

# urban habitat.

reconnecting city dwellers with nature

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THESIS BOOKLET

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Oxford Dictionary:

## **habitat**

NOUN /'hæbɪtət/

1 The natural home or environment of an animal, plant, or other organism.

1.1 *informal* A person's usual or preferred surroundings.



**CHALMERS**

Master's Thesis  
Final Booklet

### **URBAN HABITAT**

reconnecting city dwellers with nature.

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Figure 1: Human = Nature.  
(Världskulturmuseet, 2019)

## **ABSTRACT**

Today's continuous urbanization and advancing technologization of everyday life lead to an ever increasing disconnect between humans and nature. To become a sustainable society, however, we must reacknowledge our interdependency with the global ecosystems. Such environmental awareness has proven to be grounded in a question of identity: Do we consider ourselves a part of nature?

In the building sector, sustainability efforts are still marginal and mostly centered around technical solutions. These, however, have proven ineffective because they neglect human factors of behavior, attitude and identity. The built environment has also a great influence on our perception of the world. Here lies its potential to become an important actor in education for sustainable development.

This thesis explores how the architectural design of the urban home can foster the residents' connection to nature in order to encourage environmentally responsible citizens. Through transdisciplinary literature research, four relevant design concepts have been selected: Design for Biophilia, Place-Identity, Land Stewardship and Co-Evolution. Combined, they strive to expose and thereby reconnect the resident to nature and place.

These concepts are implemented in the design proposal for a multi-family house in the center of Stuttgart, Germany. As an urban infill in a dense residential area, the project will replace a lowrise parking garage on site. The key feature of the design are non-heated living spaces between inside and outside, which expose the resident to the natural features of temperature, weather, local climate and changing seasons.

The building design challenges its residents to bring their daily life into harmony with nature's changing conditions, but also strives to empower them to become active agents for the development of their home. With this holistic approach, the thesis aspires to contribute to the current discourse on the future of sustainable urban living.

keywords:

sustainability, identity, connection to nature, housing, urban living

## THESIS IDEA

The idea for this thesis came to life last summer, when I travelled through Sri Lanka for two months. There, none of the houses outside the bigger cities had glass in their window frames. People lived essentially outside all year round.

During my stay, I experienced how personal wellbeing and attachment to a place can be shaped by this way of living. Consequently, I began to wonder how such an experience could be translated into the European climate and an urban context.



Figure 2: Sri Lankan Dwelling.  
(own photography)



## **STUDENT BACKGROUND**

My motivation for this thesis is grounded in the personal inquiry on how I as an architect can contribute to the transformation of our society towards sustainability.

During my Bachelor studies at Bauhaus-University Weimar, Germany, I developed my interest for residential architecture. After two semester projects at the housing department I wrote my Bachelor's thesis on the municipal housing in Vienna, engaging in questions on social justice and the political dimension of residential architecture, as well as the urban way of living.

My strong interest for environmental sustainability in architecture arose through a course at Wageningen University on Sustainable Urban Development, as well as the introductory course at Chalmers University. In addition to that, I engaged in sustainability communication as a board member for the student association Chalmers Students for Sustainability.

Within the MPDSD programme, I gained a lot of technical knowledge during the Sustainable Architectural Design studio, but also became aware of the discrepancy between contemporary energy efficiency goals and the overall resource consumption of hightech solutions.

Leading up to the Master's thesis, I was a guest student at Göteborg University, completing a course on Education for Sustainable Development. The acquired knowledge on the psychological dimension of environmental awareness and pedagogical perspective on sustainability communication forms the base for my thesis research.

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## READING INSTRUCTIONS

The booklet is divided into six parts. Throughout the chapters, the content unfolds from a broad theoretical basis with general validity to a concrete architectural design proposal for a specific site.

The first chapter *Background* gives an entry point into the thesis. Here, the main discourse, the thesis framework and methodology are introduced.

The second chapter *Local Context* introduces the site, as well as relevant geographic, climatic and demographic information for the city of Stuttgart.

The third chapter *Foundations* provides the theoretical basis for the latter work. Relevant definitions are given, followed by the introduction of four research topics: Sustainability and Regeneration, the Human-Nature Relationship, the Ecological Citizen, and Home.

In the fourth chapter *Design Concepts*, the transdisciplinary findings are translated into four specific approaches for architectural design: Design for Biophilia, Land Stewardship, Place-Identity and Co-Evolution. Their perspective on identity and the connection to nature is highlighted. Subsequently, important overlaps between the concepts are discussed.

The fifth chapter *Design Proposal* converts the findings from the previous chapters into a concrete proposal for a multi-family apartment building situated in Stuttgart, Germany. Architectural plans and drawings communicate the spatial solutions.

The sixth chapter *Conclusion* summarizes the work, and opens a discussion on how the design proposal can contribute to the current discourse in the discipline of architecture on the future of sustainable urban living.



# 01

## Background

Storytelling

Relevance: A Design Problem

Purpose and Aim

Research Question

Methodology

Delimitation



“

*“There’s nothing fundamentally wrong with people. Given a story to enact that puts them in accord with the world, they will live in accord with the world. But given a story to enact that puts them at odds with the world, as yours does, they will live at odds with the world.*

*Given a story to enact in which they are the lords of the world, they will ACT like lords of the world. And, given a story to enact in which the world is a foe to be conquered, they will conquer it like a foe, and one day, inevitably, their foe will lie bleeding to death at their feet, as the world is now.”*

*Quinn, 1992, p. 49*

”



## **STORYTELLING**

In the 1992 novel *Ishmael* by Daniel Quinn, a young American man - frustrated with the world around him - finds his spiritual teacher in the old gorilla Ishmael. Together they discover how humanity is stuck in a detrimental storyline: the flawed narrative about our role on Earth. Until today, the ape's perspective on human culture and collective identity has remained relevant in the pursuit to understand our struggle with sustainability.

What Ishmael teaches the protagonist is the following: There is a law for the community of life. The Western cultures have begun to consider themselves exempt from this law. We do not regard the detrimental effects of our behavior on the ecosystem, because we don't consider ourselves dependent on it. If we want to turn our destructive relation with the planet around, however, we must begin to understand ourselves as part of nature again.

Today, climate change and disturbed ecosystems are no abstract concepts anymore, we can feel and see them in our everyday life. Disruptive events - like droughts, hurricanes or jellyfish invasions - demonstrate that important systems have gotten out of balance. And they confront us more than ever with the flaws of our culture, lifestyle and view on the world.

For a truly sustainable society, we must therefore begin to reflect on the stories and assumptions that form the basis of our existence. We must reconsider our role on the planet. An identity, where one considers oneself a part of nature has thereby proven an important indicator for environmental awareness.

## RELEVANCE: A DESIGN PROBLEM

The vision of a new humanity that is living in harmony with the global ecosystems and within planetary boundaries is also an architectural design challenge.

„We shape our buildings and afterwards our buildings shape us.“ said Winston Churchill. The built environment has a great influence on our perception of the world. Here lies its potential to become an important actor in education for sustainable development.

Current development, however, points into a problematic direction: rapid urbanization and advancing technologization of everyday life are leading to an ever increasing disconnect between humans and nature. The contemporary built environment is thus only hindering society to develop a deepened connection to nature.

In addition, the building sector itself remains a main culprit behind global environmental degradation and greenhouse gas emissions. Sustainability efforts are marginal and mostly centered around technical solutions that neglect the user as influencing factor.



## PURPOSE

The purpose of this thesis is the acquisition of a deepened understanding on how residential architecture can contribute to a societal shift towards a collective ecological identity.

The thesis explores how the spatial design of the urban home can facilitate a strengthened connection between the city dweller and nature, and if architecture can empower its residents to become active agents for the evolution of both the social and natural aspects of the local eco-system.

## AIM

The thesis aims to contribute to the current discourse on the future of sustainable urban living. Rooted in psychological research, it strives to translate multidisciplinary findings into a concrete spatial design. The project aims to deliver a holistic architectural proposal for a residential project as final product.



RESEARCH QUESTION

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**How can the architectural design of the urban home foster the residents' connection to nature in order to encourage environmentally responsible citizens?**

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*How can the design of the home connect residents to nature?*

*How can design promote environmental awareness and pro-environmental behaviour?*

*How can the European climate and an urban context facilitate an integrated experience of nature?*

## METHODOLOGY

The thesis follows a three-step work process; Foundations - Design Concepts - Design Proposal.

This process leads from multidisciplinary findings to architectural design, and from general knowledge to specific solutions.

### *Foundations:*

An extensive study of multidisciplinary literature forms the theoretical basis for the thesis. Research from interrelated fields like sociology, psychology and design theory has been gathered under the initial driving question: *Which factors facilitate pro-environmental behavior in people?*

From the many relevant factors, one promising trans-situational concept has been selected as study subject for this thesis: *connection to nature as critical component in the resident's identity.*

Findings were then connected to knowledge acquired during the Master's programme, namely from the fields of system thinking and regenerative sustainability. The fusion of these areas resulted in four topics of Research Foundation: *Regenerative Sustainability, the Human-Nature Relationship, the Ecological Citizen, and Home.* Knowledge in these four areas forms the basis for the design-related elaboration of the thesis.

### *Design Concepts:*

Each of the four topics from Research Foundation are investigated with a perspective on suggestions for *physical settings* that facilitate positive change.

Four Design Concepts emerge that utilize identity and connection to nature as leverage point: *Design for Biophilia, Design for Land Stewardship, Design for Place-Identity and Design for Co-Evolution.*

The four concepts are introduced and their perspective on identity and the connection to nature is highlighted. Subsequently, important overlaps between the concepts are discussed.

### *Design Proposal:*

A suitable site has been selected previous to the thesis semester. The municipality's administration has been consulted regarding local development regulations. Additionally, a broad site analysis, including the built context, local climatic characteristics and sun studies, informs the design.

With sketches and volume studies, a suitable building volume is developed. Simultaneously, more conceptual drawings on spatial configurations and a project-specific design concept evolve out of the theoretic basis. Both elements are fused to the present design proposal through an itinerary process.

Presentation of the design proposal is performed with standard architectural drawings like site plans, sections, detail drawings and perspectives.

## **RESEARCH FOUNDATION**

Regenerative Sustainability, the Human-Nature Relationship, the Ecological Citizen, Home.



## **DESIGN CONCEPTS**

Design for Biophilia, Land Stewardship, Place-Identity, Co-Evolution.



## **DESIGN PROPOSAL**

Conceptual Diagrams, Volume Studies, Floor Plans and other Drawings

## DELIMITATION

This thesis is rooted in identity research, and applies therefore for the cultural framework of western Europe. The thesis does not investigate into issues of social justice concerning access to newly built housing within the inner city. It does furthermore not consider implications for the re-design of the existing building stock.

The adoption of pro-environmental behavior can also be facilitated by external factors lying outside the architectural design of the apartment, like the political climate, the social background and economic situation. Even though these factors appeared in the research for this thesis, they are not explicitly incorporated into the proposal. Furthermore, there is an abundance of internal factors that can motivate or hinder a person to adopt pro-environmental behavior. This thesis focuses on connection to nature, as an trans-situational factor that has been investigated by research. In doing so, many of the other internal influencing factors, like locus of control, worldview and values, are implicitly addressed, too. They are, however, not investigated singularly.



## Local Context

Stuttgart, Germany

Stuttgart West

Geography

Demographics

The Plot

Daylight

Climate

IBA 2027







Figure 4: Location of Stuttgart.  
(Wikimedia Commons, 2006)

#### Political Context

Stuttgart is the capital of Baden-Württemberg, the federal state in the south-west of Germany. With about 614 000 residents („Aktuelle Zahl der Einwohner“, 2019) it is one of the major cities of the country (Statista, 2019). Both the municipality and the state are governed by the Green Party.

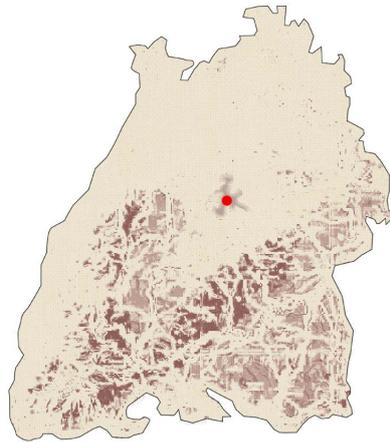


Figure 5: Baden-Württemberg.  
(own drawing)

#### Geography.

Stuttgart is situated at about 240 m above sea level, in a basin west of the Neckar valley, and at the border of two mountain ranges, the Black Forest and the Swabian Alb („Climatic Conditions in Stuttgart“, 2019).

This location limits the city's means to extend the city perimeter, and causes issues with pollution, the heat island effect and bad air quality („Climate change – challenge facing urban climatology“, 2010).

#### Climate.

The climate is mild with an average temperature of 10 Degree Celsius („Climatic Conditions in Stuttgart“, 2019). However, Stuttgart is especially at risk for increased heat stress due to average temperature rise.

2018 was the hottest year since recording began, with exceeding solar hours (130% of average), and very little precipitation (78% of average) („Die Witterung im Jahr 2018“, 2019).



Figure 6: Stuttgart West  
(own drawing)

### The Neighborhood: Stuttgart West

The main area of what is today the municipal district of Stuttgart West was developed between 1850 and 1900 („Datenkompass Stuttgart“, 2015). It follows a typical open perimeter development in a grid planning structure.

### Demographics.

Today, 35 percent of all residents have a migration background. The average household size is small, with 62 percent of single households, and 22,5 percent of 2-person households. The average flat square meter per person is 42.4. Residents' income lies within the city's average income („Datenkompass Stuttgart“, 2015).



Figure 7: Project Site.  
(own drawing)

#### Project Site.

The building block is located at the edge of the district, along a main street and close to the nearby forest. The surrounding built environment stems from the time when the district was originally developed.

Almost all neighboring buildings are apartment buildings, and reach four to seven full stories height. Prevalent materials are sand stone and plaster.



Figure 8: Project Site.  
(Google Earth, 2019)

#### The Plot.

The plot area is about 1033 m<sup>2</sup>, 45 m long, 23 m wide.

It has a north-south orientation with little shadowing by surrounding buildings. Currently, there is an one-story parking garage built on site. It is used by the neighboring police department.

The site is registered by the municipality as a development gap. Local building regulations allow for four full stories plus attic on the side facing the street, three stories plus attic in the back of the plot.



Figure 9: Gutenbergstraße.  
(own image)

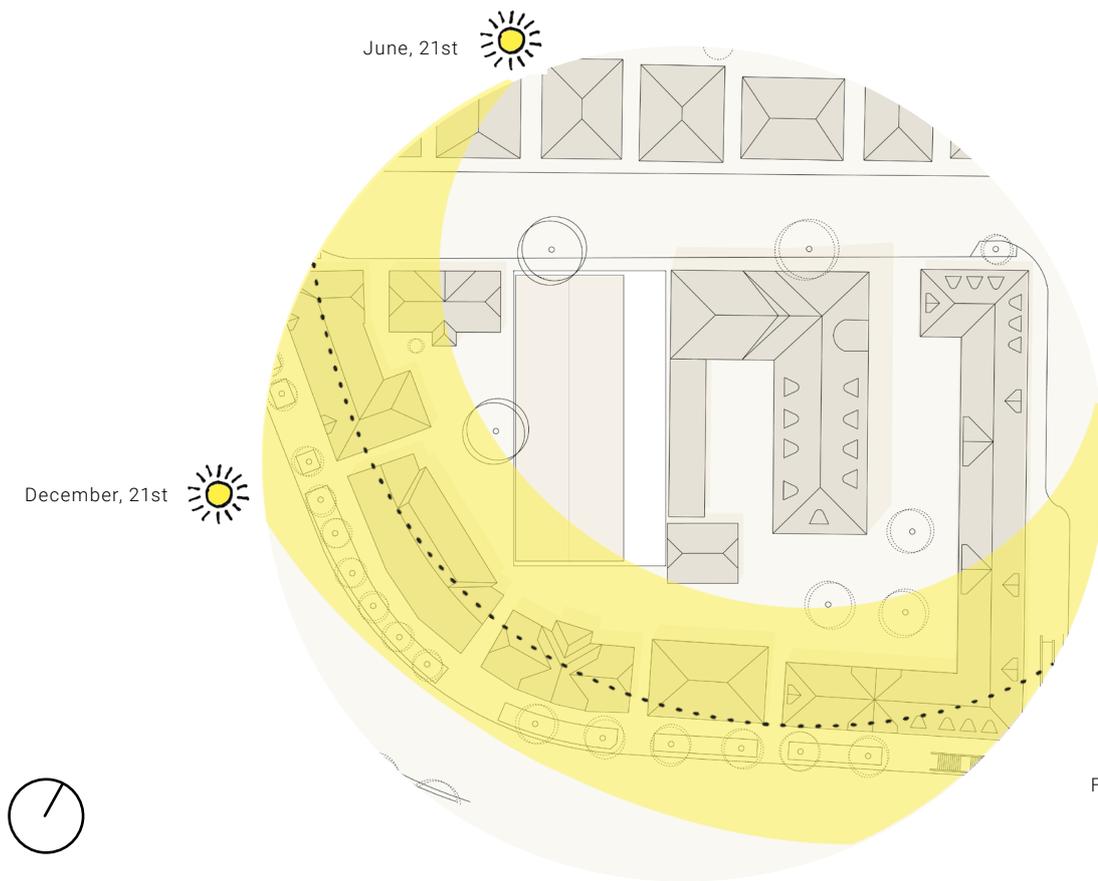


Figure 10: Sunpath Diagram  
(own drawing)

### Daylight.

The longest day is on June, 21st, with about 16 day hours and the sun reaching an angle of  $64,5^\circ$ . On the shortest day, December, 21st, there are about 8 day hours with the sun reaching an angle of  $17,6^\circ$  („Sonnenstand“, 2019).

The risk of heat stress and overheating is an important issue for built structures in Stuttgart. According to German regulation (DIN 4108-2), indoor overheating is in place for the region of Stuttgart, when the indoor temperature surpasses  $27^\circ\text{C}$ .

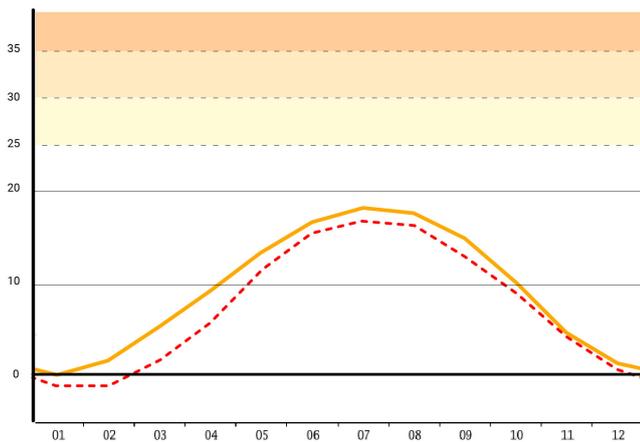


Figure 11: Climate Diagram.  
(own drawing)

- ← Desert Days [temp. max > 35 °C]: 3
- ← Hot Days [temp. max > 30 °C]: 41
- ← Summer Days (temp. max > 25 °C): 114
- ← Tropical Nights (temp. min > 20 °C): 9

— Average Temperature Stuttgart  
 - - - Average Temperature Göteborg

### Climate.

The climate is mild with an average temperature of 10 Degree Celsius („Climatic Conditions in Stuttgart“, 2019). However, Stuttgart is especially at risk for increased heat stress due to average temperature rise.

2018 was the hottest year since recording began, with exceeding solar hours (130% of average), and very little precipitation (78% of average) („Die Witterung im Jahr 2018“, 2019).

### IBA 2027.

Stuttgart is an especially interesting location, as the city is currently hosting an International Building Exhibition, IBA 2027. 100 years after the first IBA took place in the city, professionals and the public are again invited to „a new societal debate on the sustainability of urban lifestyles“ („Outcomes of the IBA Platform Process“, p.2).



Figure 12: IBA 2027. (IBA 2027 GmbH, 2019)

## Foundations

Introduction Foundations

Glossary

Regenerative Sustainability

The Human-Nature Relationship

The Environmental Citizen

Home as Node for Transformation

Conclusion Foundations





Figure 13: Relocated.  
(Nathan W. Pyle, 2019)



## INTRODUCTION FOUNDATIONS

The following chapter *Foundations* provides the theoretical basis for the latter work. Relevant definitions are given, followed by the introduction of four research topics: Regenerative Sustainability, the Human-Nature Relationship, the Ecological Citizen, and Home as Node for Transformation.

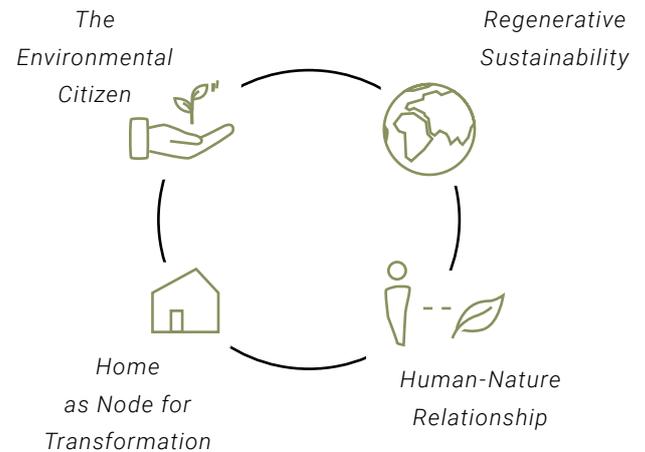


Figure 14: Research Topics.  
(own drawing)

## HISTORICAL OVERVIEW

The struggle for sustainability is not new. The western world began to realize collectively that something was at odds about 60 years ago, when society started to feel the first symptoms of disturbance in the ecosystem, when the sphere of everyday life became affected.

### *Silent Spring*

In 1962, Rachel Carson's book "Silent Spring" rose public awareness for the dangers of global human-made pollution of the environment, especially for the contamination of soils and extinction of insects through chemical pesticides (Carson, 1962). The following farreaching public attention resulted in policy changes and the surge of the modern environmental movement (Stoll, 2012).

### *Limits to Growth*

A decade later, in 1972, the Club of Rome, a consortium of leading heads of its day, expressed their conviction that "the major problems facing mankind are of such complexity and are so interrelated that traditional institutions and policies are no longer able to cope with them, nor even to come to grips with their full content." (Meadows, Meadows, Randers, & Behrens III, 1972, pp. 9-10).

Through their introduction of a system-based perspective on the issue, they elaborated explicitly how the notion of exponential growth, as present in the global economic system of capitalism, is inherently at odds with the finite resources and limited carrying capacity of the planet. They warned that this could eventually result in a systemic collapse.

### *Brundtland Report*

In the pursuit to find a common pathway into a more promising future, one of the first international achievements were the conclusions of the 1987 UN Brundtland Report "Our common future" that carved out a joint definition of sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (Brundtland et al., 1987).

Since then it has become clear that agreeing on a common goal only initiated the struggle of figuring out how to get there.

## **GLOSSARY**

a collection of definitions and relevant commentaries

### **habitat**

1 The natural home or environment of an animal, plant, or other organism.

1.1 *informal* A person's usual or preferred surroundings.  
(Oxford English Dictionary)

### **nature**

1 The phenomena of the physical world collectively, including plants, animals, the landscape, and other features and products of the earth, as opposed to humans or human creations.  
(Oxford English Dictionary)

### **place**

„a particular location that has acquired a set of meanings and attachments“  
(Cresswell, 2009, p.1)

### **sustainability**

1 The ability to be maintained at a certain rate or level.

1.1 Avoidance of the depletion of natural resources in order to maintain an ecological balance.  
(Oxford English Dictionary)

### **sustainable development**

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.  
(Brundtland et al., 1987)

Economic development that is conducted without depletion of natural resources.  
(Oxford English Dictionary)

„a framework to guide human development“ [...] „sustainable development‘ is now a term which is increasingly regarded either as internally self-contradictory (an oxymoron) or, at best, plagued by ambiguous or distorted definitions.“  
(Santillo et al, 2007, p. 60)

## **identity**

1 The fact of being who or what a person or thing is.

1.1 The characteristics determining who or what a person or thing is.  
(Oxford English Dictionary)

“An identity is both a product and a force (see Rosenberg, 1981): an assortment of beliefs about the self and a motivator of particular ways of interacting with the world.”

(Clayton, 2003, p. 46)

## **environmental identity**

„a sense of connection to the nonhuman natural environment that affects the way people perceive and act toward the world, and a belief that the environment is important and forms an important part of people’s self-concept“

(Tam, 2013, p. 66)

## **behavior**

1 The way in which one acts or conducts oneself, especially towards others.

(Oxford English Dictionary)

## **pro-environmental behavior**

„behavior that consciously seeks to minimize the negative impact of one’s actions on the natural and built world (e.g. minimize resource and energy consumption, use of non-toxic substances, reduce waste production)“

(Kollmuss & Agyeman, 2002, p. 240)

## **environmental awareness**

„‘knowing of the impact of human behavior on the environment’. Environmental awareness has both a cognitive, knowledge-based component and an affective, perception-based component“

(Kollmuss & Agyeman, 2002, p. 253)

## REGENERATIVE SUSTAINABILITY

*„The founders of Regenesys began with a fundamental belief that environmental problems were symptoms of a fractured relationship between people and nature. [...] We would need to shift from seeing ourselves as separate from nature to seeing ourselves as part of a co-evolutionary whole, in symbiotic relationship with the living places we inhabit.“*

(Mang & Haggard, 2016, p. XIV)



Regenerative Sustainability provides a visionary perspective for the human role on Earth. Instead of portraying human behavior as inherently detrimental for the planet, it draws up a future, where human actions are aligned with supporting the wellbeing of the surrounding ecosystems.

### A SOCIAL CHALLENGE

Many scholars agree today that the present challenge of finding sustainability is not a technical, but a social problem (Jasanoff, 2010; Mang & Haggard, 2016; Newman et al, 2009; Stoknes, 2015; Topouzi, 2015).

Leading voices from sustainability communication understand this social challenge hereby as a crisis of collective storytelling (Hes & Du Plessis, 2015; Hopkins, 2015). We have to reflect on what stories we tell ourselves as a society. This regards the stories about sustainability, and what stories we tell about the human role on the planet and the human relationship with nature.

### A NEW NARRATIVE

Stoknes (2015) elaborates on the dimensions of detrimental framing in the current climate debate. He uncovers how prevalent climate communication is formed by messages like uncertainty, shame, costs and sacrifice, and how this makes people turn away from the subject. Instead, he suggests framing sustainability action as a matter of insurance, health, preparedness and ethics, as well as opportunity, in order to tap into our inherent psychological patterns to stir more engaged collective action.

Similarly, Hes and Du Plessis state that “the dominant discourses of sustainable development remain trapped in fear-based narratives grounded in a mechanistic and reductionist worldview which limits the efficacy of sustainable development as a means of addressing the very issues it aims to resolve” (Hes & Du Plessis, 2015, p. 14).

Instead they propose a new storyline based on “an alternative, ecological worldview that sees humans as part of a larger community of life” (Hes & Du Plessis, 2015, p. 21). This new story encourages people to expand their ecological involvement from mere consumption of resources to a productive contribution to the ecosystem’s wellbeing.

*“It’s fascinating, how as a species and as a culture we are brilliant at imagining our own extinction and our own demise. [...] where are the films about us actually turning something around, and solving a problem, we don’t really have those films. [...] The problem is: We don’t have the stories that go with that. [...] and if you say to people: ‘What would it look like in 20 years time if we start cutting emissions by that much every year, what would it be like?’, for many people it is sitting in a cold cave eating rotten potatoes. It’s the end of the world. But actually, it could be fantastic!”*

(Hopkins, 2015)

## WHOLE SYSTEM PERSPECTIVE

Regenerative Sustainability builds upon the idea that sustainability is only achieved as a property of the whole system, and not as a characteristic of individual elements within that system (Ceschin & Gaziulusoy, 2016). Consequently, sustainability efforts should always be designed with the effect for the whole system in mind.

Furthermore, Regenerative Sustainability does not merely strive for less harm on the ecosystems or a zero impact society, but for a mutually stimulating development of both society and the natural ecosystem (Cole, 2012). This is, because both the social community and all natural features are seen as integrated elements of the overall living system.

## REGENERATIVE DESIGN

The Regenerative Sustainability concept emphasizes the role of new design approaches, which respond to the complexity of living systems (Mang & Haggard, 2016).

In the building sector, regenerative design surpasses therefore concepts of green and sustainable building design approaches, which work with isolated performance measures (Cole, 2012). Instead, the building has to be understood in its contribution to the surrounding environment, and as a player in both the natural and the social system (Cole, 2012).

In the following chapter, the concept of Design for Co-Evolution builds upon this theory.

## THE HUMAN-NATURE RELATIONSHIP

*"Unfortunately, contemporary society has become confused about the role of the natural environment in people's physical and mental lives. Many believe that the progress of civilization depends on subjugating and converting, if not conquering, the natural world. Indeed, many see this progression as the essence of civilization."*

(Kellert, 2012, p.1)



Theory on the Human-Nature Relationship brings attention to elements of unfavorable framing in our collective worldview, which separate humanity from the rest of the planet. A promising approach towards a curative relationship between human and nature is the biophilia hypothesis.

### RELEVANCE FOR SUSTAINABILITY

As most definitions of sustainability include the idea of humankind living within the planetary boundaries, an essential issue on the path towards such state is a reflection on the relationship between humans and nature (Cole, 2012).

From the human perspective, the relationship towards nature is shaped by dualistic thinking. Nature has historically been portrayed as an inferior, but dangerous other that needs to be conquered (Byrne, 2011). Such storytelling locks us in the prevalent worldview that makes comprehensive changes in overall behavior very difficult.

### DUALISTIC THINKING

Trying to comprehend the world, we tend to order what we experience into pairs: "culture – nature, mind – body, male – female, reason – emotion, self – other" (Plumwood, 1994, p. 43) The western worldview is deeply permeated with this dualistic thinking, and philosophers, from Plato to Marx, have applied this concept in their considerations to explain the world (Plumwood, 1994).

Since the 20th century, equal rights movements like ecological feminism (Plumwood, 1994), and environmental and animal rights movements (Wolch, 2007), have revealed that such a system of pairs supports implicit structures of power disparities and oppression. This is because such dualistic pairs do not merely describe a relation of equal opposites, but compose instead an overall logic of different value, with one side representing the norm and the other a deviation. Here, "[...]the qualities (actual or supposed), the culture, the values and the areas of life associated with the dualised other are systematically and pervasively constructed and depicted as inferior." (Plumwood, 1994, p. 46).

## BIOPHILIA HYPOTHESIS

As Plumwood (1994) argues, the relation between humankind and nature in the western culture is also shaped and informed by such a dualism, originating from a "denied dependency" (p.41) on nature. Since the human species began to commodify nature, humans have considered themselves superior to nature, and at the same time have since then be confronted with a dilemma: we are striving to make maximal use of nature's services, while at the same time trying to negate our dependency on it (Byrne, 2011; Kellert, 2012).

The sustainability debate is in dire need of a collective reframing on what we perceive as the challenge, and what we perceive as the goal.

Many scholars agree today that the present challenge of finding sustainability is not a technical, but a social problem (Jasanoff, 2010; Mang & Haggard, 2016; Newman et al, 2009; Stoknes, 2015; Topouzi, 2015).

Leading voices from sustainability communication understand this social challenge hereby as a crisis of collective storytelling (Hes & Du Plessis, 2015; Hopkins, 2015). We have to reflect on what stories we tell ourselves as a society. This regards the stories about sustainability, and what stories we tell about the human role on the planet and the human relationship with nature.

## MECHANISTIC WORLDVIEW

Historically, the divide between human and nature dates back to the neolithic revolution (Byrne, 2011), however, an important shift to the dualism of today occurred during the Industrial Revolution, when scientists began to describe the planet as a machine – and the human species as its engineer (Lewis, 2015). Simultaneously, this time signifies the beginning of a far-reaching physical manifestation of the dualism, i.e. environmental destruction and biodiversity loss (Bakari, 2015).

However, there is also another approach how we could conceptualize this relation: An interdependent understanding based on the Biophilia Hypothesis.

## DESIGN IMPLICATIONS

If we want to understand ourselves as part of nature, one way is to tell new stories about our relationship with the world. Another approach is spatial design that makes us increasingly aware of how connected to nature we inherently are.

In the following chapter, the concept of Design for Biophilia elaborates on the possibilities.

## THE ENVIRONMENTAL CITIZEN

*“Environmental citizenship is a personal commitment to learning more about the environment and to taking responsible environmental action. Environmental citizenship encourages individuals, communities and organizations to think about the environmental rights and responsibilities we all have as residents of planet Earth”*

(MacGregor & Szerszynski, 2003, p. 8)



Environmental Citizenship is an instrument to communicate the ethical dimension of a lifestyle that aligns with environmental values and strives for environmental protection.

### THE ECOLOGICAL INDIVIDUAL

Environmental citizenship articulates the idea that we are not only members of the human society, but also partake in the overall community of life on the planet. Just as with political citizenship, environmental citizenship comes with rights and duties for every member (Martinsson & Lundqvist, 2010).

Being an environmental citizen finds its expression in a particular self-conceptualisation and in specific behavior (Bell, 2005). Firstly, environmental identity implies that we consider ourselves part of the natural community. Secondly, pro-environmental behavior means the adoption of such actions that are directed to support the wellbeing of the ecosystem.

### ENVIRONMENTAL IDENTITY

An important element of environmental citizenship is the individual's self-conceptualization as being part of the bigger community of life (Bell, 2005). This question of identity is strongly linked to the previous discussion on the perceived human-nature-relationship and the internalized worldview.

Environmental identity means „a sense of connection to the nonhuman natural environment that affects the way people perceive and act toward the world, and a belief that the environment is important and forms an important part of people's self-concept“ (Tam, 2013, p. 66).

An environmental identity is considered the necessary foundation for environmental awareness, and consequently for sustained environmental behavior.

## PRO-ENVIRONMENTAL BEHAVIOR

Kollmuss & Agyeman (2002) define pro-environmental behavior (PEB) as „behavior that consciously seeks to minimize the negative impact of one’s actions on the natural and built world” (p. 240). This umbrella term comprises a diverse sum of actions. PEB can be performed both individually and collectively (Jensen, 2002), as a routine or at a single event (Lavelle et al, 2015). It can focus on direct environmental protection, like picking up waste, or indirect effects, like political voting choices (Jensen, 2002).

The individual motivation to perform PEB can be both external or intrinsic, which has a strong effect on how lasting the adoption of the specific PEB is (Kollmuss & Agyeman, 2002). The adoption of other PEB and a sustained performance of PEBs is most likely, when the adoption of a PEB is mainly based on the idea of a social role that the individual seeks to fulfill (Truelove et al, 2014). The concept of an ecological identity is thus highly connected to pro-environmental behavior.

## LAND STEWARDSHIP

Pro-environmental action initiatives have proven to be most effective, if they are bound to a specific place (Song & Soopramanien, 2018). One place-based pro-environmental behavior is Land Stewardship, defined as actions aimed at „caring for the ability of the land in a geographically situated place to support nominated species or communities of flora and/or fauna to persist across the surrounding landscape, as a matter of personal responsibility, for future generations” (Mumaw, 2017, p.4).

What makes land stewardship so relevant for education on sustainable development ambitions, is among others its characteristic to directly tap into the relation between human and nature, and to address the participant’s identity and social role (Chan et al, 2016).

## DESIGN IMPLICATIONS

Design approaches that are informed by the idea of environmental citizenship aim to create conditions, in which the resident has the opportunity to engage in specific pro-environmental behavior. In addition, the design should strive to emphasize elements of an environmental identity to the recipients.

In the following chapter, the concept of Design for Land Stewardship translates the present thoughts into design considerations.

## HOME AS NODE FOR TRANSFORMATION

*"The thesis suggests conceptualizing home as a node, framing understandings of home and everyday practices as a starting point for transitions to a low-impact society, rather than seeing the dwelling as an object upon or in which sustainable technologies and solutions can be placed. This is further linked to exploring agency in and of the home, acknowledging residents as active agents rather than "end-users" or consumers."*

(Hagbert, 2016, introduction)

Home as node for transformation emphasizes the high significance that the personal living space has on the construction of the individual identity. The design of residential architecture should therefore always be understood as a socio-political endeavor, and can furthermore play an important role in the development of society.



## THE SOCIAL CONSTRUCT OF HOME

The concept of home extends beyond the idea of a dwelling as physical space or its function as shelter. Home can be a symbol for individual identity, and can represent an individual's position within society (Mallett, 2004).

When we as architects design residential architecture, we implicitly articulate with it a bigger idea on the future society. From a perspective of sustainability, architects should deliberately tap into this potential, and explore how the spatial configuration and the implied meaning of a building can be utilized to empower its residents to become actor for change (Hagbert, 2016).

## BEYOND ECO-EFFICIENCY

In the discourse on a sustainable building sector residential architecture has so far primarily been examined in a very physical approach. The building's performance is analysed from the perspective of energy efficiency and resource consumption.

Here, the perspective of home as a social structure and residential architecture as a political topic offers new opportunities for sustainable development (Hagbert, 2017).

## PLACE IDENTITY

Looking at the sociological importance of home, the concept of place identity (or place-identity) gives valuable insights into the dynamics of how the design of the residence can influence its inhabitants. Place describes a geographic location, that has gained meaning to people through its cultural importance and the activities that happen there (Hauge, 2007).

The personal dwelling is a place with high importance for the individual resident, as it loaded with a multitude of social meaning. Its characteristics and societal evaluation influences our individual self-conceptualization. Simultaneously, people take action to create a dwelling that reflects their personal self-image. This aspect of identity is called place-identity. (Hauge, 2007)

## DESIGN IMPLICATIONS

Architectural design that includes the notion of home as a node for transformation offers new opportunities to utilize the potential of architecture as actor for societal change.

In the following chapter, the concept of Design for Place Identity develops further design considerations from this theoretic approach.

## CONCLUSION FOUNDATIONS

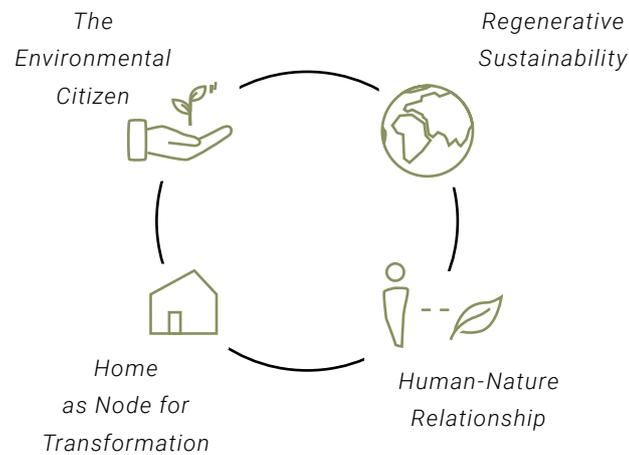


Figure 14: Research Topics.  
(own drawing)

The four introduced research areas can only help to scratch the surface of the complex subject of sustainability. However, the transdisciplinary approach and framing from a socio-psychological perspective alone already work to add insight for the architect's profession. Their impulses give food for thought to approach common design problems from new, more holistic perspectives.

These four interrelated discourses introduce the subject of connection to nature. In addition, they introduce factors on what encourages environmentally responsible citizens. In the following chapter Design Concepts, four concepts are introduced, which translate the general findings into guidelines for architectural design:

Design for Biophilia, Design for Land Stewardship, Design for Place-Identity, and Design for Co-Evolution.

## Design Concepts

From Research to Design

Design for Biophilia

Design for Land Stewardship

Design for Place Identity

Design for Co-Evolution

Interrelation between the Concepts



## FROM RESEARCH TO DESIGN

From the four research fields, two concepts have emerged that use connection to nature as leverage point: Design for Biophilia and for Land Stewardship. Two additional concepts utilize identity as leverage point: Design for Place-Identity and for Co-Evolution.

All four concepts are introduced and their perspective on identity and the connection to nature is highlighted. Subsequently, important overlaps between the concepts are discussed.

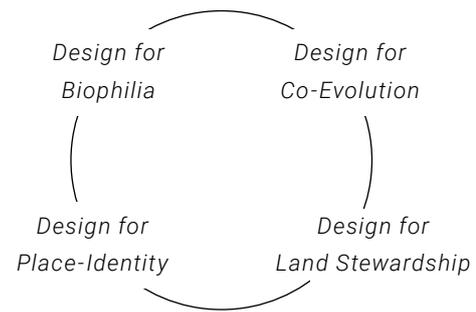


Figure 15: Design Concepts.  
(own drawing)

### DESIGN FOR CO-EVOLUTION

Design for Co-Evolution is rooted in the Regenerative Sustainability paradigm. In this visionary movement, human actors are not considered managers of the environment, but actors within the natural ecosystem.

The perhaps most visionary aspect about design for co-evolution is that the primary goal of development is to achieve a shift of mindset within participants. This is because the success of co-evolution depends fully on the continued commitment from stakeholders (Hes & Du Plessis, 2015).

### DESIGN FOR LAND STEWARDSHIP

Land Stewardship describes a specific place-based pro-environmental behavior that seeks to protect and improve natural features in a local ecosystem. The approach is especially relevant for strengthening a connection to nature, because it is place-specific and performed over a longer period of time.

Design for Land Stewardship aims to create conditions that empower residents to take on an environmental responsibility, and to engage as local gardeners or stewards.

### DESIGN FOR BIOPHILIA

Biophilic Design is based on the Biophilia Hypothesis, which proposes that humans thrive best in particular natural settings that have been beneficial throughout our evolution (Kellert, 2012).

Biophilic Design fosters the human connection to nature primarily through exposure to natural phenomena. Additionally, biophilic design encourages recipients to connect to nature through the adoption of habitual actions surrounding nature, and to allow an emotional connection to a specific place.

### DESIGN FOR PLACE-IDENTITY

Design for Place-Identity utilizes the significant influence that the home has on a person's identity. Here, the specific aim is to design the residential environment in such a way that it encourages an environmental identity in the residents.

A Place is made up of three elements: Materiality, Meaning and Practice. Design for Place-Identity thrives to touch upon all three of them. Firstly, the building itself, Materiality, should be sustainable. Secondly, everyday actions must be designed in such a way that they raise environmental awareness. Thirdly, the collective understanding of the project, Meaning, must also be that of a project of environmental attitude and action.

# DESIGN FOR BIOPHILIA

## BIOPHILIA HYPOTHESIS

Biophilic Design is based on the Biophilia Hypothesis.

*„Biophilic design is the deliberate attempt to translate an understanding of the inherent human affinity to affiliate with natural systems and processes [...] into the design of the built environment.“*

(Kellert, 2008)

## BIOPHILIA & CONNECTION TO NATURE

Biophilic Design fosters the human connection to nature primarily through exposure to natural phenomena. Additionally, biophilic design encourages recipients to connect to nature through the adoption of habitual actions surrounding nature, and to allow an emotional connection to a specific place.

## DESIGN STRATEGIES

adapted from Kellert (2015)



1. design based on natural settings that are specifically *„instrumental in advancing people’s health, fitness, and wellbeing“*



2. design that facilitates *„repeated and sustained engagement with nature“*.



3. design that emphasizes the integrative functioning of the whole ecosystem.



4. design that *„fosters emotional attachments to settings and places“*.



5. design that encourages *„positive and sustained interactions and relationships among people and the natural environment.“*

## BIOPHILIC DESIGN PATTERNS

Humans can experience nature in a multitude of ways. In order to develop biophilic design that reflects and incorporates these experiences into the architectural space, a helpful tool are biophilic design patterns. Brown et al (2014) categorize the experience of nature into three main fields, Nature in the Space, Natural Analogues and Nature of the Space.

The first field, Nature in the Space, refers to the experience of genuine nature, like flora, fauna and weather phenomena. The respective design patterns here are:

1. *Visual Connection.*
2. *Non-Visual Connection*, which refers to stimuli of the senses hearing, touching, smelling.
3. *Non-rhythmic Sensory Stimuli.*
4. *Thermal & Airflow Variability.*
5. *Presence of Water.*
6. *Dynamic & Diffuse Light.* and
7. *Connection with Natural Systems.*

The second field, Nature Analogues, summarizes design elements, where natural features and characteristics are mimicked or evoked. This includes the patterns:

8. *Biomorphic Forms & Patterns.*
9. *Material Connection with Nature.*
10. *Complexity & Order.*

The third field, Nature of the Space, focuses on the human experience in natural surroundings. It is strongly related to the evolutionary human behavior patterns, and the most abstract of the three fields of patterns. The relevant design patterns here are:

11. *Prospect.*
12. *Refuge.*
13. *Mystery.*
14. *Risk/Peril.*

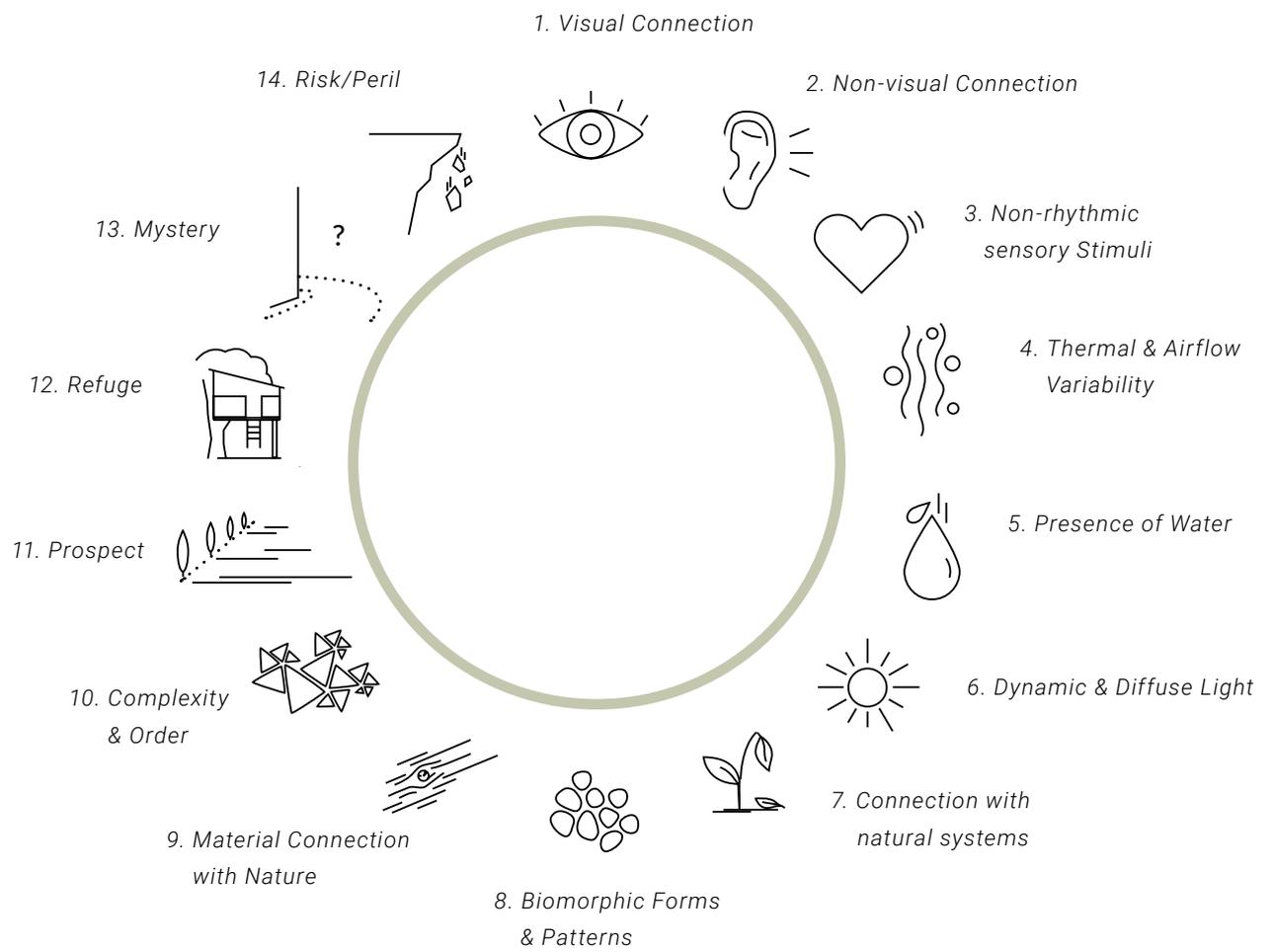


Figure 16: 14 Biophilic Design Patterns.  
 (own drawing, adapted from Browning et al, 2014)

## PATTERNS IN THE THESIS

All patterns will implicitly be incorporated in the thesis proposal. Due to the urban context of the thesis, however, an emphasis has been placed on a selection of patterns:

2. Non-visual Connection
3. Non-rhythmic sensory Stimuli
4. Thermal and Airflow Variability
7. Connection with natural systems
9. Material Connection with Nature

These five patterns have proven suitable for the specific site requirements, and can embody also the principles from the other three design concepts.



Figure 17: Selected Design Patterns.  
(own drawing)

## DESIGN FOR LAND STEWARDSHIP

Land Stewardship describes a specific place-based pro-environmental behavior (PEB) that is defined as „*conservation-oriented actions that improve the ecological features of a particular place*“ (Larson et al, 2015, p. 114).

Land stewardship actions can comprise activities like gardening, biodiversity action, improving wildlife habitat, and protecting land for its cultural benefits (Mumaw, 2017). As Mumaw (2017) elaborates, the approach is especially relevant for strengthening a connection to nature, because it is place-specific and performed over a longer period of time.

Hes and Du Plessis (2015) agree about the importance of the concept of Land Stewardship:

*“It can be argued that it is only through their relationship to place, and the possibility of playing a co-creative role in the development of that place, that people find the intimacy and meaning that fosters ongoing stewardship.”* (p. 177).

### LAND-STEWARDSHIP DESIGN PATTERNS

The following design patterns emerged from an Australian longterm program on the adoption of land-stewardship in an urban setting (Mumaw, 2017).

1. Prioritizing of indigenous species in planning
2. Creation of habitat for local keystone species
3. Educational facilities and/or material
4. Design for regular maintainance

### Design Strategies



1. design that encourages the adoption of a land ethic



2. design that educates for role as gardener and steward



3. design that supports environmental conservation and biodiversity protection



4. design that strengthens the unique characteristics of a place

## DESIGN FOR CO-EVOLUTION

Design for Co-Evolution „aims to set conditions in place which will ensure ongoing co-evolution and mutually beneficial integration of human and natural systems“ (Hes & Du Plessis, 2015, p. 127)

It originates from the Regenerative Sustainability paradigm, and is an element of the Regenerative Design movement. This visionary movement can be understood as a critique against the prevalent green and sustainable design approaches (Cole, 2012). Regenerative design does not only apply different tools and measures, but has in its core a different understanding of the relationship between humans and nature (Cole, 2012). Human actors are not considered managers of the environment, but actors within the natural ecosystem.

The perhaps most visionary aspect about design for co-evolution is that the primary goal of development is to achieve a shift of mindset within participants. This is because the success of co-evolution depends fully on the continued commitment from stakeholders (Hes & Du Plessis, 2015).

### Design Strategies

adapted from Hes and Du Plessis (2015)



1. design that includes all four levels of work

2. design and development for self-renewing capacity

3. design for stewardship through co-creation

4. design that reads the patterns of place

5. design that expresses the story of place

6. design that explores the potential to contribute to the larger system

## DESIGN FOR PLACE-IDENTITY

Design for Place-Identity is based on the concept of Place, *“a particular location that has acquired a set of meanings and attachments”* (Cresswell, 2009, p. 1).

Places are composed of the three elements of Materiality, Meaning and Practice (Cresswell, 2009), in other words, the physical space, the individual or collective understanding of this space, and the often habitual actions happening there.

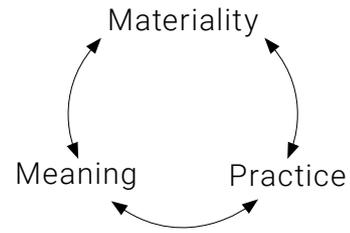


Figure 18: Elements of Place.  
(own drawing)

### PLACE AND IDENTITY

Places are part of and influence identity.

*“The influence place has on identity [...] is seen as a result of a holistic and reciprocal interaction between people and their physical environment; people affect places, and places (and the way places are affected) influence how people see themselves.”* (Hauge, 2007, p. 45)

Particular places, like that of our home, are especially important for our identity.

*„How we inhabit residential environments and the significance we give them is part of how we formulate an understanding of the world and our place in it.“* (Hagbert, 2016, p. 26).

### PLACE-IDENTITY

Place-Identity can be defined as *“the individual’s incorporation of place into the larger concept of self”* (Hauge, 2007). This can occur among others through emotions, conceptions or behavior related to a particular spatial context (Hauge, 2007). For example, I live in a particular city district, therefore I am ...

Place-Identity serves several purposes, like the formation of meaning, or the opportunity for self-expression (Proshansky, Fabian, & Kaminoff, 1983).

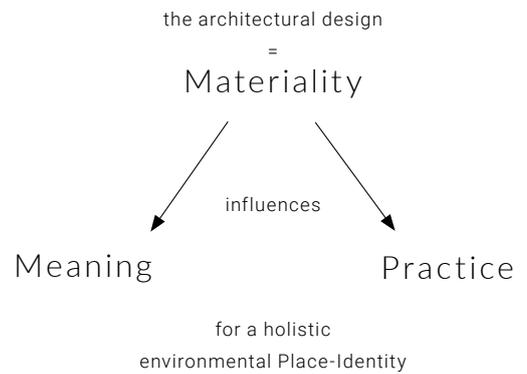
Neither the meaning of a place nor a person’s identity are static; instead, there is a constant negotiation between the physical environment, social agreements and personal self-conceptualization (Cresswell, 2009). The dynamic characteristic of Place-Identity makes concepts like participatory processes especially interesting for the architectural practice.

## DESIGN STRATEGIES

Design for Place-Identity strives to utilize the significant influence that a place can have on a person's identity. In the framework of this thesis, the specific aim is to design the residential environment in such a way that it encourages an environmental identity in the residents.

An architectural design strategy for Place-Identity aspires to shape the first aspect of place, its materiality. Through the articulation of the physical setting according to the underlying aim, the place should then inspire the other two elements of place, meaning and practice. Eventually, all three elements should articulate environmental awareness.

Practice and Meaning compose the Story of Place, (Hes, 2016) which tells us *what we do here, and why we do it*. As the design proposal for this thesis strives to bring forward environmental awareness, the Story of Place must articulate exactly that. Everyday actions must be designed in such a way that they express environmental awareness. Furthermore, the collective understanding of the project, among the residents, as well as beyond, must also be that of a project of environmental attitude and action.



## PLACE-IDENTITY DESIGN PATTERNS

1. Architecture with closed Resource Loops
2. Plus-Energy Building
3. Design the building as a Symbol
4. Design for regular engagement with the place

## Design Strategies



1. design that facilitates environmentally responsible *practices*.



2. design that emphasizes the *collective understanding* of the place as a symbol for environmental attitude and action.



3. design that creates an environmentally responsible *product*.

# INTERRELATION BETWEEN THE DESIGN CONCEPTS

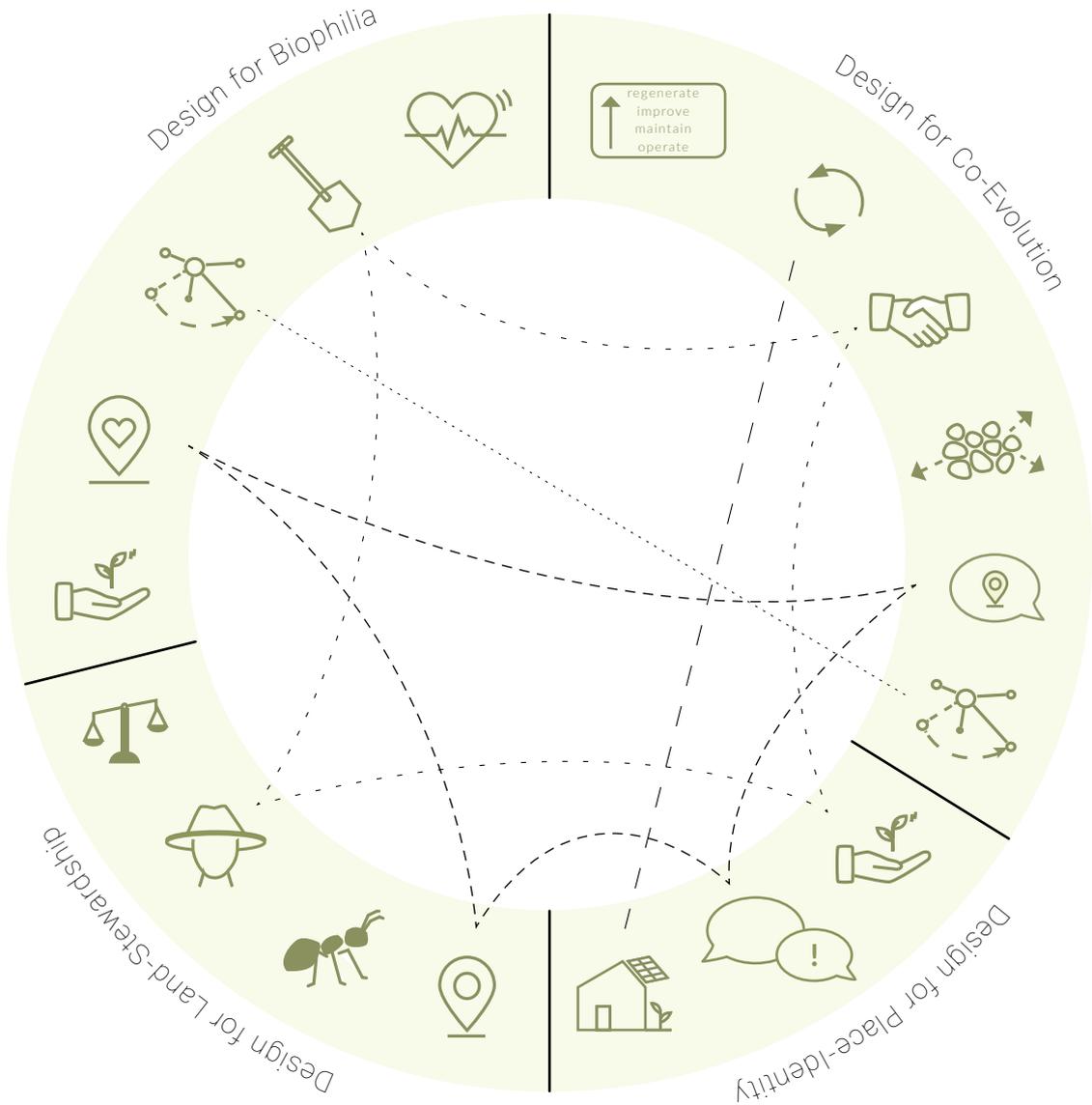


Figure 19: Interrelation between Concepts. (own drawing)

## Common Strategies



PLACE-SENSITIVE DESIGN



THE RESIDENT AS CO-CREATOR AND GARDENER

## Design Proposal

Introduction Design Proposal  
Drawings from Design Process  
Design Proposal



## INTRODUCTION DESIGN PROPOSAL

An investigation into the four Design Concepts has provided an abundance of information on design strategies and tools.

Among the diverse approaches, three overarching themes appeared as most relevant criteria for the project.



RESIDENT STEWARDSHIP

// a design that empowers residents to take responsibility for the wellbeing and evolution of the local ecosystem and the community //



CONNECTION TO PLACE

// a design that is deeply rooted to the specific geographic setting and cultural context //



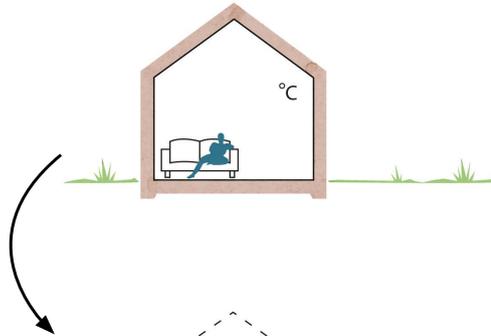
EXPOSURE TO NATURE

// a design that exposes residents to natural features and ecosystem changes over time through routine experience and community-based action //

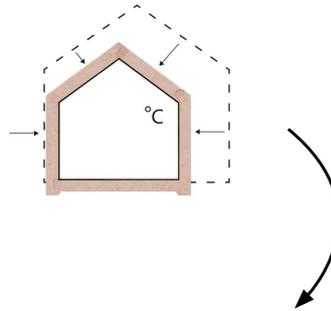
# DRAWINGS FROM THE DESIGN PROCESS

## FIRST CONCEPT DRAWINGS

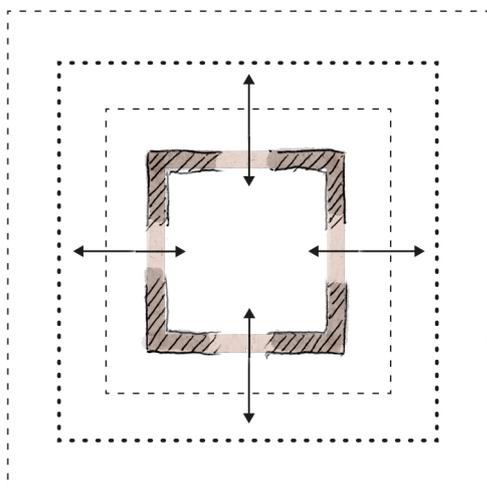
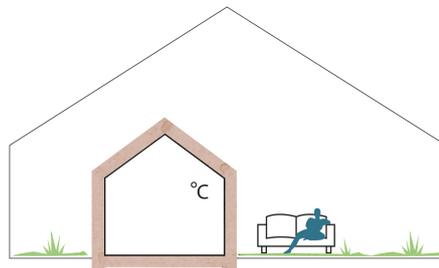
In a conventional dwelling, the building separates the resident from nature.



For the thesis project, the heated living space shrinks to a minimum, ...



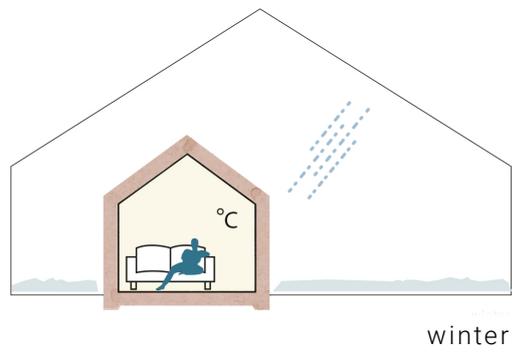
while the overall living space is extended to non-heated areas that blur the line between inside and outside.



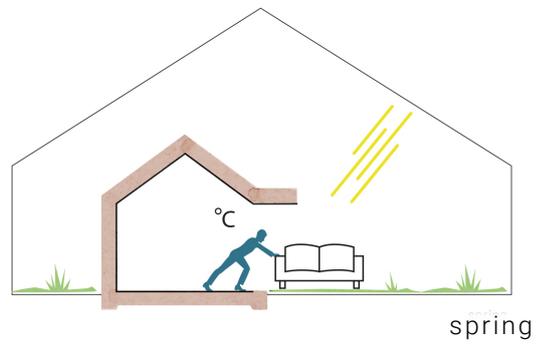
This results in a breathing floor plan, that shrinks and extends with the course of the day, and the seasons.

the breathing floor plan

In winter, most of the time is spent in the insulated building core.

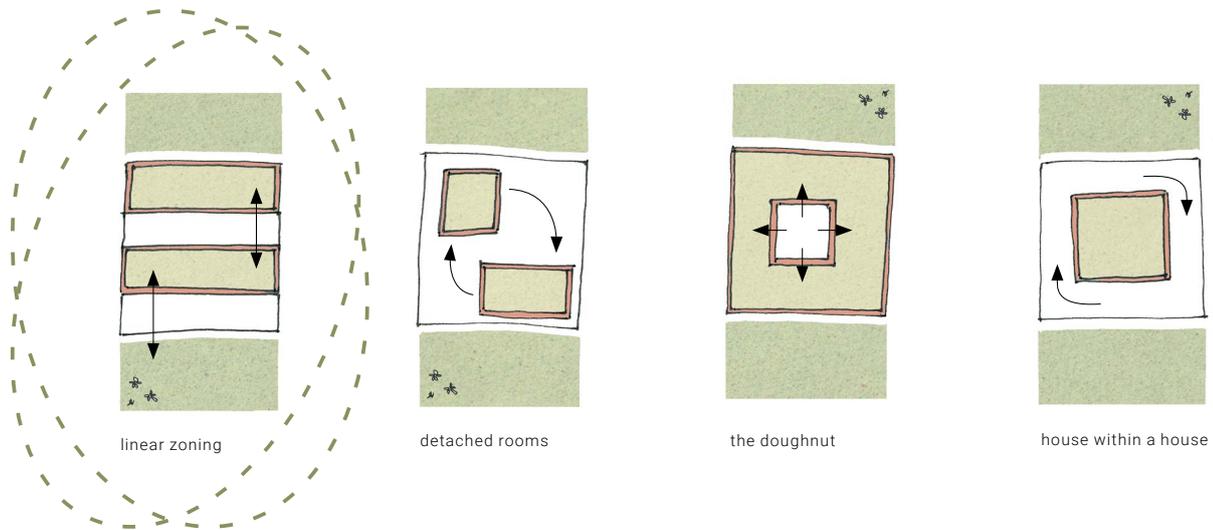


When the sun comes out, the residents transform their dwelling, and extend the living space - for a few hours or for several months.



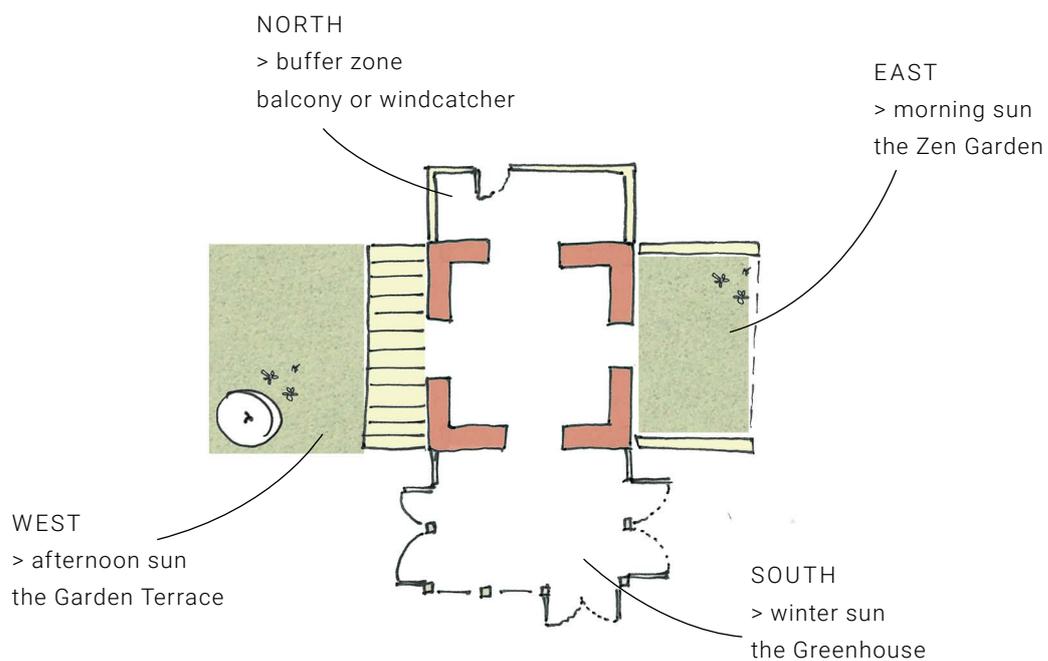
ZONING STUDIES I:

Heated and Non-heated Spaces



ZONING STUDIES II:

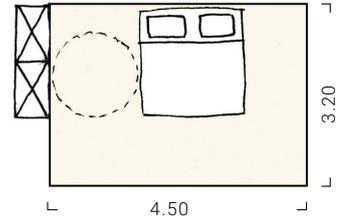
The cardinal direction influences the design of the non-heated spaces.



# THE WINTER DWELLING

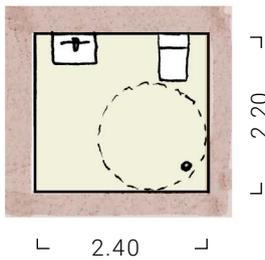
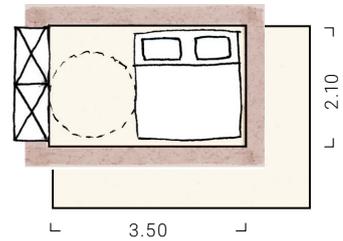
## EXPLORATION OF MINIMUM LIVING AREA AND HEATED SPACE

The German building regulations have no specific requirements for the minimum floor area of rooms in a dwelling. Suitable area was derived from space requirements regarding wheelchair accessibility. Required diameter for a clear turning circle is 1.50 m.

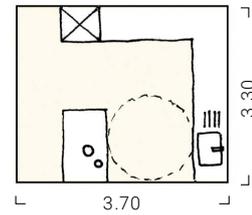


bedroom,  
wheelchair accessible  
floor area: 14.4 m<sup>2</sup>

minimum heated area: 7.35 m<sup>2</sup>

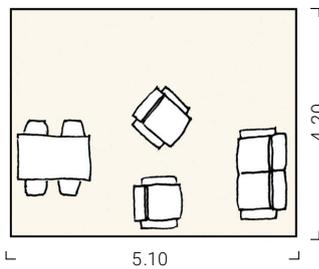
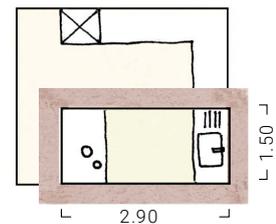


bathroom,  
wheelchair accessible  
floor area: 5.28 m<sup>2</sup>  
fully heated



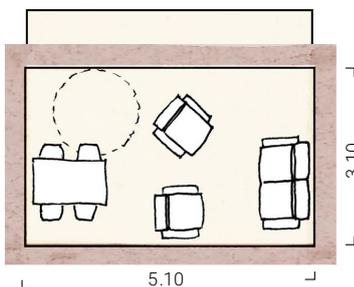
kitchen,  
wheelchair accessible  
floor area: 12.2 m<sup>2</sup>

minimum heated area: 4.35 m<sup>2</sup>



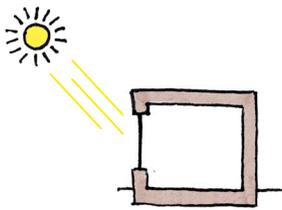
livingroom,  
wheelchair accessible  
floor area: 21.4 m<sup>2</sup>

minimum heated area: 15.8 m<sup>2</sup>

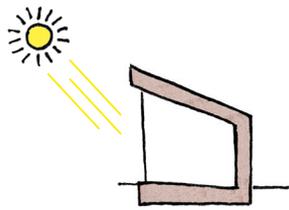


# SPACES BETWEEN INSIDE AND OUTSIDE

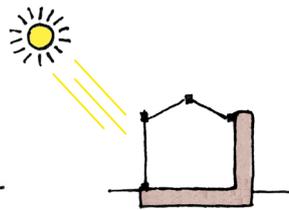
## CATALOGUE OF SPATIAL VARIATIONS



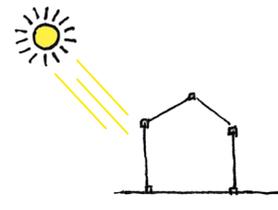
unheated regular room



winter garden

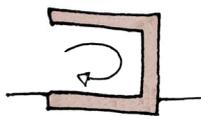


attached green house

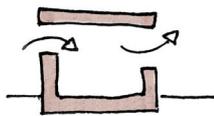


green house

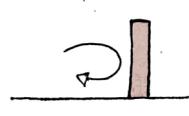
## EXPOSURE TO SOLAR RADIATION



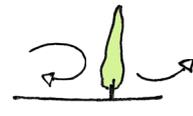
bus stop



open shelter



garden wall

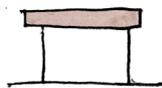


garden

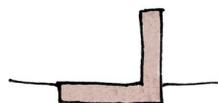
## PROTECTION FROM WIND



glazed ceiling



pavilion



sheltered terrace



terrace

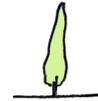
## VARIATIONS

## INFLUENCING FACTORS FOR THERMAL COMFORT



### Feature 1: Solar Radiation

- Can heat up spaces throughout the year.
- > extend comfortable period in cold months
  - > risk of overheating
  - > daylight supply



### Feature 3: Vegetation

- Diverse set of functions.
- > cooling effect through evapotranspiration
  - > vertical shading element
  - > wind barrier
  - > absorbs radiation
  - > air filtering



### Feature 2: Thermal Mass

- Stores heat for short periods.
- > extend comfortable period into nighttime
  - > stabilize temperature fluctuations
  - > should be exposed to solar radiation



### Feature 4: Wind Barrier

- Manipulates perceived temperature on skin.
- > extend comfortable space
  - > risk for heat trapping
  - > controlled wind management for both cooling and sheltering effect



Figure 20: Concept Collage: Urban Habitat.  
(own drawing)

Conceptual Exploration:

How much of the day can we spend outdoors?

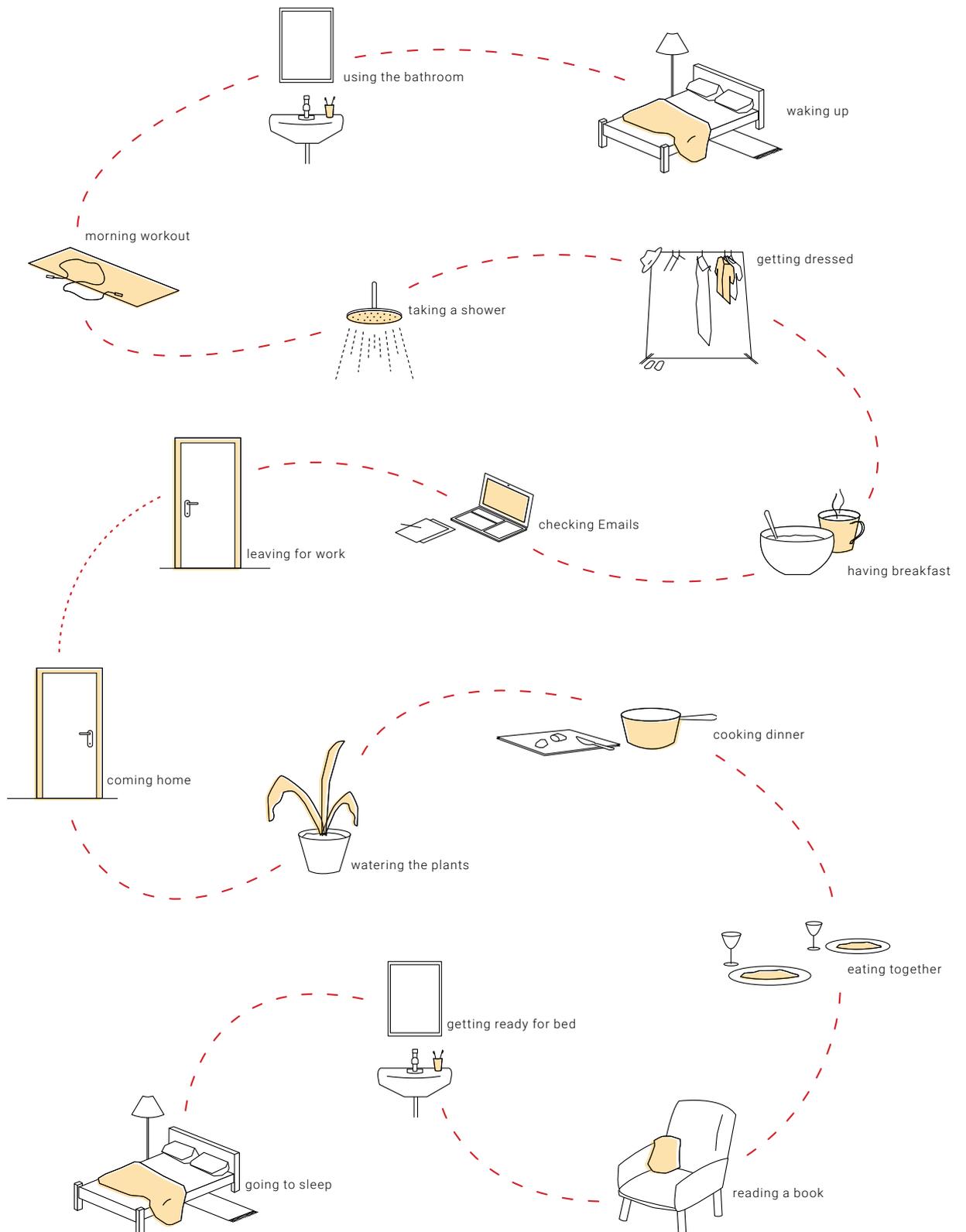
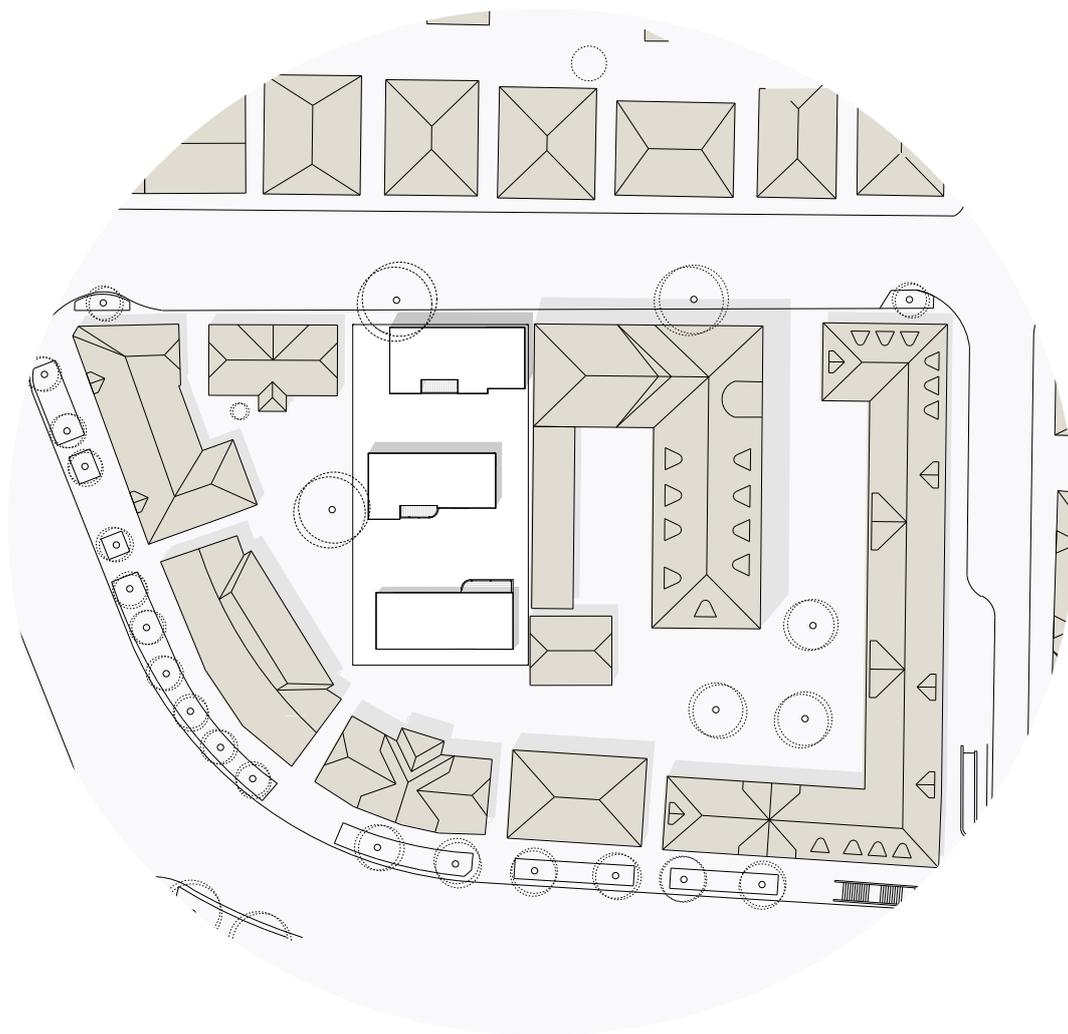


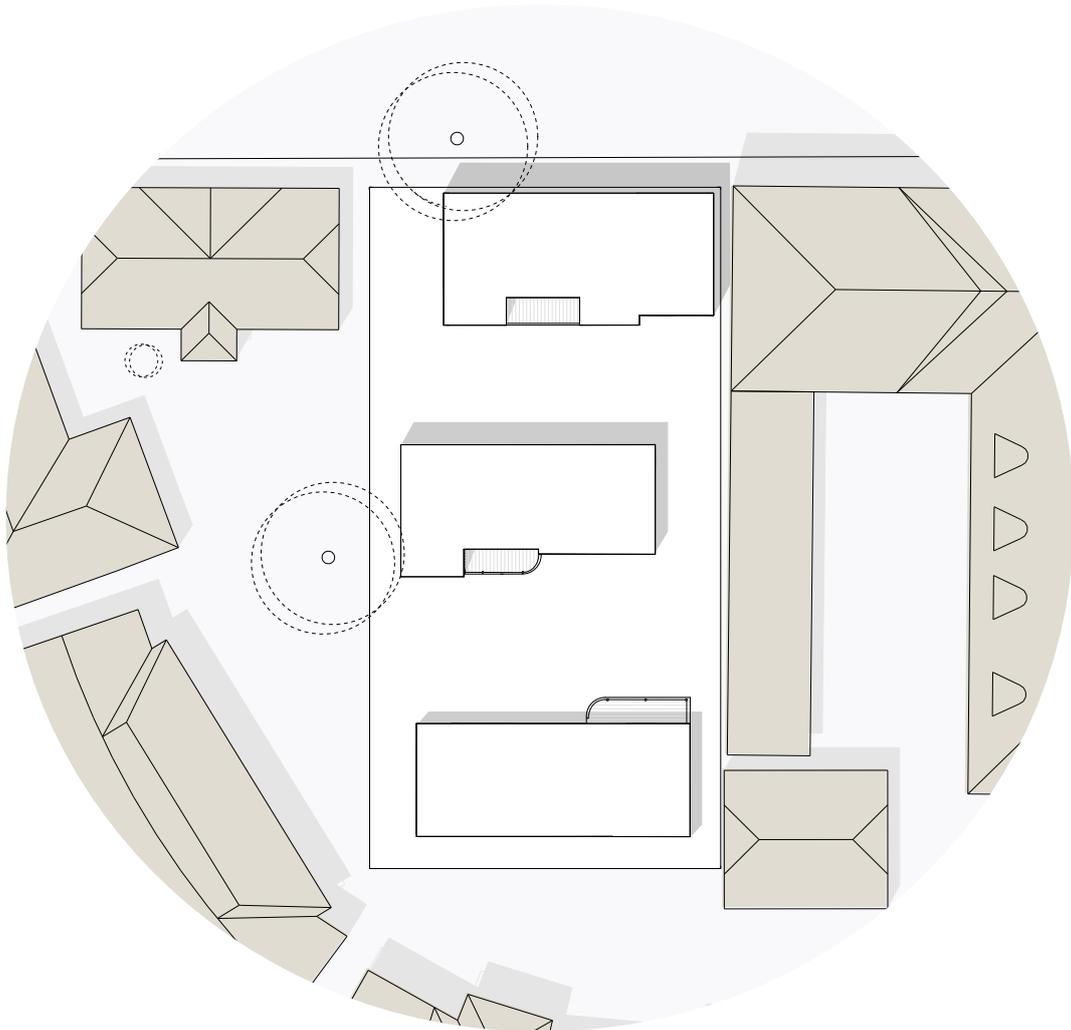
Figure 21: A Day Inside / Outside.  
(own drawing)

# DESIGN PROPOSAL



SITE PLAN

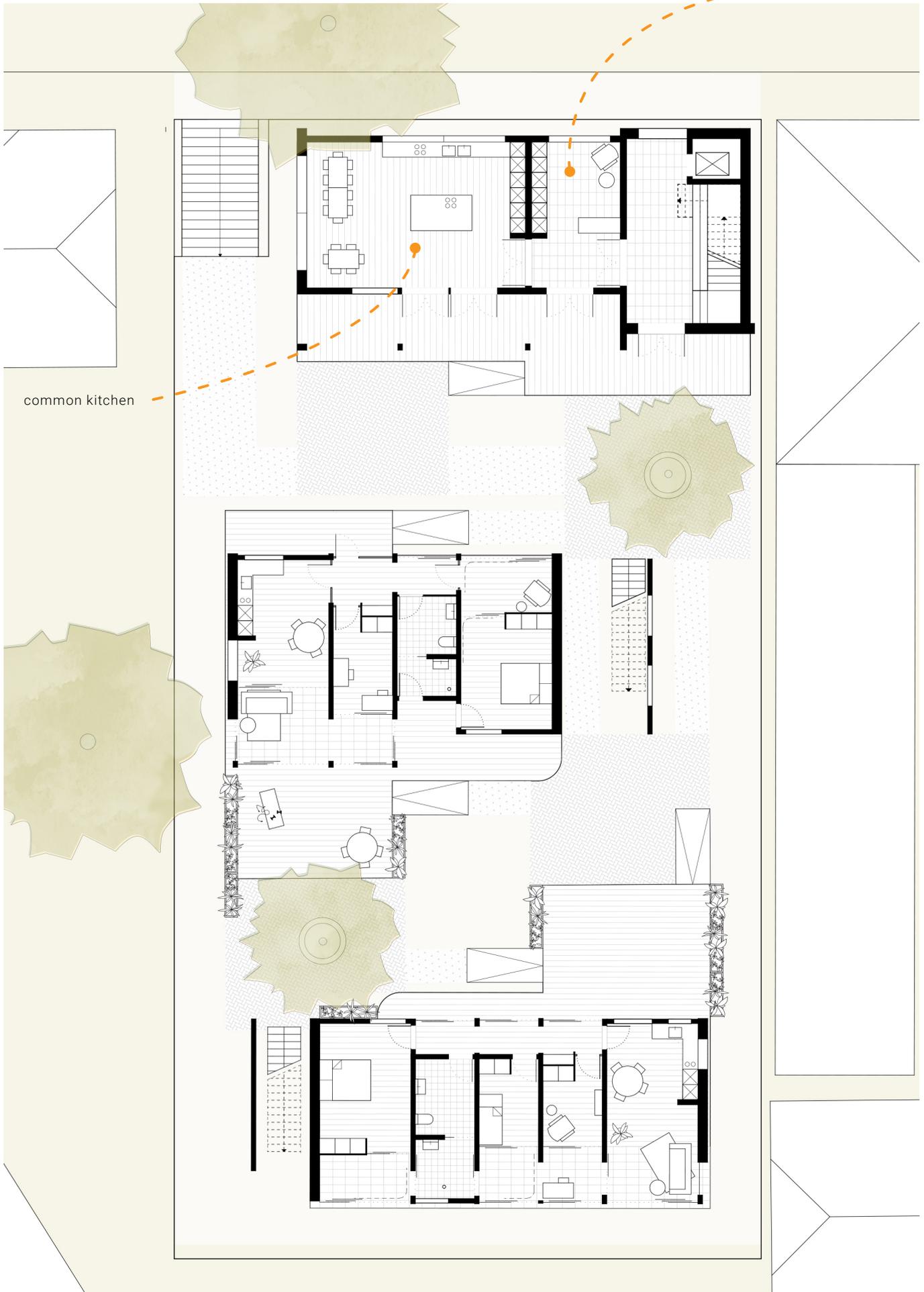
M 1:1000



BUILDING VOLUMES

M 1:500

common laundry room

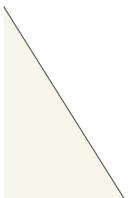
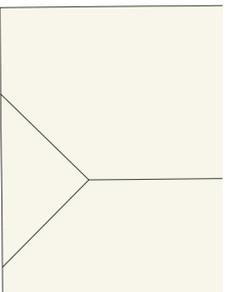
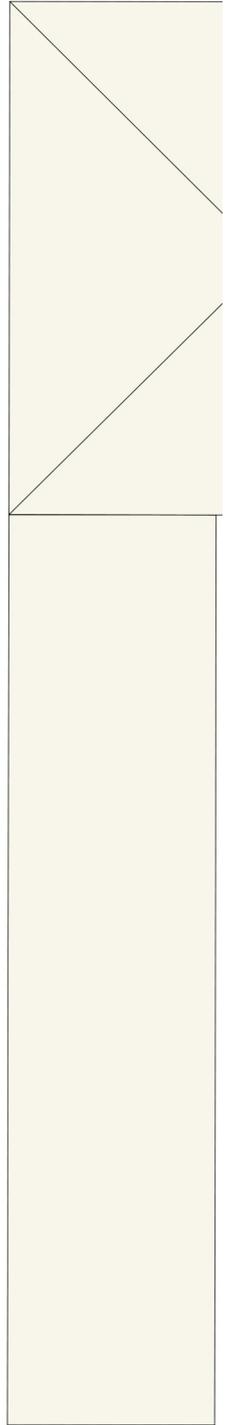
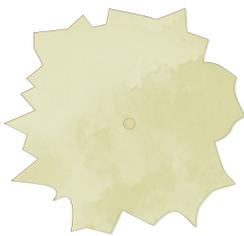
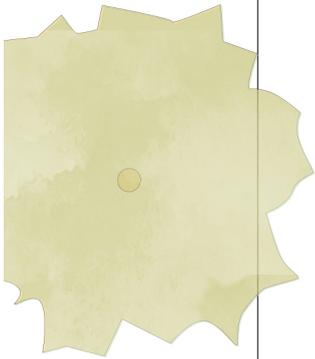
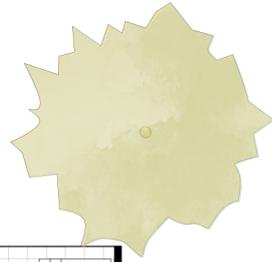
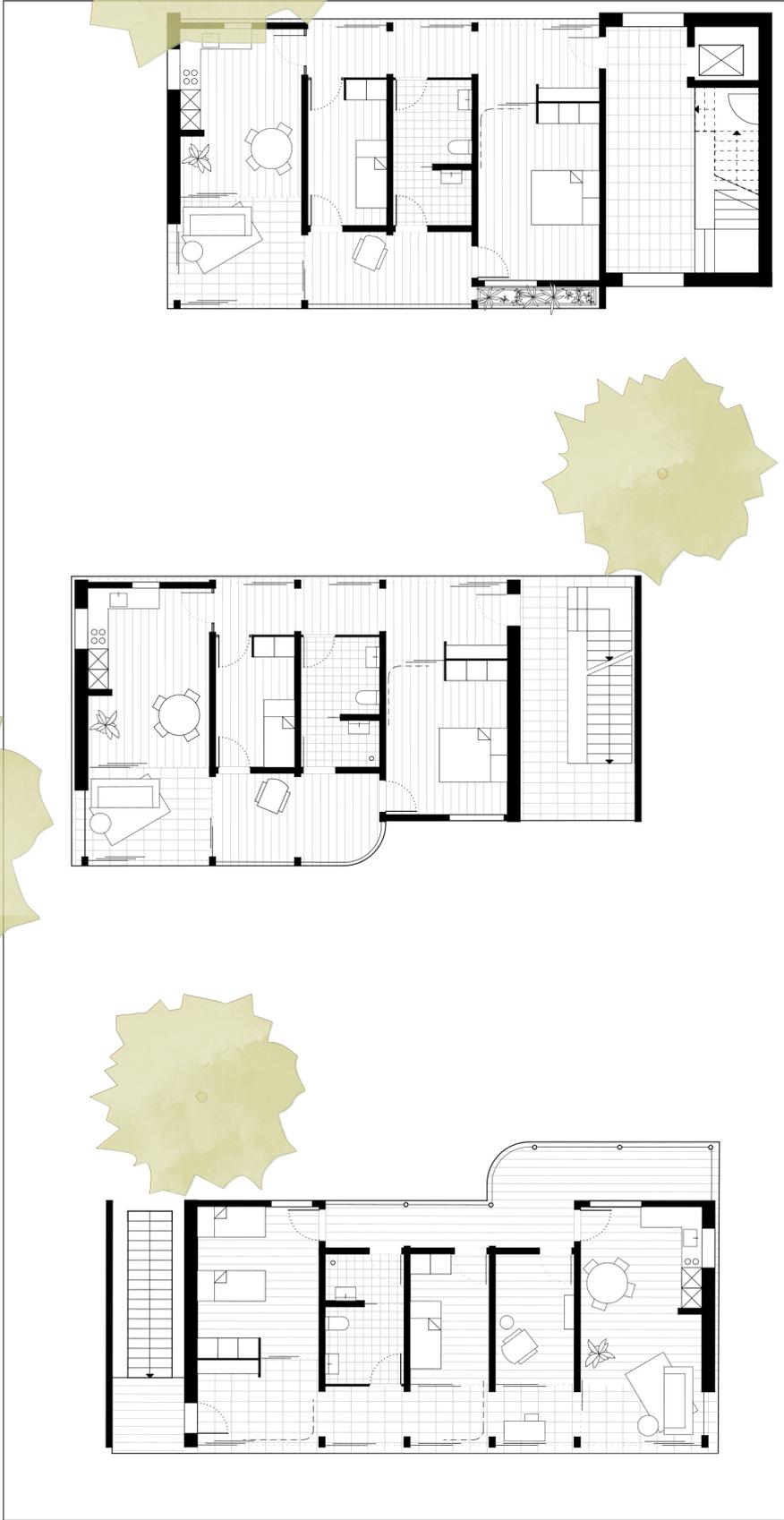
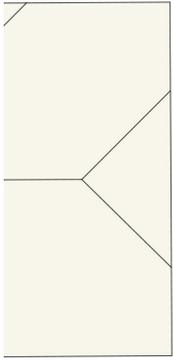


common kitchen

GROUND FLOOR

M 1:200

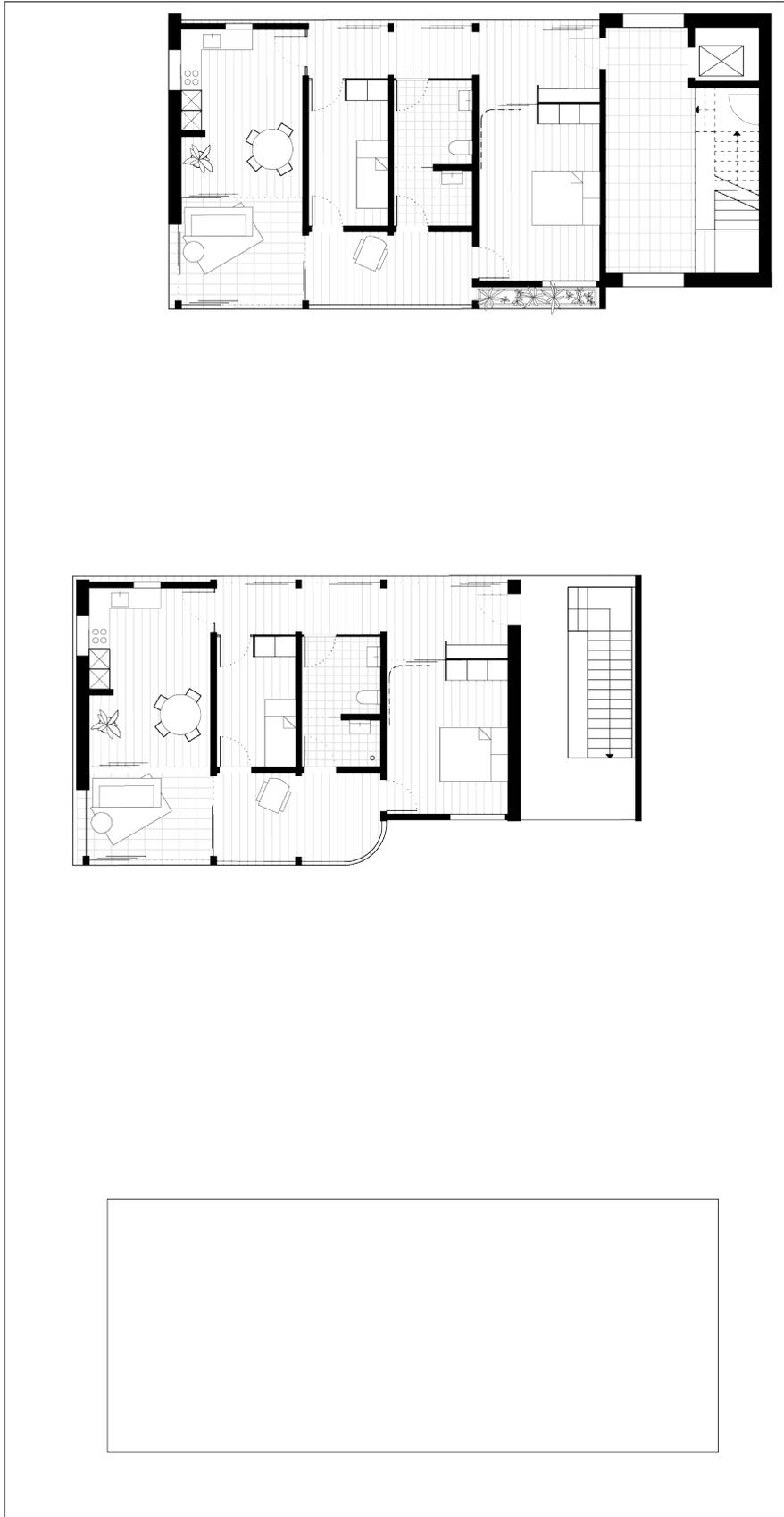




FIRST FLOOR

M 1:200

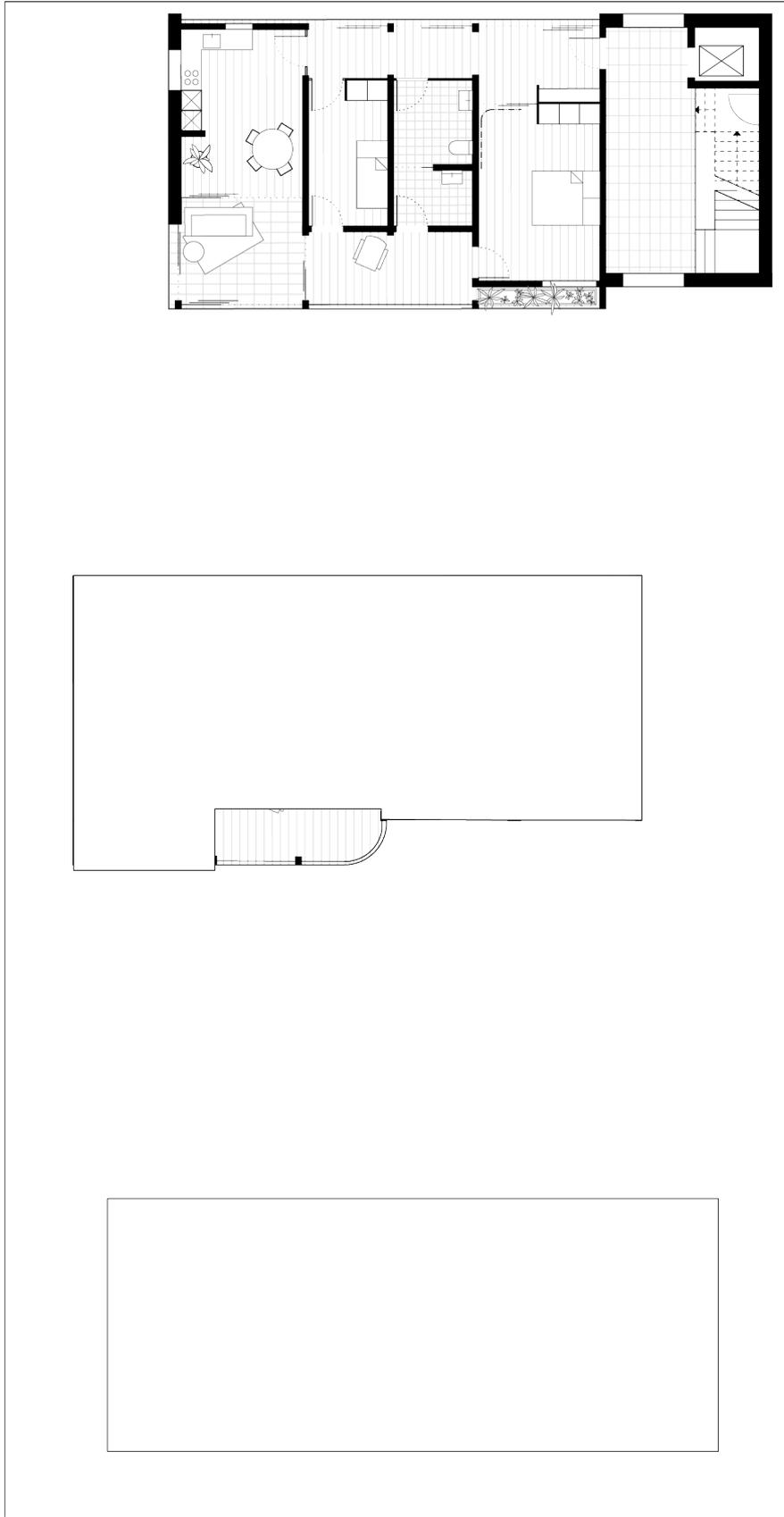




SECOND FLOOR

M 1:200





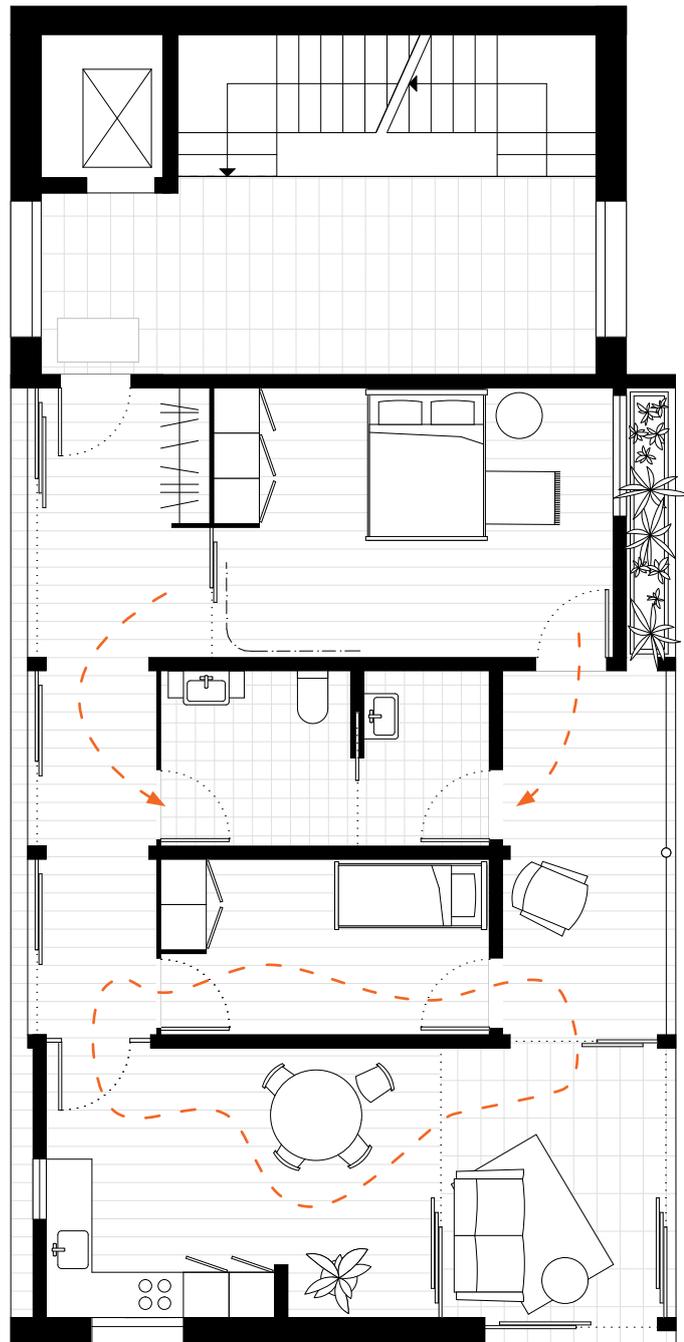
THIRD FLOOR

M 1:200



THE INDIVIDUAL APARTMENT

CIRCULATION



APARTMENT

M 1:100



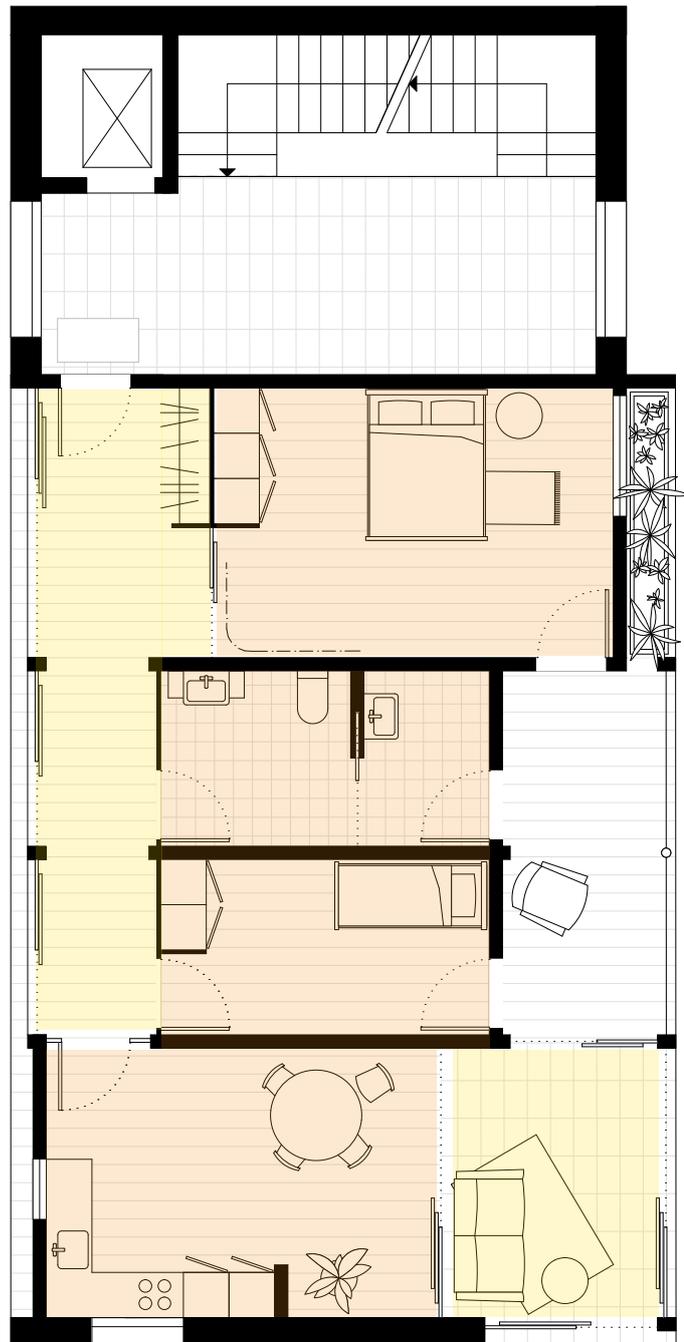
SIGHT AXES



APARTMENT

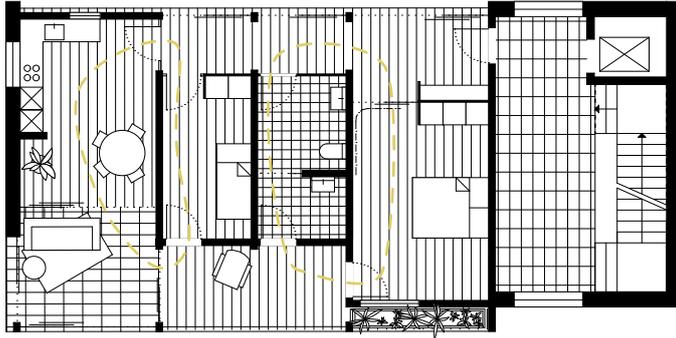
M 1:100

HEATED AND SEMI-TEMPERED SPACES

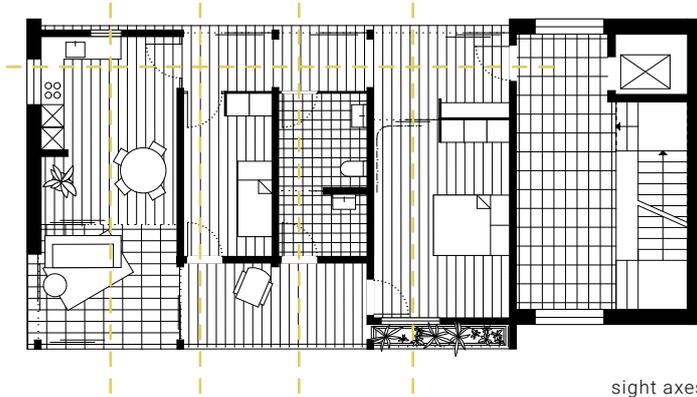


APARTMENT

M 1:100



circulation

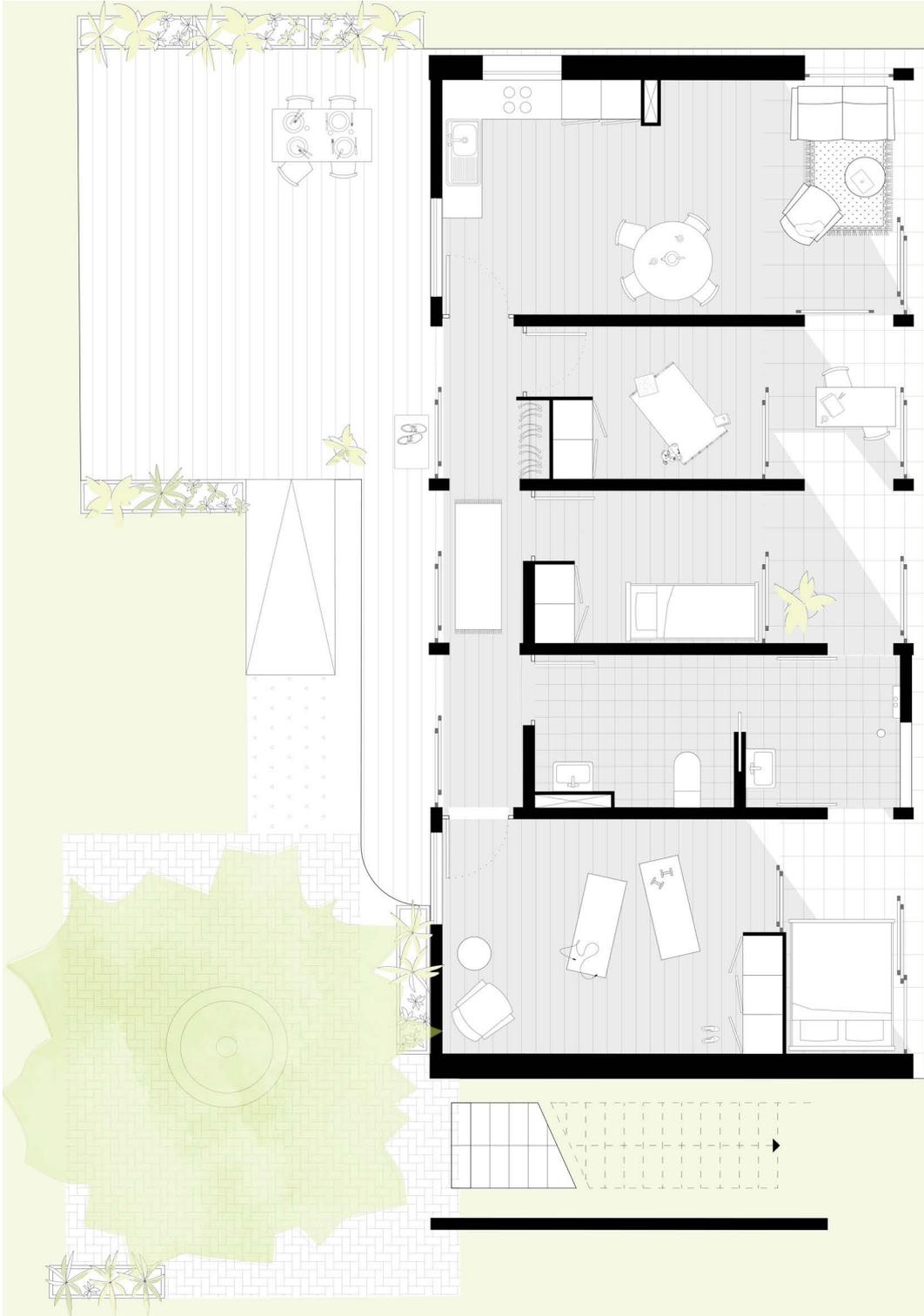


sight axes



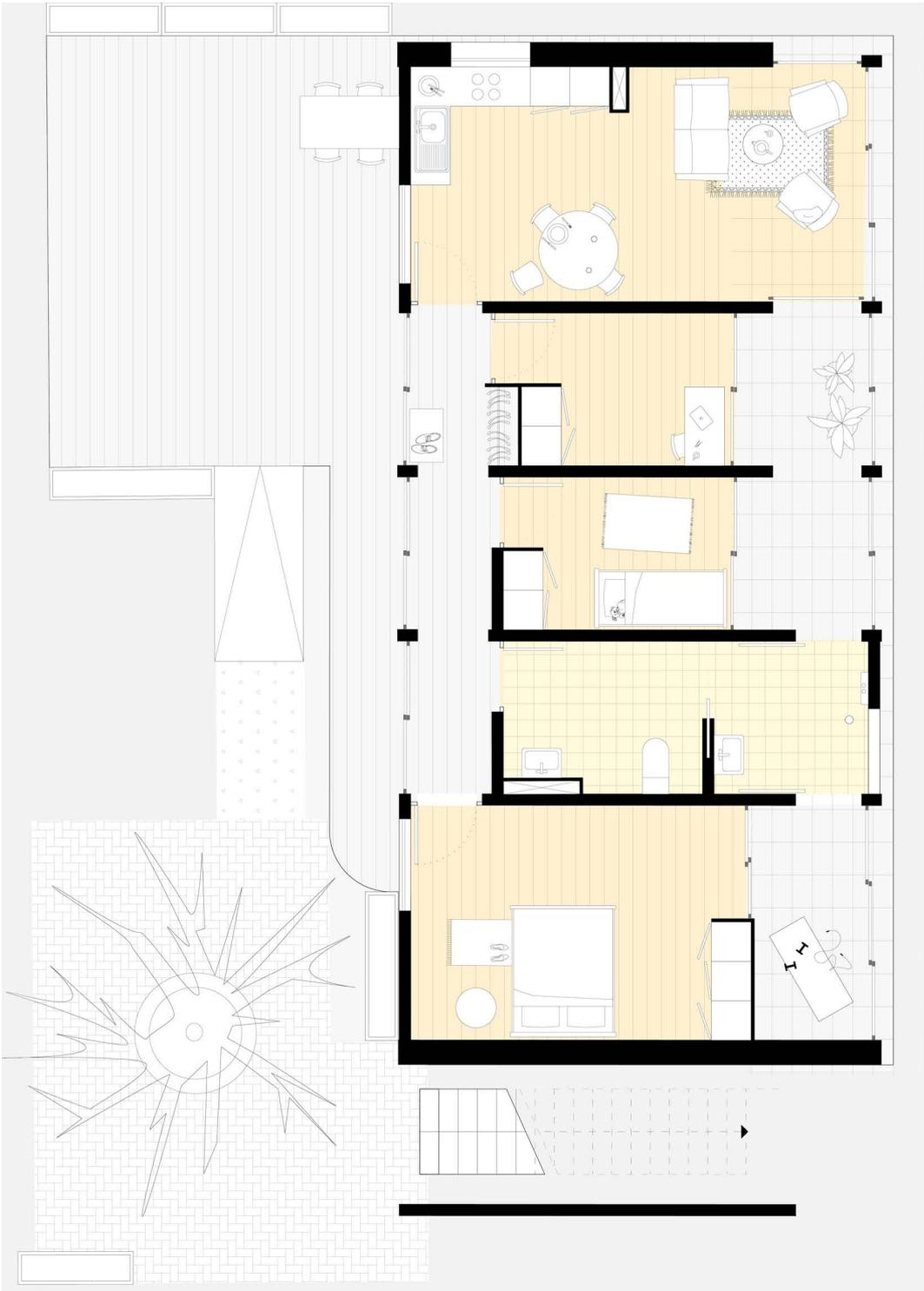
heated apartment core

APARTMENT IN SUMMER



EXTENDED FLOORPLAN INTO THE OUTDOORS

APARTMENT IN WINTER



HEATED APARTMENT CORE



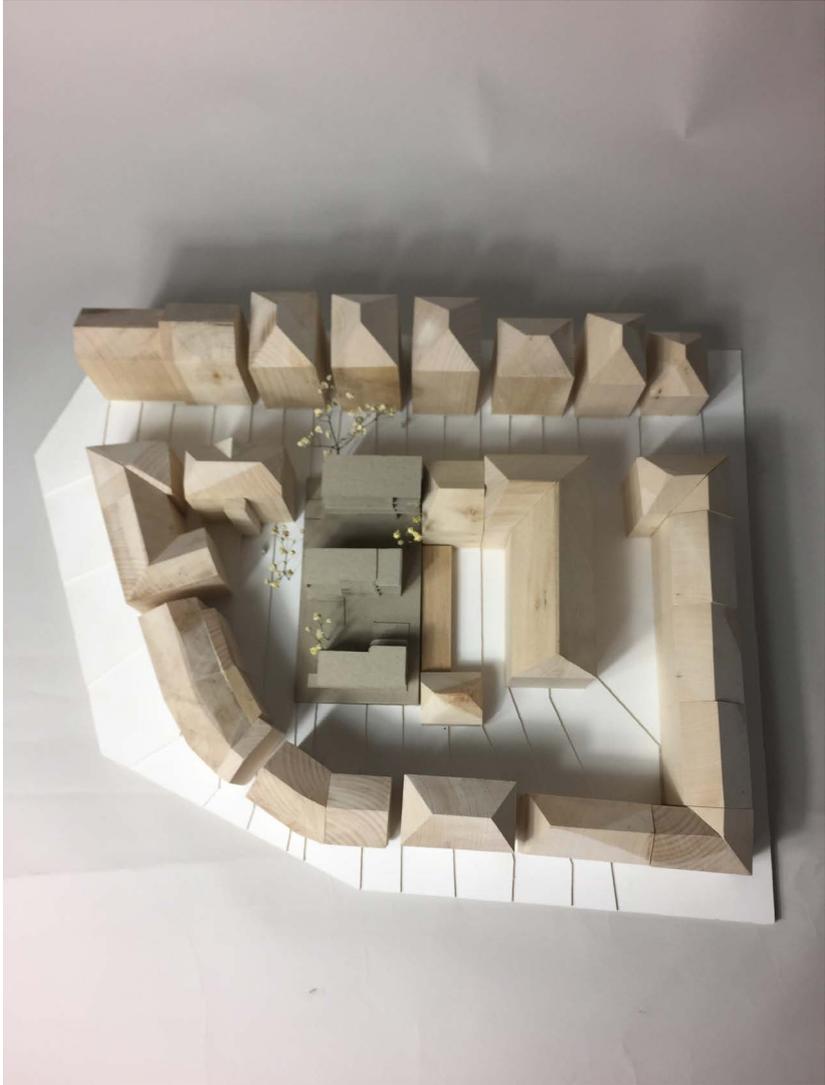


SECTION | M 1:200





PERSPECTIVE

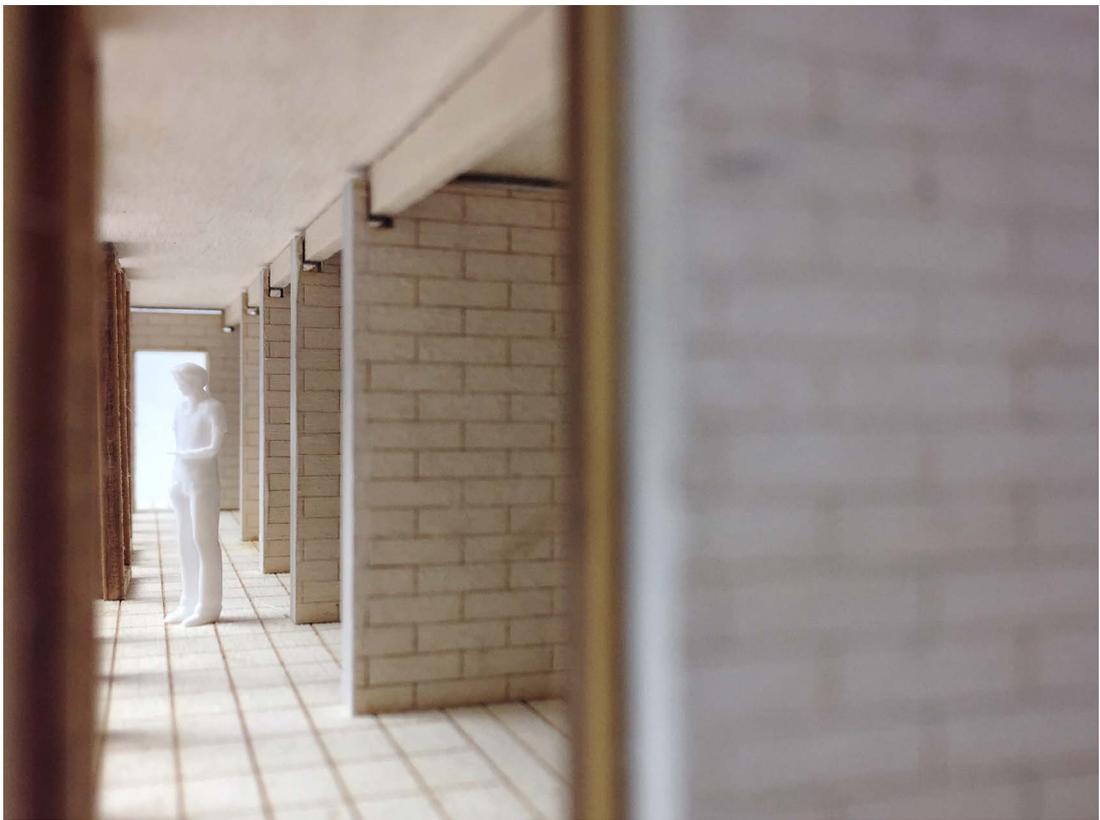














## Conclusion

Conclusion

Discussion

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## CONCLUSION

As the society is struggling to acknowledge the environmental crisis as the most relevant call to action for our current times, there is an abundance of research at hand, which may show us a way to solving this challenge.

As this crisis cuts to the fundamentals of our collective understanding on the human role on the planet, the findings from fields of philosophy, psychology and sociology are of particular relevance. It is important that other fields of practice and research, including architecture, begin to build their theory and practice on precisely those findings. This master's thesis is the attempt to such a holistic approach in architectural design.

## DESIGN PROPOSAL

The design proposal at hand is a residential project for the city of Stuttgart. The project aims to connect its residents to nature through deliberate architectural design. The European climate and particular meso-climatic conditions of Stuttgart inform the design hereby as well as the dense urban context on site. In fact, the design utilizes precisely the natural features of climate, season, weather and outside temperature to achieve the intended connection.

The heart of the design proposal is the individual apartment. Here, the main functions of everyday life are located in the heated core of the dwelling. The circulation space between individual rooms is then organised through non-heated threshold spaces. These spaces blur the lines between inside and outside, and expose the residents to weather, temperature and the seasons, whenever they are moving from one room to the other.

It was hereby a conscious aim to link the exposure to nature to everyday activities, as this has proven to be an especially effective approach for a reconnection between humans and nature.

In addition, the threshold spaces create the opportunities for a breathing floorplan. Throughout the day and the year, life at the apartment will expand into these spaces and beyond to the outside at warmer periods, only to contract to the inner core area during colder periods.

That way, residents have to take responsibility for the ever-changing arrangement of functions in their apartment. This consequence is not understood as an inconvenience, but stands instead in line with research findings that call for an emphasized resident stewardship.

Finally, the design element of non-heated but enclosed spaces has been chosen as a response to the European winter. Through airtightness and thermal mass, these threshold spaces form a suitable compromise between extended thermal comfort and direct experience of the outdoors. The design can thus be understood as a direct response to the specific conditions of the particular place, the third requirement that the research for this thesis has postulated.

## **DISCUSSION**

For future projects, there is an abundance of elements waiting to be explored. Even within the European and urban context, it would be interesting to investigate how a focus on other natural features like vegetation or the human-animal relationship would inform the architectural design. Additionally, a change of scale to a complete building block, a neighborhood or a whole town will result in new design solutions. Lastly, a focus on other building typologies, like office buildings or educational facilities would broaden the spectrum.

This thesis was also pursued with regard to the current building exhibition ‚IBA 2027‘ in Stuttgart, which is striving for „a new societal debate on the sustainability of urban lifestyles“ („Outcomes of the IBA Platform Process“, p.2). What solutions can we expect to see here from the architect’s profession?

From what I have learned during the literature research of this thesis, I would now argue clearly that it is not enough to pursue techno-centric approaches focused on efficiency and the building’s energy performance. The profession of architecture must begin to blend these technical advances with approaches that respond to the broader issues of society, like the patterns of collective behavior and identity storytelling. I am looking forward to see how such a broadened debate could be promoted in the upcoming years.

## **REFLECTION:**

### **RESEARCH VS. DESIGN**

Reflecting on the previous year of thesis studies, I personally make a clear distinction between the overall work process and the thesis product - the design proposal. And while this booklet and the final presentations display mainly the latter, I see my personal growth and achievements primarily in the former element.

This thesis began almost one year ago with the personal question on how I could utilize my profession as an architect to contribute to a more sustainable society. Then, in the following fall semester leading up to the main thesis work, my focus lay not necessarily on questions of design. Instead, I dove deeply into the field of sociology in order to understand what motivates people to adapt to an environmentally more responsible lifestyle. This issue has been a very strong interest of mine, and the understanding I gained in this field turned out to be the most satisfactory learning outcome of the whole thesis process.

Shortly after the midcrit presentation, however, a guest tutor told me that all theoretic knowledge is not relevant for our work as architects, if we do not manage to translate it into spatial design. Until today, I am not sure if I agree with him. Yes, as architects we are paid to plan buildings. And yes, given the complex theoretical subject of my thesis, I have been struggling to achieve exactly this translation, to design a building that unites the presented findings into built form. However, I also believe that the acquired knowledge will allow me to pursue my profession beyond this thesis from a more informed stance. And furthermore, I am certain that the last thesis presentation is not the end of my personal journey with this subject. Instead, I am positive that the general question of this work will accompany me into future professional projects, where I will further aim to find architectural answers to this societal question.

In the end, I believe that exactly this discourse on the relation between research findings and design solutions is what makes the heart of an architectural thesis. I am thankful to have been given this opportunity to explore their interplay, and I am curious to see how my understanding of both will develop in the future.

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