URBAN FOREST MOVEMENT(S)

Movement as design method for experiencing nature and its beneficial effects in the city of Den Haag.

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Preface

My fascination on healing nature and ideal city movements started this thesis research. I have always been intrigued by the idea of using nature and its calming effects in designs. Why not make use of this added quality to nature. Throughout history nature or the countryside has been used to escape daily life or the city. The romans did it in the form of Villa Urbana's, the elites fled the city in their estates. And even currently people go outside for some fresh air to escape their activities. Currently cities are becoming more and more dense leading to fewer of these green spaces. Nature areas and the country side are becomming hotspots for people trying to get away from the busy crowds, experiencing nature through sensorial aspects. But why do we have to travel so far to reach these kind of calming nature areas and what creates this calming effect? Can't these spaces be integrated in the city, creating a healthier living environment.

Elaborating on this interest is the fascination of the ideal city movements. These movements create healthy living environments, green spaces for all and are located in a green structure or the countryside. Not all of these ideal cities work but the movements behind them are clear, healthier living with plenty of access to green spaces. From this I wonder if we need to rethink our cities and created healthier living environments. Therefore, I decided to research how to design a new city or green structure with the calming effects of nature and its sensorial experiences. This research is carried out in Den Haag.

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Abstract

Currently cities are becoming more densified, resulting in overpopulated areas with fewer green spaces. Together with this rising health care expenses caused by mental health and current environmental design questions such as water nuisance, heath island effect, densification demands and creating a healthy living environment, leads to questioning current city structures. This thesis rethinks existing city structures, by creating a new way of designing cities which respond to current environmental design questions and offers restorative nature.
It explores methods of creating restorative nature and by researching restorative theories and their affiliation to movement and bodily experience. Movement acts as a tool for designing with an eye-level - and sensorial experience which are both crucial for perceiving nature and its beneficial effects. To design a new city structure, a historical overview is created to research healthy living environments and how these can be spatially recognised in landscape structures, urban plans and ideal city movements. The Garden City movement is used as a starting point for the research.

From this research the Urban Forest Movement is designed, working through different scales. The movement focusses on creating healthy living environments by reacting to current environmental design questions such as heath island effect, water nuisance and housing demand, and by emphasising the importance of how green spaces are experienced.
The generic model is applied to the city of Den Haag, testing it in the process. The site was chosen because it does not only have a history of walking, swimming and estate culture but it also has a different relation to the surrounding landscape relative to other Dutch cities. Den Haag, by lacking city rights, does not have a city wall allowing the city to grow and emerge with the surrounding nature.
To apply the Urban Forest Movement, it is adapted to fit the design brief that is concluded from an analysis of the site. Because the Movement works through various scales, the analysis focusses on three scales; the city/region, a main structure of the city - the line and the site. A vision is created for the city/region scale that focusses on the main spatial framework, densification and green spaces. One of these elements of the spatial framework is further elaborated, zooming in to the line scale. To implement the ideas on the lowest scale on how to create restorative green spaces which help to created healthy living environments, a design on eye-level perspective and movement is made. These are crucial design methods are used to design a park along the line. Here elevations, buildings, water structures, a planting plan and spatial sequences are used to create various bodily experiences through movement. Three different movements are introduced in the park; Gliding, Grazing and Wandering. Offering different levels of emerging in nature and experiencing its restorative effects.
Finally, conclusions and limitations of the thesis are discussed and evaluated to provide future suggestions.

KEYWORDS
Healthy living environment, city movement, restorative nature, mental health, stress, healing nature, sensorial design, Garden City movement, urban forestry, landscape design, movement, Den Haag, bodily experience, Urban Forest Movement.

PART 1: INTRODUCTION AND OUTLINE THESIS

1. Introduction

1.1 PROBLEM STATEMENT AND CONTEXT

Nature has been seen and used as a healing source throughout history, for physical and mental health. Nature offered stress relief as well as a distraction from daily life. During the Middle Ages this can be seen in courtyards, where visitors could enjoy the sensorial aspects of nature and if necessary, use the medicinal plants as pain relief (van den Berg & van den Berg, 2001). Estates where another way of using nature as an escape from daily life by creating a green space for playing games and walking both of which were seen as important ways of improving one's health (Verschuure-Stuip, 2019). While walking people improved their physical health along with their mental health by submerging oneself in nature. Although the estates were only for the elites, walking was an activity which everyone could do, making it one of the first forms, for all, of enjoying nature (Jong, 2007). The idea of city parks went further, these were designed to offer a healthier place to live for workers, improving their work performance, but also to provide a park where they could enjoy outdoor activities such as sports (Rooijen, 1984). These green structures throughout history all had nature as a healing source as one of the main ideas.

Further research shows that nature cannot only improve one's physical health by designing a green living environment but it can also improve one's mental health. This improvement is the cause of the restorative effects of nature. Theories like the Attention Restoration Theory by Kaplan and Kaplan, Stress Reduction Theory by Ulrich and Biophilia Theory by Wilson, all conclude that visiting nature could reduce stress and help with one's ability to focus (Grahn & Stigsdotter, 2003; Kaplan, 1995; Sugiyama, Leslie, Giles-Corti, & Owen, 2007; Sullivan, 2014).

While looking at this history of designing with the beneficial effects of nature, the need for these effects in densely built areas becomes more apparent. Next to this need, new design questions rise such as water storage, heat islands, densification and healthy living environments are all taken into account when designing or improving cities. Although improving the health of residents is one of these design questions, it mostly focuses on the physical side of health, offering places for regular exercise and looking into how a food-waste flow could be designed. Despite the fact that this physical health side is important, the mental health side should not be overlooked. The dictionary defines mental health as: "a person's condition with regard to their psychological and emotional well-being" (Lexico, Oxford, n.d.). A state which is highly influenced by the persons environment. A big aspect of mental health is the occurrence of stress, which can lead to depression, often resulting in a slow healing process. Consequently, stress is currently becoming one of the highest expenses in healthcare.
Stress is often linked to highly densified areas but recovery from stress can be achieved while spending time in, walking through or looking at nature (Grahn & Stigsdotter, 2003). While nature is therefore, important in cities, densification leads to fewer green areas, resulting in a very stressed city. This causes its residents to seek relief of their hectic and forever ongoing daily life in city spas, allotment gardens and even secondary homes in the countryside (Metz, 2002; Ool, 2008).

Throughout history different idealistic urban plans had as main goal to create a healthy living environment with access to green spaces. One of these was the Garden City movement which was the answer to the rising density in cities and unhealthy living environments in the nineteenth century. It offered a new planning method for designing ideal cities by rethinking their structures. The model explains a schematic plan of the ideal city and of what such a city should consist of, clarifying the main structures, functions and set up of the city (Howard, Garden cities of to-morrow, 2013).
As mentioned earlier cities are rapidly densifying resulting in fewer green spaces and overpopulated neighbourhoods. This linked to the rising healthcare expenses caused by stress and mental health and current design questions such as climate issues, densification demands and healthy living environments leads to once again rethinking the structure of cities. The Garden City movement could therefore, offer a lens into rethinking current cities and their main structures.

To design such a healthy living environment, not only should the spatial structures of cities and their relation to the surrounding landscape be reconsidered, but it should also think about how the city is perceived from its residents, keeping the eye-level perspective in mind.
Without perspective or experience there is no connection between users and space. In landscape architecture complex design questions are emphasised resulting in perception and the sensorial aspects being mentioned less. Nevertheless, nature is perceived by its users and therefore, experience should be taken into account when designing a landscape (Bobbink & Wit). City residents could improve their mental health by experiencing nature and its beneficial effects. Perceived nature does not only consist of physical elements such as vegetation and size but it also involves the sensorial aspects like sun, shade or sound. How such a space can be perceived by users to experience the beneficial effects of nature, is a starting point for the design.
Along with this, rethinking the spatial structures of a city allows for creating various connections between the living environments and green areas or the surrounding landscape. Without green areas in the city there is no restorative nature therefore, the current imbalance between green and grey should be levelled out. The layout and structures of dense cities should be reconsidered, creating healthy living environments, that focus on green structures, answering the new design questions and creating spaces with restorative effects of nature.

1.2 RESEARCH OBJECTIVE

How to design such a healthy living environment or city focussed on restorative nature, what it would look like and how it would be experienced is the topic of this thesis. Therefore, the question is raised: What might a contemporary 'Garden City movement' look like, and how can this be implemented, responding to current environmental design questions, that focusses on restorative green spaces informed by movement and bodily experience?

To understand the history and the ideas on creating healthy living environments and how

landscape tradition and urbanism spatially reacted to those, the question is raised: What are the various ideas on creating a healthy living environment throughout history and how did it result in spatial designs in urban plans, landscape tradition and ideal cities?

The beneficial effects of nature are researched through exploring the restorative nature theories and how those can be used when designing green spaces. This leads to the question: What are restorative nature theories and how can they be applied to design restorative landscapes?

To conclude this part of the research and to explore what a contemporary 'Garden City movement' might look like the question is asked: What is the Urban Forest Movement and what are the main design goals and principles that form the spatial structure of the plan?

Although the city model is a scheme for the entire city and therefore, on a larger scale, the restorative effects of nature can only be experienced from an eye level perspective, resulting in a design through the scales.

Den Haag acts as a testing ground for this new city model. The city has a rich history of walking, swimming and estate culture which will be researched and used as input for the model. Furthermore, the city has a strong relation to the surrounding landscape because of its history. The lack of city rights resulted in Den Haag not having a city wall, allowing the city to grow into the landscape. The city and site are analysed to understand the historical layers and build-up of the structure to answer the question: What are the main structures of Den Haag, how do these relate to the surrounding landscape and what are the main design questions of the city and the chosen site?

To further explore the main question and research how the generic Urban Forest Movement could be implemented in a city the question is asked: How can the Urban Forest Movement be implemented in the chosen site and how can it be further elaborated on a detailed scale?

1.3 SETUP OF THE THESIS

The thesis is split up into four parts, Part 1: Introduction and outline thesis, Part 2: Research and Urban Forest Movement, Part 3: Analysis, vision and the design, Part 4: Conclusion and reflection.
The introduction, Part 1, describes the context of the thesis and the research objective. In the methodology an explanation is given on how the research is done. Part 2 shows the main findings and conclusions of the research, resulting in the Urban Forest Movement. In Part 3 the site is researched, a vision for Den Haag is made and the concept for the site is further elaborated in the final design. In Part 4 the thesis is concluded and discussed.

The maps, sections, photos and other visualisations are made by the author, if not the source is mentioned.

2. Methodology

2.1 METHODOLOGY OVERVIEW

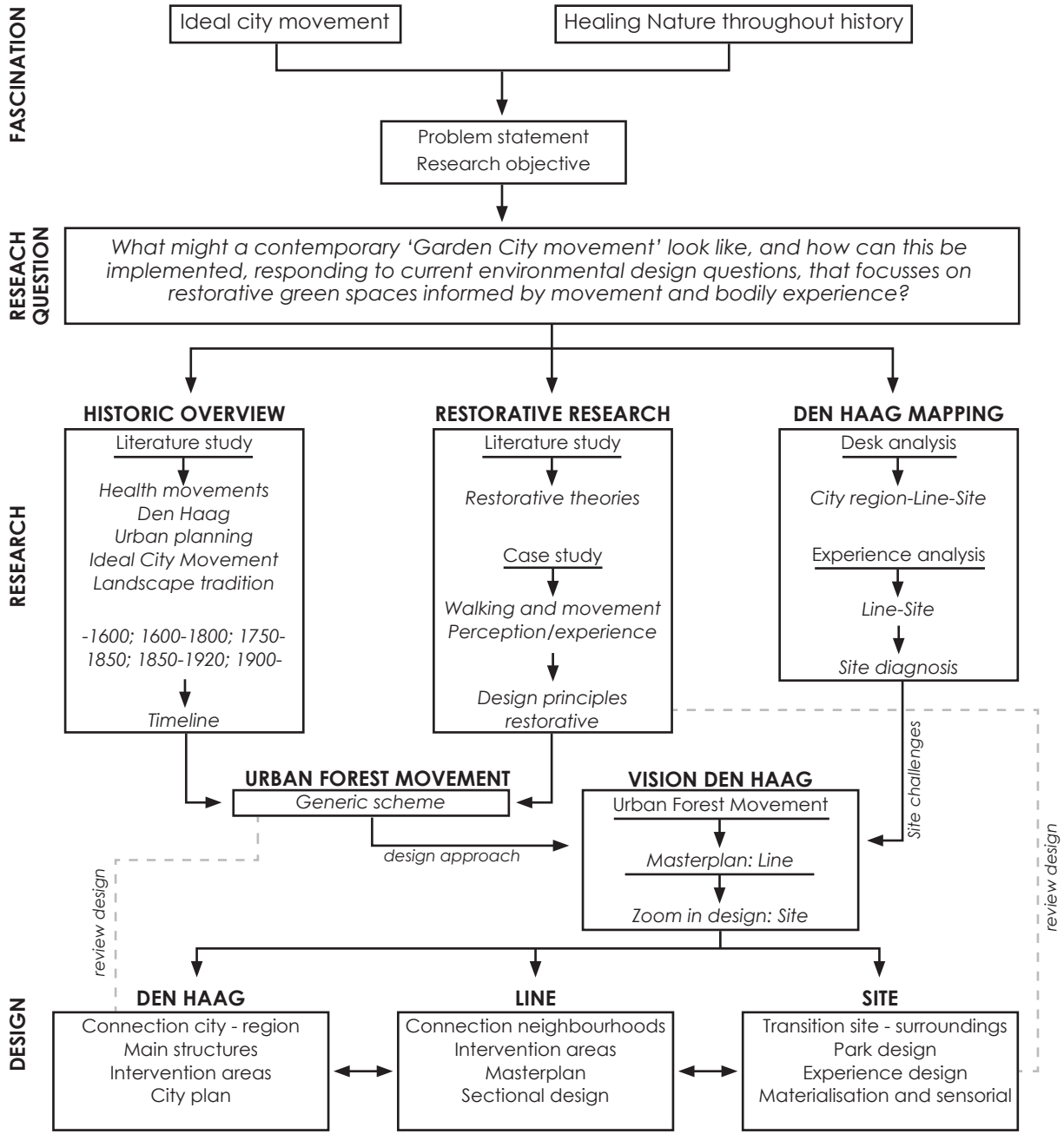


Fig. 2.1 Methodology scheme

2.2 RESEARCH METHODOLOGY

The main aim for this thesis project is to find a new way of designing cities focussing on restorative nature. To achieve this the question, What might a contemporary 'Garden City movement' look like, and how can this be implemented, responding to current environmental design questions, that focusses on restorative green spaces informed by movement and bodily experience? is researched.

Here the Garden City acts as a starting point in researching ideal city movements, their structures and their relation to the beneficial effects of nature. These will give insights into what a new scheme or model for a city could be and how this should respond to current design questions.

The research consists of three parts, a historic overview: creating healthy living environments - restorative research – conclusion, Urban Forest Movement. This last part will provide tools for a new way of designing cities, forming the Urban Forest Movement. How this movement can be used within a city will be further researched by applying and modifying it to the chosen site, resulting in a design on different scales. The design and Urban Forest Movement will inform each other resulting in a back and forth of improving and elaborating.

As mentioned earlier Den Haag is used as a testing ground for applying the Urban Forest Movement. The city is chosen for its rich history of estate culture and its remaining relation to the surrounding landscape.

The methodology explains the research methods that are used to answer the main question, following the structure of the thesis report. Part 1: Introduction and outline thesis, part 2: Research and Urban Forest Movement, part 3: Analysis, vision and the design, part 4: Conclusion and reflection.

PART 2: RESEARCH AND URBAN FOREST MOVEMENT

HISTORIC OVERVIEW: CREATING HEALTHY LIVING ENVIRONMENTS

The first part of the research focusses on ideal city movements, landscape tradition, urban planning and health movements related to healthy living environments. Therefore, the question is asked: What are the various ideas on creating a healthy living environment throughout history and how did it result in spatial designs in urban plans, landscape tradition and ideal cities?

Method

To understand how the ideas, on how to create healthy living environments, have had an influence on landscape tradition, urban planning, ideal city movements and health movements an overview is needed to summarize and compare reviewed literature. This research method allows for literature reviews from different subjects to be put in a timeframe and be compared to each other. From this historic overview, conclusions can be made leading to a better understanding of the separate researched topics.

A historic overview can be generic, it needs to be determined what subject, timeframe and space or place is chosen, to be able to use it. When determining these, and other, aspects of an overview the main research goal or question should be used to limit the time frame or how many subjects should be applied.

Applied method

This leads to the determination of the aspects of the overview, to focus the literature reviews on the needed information to answer the research question. What are the various ideas on creating a healthy living environment throughout history

and how did it result in spatial designs in urban plans, landscape tradition and ideal cities, is researched by exploring five subjects. These subjects are: health movements throughout history; ideal city movements; landscape tradition; urban planning; Den Haag. The subjects are researched using written literature, paintings, plans and photos. The determined timeframes for the historic overview are: -1600; 1600-1800; 1750-1850; 1850-1920; 1900-. These timeframes offer a way of restricting the literature research focussing on a set time period, also allowing for the found information to be compared by linking it to a period.
The conclusions from this method will be used for developing a concept for the Urban Forest Movement.

RESTORATIVE RESEARCH
Secondly the research focusses on restorative nature theories and how these can be applied when designing a site. Therefore, the question is researched: What are restorative nature theories and how can they be applied to design restorative landscapes?

Method
Literature and case studies are used to give an insight into what the main goals of restorative nature theories are and how these can be spatially applied when designing a green structure. In the chosen case studies restorative themes are used as lenses to investigate the main design goals and design principles. Different case studies are chosen to offer a variety scale, topography and style such as formal or picturesque offering a wide variety of design principles.

Applied method
This leads to a further exploration of restorative nature theories and how they can be spatially applied. Therefore, the question is asked: What are the main ideas of restorative nature theories and how can these be used in designing?
Here three theories are researched; Stress Reduction Theory by Roger Ulrich, Attention Restoration Theory by Stephen and Rachel Kaplan and Biophilia Theory by Edward Wilson (Bremer, Endale, Layla, Jannati, & Yi, 2017).
From these literature reviews various parks are researched by analysing them through the lens of restorative nature. This leads to the question: How can a green structure design offer beneficial effects of nature?
Here a part of the parks is researched through plans and design principles others are explored through literature. The researched parks are: Quirijnpark Tilburg, small scale park design; Oranjewoud Heerenveen, formal estate; Buttes-Chaumont Paris, park focussed on movement; Türkenschanzpark Vienna, park focussed on movement; The High Line New York, connecting park focussed on experience; Landschaftspark Duisburg-Nord Duisburg, park focused on experience and walking; Parc de la Villette Paris, park focussed on experience.
The conclusions from this method offer design principles for designing a restorative green space. These principles are summarized in a toolbox which is used to design the Urban Forest Movement.

CONCLUSION - URBAN FOREST MOVEMENT
To conclude the research the question is asked: What is the Urban Forest Movement and what are the main design goals and principles that form the spatial structure of the plan?
Here the findings of previous parts of the research will be summarized and developed into a concept, on various scales, forming the Urban Forest Movement. This plan is generic and needs to be altered, when applied to a site, to fit the genius loci.

PART 3: ANALYSIS, VISION AND THE DESIGN

ANALYSIS OF DEN HAAG

As mentioned earlier the city of Den Haag is chosen as site. To get a deeper understanding of Den Haag several analysis are done on different scales. From city and region scale to structure - and site scale, various subjects are mapped to offer conclusions.

Therefore, the question is asked: What are the main structures of Den Haag, how do these relate to the surrounding landscape and what are the main design questions of the city and the chosen site?

Method

To understand the region and the city of Den Haag, an analysis is done by mappings on different scales. This mapping method is a way of analysing the most relevant subjects for the city and valuating their findings to come to conclusions. Various ways of mapping, relevant to the subject, are used, such as: plan drawings, sections, photo (-collages), experiences and 3D drawings. Some of these are subjective and others objective. The subjective mappings explore my own experience during site visits, analysing views, sensorial aspects and the experience of restorative nature. The objective mappings, are researched through found information and site visits. The earlier mentioned historic overview is used to further analyse Den Haag, exploring any remains of the subjects at the chosen site.

Applied method

The research is done on different scales, each of them resulting from each other or earlier research. The analysis is done through desk study and site visits and consist of objective - and subjective mappings. The analysis shows spatial relations, water structures, climate issues, historical development, sensorial aspects - experience, ecology - vegetation, composition and urban structures. Subjective mappings are researched by walking around the site and noting my own experience, putting emphasis on the sensorial aspects.

Concluding the analysis, a design abstract on the different scales, resulting from the found design questions and problems, will be presented. This abstract will be further used in the vision and design on the three different scales.

VISION AND DESIGN

In this part the main question is further elaborated by spatial implementation and answering the question: How can the Urban Forest Movement be implemented in the chosen site and how can it be further elaborated on a detailed scale?

The design will be elaborated on different scales, showing the different levels of detail and spatial structures to create the Urban Forest Movement.

The conclusions from the analysis of the site are used together with the Urban Forest Movement to create a vision the city of Den Haag. From this the vision will be further elaborated in a masterplan and a detailed design, showing how to design with beneficial effects of nature. The designed structure will make use of the, in the research found, design principles on restorative nature.

PART 4: CONCLUSION AND REFLECTION

Lastly the thesis is concluded and further examined. Reflections on how certain elements could have been done differently, parts that are lacking and how it is relevant for the practise of landscape design and in future designs is discussed.

PART 2: RESEARCH AND URBAN FOREST MOVEMENT

3. Historic overview: creating healthy living environments

The ideas on how to create a healthy living environment have changed over time altering the way cities, parks and neighbourhoods are designed. If and how far these ideas have been translated into spatial structures that can be implemented in cities, neighbourhoods and parks is researched, showing how these different subjects have influenced each other's development. The Garden City, one of the ideal healthy city movements, is researched to further explore its contemporary applicability to current cities.

3.1 HEALTH MOVEMENTS OVER TIME

Medicinal plants have been used to cure illnesses and relieve pain. Looking through history a book on the use of vegetation for medicinal purposes can be found as early as the first century. This book offered an overview of types of vegetation and their medicinal benefits. Until the fifteenth century this book was used as a guiding tool for the medicinal treatments. The described methods were used and practised in monasteries, where courtyards offered the needed vegetation. These methods were further elaborated over time by the monks (Hajar, 2012). Along with this and with the spread of the plague, the need for a clean living environment rose, leading to the sanitary organisation of garbage, a sewer system, access to fresh water and food supply (Rhodes & Bryant, 2019).

A different type of health movement related to nature came up during the seventeenth century, focussing on exercising and amusement in nature. Johan van Beverwijck, a Dutch writer, encouraged people to walk in his medical encyclopaedia. When walking people should stay out of the sun to prevent overheating and therefore, walk in the shade of trees. Walking was a way of relaxation and amusement which was best achieved in the landscape where there was fresh air and vegetation (Jong, 2007).

This was further elaborated in a treatment which focussed on exercise by Hippocrates. Until the sixteenth century exercise was the way to maintain one's health and prevent disease (Tipton, 2014). This led to more people exercising by playing games, riding horses and playing sports not only outside the city but also in education more in the eighteenth century (Corre, 2014).

A new form of exercise, swimming, was introduced during the nineteenth century, which offered an additional health benefit, the salty sea air. This air proved to be beneficial for curing diseases. Therefore, the elites started taking trips to the beach to take a swim in the sea (Ool, 2008).

In the twentieth century, new theories offer a new way of looking at nature and its beneficial effects. These theories explain how visiting - or even looking at nature provides a restorative effect. These theories focus on how emerging oneself in nature can relieve stress and have positive effects on mental health (Bremer, Endale, Layla, Jannati, & Yi, 2017; Kaplan, 1995;).

Over time nature can be seen throughout different health movements. From directly using vegetation and turning into herbal medicine, exercising in nature for physical benefits to experiencing nature for its restorative effects on mental health.

3.2 IDEAL HEALTHY CITY MOVEMENTS

3.2.1 ESTATES

In Roman literature living in the countryside was glorified. Not only because residents could withdraw themselves from their work in the city but also because of the entertainment. Roman cities began to densify because of increased prosperity, which resulted in the middle class moving out of the city to get away from the busy lifestyle, creating many Villa Urbana's. Gardens were made even more pleasant by adding elements like a racetrack, fountains, orchards and placed to play ballgames (Ool, 2008).

Estates started appearing in The Netherlands in the sixteenth century, as a way getting away from the busy life in the city and to enjoy the entertainment linked to the countryside. These were city houses built outside of the city showing the residents status. One of the enjoyments was collecting various species of vegetation and displaying them in their garden, connecting the elite with other elites who had a similar passion. People enjoyed playing ball games, walking, going to the beach, fishing and hunting. Although the estate was a place where people came for quiet, the gardens had many different forms of amusement for the owners and the visitors. (Verschuure-Stuip, 2019).
Groups of old farms and country houses were transformed into amusement places all over the Netherlands around 1630. For instance, Frederik Hendrik van Oranje bought Huis ter Nieuburch and transformed it into a palace near Rijswijk. This led to a move of elites to the area of Den Haag, to build their own estates, forming an estate landscape. This landscape is a coherent group of estates with a similar relation to their environment (Verschuure-Stuip, 2019).
These estate landscapes therefore, can be seen as a way of finding a new city structure, linking different plots of land with a structure in the landscape. Creating a new way of living outside the city, in nature.

ESTATE LANDSCAPE: HEERWEG DEN HAAG

Along the heerwegen the composition of the estate showed a gradient between the road and the garden. The heerweg had a wide profile, 7,5 meter and aligned by trees on both sides. An example of this estate landscape is located on the north side of Den Haag along the heerweg that leads to Leiden. The estates were located in the polders on the beach walls, or on a gradient of those with the house pushed back from the road. Gates and playhouses reinforced the transition from heerweg to garden to house. Not all of the estates were directly located on the heerweg, some were connected through a perpendicular entry lane, partly in the garden and partly outside, enclosed by lines of trees. Because of these entry lanes and heerwegen the area had an orthogonal landscape structure. These estates had a visual link to their surroundings offering a higher view from a balcony or belvedere. To guard the estate from drifting sand, it was enclosed by a double row of trees. These estates used the waterways for irrigation of the lands and for their ponds (Verschuure-Stuip, 2019).

ESTATE LANDSCAPE: BARGE CANAL VLIET

Along the Vliet, a barge canal, between Rijswijk and Leidschendam on the southside

of Den Haag, various estates were located. Many of which were located directly along and oriented on the canal, providing a view on the Vliet. The heerweg was located on the other side of the estates, the backside, parallel to the canal. Most of the estates had a central, perpendicular axis that extended into an external view on the Vliet and the surrounding area. The estates are enclosed by a row of trees (Verschuure-Stuip, 2019).
Contrasting to the estate landscape researched earlier, here the estates and houses were directly located along the structure, so the residents could see and be seen. The estate landscape along the heerweg was more reserved, concluded from the positioning of the estate and the house.

3.2.2 GARDEN CITY (HAMPSTEAD/DELFT)
During the nineteenth century London experienced a flow of people into the city which led to an overpopulated urban area and a deserted countryside. The main question was raised, how do we stop the migration of people into the city and restore the amount of residents in the countryside? This can only be done by making the countryside more attractive by improving the possibility of social contact, higher personal comfort and to make the chances of progress equal to the chances in the city. The town offers high wages, job opportunities, promotions but also higher rent, unhealthy because of soot, big differences between groups and a greater distance to travel to work. The country offers beauty and wealth in the form of green views, parks, fresh air and calming sounds. Negative effects of the countryside are little entertainment so it is very dull, low and unpredictable wages and there are no sanitary arrangements (Howard, Garden cities of to-morrow, 2013).
These two different ways of living act as magnets and attract people to them, but according to Ebenezer Howard there is a third alternative. In this alternative the qualities of the town and the countryside are combined in a new way of living and a new method of urban design, the Garden City. This is a site of six thousand acres which consists of built area, agricultural fields and green spaces. A circular city, divided by boulevards into six equal parts from the centre to the outskirts. To prevent expansion into the surrounding landscape the city is enclosed by a railway. The public garden, at the hearth of the city is surrounded by public buildings and the Crystal Palace, a covered public park. The built is oriented on the avenues or on the boulevards. There are community gardens and sanitary arrangements. The industrial areas are placed in the outer ring next to the train rail, resulting in lesser traffic in the town itself. Although Ebenezer designed a scheme for such a city, but it must be implemented and changed to fit a site (Howard, Garden cities of to-morrow, 2013).

An example of a Garden City is Hampstead, which is currently intertwined within the London suburbs. The Garden City offers a low density neighbourhood with dwellings, for all classes, with front gardens creating a green space. The streets have a wide profile with trees and the public green spaces are open to all residents. The dwellings are placed so that there are no spoiled views. The end result is a city with a clear design structure, a dense centre, different neighbourhoods and morphologies, a boundary to enclose the city, axis and landmarks (Castex, Depaule,

& Panerai, 1984).
Another example of a Garden City, in The Netherlands, is The Agnetapark in Delft. This garden village was built in 1884, as a neighbourhood for the workers of the nearby factory. The neighbourhood is set up in the English landscape style, in the centre a public park, with a water structure, and the streets parallel to that. Here multiple homes are placed together under one roof to make it look like big villas. These buildings all have their own garden which are enclosed by hedges, creating a green atmosphere. Public buildings are located directly next to the park, keeping with the Garden City principle. Views on the water structure are guided by trees and vegetation (Kuitert, 2000).

3.2.3 FRANKFURT GREEN BELT (RÖMERSTADT)
During the nineteenth century many cities densified which meant that there was a need for urban expansion. This caused the agricultural land to be pushed to the outer areas, which led to a division in city and countryside (Kohler & Moffat, 2008; Cal, 2018). To keep up with raising demand for housing in Frankfurt a new framework was introduced. This framework was designed to provide housing for groups of lower income, to stimulate an overall design and to oversee property speculation. Architect Ernst May was selected to develop this new part of the city. May, inspired by the Garden City, designed plans that answered the needs of the population. The main goals were: create as much, inexpensive, dwellings as possible; answer the needs of the residents; select locations that are inexpensive; dwellings need to be designed as functional as possible; neighbourhoods should be completely autonomous; dwellings should be healthy (Mullin, 1977).
There was no space left in the existing urban tissue to built large new neighbourhoods causing these new developments to be placed outside of the city, along the outskirts. These sites helped to preserve a 'green belt' in the urban tissue. The neighbourhoods were designed in such a way that there was as much sunlight and airflow in the dwellings as possible, as well as space for gardening (Mullin, 1977). During the first and second world war the allotment gardens proved essential, for the public health. This inspired landscape architect Leberecht Migge to formulate new principles to design a neighbourhood with its own food and waste flow. Migge created a model in 1918 where in the residents could grow food in their own gardens and recycle the produced waste through composting. These neighbourhoods, for workers, contained of social houses were located in Frankfurt and were called the Siedlungen (Kohler & Moffat, 2008; Cal, 2018).
Connections between the city and the neighbourhoods, or Siedlungen, were designed as infrastructure. They were then connected through the earlier mentioned green belt, which is meant to link them as a community. In total there were 24 of these Siedlungen planned, the ones located along the Nidda river valley were realised following the original design goals. This area previously a swamp which was transformed into agricultural areas. By giving the swamp this programme May insured that this would remain as a green belt. Migge designed the green belt around the Nidda river valley, creating cycling- and walking routes. The design for the valley consisted of terraces

each having their own function. On the first terrace, along the river, people could walk and ride their bike, the second terrace was meant for playing sports, the third for gardening and the final step was built up by the dwellings (Mullin, 1977).
Bernard Lassus, landscape architect and planner, designed the green belt as a multi-functional design for the residents. It preserves the different landscapes and creates a generality and a boundary along the city. This green space other than an ecological corridor, forms a setting where people can interact with nature, on a mental and educational level, gaining knowledge on the environment. Nature areas across the belt have become popular resting spaces for the users (Moghadam, 2016).
One of the realised Siedlung neighbourhoods is Römerstadt in Frankfurt. The neighbourhood lies in between one of the main infrastructures and the Nidda valley. Residential buildings rise, parallel to the valley along the secondary streets. These parallel lines are cut up by curves in the streets, forming smaller, enclosed spaces. The neighbourhood is made up of terraces going down in the valley, with on the lowest terrace the allotment gardens. Breaking up the neighbourhood are perpendicular pathways ending at belvederes looking over the valley (Castex, Depaule, & Panerai, 2003).

The estate landscape, Garden City and the Siedlungen all have the same goal, creating a new living environment outside of the city with beneficial results. These are all constructed out of multiple neighbourhoods, cities or estates linked to each other by a structure in the landscape such as a canal, a railroad or a green belt. The estates were for the elites whether as the Garden City and the Siedlungen were meant for everyone.

3.3 LANDSCAPE TRADITION

Nature has always been seen as a healing source and therefore, can be used to create a healthy living environment. In the middle ages this can be seen in the courtyards of cloisters, which were meant for meditative and restorative purposes. Here patients could relieve their pain by experiencing nature with their senses. The gardens were seen as small paradises, locus amoenus, islands in a cursed world (Ool, 2008). Although the gardens provided a healing source, nature itself was seen as an unsafe place where illness and plagues ruled (van den Berg & van den Berg, 2001). The elites had their own gardens connected to their city house, which was used for food production, bleaching, socializing and relaxing. The courtyards were not public. Public green in the city was in the form of tree plantings, which were used for wood production, as recognition points and as protection against wind, rain and thunder.

The city walls became ineffective with the use of cannons therefore, they were replaced by green city walls covered with shrubs and trees, providing wood and safety for the city. Outside the walls the elites spent their time in Houten, enclosed parks or wooded areas. Here they hunted, socialised and enjoyed games such as Malie (Rooijen, 1984).

During the Renaissance the term landscape was used to describe the cultivated areas in nature. Here nature was seen as a landscape without the threats, offering a view. This can be seen in the villas of Rome.

The Horti Farnesiana was a public urban garden which offered a view on the city and the landscape, linking the garden to the genius loci. This kind of gardens were designed in an ordered way, which focusses on movement, controlling the perspectives, working with the topography and creating a view (Steenbergen & Reh, 2011).

In the sixteenth to eighteenth century estates were introduced as a way for the elites to be outside and experience nature or countryside in its idyllic state (van den Berg & van den Berg, 2001). They offered a break from the city (Verschuure-Stuip, 2019). These estates were linked together by axis and lanes creating a transition between landscape and the city. Most estates had a formal layout with as main design element, the axis. These lines formed sightlines which disappeared on the horizon, and were framed by a background of natural forests. The axis laces the landscape with the estate and the city, making use of the topography. Nature is represented as an ordered sequence of ground surface, plants, water and light. The garden shapes were manipulated so they would create the perfect perspective (Steenbergen & Reh, 2011).

During the seventeenth century walking became popular within the middle class, not the elites, for they had their own private gardens. For the middle-class walking was seen as leisure and was done in gardens, on city walls, on avenues that lead out of the city and on boulevards. These public spaces where full of people, of middle and lower class, escaping their intensive labour filled week on Sundays (Jong, 2007).

During the eighteenth century the gardens and parks of the nobility were opened for the residents of the city. These residents were the elites and all got a key which granted them access (Rooijen, 1984). During the romance, the nineteenth century, the appreciation of wild nature occurs. Here the English landscape style is used for its health benefits, balancing directed – and effortless attention providing a balanced mental state. Picturesque gardens encourage curiosity without being too demanding (Thompson, 2011). This English landscape style is a result of creating a new attractive living environment for the elites. It formed a green nature living environment within the city. This living environment was an urban landscape garden with a circular, ceremonial route, creating a link between the landscape and the theatrical scenes formed by the built (Steenbergen & Reh, 2011). In the nineteenth century the city walls were transformed into parks and boulevards where residents could walk. Here people could clear one's mind in a landscape that provided pathways with vistas (Rooijen, 1984).

In the nineteenth century, a big park was needed to balance out the negative effects of the growing city which created a dense and polluted living environment. This park needed to offer a place to get away from the city by feeling completely emerged into nature, which meant that the city must not be visible from the park. It also needed to be accessible and have a central location in the city. There should be a balance between human use of nature and nature itself and different speeds of movement should be separated (Steenbergen & Reh, 2011).

During the twentieth century there was a shift in green spaces. The public health needed to be improved, providing the workers in many cities with the opportunity to visit parks. These parks offered recreation and relaxation in nature, helping the workers recover from their work week and improve their health (Rooijen, 1984). This functional urban park was designed in a formal but modern style, offering many different functions (Steenbergen & Reh, 2011). The emphasis in these parks lies on the physical improvement not so much focussing on mental health (Thompson, 2011). Many of the cemeteries in the city were transformed into parks, providing the workers with sunlight, fresh air and movement (Rooijen, 1984).

Throughout history having a garden was used not only for food and wood production but they were also used for socialising, relaxing and heaving a break from daily life. While these were only for the elites, the other classes found their own way of enjoying nature on places or structures which had a different function. These boulevards, tree plantings or city walls offered a way to escape from the work life. The later designed parks for all had various functions and way of spending time in it for its users, focussing more and more on the activities in nature.

3.4 URBAN PLANNING

At the end of the sixteenth century a city design consisted of a grid parcellation which offered equal accessibility for the whole city, a uniform city, public spaces and maximum light and air accession. The public spaces, or markets, were distributed evenly over the city to again, ensure good accessibility (Klerk & Cammen, 2010).

During the seventeenth century, the Golden Age, many of the Dutch cities grew because of the immigration. Therefore, cities had to extend out into the landscape which also led to a new city wall surrounding these expansions. These new fortifications were made from green walls, to ensure that no canon could penetrate the city. The expansions had as main design goals; separation of functions, sanitation, accessibility and a coherence between old – and new city. During this time Rationalistic parcellation shaped the new neighbourhoods, not only for maximum light and air accession but also for military purposes (Klerk & Cammen, 2010).

In the nineteenth century a new urban movement emerged, the Garden City. Here residents could live in spacious neighbourhoods with better living quality. Public green was designed as parks and residents had their own private garden.

Many of the estates were redesigned in this period, into villa parks. Here residents could enjoy a combination of recreation, nature and living (Ool, 2008).

A century later many different forms of urban planning were used to design new neighbourhoods. The Monumental urban plan consists of a symmetrical street design with monumental squares, monumental buildings, building blocks and a different of set spatial characteristics for each street. All together it offered one city image with community courtyards (Klerk & Cammen, 2010).

Another form of urban planning during this period was the Functional urban plan, focussing on mass production, placements of buildings for optimal incidence of light and avoidance of closed build blocks. The different neighbourhoods are separated

by green areas and connected with recreational areas. Green is seen as a separate function (Klerk & Cammen, 2010). From this concept the Stamp urban plans emerged, it was a way of building fast and cheap by constructing with a crane. The car had an important role in these neighbourhoods, each resident had their own parking space and room was made for the car. The open neighbourhoods with community gardens are designed to create a sense of community (Klerk & Cammen, 2010).
While the last two urban planning styles, functional and stamp, were all about standard housing and building fast causing a monotone living environment, a counter reaction emerged, the 'cauliflower neighbourhood'. This was designed with small scale and recognizability in mind. The low-rise neighbourhood offered a diversity in paved and green areas, a diversity in housing, a clear private and public gradient and a clear orientation. Child friendly - and car free areas were created by green spaces meandering through the neighbourhood (Klerk & Cammen, 2010).
During the twentieth century, another reaction to the high housing need were the Vinex neighbourhoods. These had four main design goals; strengthen the shopping centres, limit the amount of people moving out of the middle large cities in the Netherlands, protect the open – natural areas from expansion and densification , and limit the amount of work-live commuters (Klerk & Cammen, 2010).

The various mentioned urban plans try to create neighbourhoods that meet the needs of the build period but also keep a healthy living environment in mind. Neighbourhoods are planned in such a way that there is enough fresh air, sunlight and public space. This results in different ways of creating green spaces, in public parks or private gardens, surrounding or piercing the neighbourhood.

3.5 GREEN STRUCTURES IN DEN HAAG

Den Haag has many of the landscape tradition green spaces mentioned earlier such as estates and public parks. Many different types of estates can be found in and around Den Haag which most of them were realised during the seventeenth until the nineteenth century. Although Den Haag follows most of the landscape tradition movements it also was one of the first cities to create a connection to the beach, creating the Scheveningseweg. This boulevard that leads to the beach was built in 1650 which led to a beach culture. This beach culture was only seen around the nineteenth century in other parts of the Netherlands (Ool, 2008). The Haagse Bos is another example of Den Haag being ahead of the movements. This forest was a remaining part of a Medieval inner dunes forest which was a popular hunting ground. In the sixteenth century the forest was the first one to be protected against logging in a nature conservation manifest. The forest was opened for public in 1613 (Oldenburger-Ebbers, Backer, & Blok, 1998).
Den Haag does not have a city wall therefore, the transformation of those in parks and boulevards never made an appearance in the urban tissue (Schuppen, 2006). The Zuiderpark is an example of the public park movement and was realised around 1908, aligning with the period of the movement itself.

3.6 HISTORIC OVERVIEW - CONCLUSION

DEN HAAG

URBAN PLANNING

- GRID PARCELLATION (marketsquare)

- CITY EXPANSION (city walls)
- RATIONAL PARCELATION

	-1600	1600-1800	1750-1850
LANDSCAPE TRADITION	**ORDER** - HOUTEN (leisure purposes) - COURTYARDS - (restorative, garden) - CITY WALLS - (fortification) - TREE PLANTING - (wood production) - URBAN GARDEN - (escape) - CULTIVATION - MEDITATION (sensorial nature)	**FORMAL** - ESTATES - (escape, promenading, leisure purposes) - WALKING - ESCAPING (controlled nature, elites)	**ENGLISH/PICTURESQUE** - PARK CITY WALLS - (promenading, leisure pu experiencing nature (bir eye view) - BOULEVARDS - (promenading) - WALKING - EXPERIENCING NATURE (elites)
IDEAL CITY PLAN		ESTATE LANDSCAPE	
HEALTH MOVEMENTS IN HISTORY	MEDICINAL PLANTS IMPROVE SANITATION: water supplies, garbage, sewage, food inspection (13th - 14th century)	WALKING (17th century) EXERCISES, GAMES, SPORTS (16th-17th century)	SWIMMING (19th centu

Den Haag images (source: beeldcollectie Haags Gemeentearchief)

Estate Landscape (source: Cruquius & Cruquius, 1712)

Fig. 3.1 Historic overview


Van Stolkpark 1875


Zorgvliet 1919


Zuiderpark 1908


Westbroekpark 1926


Willemspark 1813


Marlot 1924


Marlot 1924


Meer en Bosch 1910

- VILLAPARK (green living environment)
- GARDEN CITY (community and private gardens, public parks)

- MONUMENTAL (community gardens)
- FUNCTIONAL (neighbourhood distinction because of green structures, Highrise to make space for public green, green is also program)
- STAMP (community gardens, public green)
- CAULIFLOWER (meandering green spaces)
- VINEX (protection naturel areas facing urbanization)

rposes,
ds

1850-1920

ENGLISH

- CITYPARK - (escape, pastoral, promenading, leisure purposes)

- WALKING
- ESCAPING

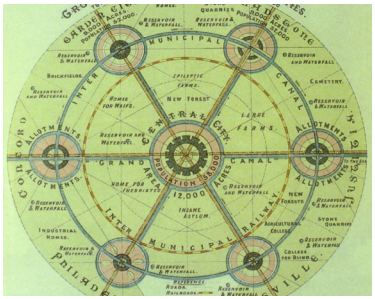
1900-

FORMAL/MODERN

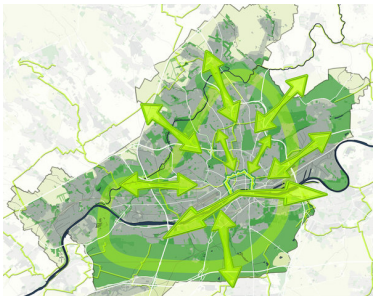
- PUBLIC PARK - (promenading, leisure purposes, socialising, sport and play, education, gardening)

- ACTIVITIES IN NATURE

GARDEN CITY



SIEDLUNG



ury)

RESTORATIVE NATURE THEORIES (20th century)

Garden City (source: Howard, The Garden City Concept, 1902)

Siedlung: (source: Grün erleben in der Stadt: Korridore zum GrünGürtel)

The main similarity in the ideas on how to create a healthy living environment is the use of nature, which can still be recognised in spatial structures in cities and in the surrounding landscape. The idea of exercising in nature in the sixteenth to eighteenth century resulted in green structures that can still be recognised such as the houten, estates, tree plantings and parks on city walls. The further developed ideas on healing nature resulted in the design of healthy living environments such as the Siedlungen and the Garden City. From the healthy living environment movements new neighbourhoods were realised designing with sunlight, wind and public green spaces, resulting in big scale open urban plans. City parks were added to offer green public spaces with many functions to the masses, improving the health of workers. At the same time the restorative nature theories came up, emphasising that spending time in nature improves mental and physical health. Not only by doing activities in nature but rather by emerging in nature and experiencing it. A new respond from urban planning and landscape tradition is needed to spatially apply these theories.

When designing a healthy living environment or a new ideal city 'model' it should work through the scales. The Garden City 'model' does not do this, it is a diagram on one scale, not offering design ideas for the lower scales. This leads to a disconnect between the scheme and how it could be implemented in a site. The Garden City model is obsolete not only by missing a design through the scales but also by not answering current design questions. The Garden Cities however do show the movement on different scales. Therefore, the design of a new ideal city model, should work through the scales, from planning to experience level, answering current design questions such as climate change, densifications and healthy living environments.

4. Movement as restorative green structure

As mentioned in the previous chapter the restorative nature theories emerged in the twentieth century. However, the historical overview did not yet show an example of a design with these theories integrated in it. To better understand these theories and how they could be implemented is explored in this chapter.

4.1 RESTORATIVE NATURE THEORIES

Nature can have beneficial effects on mental health and on wellbeing. There are three theories which explain how nature can have these effects; Biophilia Theory by Edward Wilson, Stress Reduction Theory by Roger Ulrich and Attention Restoration Theory by Stephen and Rachel Kaplan (Bremer, Endale, Layla, Jannati, & Yi, 2017).

The first theory claims that humans have an undeniable love for nature, because of the relation between humans and nature throughout history. The sense of safety in nature descends from the idea that in open spaces, threats can be seen ahead. Therefore, Biophilia claims that a savannah like landscape, including an open space with water remains as the most restorative type of nature (Bremer, Endale, Layla, Jannati, & Yi, 2017; van den Berg & van den Berg, 2001).
Roger Ulrich claims in his theory, The Stress Reduction Theory, that by positioning oneself in nature one would feel like they are removed from their everyday life and the stress that comes with it. Secondly nature provides an aesthetic image, distracting someone from their daily activities and keeping their attention not only by the aesthetics but also by fascination, leading to a longer stay in nature. Even a view on nature could already provide restorative effects for mental health (Bremer, Endale, Layla, Jannati, & Yi, 2017; Grahn & Stigsdotter, 2003).
The final theory is the Attention Restoration Theory by Stephen and Rachel Kaplan. It claims that attention fatigue can be relieved by nature. This fatigue is caused by a long period of directed attention, an attention which demands effort, and can only be restored by involuntary attention or also called fascination. Nature consists of legibility and mystery causing its visitors to roam further through it because of fascination and interest. Nature offer a feeling of being away freeing visitors from directed attention (Bremer, Endale, Layla, Jannati, & Yi, 2017; Kaplan, 1995).

These theories have similarities as on how these beneficial effects can be experienced or achieved, such as emerging the visitor in nature, creating a sense of being away from daily life or triggering the visitor's fascination by a balance between mystery and legibility. Although they provide some design ideas, the theories don't clarify how these ideas can be spatially implemented.

4.2 MODES OF WALKING

However, the ideas can be recognised in the modes of walking by Hendrik Schultz. He claims that that there are three modes of walking: the discovery -, the flow – and the reflective mode. The first focusses on curiosity and fascination, while walking people are only paying attention to the surrounding area, letting their surrounding sink in and collect information. This is done from fascination and hence there is no precedent idea or goal (Schultz, 2019). This is similar to the Attention Restoration

Theory from Kaplan and Kaplan. This theory suggests that mental fatigue caused by too long directed attention, attention for which people need to make effort to focus, can be relieved by effortless attention, fascination -based activities (Kaplan, 1995). During the discovery mode people get new insights on the landscape by linking sensorial aspects, views with areas. This mode is an important tool while designing for the region or larger scale areas (Schultz, 2019).
The second, the flow mode, explains the effect which occurs during the walk while listening to one's intuition, instinctively walking along lines in the area, becoming one with the landscape. This is achieved by offering inspiring areas which distract walkers from their own thoughts (Schultz, 2019). The last mode, the reflective mode, shows a final stage of a walk, reflecting on the experiences and putting it on paper, creating drawings and explanations (Schultz, 2019).
The understanding of a landscape can change during a walk, each area can be experienced differently by looking at the area or engaging in it. It encourages the walker to emerge in nature and therefore, forget their thoughts. While walking people leave their traces in the landscape, altering it mentally and physically, such as creating new lines in the surface. Walking does not only include motion but also experience and creativity, understanding the landscape by linking it to our own ideas. During the walk people are fully emerged in nature providing them with the opportunity to create new memories (Schultz, 2019).

Other ways of walking further substantiate the link of walking with emerging in nature and generating fascination. John Dixon Hunt, claims that there are different ways of walking and moving through a landscape or garden; the ramble, the procession and the stroll. The last two particularly explain how these walks offer experiencing nature and generating fascination.
The stroll offers a route which links incidents and movement together, providing the hiker with a purpose of walking and an end point. Here a defined route and visual marks are designed to provide the hiker with a sense of direction. During the walk the hiker experiences different theatrical elements such as build elements and resting places, which are announced along the route by framed views, leading the visitor to want to discover more (Hunt, 2002).
The ramble provides a route or movement that can go on forever, stimulating one's curiosity and impulse to wander. Because the curiosity of the hiker is triggered, which leads to a ramble, the walk is usually done alone. While a park will offer a route for the hiker to walk, a defined route is left out to stimulate the hiker's own initiative to explore nature. This leads to a new exploration of nature each time the visitor enters the garden. Landmarks can guide movement in these gardens but the design avoids direct sightlines, placing landmarks in such a way that the hiker can find its own route to it. When walking out of interest without a path, hikers will look for topographical elements in the landscape such as waterways and elevation lines (Hunt, 2002).

4.3 HISTORY OF WALKING AND MOVEMENT

In the Netherlands the connection between the core of the city and the surrounding landscape, with everything in between, was formed by walkways. Johan van Beverwijck,

a Dutch writer, encouraged people to walk, in the seventeenth century, explaining that the human body is not meant for sitting still but for being used, walking was a perfect way to exercise, not being too demanding (Jong, 2007).

Walking was only for the middle class during the seventeenth century, the elites had their own private gardens. Walking was seen as leisure and was done in gardens, on city walls, on avenues that lead out of the city and on boulevards. These public spaces where full of people, of middle and lower class, on Sundays escaping their intensive labour filled week. During these walks they could discover something new, experience amusement with others and escape the order or expected behaviour in urban settings.
Not only was walking a form of leisure, it was also used to understand the landscape by researching it. Botany was first seen during the sixteenth century but the activity was a century later seen during walks. Here the emphasis lied on the understanding and observing of the landscapes people came across. The city was no longer seen as the main and most important element in the landscape but it was seen as one of the elements of the landscape (Jong, 2007).

During the seventeenth- and eighteenth-century walking was also prominent in country-house poems. Here the urban elites composed a poem which allowed the reader to imagine being on the walk in the garden which is explained in a day but showcasing the different seasons. Poems explain how the garden is experienced by the walker's movement. The elites also used walking to show off their correct behaviour and civility to emphasise and support their social position (Jong, 2007).

Walking provided a way of escaping one's everyday life. Living and working in the city was very organised and structuralised. Contrary to this, the surrounding landscape was wild, offering a much-needed difference in scenery to everyday life. Walking symbolised freedom and acted as exercise, playing opportunity and opportunity for discovery all while collecting knowledge. City walls provided a higher place in the landscape from where people could see a panoramic view of the area. People were "refreshed" after talking a walk (Jong, 2007).

In the twentieth century Bernard Lassus wrote that walking is a succession of ambiances, each having their own effect on the stroller's senses, understanding of a place and time. While walking people cross boundaries and discover places where they have never been before (Jong, 2007).

During the industrialisation in the nineteenth and twentieth century, the rise of the railway introduced a new way of experiencing the landscape other than walking. Not only produced this speed a new experience of movement and view on the surrounding environment but it also started a new way of designing different movements or speeds through the landscape. Because of this new speed various landscapes that were previously far apart suddenly seemed to dissolve into each other. When traveling by train the traveller loses the sensorial part of nature but by seeing nature pass by, they could discover landscapes they would want

to visit later. These panoramic views on the landscape, created by the speed of the train, are later transformed into urban parks. Here vistas are created by curving routes and patches of vegetation, framing or revealing a view that stimulates an experience that can only be witnessed by movement. This links back to traveling by train where its users are continuously seeing something different, a fast way of experiencing the landscape (Freytag, 2002).

Although emerging oneself in nature and experiencing it and generating fascination, the common design ideas of the restorative theories can be recognised in walking, nature can be experienced by any type of movement through nature. Although traveling by train won't let the visitor experience the sensorial aspects of nature it will show various panoramas, creating fascination to later visit those landscapes. Therefore, different speeds of movement offer various levels of experiencing nature and accordingly experiencing its beneficial effects.

4.4 KINESTHESIA AND SYNESTHESIA

To understand how people, interpret the surrounding space we have to take into account the kinaesthetic, the movement of the body, and synesthetic experience, sensorial perception. (Velde, 2018).

The human body connects to a space through tangible experiences, without these you cannot perceive a space. Tangible or qualitative terms can be described as elements that the human body perceives such as; colour, texture, depth, wind, sun, sound etc. A space is further experienced by the way that the human body is oriented. The body has two sides, a front- and a backside, these define the dimensions and orientation of a space (Casey, 1997).

By moving through a space, elements in it and the space itself will be experienced differently. This is a result of the visual relation between the body and a space, explained by Husserl's concepts of near-sphere and far-sphere (Velde, 2018). Space or elements which are near will allow the body to see them as accessible or familiar, where one can move to. Spaces which are far, seem to be inaccessible and unknown, for they are not in in reach. Husserl mentions that walking creates a way to link the spheres and create one environment. Without this connection, segregated tangible experiences would only offer one side of a space such as colours or texture, it would not form a whole space. A space cannot be experienced without kinesthetics or synesthetics, the experience of the human body in a space and its sensorial perception of that space. How one is moving or resting in a space and how this affects the experience of; the textured ground one is standing on, the changing depth of a space while walking, difference in sun and shade while walking, different colours and sounds, all contributing to the experience of that space (Casey, 1997).

PATHS

During a walk, spaces, experiences, views and sensorial aspects are linked showcasing the landscape and its characteristics. Pathways offer an approach on how to walk through these landscapes while experiencing the different textures, elevations, sounds, smells etc. Although these pathways give an insight on how to experience these different landscapes, they don't add to the

experiences of these spaces. This is because the texture of the path is usually the same in one park, landscape or garden, this to clarify for the walker what is the route. If the pathway would change, in texture or material, along with the spaces it would make walkers more aware of their context and the spatial characteristics of that space (Lassus, 1998).

4.5 CASE STUDIES: KINESTHESIA, SYNESTHESIA AND MOVEMENT

To understand how a visitor can be emerged in nature by the kinaesthetic and synesthetic experience further and to understand how to design with movement various parks are looked into.

4.5.1 PARC DE LA VILLETTE, PARIS

Tschumi designed a composition scheme for the park, which was needed to give a response to the irregular site. The scheme consists of lines, spots and surfaces of which the lines are a way of organising movement throughout the park. These lines are formed by three elements; roofed pathways, parallel to the waterways connecting to the surrounding neighbourhoods, avenues, enclosed by lines of aligned trees, which connect different activities in the park, a curving pathway that leads the hiker trough different theme gardens. The last one, the Promenade de Jardins, consists of a sequence of unrelated images or frames, allowing the visitor to experience these images separate, thus the route does not have a beginning or end. It uses similar design principles as the pictorial English gardens, although the route in Parc de la Villette is not determined. Here the pathway allows hikers to choose their own sequence of frames creating their own experience. The park offers a sensorial experience through the Jardin des Bambous, here the sunken pathway blocks the hiker views leading them to experience the garden with other senses (Velde, 2018).

Fig. 4.1 Promenade the Jardins Parc de la Villette (source: Vicedi à Paris)

Fig. 4.2 Sensorial experience Parc de la Villette (source: Lastorina, 2009)

4.5.2 LANDSCHAFTSPARK DUISBURG-NORD

The design of the Landschaftspark Duisburg-Nord by Latz focusses on the novel reading of the area, concentrating on the existing industrial site and the elements that are a result of that such as rail tracks, waterways and the vegetation. It consists of four layers; waterpark, rail park, promenade park, fields and gardens. The rail park layer consists of the transformed rail tracks, in the remaining harp shape, which offer space for different types of movement. These different types are separated in pathways which are elevated above the park, sunken and enclosed in tunnels and sloping to link the other paths. Another layer, the promenade park is designed with the same principles, by transforming the original bridges and roads that were found in the site. Movement allows the visitor to experience different areas and link views to understand the composition of the park. This movement happens on three different scales; the separated park spaces, these park spaces together and the park as a part of the bigger Emscher system. Because of these three scales the park can be used and experienced in different ways such as exploring a part of the park on foot or traveling across the entire park by bike. Therefore, it is not possible to oversee the entire composition of the park and the area from one point (Velde, 2018).

The spatial design of the park is supported by a kinaesthetic scheme, to let the visitors experience the full design of the park. This can be seen in the blast furnace area, where all paved or hard surfaces allow for a free roaming of the site, which before was prohibited. Visitors will discover different events and experiences while walking around. The industrial buildings and elements are cut open in certain places to provide new accesses and sensorial experiences. This results in visitors feeling like they are within the structure or towering over it which increases the bodily experience, strengthening the kinaesthetic design (Velde, 2018).

Part of this design is the sensorial experience

Fig. 4.3 Accessibility Duisburg Nord (source: Rudowitz, 2019)

Fig. 4.4 Tactile experience Duisburg Nord (source: Berns)

which can be experienced in the park through the different materials and textures used in the pathways and industrial buildings, the different microclimates created by the dark, enclosed bunkers or the waterways, the smells and sound created by different types of vegetation and the dark and light difference created by different types of canopy and vegetation (Velde, 2018).

4.5.3 THE HIGH LINE, NEW YORK

The design scheme of The High Line focusses on spatial and how the visitor moves through it. With the most important aspect of the design being the speed, encouraging the visitor to move through the design slowly to allow for distraction. Because of the length and the surrounding buildings of the park it cannot be seen as a whole, it can only be experienced by walking, viewing it as a series of different spaces and atmospheres. This relates back to the panoramic perception, creating different views one after another therefore, the visitor can be seen as a moving train experiencing the landscape it moves through. The vegetation plays an important role in the sensorial experience, creating a sometimes an enclosed space by dense planting and other times an open space covered in grasses moving in the wind. These types of vegetation offer different sounds, smells, textures and visuals. The views from The High Line offer different images of the city, from enclosed by high building blocks to views on the Hudson River, which can only be experienced while walking through the park. The surface texture of the park is smooth which allows effortless walks in the park (Velde, 2018).

4.5.4 TÜRKENSCHANZPARK, VIENNA

The Türkenschanzpark in Vienna was in a way a representation of the surrounding landscape, the Semmering, a mountain range. This mountain range was made accessible by a railway, which connected the city to the surrounding landscape. The train provided views on the pastoral

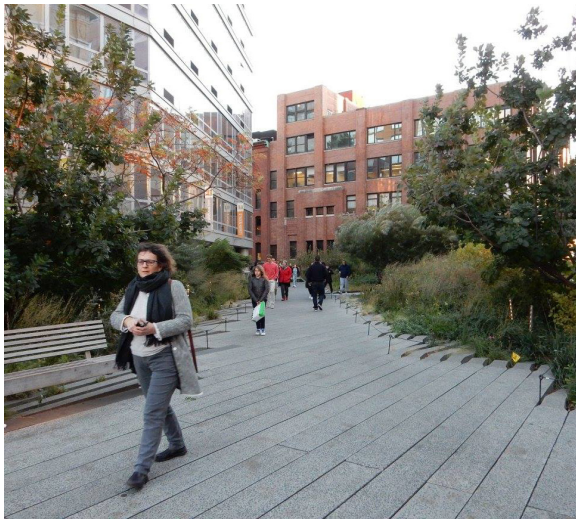


Fig. 4.5 Smooth pathway The High Line

Fig. 4.6 Sensorial experience by vegetation The High Line

landscape, in which the modern viaducts emphasised this atmosphere even more. Later the Türkenschanzpark was made more accessible by an added railway station. Straight bridges added to the park link to the tracks. The park offers a mountain like landscape experience for hikers with steep slopes, waterfalls, waterways and open fields. The steep paths offer a challenge for the hikers and raises awareness of how the speed of walking as movement is experienced in contrast to the train (Freytag, 2002).

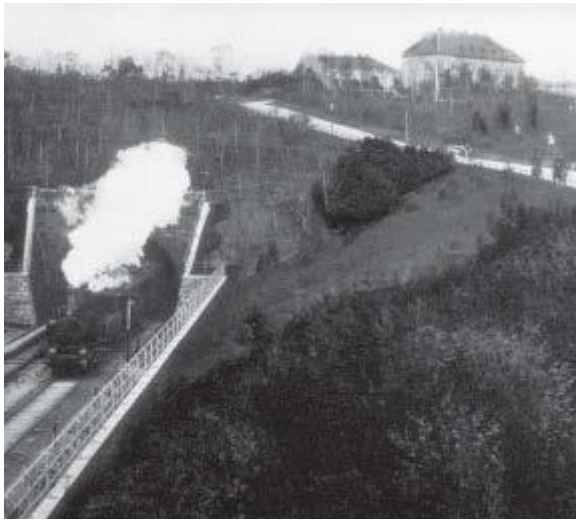


Fig. 4.7 Fast movement, train Türkenschanzpark (source: (Historisches Museum, Vienna, 1910)

Fig. 4.8 Türkenschanzpark steep path Türkenschanzpark (source: Plesky, 2017)

4.5.5 BUTTES-CHAUMONT, PARIS

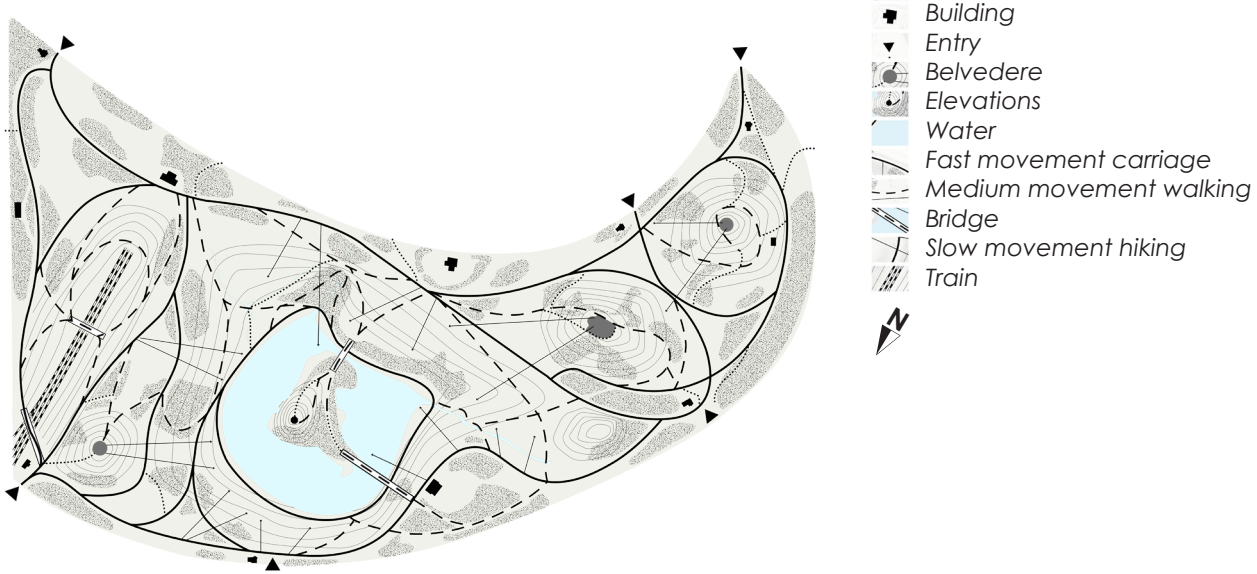


Fig. 4.9 Plan Buttes-Chaumont - 3 movements

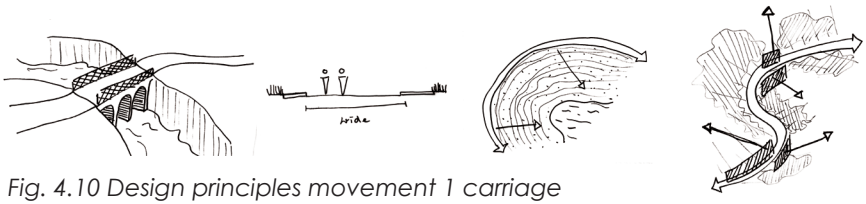


Fig. 4.10 Design principles movement 1 carriage

Fig. 4.11 Design principles movement 2 walking

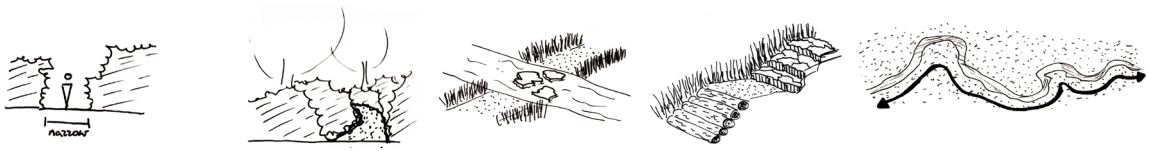


Fig. 4.12 Design principles movement 3 hiking

Fig. 4.13 Buttes-Chaumont fast route (source: Beaudouin, 2011)

Fig. 4.14 Buttes-Chaumont pedestrian route (source: Bennewies, n.d.)

In Buttes-Chaumont three types of movement can be recognised, each having their own width, material, and steepness of pathways. These types are hiking, walking or riding a horse or by travel by carriage. The faster the movement the less it is connected to the landscape, for instance by removing any height differences by building bridges or tunnels. Promenades consist of a smooth surface, a certain width and no to little elevations as possible, creating the perfect route for carriages. The pedestrian routes however were designed to feel like rural pathways consisting of narrow paths with steep slopes and stairs made of wood and stones. These routes followed creeks and other topographical elements in the landscape, offering the hikers an exciting trip that was unpredictable (Freytag, 2002; Velde, 2018).

4.5.6 ORANJEWOUD, HEERENVEEN

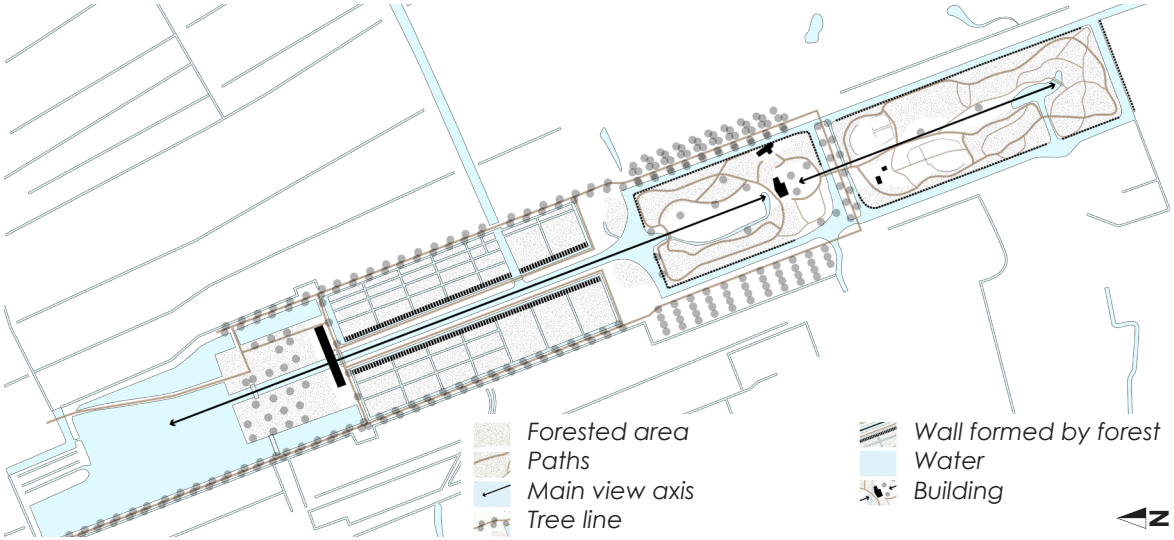


Fig. 4.15 Plan Oranjewoud - routing and views

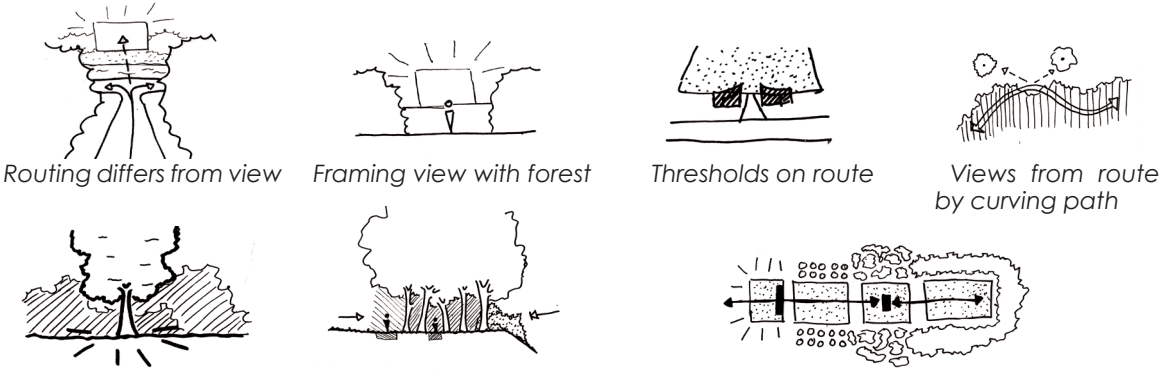


Fig. 4.16 Design principles Oranjewoud

Oranjewoud, is an estate in the north of The Netherlands redesigned by Michael van Gessel. He emphasised the formal layout by strengthening the views and the main set up of the site. A main axis offers a view on the house. To reach this house visitors need to follow the route which differs from the main sight line or axis. This creates interest to explore the site. The site exists of multiple islands all connected by views. To reach an island visitors need to pass a threshold emphasising the change of space (Gessel, 2004-2005).

4.5.7 QUIRIJNPARK, TILBURG

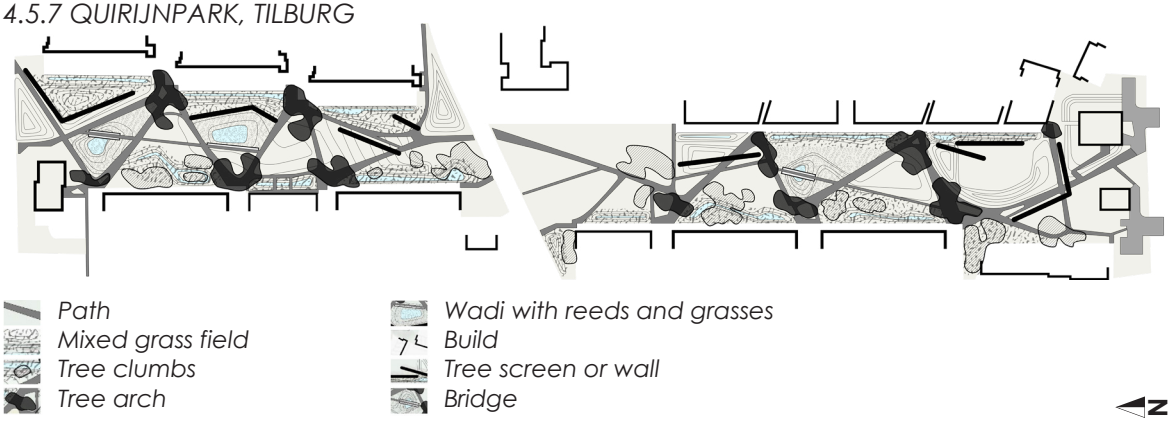
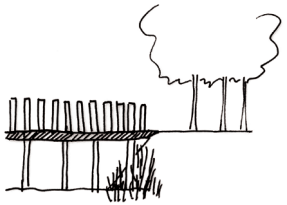
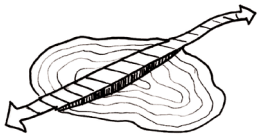
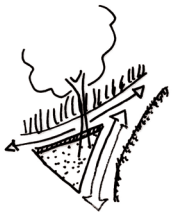


Fig. 4.16 Plan Quirijnpark - composition and transitions

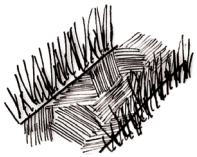


Movement - path emphasising height difference





Nature cut outs guiding the route



Elements of the park refer to textures and lines in nature

Entry to the park emphasised by tree arches

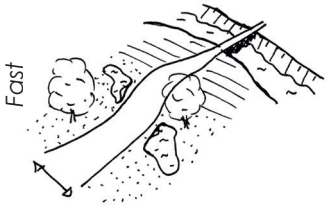
Movement to the park emphasised by a step

Fig. 4.17 Design principles Quirijnpark

The Quirijnpark is a park that offers a connection between two neighbourhoods in Tilburg. Dug out part serve as wadis for temporal water storage. Using the dug-up soil, elevations in the park are created to form boundaries and spaces. The paths are made up of concrete elements which emphasise the height differences in the park. The design refers to natural structures and lines by translating them into elements in the park such as the textured path, bridge railing and light posts (Karres en Brands, 2001-2010).

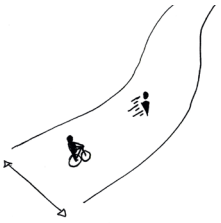
4.6 CONCLUSION: MOVEMENT DESIGN PRINCIPLES

SPEED OF MOVEMENT



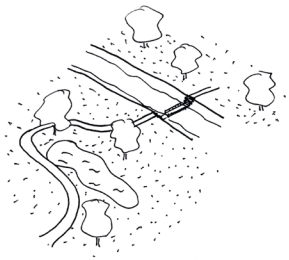
Leveling landscape for smooth route

Panoramic views

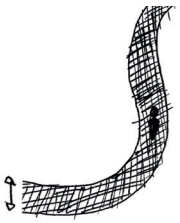


Smooth and wide path

Sightlines by framing and curves

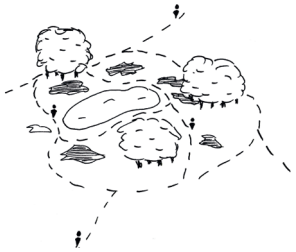


Path following the landscape

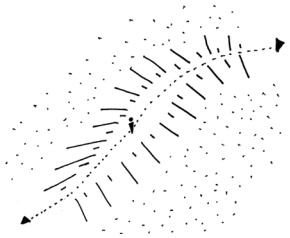


Textured and narrow path

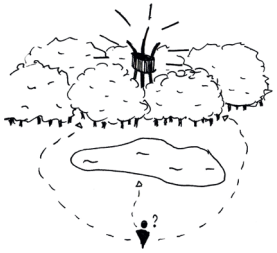
CREATING FASCINATION BY WALKING



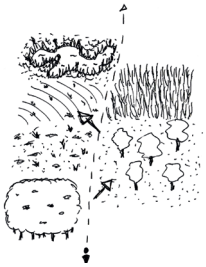
No begin or end



Hikers follow topographic forms



Indirect paths to landmarks



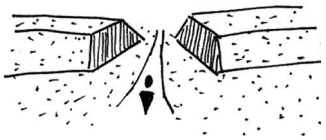
Seperate views

Fig. 4.18 Toolbox movement design principles

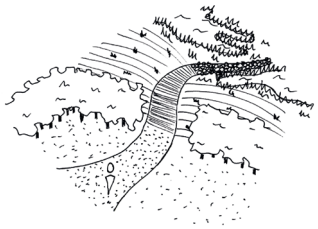
BODILY EXPERIENCE

Movement

Enclosed or dug paths



Cut through elements



Textures according to surroundings

Sensorial

Smooth path for ultimate sensorial experience

Smell, colour, textures and sound by different textures and vegetation

Blocking out views to emphasise other senses

Although the restorative nature theories don't suggest spatial implementations them self, a link has been discovered between emerging in and experiencing nature, through fascination, and movement. Movement can consist of walking, biking, traveling by train etc. and all have their own link to the landscape. The faster someone is moving through the landscape the less someone will be emerged in nature, but this fast movement does give previews on places that they might want to visit later. The slower the movement the more the visitor is emerged in nature by fully experiencing it. Experiencing the elevations, textures on the surface, wind through the vegetation and many more aspects that will let someone be emerged in nature. Therefore, when designing with restorative nature theories and the beneficial effects of nature one should use movements as their main design tool. How these different movements can be visualised or created is shown in the different case studies. The most important design principles found for designing movement are shown different themes: speed of movement, creating fascination by walking and bodily experience.

The Urban Forest Movement, which is focussed on a new way of designing cities with restorative theories in mind should use movements as main design tool for creating experiences and spaces with those beneficial effects.

5. Conclusion - Urban Forest Movement

5.1 CONCLUSION HISTORIC OVERVIEW AND MOVEMENT AS RESTORATIVE GREEN STRUCTURE

The earlier research explains that nature has been used as a way of creating healthy living environments. Nature offers a counter balancing the unhealthy living environments of the city and improves one's health. The most dedicated designs were the ideal city movements, coming up with a new way of designing living environments. Although not all of these models were applicable and some were too idealistic resulting in a lack of dimensions and detailing.

The research on restorative nature theories explains that these beneficial effects of nature can be experienced by emerging oneself in nature and creating fascination in it, this could be achieved by moving through a space. Not only walking but also faster movements can offer different levels of emerging in or experiencing nature. Each speed of movement has their own set of spatial design principles.

5.2 URBAN FOREST MOVEMENT

From these conclusions the Urban Forest Movement is designed, creating a generic spatial framework to rethink existing cities and their structures through various scales. The movement's main goals are to create a healthy living environment with restorative nature in mind, to create a spatial framework that responds to current environmental design questions such as water storage, food supply, densification and heath islands, to create green spaces which can improve mental health by experiencing the beneficial effects of nature, to increase the biodiversity in the city through these green spaces and to use bodily experience and movement as the main design principles in creating these natural spaces in the city.

The main green structures, follow historic lines in the landscape such as elevations, waterways or infrastructures. Green spaces along these lines are framed by buildings offering previews linking back to the pastoral views from the train. The secondary routings in the neighbourhoods provide green connections between different parks and part of the city. The main structure can be divided into Lane, Country Lane and Forest. Each of these elements have their own role in the structure of the city: The Lane acts as entryway to the city; the Country Lane offers a secondary movement; the Forests are the resting space offering a break from the city to connect the users with nature.

Each of the structures also has a role of answering current design questions. The Lane, other than having an entry function and focussing on movement, it houses the transport flow, connecting the city to its surroundings. The structure can further be seen as a densification area and be used to expand the city into the surroundings if

needed. The Country Lane greens existing neighbourhoods and distributes any grown produce from the Forest. The Forest apart from being a resting space offers water storage for the city and provides space for food production. All of these structures are planted with species of vegetation which increase the biodiversity of the city.
Zooming in further into the different elements of the structure, a division is made between resting - and movement spaces, with the movements having views and access to the resting spaces. Here the Promenade offers a fast movement to connect the city with the surrounding landscape, while offering views into the places, not showing any resting movements such as parked cars. The Passage is a movement that connects different elements in neighbourhoods together, allowing for easy access to green spaces. The Place offers a break in this structure, these green spaces are enclosed and give a sense of being in a different world.
Zooming into the Place, three different movements can be recognised: Gliding, a fast movement experiencing and emerging little in nature, offering a quick glance or walk in the park; Grazing, a medium movement that meanders through the park offering an overall experience and linking program; Wandering, a slow movement that completely emerges oneself in nature, moving in the park with no prior intention. All of these movements offer a connection between the space and the visitor by views, materialisation, sounds, colours, etc. The speed of the visitor influences how much of emerging in nature is experienced and thus how much of the restorative effects of nature is experienced.

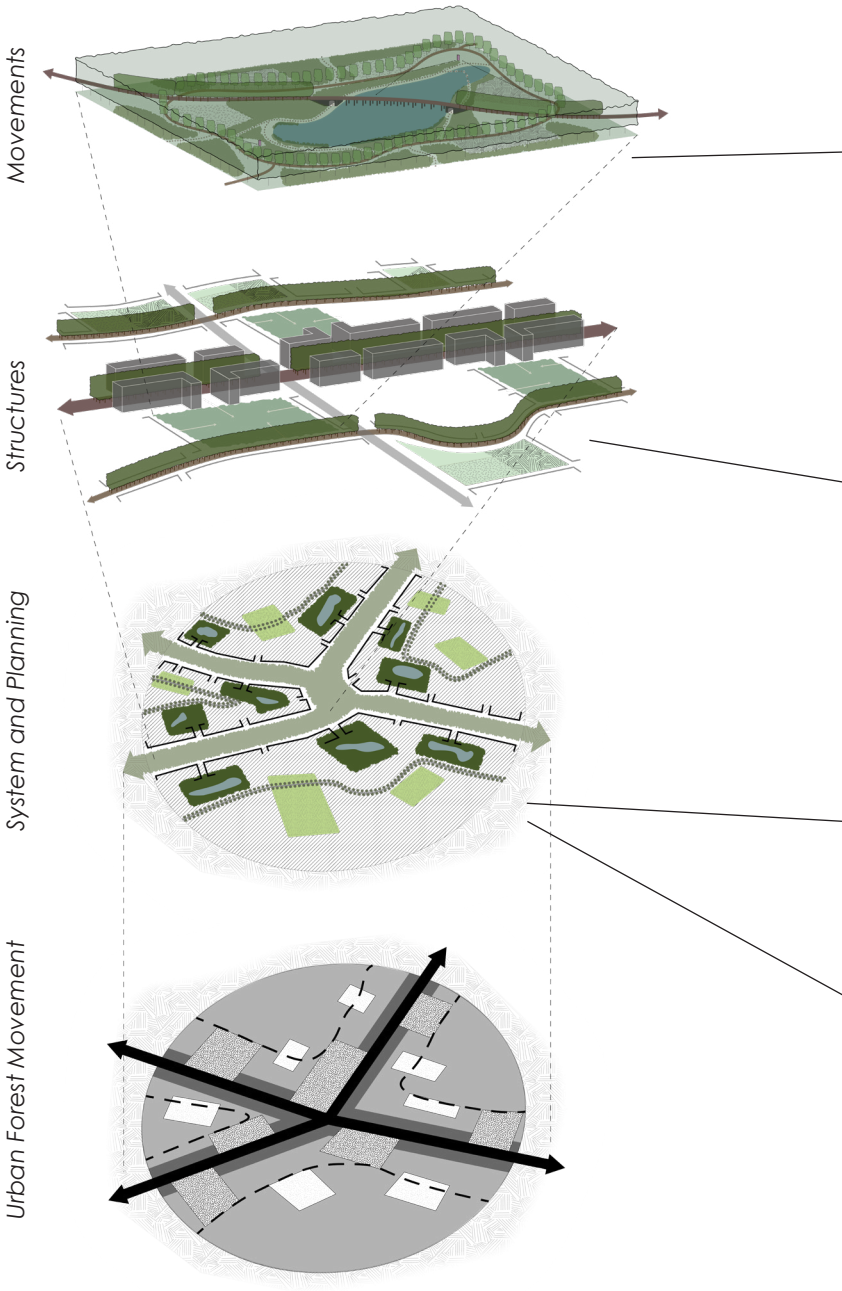
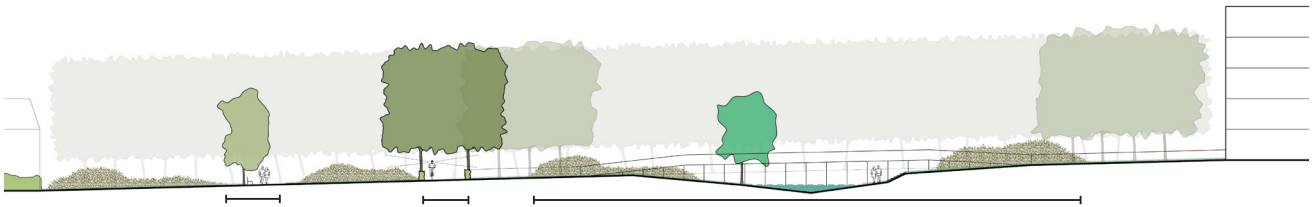


Fig. 5.1 Urban Forest Movement model



Grazing
- Materialisation follows surroundings
- Direct route to view
- 3M wide
- Linking program and meeting spaces

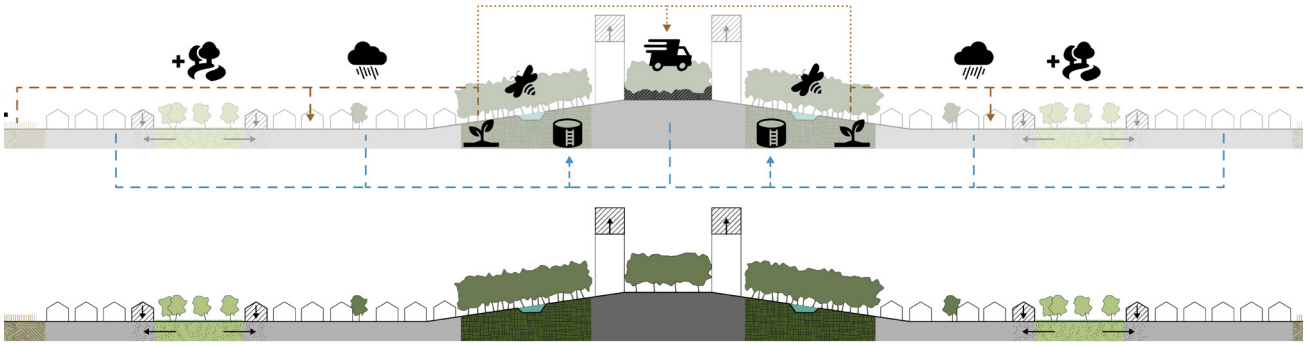
Gliding
- Pastoral landscape
- Leveling landscape
- Long views
- 4M wide
- Framing views

Wandering
- No defined path
- Kinesthetic and synaesthetic experience
- Following lines in the landscape
- Indirect routes to views

Passage
- Front gardens
- Connecting program
- Increase biodiversity
- Slow traffic route

Place
- Enclosed by buildings
- Transition inside - outside place
- Views in the site

Promenade
- Segregated movements
- Framing views on place
- Emphasis on crossings
- Parking in neighbourhoods (courtyards)
- Facilities in plinth



Hinterland
- Water storage
- Food production in allotment gardens and urban farms
- Forresting existing parks
- Connect leisure and nature
- Increase biodiversity

Forest

Lane
- Transport flow
- Collecting food/waste/produce surplus from surroundings
- Densify along infrastructure
- Expand city by extending the infrastructure into the landscape
- Increase biodiversity
- Connect city to the surrounding landscape

Country Lane
- Food flow
- Greening neighbourhoods
- Connect and add Leisure areas
- Transition between park and neighbourhoods
- Increase biodiversity

Fig. 5.2 Urban Forest Movement sections

PART 3: ANALYSIS, VISION AND THE DESIGN

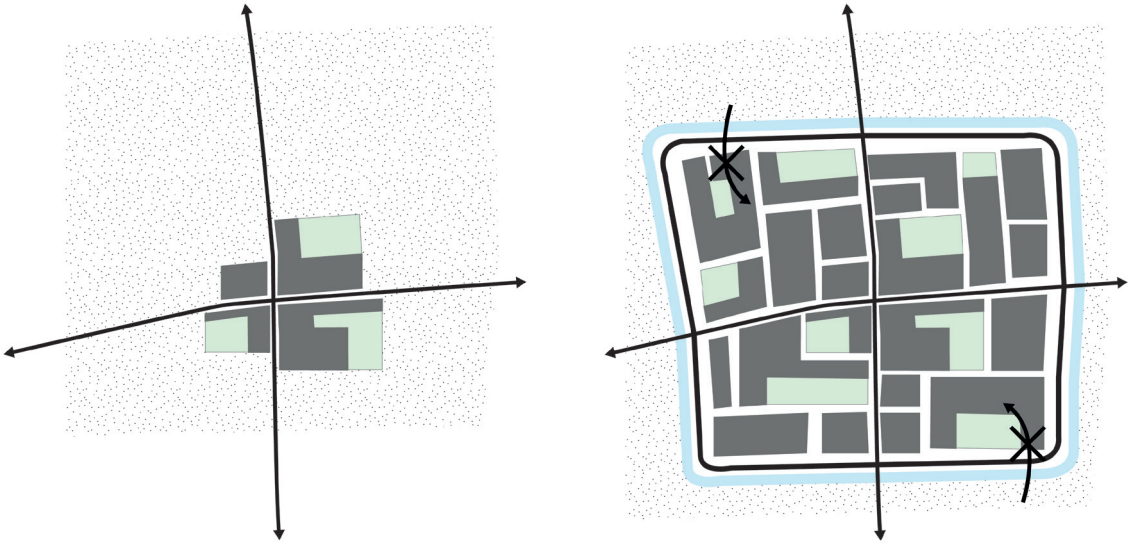
6. Analysis Den Haag

6.1 CITY AND REGION ANALYSIS

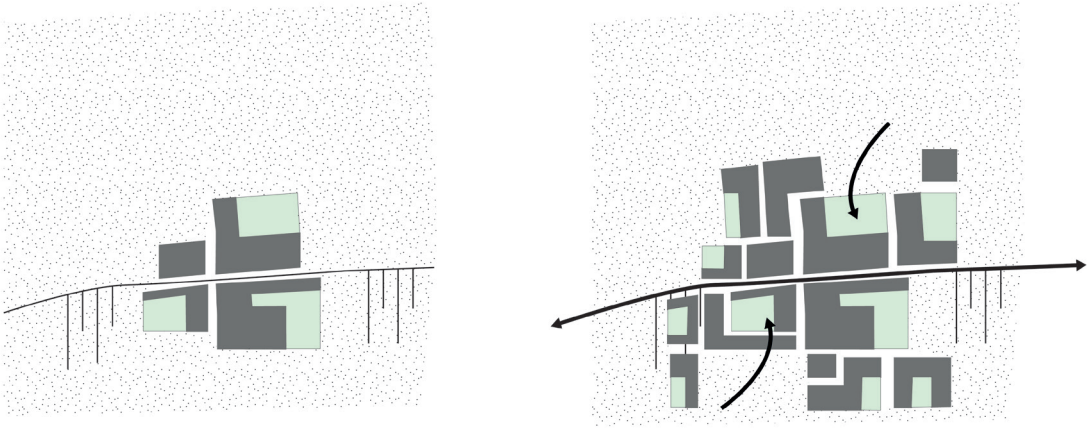
6.1.1 WHY DEN HAAG?

Den Haag is chosen as the testing and research site for the Urban Forest Movement because as mentioned earlier it has a different relation to the surrounding landscape. Most Dutch cities had city rights, which meant that a city wall was built to protect it from intruders. These city wall can still be recognised in the urban tissue. Although it provided safety it also acted as a boundary towards the surroundings. The connection between the landscape and city was reduced to views and pathways. There was no relation between the urban tissue and public spaces inside the city and the nature outside the walls (Schuppen, 2006).

Den Haag differs from most Dutch cities because of its lacking city wall. Den Haag never got city rights which meant that they did not build a city wall. Therefore, the city was able to grow into the surrounding nature and emerge oneself into it. Any expansions were directly related to the landscape allowing for a better connection between the inner city and the surroundings (Schuppen, 2006).



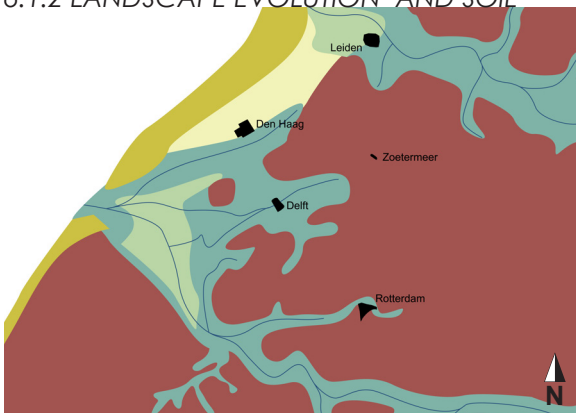
City growth wall development



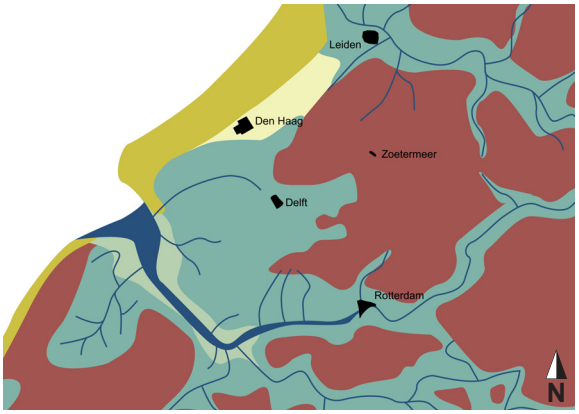
City growth without wall development

Fig. 6.1 City development with or without city walls

6.1.2 LANDSCAPE EVOLUTION AND SOIL

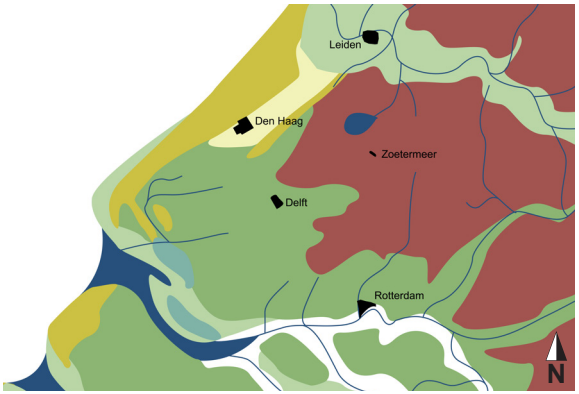


Region Den Haag 500 B.C



Region Den Haag 100 A.D

Region Den Haag 800 A.D



Region Den Haag 1500 A.D

Region Den Haag 1850 A.D

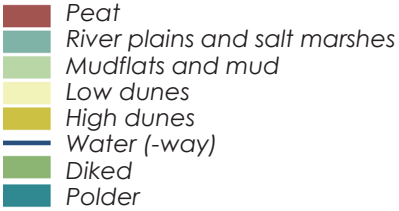


Fig. 6.2 Evolution of the landscape, area of Den Haag (source: Webgispublisher, 2019, illustrated by author)

Fig. 6.3: Soil and elevation of the city (source: Opendata gemeente Den Haag, n.d., illustrated by author)

The landscape evolution of the area of Den Haag shows how the shoreline moved overtime and how the lines are not parallel to the current shoreline. Because these dunes were higher than the surrounding landscape people started to settle on these higher ridges, from there the city grew. Therefore, the main structures of Den Haag are linear from east to west closely related to the shoreline but not parallel (Schuppen, 2006).

6.1.3 HISTORY OF DEN HAAG

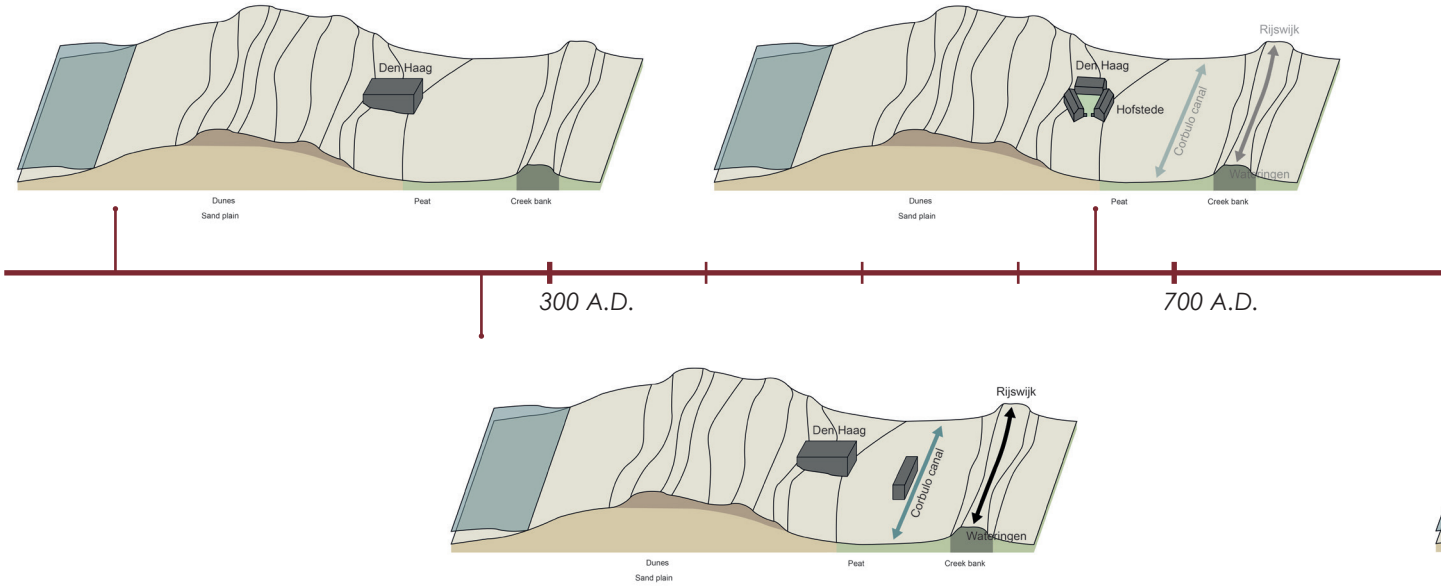
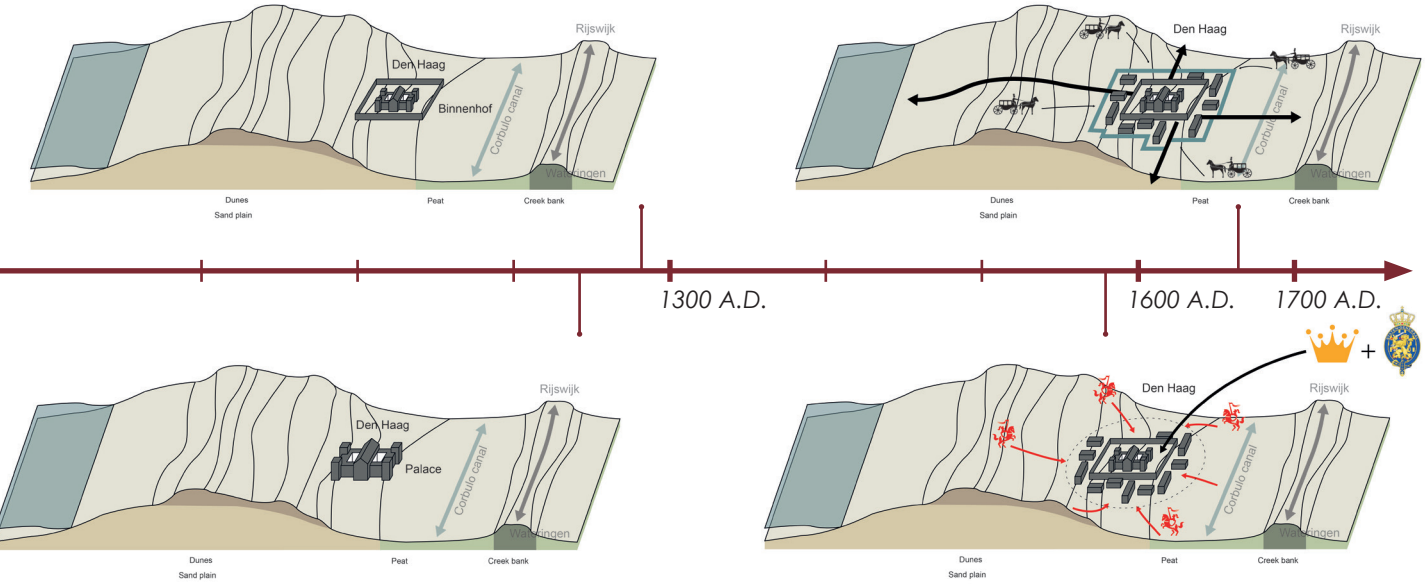


Fig. 6.4: Origin of Den Haag (source: Schuppen, 2006, illustrated by author)

Den Haag was built at this location because of the gradient from dry to wet, dunes to peat. In the second century A.D. Romans built a road to connect Rijswijk and Wateringen, two villages close by. The canal of Corbullo offered another new connection between the Maas and the Oude Rijn. Because of this the city started to expand along the canal.

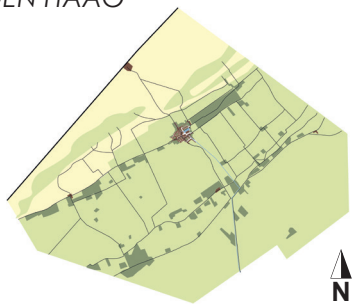
Many centuries later around seven hundred A.D. Den Haag was a Hofstede, a big farm. This later was transformed into a palace by Count Floris IV which was later altered again, by Willem II van Oranje into a courtyard that resembles the Binnenhof of Today.



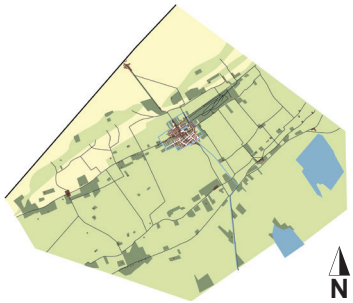
Around the end of the sixteenth century the Prins van Oranje moved to Den Haag and the States General settles in the city. This causes a massive move of elites towards Den Haag. Although Den Haag started to grow the city was lacking a defence structure because it had no city rights. Therefore, the Prins built the singel in 1621, a small defence structure which offered a way of controlling who enters and departs the city (Schuppen, 2006).

6.1.4 HISTORICAL BUILT UP OF DEN HAAG

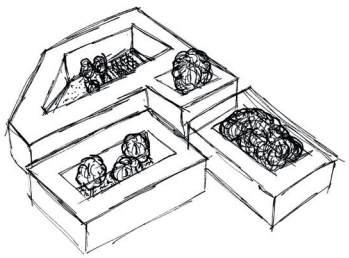
Den Haag 1300



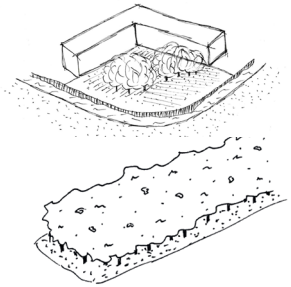
Den Haag 1560



Den Haag 1670



Courtyards

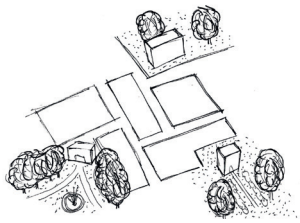


Monastery garden + Haagse Bos

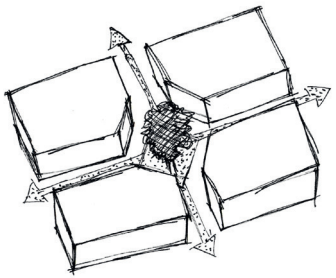
Den Haag 1850

Den Haag 1909

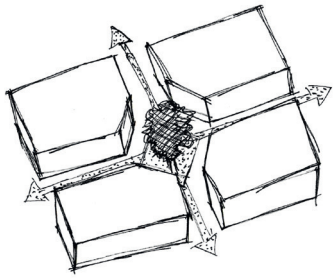
Den Haag 1945



Estates



Monumental structures



Monumental structures

Fig. 6.5 Evolution of Den Haag (source: Haags Historisch Museum, n.d., illustrated by author)

Den Haag 2012 *Patchwork*

Fig. 6.5 Evolution of Den Haag (source: Haags Historisch Museum, n.d., illustrated by author)

The urban structure of Den Haag grew over time. The city started as a small settlement which grew into a town made up of closed blocks with courtyards. After further expansions Den Haag developed into a city with semi open building blocks with monastery gardens. The Haagse Bos was also opened for the public and protected from logging, creating a leisure forest for hunting.
After this more and more estates were realised on the edges of Den Haag. The first city expansions were designed with the monumental structures as design principles.

When looking at the city now, after WOII and the new urban movement the city structure has changed into a patchwork of green areas and neighbourhoods.

6.1.5 HISTORICAL STRUCTURES IN DEN HAAG

Estates landscapes in 1712 versus 2020

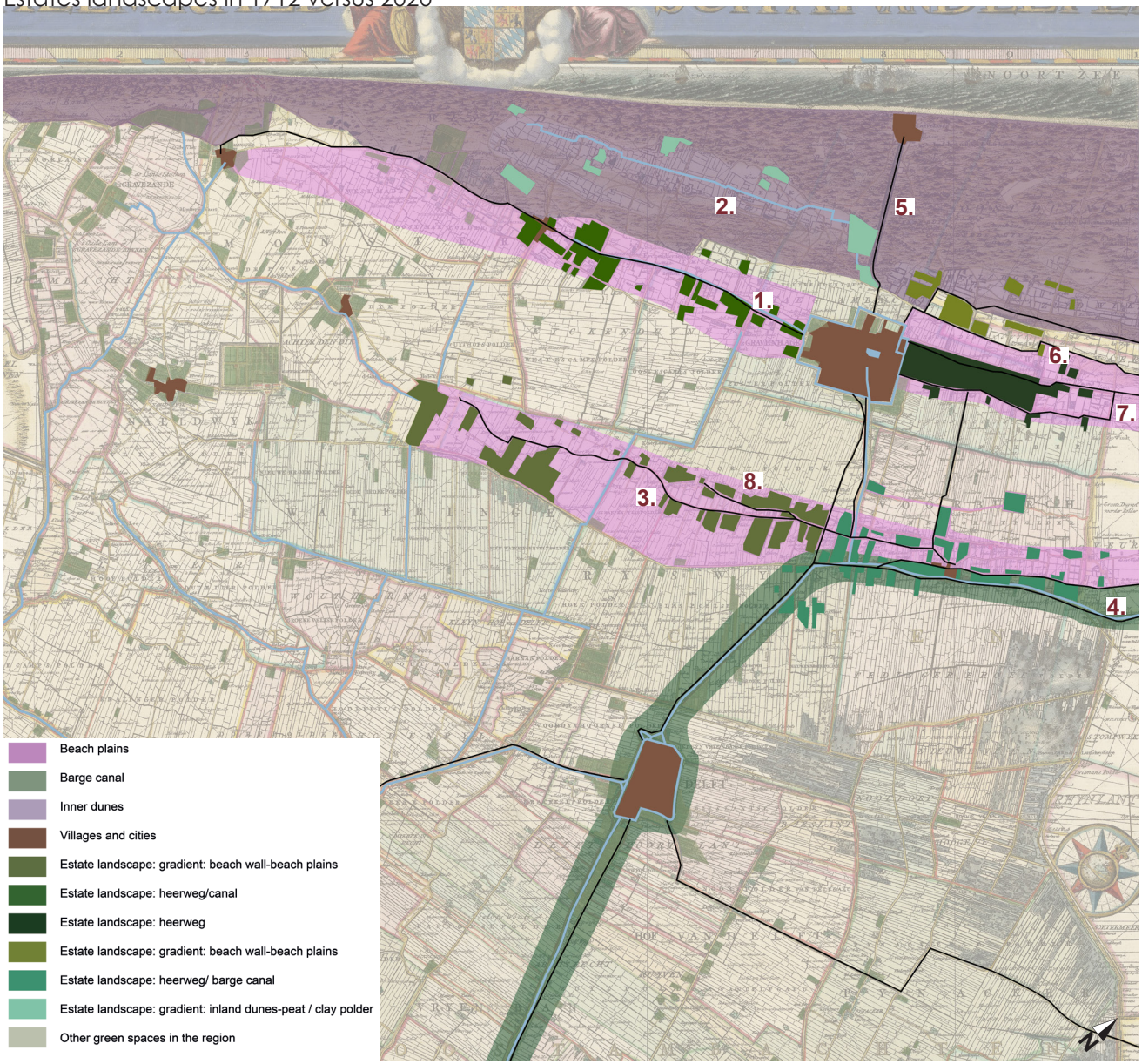


Fig. 6.6: Estates in 1712 Map of the Hoogheemraadschap of Delfland (source: Cruquius Cruquius, N., & Cruquius, J., 1712, edited by author)

1. Loosduinseweg: Location estates heerweg/canal

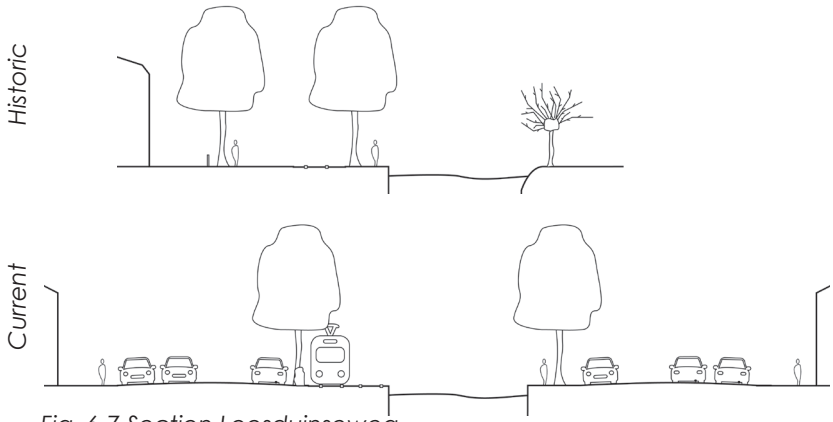


Fig. 6.7 Section Loosduinseweg

Fig. 6.8 (source: Noort, n.d.)

Fig. 6.9 (source: Google maps, 2018)

2. Haagse Beek: Location estates relief (gradient: inland dunes-peat / clay polder)

Fig. 6.10 (source: Sportlaan (rechts) met de Haagse Beek, 1931, Collectie Haags Gemeentearchief)

Fig. 6.11 (source: Google maps, 2017)

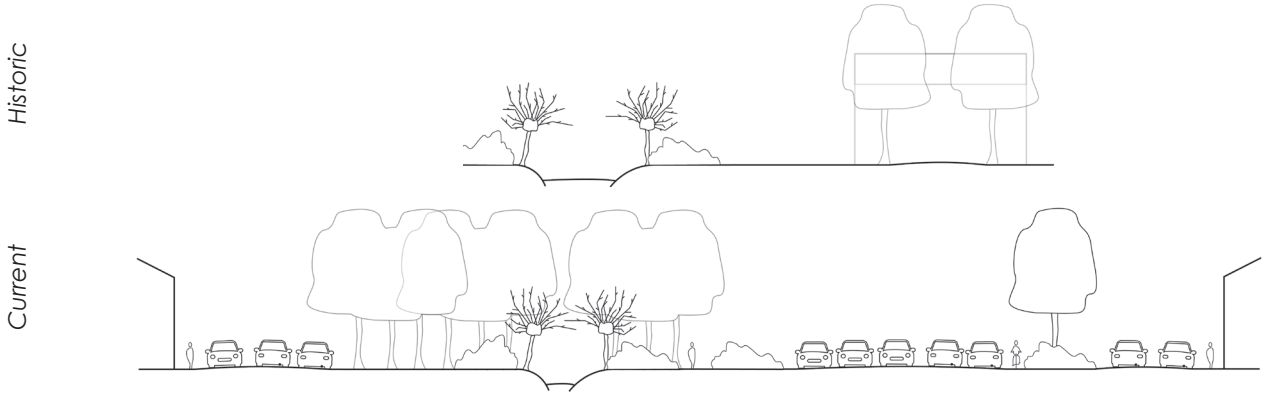


Fig. 6.12 Section Haagse Beek

3. Van Vredenburchweg: Location estates relief (gradient: beach wall-beach plains)

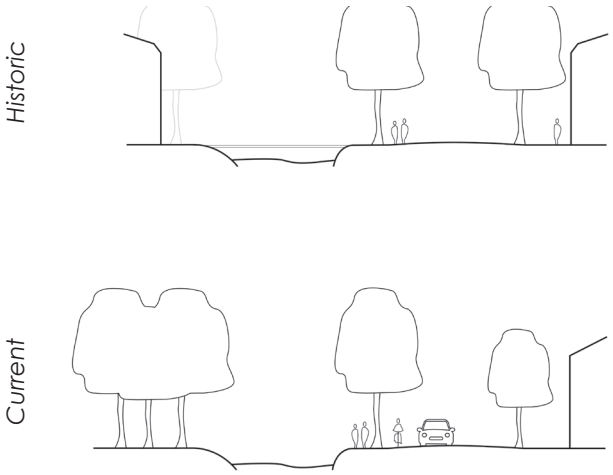


Fig. 6.13 Section Van Vredenburchweg

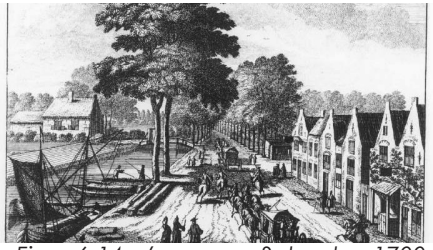


Fig. 6.14 (source: Schenk, 1700, Collectie Haags Gemeentearchief)

Fig.6.15 (source: Google maps, 2018)

4. Westvlietweg: Location estates heerweg/ barge canal

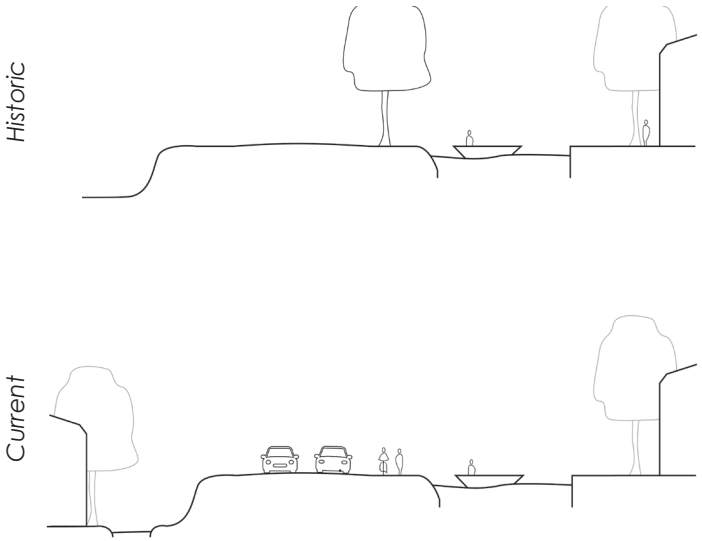
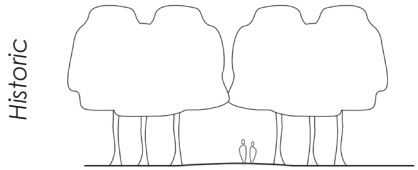


Fig. 6.16 Section Westvlietweg

Fig. 6.17 (source: Leidschendam, 1976, Collectie Haags Gemeentearchief)

Fig. 6.18 (source: Google maps, 2019)

5. Scheveningseweg



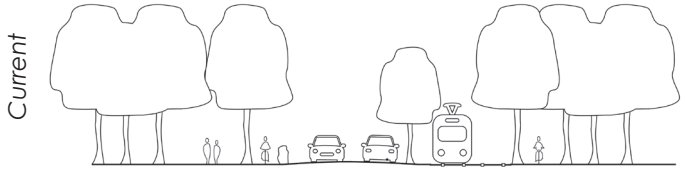


Fig. 6.19 Section Scheveningseweg

Fig. 6.20 (source: Scheveningseweg, ingang Scheveningse Bosjes, 1890, Collectie Haags Gemeentearchief)

Fig. 6.21 (source: Google maps, 2019)

6. Wassenaarseweg: Location estates relief (gradient: beach wall-beach plains)

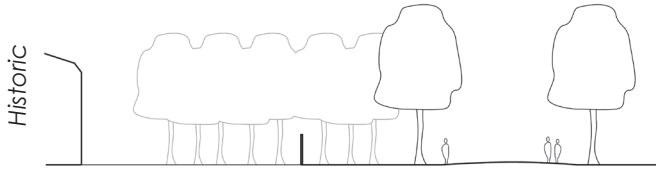


Fig. 6.22 Section Wassenaarseweg

Fig. 6.23 (source: Wassenaarseweg vanaf ingang 'Oostduin', 1908, Collectie Haags Gemeentearchief)

Fig. 6.24 (source: Google maps, 2017)

7. Leidsestraatweg: Location estates heerweg

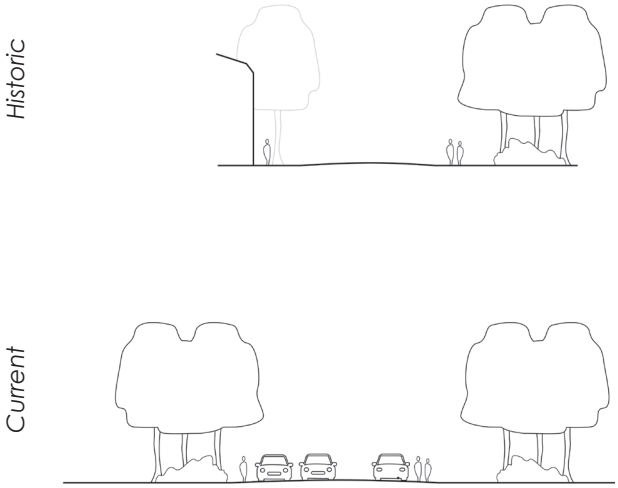


Fig. 6.25 Section Leidsestraatweg

Fig. 6.26 (source: Leidsestraatweg, Roomhuis-Boshek, 1903, Collectie Haags Gemeentearchief)

Fig. 6.27 (source: Google maps, 2018)

8. Julianalaantje: Location estates relief (gradient: beach wall-beach plains)

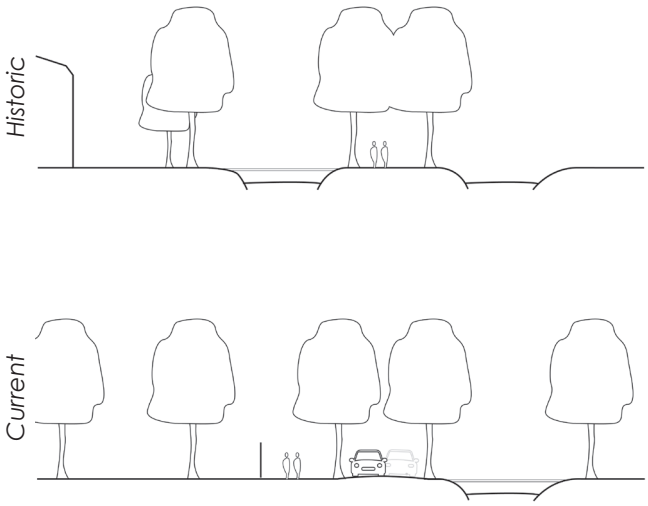


Fig. 6.28 Section Julianalaantje

Fig. 6.29 (source: Juliana laantjes, n.d.)

Fig. 6.30 (source: Google maps, 2019)

6.1.6 HISTORICAL STRUCTURES IN DEN HAAG AND SOIL TYPE

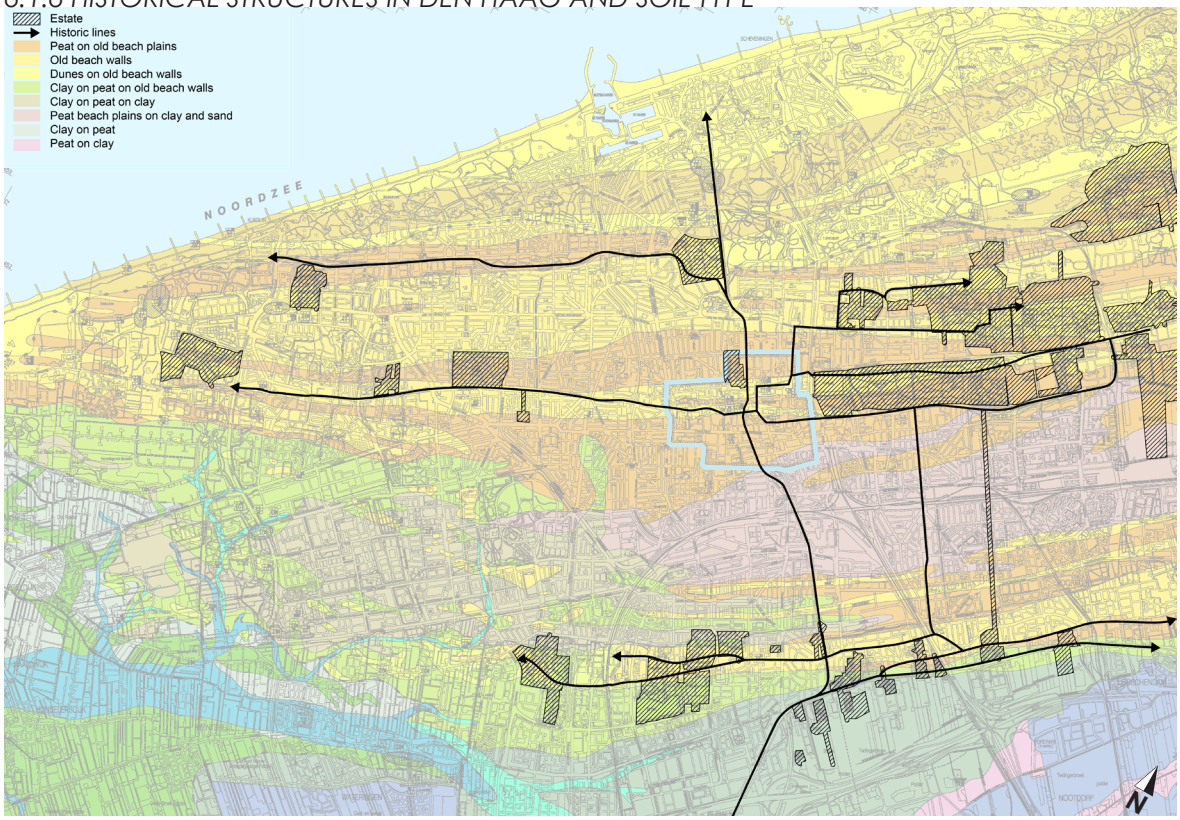


Fig. 6.31: Historic lines and estates and their relation to the soil type, archaeological-geological map of Den Haag (source: Waasdorp & van Veen edited by author)

Most of the historic lines are on the higher soil types, the old beach walls or on a gradient of those. Because of the elevation most of the elites lived on these parts of Den Haag. Therefore, most of the historic lines can be found on these higher grounds. The less fortunate residents of the city lived in the lower parts, the peat areas.

6.1.6 HISTORICAL STRUCTURES IN DEN HAAG VERSUS CURRENT INFRASTRUCTURE

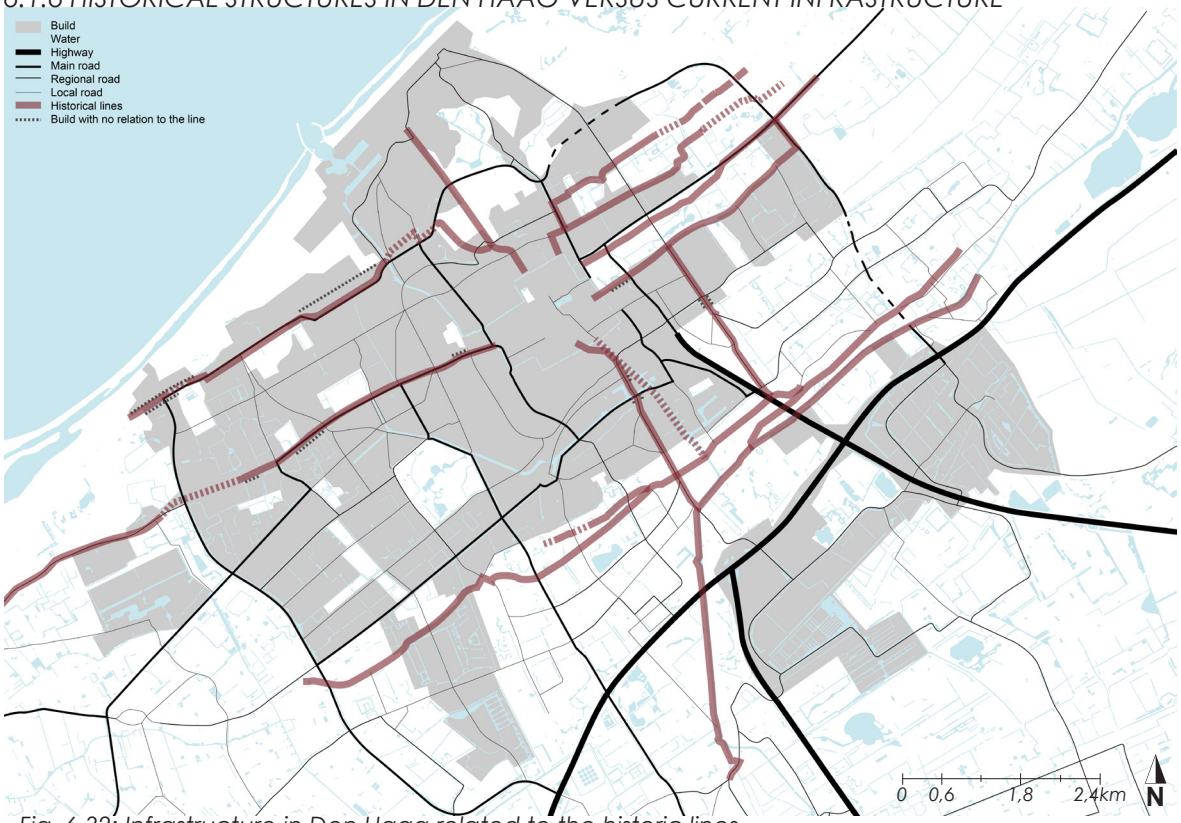


Fig. 6.32: Infrastructure in Den Haag related to the historic lines

Many of the historical structures of Den Haag are still recognisable in the city. These old infrastructures can be recognised by tree plantings, measurements and architecture along it. Some however changed drastically such as the Loosduinseweg and the Haagse Beek. These structures were scaled up with infrastructure as a main design point and have been taken over by cars. The most important infrastructures on the west side of the city are on these old historic lines. On the east side the historic structures are not used as main - but as secondary infrastructures. Therefore, the historic lines on that side of the city can still be recognised.

6.1.7 CLIMATE ISSUES IN DEN HAAG

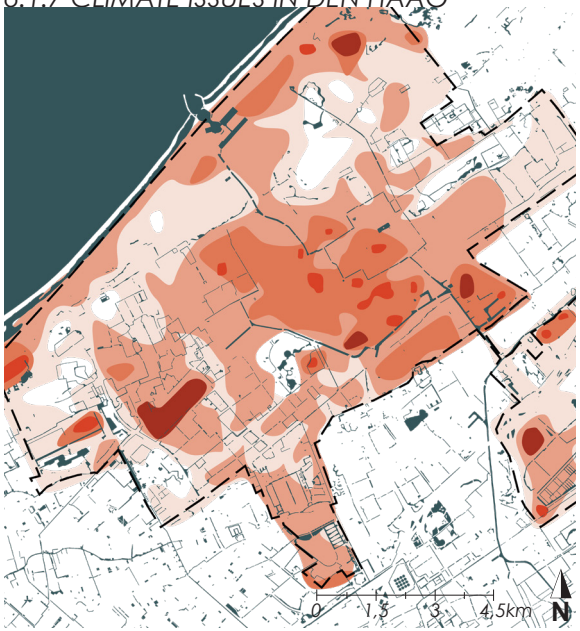


Fig. 6.33: Heat islands in Den Haag (source: Gemeente Den Haag, sd, illustrated by author)

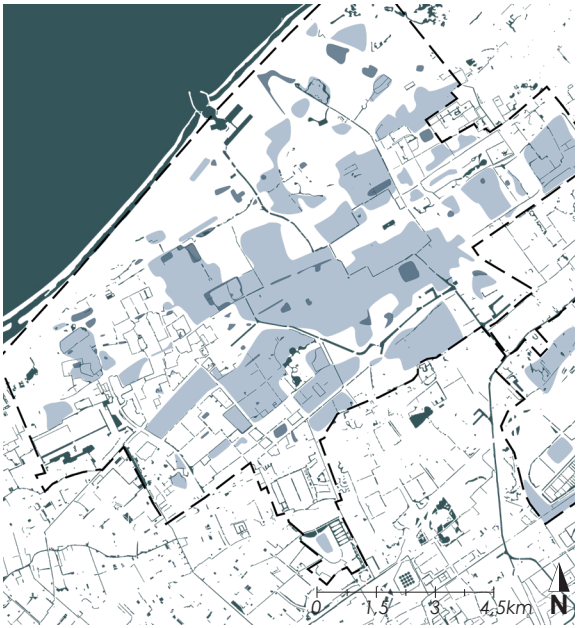


Fig. 6.34: Water nuisance in Den Haag (source: Gemeente Den Haag, sd, illustrated by author)

Den Haag is a dense city which leads to heat island in the city centre. The most severe heat island can be seen on the spot of a business park in the south-west part of the city.

Most water nuisance can be found in the dense neighbourhoods in the city. The water system of Den Haag consists of two parts, the higher area which directly drain to the present boezem system and the lower polder areas which pump their water to the boezem system. Den Haag has a pumping station, that drains water to the sea. Because there is only one that drains to the sea, there can be some water nuisance resulting from heavy rains.

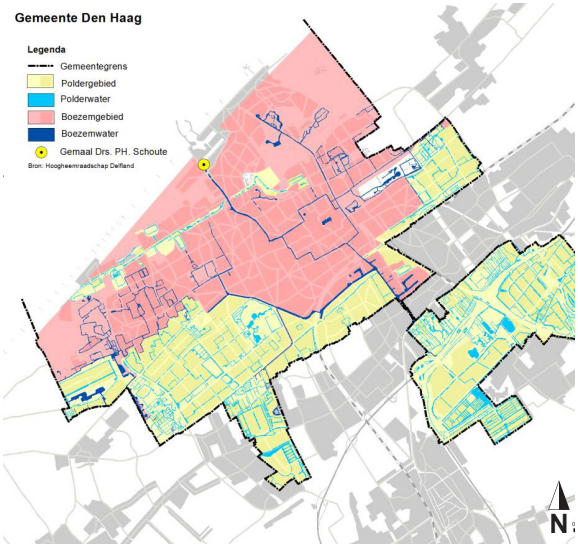


Fig. 6.35: Watersystem Den Haag (source: Watersysteem Den Haag: boezem(gebied) en polders Den Haag, 2014)

6.1.7 NATURE IN DEN HAAG AND THE REGION

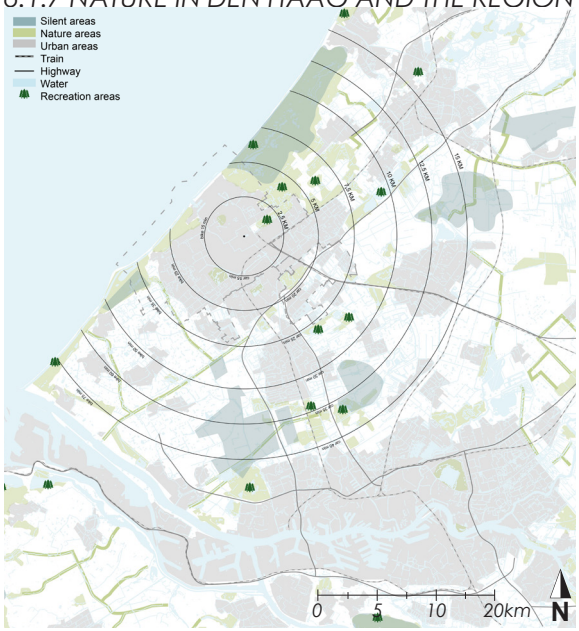


Fig. 6.36: Nature and recreation in the region of Den Haag (source: Ecologische hoofdstructuur en belangrijke weidevogelgebieden, 2011, illustrated by author)

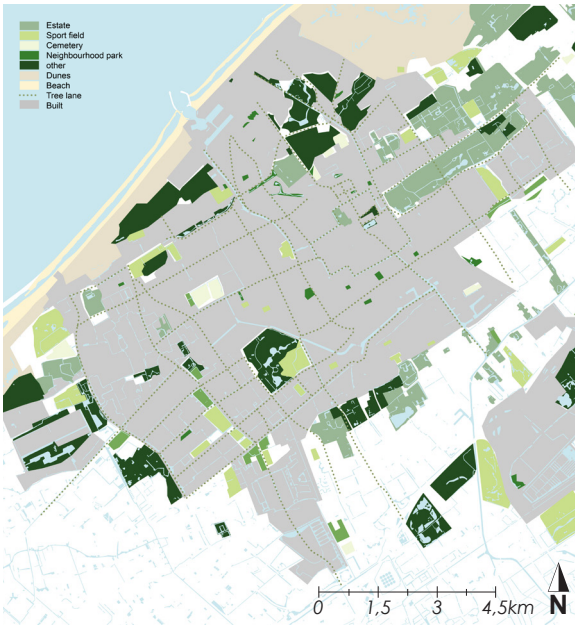


Fig. 6.37: Main green structure in Den Haag

From the analysis of the region the conclusion can be made that the west side of Den Haag has fewer nearby nature areas. Residents here have to travel further to a green space. When zooming into Den Haag many green structures can be seen piercing into the city on the east side, while in the west the green structure consists of patches. On this side the connection of the city to the landscape is lost resulting in also a weakened ongoing green structure along the beach.

Many green spaces have the function of sport or cemetery, functions which will not be of daily use to everyone.

The estate structures have disappeared in the west side of the city resulting in fewer green spaces relative to the east side of the city. The historic lines can still be recognised in the city with the attached estates. One of these lines seems to have transformed into a big traffic infrastructure, developing the estates along it into urban areas. There seems to be a missing link between the city and the surrounding landscape on this side, which was formerly made by this historic line.

Fig. 6.38: Historical structures, estates and green structure in Den Haag

6.1.8 CONCLUSION

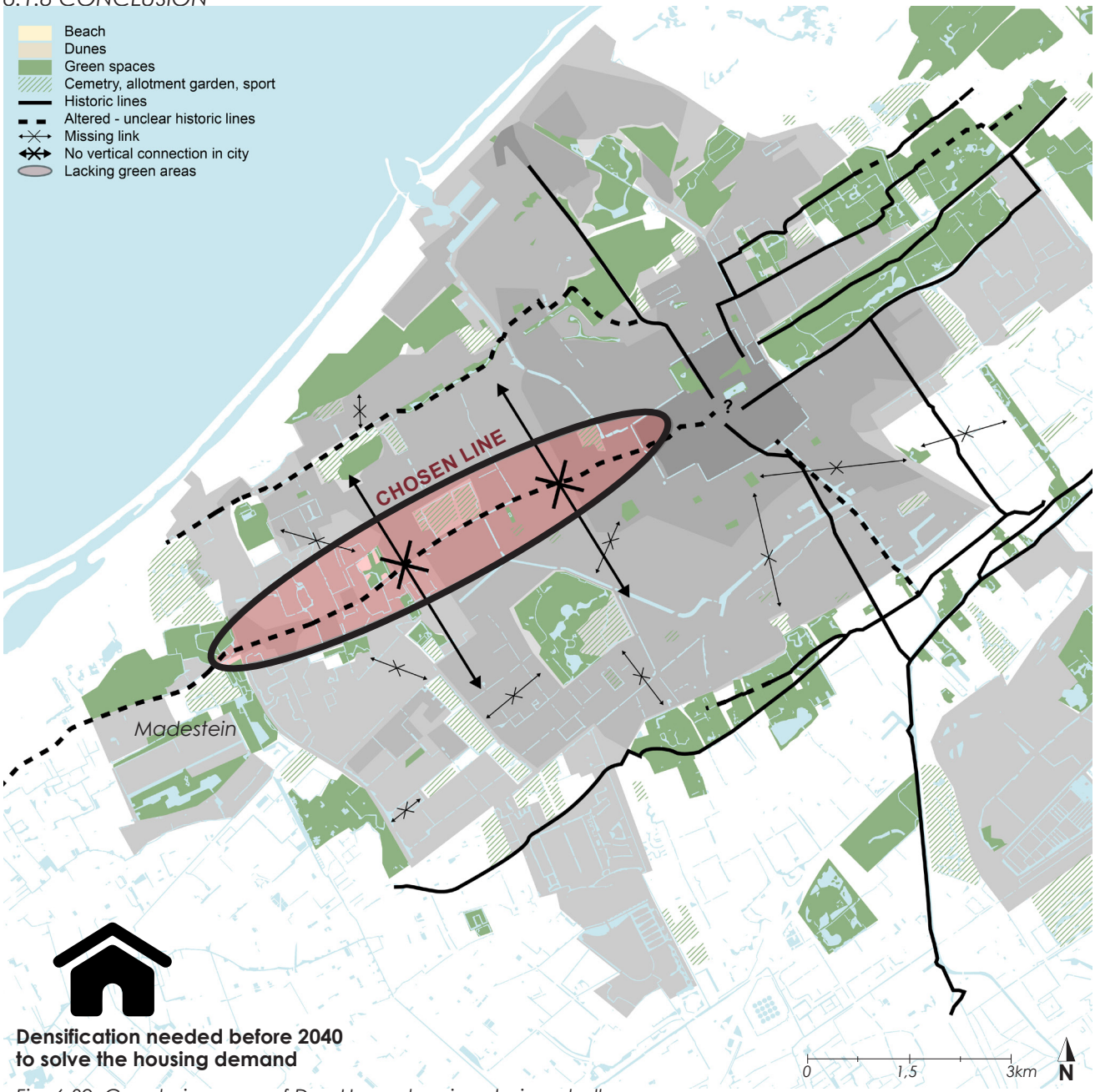


Fig. 6.39: Conclusion map of Den Haag showing design challenges

Design brief:
- Historical lines as main structures of the city
- No defined ending of historical lines
- Missing link north and south
- No connection or route between secondary green spaces
- Housing demand
- Lacking green areas along historical lines
- Reduce water nuisance
- Reduce heat island effect

Chosen line
The chosen line is selected to be explored further because of its crucial missing link from the city to the west landscape and the rest of the city. The line also offers an opportunity to make north and south connections and it has little green spaces along it.
The Line (Loosduinseweg) is located from the city centre or singel in the east to the leisure nature area (Madestein) in the west.
The line consists of an infrastructure and the surrounding neighbourhoods.

6.2 ANALYSIS LINE - LOOSDUINSEWEG

6.2.1 HISTORICAL ANALYSIS

Fig. 6.40: Remaining and recognisable historic structures along the Loosduinseweg (source: Kaart van het Hoogheemraadschap van Delfland, Cruquius Cruquius, N., & Cruquius, J., 1712, edited by author)

The historical analysis shows the remaining historic structures along the Loosduinseweg. Some of the estates are still recognisable in the urban landscape, forming parks along the route with the composition of the estate, formal or English style still remaining. Other estates have been replaced with urban developments. Some of the historic route can still be seen in the placement of the crossings. And a small part of the barge canal still remains.

0 50 100 200m
N

6.2.2 *SPATIAL ANALYSIS*

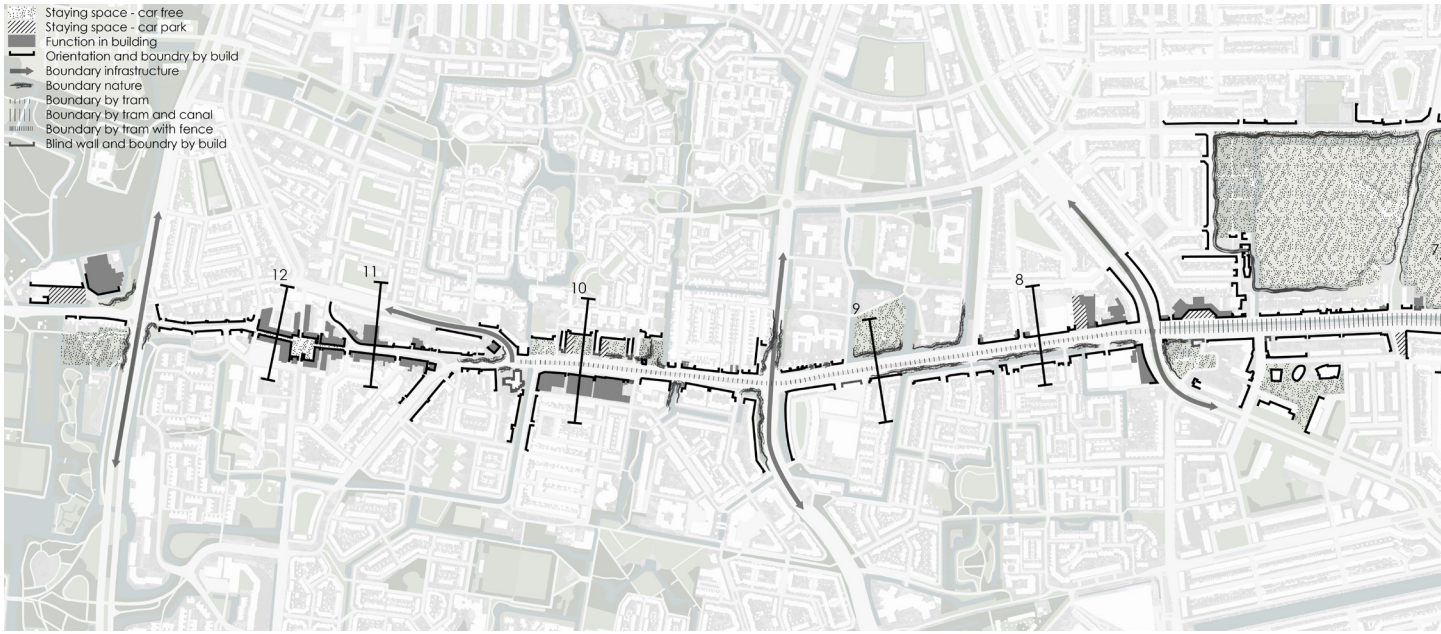


Fig. 6.41: Edges, boundaries, functions, sections and spaces related to the Loosduinseweg

The spatial analysis shows the different spaces and edges along the route. There are many different spaces along the route with each their own measurements, private to public transition and functions. There are boundaries along the route such as water structures next to green spaces but there are also boundaries on the route. The tram and canal are hard to cross. The route mostly consists of traffic spaces but there are some staying spaces next to the route as well. These are mostly enclosed by vegetation or fences to ensure that it is a safe place secluded from the traffic. Along with built edges, vegetation also provides edges along the route.

On the next pages parts of the route are visualised in sections and views. These show the size of the space, the boundaries and the transition from the building to the sidewalk.

6
5
4
3
2
1
0 50 100 200m
N

Fig. 6.42 View from section 1

Fig. 6.43 View from section 2, tram forms boundary

Fig. 6.44 View from section 3, route inbetween cars

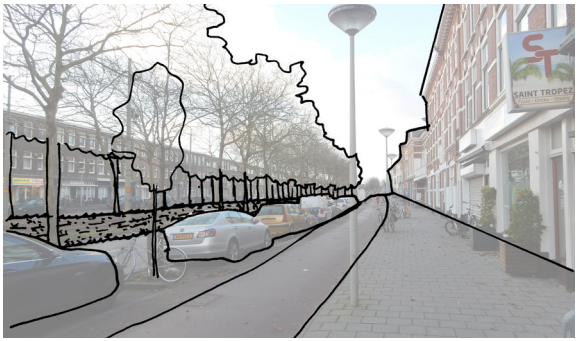


Fig. 6.45 View from section 4 green tram rails

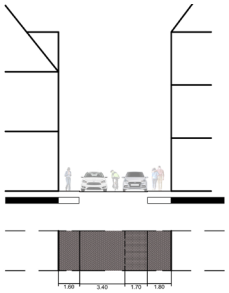


Fig. 6.46: Section 1

Fig. 6.47: Section 2

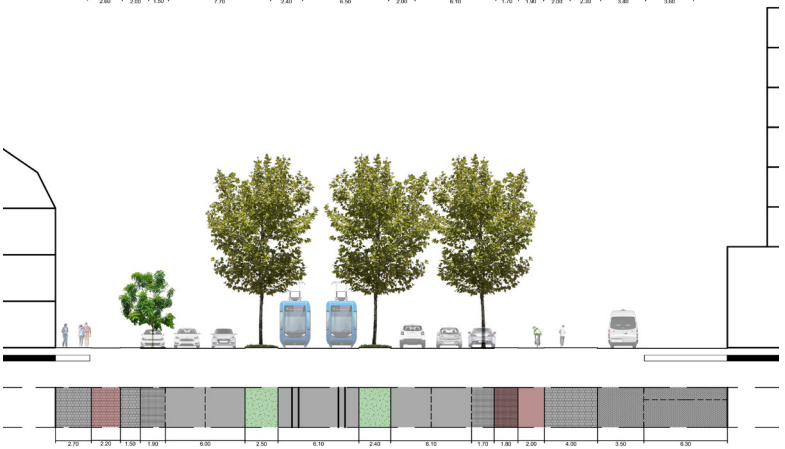


Fig. 6.48: Section 3

Fig. 6.49: Section 4

0 5 10 15m

Fig. 6.50 View from section 5, enclosed playground by fences

Fig. 6.51 View from section 6, no connection with canal

Fig. 6.52 View from section 7, Vegetation forms boundary

Fig. 6.53 View from section 8, trees support line

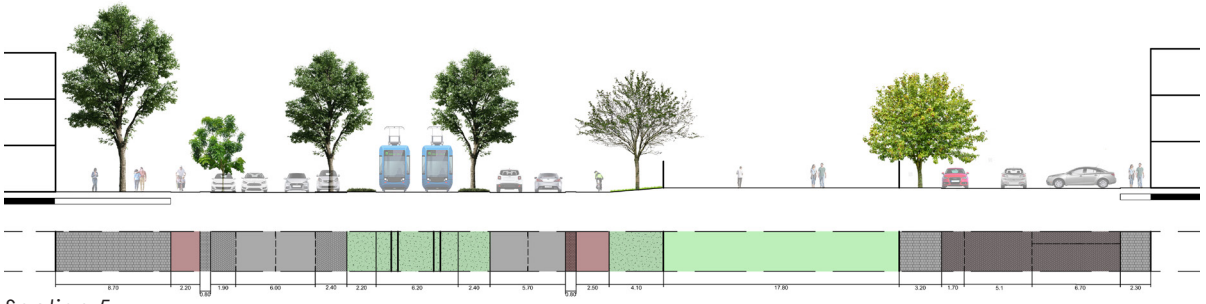


Fig. 6.54: Section 5

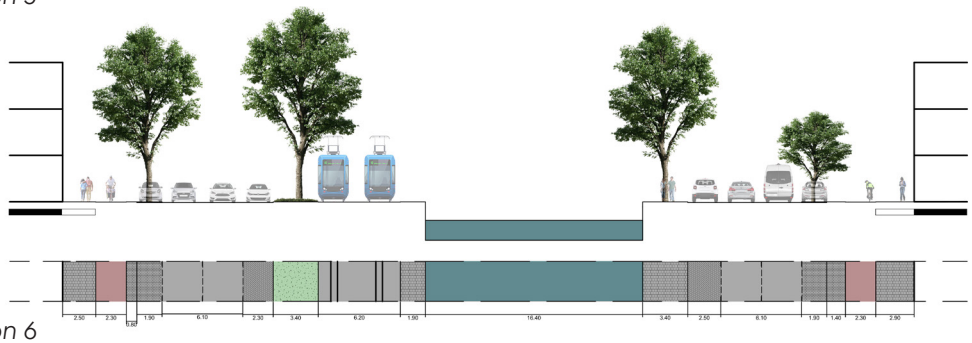


Fig. 6.55: Section 6

Fig. 6.56: Section 7

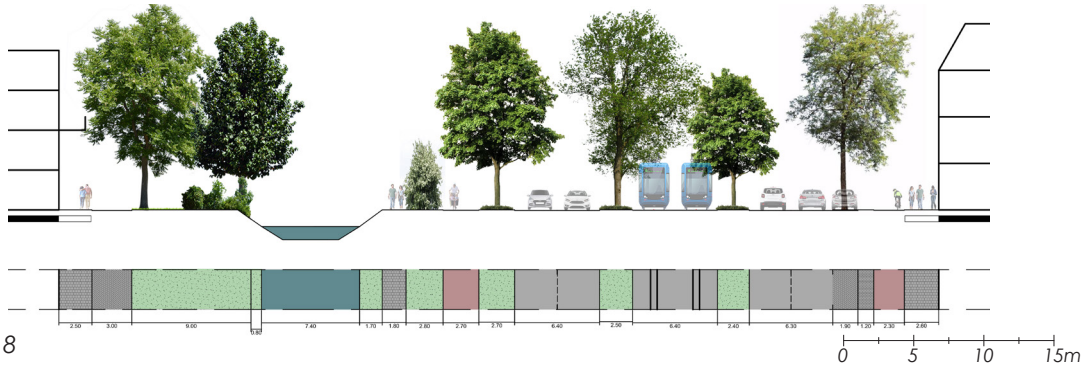


Fig. 6.57: Section 8

Fig. 6.58 View from section 9, green area fenced

Fig. 6.59 View from section 10, route dominated by tram rail

Fig. 6.60 View from section 11, enclosed pathway

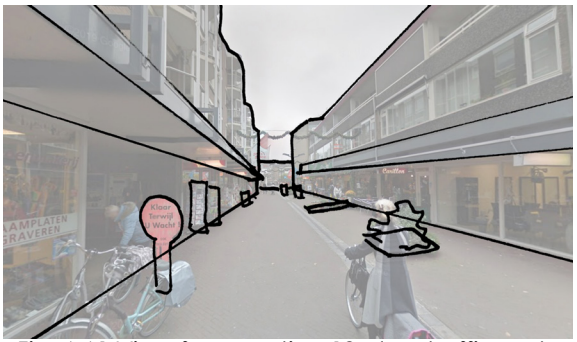


Fig. 6.61 View from section 12, slow traffic route

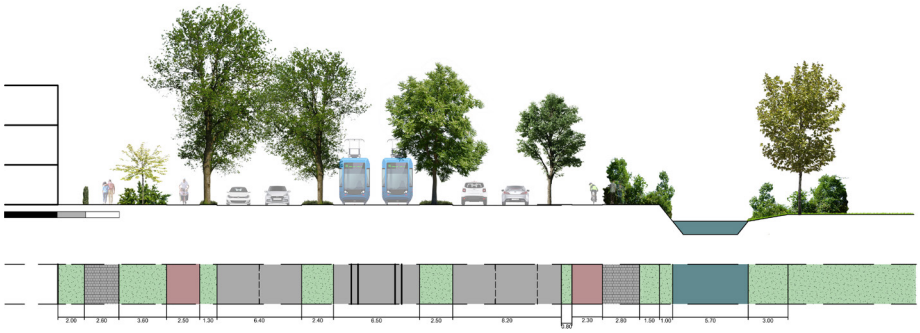


Fig. 6.62: Section 9

Fig. 6.63: Section 10

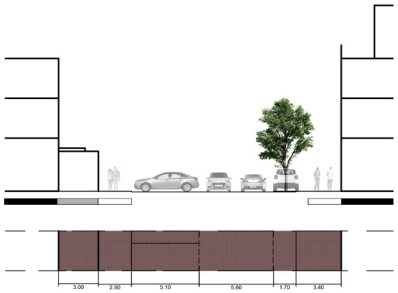


Fig. 6.64: Section 11

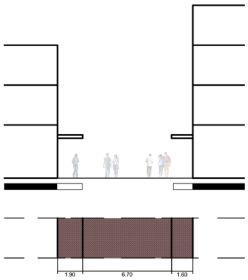
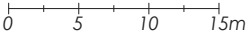


Fig. 6.65: Section 12



6.2.3 *EXPERIENCE ANALYSIS*

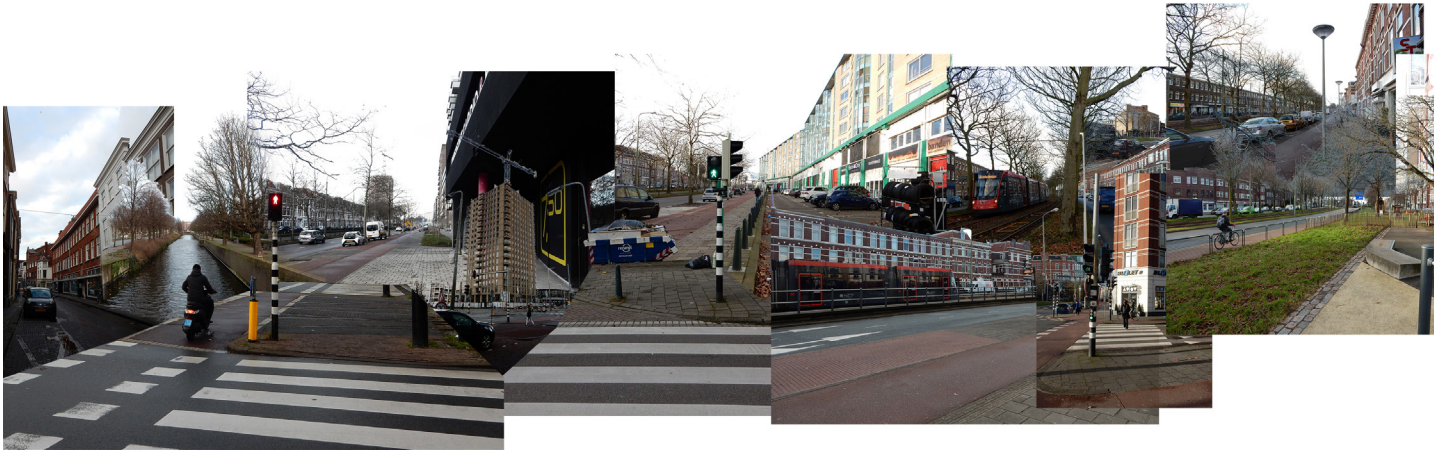


Fig. 6.66: Photo collage experience along walked route

In this collage the experience along the route is captured in photos, offering an insight into the walk. In the collage left the east part of the route is starting from the singel, the right side is the west part of the route ending at leisure area Madestein. The collage is controlled by crossings and grey paced surfaces. Here and there trees offer a different texture.


halve de boom

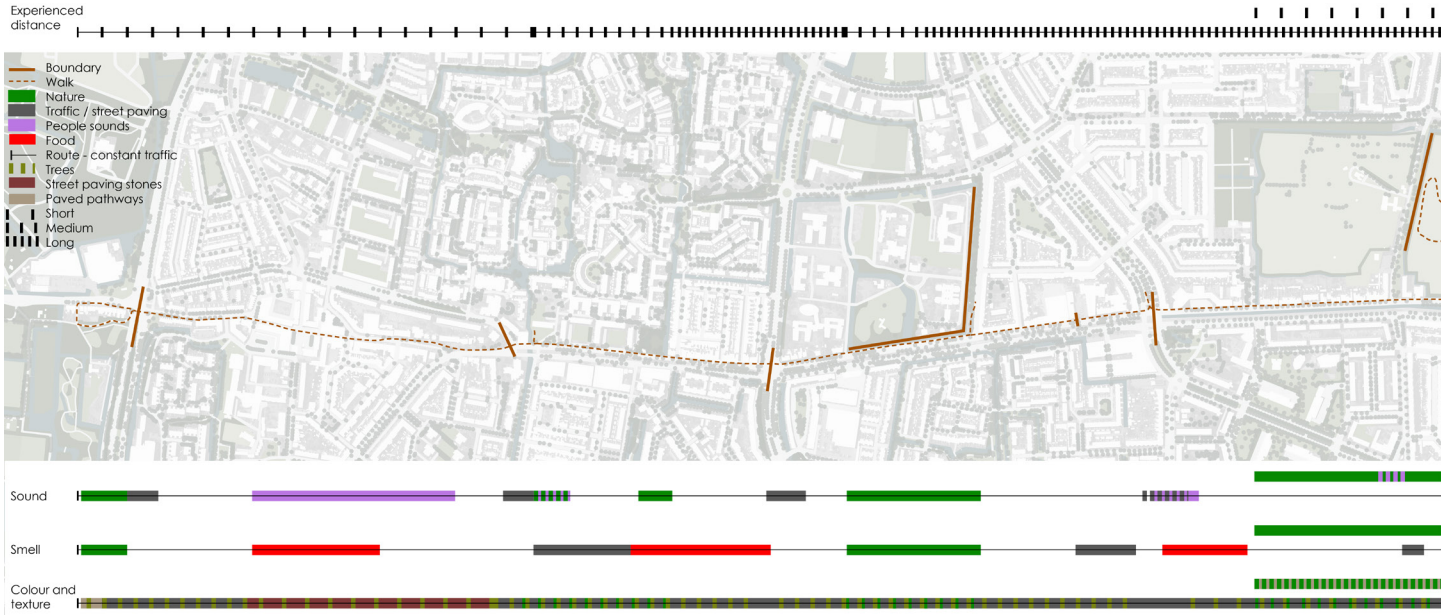


Fig. 6.67: Sensorial analysis and experienced duration of the route

During the walk many senses were triggered. All along the route sounds of traffic were overpowering any other sounds. This also resulted in fuel smells which were sometimes cut up by food and industrial scents. The paved route had a similar tile allong the Loosduinseweg, along in the centres the paving changed. The route existed of traffic. Therefore, when along the route a small patch of green occurred the change in senses was big. In these green spaces natural senses, sounds and textures emerged providing a completely different experience. In some parts the route felt a lot longer than it was related to the distance. This was because of lacking views, or obstruction of a view, no differences or no human scale.

0 50 100 200m
N

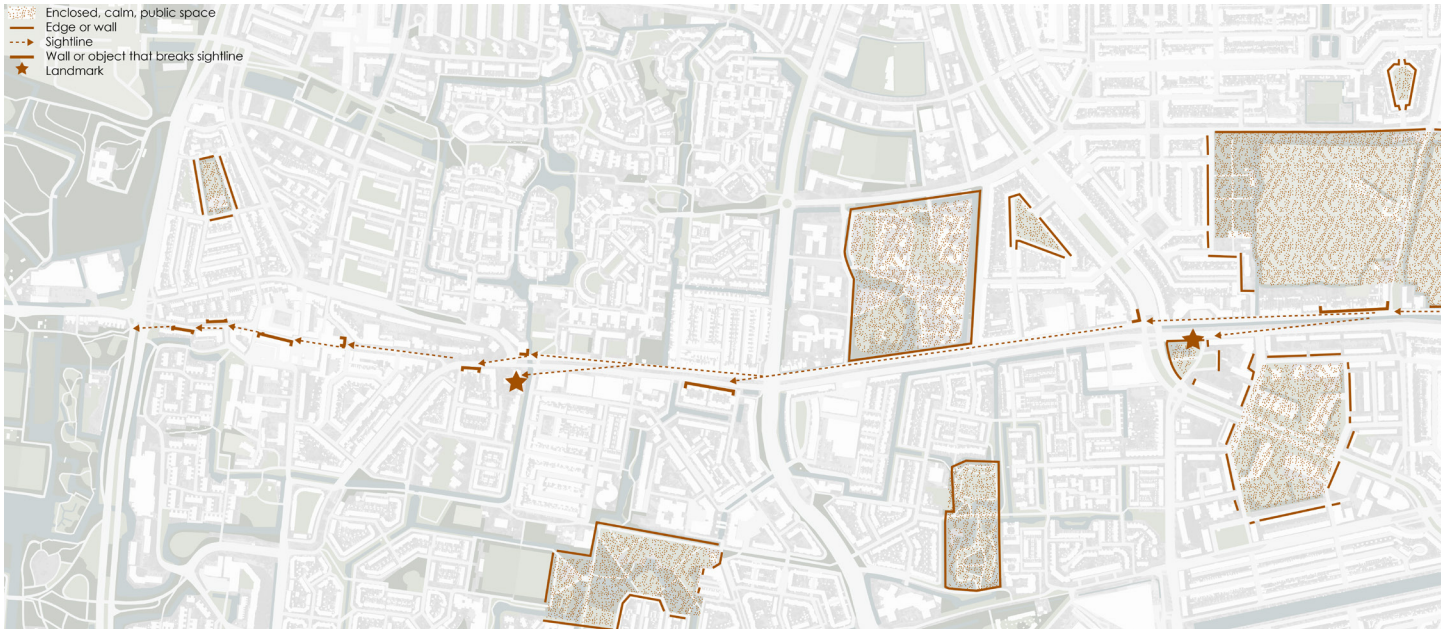


Fig. 6.68: Walked route from the city centre towards the east, inaccessible green and sightlines

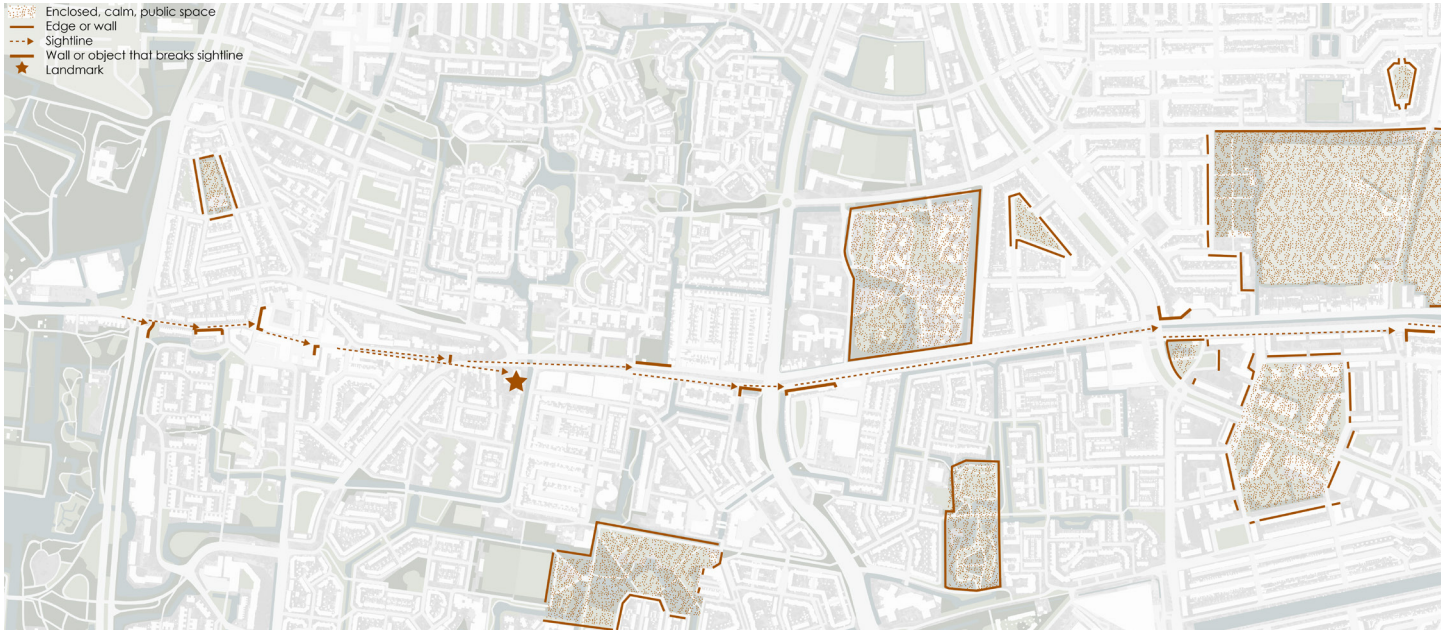
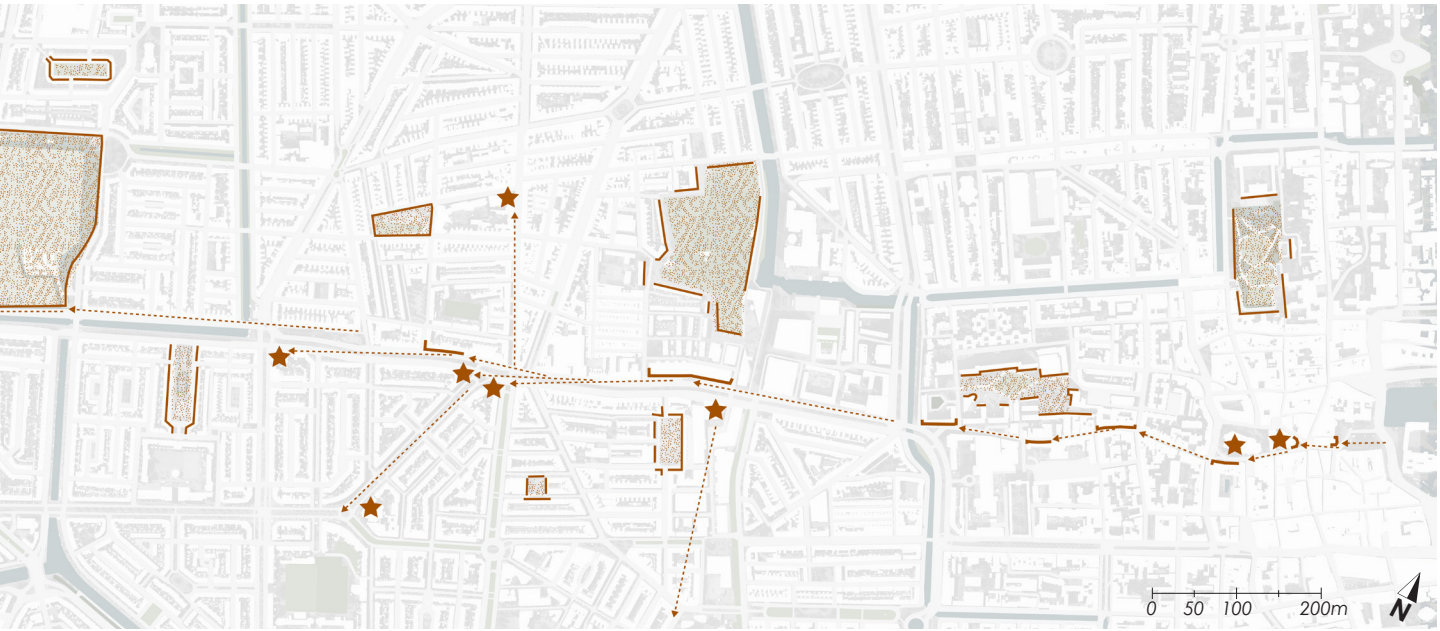
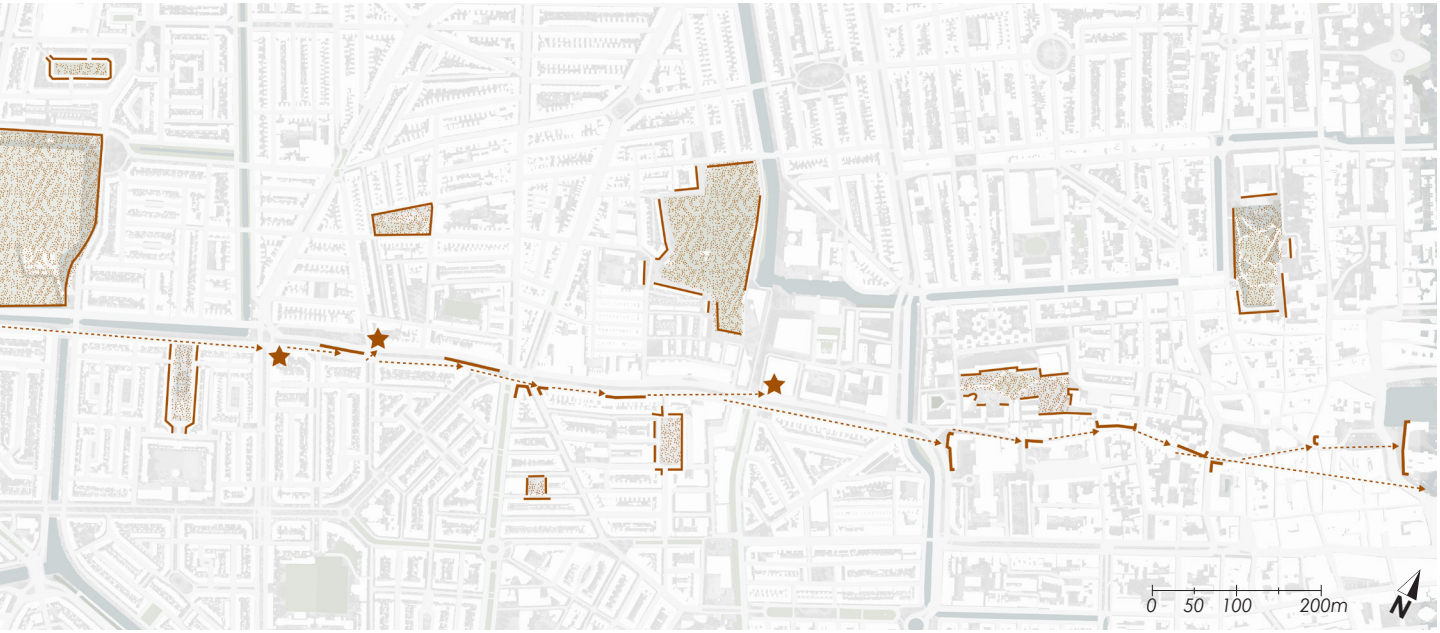


Fig. 6.69: Walked route from the east towards the city centre, inaccessible green and sightlines


0 50 100 200m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6.2.4 LYNCH ANALYSIS

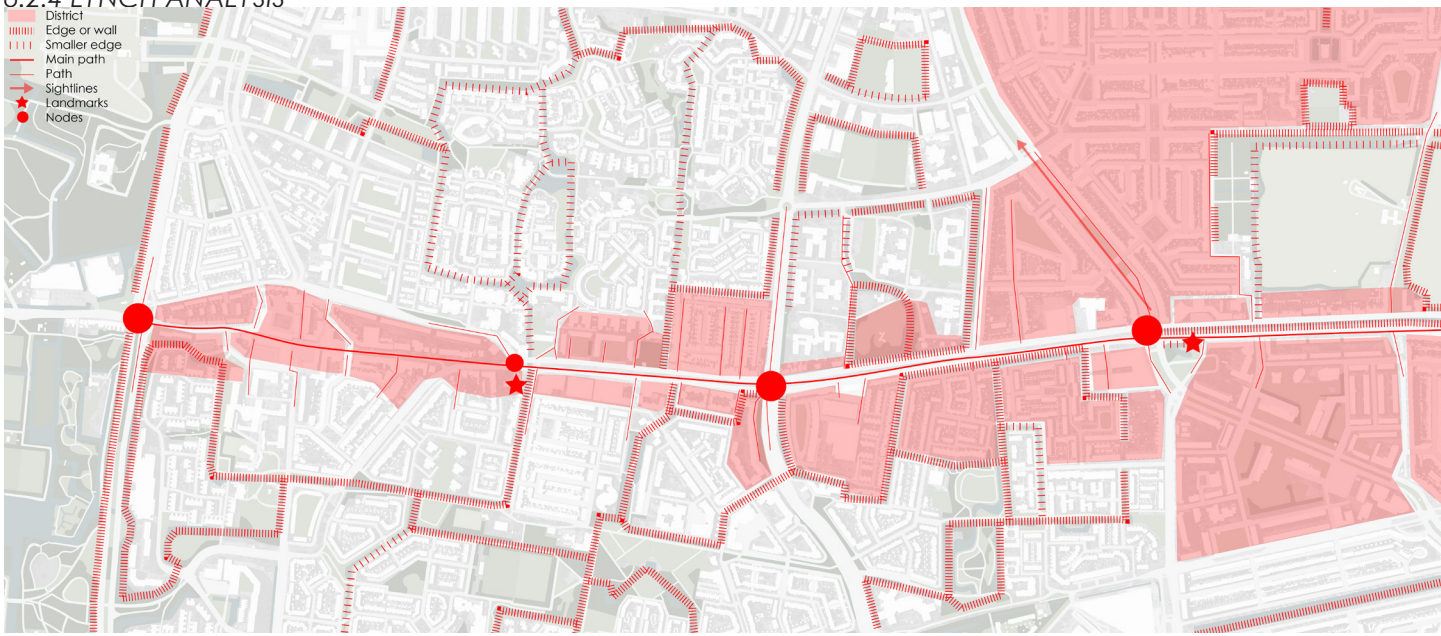


Fig. 6.70: Districts, walls, edges, paths, nodes and landmarks

The lynch analysing strategy was used to offer an insight to the walking experience according to districts, edges, paths, sightlines, landmarks and nodes.
It shows that almost after each node a new district starts, the nodes really divide the neighbourhoods around the Loosduinseweg. Many of the green areas are not accessible, this due to water which forms a boundary. Landmarks along the east side of the route guides the hiker towards the next point, after those the length of the route becomes hard to estimate. Furthermore, the landmarks were placed along sightlines from the city towards the west, they were not seen when walking the other way around.

Fig. 6.71 Landmarks along route

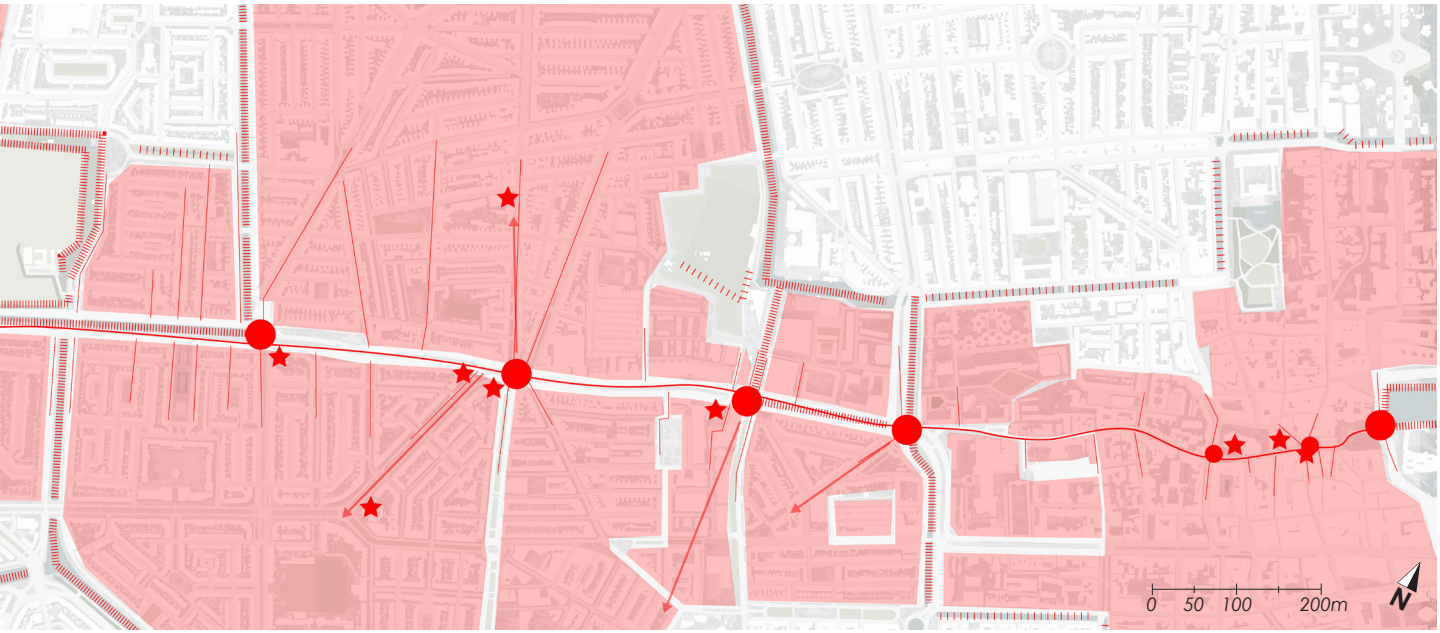


Fig. 6.72 Landmarks along route

6.2.4 GREEN AND CLIMATE ISSUES

Fig. 6.73: Heat island and water nuisance (source: Gemeente Den Haag, sd, illustrated by author)

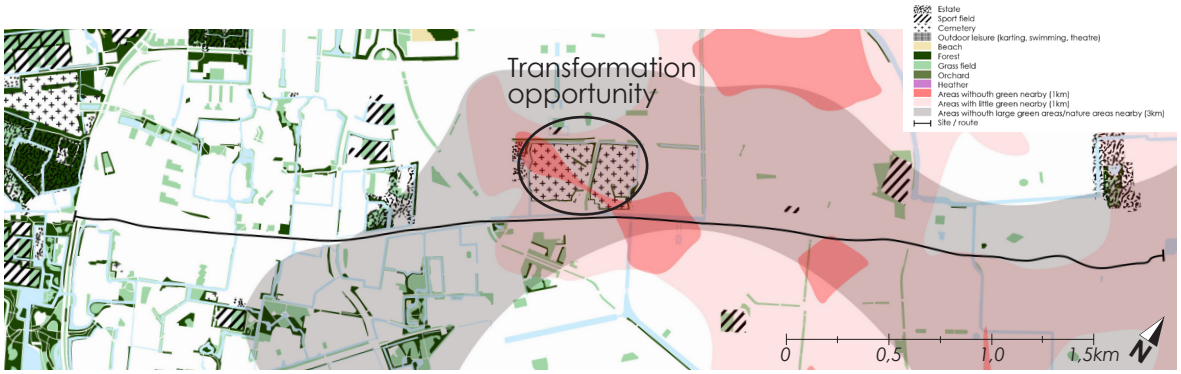


Fig. 6.74: Green areas and lacking amount of green

The climate issues as visualised in the map consist of a few heat islands and places where there is water nuisance. The municipality of Den Haag shows that there are some problems but these can be solved by adaptation of the urban areas.

The green analysis of the area along the Loosduinseweg shows although there are many green spaces not all of them have a function that can be used by everyone such as sport or a cemetery.
When further analysing an area emerges where there is little to no green nearby. According to theories smaller green spaces should be within a 1km walking distance and bigger nature areas should be within a 3km walking distance. The cemetery Oud and Nieuw Eykenduinen provides an opportunity for transformation to create an extra green space in the neighbourhood.

6.2.5 SURVEY ANALYSIS

During the site visits some talks with the residents along the Loosduinseweg provided new insights into the site. Many residents tried to avoid the Loosduinseweg because they felt unsafe due to the heavy traffic.

6.2.5 HISTORIC OVERVIEW IN THE SITE

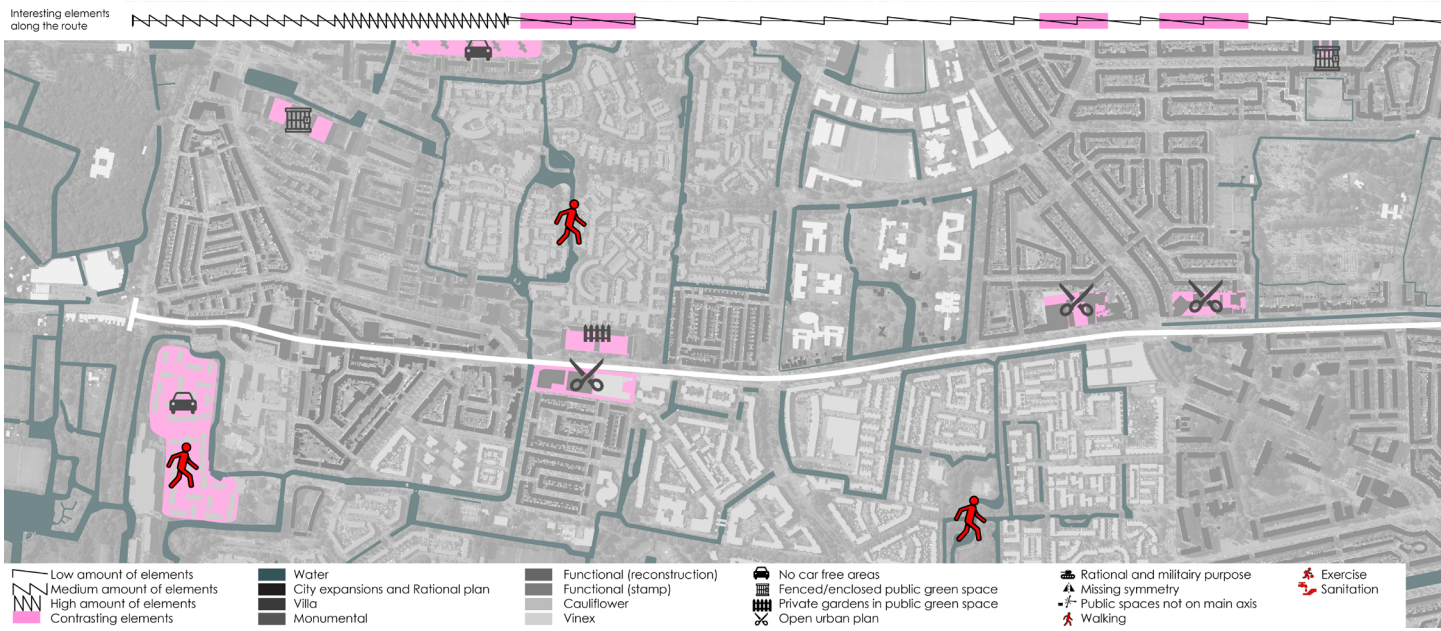


Fig. 6.75: Urban Planning: different urban plans and controversies along the route

Certain areas along the line contain few elements that catch the eye leading to a one tone walk. When Looking through the lens of health in Urban Planning some of the ideas can still be recognised in the structure of neighbourhoods. Although the cauliflower neighbourhoods are supposed to offer a safe, car free and green public spaces along the site they have been taken over by parked cars. Some of the built structures are cut up along the line and replaced by large warehouses, opening the urban plan. Some parts of the line are asymmetric contrasting to the urban plan surrounding it. Many of the small green spaces, once designed for the residents to enjoy are now fenced of creating a disconnect.

0 50 100 200m
N

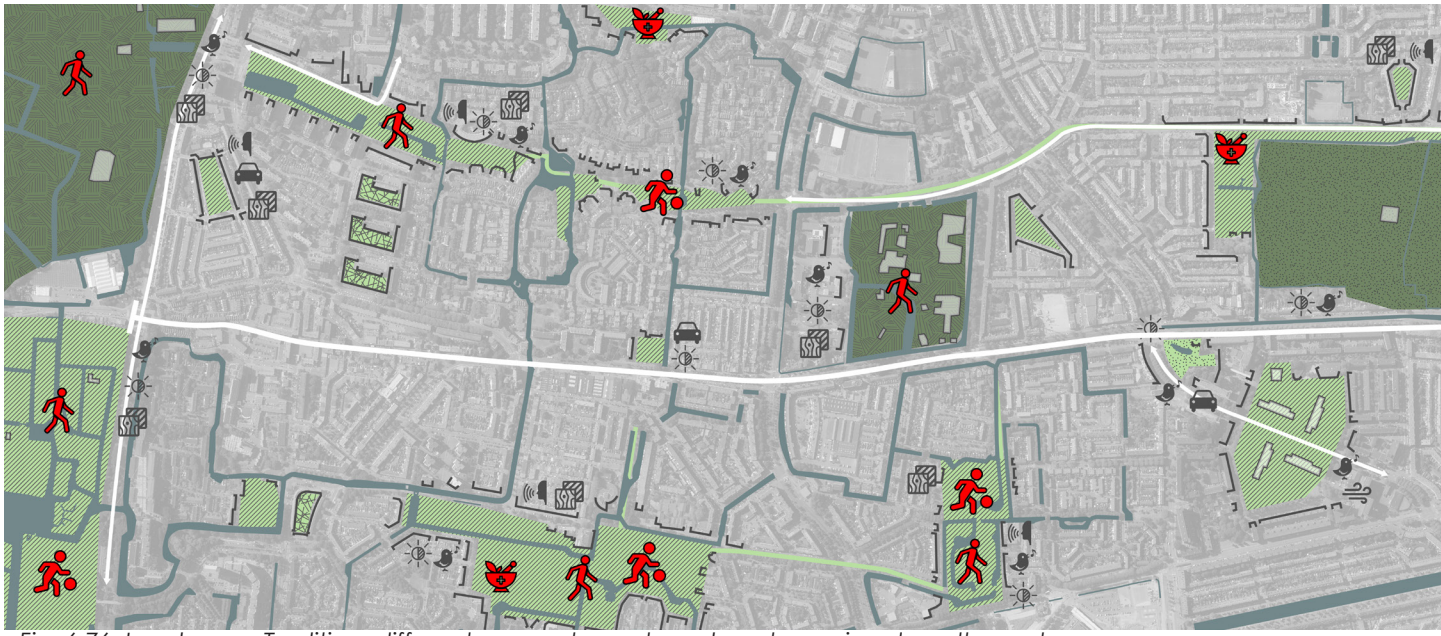


Fig. 6.76: Landscape Tradition: different green elements and controversies along the route

The green spaces along the Loosduinseweg have many different histories and functions. When looking through the lens of health in landscape tradition many of the spaces offer room for exercise such as playing sports and walking. Other parks consist allotment gardens, where residents can grow their own food or medicinal plants.
The current green areas can be categorised in three themes: estates (formal/English style), courtyards and modern parks.

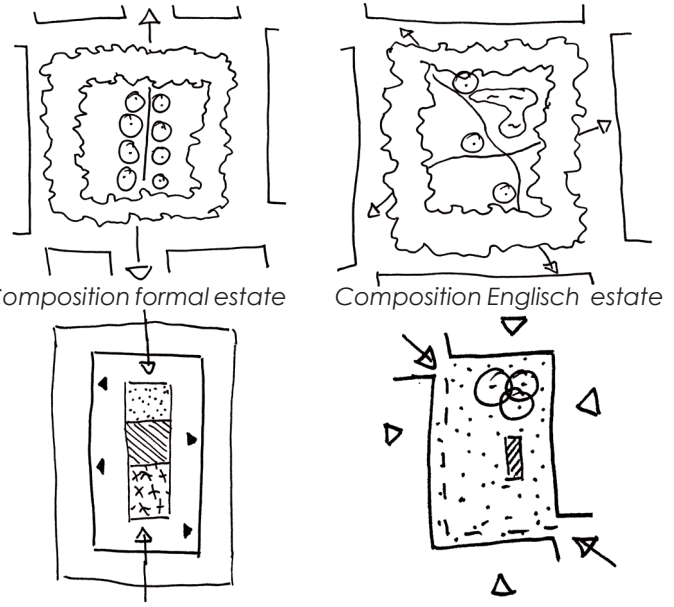
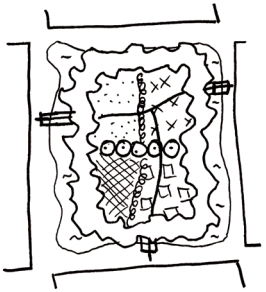
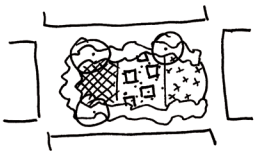


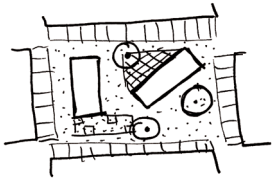
Fig. 6.77: Composition schemes



Composition seperated modern park



Composition enclosed modern park



Composition open modern park

6.2.10 CONCLUSION ANALYSIS

Fig. 6.78: Concluding map

Design brief:
- Loosduinseweg is a patchwork, lacking overall design
- Secondary route, the slower movement to the east stops before reaching the city centre
- Two different green structures along the route
- No defined route for types of movement, fast (car), medium (bike) and slow (walking)
- Cemetery could offer a new green space.
- Lacking connection between north and south of the Loosduinseweg
- Green spaces enclosed by boundaries, not accessible from route
- Boundaries on route such as tram, canal
- Lacking landmarks along the second part of the walk (west) leading to perceived long travel

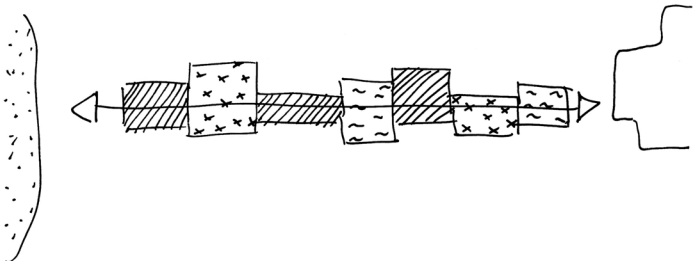


Fig. 6.79: Patchwork along the route

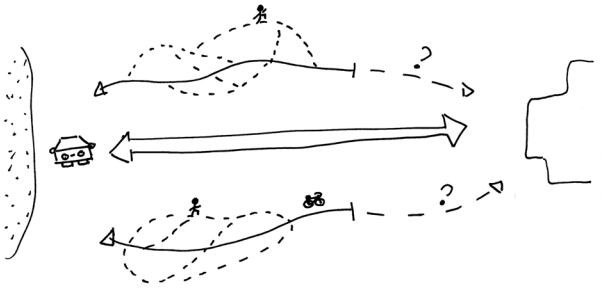
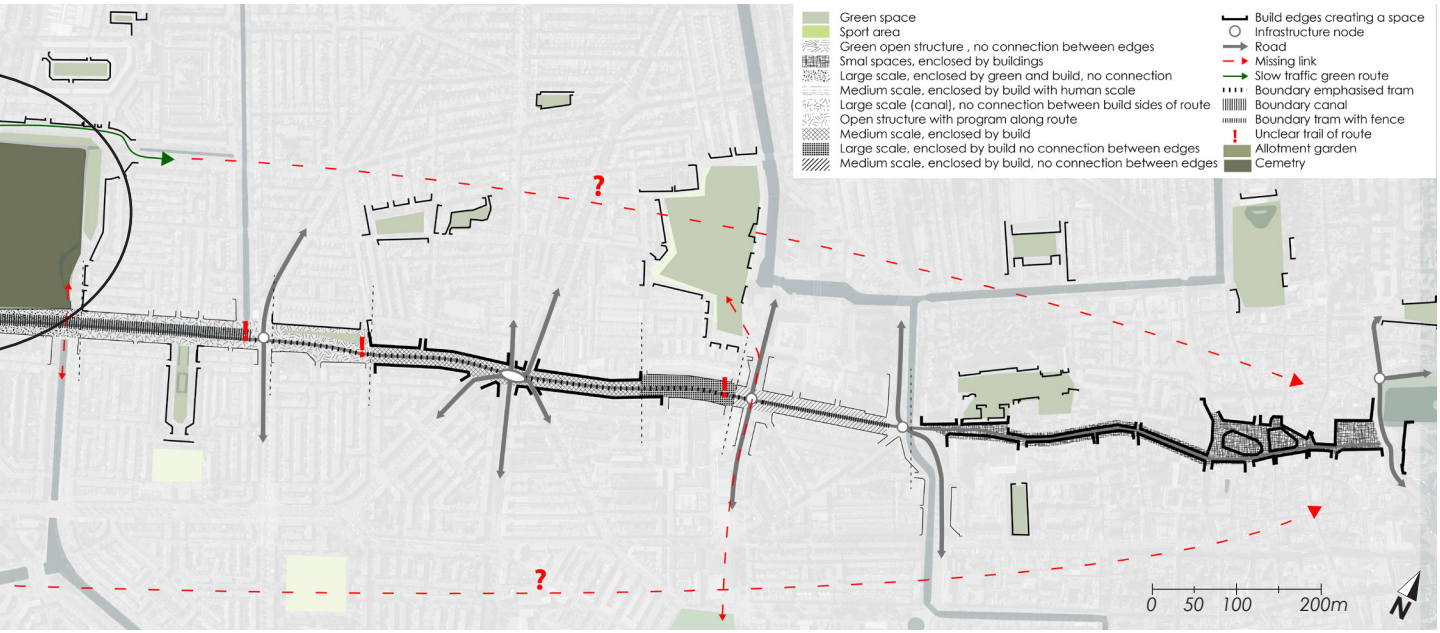


Fig. 6.80: Different speeds of movement related to structures, missing links



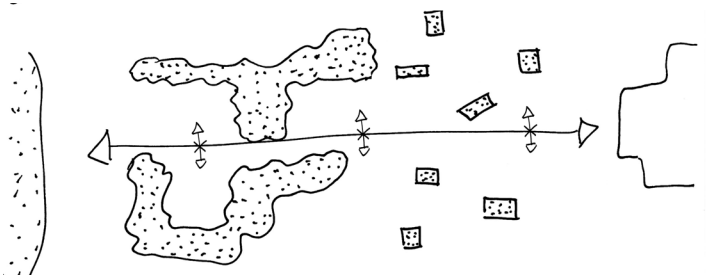


Fig. 6.81: Two different green structures along the route

The site, Oud and Nieuw Eykenduinen is chosen as site because it offers the most opportunities for transformation. The site is now very closed off and is used as a cemetery. It is located in one of the areas where green is most scarce. Although it is located next to the Loosduinseweg, the sensorial experience is very calming. Therefore, it has the most protentional to be transformed.

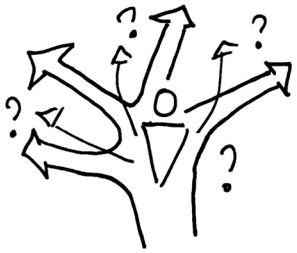
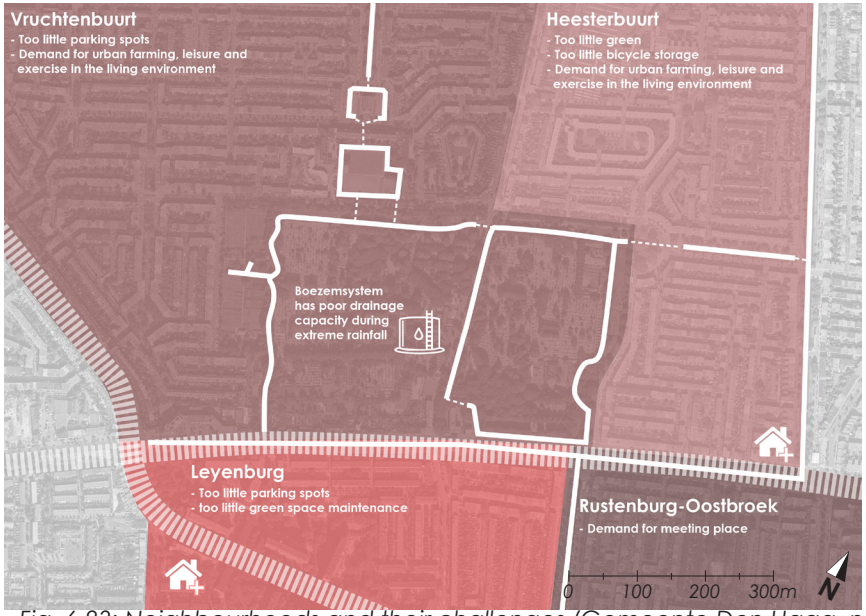


Fig. 6.82: Confusing intersections for ongoing route

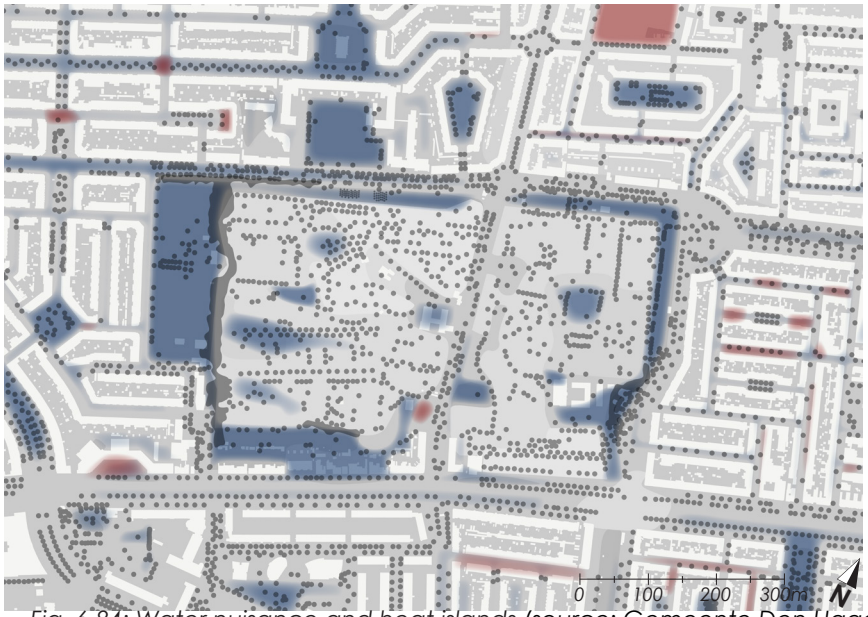
6.3 ANALYSIS SITE - OUD AND NIEUW EYKENDUINEN

6.3.1 SITE AND SURROUNDINGS



The boezemsystem is overwhelmed during heavy rains therefore, water storage should be added. Many residents want more public spaces where they could exercise, meet and do some gardening.

Fig. 6.83: Neighbourhoods and their challenges (Gemeente Den Haag, n.d. illustrated by author)



The water nuisance areas are the lower lying areas in the site. Although these spaces are the lowest, they have little water surface leading to water nuisance. The heath islands seem to be linked to large paved areas without vegetation.

Fig. 6.84: Water nuisance and heat islands (source: Gemeente Den Haag, sd, illustrated by author)

There are many different building-styles surrounding the cemetery. Transitions between public and private spaces also seems to differ from front gardens to Delftse stoep to no transition.

Front garden
Delftse stoep
Different style facades
Parking

Fig. 6.85: Transition public - private and building styles

The cemetery is inaccessible because of water, vegetation and buildings. The surroundings houses a variety of functions.

Allotment garden
Cemetery
Orchard
Petting zoo / urban farm
Sportfield
Park
Church
Functions (shops etc.)
School
Playground
Bicycle path
Public transport

Fig. 6.86: Boundaries, accesibility and program

6.3.2 *HISTORY AND ELEVATIONS*

Fig. 6.87: History of the site

The cemetery grew organically. Although they are near each other these are two different cemeteries which once were each other's rivals. The Nieuw Eykeyduinen was added later and has its entrance on the other side. The Oud Eykeyduinen dates back to the seventeenth century, a ruin from that time can still be recognised.

Fig. 6.88: Elevation

The elevations have an influence on accessibility and spatial structure as shown in the sections.

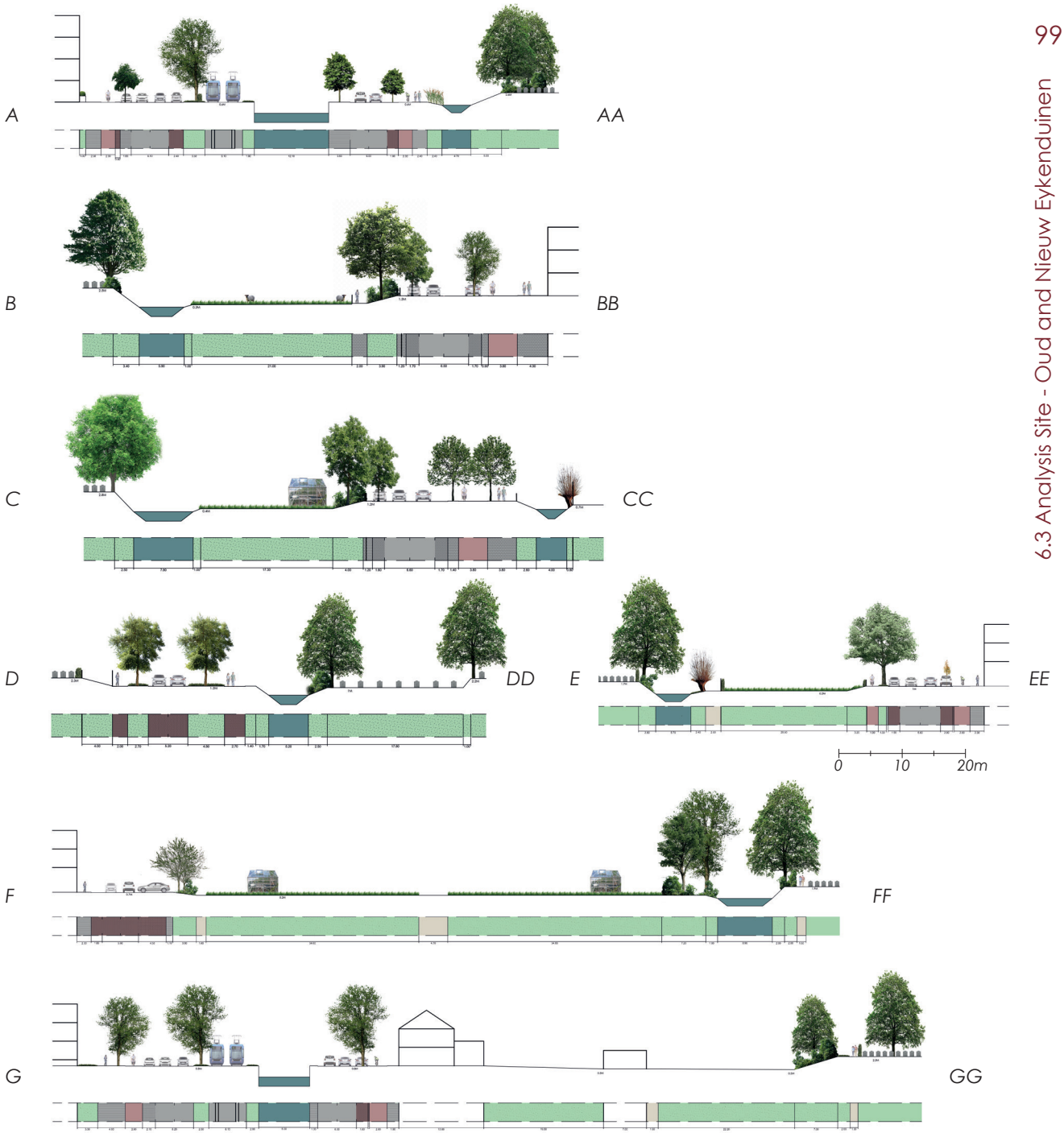


Fig. 6.89: Sections of the edges of the site

6.3.4 *EYE-LEVEL EXPERIENCE*

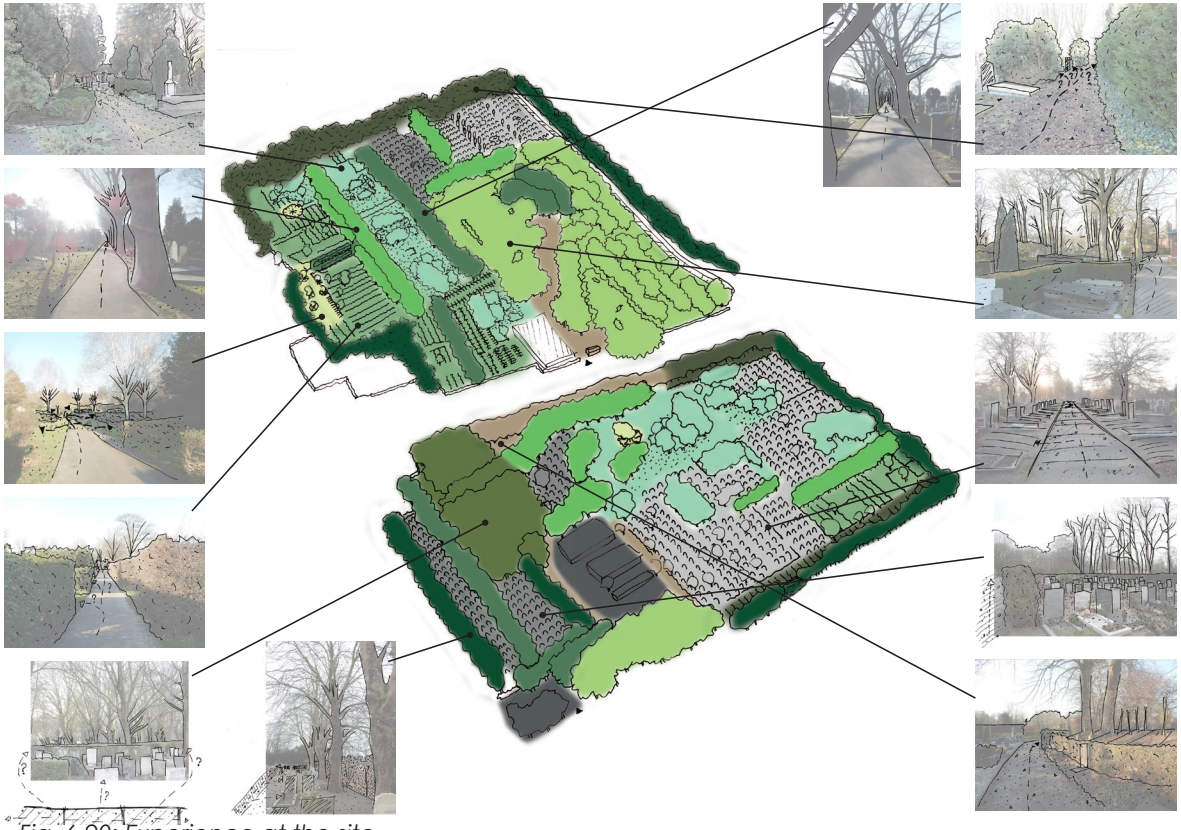
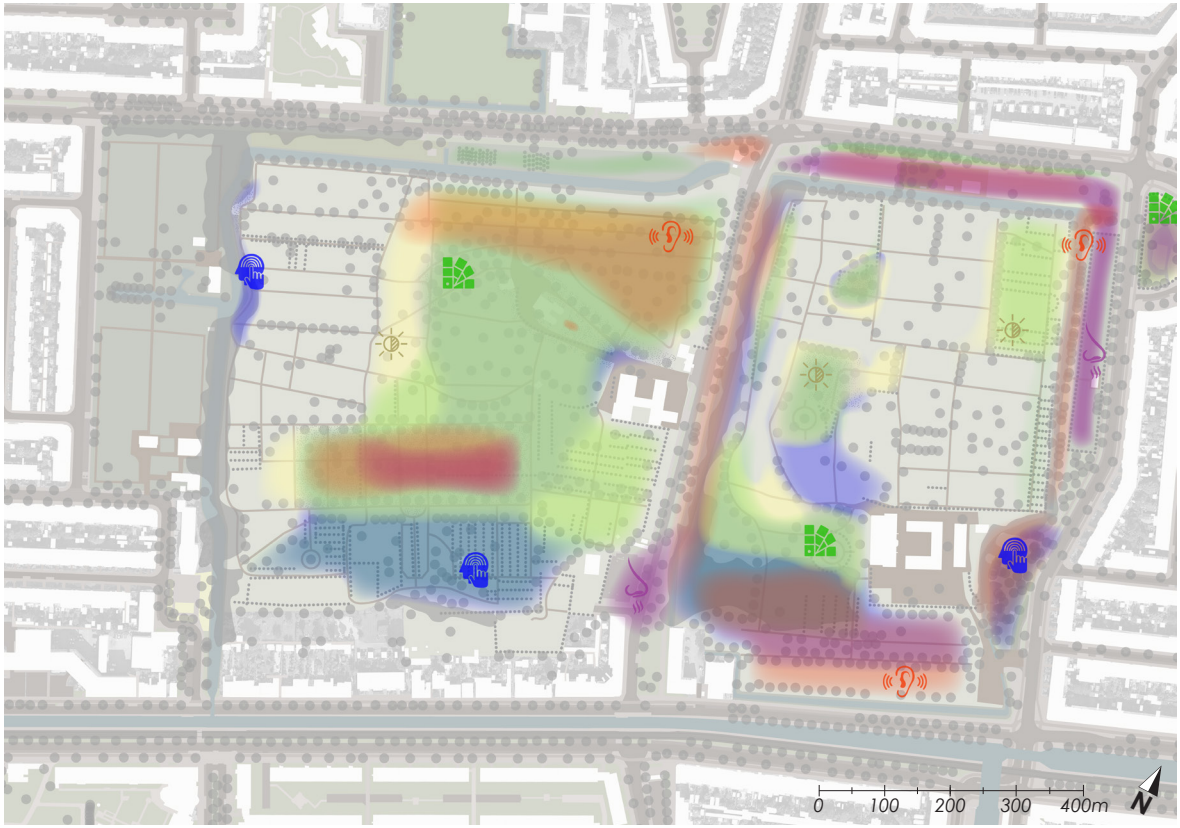


Fig. 6.90: Experience at the site

Walking around the cemetery, many different atmospheres can be found. While walking differences in experience can be recognised by amount of enclosure, interrupted or ongoing view lines, amount of differences in vegetation, different materials and colours and the dimensions of the space.



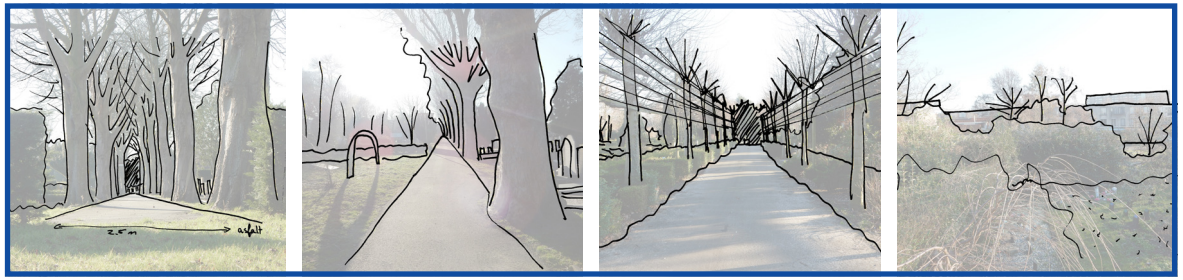
Many different textures and colours
Many changes in sunglight and shade
Interrupted viewlines leading to further exploring
Many different smells by vegetation
Various nature sounds

Fig. 6.91: Sensorial experiences at the site

While walking around the two cemeteries different sensorial aspects can be experienced. The sounds of cars, public transport and other movements outside the cemetery can be heard all over the site and will therefore, not be visualised in this map.
The spaces which have many layers of sensorial aspects such as textures and colours, light and shade and interrupted views are located at spaces with many different types of vegetation and various amounts of enclosure.

Fig. 6.92: Serial views on the site

Fig. 6.93: Serial views



6.3.4 *PLANTING*

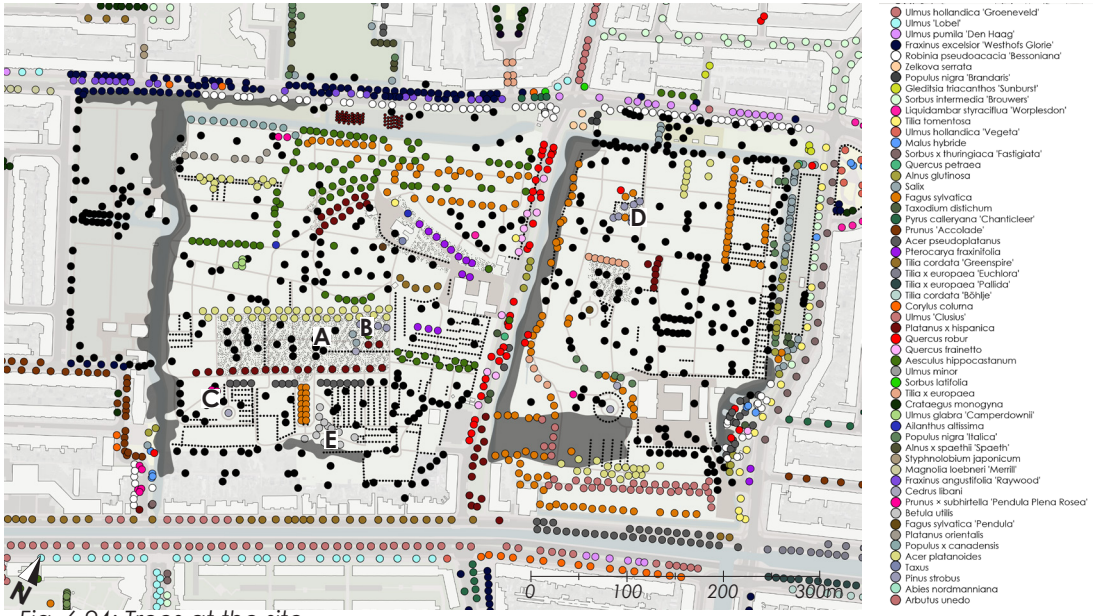
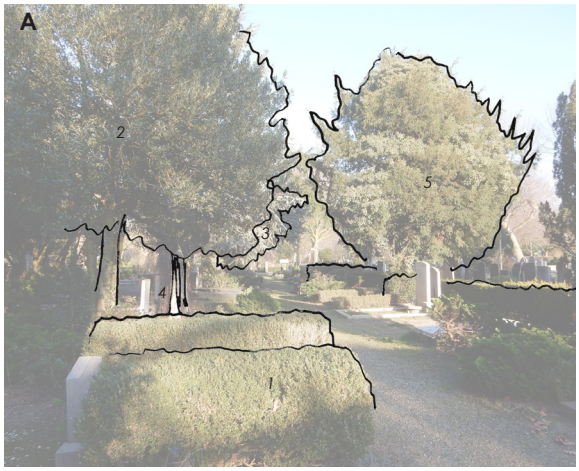


Fig. 6.94: Trees at the site



1. Buxus - 2. Ilex aquifolium - 3. Abies nordmanniana - 4. Betula - 5. Picea abies

1. Pieris - 2. Abies nordmanniana - 3. Chamaecyparis lawsoniana - 4. Taxus - 5. Pinus strobus - 6. Thuja plicata 'Excelsa' - 7. Athrotaxis

Fig. 6.95: Species of vegetation at the site

1. Lavandula - 2. Buxus - 3. Populus x canadensis - 4. Prunus laurocerasus 'Otto Luyken' - 5. Betula - 6. Prunus avium - 7. Arbutus unedo

1. Hydrangea - 2. Prunus laurocerasus 'Otto Luyken'

1. Juniperus communis - 2. Larix decidua - 3. Carpinus betulus - 4. Pinus strobus

1. Betula utilis var. jacquemontii - 2.Spiraea - 3. Taxus

Along with the planted tree structures many different species can be found in de site. These are a result from people decorating and honouring their loved one's graves by planting vegetation. Over the years these shrubs have grown into trees and created new clumps of species. These add a new level to the composition of the cemetery, spontaneous clumps of biodiversity.

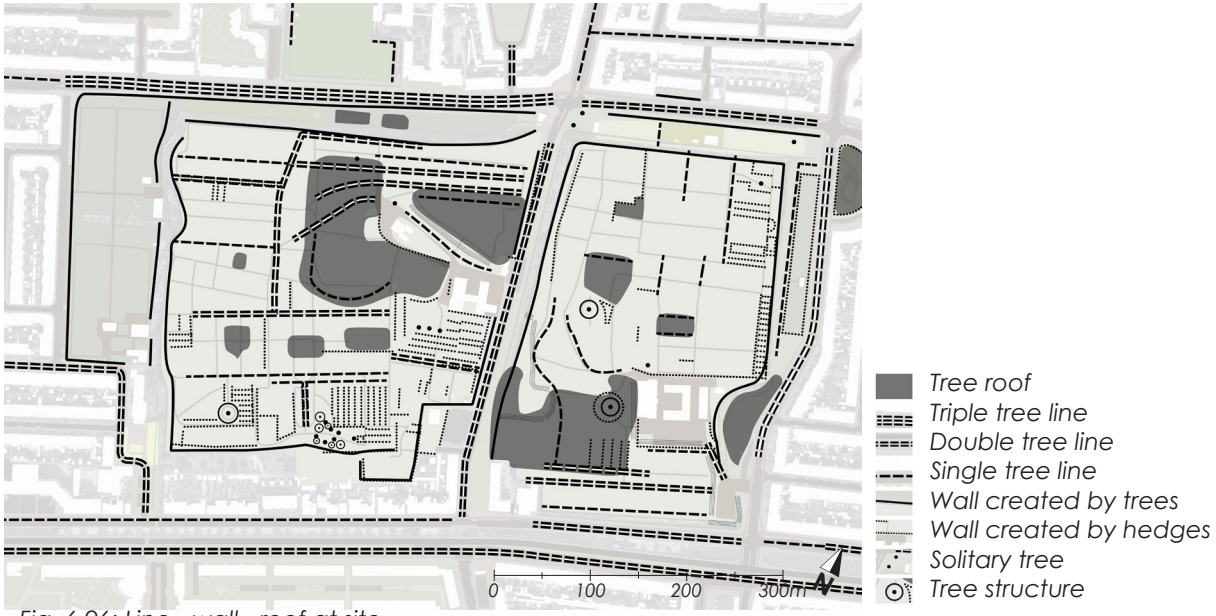


Fig. 6.96: Line - wall - roof at site

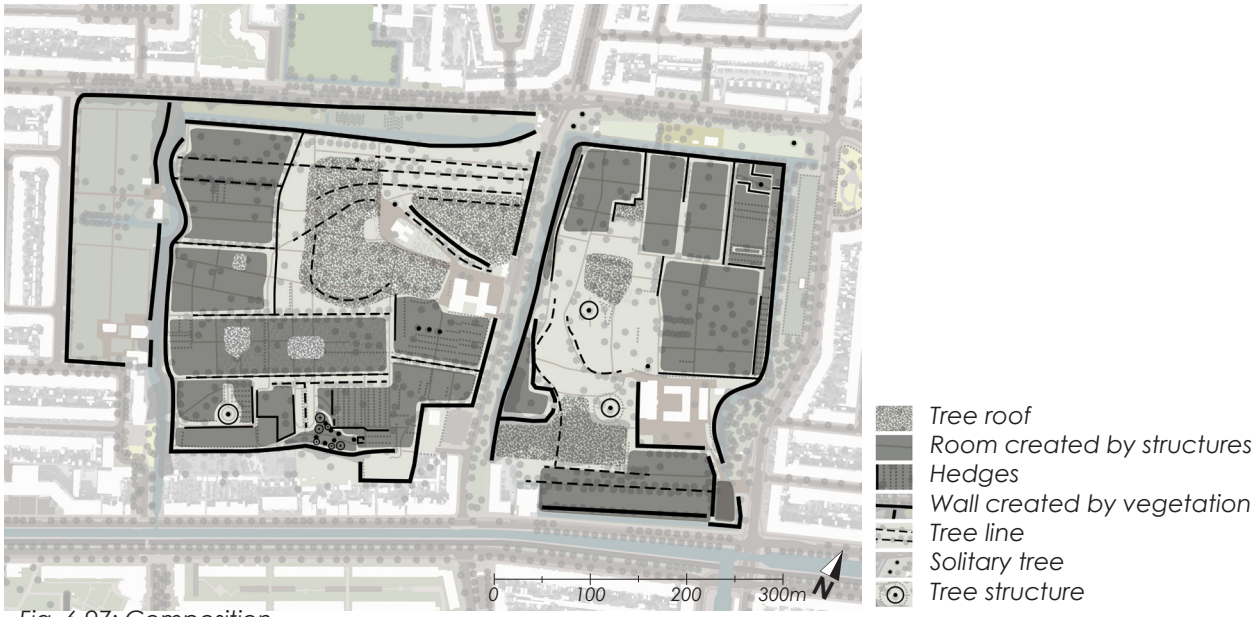


Fig. 6.97: Composition

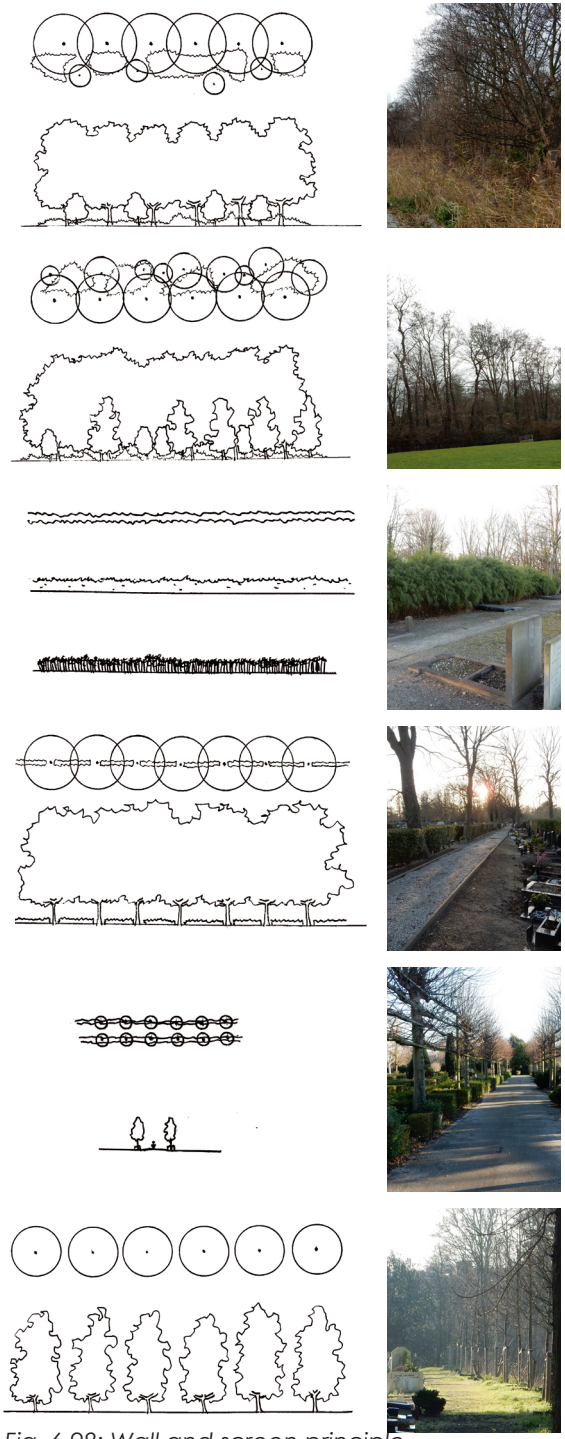
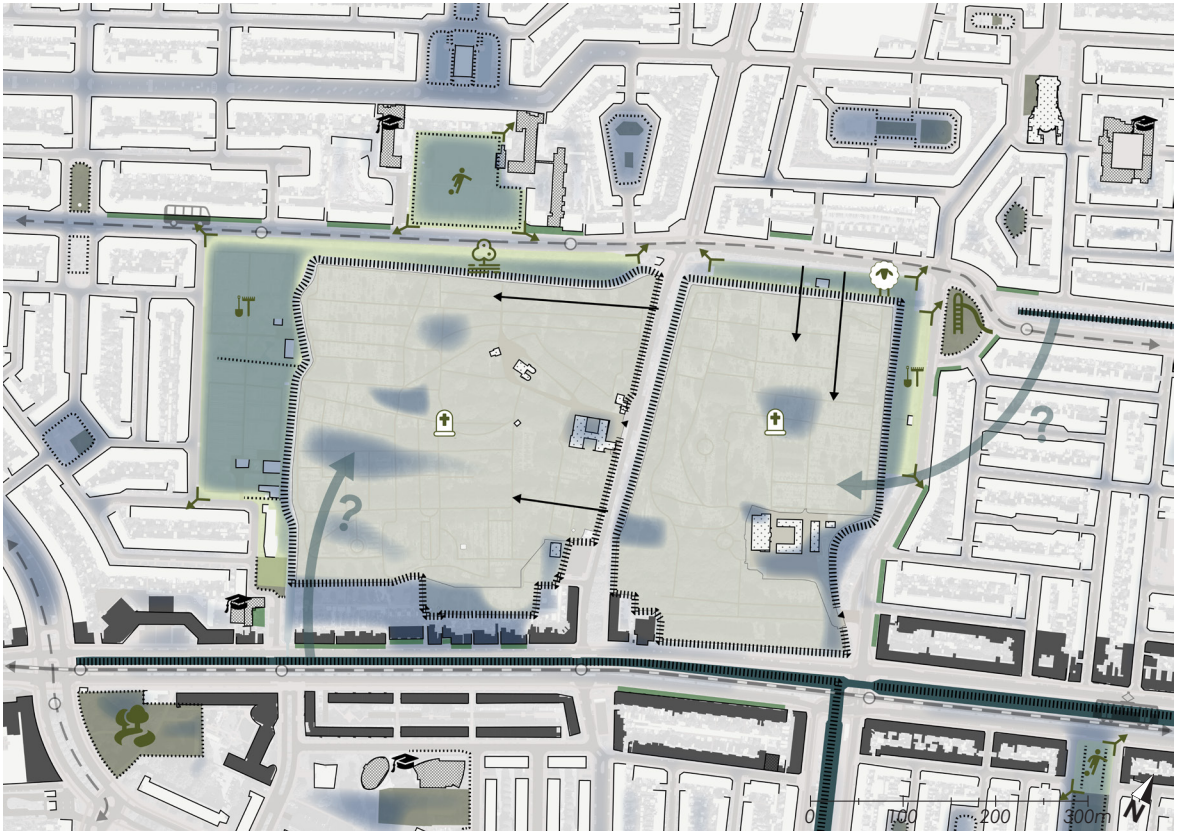


Fig. 6.98: Wall and screen principle

Fig. 6.99: Line and clump principle

6.3.5 CONCLUSION



Cemetery
Water nuisance
Allotment garden
Orchard
Demand for expanding
Petting zoo / urban farm
Playground
Sportfield
Sightline
Front garden or Delftse stoep
Church
School

Fig. 6.100: Conclusion site and context

The residents from the surrounding neighbourhoods want to have more spaces to meet and to recreate in parks. The boundaries around the entire site result in a disconnect between the surroundings and the site. The site could help with the housing demand, enclosing the Loosduinseweg. The water storage during heavy rains could be improved by linking it to the site, relieving the surrounding neighbourhoods.
The cemetery consists of many different rooms, some experienced better than others. The red rooms have little vegetation, big open spaces and consist mainly of burial stones. This results in a lack of human scale and sensorial experience. The green rooms offer different spaces and experiences created by various species of vegetation.

Fig. 6.101: Conclusion site

The purple zone has currently the strongest sensorial experiences in them.

Design brief:
- A better accessible park, removing the boundaries connecting.
- Various spaces should be alternated, creating an interesting experience.
- The current structure could be transformed and used in the design, using of the current species of vegetation and extending them could improve biodiversity.
- Water storage had the added bonus of guiding movements.
- Entrances to the park should be marked.
- Program should be added to the park to offer a space for the surrounding residents.

6.4 CONCLUSION ANALYSIS DEN HAAG - DESIGN BRIEF CITY - LINE - SITE

From the analysis on different scales, various conclusions are drawn which form one of the starting points of the design. To conclude the analysis a sum-up of the conclusions is made to further explain the design brief according to the analysis.

The large scale, the city of Den Haag, mainly focusses on defining the main spatial structure of the city, the historic lines. Currently some of these have been transformed and are unrecognisable. Resulting in an uneven spatial structure with missing links to the west side of the city. These should be reclaimed as main structure of the city and should have defined endings to emphasise the transition between city and surrounding landscape or city and centre. These lines could be used to green their surroundings, answering the green demand in those neighbourhoods.

There is a missing link between north and south of Den Haag. This is mainly a result from the big infrastructures forming a boundary. Secondly the secondary green spaces are missing a connection, resulting in a lacking north and south link.

Den Haag wants to design for the future, answering climate change demands such as water storage and reducing heath islands. The city also needs to build more houses, resulting in a densification question.

Therefore, the design brief entails; defining the historic lines/spatial structure; solving the missing links between green spaces and north and the south; greening the city; densifying; reducing heath island effect and water nuisance.

The second scale, the line, also focusses on missing links between green spaces and the north and south part of the city. Besides this, the line itself is a patchwork of different spaces lacking an overall link or atmosphere. Resulting in an uncoherent infrastructure. Making it difficult to follow the route.

The secondary route aligned with the line stop before reaching the city centre creating a missing link.
Green spaces along the line are enclosed by water or buildings making them inaccessible from the route. These green spaces are also not connected to each other.
The line itself also form a boundary by the tram and water structures on it.
The route feels long, due to the lack of landmarks, and human scale.

Adding green spaces or transforming old structures, such as the cemetery, along the line could improve the experience along the route and solve the lack of green spaces.

Therefore the design brief entails: a coherent design for the line; finishing the secondary movements towards the city centre; define the different movements and their space along the route; creating a connection between the green spaces and the north and south of the line; make the green spaces better accessible; create human scale and visual ques along the line; transforming the green spaces along the line, the cemetery.

Lastly the site was analysed resulting in conclusion mostly focussing on accessibility of the site and experience.

The site, a cemetery, looks like a green space but is almost inaccessible due to its one entrance. topography and water emphasise the inaccessibility.

The surrounding neighbourhoods demand more meeting places and spaces for leisure activities. Water storage is needed during heavy rainstorms, when nuisance arises.

The current site is a cemetery with many different spaces, atmospheres and vegetation species creating interesting structures which could be used during the transformation. Although some of these spaces are interesting, most rooms in the site lack human scale and variety. Here the many burial stones without vegetation don't offer the same level of experience related to the others. The various species of vegetation found on the site could be extended to increase biodiversity.

Therefore, the design brief entails: create water storage that can be used during heavy rain storms; a better accessible park with marked entrances; spaces should be left open for residents of the surrounding neighbourhoods to use them for leisure activities; a part of current structures, rooms and vegetation could be used in the design to enhance experiences, increase biodiversity and to link back to the cemetery.

7. Vision Den Haag

7.1 VISION DEN HAAG

To apply the Urban Forest Movement, the main structures of Den Haag, the historic lines, are used to create a spatial framework. These lines need to have a defined ending. Transforming these lines into the Lane of the Urban Forest Movement, the infrastructures need to be reduced and redistributed over other existing infrastructures.

The secondary lines, the Country Lanes consist partly of already existing structures which need to be extended and of new routes. These new routes are designed from using current infrastructures or green structures which are closely to the Forests. Other than offering a secondary route it connects green space in the neighbourhoods together. These can also be used to green a neighbourhood.

The Forest next to the Lanes are made up of current green spaces mostly consisting of old estates. Some of these Forests are relatively harder to access resulting in a needed breakthrough of built structures. Some current green spaces with specific functions will be transformed into public parks so that, that everyone can enjoy the green spaces.
Den Haag needs to densify to answer the rising housing demand. This densification happens along the Lanes, just as the Urban Forest Movement suggests, to strengthen the existing historic lines as lanes. The build is oriented on the Lane to enclose the Lane even more.

The Lanes, Country Lanes and Forests are planted with trees to battle the heath island effect and to add biodiversity to the city. Further the water nuisance is relieved by adding water storage in the Forests.

The added elements to the Urban Forest Movement in Den Haag are the north-south connections. These are designed to create a better accessibility to green spaces and to link the north and the south of the Loosduinseweg, which is currently a boundary. These connections can add new green spaces to neighbourhoods.

Fig. 7.1: Connection Lane to the surrounding landscape

Fig. 7.2: Vision map Den Haag and surroundings

- *Crossing of Lane structures*
- *Forest*
- *Secundary green space*
- *Courtyards*
- *Lane*
- *Country lane*
- *Infrastructue*
- *Water/sea*
- *New green connection*

0 1,0 2,0 3,0km N

7.2 MASTERPLAN LINE - LOOSDUINSEWEG

7.2.1 CONCEPT

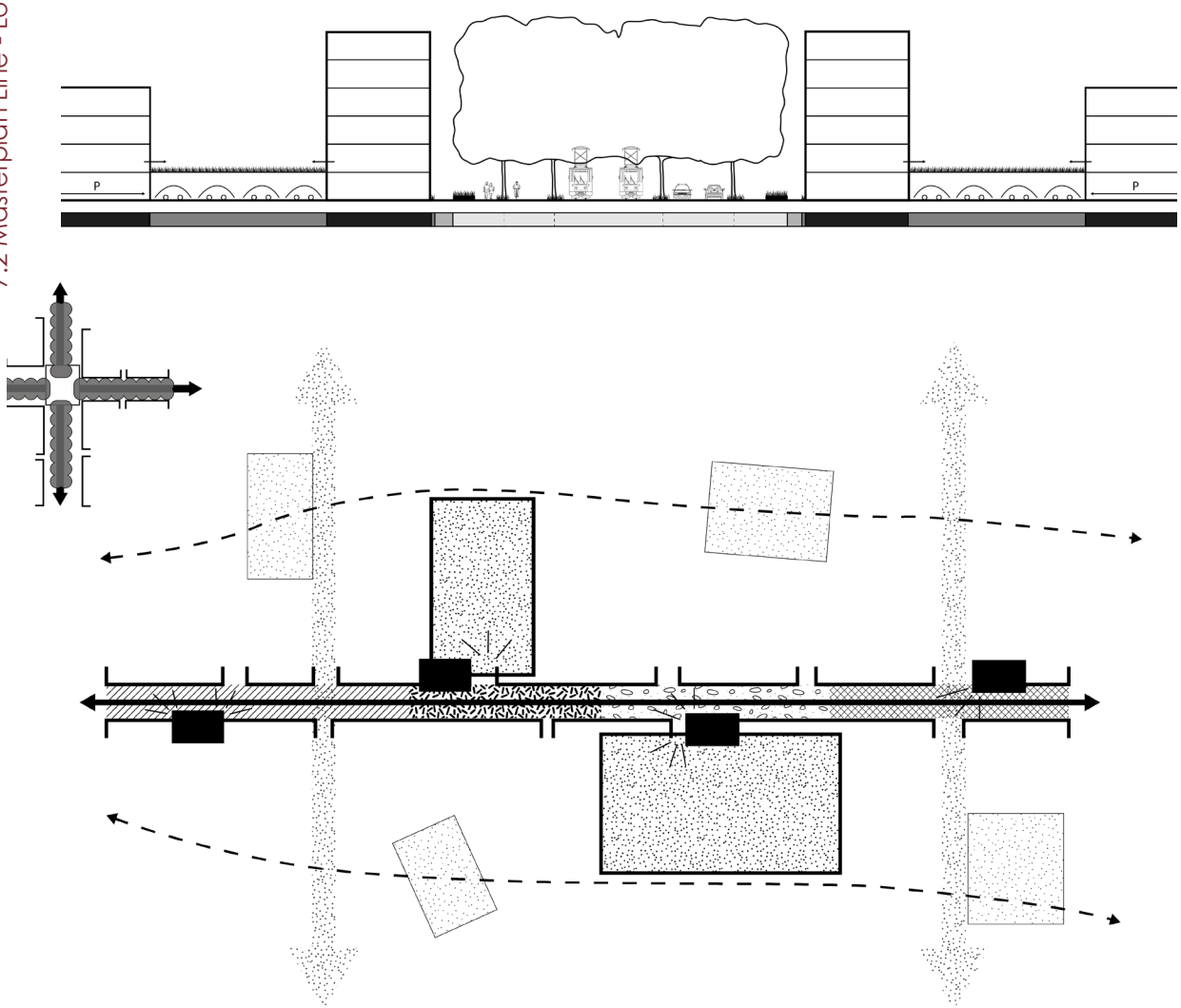


Fig. 7.3: Concept line

The Loosduinseweg or Lane, shows how the second scale of the Urban Forest Movement can be applied to and existing structure. Here the Loosduinseweg is the Lane, with attached the Forests and behind those the Country Lanes. To transform the Loosduinseweg into a uniform structure, the structure with different types of movements is paved as one whole. The different movements, the tram, car, bicycle and walking are linked together by using one clear materialisation with the tree lines offering a distinction between them. To further create one structure, the Loosduinseweg is enclosed by buildings. This is done by adding new build structures in current open spaces. These build structures are designed to house parking underneath a courtyard, creating parking space out of sight and a shared green space. The buildings are placed in such a way that they create entrances or previews into the forests, generating interest from the people on the Lane. These blocks also create new landmarks allowing for easier defining of a distance. A Delfste stoep and planter box or green patch are added to create a transition from the fast movement to the dwellings.

Crossings with other Lanes of structures in the city are emphasised through an opening in the canopy. This offers a change in enclosure and view lines, offering an overview in of structures to decide where to travel next.

Although the structure feels like one element it does have different parts, emphasising that it cuts through different parts of the city. Therefore, different atmospheres are created along the line to fit the surroundings, such as squares with functions near the city centre, a sloped green bank next to the canal and singels to refer to the cauliflower neighbourhoods.

The Country Lanes are extended to the city centre in the form of a tree line structure. Here gardens and views on the forests create a green environment. The tree structures are also used to create north and south connections.

The chosen trees along the Lane are selected because they can currently be found along the line and because they will increase biodiversity.

7.2.2 DESIGN

Fig. 7.4: Plan line design

- Forests
- Courtyards
- Water
- Passage
- New buildings
- Square
- Promenade
- Crossing

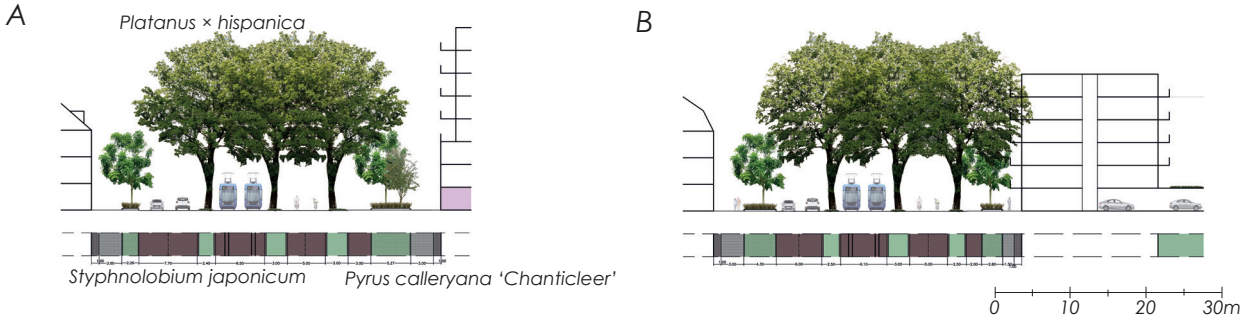
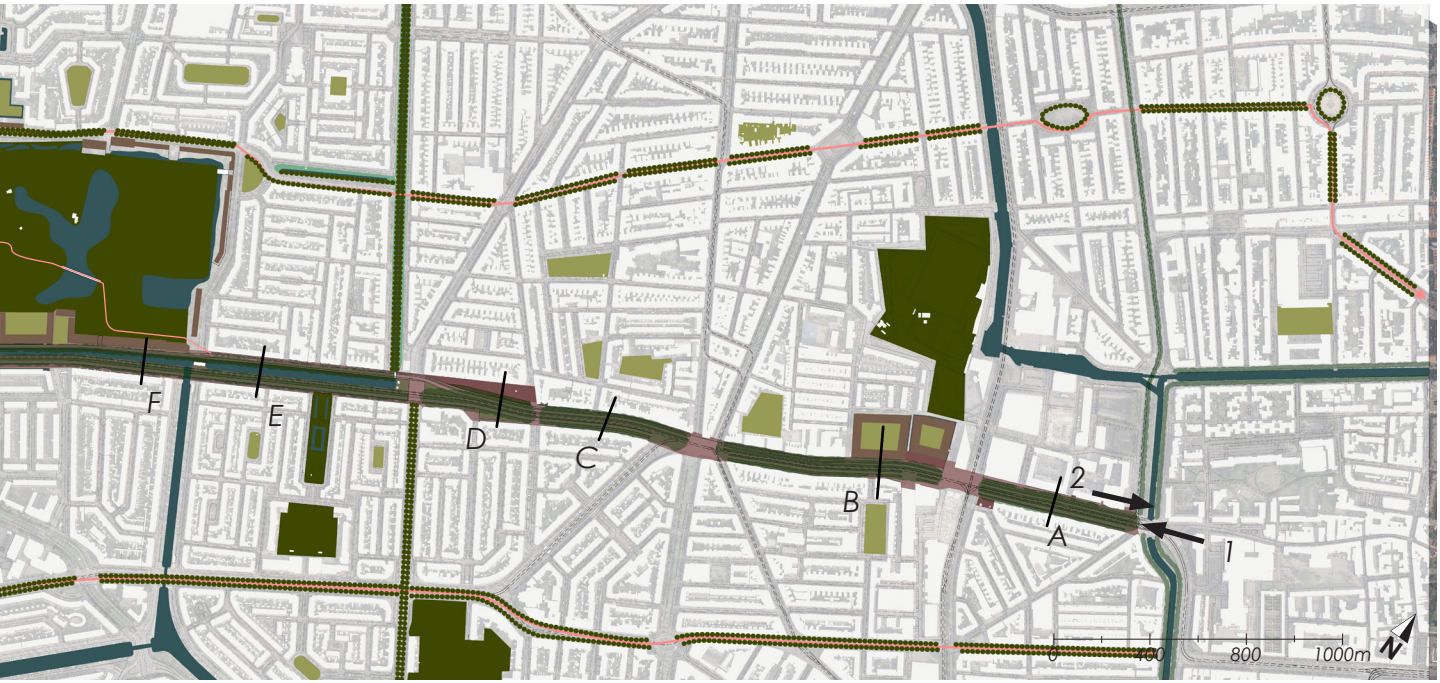


Fig. 7.5: Sections of the line



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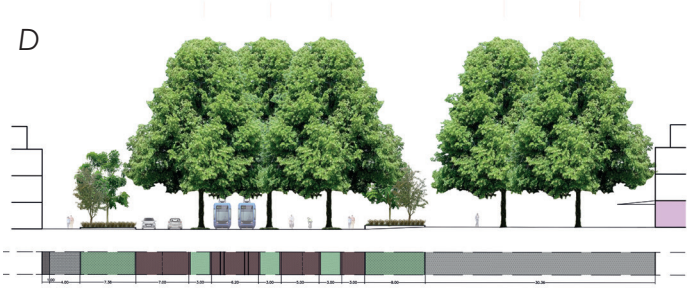
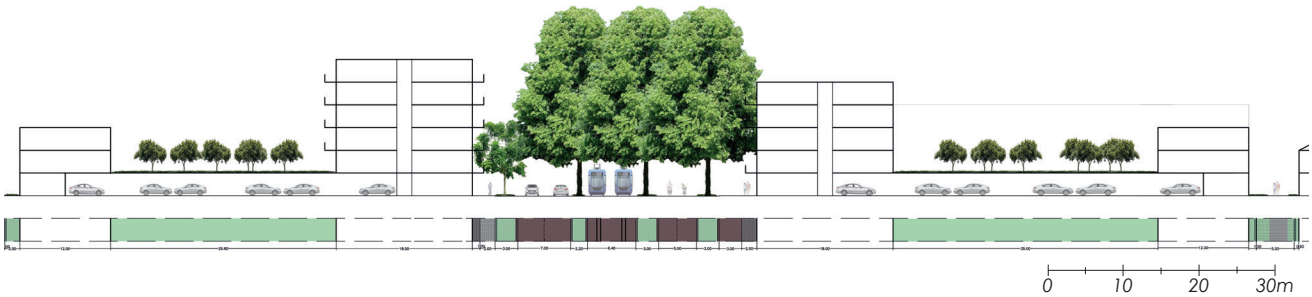


Styphnolobium japonicum
Pyrus calleryana 'Chanticleer'

Fig. 7.6: Sections of the line

J



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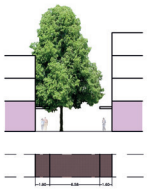


1

2

Fig. 7.7: Crossing of lines, opening the canopy to show the various possible directions and change of structure

8. Design - Eykenduinen Park

8.1 SITE CONCEPT

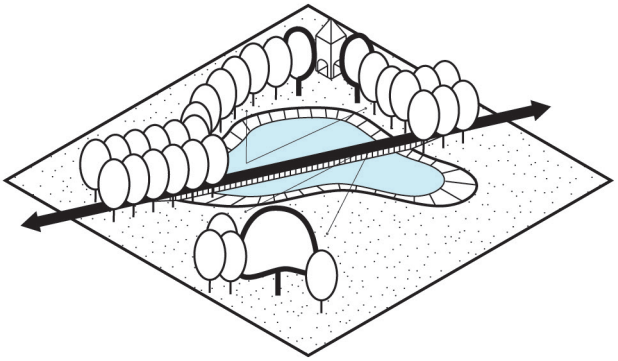
The design of the site, Oud and Nieuw Eykenduinen dives deeper into the final scale of the Urban Forest Movement, Gliding, Grazing and Wandering.

The site offers a different level of experiencing nature and emerging in nature per movement. When Gliding, visitors only experience glimpses of the park that can be seen from the main route. These views are framed by using vegetation. The route travel through different spaces offering a pastoral experience of the park. The ground cover is smooth and there are little to no elevation, by creating bridges and slopes, making the movement a smooth experience.

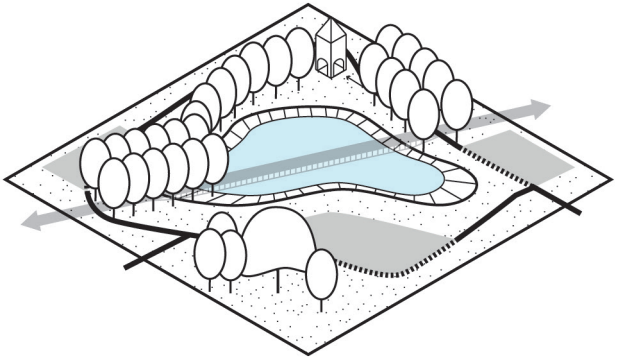
When Grazing the visitor experiences the park from different angles following the route. This route differs in materialisation to link the path to its surroundings and let the visitor experience this change. From this path different landmarks and open views generate an interest in exploring the park further the next time. From this movement different functions can be found in the park.

When Wandering the visitor is completely emerged nature, experiencing the different spaces, colours, sounds, textures and struggles to reach a certain space in the park. Here visual cues are used to generate fascination, balancing mystery and legibility, and further walks without creating a path. Stairs and steep climbs make the visitor realise the difference in elevations.

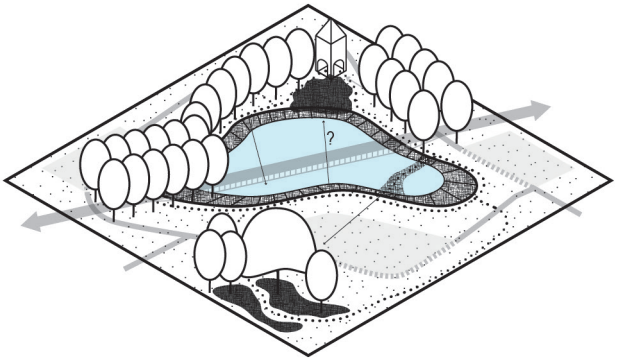
These movements meet each other in different ways, so can the Wanderer walk underneath the bridge of the Gliding movement and can the grazing movement trigger one to step of the path into wandering. The design takes the found conclusions from the analysis into account by creating marked entrances to the park and creating space for various program.



Gliding



Grazing



Wandering

Fig. 8.1: Concept 3 movements

8.2 SITE DESIGN

8.2.1 PLAN

Fig. 8.2: Plan

The current structure of the cemetery is used to create the design. The elevations are enlarged to create a lake and small hills, defining spaces. The water structure also acts as water storage for the boezemsystem.
The edges of the park are clarified by adding the build structures, at the same time providing a wall to the Loosduinseweg and clear entrances. The kept tree structures form most of the paths in the design and result in spaces created by the interaction between new and old tree structures. The found species of vegetation are used and elaborated to increase biodiversity in the site. The design is further detailed and explained through different drawings and visualisations.

- *Elevations*
- *Water*
- *Forest*
- *Trees*
- *Stairs*
- *Bridge*
- *Gliding*
- *Grazing*
- *Burial stone*
- *Sport*
- *Playground*
- *BMX course*
- *Guiding bush*
- *Allotment garden*
- *Reed*
- *Burial structure*
- *Belvedere*
- *New buildings*
- *Existing buildings*
- *Stepping stones*
- *Urban Farm*

8.2.2 TRANSITION PARK AND SURROUNDINGS

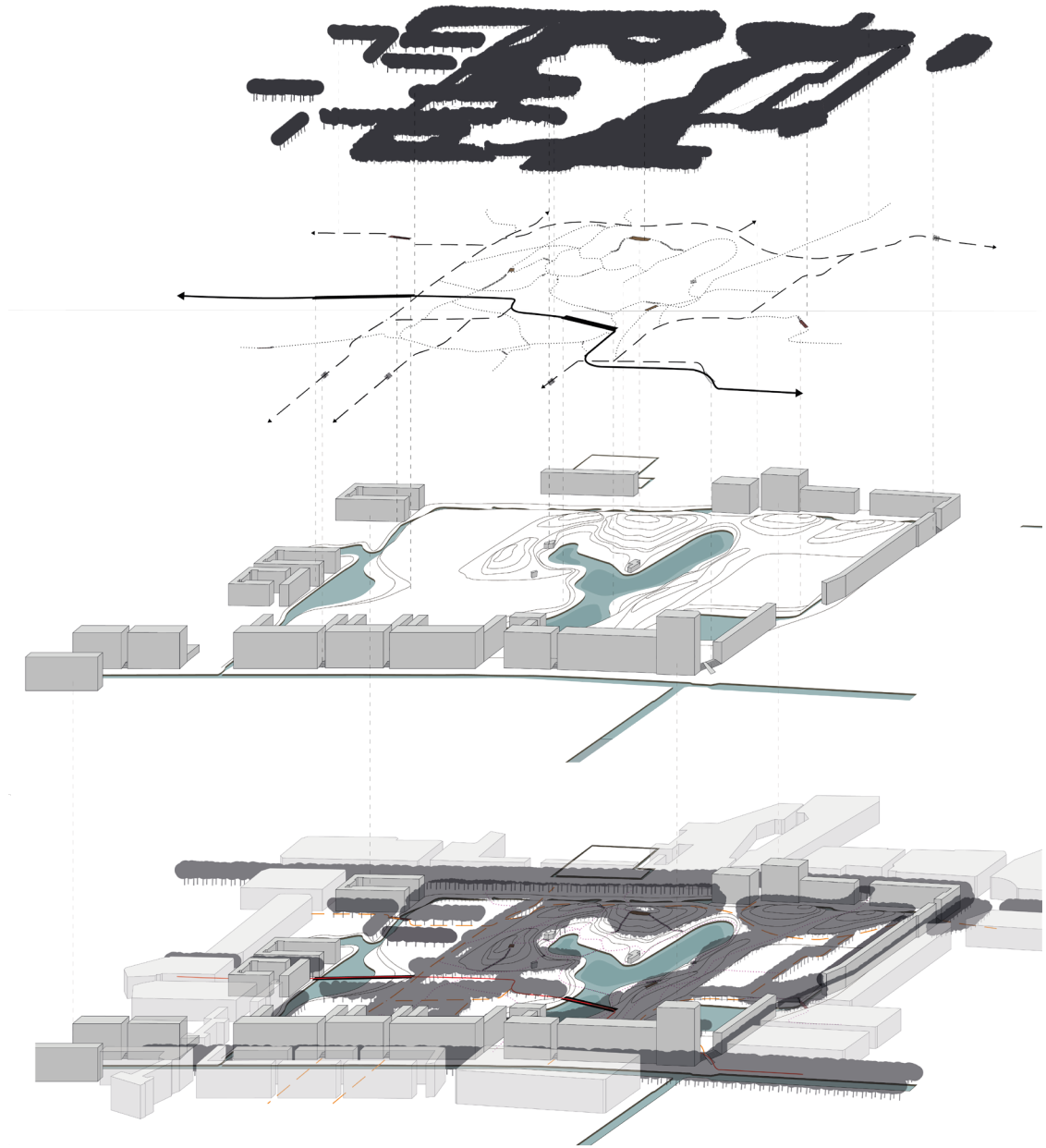


Fig. 8.3: Exploded view of the park (exaggerated vertical scale)

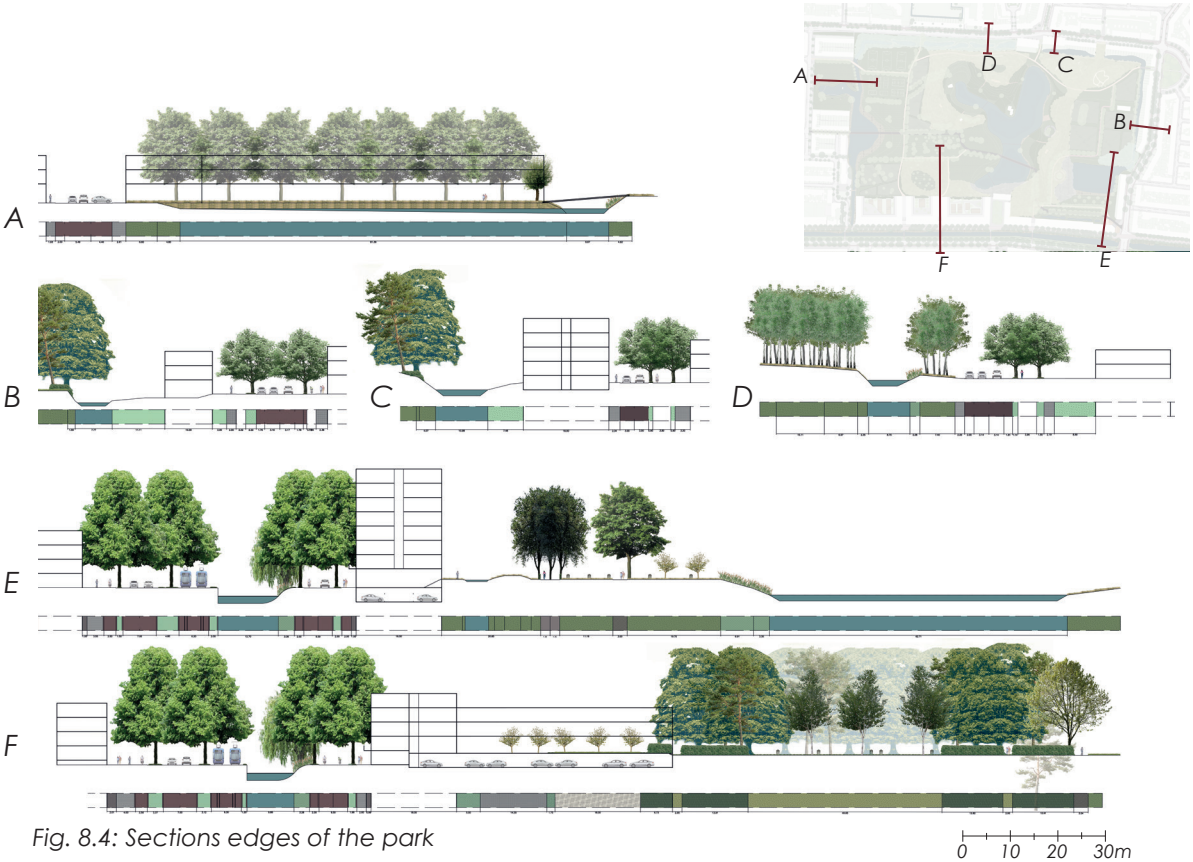


Fig. 8.4: Sections edges of the park

The edges of the park are determined by newly added building blocks. These blocks create a transition from the neighbourhood and the park, offering passages and sightlines into the park. The buildings respond the hight difference between the surroundings and the park, making the park more accessible by adding slopes and stairs.
The blocks also create different types of entrances to the park. The Gliding movement needs a marked entranced leering people from the Lane into the park. Therefore, the entrance e should stand out and be clearly visible. The secondary entrances for the Grazing movement are framed by the buildings creating a clear passage without forming a landmark. One example is the entrance green space on the east side of the park, which frames the view on the park. A few smaller unmarked entrances can be found hidden by vegetation. These need to be discovered and allow for the Wandering movement to find its own way into the park.

The water structures around the park are extended into a lake. This lake along with wadis in and next to the park offer extra water storage for the boezemsystem, connecting the water structures with the Barge canal and singel. There are two part to the lake, the lower part which are always filled with water and the higher parts which are filled with water when there is need during heavy rains. When the lake is only parlty filled stepping stones provide a route to the other side.

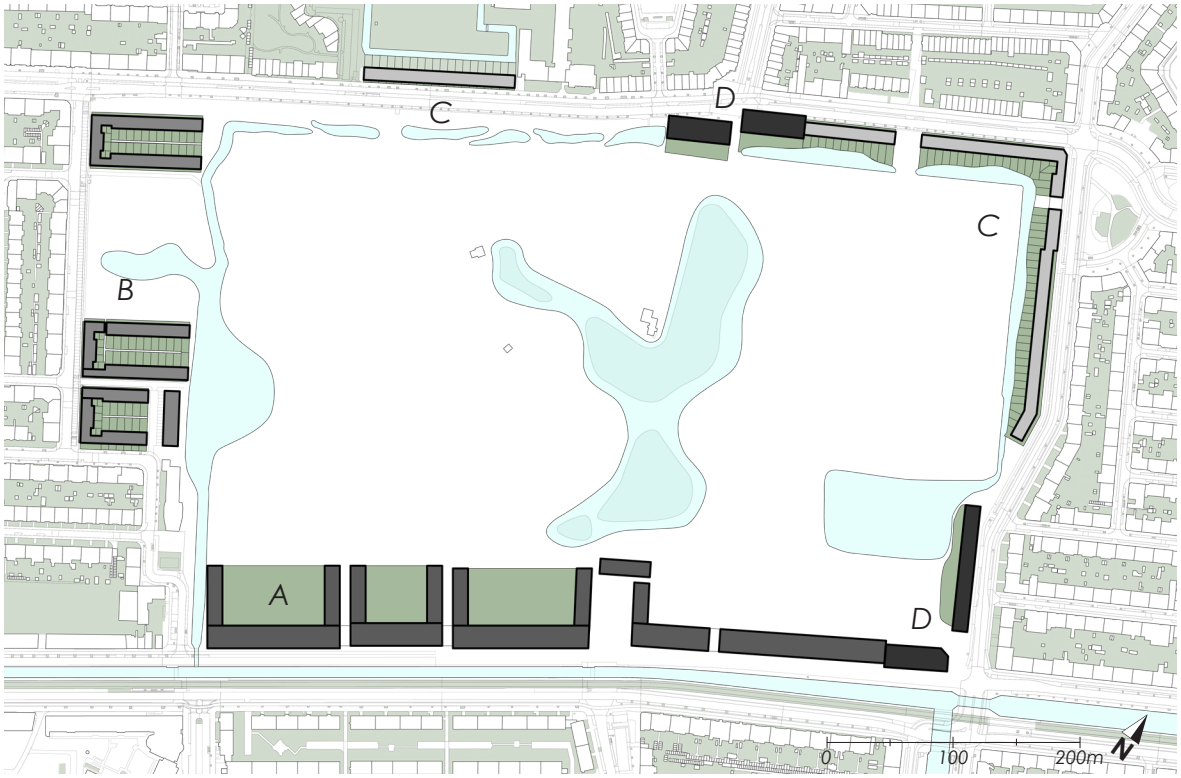
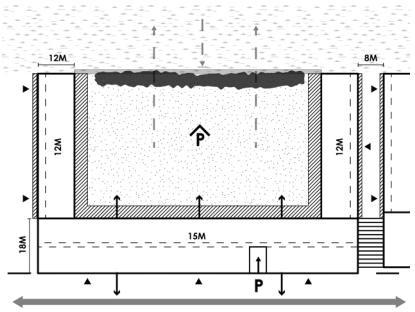


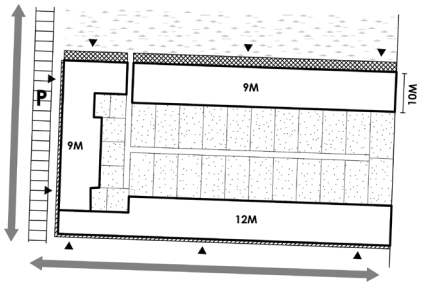
Fig. 8.5: Urban edges surrounding the park

The buildings blocks create a transition from inside the park to outside. This is done by creating passages which balance out the height difference. This is accomplished by adding stairs, slopes and bridges. These elements are framed or marked by the buildings. To further apply the masterplan for the Lane building blocks with courtyards are realised on the south side of the park (A). These level out the height difference by using it as a parking space (fig. ???). This allows for a community roof garden on top that transitions into the park.
The block on the west side of the park (B) offer an extension of the existing neighbourhood creating streets that lead to the park.
Building blocks on the east side of the park (C) create an edge of the park, enclosing it and responding to the surrounding structures. These have wadis in their back gardens as boundary to the park.
Entrances created by the buildings block on the south and north side of the park, are pushed back or forward to block a view, emphasising the entrances. The blocks are higher than the surrounding buildings, resulting in long view lines.

A



B



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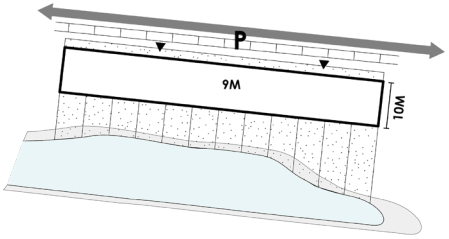

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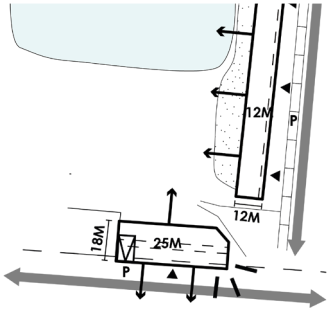


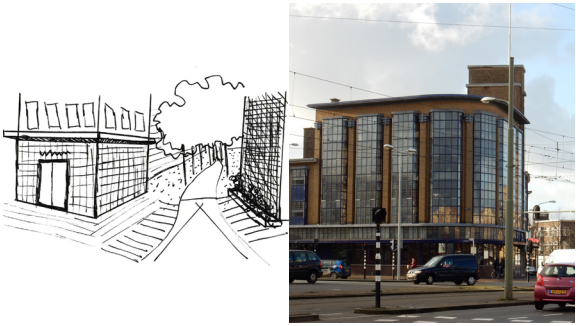
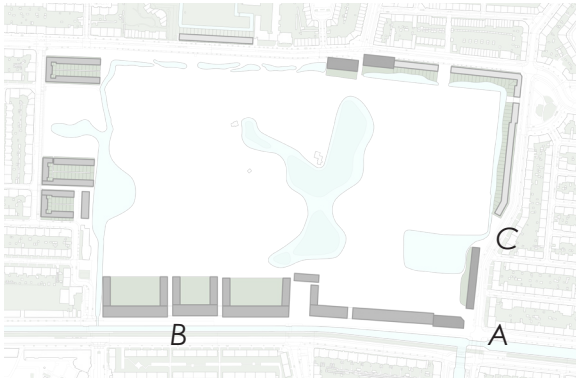


Fig. 8.6: Parcel passport per urban block



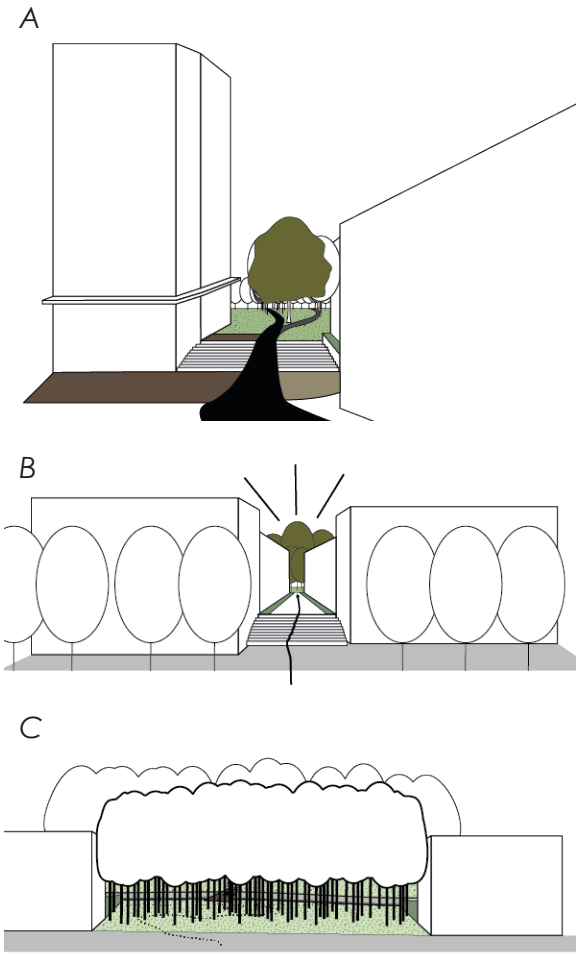
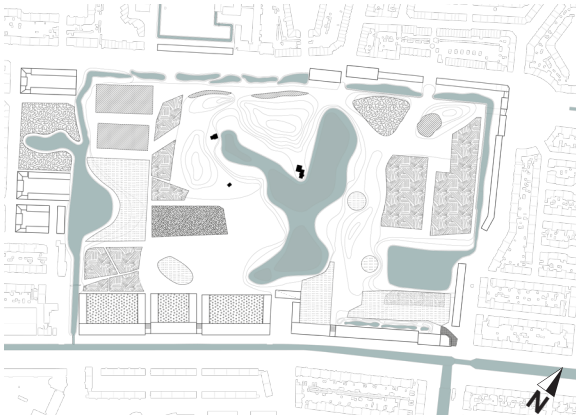


Fig. 8.7: Entrances to the park

Different entrances to the park are created by buildings and vegetation. Some of the entrances are deliberately hidden or not marked to let visitors explore and find them on their own. These are sited in the forests and are bridges or openings in shrubs.
The second type of entrance are those that are visible from the surrounding neighbourhoods. Some of these are marked by a small square or by a pushed back building block. Here stairs and bridges offer a threshold or transition between ark and surroundings.
The thirds entrance, the main entrance, is marked through buildings. The building is higher and has a different materialisation to ensure that it stands out for its surroundings. In between the buildings a square from the threshold. The buildings form a funnel towards the park.

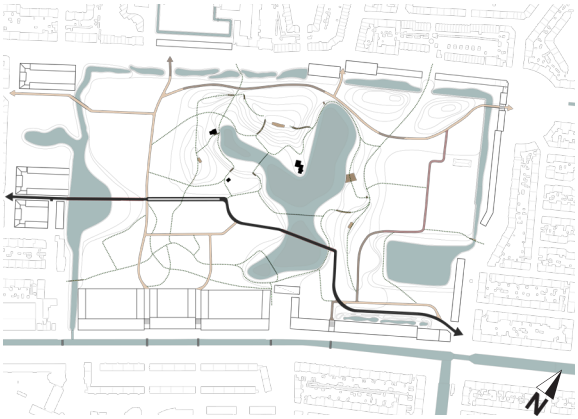
The water structure on the next page shows how the pond connects to the boezem system. The pond can act as water storage during a heavy rainstorm by opening the lock on the north-east side of the site.

8.2.3 LAYERS OF THE PLAN

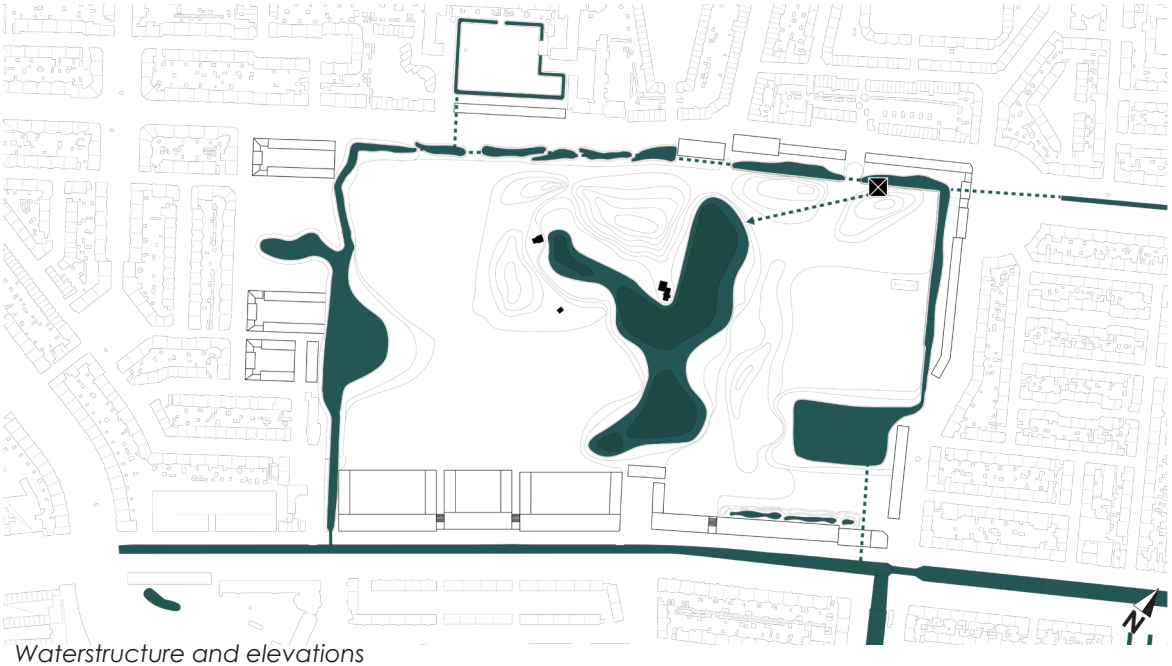


Program

- Sport
- Play
- Remaining burial stones
- Allotment garden/ urban farm
- Elevations
- Water
- Shared courtyard
- Remaining cemetery structure



Routing



Waterstructure and elevations

Fig. 8.8: Facet maps

8.2.4 SPATIAL STRUCTURES

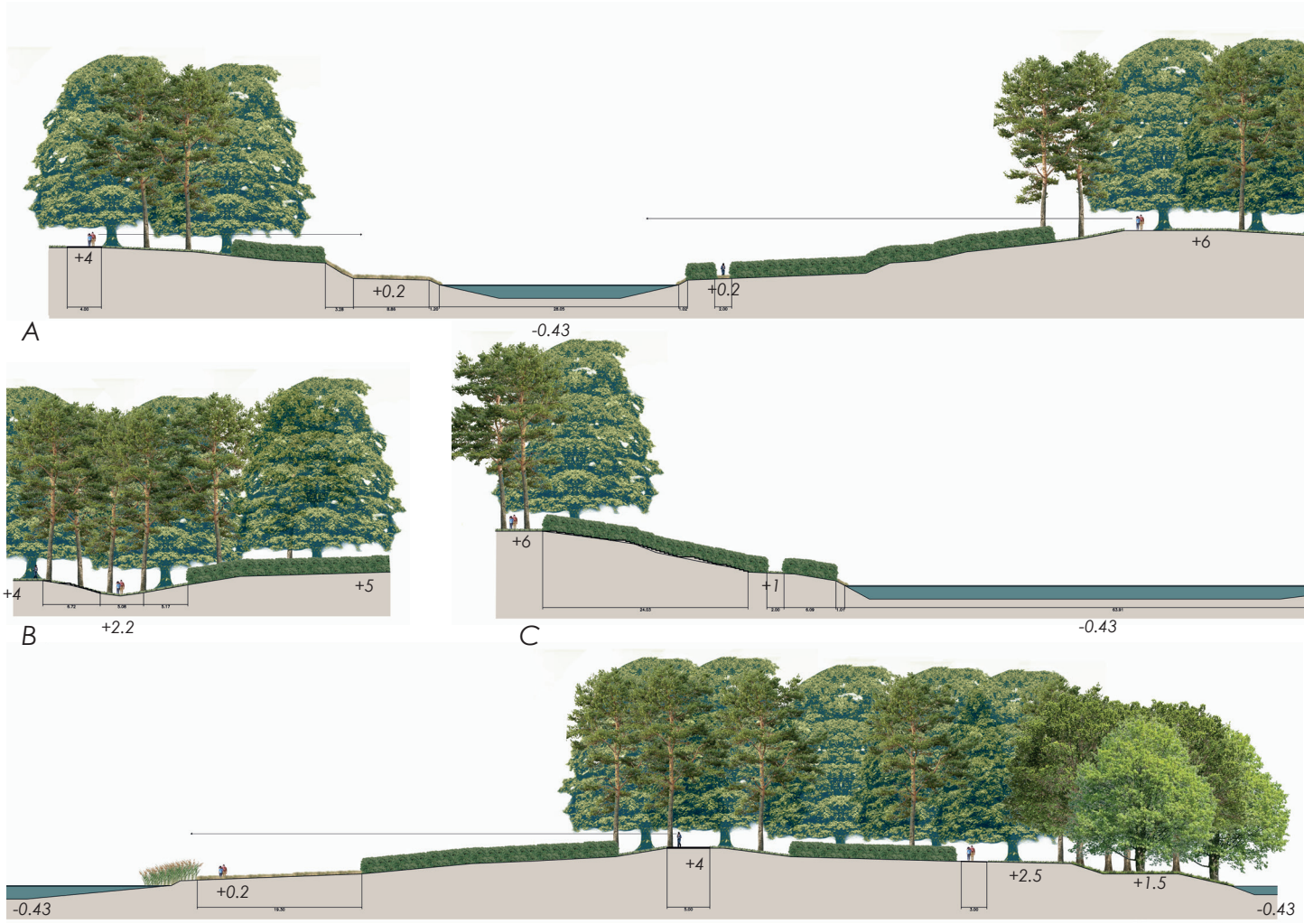
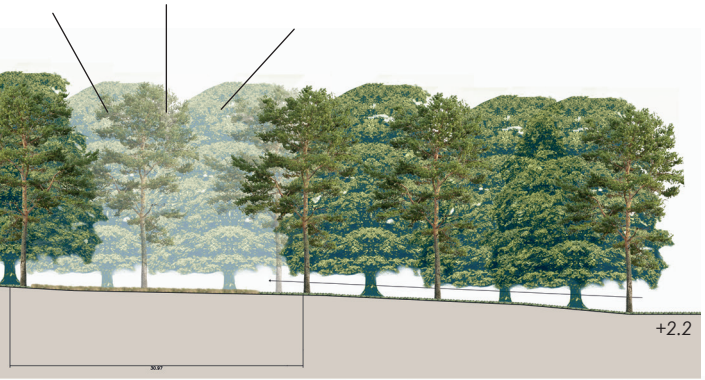
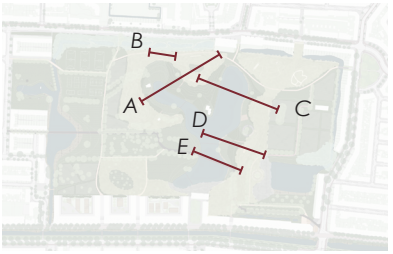
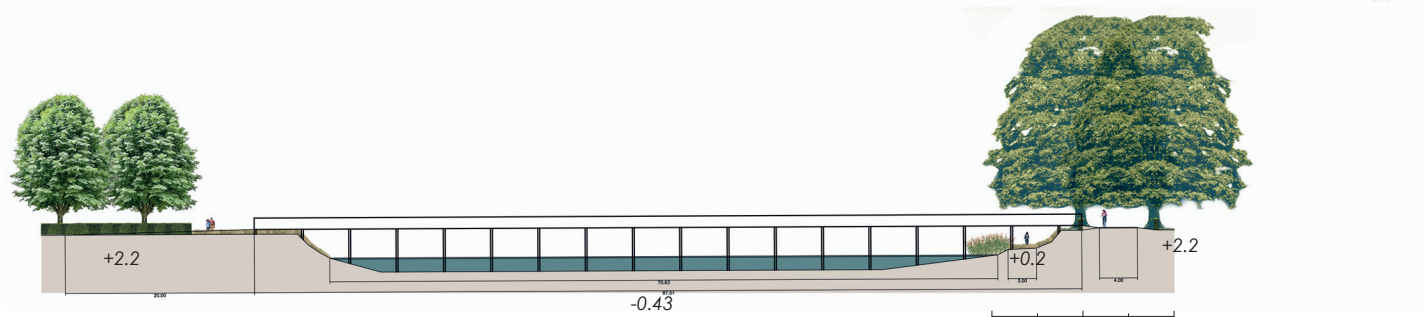


Fig. 8.9: sections spaces in the park

These sections show how spaces are created by the amount of enclosures caused by the elevations, shrubs and canopy.
In some of the sections the canopy is opened, to offer light and dark contrasts and views on these spaces, or ended at a certain point to offer views that extend beyond the canopy.







E

8.3 EXPERIENCE OF THE PARK AND THE THREE MOVEMENTS

8.3.1 GLIDING

Fig. 8.10: Experience from gliding through the park

Gliding offers a glimpse of the park, traveling along a smooth path enclosed by a canopy and hedges which frame views. The route uses the existing tree structures on the site. It differs from these lines for a smoother curved route. The tree lines are kept to show how a smooth route differs from the rigid tree lines. The spatial structure of the route differs in the site offering different experiences related to the placement of trees. The route is introduced through clearly marked and defined entrances.

The route itself is materialised in asphalt and is raised from the surface to create a threshold in a form of a step. The path offers a smooth surface not linking to the surface below.
The path is placed on top of soil cells, removing pressure of the path on the tree roots.

View lines are created by existing tree structures or sharp changes in the direction of the path. These views are oriented on buildings, striking trees or vistas.

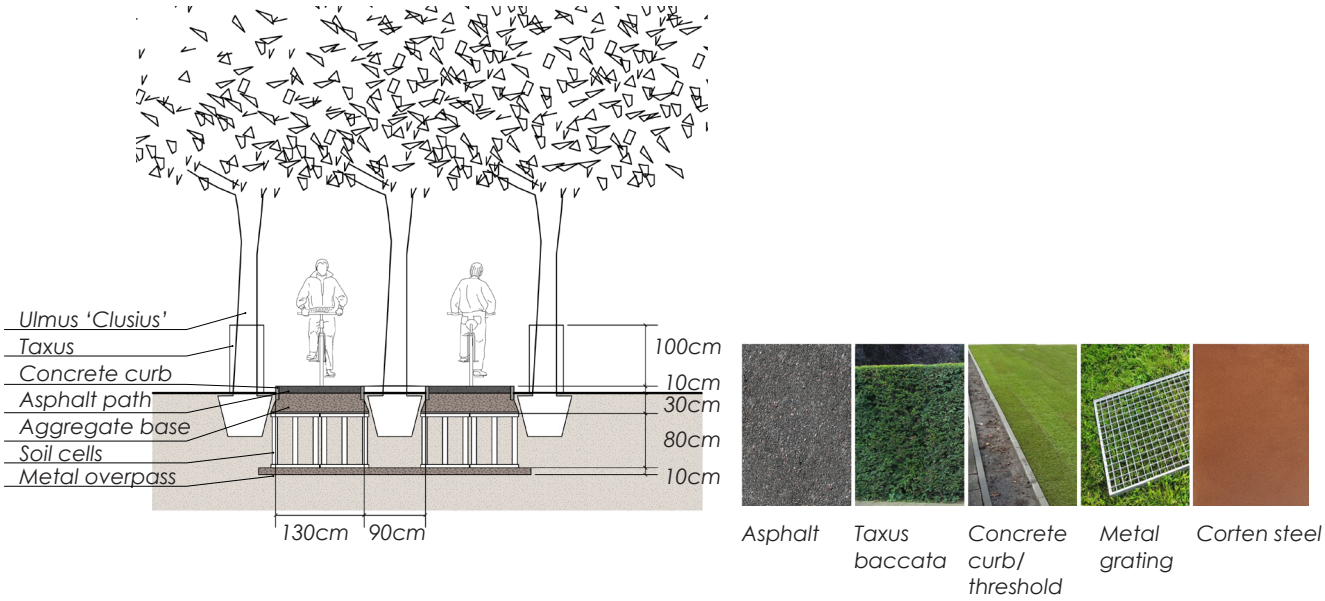


Fig. 8.11: detail path gliding and material palette

The route can be travelled from west to east and the other way around. This results in a different experience when it comes to views and sequence of open and enclosed.
A pastoral sequence of spaces in the park is displayed along the route. This results in a route from the south entrance experienced as: a funnel like paved entrance square with a green background enclosed by buildings, an open field with the tree structure running through, a dense forest emphasising the light outside the canopy, an open space over water offering long view lines to elements which are inaccessible from the route, an enclosed space between existing divers vegetation clumps and the forest, an open view above water which later is enclosed by building blocks, suggesting the end of the route in the park.

8.3.2 GRAZING

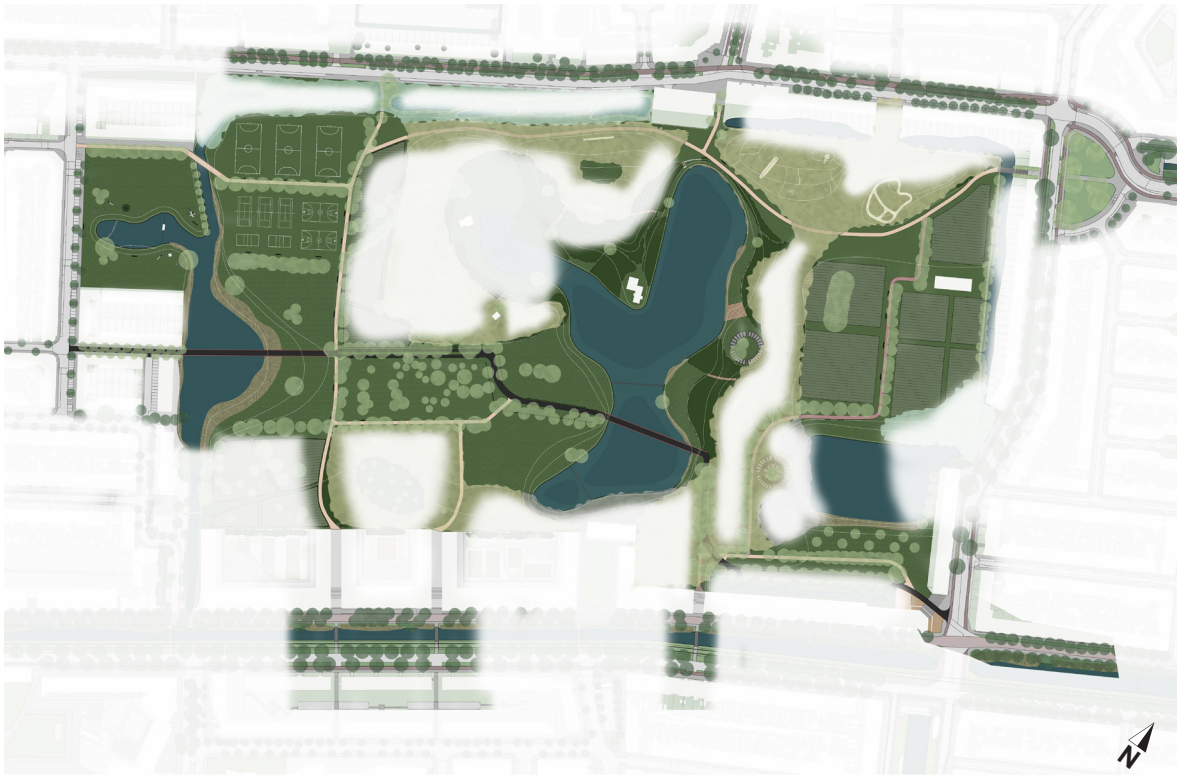


Fig. 8.12: Experience from grazing through the park

The Grazing route offers an experience of the park on the paths. These paths meander through the park avoiding large height differences and water structures. This creates a smooth path without levelling the landscape. The path connects different spaces where various functions and meeting spaces can be found. These programs are also knitted with the elevations such as a playground and jogging track, which use the height differences to create a connection between the program and nature.

The route is materialised in three different materials, a paved route responding to the urban farm, fine gravel in the open spaces focussing on the visual experience, and coarse gravel underneath the canopy, focussing the sound and textural experiences. The path is three meters wide to allow for visitors to interact.

When the two movements, Grazing and Gliding, meet the Gliding path cuts of the Grazing path. A threshold acts as a clear distinction between the two movements

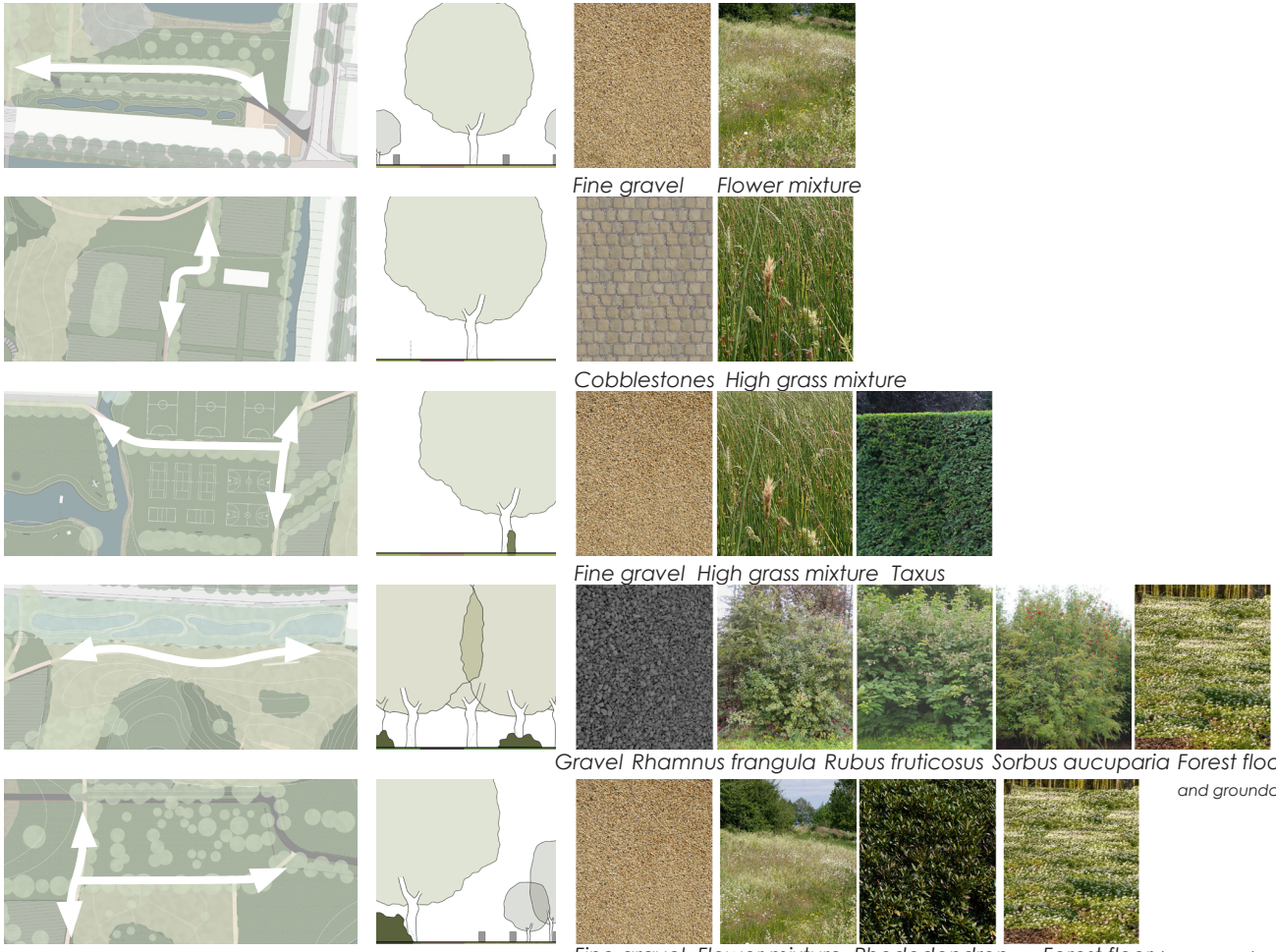


Fig. 8.13: location path grazing and matching material palette

emphasising the change in route.
Because the route crosses many different spaces the overarching structure, one tree line is always present.
The entrances for this movement are integrated in the urban structure, creating views into the park through streets, creating a green space to frame an opening in the urban structure or by pushing back buildings opening a space.

Different spaces are linked together through the route. Views or spaces from the route generate fascination causing visitors to explore the park outside the paths. To generate such fascination a contrast between light and dark is made, by opening op the canopy, or a landmark is place along the route such as a remaining burial stone or building.

8.3.3 WANDERING

Fig. 8.14: Experience from wandering through the park

The Wandering route offer a complete emerging in nature. This route is not an actual path but rather a composition of elevations, vegetation, landmarks and assisting elements. Thus the visitors define their ownr route, altering it as they walk, having no previously determined route.
The route offers a variety of spaces and experiences each emphasising a different aspect of that space.
In the dense forests the visitor is guided through the dense shrubs to open spaces, viewing platforms and striking trees or structures. While doing so the visitor experiences the different textures in the forest, from the species of trees to the shrubs and the herbs. The sound of wind rustling through the leaves stands out. Other parts of the forest emphasise different ground surface textures and the difficulty to get through the forest. These forests are densely planted to emphasise the difference in light and dark drawing visitor's attention to explore.
Open spaces along the water, wind and sunlight are emphasised. Here tall grasses, reeds and flowers move in the wind and catch the sunlight. In the background the visitor can still hear the leaves rustling in

Fig. 8.15: location path grazing and matching material palette

the wind. In these open spaces, views offer guidance on where to continue their walk. In the open spaces in the forest bright colours contrast to the dark canopy offering another experience.

Some of the remaining structure of the cemetery offers a large diversity in vegetation resulting in a burst of textures, colours and smells. Other spaces are densely planted by young, thin trees resulting in a maze of tree trunk where the visitors need to find his way through. These spaces offer a transition between outside and inside the park. Other entrances are tucked away behind vegetation or emphasised by elevations. The Wanderer needs to find these entrances as not all of them are pronounced to the surrounding urban tissue.

In some spaces the burial stones remain, referring back to the old use of this park. Some of these are used as landmarks. Although there is not a path, in some places the route is marked by stairs, stepping stones or bridges offering a sense of direction. Because Wandering has no path it meets other paths withouth a threshold.

On the next pages the three movements are shown in a sequence of drawings, displaying textures, amount of enclosure and colours. Firstly, they are displayed as a strip, secondly as sequence showing their correlation.

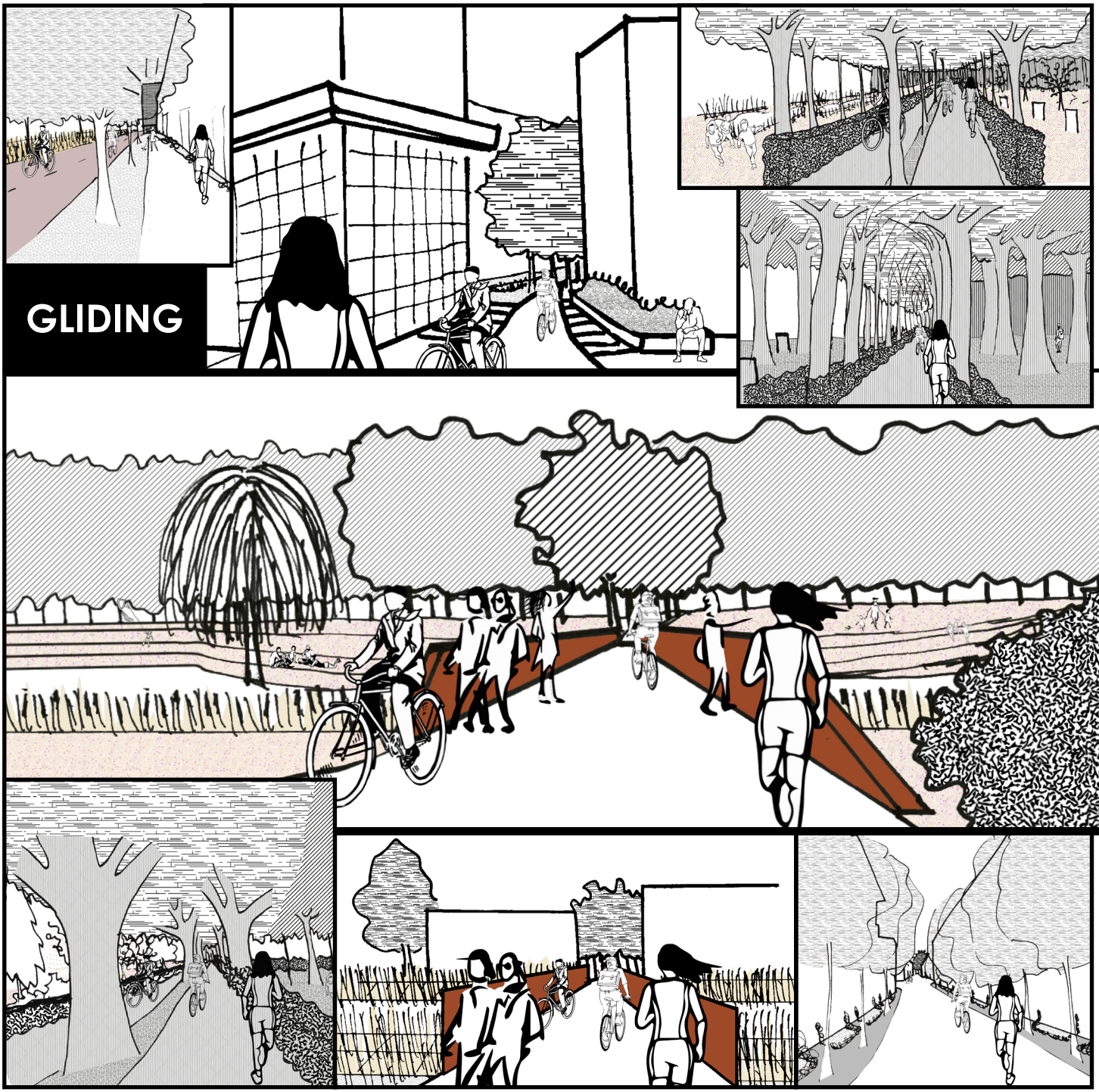


Fig. 8.16: Strip eye level experience gliding through the park

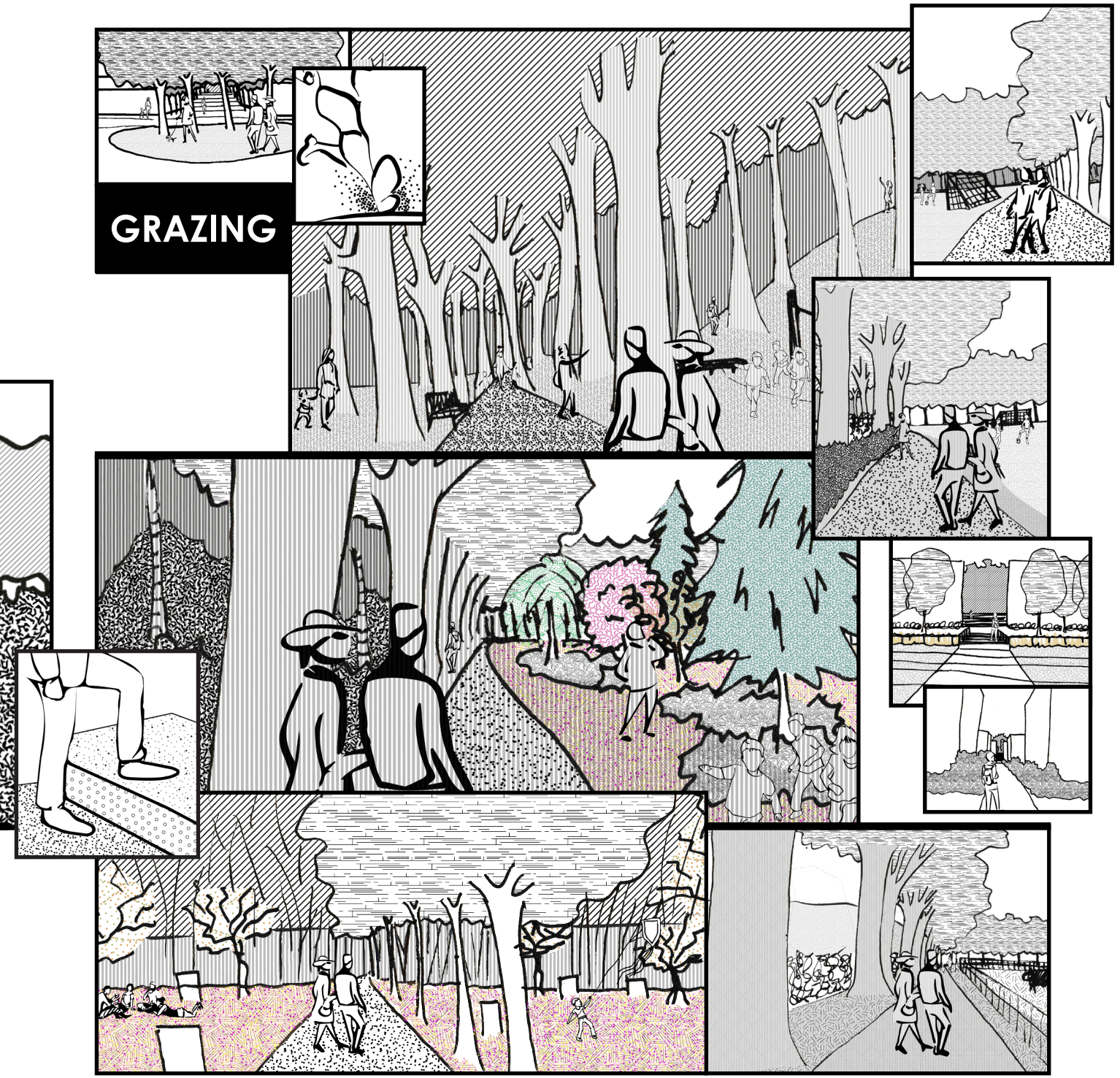


Fig. 8.17: Strip eye level experience grazing through the park

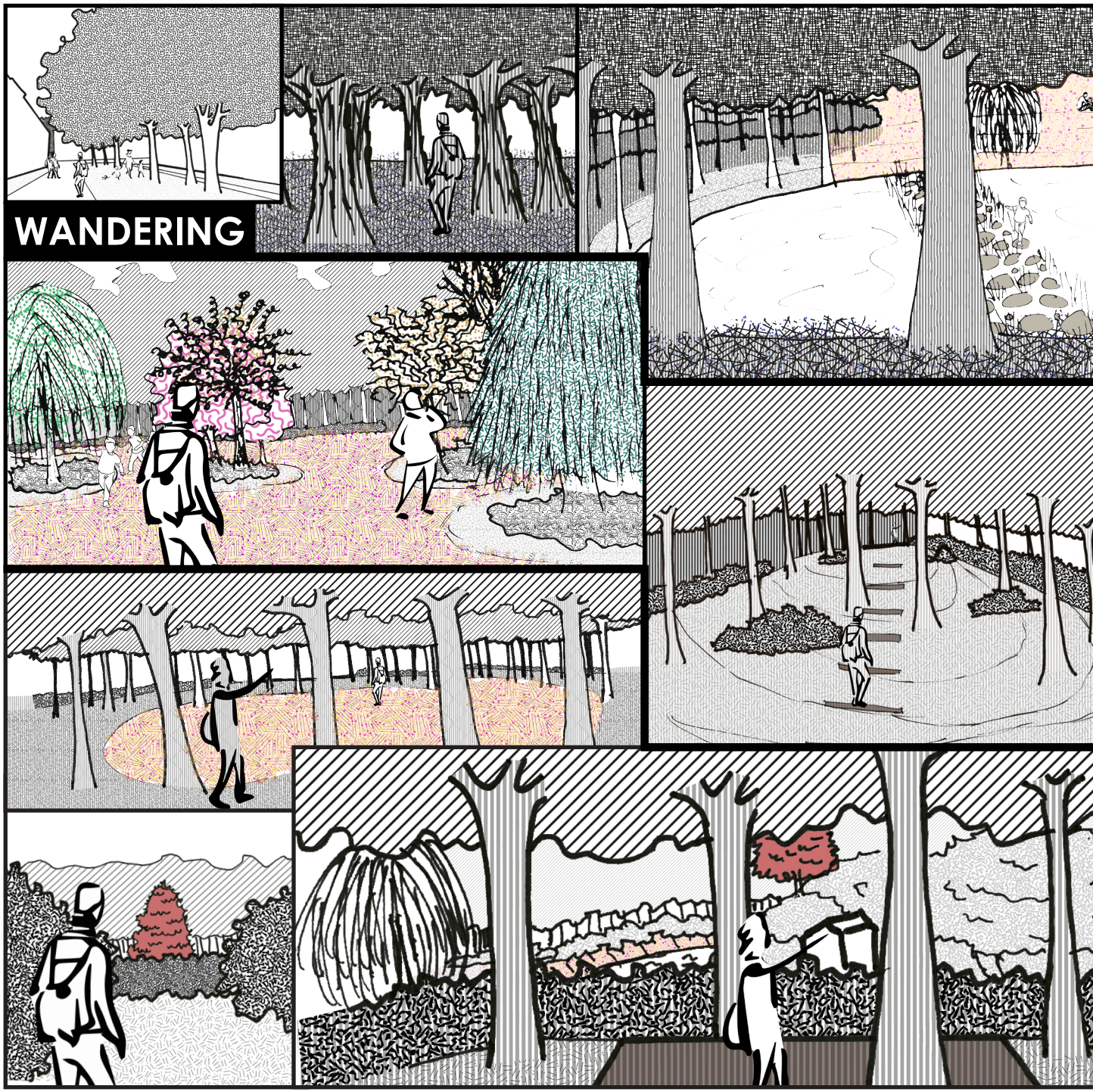
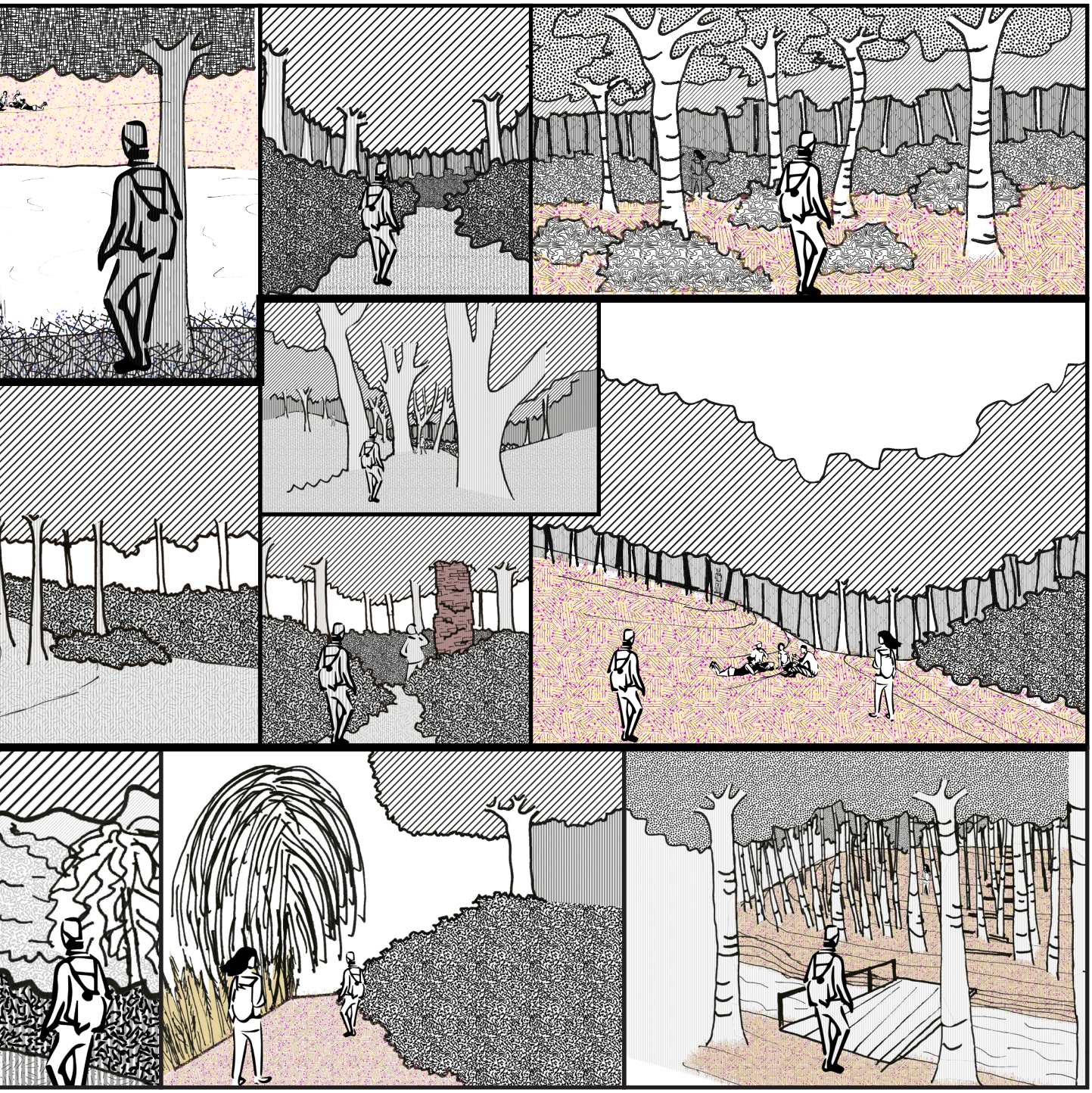


Fig. 8.18: Strip eye level experience wandering through the park



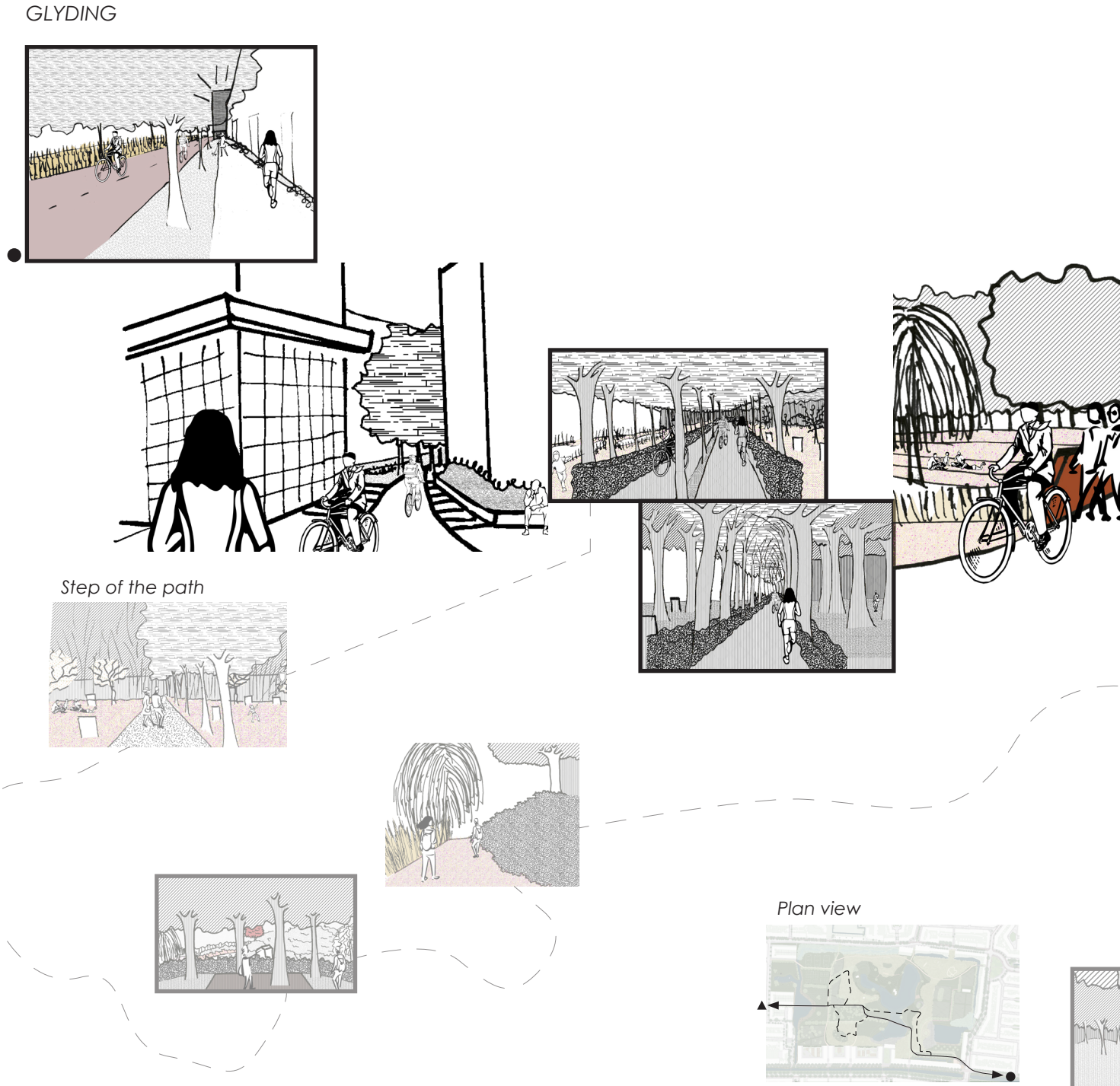
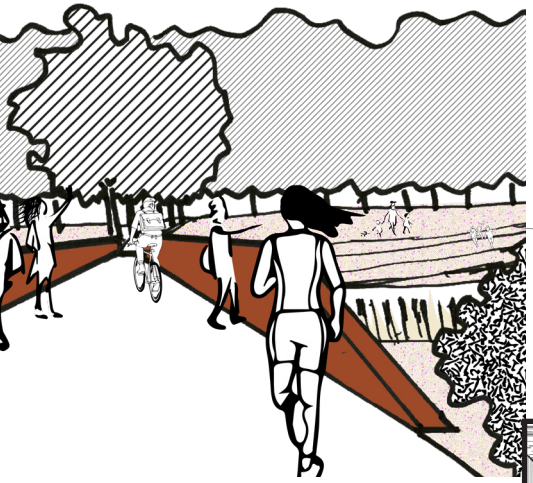
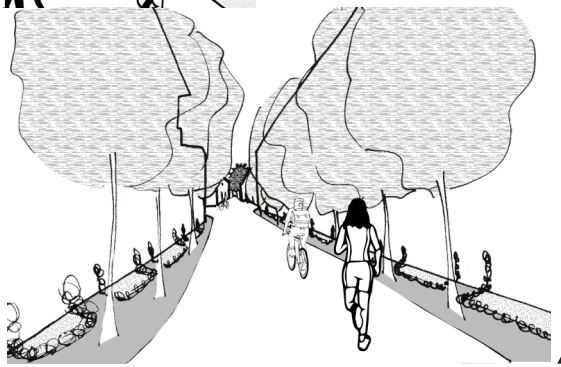
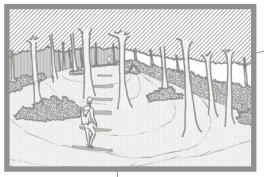


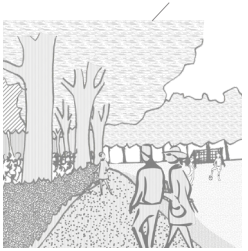
Fig. 8.19: Spatial sequence in relation to distance eye level experience gliding through the park

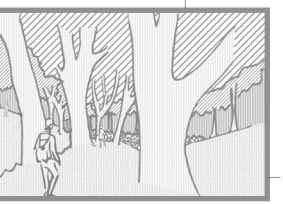


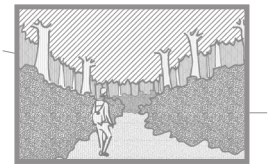


Step of the path









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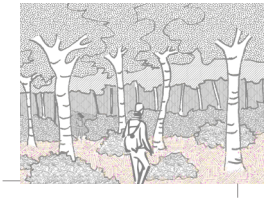


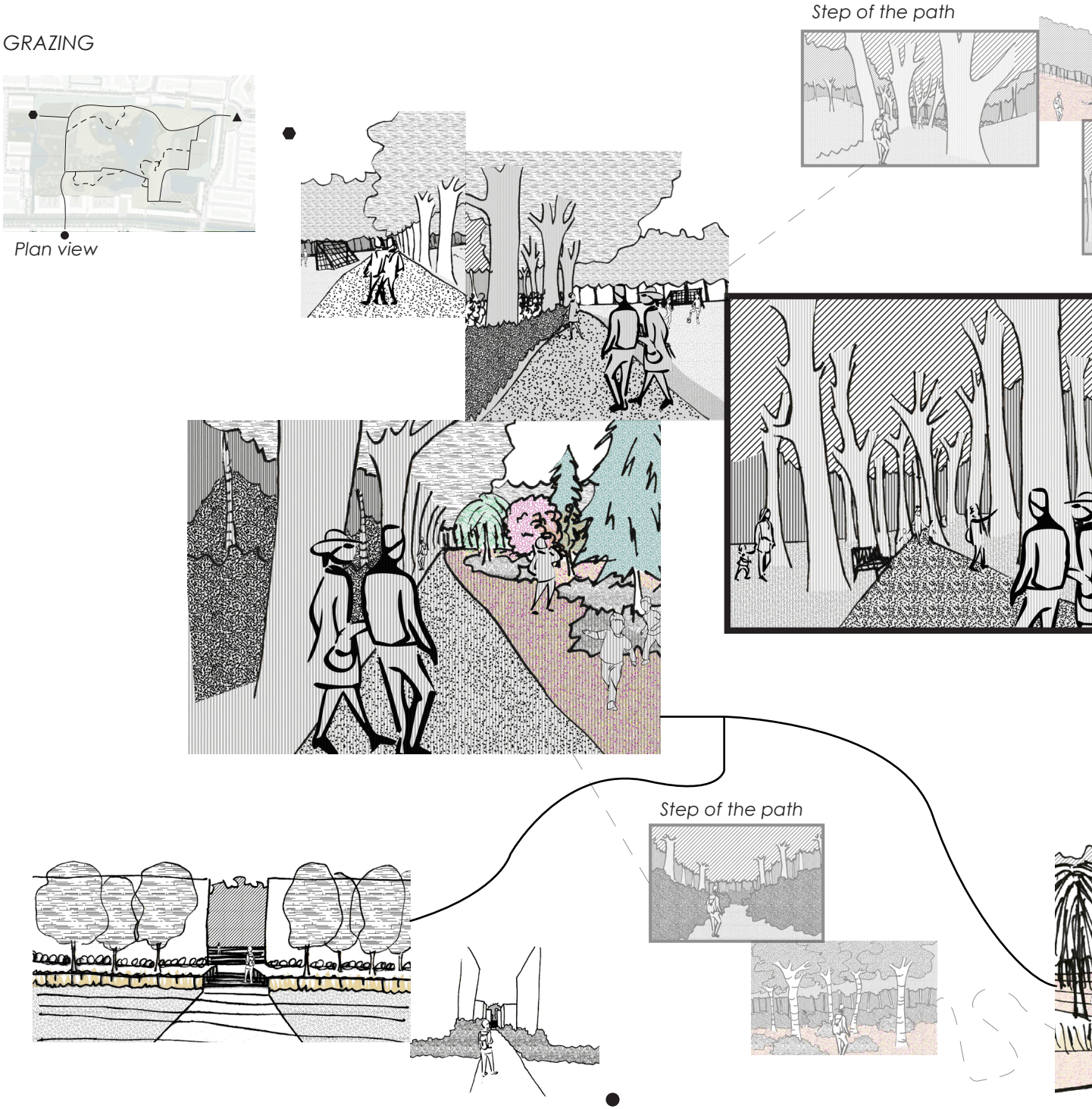
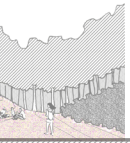
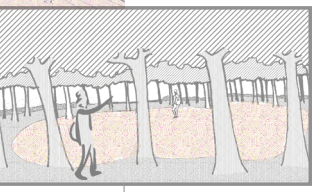
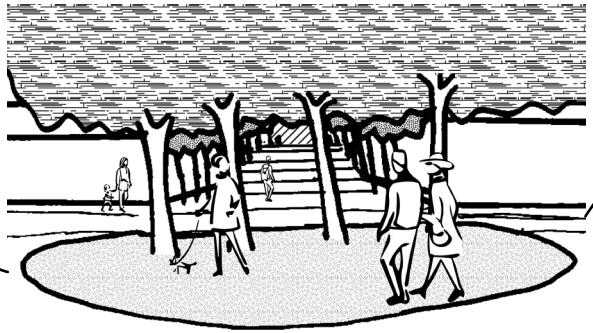
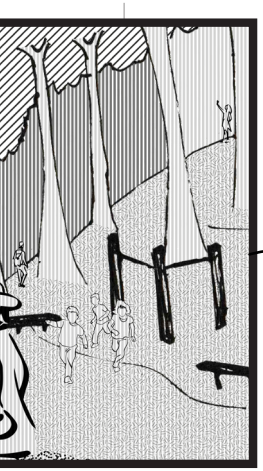


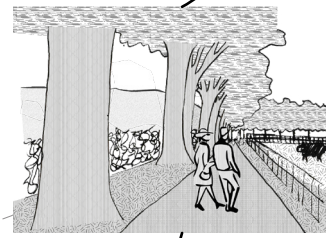
Fig. 8.20: Spatial sequence in relation to distance eye level experience grazing through the park



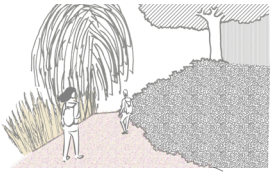


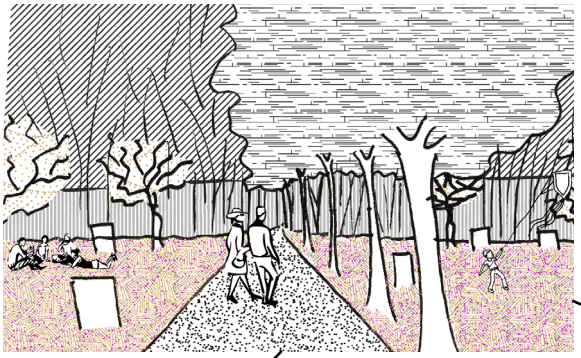






Step of the path





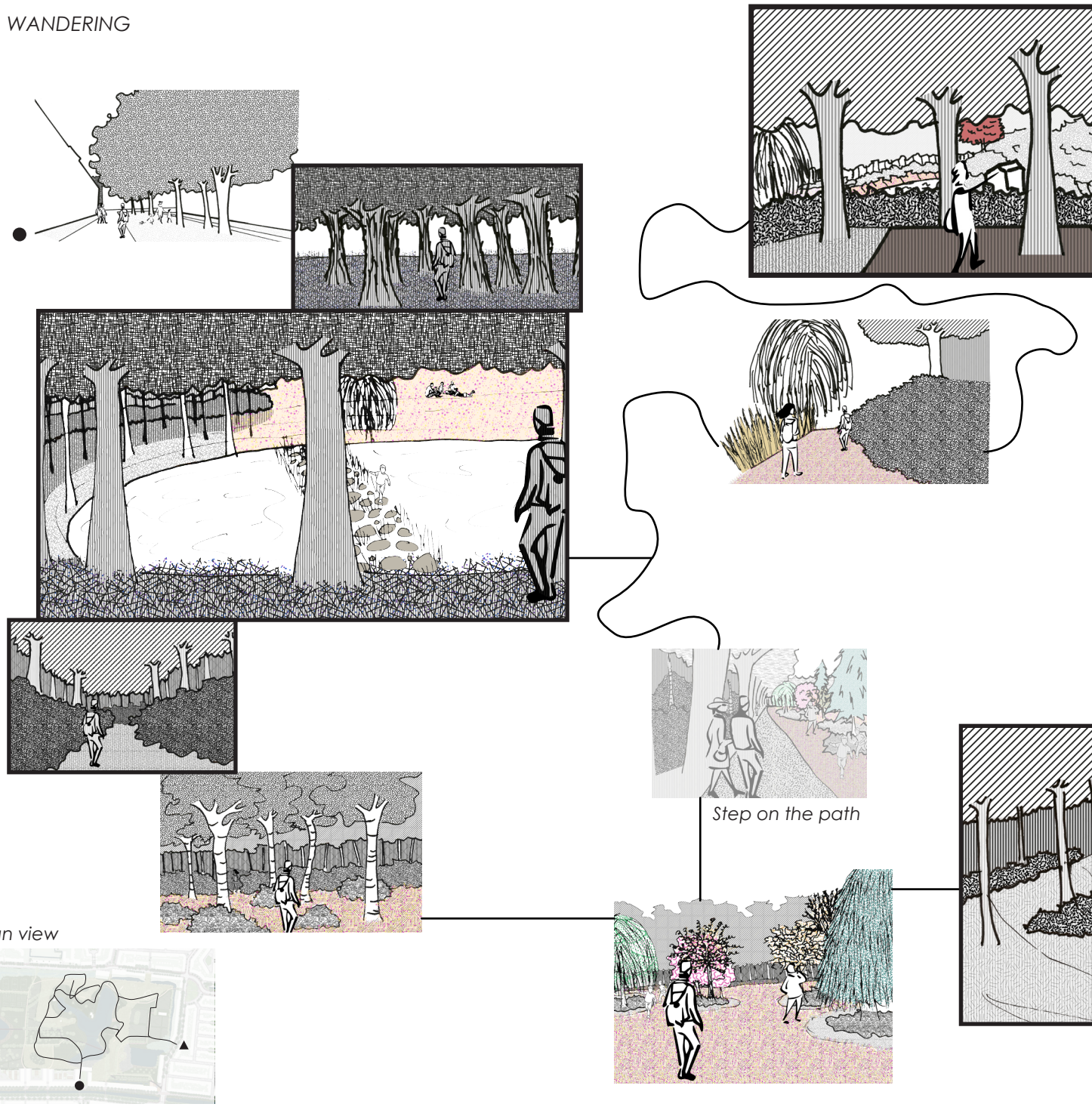
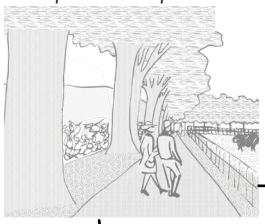
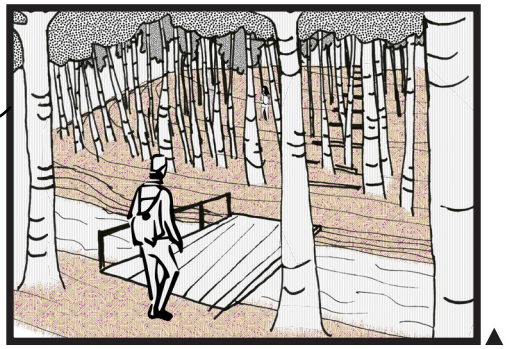
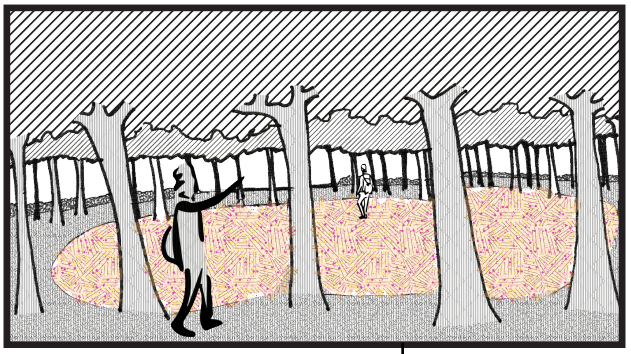


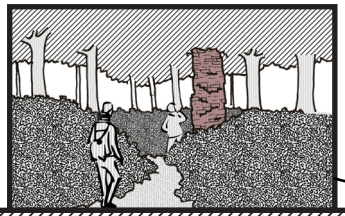
Fig. 8.21: Spatial sequence in relation to distance eye level experience wandering through the park

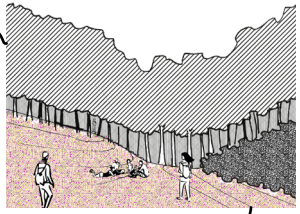
Step on the path

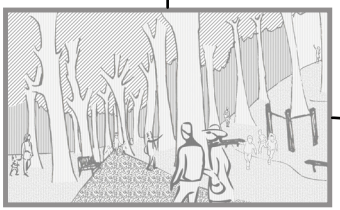




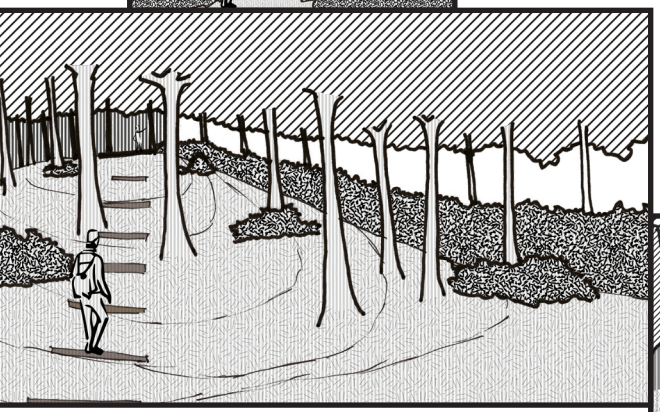








Step on the path



Step on the path

8.3.4 EXPERIENCING STEPPING OF THE PATH

The visualisations of figure 8.22 show how one would move through the park. The top image shows the beach and pine forest with the gravel path. These elements focus on the soundscape. The topography shape the movement by creating view lines of, of the path. This is accentuated by the hard contrast between light and dark, the open field and the enclosed forest. Here the fascination of visitors is triggered by the light and topography, which might result in visitors stepping of, of the path. Elements such as the stairs create a guiding element for other movements. The elephant paths show that movement has influenced the ground covers and acts as a different texture. These again influence the movements of visitors.

When exploring further, moving through the opening in the topography an open space unfolds. The second image shows the transition between the open meadow and the forest. Here the high textured grass, flower field showcases the wind. Due to the open space sunlight plays a crucial role in the experience of the space. Here topography slopes down to the pond, triggering the visitor to further explore the space. The space is enclosed by dense shrubs and topography only showing a few openings, guiding movement to the next space. The remaining building acts as a visual mark in the space, drawing the visitors attention. Here again the difference between the light space and the dark forest defines the current meadow.

After moving to the building the third image shows a view line across the pond to the other side of the park. Here the water ripples through the wind along with the high grass, flower field. The solitary tree, the Salix sepulcralis 'Chrysocoma', moves in the wind, drawing the eye to the other enclosed area of the pond. From here to openings in the shrubs show other directions. The pathway to the other building is hidden but a hint is giving through the opening in the shrubs. Here a solitary Acer rubrum catches the visitors eye with its striking colour. Stepping stones offer a different pathway to explore. On the other side of the pond reed is moving in the wind and two trees form visual marks.

Fig. 8.22: Visualisations of stepping of the movement grazing to wandering with a plan view

1

2

3

8.3.5 SPACE AND ATMOSPHERE - PLANTING

Different open and enclosed spaces are created by tree structures and forests. The contrast between open and enclosed spaces offers a diverse walk through the park emphasising the different spatial characteristics.
The forests work together to create a wall around the central pond, resulting in an enclosed space in the middle of the park. These different forests and structures have various spatial qualities and atmospheres.
Solitary trees are used to create visual marks in the park, guiding movement through the park.
Various species of vegetation are used to create different sensorial experiences, additional these species increase biodiversity in the site.

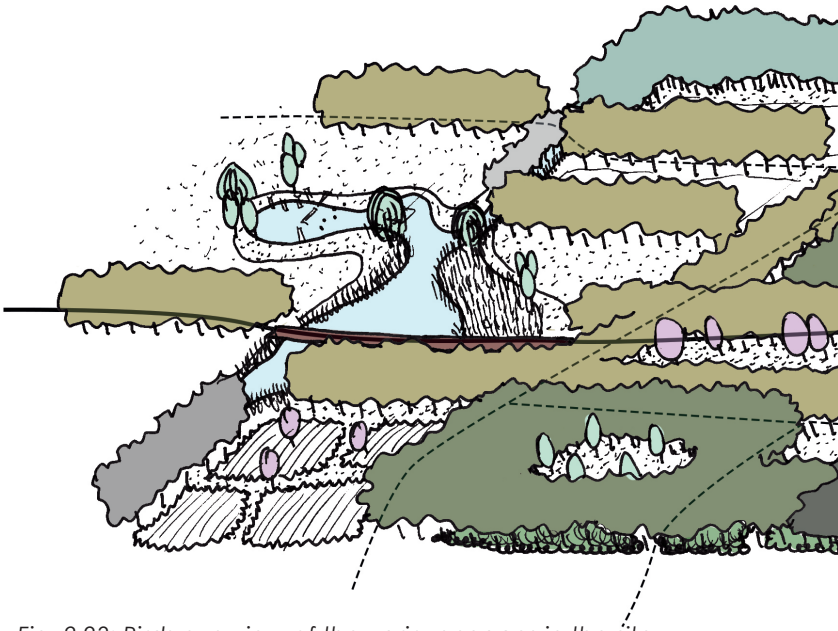


Fig. 8.23: Birds eye view of the various spaces in the site

A

SWAMP FOREST
Dense forest formed by closely planted (young) trees forming a maze. Forcing visitors to chose their own path. The space focussus on contrasting colours, tree trunks and flower mix, and wind movement through a mid high flower/grass mix.

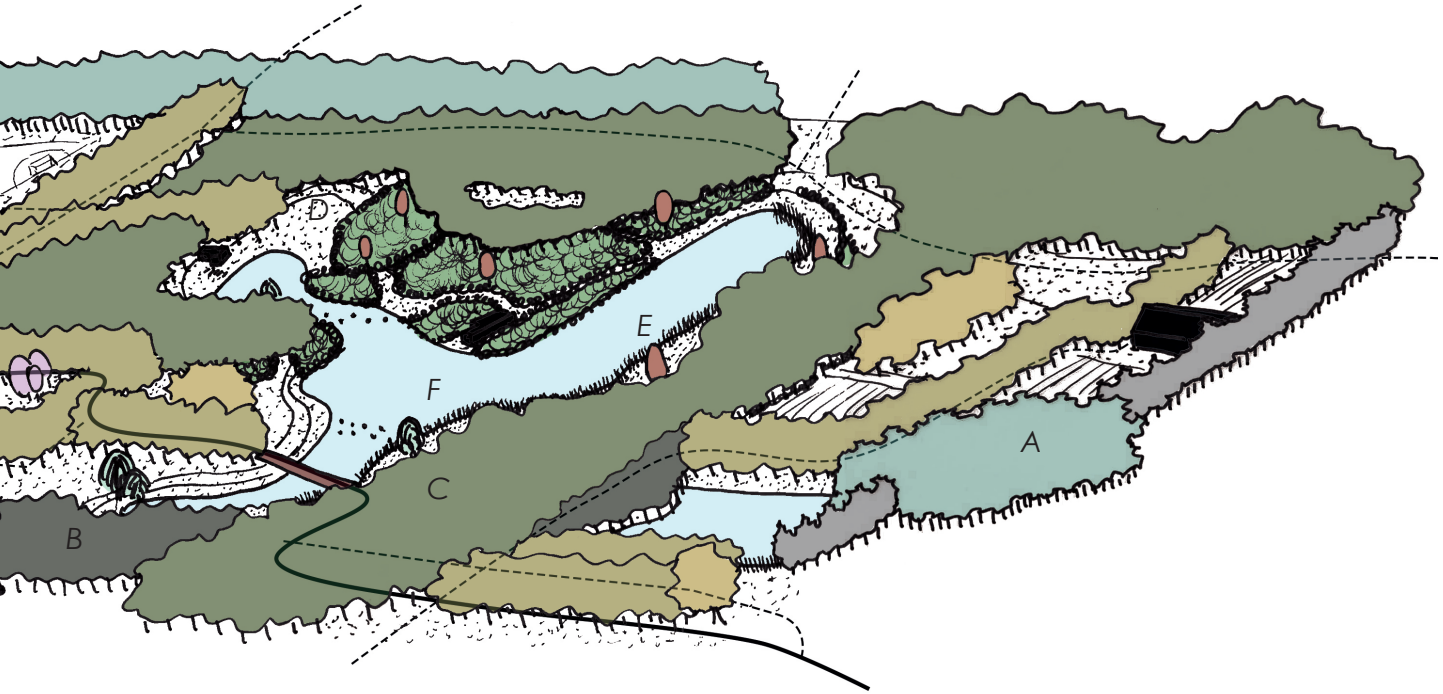
B

HORNBEAM AND ASH FOREST
Dense forest emphasising the difference between the dark forest and the light reflecting water surface. Wet, textured ground surface, emphasising the various groundcovers, encouraging visitors to find their way through the vegetation.

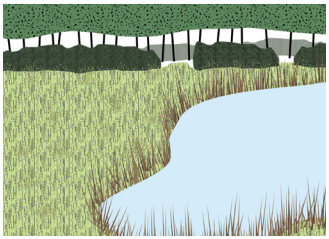
C

PINE, OAK, BEECH FOREST
Semi transparant, dry forest allowing for wind to blow through the trees. The wind through the trees and grasses result in a rustling sound. Partly open withouth shurbs allowing for sightlines other parts are planted with shrubs to guide the way. Various textures throughout the space.

Fig. 8.24: Diagrammatic drawings showing the main principles

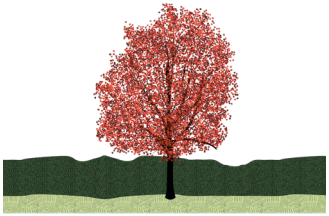


D



FLOWER MEADOW
Open spaces emphasising the movement of wind through a high flower mix and reed along the water structure. High grasses are added to emphasise this movement. The sunlight is reflected from the water and picked up by the reed, showcasing the open space.

E



SOLITARY TREE - COLOUR
Eye catching solitary tree that stands out from other vegetation by its red colour and fine texture. It acts as a visual link and guides movement through the park.

F

SOLITARY TREE - MOVEMENT
Eye catching solitary tree that shows the movement that is caused by wind and at the same time causing a rustling sound. This tree forms a visual link and guides movement through the park.

8.3.6 *SENSORIAL EXPERIENCE - PLANTING PLAN*

The sensorial experience in the park is explained through figure 8.25, showing the different aspects along the various movements. The aspects are mostly related to the planting plan and open or enclosed spaces created by the forest, water structures or elevations. Sound, smell, colour and open or enclosed spaces create different experiences along each of the routes.
The image shows that no route has one similar experience, it changes along the route.

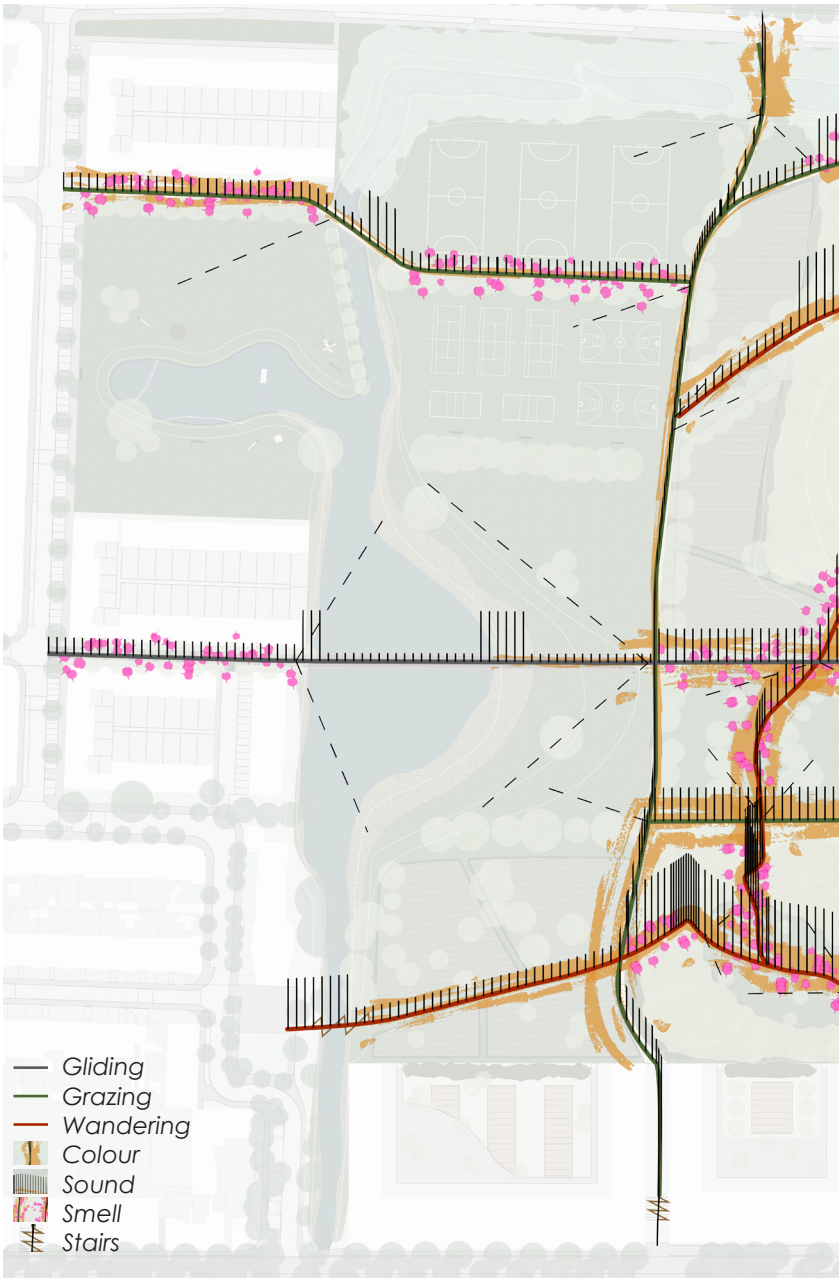


Fig. 8.25: Sensorial map of the movements in relation to the planting plan

8.3.7 PLANTING PLAN

Fig. 8.26: Woody species

Fig. 8.27: Shrubs

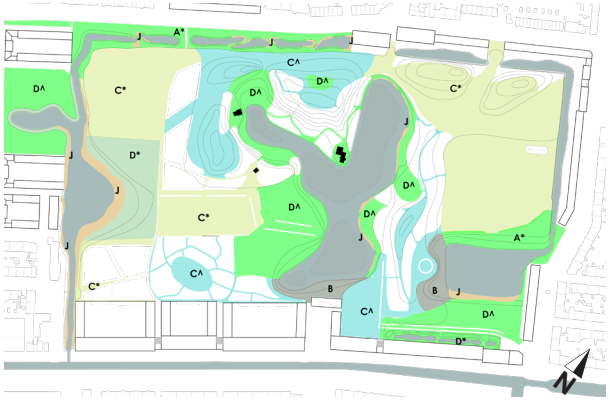


Fig. 8.28: Herbs and grasses

Different types of forest, spaces and tree structures are used to create the various experiences throughout the park. To create these each type has been further explained and coordinating species of vegetation are selected.

The park is elevated from its surroundings due to its old function, the cemetery. Therefore, the soil consists of a sand and loess layer, a peat layer and an old dune and beach sand layer. To create a pong a loam layer is added to ensure that the water in the pond doesn't fluctuate due to the groundwater level.

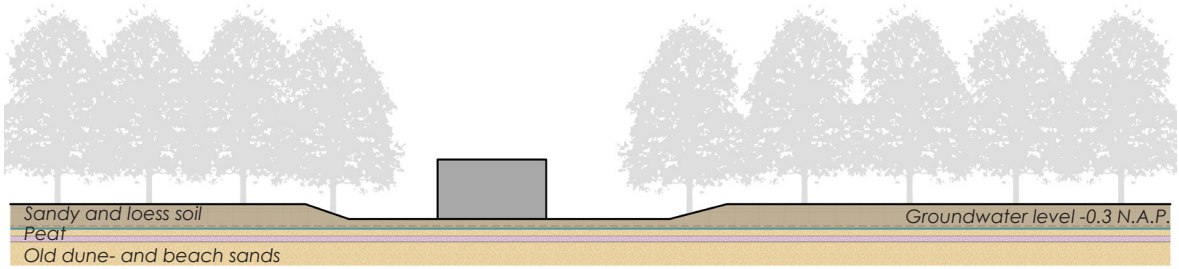


Fig. 8.29: Soil section park current situation

new or existing	Type of structure	Species of vegetation (woody)	Species of vegetation (shrubs)	Species of vegetation (grasses, herbs)	growth rate	spring	summer	autumn	winter	sensorial aspects
new A	**Swamp forest** Dense forest of young trees planted on a transition from wet to dry ground. Surface planted with low to mid high grass and flower mixture.	Wet: • Betula pendula, • Alnus glutinosa Dry • Betula utilis var. Jacquemontii, • Alnus x spaethii 'Spaeth'		A* • Flower mixture G3 (wet and moist soil) https://www.cruythoeck.nl/winkel/mengsels-voor-bloemrijk-grasland/Flower-mixture-g3-voor-jaarrond-natte-tot-vochtige-gronden/p80	10-20 years	White, purple, yellow (Flower mixture G3)	White, purple, yellow (Flower mixture G3)			Colour of bark (Betula pendula, Betula utilis var. Jacquemontii) Movement of vegetation through wind (Flower mixture G3)
new B	**Hornbeam and Ash forest** Dark forest cosisting of trees with a dense crown. Different textures on the ground surface showing harsh differences, saturated green plants in contrast to the dark forest. Forest sted on a wet part of the park. Only herbs to keep the viewlines on the water.	• Carpinus betulus • Fraxinus excelsior • Acer platanoides • Ulmus minor		• Hedera helix • Dryopteris filix-mas • Dryopteris dilatata • Ajuga reptans • Galium odoratum • Eurhynchium striatum • Plagiomnium undulatum • Actaea simplex 'White Pearl' • Aconitum napellus • Anaphalis triplinervis • Saxifraga urbium • Thalictrum delavayi	10-20 years (Ulmus minor, Fraxinus excelsior, Acer platanoides) 50-60 years (Carpinus betulus)	Yellow/green (Fraxinus excelsior, Acer platanoides) - yellow/green Red (Ulmus minor) Purple/blue (Ajuga reptans) White (Galium odoratum)	Blue (Aconitum napellus) White (Anaphalis triplinervis, Saxifraga urbium) Purple/pink (Thalictrum delavayi)	Leaf yellow (Carpinus betulus, Fraxinus excelsior, Acer platanoides) Yellow (Hedera helix) White (Actaea simplex 'White Pearl')		Fragnant flowers (Acer platanoides, Galium odoratum, Ajuga reptans, Actaea simplex 'White Pearl')
new C	**Pine, oak and beech forest** Semi transparant forest that has a rustling sound due to the wind. Texture differences between the different trees and shrubs, from dense to open and smooth to rigged. The forest is located on the higher and dryer parts of the park. Determined shrubs are used to guide movement.	• Pinus sylvestris • Quercus robur • Fagus sylvatica • Tilia cordata (after 25 years cut down to open up the forest to allow for more wind and sound)	Guiding shrubs in determined spaces C1 • Rhododendron ponticum Spaces withouth program C2 • Rubus fruticosus • Sorbus aucuparia • Rhamnus frangula	Spaces withouth program C* • Anemone nemorosa • Trientalis europaea • Maianthemum bifolium • Hupersia selago • Cornus suecica • Luzula pilosa Spaces with program C* • NGW2 grass mixture https://www.cruythoeck.nl/winkel/grass mixtures/ngw2-middenschraal-grass mixture/p106	10-20 years (Pinus sylvestris, Tilia cordata) 20-50 years (Quercus robur) 50-60 years (Fagus sylvatica)	Purple (Rhododendron ponticum) White/pink (Rubus fruticosus, Anemone nemorosa) White (Sorbus aucuparia, Rhamnus frangula, Trientalis europaea, Maianthemum bifolium, Cornus suecica) Red/purple/white/green (NGW2 grass mixture)	Yellow (Tilia cordata) White/pink (Rubus fruticosus) White (Rhamnus frangula, Trientalis europaea) Red/purple/white/green (NGW2 grass mixture)	Leaf yellow (Tilia cordata) Leaf yellow/red (Quercus robur, Fagus sylvatica) Red/purple/white/green (NGW2 grass mixture)	Evergreen (Pinus sylvestris, Rhododendron ponticum, Rubus fruticosus)	Sound of vegetation (Pinus sylvestris, Fagus sylvatica, Luzula pilosa, Luzula pilosa,) Fragnant flowers (Tilia cordata, Anemone nemorosa, Maianthemum bifolium)
New D	**Flower meadow** Open spaces on transitions between the water structures and the higher parts of the park. High flowers and grasses showing wind and colour.			• Miscanthus sacchariflorus • Miscanthus sinensis • Molinia caerulea High flower meadow D* • Flower mixture G3 (wet to moist soil) https://www.cruythoeck.nl/winkel/mengsels-voor-bloemrijk-grasland/Flower-mixture-g3-voor-jaarrond-natte-tot-vochtige-gronden/p80 • Stipa tenuifolia • Stipa calamagrostis High grass and flower meadow D* • NGW1 Swamp grass mixture + Flower mixture G3 (wet to moist soil) https://www.cruythoeck.nl/winkel/grass mixtures/ngw1-moerasschraal-grass mixture/p107		White, purple, yellow (Flower mixture G3)	White, purple, yellow (Flower mixture G3) Bronze (Molinia caerulea)	Red/brown (Miscanthus sacchariflorus) Pink (Miscanthus sinensis) Bronze (Molinia caerulea)	Remains in winter (Miscanthus sacchariflorus, Miscanthus sinensis, Molinia caerulea, Stipa tenuifolia, Stipa calamagrostis)	Vegetation catches sunlight (Miscanthus sacchariflorus, Miscanthus sinensis, Molinia caerulea) Movement of vegetation through wind (Miscanthus sacchariflorus, Miscanthus sinensis, Molinia caerulea, Stipa tenuifolia, Stipa calamagrostis)
new (exisiting structure extended) E	**Hedgerows** Densly planted wall with different textures dividing the gardens from the park. Structure planted on a bank near the water.	• Populus nigra 'Italica' • Populus × canadensis • Salix alba • Alnus glutinosa			10-20 years (Salix alba, Alnus glutinosa, Populus × canadensis) 20-50 years (Populus nigra 'Italica')					Sound of leaves (Populus × canadensis)
new F	**Coppice** Transparant screen shielding the sportfields. Planted on a bank, with a high grass/flower mixture.	• Salix alba			10-20 years					
new G	**Articulation** Low wall enclosing/framing a space. Hedge textured rigid.		• Taxus baccata							
new H	**Solitary tree** Eye catching tree that can survive on semi wet and dry soil. Striking color in the fall and summer.	• Acer rubrum				Red (Acer rubrum)		Leaf red (Acer rubrum)		Fragnant flowers (Acer rubrum)
new I	**Solitary tree** Eye catching tree that can survive on wet soil, with an outstanding texture and structure.	• Salix × sepulcralis 'Chrysocoma'								
new J	**Screen** Semi transparant screen next to the water enclosing a space. Mix of high transparant reed on wet soil that moves in the wind and keeps its structure during the winter			• Miscanthus sacchariflorus • Miscanthus sinensis • Molinia caerulea			Bronze (Molinia caerulea)	Red/brown (Miscanthus sacchariflorus) Pink (Miscanthus sinensis) Bronze (Molinia caerulea)		Movement of the wind through vegetation (Miscanthus sacchariflorus, Miscanthus sinensis, Molinia caerulea) Vegetation catches sunlight (Miscanthus sacchariflorus, Miscanthus sinensis, Molinia caerulea)
new K	**Orchard** Orchard with mown out paths in a grass field. Mixture of species of fruittrees on dry soil.	• Malus sylvestris • Prunus avium			Fast 10-20 (Prunus avium) Medium 20-50 (Malus sylvestris)	White/pink (Malus sylvestris) White (Prunus avium)		Leaf yellow/red (Prunus avium)		
new L	**Clump** Group of trees	• Betula pendula								
existing structure (extended) M	**Line**	• Aesculus hippocastanum				White (Aesculus hippocastanum)		Leaf yellow/orange (Aesculus hippocastanum)		
existing structure (extended) N	**Wall - line**	• Acer platanoides				Yellow/green (Acer platanoides)		Leaf yellow (Acer platanoides)		Fragnant flowers (Acer platanoides)
existing structure O	**Clump** Various present species of trees	For example • Arbutus unedo							Evergreen (Arbutus unedo)	
existing structure (extended) P	**Solitary tree**	• Betula utilis var. Jacquemontii								
existing structure Q	**Solitary tree**	• Cedrus libani							Evergreen (Cedrus libani)	
existing structure (extended) R	**Line**	• Fagus sylvatica						Leaf yellow/red (Fagus sylvatica)		Sound of leaves (Fagus sylvatica)
existing structure (extended) S	**Line - screen**	• Fagus sylvatica • Ulmus 'Clusius'						Leaf yellow/red (Fagus sylvatica) Leaf yellow (Ulmus Clusius')		Sound of leaves (Fagus sylvatica)
existing structure T	**Solitary tree**	• Fagus sylvatica 'Pendula'						Leaf yellow (Fagus sylvatica 'Pendula')		Sound of leaves (Fagus sylvatica 'Pendula')
existing structure U	**Clump**	• Ilex aquifolium • Abies nordmanniana • Picea abies							Evergreen (Ilex aquifolium, Abies nordmanniana, Picea abies)	Fragrant flowers (Abies nordmanniana)
existing structure V	**Clump**	• Pterocarya fraxinifolia						Leaf yellow (Pterocarya fraxinifolia)		
existing structure W	**Line**	• Platanus x hispanica				Yellow (Platanus x hispanica)		Leaf yellow (Platanus x hispanica)		
existing structure X	**Screen - line**	• Tilia cordata					Yellow (Tilia cordata)	Leaf yellow (Tilia cordata)		Fragrant flowers (Tilia cordata)
existing structure (extended) Y	**Line - screen**	• Ulmus 'Clusius'						Leaf yellow (Ulmus 'Clusius')		

Fig. 8.30: Planting scheme/table

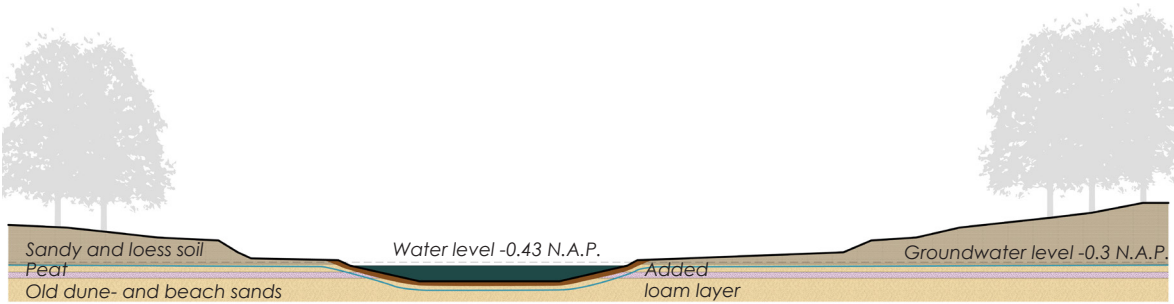
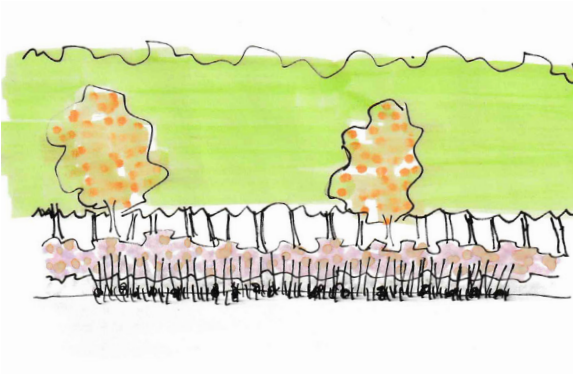


Fig. 8.31: Soil section park design

Winter - remaining structures and plants

Summer - textures and density

Spring - various colours



Autumn - colours and density

Fig. 8.32: Seasonal concept

Not only is the park a different experience during each visit as a result of fascination and undetermined paths, it is also different due to the changes through the seasons. The concept for the different season focusses on contrasting colours in vegetation, different textures from rigid to smooth and it focusses on remaining structures and their textures.

The different elements of the composition, roof, clump, solitary tree, line/screen, wall and guiding element, shape the spaces in the park. Together with the elevations the composition of the vegetation creates different experiences along the several routes. The solitary trees are used as landmarks in the site. The lines as guiding elements. The walls are created as boundaries of the park and privacy screens.
The old and new vegetation structures work together to create spaces in the park.

8.3.8 COMPOSITION AND NEW - EXISTING ELEMENTS

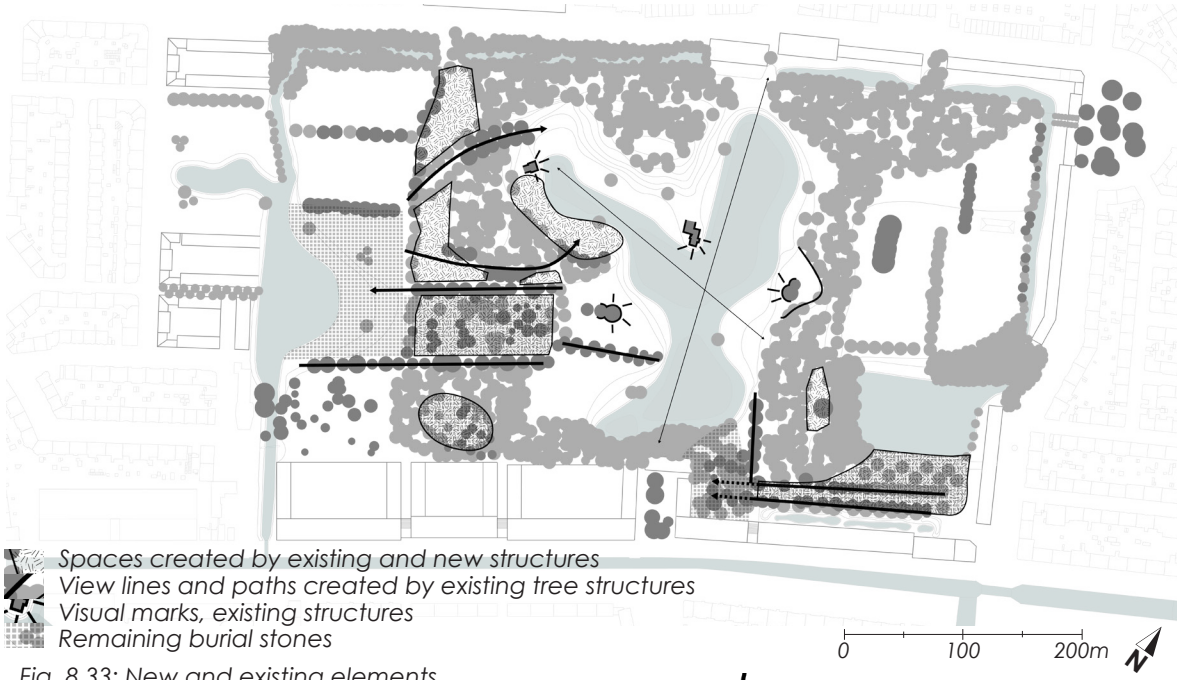


Fig. 8.33: New and existing elements

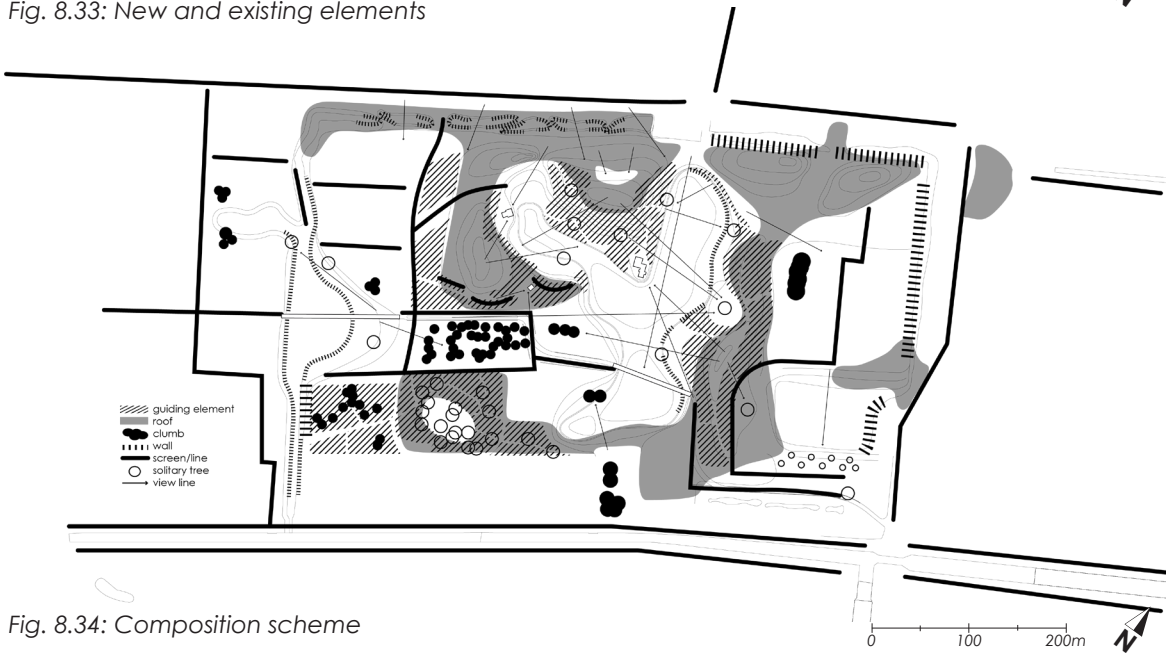


Fig. 8.34: Composition scheme

8.4 PROCESS

8.4.1 PHASES

Fig. 8.35: Phase 1: Planting and existing structures

Each big new tree structure has pioneer and climax species. This offers a changing structure but still keeping the forest atmosphere.
By using the existing structures in the site some of these atmospheres can already be found experienced. Although many of these trees are climax species and will last a long time, the pioneer structures need to be replaced in the future. In phase 4 some of the pioneer species are removed to create space for climax species or to create a less dense forest.

How both of these new and old structures are extended, planted and replaced through the years is visualised in the process drawings.

Fig. 8.36: Phase 2: 10 years

Fig. 8.37: Phase 3: 20 years

Fig. 8.38: Phase 4: 35 years - removing some pioneer species to create space for the climax species and to open up the forest

8.4.2 TRANSFORMATION

Current situation

The current site has two main entrances and is cut into two parts by an infrastructure.

Framing the cemetery to create entrances, making the site better accessible.

Realising the spatial structure of the design, the elevations, water structures, tree structures and routes.

Fig. 8.40: Transformation park design over time

Fig. 8.39: Phase 5: 60 years - replacing structures

Realised park

Leaving the cemetery but facing it out over a few years, letting vegetation grow into a forest or removing it to create an open field.

Open spaces providing areas for program. These spaces are left open to be filled in to fulfill the various demand of users of the park over time.

Over time the cemetery is transformed into a multifunctional park that houses waterstorage, sport, production fields and also emerges its users in nature.

8.4.3 SCENARIOS

Fig. 8.41: Scenario Production forest

This scenario shows how the park could transform or change to fit the needs at that time. Here population growth has led to a high demand in food. To keep the experience of the three movements in the park and combine it with food production a production forest is created. Here different levels of vegetation, fruit trees, bigger shrubs, bushes and field are used to create different spaces with layered experiences such as sounds, textures and colours. In this way the production forest provides food for the surrounding residents while also offering a restorative experience.

Fig. 8.42: Scenario Greening cemetery

In this scenario economic decline has led to not being able to transform or improve green spaces. Although there is no budget to change the site, it could transform over time through offering trees as memorials instead of burial stones. This could eventually lead to a forested cemetery slowly phasing out the burial stones. Resulting in a green park with links to its former program, which offers the various wanted experiences. Not only creating a green space for the neighbourhood but also offering restorative experiences.

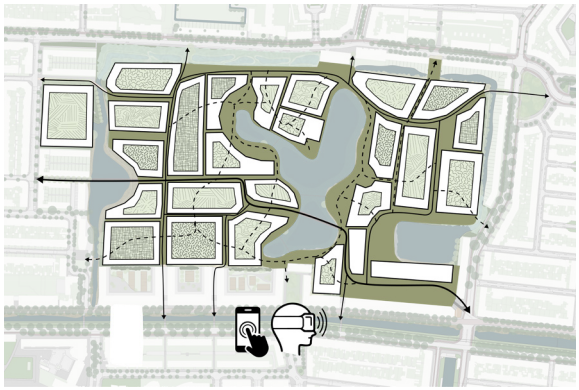


Fig. 8.42: Scenario Building experience path

Finally, in this scenario the housing demand has increased resulting in fewer and smaller green spaces in dense neighbourhoods. Here the idea of the courtyards is further extended in the park, using the composition as main design scheme. The movements can find their way through the buildings. The courtyards are accessible but the entrances are hidden, resulting in a wander through the neighbourhood. To fully experience the site, visitors visit the courtyards, which use virtual technology and mobile apps to emphasise sensorial experiences such as sounds or colours and to make the space feel bigger. Resulting in the idea of emerging in nature through the use of projections and sound systems.

8.5 DETAILS

8.5.1 REMAINING CEMETERY STRUCTURE

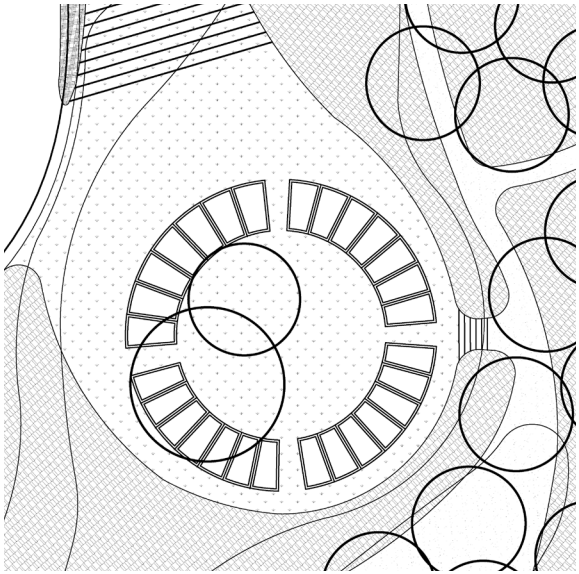


Fig. 8.41: Plan detail existing cemetery structure

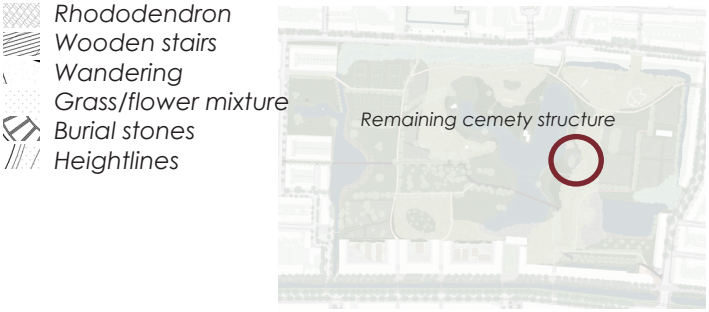


Fig. 8.42: Section detail existing cemetery structure, heigth difference

The detail of the existing cemetery structure shows how the kept structures is merged into the new park. The structure is enclosed by vegetation making its structure stand out even more. To reach the stairs on the other side, the visitor must walk around or cross the structure experiencing it. Stairs leading up the the structure are wide, to focus the view in one direction on the structure.

8.5.2 BRIDGE

Fig. 8.43: Section detail bridge

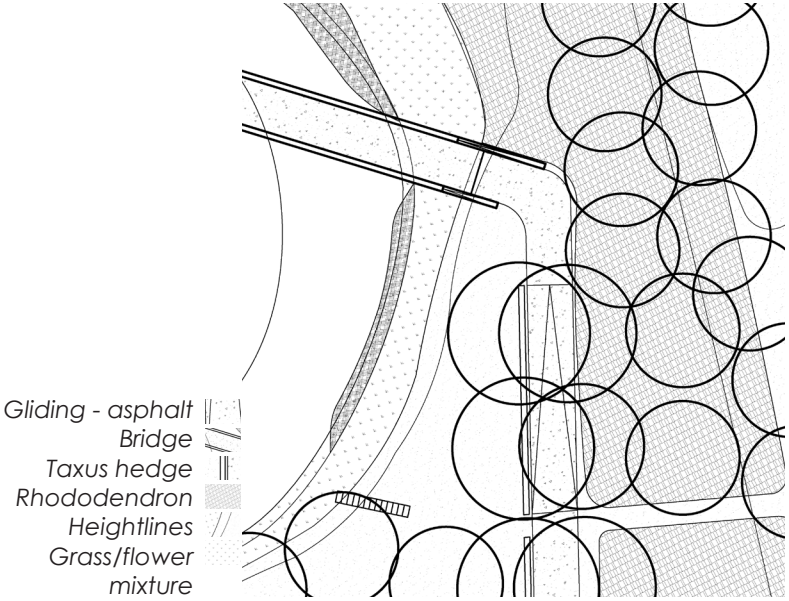


Fig. 8.44: Plan detail bridge

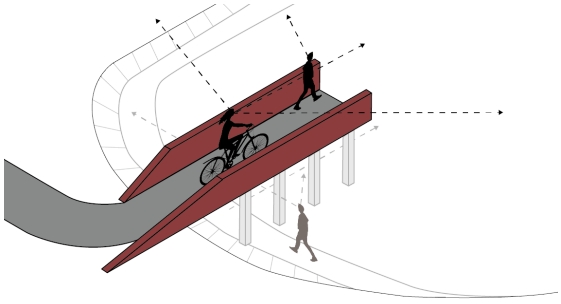


Fig. 8.45: Concept bridge

Fig. 8.46: Reference bridge (source: Frei)

The detail of the bridge shows how the Gliding movement is forced to make a harsh turn, creating a view on the lake and the building next to it. The path slopes before the bridge allowing for a smooth, without noticing the path, transition to the bridge. The bridge is materialised in corten steel with wide bridge railings, levelling out the landscape. Here the movement gets a different experience by opening the canopy revealing a large open space, but not experiencing the water underneath them. From the park looking at the bridge, the colour and texture play into the experience of the wandering movement. This movement can therefore, also walk underneath the bridge. From underneath the bridge, the construction frames the view on the other side of the lake.

8.5.3 ENTRANCE TO THE PARK

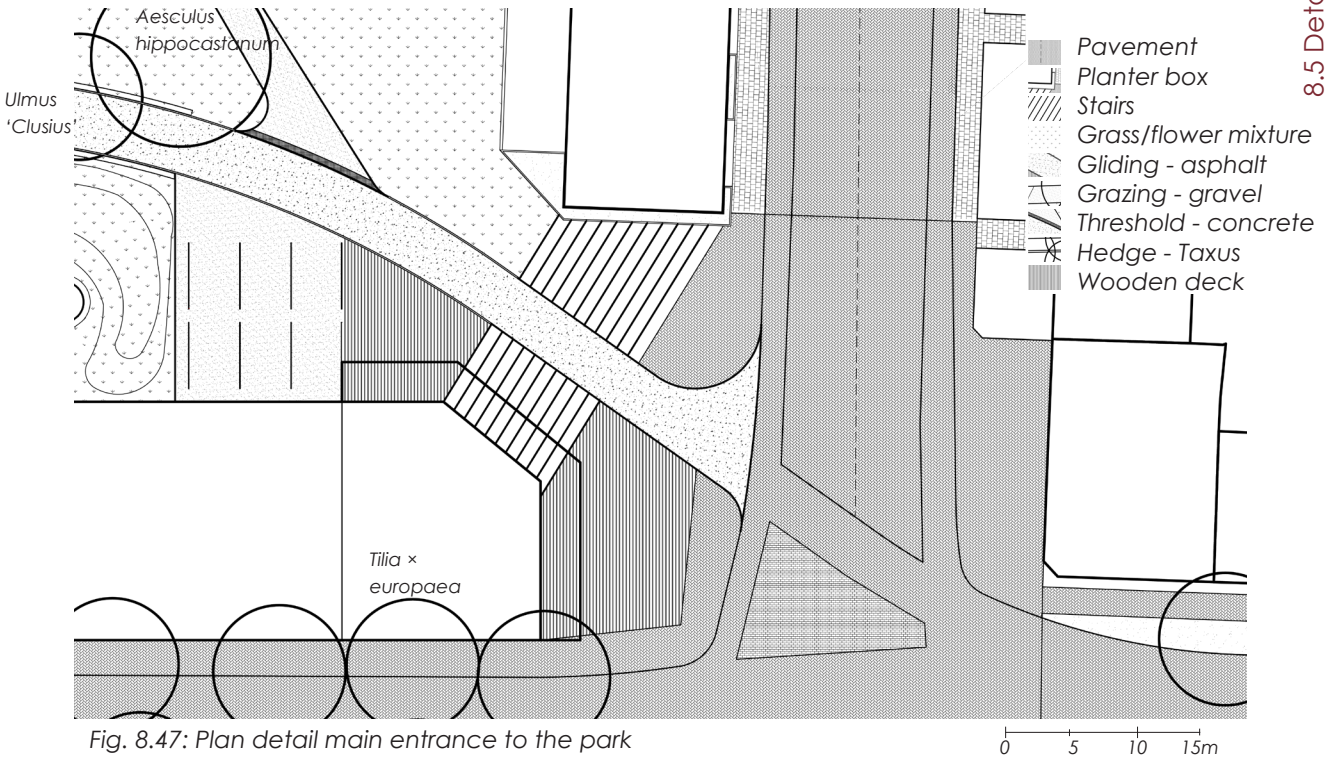
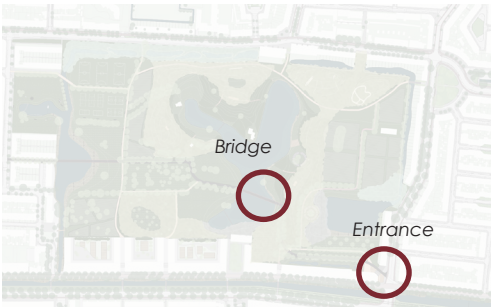


Fig. 8.47: Plan detail main entrance to the park



The detail of the entry shows the funnel effect of the square and how the transition between the buildings and the public space is created. The Gliding movement slopes into the park whether as the other movements are represented in stairs, one being the wooded decking leading to the path and the other being the stairs leading to the grass field. The singular tree forces visitors to make a decision between the paths. the transition between the Gliding and the Grazing movement is visualised by the threshold. From the Loosduinseweg the building can be seen from far away guiding people into the park creating the main entrance.

8.6 CONCLUSION DESIGN EYKENDUINEN PARK

As shown through the three scales of the design, the Urban Forest Movement can be applied by adapting the design goals to the specific site. From conclusions of the analysis a concept is made for the different scales that links back to the movement.

On the highest scale it results in a vision for the main spatial framework of Den Haag and the ideas on how the city can expand or develop over time. Ideas on how green spaces can be added and linked to the main structures and how these could answer current environmental questions.

On the medium scale, the line, a masterplan shows how the spatial framework lands in different neighbourhoods. Acting as a movement through the city, offering previews of the surrounding green spaces. This movement generates the fascination of users to explore these linked green spaces further and to step of, of the structure through framing, views and marked entrances. Framing also provides a place for the densification of Den Haag. The movement is defined by a tree line that creates a spaces underneath, only opening for visual lines on green spaces of where routes meet.

In the lowest scale, the cemetery into an accessible park, with program for the surrounding neighbourhoods. Here a combination of three movements, vegetation, materialisation and elevations are used to create different experiences in the park. The three movements, gliding - grazing - wandering, they have their own paths, materialisation and type of entrance. The beneficial effects of nature are experienced through fully emerging in nature, which is experienced in wandering. Here the sensorial elements to the design are crucial in order to feel completely emerged in nature, finding a balance between fascination and legibility. Switching between the movements is triggered through visual marks. When changing movements, the visitor experience stepping of the path, from an actual step, materialisation difference to no path at all. Entrances to the park are created by adding framing buildings or plantings, linking the park transition into its surrounding neighbourhood.

To conclude, the design shows that the Urban Forest Movement focusses on how green spaces are experienced in the city. This is done through movement, bodily experience, emerging in nature and the framing of these green spaces. Therefore, it can be said that the movement, although mentioning adding green spaces in the city, focusses on transforming existing green structures and spaces, to let visitors experience nature through emerging in it.
Therefore, the definition of the Urban Forest Movement can be defined as a generic spatial framework for a city that works through three scales with coordinating design principles. It uses green structures and spaces to create a healthy living environment and restorative nature while responding to current environmental design questions such as water nuisance, housing demand and heath island effect. Movement and framing are tools that are used to trigger people's fascination to explore and step into the green spaces. These green spaces and structures let visitors experience and emerge in nature through various movements. These movement emphasise the visitors

bodily experience of that space through vegetation, elevations and materialisation. Here the smell, colour, texture, sound and difference between light and dark created by different species of trees, shrubs and grasses are crucial. To create this emerging in nature, existing green spaces are transformed or if needed new spaces are added. The Urban Forest Movement can be applied to a site by adapting the design goals to fit the genius loci of a site.

PART 4: CONCLUSION AND REFLECTION

9. Conclusion and reflection

9.1 CONCLUSION

The use of nature to create a healthy living environment can be recognised throughout history in various ways such as exercise and walking in nature from the seventeenth century (Hajar, 2012; Jong, 2007). These uses of the nature and its beneficial effects on living environments have left traces in the landscape, structures like estates, tree plantings, and park on city walls. These movements can also be recognised in urban planning structures such as open building blocks allowing for optimal sunlight, wind access and public green spaces (Klerk & Cammen, 2010). The ideal cities, such as the Garden City, used the principles of living in nature to create healthy living environments. In the twentieth century the idea of restorative nature, concluding that nature, besides improving physical health, can improve mental health comes up (Bremer, Endale, Layla, Jannati, & Yi, 2017; Kaplan, 1995).

These restorative nature theories, Biophilia Theory, Stress Reduction Theory and Attention Restoration Theory, explain how nature can have positive effects on mental health. These are focussed on fascination and emerging in nature to experience its beneficial effects (Bremer, Endale, Layla, Jannati, & Yi, 2017; Kaplan, 1995). To achieve emerging in nature one needs to experience it fully, by moving through it. Different types of movement or speed allow for various experiences and levels of emerging in nature. To be fully emerged in nature a bodily experience is needed, exploring the space through the senses and movement (Casey, 1997; Freytag, 2002; Schultz, 2019). Therefore, to apply the restorative theories in a design, movement and added experiences should be used to create a space or route which offers the beneficial effects of nature.

The previously mentioned conclusions lead to the Urban Forest Movement, which consists of a generic spatial framework that rethinks current city structures through different scales. The main goals of the movement are to create a healthy living environment, a spatial framework that responds to current environmental design questions, green spaces which can improve mental health through the restorative nature theories, to increase biodiversity in the city through these green spaces and to use bodily experience and movements as main design principles to create natural spaces in the city.

The spatial framework consists of three scales with each three structures. The biggest scale covers the entire city, focussing on transport flows, water storage, connections to the surrounding landscapes, extensions and densification. The spatial structures on this scale are the Lane, a highly densified, green infrastructure which connects the city to the surrounding landscape, Country Lane, a secondary green route which connects spaces together, and the Forest, a green space that offers a break from the city, houses water storage and food production and connects visitors with nature. These structures are planted with selected trees that increase the biodiversity in the city.

Zooming into these structures, elements can be divided into the Promenade, Passage and Place. The first two are focused on movements and the Place offer a resting space. Here the design principles of different movements can be applied, the faster the movement the less it experiences of nature.

The last scale focusses on the Place, offering three movements and the added amount of

experienced nature in it. Gliding the fastest movement only offers a quick glance of the Place. Grazing, a slower movement, offers an overall experience of the park. Wandering, the slowest movement offers complete emerging in nature.

The Urban Forest Movement is applied by finding the main structure of a city and adapting the movement ideas to fit the site and its design brief, combining the previous set goals with the site's challenges. This results in a spatial framework that fits the city and site. After an analysis of Den Haag the historical lines are selected as spatial framework. To apply the framework through the scales a line and site, with their own design brief, are selected from the analysis. These form the Promenade, the Loosduinseweg, and the Place, Eykenduinen Park.
A vision for Den Haag shows how the spatial framework of the Urban Forest Movement could be applied to the city showing which structures need to be altered or created. One of these structures, the Loosduinseweg, dives deeper into the Movement. Here a masterplan and sectional design show the principles on a lower scale, display where interventions are needed to create the different elements, such as adding building blocks, greening neighbourhoods, extending the secondary routes, framing the Places and creating north and south connections.
The lowest scale, the Place, Eykenduinen Park show how a park design can create a restorative green space through different types of movement and bodily experience. Here the found design principles from the research are used to create the three movements, Gliding, Grazing and Wandering. Examples of the used design principles are: levelling out the landscape; long view lines; pastoral landscape; smooth or uneven ground surfaces; topographic forms to guide movement; sensorial aspects; different materialisations. To emphasise these movements, different types of entrances to the park are made. Elevations, water structures, visual marks, materials and vegetation are used to create different experiences in the park.

To conclude this research the main question: What might a contemporary 'Garden City movement' look like, and how can this be implemented, responding to current environmental design questions, that focusses on restorative green spaces informed by movement and bodily experience? is answered.
From the completed research and design the conclusion can be made that a contemporary Garden City movement is a new movement. This movement is not a new take on the original Garden City model. For the Garden City model is only based on one scale, not thinking on the experience scale or how it could be applied. Therefore, a contemporary Garden City movement is a new movement, the Urban Forest Movement. The Movement consists of a generic spatial framework with three scales and coordinating design principles. These can be directly applied to the site by adapting them to the found conclusions and spatial characteristics of the site. It focusses on creating healthy living environments through green spaces and structures keeping the current environmental design questions in mind. The Urban Forest Movement emphasises the importance of experiencing a green space through bodily experience and movement. The movement does not focus on greening city but rather focusses

on transforming green spaces or structures, only adding green spaces if necessary. Here visitors can fully experience a space through vegetation, spatial structures and materialisation. Crucial elements to bodily experience are views, smells, colours, sounds and textures created by various materials, trees, shrubs and grasses.
Through the scales, movement is used to preview nature and to generate fascination which leads to further exploration of those green spaces. The lowest scale, the site design, shows this in the form of three movements: Gliding, Grazing, Wandering. These movements have their own experience of the park and level of emerging in nature created through vegetation, materialisation and elevation. The slowest movement, Wandering, emerges visitors in nature the most, letting them experience the beneficial effects of nature, its restorative capability, by balancing fascination and legibility.

DISCUSSION AND LIMITATIONS RESEARCH
The conclusions that are drawn from the research are limited, this because the Urban Forest Movement was only applied to one site, Den Haag. To research if this Movement could work for other cities, with or without existing strong structures, it should be tested on multiple sites. Not only should the spatial framework be tested on its applicability, the three movements, Gliding, Grazing and Wandering, should also be applied on different types of parks. This could research if elevations or picturesque or formal landscape styles influence the amount of fascination and restorative nature in a site.
Secondly, the spatial framework of the Movement, asks for various changes to the current urban pattern of Den Haag. Because of this framework some historic structures have been reduced or removed to create the spatial structure. This leads to the question how much of this Urban Forest Movement will be achieved and if not completely achieved will the spatial framework still keep its structure in a toned-down version.
Finally, in the current situation of the COVID-19 pandemic, people are stressed and need to find a way to relieve this stress. Therefore, restorative nature could offer an answer. The design tackles the restorative nature theories and applies them in the site. But because these restorative qualities are created by fascination and a balance between mystery and legibility, there are spaces without overview. This results in walkers meeting each other without being able to predict it and therefore, it might be hard to keep the needed distance. Resulting in the dilemma between keeping distance and experiencing the beneficial effects of nature.

9.2 REFLECTION

In the reflection the thesis in discussed and reviewed on different topics, reflecting how and if I could have done them differently and what I learned in the process. The reflection will be concluded with an outlook of the project.

THE THESIS PROJECT IN RELATION TO THE URBAN FOREST PLACES LAB AND THE GRADUATION STUDIO FLOWSCAPES.

The project researches a new way of designing cities and their main structures, creating healthy living environments with restorative effects. These new, healthy living environments and green spaces relieve stress and improve the mental health of its residents, while responding to current environmental design questions. Throughout the project I came to the conclusion that it was not the amount of green in cities that led to a healthy living environment, but it was influenced by how the green spaces were experienced. Resulting in a design method of using trees, shrubs and grasses to create an experience in a space. This links back the Urban Forest Places lab which focuses on different green structures and scales in the urban environment, exploring trees, their composition and effect on the urban environment.

The designed spatial framework, consisting of forests, green spaces, lanes and country lanes can be recognised in one of the thematic lenses of the Flowscapes Graduation Lab. This Green Infrastructure lens consists of green structures which are linked together to form one network. These structures in urban areas offer spaces for leisure, food supply, water storage, nature etc. each of them having their own beneficial effects on their surroundings. This is further explored in the thesis researching the beneficial effects of nature for its users, by researching the restorative side of nature. Another element mentioned in the Flowscapes Graduation Lab is the research by design method. Here design is used to understand the spatial characteristics of a site or to research different design elements. In the thesis this method is used to reinforce and investigate the Urban Forest Movement. While the main design is on the lower scale, detailing out how the different movements work in relation to restorative nature, the Urban Forest Movement is still being improved and worked on. This leads to a back and forth of zooming in and out resulting in new ways of looking at the project offering new insights for the design on the different scales.

One of the main perspectives in landscape architecture is perception, how users experience a space and the created design. In my thesis the lens of perception is one of the main design tools to create spaces which offer bodily experiences, created by contrast between light and dark, textures, colours, smells, sounds, amount of enclosure and elevations, reinforcing the importance of the lens perception.

Further the project is be related to urbanism, creating a new way of designing a city. Focussing on living environments, main structures, ways of planning a city and creating transitions between parks and neighbourhoods.

SOCIETAL RELEVANCE

Currently cities are becoming more dense resulting in overpopulated neighbourhoods

and little green spaces. Together with this the rising mental health problems and new environmental design questions such as heath island effect, water nuisance and densification, results in questioning our current city structures. The mental health side of the thesis is becoming an important design question in creating healthy living environments that offer green spaces in dense cities. The research explores a new way of designing a city with current environmental design questions in mind but also by focussing on restorative nature and healthy living environments. Not only should the city structure be designed from a planning point of view but also from an experience point of view. Designing the main framework with movement in mind and how residents of the city are going to experience these structures.
This thesis researches new methods on design cities on different scales, focussing on healthy living environments and using nature for its restorative effects. Conclusions show that when designing green spaces in cities it is not about the amount of spaces but about how these are experienced. Offering a new design method for designing future dense cities with, maybe fewer but, effective green spaces. The research could be used in further development of current cities.

METHODOLOGY AND DATA COLLECTION
While doing the literature research, a historic overview offered a way to summarize a part of the research. This helped me by giving me an overview of green structures and their relation to events or movements over time. Seeing relations between urban planning, health movements, green structures and ideal city movements, helped to understand how all of these elements had influenced each other. It also gave new insights on what elements this Urban Forest Movement should have.
Although the overview was a good way to summarise the literature reviews and to oversee the conclusions, these were only of little influence when designing the Urban Forest Movement. The historic overview was needed to build up an understanding of the events over time in the different subjects, which extended my knowledge about the subjects. This helped me understand how cities and parks developed, with which design goals in mind, related to healthy living environments. By being able to recognise these structures or patterns in the existing urban tissue, a new framework was easier to design by piecing these elements together. Therefore, the conclusions from the historic overview may not directly have influenced the Urban Forest Movement, but rather have influenced the creation of the spatial framework indirectly by using the obtained background knowledge.

The second part of the research used literature reviews and case studies to answer the question. Although there were a lot of literature studies on mental health related to restorative nature, how these findings could be spatially applied in the design was not clearly mentioned. This prompted the research on how elements of these restorative theories could be recognised in design methods or activities. After further research and feedback from my mentors a link was found between the restorative nature theories and experience and walking. To transform these conclusions into design principles, multiple case studies were

researched. Many of these cases didn't just focus on walking but on different speeds and types of movement. Explaining that to experience nature one needs to move through it. To explore these findings new literatures studies were done which offered a similar conclusion. This led to a further exploration of two themes: movement in relation to experience levels of nature and kinesthetic and synesthetic experience.
To conclude all these different elements and findings a toolbox for movement was created, where the most crucial design principles were summarised.
Because the research started with literature reviews and case studies and there was no precedent goal, an overview or design method, only answering the research question, it felt easy switching between the two methods. This allowed for a lot of research and finding conclusions without immediately valuating them, allowing for the two types of research to complement each other.

GENERALISE THE RESEARCH
The explored literature and case studies offered input for the Urban Forest Movement, a generic scheme with design goals. These goals might differ for each city but the main outline of the Movement stays the same. How this can be implemented into the site has been shown in the design. Here the design principles, main structures and movements are adapted to fit the design brief of the site. From this the Urban Forest Movement can be implemented through the different scales. Although the Movements is generic, it does require main structures in the city's pattern or in the landscape. If those are missing new structures need to be designed.

ETHICAL ISSUES AND DILEMMAS
The restorative element in the thesis caused a dilemma. According to the literature studies, restorative effects of nature can be achieved by designing a space where visitors are emerged in nature, restricting long views or sights of the surrounding city. This results in a dense forest with no or little sightlines from outside. While restorative effects benefit the mental health of residents so does the feeling of safety. With such a dense park or forest in their neighbourhood it might have negative results on the feeling of safety. Therefore, when designing that park, I needed to find a balance between the restorative design elements and the quest of feeling safe, which was about making choices. After the design I can conclude that the restorative effects in my design did overtake the idea of feeling safe, designing a park with many enclosed, unclear paths and spaces.

Other dilemmas that I faced were the preservation of certain historic buildings and the cemetery. The site for is currently a cemetery, one of the oldest cemeteries in the Netherlands. It consists of monumental tree structures and has many historic important memorials sited in it. To create a restorative green space the function of the cemetery had to be removed, which caused the dilemma, to keep certain structures, keep the function or to keep the elevations. People that have family members or friends buried on the cemetery of course want to keep the graves intact, surrounding residents might want to change it because they demand more leisure areas. Therefore, I had to ask myself how to transform such a site. To slowly transform the cemetery into a park memorial trees could

be planted instead of burial stones, phasing out the cemetery. Or by looking at examples in cities like Copenhagen, where we can see people enjoying the green environment of the Assistens Cemetery, a connection can be made between leisure and cemetery.
After deliberation I decided to remove the function of the cemetery, amplify the existing elevations, to keep some of the tree structures and burial stones to link back to the old function of the site. I chose this option to pay tribute to the old site but to still offer myself a free canvas for my graduation project.

DIGITAL MENTORING AND OTHER ISSUES RELATED TO THE CORONA-CRISIS
I concluded that the digital mentoring due to the Corona-crisis had positive and negative sides. Communicating my design choices and clearly drawing the spatial design elements was a bit difficult for me. I found that not only was I not able to talk through all the elements in the drawings but I also had to think how I drew them to clearly communicate my ideas. This resulted into early thinking of drawing methods while having them left open could have created new insights during the design process.
While these were some of the negative aspects, I also experienced some positive ones. For instance, as mentioned earlier the drawings were important, thinking about how to visualise and make them this early also allowed me to see which drawing styles were better to use. Which was helpful for some elements at the end of the thesis.

VISUALISATIONS
During the quest to visualise the Urban Forest Movement many different visualisations were tried, from sketches, exploded views, birds eye views, strips, sections to a model. Trying to find a clear way to visualise the different scales and their own structures, principles and experiences. Each time new found ideas from the design were processed in the Urban Forest Movement and a new style of drawing was tested.

PROCESS OF THE THESIS
I started my thesis with the fascination for healing nature and ideal city movements and how these two could be linked to create a living environment where residents don't feel the need to flee the city for peace and quietness. Through researching I found out that I needed to widen my lens to how to create healthy living environments by reacting to larger design questions such as water nuisance, heath island effects and densification while also using nature for its beneficial effects. These elements soon seemed to be linked to each other and could be used to create a generic scheme and detail design which focussed on both parts of my earlier fascination. Therefore, I decided to further explore the ideal city movements, mainly the Garden City movement, and restorative nature theories on how to design a current version of an idealistic healthy city movement. The restorative side of the research mostly focussed on the literature and how this could be applied, which was later found to be possible through movement and bodily experience. The ideal city movements were further explored by seeing how the ideas were used in current city structures and if certain elements or structures could be used in the design.
From this, conclusions were drawn and the first ideas on how to create a generic scheme were drawn up. This scheme was

designed through the scales and was tested every time I zoomed in or out. As a result of this method, working through the scales, the detailed design and city vision were matched to each other and offered new insights for the design on the different scales. While starting with the design one of the most important design tools of the project was found, movement. With this find, many things fell into place such as how to create larger green structures in cities and how to let visitors experience restorative nature in the parks. Movement became the main idea behind the spatial structure of my ideal city movement the Urban Forest Movement. This finding provided me with a design tool that I could use on different scales, using it for its level of speed and what is experienced from it on a city scale to it being a way of letting people experience a space fully by emerging in it though bodily experience.
Working through the scales and using literature, helped me get to a level of detail in my design which reinforced my ideas and the movement on a larger scale, showing how it could work on a zoomed in site.
Using the conclusions from the research led me to be able to substantiate the design choices and demonstrate the concept behind the design through the scales.
Although not all of the literature and design research was as directly applicable to the design as others, these all contributed to my knowledge about the topic of my thesis. Therefore, in a way these parts of the research had their own input in some design choices, indirectly using them to substantiate the design.
A part of the project which I feel I could develop further is the process or transformation of the scheme. Here a more detailed out scenario design could have made the generic Urban Forest Movement stronger, allowing it to be adapted to any new design challenges or sites.

OUTLOOK
Looking back at the project with the gained knowledge the relevance of the researched themes becomes clear for current cities. This project could offer new insights into designing future cities and their spinal green structures. The idea of movement, bodily experience and eyelevel perspective, is one of the crucial elements in this project. As shown how this could be used to design green structures and nature areas in a city, it should form one of the main design tools when designing future cities.

Currently the Urban Forest Movement is applied and further researched for the city of Den Haag. Although this offered a site from where to start the project and to see if it could be applied, this results in a limited applied design. The Generic Movement can be further researched and improved by applying it to various other cities. Cities with an existing green, spatial framework, such as a historic green city wall, or cities that lack an overall green structure. By applying the movement to different city structures the spatial framework could be elaborated.

Further research on a lower scale, park scale, could lead to new ideas on how to design a park. Currently the main park design in the project can be related back to contemporary design tools to create spaces and experiences, such as elevations, planting schemes and materialisation. Further research could dive into a new design method, such as virtual reality, to create these bodily experiences in nature.

This could offer a new insight into green spaces in cities. This is mainly a design question with the rising demand for housing and the fewer spaces which are available for nature in the city. Can densification and emerging in nature be combined in a space and if so how? Questions such as, how can virtual reality be used to create an emerging experience in nature, rise. Leading to what could be a next step in the research, exploring new design tools.

Finally, the movement could be looked at through different scenarios to create a better adaptable and sustainable spatial framework for a city. Scenarios such as economic decline, extreme climate change or extreme population growth could all have their own influence on the green spaces. This leads to questions such as, how can a food production area offer a similar emerging experience to a park and be implemented in a city or could smaller green spaces, due to densification, combined with virtual reality still offer an experience of emerging in nature. Not only could these scenarios offer new insight into how to design a green space on a zoomed in scale but if could also be investigated on the larger scale. For instance, how could the Urban Forest Movement offer design methods on dealing with rising sea levels or cities in The Netherlands getting intertwined.

The conclusions from this project lead to new questions that could be further researched, to investigate how to create an ideal healthy living environment in cities, using restorative nature, that responds to environmental design questions that are relevant at that time.

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11. Glossary

Restorative nature: beneficial effects of nature for the health of its users, theories like the Attention Restoration Theory by Kaplan and Kaplan, Stress Reduction Theory by Ulrich and Biophilia Theory by Wilson, all concluded that nature possesses restorative effects. Visiting nature could reduce stress and help with one's ability to focus (Bremer, Endale, Layla, Jannati, & Yi, 2017).

Stress: continuing state of psychological tension causing mental pressure, which effects the body (Kaplan, 1995).

Ideal city movement: idealistic urban plans which focus on a healthier way of living, most of them sited in the countryside outside of the city.

Urban forestry: forest and trees in relation to the urban environment and how these improve each other. One of the main ideas is that trees are one of the most important elements or structures in an urban environment.

Movement: a way of changing one's position in space by means of walking, cycling, traveling by car, tram or train etc.

Bodily experience: how one would experience a space by movement, kinesthetics and synesthetics. Movement allows one to experience all the elements of a space through the body, from different textures to dimensions of a space (Casey, 1997).

Urban Forest Movement: a generic spatial framework for a city that works through three scales with coordinating design principles. It uses green structures and spaces to create a healthy living environment and restorative nature while responding to current environmental design questions such as water nuisance, housing demand and heath island effect. Movement and framing are tools that are used to trigger people's fascination to explore and step into the green spaces. These green spaces and structures let visitors experience and emerge in nature through various movements. These movement emphasise the visitors bodily experience of that space through vegetation, elevations and materialisation. Here the smell, colour, texture, sound and difference between light and dark created by different species of trees, shrubs and grasses are crucial. To create this emerging in nature, existing green spaces are transformed or if needed new spaces are added. The Urban Forest Movement can be applied to a site by adapting the design goals to fit the genius loci of a site.

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12.8 DESIGN

12.9 CONCLUSION AND REFLECTION

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