Death in the City

Integrating funerary places
In urban fabrics

Requiem

Under the wide and starry sky,

Dig the grave and let me lie.

Glad did I live and gladly die,

And I laid me down with a will.

This be the verse you grave for me:

Here he lies where he longed to be;

Home is the sailor, home from sea,

And the hunter home from the hill.
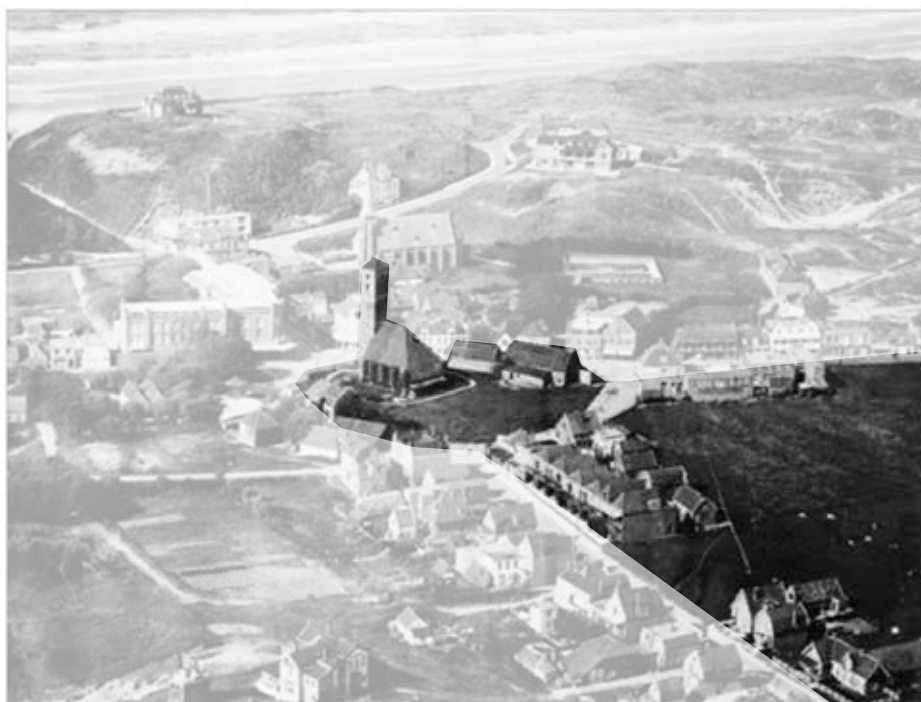
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Figure 1: Fascination Wijk aan Zee 1930-2016

Introduction

1.   Fascination

I grew up in a small village. The first cemetery that I knew of was a little graveyard surrounding the local church. When at some point a fountain was constructed on the village square, human bones were dug up in the process; signs that the graveyard had been bigger. This part of the graveyard however had been covered up to free up space for the living. What struck me was the contrast between the atmosphere I thought belonged at a place where people were buried, and the atmosphere as I experienced it on the square. This dichotomy of 'sacred' and casual urban space became apparent only when I was conscious about what was hidden in the soil underneath the square. On one hand the whole nature of the space depended on something buried underground, but on the other hand, the presence of bodies had never bothered anyone or disturbed anyone. One could even go as far as to say that the small graveyard on the square gave an atmosphere representing the more traditional life of the little village, where the dead are not separated from the living. Later when I moved to bigger cities, it confused me that cemeteries seemed so secluded from society. The graveyards seemed more a place where the dead were put away rather than a part of life.

2.   Problem field

The concept of death has been with us for all of humanity. Every human ever alive has or will die. The way we deal with our dead and the space we allow the dead to occupy in our society carries cultural and personal norms and values. Cemeteries are known as demarcated sites to commemorate specific people, but these spaces also serve the living as a place to reflect, ensuring a different perspective on life. These tranquil and spiritual places provide visitors with a sense of humility and peace.

How we have dealt with our deceased in the past 10000 years has changed a lot. The changes that have taken place mostly concern cultural differences regarding the funeral rites, the method of disposal of the body, and the marking of the grave. In the last 100 years rapid advancements in technology and a changing attitude towards our surroundings have allowed for an unforeseen increase in possibilities. Adopting new options may be necessary, for there are more and more living people, and leaving the dead to pile up every passing minute. If our current methods of dealing with deceased adversely affect the living or do not live up to the potential of enriching the lives of those who are left behind, it might be time to give critical attention to the consequences, and explore alternative ways of how death can interact with our landscape.

3.   Research / design objective

In my thesis I want to re-evaluate the position cemeteries have in our society. When we started building cemeteries it happened pragmatically, to give the deceased a spot, while minimising the negative effects for the living and our surroundings. While our environments have urbanised, and our technologies have advanced, our cemeteries have yet to adapt to our new world. To figure out how future cemeteries might look like I will try to answer the following questions in this thesis:

  - How have we dealt with the deceased in the past?
  - What are the environmental consequences of dealing with dead bodies?
  - What do humans wish to happen to their remains?
  - What do humans desire in the mourning process?

After answering these questions, I will argue for a new type of commemoration space that could replace cemeteries as we know them. I will try to answer the following design questions:

- What could this new type of memorial space look like?
- How can these new places be reintegrated in the urban fabric?

4. Hypothesis

Would it be possible to change our cemetery culture into something else? There is a lot to gain in changing the place of death in society.

1. New solutions can be better adjusted to the needs of the bereaved during the mourning process.

2. These solutions can be adaptable to changing technologies of bodily disposal, because this new concept will be based on the human factor that remains the same over the different methods.

This will result in spaces that can empower the bereaved and aid in the grieving process, while being more widely used and space efficient, and therefore more sustainable.

5. Site introduction

The concept should be usable in any big city. The qualifications for the selection of the testing site were quite open. As a site I chose The Hague because this is one of the big cities in the Randstad, the centre of the Netherlands, and also currently one of the fastest-growing cities in the Netherlands.

6. Relevance (scientific/societal)

This research will be relevant for society. For society it can improve life in several ways. First and foremost, the project provides a mourning place in the daily surroundings. For others it can provide a place for silent contemplation of life, and the benefits of the healing powers of nature of troubles that are not death related.

In our current social media absorbed life, effort is put in portraying a perfect life, and hiding the less appealing parts of human existence. This project aims to provide a physical place suited for the gracious expression of the non-perfect parts of life, be it a place to meet with people and talk about the sadder parts of life, a place where one can wander alone, or to plant and witness the flowers that commemorate the dearly missed.

The scientific relevance lies in the question of what do we do with the deceased of our ever-growing population? These questions are universal, and other countries have already started exploring possibilities. However, since funeral customs and death related practices are so culturally tied it is essential to explore this problem from a Dutch context, as one of the most densely populated countries. More closely related to the discipline of landscape architecture this thesis tries to collaborate of the spatial translation of the principles of healing gardens in non-medical contexts. Broadening the applicability of these concepts in order to improve the lives of the general population and especially assist people going through vulnerable periods.

7. Reading itinerary

My thesis project started with the question what future cemeteries would look like. This broad and general question turned out being not directly related to the discipline of landscape architecture. Therefore, my initial research takes a lot from history, biology, forensic and social sciences, psychology and thanatology. However, after this broad exploration the project was guided back to the domain of landscape architecture, to explore its tools in the context of deathscapes.

In the first chapter I research the history of what we do with our dead and how and why we ended up with our cemeteries the way they are now. From different types of burial mounds, to church burials, to cemeteries and on to our currently preferred cremations. Then I dove

deeper into the technical aspects and the interactions between the deceased and the soil. What happens when a body decomposes, and what is left after cremation? This chapter ends with a short look into new methods of bodily disposal that are being developed at the moment. Then I looked into the wishes of the people, the actual number of casualties, the processes of the funeral, and the mourning period afterwards, and how these have changed over time.

Based on these three chapters in chapter four I develop a concept of a new type: The commemorationscape. In the fifth chapter I explore selection criteria, and with them pick and analyse a location as testing site for my concept. In the sixth chapter I further define actual design tools specific to my commemorationscape.
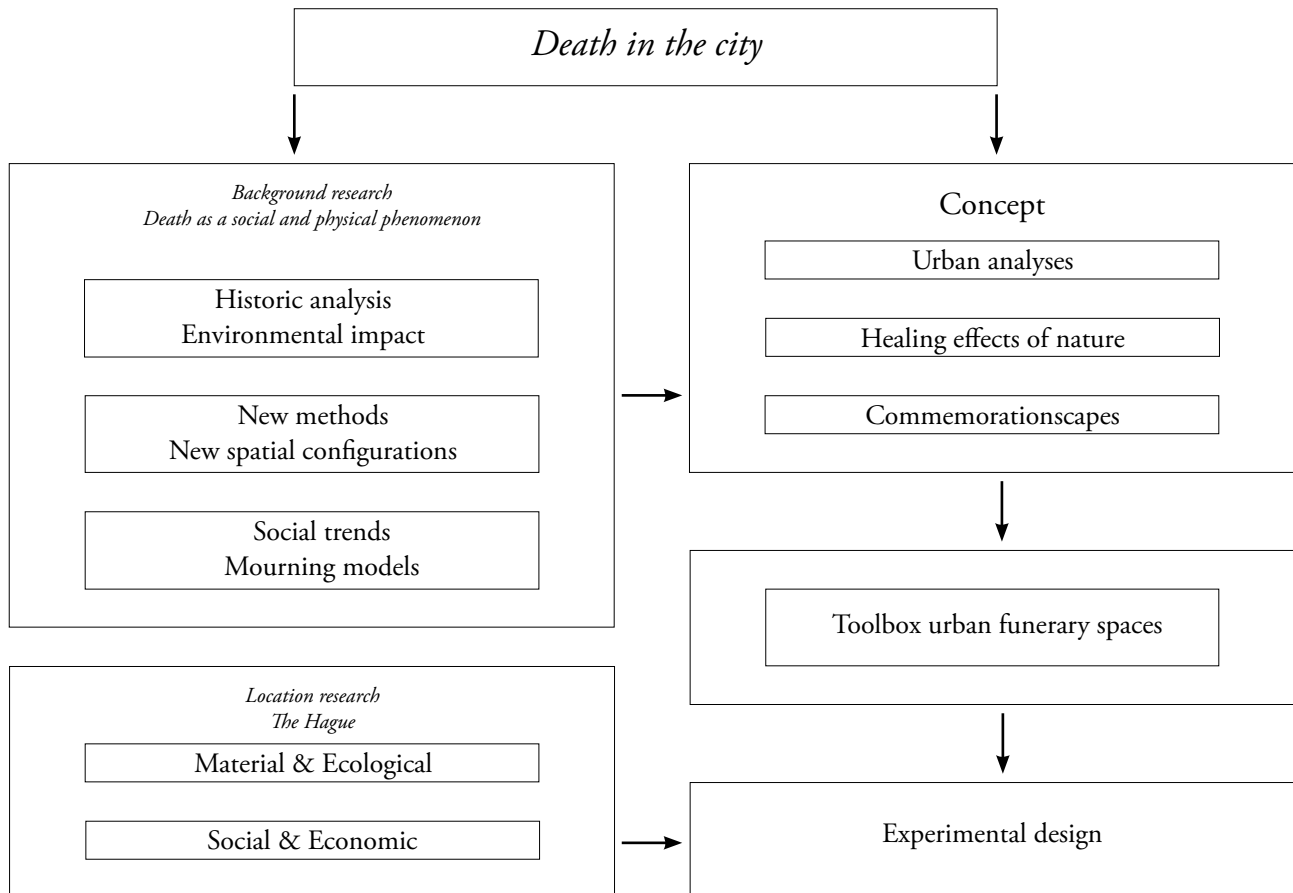
Death in the city	

Background research
Death as a social and physical phenomenon

Historic analysis
Environmental impact

New methods
New spatial configurations

Social trends
Mourning models

Location research
The Hague

Material & Ecological

Social & Economic

Concept

Urban analyses

Healing effects of nature

Commemorationscapes

Toolbox urban funerary spaces

Experimental design

Figure 2: Methodology schema

History of dealing with deceased in the Netherlands

"The core meaning of any individual or group identity, namely a sense of sameness over time and space is sustained by remembering and what is remembered is defined by assumed identity."

— Gillis, 1994 (p. 3)

Whether the bodies of the deceased are buried in the ground, or placed within elaborate tombs, their location holds symbolic meaning as well as practical historical meaning for the surrounding. Burial sites are significant to a community's sense of well being and to the preservation of history within the community by teaching the living about the past.

Looking at our history of dealing with death there are roughly four characteristic periods based on views on death and the relationship within the landscape and later cityscape. The landscape had been changing dramatically between these periods, from a swampy wetland in the hands of tidal forces, to the man-controlled land we know now. The four periods are however first and foremost characterised by their methods of dealing with the deceased.

In the first period, the ancient period the dead were buried or burned, and these sites were eternalized and made recognizable with mounds in the landscape, some still lasting.

In the second period, the Christian period, religion drastically changed how the dead were disposed of. The dead required a storage place to await judgement day, instead of a memorial. Preferably, this space had to be on sacred ground, inside the church or within the surrounding grounds.

The third period is characterised by a separation between the church and the place of burial. The old ways of doing things was no longer viable due to the increasingly fast and densely growing population.

The last period, the modern period, defined itself by the reintroduction of a "new" method to dispose of the dead bodies. Due to the rising population a method to dispose of the dead that required less space was desired. This lead to the reintroduction of cremation.

When diving deeper in the spatial aspects of these four period, it will become clear how much of an impact our deceased have had on the landscape over time, and what spatial typologies are connected to the different periods.
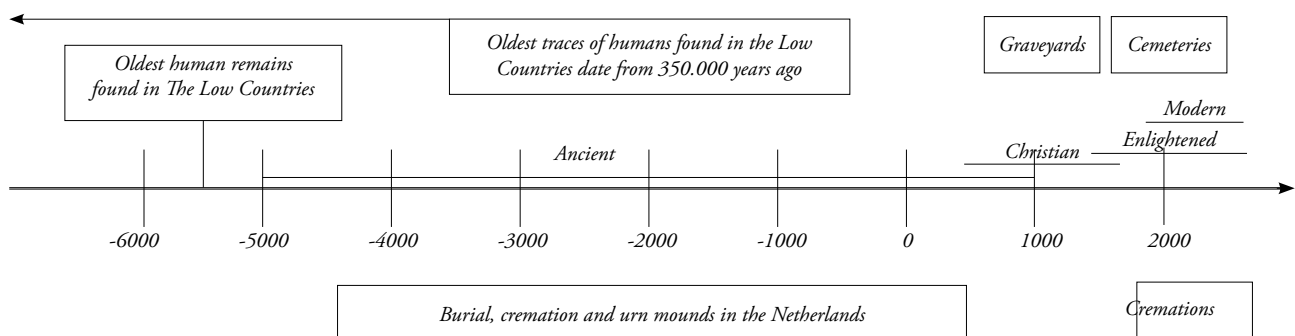

Figure 3: Historical time line

1.   Tumuli (-5500- 250)

The first grave markers erected for the dead were highly monumental structures that had a big impact in the landscape. These structures were more than just a covering for the body, sheltering it from view and wild animals. These mounds however also housed that person in the memory of those who lived on. There are several types of burial mounds. (Byvanck, 1942)

Dolmen: Humans were buried inside stone chambers. These chambers were covered with soil and would slowly re-vegetate into the landscape, although the surrounding ring of stones (kransstenen) still hinted at what happened inside.

Palisade mound: A large mound surrounded by erect wooden poles, often oak, evenly spaced. Sometimes this type was even topped with a tree. Within people were buried in hollowed tree trunks, or the mounts were built on burn graves.

Beehive mound: This type of mound is characterised by the covering of the deceased with a basket like structure, which would slowly re vegetate and grow into the landscape as a small mound.

Ring wall mound: This type of mound has an extra ring surrounding the burial mound. Increasing the monumentality and allowing it to stand out even more in the landscape.

The burial mounds were often reused and newly deceased would be buried in existing mounds. Later when cremations became more prevalent ash filled urns or ashes in shrouds were also added to existing mounds, that were enlarged when they got "full".

Urn mounds: In the end of the bronze age urns were buried alone or in groups in little mounds in the landscape. Sometimes whole fields were filled with these. Around this time people also started burying items with
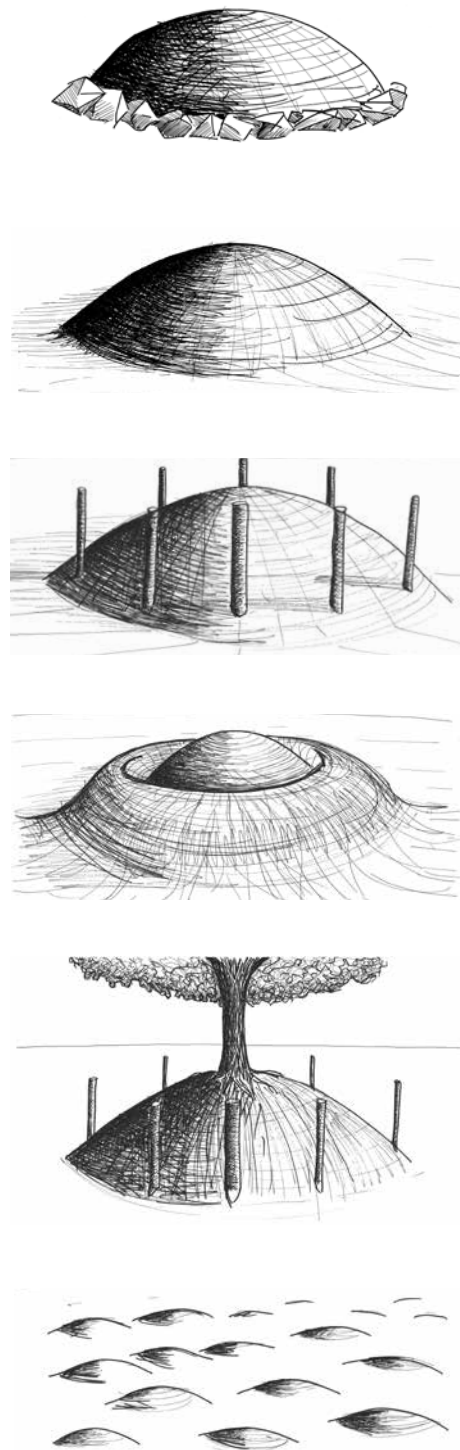

Figure 4: Grave mounds and urn fields

their deceased.

The burial mound had a close relation to the landscape, they were only built on higher grounds. Mapping out these mounds on the soil map shows this correlation.

2.   Church & Graveyards (250-1800)

With the dawn of Christianity, the individual disappeared to the background in the face of god. One of the biggest changes that took place was the prohibition of cremation. Bodies had to be inhumed as a whole. Where the burial mounds were often places a little outside of the settlements, now burial places were put close to the church within the settlements to protect the graves from disturbances by grave robbers or wild animals. In the early middle ages we discovered the tools to control our land. This allowed for settlements more

evenly distributed across the country. The peat landscape was drained and made liveable, while dikes protected out coasts.

The most desired graves were originally in the floor of the church since this was sacred ground. There were however only very few of these places available, so this was only accessible for the most privileged in society. In large cities like Amsterdam problems arose with the constant reopening of the church floors. The air of decomposition permeated the church, and the floors became unstable, leading to dangerous collapse and the spread of more miasma.

The second best option was to be buried on sacred ground: the churchyard. When finances allowed, a simple grave marker was put on the grave. This was often a small wooden cross that would decay over time, but sometimes more elaborate stone markers were placed
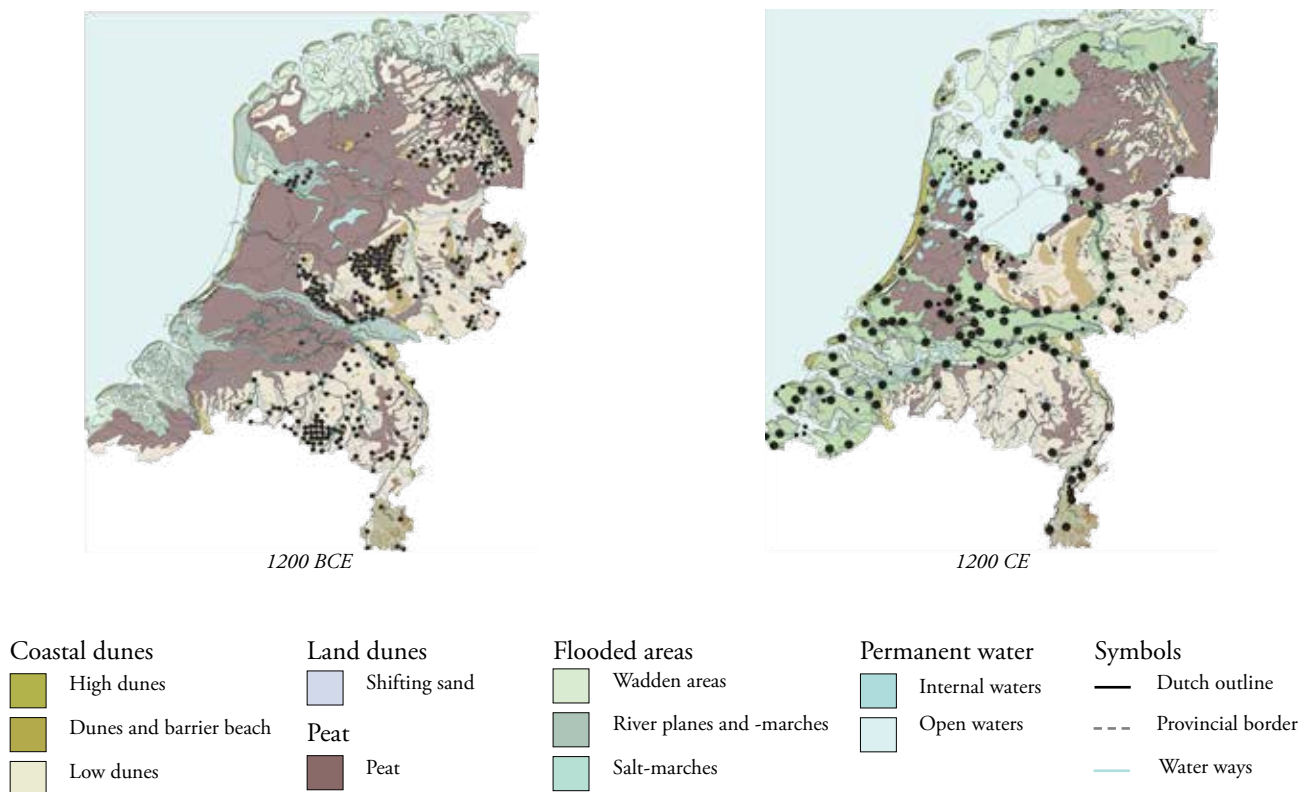

1200 BCE

1200 CE

Coastal dunes
High dunes
Dunes and barrier beach
Low dunes

Land dunes
Shifting sand

Peat
Peat

Flooded areas
Wadden areas
River planes and -marches
Salt-marches

Permanent water
Internal waters
Open waters

Symbols
Dutch outline
Provincial border
Water ways

Figure 5: Settlements depending on landscape type.

resembling church floor aesthetic. These graves were often reused out of necessity and due to limited space in city centres. The exhumed bones were collected and reburied in mass graves.

In medieval times the churchyard was still used as community green space, since this was before the dawn of public parks. It was use d for theatre, judgements, markets, fairs, dances and so on. Thus, the dead still had a physical central place in the lives of the living.

This way of dealing with the dead changed in 1810 when science improved to the point that we got conscious about where we bury, and the impact burying people has on our surroundings. New laws prohibited inner city burials, with the only exceptions being small villages.

The first outer city cemetery that was build according to these ideas in the Netherlands was Ter Navolging in The Hague. This cemetery quite literally copied the church floor pattern of flat gravestones and there is a beautiful sequence from the street entrance to the enclosed cemetery. A plaque dating from the moment of founding explains: "My rotting remains have to be far away from the city, for as I in my life prevented to impair others, so do I wish to do after my death. " Although this cemetery is no longer apart from the city as originally planned, it is still an interesting example spatially, and will be analysed further in chapter 6.
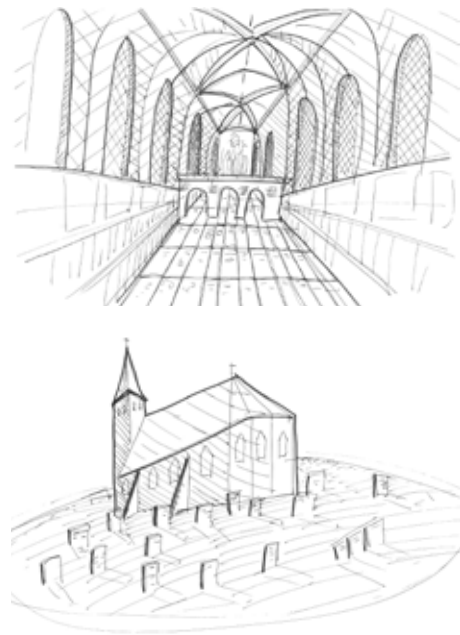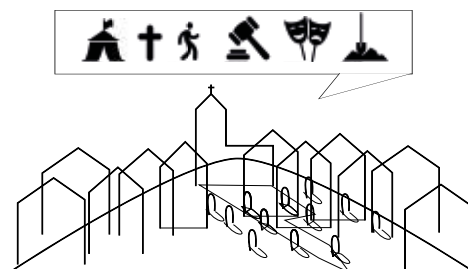

Figure 6: Church burials

Figure 7: Medieval uses of the churchyard.

Figure 8: Cemetery Ter Navolging

3.   Cemeteries   (1800)

When we started building cemeteries the burial place transformed from a place to store the deceased to a mourning place for the bereaved.

In 1810 when the Netherlands came under command of the French, French laws were adopted, among which were the laws that forbid burying in the church or near housing. This led to the first cemeteries that were often no longer directly connected to a church and placed on the edge of settlements. (These laws did not apply in small villages. Therefore many small villages still have a traditional graveyard around a church.)

Graveyards were seen as unsanitary, overcrowded, and had like the churches in earlier times started to exude miasmas. The earliest outer city cemeteries were private initiatives founded just outside of the settlements. Many of these outer cemeteries have due to urban growth again been surrounded by the urban sprawl. (In earlier times Jewish religion already prescribed a burial just out of the city walls.)

To more clearly see the differences between these cemeteries and the earlier graveyards its helpful to look at a definition. A cemetery can be defined by the following characteristics (Rugg, 2000):

1. Demarcated sites of burial.

2. Internal layout, ordered to:

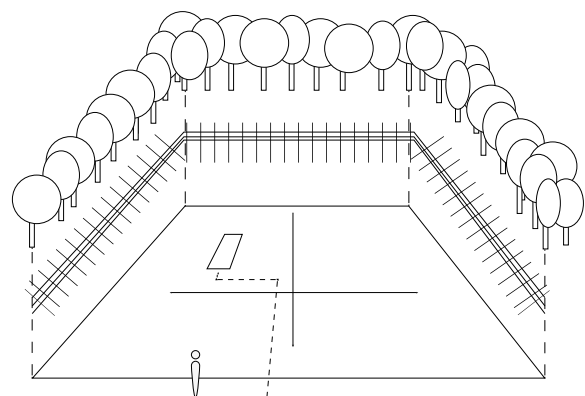   Allow families to claim graves,

      Conducting funerary rituals.

3. Principally secular, but to some degree sacred.

4. Serving the whole community.

Figure 9: Types of mourning

Figure 10: Elements of a cemetery

4. War cemeteries (1900)

Around 1915 a new type of cemetery came into existence. The large number of casualties caused by the war had to be put away in a dignified way that showed respect. This was an innovation because for the first time every soldier, regardless of his rank, had the right to an individual burial. (Previously only officers enjoyed this privilege.) (Prost, 2011) This meant a perpetual resting place at the expense of the state.

To accommodate a new type of monument was developed by various counties. Easily recognised, the tombs lined up to perfection, like a regiment under inspection. The architectural aesthetics were chosen to pay tribute to the national culture in question.

The cemeteries were realized after the war had ended by regroupings of individual makeshift graves and improvised graveyards. The graves were for those who died at the front. The French and Germans restricted this even further by only burying named bodies. The English also buried nameless remains whose marker declares them "known unto God".

Another obstacle was what to do with all names without bodies. Those soldiers that were missing in action, did their family not deserve a place to mourn? Prost (2011) states that:

"The pressure to preserve and recognize the names of missing soldiers is characteristic of the Anglo-Saxon world. The identity of the individual embodied by his name is more important than his material remains."

The Commonwealth War Graves Commission therefore decided to create memorials upon which the names of the fallen were inscribed.

Many families wanted their deceased back home, rather than on some distant cemetery. Unless the state bore the expenses, this was not an option. Lest the cemeteries be filled with poor only, it was decided by the CWGC that all fallen in battle would be buried together:

"… Officers and soldiers resting side by side in death as in combat."

An important condition for this was the high standard of maintenance promised to the bereaved. Their deceased had graves worthy of their sacrifice, well-tended, and most importantly the graves were in perpetuity, would remain forever and their deceased shall never be forgotten.

Grave markers contained the name, the rank, the insignia of the regiment to which the dead soldier belonged, the date of death, a religious symbol, and a few lines left for use by their family. Furthermore, each cemetery needed a list of graves and a map allowing each grave to be easily found. In that sense the cemeteries were designed to be visited by families in mourning.

Figure 11: The war cemetery of Margraten.

5.   Cemetery styles

Cemeteries like gardens can be shaped in any way in accordance with the definition. There are different styles of cemeteries that have prevailed over the past centuries in the Netherlands. Kok (1994) defines the following styles:

1.   Christian cemetery

The first cemeteries were Christian cemeteries outside the city centres. These cemeteries copied the aesthetic of church floor burials. They are pragmatically designed. Simple and sober, graves in rows on both sides of the paths, forming simple geometric patterns usually with a cross at the centre. (Keddeman, 2011) An example of this style is the cemetery Ter Navolging.

2.   Romantic cemetery

At the end of the 19th century the appearance of the cemeteries changed to reflect their function as green spaces in the city. Park like cemeteries based on English landscape style were laid out, with curving paths, dramatic monuments and sadness and sorrow as main themes. The relation between death and nature was created. (Kok, Wille & Boerhof 1994) An example of this style is the old cemetery of Leeuwarden. Especially in America the rural cemetery movement took the country by storm and some gorgeous examples can be found there.

3.   Eclectic cemetery

In the beginning of the 20th century new trends appeared. Due to the great war there was a need to feel more in control of death, although death became less present in the daily life due to technical advancements. These changes translated into cemeteries that were based on geometrical patterns; Squares, circles, triangles and a hierarchy in paths were characteristic for this type. The general mood of these places became more formal and sober than the romantic cemeteries. (Kok, Wille & Boerhof 1994)
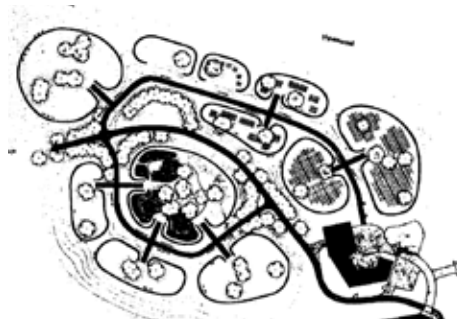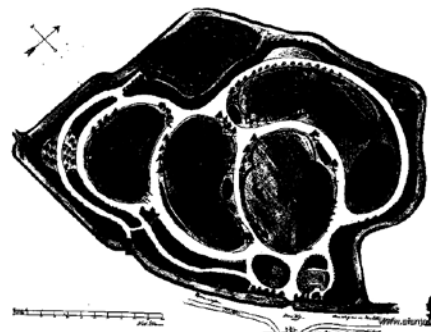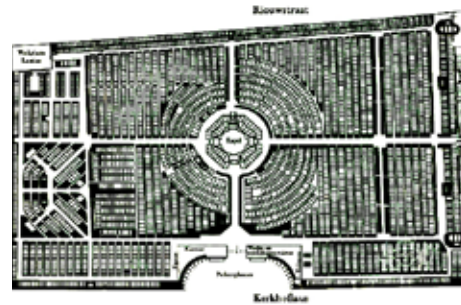

Figure 12: Cemetery styles (top to bottom)
Christian, Landscape, Modern, Post modern.

4. Modern cemetery

After the Second World War, grand building operations aimed to rebuild the country. This rebuilding included the design of new cemeteries. In line with the urban development the cemeteries were designed in a functional way from a architectural perspective. The cemeteries are characterized by orthogonal path systems and rectangular grave fields. (Kok, Wille & Boerhof 1994) A famous example of this style is the general cemetery of Doorn.

5. Postmodern cemetery

During the 70's and 80's, a counteraction to the earlier sober designs prompted a trend of postmodern cemeteries. People objected to the division between death and society and tried to return to a more traditional type of cemeteries. Cemeteries of this kind were more irregular, greener and informal. In the case of the Oosterdreef cemetery in Almere-haven the cemetery was even integrated in the neighbourhood without any fencing surrounding it. In shape this cemetery made a clear reference to the burial mounds of earlier times. (Kok, Wille & Boerhof 1994

6. Natural cemetery

Currently few cemeteries are developed, but there is a growing interest in natural burial places. This trend originated in the UK, where privately owned agricultural land is used for burial. This land will not be maintained anymore, giving nature the opportunity to reclaim it.

In the Dutch context this concept has somehow developed into the idea of using existing nature for burial in perpetuity as means of conservation, since land with bodies cannot be easily developed anymore. A few problems quickly arise here. This concept inly allows for low-density burial and when the site is full, no additional income can be generated to pay for maintenance. Furthermore the burial of the bodies will pollute the soil, spoiling it both as a cemetery and as nature park.

A more realistic approach has been to design cemeteries with a more natural feel and restricted use of grave markers. Graves can be marked with stones, wood (that will decay over time), or plants. In some cases GPS is the only method of locating graves. This idea appeals to people because it links humanity back to nature, and allow the nutrients in the body to be reintegrated into the natural circle of life.

An initiative to gather money for maintenance of old estates allows for burial of non degrading urns in old estates. The small volume of the urn will limit the impact, and no disturbance is caused to the protected nature.

6. Crematoria (1920)

At the end of the 19th century the health concerns that had led to rural cemeteries also brought another change; the reintroduction of cremation. Cremation was seen as a clean way to dispose of the dead. The Church objected to this. At that time burial was prerequisite for resurrection on judgement day. This did not prevent others from choosing for cremation.

Cremation was initially seen as a cleaner, neater and more dignified way of going, opposed to rotting in a crowded cemetery. This is especially clear in the promotional image below. Cremation was seen as something more appropriate for our modern world, detached from nature and no longer relying on natural decomposition. (Klaasens & de Groote, 2012)t

Countries around us accepted cremation long before we did. The first Dutch crematorium dates from 1914 and is located at the Westerveld Cemetery in Driehuis. Cremation at the time was still illegal. However, the law did not specify who could be prosecuted in cases
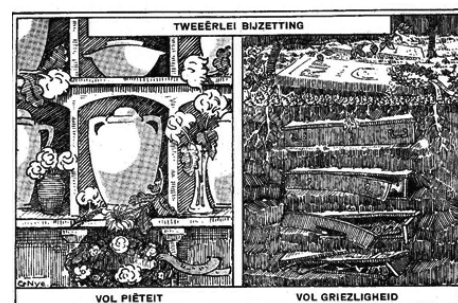

Figure 13: Promotional image for cremation

of cremation. Therefore, cremation was tolerated. It took until 1966 until cremation was legalised as well as accepted by the pope. Although still only when expressly wished for by the deceased. It took until 1991 for cremation to obtain an equal footing with burial.

Due to this late introduction we have a relatively low cremation rate compared to the countries north of us we have a. Especially Denmark, which leads with 82% cremated. To the south of us cremation never got as popular; burial is still the most prevalent option. In Italy and Ireland, the cremation rate is as low as 20%. This might be due to a combination of religious reasons as well as limitations of the climate.

Since cremation developed in the last century it remains spatially subordinate to the cemeteries, with most crematoria being later additions to existing cemeteries. (Keddeman, 2011). Recently built cemeteries are often developed together with a crematorium although far from always. Despite the rapid increase in popularity of their use, only a few crematoria have been constructed without cemeteries.

It might feel paradoxical that although currently twice as many people choose for cremation (67%), there are still 25 times more cemeteries in use in the Netherlands. This can be explained by looking at the streamlined process of a cremation, that presents itself in the general
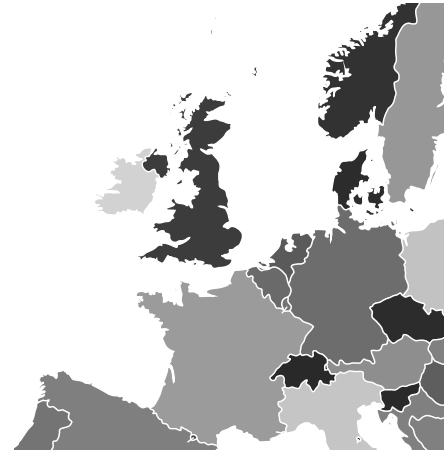
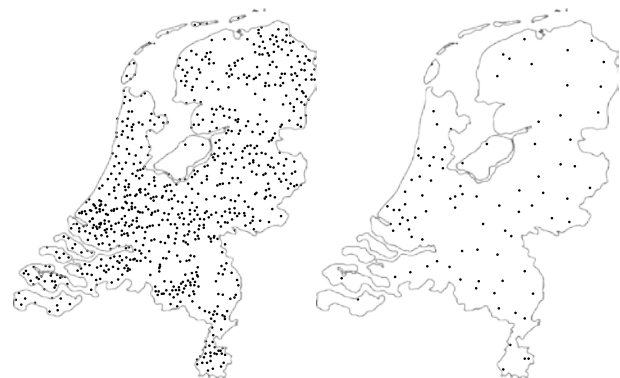

Figure 14: Cremation rates in Europe

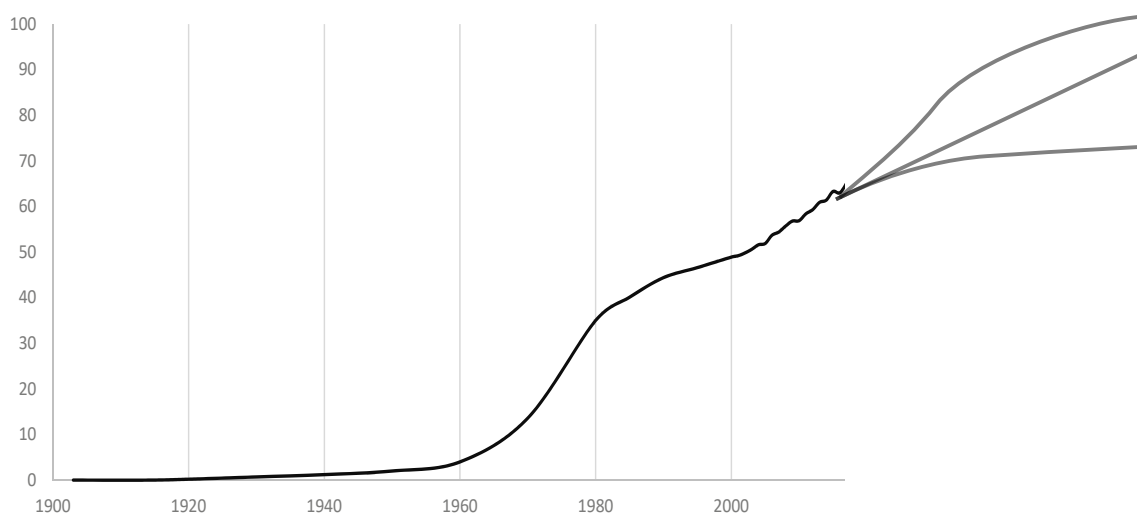*Figure 15: Density of cemeteries /crematoria*

Figure 16: Prognosis cremation trends.

routing; one door in, and another door out. Funerals are a business after all, so it only makes sense to try to fit in as many as possible. (Klaasens & de Groote, 2012)

The question of the design of crematoria in itself challenged designers, for not only was this a new building type, its character was also ambiguous. On the one hand it was a rather technical means of bodily disposal, but on the other hand it still had to answer to the needs of the bereaved in a more symbolic way. It still had to be a meaningful place for the funeral. (Grainger, 2005)

This literally translated in the questions of what styles to employ. The styles associated with dignity were often associated with religion. Traditional burial practices, did not in the same way express the progressive ideologies cremation promoted. This caused the first crematoria to be quite modernist, and heavily criticized as blank, discrete non-places, hardly distinguishable from other buildings, uninviting and unfit for mourning. (Klaasens & de Groote, 2014)

While we as society adapted to this new method, so did we come te realise that it could not so easily replace what we had. In order to fulfil the emotional needs of the bereaved, buildings started opening up again to the landscape that surrounded them. New crematoria were to be notable, light and airy buildings that clearly communicated to the outside world that they perform a special and important function in society as cemeteries had in the old days. (Klaasens & de Groote, 2014)

Summary

As long as there have been humans we have had to deal with death. For most of our history this meant burial, either whole bodies or cremated remains in a specific site near or in settlements. Therefore, death has always been strongly connected to our landscape or cityscape.

In ancient times the settlements were small dots in an all comprising landscape. Large monuments were built for the death in this wilderness. Death got a place outside of society, but clearly a man-made intervention.

In Christian times a change took place. People lived to die and go to heaven; death was therefore quite justly placed at the centre of society. The deceased were buried on small pieces of sacred land. Reusing the same area over and over again, until the populations grew too much.

In enlightened times we changed strategy and moved these continuously used grave fields outside of our settlements. Almost as if returning to earlier times, be it with smaller monuments. Our cities were for living and the death had to be stored in a way that did not harm those left behind. This measure led to some of the most beautiful park like cemeteries. Maybe we could have continued this way if it was not for the mass graves required in the two world wars, the baby boom following,

Cremation in its reintroduced context caused for the first time a clear disconnect between death and the landscape. No longer was the landscape an essential element in the disposal of the dead. The funerary industry answered by reconnecting through architectural means, but after the funeral the bereaved were left without a place to mourn if they did not choose to bury or store the cremains at a cemetery.

If the cremation rate rises any further, let alone the introduction of more advances methods of bodily disposal, we might be looking at a future where burials are rare. Cemeteries won't be necessary anymore in our urban fabric. However, debates about the placelessness of crematoria show that there is indeed a need for the connection between death and the landscape. Why is this? And what could those places look like?

Environmental impact of bodily disposal

"We are biology, we are reminded of this at the beginning and the end; at birth and at death. In between we do what we can to forget." (Roach, 2003. Page 84.)

What is the impact of disposing bodies and what customs and regulations are there to prevent harm to the living? This chapter ends with a short look at measures that address future problems of population growth and sustainability.

1.   Current Practices

Burial is the most common way of disposal in the western world since the dawn of Christianity. However, cremations have made a rapid upcoming in the 20th century. Now 65 % of the death are cremated, and 35% is only buried. Although giving your body for "science" is widely known as a legal option, only about 500 bodies are necessary for scientific purpose per year. Therefore, this option will not be discussed in this report.

Burial

In the Netherlands there are two types of graves for burials; private/family graves and general graves. (Rented/ Communal graves)

A private/family grave (rented grave) can house more coffins. In general, at the time of the funeral the relatives pay for a period is 20 years. After that the period can be elongated by periodical payments. Graves can be decorated as wished.

A general grave (communal grave) is often cheaper. One does not have to pay for the burial rights, however there can be up to 3 strangers buried in the same grave. After 10 years the grave is emptied. Although not usual, some cemeteries allow for the placement of a small grave marker.

Eventually all graves are emptied, and the bodily remains are placed in an ossuary or reburied in a pit with remains form other emptied graves. (knekelput) In wet soils the burials are often in concrete vaults, that prevent any interaction between the body and the surroundings environment.

Cremation

The body of the deceased will be burned in a special oven. The process takes about 75 minutes. With this method an average human is reduced to 3kg of ashes. Dutch laws prescribe a period of 4 weeks before the ashes will be released and can be picked up by the relatives. There are quite some options of what can be done to ashes. The most common ones are:

Scattered:
- Land
- Sea
(with fireworks, weather balloons or boats)

Stored:
- Buried
- Columbarium
- Privately kept

Turned into :
- Diamonds (compresses ashes)
- Tree (grown from ashes)
- Tattoo (ashes mixed with ink)
- Artwork (ashes mixed with paint or clay)
- Teddy bear (ashes sewn into fabric)
- Hourglass/ glass work (ashes mixed with glass

Although what the family does with the ashes is officially unknown and does not have to de disclosed. Dijk & Mennen (2002) published the distribution of ash destinations of one significant Dutch funeral company. (Yarden) This research indicated that by far most of the ashes are scattered. (56% on land and 16% at sea) Only 12% is put in urns either buried or put in columbarium. Of the remaining, 8% of the relatives indicated that parts of the ashes would be incorporated by artistic means, and another 8% took the ashes home to be privately kept.

2.   Preliminary impact.

When looking at sustainable funeral practices, more is taken into account than just what happens to the body. The initial preparation phase of the funeral cannot be overlooked when looking at the environmental impact. Elements like the flowers, ceremony (building, energy, consumptions), transportation of deceased, preparations (washing clothing), cards and newspaper announcements, and transport of the guests towards the ceremony. Since these elements are very personal, this aspect has often been excluded from research, but when considering environmentally friendly funeral, these are sure elements to take into consideration. (Keijzer, 2017 & 2011) For this research I have chosen to focus on the environmental impact of the interactions between the dead bodies and the landscape and leave the funeral itself out.

3.   Cemeteries & water contamination

Within graves bodies decompose. The speed of the decomposition process depends highly on the surroundings. Elements of influence are:

- Temperature (The warmer the faster)
- Moisture (Not too wet, not too dry)
- Oxygen content (More oxygen is faster decomposition.
- Soil type (faster in coarse sand than clay or loamy soils)
- Depth of burying (The deeper the slower)

The soft tissue is usually gone after a few weeks, but the breaking down of the fat can take years. After that only a skeleton is left. (De Molenaar, Mennen & Kistenkas, 2009) During putrification of the body there is a seepage of decay products into percolating water. For each kilo of body weight 0.4-0.6 litres of leachate are produced. This leachate is 60% water, 30% salt and 10% organic substances, containing bacteria viruses and decomposition products. (Zychowski &Bryndal, 2015) Many of the decomposition products are identical to those present naturally in the environment, in addition to those, ammonia gas and carbon dioxide are formed. In porous soil movement of this seepage can be rapid,

carrying water borne diseases. Adsorption of the viruses to soils decreases by water velocity. Pathogenic organisms are largely retained at or near the soil surface. Factors influencing the survival of viruses in soil: (Ucisik, Rushbrook, & WHO, 1998)

- Temperature
- Desiccation (Virus reduction in drying soils)
- Soil pH (controls viruses' soil adsorption)
- Cations (Certain cations have thermal stabilizing effect on viruses and control soil adsorption)
- Soil texture (clay minerals and humid substances increase water retention)

Plants can be used to remove some viruses and bacteria from the soil by adsorption and slowing water speeds. Furthermore, an unsaturated layer protects against seepage into ground water, by acting both as an adsorbent and a filter. Decomposition of interred bodies increases the microbial activity in the surrounding substrate, associated with the release of organic compounds. (Zychowski &Bryndal, 2015)

Most of the biodegradation of this organic components occurs within the unsaturated zone. The thicker the zone, the higher the opportunities for attenuation of leachates. Therefore, the base of burials pits should be above the highest natural water table. Deep rooting trees that consume large amounts ground water and seepage water will help by decreasing the water level. (Ucisik, Rushbrook, & World Health Organization, 1998).

According to Dent and Knight (1998) a body of 70 kg contains approximately:
- 50000   gr Water (70-75%)
- 16000   gr Carbon
- 1800   gr Nitrogen
- 1100   gr Calcium
- 500   gr Phosphorous
- 140   gr Sulphur
- 140   gr Potassium
- 100   gr Sodium
- 95   gr Chlorine
- 19   gr Magnesium
- 4   gr Iron

Water sampling around burial sites show increased levels of:

- Chloride
- Nitrate
- Nitrite
- Ammonium
- Orthophosphate
- Iron
- Sodium
- Potassium
- Magnesium

Regarding natural burial, a research from 2009 (Molenaar, Mennen & Kistenkas) points out that due to lower density of graves, decomposing bodies have generally little impact on the nature. Exceptions are the acidic and eutrophic effects caused by salts and nitrogen and phosphorous compounds. These may pose a hazard to rare and threatened nature areas. Therefore, naturally nutrient rich environments, like enriched production forests, that are less sensitive for disturbance compared to nutrient low environments are better suited to be used as natural burial grounds.

Furthermore, there are the disturbances related to digging and refilling the grave, and visits to the grave. When the grave is dug the flora and fauna is completely disturbed. The impact of this depend the age and use of the forest. Natural forests often have developed over time complex soil layering and biodiverse symbiotic relationships that can occur of very local scales, which would be ruined by the disturbance caused by burial. Production forests are on the other side of the spectrum. Since the trees are grown to be cut, their life time is relatively short. Biodiversity is controlled and usual, only one specie is grown. The roots are young and can adapt to the disturbance more easily. Next to the risks for the forest there are also concerns for the body. Natural burial sites are susceptible to disturbance by animals.

Concludingly, forest types can be arranged depending on the level of disturbance burial would cause. The least impacted forest type is production forests, followed by multifunctional forest, as well as park forest and forests on estates. The most impacted nature type is then natural forest.
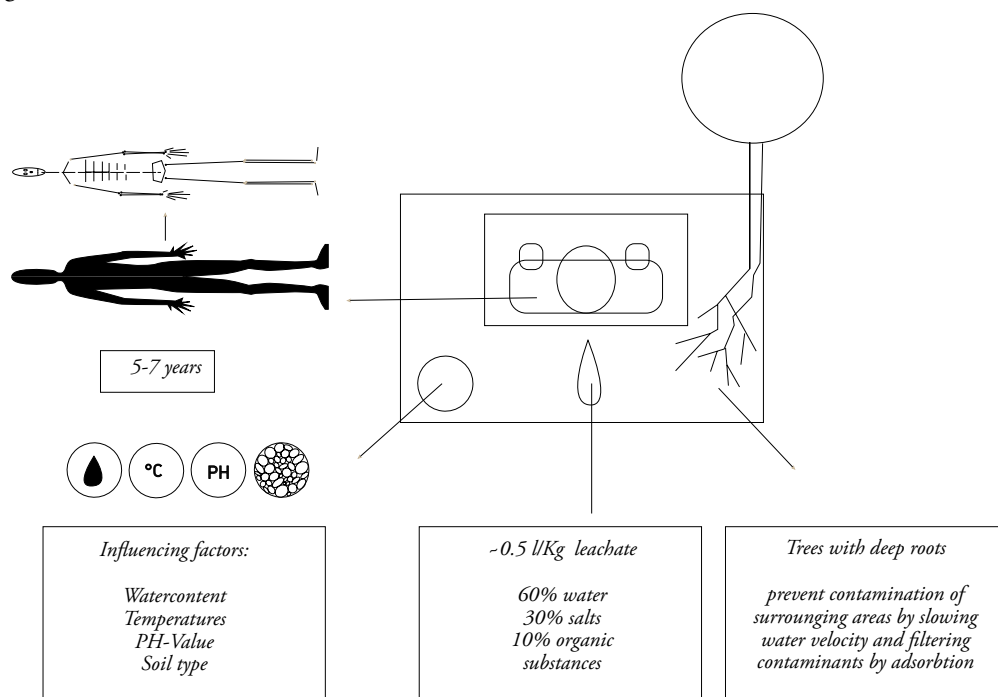

5-7 years

Influencing factors:

Watercontent
Temperatures
PH-Value
Soil type

~0.5 l/Kg leachate

60% water
30% salts
10% organic
substances

Trees with deep roots

prevent contamination of surrounging areas by slowing water velocity and filtering contaminants by adsorbtion

Figure 17: Decomposition process

4.   Guidelines for placing cemeteries:

General research presents the following recommendations for the location of cemeteries:

*   No Burials within 250 meters of any water source from which potable water is drawn. (Well, borehole or spring)
*   At least 30 meters away from any other spring or watercourse.
*   At least 1 meter of subsoil below the bottom of the burial pit
*   The base of the burial pit must be at least one meter above the highest natural water table.
*   When backfilling the excavations at least one meter of soil must cover at surface.
*   Cemeteries should be positioned on gentle slopes. Causing favourable conditions for surface flow.
*   Not too permeable soils, (to prevent leachate to rapidly access groundwater) not low permeable soils (Cause favourable conditions for adipocere, corpse wax).
*   Cemeteries should be surrounded by a

buffer zone composed of trees with deep roots.

For the Dutch context some extra regulations apply. The Dutch guidelines prescribe that single graves should be at least 1.35 meters above the average highest water table. When the grave is shared, for every casket 0.7 meter is added. The clothing of the deceased and the casket may not disturb the decomposition process and has to be biodegradable. An exception is made for personal items, that relatives wish to bury with the deceased, these items are not subjected to any rules. (De Molenaar, Mennen & Kistenkas, 2009) Furthermore regulations dictate that the grave cannot be reused earlier than 10 years after the last burial. This limitation had been the guidelines for general grave terms.
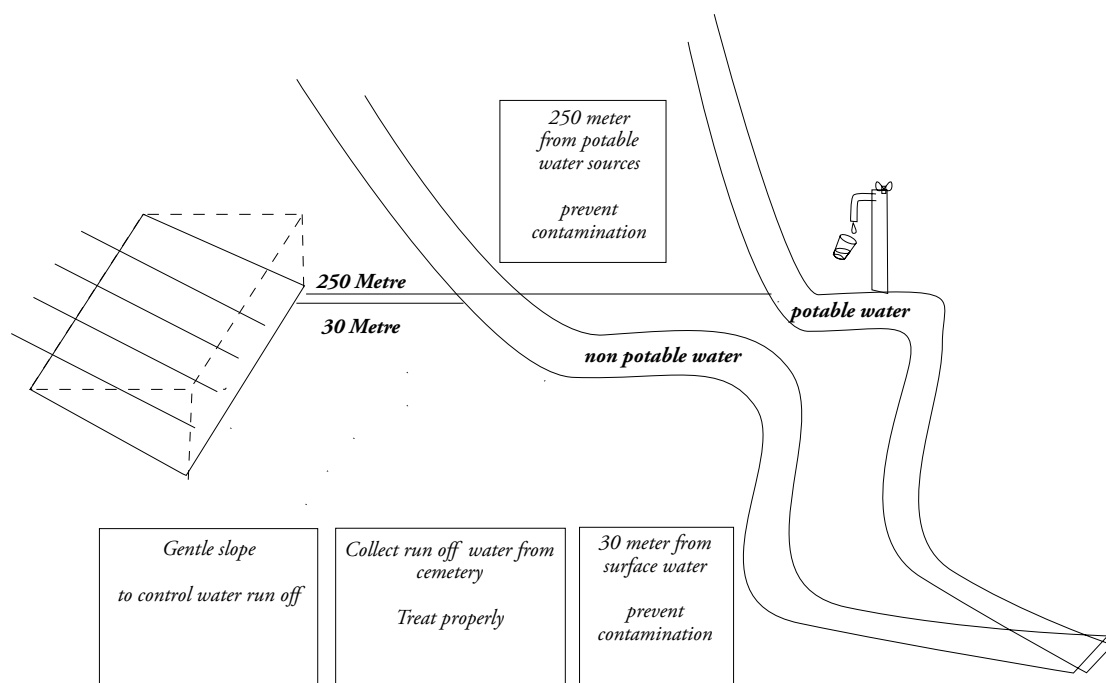

Figure 18: Guidelines for the site choice of cemeteries

5.   Scattered ashes or buried urns

Cremated remains are mostly calcium and phosphorous compounds, but also contains heavy metals like copper, chrome, nickel and zinc. (Molenaar, Mennen & Kistenkas, 2009) Up to 90 scatterings a year is the restriction for the phosphorous compounds. Up to 370 scattering a year per hectare is the limit for in deteriorating increase of heavy metal for soil and ground water. These limits are reflected in the guidelines for monitoring of the soil of scattering fields.

6.   Guidelines for crematoria

Regarding the environmental impact of cremation there are guidelines for crematoria to ensure both soil and air quality.

Soil quality

There are regulations to scattering fields. Up to a maximum of 90 scatterings per hectare per year can go unmonitored. Otherwise the quality of the soil needs to be monitored periodically, depending on the number of scatterings yearly. Up to 370 scatterings per hectare per year can do with monitoring every 25 years. Where more than 370 yearly scatterings occur, soil needs to be monitored every 5 years. Furthermore, the crematorium needs to do a Leaching test to measure phosphates in the soil. There is a maximum of 1.000 milligram of phosphates per square meter.

Some scattering fields are used in rotation. Varying

Figure 19: Cremation process

periods of at least 10 years, being used or not being used. Management needs to ensure that the ashes are scattered evenly, and that no ashes are blown to surrounding areas. (Bodemvoorschriften voor het in gebruik hebben van een strooiveld, n.d.)

Air quality

- To prevent harmful emissions, metal and plastic handles and decorations need to be removed from the casket before it is put in the oven.
- To ensure a good combustion process, the temperatures of the flue gases needs to higher than 800 °C at any point.
- The oxygen content needs to be monitored, ensuring a minimum of 6%. Momentary dropping may not last longer than a minute, nor get lower than 3%.
- To prevent forming of nitric oxide, a Low-NOx burner is mandatory
- Amalgam tooth fillings can cause mercury emission. This must e prevented by an adsorption medium and a filter, that are well maintained
- This post-treatment installation also needs prevent or minimize dioxins and dioxin-like compounds.(Luchtvoorschriften voor crematoria, n.d.)

A problem is posed by the lack of regulations for ash destinations. Although legally permission of the land owner is required for scattering, in practice since no disclosure of ash destination is required, scatterings often happen often without notification of the land owner. Internet fora are full of recommendation to not bother getting permission, since it is hard to trace and the simplicity of unnotified scatterings allows the bereaved freedom and prevents disappointment in these emotionally trying times that might come when permission is denied. This practice in particular can harm fragile areas of nature conservation.
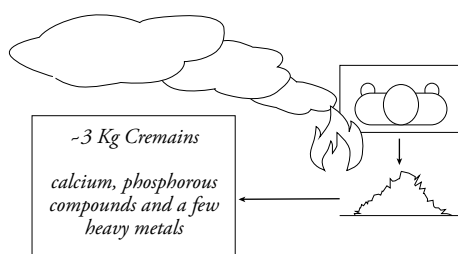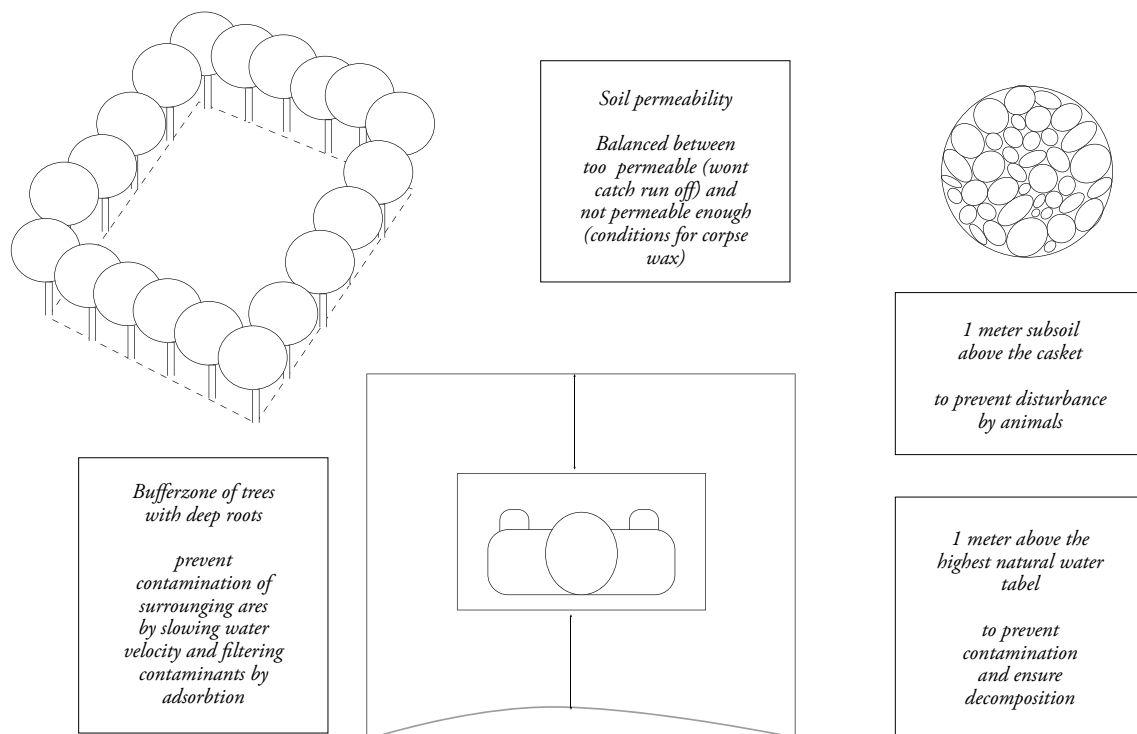
Figure 20: Factors influencing the decomposition process

7. Comparison ash-scattering vs. Burials

A fundamental differences between ash scatterings and burial is the time over which the impact takes place. Scattering of cremated remains releases the compounds at once, and they are immediately available for the environment to interact with. In contrast, buried bodies release the compounds and the decomposition fluid at a slow rate therefore the impact of ash scattering in relatively higher in general.

Furthermore, the effect of phosphorus compounds is less of an issue when it comes to burial, since these are only released when the bones decompose which in most circumstances does not happen within the buried period of 10-20 years. Lastly since the bodies are buried below the effective root zone, the impact of disturbance of the soil during the act of burial on plant life is often larger than the impact of the compounds released over time during the decomposition process.
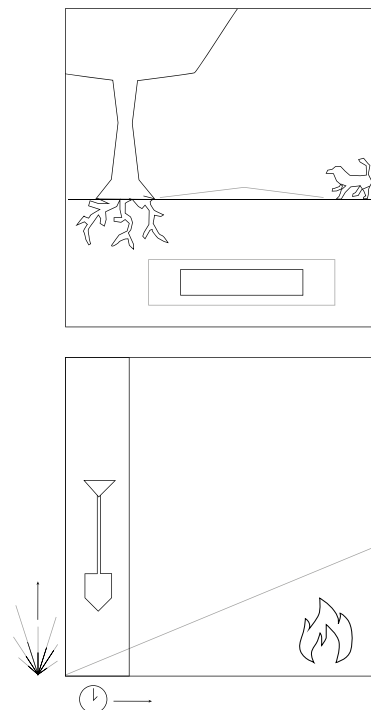
Figure 21: Difference impact cremation versus Scattered ashes

8.   *Densification of the dead*

In the Netherlands in 2018 about 150.000 people died. This number is growing fast over the years. The coming decennia only steeper growth is expected by Dutch bureau of statistics (2017a, 2018). This growth is partially caused by the baby boomers, that were born in large numbers after the Second World War. (CBS, 2017b) This increase is one of the challenges of the future when it comes to dealing with the dead.

The land-use aspect of graves is one of the biggest contributors to the environmental impact. (Keijzer, 2011).   When looking at densifying schemes for cemeteries, a few examples already exist. (See appendix 2 for more detailed descriptions.)

The common way in the Netherlands is to empty and reuse the graves after 10 years, but this is not everywhere the case. In the United Kingdom emptying graves is prohibited by law, resulting in an even less maintainable situation. In Greece on the other hand, graves in urban cemeteries are cleared as soon as 3 years.

However regardless of how soon we clear the graves, as long as our population is growing and our cities are getting denser we will continuously need more graves. Some other countries have found novel ways to densify the dead. These examples can be summarised in a few spatial configurations.

In the middle eastern Yarkon Cemetery, where religion prescribes single graves, buildings basically stack layers of single graves. Thus, densifying the graveyard by the number of floors added. The prescribed connection of the graves to the soil is made by filling the columns with soil. A measure deemed good enough by religious leaders.

 A Brazilian inner city "cemetery" further densified by stacking wall graves. Increasing the number of graves by 4-5 times per floor. This example offers also spaces for urns. Leading us to the most densified form of individual spaces for the dead. (Hariyono, 2005)
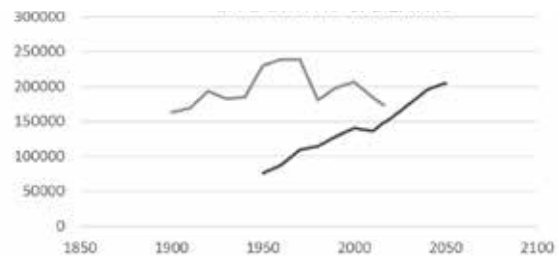
One can get more densified when looking at the non

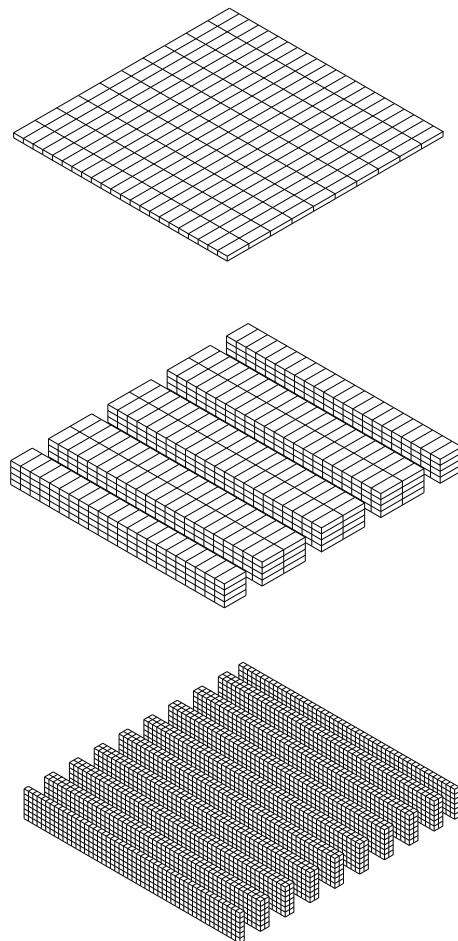*Figure 22: Number of births and deaths over time*

Figure 23: Storing dead (top to bottom)
1. Single layer
2. Wall graves
3. Urn walls

individual places that come in the form of scattering fields, where the lack of individual spaces allows for many to use the same space. The lack of individual memorials in this case opens up the possibility of a full separation.

Wouldn't it be better to discretely dispose of the death in an environmentally friendly way, and leave the commemoration space unpolluted? When it is already accepted to mourn at a anonymous site, how much does the invisible presence of ashes add?

The potential answers to these questions have been addressed in relation to research towards new means of bodily disposal, some of which do not result in remains for the bereaved. These new methods originated in a desire to limit the environmental impact at the source.

9. New Methods of disposing of bodies

"The merits of a death custom are based emotions, a belief in the unique nobility of one's own culture. That is to say, we consider death rituals savage only when they don't match our own." (Doughtry, 2017. Page 15.)

There are various relatively new methods for disposing of bodies. Some of which are quite frowned upon. I will shortly discuss the following three: Promession, Resomation and Recomposing. While these methods aren't legalised yet the discussions around the legalisation process have already started in the Netherlands. (Crone,2018)

Promession (cryomeren/vriesdrogen)

Promession promises a greener alternative for cremation. The body is not burn but frozen, by placing it in a vat of liquid nitrogen. Once it is frozen and brittle, the metal container the body is in is shaken through ultrasound to make the body break up into pieces. At this point, a vacuum is placed over the container to suck up any leftover moisture, quite literally freeze-drying the body. Then, a strong magnet is placed over the body so any dental fillings, prostheses, medical devices or contaminants will be safely removed. The remains can be buried and should be decomposed in 6 months. The remains are supposedly odourless and safe for the

surroundings. Although the impact of added nutrients will remain the same, the loss of bacterial activity should ensure less harm. (http://www.promessa.se/about-life-death/)

This prize-winning technique was introduced in 1997, making big headlines at the time and a company was started to turn these ideas into reality. However it seemed impossible to realise. In 2015 the company was liquidated without being able to produce a functioning facility. Critics question the idea and the method is considered dysfunctional and is no longer being developed. Although this company has failed to deliver a method it has been one of the first to start the debate on new methods that radically change how we see our death and the impact they have on our surrounding, allowing for reconsiderations of age-old ways of doing.

Resomation (Alkaline hydrolysis)

In the Resomation process, also called "water cremation" the soft tissue of the body is decomposed by means of heat and lye under pressure. The casket will be removed before the Resomation and can be reused. The body must be wrapped in protein-based fabrics like wool that can decompose along with the body. The process takes three to four hours. Elements that won't decompose are the bones and any medical additions to the body. The latter can be removed and when possible recycled. This leaves only the bone fragments behind. These can be crushed and will be handed back to the relatives of the deceased to be scattered or buried like ashes but with a reduced impact on the environment. The solution left behind contains:

- Amino acids
- peptides
- sugars
- salts

This liquid can be safely returned to the water cycle free from any traces of DNA due to the high temperatures of te process, or can be treated and locally.

A funeral involving Resomation can the same as one involving flame cremation until the point at which

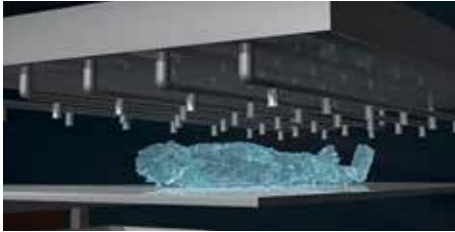*Figure 24: New methods of disposal (top to bottom)*
Promession, Resomation, Recomposition

the body is committed from public view. This method is been critiqued as inhuman and almost criminally in it's dissolving of humans. This however did not stop the developments. Promotion of this method focusses on it being a flameless more natural and environmentally friendly form of cremation. The first Resomation facilities are already in use in America and South-Korea.

In the Netherlands this method is not yet legal. However, while conducting this research news articles have been published announcing a current re-evaluation of funeral methods, indenting to increase the options. (Crone, 2018)

In the question of densification, the technique of Resomation merely offers a more environmentally friendly "cremation", leaving the bereaved with the same choices they have after cremation, and leaves us with the same considerations.

Recompose

This is the newest addition to the group. This method aims to " gently converts human remains into soil, so that we can nourish new life after we die." (Recompose.com) This method tries to compost human, allowing for the natural decomposition process to take place in idealised circumstances.

In the process bodies are covered with wood chips and aerated, providing the perfect environment for naturally occurring microbes and beneficial bacteria, that aid the decomposition process. Over the span of about 30 days, the body is recomposed, creating soil which can then be used to grow new life. This is the newest of the techniques are still in developmental stage. It is assumed that this process will lead to about 30 kg of compost per decomposed body. The bereaved could use this compost in their gardens, turning their private green into a place literally shared with their deceased.

Recompose goes further then Resomation by proposing to use deceased as a compost, to let it go up again in the natural cycles. This method is the most scalable up to now. The preferred death space could then even be a community vegetable garden where the dead could

literally help feed the living. This might however be a little too far- fetched for ethical approval. Opposition to this method argues that using the deceased as compost to feed a garden is undignified and will in a way deny with death a last resting place. Although this is a personal matter and those interested in natural burial might not share these feeling.

Summary

In general, corpses have an undeniable detrimental effect on our environments. This may be true now more than ever, due to the amount of medicine and medical devices placed into our bodies. Modern medicine aiming for people to have longer and healthier lives does no longer directly relate with living natural. We deny our basic biological origins and aim to delay and slow the inevitable decay. Doing so we has turned our bodies into waste bins, polluted with chemicals, mechanical parts, and heavy elements, all to the detriment of the soil and air where buried or cremated.

Our waste is getting more attention lately as we focus on principles like cradle to cradle, circular economies, and zero waste models. In a way, the bodies of our deceased are physical waste with emotional and cultural values, that prevents us from disposing of them with or like other biological waste. It is inevitable to fundamentally start reconsidering how we deal with death.

Human life is important and in death, everyone deserves to be commemorated in an honourable way. However, with the directions society's modernisations are taking, it might be time to let go of the notion that dignified commemoration has to be tied to (the disposal of) the physical body. Would it be possible to honourably commemorate and mourn a lost human life, while rationally treating the corpse in a way that least harms our environment? Could we be sustainable in death: Meeting the needs of the present without compromising the ability of future generations to meet their own needs? (Brundtland, 1987) The new methods of bodily disposal offer a glimpse of possible futures. There is no perfect method yet, however, these daring new initiatives open up our minds to the new possibilities. Ultimately, we will need a method of dealing with the deceased that is scalable to meet future generation's needs without compromising on the immaterial and emotional aspects of death.

To posit a question more related to the discipline of landscape architecture we might ponder how we can shape spaces for commemoration that are no longer tied to the limitations that the incorporation of the bodily remains bring. Such places might make these new bodily disposal methods more attractive by not denying the bereaved a place to mourn. Initially these places could be used for scatterings, providing an alternative to the fragile nature sites that are currently used. What could these places look like and what are the needs of the bereaved regarding places of commemoration? How can our environments support those who lost someone in their mourning process? The next chapter will look into these questions.

The livings side of dying

"The life of the dead is placed in the memory of the living" (Cicero, Philippica IX, 5.)

1.   Funeral wishes of our country

Funerals are basic right. In the Netherlands municipalities will even provide a funeral when there are no relatives of the deceased to be found. Some municipalities have guidelines ensuring the presence of at least one visitor for lonely funerals. In these cases, an attendant of the funeral company will attend the exhumation or cremation.

In 2002 an initiative was started to have poets compose a poem for the lonely departed. In big cities one of a rotating group of poets will create a poem for departed with no relatives. This poem will be recited at the funeral to ensure a dignified ending. This is one of the many ways in which our cultural values show.

As the different ways of dealing with dead suggest, the view on death is culturally determined. The personal view of death: views differ on several subjects. Walter (2010) lists the following topics:

O   Should we let go of the death to continue with them?
O   Who should be mourned? The sacred? Family? Celebrities?
O   What should mourners do with their emotions? Contain? Or express?
O   Should mourners be excluded from life? Or socially included?
O   Does religion or other belief systems normalize or pathologize suffering?

Of these topics many have also changed for us over the time. Cemeteries are living places that reflects the conditions and social realities of the surrounding community both past and present. Our deathscapes are bound to be changing alongside with our views, that over the centuries have become a lot less restrictive.

Broadly speaking there are 4 clear trends in the funeral industry of today. Kelderman (2011) lists:

Individualisation Meaning a change of focus from the community to the specialness of the individual as a distinct entity. This change shows for example in the highly personalised grave markers.

Multiformity; this means the existence of multiple choices that are all equally accepted in the social context. Which increases the number of possible choices and with that the ability to articulate oneself as an individual.

Secularisation signifies the process of disconnecting from church, and religion. The choices one makes are based on individual preferences rather that prescribed by community, church of some higher authority.

Multiculturalism; cultures that allow for multiple cultures or ethnicities, existing within the whole without sacrificing their particular identities. This often includes different religions.

These trends have radically changed how funerals are organised. Earlier funeral services focus mainly on the deceased's entry to heaven and God's ability to give the bereaved the strength to cope with their recent loss. In contrast, secularised services celebrate a person's individuality and life. (Cook & Walter, 2005) This is emphasized in the outcomes of the recent marketing study that indicates that half the Dutch population think the funeral may be a sort of "party". (NL-eyes, 2017)

The new funeral rites that belong with this change are thus characterised by a more personalised character. This has radically changed the role of the funeral director from prescribing the way it goes, to offering options to create a unique event. This means on one hand that the wishes of the deceased are closely followed, but on the other hand it is also more often about the wishes of the bereaved. For them the funeral is seen as a event in service of the mourning process.

In the mourning process it is important to express emotions. These emotions are often expressed by the bereaved among each other. Around the time of the funeral, a need for connectedness is felt.

The funeral is seen as a shared emotional experience aiding in the bonding process between the bereaved and other attenders. At the same time the connection between the bereaved and the deceased is strengthened; personal speeches, pictures, music or just the presence of the attenders can reinforce these connection. (Blok et al., 2018)

Burial or cremation? Why choose for burial or cremation? There can be many reasons to prefer one over the other. This remains a highly personal matter, although some views are more commonly shared. Glass and Samuel (2011) Distinguish the following profits and cons of both options:

With burial as default option for so long it might be interesting to see why people started deviating from the norm? The different reasons for cremation are partially reflected in the different ash destinations. Where some do not want to take care of a big grave but would like a place to visit, a columbarium was the ideal solution, others merely object to the idea of decomposing in the ground but would like a place to tend to, for them there are urn graves.

Burial	Cremation
A place to mourn Memorial Place to care for	Possibility to create own Special place by scattering ashes
Proper closure Sense of space	Cheaper No place to mourn
Religiously preferred	Space efficient

Many just do not want to take up space when dead, and wish their ashes to be scattered. Others are appealed by the unique artworks that ashes can be incorporated in, in many ways allowing them to keep the deceased to remain close by.

3.   Funeral rites

Funeral rites are rites of passage; when an individual leaves one state or group to enter another. Rites and rituals help the deceased through their crisis by prescribing ways of doing. In this case the rites mark the passage between life and death. They consist out of 3 parts: (van den Akker, 2006)

Rites	Deceased	Relatives
Separation	From living (definetely)	From living (Temporary)
Transition	Funeral	Temporary excluded
Incorporation	In the realm of the dead	In the realm of the living

Funeral rites and rituals in the Netherlands are quite the same between cremation and burial. The funeral service answers three needs (Cook & Walter, 2005):

1.   To say farewell

2.   To give a reasonable accurate account of the quality of the character we lost

3.   To articulate the love affection and regard in which the deceased was held.

Most people do not dwell on their funeral wishes and, in the Netherlands, only 30% of the populations had their wishes written down. (NL-eyes, 2017) Although views on death are culturally determined there are trends visible over the entire of the population. Within these broad trends there are more specified customs and obligations tied to cultural subgroups. Most expressed on these matters are religious groups. (Walter 1999) Therefore I will shortly look at the funeral customs of the most prevalent religions.

No religion (51%): Most of the Netherlands are not religious. However, death as a change of status is most difficult to leave symbolically undefined and meaningless. Although plenty see death as an absolute end. Many of the Dutch confess they believe in something, the precise nature of which cannot be known to the living. This something-ism (Ietsisme) reaffirms the shift from religious institutions to the individuals. (Venbrux, Peelen & Altena, 2009).

Burial rituals are very free and highly adaptable to personal preferences of the deceased and the bereaved, to express the character of the deceased for a final time. A traditional Dutch funeral consists out of a

1. Funeral ceremony in an auditorium or aula,

In case of burial: a walk to the grave

3. Saying the final goodbye to the coffin

4. Reception in with cake and coffee in a reception room or café.

With cremations the second step is absent. The bereaved most commonly say final wished in the ceremony room. In newer crematorium that have adapted to contemporary wishes, it is possible to guide the coffin to the cremation oven. (Keddeman, 2011)

Christianity (39%): (Catholic, 24%, reformed, 9%, protestant 6%t etc.) Christians believe in resurrection day. At this day of judgement all the dead will be standing up again to be judged. Burial used to be a necessary prerequisite, but in 1963 the Pope allowed cremation for Catholics. Some Christian movements were already less restrictive other branches of Christianity still oppose it.

A Christian funeral service is led by a priest or minister. Payers and hymns are sung, and scripture readings are common. A remembrance is given by someone close to the deceased. The priest or minister then leads the procession to the cemetery or crematorium.

The Christian funeral service is often still focused on guiding the deceased and god's ability to give the grieving strength. Often also the connection is made with ones that are already gone. (Christian funeral service rituals, retrieved from: https://www.funeralwise.com/customs/christian_overview/)

Islam (5%): Islamic funerals follow specific rites. The burial should take place as soon as possible, preferably within 24 hours of the dead. Cremation is not accepted. The first step is the bathing of the corpse with heated water. Preferably this happens hours after death. After the bathing the corpse will be wrapped in a simple plain cloth. The deceased will remain shrouded like this for several hours while friends and family can come pass on their respect and condolences.

After this the community gathers to offer collective prayers. Afterwards the deceased is taken to the grave. The grave should be at right angle to the direction of Mecca. The body is placed in the grave laying on its rights side facing Mecca. Simple grave markers should be raised no more than 30 cm to prevent walking or sitting on the grave. Handfuls of soil are poured into the grave while qur'anic verses are cited, and last prayers are said. Afterwards the grave is filled up by gravediggers. The grave must remain in perpetuity. (Authentic Step by Step Illustrated Janazah Guide retrieved from http://www.missionislam.com/ know-ledge/janazahstepbystep.htm)

Many cemeteries have Islamic fields rightly oriented in single rows for orientation. However, due to the common Dutch practice of emptying the graves when the grave rights are no longer renewed, many Muslims prefer to be buried in their motherland or fatherland, where in perpetuity graves are the norm. For the older generations this is very important, but the second-generation Muslims already begin to adapt. (Jansen, 2016)
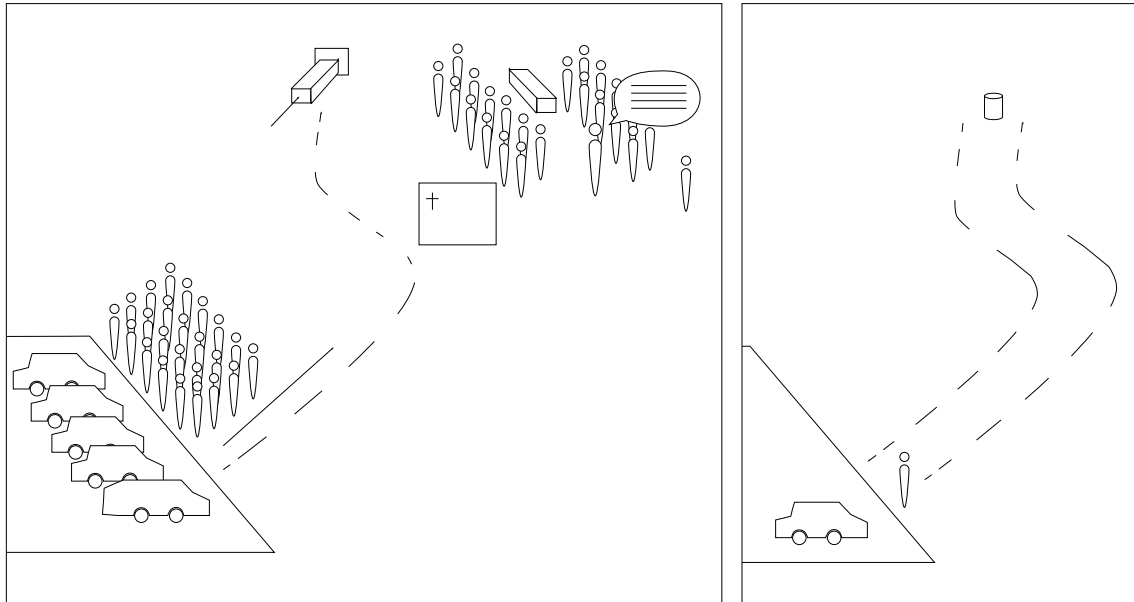
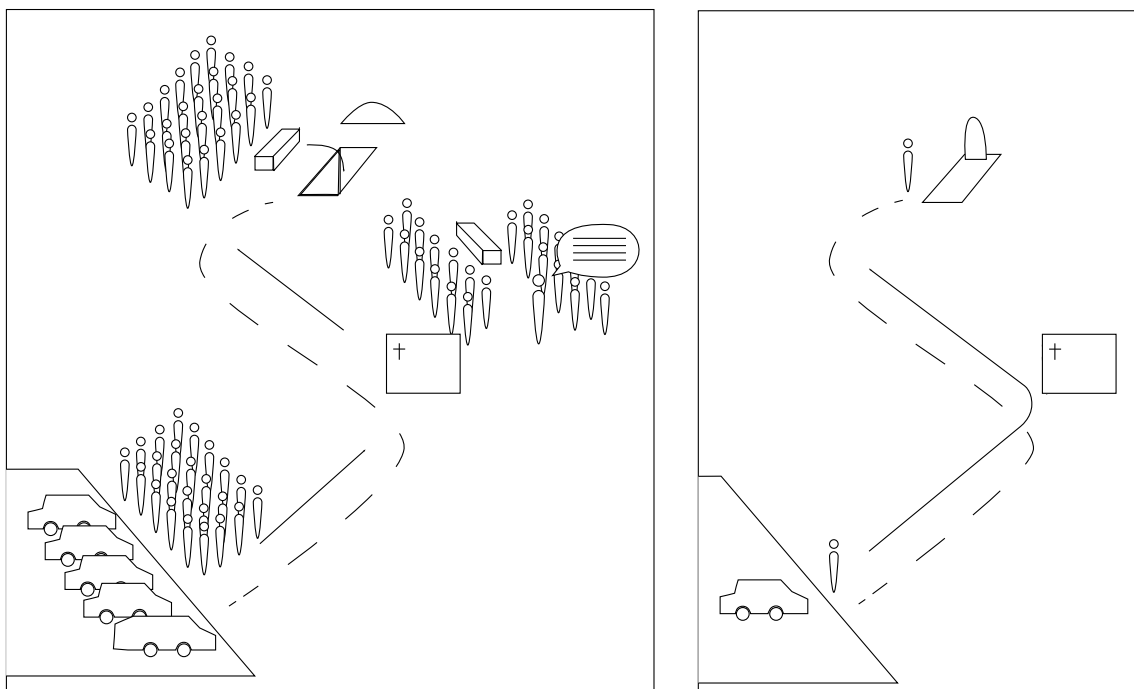*Figure 25: 1. Funeral process towards burial 2. Mourning*

Figure 26: 1. Funeral process towards cremation 2. Picking up the ashes

5.   Models of mourning

After the funeral starts the mourning period in which the berieved adjust their lifes to the new situation. We have gradually evolved from traditional to modern to post modern society. The change in social structure has also effected how we grieve. (Walter, 2007)

Traditional society: Living in small villages everyone knows each other. The social network is tightly knit. When someone dies this has a impact on the entire village, and to a greater or lesser degree the entire village mourns. When an elderly person dies, it happens at home surrounded by family and the mourning immediately starts. The entire village will notice the change in behaviour.

For help with the grieving process people turn to a religious person, that will help with the emotional and existential questions a death close to one may cause. Grief is normalized, as an individual journey that is unique for all.

Modern Society: Due to urbanisation and geographical mobility, our social circles are fragmented, and complex. When someone dies, those who mourn are scattered in various places. The elderly are put away in nursing homes and when they die the family and relatives must come from all different places. In western societies grief is seen a private affair, property of the direct relatives. And only those in this small circle are considered mourners.

In contrast, cultures of Japan and Ireland have a very different view on this. Everyone who knows one of the chief mourners is expected to come to the wake or the funeral. The funeral is less about the deceased as an individual but about the diverse networks of relationships in which family members are enmeshed. Furthermore Japanese and Chinese societies, bereaved do not "let go", rather they are turned into ancestors. The living continues into their future with these ancestors. The ancestors can be consulted at times of need in life. (Water, 1999)

For help with the grieving process people turn to medical specialists, who aim to distinguish the abnormal from
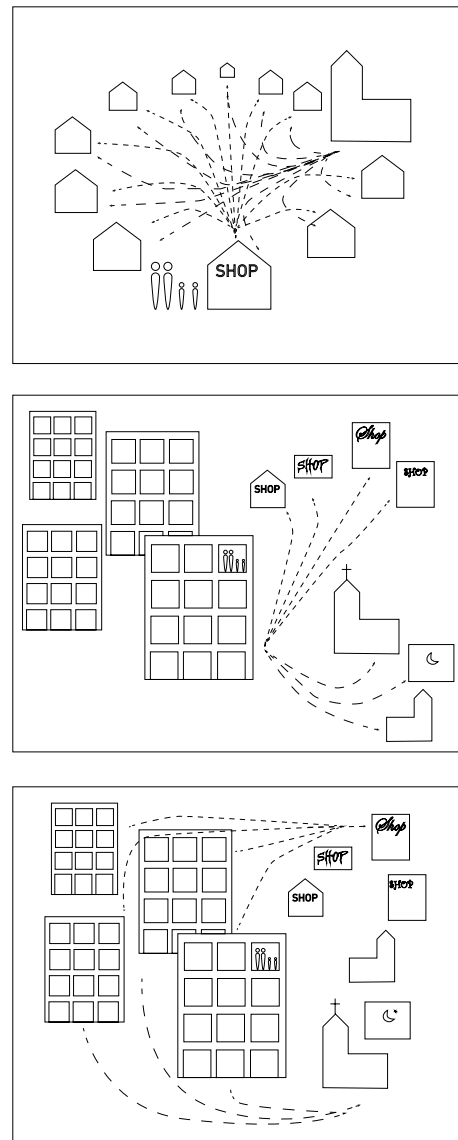
Figure 27: Models of mourning (top to bottom)
1. Traditional
2. Modern
3. Post Modern

the normal grief. Grief may be pathologized. Specialists advise to "let go". The grief is pain of letting go in order to become a free individual again that can re-engage with other free individuals. (Water, 1999)

Lastly, post modern society: is characterised by an increasing globalised world of instant communication

with acquaintances and strangers. This opens new ways in which previously isolated individuals can relate to each other and the wider public. The Postmodern society brings together people who had hitherto no knowledge of one another, that the same kind of loss in common.

Professionals and experts are usually excluded from these groups. "No longer can priest or scientific expert tell us how to live, how to die, how to grieve. It all depends on personal choice, and on the community with which one identifies." (Walter, 2007)

6.   Mourning in the digital age

Is there still a need of a physical place to mourn? Nowadays social media strongly influenced how mourners can interact both with each other and the outside world. User-generated content allows for more people to become mourners, to share in the feelings as well as to aid in the memorialising, to commemorate and to offer condolences. (Walter, 2015)

This increases the impact of a death in society by allowing a bigger group of relations to share in feelings of mourning. In this process relates treatment of death in our (post)modern society back to that of traditional
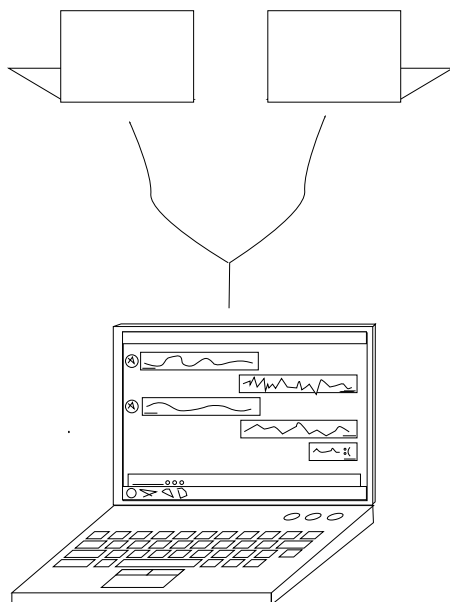
Figure 28: Reconnecting in an increasingly globalizing world

society, enabling one to share mourning with his whole social circle despite of the distance that blocked this in the modern society. Also, this content can be accessed any time and any place, increasing the occurrence of death in daily life, be it virtually. Death is no longer hidden. (Walter, 2015)

7. Influence of death on society

The influence of death on society have been thoroughly researched in the field of psychology. One of the things that has come out of this research is the terror management theory. It proposes that a basic psychological conflict, that results from having a self-preservation instinct whilst realizing that death is inevitable and to some extent unpredictable. This conflict produces terror. This terror is managed by embracing cultural values, or symbolic systems that act to provide life with enduring meaning and value. (Greenberg, Pyszczynski, Solomon, 1986)

Especially in young and middle-aged adults, death awareness can motivate people to enhance their physical health. (Taubman-Ben-Ari & Findler, 2005) Mortality salience can in individuals prioritize personal growth and living up to positive standards and beliefs; to build supportive relationships and encourage the development of peaceful, charitable communities; and foster open-mindedness. (Vail, et all, 2012) Therefore, it is important to keep death within society.

Example of this are beliefs in an afterlife or other religious beliefs that mitigate the fear of death by offering literal or symbolic immortality. (Jonas & Fischer, 2006) Terror management theory also argues that other cultural values can offer symbolic immortality. Examples of these are values of national identity, posterity, and human superiority over animals. (Goldenberg, J. L.; Pyszczynski et all, 2000)
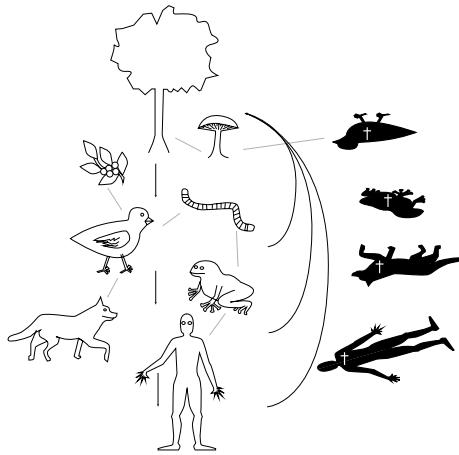
Figure 29: Nutrient cycles in nature

8. Inspiration in nature

This search for immortality is likewise expressed in popular mantra's like " Gone but not forgotten." Especially in post-modern views on grief, the focus lies on living with the change, rather than moving on and forgetting about it.

Commemoration is thus intended as anti-entropic, a force by which the effects of time - primary among them: forgetting- are mitigated. The deceased is condensed in the memory. Commemoration stills time and creates a state of eternal presence. The deceased will remain the same, while the bereaved will continue with their lives.

This is especially clear on cemeteries, where recent and earlier deceased lie side by side, their characters reduced to names, dates of birth and death carved in stone for "eternity".

In the non-human world death is not only part of life it is a source of life. As the old Dutch saying goes, one's death is another one's bread. Death is necessary for the continuation of life in the natural ecosystems, and immortality can be found in the continuation of species, and the passage of time highlighting what is there, rather than what used to be. Death is no abnormality here but a frequent guest.

These processes in nature are helping grievers through

their mourning. "...Symbolism of flora plays a role in continuing to keep memories alive at living memorial sites." (McMillen, Campbell & Svendsen, 2017) Unlike gravestones that, unless carefully maintained will show of the passage of time by looking dirty, growing moss, and making the bereaved feel guilty for moving on with their lives, and not taking the time to look after the grave. Living memorials can blossom over time and grow symbolising a positive change.

Flora traditionally used in context of death and memorial can aid in creating an atmosphere associated with deathscapes. Through the use of more localized plants and symbols that are particular to the site, ties to the genius loci and the shared identity of the place can be reinforced. In both ways "(plants)...serve as a mechanism to promote healing and recovery." They highlight the passage of time and form metaphors for resilience and continuous adaptation in life for the betterment. (McMillen, Campbell & Svendsen, 2017)

9. Nature and mourning

Death has long been linked to nature. Our dead is seen as a sign of our nature, that we are not as invincible as we might seem in our concrete fortresses. We always used to rely on the powers of nature to decompose us, and until modern cremation these ties with nature were inseparable.

There is more in it than that, however. Death of a close one is the most stressful thing we can experience. Holmes and Rahe (1967) created the social readjustment scale, that measures the stressfulness of a life event by the social readjustment it requires. It comes to no surprise that this scale is topped with the death of a spouse, which is closely followed by the death of a close family member and the death of a close friend. Death is immensely stressful and bereaved need a way of dealing with this stress. Contact with nature can help in reducing stress.

Kaplan & Talbot (1982) were forerunners in this part of the field and explored how nature combines the components of restorative environs that aid in reducing stress:

1. Being away; Frees one from the cause of stress. Here being away can be seen both as a conceptual as well as a physical change. Being in another setting makes it more likely you will think other thoughts.

2. Fascination; involuntary attention drawing your mind away, this is a kind of attention that requires no effort. It allows one to function without direct attention, which clears up mental space for restoration.

3. Extent; A combination between connectedness and scope. The environment should be rich and coherent enough to provide the feeling of being in a whole different world, and large enough so one can move around in it.

4. Compatibility; What one wants to do and what one feels like should be done is needed doing by and supported by the environment. When the environment requires that what feels intuitively right, the relations with the environment becomes effortless.

Ordinary natural settings evoke soft fascination: a moderate fascination accompanied by aesthetic pleasure perfect to facilitate restoration. (Herzog, Black, Fountain & Knotts, 1997).

Summary

Death and funeral customs are inherently defined by cultural norms and values. These norms and values are ever changing as our society develops. Recent changes point towards more individualised funerals. The initial shock after death causes grief. After the immediacy of the funeral the mourning process commences in full force. During this period of adaptation to the new situation social support is essential. This process has been explored through the different models of grief. The most recent ideologies embrace finding ways to incorporate the deceased being dead in our new situations and argue hereby that death is a part of life. Technological advances have successfully reconnected humans in need in cyberspace. How could our environments assist in the fulfilment of these needs?

Terror management theory argues that being aware of death leads to improvements of life. Fear of death is mitigated by beliefs and actions that offer literal or symbolic immortality. Popular mantras further enhance the idea that to be forgotten is the end of life. The act of commemorations opposes entropy, mitigating the effects of time. Commemoration stills time for the deceased.

This view is opposite of death's role in nature, where it is a catalyst for the continuation of life. Ecological resilience ensures nature bounces back to an equilibrium after a disturbance. The sight of nature is an inspiration for mourners, promoting healing and recovery.

Now our technological advances have reached the point where nature does not need to take a role in the disposal of bodies anymore, we have come to realise that nature's role in the mourning process has been underestimated. Contact with nature, through stimulation of the mind to wander, helps us deal with the stress that death causes. How could these powers be optimally utilised in order to aid the mourning? How can we define deathscapes without the dead? It might be time to develop a new kind of green typology; rather than deathscapes, we need commemorationscapes: green oases in the city where bereaved can meet each other, or mourn alone while enjoying the benefits that nature offers.

Urban implications of a new model

It has become clear that it is time to reconsider our cemeteries. A new model has been hinted at that could replace the current options for death. This model makes sense in the historical time line of what we have been doing to our death by embracing the possibilities that our technological advancements bring. Since it proposes a separation between the processing of the body and the commemoration it is adaptable to the introduction of new methods. Furthermore, it can better answer the needs of the bereaved in the most trying times than the current alternatives can. What would this model mean for cities? What implications does this concept have for our urban environments? Let us first look at the spatial problems that exist in the current situation.

1. The problem of cemeteries

Cemeteries originated out of overcrowding at inner city cemeteries, and the decomposing caused unhealthy situations. As a result, cities created new bigger cemeteries outside of the city borders. Inspired by new knowledge and health concerns these cemeteries were often well bordered, with a separate water system surrounding the site and a fence to keep out animals and deep-rooted border plants all around the site. These sites gained attraction as public green because the conditions that prevented health risk, provided great opportunities for ecologies. The most beautiful and oldest trees are often located on cemeteries However, as urban expansion continued, these places became reintegrated in the urban fabric although still separated from the living by the planted borders and fences.

For 44% of the Dutch people the price of the funeral is very important. They want their own funeral to be as cheap as possible. (NL-eyes, 2017) Combined with the funeral trends of secularisation and multiformication it comes to no surprise that cremation still gaining popularity. (Grol, 2017) Furthermore, people live longer nowadays than was expected when many cemeteries were designed. These factors pose a threat to urban cemeteries.

To keep cemeteries cost-effective with less burials, the prices of the cemeteries must rise, or saving costs on the product (maintenance and service), making them even less attractive. (Van Haren, 2017) While the old cemeteries now slowly become unaffordable, they might eventually disappear from out thought.

Many cemeteries have adapted to the cremation trends by offering places to bury or store ashes. These have aided in mitigating the problems, but they do not address the new technological advances, nor different reasons that people choose for cremation. Cemeteries' utility remains limited to the bereaved that want to use their services, hereby limiting their usefulness to society as a whole.

This new concept for commemoration spaces can serve a larger target group including all who have lost someone regardless of their preferred method of bodily disposal, but also others that are in need of contemplative space. It can aid in uniting mourners that are in highest need of social support in their neighbourhood, strengthening the ties people have to their surroundings. Bringing death back in daily life by giving it a place in local communities, aiming to invite citizens to support each other reinstating the benefits of mourning as it was in traditional societies, that have been lost in modern times.

2. Death in the city

Initially one cemetery could suffice in cities in the same way as they only needed one commercial centre, but with urban growth providing a bigger population there was need for a different spatial organization consisting out of separate city centres each serving to a small area, covering the city together. Many necessary functions like shops and small businesses are distributed over cities in this way. Cemeteries remain an exception due to their spatial characteristics, taking up a lot of space, threatening to pollute their surroundings and not a daily necessity for most. Cemeteries also stand out as they serve their community on a different time line. While fewer people choose for cemeteries. It has not be necessary to build as many.

Could death be distributed across the city like small scale social functions. A separate network of small mourning

spaces, where people living nearby can mourn their beloved, where maybe even the ashes could be scattered? A new typology of death spaces in society. Places where one can mourn individually, or be comforted by others within their community without having to travel far away from their daily life. Would it have any additional benefits to the city?

2. *Urban-Rural relationship*

The concept of urban-rural relationships is often used to promote a idea of functional interdependencies between the modern city and the countryside. At first these models were used to explain the relation between the market place and the fields. Many urban-rural relationships today are moving further than simple one-way exchanges to form a more complex and dynamic symbiotic relation that shape both the fortunes of cities and countryside. (Davoudi & Stead, 2002).

Something interesting showed up when looking at the spatial demands of death   (See p.35). There is a peak at the time of the funeral, when many coming from far and near need to assemble on a short notice to pay respects to the deceased. Where cemeteries afterwards still function as spaces, in case of cremation this funeral site functions as a non-space, visited only once. (Or twice, when

Figure 30: Relation cityscapes/deathscapes over time.(Left to right) 1600, 1900 & 2000.

Figure 31: A new relation between cityscapes and deathscapes
Figure 27: Urban Acupuncture

picking up the ashes.) It it a purely ceremonial space that needs to accommodate dignified services, and be easily reached.

After this funeral the grief is shared in smaller gatherings or processed in solitary contemplation. These later stages of the mourning process accompany the readjustment in daily life. This readjustment could be facilitated by relocating the mourning place within the surroundings of the daily life.

 Of the Dutch population 70% lives in urban setting. (Steenbekkers Vermeij & houwelingen, 2017) Urban areas are characterized by being administrative, commercial, religious, and cultural hubs for their larger surrounding areas. (Smith, 2006) Urban areas as a rule cannot produce their own food and therefore must develop some relationship with a hinterland which sustains them. The rural hinterland in this model practices the space consuming task of agriculture. Why would they not sustain the city by retaking other space consuming tasks like disposal of bodies and hosting the funeral process.

The old Dutch word for cemetery is "dodenakker" literally meaning (arable) field of dead. The future presence of death in the city could be in the shape of commemorative gardens that can provide the contemplative space of a cemetery without the spatial limitations and costs that the dead bring. Such a system of gardens is more easily scalable to neighbourhoods than our contemporary cemeteries. These advantages allow them to be better integrated in out urban fabric.

By returning places for the dead to the residential centres, the Urban-rural relationship can be refined. The rural areas can provide the urban areas with spacious cemeteries for burials if still desired, as well as places for the funeral ceremonies. This will gain them employment. Space demanding concepts like green burial could be further explored in feasibility here. While the average person has a place to mourn nearby home.

3. *Theories on cities*
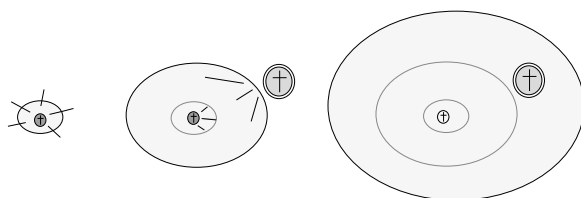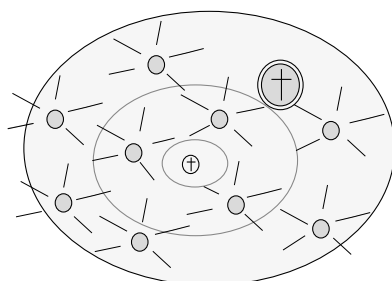
Urban acupuncture

These commemorative gardens can be used during the mourning process, after the funeral. They are not designed to hold the funeral or cremation. This can be done at local crematoria or cemeteries outside the city limits.

Urban acupuncture provides the theory for this type of intervention, aiming to relieve stress in the entire area though small interventions. Sites are selected through analysis of social, economic and ecological factors.

Assemblages

Traditionally there is a strict scale defined hierarchy in the city and the city is divided into municipalities, townships, districts and neighbourhoods for administrative purposes. These lines in spatial reality do not always signify the borders between areas as experienced by the population. This brings us to an alternative reading method of the city:

This theory of assemblages proposed that the city as an assemblage is composed of infinite smaller assemblages. Each assemblage is continuously formed process of producing properties through interactions between social assemblages and material components

" ..Arranging and organizing and claims for identity, character, and territory." (McFarlane, 2010)

This theory allows for different interpretations of a commemorative place depending on the identity and experience of the perceiver.

Milieus in these assemblages are defined by their external milieu, that reaches the internal milieu, filtered through a membrane. This transition from the active external milieu towards the almost "sacred" atmosphere inside spaces of death is essential for the functioning of the garden.

5. Goals Summary:

My project aims to reintegrate death in the urban fabric of residential areas. The bereaved living here can be comforted by having a nearby place to mourn regardless of the preferred method of bodily disposal. These places aim to unite people in communities based on where they live. The new memorial places will feature a design where plants and the forces of nature accentuate the

Figure 32: Elements of assemblages:
Exterior Milieu, Membrane, Interior Milieu
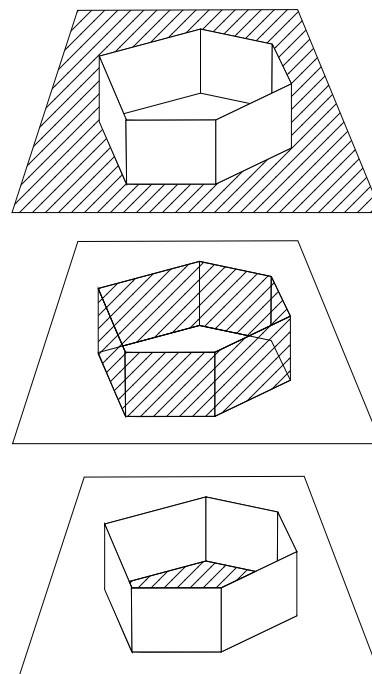
Figure 33.: Concept: a flock of memorial gardens linked to a funeral home.

continuation of time, which has been shown to help relief stress in the grieving process. Furthermore, these places will keep the mourning between the living, rather than sequestering them, avoiding reinforcement of the social isolation especially prevalent among the bereaved elderly.

For the general population the presence of commemoration spaces in the city is intended to bring forth the positive effects of mortality salience, as well as the beneficial environmental effects associated with more green spaces. All who feel the need for the healing powers of nature are invited to use the garden with respect to those who have lost someone. The garden can add a new distinct atmosphere to the range our public spaces provide for. Altogether, this project first and foremost aims to be to the benefit of the general population.
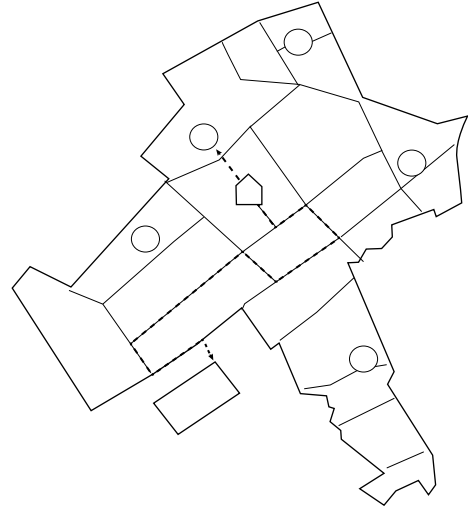
Figure 34: Funeral place versus place for mourning and contemplation
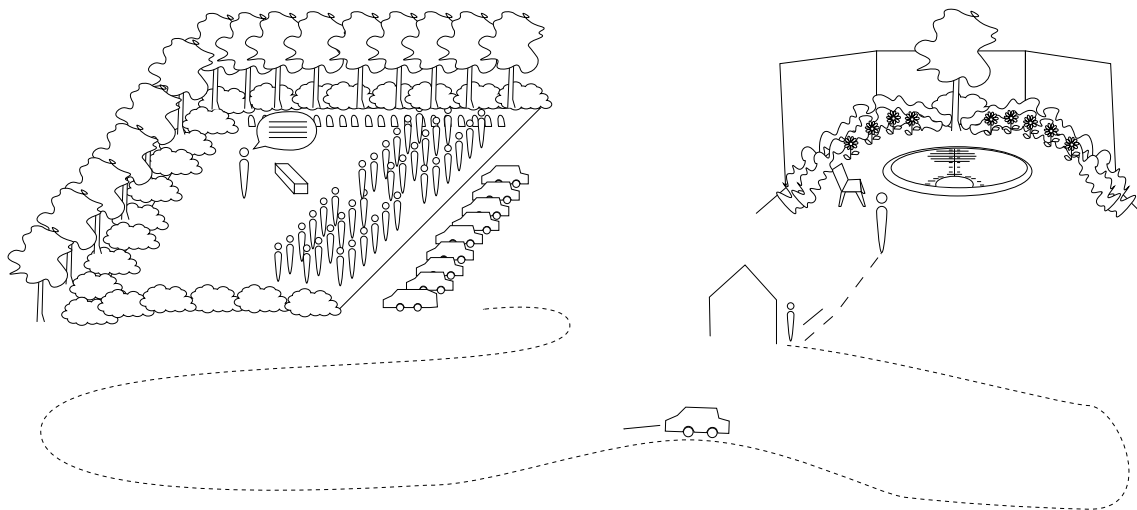
Figure 35. Space consumption of a funeral versus space consumption of commemoration.

From places to spaces

1. The materialities of death

Cultural practices can be divided in the material practices and the immaterial practices. The materialities of death are the material objects that have an influence on the mourning process. Among these are for example artefacts related to the deceased, landscapes there they rest and the corpses themselves. Traditionally the grave forms the locus of mourning. Here objects bearing symbolic meanings are placed to support the emotions that are part of the mourning process and express the act of remembrance. (Sabra, Andersen & Rodil 2015)

We can look deeper in the benefits gained by traditional graveside practices by comparing the actions undertaken to the reasonable person model (RPM) by Kaplan and Kaplan. (2005) This model proposes that humans are at their best when basic informational needs are met. It focusses on three domains of informational needs.

Exploration and understanding are about the dual human needs to make sense and to extend what one already understands.

Restoration is necessary for maintaining the capacity to respond appropriately to the abundance of information surrounding us.

Meaningful action concerns the need to participate, to be an active part of the information-rich world around us.

The materialities of traditional death practices ensure the fulfilment of these needs. Ever-changing natural elements of the cemetery landscape can fuel our desires for exploration and understanding. The contemplative moments at the green grave sites can restore our needs and in the act of tending to the grave we can find meaningful action. This meaningful action might be there reason many still like graves. The grave gives the bereaved an opportunity to continue caring for the deceased. Furthermore the graves also establish a sort of the material continuity of the deceased in this world.

(Petersson & Wingren 2011) The deceased is still present in the world, and can still be visited when the need it felt.

The importance of this continuity can be linked to sayings like: "out of sights out of mind." We struggle to see the deceased as a pure spirit in immaterial abstraction. Material things are not only associated with the deceased, they are part of them. (Gibson, 2004) Thus, materiality is a crucial part of the link between the living and the dead. To touch something is also to be closer to and more engaged in what one is experiencing than merely looking at it. (Idem.) Additionally, "we are often touched by what we touch." (Hetherington, 2003)

Modern materialities.

When cremation was introduced the material relation with death changed fundamentally. The materiality of the corpse fixates it in a place in a way that the ashes of a cremated body do not.

"The conversion of the corpse into ashes and bone fragments by cremation terminates the concept of a person as made up of body and mind, emphasizing the separation of body and person. The person instead becomes an idea." ... "Cremation transposes the corpse rapidly to a completely altered materiality, which is fundamentally inconsistent with the idea of a bodily and physically present person." (Sørensen, 2009)

While on one hand the process of cremation can be seen as removing the physical ties and the link between the memory of the person and the body. The many ash destinations highlight this process rather as one of densifying the deceased. The "miniaturisation and portability" of cremation ashes gives the bereaved the freedom to bring the deceased and their commemoration of this person closer to home or any other place that is special for them. This introduces a mobility of remembrance that was not possible before. (Sidaway, 2016) It also allows for a direct continuous attachment. The material differences between the traditional grave site and the most common ash destinations is even more expressed when looking at how strangers can precieve the deceased. The distinction between the physical manifestation of graves and columbaria representing the

deceased and the immaterial commemoration are quite contrasting.

When we bury the body at a place, we link that place to the story of the deceased. In the minds of the bereaved the ties between the deceased and this space are inseparable. In the physical space this person is still present for stranger through the materiality of the grave and what can be communicated through this. The death is visible for society allowing for shared grief as experienced in traditional societies.

There have recently quite a few examples of places that link the narratives of the deceased kept in online databases to the physical places on the cemetery. This can happen through audio-guided tours, that tell about the deceased, of through QR-codes on the grave markers. (Sabra, Andersen & Rodil 2015) This process furthers allows for some sort of immortalisation of the bereaved.

When after cremation the ashes are scattered or infused in a piece of art, there is no materiality anymore that unconditionally tells of the deceased. The deceased is only precievable for or through the bereaved. This limits the sharing of grief and takes the deceased away from society. Death becomes once more invisible to society, removed from the public sphere and added to the private world.

This differences might be even more expressed in the sacredness that is generally associated with cemeteries. The sacredness here is ensure by sequestering the death off from society. (Rugg, 2009) The new properties of death that come with cremated remains partially rule out such sacredness in reducing the deceased literally to a smaller material object that can have it's place in daily life. It greys out the hard line between life and death in allowing the deceased a continuous existence. Mathijssen, 2017)

2. Cemetery as a palimpsest

A word palimpsest refers to the practice of reusing parchment by scraping or washing off existing text. This is not a perfect process, and remnants of past inscription are left, still visible if looked at intensely. In out use of

cemeteries this concept is interesting. When the graves are emptied and reused these narratives may linger or be forgotten. A state occurs where immaterial traces of the old coexist with the new. While the old grief fades new grief takes over the place.

In a traditional cemetery this change is physical very strong. One gravestone is removed and demolished while a new creation is put in its place, signifying a different body under the earth. While these strict changes make sense in the cemetery management point of view, they contradict the mourning process, that flows more gradually.

The mourning process is unique for everyone, takes place gradually over time. Like plants in nature come and go, some lasting longer than others, and some flowering bright but fading fast. When designing places of commemoration allowing for such smooth transformations, the mourning process of the bereaved can be aided. By using living memorial that lasts a certain period of time, the physical presence of the deceased is elongated, and will naturally decay with time as the mourning process if endured.

3.   The act of commemoration

Commemoration is the act of calling in remembrance. Remembrance can be defined as the state of bearing in mind, the act of recalling, as well as the memory of a person, thing or event. As mentioned before, commemoration preserves someone or something
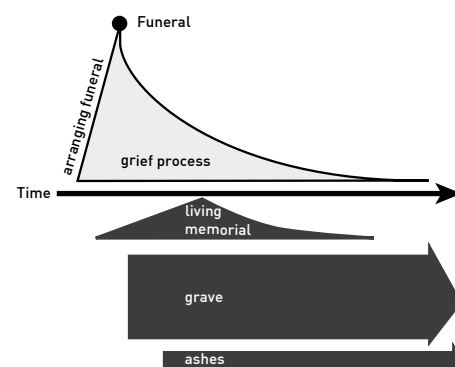
Figure 36: Material time lines of different memorial types compared to the period of mourning.

in memories. (Wolschke-bulmah. (2001) Hereby counteracting natural entropic forces of for example forgetting. The act of commemoration is therefore very important for the bereaved. Rather than letting the deceased fully go, life is adjusted to living with the deceased in a commemorated state.

The concepts of memory and identity are related to each other. Our identity is based on our history, and without remembrance and commemoration of this history the identity is inconceivable. Thus, memory is a prerequisite for identity, that is formed by a continuity over time. (Wolschke-bulmah, (2001) Commemoration of the past in general is thus essential for remaining who we are as a person but also in a wider sense as a culture.

Our landscapes are the centres of our personal and collective memories. (Taylor, 2008). We exist in space and therefore so do our recollections of past experiences. This allows for the act of mourning and remembrance to be an inherently spatial as well as temporal phenomenon. Experienced and expressed physical sites of commemoration and in virtual communities. (Sidaway, 2016)

Death plays a significant role in the process of establishing identity. The commemoration of the death helps eminently to establish and maintain identity. (Wolschke-bulmah, 2001) While our modern lives change rapidly, the landscape also changes, but far more slowly; it constitutes a living link between what we were and what we have become through our experiences. (Drabble, 1979) The phenomenology of the landscape is key in realigning these different time lines, putting the deceased in perspective with our larger history as a community by the intensity of the corporal experience of natural elements.

4. The garden as place for commemoration.

It makes sense that we need material spaces of commemoration, but what should these spaces be like? The identity of the place can be dissecting into its physical components, its activities and its symbols and meanings. (Taylor, 2008) All Three of these aspect shave to be addressed in the design of an appropriate commemoration space. Which physical components can help the bereaved? What activities belong to mourning process? And what symbols can help in expressing the nature of this place, and allow the bereaved to place themselves in the narrative of a continuing society as whole?

The importance of nature as in healing process as a symbol of hope and continuation suggests some kind of green garden or park like setting as ideal place of commemoration. While parks are generally more public and designed for recreative purposes, it might be more suited to call this new type of green space a garden, highlighting the more enclosed character, and private, almost sacred atmosphere.

These gardens will aim to accentuate natures vulnerability. They function as metaphors for resilience. The transience of plant life and nature symbolises both decay as a part of life as well as continuous rejuvenation. Hereby nature offers the bereaved a sympathy for their loss in this fragile world, while at the same time offering a consolation in its seasonal renewal and regeneration. (Hunt, 2001) The garden can hereby put the lamented loss in relation to the eternal continuation of life.

Gardens are active in telling the story of the place. The concept of the genius loci, dating from Roman times, describes the spirit of a place, that determines its essence. (Thompson, 2003) Gardens are suited to reaffirm the narrative, theme, or the geomorphology of the site, celebrating the sites identity. (Hunt, 2001) Aben & De Wit go even as far as to define the garden as "The most condensed unit in which the historical, functional and spatial complexities of the landscape are made manifest." (1999) Gardens as a archetype thus are at remarkably suited for the role as place of commemoration.

5. Healing gardens

"Nature is but another name for health." Thoreau (1962)

What activities belong to the mourning process? Commemoration needs first and foremost a place for quiet contemplation where one can recall the deceased
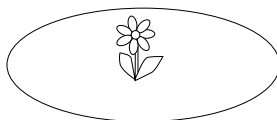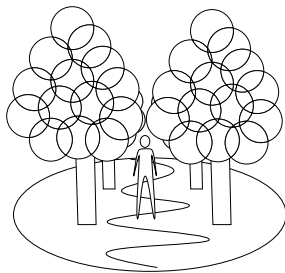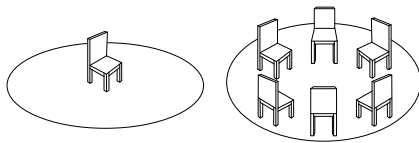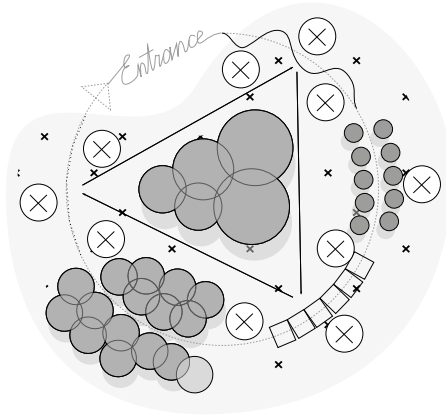
Figure 37. Initial design tools

and focus on the memories. In the mourning process it is also important to have social support. So there need to be places to be alone as well as to be together. Additionally physical exercise is recommended in relation to mental well being. Lastly there need to be plenty of opportunity for nature to serve as positive distraction from the consuming emotions that come with grief.

In the history of gardens one specific type is the healing garden or therapeutic garden. Healing gardens were already common in ancient times. (Marcus & Barnes, 1999) Although generally regarded as defined by their location within a healthcare facility, (Hartig & Marcus, 2006) others define the garden by its function: "the place to reduce stress to the user by using a variety of natural elements with a specific design in the garden, which helps restore the mental and physical state." (Momtaz, 2017) Or it's program: "A place for passive or quasi-passive activities such as observing, listening, strolling, sitting, exploring and so on." (Marcus & Barnes, 1999)

Among others, Betsy Severtsen (2015) has researched what the essential elements are of healing gardens. She distinguishes the following four elements:

1. Sense of control

2. Social support

3. Physical movement

4. Access to nature as positive distractions

These elements for healing environments closely overlap with the elements necessary for healing after loss of a loved one.

When looking from this perspective to the current material culture surrounding death we can clearly recognize the elements in common. Aswell as elements lacking. Regarding cemeries. There is sure access to nature and place for movement, and sense of control in grave markers, but what lack is a place for social support. Furthermore, cemeteries tie the mourning process to unnatural time limits. In a commemoration garden this could be avoided, by allowing for living memorial. The garden can also help others, who have not suffered a loss, that do need a healing environment.

Regarding Cremations, there are far more ambiguous in experience based on the different ash-destinations. The invisibility of the loss can put a restrain on the social support. The portability of cremains could both prevent as well as ensure physical movement and access to nature. (Many ashes are scattered in natural environments, that welcome regular visits but some are kept at home or scattered in non visit-able places.)

Commemorative gardens aided by design principles for healing gardens can help the bereaved. Recalling the reasonable person model: by designing a place that requires doing or supports doing the actions that aid in processing the grief in a healthy way, the bereaved are encouraged to take care of themselves. What design principles are suited to create these commemorative gardens? There are many researches into healing gardens and evidence-based design principles that are applicable for commemorative gardens.

Many of the researches into design principles of healing gardens are focussed on specific target groups or diseases, e.g. children, elderly, cancer, or Altimeter's patients. In my assessments of design principles, I have filtered these sources out focussing on principles that are more general and therefore more applicable in the context of commemorative gardens. I have sorted the design principles I found over the essential elements distinguished by Severtsen. The design principles are taken from Momtaz (2017), Paraskevopoulou, & Kamperi (2018) and Marcus & Barnes, (1999).

6. Design principles

1. Enhance control feelings

- Paths for the disabled.
- Different seating options
- Sunny and shady areas
- Create different areas to choose between,
- Spaces that stimulate different sense
- Places that vary in privacy
- Minimize intrusions:
- Create places to be alone.
- Sense of enclosure from the world.

- Hidden places
- Water

2. Places for social support

- Areas for small groups
- Plenty of seating
- Movable seating
- Comfortable seating

3. Nature as positive distraction:

- Vegetation major portion of the garden
- Attract butterflies
- Vivid colours that change with seasons
- Planting with varied densities.
- Attractive views
- Soothing sounds.
- Open in all seasons
- Multi sensory experience.

4. Encourage Exercise

- Encourage walking/
- Narrow curving paths
- Destination points.
- Paths with varying experiences (Open/enclosed)

7. A toolbox for gardens of commemoration

The general spatial concepts for the commemoration gardens is thus a combination of these four essential elements. By combining different landscape archetypes, different symbolic meanings and spatial configuration with general tools in garden design a toolbox can be created for these gardens.

This toolbox will allow for endless replication of this new type of urban green space in existing as well as new neighbourhoods. Requirements for site selection will be

discussed to ensure the garden is properly fitted in its surroundings to optimise the potential.

The mourning period is characterised by strong emotions and various moods tied to these. These mood desire different surroundings for best processing. Sometimes one wants to hide away from the worlds, sometimes one wants to sit and observe the worlds ad sometimes one wants to actively engage with the world for example. To enhance control by allowing for different areas to choose from but also keep the garden legible the main body of the garden will be divided into three areas that are characterised by opposing spatial experiences.

- Enclosed/open,
- Nature over men/men over nature,
- Soft/hard.

The toolbox draws inspiration from two natural archetypes, grasslands and the woodland/forests. These types evoke distinct emotional responses. The relaxing open spacious views of meadows with various wild grasses and wild flowers contrasts the serenity of the dark dense and cool forest. The threshold between these archetypes are places is almost a separate place in itself. The experience of the forest is emphasized by the view from underneath the dense canopy on the bright sunlit meadow. The meadow likewise gains quality from bordering the forest where trees provide shade.

As much as we like these natural spaces, in order to respect human distinction from animals in the creation of culture. There will be places in the garden that will show out culture landscape in the shape of a series of small gardens. These gardens highlight a different aspect of the relation between humans and plants. In addition to these internal bodies of the garden it is essential to give unproper attention to the entrance that will guide the visitor from the busy daily life in to an atmosphere fitted for mourning.

1.   The Entrance

Mourning is a very personal process, and each individual mourns in a unique way. Therefore, it is important to provide some privacy when entering the garden. One shouldn't have to expose oneself while feeling vulnerable. In the reading on assemblages the entrance zone is the membrane through which the outside world is filtered through. From the sheltered entrances the bereaved can enter different zones in the garden.

2.   The meadow

The meadow is a wide-open plane. Here sunshine can banish dark moods. The meadows are a place of brightness positivity and clarity. Seas of flowers from May to October demand appreciated for the little things in life. The meadows stimulate the sense. The wind rushing through the tall grasses, insects chirping and bright flowers or different textures pleasing the eye.

Stark seasonal changes in flowering grasses and forb ensure and interesting view different with each visit throughout the year is. The grasses are plenty and grow fast flowering one after each other as an endless choreography of colour and shapes bounded only by the seasons highlighting natures rejuvenating abilities. Wild as they may seem, the meadows are a man-made landscape here. It can only happen when tree growth is actively prevented by removing young spouts. The meadow hereby embodies the first interactions between nature and man when humans started settling in space.

3.   The forest/ woodland

 "Forests beat the signature of time and eternity." Rolston, 1998, p.157

Forest take time to develop and grow slow. They are ancient witnesses to our ephemeral lives. This deeper level of time grants to forest part of its sublime appeal. The spiritual experience, some mourners seek of being part of something bigger finds a place in here.

Forests from a historical point of view have often been in a positive light as places of refuge and the homes of mythical encounters, but they also have a darker side. In ancient times forest harboured dangers of outcasts and wild animals. (Rolston, 1998) In later times men took over and the forest was domesticated and became hunting grounds.

Figure 38. Three zones: The meadow, The forest and The garden.

The forest symbolises wild nature and allows one to emerge in its surroundings. To literally hide away from the world and submit to the experience. The forest is a dense enclosed space where plants are allowed to show their natural form. This denseness van also be used as a barrier to block out undesirable areas in its surroundings.

The forest highly stimulates the senses starting from the sound by walking through it. The colder moister air in the shades of the trees, the smell of moist wood and flowering groundcovers. . The ultimate wilderness experience was one of solitude. (Taylor, 2008) The forest is very fit for being alone, when one, even more aware of its surroundings, lost in thoughts can fully submit oneself to the experiences of the sense

The forest is best experienced by going through it. But the forest can also be used to provide a feeling of safety when looking from under the trees to open areas. The appeal of this experience is explained by the prospect refuge theory. This theory describes a universal human need for places from where one can see around without being seem himself. These places are typical for the edge of a forest where it meets a meadow.

4.   The garden

"I fault cultiver notre jardin"

With these words Voltaire ended his philosophical Roman Candide ou l'optimisme (1759). We must now tend to our garden. When trying to change the world we must start at what lies within our power. In contrast to most parts of our existence including death, the garden is a space over which we have full control. Art as a form of human creation is seen as sign of cultural advance. Langer (1966) proposes this is because art actually helps in shaping our emotional experience.

Gardens are traditionally intermediate zones, between inside and outside, social and private, town and country. (Hunt, 2001) This is also the place where the mourning takes place, symbolically the commemoration of the death by the living. Death is at once an everyday occurrence and an extraordinary experience in the lives of those affected. It is at the same time intensely private and personal while often simultaneously experienced

and expressed collectively and publicly. (Sidaway, 2016) In gardens one could withdraw himself from the contemporary urban life. Garden cemeteries engaged with this idea by purposely creating places that allowed for withdrawal from urban life for contemplation. (Hunt, 2011)

Gardens are in essence places that bring about the celebration of something that no longer is. Hunt declares: "Gardens and garden making entails a backward-looking stance, a lament for lost perfection. This is especially clear in the fact that gardens often gesture to some version of lost world, a utopia, Eden or arcadia." (2001) Gardens can be seen as striving to make up for these lost worlds, and in doing so, creating a new earthly perfection, whose transience underlines the lamented. (Hunt, 2001) "Human happiness in its most perfected state as a garden existence." (Harrison, 2008) These ideas translate into more strictly designed spaces featuring clipped well maintained plants and flowering borders displaying ranges of plants that would not naturally occur this way

8. Structuring themes and symbolism

Plants have often from ancient time symbolic meanings often depending on their physical characteristics (evergreen or deciduous) as well as their signs of reproduction (fruits and flowers) or overall shape or specific characteristics.

Flowers

Flowers of then carry a symbolic meaning related to hope, joy and ephemerality. These are especially used for young people that died in the bloom of their youth. In grave markers these are also represented at picked flowers. (Wille, 2005)

Roses represent love, joy and highest beauty. The rose also depicts ephemerality by how quickly it loses its petals. (De Cleene, 2002)

Chrysanthemum has been a flower typical for churchyard because of the flowering period in autumn fit for all Saint's day. (De Cleene, 2002) In non-religious context this late flowering can be great in ensuring there are

always flowering signs of renewal in the garden.

Evergreens

Evergreens symbolise eternity, immortality and life after death. As is ignoring the ravages of time, and entropy in the world, they remain static through seasons. (De Cleene, 2002)

Cypress. In western antiquity the cypress tree has been especially related to death. This due to the aromatic properties of the wood. It was often used for cremation. Later cypress wood was often used for caskets, due to its durability. (De Cleene, 2002) The Greek myth of Cyparissus that was turned into a cypress tree by Apollo after suffering loss that caused him to want to die (Terwen, 1856). While original cypress trees do not grow on our climate, Californian cypresses could take over the symbolic role. Another alternative can be the Taxus. This species is also a well know cemetery tree. During the 19th century plants with small dark refined leaves were thought to capture the right atmosphere for cemeteries. (Wille, 2005)

Pine trees are also signs for fertility because of the many seeds in the pinecones. Hereby also symbolises immortality.

Holly represents immortality. According to a Christian legend all trees objected against being used to make the cross except for the holly.

Ivy symbolises loyalty friendship and affection due to its adhesive root system. Also, as an ever-green it represents immortality.

Weeping trees.

Although there are several species that belong in this category the weeping trees, as the name suggests are a widely knows symbol for sadness and old age. They are clearly recognizable by their arched crown and pendulous branches that can reach to the ground. Although some are natural most weeping trees nowadays are cultivars.

Other deciduous trees symbolise rejuvenation and strength in their seasonal renewal and continuity. They are metaphors for healing after hardships of time. (McMillen, Campbell & Svendsen, 2017)

Fruit trees

Fruit baring trees symbolise human life; times of rest, awakenings, growth and pruning, and eventually flowering and baring fruits. (Brugge, 2006) Many fruit trees have a separate more specific meaning.

Apple is most well known as the forbidden fruit in the garden of Eden that Adam and Eve eat from the tree of knowledge of good and evil. It is also the centrepiece in the Greek myth of the Golden Apple of Discord. In both the apple seems to be a sort of most primal fruit in these myths.

Guiding themes

These symbolic meanings can broadly be summarized in two categories:

1. Meanings related to specific age groups (Flowers / Weeping trees)

2. Meanings related to the passage of time (Deciduous/ Evergreen)

I have chosen to use these separate meanings as guiding themes within my gardens to further structure the healing elements.

Wadden coast

Dune coast

The Dutch coastal zones

Delta coast

Figure 39. Three coastal types of the Netherlands

Site selection

The choice of site to test my concept in was a combination of different elements. For the theme of my thesis, how to deal with death in the future, it came natural that dense urban areas would prove most interesting to look at, since these places experience the problems first. This narrowed the search down to the Randstad.

My personal preferences lay with coastal landscapes, and within the Dutch coast specifically, the dune landscape comes to mind. This allowed me to further focus my region of interest to The Hague.

Figure 40. The densest parts
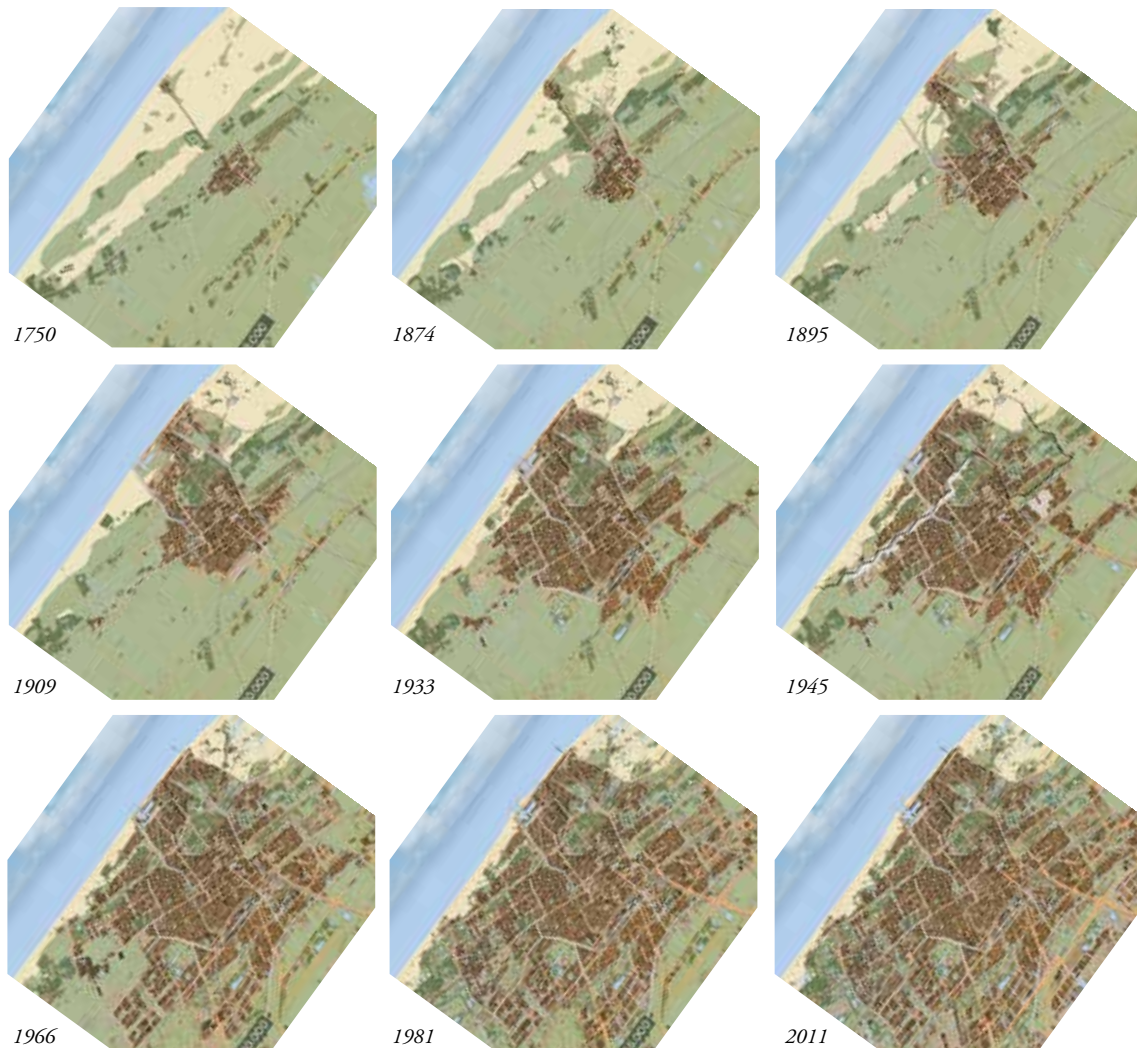
Figure 41 Development of The Hague over time

A Short history

Traces from earlier settlements have been found in The Hague, dating from up to 3000 BCE. The fundamentals from the current city date from 1230 when a count bought the estate there. This place became the main residence for the Counts of Holland and hereby attracted many political institutions. From here on the village surrounding the estate slowly started growing.
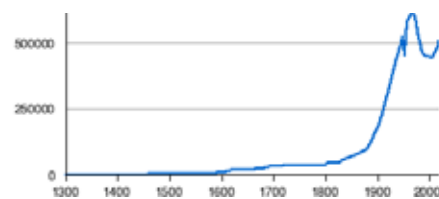
Figure 42. Population growth The Hague

In the 17th century the city was sizable with 16000 inhabitants and still growing. When the industrial revolution hit the Netherlands the city grew faster than ever, resulting in big monotonous expansion plans.
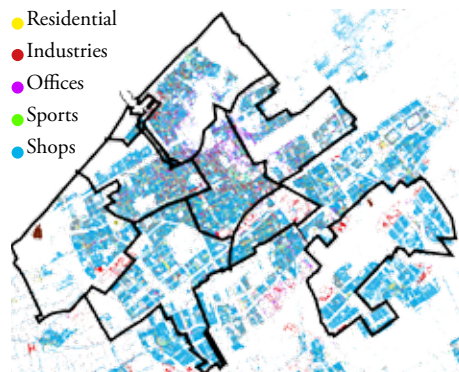
Figure 43. Main functions of buildings
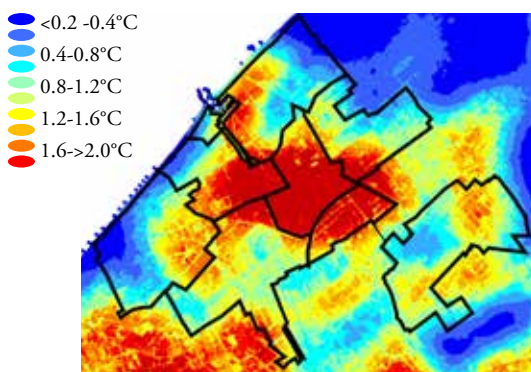
Figure 44. Urban heat island effect
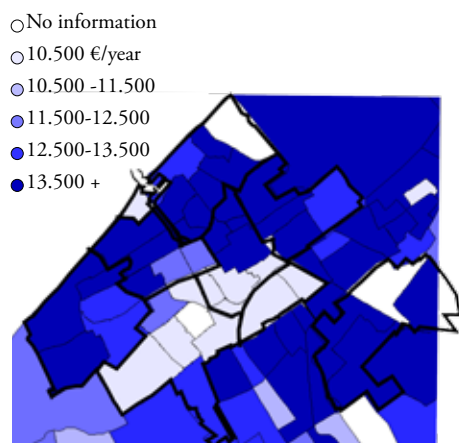
Figure 45. Average income

By combining different statistics about population density and number of deaths per number of inhabitants the number of deads per square kilometre was calculated for the different townships. Other factors that were taken into account are:

- The income levels: Lower income levels correspond with to lower geographic mobility. This might highlight the areas where the need for this kind of intervention is the largest.
- The functions: The gardens are most useful in mainly residential areas.
- The urban heat island effect. This highlights the potential of providing greater balance to the surrounding environment.

Comparing these results with the soil map, the Escamp borough stands out as the best place within The Hague to test my concept, serving the needs of the area, as well as being in landscape interest.

Figure 46. Population Density (1000 Inhabitants/ha)

Figure 47. Density (Deaths /km2 /year)
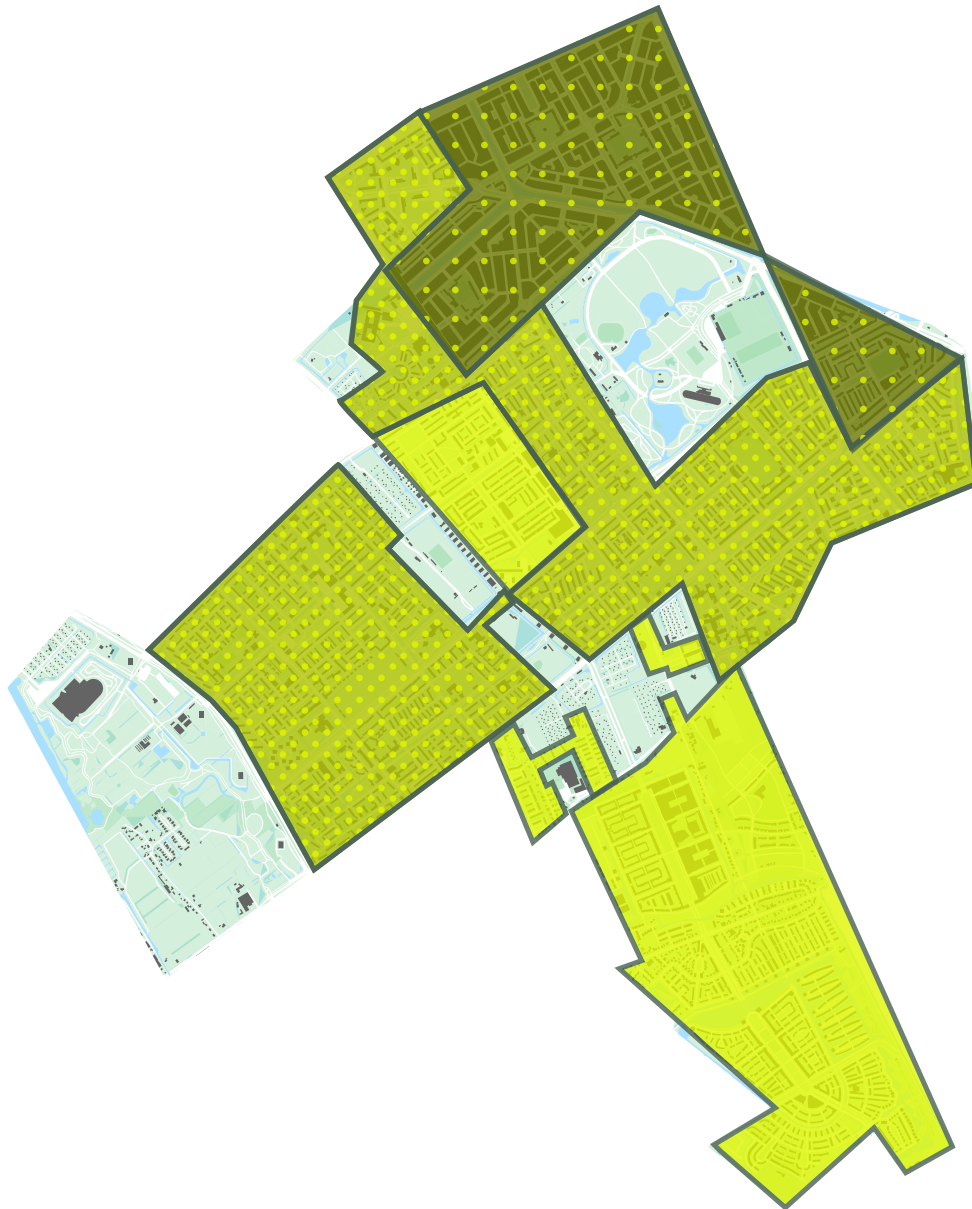
Urban introduction

There are three clearly distinguishable urban types present in the chosen borough. These neighbourhoods each reflect in their form a different relation between the city and the surrounding landscape. Furthermore, they are designed for different lifestyles as is visible in the types of green in the residential areas.

Neighbourhood types

■ Pre-war

■ Post war

■ Contemporary

Few interventions

Many interventions

1. Pre-war

The oldest part of the area dates from 1930, and is part of the urban expansions after the First World War. These areas are characterised by a hierarchical build-up. Building blocks form dense geometrical pattens, wherein the blocks closest to the big roads are four story apartment blocks with "portiek" entrances. These taller blocks embrace and protect blocks of two-story family homes and little play squares. The public space is comprised of roads, sometimes lined with trees. Except for a small squares here and there, all the functional green is formed by private gardens.

2. Post-war

After the Second World War the city expanded rapidly, but in a radically different shape language. Rather than a geometric carpet covering all, here the expansions are towers and blocks punctuating on the landscape. The areas are characterised by big green grass planes that are sparsely used, but offer an open airy feel to the neighbourhoods compared to the older areas. There is little to no private green, and stores and facilities are grouped in denser shopping areas, no longer integrated in the residential areas.

3. Contemporary

The last neighbourhood type reflects back on the earlier patterns, with geometric foundation and a variation in scales throughout the area. In this area special attention is given to accentuate the spaces as unique, rather than applying a generic pattern over the entire area. This neighbourhood is a Vinex-extension of The Hague and therefore embedded itself in water features to provide a feel of suburban living, bringing the residents closer again a nature, be it still a very controlled form of nature.
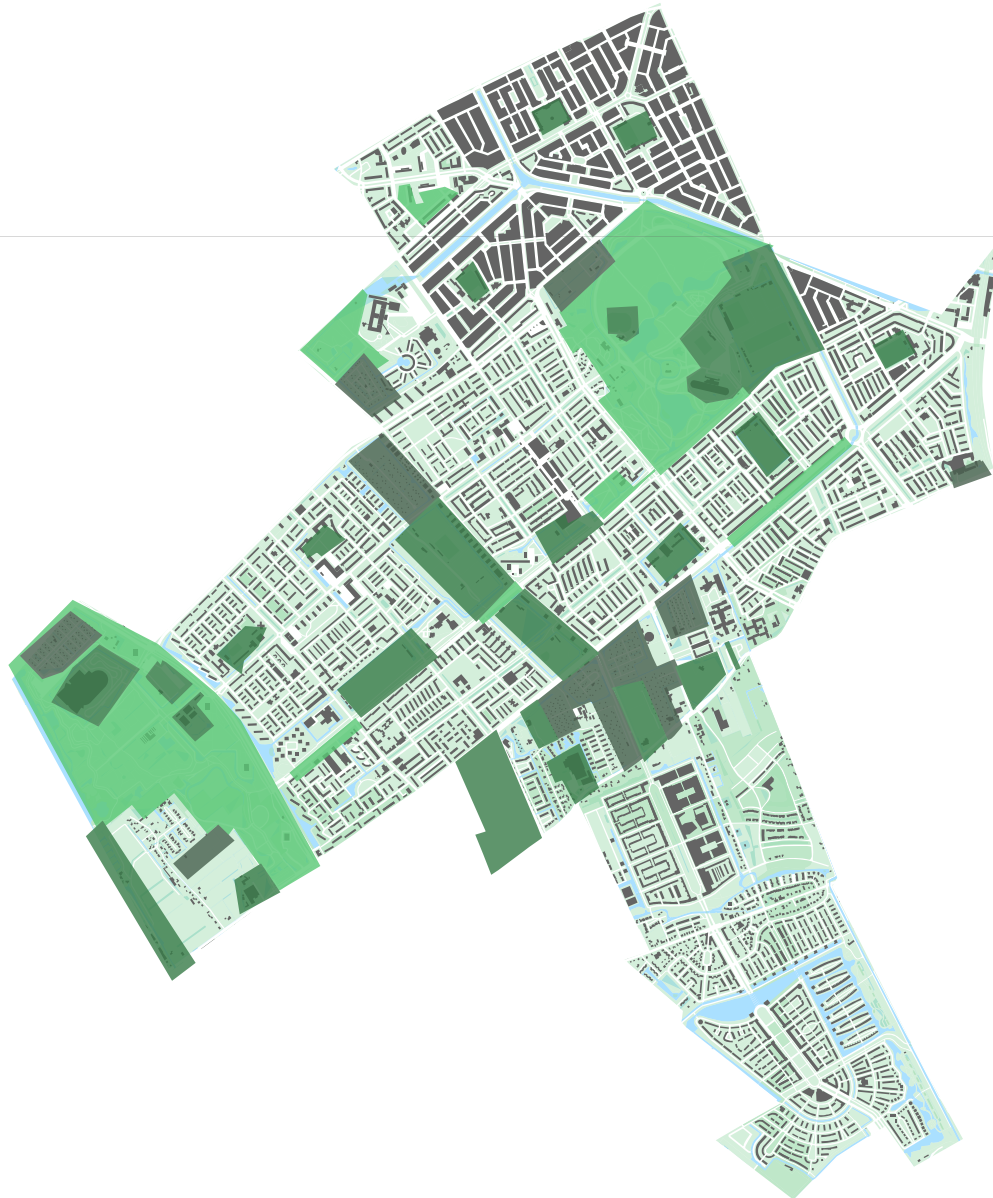
Green types

There are three main varieties of green, ranging from public to private, there is one big park, quite a few sport fields and also quite a few allotment gardens spread over the area. What is interesting is that these green areas are located at the edges of the city, or bordering on different areas which once formed the edges of the city.

Neighbourhood types

Parks

Sports fields

Allotment gardens

1. Parks

There are two big parks in this borough; the Zuiderpark and the Uithof. The first is part of the interbellum city expansions and partially initiated to create work for the poor population. The park consists of big playing fields and a few ponds surrounded by gardens with different themes. There is a natural playground, a deer park, a tree garden and so on. The other park, the Uithof, is called a nature park and has a more natural setting. Both parks are purposed for recreation and combine the nature with leisure sports. In one there is a pool and bowling complex, and in the other a roller skating rink and a miniature golf course.

2. Sports fields

Furthermore, there are big sports fields for the sport clubs; soccer, athletics and more. These are clearly visible on the map and satellite photos, recognised as bright green rectangles of regular size and with uniform maintenance, open and moist an existing use.

3. Allotment gardens

The last big green areas are the allotment gardens. The prevalence of these complexes highlight an interest of the people into getting hands on with nature, and reclaim a little bit of nature for themselves again. These complexes are range from 100 to 200 gardens of 150-300 m2 each.

6000 BCE

3000 BCE

2000 BCE

1000 BCE

1300 CE

2000 CE
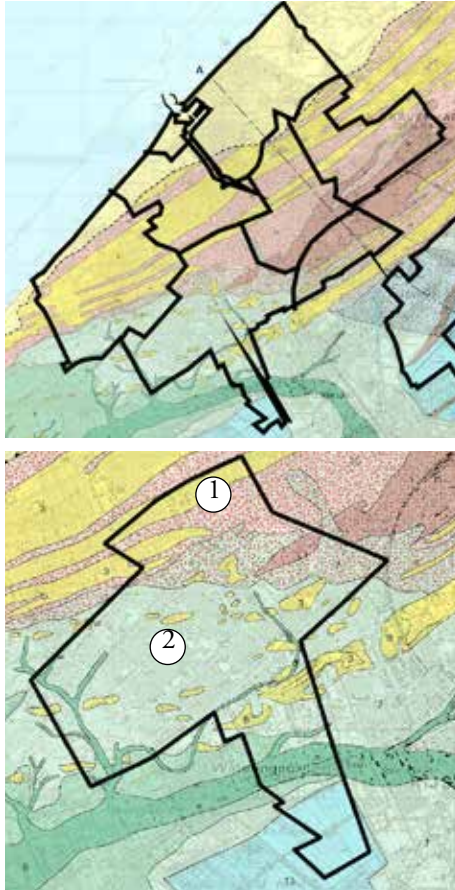
The creation of the landscape

The landscape as we see it today has grown over thousands of years. In the geological sections on the left the process is visible. The pleistocene sands form the basis for this area, initially covered by a layer of peat. Wind and sea have continuously deposited more material. As the sea levels rose the finest clay was deposited most land inwards, while the heavier sand stayed at the coastline. Further sand blown by the wind lands at the dunes, slowly accumulating to grow and move the dunes. This process is repeated over thousands of years, creating the landscape we see today. The first location is on peat layered on sand. The second location is on clay grounds.
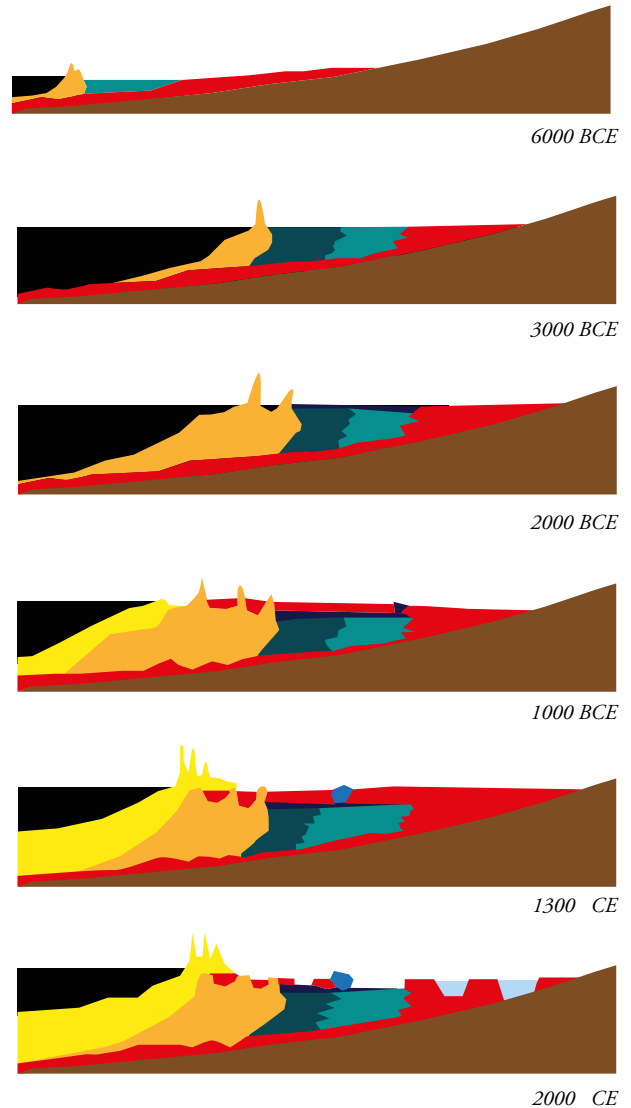
Geological section

- Pleistocene sand
- Peat
- Old beach ridges
- Young beach ridges
- Old marine deposits (sand)
- Old marine deposits (clay)
- Old blue sea clay
- Young sea clay
- Peat lakes

1. Dune landscape

The dune landscape is popular as a recreational place. Characterised by the scarce vegetation and soft sand blowing in the wind. The dune landscape consists of four clearly discernible elements. 1. The shoals, sand ridges generally submerged in the sea. 2. The beaches, this is where sea and land meet. 3 The young dunes, shaped in the Middle Ages, are still in development, especially on the sea side where wind continuously deposits fresh sands. 4. The old dunes, long sand ridges of usually only a few meters high. They are a few thousand years older than the young dunes. Sometime in between the peat has formed.

2. Peat landscape

The peat landscape is a type of wetland that consists of accumulated decayed plant material submerged in alkaline surface water. This landscape developed when the dunes sheltered off the backland from the salty water of the sea, and rain and river water desalinated and moistened the backland. In older times the peat was mined, dried and used as fuel. Later the land was often drained for agricultural uses by digging a close network of ditches. This lead to land subsidence. The peat landscape is thus a wide open landscape with sometimes endless seeming straight channels.

3. Sea clay

This landscape is shaped by the clay particles deposited from the sea at high tide. This results in a wide open and moist landscape quite like the peat landscape. The clay retains a lot of water, making this land very suitable for agriculture. This is especially clear in the southeast part of the Netherlands, which houses the largest greenhouse district in the world. Over time the sea clay landscape was often covered in peat and only surfaced again once the peat was mined, creating peat lakes in the landscape.

Eik en Duin
Since: 1247

St. Petrus banden
Since: 1830

Kerkhoflaan
Since: 1830

Parklaan
Since: -

Persijnhof
Since: 1906

Oosterbegraafplaats
Since: -

Westduin
Since: 1950

Jewish cemetery
ince: 1694

St. Agatha
Since: 1795

John the Baptist
Since: -

St.Barbara
Since: 1920

Eikelenburg
Since: --

Rijswijk- Oud
Since: 1915

Jaffa
Since: 1868

Iepenhof
Since: 1969

St. Janshof
Since: 2004
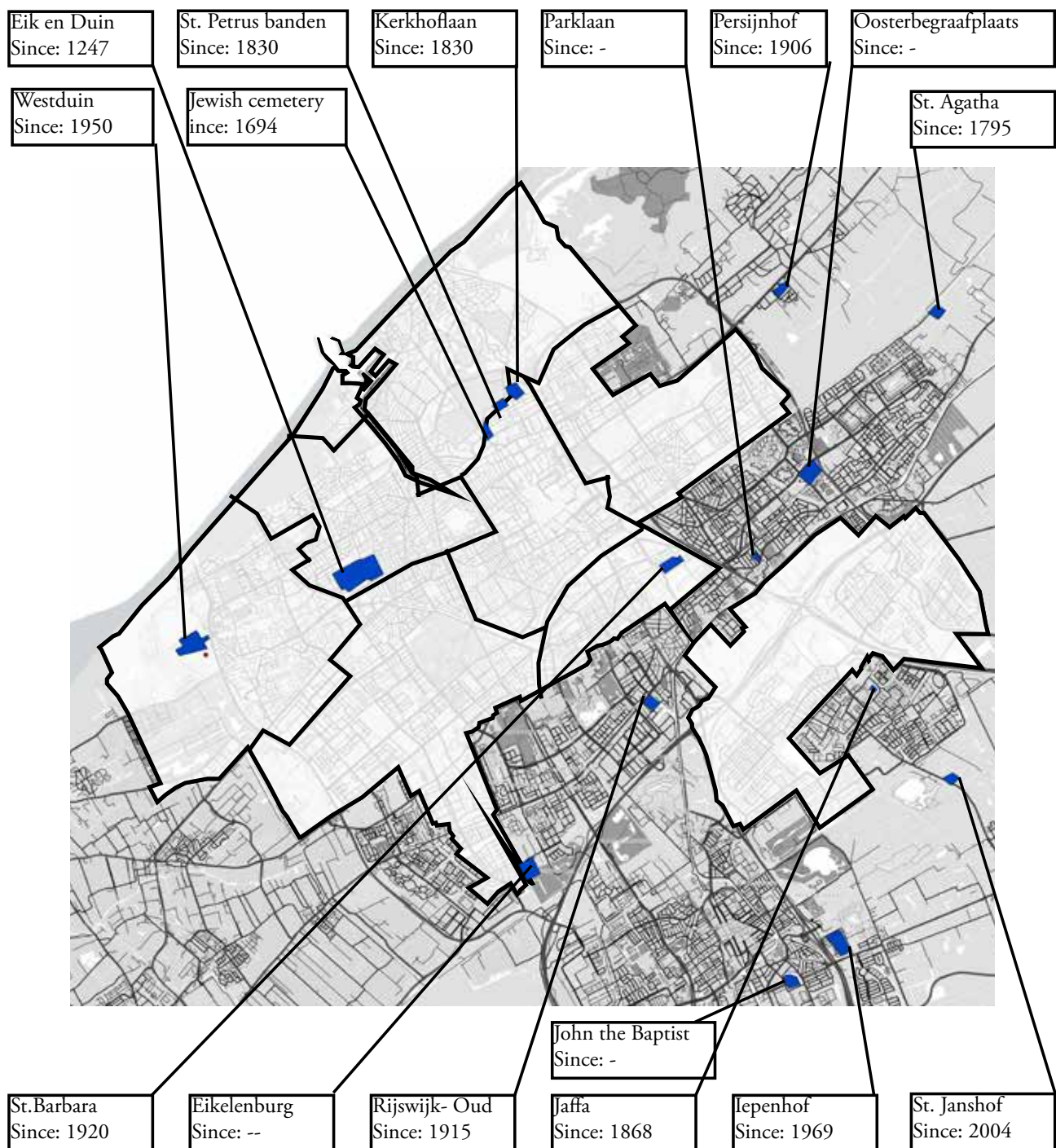
Figure 48. Cemeteries in The Hague

The Escamp borough is the only borough that does not have its own cemetery. This is partially due to the fact that this borough is one of the youngest ones comprising mostly of pre-war urban expansion, the post-war expansions and the most recent vinex wijken.

Furthermore, the oldest and largest general cemetery of the city is located next to this borough. Surrounding municipalities house the cemeteries related to specific religious orientations.
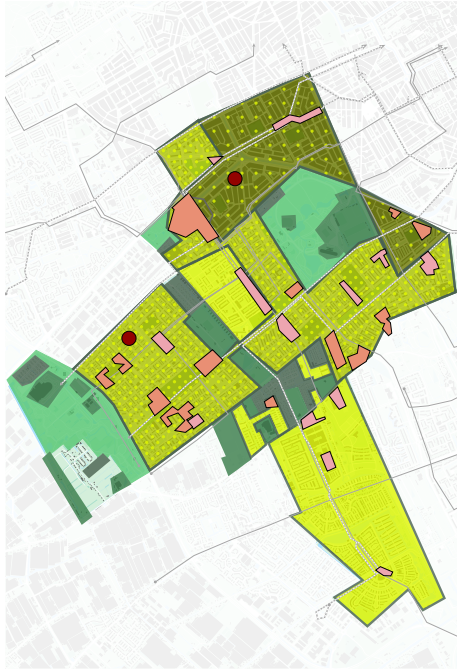
Site selection

The test sites for my gardens have been carefully selected in the chosen borough. The sites had to be located within residential areas but away from commercial or cultural function. This ensures that the gardens will be a destination in itself rather than a extra to an existing use. The sites are also both located near sounds of life like schools or backyards.

In my search I focussed on the interbellum and post war extensions of The Hague. These two areas both have a very distinct character, that is shown through urban patterns, and the views on nature as expressed in the relation with green space. This resulted in two very different spots.

The first site, in the pre-war area, is characterised by its density, bordering the backyards of family homes and apartments. The second site, in the post-war area, is characterised by a separation of function, situated next to a primary school. Furthermore, this helps in creating a suitable atmosphere for commemoration.
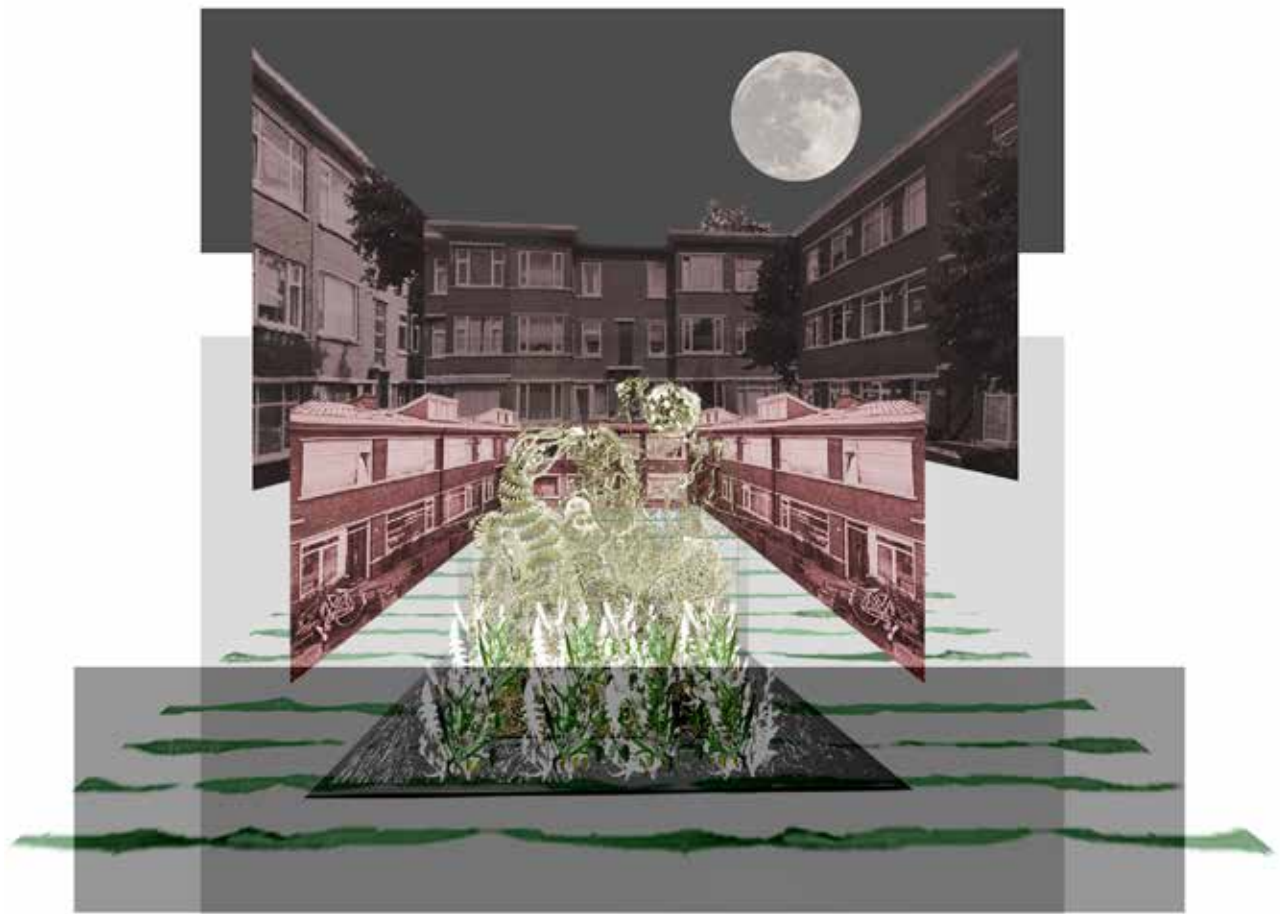
Garden 1

Site one is located in the interbellum expansion of the city. The neighbourhood's characteristic hierarchical layout is a perfect fit for the purpose of these gardens.

Plot situation 1

The first plot is situated in a rather shady place. In the summer one third of the plot is shaded and in the winter almost all of it. Furthermore, the plot is visible from the east and south neighbours. Due to this enclosure there is little wind.

It is in line with the houses, and borders the backyards of some. This intimate character belonging in the centre of this hierarchical neighbourhood has great potential for an enclosed green type.

It ensures that when leaving the bigger streets and entering the smaller housing area the scale already gets more human. This progression can be continued into the garden, as is demonstrated by the route of perspectives shown on the next page.

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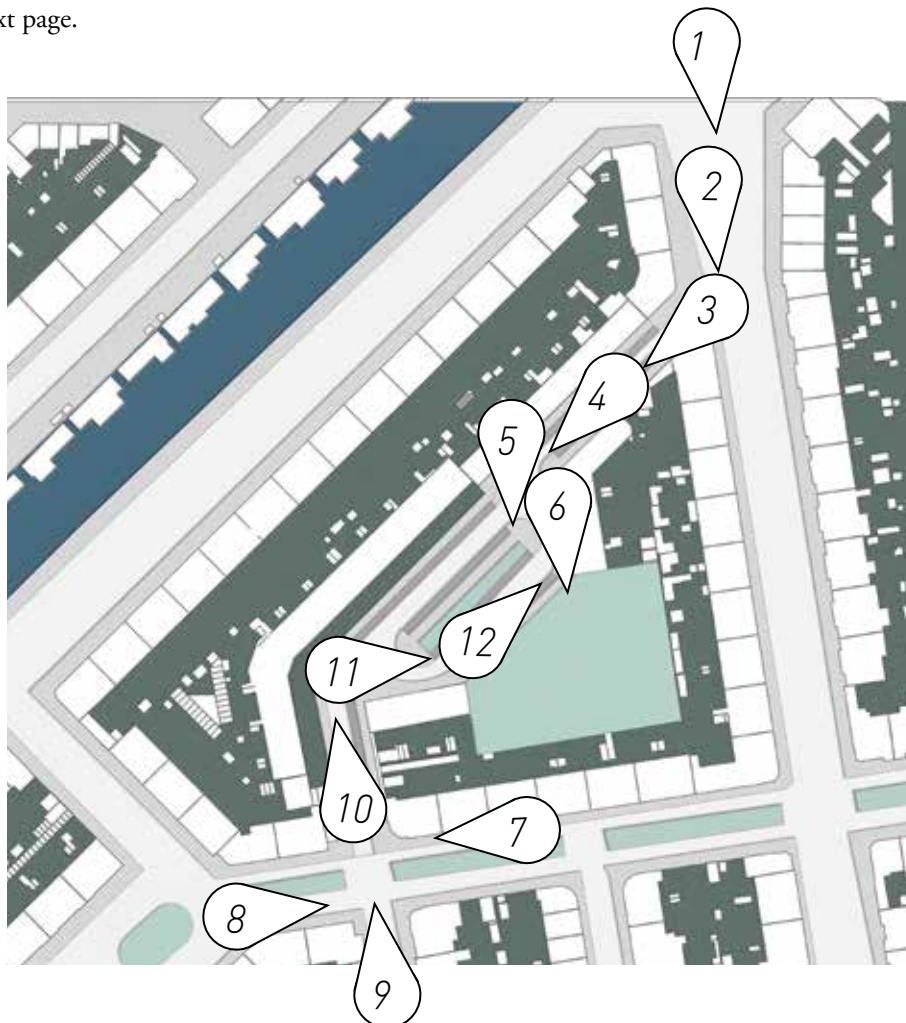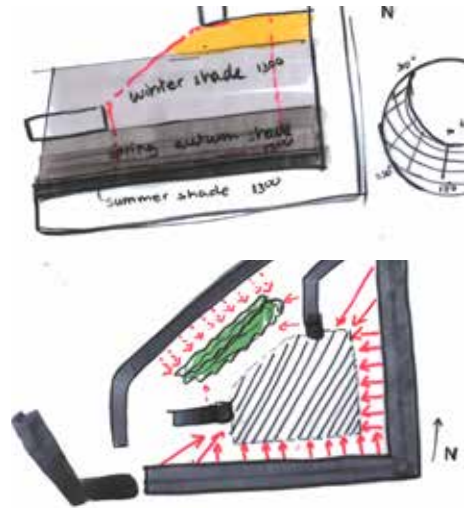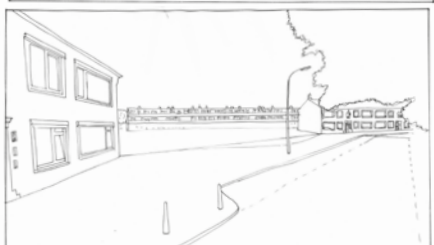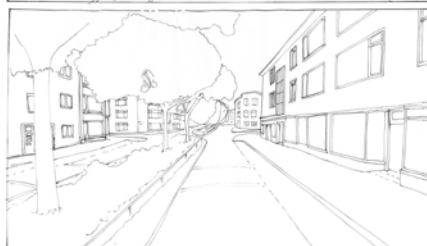
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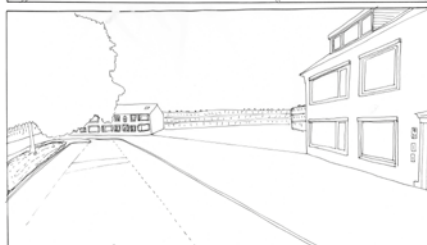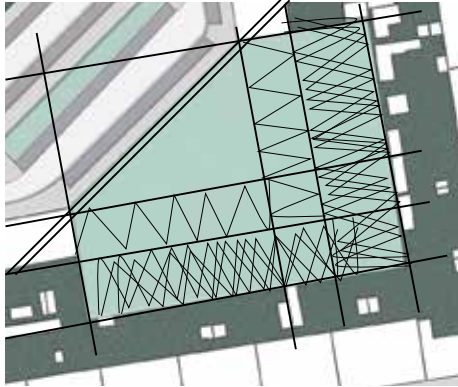
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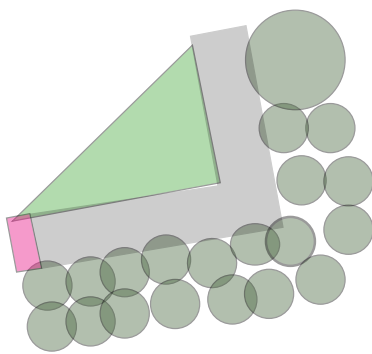
Three zones

Progression through the garden
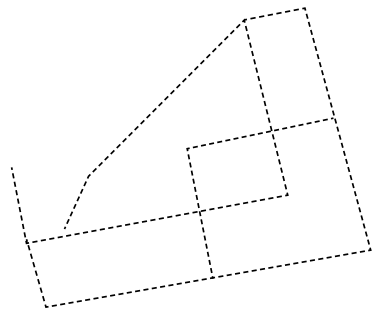
Circulating routes
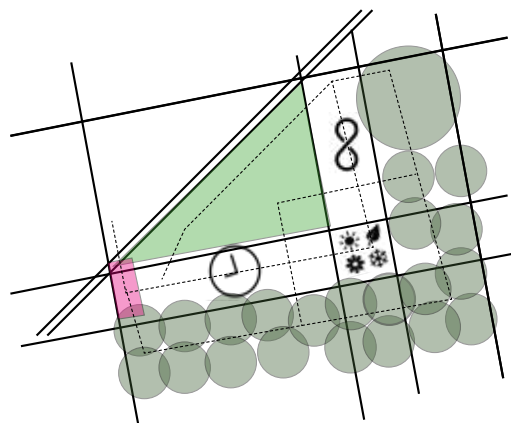
Garden 1

The first gardens deals with the theme of showing time. A series of four gardens shows a gradient in dealing with this theme. The first garden is focussed on the experience of the presence. The second and third garden try to engage with the seasonal awareness. The last garden aims to create a place where time's influences are tamed.

There is a meadow with wild flower areas half enclosed by this series of gardens. On the other side of the gardens is the denser area that shows a forest like atmosphere.

These zones are distinguished as spatial continuation of the surrounding areas. The wilder private forest takes the place of the back gardens.

The cultivated garden takes the place of the houses and the meadow is where the open public space would be.

The other side of the meadow is enclosed by a wooden pergola walkway, which has exits on both sides.

meter
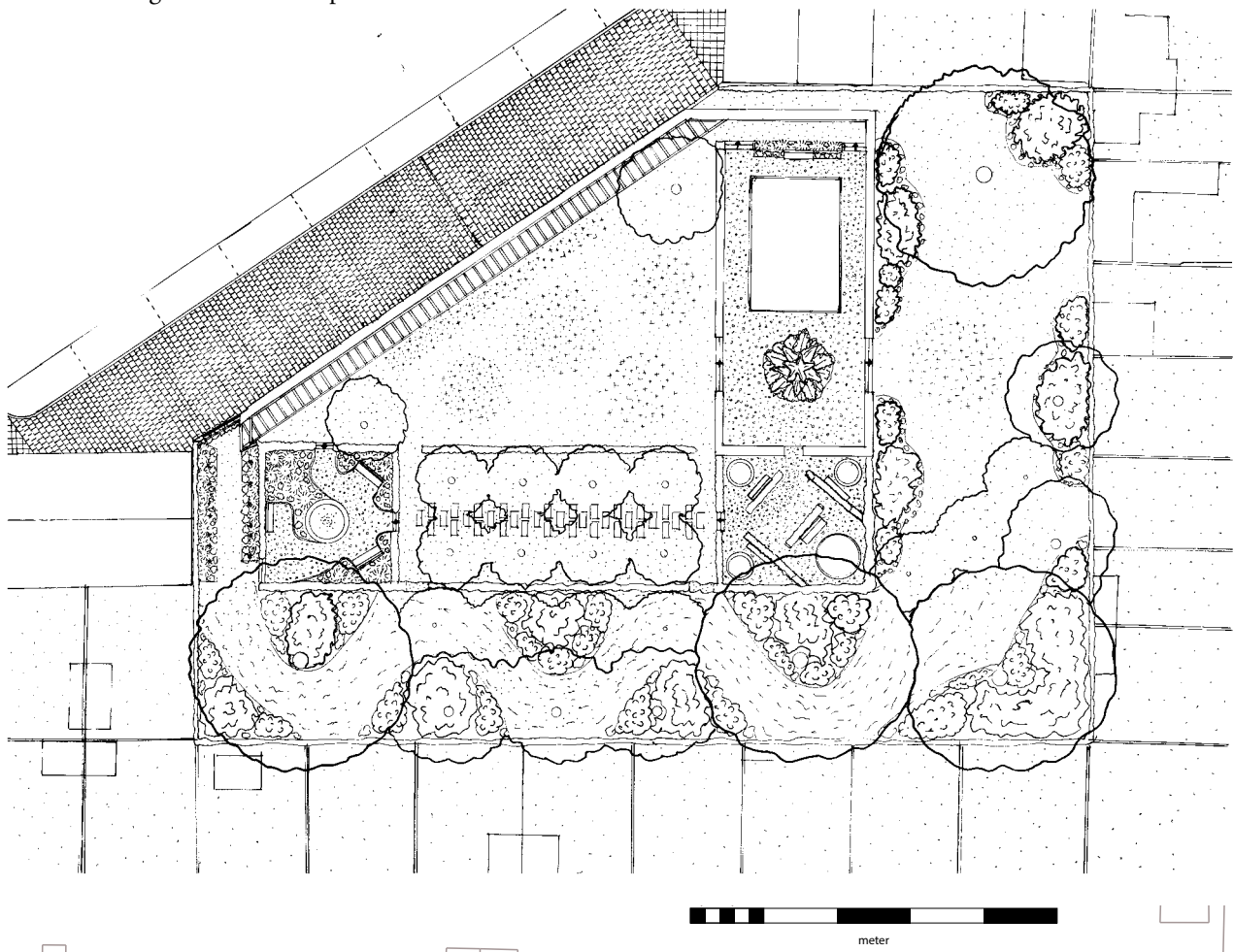
Flower entrance

The flower entrance is designed to give a homely feel and invite the visitor in. This atmosphere tries to put the visitor as ease. The path is lined with borders that will flower white and bright.

Halfway in, one can enter the first garden space. If one chooses to continue into the shady areas one enters the forest path.

The garden of moments.

The first garden is designed to immerse the visitor in the garden experience by fully engaging the senses. This is done first with a fountain of which the noise blocks surrounding noises.

This garden features high flowerbeds that are planted with species known for their scents and visual attractiveness as well as attractiveness to birds and insect. There are benches to sit and rest and allow the senses to enjoy nature.

The Garden of Seasons spring

The second space is an orchard of flowering apple trees
where a path of tiles leads the visitor on to the next garden.
On the side of the meadow the garden is enclosed with
a low hedge. On the south side a higher hedge closes the
orchard off from the forest area. Tree is placed

The Garden of Seasons autumn

The second space has benches placed facing the hedge
and the small lily ponds that are placed in the garden.
The middle of the garden is taken by two espaliers that
blocks the benches from the view of those who choose
just to pass.

The Garden of Eternity

The last garden in the series tries to stop the forces of
time. When in the mourning process one might feel
the need get away from everything that reminds of the
daily life, including the passage of time. This garden is
designed as a safe haven for such occasions. A place that
will remain the same regardless of what happens around
the garden. The centre piece of this garden is a reflecting
pool that links heaven to earth in its reflection.

Wild flower meadow

The wild flower meadow allows for enjoyment of the sunshine, contrasting to the smaller shady gardens. The meadow is bordered by a walkway that links all the spaces together. In the meadow a magnolia tree is placed to provide shade and privacy for the ends of the walkway.

The Forest

A curvilinear path leads through the forest. Various large shrubs block the view to the places that lie further ahead. At several spots the opportunity arises to enter the various garden or to pass through them to enter the meadow.

The forest ends at a clearing facing the biggest tree on the site; a common wing nut. During the season this trees displays its flowers in festive garlands. The dense canopy shelters the exit concealed behind the wing nut.
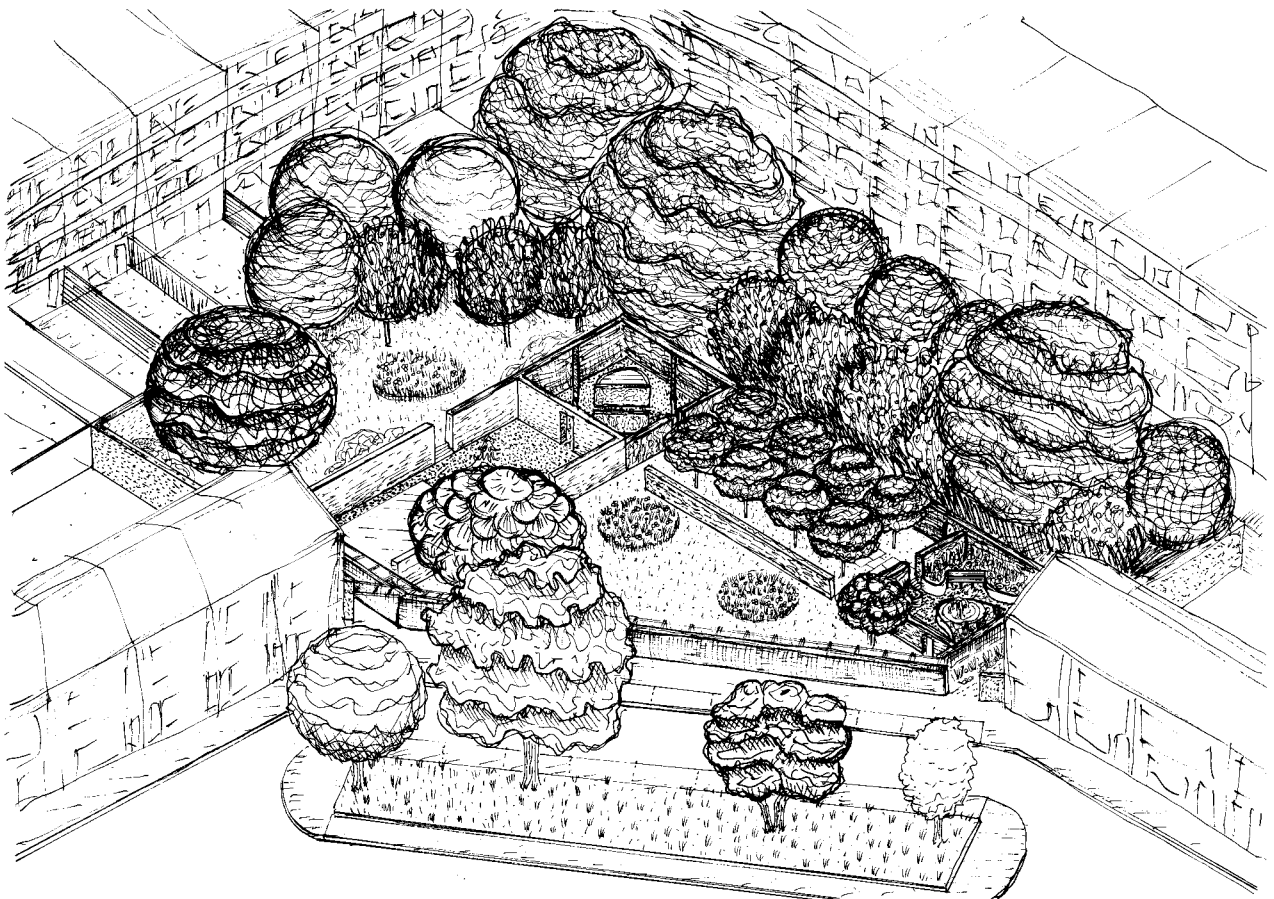
Garden 2

Site two is located in the post war urban expansion that has taken over the polder landscape. The neighbourhood is very open and lacks the hierarchy that is so typical for the first site.

Plot situation 2

The surroundings of the second garden could not differ more from the first. The open layout of the area ensures a sunny plot. The downside of the urban layout is that there are several high-rise buildings that look into the garden. Furthermore, there is no clear entrance since the garden is surrounded by public space.
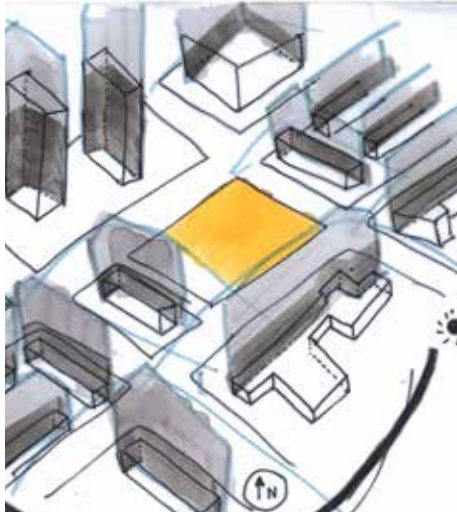
There are many trees in the surroundings and the neighbourhood is very green, but the green is rather monotone; mostly green planes and trees. The neighbourhood is characterised by vertical elements that act as landmarks. These can be seen in the perspective route surrounding the plot.

The garden is situated in the plot by creating a mound along the side of the plot along the high rise. This barrier closes off the garden, but also provides balance to the place. The forest zone is situated on this ridge. The main body of the rest of the garden is shaped by the meadow zone. The big space this creates is further divided into gardens, each forming separate elements in the space. These gardens symbolise different age groups of mourners.

The characteristic landmarks in the areas are represented in the garden by a watchtower that reaches out over the treetops of the forest from which one can take a position of power and look down on the garden as a whole.

The entrance is situated on the east side. Between the existing trees a small bridge leads visitors over the ditch into the garden. The bridge symbolises the transition from daily life into a sacred space. From there on one enters an enclosed hallway from where the different zones of the garden are accessible.

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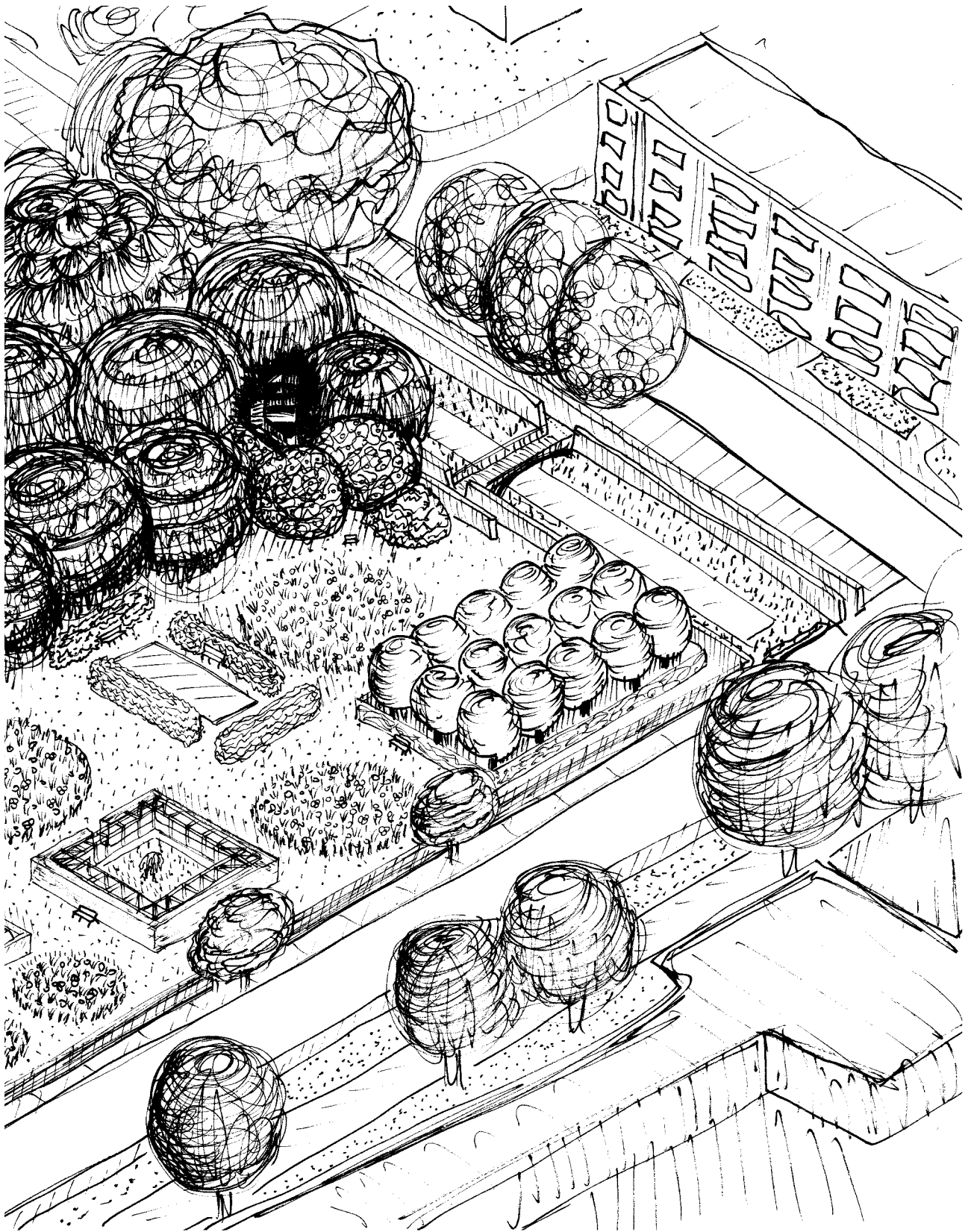*idea*
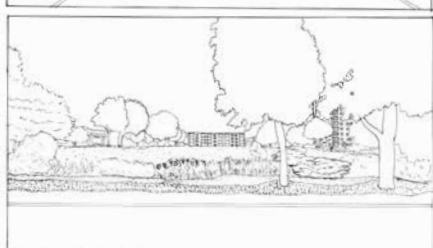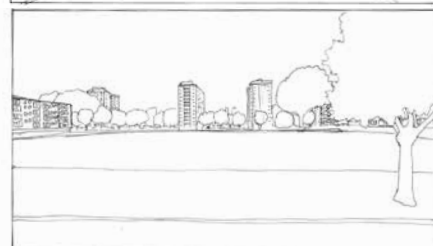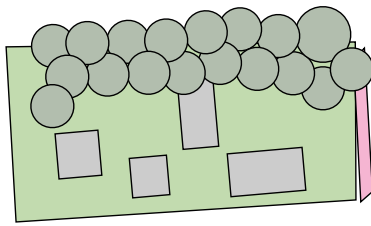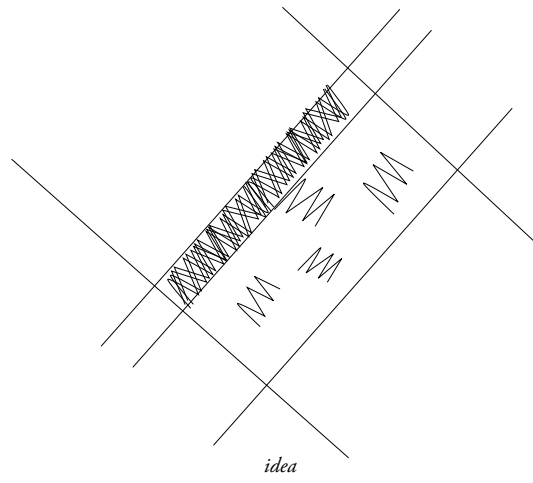
Three zones

Themes in the garden

Circulating routes

Concept
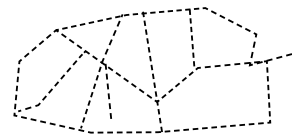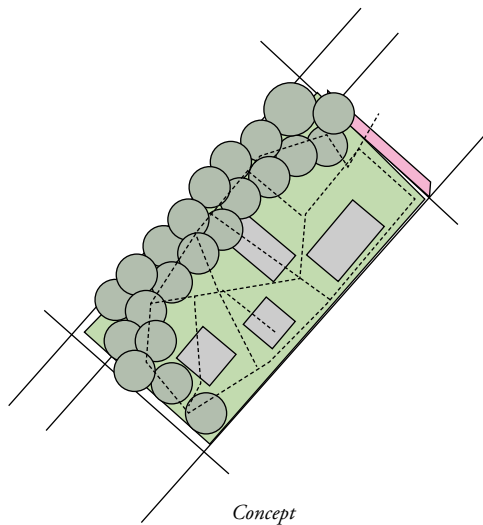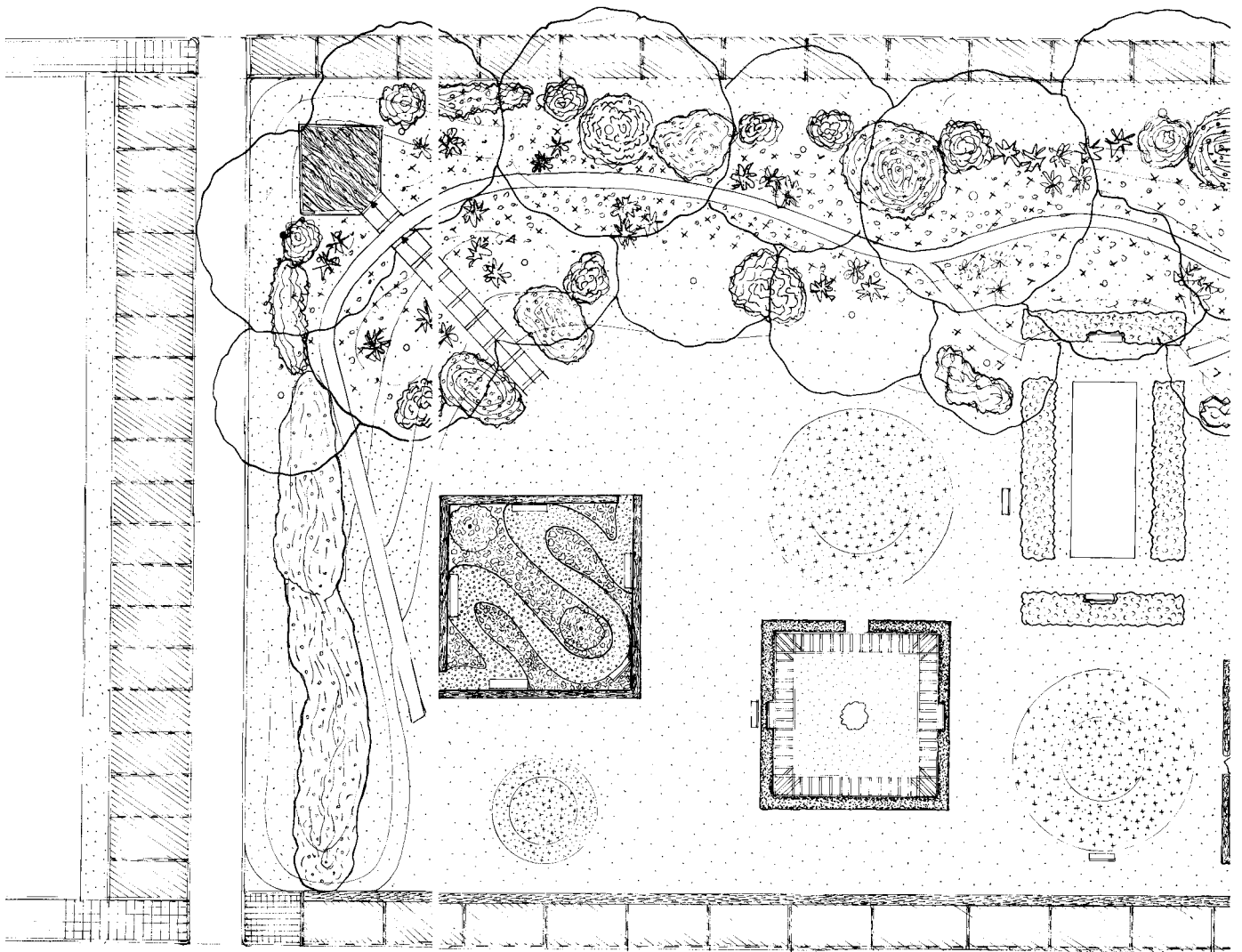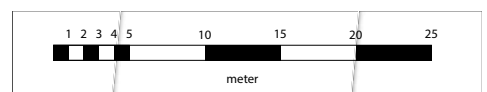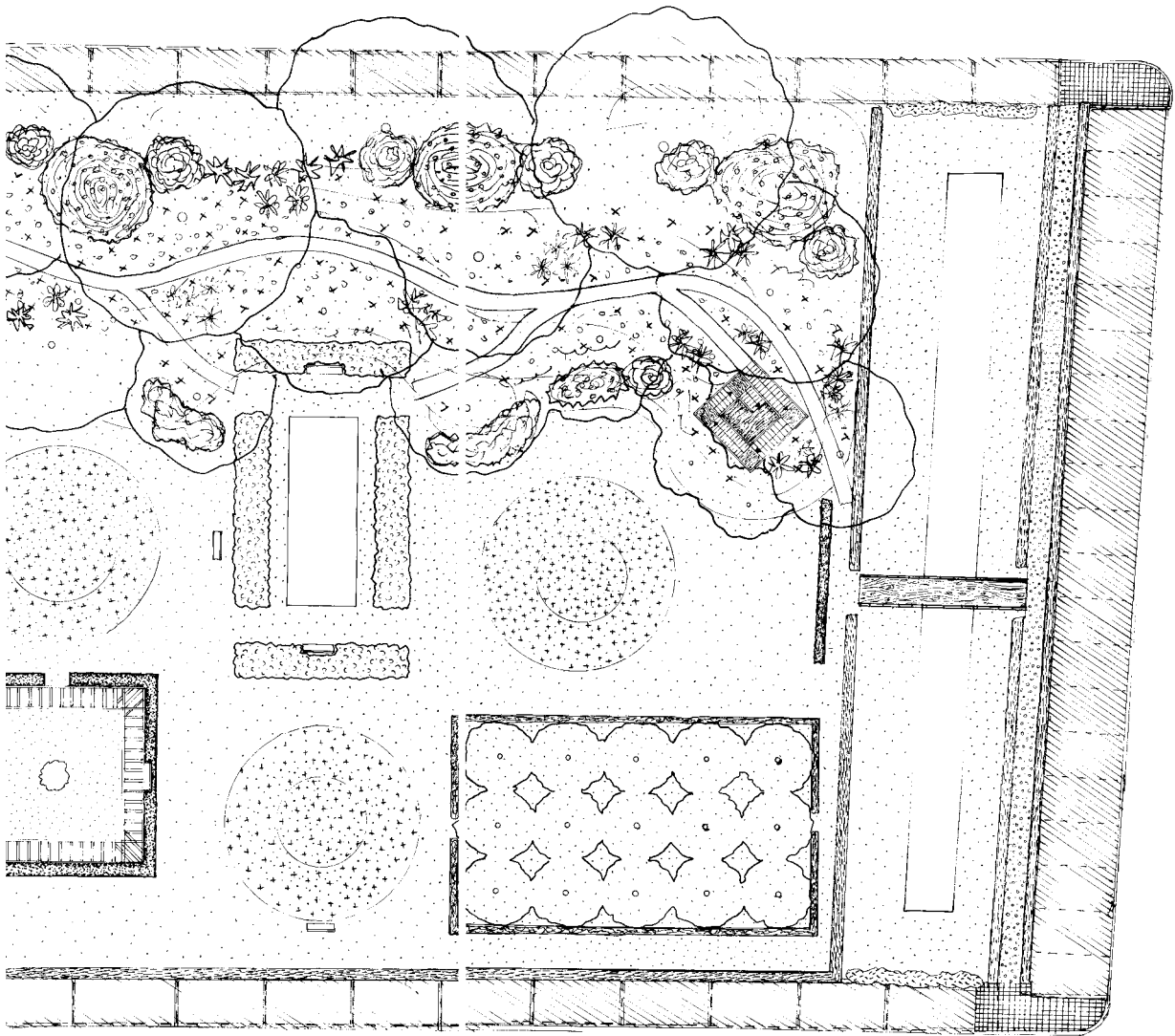
The entrance

The entrance to the garden is hidden away between tw
hedges. From there on, a bridge needs to be crossed
reach the commemoration space.

The Garden of Abundance

The first and largest garden represents the lengthiest part of life: our productive life. This garden takes shape as an orchard with fruit producing trees.

The strength that belongs in this life phase is translated into the use of deciduous hedges that shed their leaves in fall, opening the garden up to the surroundings.
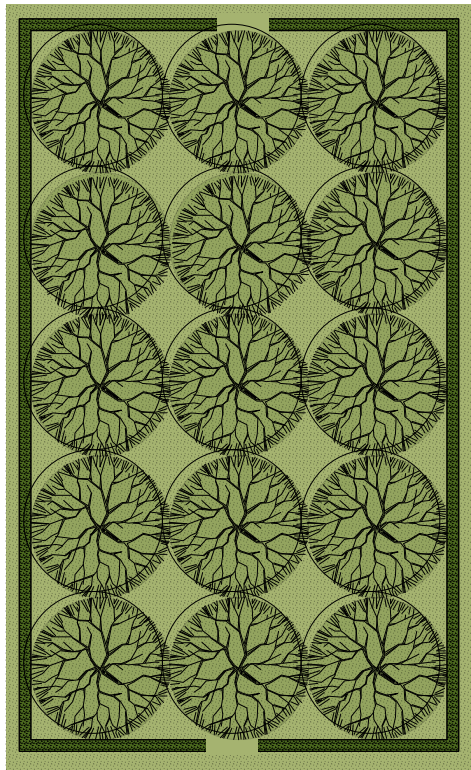
The Garden of Wisdom

The smaller second garden represents old age. A single weeping mulberry tree takes the centre in a square, reminiscent of a cloister garden.

The garden is enclosed by a wide protective evergreen enclosed by a. Along the hedge a wooden pergola structure allows for circular walks. In the shade of this structure benches are found on the east and west side.

The garden only has one point of entry, which is quite wide. From within the forest one can look all the way over the meadow into this garden through the wide opening and see and its mulberry tree.
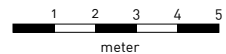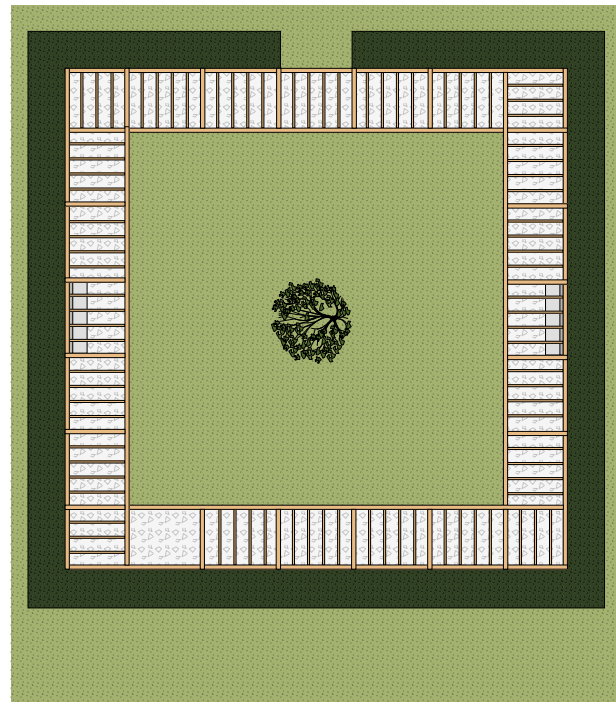
The Garden of Innocence

The last garden represents the young and youth. This concept is translated into a playful flower garden designed to attract insects.

The purposeful and erratic flight of bees resemble children going home. In Germanic cultures the erratic flights of bees have been further associated with wandering souls. Butterflies are a similar insect that is related to death, and due to it fragility often used to represent the soul leaving the body.

An arrangements of flowers that will bloom throughout the seasons provides continuous interest for these critters. A small water basin provides other needs. This garden is well closed by a thick hedge of evergreen Californian cypress in a fairy-tale blue colour that goes complements the white flowers.
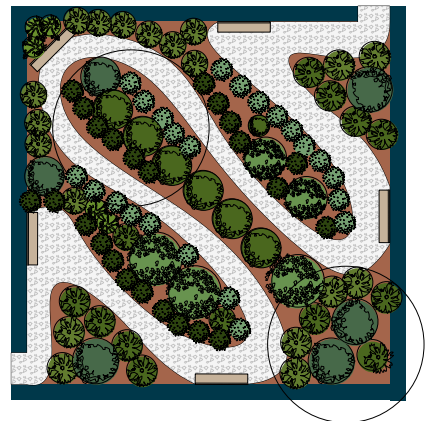
The Garden of Reflection

The second largest garden borders the forest and has entrances both from the forest side and the meadow side. The theme of this garden is reflection. This is quite literally translated to a reflective pool.

The pool aids in reflective thoughts by accentuating the other side. When sitting under the dense canopy of the forest trees one sees the open meadow reflected in the pool. When looking from the open meadow side of the garden one faces the forest and its reflection. The dark atmosphere of the frost is emphasized by the big red beech tree that is centrally positioned.

In contrast to the modern minimalist design of the reflective pool with its mirror smooth surface, the surrounding hedges are big and wild rhododendron shrubs displaying an abundance of white flowers.
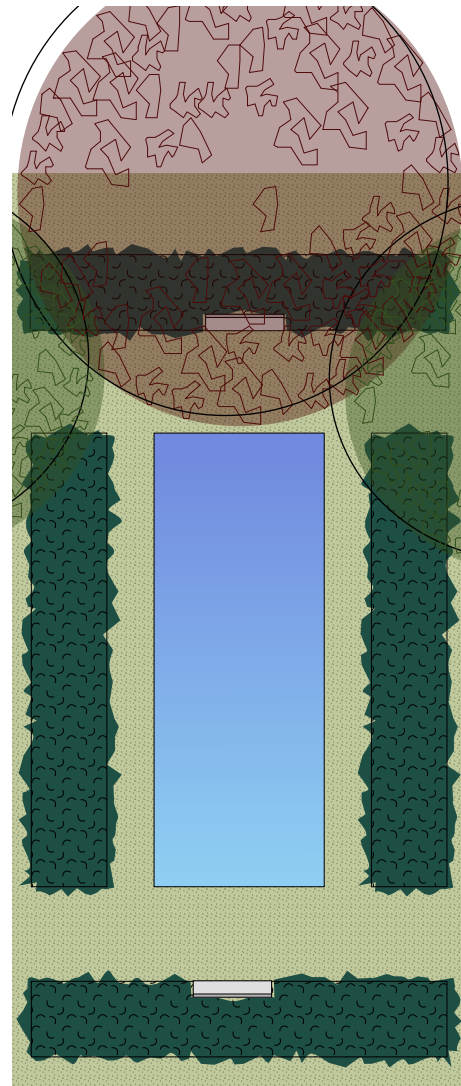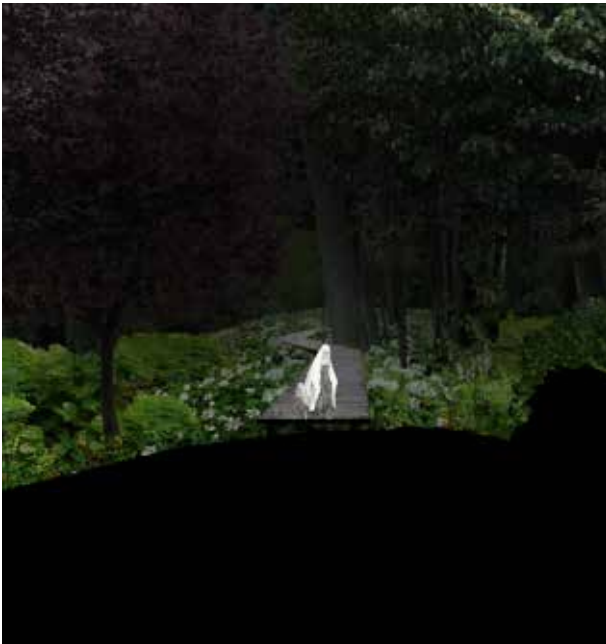
The Forest

The forest in this garden is situated on a ridge. The elevation allows for a pleasant view of the garden. At the end of the forest a small balcony provides a viewpoint back to the normal world. From here one can enter the meadow part of the garden or return through the forest.

The watch tower

In the beginning of the forest zone a watchtower is placed. The tower leads to a viewing platform 12 meters high. (As high as the middle high apartment buildings surrounding two sized of the plot.

The tower is placed against the existing full grown populus tree that blocks the view outward of the garden. Higher trees on both sides of the tower frame the panoramic view into the over several gardens in the garden.

The viewing platform is oriented to the south and will be a bright lit sunny place. The stairs towards the platform are hidden behind the trees to further enhance the achievement of reaching the top when breaching through the upper dense canopy.

Management and details

1. *Use of the garden*

How far are people walking to reach it? Yang and Diez-Roux (2012) found a median walking time of ten minutes for daily walking trips. For trips to a memorial garden that are more likely weekly or monthly these ranges could be bigger.

Furthermore, there might be a differences in geographical mobility depending on the urban plan. In more traditional neighbourhoods with a finer denser set up is designed for bicycles and foot rather than cars unlike the modern neighbourhood.

However, the 10 minutes forms a conservative estimate to start from. Walking time of 10 minutes will open up a residential area of about 70 ha. Earlier statistics predict 0.75 people die a year per ha in this borough. This equates to about 52 people passing each year within the conservatively estimated daily walking trip distance.

2. *Opening hours*

The gardens of commemoration should help in developing an environment where open expressions of grief can be both accepted and even supported. Ideally so we as a society may more easily adapt after loss, and grow accustomed and more resilient to it.

To ensure safety and dignity the garden will be closed at night. On certain dates the garden will be open at night, like the "lichtjesavonden" at cemeteries. Where cemeteries only do this once a year, these gardens could do it more often when there is demand.

At these nights everyone could be welcome, alone or together, to dwell on the loss of loved ones. These moments can also be used to commemorate certain types of deaths, allowing bereaved with comparable grief to meet up and console each other.

3. *Garden as ash destination*

Since the garden doesn't rely on fragile natural environments, it is possible to allow for scattering of ashes.

The two commemoration gardens are approximately 0.25 and 0.5 Ha. If all nearby deceased would be cremated and wish for their ashes to be spread in the gardens, that would result in 52 scatterings yearly each. This corresponds to a respective scattering density of 208 and 104 per Ha. This number falls well within the ash scattering guidelines of 370 per Ha per year for heavy metals. The phosphorous content exceeds the threshold of 90 scatterings per Ha per year, and will require monitoring once every 25 years. The flora for the gardens have been carefully selected to take possible over-fertilization into account.

4. *Management of the garden*

Design details Garden 1

I have chosen to detail the route of water features that is the main theme of the first garden. The first water feature is a fountain that will block out the sounds of the surrounding urban life. It is thus situated at the beginning of the garden.

The fountain has a wide brim of concrete of sufficient height to sit on. The pathways in between are from white gravel. Against the fountain a planting feature is placed that continues the dynamics of the water by featuring species that move much in the wind.
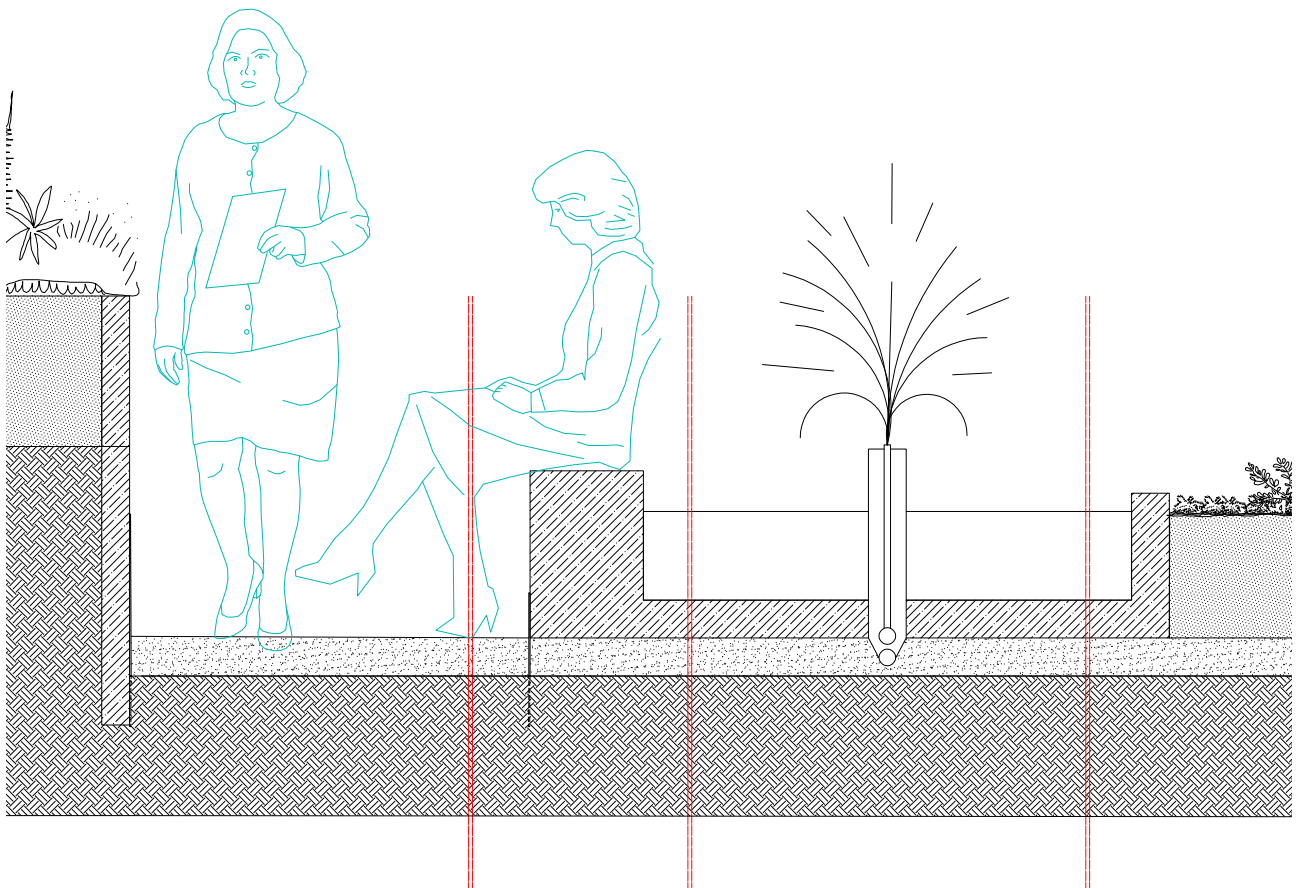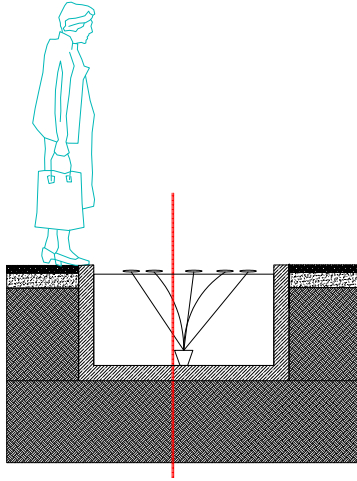
The second water feature is a quiet lily pond that will relate to the outer world by showing seasons in the flowering times of the lilies. The other elements in this garden join in this effort by displaying seasonal differences in colouration of the hedges.

The pond is designed with straight lines in circular shapes that accentuate the theme of the lily leaves. The pond is positioned below ground level to link the visitor to the earth.
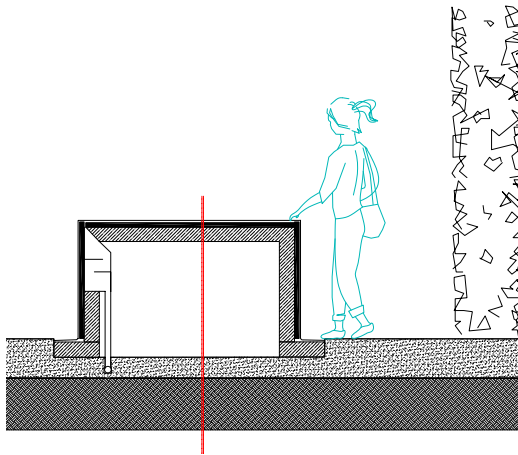
The last water feature is the reflection plane. This water feature links heaven to earth in reflection. This theme is taken further into the garden by a selection of only evergreen elements. The garden takes a neutral position versus time. Deepest in the garden is the place where time stands still, furthest positioned from the hustle and bustle of daily life.

Therefore the water plane is elevated. By continuous water pressure a smooth mirror like reflective plane is created.

Design detail Garden 2

As essential element of the second garden I have chosen to detail the elevated pathway in the forest. This element has an ambitious purpose: creating a forest-like enclosed dense atmosphere in the small space.
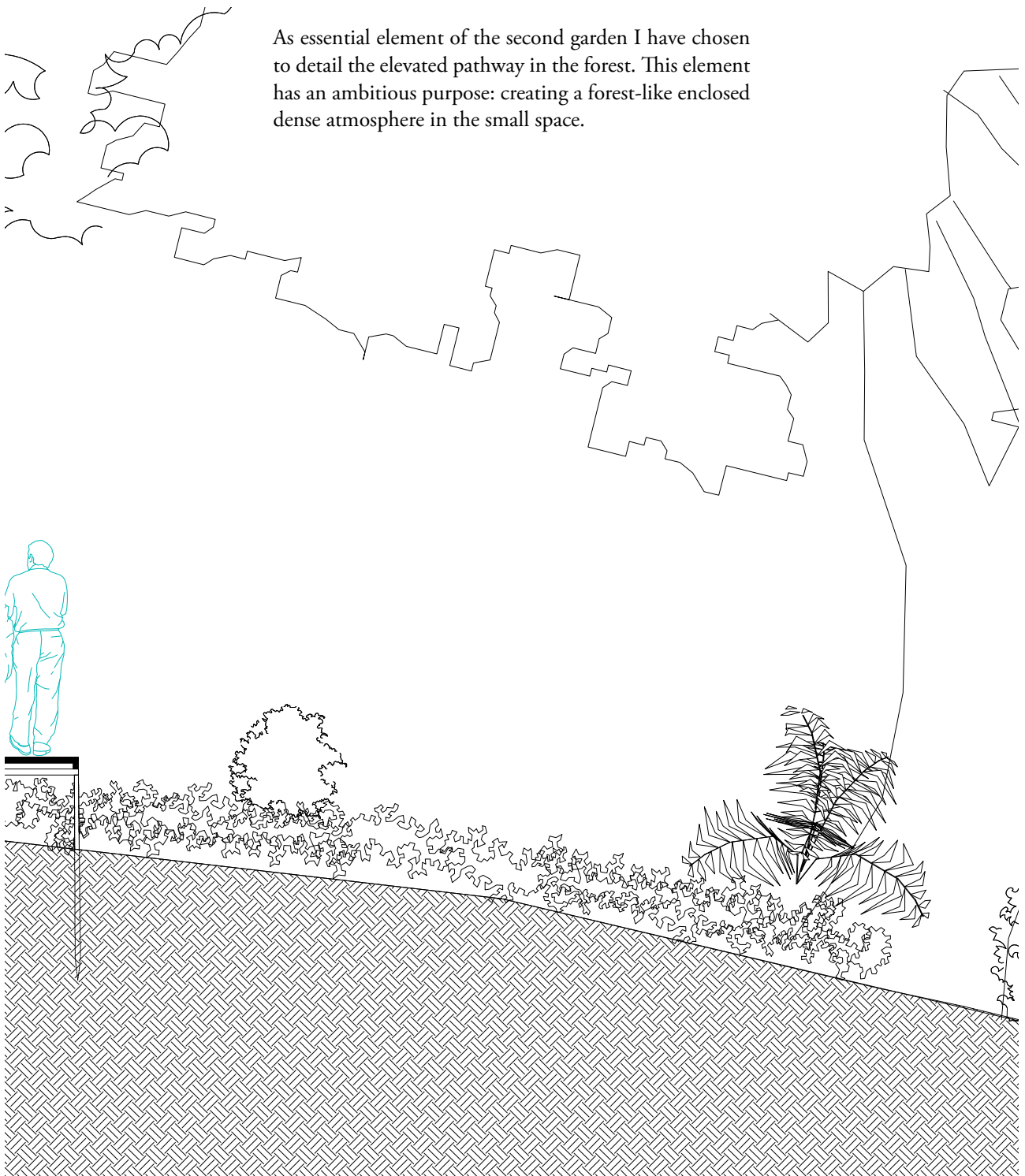
Wild flower meadows

The wild flower meadows are sown with seeds of white flowering wild flower species that are native to our country. T May and October. He species ensure there are always some plants blooming between May and October.

- Achillea millefolium (gewoon duizendblad)
- Alliaria petiolata (look-zonder-look)
- Cardamine pratensis (pinksterbloem)
- Centaurea montana 'Lady Flora Hastings' (knoopskruid)
- Chenopodium bonus-henricus (brave Hendrik)
- Claytonia perfoliata (winterpostelein)
- Coriandrum sativum (koriander)
- Cosmos bipinnatus 'Sonata White'(kosmos)
- Daucus carota (wilde peen)
- Echinops sphaerocephalus
- Fagopyrum esculentum (boekweit)
- Filipendula ulmaria (moerasspirea)
- Galium molugo (glad walstro)
- Helianthus annuus 'Italian white' (zonnebloem)
- Leucanthemum vulgare (wilde margriet)
- Luzula campestris (gewone veldbies)
- Malva moschata 'Alba'(Kaasjeskruid)
- Matricaria recutita (echte kamille)
- Nigella damascena 'Miss Jekyll White' (juffertje in 't groen)
- Plantago lanceolata (smalle weegbree)
- Raphanus sativus subsp. oleiferus(bladrammenas)
- Reseda lutea (wilde reseda)
- Reseda luteola (wouw)
- Serradella Ornithopus sativus(serradella)
- Silene latifolia alba (avondkoekoeksbloem)
- Silene vulgaris (blaassilene)
- Trifolium arvense (hazepootje)
- Valeriana officinalis (echte valeriaan)

Garden flower selection

The gardens are filled with flowers that flower throughout the season. The designed selection features only plants with white flowers.

- Buddleia 'White Ball' (butterfly bush)
- Chrystanthemum
- Viburnum Davidii
- Camellia Japonica (White)
- Lavandula angustifolia 'Alba'
- Echinacea purpurea 'White Swansun
- Salvia nemorosa 'schneehugel'
- Acanthus mollis 'Rue Ledan'
- Lupinus 'Noble Maiden'
- Eupatorium maculatum 'Album'
- Deutzia gracilis 'Nikko'
- Fothergilla major
- Spiraea betulifolia 'Tor'
- Helianthemum 'The Bride'
- Hydrangea paniculata 'Savill Lace'
- Leucanthemella serotine
- Phlox 'Calvides White'
- Narcissus triandrus 'Ice Wings'
- Physostegia virginiana 'Summer Snow'
- Aruncus diocicus
- Helleborus niger
- Tulip ' mount tacoma'
- Liriope muscari 'Monroe White' & Muscari botryoides 'Album'
- Prunus subhirtella 'Autumnalis'
- Wisteria sinensis 'Alba'
- Fallopia aubertii

Forest species

The forest is built up from three layers. First and largest Capitalization are the trees. These provide the canopy and the shade resulting in a cooler and moister environment. These are species like:
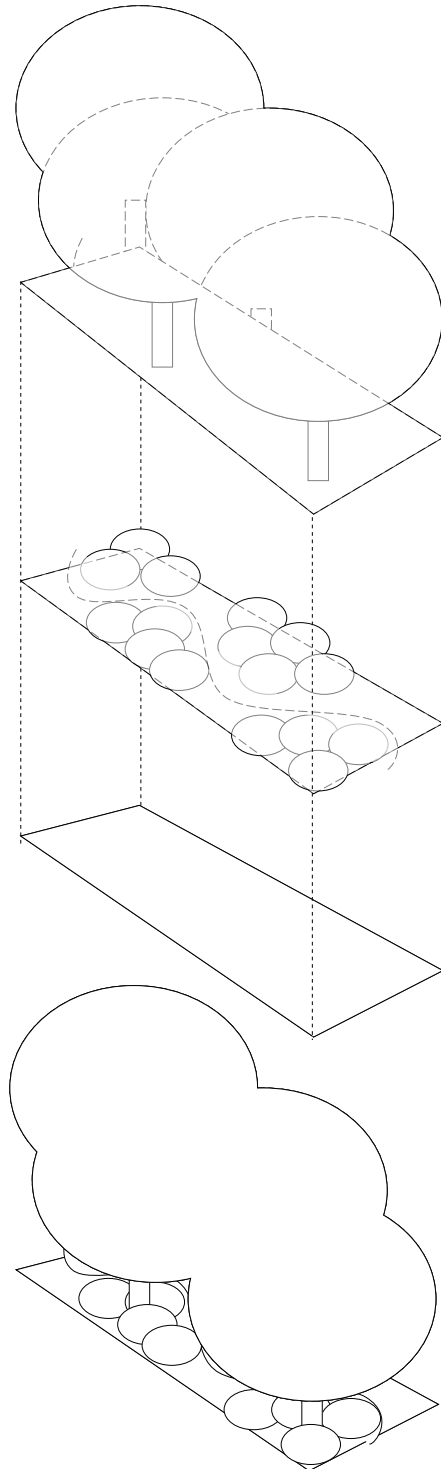
- Beech
- Oak
- Linden
- Hawthorn
- Elderberry

Since this forest is so small a layer of big woody shrubs has been added to block the view and create curves routes. Species like:

- Viburnum
- Rhododendron
- Hazel

The surrounding area is filled with flowering groundcovers and small ferns like:

- Wood anemone
- Lily of the Valley
- Bears leek
- Bracken

Phasing of the plan

The garden will be planted all at once to ensure it is ready as soon as possible. The different characteristics of the separate areas are directly linked to the time it takes for them to take shape. The zones will be finished in the following order: meadows, gardens, shrub layer of the forest.

Phase 1 (1 year)

Everything will be planted all at once. This will lead to relatively empty flower beds of small saplings before the plants grow in, spaced out wide enough to give them room for their future size. The tiny trees do little for the space, and are very far from resembling the forest they will grow into.

The grass planes and the wild flower meadows will grow fastest into their final shape. Many herbaceous plants that live annually or biannually will sprout up quickly after sowing the seeds. They lift the first tip of the veil, revealing a part of the final look of the garden. The meadow will be enclosed by the hedges.

These hedges can be purchased in full grown state dividing the garden as a whole into separate garden rooms, ensuring that the space is already usable and capable of providing some sense of enclosure for separate users at the same time.

The non living materials of the garden will be built already; the paths, the pergola walkway and the benches. Lastly the water features can be installed providing a soothing sound to the first visitors.

Phase 2 (5 years)

After the first years the garden areas will have neatly grown in. The entrance will start looking representative for the purpose of the garden. The first and the second zones are all ready.
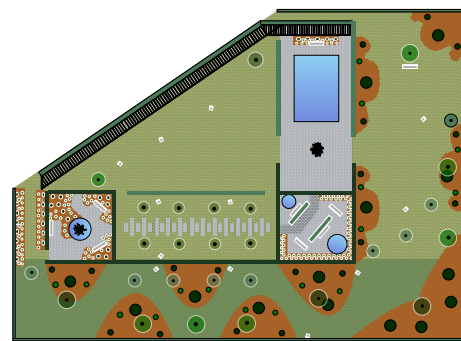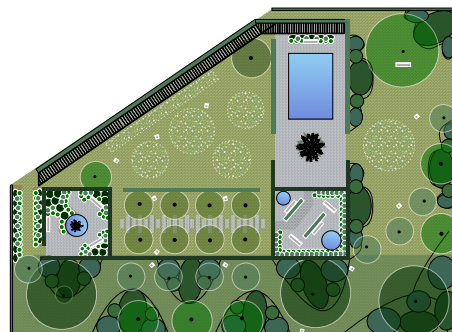

Phase 1 (1 year)
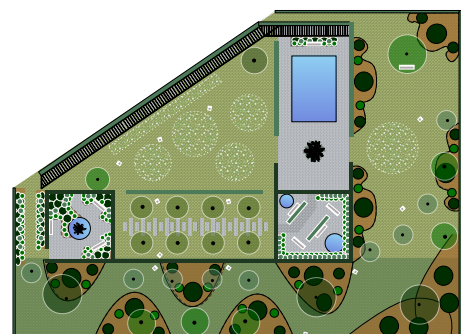
Phase 2 (5 years)

Phase 3 (10 years)

After 10 years the shrubs will be neatly filling out the space under the trees, although the canopies are not nearly full grown. With the shrubs big enough, the space already hints at its future appearance.

Phase 4 (20 years)

After approximately 20 years the trees will have their wide canopy. The garden will be finalised now the last zone has matured. The full grown trees ensure privacy from the surrounding buildings.

Phase 3 (10 years)
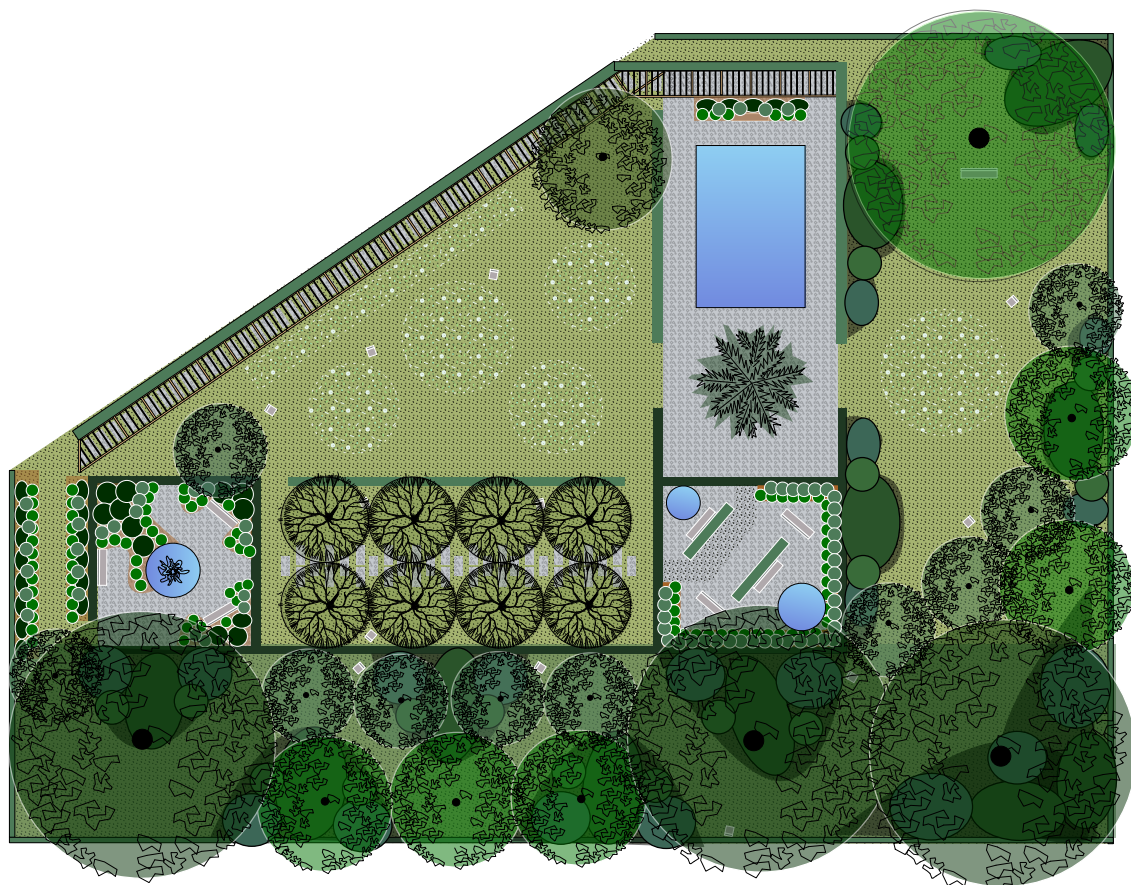
Phase 4 (20 years)

Metropolitan scale

The left map above shows the area of influence of the two chosen locations to test my concept. This concept is designed to be replicable in all residential areas.

The map to the right shows a situation where all residential areas have their own commemoration garden. This would provide everyone with a quiet place to mourn or to contemplate life when they are in need of nature's healing power.

In new urban areas to be developed this type of green space can be taken into the programme of facilities that society needs. This could improve the life of the general population and especially assist people going through vulnerable periods.

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Conclusion

My project aims to explore a new spatial concept of our landscapes of grief, that can assist grieving members of society better in their adoption to the change that death brings. This project aims to demonstrate the ability of landscape architecture to spatially translate the findings of non-spatial disciplines into our spatial realm.

The initial research question was quite broad: aiming to examine the possible future of cemeteries in urban environments. A broad exploration of the context led to a concept of commemoration gardens. I created a toolbox for this concept to aid in the design of these places and ensure the replicability.

The design of such a commemorative garden is created by combining this toolbox with the specific elements of the site. To explore the implementations, the toolbox is applied to two very different locations within the city of The Hague. The designs that follow from this demonstrate the benefits of this new concept both in regard to the feelings of the bereaved as well as in regard to possible changes in methods of disposal. The designs showcase the spatial language to be associated with these places.

Reflection

I started my thesis project with a fascination of how our society deals with our dead and the spatial consequences this has. My aim was to uncover a way of dealing with the dead, that would more closely answer the needs of the bereaved and support the integration in society.

This research will be relevant for society. For society it can improve the standard of living in several ways. First and foremost, it provides the mourning with a place to mourn in their daily surrounding. For others it can provide a place for silent contemplation, and the benefits of the healing powers of nature. In our current social media absorbed life, much effort is put in portraying a perfect life, and hiding the less appealing parts of human existence. This project aims to provide a physical place suited for the gracious expression of the non-perfect parts of life, be it a place to meet with people and talk about the sadder parts of life, a place where one can wander alone, or to plant and witness the flowers that commemorate the dearly missed.

The scientific relevance lies in the question of what do we do with the death in our ever-growing population? These questions are universal, and other countries have already started exploring possibilities. However, since funeral customs and death related practices are so culturally tied it is essential to explore this problem from a Dutch context, as one of the most densely populated countries. More closely related to the discipline of landscape architecture this thesis tries to collaborate on the spatial translation of the principles of healing gardens in non-medical contexts. Broadening the applicability of these concepts in order to improve the lives of the general population and especially those who need it the most.

In the de design process I have been fascinated with Elise van Doorn's model of the design process. She distinguished five elements that are always present in the process. These elements are:

1. Experimenting or exploring and deciding: Coming up with alternatives on the one hand and finding criteria, testing and evaluating on the other hand; diverging and converging at the same time.

2. Guiding theme: A theme or concept that guides the design process.

3. Domains: there the experimenting takes place is. Domains in architecture:

1. Space

2. Material

3. Site

4. Function

5. Socio-cultural context

4. Frame of reference: References provide patterns,

diagrams, rules of thumb and solutions to be used further in experimentation.

5. Laboratory: Our means of doing. In architecture this laboratory consists of visual language, sketching and modelling.

My initial research led me from looking at our history of dealing with the dead, to the scientific advancements that led to our current methods of physically dealing with the dead, on towards future proposals of body disposal, ending with the needs of the bereaved and a concept of a spatial programme that could replace our cemeteries. This initial quest borrowed a lot of information from other disciplines but eventually resulted in a landscape architectural design challenge.

Parallel to this I started visiting cemeteries. Initially I studied several nearby cemeteries. Subsequently I started to specify and visit cemeteries incorporating specific design ideas or cemeteries that are known for their atmosphere. These experiences grew into my frame of reference, regarding space and material.

From this point on a different kind of research started. A landscape architectural research based on one hand on the site analysis and on the other hand on my observations from case studies. These served as guidelines for the design. This methodology is fairly subjective and susceptible to personal opinion and preferences, instead of being as robust as evidence-based design. Ideally one would be able to combine these two design strategies. However, evidence is scarce when exploring new fields.

After P2 I started experimenting within the architectural laboratory of visual design tools to get a better idea of what spaces in my design should be like. While I was generating experimental spaces I developed criteria to judge these with. For P3 I had iterated upon my initial designs to form a collection of elements I deemed essential. These elements guided me back into literature research focused on healing gardens. By combining design experiments and the new insights that this literature brought me I could further refine my elements into a toolbox that can be used for the design of this type of gardens. The time until P4 has been filled with site models experiments to further investigate the use of the

toolbox I designed and to see how this toolbox can be applied to two radically different neighbourhoods.

My graduation project resonated with the theme of the graduation studio Flowscapes. My project looks at flows in the sense of natural processes and seasonal cycles in relation to the cycle of human life. When someone passes away, we think of it as the end of an era, an abrupt linear demarcation in time. Contrasted to this when flowers and trees wilt, we see it as a part of the season, a fading cycle in time. By establishing memorials that decay I hope to accentuate a view of death as part of a the natural life cycle, encouraging grief to lessen and pass with the seasons, and bringing people back closer to nature.

I have filled P5 with iterating upon and refining the details on my presentation memorial gardens, allowing them to provide the essential sensory elements that are necessary according to my research.

When dealing with the dead ethical issues are likely to appear. In the beginning of my thesis I thought of designing a fitting space to accommodate for new and promising methods of bodily disposal, especially alkaline hydrolysis. It soon became evident these methods are not yet legalized and facing ethical objections. Different and new is often labelled wrong and unethical. People have strong opinions of what should and shouldn't be done with our deceased. (Particularly controversial practices for example can be found in the Irish wake games.) Facing expressed personal preference objections and an indeterminate legalisation, adaptation to new methods of bodily disposal is rife with uncertainty. I refocused my research on the universal and long lasting effects of death upon society. This was the catalyst for my design concept of a memorial garden that can aid in the grieving process. Regardless of the preferred method for disposal of the body, the memorial garden concept remains timeless, making this design tool set a valuable contribution to the discipline of landscape architecture, showcasing the healing power of nature for the bereaved.

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Appendix:

1. examples of cemetery buildings

2. P2 design and post-P2 modelling studies

3. P3 design and post P3 modelling

Appendix 1 Examples of cemetery buildings

1. Build examples

Catacombs of Paris, 1774

The catacombs of Paris are underground ossuary which hold the remains of more than 6.000.000 people. It was created to relief the pressure on the city's overcrowded cemeteries. They have not been long in use and quickly transformed into a touristic attraction rather than a solution to the problem.

San Cataldo Cemetery, 1971

Although not in a highly urbanised setting, this cemetery already embraced a vertical form. The cemetery consists of one square building in a courtyard lined by covered walkway, open arcade. The whole complex had no windows or doors, consists only of shells with places to put the urns. The complex houses the remains of about a 1000 dead. Only parts of the original plans were executed, the original design features more walkways in the courtyard, greatly increasing the death density.

Memorial Necrópole Ecumênica in Santos, Brazil (1983)

This Brazilian cemetery is designed considering death

as a reflection of living. Dominic Fretin, architect of the building: "We live one above the other and we die one above the other- with a view." (A Tomb with a view, Aeon Videuo, 2017) This tower has burial spaces as well as a cinerary, a crematory and facilities. This building has space for up to 25.000 remains. The spots are varying in price depending on the location within the view and the view. The tombstones are alike, for the family there is the possibility to put fresh flowers. Further personalisation seems impossible.

Vertical extension of Yarkon cemetery (2014)

This Israeli vertical cemetery, an extension to a overfull cemetery at the outskirts of Tel Aviv, is now the default option for this region. It offers space for up to 250.000 graves, providing enough space for the coming 25 years. Muslims, Eastern orthodox Jews and orthodox Christians oppose cremations. Furthermore, these religions require burial in perpetuity. To maintain tradition and dignity for the departed without taking more space from the living This building was built. Rabbis have ruled this building kosher. All bodies must be buried separately on a layer of dirt. Columns filled with dirt connect all floors to the ground.

Jerusalem's new underground cemetery.

This project is well on its way to being build. This project is a literal reference to the underground burial in caves and tunnels that were usual in biblical times. In our current times, the problem of space shortage is answered

using state of the art excavation techniques, reviving old practice. The plans offer space to 22.000 individual graves. The deepest 50 meters below surface. The costs of the excavations are estimated around 50 million USD, making the graves relatively affordable compared to the rare alternatives that city offers, which run op to 20.000 USD.

2. Hypothetical solutions

Martin McSherry, Oslo

This project aims to actively impact its surroundings, by reminding the city of death's existence. McSherry implemented different area s for Jewish, Muslim, Christian and non-believers in the same tower. The tower also provides a columbarium. One important aspect of this project is the idea that this building should grow with the number of deceased it contains. Being continuously expanded as more are interred. From a spatial of point of view this tower simply aims to create more of the conventional park like cemetery.

Tower for the death

This project is an entry for the 2011 Skyscraper competition by Israel López Balan, Elsa Mendoza Andrés, Moisés Adrián Hernández García. The project proposes an inverted skyscraper to house the death. The route to the depth is designed to reflect the emotional journey of the bereaved

- Shock
- Emotional release
- Crisis
- Symptoms of distress
- Hostile directions
- Guilt
- Depression withdrawal

Silo Crematorium

Two students: Fredrik Thornström and Karolina Pajnowska came up with the plan to convert a old grain silo in to a columbarium. This adaptive reuse aims to bring the death closer to the living, since the crematorium is only half of the plan. The other silo is planned to be transformed into housing. In the crematorium a large space is created for the ceremonies. A second large opening features a waterfall. Each urn will have its own spot.
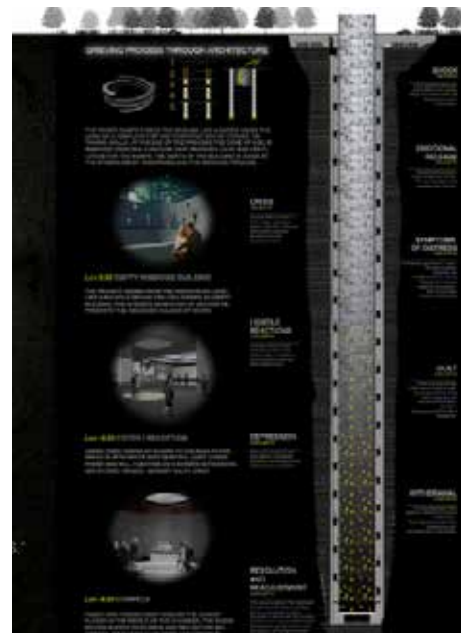
Appendix 2 Design P2
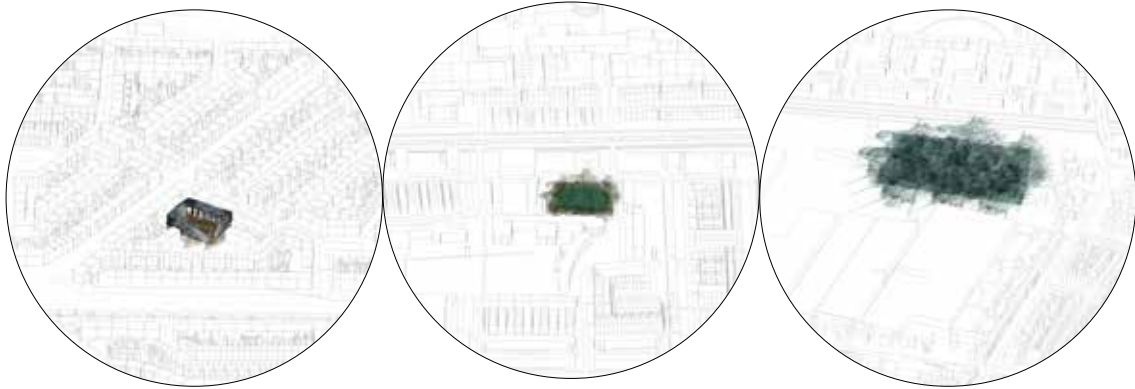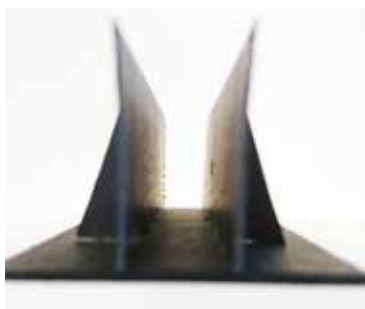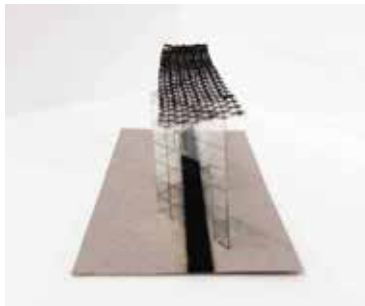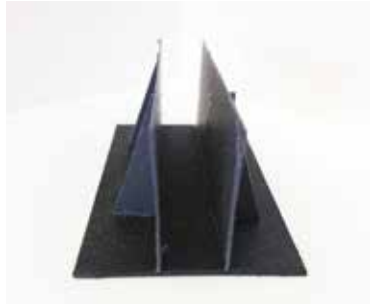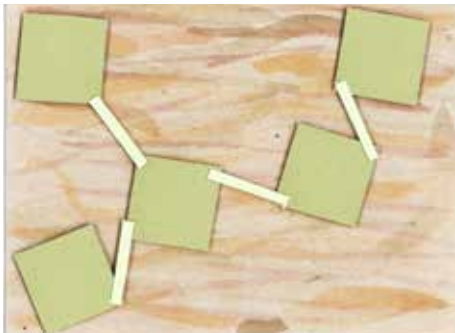
⑥ Cosy place, only sky visible

Ⓐ GROUP PLACES

(2.1) VIEW
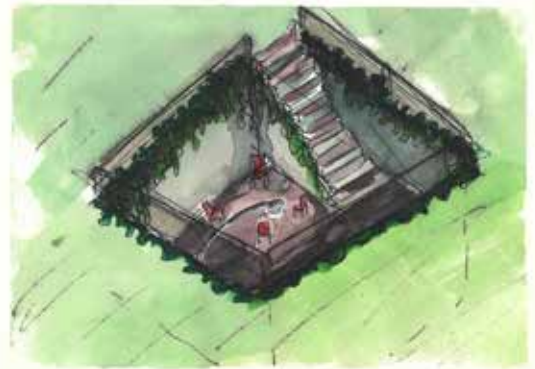
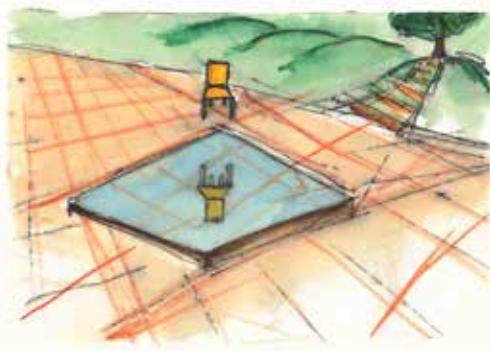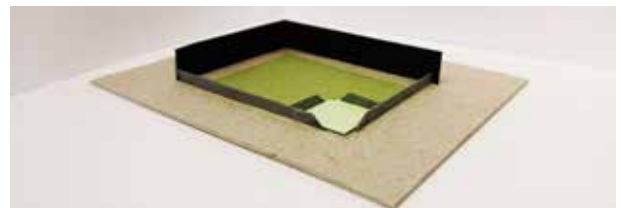⑩ Safe under tree, Pterocaria?

⑥ GRAVE MOUNT LANDSCAPE

① single experience
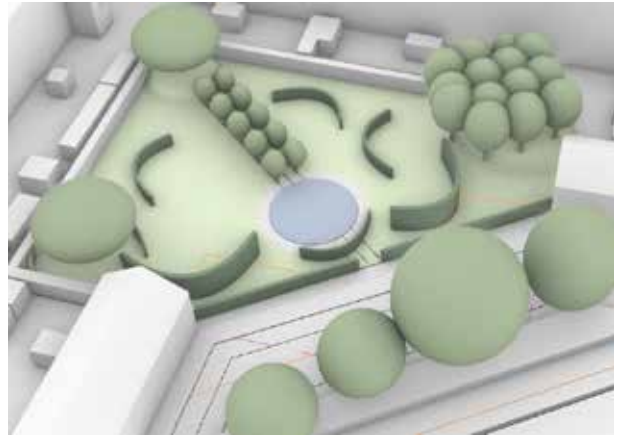
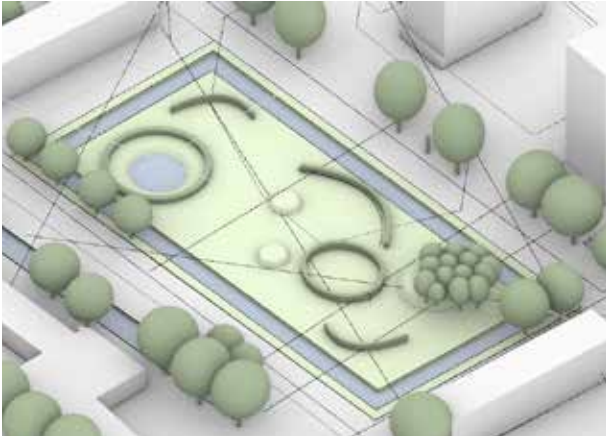*Post P3 Site model experiments*