.

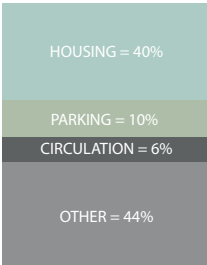
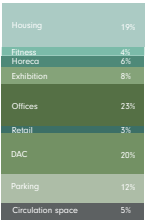
28.000 m²

OMA

GROUND FLOORPLAN

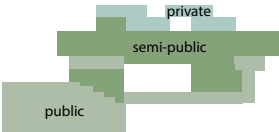


SECTION

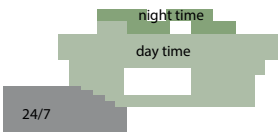


PROGRAM

PUBLIC VS PRIVATE



TIME SCHEME



CIRCULATION SPACE



SOCIAL HOUSING

According to the Decentral policy government (2020) there is a lack of housing classes 2, 3 and 4. To create a flow in the housing market, The Living City provides these three classes of housing. Furthermore, the Decentral policy government stated that the ideal ratio between such housing is 40 - 40 - 20.

CLASS	CLASS 1	CLASS 2	CLASS 3	CLASS 4	CLASS 5	CLASS 6	CLASS 7
Sector	Social housing	Social housing	Social housing	Medium rent	Medium rent	High rent	Private rental
Price range	< €592,55	€592,55 - €635,05	€710,68	€710,68 - €872	€872 - €971	€972 - €1.300	> €1.300
Income per year	< €22.000	€22.000 - €30.150	< €36.165	€36.166 - €44.360	€44.360 - €54.248	€54.248 - €72.330	> €72.330



HOUSING DIVISION

40% Type A

60 m2 3 €592,55 - €635,05
Square meters Rooms Price

CLASS 2

40% Type B

75 m2 4 €635,05 - €710,68
Square meters Rooms Price

CLASS 3

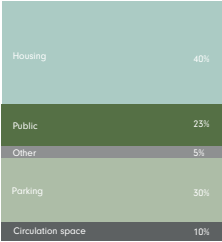
20% Type C

100 m2 5 €710,69 - €872
Square meters Rooms Price

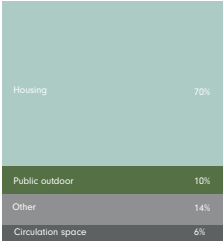
CLASS 4

BENCHMARKING OF THE GREEN CITY BLOCK REFERENCES

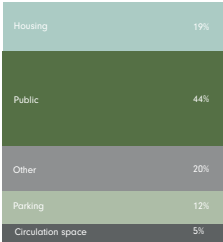
STONE GARDENS - 6.413 M²



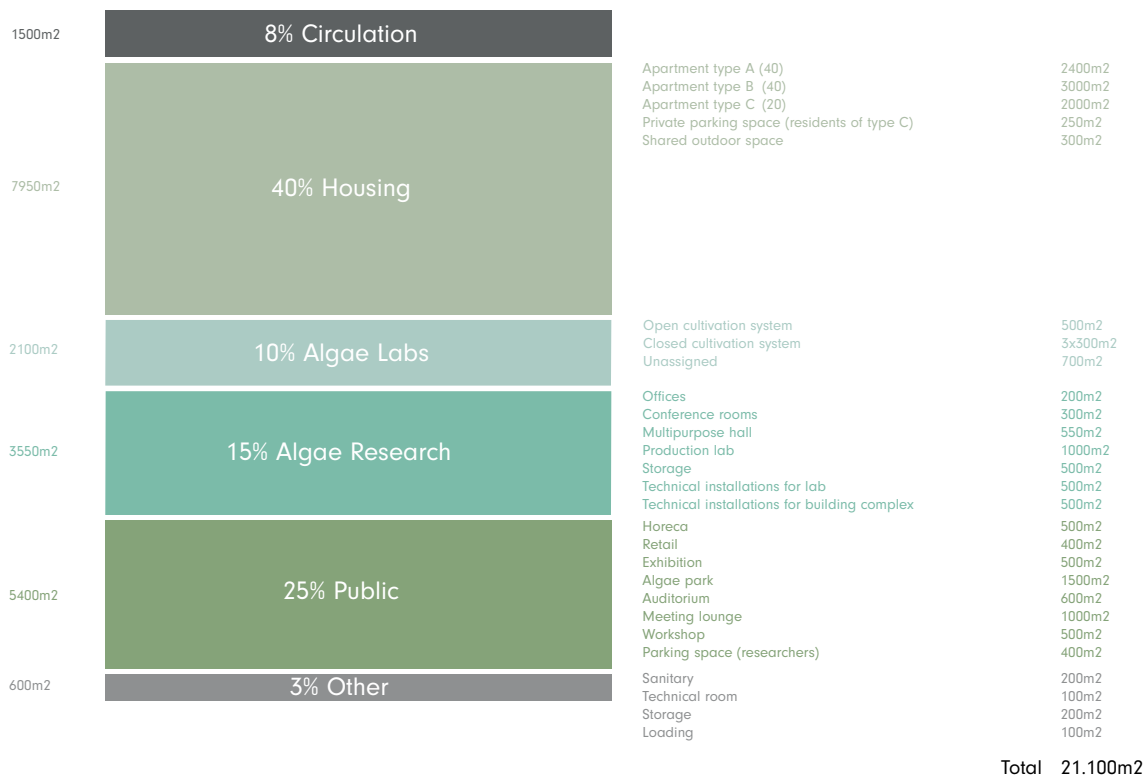
INTERLACE - 169.600 M²



BLOX - 28.000 M²

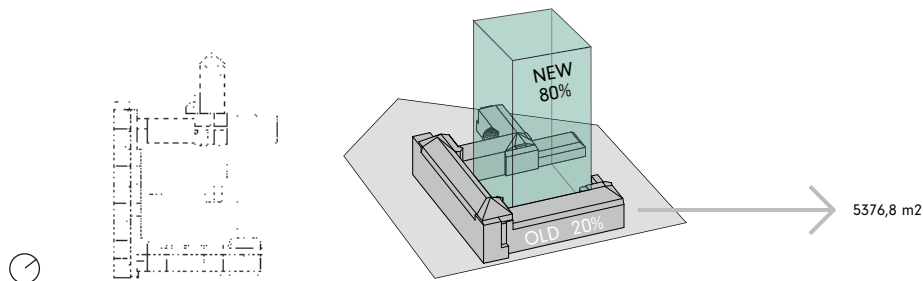


PROGRAM BAR

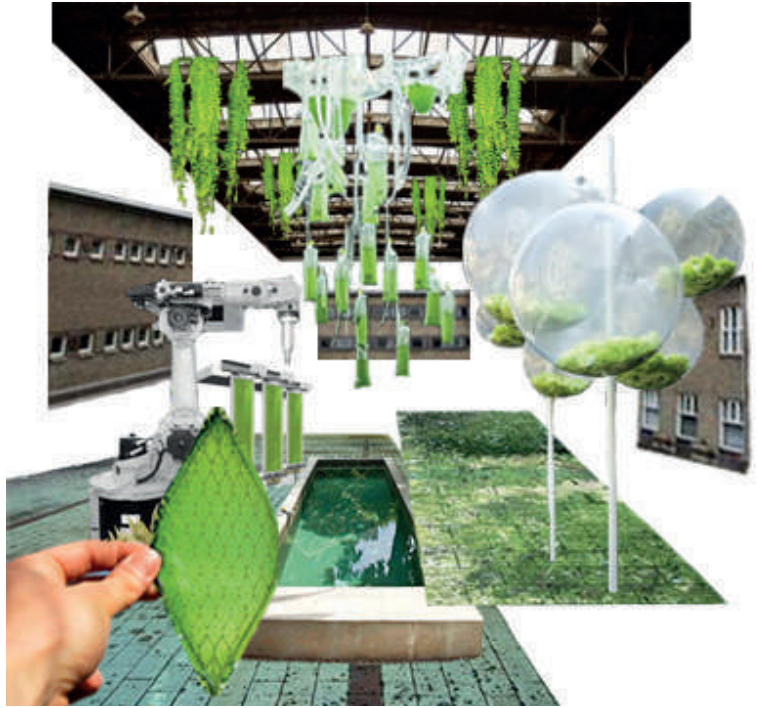
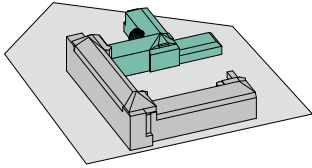


RENOVATION

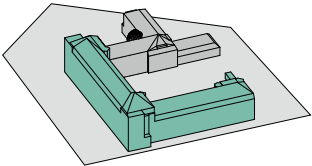
The Living City will use the existing building and emphasize its old character and strengths. Therefore, it is necessary to analyze what is already there and assign the right program to each building element. Proposed is to use the gyms and bathrooms for algae labs and the old classrooms for housing.



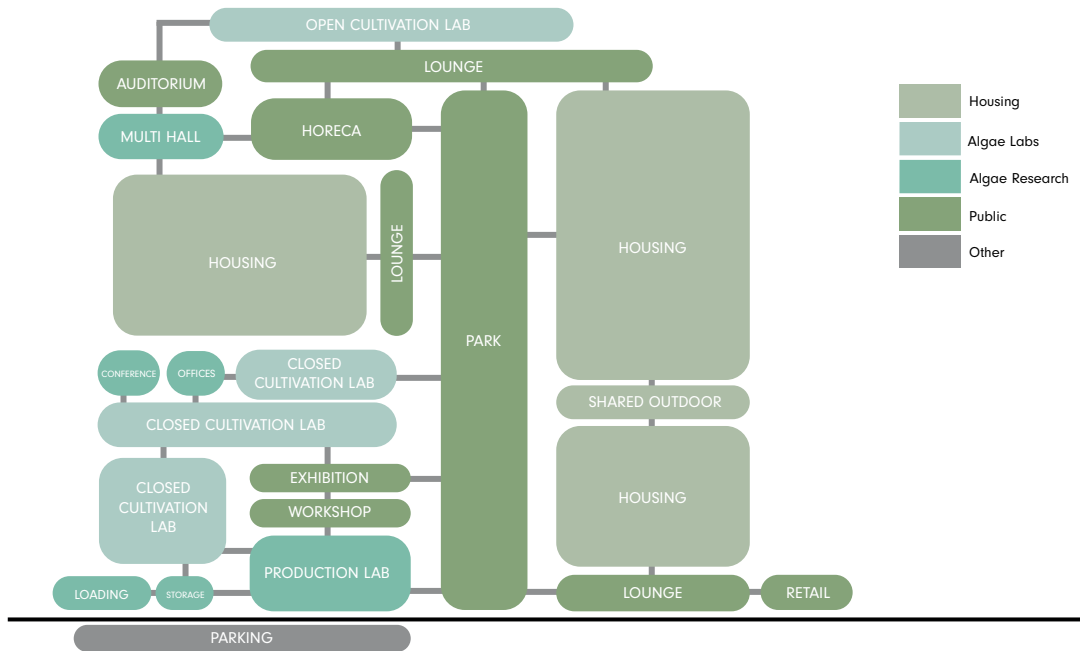
Total program: 21.000 m²



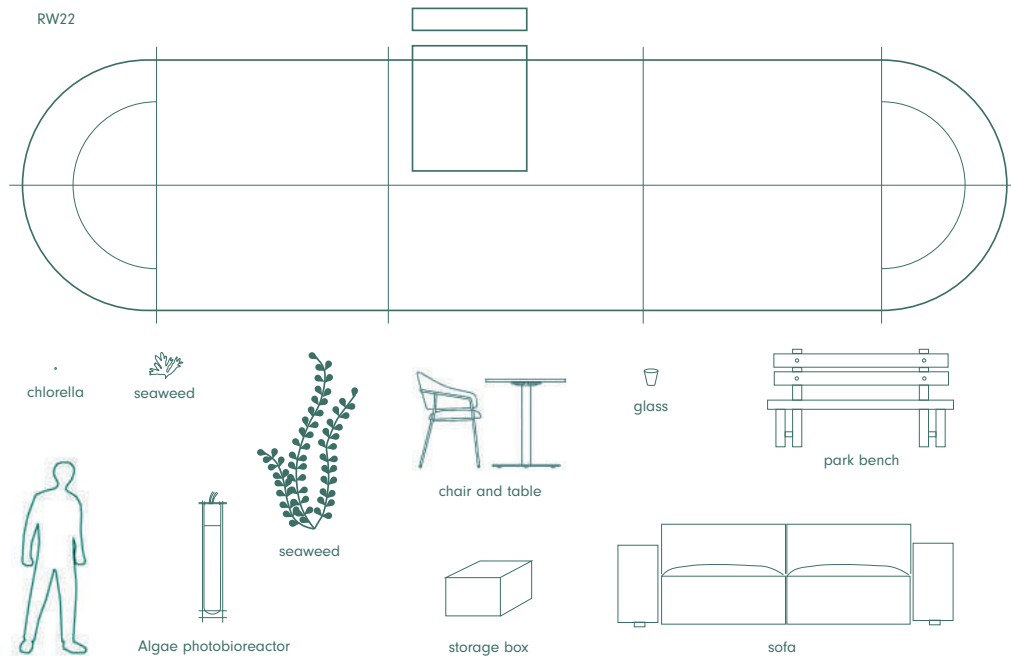
GYMNASTICS AND BATHROOMS FOR ALGAE LABS



CLASSROOMS FOR HOUSING



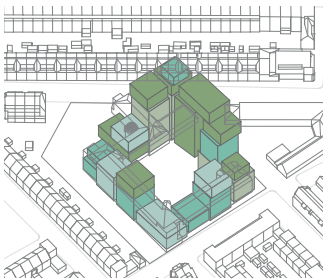
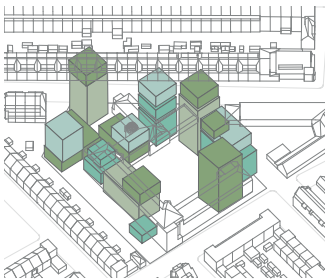
PROGRAM RELATIONS



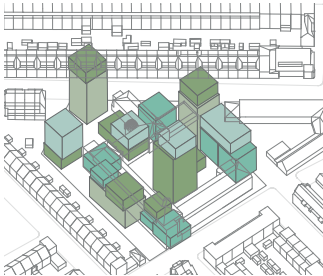
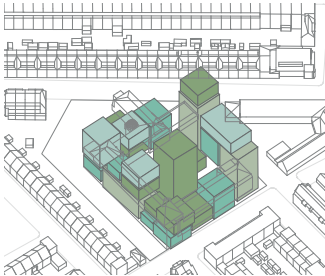
NEUFERT

PROGRAM ORGANISATIONS ON SITE

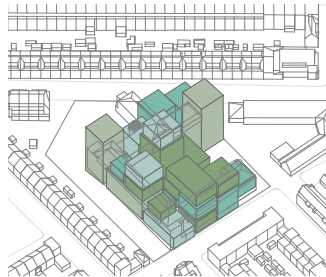
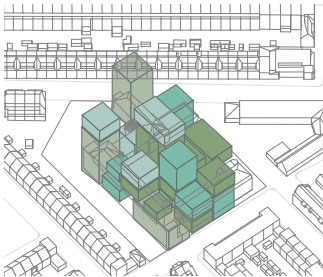
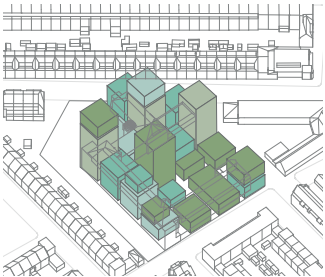
Open space in center



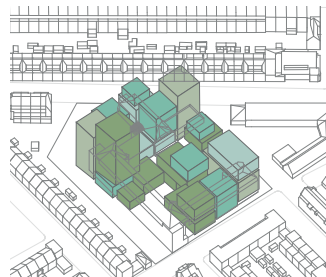
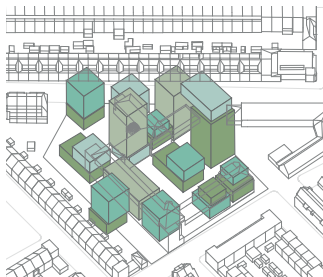
Algae labs on top



Revolve around park



Public functions as connection





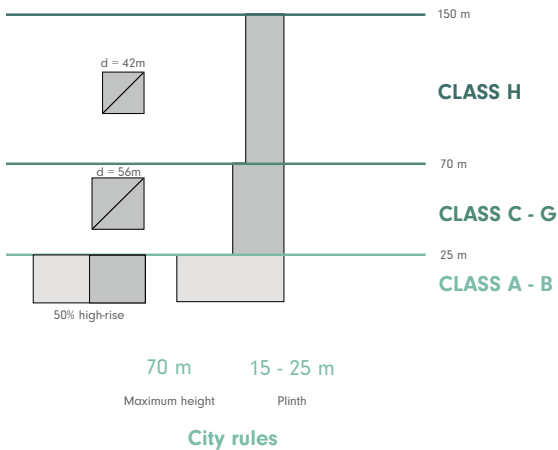
URBAN RULES

A crucial difference between the two analyzed neighborhoods is the density. The assigned high-rise zone Zuidplein contains mostly mid- and high-rise blocks. Whereas the Garden Suburbs contain low-rise strips.

Class E, F, G and H
Mid- and High-rise blocks



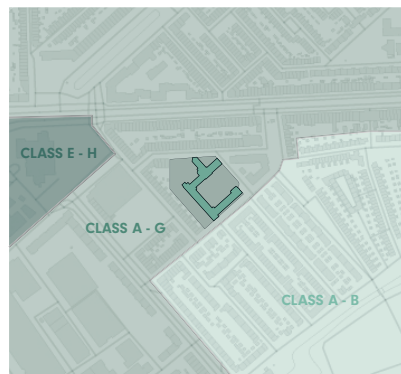
Class A and B
Low rise strips



The municipality of Rotterdam has assigned Zuidplein to extend with class H buildings up to 150 meters. Outside this area, buildings are allowed to have a height of maximum 70 meters. However, the Garden Suburbs have a protected city view and must contain only class A and B (25 meters high). Since our building is located just outside the two zones, the building height can reach a maximum of 70 meters.

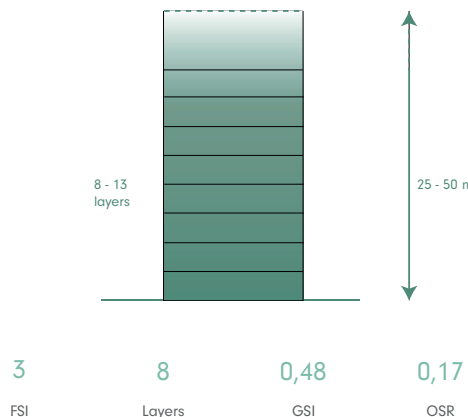


EXISTING BUILDING CLASS



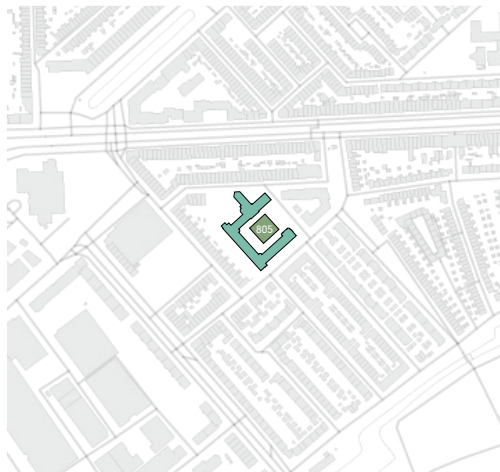
DENSITY ZONES

The Living City aims to be a transition between the two discussed zones. It will be a catalyst within the area and set an example of the new typology. The optimal city block rates around 50 meters. Therefore, the Living City will become a hybrid mid-rise block (class F).

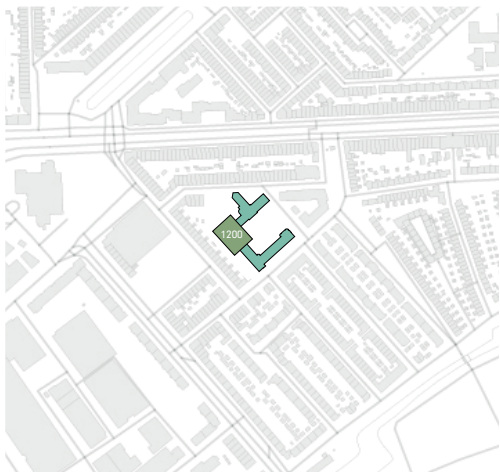


CLASS F: hybrid mid-rise

MAXIMUM PLOT
As a matter of fact, it is possible to create a skyscraper on the site. This is the maximum plot of the location. Below are two options shown.



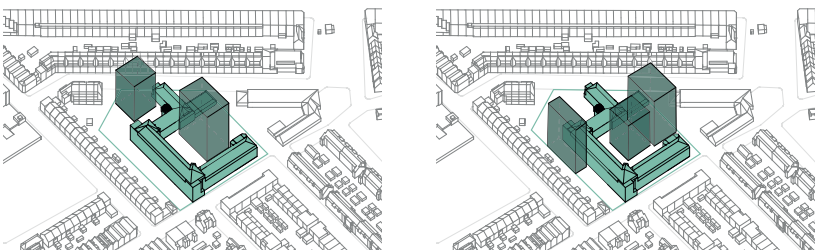
CLASS H: high-rise



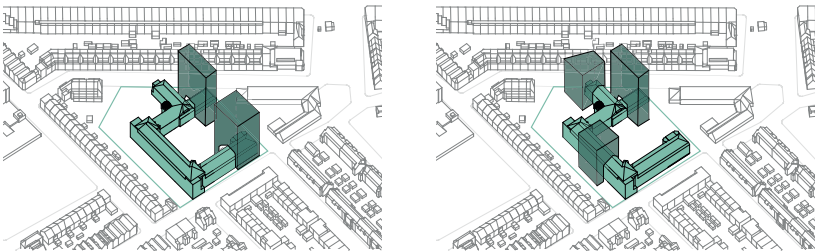
CLASS H: high-rise

MASSING OPTIONS

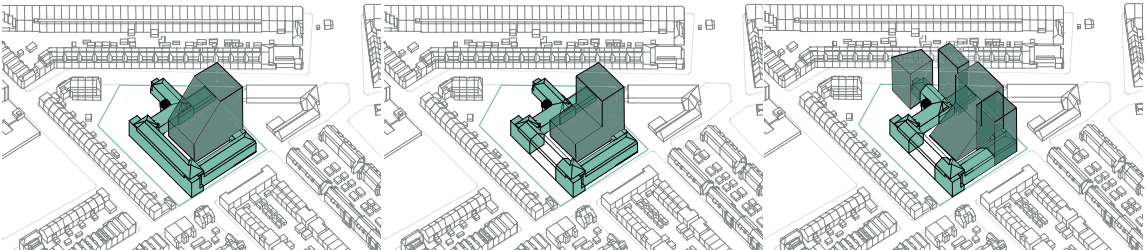
Detach additions from the existing building



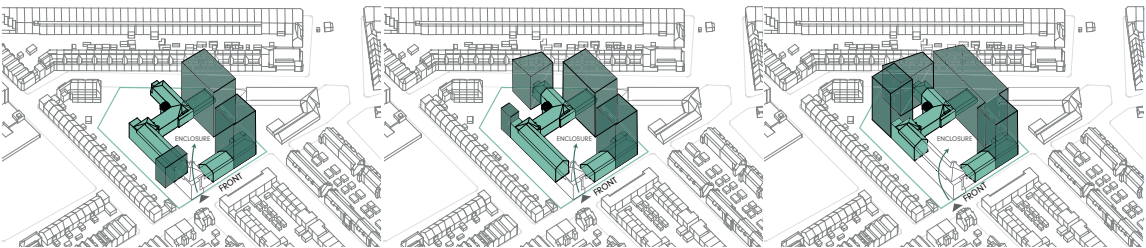
Bridging over the existing building



Built from low to high

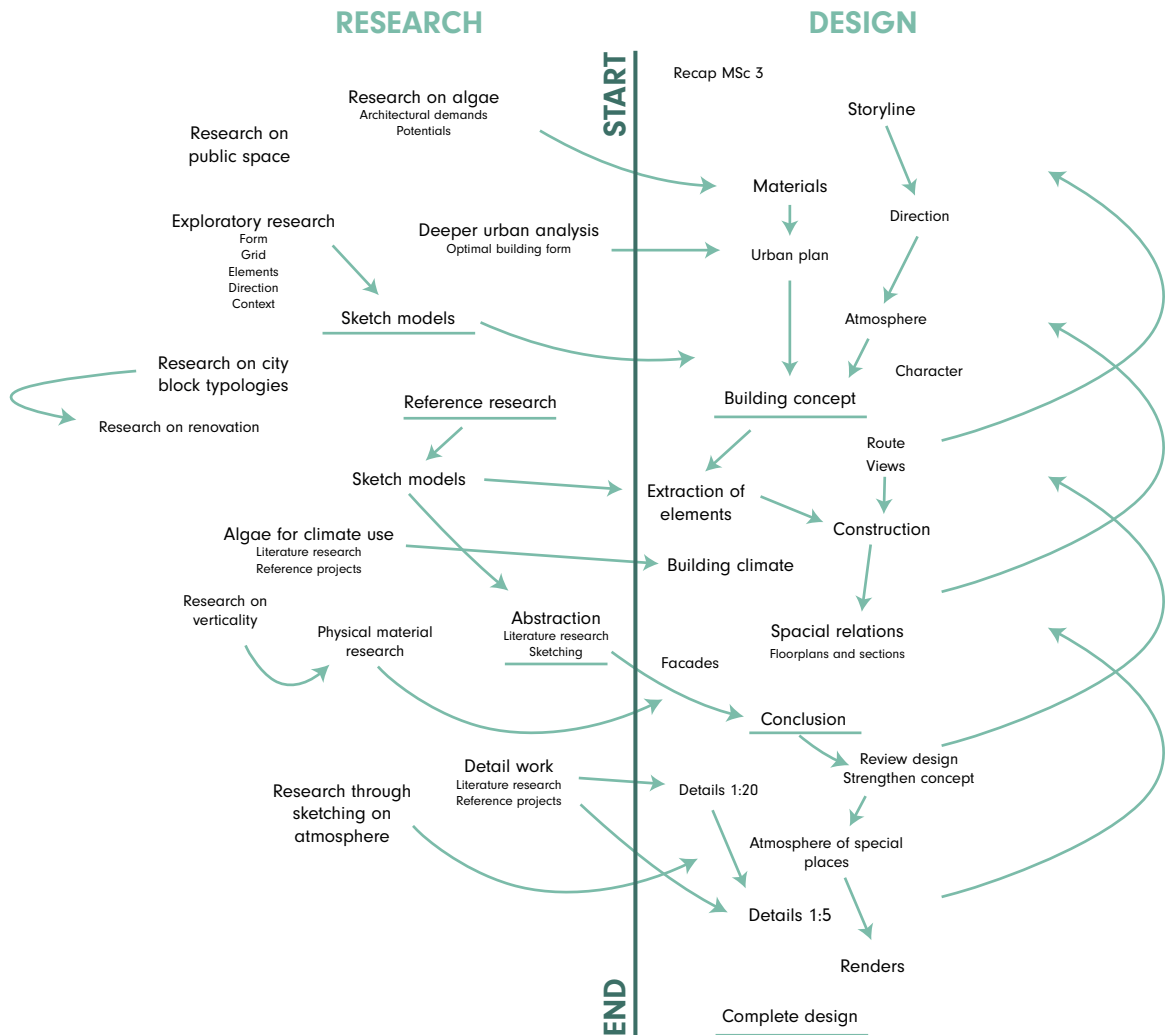


Change enclosure and approach



MSC 4 TIMELINE

MSC 4 TIMELINE



Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Hannah Baghuis
Student number	4599977

Studio		
Name / Theme	Complex Projects	
Main mentors	Manuela Triggianese and Eline Blom	Architecture; History and complexity
Second mentors	Hubert van der Meel and James O'Callaghan	Architectural Engineering + Technology
Argumentation of choice of the studio	For my final master project, I am interested in focusing on the narrative and the concept of the design. For me, these are the most important parts of the design process. More specific for complex projects, I look forward to designing through all scales while combining all fields that relate to architecture.	

Graduation project	
Title of the graduation project	The Living City An algae research lab with a public green campus, combined with livable densification.
Goal	
Location:	A former school building from 1923 in Vreewijk, Rotterdam. (Designed by city-architect Ad van der Steur.)
The posed problem,	The Garden City concept was created as a response to the rapidly industrializing cities. The concept evolved into Garden Suburbs and now, due to the current city typologies, the valuable design principles are in danger. Migration of the concept occurs within the researched site, which resulted in Garden Suburbs with a healthy green environment and an engaged community. Now, the assigned high-rise district Zuidplein is expanding and the character of the Garden Suburbs is endangered.

research questions and	"How can the experimental urban model of the Southern Garden Suburbs of Rotterdam be transformed in order to adapt and contribute to the expanding high rise city center?"
design assignment in which these result.	The design principles of the original concept are still of value and the new central location of the Garden Suburbs offers opportunities to new ways of densification. To meet the new requirements for our future cities, we need to renovate the inner city in a sustainable way. To do so, we can use the valuable design principles of the original Garden Suburbs and combine these with the existing urban typology without losing the benefits of the contemporary city. Within this perspective, a new urban typology is created, that transforms the city into a green and social place.
Process	
Method description	
<p>First a practical site analysis is done, along with a historical and cultural research. After the general knowledge, a literature research on the Garden City is done and the migration and evolution of this concept is further explored. To deepen this research, a SWOT-analysis on global scale (on the city center typology and the Garden Suburbs) is done with an additional analysis on three design projects for Garden Suburbs. This results into the 4 focus points of the new urban typology: greenery, densification, efficiency and community. To implement the general conclusions in the design proposal for the case study, the same research and steps are done regarding the case study location: a SWOT-analysis of Zuidplein (a future high-rise center) and Bloemhof and Vreewijk (two Garden Suburbs). The 4 focus points are developed through an exploratory research and form the design principles of the project. The result is an ambition and program for a multi-purpose city block on an assigned location within the case study.</p>	

Literature and general practical preference

I intend to use data and researches that focus on reforming the urban typology and on the Garden City, Garden Suburbs and its valuable principles. The main research on reforming the urban typology are:

1. Yudina, A. (2017). Garden City: Supergreen Buildings, Urban Skyscapes and the New Planted Space. United Kingdom, London; Thames & Hudson Ltd.
2. Future Spaces Foundation (2016). Vital Cities not Garden Cities. Consulted from: <https://www.futurespacesfoundation.org/wp-content/uploads/2016/04/Vital-Cities-not-Garden-Cities-FSF-dps.pdf>
3. Municipality of Rotterdam (2014, April). Nationaal Project Rotterdam Zuid.
4. Parsons, K. C. and Schuyler, D. (2002). From Garden City to Green City; The Legacy of Ebenezer Howard. United Kingdom, London; The Johns Hopkins University Press.
5. Schropfer, T. (2015). Dense + Green : Innovative Building Types for Sustainable Urban Architecture. Switzerland, Basel; Birkhauser.
6. Sim, D. (2019). Soft City. United States, Washington; Island Press.

The main research on the Garden City and Garden Suburbs are:

1. Stern, R. A. M., Fishman, D. and Tilove, J. (2013). Paradise Planned: The Garden Suburb and the Modern City. New York, NY: The Monacelli Press.
2. Town and Country Planning Association (2013). Creating garden cities and suburbs today; a guide for councils. United Kingdom, London; TCPA.
3. Town and Country Planning Association (2011). Re-imagining Garden Cities for the 21st Century: Benefits and Lessons. United Kingdom, London; TCPA.
4. Van Meijel, L., Hinterthür, H. & Bet, E. (2008). *Rotterdam-Zuid; cultuurhistorische verkenning van vooroorlogse wijken*. Municipality of Rotterdam, dS+V, Bureau Monumenten.
5. Shelter (2014). Wolfson Economics Prize MMXIV; How would you deliver a new garden city which is visionary, economically viable, and popular? Consulted from: https://england.shelter.org.uk/_data/assets/pdf_file/0005/941324/SHELTER_WolfsonPrize_WEB.pdf
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Reflection

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

The design assignment relates to multi-discipline problems world-wide. Creating a vision on a bigger scale and migrating, rescaling and implementing this into a well-functioning public building is an intriguing task within the field of architectural design. Taking all fields of architecture into consideration is key to a complex project design. My graduation project reacts on a migrated and evolved topic with a global vision and implements the created vision in an architectural design on the scale of the assigned location.

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

The project anticipates on the existing context and current problems world-wide. The design principles of the Garden City are relevant for this period of time we are living in. Cities are facing large problems that we cannot turn away from. Envisioning a new urban typology for our contemporary cities is an essential task to be done to make our cities survive the upcoming century.

