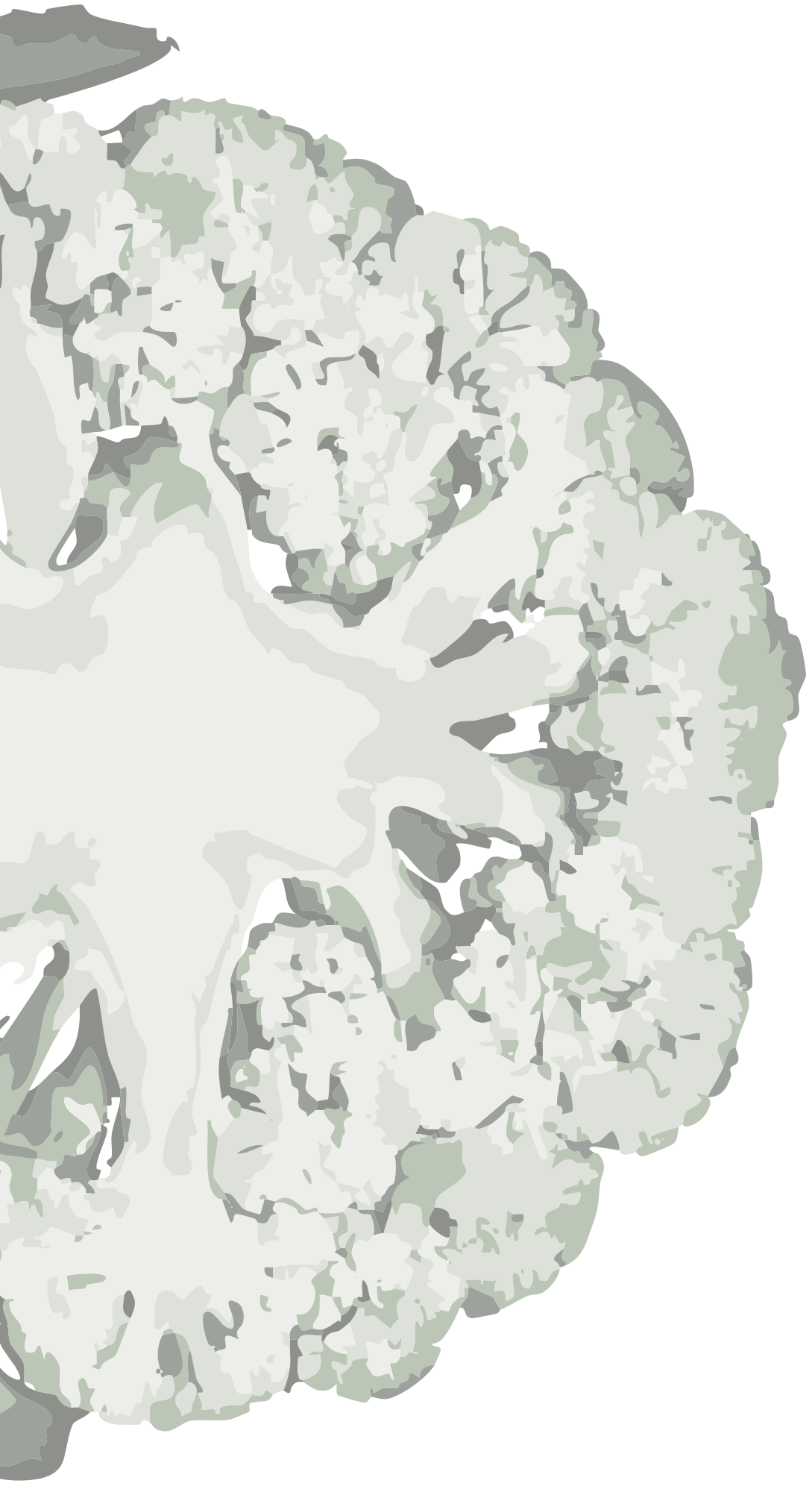


# The Cauliflower 2.0

Re-design of the Raadsledenbuurt in Houtwijk

Graduation Report - Hieke Teunissen - 54833867



## Colophon

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### **Faculty**

Architecture and the Built Environment

### **Graduation Studio**

Designing for Health & Care - AR4AD300

### **Student**

Hieke Teunissen - 5483867

### **Responsible Supervisor**

Kobe Macco

### **Supervisor**

Birgit Jürgehake

### **Building Technology Tutor**

Annemarie Eijkelenboom

### **Delegate**

Harry Boumeester

### **Edition**

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## Foreword

This graduation report, *Cauliflower 2.0*, is written by Hieke Teunissen for the **Designing for Health and Care graduation studio**. The studio began with a group research project on the Houtwijk neighbourhood in The Hague, which was approached through the lens of health and care. From this research, a personal interest in the post-war cauliflower neighbourhood typology developed.

The report focuses on the Raadsledenbuurt neighbourhood in Houtwijk, examining how this type of neighbourhood, originally designed to foster safety and community, can be adapted to address contemporary challenges related to well-being, housing and social cohesion.

The report is structured into five parts and addresses the following main question:

*“How can architectural and spatial design strategies transform the cauliflower neighbourhood of Raadsledenbuurt in Houtwijk into a resilient 21st-century neighbourhood?”*

The first section introduces the problem statement, research question and scope. The second part outlines the research approach and theoretical framework. The third part presents the results, including the sub-questions, design brief and design proposal. The fourth section contains the conclusion and discussion, followed by the appendices.

This graduation project contributes to the conversation around post-war neighbourhood renewal by examining how architectural and spatial design can promote health and care, while reimagining the cauliflower neighbourhood as a sustainable living environment.

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# 01.

## Introduction

- 01.1 General Introduction
- 01.2 Problem Statement
- 01.3 Research Questions
- 01.4 Scope



## 01.1 General Introduction

The Netherlands is currently facing several interconnected challenges, including housing shortages, demographic changes, and a decline in public health. An ageing population, smaller household sizes and limited housing diversity are putting pressure on urban neighbourhoods and the healthcare system (Ministerie van Algemene Zaken, 2023; RIVM, 2023).

Houtwijk, a post-war neighbourhood in The Hague, clearly illustrates these challenges. Originally designed primarily for families, the neighbourhood is characterised by a low-rise, cauliflower-style urban layout and housing (Abrahamse, 2019). Today, Houtwijk has an average household size of 2,2 people and a growing elderly population, which no longer aligns with the cauliflower neighbourhood (OOZO.nl, n.d.; AlleCijfers, 2025a).

At the same time, residents of Houtwijk experience significant health challenges. Around 20% of adults are obese, 55% are overweight and mental health issues are also prevalent, with 11% reporting suicidal thoughts, 11% experiencing depression and 23% reporting stress in the past four weeks (AlleCijfers, 2025b). Although Houtwijk offers substantial green public spaces, only 45% of residents meet the recommended level of physical activity (AlleCijfers, 2025b). Den Hertog et al. (2022) state that well designed green environments could encourage exercise.

This graduation project focuses on the Raadsledenbuurt in Houtwijk, a cauliflower-style post-war neighbourhood characterised by spatial and social challenges. It makes a valuable contribution to the debate on the renewal of post-war neighbourhoods by reimagining the area as a sustainable place to live.

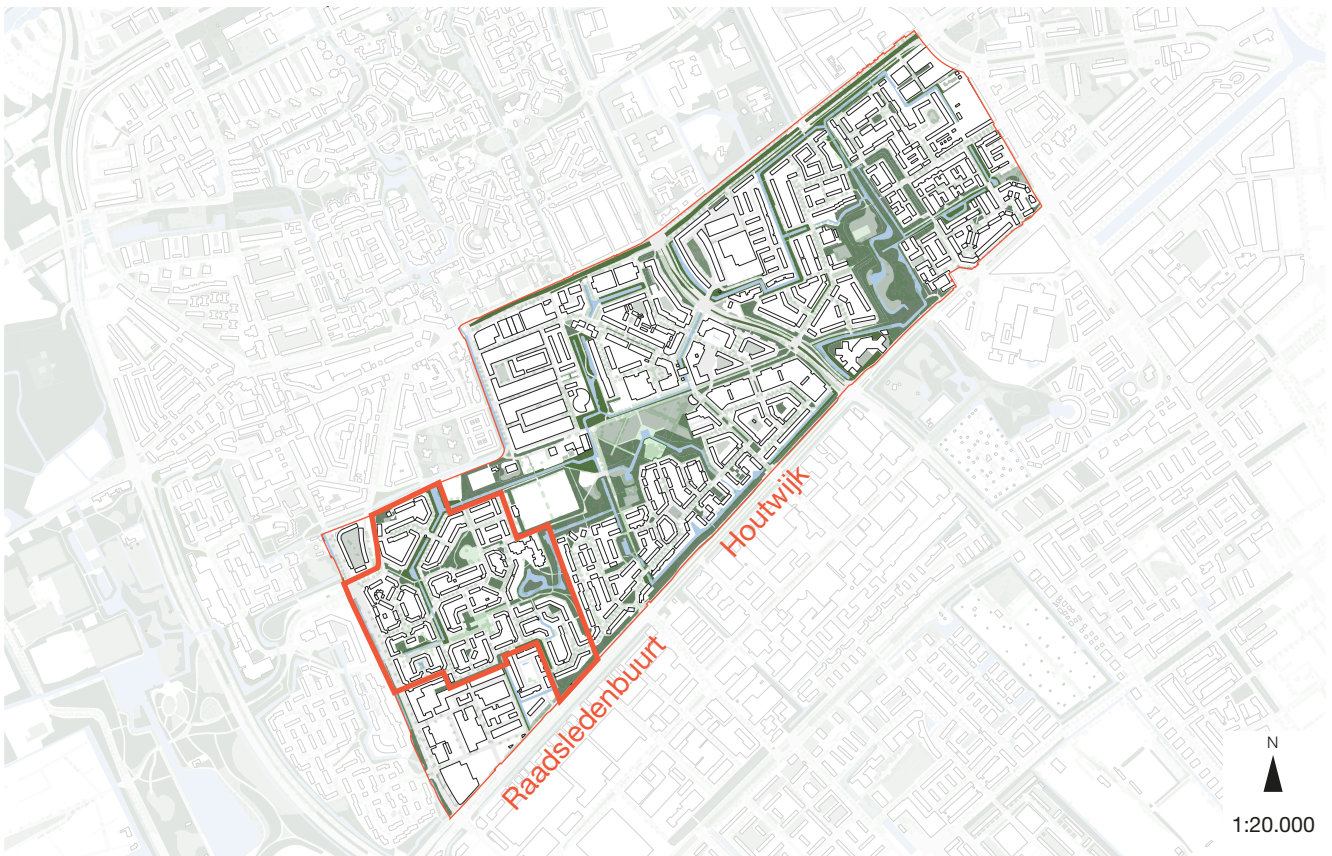


Figure 1: Map Raadsledenbuurt in Houtwijk , Source: (Own Work)

## 01.2 Specific Problem Statement

The Raadsledenbuurt was built between 1980 and 1986. Like many such neighbourhoods, it faces social, spatial and architectural challenges (Abrahamse, 2019; Kompagnie, 2023).

### Monotony and Housing Quality

The oil crisis of 1979 significantly impacted housing construction in the early 1980s. Consequently, housing quality declined due to the use of less durable materials, reduced architectural expression and less experimentation with floor plans (Abrahamse, 2019). Architectural diversity in building heights, façades, roofs and building lines largely disappeared. However, Abrahamse (2019) suggests that a lack of architectural variation can lead to health problems ranging from boredom to depression. This monotony is clearly visible in the Raadsledenbuurt, as can be seen in figures 2–4.

Consequently, most cauliflower neighbourhoods have only one function: housing. However, experts argue that this lack of mixed-use facilities contributes to the area's decline and reduced liveliness (Abrahamse, 2019). The Raadsledenbuurt is largely monofunctional, with housing as its primary use and a separate industrial area to the south.

### Orientation

The cauliflower neighbourhood was designed around the principle of the human scale, in response to the large-scale housing developments of the 1950s and 1960s. This resulted mainly in low-rise, ground-bound housing without landmarks (Abrahamse, 2019). The monotone architecture and lack of orientation points make navigating the neighbourhood difficult. The Raadsledenbuurt also lacks landmarks and has monotonous architecture. This makes navigating this neighbourhood difficult.



Figure 2: Monotone Architecture in Raadsledenbuurt, Source: (Own Work)



Figure 3: Monotone Architecture in Raadsledenbuurt, Source: (Own Work)



Figure 4: Monotone Architecture in Raadsledenbuurt, Source: (Own Work)

### Public space

The design of cauliflower neighbourhoods is strongly influenced by the idea of discouraging car use. Accessibility is organised via a ring road, with streets that become increasingly narrow and winding the further you go into the neighbourhood. These streets are intended to provide safe play areas for children (Abrahamse, 2019).

The Raadsledenbuurt, which was intended for families, is now dominated by small households of 2,2 people (OOZO.nl, n.d.; AlleCijfers, 2025a). This demographic change has resulted in a mismatch in the use of public spaces, such as playgrounds.

The large amount of pavement space allocated for parking increases the urban heat island (UHI) effect (MooiNL, 2025). Higher UHI levels are evident in the Raadsledenbuurt neighbourhood around housing blocks and paved areas such as car parks (Atlas Leefomgeving, 2020). Also due to excessive paving, multiple areas in the Raadsledenbuurt neighbourhood experience high water levels after heavy rainfall (Atlas Leefomgeving, 2018).

### Residents

The neighbourhood consists predominantly of owner-occupied housing, with a smaller proportion of social housing (Gemeente Den Haag, 2025). This ownership structure complicates the redevelopment of housing.

**“It is no longer families with a father who works and a mother who stays at home and looks after the children.”**

- *Kompagnie (2023, p.7)*

Consequently, social housing causes social safety issues. Abrahamse (2019) links social safety issues to social housing from the 1980s, which is present in the Raadsledenbuurt neighbourhood. In a newspaper article, Kompagnie (2023) states that residents are complaining about the changing demographics of the neighbourhood, which is creating social problems.

### Social Cohesion

The social cohesion in the Raadsledenbuurt has declined. Kompagnie (2023) interviewed residents of such neighbourhoods in Houtwijk. She describes the growing anonymity between residents.

**“New neighbours don’t even come over to say hello”**

- *Kompagnie (2023, p.1)*

Abrahamse (2019) states that threshold zones are important for social encounters. However, in the Raadsledenbuurt, private spaces such as garages and small kitchen windows connect to public areas, and back gardens are enclosed and accessed via narrow, dark paths. Closed curtains further reduce social interaction, thereby weakening social cohesion.

### Conclusion

In summary, the Raadsledenbuurt faces challenges typical of cauliflower neighbourhoods. While its urban structure and ownership patterns limit large-scale transformation, targeted, neighbourhood-specific interventions can address these issues (MooiNL, 2025).

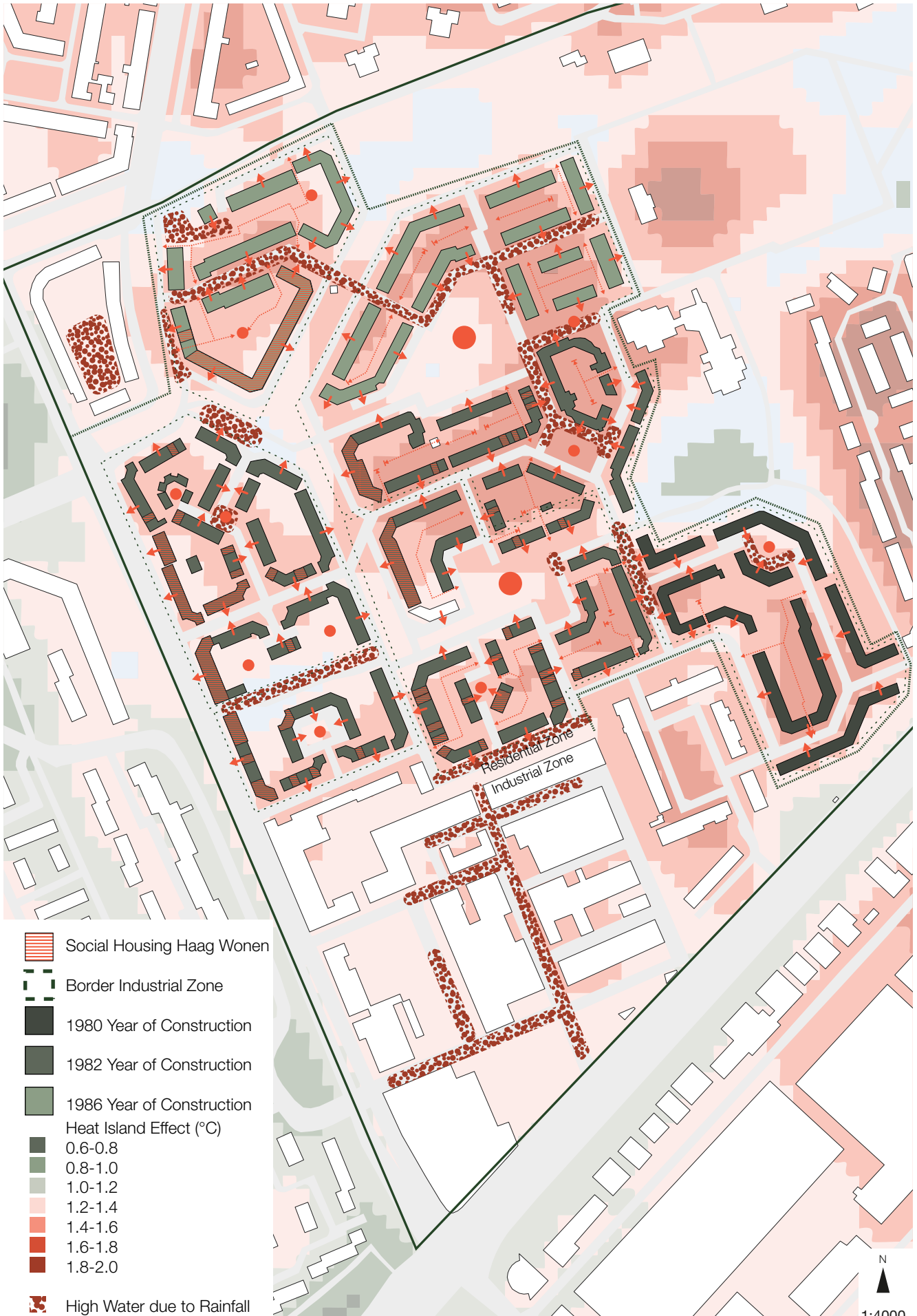


Figure 5: Inventarisatie Cauliflower Neighbourhood Raadsledenbuurt, Based on (Atlas Leefomgeving, 2018, 2020; 2025; Gemeente Den Haag, 2025)

### 01.3 Research Questions

This research will answer the following main question:

*“How can architectural and spatial design strategies transform the cauliflower neighbourhood of Raadsledenbuurt in Houtwijk into a resilient 21st-century neighbourhood?”*

A resilient 21st-century neighbourhood is pleasant to stay in (experiential value), does not exhaust nature but instead nourishes and protects it (future value), and organises the landscape efficiently so that different functions reinforce each other (use value). This combinations contribute to a better neighbourhood, now and in the future (MooiNL, 2025).

The main research question has been subdivided into multiple sub-questions:

- 1. Which problems are current in the cauliflower neighbourhood of Raadsledenbuurt in Houtwijk?*
- 2. What are the architectural and spatial criteria of a 21st century neighbourhood?*
- 3. What are the architectural and spatial characteristics of a typical cauliflower neighbourhood?*
- 4. Which architectural and spatial characteristics of a typical cauliflower neighbourhood are present, absent or underrepresented in the Raadsledenbuurt in Houtwijk?*

### 01.4 Scope

The location and thematic focus are two of the key defining elements of this research. Situated in the Raadsledenbuurt, a sub-neighbourhood of Houtwijk in The Hague, the study explores the transformation of a cauliflower-style neighbourhood into a resilient 21st-century neighbourhood.

Redesigning the entire Raadsledenbuurt on an architectural scale is beyond the scope of this research. Therefore, the study has been narrowed down to developing an overall vision for the neighbourhood, with one selected block (see Figure 6) being designed at an architectural scale.



Figure 6: Scope Location, Source: (Own Work)

# 02.

## Approach

- 02.1 Methods
- 02.2 Theoretical Framework



## 02.1 Methods

The general method of this project will be done by research for design. First research will be done to start the design proces. Further on in the design proces, possibly further research will be needed.

Each subquestion will be answered by its own method.

*1. Which problems are present in the cauliflower neighbourhood of Raadsledenbuurt in Houtwijk?*

This subquestion will be answered by **literature research** and **data research** on problems within cauliflower neighbourhoods and portraying on Raadsledenbuurt by doing **architectural observations**.

*2. What are the architectural and spatial criteria of a 21st century neighbourhood?*

The subquestion will be answered through **literature research**, which focuses on the architectural and spatial elements of a 21st century neighbourhood.

*3. What are the architectural and spatial characteristics of a typical cauliflower neighbourhood?*

The subquestion will be answered through **literature research**, which focuses on the architectural and spatial elements of a typical cauliflower neighbourhood.

*4. Which architectural and spatial characteristics of a typical cauliflower neighbourhood are present, absent or underrepresented in the Raadsledenbuurt in Houtwijk?*

The subquestions will be answered through **urban and architectural analysis** of Raadsledenbuurt, wich focuses on the typical architectural and spatial elements within this area.

### Planning

A project plan has been developed for this research, which is presented in Figure 7. The plan outlines the weekly tasks and associated deadlines for each project phase, where applicable. These deadlines are organised around the A1–A4 submissions and their corresponding presentations. While the project plan serves as a guiding framework for the research process, deviations from the schedule may occur as the project develops.

Quarter 1	<b>Phase 1: Group Fieldwork</b>	
	Week 2.1: Kick-off Week + Start Group Research	
	Week 2.2: Group Research + Generic Problem Statement	
	Week 2.3: Group Research + Wheelchair + Observational Exercises	
	<b>Phase 2: Individual Research</b>	
	Week 2.4: Specific Problem Statement + Research Questions	
	Week 2.5: Research Questions + Theoretical Framework + Specific Problem Statement	
	Week 2.6: Research Questions + Theoretical Framework + Fieldwork	
	<i>Christmas Holidays (2 Weeks)</i>	
	<b>Phase 3: Location and Brief</b>	
Week 2.7: Finalise Graduation Report Part 1 and Part 2		
Week 2.8: A1 Graduation Report Submission + Prepare Presentation		
Week 2.9: A1 Presentation		
Week 2.10: Implenting Feedback of A1 Presentation		
<b>Deadline:</b>	A1 Submission in Week 2.8 A1 Presentation in Week 2.9	
<i>Spring Break (1 Week)</i>		
Quarter 2	<b>Phase 4: Preliminary Design (SO)</b>	
	Week 3.1: Research	
	Week 3.2: Vision + Design	
	Week 3.3: Design	
	<b>Phase 5: Provisional Design (VO)</b>	
	Week 3.4: Design	
	Week 3.5: Design	
	Week 3.6: Design	
	Week 3.7: A2 Graduation Report Submission + Prepare Presentation	
	Week 3.8: A2 Presentation	
Week 3.9: Implenting Feedback of A2 Presentation		
Week 3.10: Implenting Feedback of A2 Presentation		
<b>Deadline:</b>	A2 Submission in Week 3.7 A2 Presentation in Week 3.8	
Quarter 3	<b>Phase 6: Final Design (DO)</b>	
	Week 4.1: Design	
	Week 4.2: Design	
	Week 4.3: Design	
	Week 4.4: Finalising Design	
	Week 4.5: Model Making	
	Week 4.6: A3 Graduation Report Submission + Prepare Presentation	
	Week 4.7: A3 Presentation (Greenlight)	
	Week 4.8: Implenting Feedback of A3 Presentation	
	<b>Deadline:</b>	A3 Submission in Week 4.6/4.7 A3 Presentation in Week 4.7/4.8
<b>Phase 7: Finalisation</b>		
Week 4.9: A4 Graduation Report Submission + Prepare Presentation		
Week 4.10: A3 Presentation (Greenlight)		
<b>Deadline:</b>	A4 Submission in Week 4.9 A4 Presentation in Week 4.10	

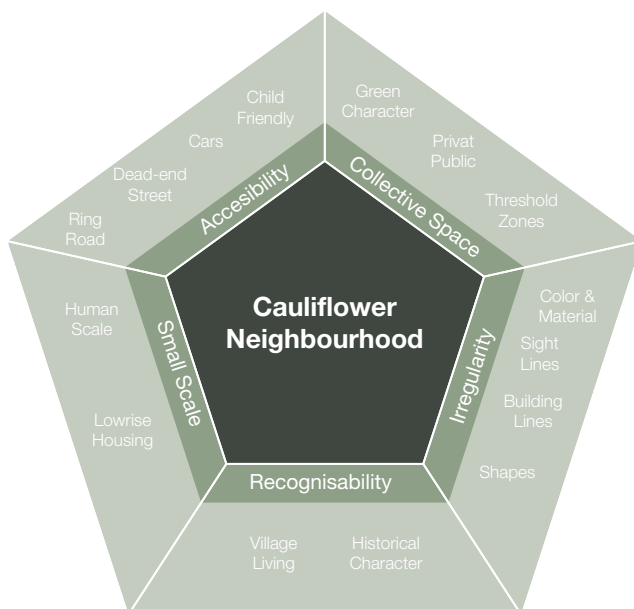
Figure 7: Planning Graduation Project, Source: (Own Work)

## 02.2 Theoretical Framework

The theoretical framework of this research consists of the notions: **Cauliflower Neighbourhood**, **Transition** and **Resilient 21st Century Neighbourhood**. The theoretical framework is based on two reports.

The notion of cauliflower neighbourhood is based on “Opkomst en Ontwikkeling van de Bloemkoolwijk” (Emergence and Development of the Cauliflower Neighbourhood) by Abrahamse (2019), which analyses the spatial and architectural characteristics of cauliflower neighbourhood.

The notions transition and resilient 21st century neighbourhood are based on “Handreiking Woonwijken van de toekomst” (Guide to Residential Areas of the Future) by MooiNL (2025), which defines transitions of neighbourhoods and transition tasks for the following decades.



**Figure 8:** Cauliflower Neighbourhood Theoretical Framework, Based on: (Abrahamse, 2019)

### Cauliflower Neighbourhood

The notion cauliflower neighbourhood is divided into the following subnotions: **small Scale**, **recognisability**, **irregularity**, **accessibility** and **collective space**, shown in Figure 8.

#### *Small Scale*

These neighbourhoods are characterised by **low-rise, ground-bound housing** designed with the **human scale** in mind. While this approach was intended to improve liveability, it often resulted in poor orientation and a labyrinthine structure (Abrahamse, 2019).

#### *Recognisability*

In order to enhance recognisability and social cohesion, designers drew inspiration from **village life** and **historical context**. Public spaces and streets were designed to encourage informal encounters between residents (Abrahamse, 2019).

#### *Irregularity*

A rejection of monotony led to controlled irregularity, expressed through **staggered building lines**, **non-straight sightlines** and **variation in roofs, colours, and materials**. In practice, however, this variation remained subtle due to economic constraints (Abrahamse, 2019).

#### *Accessibility*

Accessibility is organised via a **ring road** with branching residential streets that gradually become narrower and more winding to slow **car** traffic and increase **safety for children** (Abrahamse, 2019).

#### *Collective Space*

Finally, cauliflower neighbourhoods are largely monofunctional, with housing arranged around **communal green spaces**. However, the **thresholdzone** between **private and public** space often limits social interaction, as dwellings tend to turn inward and residents have enclosed private gardens (Abrahamse, 2019).

### Transition

MooiNL (2025) defines a transition as the simultaneous **phasing out** of the existing system and **building up** of a new one, conceptualised through the X-Curve (Figure 9).

Additionally, neighbourhood transitions are described using an hourglass model that distinguishes social and ecological domains, which converge in the raw materials transition. The two ends represent the most complex and time-consuming phases (Figure 10).

### Resilient 21st Century Neighbourhood

The transitions shown in the hourglass represent past developments and ongoing processes that are relevant to the future. According to MooiNL (2025), some transitions are being stimulated more strongly due to increasing urgency. The

housing, climate and energy transitions currently dominate the agenda.

**Living together** focuses on creating a safe and liveable residential environment for the future. The **local economy** is driven by the changing relevance and demand for local facilities within neighbourhoods. **Housing** is motivated by housing shortages, changing household compositions and limited residential mobility. **Raw materials** are driven by the use of waste streams and the implementation of circular construction practices. **Mobility** is driven by climate goals, aiming for greener mobility and reduced travel demand. **Energy** is primarily driven by the heating transition and the need for an expanded electricity network. **Water and soil** are driven by climate change, with heat stress and flooding as key challenges.

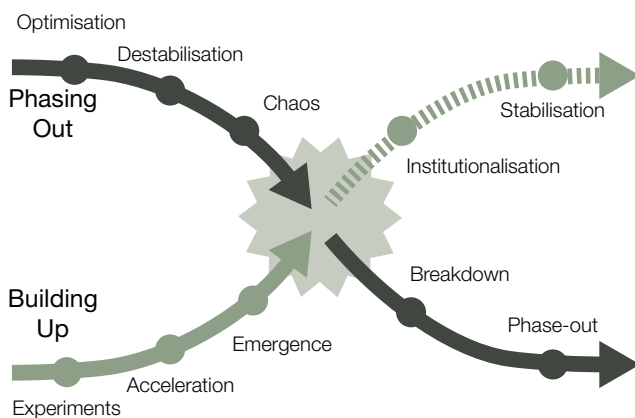


Figure 9: X-curve of Transition, Based on: (MooiNL, 2025)

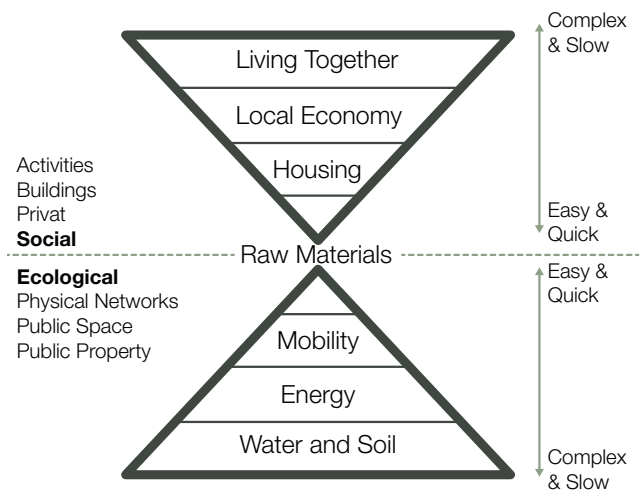


Figure 10: Hourglass with Transitions, Based on: (MooiNL, 2025)

### Specific theoretical framework

This report's theoretical framework integrates three key concepts and their associated sub-concepts: the **cauliflower neighbourhood, transition** and the **resilient 21st-century neighbourhood**. Figure 11 shows the resulting integrated framework.

Due to time constraints, a hierarchy has been established among these concepts. The highlighted notions are considered the most relevant to the project, while the non-highlighted notions play a supporting background role.

This hierarchy is based on a report by MooiNL (2025), which emphasises that the transformation of cauliflower neighbourhoods from the 1970s and 1980s hinges heavily on collective living and identifies housing as the primary catalyst for change. The notion of living together is particularly relevant in the Raadsledenbuurt, where social cohesion and perceived safety are declining (Kompagnie, 2023). The neighbourhood has experienced a population decline, resulting in reduced activity and fewer 'eyes on the street'. Additionally, there is a mismatch between the existing housing stock and the current demographic composition, alongside a broader housing shortage in Houtwijk (OOZO.nl, n.d.; AlleCijfers, 2025a). Therefore, addressing housing density and strengthening collective living are essential to improving safety, social cohesion and overall liveability in the Raadsledenbuurt.

MooiNL (2025) also emphasises the importance of adapting to climate change in paved communal areas, which are typical of cauliflower neighbourhoods. This issue is equally relevant in the Raadsledenbuurt, where extensive paving leads to heat and water stress (Atlas Leefomgeving, 2018; 2020).

Additionally, MooiNL (2025) identifies transition themes such as shopping centres as catalysts for densification, enriched school environments and personalised energy solutions. However, these themes are less directly related to the primary challenges in the Raadsledenbuurt and are therefore considered of secondary importance within this project.

Several defining characteristics of the cauliflower neighbourhood are linked to the key notions of **living together, housing, and water & soil: collective space, recognisability** and **small scale**. These are considered the most relevant spatial qualities as they directly support the transition towards the highlighted aspects of a **resilient 21st-century neighbourhood**.

Figure 11 illustrates how the key notions of the **cauliflower neighbourhood** and the **resilient 21st-century neighbourhood** are interconnected through transition processes. While additional notions remain relevant, they are primarily considered in the background due to the project's scope and time constraints.

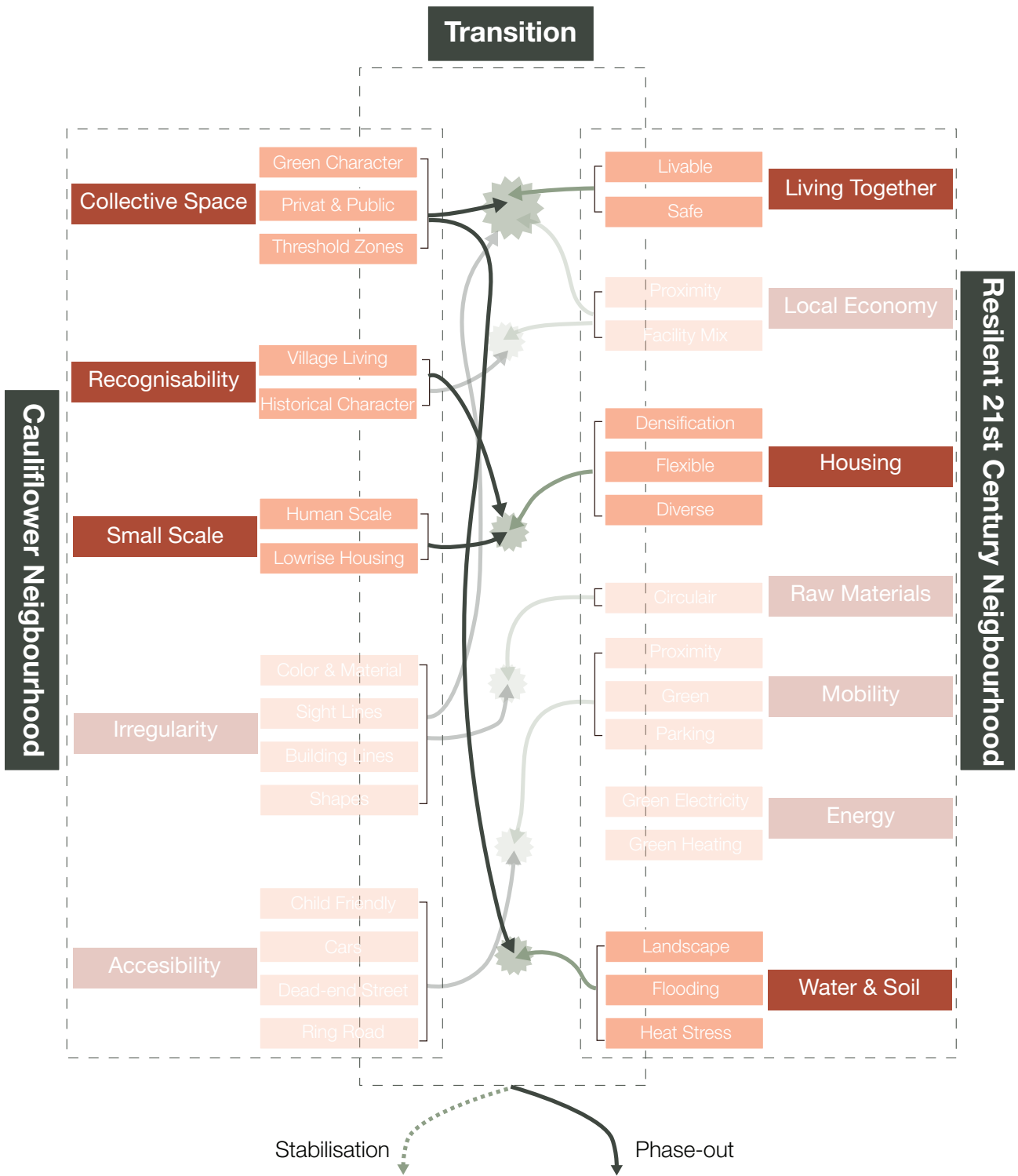


Figure 11: Specific Theoretical Framework, Based on: (Abrahamse, 2019; MooiNL, 2025)

# 03.

## Results

- 03.1 Subquestion 1
- 03.2 Subquestion 2
- 03.3 Subquestion 3
- 03.4 Subquestion 4
- 03.5 Design Principles
- 03.6 Concept
- 03.7 Location Analysis
- 03.8 Program of Requirements
- 03.9 Integration into Design



### 03.1 Subquestion 1

*“Which problems are present in the cauliflower neighbourhood of Raadsledenbuurt in Houtwijk?”*

Ubink and Van der Steeg (2011) analysed over 150 cauliflower neighbourhoods in the Netherlands and identified several issues, which are also evident in the Raadsledenbuurt.

#### Social Cohesion

According to Ubink and Van der Steeg (2011), 88% of the studied neighbourhoods scored below the Dutch average in terms of social cohesion. Furthermore, 58% of the neighbourhoods have a negative trend over time. The Raadsledenbuurt show a similar trend. Ministerie van Binnenlandse Zaken Koninkrijksrelaties (2024) assessed neighbourhood liveability, which social cohesion is part of (Figure 12). Figure 13 shows a deviation, wherein the west part scores more negative.

#### Nuisance and Safety

Compared to the national average, perceived safety had declined in 70% of the analysed neighbourhoods (Ubink & van der Steeg, 2011). Ministerie van Binnenlandse Zaken en Koninkrijksrelaties’ (2024) livability assessment also includes nuisance and safety as indicator (Figure 12).

Again, a contrast is observed within the Raadsledenbuurt. Abrahamse (2019) notes that social housing developments in cauliflower-style neighbourhoods from the 1980s are often associated with higher levels of perceived unsafety, which also is evident here. Thereby, residents report frequent nuisance in areas surrounding social housing complexes in Houtwijk (Kompagnie, 2019; Chavannes et al,2025). Marée and Van Leemput (2025) argue that social control has declined due to placement of fences between privat and collective space, which is also visible in Raadsledenbuurt.

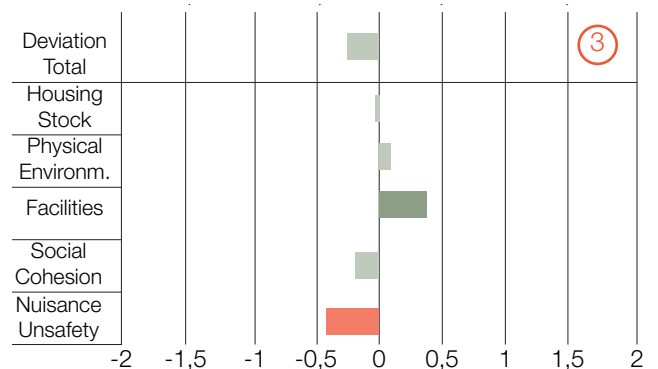
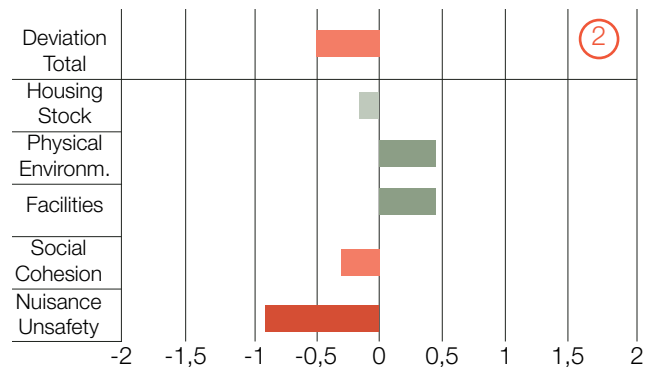
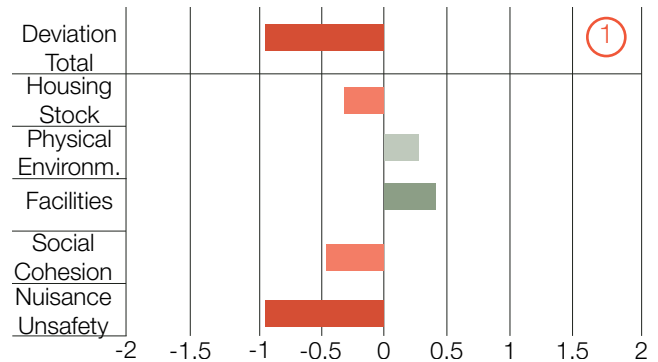


Figure 12: Diagrams Leefbarometer, Based on: (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2024)

# Results

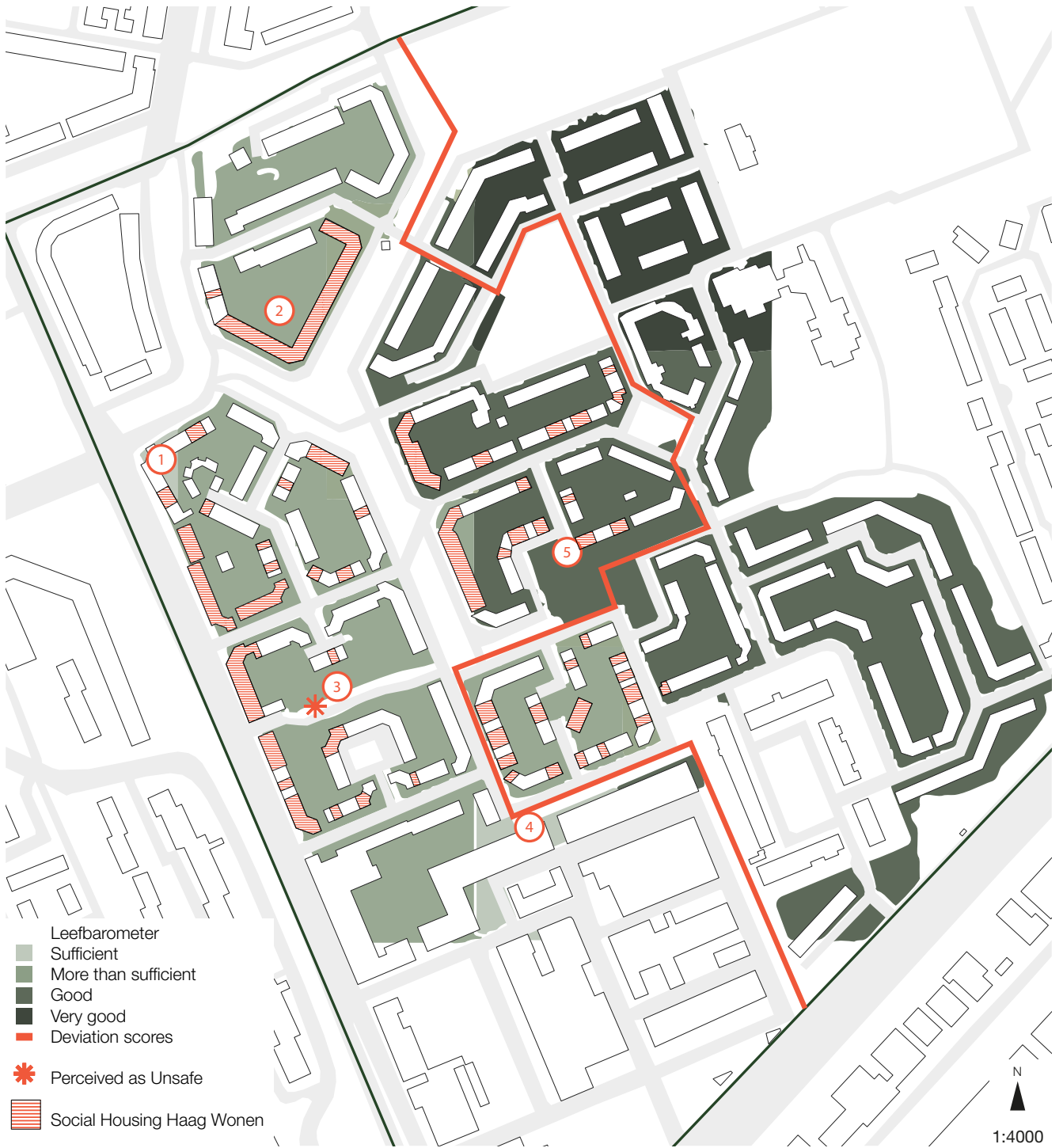
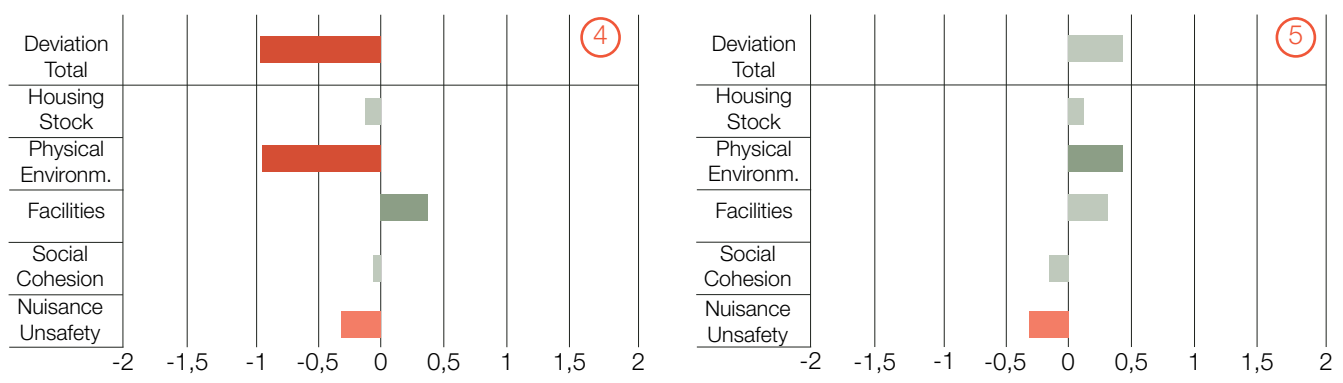


Figure 13: Map Living Together, Based on: (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2024; Chavannes et al., 2025; Gemeente Den Haag, 2025)



### Demographic Mismatch

Ubink and Van der Steeg (2011) describe cauliflower neighbourhoods as being in a ‘pre-ageing’ phase. They predict that ageing and dejuvenation will both increase in the coming years, while the number of families continues to decline. Demographic change may result in an imbalance between the original target group and the current population.

This trend is evident in the Raadsledenbuurt, where the dominant age group is 45–65 years old (Allecijfers, 2025a). However, the neighbourhood’s public spaces remain focused on children, visible in the playgrounds primarily intended for younger age groups.

### Nature and Climate

A feature of residential design in the 1970s-80s was the close connection between housing and nature. Gardens inspired by Louis Le Roy were designed as green, semi-public spaces intended to encourage social interaction (Ubink & Van der Steeg, 2011).

Green elements are present in the Raadsledenbuurt. However, green and blue networks are fragmented and the “woonerven” themselves contain little to no greenery. Due to this fragmentation and the high amount of paved surfaces, the neighbourhood faces several climate-related challenges (Atlas Leefomgeving, 2020;2018), (Figure 15).

### Conclusion

*“Which problems are present in the cauliflower neighbourhood of Raadsledenbuurt in Houtwijk?”*

The current problems within Raadsledenbuurt are decreasing social cohesion, unsafety and nuisance, demographic change, fragmented green and urban climate problems. Figure 14 links the current problems and with the connected the transitions of a 21st century neighbourhood. It shows that the current problems are mainly connected with the transitions: housing, living together and water & soil. This means that the combination of these transitions is essential.

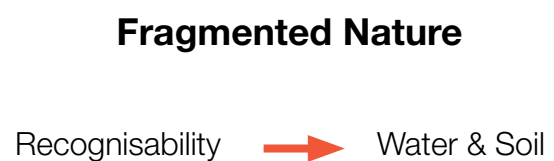
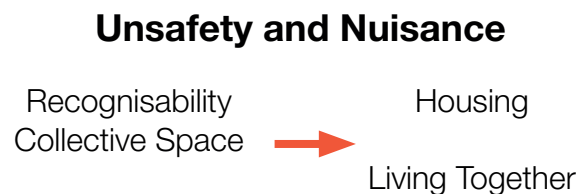


Figure 14: Link Current Problems to Transitions, Source: (Own Work)

Results

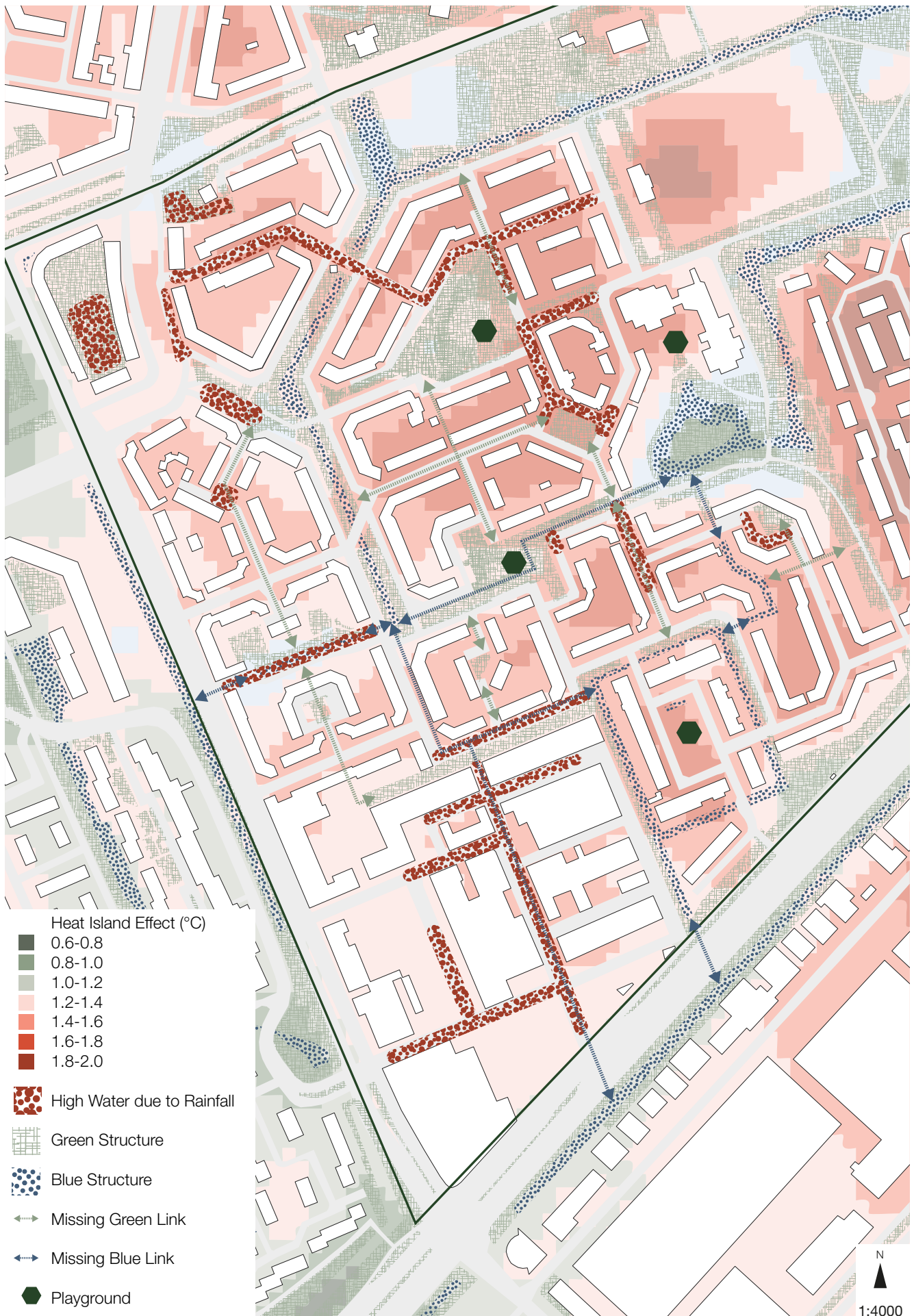


Figure 15: Parking and Climate/Water in Raadsledenbuurt, Based on: (Atlas Leefomgeving, 2018, 2020)

1:4000

## 03.2 Subquestion 2

*“What are the architectural and spatial criteria of a 21st century neighbourhood?”*

The resilient 21st-century neighbourhood is defined in the theoretical framework by seven notions, wherein the focus is on three of them: Living Together, Housing and Water & Soil (MooiNL, 2025).

In the book “Soft City”, Sim (2019) addresses major urban challenges such as global warming, segregation, rapid urbanisation and resource and space scarcity. These challenges are integrated within the transitions of MooiNL (2025)

### Soft City

Sim (2019) argues that these issues can be addressed through the concept of the ‘soft city’ as a smart city, which prioritises human-scale design over high-tech solutions. He emphasises the importance of making better use of existing buildings, spaces, and materials. Instead of relying on density alone, he suggests that differentiation, mixed use and human-scaled environments are more effective responses to contemporary urban challenges. Nine criteria points are made, to create a livable and dense environment, called a “Soft City” (Figure 16) (Sim, 2019, p. 213).

### Selection of Criteria

Figure 16 shows the nine criteria, which can be categorised under three main themes: Diversity, Human and Earth. Several criteria are highlighted in the figure as they directly relate to the key notions of a resilient 21st-century neighbourhood. These include Diversity of Built Form, Diversity of Outdoor Space, Human Scale, Sense of Control and Identity, and Greater Biodiversity.

The remaining criteria are still relevant, but in line with the theoretical framework, they play a more supportive background role in this project.

### Conclusion

*“What are the architectural and spatial criteria of a 21st century neighbourhood?”*

According to Sim (2019), a resilient 21st-century neighbourhood is defined by nine criteria. Based on the applied theoretical framework, five of these are identified as being the most significant for this project: Diversity of Built Form, Diversity of Outdoor Space, Human Scale, Sense of Control and Identity, and Greater Biodiversity. Figure 16 also illustrates examples of design elements that can be incorporated into the design assignment.

	Criteria Soft City	Examples of Design Elements
Diversity	<b>Diversity of Built Form</b>	Difference in buildings, dimensions, typologies Visual variation
	<b>Diversity of Outdoor Space</b>	Difference in public, private and shared outdoor space Different typologies of space for different activities Hybrid space that connect inside and outside Streets as public spaces Public spaces as places for mobility
	Flexibility	Multipurpose indoor and outdoor spaces Biggest proportion of built volume is ground floor Backs with room for growth Enclosed spaces for activities Room on edge of buildings for temporary overflow Independent building parts
Human	<b>Human Scale</b>	Smaller dimensions and spaces No higher than six stories, ideally four or five Multi sensory experiences Particular care for eye-level
	Walkability	Walk-in, through and up buildings Higher proportion of ground floor Visual and physical connection inside outside Direct access to useful outside spaces Walkability at neighbourhood scale
	<b>Sense of Control and Identity</b>	Hierarchy of identifiable territories Clarity between public and private Fronts and Backs Enclosure Smaller units Shared spatial focus Useful edge zones Significant Corners
Earth	Pleasant Microclimate	Consistent microclimatic conditions Protection from strong wind Solar penetration and avoidance of shadows Protected outdoor spaces Useful openings Rain protection at edges
	Smaller Carbon Footprint	Fewer exposed facades Smaller dimensions to allow natural light and ventilation Simpler construction and foundation system Less reliance on complex technology Layout on walking promotion
	<b>Greater Biodiversity</b>	Multiplicity of smaller, individual outdoor spaces Many protected spaces and edges Smaller dimensions of buildings to allow greenwalls and roofs Smaller scale for water management and slower infiltration Soft landscaping where possible.

Figure 16: Nine Criteria for Livable Urban Density in Soft City and Connection with Framework, Source: (Sim, 2019)

### 03.3 Subquestion 3

*“What are the architectural and spatial characteristics of a typical cauliflower neighbourhood?”*

A cauliflower neighbourhood is characterised by its spatial and architectural features.

#### Spatial Layout

The spatial structure of a cauliflower neighbourhood is organised by two elements: traffic and nature (Ubink & Van der Steeg, 2011). Figure 18 illustrates layout of the cauliflower structure. Traffic circulation follows a hierarchical system: main road surrounding the neighbourhood, roads providing access within the fabric and smaller streets serving the cells.

From the 1960s, appreciation for existing landscapes began to influence urban design. Existing natural features increasingly became structuring elements within neighbourhood layouts. Thereby, residential areas are organised into various parcel typologies, shown in Figure 17 (Ubink & Van der Steeg, 2011)

#### Collective Space

In residential areas, housing is arranged around communal green spaces. The transition between private and public spaces plays an important role in facilitating social interaction while maintaining privacy (Abrahamse, 2019).

Garages, carports and kitchens faces the street-side to enhance privacy. Living rooms generally face private gardens, to visually and spatially connect with the collective green spaces. This layout is intended to encourage informal encounters and social interaction (Abrahamse, 2019).

#### Irregularity

In reaction to modernist architecture, cauliflower neighbourhoods rejected uniformity. Excessive repetition of architectural elements could negatively affect mental well-being, leading to boredom or depression (Abrahamse, 2019).

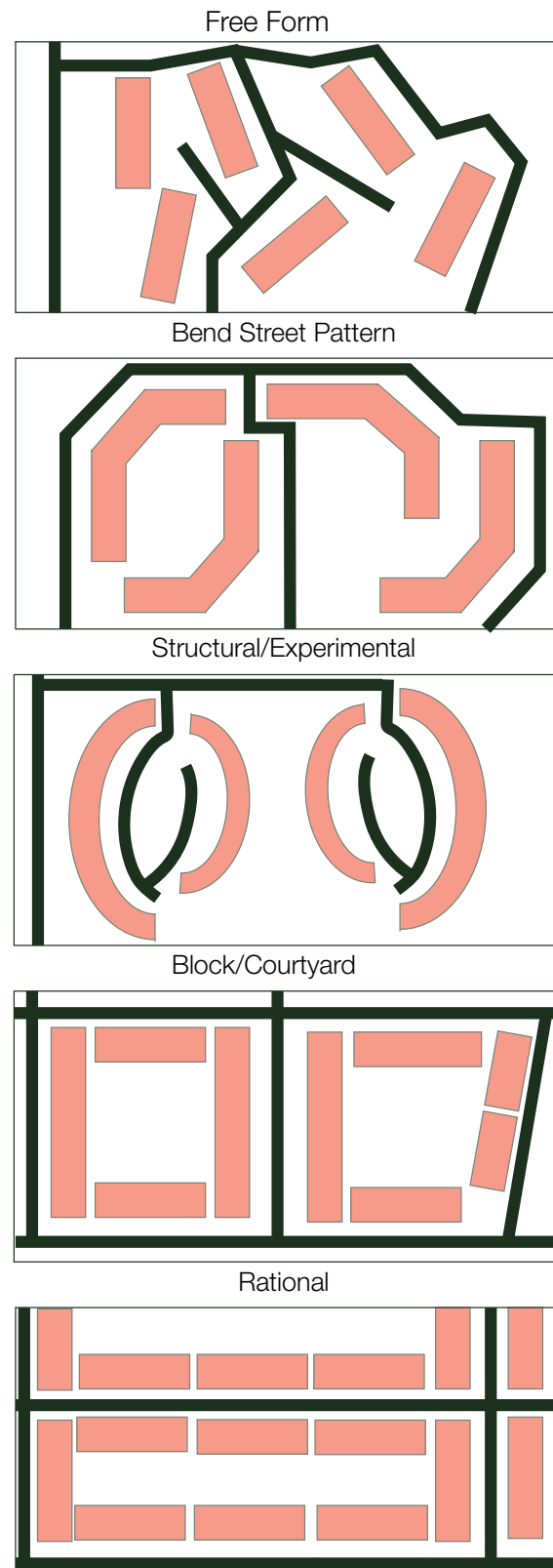


Figure 17: Parcel Types, Based on: (Ubink & Van Der Steeg, 2011)

Therefore, irregularity was introduced. This was achieved by staggering building lines and avoiding long sightlines. At smaller scale, it was done through differences in roof forms, colours, and materials (Abrahamse, 2019). This irregularity enhances the recognisability of individual buildings (Ubink & van der Steeg, 2011).

**Small Scale**

The cauliflower’s architectural scale is a reaction to the tall buildings of modernist architecture. This type of architecture is characterised by low-rise, ground-bound housing. The aim was to create more liveable architecture on a more human scale. However, in practice, this often resulted in poor orientation (Abrahamse, 2019).

**Orientation**

Recognisability and irregularity are also rooted in theories of Gordon Cullen and Kevin Lynch. Kevin Lynch emphasised the importance of routes, nodes and landmarks for orientation in urban environments. Gordon Cullen focused on changing perspectives, arguing that variation enhances visual interest and navigability. These theories informed logic of cauliflower neighbourhoods by supporting orientation through varied and recognisable urban forms (Ubink & Van der Steeg, 2011).

**Conclusion**

*“What are the architectural and spatial characteristics of a typical cauliflower neighbourhood?”*

A typical spatial layout characterises cauliflower neighbourhoods. Housing is situated around collective spaces, where transition zones are important. On a more architectural scale, irregularity and small scale are starting points. However, this can result in poor orientation.

Figure 19 illustrates the key features of a cauliflower neighbourhood in relation to the highlighted concepts of a resilient 21st-century neighbourhood and the ‘soft city’ criteria.

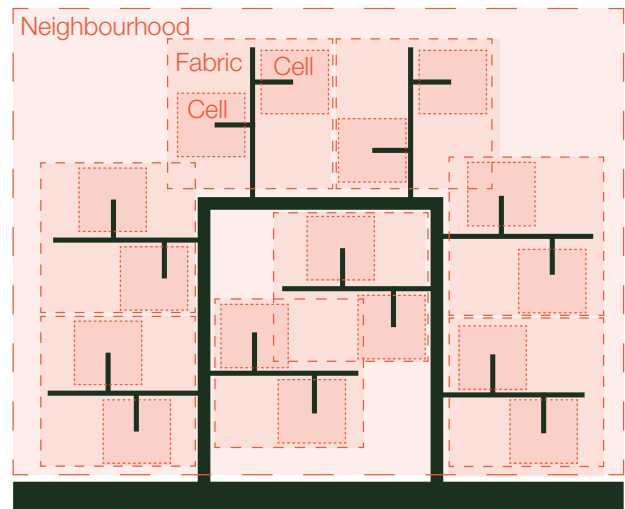


Figure 18: Traffic Structural Elements, Based on: (Ubink & Van Der Steeg, 2011)

**Spatial Layout**

Water & Soil → Greater Biodiversity  
Human Scale

**Collective Space**

Living Together → Diversity of outdoor space

**Irregularity**

Housing → Sense of Control & Identity  
Diversity of Built Form

**Small Scale**

Housing → Human Scale

**Orientation**

Water & Soil → Human Scale  
Living Together → Sense of Control & Identity

Figure 19: Cauliflower Neighbourhood Connected to Resilient 21st Century Neighbourhood, Source: (Own Work)

## 03.4 Subquestion 4

*“Which architectural and spatial characteristics of a typical cauliflower neighbourhood are present, absent or underrepresented in the Raadsledenbuurt in Houtwijk?”*

The Raadsledenbuurt exhibits some characteristics of a cauliflower neighbourhood. The absence or underrepresentation are not unexpected. Original design intentions behind cauliflower neighbourhoods often differed from their realisation, due to economic reasons (Abrahamse, 2019).

### **Spatial Layout**

The Raadsledenbuurt is structured by three hierarchical road types and the underlying natural landscape, resulting in an orthogonal, polder-based structure. The spaces within this framework can be interpreted as a combination of fabric and cells. The predominant parcel type is courtyard typology.

### **Threshold Zones**

In the Raadsledenbuurt the threshold zones are harsh between private and public green; Private gardens are currently enclosed by fences, resulting in narrow pedestrian paths behind the dwellings. Collective gardens are absent.

### **Small Scale**

The Raadsledenbuurt is characterised by its small-scale architecture. Ground-bound, low-rise housing can be found throughout the neighbourhood. However, it also contains mid-rise, nonground-bound housing (figure 20)

### **Orientation**

Gordon Cullen's ideas are evident in the constantly changing perspectives experienced when moving through the neighbourhood.

Despite this, it remains challenging to orient oneself, as the degree of irregularity is limited. The principles associated with Kevin Lynch, such as clear landmarks, nodes and sightlines, are largely absent, which makes orientating hard.

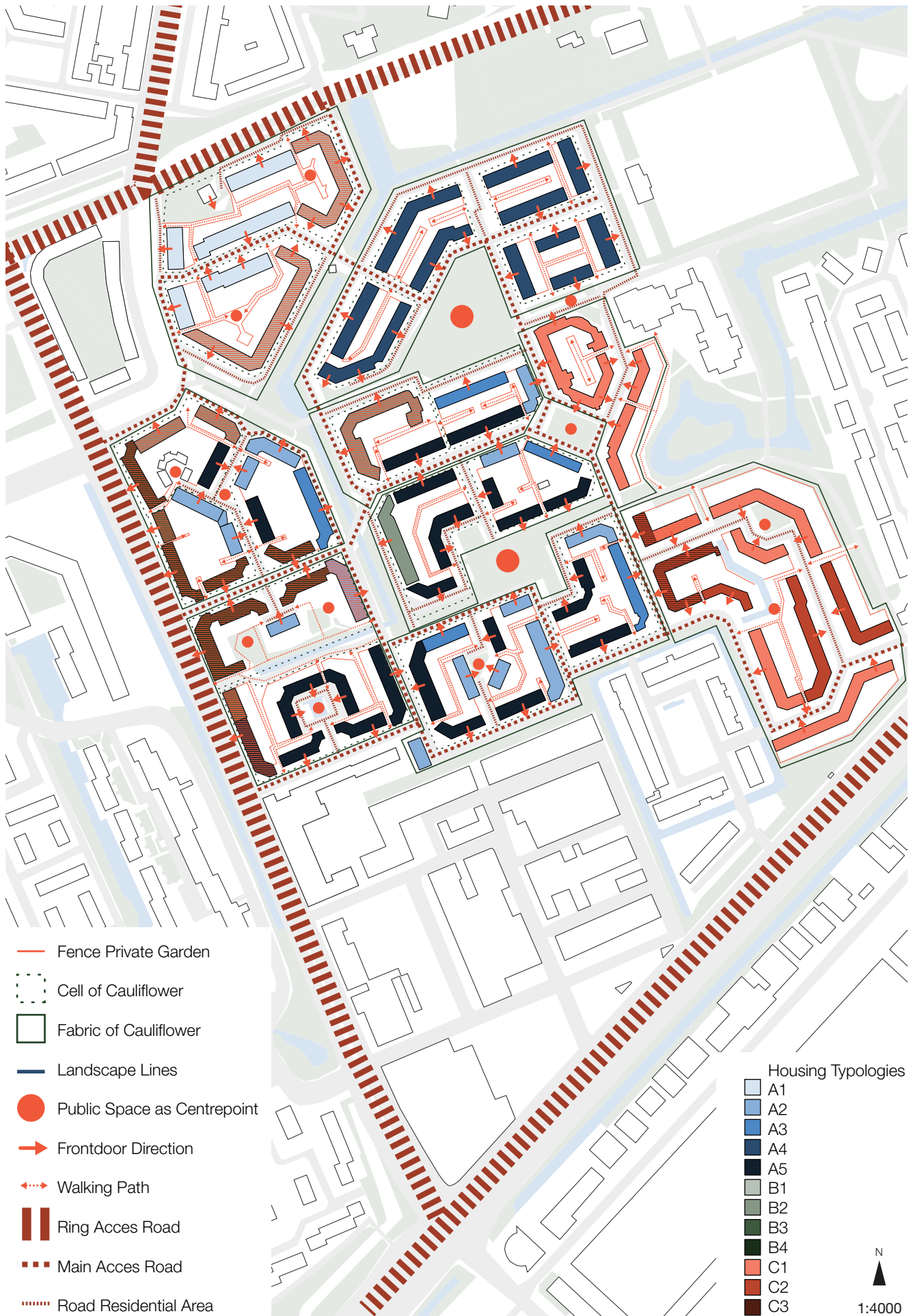
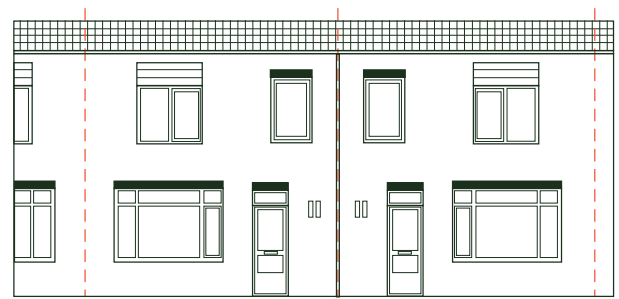


Figure 20: Cauliflower Neighbourhood Characteristics in Raadsledenbuurt, Source: (Own Work)

## Results



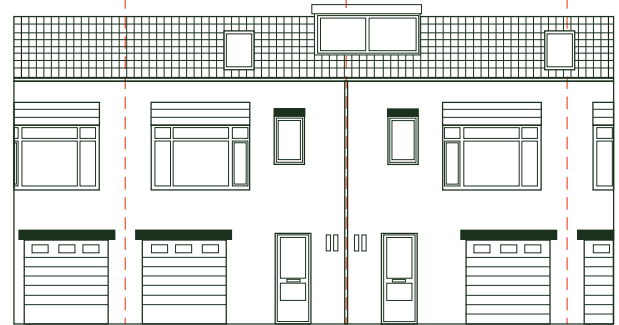
Rowhouse: A5



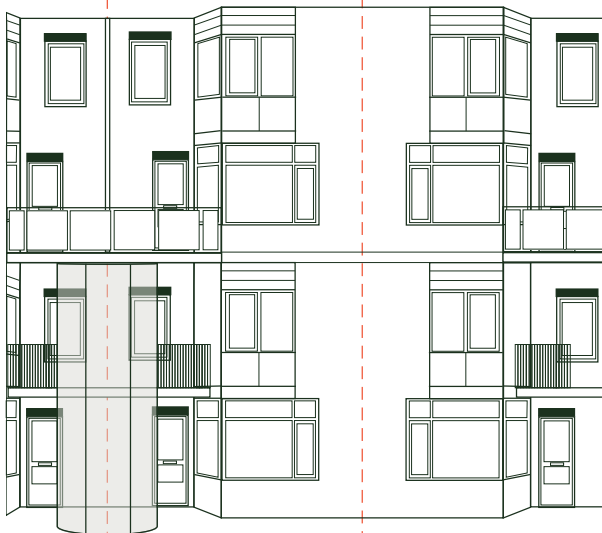
Rowhouse: A2



Low-Rise Stacked  
Housing: B3



Rowhouse: A3



Low-Rise Stacked  
Housing: B4



Low-Rise Stacked  
Housing: B2

**Figure 21:** Facades within Raadsledenbuurt, Source: (Own Work)

### Irregularity

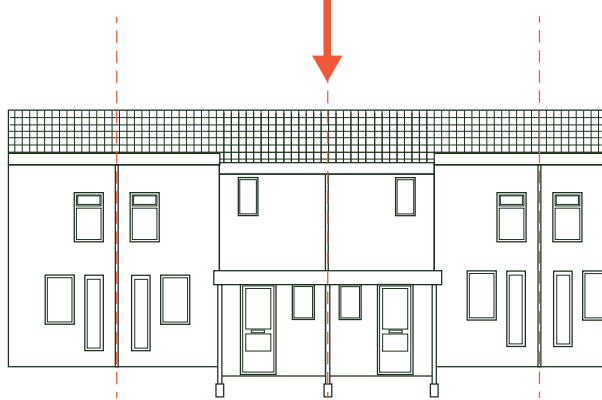
The reaction against monotony of the 1950-60s, is evident in the Raadsledenbuurt neighbourhood. The western neighbouring area is characterised by monotonous high-rise development, whereas the Raadsledenbuurt is a transition zone that decreases in height towards the east.

Figure 20 shows the clustering of visual regularity, particularly in the eastern part of the neighbourhood. However, it should be noted that the architectural differences between the typologies remain relatively subtle.

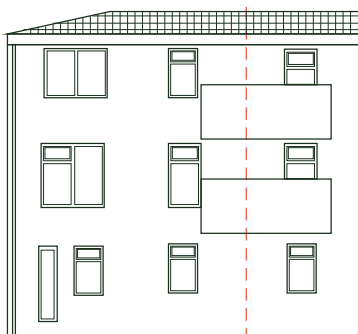
Results



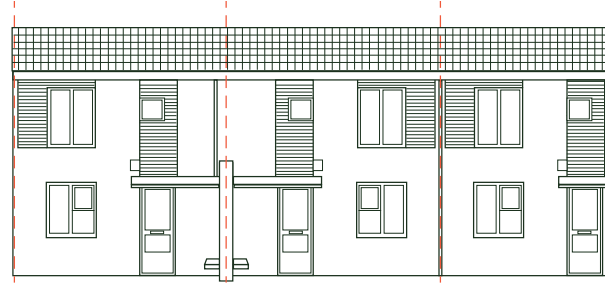
Black/Red Housing: C1



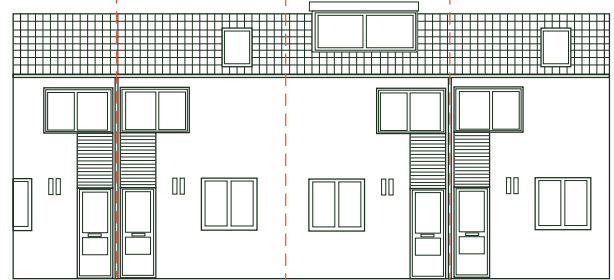
Black/Red Housing: C2



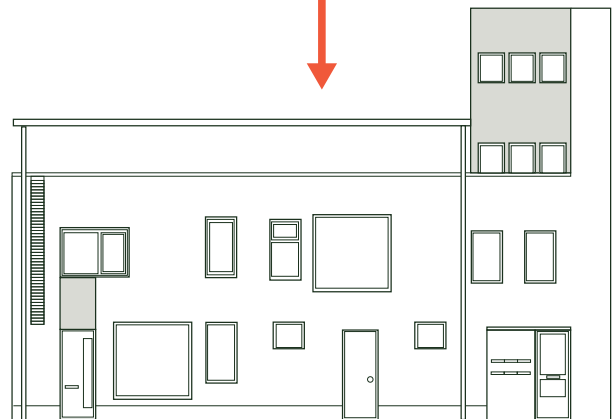
Black/Red Housing: C3



Rowhouse: A4



Rowhouse: A1



Low-Rise Stacked Housing: B1

Figure 21 shows different facade typologies, which illustrates that they are family of each other, which shows only minor irregularities. The most irregularity, achieved through differences in form and colour, occurs between typologies A and B compared to typology C.

### Functional Layout Housing

The typical functional layout of housing in cauliflower neighbourhoods is partly present in the Raadsledenbuurt. Figure 22 shows the functional layout of the housingblocks within the design location.

Building blocks 22p, 24p and 26p have a garage and hallway at the front of the ground floor and two bedrooms at the back. The first floor contains the kitchen and living room.

Building blocks 23p and 24p have a bedroom on the street side of the ground floor, alongside the living room and kitchen. Funda shows that, in some cases, this bedroom has been combined with the living room (Borgdorff Makelaars Wateringen, 2026).

Building block 15–21 has the living room on the street side and the kitchen and one bedroom facing the garden. According to Funda, the ground-floor bedroom is often incorporated into the living/dining room (Makelaars Korporaal & Bertels B.V., 2026), resulting in one fewer bedroom.

This analysis shows the placement of bedrooms on the groundfloor, which was not mentioned in functional layout of housing in cauliflower neighbourhoods. Thereby, it was not designed with collective gardens, even though it has the courtyard spatial layout.

### Resilient 21st Century Neighbourhood

Significant opportunities for transition become evident when the spatial and architectural characteristics of a cauliflower neighbourhood are compared with the highlighted notions of a resilient 21st-century neighbourhood.

An analysis of the spatial layout and façades shown in Figure 21, in relation to the **living together** and **housing** notions, reveals a lack of interaction at the ground-floor level. This absence of active facades may reduce social interaction and negatively affect perceived safety. Additionally, the area has limited housing diversity, as the existing properties are mostly multi-bedroom apartments and low-rise dwellings on the ground floor.

Furthermore, the presence of harsh threshold zones between private and public spaces reduces liveability and safety, both of which are key aspects of the **living together** notion. However, the fragmented landscape structure also presents opportunities to address the **water & soil** theme, particularly in relation to climate adaptation and spatial reconfiguration.

### Conclusion

*“Which architectural and spatial characteristics of a typical cauliflower neighbourhood are present, absent or underrepresented in the Raadsledenbuurt in Houtwijk?”*

The Raadsledenbuurt exhibits the spatial layout and small scale typical of a cauliflower neighbourhood. The layout is primarily determined by the infrastructure, and the landscape is fragmented. The Raadsledenbuurt has a lack of orientation, irregularity and threshold zones.

The characteristics of the cauliflower in the Raadsledenbuurt can be seen as an opportunity to rethink the notions of living together, housing, and water and soil.

# Results

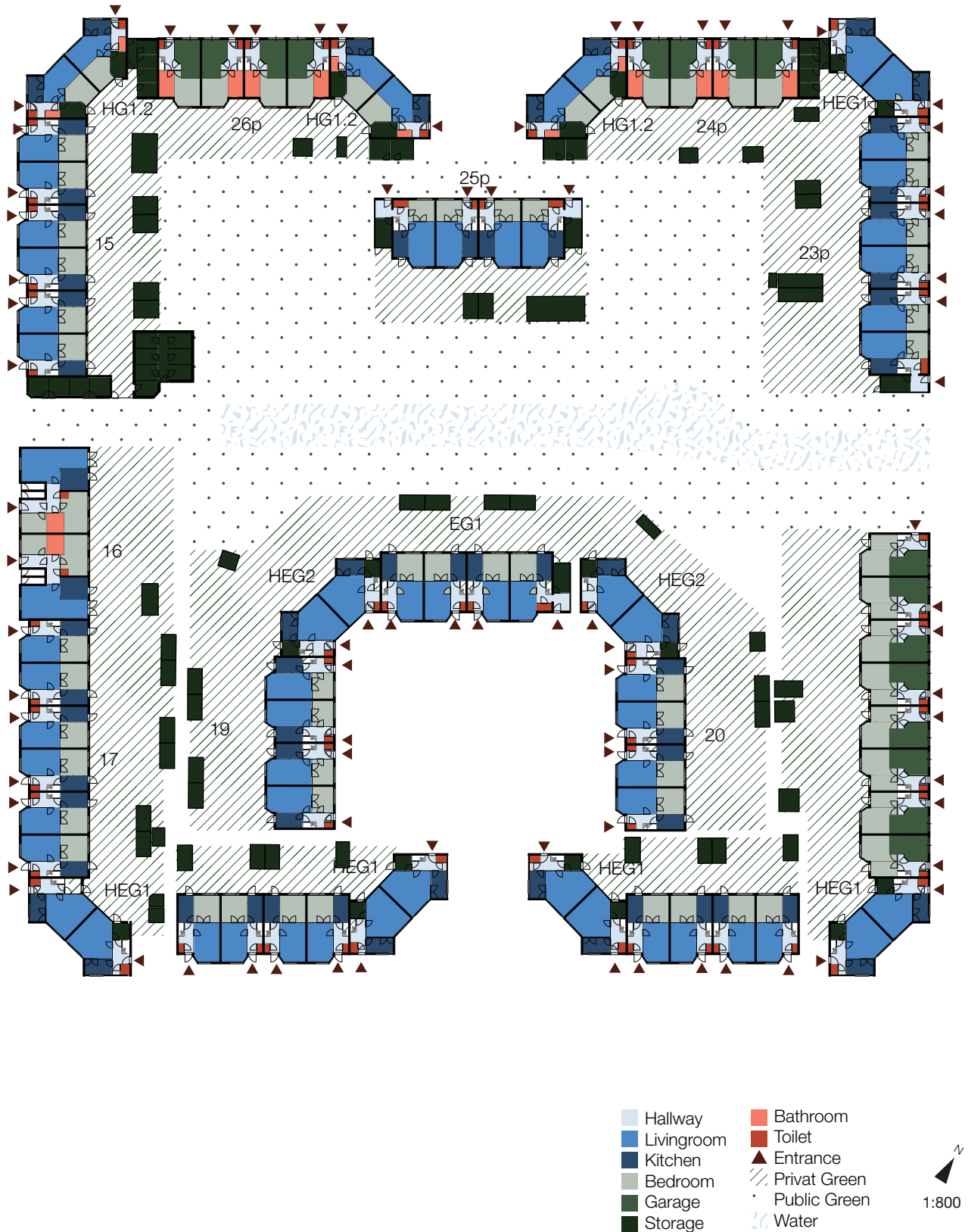


Figure 22: Housing Floorplan Analysis, Source: (Own Work)

## 03.5 Design Principles

The aim of this project is to transform the cauliflower neighbourhood of Raadsledenbuurt into a resilient 21st-century community. Chapter 01 introduced the theoretical framework, which is structured around three key notions and distinguishes between primary and secondary importance. The focus is on developing a resilient neighbourhood in which **living together**, **housing**, and **water & soil** are central. Within the cauliflower neighbourhood concept, emphasis is placed on collective space, recognisability, and small scale.

The selection of five out of the nine design principles from Soft City by Sim (2019) was informed by this hierarchical structuring of the theoretical framework. Figure 23 shows all nine design principles, highlighting the five most relevant ones. Examples of potential design elements are provided beneath these principles to illustrate how they may be applied within the design proposal.

## Results

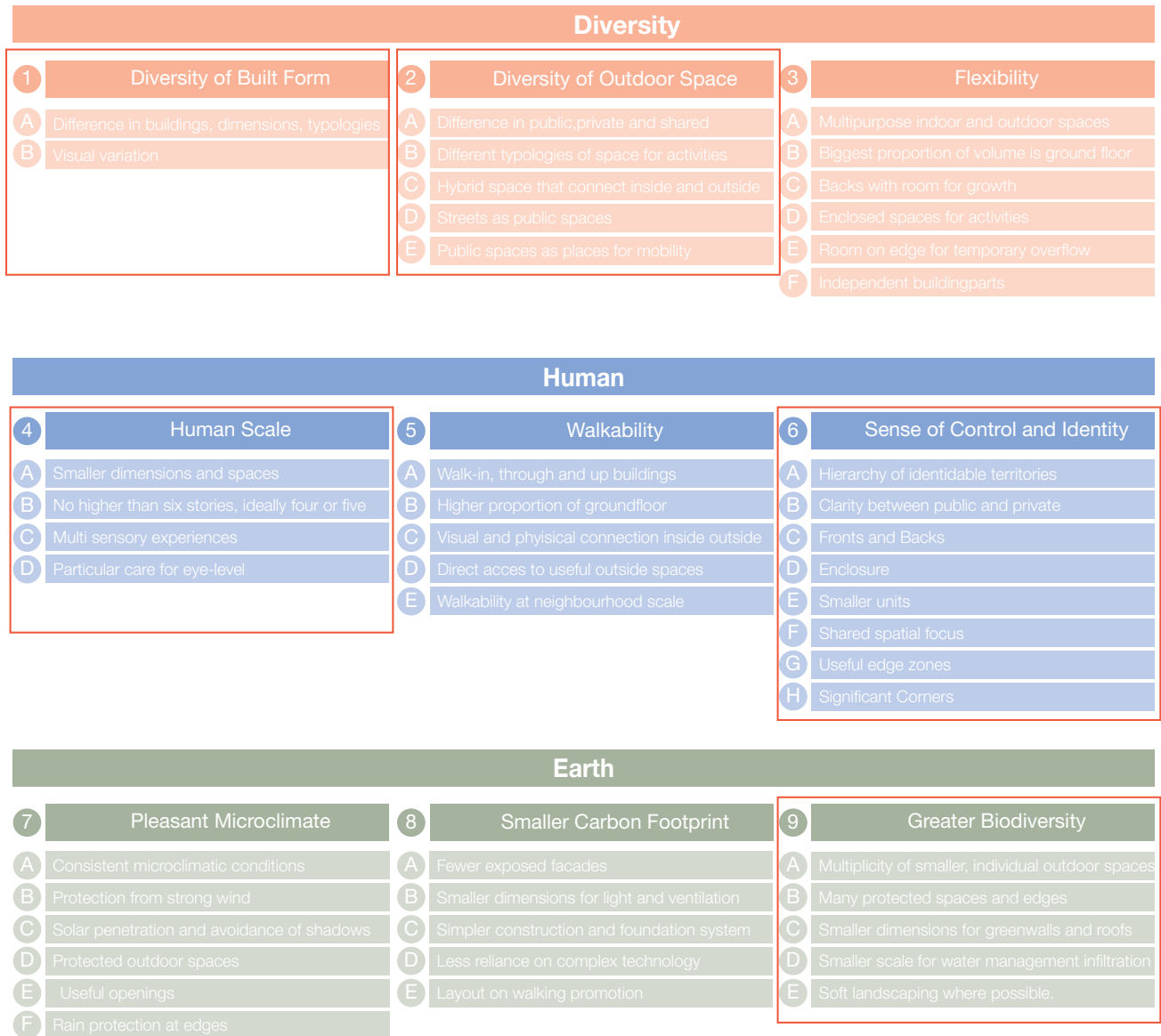


Figure 23: Design Principles, Based on: (Sim, 2019; Abrahamse, 2019; MooiNL, 2025)

# Results

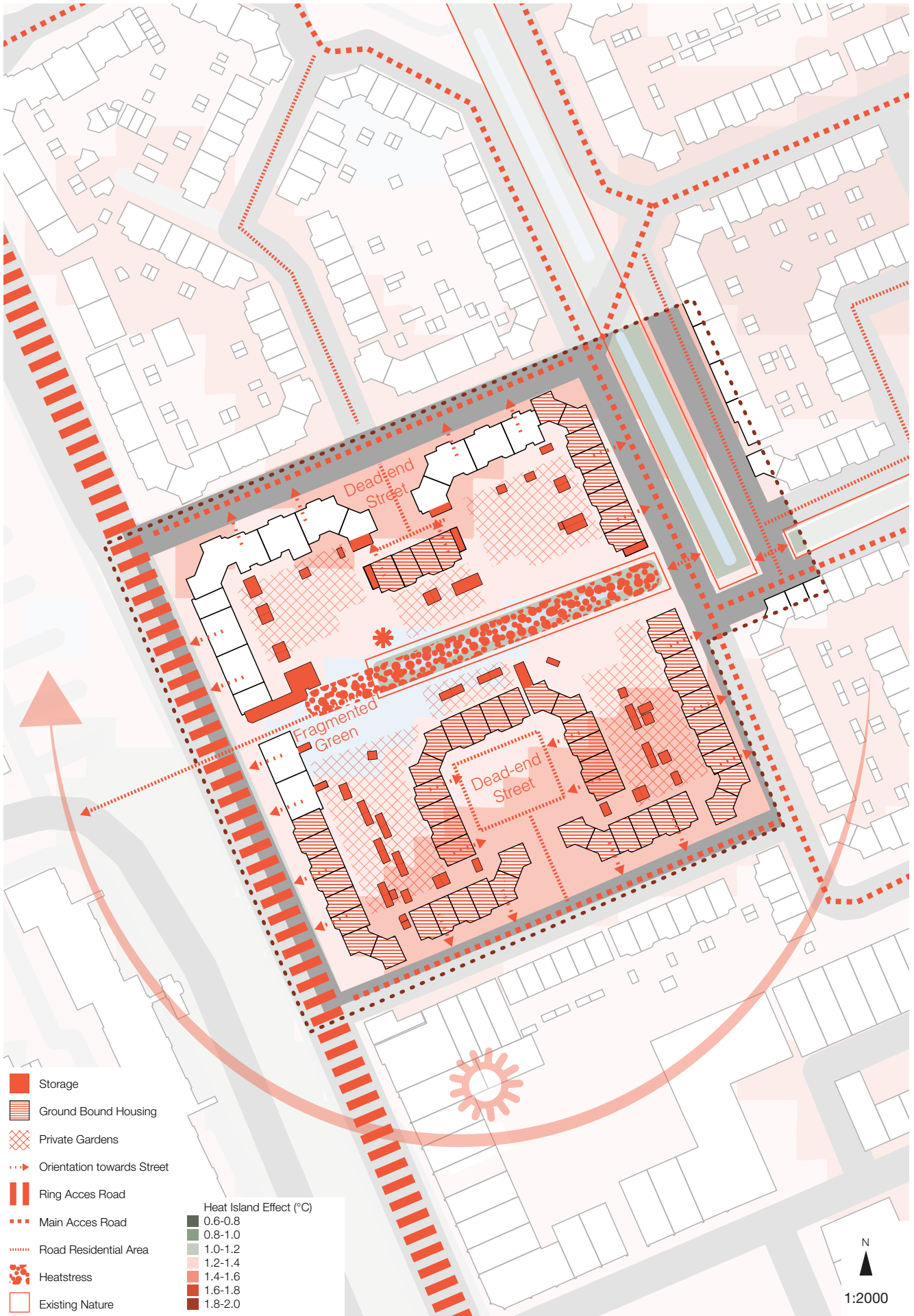


Figure 24: Site Analysis Current Situation, Source: (Own Work)

### 03.6 Location Analysis

Chapters 03.1 and 03.4 analyse the location, focusing on the neighbourhood's current issues and the characteristics of a cauliflower neighbourhood. Building on these findings, this chapter provides an overview of the current situation and identifies opportunities for transitioning to a resilient 21st-century neighbourhood.

Figure 24 illustrates the current state of the design location, highlighting fragmented green spaces, dead-end streets, climate stress, the absence of collective gardens and ground-bound housing.

Figure 25 illustrates the opportunities for transitioning to a resilient 21st-century neighbourhood in green and the limiting threats in red. Some housing and private storage structures obstruct spaces that could be used for densification, communal areas, and stronger links between nature and streets. Additionally, many houses face outwards, resulting in fewer 'eyes on the street' and potentially reducing natural surveillance, which could lead to safety issues within the building block.



Figure 25: Site Analysis Chances for Transitions, Source: (Own Work)

## 03.7 Concept

This design aims to create a resilient 21st-century neighbourhood with a primary focus on living together, housing, and water and soil. These three themes have informed the selection of design principles and form the basis of the overall concept.

The design principles are:

1. Diversity of built form
  2. Diversity of outdoor space
  4. Human scale
  6. Sense of control and identity
  9. Greater biodiversity
- These design principles can be seen in the concept.

### Location

The location analysis indicates that the current urban structure is highly individualised. Residents are primarily oriented towards their private gardens and lack a connection to the surrounding public green spaces. Consequently, the existing open spaces are fragmented and largely underutilised, functioning more as residual areas than meaningful, collective environments. This demonstrates that the current situation lacks the design principles.

### Concept

In response, the design concept focuses on strengthening social connections, integrating nature and improving housing diversity, using a woven patchwork of five landscape typologies. This approach redefines both the currently individualised spaces and the underused residual spaces as shared, meaningful environments. With this, it touches on the **first design principle: diversity of outdoor spaces** and **design principle nine: greater biodiversity**.

These five landscapes act as threads in a woven fabric, forming a layered, interconnected spatial structure that supports social cohesion and ecological resilience. Within this concept, the notion of home expands to include the neighbourhood as a whole, encouraging a sense of collective ownership and inclusivity. Here, it touches on **design principle six: sense of control and identity** and **design principle eight: greater biodiversity**.

### Landscape typologies

These typologies are organised hierarchically, ranging from large-scale public spaces to smaller, more private domains. Figure 26 illustrates this hierarchy, demonstrating how the typologies interconnect to form a continuous spatial fabric. This hierarchy, which ranges from large-scale public spaces to smaller, more private domains, reflects **the fourth design principle: human scale**.

The five typologies are: Park, Avenue, Street, Garden Chamber and Garden. Each typology incorporates distinct spatial characteristics that enhance recognisability, improve orientation and establish clear yet gradual transitions between public and private spaces, key aspects reflected in **design principle one: diversity of built form** and **design principle four: human scale**.

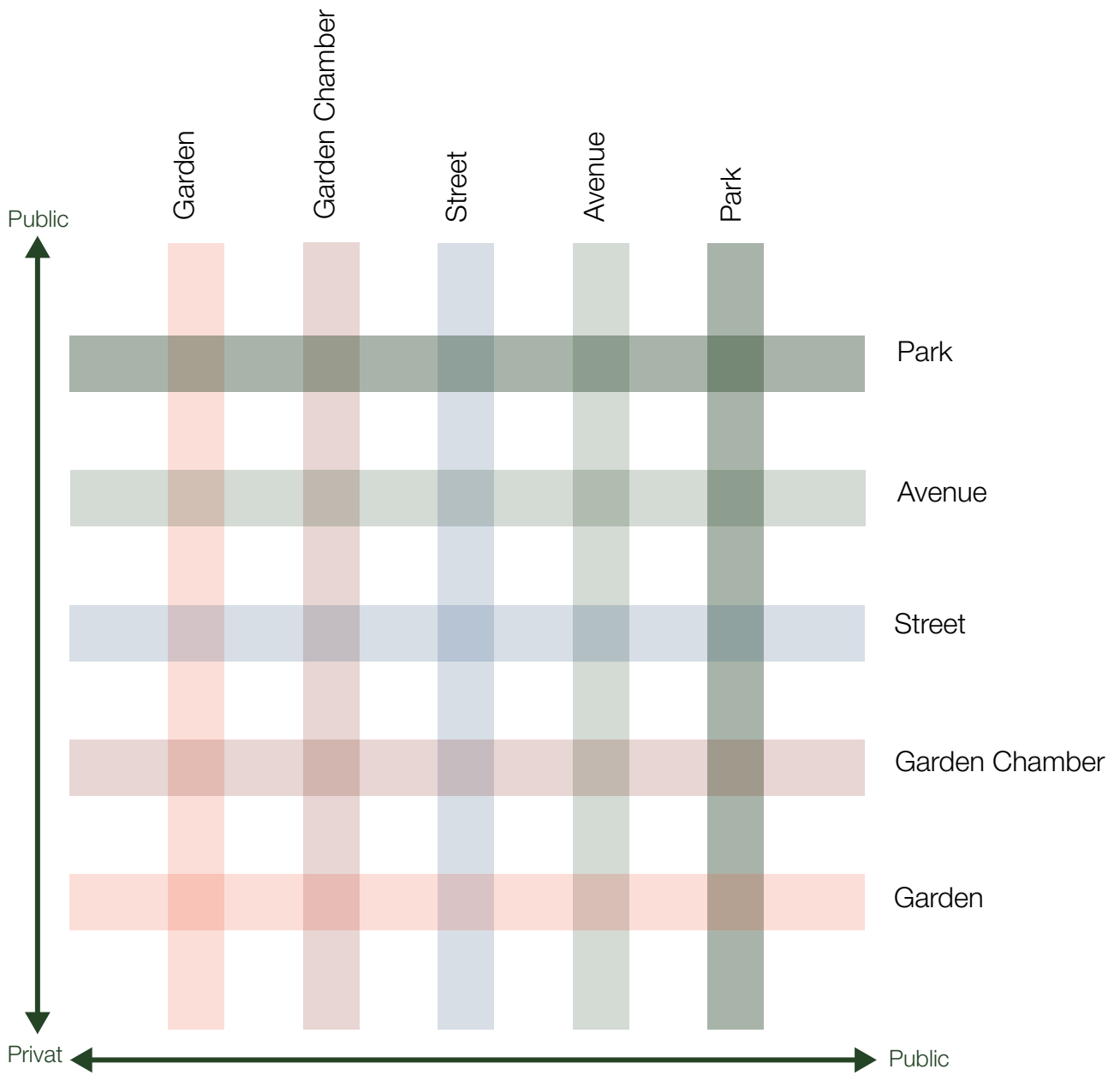


Figure 26: Concept Woven Landscapes, Source: (Own Work)

## 03.8 Program of Requirements

The programme of requirements is derived from the three main concepts of the resilient 21st-century neighbourhood, as defined in the theoretical framework, and is informed by the chosen design principles.

The current design of the location consists of 104 family dwellings, primarily in the form of low-rise, single-family homes and multi-bedroom apartments. Consequently, the existing housing stock can be characterised as relatively monotonous. Additionally, the neighbourhood's demographic composition has shifted, with older adults now forming a significant proportion of the population (OOZO.nl, n.d.; AlleCijfers, 2025a).

This reveals a clear mismatch between the theoretical framework, the design principles and the existing spatial and social conditions. To address this, the proposed programme introduces a greater diversity of housing types. In particular, there is a need for smaller dwellings, such as one- and two-bedroom units, which are currently underrepresented. These typologies respond to the demographic shift and align with the design principles outlined by Sim (2019), such as **design principle one: diversity of built form and design principle four: human scale**.

Furthermore, providing suitable housing for older adults enables housing flow, allowing older

residents to move to more suitable properties and freeing up larger homes for families. Starters and older adults can move into the newly build housing. This process would support a more balanced and mixed demographic composition, which is currently lacking in the area (OOZO.nl, n.d.; AlleCijfers, 2025a).

In addition to diversification, densification is a key objective identified in the theoretical framework. This implies an increase in the total number of dwellings in the area. According to MooiNL (2025), higher residential density can support the development of local amenities such as small shops, cafés and community facilities, enhancing the neighbourhood's overall liveability.

Figure 27 illustrates the programme's transformation: the current program and the proposed programme of requirements. Twenty houses marked in the location analysis will be demolished to create more space for construction. The design will incorporate those twenty family houses, so that the old residents can move in there. The comparison highlights increased diversity in housing types and the introduction of public functions. The proposed floor areas per dwelling are based on standard measurements of the book "De Menselijke Maat" by Haak and Leever- Van Der Burgh (1980) and serve as guiding references for the design.

## Current Program

<b>Existing Housing</b>	<b>104 houses</b>
Family Housing	102 houses
Wheelchair accessible housing	2 houses



## Deconstruction

- 20 family houses  
84 houses left



## Program of Requirements

<b>Newly added housing</b>	<b>94 houses</b>
Studio	44 houses
Apartment	34 houses
Family house	16 houses
<b>Total housing</b>	<b>178 Houses</b>

<b>Studio</b>	<b>40-50 m<sup>2</sup></b>
(1) Livingroom	20 m <sup>2</sup>
(1) Kitchen	7 m <sup>2</sup>
(1) Entry	5 m <sup>2</sup>
(1) Bedroom	10 m <sup>2</sup>
(1) Bathroom + Toilet	4 m <sup>2</sup>
(1) Garden/Balcony	5 m <sup>2</sup>

<b>Apartment</b>	<b>50-75 m<sup>2</sup></b>
(1) Livingroom	20 m <sup>2</sup>
(1) Kitchen	7 m <sup>2</sup>
(1) Entry	5 m <sup>2</sup>
(1/2) Bedroom(s)	10 m <sup>2</sup>
(1) Bathroom + Toilet	4 m <sup>2</sup>
(1) Storage	5 m <sup>2</sup>
(1) Garden/Balcony	5 m <sup>2</sup>

<b>Family house</b>	<b>75-100 m<sup>2</sup></b>
(1) Livingroom	20 m <sup>2</sup>
(1) Kitchen	7 m <sup>2</sup>
(1) Entry	4 m <sup>2</sup>
(3/4) Bedrooms	10 m <sup>2</sup>
(1) Bathroom + Toilet	4 m <sup>2</sup>
(1) Toilet	2 m <sup>2</sup>
(1) Storage	5 m <sup>2</sup>
(1) Garden/Balcony	5 m <sup>2</sup>

<b>Parking</b>	
Shared cars (private)	0,5 per house (98 parking spots)
Bike storage (private)	2,0 per house (576 parking spots)
Car parking (public)	10 parking spots
Bike storage (public)	40 parking spots

Figure 27: Program of Requirements, Based on (Haak & Leever- Van Der Burgh, 1980)

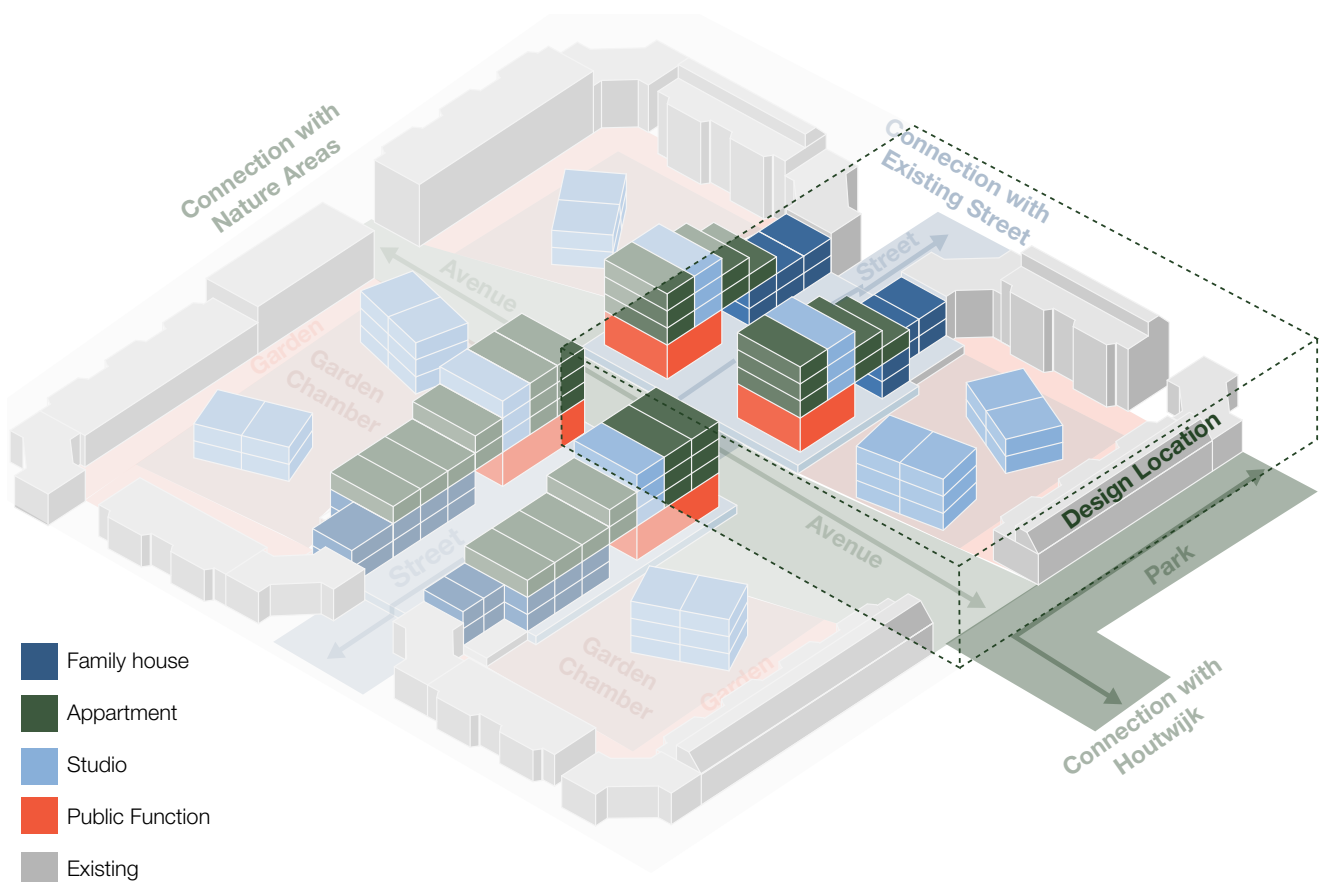
### 03.9 Integration into Design

As discussed in Chapter 3.7, the concept of a 'patchwork of landscapes' involves a transition from large-scale public spaces to small-scale private domains, creating a distinct spatial hierarchy.

Figure 28 illustrates the integration of landscape and function within the design. The park connects Raadsledenbuurt to the wider green structure of Houtwijk, and the avenue links the site to the surrounding green areas, forming a continuous corridor. The street typology creates a strong axis between building blocks. At a smaller scale,

garden chambers provide shared green spaces with garden houses, and each dwelling includes a private garden, so completing the hierarchy.

The design combines housing with public facilities. They replace missing neighbourhood facilities while supporting social interaction and circularity. Located at the corners of the building blocks, these facilities define central spaces and emphasise the corners as landmarks, thereby reinforcing recognisability and orientation, which can be seen partly in **design principle six: sense of control and identity**.



**Figure 28:** Axonometric drawing of Functions and Patchwork of Landscapes, Source: (Own Work)



The park is the most public typology, extending throughout the Raadsledenbuurt and connecting it to the wider Houtwijk area (Figure 30). It serves as the neighbourhood's primary ecological and social backbone. Structured around the canal, the park will be transformed to create a continuous water line, improving the notions of **recognisability** and **water & soil** of the theoretical framework.

The housing along the park has been redesigned to encourage social interaction, with street-facing kitchens and small front gardens with seating forming a soft boundary between public and private spaces, connecting with the notions of **human scale** and **livability** (Figure 29).

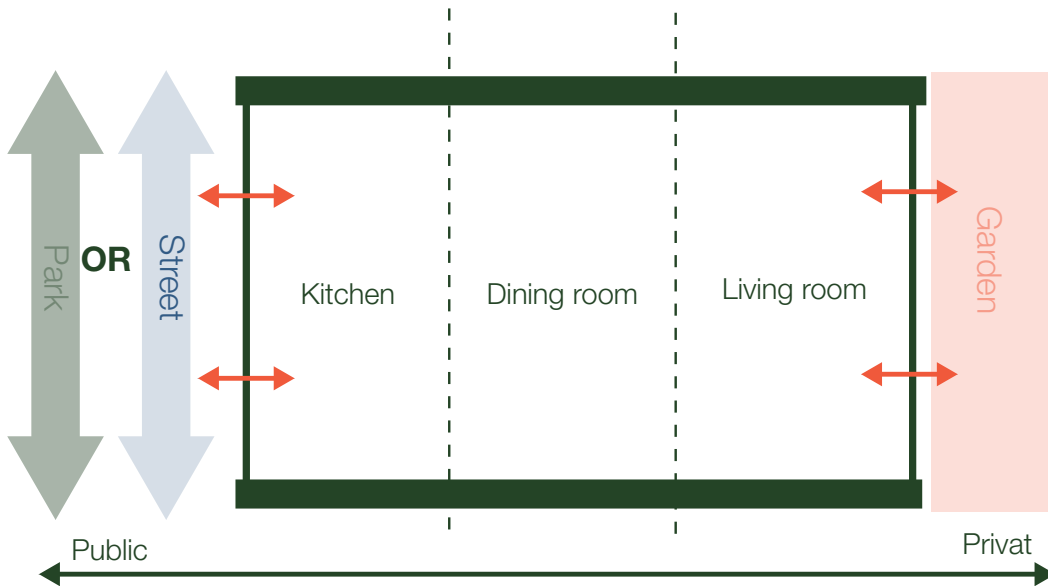


Figure 29: Schematic Floorplan of Groundfloor Layout in Relationi to the Landscapes, Source: (Own Work)



Figure 30: Isometric Section Park, Source: (Own Work)



The avenue branches off from the park and runs through the design area, linking the central green space to the surrounding parks in Houtwijk. It functions as an important ecological and spatial connector. Running alongside the public functions at the heart of the building block, it serves as a key cycling and emergency route. Figure 31 illustrates how the public functions work together.

Various outdoor public spaces (**design principle two: diversity of outdoor space**), such as terraces, tribunes and water playgrounds, are directly linked to indoor functions along the avenue. In this way, the avenue embodies the notions of **collective space, living together, and water & soil**.

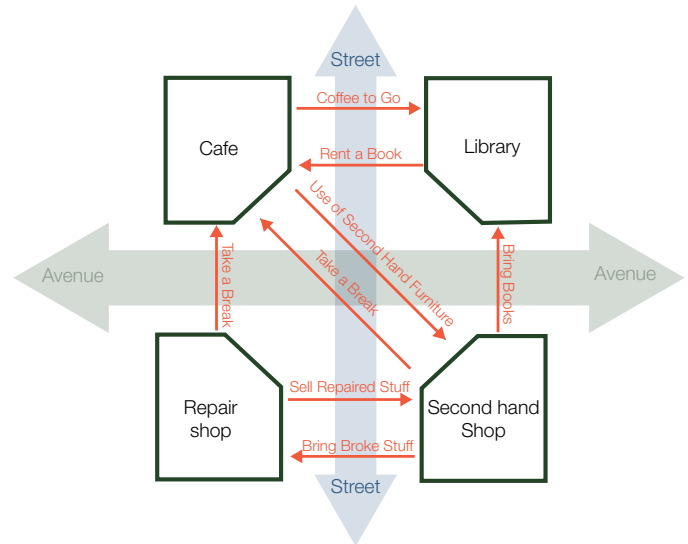


Figure 31: Scheme of Public Functions, Source: (Own Work)



Figure 32: Isometric Section Avenue, Source: (Own Work)

## Results



The street is a semi-public space where everyday social interaction, such as meeting neighbours, is central. It is designed on a smaller scale compared to the larger landscape elements. A consistent material language of the axis reinforces this continuity, emphasising the **human scale** and the **threshold between private and public** space, as outlined in the theoretical framework.

The facades have a fill-in grid system, wherein the facade has a homogenous appearance but still has different fill-ins (**design principle one: diversity of built form**). This system is used on all the facades to create a coherent appearance. The more open elements are used on the more private sides of housing and the more closed on the public.

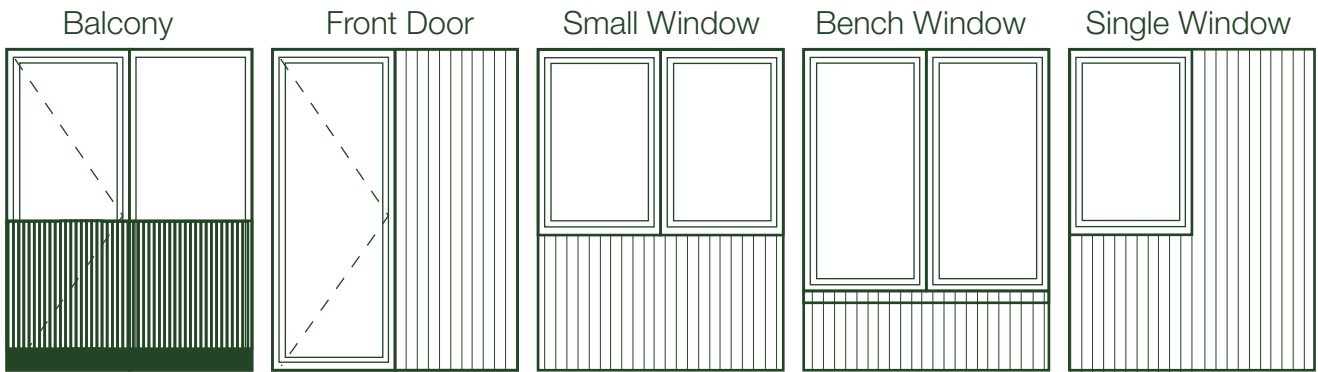


Figure 33: Facade system, Source: (Own Work)

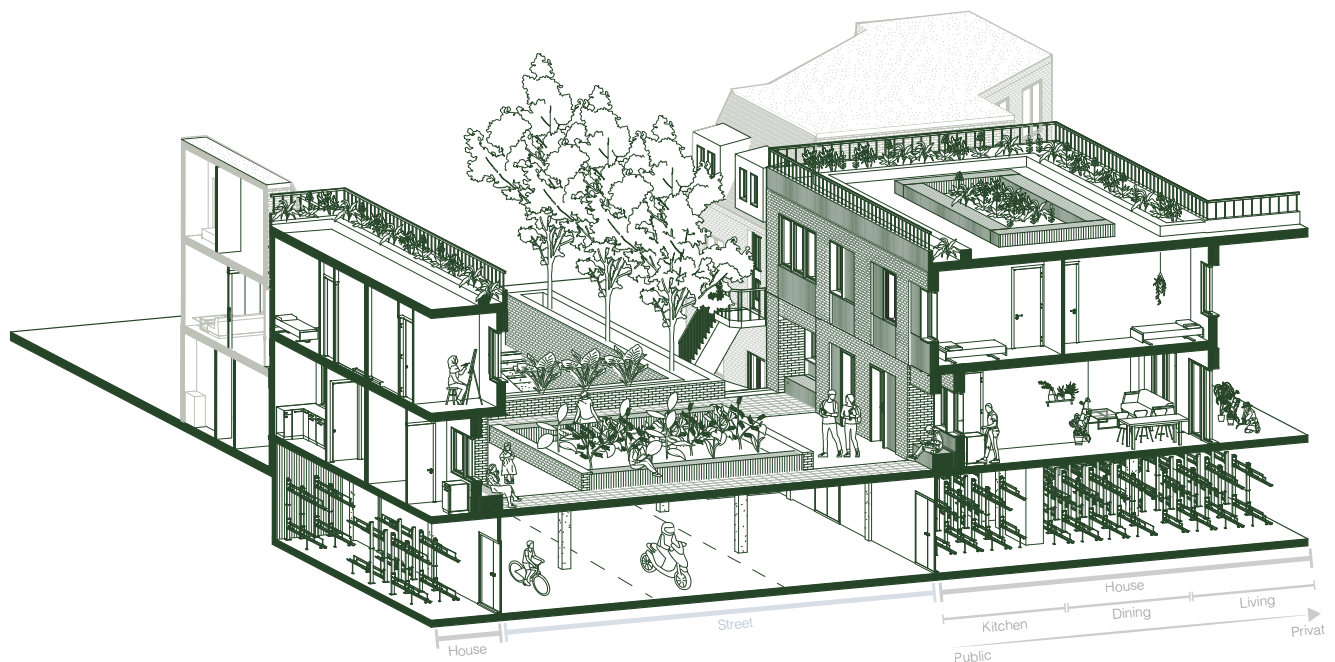


Figure 34: Isometric Section Street, Source: (Own Work)



Unlike the other typologies, the garden chamber is not linear but defined as an enclosed area formed by surrounding building blocks. It functions as a collective green space in which urban villas are placed.

The façades facing this space are more open and fluid, creating softer transitions between inside and outside. As a result, the functions along the garden chamber are more private compared to

those facing the more public typologies, such as the street.

The garden chamber has a distinctly green character, with diverse planting that supports biodiversity and creates a pleasant environment for walking and informal use. The notions of **water & soil** and **collective space** from the theoretical framework are present and thereby **design principle eight: greater biodiversity.**

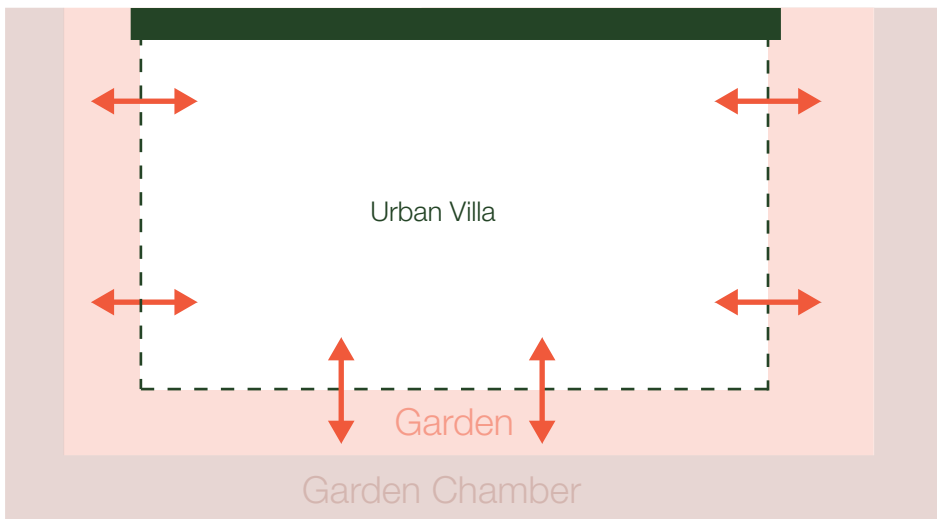


Figure 35: Floorplan of the Urban Villa in Relation into the Garden and Garden Chamber



Figure 36: Isometric Section Garden Chamber, Source: (Own Work)



The final landscape typology is the garden of each dwelling. The garden is the most private typology and is directly connected to the garden chamber. Representing the private outdoor space of the dwelling, it incorporates a more open and gradual transition towards the collective space. The transition from garden to garden chamber is marked by a subtle change in level (Figure 37), which clearly defines the two spaces while enabling visual connection, social interaction and a sense of spatial control. In this typology, the notions of **collective space**, **human scale** and **living together** are present. Herein, **design principle four: human scale** and **design principle six: sense of control and identity**.

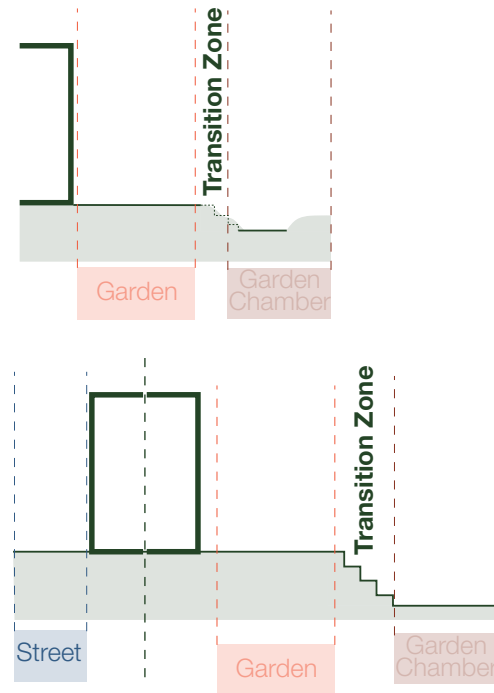


Figure 37: Scheme of Transition Zones between Garden and Garden Chamber



Figure 38: Isometric Section Garden, Source: (Own Work)

# 04.

## Conclusion and Discussion

- 04.1 Conclusion
- 04.2 Recommendations and Implications
- 04.3 Reflection



## 04.1 Conclusion

This graduation report addresses the following key question: *“How can architectural and spatial design strategies transform the cauliflower neighbourhood of Raadsledenbuurt in Houtwijk into a resilient 21st-century neighbourhood?”*

In order to transform the Raadsledenbuurt, it is necessary to understand its current spatial and social conditions, the characteristics of the cauliflower neighbourhood typology, and the criteria of a resilient 21st century neighbourhood.

The neighbourhood is currently facing several challenges, including a decline in social cohesion, safety issues and nuisances, demographic changes, fragmented green spaces and urban climate problems. These issues are closely linked to the transitions identified in the theoretical framework, particularly those relating to housing, living together, and water and soil. This shows that tackling these transitions together is vital for transforming the Raadsledenbuurt neighbourhood.

According to Sim (2019), a resilient 21st-century neighbourhood is defined by nine criteria. Within the applied framework, five of these criteria are considered to be the most relevant for the transformation of the Raadsledenbuurt: Diversity of Built Form, Diversity of Outdoor Space, Human Scale, Sense of Control and Identity, and Greater Biodiversity.

The Raadsledenbuurt reflects the spatial structure of a typical ‘cauliflower’ neighbourhood, characterised by a small-scale, infrastructure-led

layout with fragmented green spaces. It lacks clear orientation, spatial hierarchy and well-defined threshold zones between private and public spaces. However, these characteristics also present an opportunity to reconsider and redesign the relationships between living together, housing, and water and soil.

The “patchwork of landscapes” design concept addresses these challenges, aiming to transform the Raadsledenbuurt into a resilient 21st-century neighbourhood. It focuses on strengthening social relations, integrating nature and diversifying housing, using a system of five interwoven landscape typologies. This approach reimagines private and unused spaces as shared, meaningful environments.

The five landscape typologies function as interconnected layers within a coherent spatial fabric, supporting social cohesion and ecological resilience. The concept of ‘home’ extends beyond the dwelling to encompass the neighbourhood as a whole, thereby encouraging collective ownership and inclusivity.

Ultimately, the five resilience criteria selected by Sim (2019) are embedded throughout the design. The proposal addresses the identified social and spatial problems, such as declining cohesion, safety concerns, demographic shifts, fragmented green spaces, and climate-related stress, by establishing a structured hierarchy of landscapes and clearly defining threshold zones. Together, these elements address the cauliflower neighbourhood’s core urban and architectural weaknesses and form the basis for its transformation.

## 04.2 Recommendations and Implications

An architectural design is always a work in progress, with aspects that could be developed or improved with more time. This chapter considers possible design directions, future research opportunities and elements that could be applied to other projects.

### Further Development of the Design

As the design is embedded within an existing urban context, any intervention will directly affect current residents. To address this responsibly, it is essential to involve residents early in the design process using participatory design methods.

Further research into prefabricated construction methods could reduce on-site construction time and limit disruption to the neighbourhood. Additionally, several of the dwellings marked for transformation are owner-occupied. These transformations should therefore be developed in close collaboration with residents. Currently, the specific preferences and needs of existing inhabitants have not been incorporated.

The current proposal focuses on new-build housing. Future development should place greater emphasis transformation of existing housing to ensure that any changes made are structurally feasible. The potential for subdividing existing dwellings has yet to be explored. This could provide additional housing capacity. Similarly, some roofs in the neighbourhood are suitable for extensions upwards. This could increase density without significantly expanding the spatial footprint.

As the 'patchwork of landscapes' concept integrates architectural and landscape elements, a more interdisciplinary approach would be beneficial. Collaborating with a landscape architect student could enhance the quality of public spaces and gardens within the design.

### Recommended Research

This graduation project was based primarily on a literature review and an urban-architectural analysis. While this provided a solid theoretical and spatial foundation, having a more participatory approach could have improved the outcomes. This would provide deeper insight into local experiences, perceived neighbourhood challenges and preferences regarding spatial qualities and functions.

Such an approach would shift the research process towards a more bottom-up methodology. It would likely result in stronger alignment between the design and the needs of current residents, increasing local support and ownership of the proposed interventions.

### Takeaways of the Design

This design only represents one part of the Raadsledenbuurt neighbourhood. Its redevelopment should form part of a comprehensive strategy for the whole neighbourhood. Redeveloping only a portion could lead to feeling of inequality and weaken social cohesion.

The proposal shows that existing neighbourhoods have potential for densification. This approach can help to address housing shortages, particularly in urban areas.

At the same time, the design shows that densification does not have to come at the loss of green and recreational spaces. In fact, it can create spaces that are more accessible and better used, replacing underutilised and neglected green areas.

## 04.4 Reflection

In addition to recommendations on the design itself, this section discusses the design process, the position of the architect and societal impact.

### Process

During the initial design phase, drawings and models were created manually. This analogue approach enabled rapid exploration of variations and encouraged experimentation. However, working analogously sometimes resulted in a loss of precision. When transitioning to digital tools, it became apparent that some ideas were less feasible in practice, suggesting that integrating digital modelling earlier in the process could have improved the translation of concepts into buildable proposals. A parallel workflow combining digital and analogue methods would likely support both creativity and technical accuracy.

As the process progressed, the shift towards digital work reduced the amount of hand-drawn experimentation. This resulted in fewer iterations and a more limited exploration of alternative solutions. Maintaining analogue sketching throughout the process could have enabled more iterative and exploratory design development. Additionally, while multiple design variations were developed, not all of them were systematically documented or retained. A more structured method of recording iterations would have been beneficial, particularly for discussions during tutoring sessions. This would have enabled a better understanding of the development process rather than just the final outcomes.

Finally, preparation for tutoring sessions was sometimes disorganised. Although drawings and questions were prepared in advance, the presentation of material and articulation of design decisions could have been more organised. A clearer structure for presenting work and formulating questions would likely have improved the efficiency and depth of feedback sessions.

### Position and societal impact

While working on this graduation project, I started thinking more about the role of architects and researchers in society and their impact. This became even clearer during the Climate Fresk workshop.

Designing and constructing something new can have significant consequences for the health of the earth, and therefore for human life. The materials used and the construction method play an important role in this, but that is not everything. Land use also has a significant impact.

In my project, I tried to incorporate buildings into underused land that was almost considered “no man’s land”, particularly areas that, at first glance, did not appear suitable for housing. I really enjoyed exploring ways to densify areas in places where this is not very common.

I believe that this type of densification, whether within public spaces or next to existing housing, is an important strategy that requires further research. This could be the future for many Dutch cities, which are struggling with land use and a housing shortage.

Within this concept of building in existing environments, a difficult question arises: who is going to initiate such projects in reality? Should architects take the initiative by designing proposals and approaching municipalities? Or should municipalities or residents take the first step? I believe architects could play a significant role in guiding this process, demonstrating to municipalities the opportunities available for constructing additional housing.

Lastly, I believe that the roles of architect and researcher should be closely intertwined in order to create context-specific solutions. This became very clear to me during this project.

## *Conclusion and Discussion*

# 05.

## Appendices

- 05.1 Literature
- 05.2 Acknowledgements



## 05.1 Literature

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## *Appendices*

