

CREATING CHILD-FRIENDLY SPACES TO IMPROVE SOCIAL INTERACTION:

A CASE STUDY ON WILHELMINA OORD, A FORMER BENEVOLENT COLONY



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ABSTRACT

This thesis presents a design for Wilhelminaoord, the Netherlands. Established in 1821, Wilhelminaoord was part of the colonies founded by the Society of Benevolence. The aim of this utopian social experiment, initiated by Johannes van den Bosch in 1818, was to discipline and train the poor in self-sufficient farming villages. The current landscape is characterised by the original grid-like layout and in 2021, with its legacy of experimentation, large parts of Wilhelminaoord were recognised as a UNESCO World Heritage Site.

A spatial disconnect caused by the grid-like layout is found in Wilhelminaoord, which is currently a normal Dutch village. Next to dispersed public spaces, there is also a lack of child-friendly spaces, like playgrounds. The aim of this study is to design child-friendly spaces in Wilhelminaoord to improve social interaction amongst children, while preserving the historic landscape attributes of the former colony. A literature review was performed on children's social interaction in public spaces, which were then compared to the site's existing conditions. Additionally, a site analysis was done on the historic landscape attributes from the colonial period, defined by UNESCO. Using the method of research through design, a Village-Scale and Detailed Design of Wilhelminaoord is presented. The design is focused on safe and green spaces, and the representation of the village's history through learning landscapes. A child-friendly garden is developed, to represent the former colony's self-sufficiency.

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1 INTRODUCTION

Established in 1821, the Dutch Wilhelminaoord was part of the colonies of the Society of Benevolence. The aim of this utopian social experiment, initiated by Johannes van den Bosch in 1818, was to discipline and train the poor in self-sufficient farming villages (Schrauwers, 2020). The different colonies are recognised by a grid-like layout, with small identical houses equally spaced out. Each house included a small plot of land for home gardening, and a larger agricultural field (Dorgelo, 1964). The grid-like layout of the colonies and its legacy of experimentation was recognised as a UNESCO World Heritage Site in 2021 (UNESCO, 2017).

A spatial disconnect is found in Wilhelminaoord, which has evolved into a normal Dutch village, located in Drenthe (Figure 1). The few public spaces from the colonial period are very dispersed, causing a spatial, but also social, disconnect (Dorgelo, 1964). Although around 13% of the town's residents are children under the age of 15, very little child-friendly spaces are found (CBS Dataportaal, 2023). Wilhelminaoord scores a 0 out of 100 (Dutch mean = 60) on sports- and playgrounds in Beweegvriendelijkheid (Mulier instituut, 2024). The village has shown interest in creating a communal play garden (*beleef- en beweegtuin*), which has yet to be realised (DFW, 2024).

More research needs to be done on how cultural heritage, particularly, spatial heritage, can be adapted and preserved through spatial interventions. Additionally, the ways of how spatial and social connections, specifically in former colonies, could be improved for children.

1.1 THESIS STATEMENT

This thesis aims to create a design for child-friendly spaces in Wilhelminaoord to improve social interaction, while preserving the historic landscape attributes of the Benevolent Colony. With this aim, the following main research question has been defined:

In what ways could children's social interaction in Wilhelminaoord be enhanced through spatial interventions, while preserving historic landscape attributes?

To aid in finding the answer to the research question, three specific research questions have been defined:

SRQ1: What design principals promote social interaction for children, and how are these currently applied on site?

SRQ2: Which historic landscape attributes are currently found within the landscape of Wilhelminaoord, and which cannot be changed according to the UNESCO World Heritage?

SRQ3: What spatial interventions could add child-friendly recreational play options which promote social interaction and educate on the colony's self-sufficiency?



Fig. 1. Map showing the province of Drenthe and the village of Wilhelminaoord (data: CBS, 2024; map: Van de Wetering, 2025).

2 THEORETICAL FRAMEWORK

2.1 KEY CONCEPTS

The following key concepts have been investigated to create a design for Wilhelminaoord, and to answer the research question:

Children's Social Interactions: This study will research how children (ages 3-12) interact with each other in public outside spaces, and how this can be increased through design (see Child-Friendly Spaces). Children's Social Interactions are often seen during play (Stanton-Chapman et al., 2018). The attractiveness of outdoor play is enhanced by seeing other children, as children are more inclined to go outside, and play, if it is with another child (Furneaux et al., 2019).

Child-Friendly Spaces: This study will research which features make a child-friendly space, specifically an outdoor space, like parks, streets or playgrounds. A child-friendly space is often defined as a safe, varying, green space, with different attributes for play. These include, but are not limited to enclosure, the use of natural materials, climb attributes, and space for active play (Pelletier et al., 2014; Veitch et al., 2020).

Historic Landscape Attributes: This study will research the historic landscape attributes of the Colonies of Benevolence, specifically the colony Wilhelminaoord. Different landscape attributes originating from the colony are found in the village of Wilhelminaoord. The grid, the tree-lined avenues, and the spatial pattern of the farmhouses resemble the original structure of the colony's landscape (UNESCO, 2017).

3 METHODOLOGY

3.1 METHODS AND MATERIALS

To aid in answering the research question, the methods of Research for Design (RFD) and Research through Design (RTD) were applied (Lenzholzer et al., 2017). SRQ1 and SRQ2 followed RFD, while SRQ3 followed RTD.

3.1.1 SRQ1

For SRQ1, a literature review was conducted on the key concepts of Children's Social Interactions and Child-Friendly Spaces. The platform Scopus was chosen, for it contains a large number of peer-reviewed articles. A literature search was performed on May 13th, 2025. The following keywords with spelling variations were extracted from the key concepts:

Children's Social Interactions: *social interactions; social activities; social encounters.*

Child-Friendly Spaces: *spatial attributes; spatial qualities; spatial design; spatial characteristics.*

To account for the target demography of children, the keywords child(ren) and youth were also included. The keywords rural, street, road, pavement, play, and leisure were included to limit the search to leisure and street interactions. The keywords were to be found in the titles, abstracts, and keywords of peer-reviewed articles.

The subject area of the literature search was limited to Environmental Science and Psychology. Only publications published during or after 2010 were used, to identify a modern view on social spaces. The articles were limited to the English language.

The search string was defined as follows:

TITLE-ABS-KEY ((social AND (interact OR activit* OR encount*)) AND ((spatial OR spac*) AND (attribute* OR qualit* OR design* OR characteristic*)) AND (child* OR youth) AND (rural* OR street* OR road* OR pavement* OR play* OR leisure*)) AND PUBYEAR > 2009 AND PUBYEAR < 2026 AND (LIMIT-TO (SUBJAREA, "ENVI") OR LIMIT-TO (SUBJAREA, "PSYC")) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (LANGUAGE, "English"))*

The literature search resulted in 173 articles. The abstracts of these articles were then scanned for relevance to the study. Exclusion criteria included the articles being unrelated to design, children, outdoor environments, or social interaction. This resulted in 28 articles deemed relevant to the study. These articles were then scanned to reject articles which did not include relevant design principles. This narrowed it down to 13 articles useful to the study, from which the design principles were extracted.

The results of the literature review, alongside field visits for a site analysis, were used to define and categorise relevant design principles that could be applied to a design. Additionally, the design principles were identified in the current situation of the site.

3.1.2 SRQ2

For SRQ2, the UNESCO World Heritage Nomination File (applied scientific research) has been studied, along with scientific literature, to highlight the Historic Landscape Attributes of the colony, and to examine the design opportunities and restrictions (UNESCO, 2017). A site analysis has been performed using current and historical maps, to get a visual understanding of the historic landscape attributes.

3.2 DESIGN PROCESS

3.1.3 SRQ3

For SRQ3, a focus was on combining spatial features from SRQ1's literature review and SRQ2's historic landscape attributes, to design a detailed spatial intervention. This intervention is meant to further preserve and highlight the historical value of the site by combining recreational play with the self-sufficiency of the former colony. Different design principles, identified in the previous sections, have been combined and tested with two design variants.

3.1.4 RELIABILITY & VALIDITY

To ensure reliability and validity in the literature review, different exclusion criteria have been defined for the screening of the articles. For the site analysis of present time, only recent (post-2020) data was used, to ensure validity. To ensure the reliability and validity of the design, every step was supported by scientific literature.

SRQ1 and SRQ2 have resulted in different design principles, opportunities, and restrictions, according to the relevant key concepts. These were layered to create two different design variants, for SRQ3. After testing and evaluating the variants, one final detailed design was then chosen. The Village-Scale design is based on the principles found in the SRQs.

A flowchart of the process is found in Figure 2.

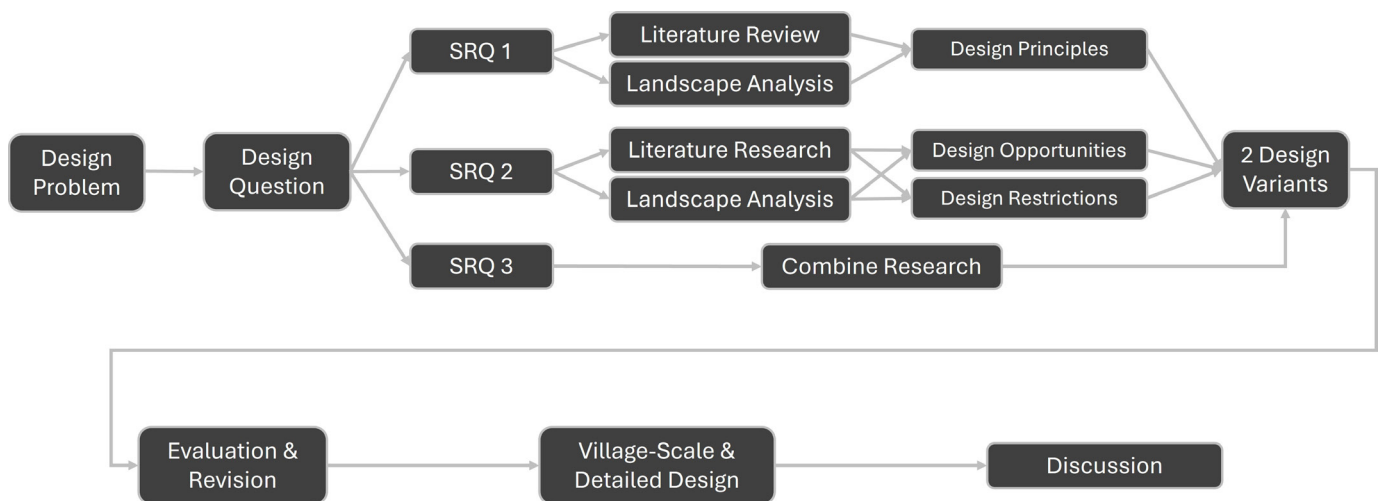


Fig. 2. Flowchart of the design process (Van de Wetering, 2025).

4 RESULTS

4.1 SRQ1

4.1.1 LITERATURE REVIEW

The following design principles were found during the literature review:

Learning Landscapes: using engagement in activities as a way to promote learning in context is also known as Learning Landscapes. It can be applied to free play, guided play, and games (Hassinger-Das, 2014). These child-focused community-specific activities promote children’s outdoor play (Moran et al., 2017; Pelletier et al., 2024). This in effect promotes social interaction. As an example, implementing a children’s garden can have a positive effect on the learning of social skills and engagement with nature, especially in a naturally rich environment (Laaksoharju et al., 2012).

Green Spaces: green spaces display more positive social interactions (Van den Bogerd, 2025). It also provides opportunities for hiding places and play. Grass fields provide opportunities for active play (Kreutz et al., 2021). Natural elements contribute to the area’s level of enjoyment, which is a way to encourage children to walk to school (Romero, 2014).

Safe Spaces: although independent mobility of children on the street increases the potential of social interaction, children are often kept off the street due to danger of strangers and vehicles (Furneaux et al., 2019). Rural communities should focus on creating safe outdoor spaces (Pelletier et al., 2024). Dead-end streets are generally associated with opportunities for safe outdoor play (Islam et al., 2016). Alleys provide a safe space for play between children, with more liberty in self-directed play (Furneaux et al., 2019).

Playgrounds: playgrounds offer a place for children to meet (Romero, 2014). They should be physically accessible, but also include play equipment that provides a variety of play opportunities (James et al., 2022). They should also incorporate unique and challenging equipment (Stanton-Chapman et al., 2018). Peer play (play among multiple children) account for more social interactions, which should be reflected through multi-user play equipment (James et al., 2022; Kreutz et al., 2021).

The following table includes some features that have a positive effect on social interaction:

Table 1. play area features that have a positive effect on social interaction.

Playground Attributes	Landscape Attributes	Park Attributes
Friendship swing (James et al., 2022);	Open Spaces (Islam et al., 2016; Moran et al., 2017);	Seating (Kreutz et al., 2021);
Rotating climbing globe structure (James et al., 2022);	Various natural materials (Laaksoharju et al., 2012; Romero, 2014);	Picnic and barbeque areas (Veitch et al., 2020a);
4-user sec-saws (James et al., 2022);	Hill structures (Stanton-Chapman et al., 2018);	Shelter (Veitch et al., 2020a);
Challenging play structures (Kreutz et al., 2021);	Grass fields (Veitch et al., 2020a).	Tables (Veitch et al., 2020a).
Shelter (Kreutz et al., 2021);		
Climbing structures (Laaksoharju et al., 2012);		
Large adventure playground structures (Veitch et al., 2020b);		
Interactive areas (Veitch et al., 2020b);		
Obstacles courses (Veitch et al., 2020b);		

4.1.2 SITE ANALYSIS

The design principles found in the literature review are not based on the current situation of Wilhelminaoord. The following section will put them into the village's context and illustrate their presence in the landscape. A focus will be on the developed suburb part of Wilhelminaoord, as around 91.7% of the village's children live here (CBS, 2023).

Learning Landscapes: currently, no public (playful) learning landscapes are found in Wilhelminaoord. The schoolyard of the primary school (B on Figure 3) and the small petting zoo (C on Figure 3) could both provide opportunities for learning landscapes. For this, spatial interventions need to be taken.

Green Spaces: different green spaces are found in the town's centre (Figure 3-7). Most of them consist of grass fields, with some scattered trees. Where these spaces currently have no function, they could provide opportunities for play or seating areas, as most of them are surrounded by houses.

Safe Spaces: although the whole of the town centre is a 30kmh zone, many of the streets could still form a risk to the independent mobility of children, as cars are driving too fast (DFW, 2024). More than half of the streets in Wilhelminaoord do not have a sidewalk (Figure 3, 8, 9). Interestingly, this is especially seen at roads leading to green areas, making them less independently accessible to children. To make the village safer for children, sidewalks could be added to the streets without them.

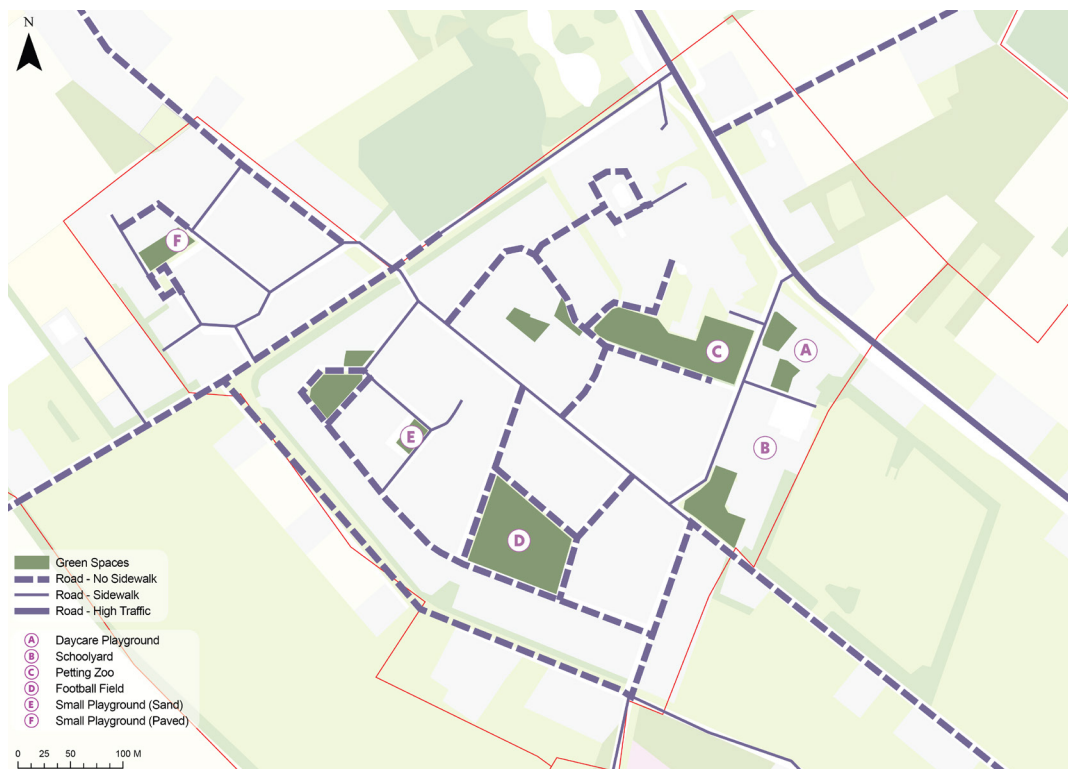


Fig. 3. Map of Wilhelminaoord showing green spaces, roads, and play areas (Van de Wetering, 2025).



Fig. 4. Picture showing a green space in Wilhelminaoord (Van de Wetering, 2025).



Fig. 5. Picture showing a green space in Wilhelminaoord (Van de Wetering, 2025).



Fig. 6. Picture showing a green space in Wilhelminaoord (Van de Wetering, 2025).



Fig. 7. Picture showing a green space in Wilhelminaoord (Van de Wetering, 2025).



Fig. 8. Picture showing a road with a sidewalk in Wilhelminaoord (Van de Wetering, 2025).



Fig. 9. Picture showing an avenue without a sidewalk in Wilhelminaoord (Van de Wetering, 2025).

Playgrounds: a few play areas are found in Wilhelminaoord, although half of them are semi-private. The following section will evaluate each play area on some of its features:

A. Day care Playground (Figure 10):

The village hall of Wilhelminaoord holds a day care centre, which includes an enclosed playground. Although this playground has some play structures and natural elements, it is not accessible to the town's children.

B. Schoolyard (Figure 11):

The primary school has a large schoolyard, with different (challenging) play structures. It also includes hill structures, grass fields, and sports equipment. No multi-user play structures are found in the schoolyard. It is accessible during the day for children.

C. Petting Zoo (Figure 12):

The small petting zoo located across the village hall houses sheep, goats, rabbits, and chickens. It is managed by volunteers from the nursing home, which is located next to it. It is quite rundown, and it is not openly accessible. Additionally, the electric fence could form a risk to children.

D. Football Field (Figure 13):

Surrounded by oak trees and wildflowers, a grass field is found with two football goals. There are no other attributes found, except one bench, which is placed in an unconventional direction.

E. Small Playground (Sand) (Figure 14):

The (non-challenging) play attributes in this small playground are placed on sandy ground. It also includes one picnic bench. Grass is laid on the rest of the area. It contains no natural elements, except some (non-climbable) trees.

F. Small Playground (Paved) (Figure 15):

On this grass field, two play attributes are found, placed on rubber tiles. A bench is also found. This playground has limited shaded areas.



Fig. 10. Picture showing the daycare's playground (Van de Wetering, 2025).



Fig. 11. Picture showing the schoolyard (Van de Wetering, 2025).



Fig. 12. Picture showing the petting zoo (Van de Wetering, 2025).



Fig. 13. Picture showing the football field (Van de Wetering, 2025).



Fig. 14. Picture showing the sandy playground (Google Streetview, 2010).



Fig. 15. Picture showing the paved playground (Van de Wetering, 2025).

4.2 SRQ2

The following sections highlight different design principles, opportunities, and restrictions mentioned in the UNESCO World Heritage Nomination file of the Colonies of Benevolence (UNESCO, 2017). Only concepts relevant to Wilhelminaoord have been extracted.

4.2.1 DESIGN PRINCIPLES

The landscape shapes man and man shapes the landscape.

Main Structure: an orthogonal (grid) structure is found in Wilhelminaoord, with a block-like parcellation. Long tree lanes are categorised in primary and secondary tree-lined avenues. On the open landscape, scattered buildings are found in a fixed pattern. The families of the colony used to live in small farms, which were laid out in parallel ribbons. The colony had a boundary of barge canals (Renes, 2019).

Planting: Along the avenues, the common oak (*Quercus robur*) and beech (*Fagus sylvatica*) are mainly found. The cemetery had a so-called Apostle tree, twelve beeches in one planting hole, which had been there since the beginning of the colony, until 2019, when it was destroyed by a storm.

4.2.2 DESIGN OPPORTUNITIES

Goods were manufactured for personal uses.

Innovation: later colonies (like Wilhelminaoord) were built with experience gained from the earlier ones. They opted for innovative agriculture (Renes, 2019).

Self-sufficiency: goods from workshops (like the spinning hall, weaving mill, blacksmith, and the carpenter) were manufactured for personal use. The extra food supplies provided by the horticulture had a positive impact on food prices.

Adaptive reuse: the historical buildings are in good condition, and are being reused for different functions. Rustoord II, the former care home, has been reused to host schools from The Hague for ‘nature weeks’ in Wilhelminaoord. Some of the dirt roads have been paved to support increased traffic. The original school is now a house.

4.2.3 DESIGN RESTRICTIONS

The old structure is the new basis.

Direct Protection: along with the protected colony property, a 1577.09ha buffer zone is also nominated to protect the open view. The Society of Benevolence still exists, and leases the buildings and land. Rules also apply for nature conservation and management, as it is protected by NatuurNetwerk Nederland.

Landscape Structure: the landscape structure and components should be preserved. This includes the typology, road structure, planting, water structures, buildings, and their measured patterns. Original planting has to be preserved or replanted, particularly avenue plantings. The old structure should be the new basis.

Buildings: historic buildings should be preserved. Adaptive reuse should be in line with history and the landscape structure. Imitations should be avoided.

4.2.4 SITE ANALYSIS

The following section will present some of the historic landscape characteristic through maps and images, to visualise how they are currently applied to the site.

Tree-Lined Avenues: Figure 16 shows how the colony's avenues are laid within the landscape. The main avenues are currently still the most prominent roads in the landscapes (the N353 and Westvierdeparten). The side avenues are also still prominently visible in the village, with luscious tree lanes (Figure 18).

Water Structures: the water structures from the colonial period are still present in the landscape, as seen on Figure 17, 19, and 20. A distinction in size is seen, resulting in main and side moats. The main moats are found along the perimeter of the colony. The side moats identify the pattern of the farm houses, as they are wrapped around the plots.

These characteristics are still very prominent in the landscape, for they need to be preserved according to the UNESCO World Heritage. As Wilhelminaoord is now a modern Dutch village, most of the public self-sufficiency elements have disappeared, although some villagers still sell their produce from home (Figure 21).



Fig. 16. Map showing tree-lined avenues (Van de Wetering, 2025).

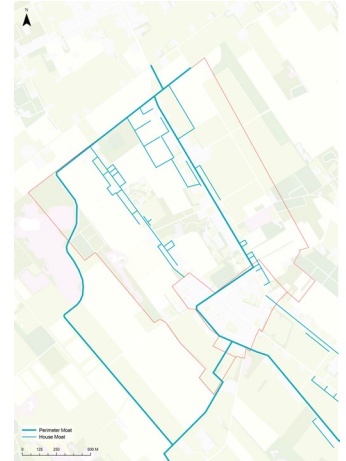


Fig. 17. Map showing water structures (Van de Wetering, 2025).



Fig. 19. Picture showing the water structures (Van de Wetering, 2025)



Fig. 20. Picture showing the water structures (Van de Wetering, 2025).



Fig. 18. Picture showing tree-lined avenues (Van de Wetering, 2025).



Fig. 21. Picture showing a sign with "For Sale; Eggs & Onions" (translated from Dutch) (Van de Wetering, 2025).

4.3 SRQ3

During the colonial period, each farmhouse was accompanied by a vegetable garden. In the period of 1818 to 1859, these gardens were meant to provide for the colonists' personal needs. Even children were thought how to farm (Dorgelo, 1964). This horticultural focus is a good example of the self-sufficiency of the colonies.

The town centre of Wilhelminaoord is, in the present day, not focused on the self-sufficiency of food. As mentioned in the previous sub-chapter, some residents might consume and sell their own produce, but there is no communal vegetable garden.

As found in the literature review, learning landscapes and green spaces have been shown to improve social interaction among children (Moran et al., 2017; Pelletier et al., 2024; Van den Bogerd, 2025). Specifically, garden environments have not only been shown to enhance social interaction, but also creativity, skillfulness, and community (Laaksoharju et al., 2012).

The following section will present two design variants for a child-friendly garden in Wilhelminaoord, to test and define guidelines for the detailed design. The first variant presents a most-ideal child-friendly garden following the paper from Laaksoharju et al. (2012), while a lower-budget alternative is presented in the second variant.

4.3.1 IDEAL CHILD-FRIENDLY GARDEN

To design a child-friendly garden, Laaksoharju et al. (2012) recommended the following requirements:

- Children should not be required to be extra cautious.
- Children should not be forbidden to use certain areas.
- Planting should be multidimensional, with variation of species.

- The garden should be enclosed to ensure safety and security, the material does not matter.
- Some areas should be left untamed and unmaintained, to allow children to experience the feeling of adventure and where they can, for example, build huts; where such an area is not possible, alternatives are planting tall shrubs or herbaceous plants.
- The garden plots should be distinct with wide paths. To allow discussion, the ideal size would be 0.80 meters wide, which fits four rows of vegetables or herbs.
- A water feature should be included, as this catches children's attention, disregarding the size.

These requirements were implemented into the design variants, to reflect an ideal child-friendly garden.

The proposed location for the child-friendly garden is the unused open area in front of the primary school. It is located along one of the colony's side avenues, which is a road that is accessible to children, due to its sidewalk. This location also gives opportunities for close-by lessons organised by the school.

The proposed design for a child-friendly garden is presented in Figure 22.



Fig. 22. Map showing the design for the ideal child-friendly garden (Van de Wetering, 2025).

4.3.2 RAISED GARDEN BEDS

A child-friendly garden is a large intervention and could be a large expense for the village. Thus, in the following section, a lower-budget alternative to a garden is presented.

Rather than one big garden at one location, which requires a lot of landscaping and materials, the garden environment is scattered across the village.

In 2024, raised flower beds were placed in Wilhelminaoord by the town's community (DFW, 2024). To utilise that interest in the design, additional raised garden beds are placed at the town's different green spaces. Instead of flowers, they will contain vegetables, like the previous variant's garden beds.

They were made to be 80 cm wide, following Laaksoharju et al. (2012) recommendation (Figure 23). Benches were placed by the garden beds, to provide parents a place to sit. As the garden beds are located close to houses, water can be collected from there. An example space for the raised garden beds is presented in Figure 24.

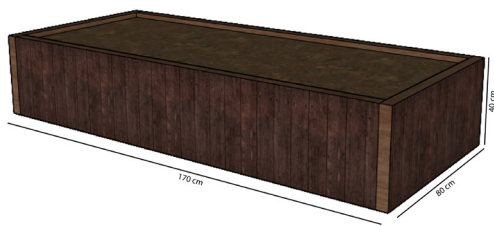


Fig. 23. Model of raised garden bed (Van de Wetering, 2025).

4.3.3 EVALUATION

The two variants have shown different alternatives to introduce a garden environment to Wilhelminaoord. While the child-friendly garden promotes ideal social interaction, the raised garden beds might be more achievable to realise in a small village. To both enhance social interaction and achievability, a combination of the variants could be created. Many of the ideal child-friendly garden requirements could be realised at the set location, but instead of garden plots, raised garden beds are placed to reduce the required landscape interventions. It could be argued that basic raised beds are not attractive to children specifically. How this could be improved is presented in the next chapter, along with the other design guidelines.

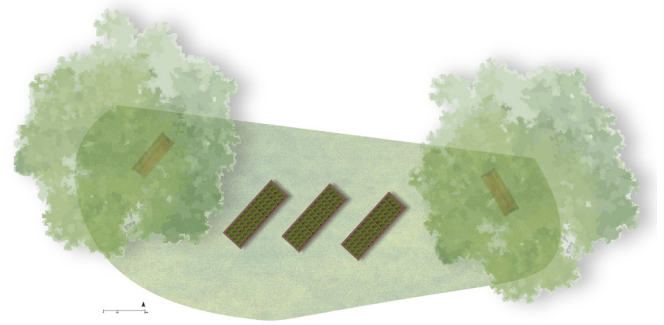


Fig. 24. Map showing the design for the second variant (Van de Wetering, 2025).

4.4 THE DESIGN

4.4.1 DESIGN GUIDELINES

The following chapter will define guidelines for the village-scale and detailed design of Wilhelminaoord. These guidelines are based on the results of the sub-research questions.

Safer Roads & Avenues: As concluded from the literature review, safe spaces contribute to the enhancement of social interaction among children (Furneaux et al., 2019; Pelletier et al., 2024). The site analysis showed that more than half of the streets in Wilhelminaoord do not have a sidewalk, especially at roads leading to green spaces. The design aimed to improve independent mobility of children, by transforming streets to include sidewalks. The former colony's tree-lined avenues are still prominent in the village and need to be preserved. The street interventions made sure that the oaks do not need to be moved or removed.

Child-Friendly Garden: After testing and comparing the two variants in SRQ3, it was concluded that a combination of both would be most desirable for a child-friendly garden. A point was made about the raised garden beds, which at its basic state, could be unattractive for children. For this reason, Play Planters were designed, which are explained in the garden's design chapter, on page 26. The child-friendly garden could improve social interaction and promote playful learning (Laaksoharju et al., 2012).

Play Areas: The literature concluded that green areas display positive social interactions (Van den Bogerd, 2025). Multiple un(der)used green spaces are found in Wilhelminaoord, which, as concluded from the site analysis, could be improved. Transforming these green spaces into play areas with different attributes could further improve social interaction among children (James et al., 2022; Kreutz et al., 2021; Romero, 2014; Stanton-Chapman et al., 2018).

Creating learning landscapes promotes children's outdoor play (Moran et al., 2017; Pelletier et al., 2024). SRQ2 showed that Wilhelminaoord has a great history, being a former Benevolent Colony. This history could be represented through learning landscapes. The child-friendly garden already teaches about the self-sufficient gardening of the colony. The different green spaces of Wilhelminaoord could represent different themes of the colony's history, as play areas. This is elaborated on in the next chapter.

4.4.2 VILLAGE-SCALE DESIGN

Figure 27 shows the village-scale design of Wilhelminaoord. The upgraded roads and green spaces are included. An example of a road and an avenue is shown in Figure 25 and 26, respectively. Sidewalks are now included, separated from the street by tall grass, to prevent cars driving on it.



Fig. 25. Section showing a redesigned road (Van de Wetering, 2025).



Fig. 26. Section showing a redesigned avenue (Van de Wetering, 2025).

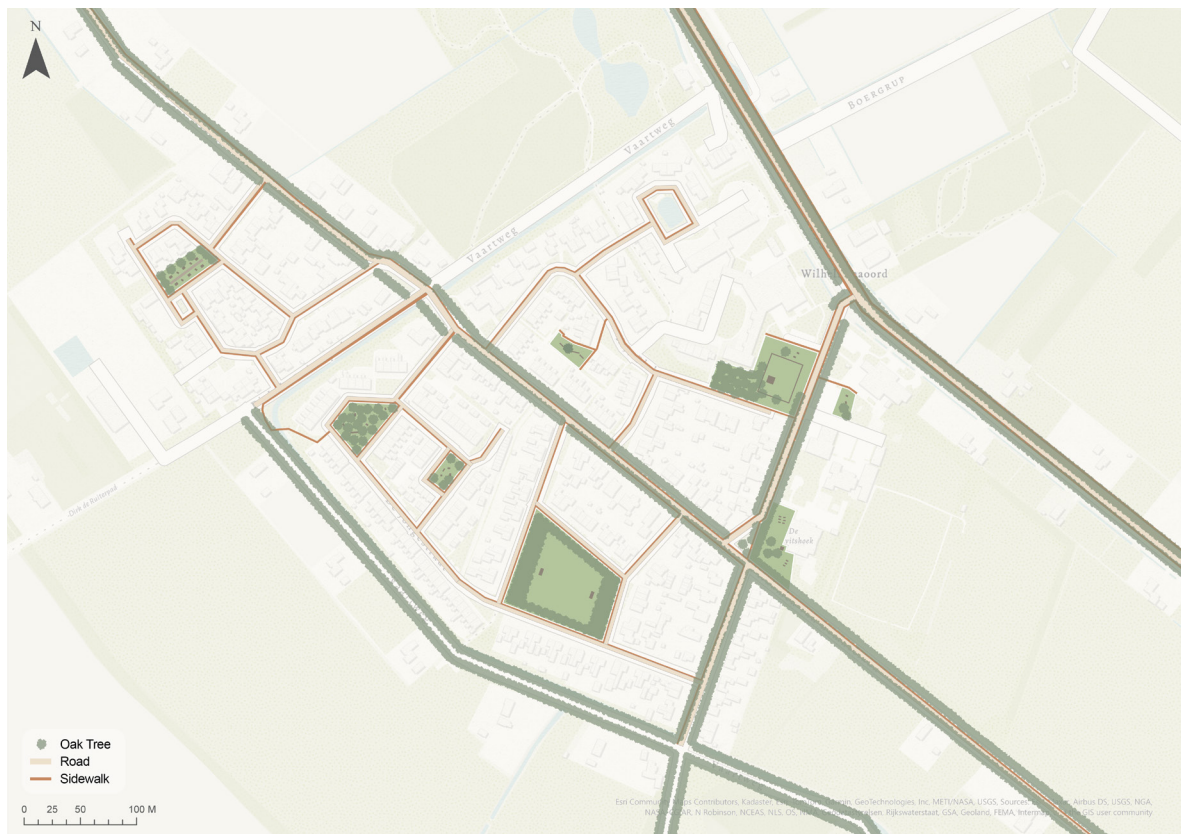


Fig. 27. Map showing the village-scale design of Wilhelminaoord (Van de Wetering, 2025).

The following themes for the green play areas have been defined in Table 2:

Table 2. Themes for the play areas, with their inspiration.

	Theme	Inspiration
A	Water	The water structure / moats
B	Animal	The animals owned by colonists
C	Heathland	The historic landscape
D	Openness	The landscape structure
E	Workshop	The colony's workshops
F	Forest	The landscape structure
G	Village	The spatial structure

Sections have been made for each play area, which are referenced on Figure 28. Figure 29 shows the Water play area; a detailed section in Figure 30 shows a climbable play attribute for both goats and children, which is placed in the Animal play area (Figure 31); Figure 32 shows the Heathland play area; Figure 33 shows the Openness play area, represented as a football field; Figure 34 shows the Workshop play area; Figure 35 shows the Forest play area; lastly, Figure 36 shows the Village play area, which is a miniature version of the colony. A visualisation for the Water play area is seen in Figure 37. The red square on Figure 28 shows the area for the child-friendly garden, specified in the next chapter.



Fig. 28. Map showing the location of the sections (Van de Wetering, 2025).



Fig. 29. Section of the Water play area (Van de Wetering, 2025).

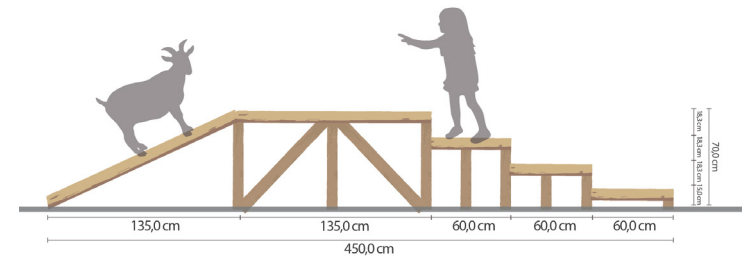


Fig. 30. Detailed section of the play attribute (Van de Wetering, 2025).



Fig. 31. Sections of the Animal play area (Van de Wetering, 2025).

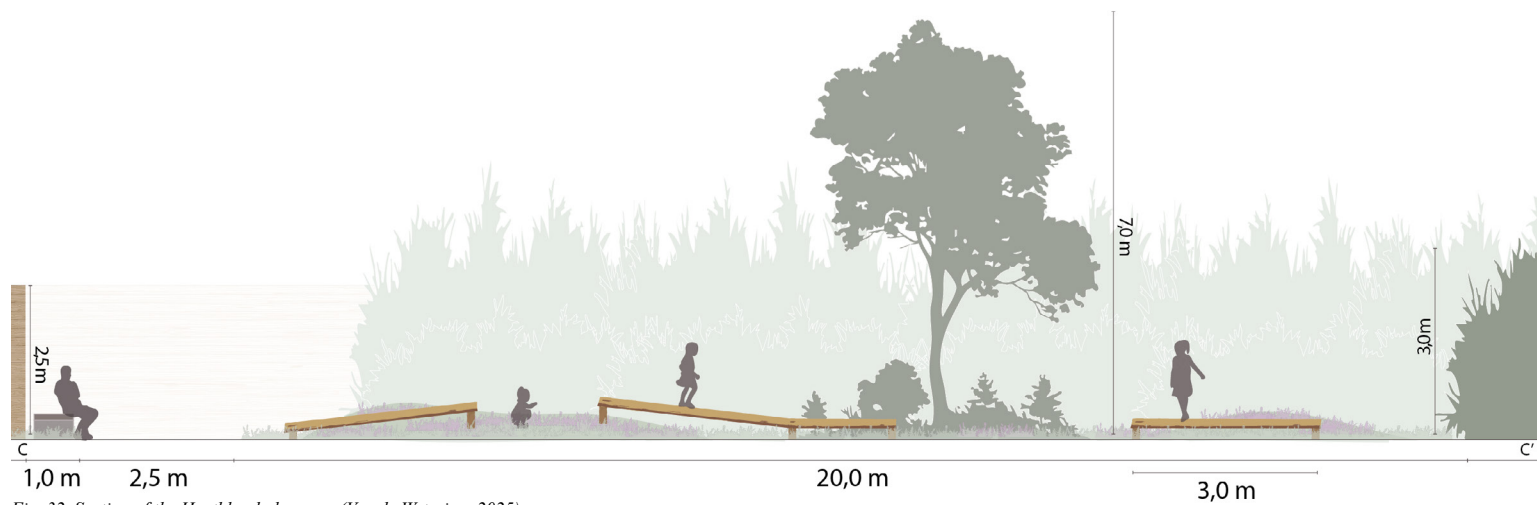


Fig. 32. Section of the Heathland play area (Van de Wetering, 2025).

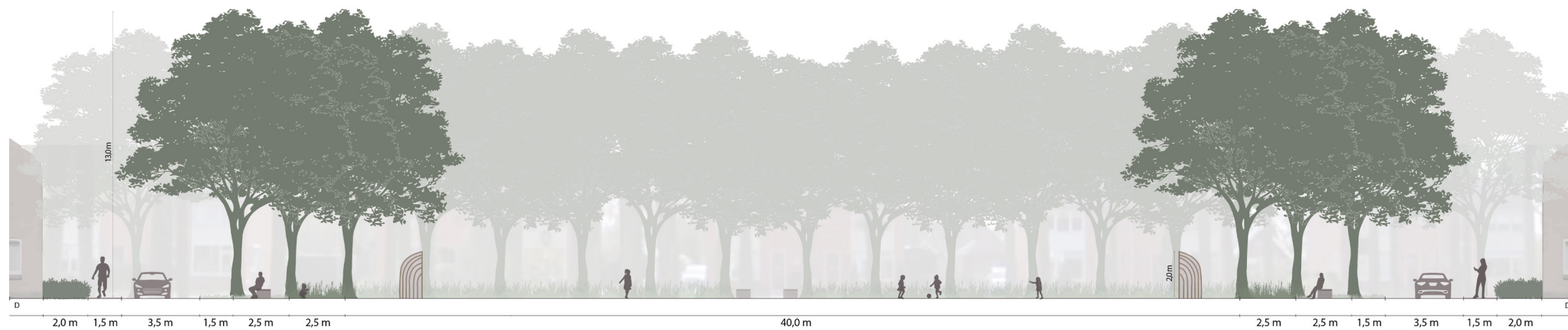


Fig. 33. Section of the Openness play area (Van de Wetering, 2025).



Fig. 34. Section of the Workshop play area (Van de Wetering, 2025).



Fig. 35. Section of the Forest play area (Van de Wetering, 2025).

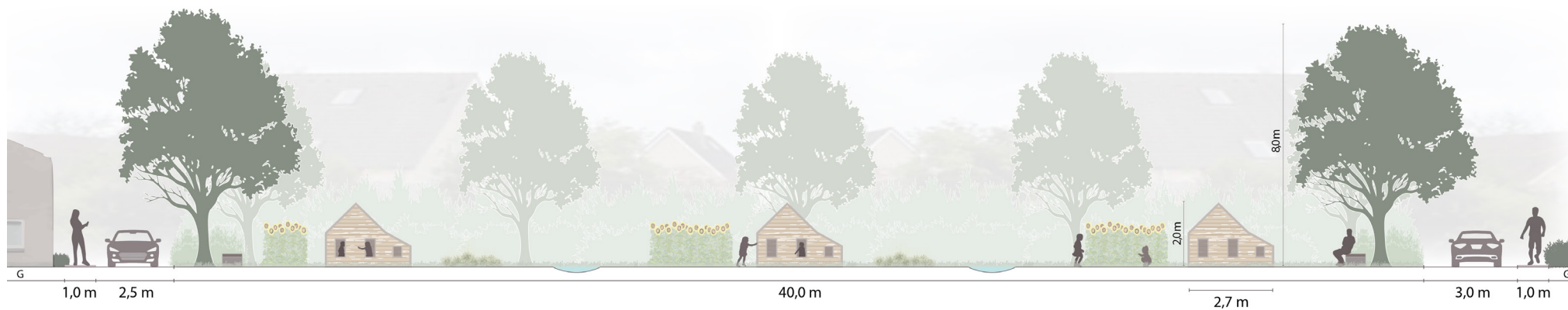


Fig. 36. Section of the Village play area (Van de Wetering, 2025).



Fig. 37. Visualisation showing the Water play area (Van de Wetering, 2025).

4.4.3 DETAILED DESIGN

Figures 40 & 42 show the final design for the child-friendly garden. Play Planters are placed (Figure 38 & 39), along with climbable rocks. A slide is also found. A shed and different water features provide materials for gardening.

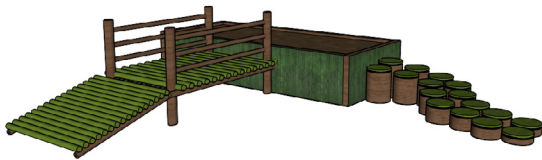


Fig. 38. Model of the Play Planter (Van de Wetering, 2025).

A mix of different bushes is found, for children to play in. The site originally contained a ditch, which is made accessible for children to play in (Figure 41). See Figure 43 for an impression of the garden.

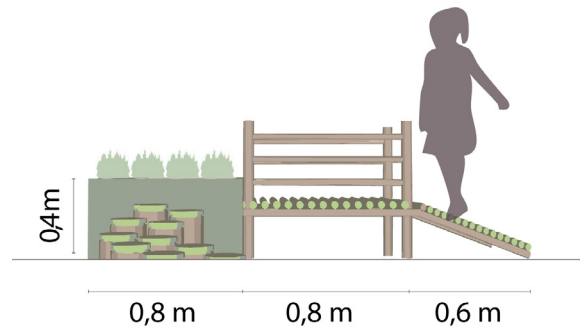


Fig. 39. Section of the Play Planter (Van de Wetering, 2025).



Fig. 40. Map showing the design of the child-friendly garden (Van de Wetering, 2025).

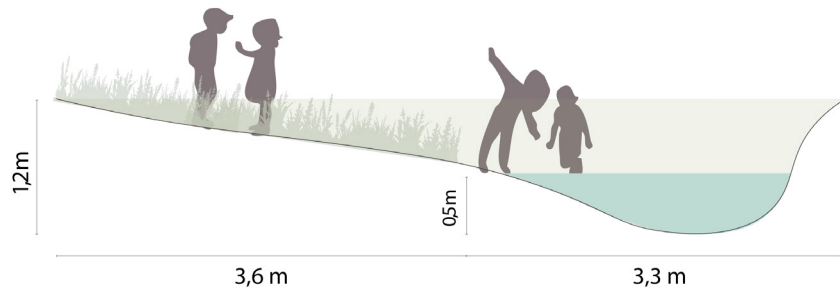


Fig. 41. Section of the ditch (Van de Wetering, 2025).



Fig. 42. Section of the child-friendly garden (Van de Wetering, 2025).



Fig. 43. Visualisation of the child-friendly garden (Van de Wetering, 2025).

5 DISCUSSION

The results of this thesis have provided insight into design solutions that could improve social interaction among children, combined with the preservation of Wilhelminaoord's history. Different methods were used to come to the final design. In the following section, it is discussed how each method influenced the results of this thesis. Additionally, the consistency in the use of the key concepts is described. To conclude the general discussion, the functional value and the aesthetic quality of the design are evaluated.

To research different design principles that promote social interaction among children, a literature review was conducted. Four main design principles were extracted from this review: Learning Landscapes, Green Spaces, Safe Spaces, and Playgrounds. Different tangible attributes were also found. These principles and attributes are found in the design in different ways.

Firstly, the Learning Landscapes are prominently found in the Child-Friendly Garden. By planting and caring for their own crops, children are taught about different aspects of flora and fauna (Laaksoharju et al., 2012). Besides the primary gardening skills, different insects or birds might also appear on site, which could be a learning point. The fact that the garden is located besides the primary school, opens up potential for accessible lessons during or after school hours. Learning Landscapes are also found in the different play areas scattered throughout the village-scale design. The different themes could teach the children about the different aspects of the Colonies of Benevolence, requiring they have some kind of legend or explanation.

Next, Green Spaces are found all throughout the design. The current state of the Wilhelminaoord already provided various unused green spaces. Almost all of these have been repurposed into a play area. Although this might develop disturbances to the flora and fauna (due to playing children in the planting, for example), the play areas actually improved the green quality of the spaces, due to the increased planting and plant variety. Different green elements are found throughout the village-scale design, from grass fields to wild bushes, to provide variety for play and social interaction.

Safe Spaces are also included in the design, even if it is more subtle. It is primarily shown in the redesigning of the village's streets, with the addition of separated sidewalks. Although it might guide children to travel safely, it is probable that it does not stop them playing on the car lanes. Other design solutions could have been considered, like the placing of speed ramps or planter boxes, to slow down the road's traffic. Another place that safe spaces are introduced, are the play areas. Most areas are enclosed by either hedges, bushes, or fencing. Although it might provide protection from the surrounding areas, or traffic, it might not enhance the safety inside it.

Finally, the principle of Playgrounds is very prominent in the village-scale design. The different play areas provide a variety of play opportunities and unique experiences. Various play attributes have been used that could increase social interaction among children. The play areas are scattered throughout the village, which makes them accessible for most homes in the village centre.

To research the different design principles, opportunities, and restrictions of the village's former colony, UNESCO's nomination file (2017) was conducted. Several have been included in the design. The following section will evaluate this. The extracted design principles were the main structure and the planting. As further presented in the site analysis, these are currently still prominent in Wilhelminaoord's landscape, although the village centre does not show the iconic housing pattern. The design is also not focused on this pattern, although an effort is made to maintain the tree-lined avenues and the water structures.

Some design opportunities were also found, including innovation, self-sufficiency, and adaptive reuse. From these three, self-sufficiency is most notable in the design, as it is focused on in the child-friendly garden. Innovation and adaptive reuse might be less visible in the design itself, but could be more seen in the design process. For the child-friendly garden, two test variants were designed, which could be compared to the use of previous experience in colony development. Additionally, the adaptive reuse could be seen in the redesigned green spaces of Wilhelminaoord. They are not fully replaced, as all original trees are included in the design, for example. The design restrictions had a more direct effect on the design. As the former colony is protected by UNESCO, rules are in place. The landscape structure, its components, and the historical buildings had to be preserved. This has been complied with in the design.

To research different design solutions to enhance social interaction combined with the education on the former colony's self-sufficiency, two variants were developed.

These variants influenced the village-scale and detailed design in different ways.

The ideal child-friendly garden variant had a big influence on the final design. Even though the original variant didn't include the Play Planters, it did introduce a central meeting spot for children in the village. The requirements of Laaksoharju et al. (2012), were also mostly represented in the final garden design, and even in some ways in the village-scale design.

Although the idea of the scattered raised garden beds was not represented in the self-sufficiency aspect of the final design, it did have an influence on the play areas. These were scattered around the village, to make them closely accessible to all residents.

To stay within the scope of this thesis, only two variants have been created. The validity and reliability could be improved by introducing more variants, or more quantifiable ways to test them.

Three key concepts were defined and investigated: children's social interaction, child-friendly spaces, and historic landscape attributes. These concepts defined the scope of the thesis, and were consistently followed throughout the research, analysis, and design. Children's social interaction was improved by reviewing literature on it, which resulted in different spatial interventions that also improved the child-friendliness of the space. The historic landscape attributes were used as a basis for the design, a foundation to build on.

It has been shown that the different methods, but also the key concepts, have influenced the presented design. It has not been discussed how the design

stands on its functional value and aesthetic quality. The functional value of the play areas and child-friendly garden could be argued to be adequately presented, as it represents the themes and provides child-friendly spaces that enhance children's social interaction. Subsequently, the aesthetical quality could also be argued as sufficient, for the following reasons: the design took a child-friendly scale in account, which is represented in the size of play attributes; natural materials were used for the play attributes, to keep the essence of a green space; and the spatial interventions fit within the scale of the landscape, under the tree canopies.

5.1 LIMITATIONS & RECOMMENDATIONS

Some limitations were found during the research process, which are described in the following section, along with recommendations on how to overcome them in future research.

During the site analysis, no interviews were held. Due to this, the needs and wants of Wilhelminaord's children are unknown. To gain more insight into potential design solutions, and to improve the validity of the thesis, researchers should include interviews in future research.

Parents and their interactions fell outside the scope of this thesis. As they have an influence on the independent mobility of children (Furneaux et al., 2019), further research is needed on their views of different spatial problems for them and their children.

They could also be included in design decisions, with surveys, for example.

One of the design principles found in the literature review was safe spaces. This has been applied as the design guideline for safer roads and avenues. A limitation regarding safe spaces is found in the design, in the different play areas. Although some safety regulations were taken into account, like (partial) enclosure, more research needs to be done on the plant types. Some common plant types could be poisonous or dangerous for children. Researchers could create a database with plants that are suitable for children's play areas.

The design has presented different play areas, themed after different historic attributes from the former colony. Without an explanation, children might not know what these themes entail. To improve this in future research, different methods to educate children in a space could be analysed, such as a route map.

This thesis introduced the Play Planter. It is a method to make raised garden beds more attractive to children. More research needs to be done on the effectiveness of the Play Planter. Only one variant of the Play Planter is presented. Designers could include different variants in their designs, to make it more dynamic.

6 CONCLUSION

This thesis aimed to create a design for child-friendly spaces in Wilhelminaoord to improve social interaction, while preserving the historic landscapes attributes of the Benevolent Colony. To come to this design, the following research question had to be answered:

In what ways could children's social interaction in Wilhelminaoord be enhanced through spatial interventions, while preserving historic landscape attributes?

The sub-research questions have aided in finding the answer to this question. Different methods have been applied to develop different design guidelines. SRQ1 conducted a literature review on children's social interaction and child-friendly spaces. This resulted in different design principles: learning landscapes; green spaces; safe spaces; and playgrounds. SRQ2 analysed the UNESCO nomination file and presented different design principles, opportunities, and restrictions about the historical landscape attributes of the former colony. SRQ3 focused on the former colony's self-sufficiency and the theory of Laaksoharju et al. (2012) to test two variants of a child-friendly garden environment.

A village-scale and detailed design have been presented for the centre of Wilhelminaoord. This included: safer roads & avenues, by adding separate sidewalks; a child-friendly garden, which is a refined design from the two previous variants; and different play areas at the village's green spaces, themed after historic attributes of the former colony.

This all has concluded that in order to enhance children's social interaction through spatial interactions, play areas should be created that include multi-user attributes, green spaces should be included with natural elements, safe spaces should be created to promote independent mobility, and learning landscapes should be developed through garden environments. An effective way to preserve historic landscape attributes, is to make them part of a design. It could be a tangible representation, with planting, or intangible, with concepts like gardening to represent self-sufficiency.

Based on these conclusions, designers should include different guidelines in their design to make it more inclusive to children, while also researching ways to represent the (cultural) history of a landscape.

7 REFLECTION

I have always been interested in applying the historical or cultural landscape of a site to its design. That is why I was very intrigued by this topic, the Colonies of Benevolence. One of my learning goals was to discover how cultural and historical geography, in this case specifically cultural heritage, could be applied to landscape architecture. I have discovered that cultural heritage could bring restrictions to your design freedom (which in this case relates to the preservation of the landscape structure), but it could also bring inspiration or opportunities (like using the former colony's self-sufficiency as a motivation for a garden).

The time frame of eight weeks for this thesis brought different strengths and weaknesses to the results. A weakness to point out is that it limited opportunities for detailed elaboration on the various concepts. As seen in the limitations, no interviews were held, which would have given a better insight on the residents' wants and needs. If the level of appreciation of the village's cultural heritage was known, a different result might have been seen in the design.

On the other hand, the short time frame required the scope to be very clear and concise, which in turn helped in the design process. It led to a consistent design, due to being limited by different key concepts and literature. The methodology might have also aided in this, as it was clearly defined from the beginning. Improving in applying scientific methods and literature to landscape design was one of my learning goals, which was achieved during this project.

Besides the method of Research for Design, Research through Design was also applied in this thesis. Although more testing could have been done on the village-scale design, one particular example showed its application of Research through Design. The choice was made to use raised garden beds in the child-friendly garden, but after designing the variants, it became clear that they might not be attractive to children. This evaluation point led to the idea of Play Planter, which are colourful raised garden beds with climb or play attributes. This showed how previous designs have influenced and improved the final design. However, as also mentioned in the limitations, more research should be done on these Play Planters, as it is not clear if it is actually more attractive to children.

A lot more research could be done on the combined topics of children's social interaction and cultural heritage, but this thesis has been a good starting point. I am proud of what I have delivered for this thesis within the time limit, and I am also proud of the design.

USE OF GENERATIVE AI STATEMENT

An effort was made to not use any Generative AI during this thesis. Any assets used in maps, sections, or visualisations were (freely) licensed from Adobe Stock, where AI generated assets were excluded. No Generative AI functions were used in Illustrator, InDesign, and Photoshop. No Large Language Models, like ChatGPT or Gemini, were used for this thesis.

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