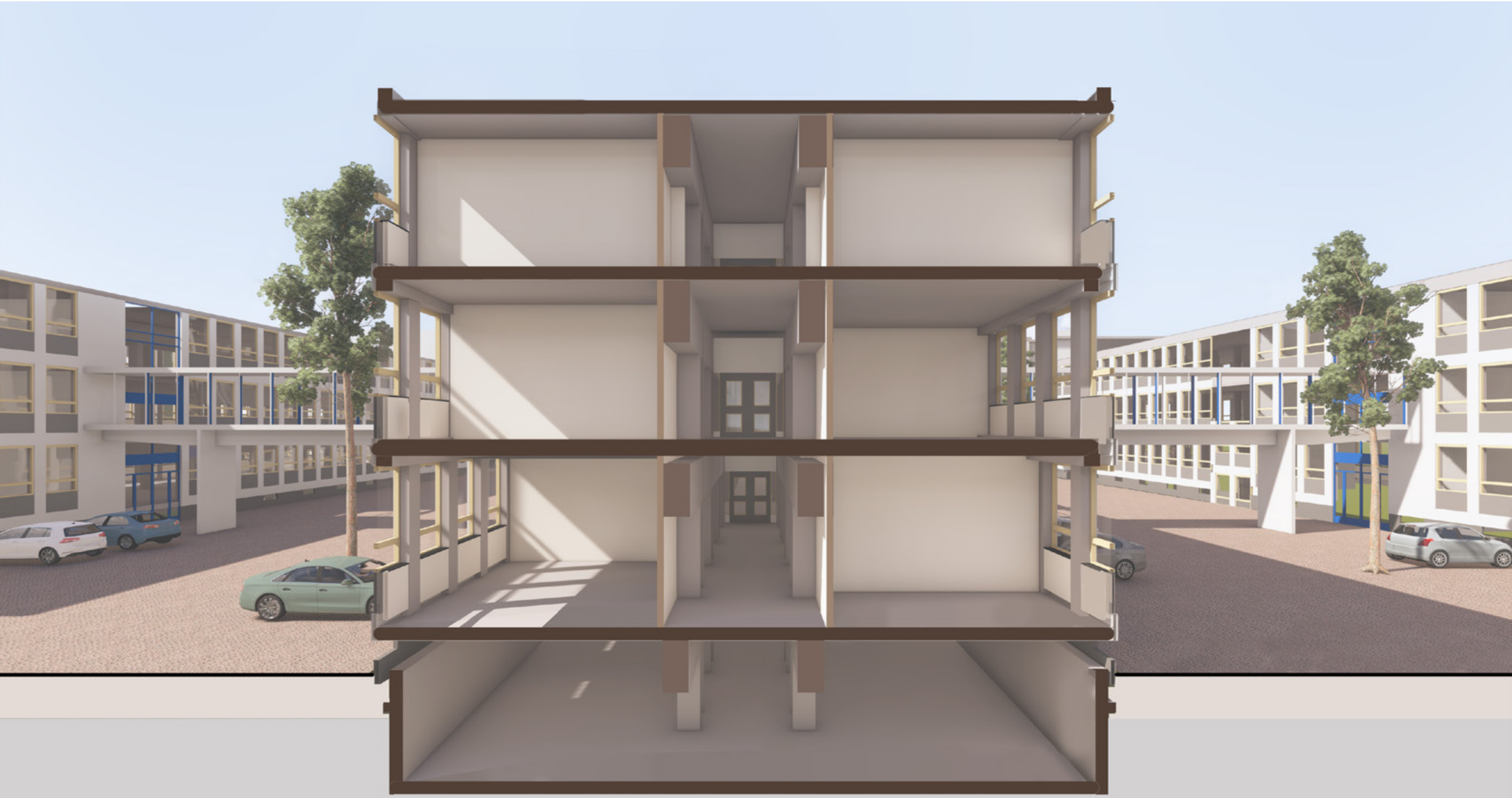
THE NATURAL IN-BETWEEN PLACE FOR STRESS RELIEF THROUGH BIOPHILIC DESIGN

Prototype: Renovation design Applied Sciences Building (TNW) on TU Delft Campus
Graduation presentation Masja Rietveld

THE WAY I GREW UP WITH NATURE

WHO OF YOU REALLY ENJOYS TO SPEND HOURS AND HOURS IN THESE KIND OF SPACES?



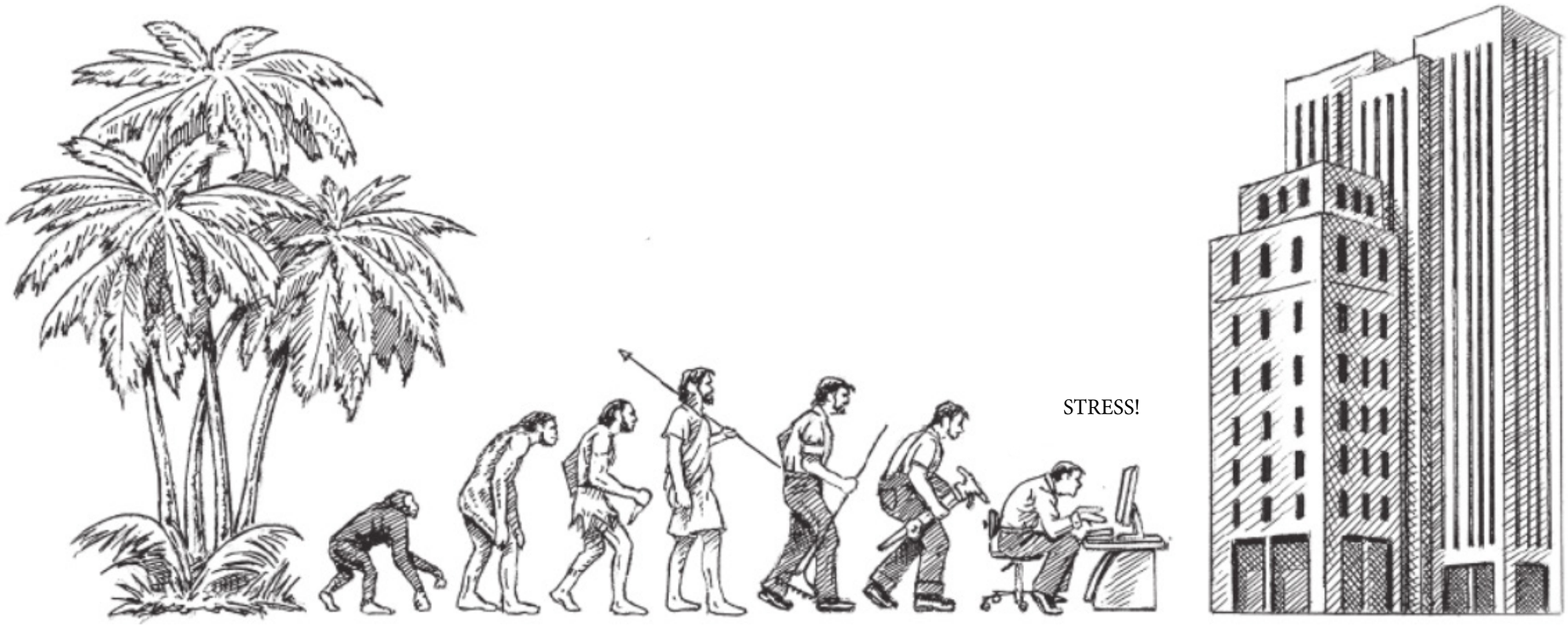
WHO OF YOU REALLY ENJOYS TO SPEND HOURS AND HOURS IN THESE KIND OF SPACES?




PROBLEM STATEMENT

A SIGNIFICANT CHALLENGE WE FACE IS FINDING WAYS TO INTEGRATE NATURE INTO OUR BUILT ENVIRONMENT FOR STRESS RELIEF

‘’We humans are programmed as we experienced the world years ago in nature, but over the years, we lost our balance. We moved from being a part of nature to being apart from nature’’ (Attenborough & Hughes, 2020, p. 125).



The perceived evolutionary role of humans in the modern world and their movement to the city (Kellert, 2018)

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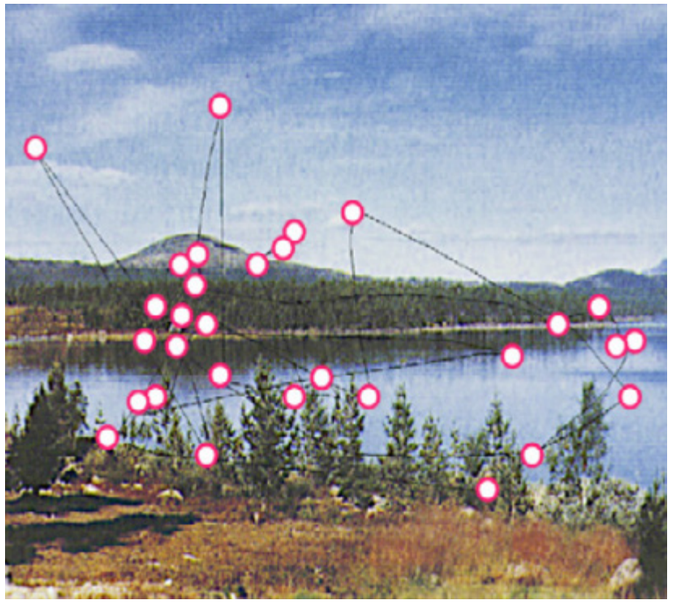
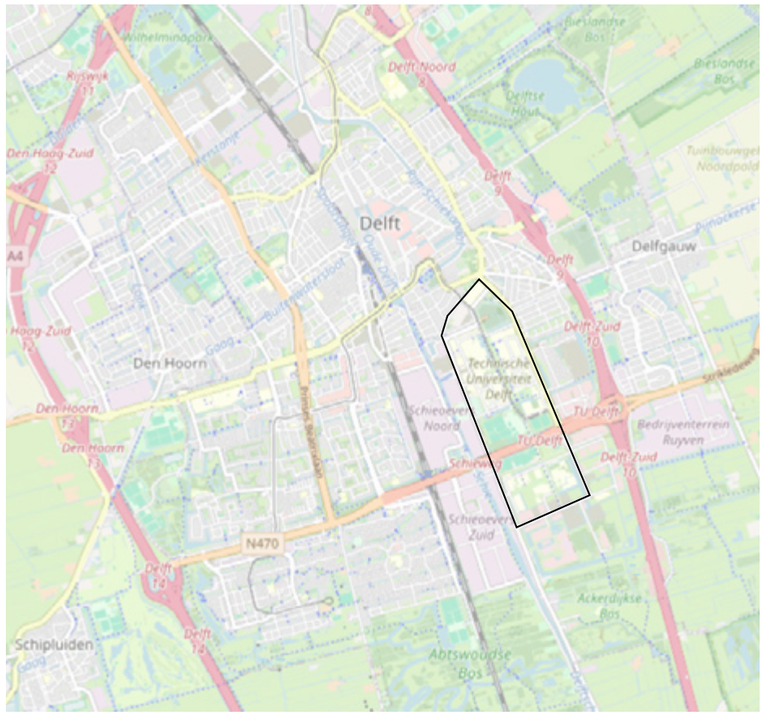


Beetje natuur, grote invloed (M. Mieras, z.d.)

STRESS - TU DELFT

‘‘97% of TU Delft students experience stress, with 70% experiencing excessive performance pressure and 51% reporting psychological complaints such as anxiety and gloom’’ (Rooijakkers & TU Delta, 2021)

TU DELFT CAMPUS SITUATION



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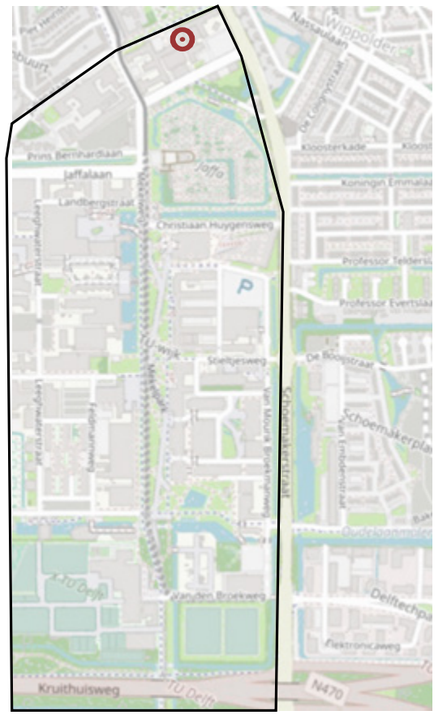

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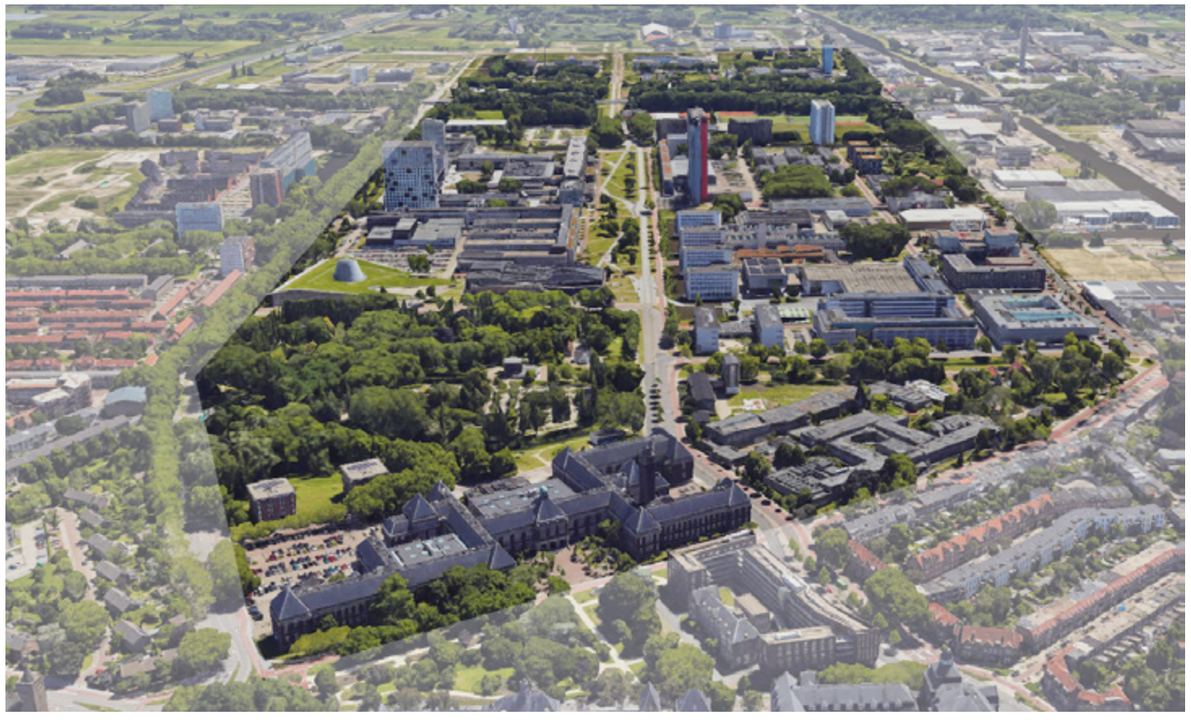

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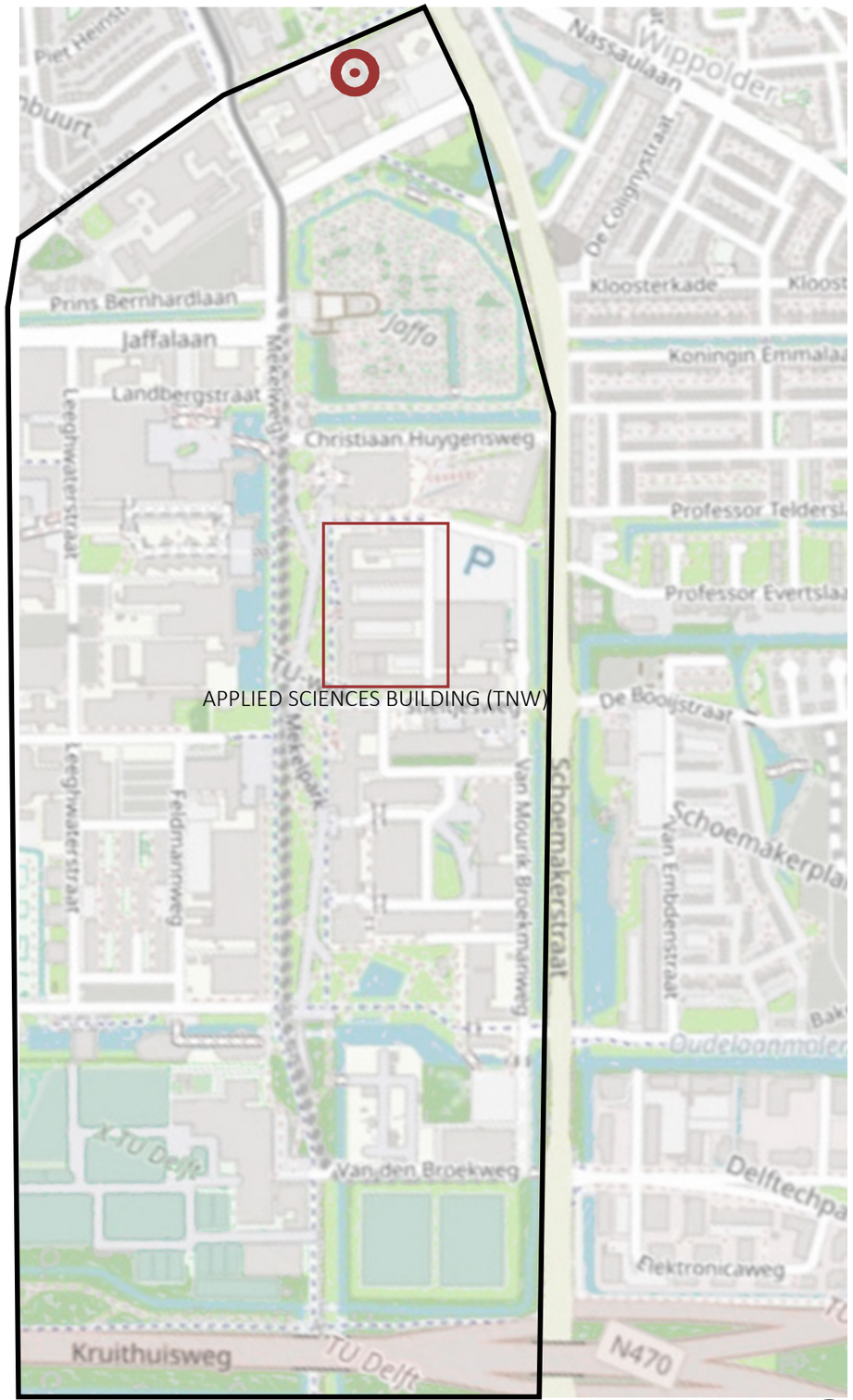

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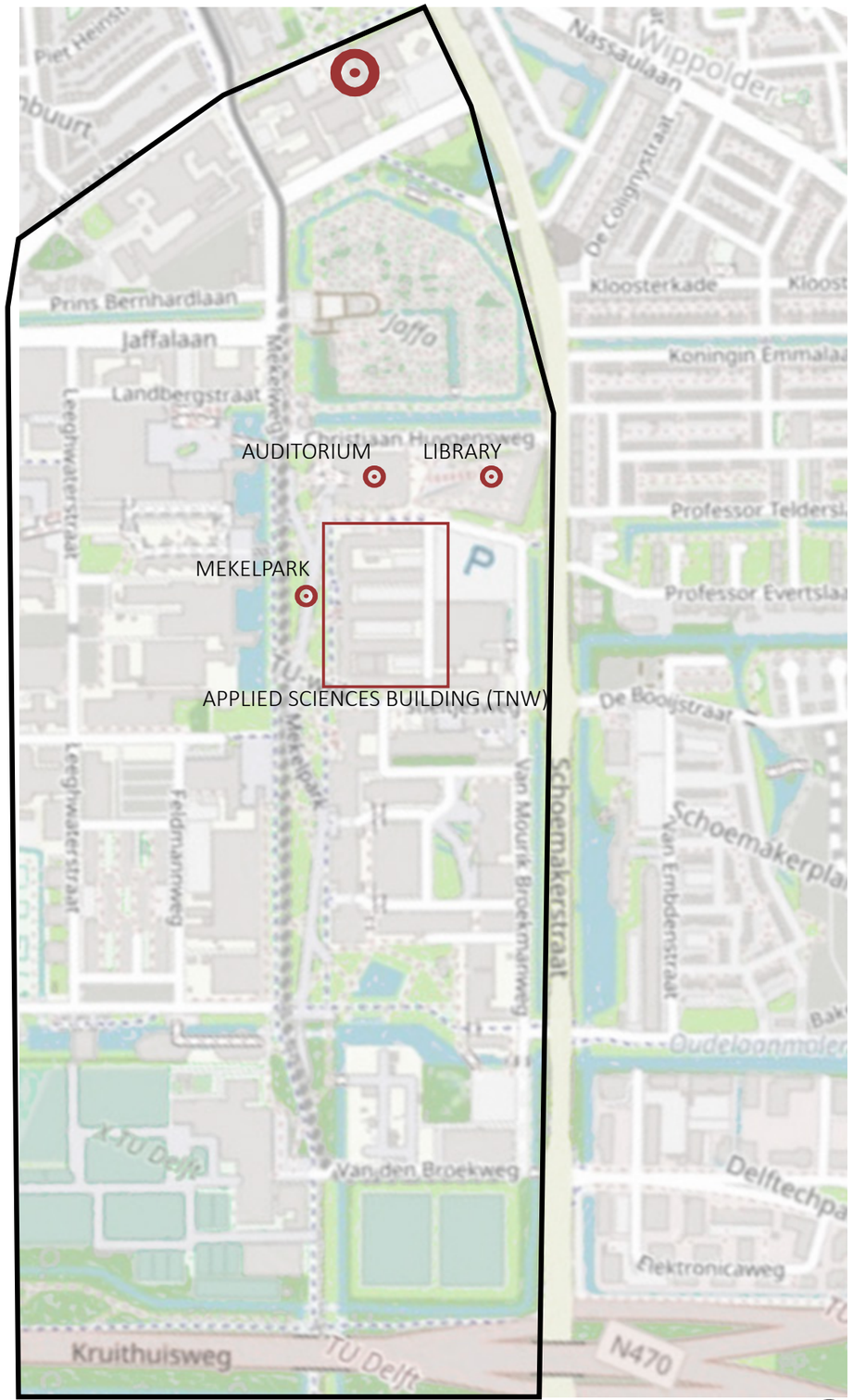
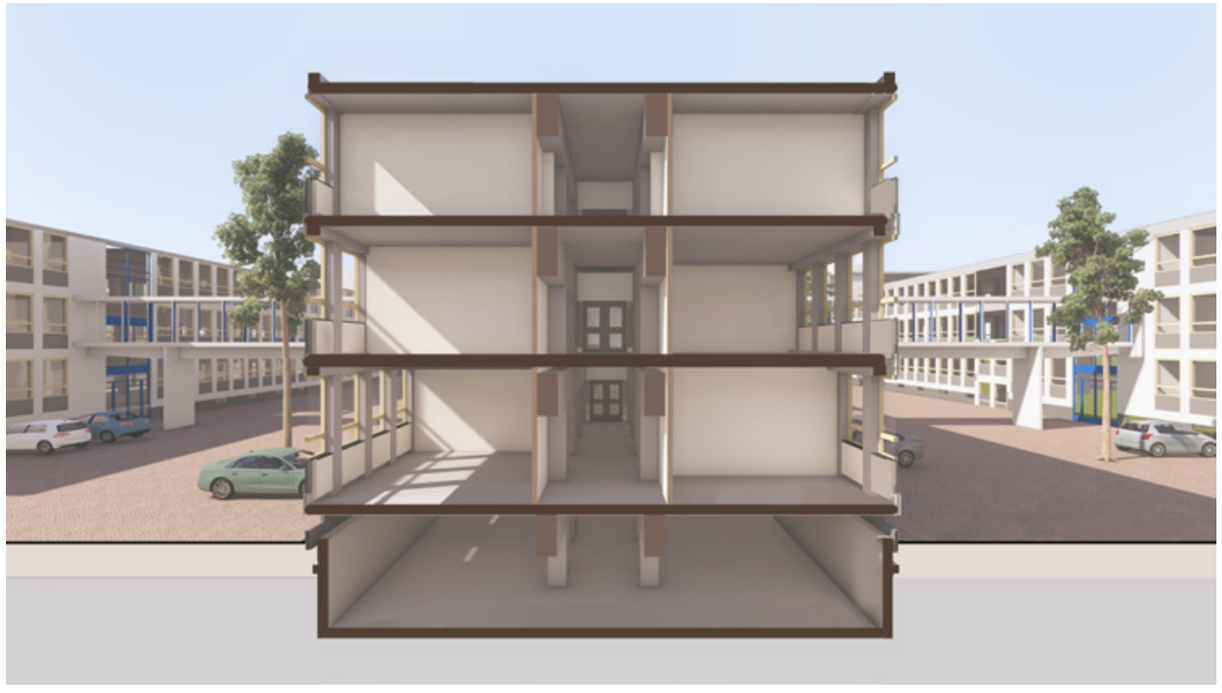
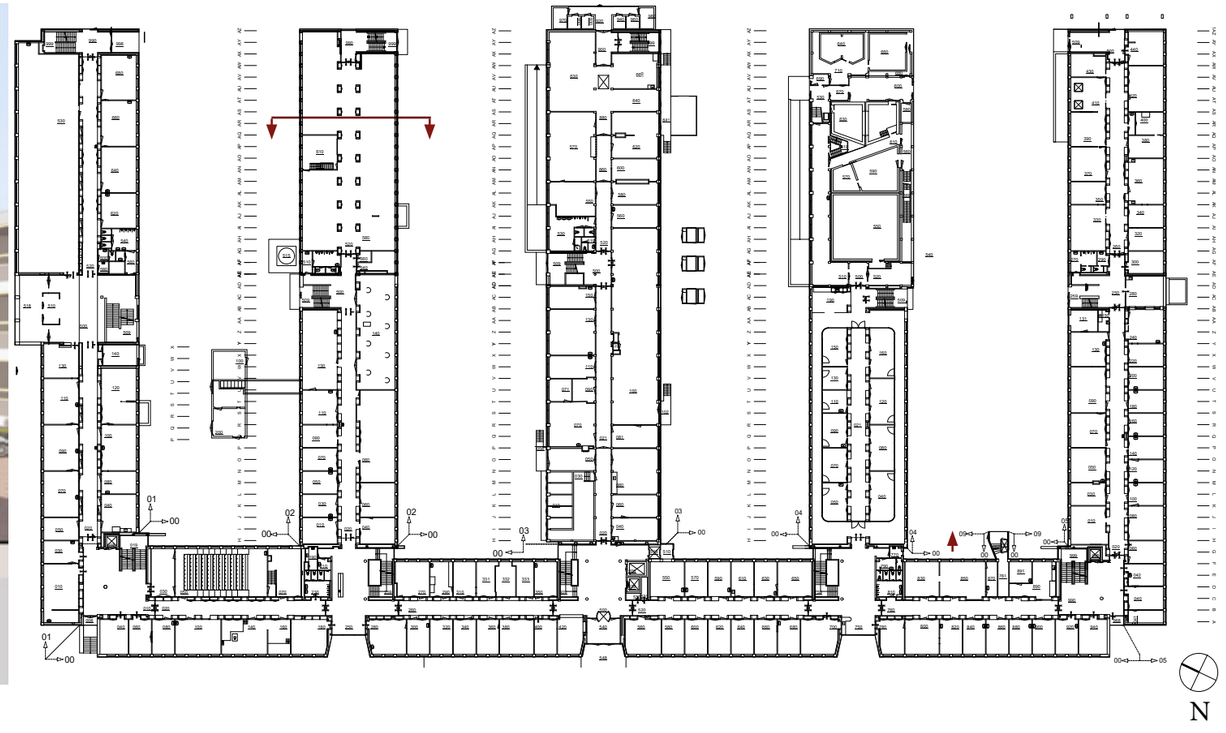


EXISTING TNW BUILDING SITUATION
NO CONNECTION WITH NATURE





HISTORY OF TNW BUILDING

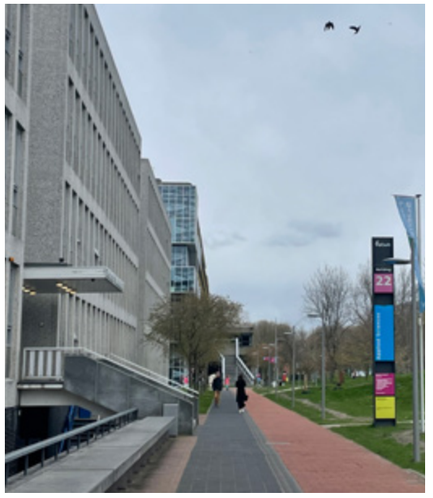
ARCHITECT: DIRK ROOSENBURG, 1963

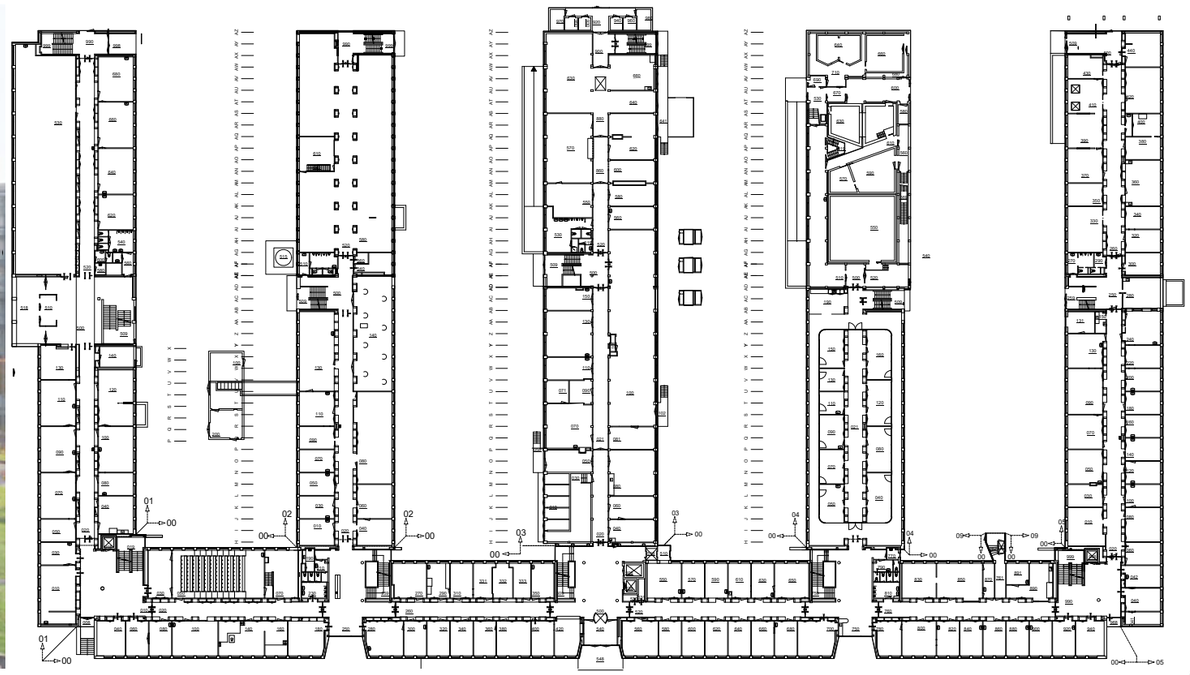
EXISTING TNW BUILDING SITUATION
THERE IS POTENTION

TU Delft: ‘’We strive for a natural, biodiverse campus where people and nature co-exist’’ (TU Delft, 2023)









HOW TO USE THIS POTENTION?

HOW TO USE THIS POTENTION?

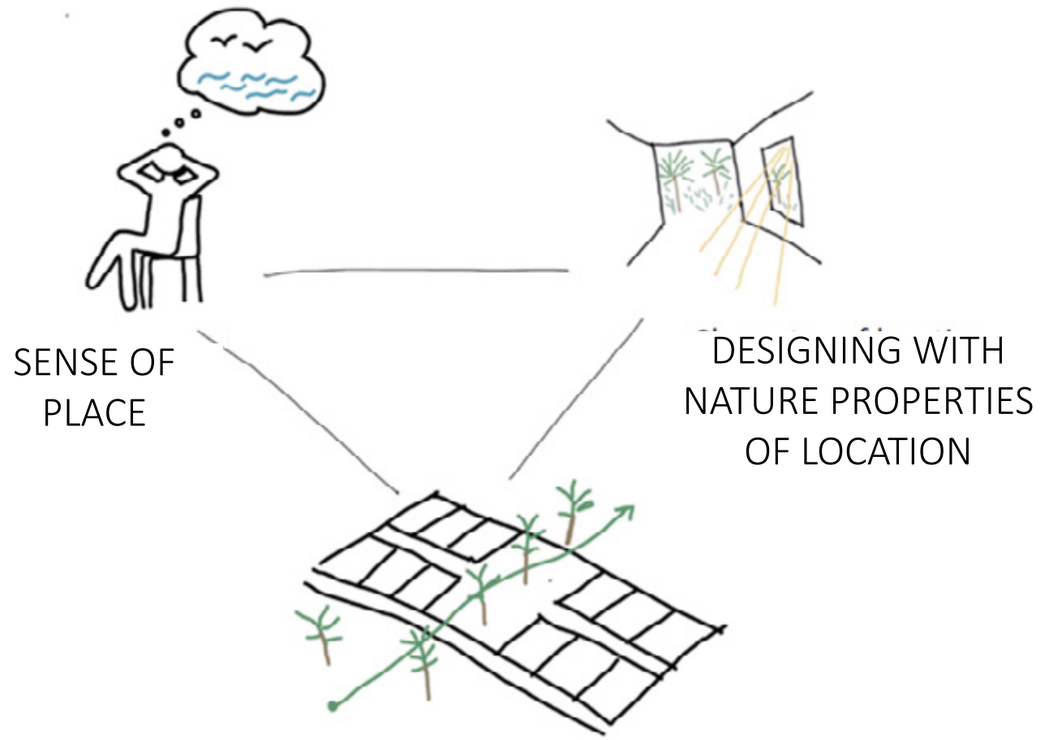
STRESS!

RETHINKING THE WAY STUDENTS LIFE:
A PLACE FOR STUDYING, LIVING AND CULTURE

WHAT KIND OF SPACES TO DESIGN?

WHAT KIND OF SPACES TO DESIGN?

NATURAL IN-BETWEEN PLACE



HOW TO DESIGN?

?

RESEARCH GAP

THE NEED TO TRANSLATE BIOPHILIC THEORIES INTO PRATICAL DESIGN OPPORTUNITIES FOR ARCHITECTS

A NATURE IN THE SPACE DESIGN GUIDE FOR STRESS RELIEF THROUGH BIOPHILIC DESIGN

MASJA RIETVELD

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m.m.rietveld@student.tudelft.nl

ABSTRACT

People are becoming disconnected from nature, mainly due to the urban environment, resulting in high stress levels in modern society. Biophilia, our innate attraction to the patterns and processes of nature, is used by biophilic designs to reduce stress. This research focuses on translating biophilic theories into stress-reducing design parameters through the biophilic category 'nature in the space'. Nature in the space involves the direct presence of nature in a space, including plant life, water, and animals, as well as natural elements like breezes, sounds, and scents. The goal is to develop a practical design guide that architects can use to integrate appropriate design patterns and parameters on a project-by-project basis. The six biophilic stress-relieving design patterns are visual and non-visual connection with nature, non-rhythmic sensory stimuli, thermal and airflow variability, presence of water, and dynamic and diffuse light. Designing for multiple sensory experiences through natural and living processes is crucial. This can be achieved by using the following design parameters: high-quality view of natural elements, biodiversity, clean flowing water, exposure variations, and day and seasonal shifts.

KEYWORDS

Stress Relief, Design Guide, Biophilic Design, Nature in the Space, Natural In-Between Place, Biophilia, Nature

I. INTRODUCTION

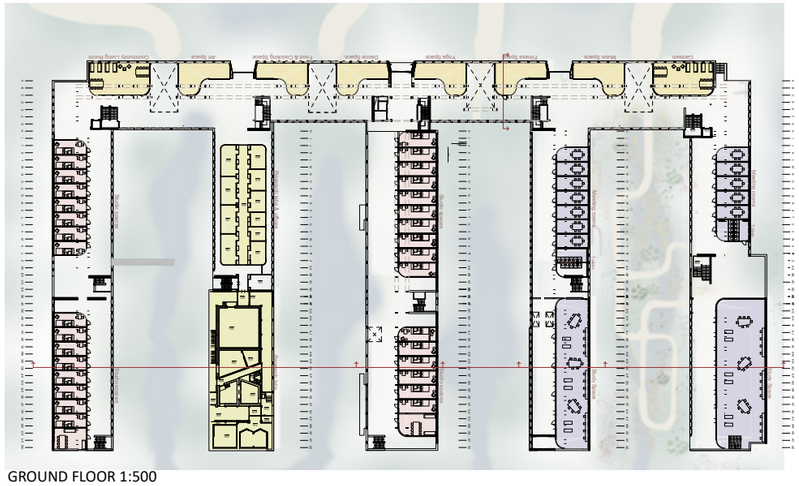
"We humans are programmed as we experienced the world years ago in nature, but over the years, we lost our balance. We moved from being a part of nature to being apart from nature" (Attenborough & Hughes, 2020, p. 125).

Figure 1: The perceived evolutionary role of humans in the modern world and their movement to the city (Kellert, 2018)

Modern society increasingly sees nature as a relic of the past, a recreational and aesthetic amenity rather than an essential part of life. People are becoming more disconnected from nature due to various factors, mainly because they spend most of their time in urban environments. This disconnection between humans and nature results from a society prioritising technology and indoor activities while neglecting the importance of the natural world. Figure 1 humorously illustrates the perceived evolutionary role of humans in the modern world and their movement to the city (Kellert, 2018). Urban dwellers' relationship with nature is complex. Raised in urban environments, they are susceptible to environmental stimuli and stress but less inclined to seek out nature. This leads to a stimulus-seeking strategy that compromises attention and self-control, resulting in a stressful and busy life (Joye et al., 2013). According to de Graaf et al. (2010), approximately one in five people in the Netherlands experience either a depressive or anxiety

DESIGN GUIDE

A Nature in the Space Design Guide for Stress Relief through Biophilic Design



GROUND FLOOR 1:500

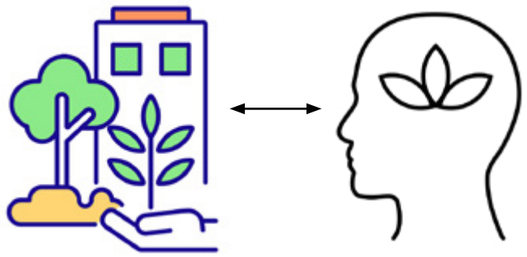
PROTOTYPE

The Natural in-between Place for Stress Relief through Biophilic Design

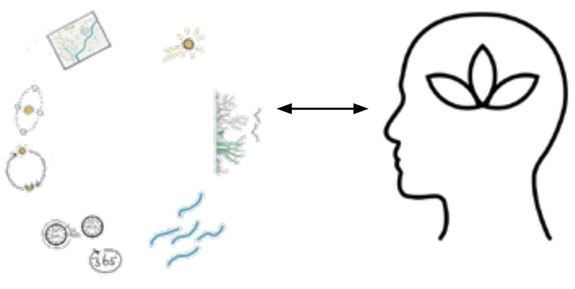
RESEARCH OUTLINE

THEMATIC RESEARCH QUESTION:

How to use the biophilic design category nature in the space to increase stress relief as an architect?



BIOPHILIC DESIGN AND STRESS RELIEF



SPATIAL IMPACT

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1. INTRODUCTION

"We humans are programmed as we experienced the world years ago as nature, but over the years, we lost our balance. We started from being a part of nature to being apart from nature." (Abrahamsen & Hughes, 2020, p. 175).

Figure 1: The perceived evolutionary role of humans in the modern world and their environment in the city (Gallet, 2018)

Modern society increasingly sees nature as a relic of the past, a recreational and aesthetic amenity rather than an essential part of life. People are becoming more disconnected from nature due to various factors, mainly because they spend most of their time in urban environments. This disconnection between humans and nature results from a society prioritising technology and indoor activities while neglecting the importance of the natural world. Figure 1 humorously illustrates the perceived evolutionary role of humans in the modern world and their environment to the city (Gallet, 2018). Urban dwellers' relationship with nature is complex. Raised in urban environments, they are susceptible to environmental stimuli and stress but less inclined to seek out nature. This leads to a stimulus-seeking strategy that compromises attention and self-control, resulting in a stressful and busy life (Jerve et al., 2019). According to de Graaf et al. (2018), approximately one in five people in the Netherlands experience either a depressive or anxiety

TRANSLATION TO DESIGN GUIDE FOR ARCHITECTS:

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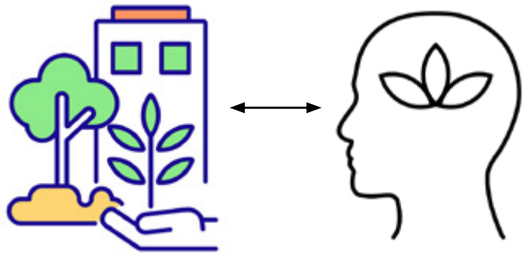

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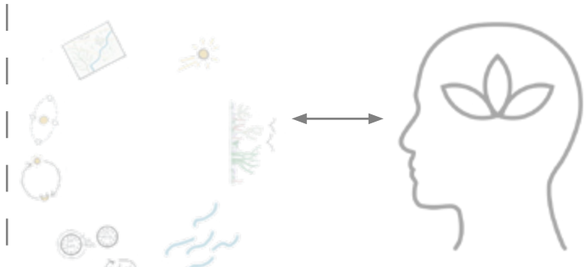

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1. INTRODUCTION

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Modern society increasingly sees nature as a relic of the past, a recreational and aesthetic amenity rather than an essential part of life. People are becoming more disconnected from nature due to various factors, mainly because they spend most of their time in urban environments. This disconnection between humans and nature results from a society prioritising technology and indoor activities while neglecting the importance of the natural world. Figure 1 humorously illustrates the perceived evolutionary role of humans in the modern world and their movement to the city (Kaplan, 2018). Urban dwellers' relationship with nature is complex. Exposed to urban environments, they are susceptible to environmental threats and stress but are noticed to seek out nature. This leads to a stimulus-seeking strategy that compromises attention and self-control, resulting in a stressful and busy life (Jerie et al., 2018). According to de Graaf et al. (2018), approximately one in five people in the Netherlands experiences either a depressive or anxiety

Figure 1. The perceived evolutionary role of humans in the modern world and their movement to the city (Lasker, 2018)

TRANSLATION TO DESIGN GUIDE FOR ARCHITECTS:
A Nature in the Space Design Guide for Stress Relief through Biophilic Design

BIOPHILIC DESIGN

A WAY TO INTEGRATE NATURE INTO OUR BUILT ENVIRONMENT FOR STRESS RELIEF

Our innate attraction to the patterns and processes of nature (Kellert, 2018)

BIOPHILIA

Draws on our biologically ingrained tendency to interact with and experience nature.

BIOPHILIC DESIGN

A strategy to address:

- workplace stress
- student performance
- patient recovery
- community cohesion
- and other health and well-being challenges

RESEARCH OUTLINE

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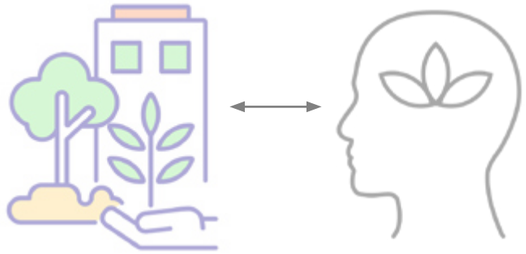

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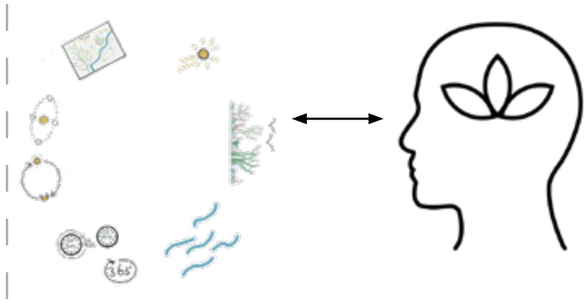

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MASJA RIETVELD

TRANSLATION TO DESIGN GUIDE FOR ARCHITECTS:
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BIOPHILIC DESIGN PATTERNS

	14 PATTERNS	*	STRESS REDUCTION	COGNITIVE PERFORMANCE	EMOTION, MOOD & PREFERENCE
NATURE IN THE SPACE	Visual Connection with Nature	* * *	**Lowered blood pressure and heart rate** (Brown, Barton & Gladwell, 2013; van den Berg, Hartig, & Staats, 2007; Tsunetsugu & Miyazaki, 2005)	**Improved mental engagement/ attentiveness** (Biederman & Vessel, 2006)	**Positively impacted attitude and overall happiness** (Barton & Pretty, 2010)
	Non-Visual Connection with Nature	* *	**Reduced systolic blood pressure and stress hormones** (Park, Tsunetsugu, Kasetani et al., 2009; Hartig, Evans, Jamner et al., 2003; Orsega-Smith, Mowen, Payne et al., 2004; Ulrich, Simons, Losito et al., 1991)	**Positively impacted on cognitive performance** (Mehta, Zhu & Cheema, 2012; Ljungberg, Neely, & Lundström, 2004)	**Perceived improvements in mental health and tranquility** (Li, Kobayashi, Inagaki et al., 2012; Jahncke, et al., 2011; Tsunetsugu, Park, & Miyazaki, 2010; Kim, Ren, & Fielding, 2007; Stigsdotter & Grahn, 2003)
	Non-Rhythmic Sensory Stimuli	* *	**Positively impacted on heart rate, systolic blood pressure and sympathetic nervous system activity** (Li, 2009; Park et al, 2008; Kahn et al., 2008; Beauchamp, et al., 2003; Ulrich et al., 1991)	**Observed and quantified behavioral measures of attention and exploration** (Windhager et al., 2011)	
	Thermal & Airflow Variability	* *	**Positively impacted comfort, well-being and productivity** (Heerwagen, 2006; Tham & Willem, 2005; Wigö, 2005)	**Positively impacted concentration** (Hartig et al., 2003; Hartig et al., 1991; R. Kaplan & Kaplan, 1989)	**Improved perception of temporal and spatial pleasure (alliesthesia)** (Parkinson, de Dear & Candido, 2012; Zhang, Arens, Huizenga & Han, 2010; Arens, Zhang & Huizenga, 2006; Zhang, 2003; de Dear & Brager, 2002; Heschong, 1979)
	Presence of Water	* *	**Reduced stress, increased feelings of tranquility, lower heart rate and blood pressure** (Alvarsson, Wiens, & Nilsson, 2010; Pheasant, Fisher, Watts et al., 2010; Biederman & Vessel, 2006)	**Improved concentration and memory restoration** (Alvarsson et al., 2010; Biederman & Vessel, 2006) **Enhanced perception and psychological responsiveness** (Alvarsson et al., 2010; Hunter et al., 2010)	**Observed preferences and positive emotional responses** (Windhager, 2011; Barton & Pretty, 2010; White, Smith, Humphryes et al., 2010; Karmanov & Hamel, 2008; Biederman & Vessel, 2006; Heerwagen & Orians, 1993; Ruso & Atzwanger, 2003; Ulrich, 1983)
	Dynamic & Diffuse Light	* *	**Positively impacted circadian system functioning** (Figueiro, Brons, Plitnick et al., 2011; Beckett & Roden, 2009) **Increased visual comfort** (Elyezadi, 2012; Kim & Kim, 2007)		
	Connection with Natural Systems				**Enhanced positive health responses; Shifted perception of environment** (Kellert et al., 2008)
NATURAL ANALOGUES	Biomorphic Forms & Patterns	*			**Observed view preference** (Vessel, 2012; Joye, 2007)
	Material Connection with Nature			**Decreased diastolic blood pressure** (Tsunetsugu, Miyazaki & Sato, 2007) **Improved creative performance** (Lichtenfeld et al., 2012)	**Improved comfort** (Tsunetsugu, Miyazaki & Sato 2007)
	Complexity & Order	* *	**Positively impacted perceptual and physiological stress responses** (Salingaros, 2012; Joye, 2007; Taylor, 2006; S. Kaplan, 1988)		**Observed view preference** (Salingaros, 2012; Hägerhäll, Laike, Taylor et al., 2008; Hägerhäll, Purcella, & Taylor, 2004; Taylor, 2006)
NATURE OF THE SPACE	Prospect	* * *	**Reduced stress** (Grahn & Stigsdotter, 2010)	**Reduced boredom, irritation, fatigue** (Clearwater & Coss, 1991)	**Improved comfort and perceived safety** (Herzog & Bryce, 2007; Wang & Taylor, 2006; Petherick, 2000)
	Refuge	* * *		**Improved concentration, attention and perception of safety** (Grahn & Stigsdotter, 2010; Wang & Taylor, 2006; Wang & Taylor, 2006; Petherick, 2000; Ulrich et al., 1993)	
	Mystery	* *			**Induced strong pleasure response** (Biederman, 2011; Salimpoor, Benovoy, Larcher et al., 2011; Ikemi, 2005; Blood & Zatorre, 2001)
	Risk/Peril	*			**Resulted in strong dopamine or pleasure responses** (Kohno et al., 2013; Wang & Tsien, 2011; Zald et al., 2008)

14 Patterns of Biophilic Design (Terrapin Bright Green, 2014)

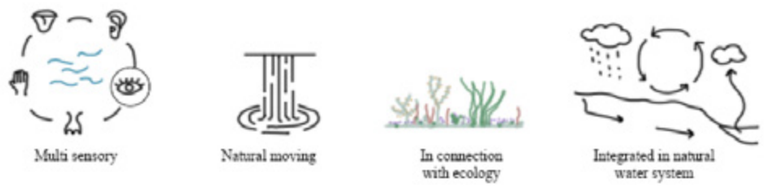
PATTERN STRUCTURE

Example: Presence of Water pattern

STRESS RELIEF INFLUENCE

Enhancing the place experience by using the multisensory properties of water

DESIGN GOAL



DESIGN DIAGRAM

It's essential to focus on natural systems and flowing clean water which focus on multiple senses

PATTERN CONCLUSION

14 PATTERNS		*	STRESS REDUCTION
NATURE IN THE SPACE	**Visual Connection with Nature**	* * *	**Lowered blood pressure and heart rate** (Brown, Barton & Gladwell, 2013; van den Berg, Hartig, & Staats, 2007; Tsunetsugu & Miyazaki, 2005)
	Non-Visual Connection with Nature	* *	**Reduced systolic blood pressure and stress hormones** (Park, Tsunetsugu, Kasetani et al., 2009; Hartig, Evans, Jamner et al., 2003; Orsega-Smith, Mowen, Payne et al., 2004; Ulrich, Simons, Losito et al., 1991)
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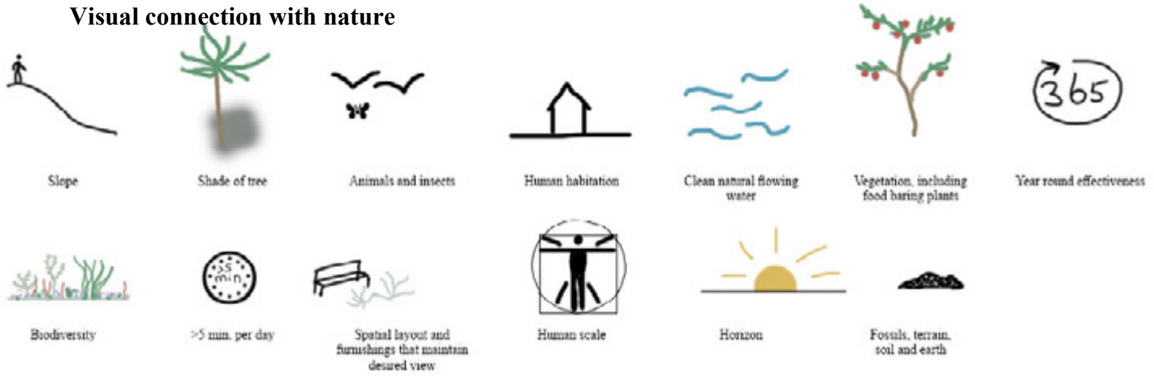
14 Patterns of Biophilic Design (Terrapin Bright Green, 2014)

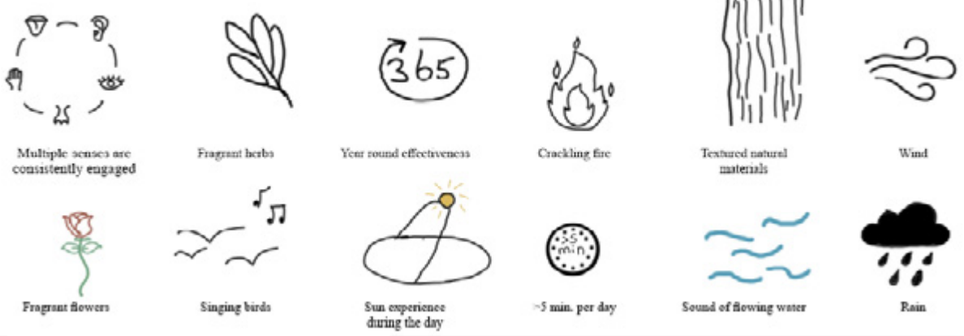
ANALYSIS OF PATTERNS

Visual connection with nature



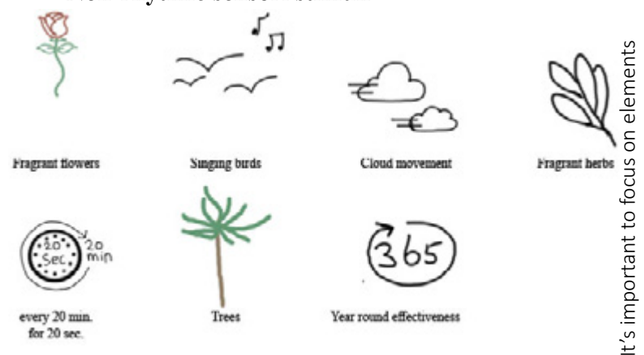
The design goal can be achieved by **high quality view of natural elements,** living systems and natural processes. In addition, increased visibility of **biodiversity** is very important.

Non-visual connection with nature



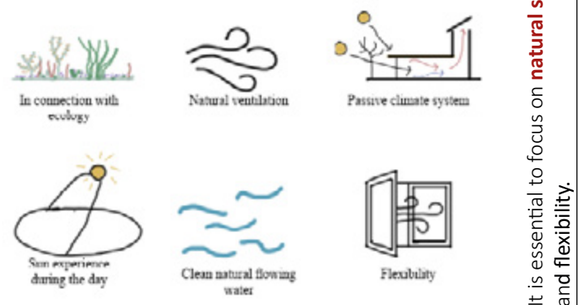
It's important to focus on elements which provide that **multiple senses** are consistently engaged together.

Non-rhytmic sensori stimuli



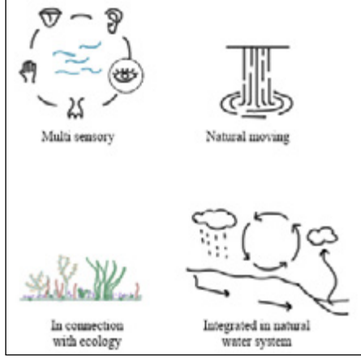
It's important to focus on elements which provide **momentary exposure** to unpredictable movement, peripheral vision, and periodic scents or sounds.

Thermal and airflow variability



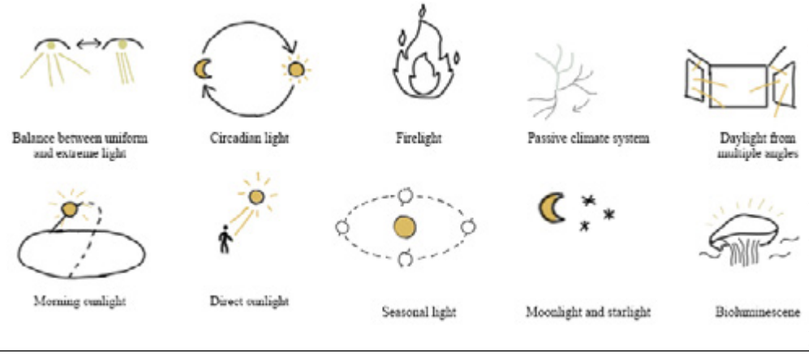
It is essential to focus on **natural systems** and flexibility.

Presence of water



It's essential to focus on **natural systems** and **flowing clean water** which focus on **multiple senses.**

Dynamic and diffuse light

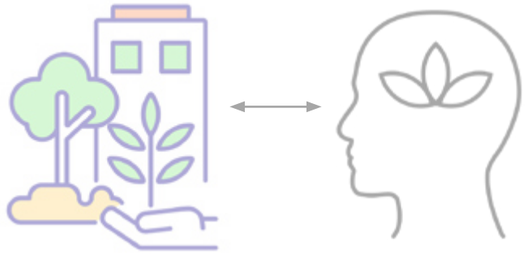


It's essential to focus on **natural light systems** and changing intensities of light and shadow over time.

RESEARCH OUTLINE

THEMATIC RESEARCH QUESTION:

How to use the biophilic design category nature in the space to increase stress relief as an architect?



BIOPHILIC DESIGN AND STRESS RELIEF

SPATIAL IMPACT

A NATURE IN THE SPACE DESIGN GUIDE FOR STRESS RELIEF THROUGH BIOPHILIC DESIGN

MASJA RIETVELD

Faculty of Architecture & the Built Environment, Delft University of Technology
Julianalaan 134, 2628BL Delft
m.w.rietveld@student.tudelft.nl

ABSTRACT

People are becoming disconnected from nature, mainly due to the urban environment, resulting in high stress levels in modern society. Biophilia, our innate attraction to the patterns and processes of nature, is used by biophilic designs to reduce stress. This research focuses on translating biophilic theories into stress-reducing design parameters through the biophilic category 'nature in the space'. Nature in the space involves the direct presence of nature in a space, including plant life, water, and animals, as well as natural elements like breezes, sounds, and scents. The goal is to develop a practical design guide that architects can use to integrate appropriate design patterns and parameters on a project-by-project basis. The six biophilic stress-relieving design patterns are visual and non-visual connection with nature, non-rhythmic sensory stimuli, thermal and airflow variability, presence of water, and dynamic and diffuse light. Designing for multiple sensory experiences through natural and living processes is crucial. This can be achieved by using the following design parameters: high-quality view of natural elements, biodiversity, clean flowing water, responsive variations, and day and seasonal shifts.

KEYWORDS

Stress Relief, Design Guide, Biophilic Design, Nature in the Space, Natural By-Between Place, Biophilia, Nature

1. INTRODUCTION

"We humans are programmed as we experienced the world years ago in nature, but over the years, we lost our balance. We started to feel separated from being a part of nature to being apart from nature." (Abrahamough & Hughes, 2020, p. 123).

Figure 1: The perceived evolutionary role of humans in the modern world and their environment to the city (Kellert, 2018)

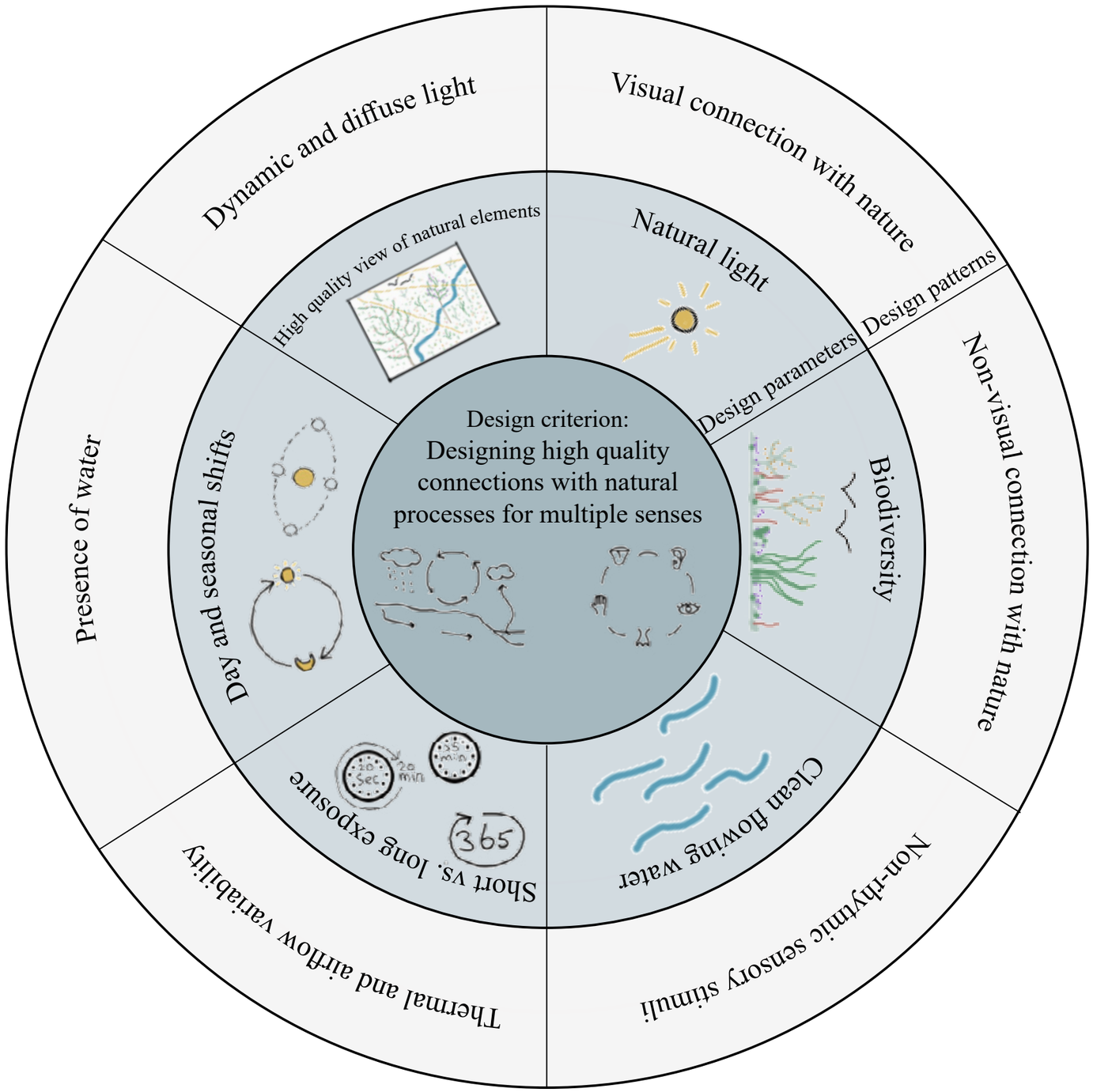
Modern society increasingly sees nature as a relic of the past, a recreational and aesthetic amenity rather than an essential part of life. People are becoming more disconnected from nature due to various factors, mainly because they spend most of their time in urban environments. This disconnection between humans and nature results from a society prioritising technology and indoor activities while neglecting the importance of the natural world. Figure 1 humorously illustrates the perceived evolutionary role of humans in the modern world and their assessment to the city (Kellert, 2018). Urban dwellers' relationship with nature is complex. Raised in urban environments, they are susceptible to environmental stressors and stress but also inclined to seek out nature. This leads to a stimulus-seeking strategy that compromises attention and self-control, resulting in a stressful and busy life (Jeve et al., 2018). According to de Graaf et al. (2018), approximately one in five people in the Netherlands experience either a depressive or anxiety

TRANSLATION TO DESIGN GUIDE FOR ARCHITECTS:

A Nature in the Space Design Guide for Stress Relief through Biophilic Design

TOOL

DESIGN GUIDE CONCLUSION



TRANSLATION FROM RESEARCH TO DESIGN

A NATURE IN THE SPACE DESIGN GUIDE FOR STRESS RELIEF THROUGH BIOPHILIC DESIGN

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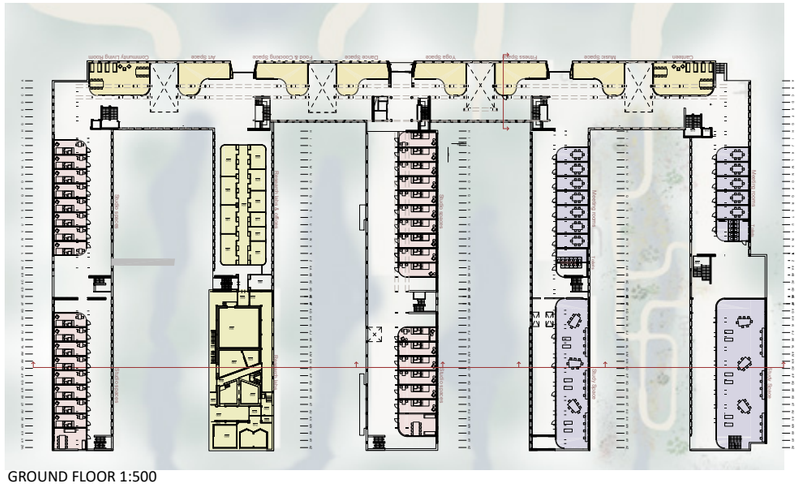
DESIGN GUIDE
A Nature in the Space Design Guide for Stress Relief through Biophilic Design



GROUND FLOOR 1:500

PROTOTYPE
The Natural in-between Place for Stress Relief through Biophilic Design

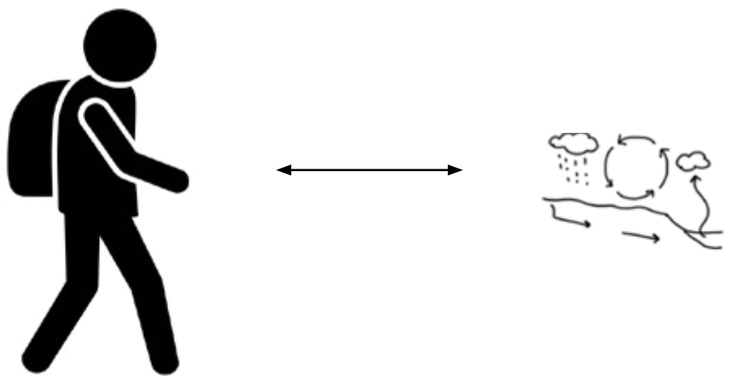
STRESS!

AMBITION THEMES

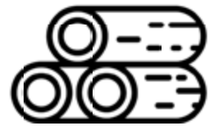
PERCEPTION

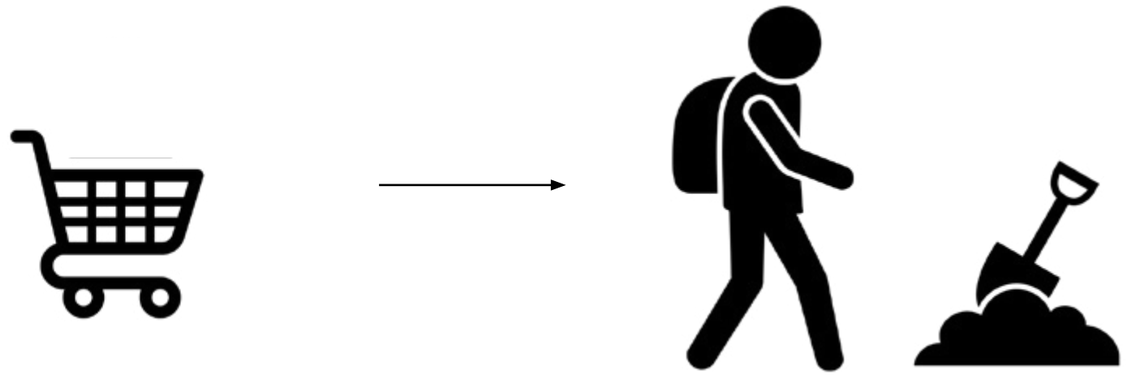
Stress relief through nurturing our inniate attraction to the pattern and processes of nature, making us aware of nature

AMBITION THEMES
SUSTAINABILITY



AMBITION THEMES
MATERIALS





STRESS!

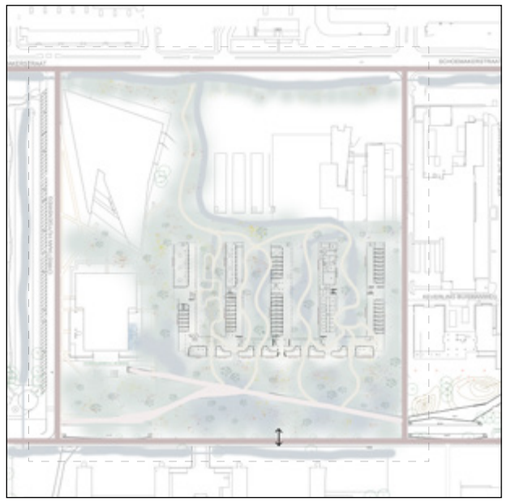
AMBITION THEMES
CLIMATE DESIGN

LEARNING TO LIVE WITH AND MAKE
THE MOST OF THE WEATHER

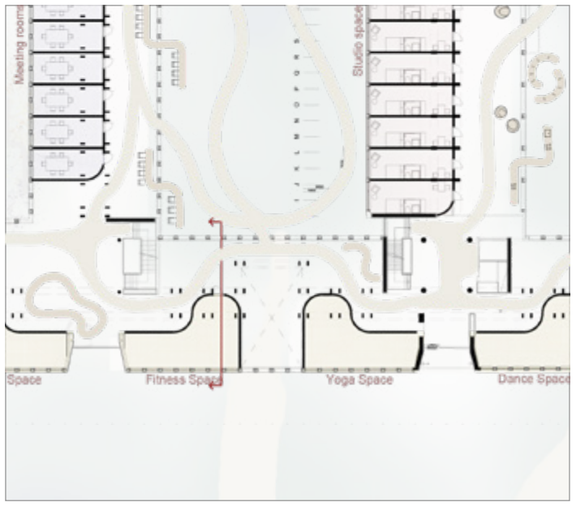
DESIGN OUTLINE

OVERALL DESIGN QUESTION:

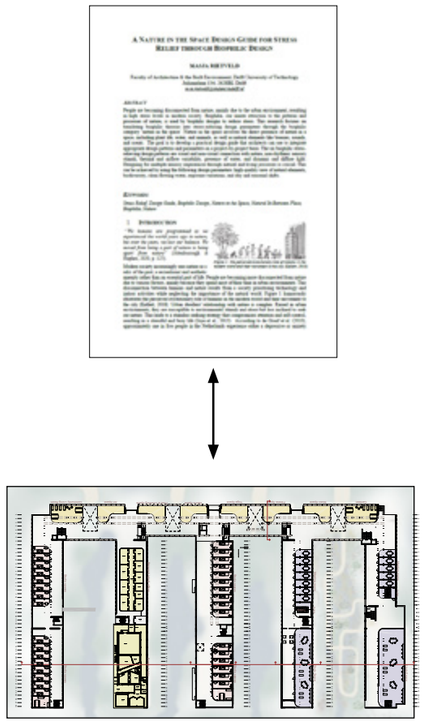
How to make a renovation design for the TNW building by incorporating natural in-between places for stress relief?



LANDSCAPE - TU DELFT CAMPUS VISION



RETHINKING OF THE WAY WE LIVE BY EXPLORING BUILDING - LANDSCAPE BOUNDARIES



BUILDING INTERVENTIONS IN SECTION

DESIGN OUTLINE

OVERALL DESIGN QUESTION:

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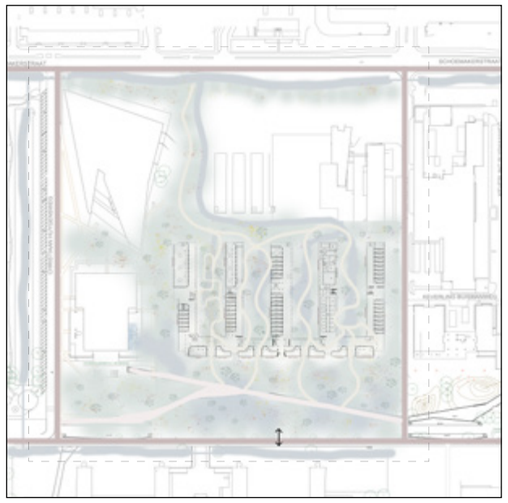

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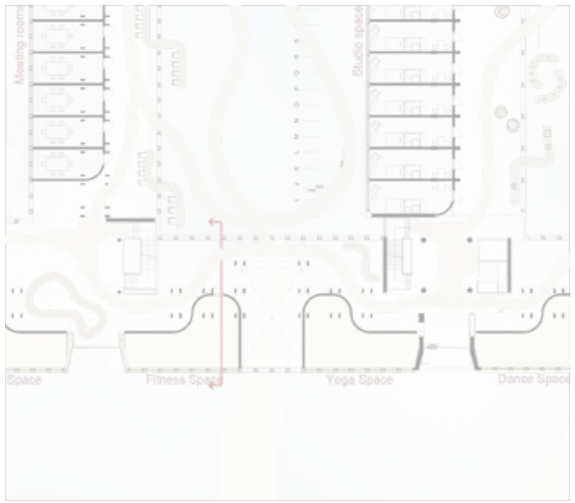

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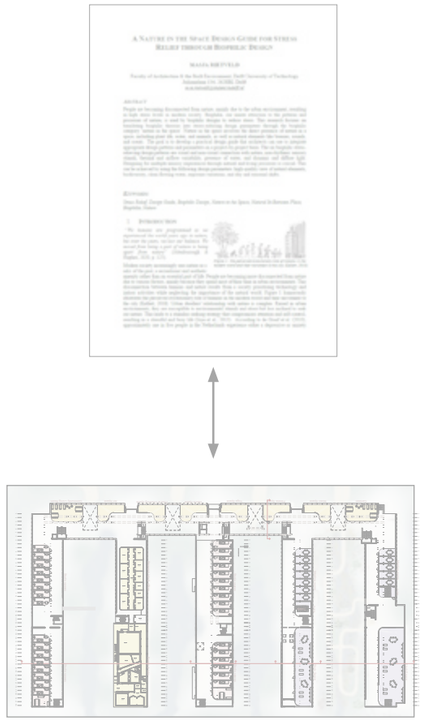

BUILDING INTERVENTIONS IN SECTION

DESIGN OUTLINE

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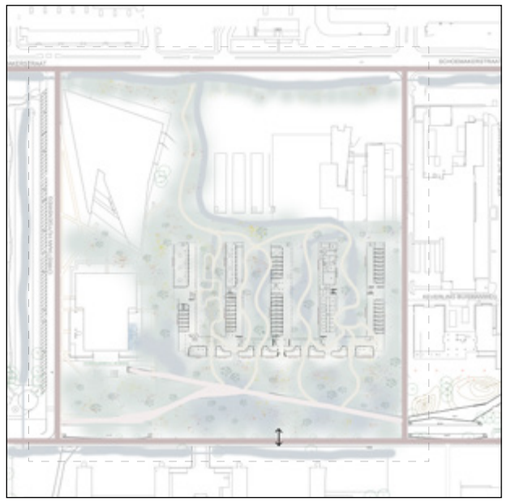

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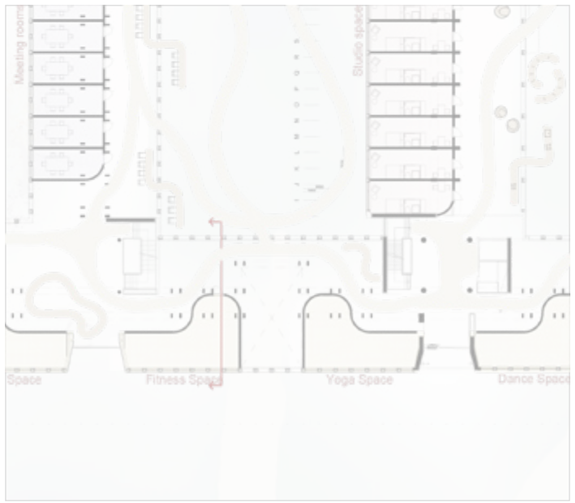
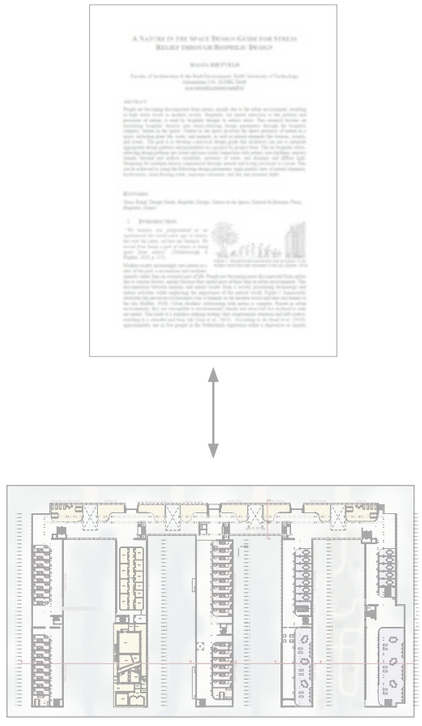


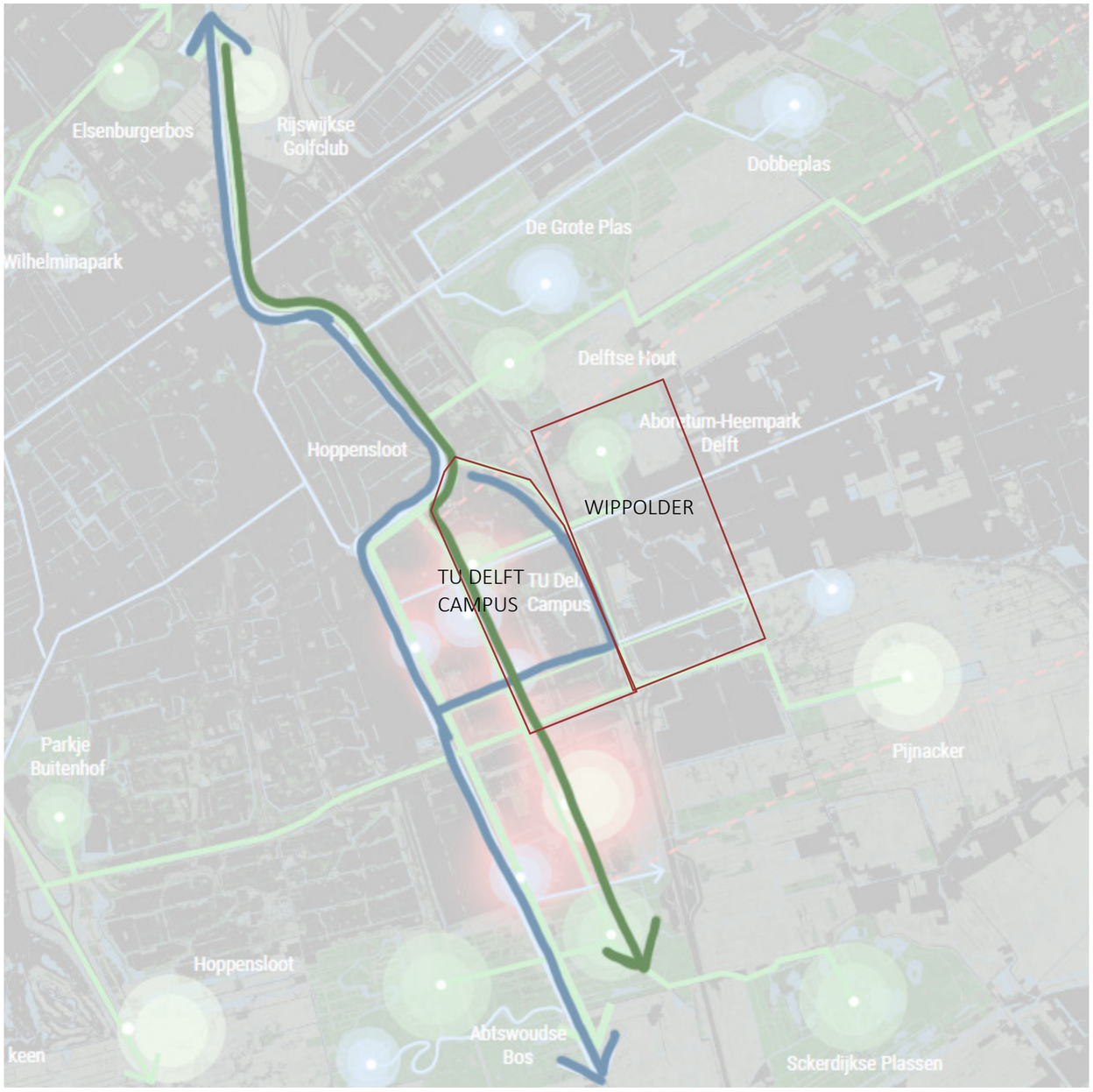
RETHINKING OF THE WAY WE LIVE BY EXPLORING BUILDING - LANDSCAPE BOUNDARIES



BUILDING INTERVENTIONS IN SECTION

DELFT SITUATION

CAMPUS AS GREEN & BLUE CONNECTORS

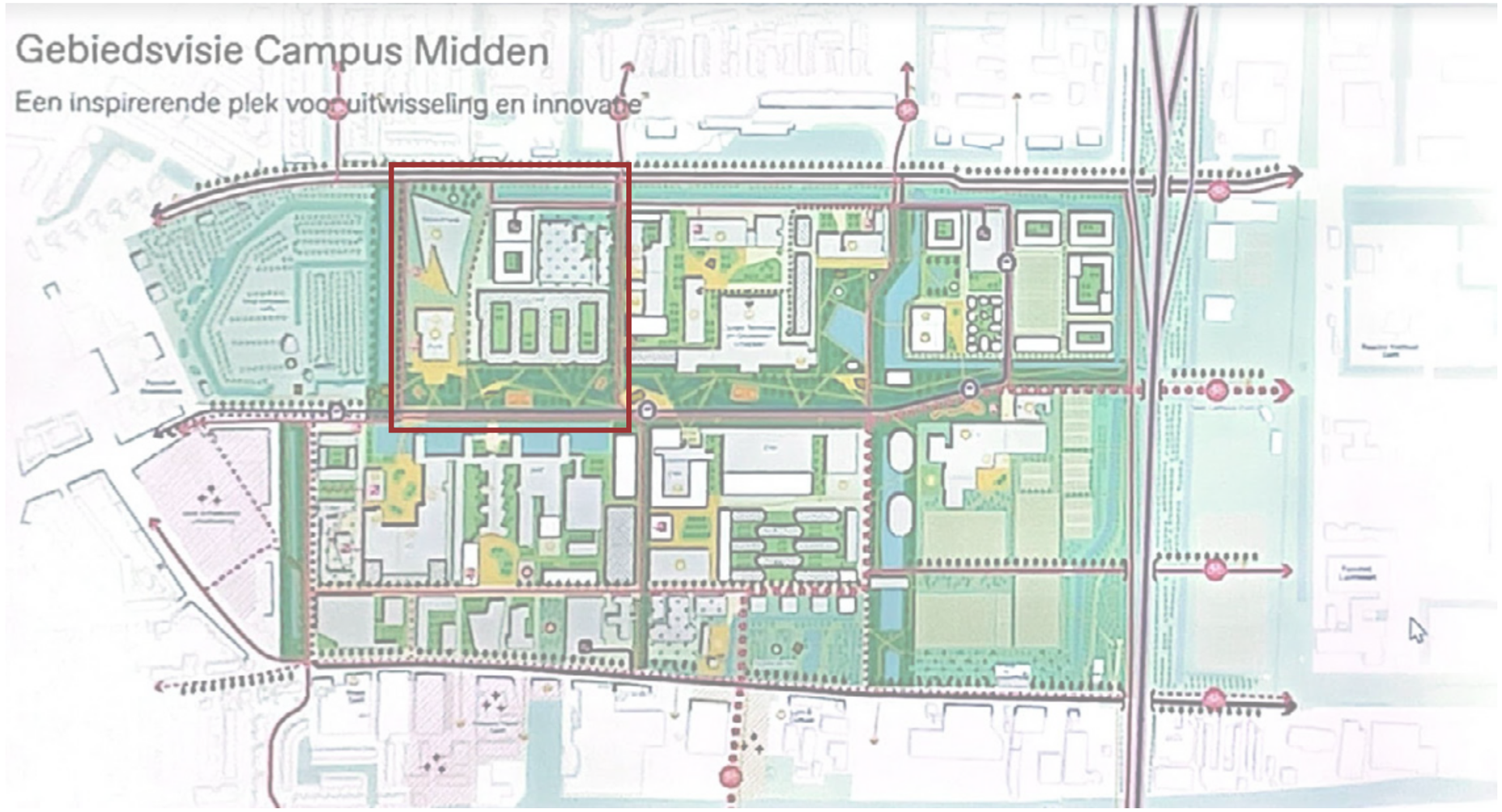


Liaw (2021)

N

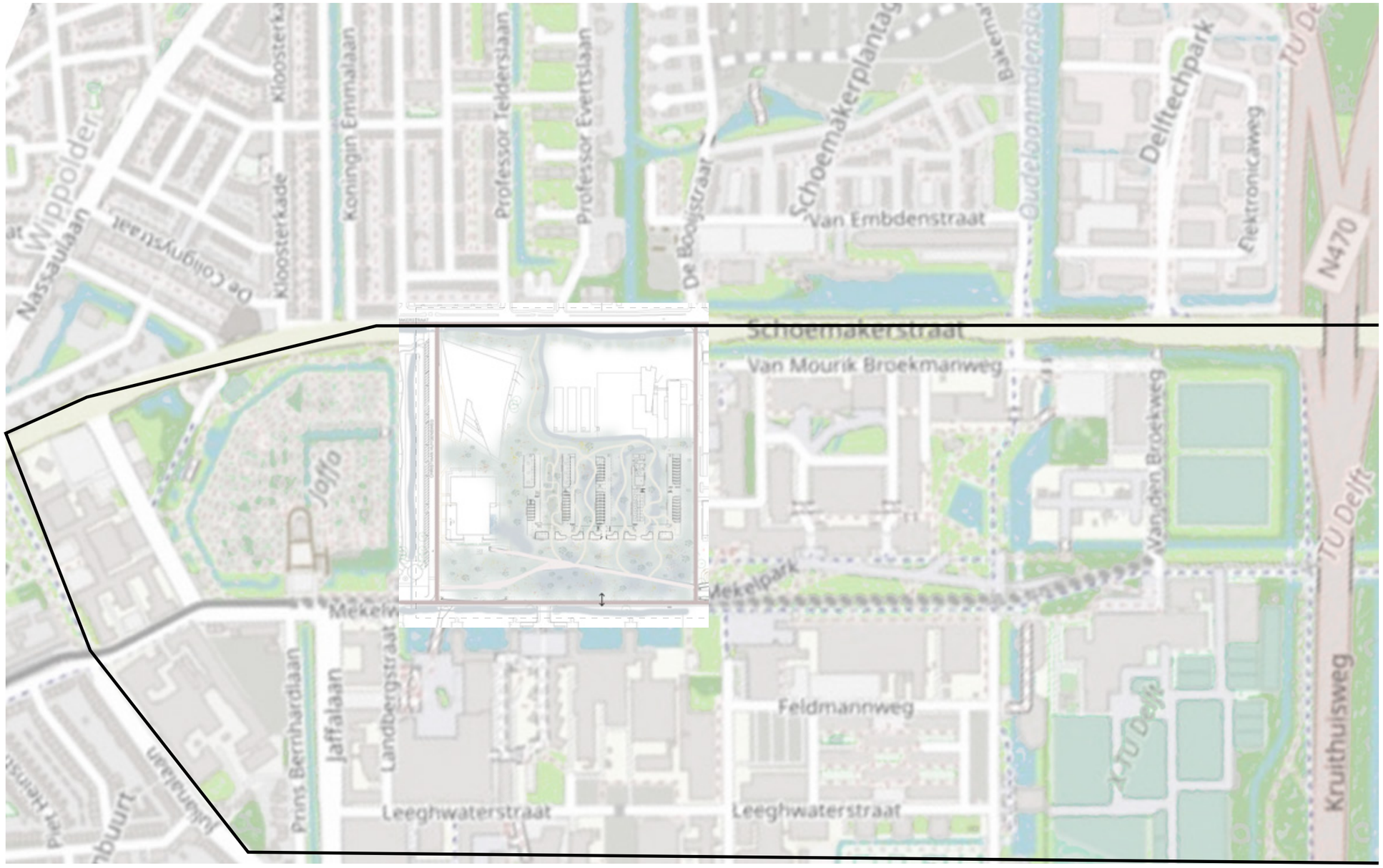
CAMPUS SITUATION

TU DELFT VISION



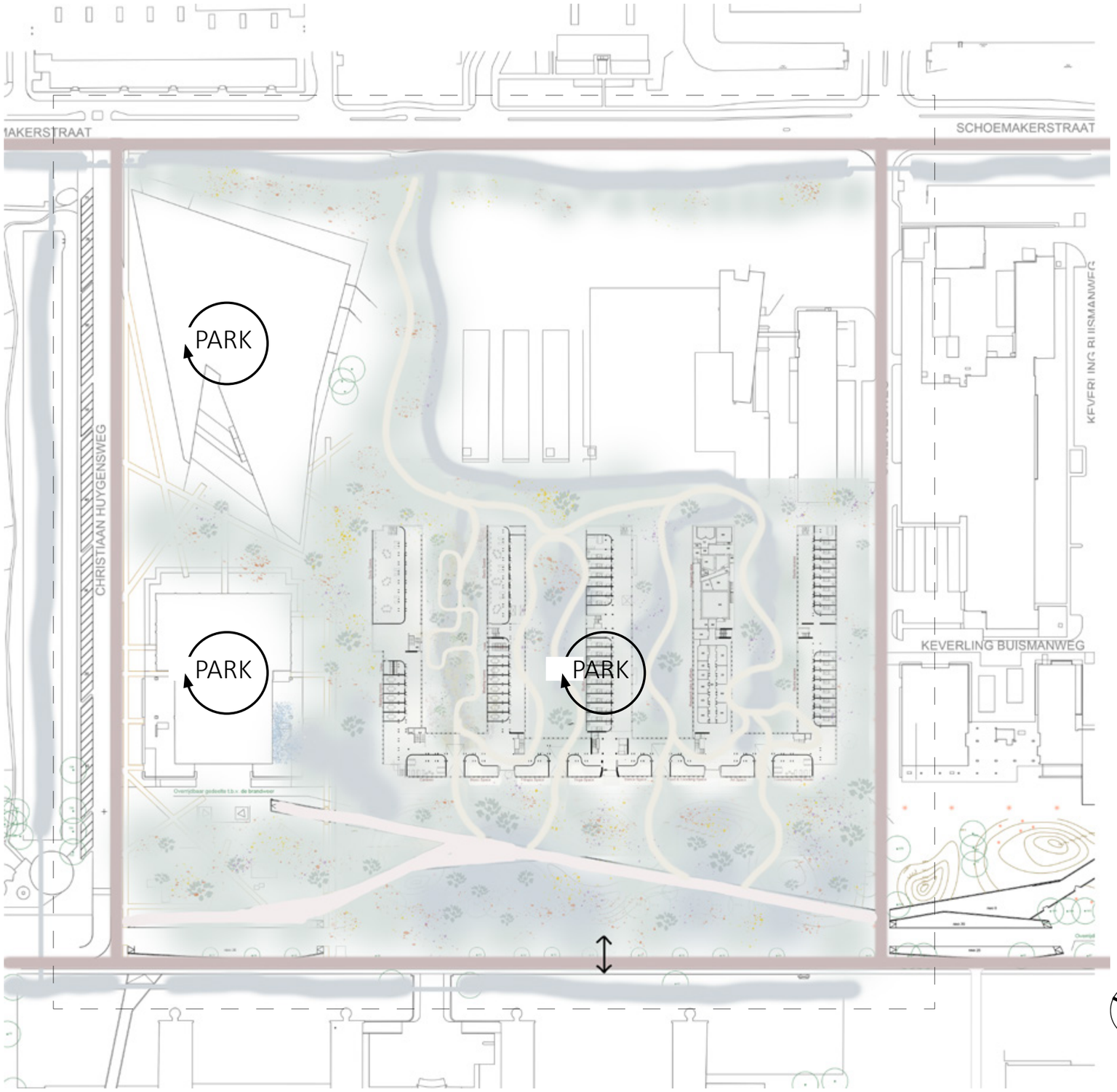
CAMPUS SITUATION

BLOCK LEVEL: MAKING CONNECTIONS, STRENGTHEN MEKELPARK



BLOCK SITUATION

CAMPUS AS A LANDSCAPE, BUILDING AS A PARK



BLOCK SITUATION

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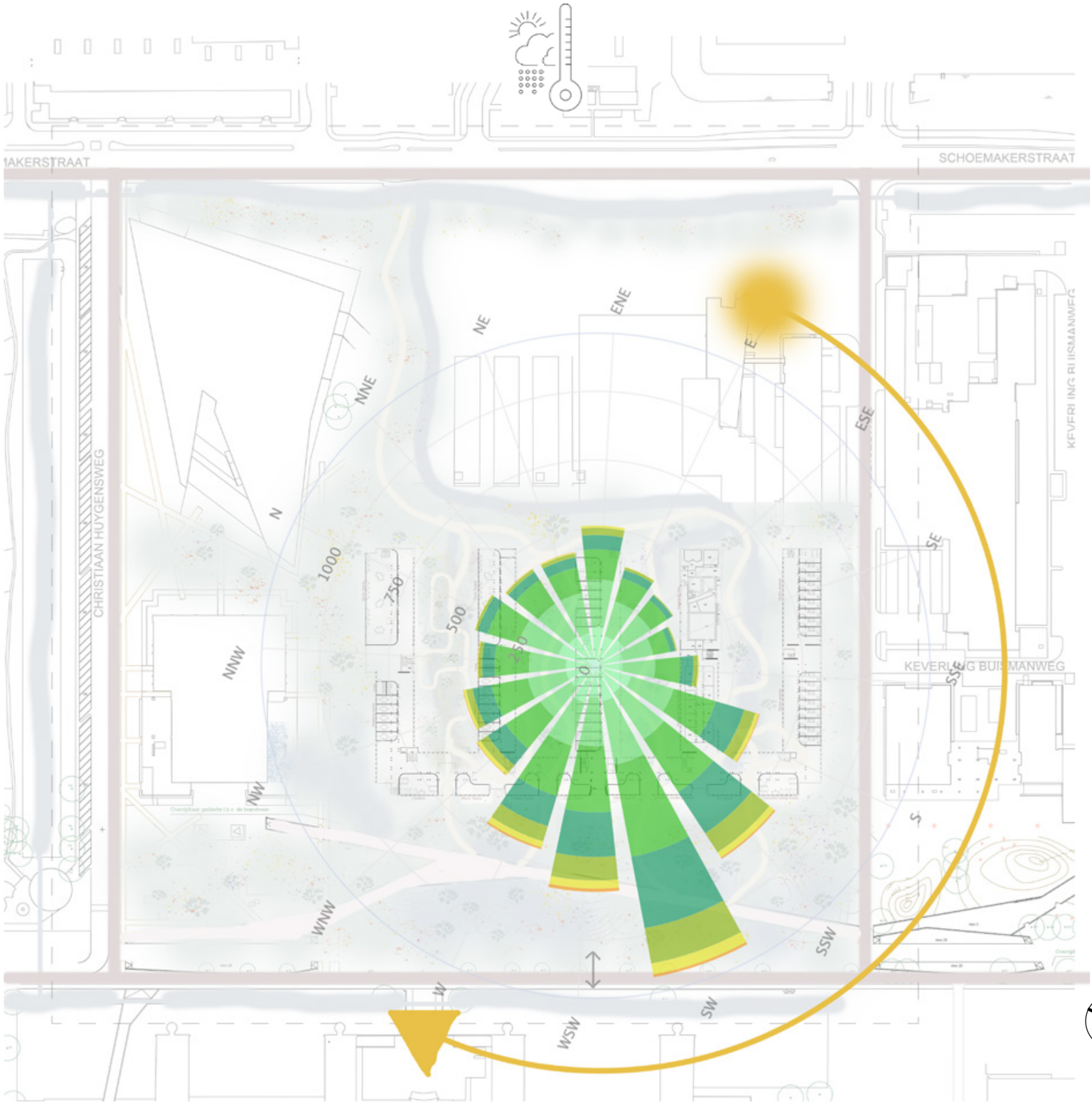

DESIGN OUTLINE

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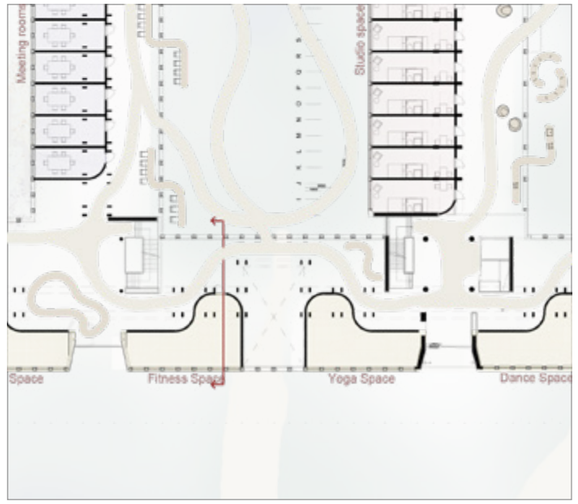
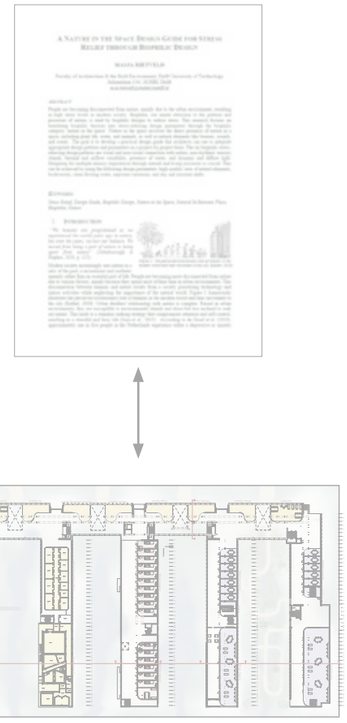
LANDSCAPE - TU DELFT CAMPUS VISION



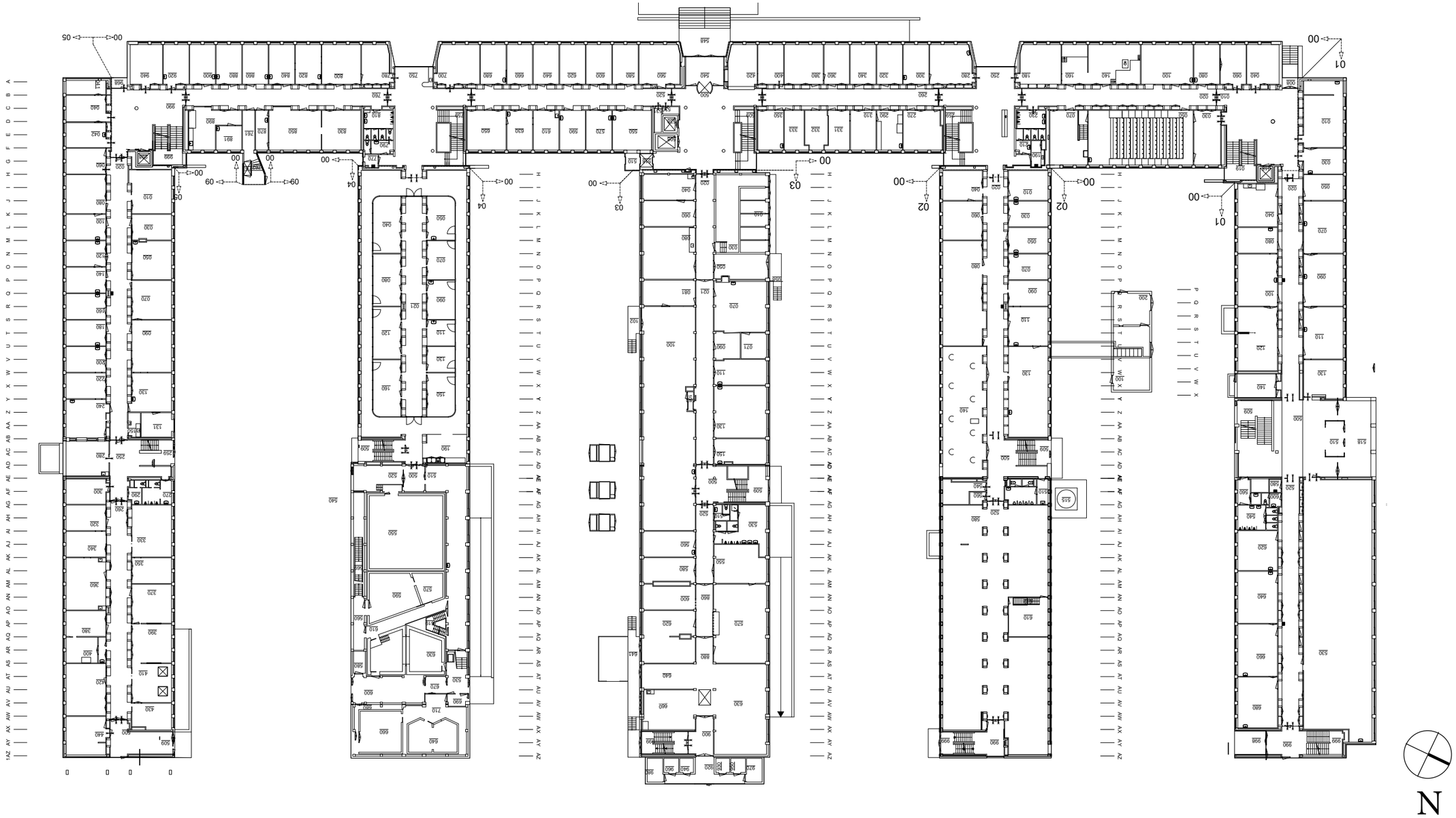
RETHINKING OF THE WAY WE LIVE BY EXPLORING BUILDING - LANDSCAPE BOUNDARIES



BUILDING INTERVENTIONS IN SECTION

EXISTING FLOORPLAN

NO CONNECTION WITH NATURE



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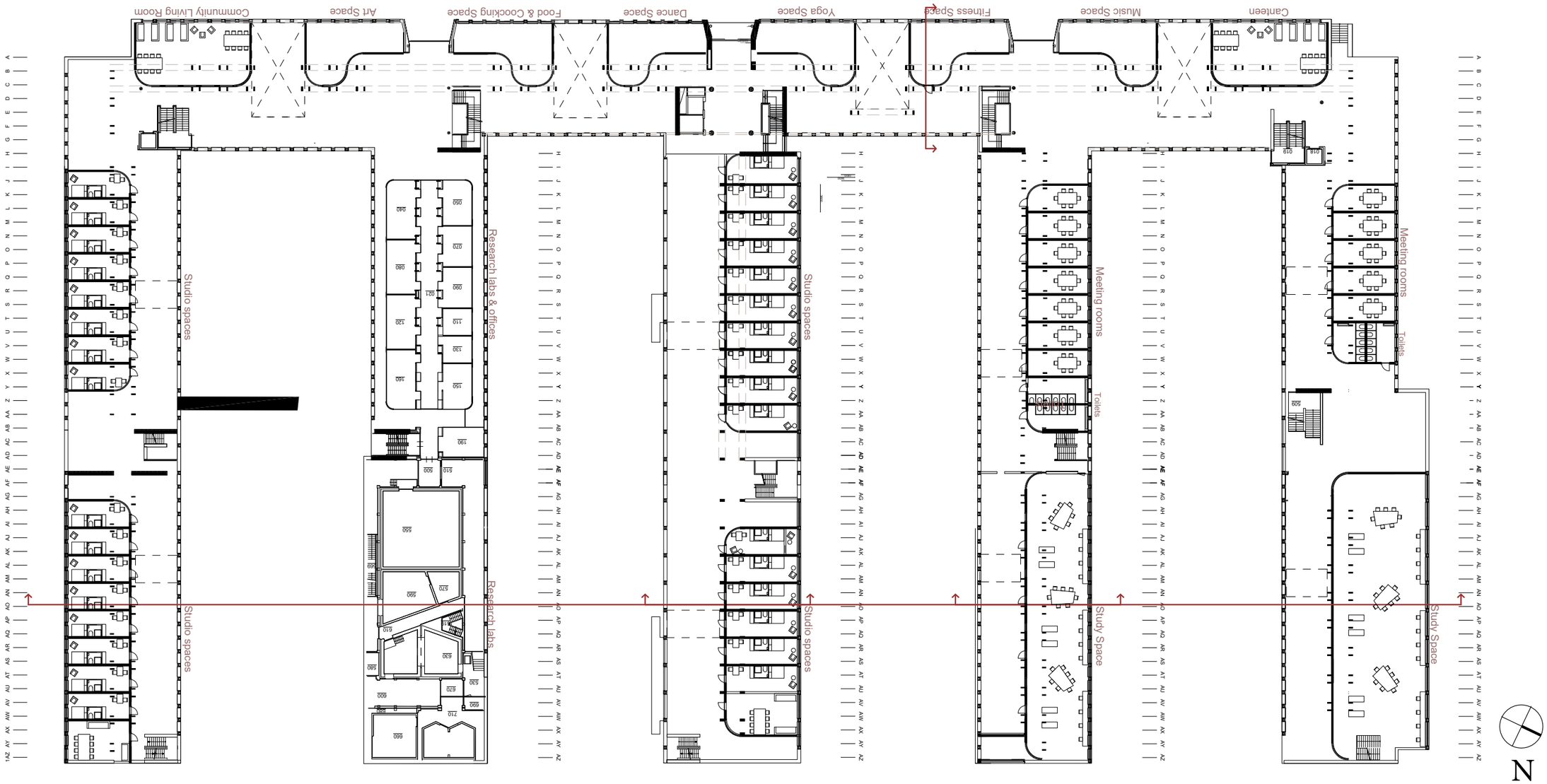
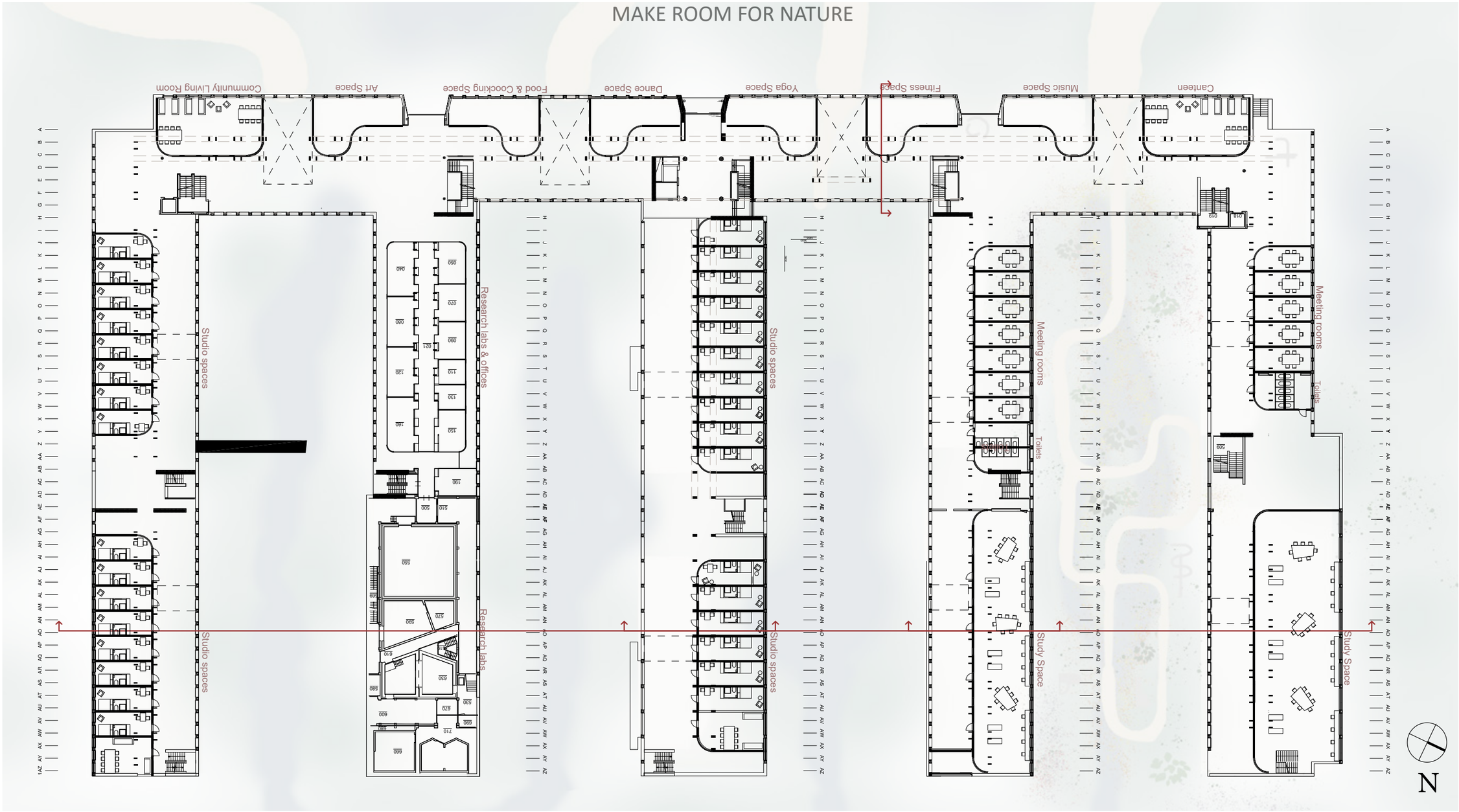
GROUND FLOOR IN SITUATION 1:500

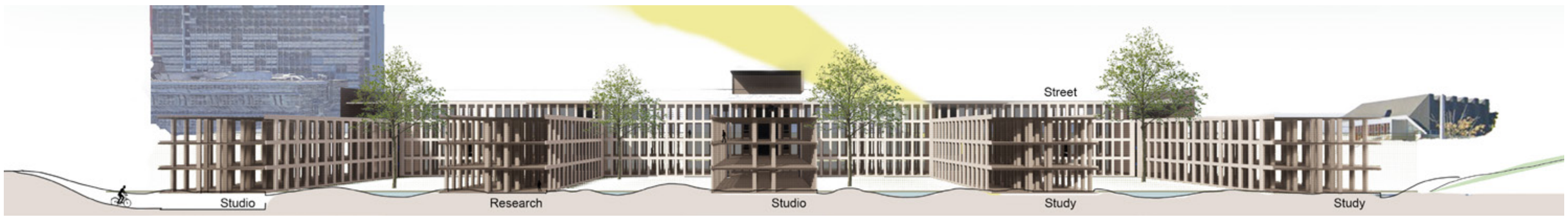
MAKE IT OPEN, APPRECIATE THE STRUCTURE



GROUND FLOOR IN SITUATION 1:500

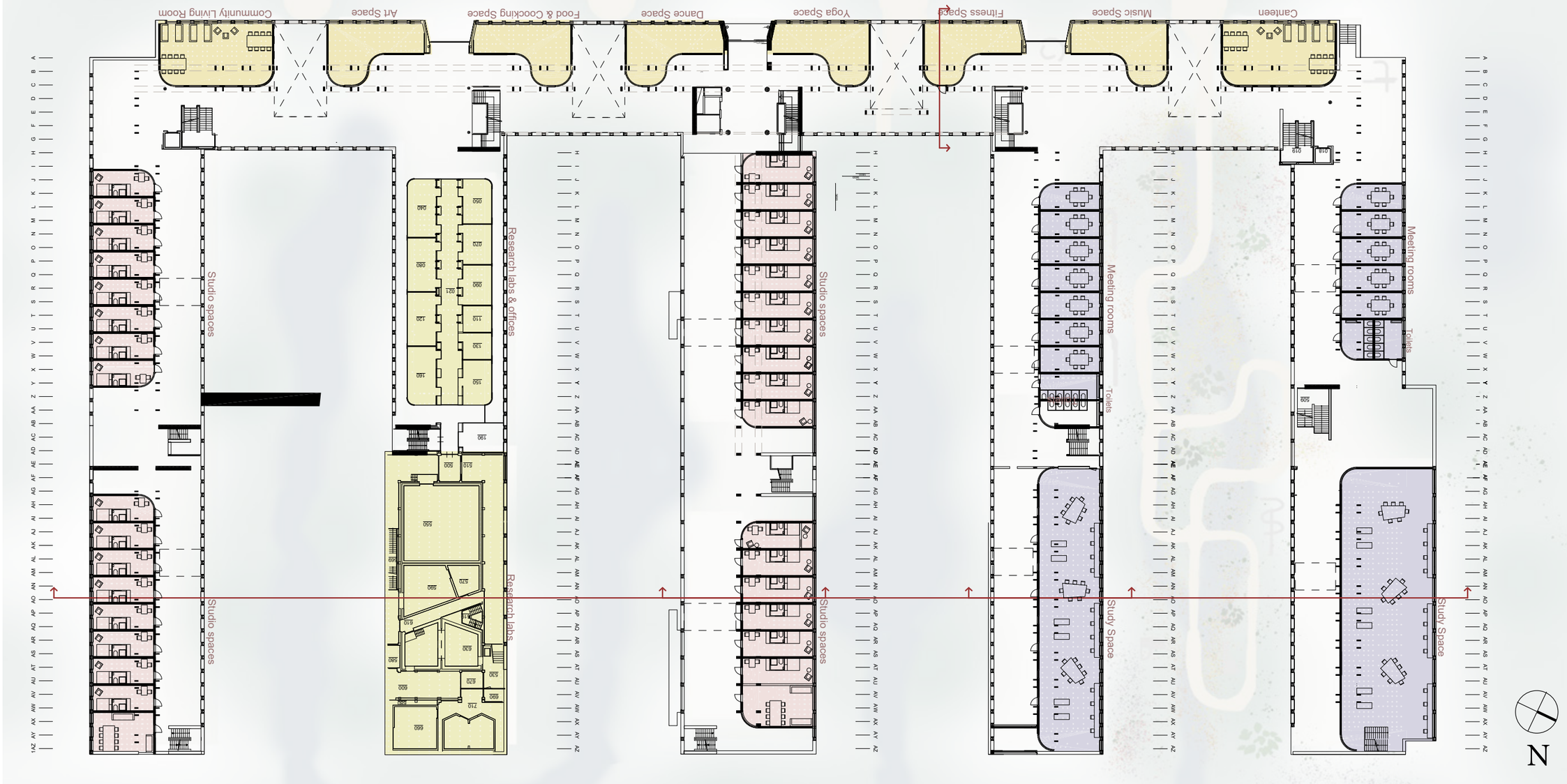
MAKE ROOM FOR NATURE

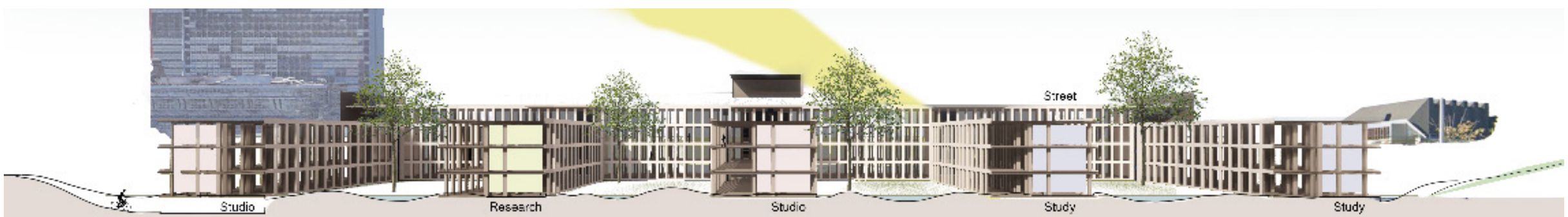




GROUND FLOOR IN SITUATION 1:500

CREATING SLOW BOUNDARIES THROUGH THE NATURAL IN-BETWEEN PLACE

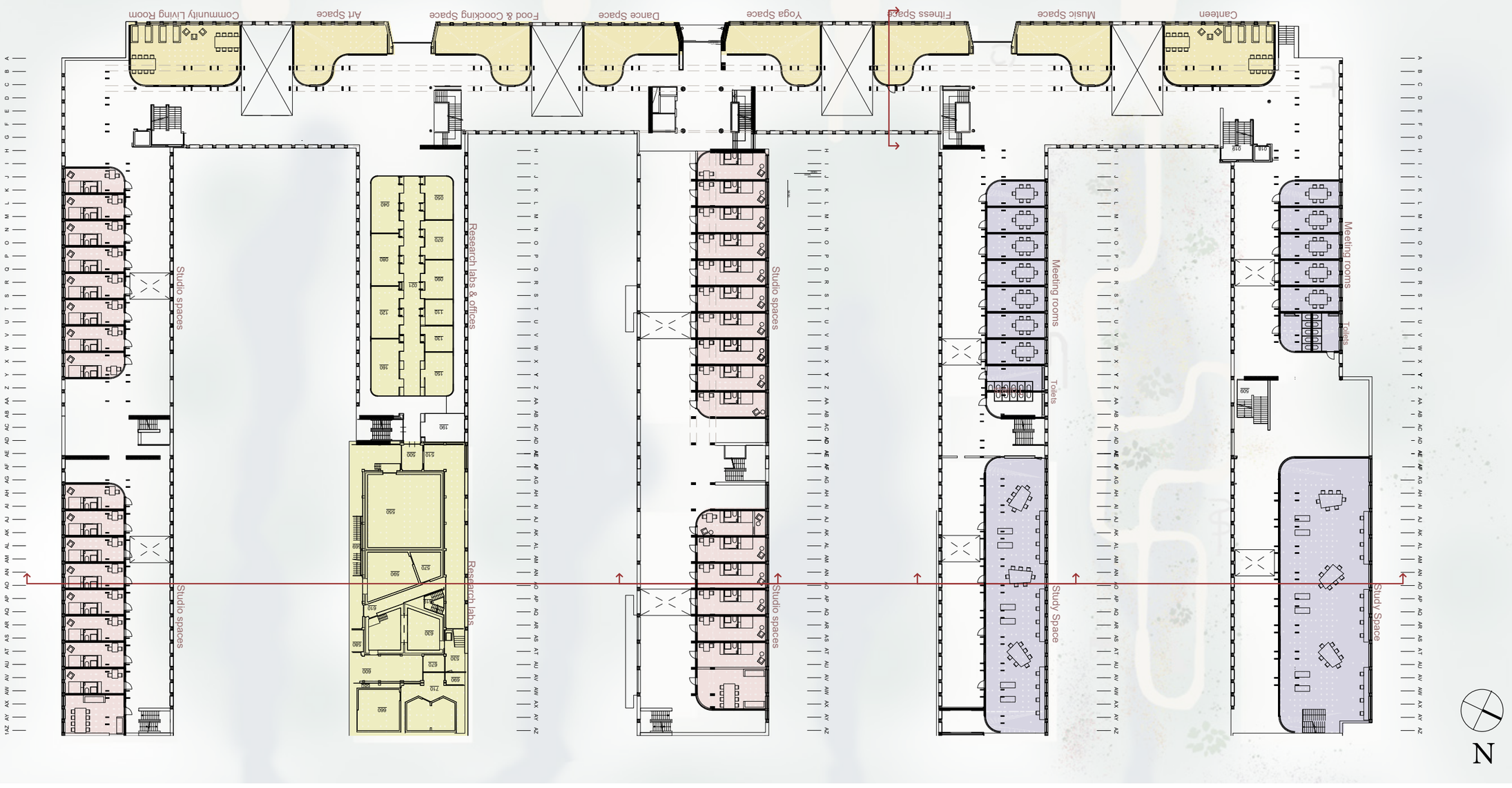




STREET RESEARCH STUDIO STUDY

GENERIC 1ST & 2ND FLOOR

THE FLOORPLAN IS A REPETITION, THE LANDSCAPE IS DIVERSE



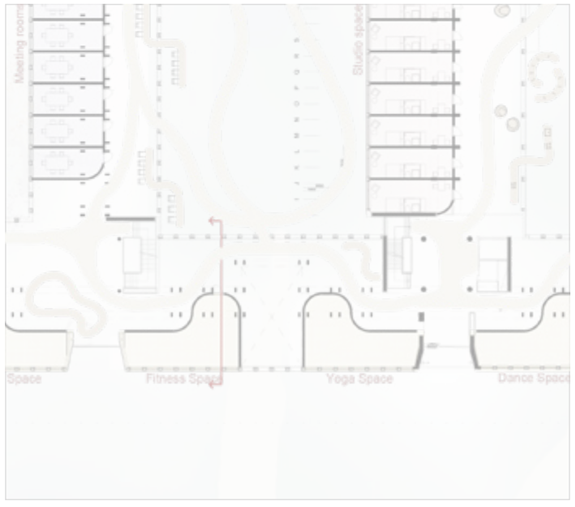
STREET RESEARCH STUDIO STUDY

DESIGN OUTLINE

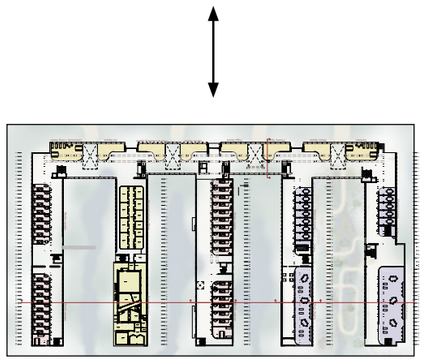
OVERALL DESIGN QUESTION:

How to make a renovation design for the TNW building by incorporating natural in-between places for stress relief?

LANDSCAPE - TU DELFT CAMPUS VISION

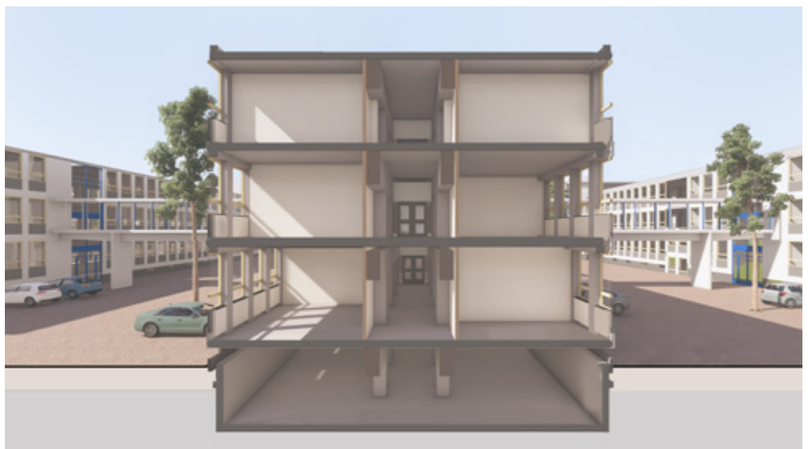


RETHINKING OF THE WAY WE LIVE BY EXPLORING BUILDING - LANDSCAPE BOUNDARIES

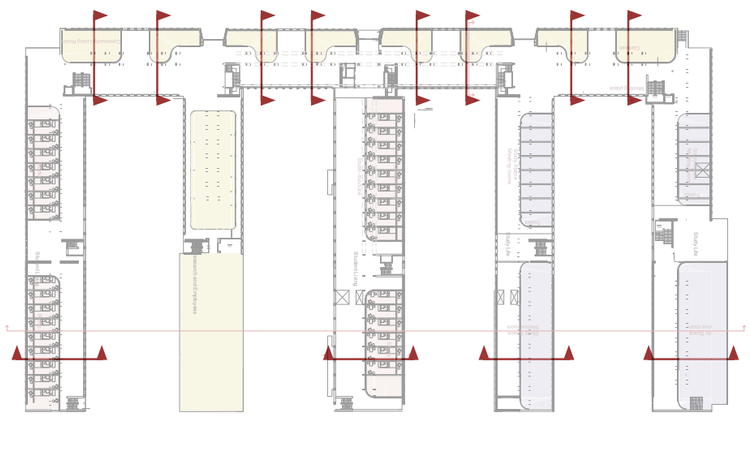


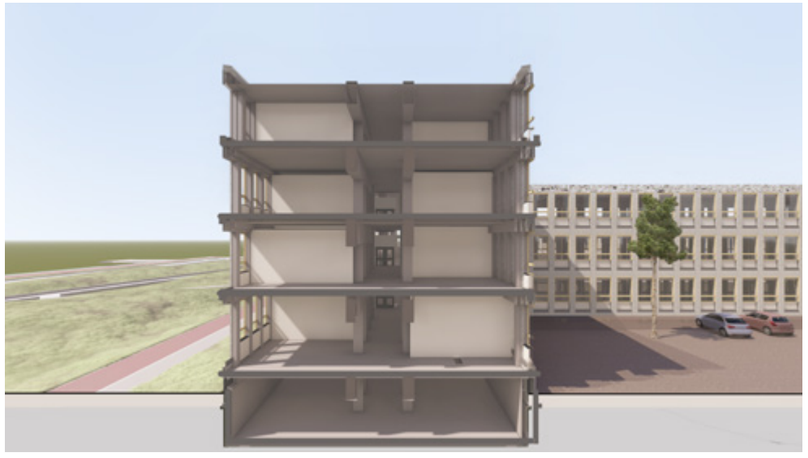
BUILDING INTERVENTIONS IN SECTION

INTERVENTIONS
IN SECTION FOR PERCEPTION

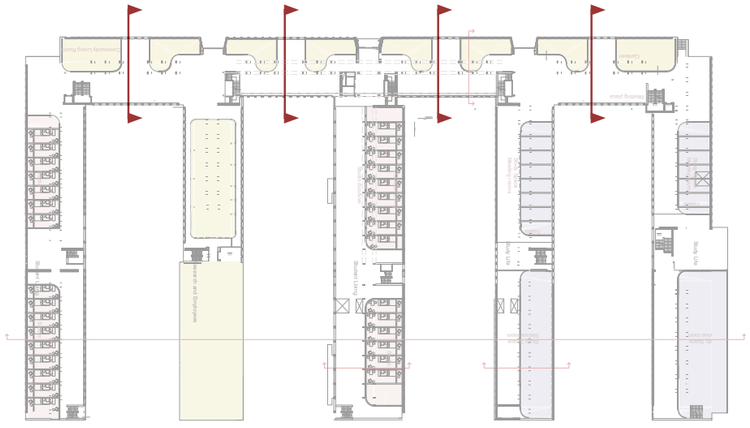


0. EXISTING- GENERIC SECTION



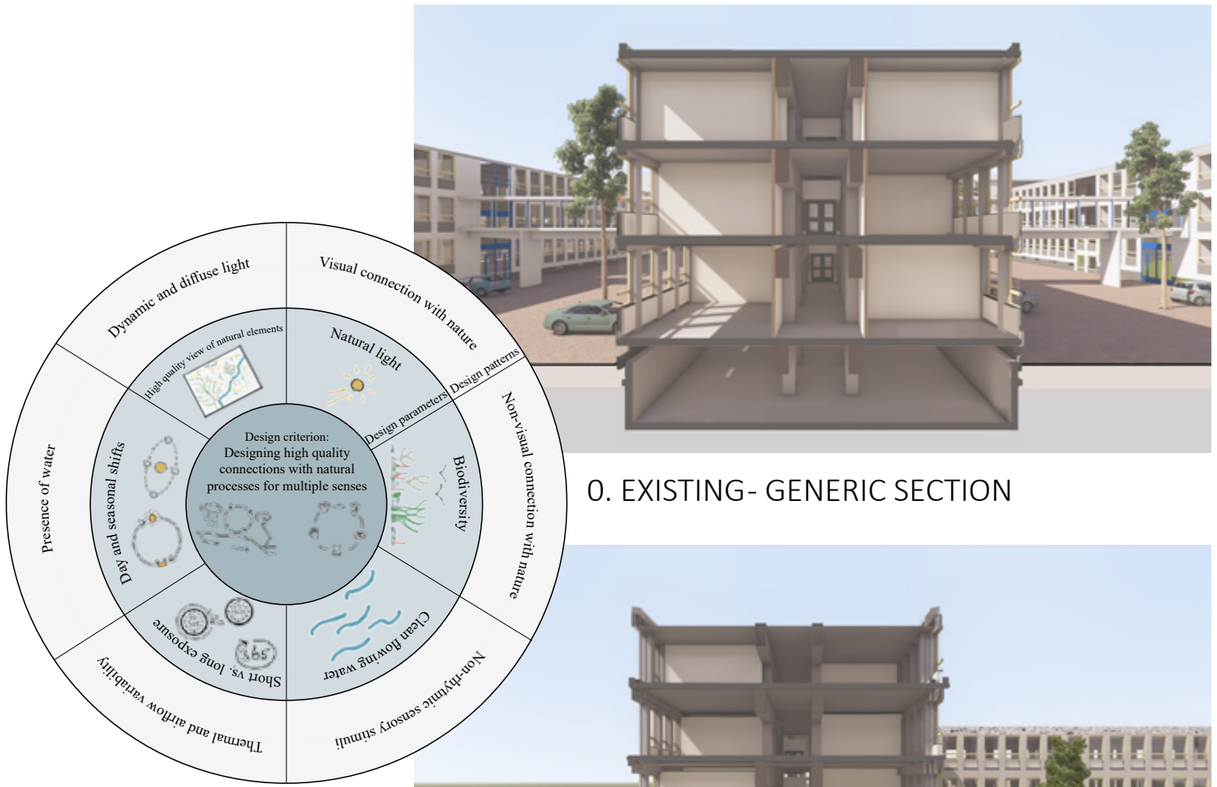


0. EXISTING- ENTRANCE SECTION

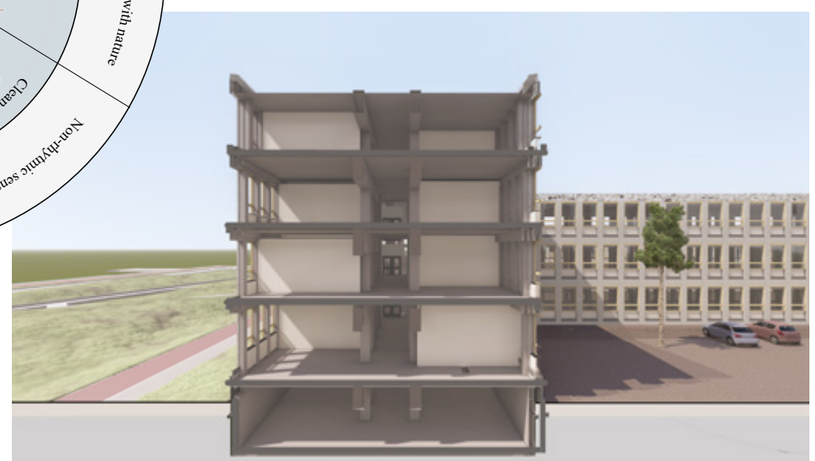


INTERVENTIONS

LANDSCAPE BROADENING, CONSTRUCTION IN DEPTH RESEARCH



0. EXISTING- GENERIC SECTION



0. EXISTING- ENTRANCE SECTION

0. EXISTING

1. OPEN STRUCTURE

2. LANDSCAPE

3. CLAY CLIMATIZED ZONES

4. ROUTING

5. USE

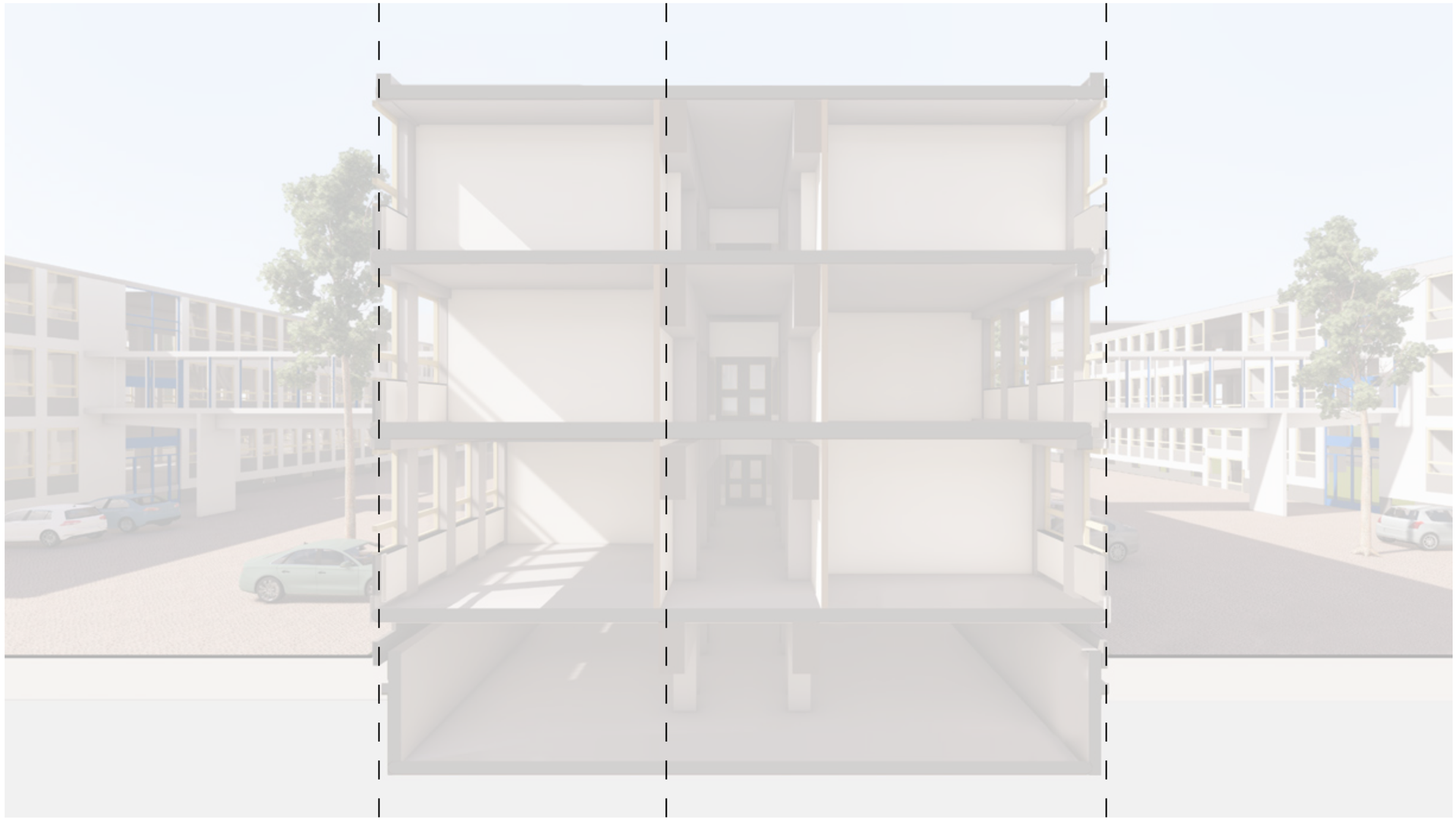
AMBITION THEMES

PERCEPTION

SUSTAINABILITY

MATERIALS

CLIMATE DESIGN



LANDSCAPE | NATURAL IN-BETWEEN PLACE | INSIDE | LANDSCAPE

INTERVENTIONS

0. EXISTING

1. OPEN STRUCTURE

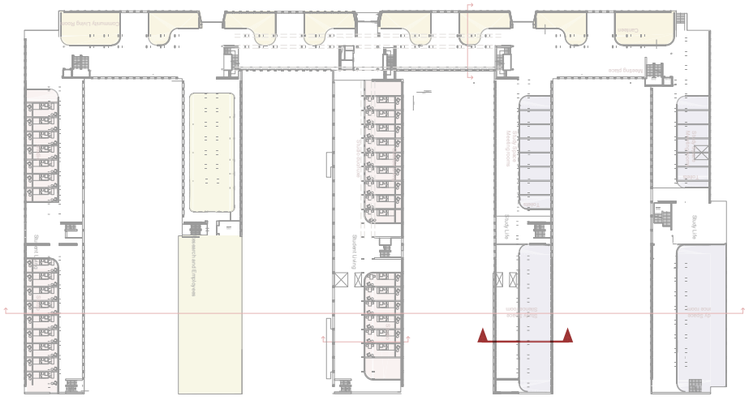
2. LANDSCAPE

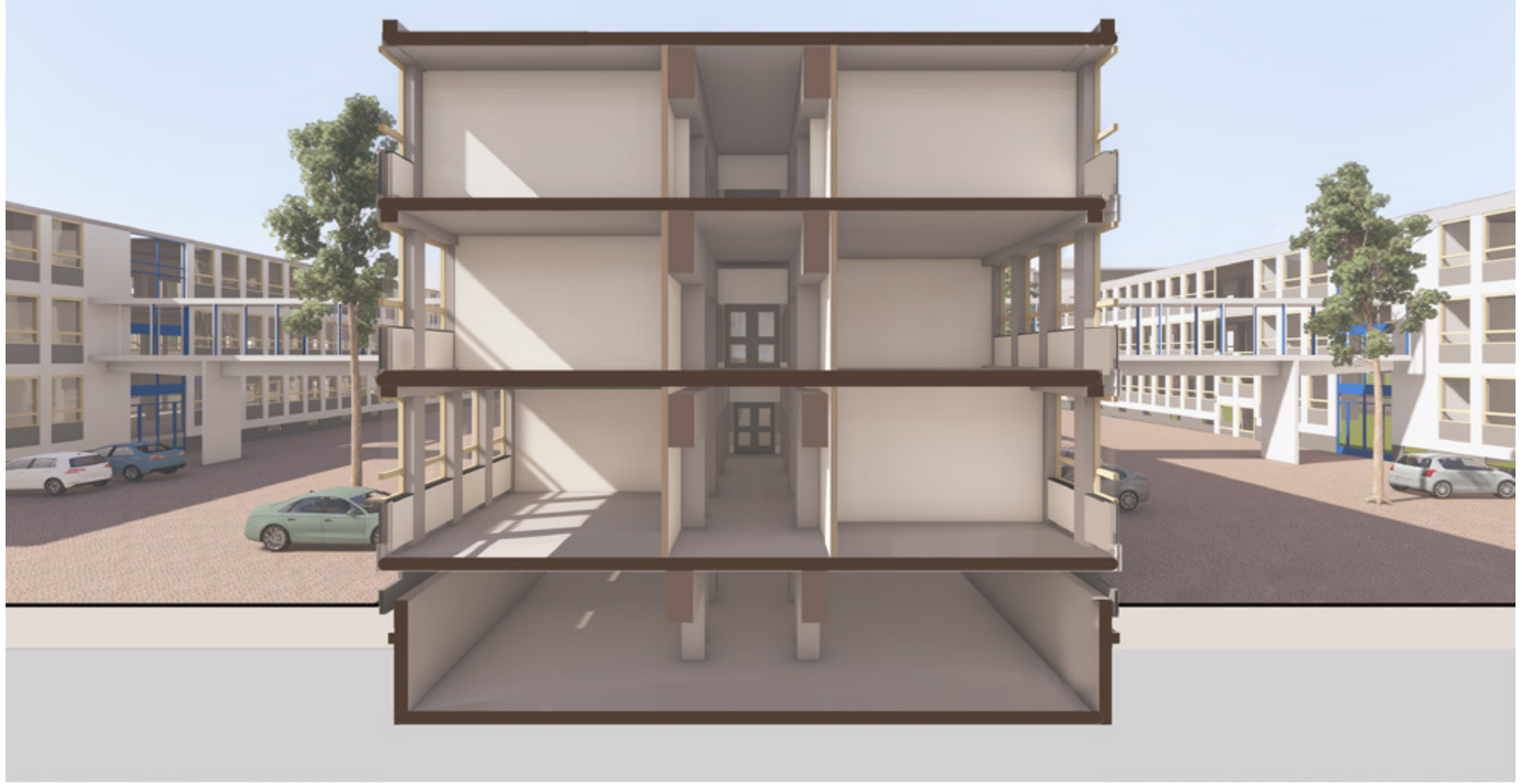
3. CLAY CLIMATIZED ZONES

4. THE EXPERIENCE OF ROUTING

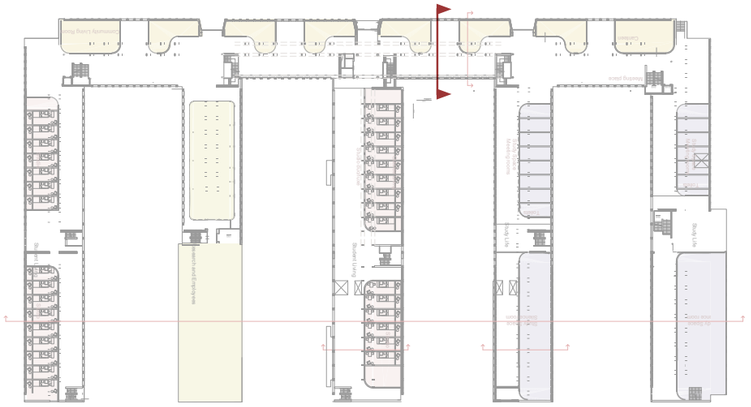
5. THE EXPERIENCE OF INTERIOR

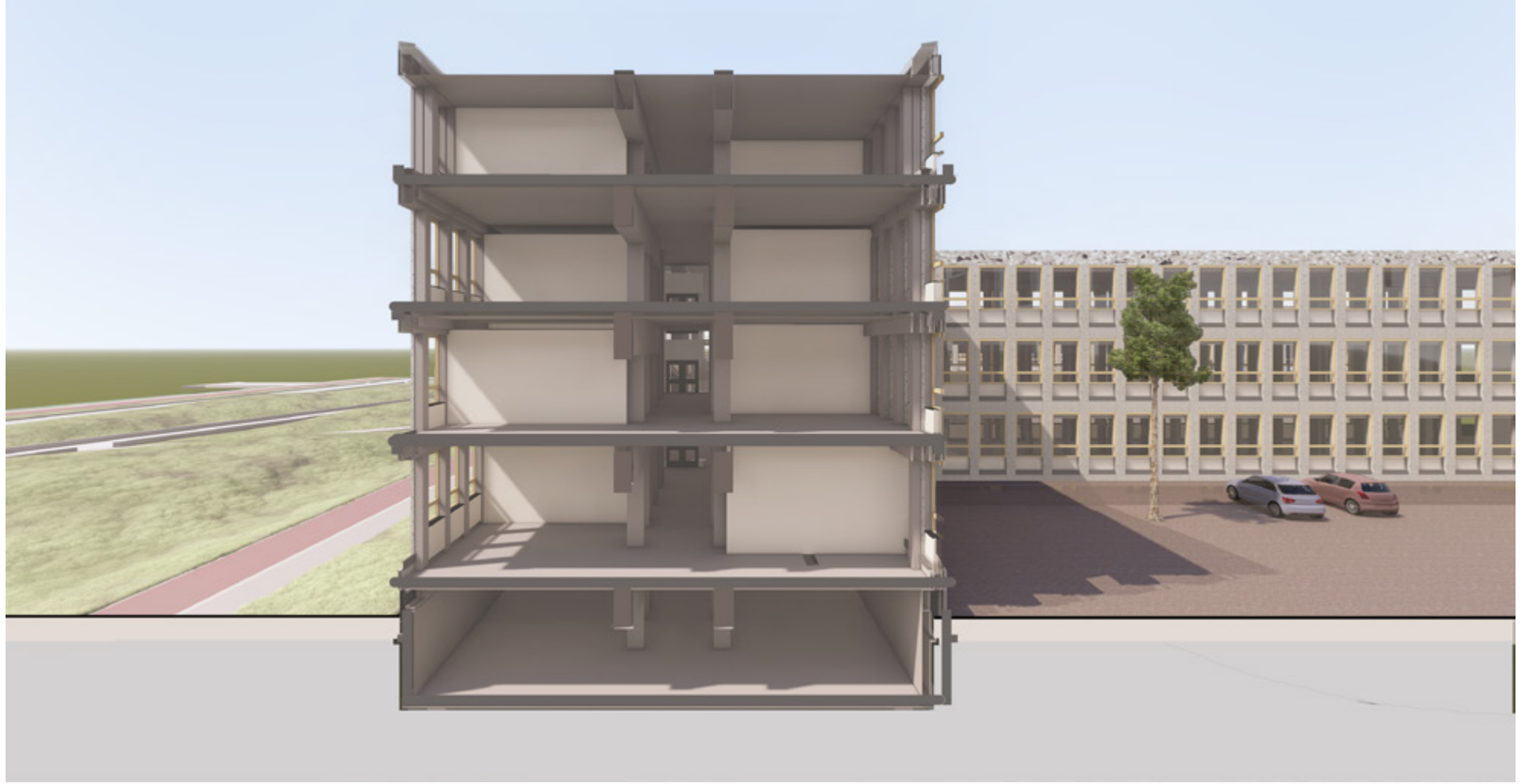
0.EXISTING - GENERIC





0.EXISTING - ENTRANCE





INTERVENTIONS

0. EXISTING

1. OPEN STRUCTURE

2. LANDSCAPE

3. CLAY CLIMATIZED ZONES

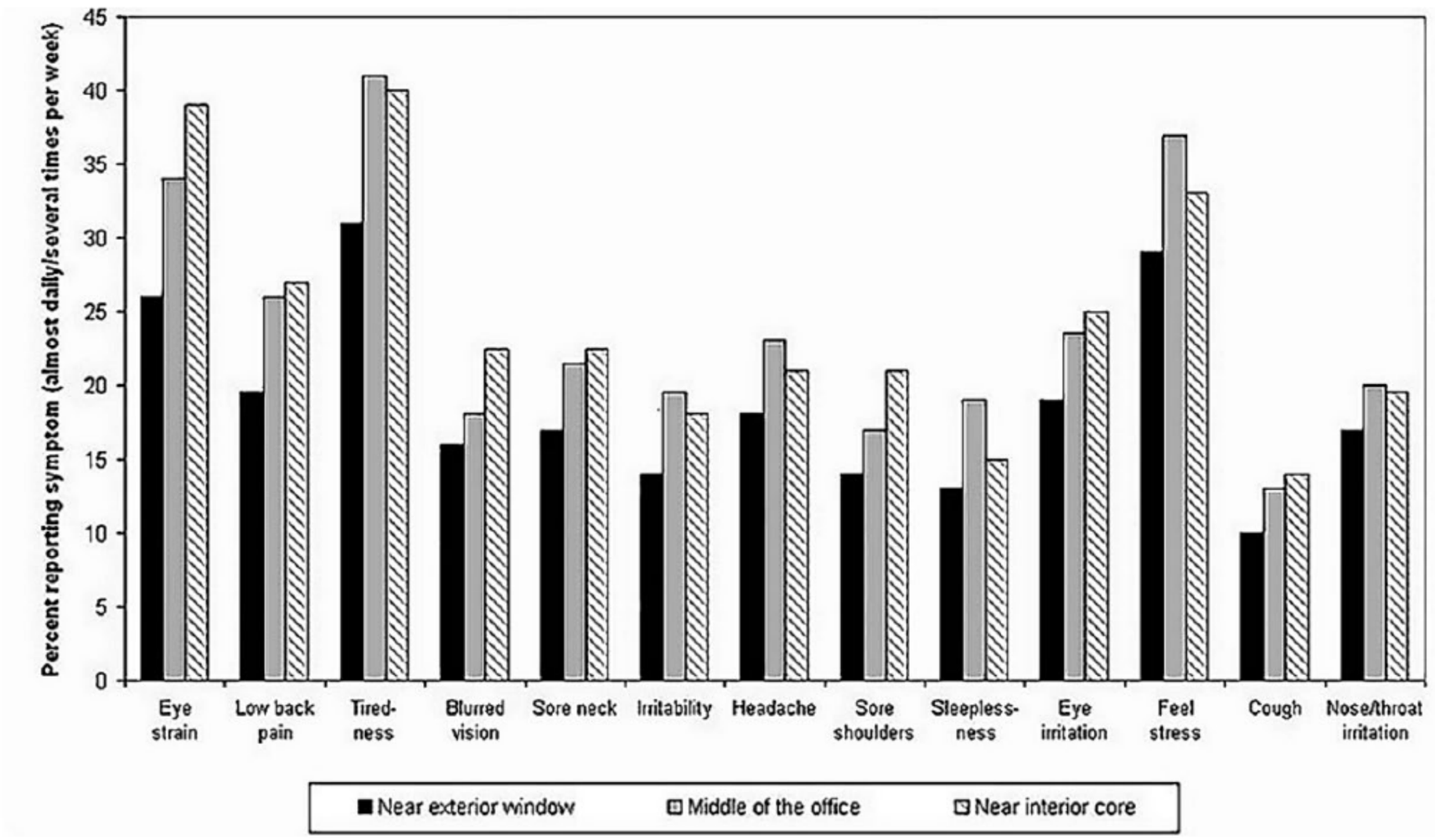
4. THE EXPERIENCE OF ROUTING

5. THE EXPERIENCE OF INTERIOR

1. OPEN STRUCTURE - GENERIC

HIGH QUALITY VIEW OF
NATURAL ELEMENTS

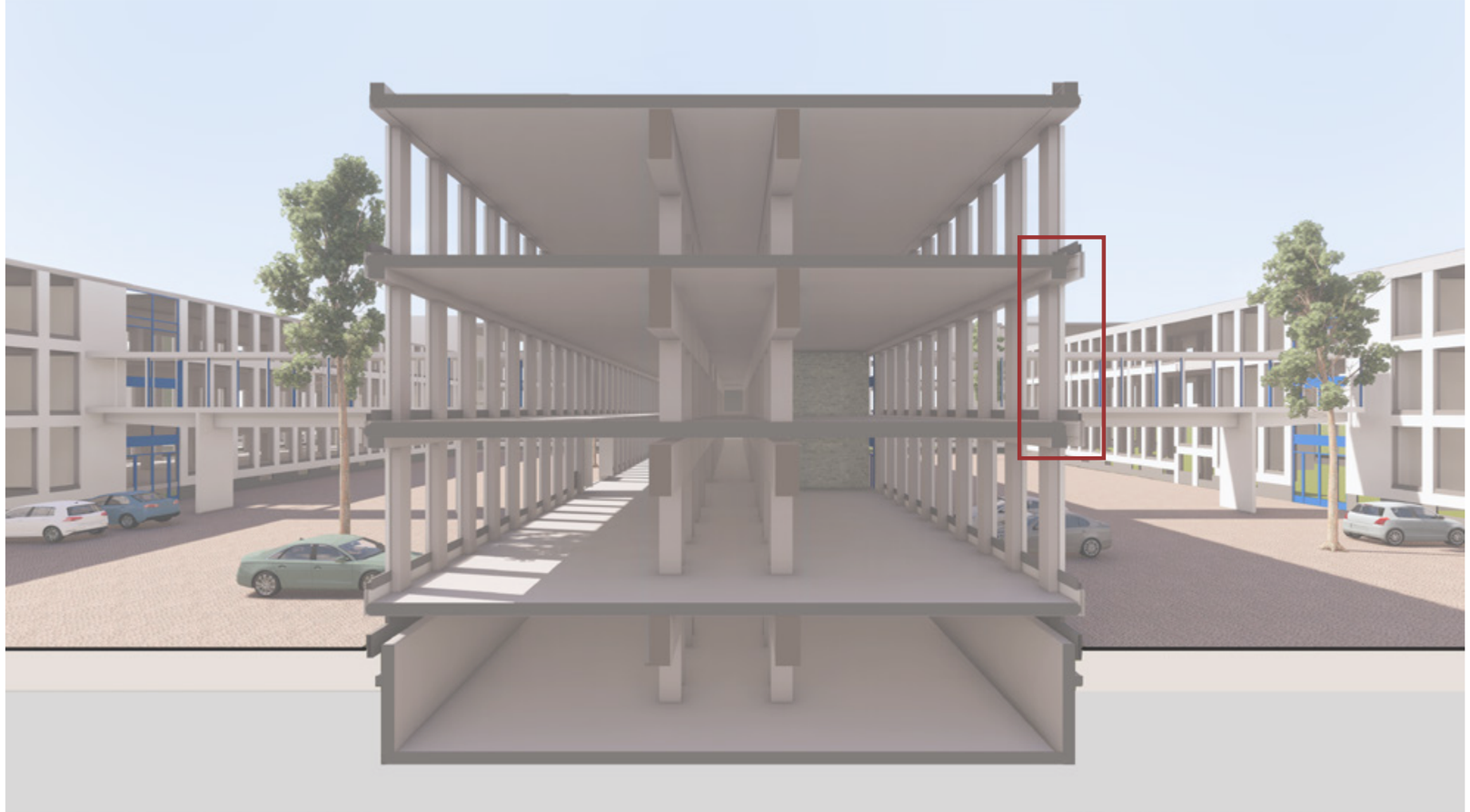
In humans, the **visual sense overwhelmingly dominates** and serves as the primary means through which people perceive and react to plants, animals, water, landscapes, and other elements of the natural environment. (Kellert et al., 2018).

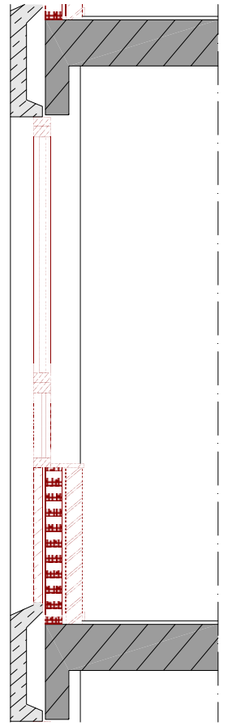


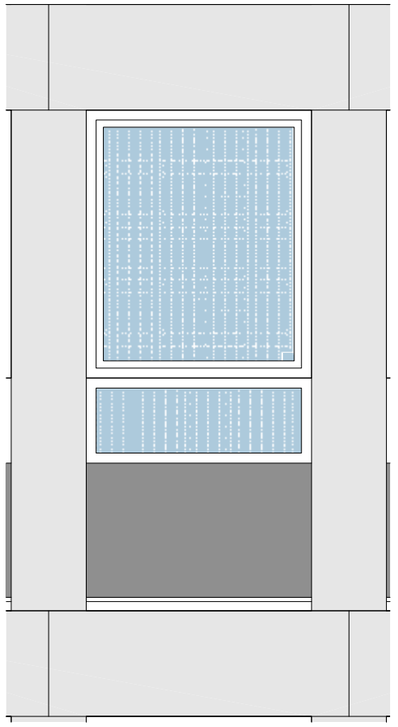
Comparison between window proximity and health complaints (Kellert et al., 2011)

1. OPEN STRUCTURE - GENERIC

HIGH QUALITY VIEW OF
NATURAL ELEMENTS

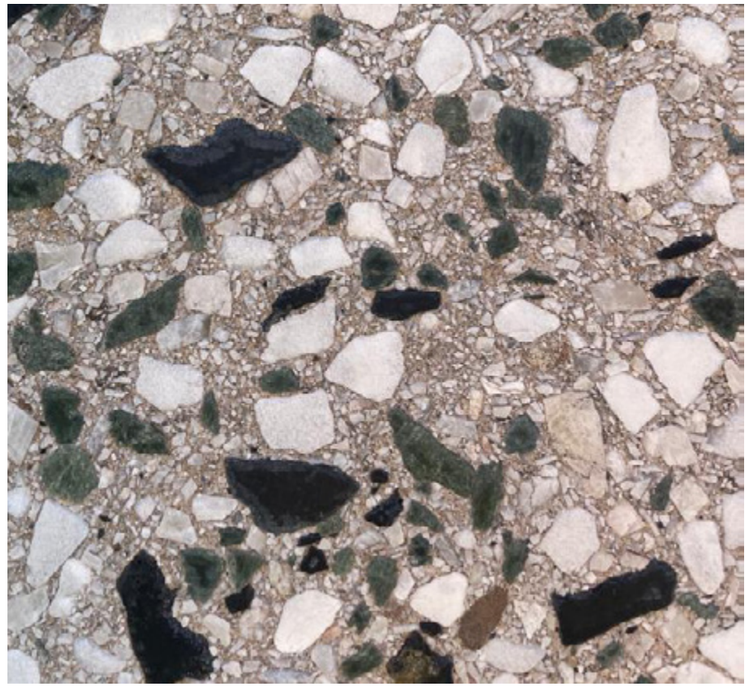


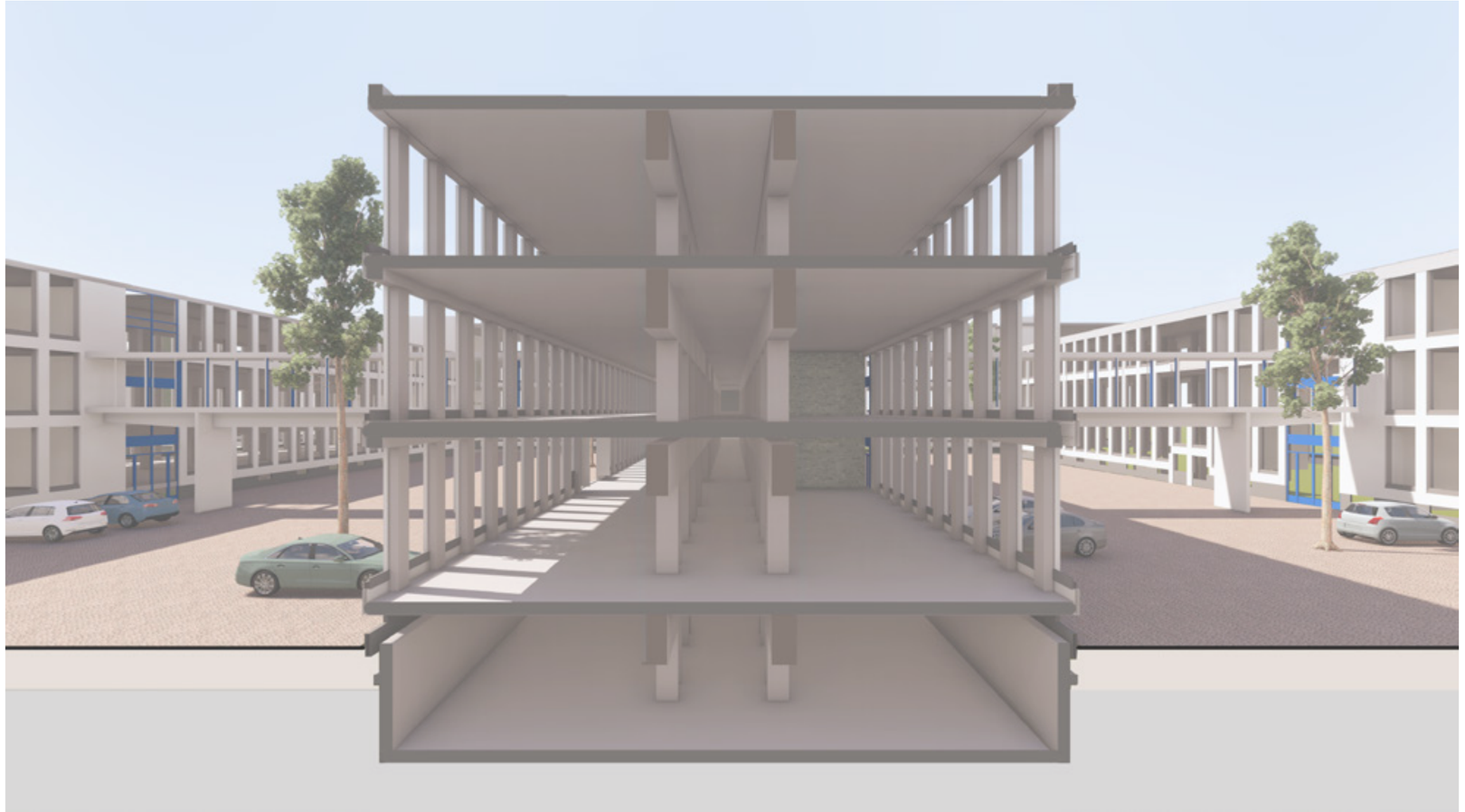




1. OPEN STRUCTURE - GENERIC

A NEW RENOVATION APPROACH

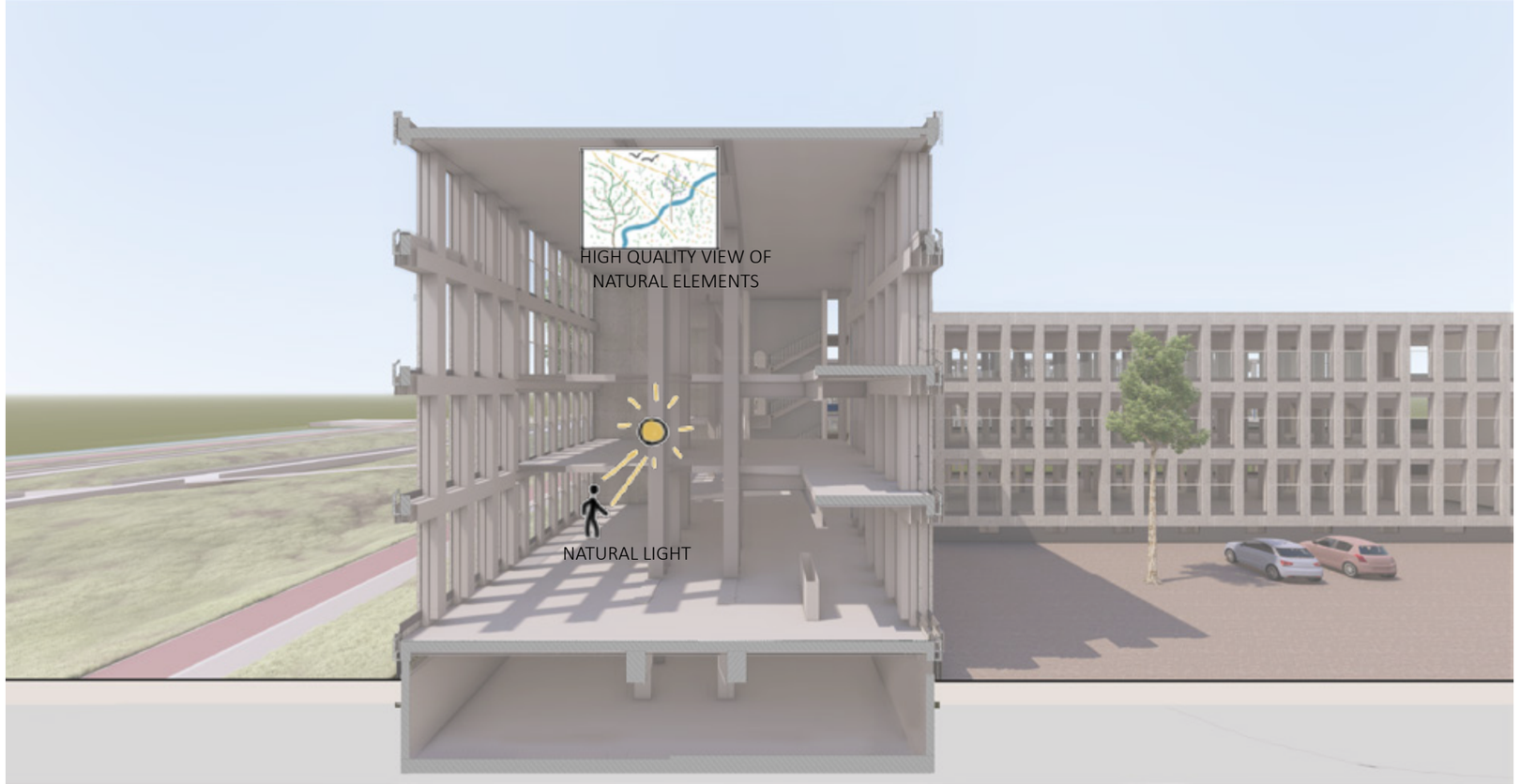


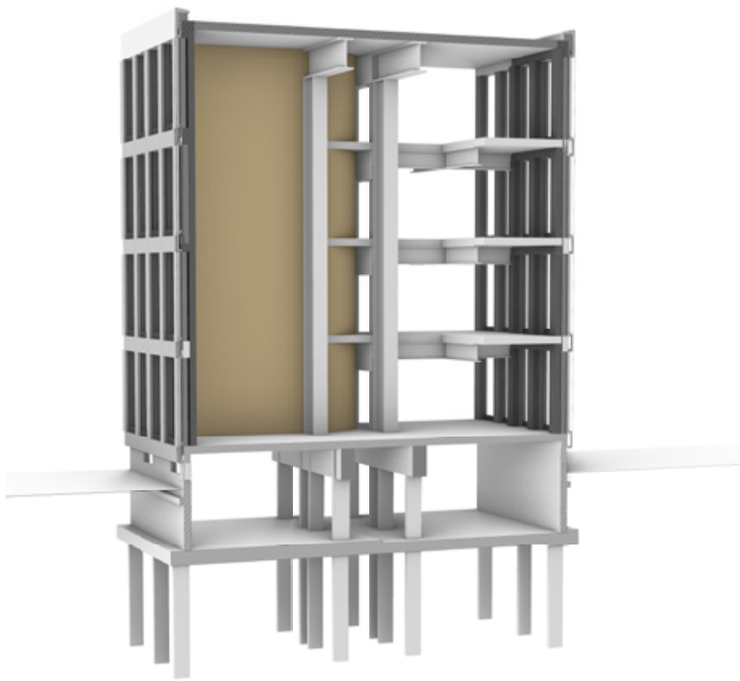


1. OPEN STRUCTURE - ENTRANCE

CREATING OPENINGS FOR LIGHT AND VIEWS

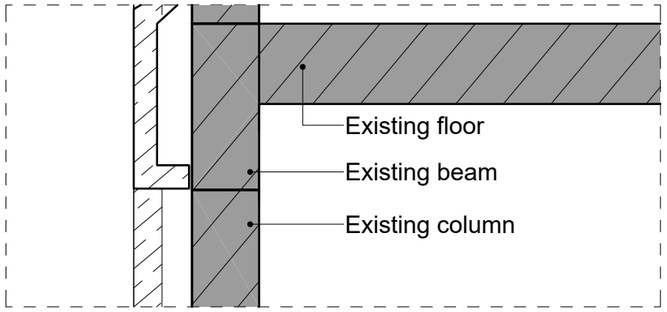
A NEW RENOVATION APPROACH

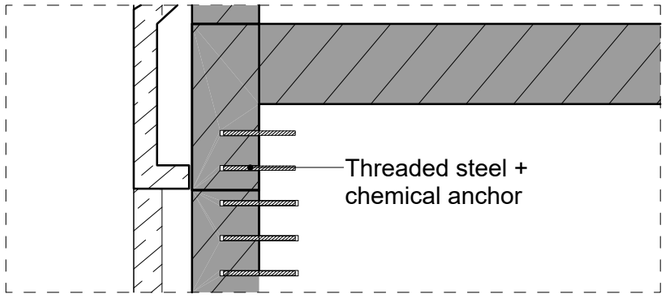


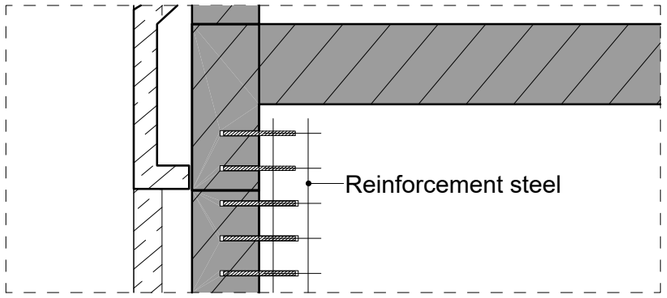


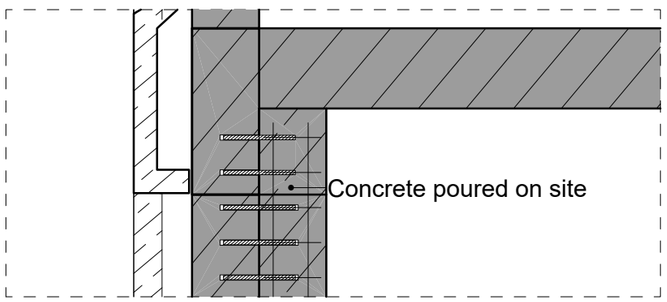
1. OPEN STRUCTURE - ENTRANCE

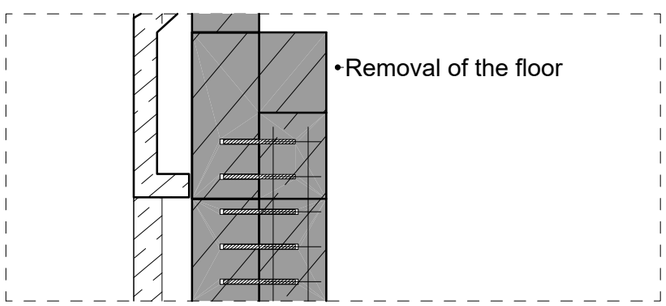
STRENGTHEN STRUCTURE, REMOVE FLOORS





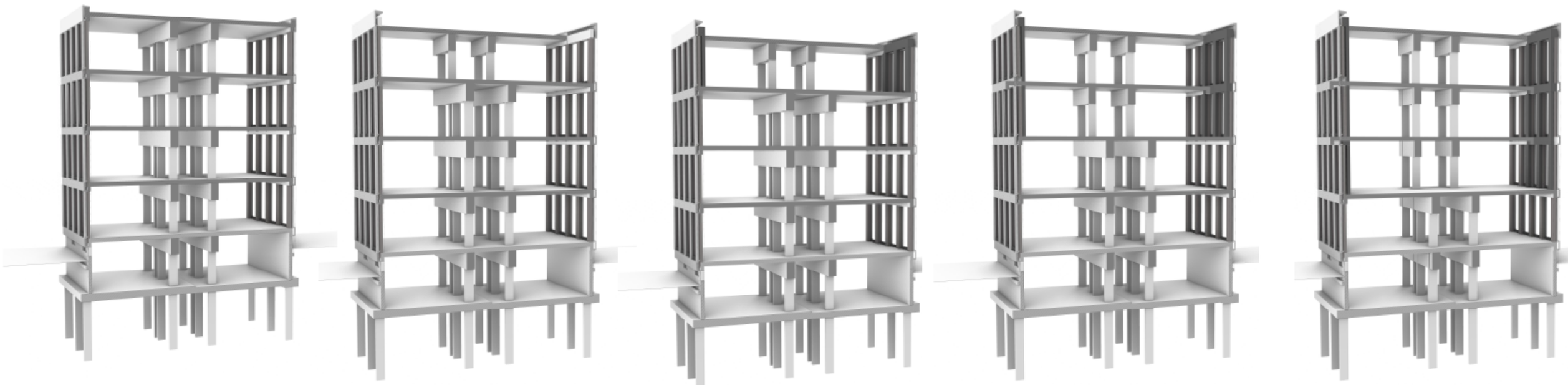


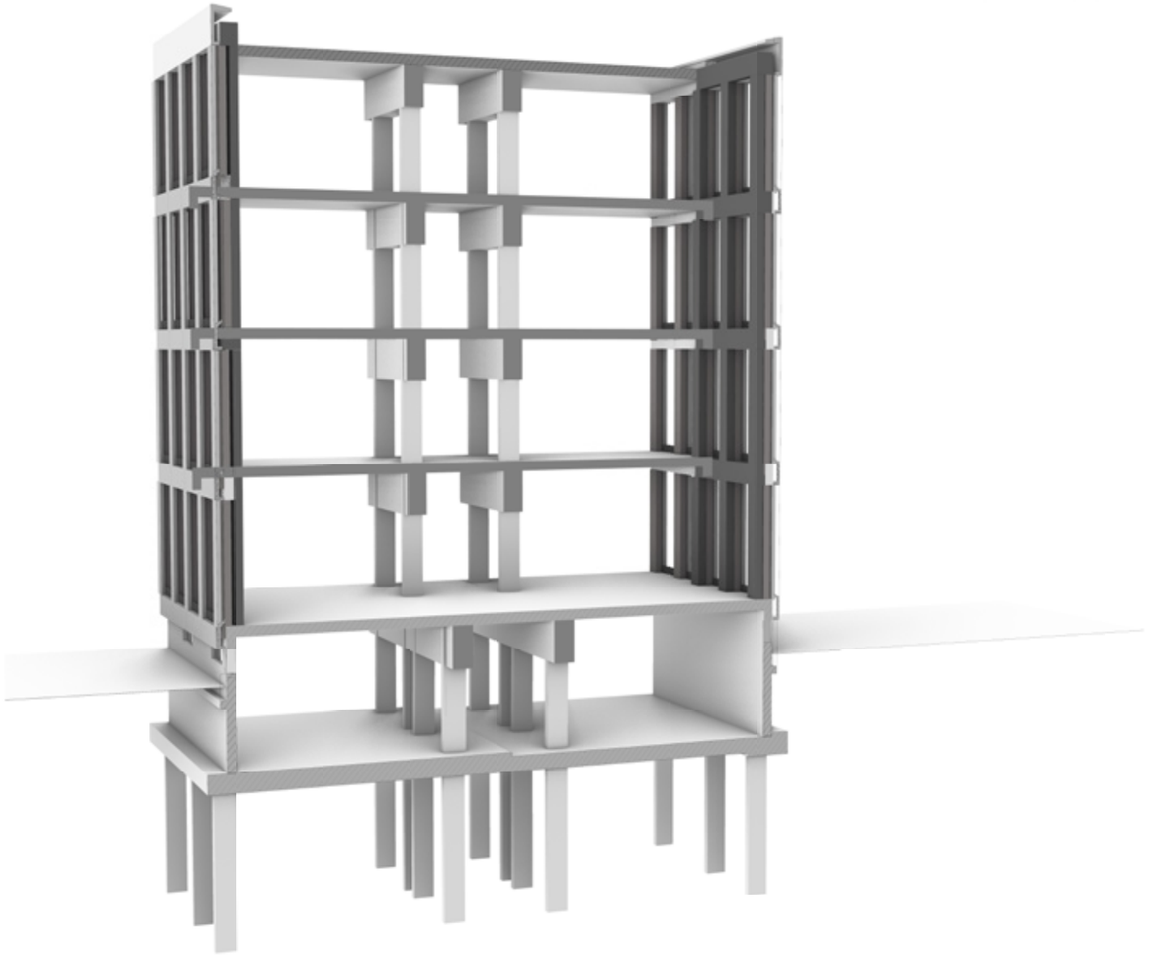




1. OPEN STRUCTURE - ENTRANCE

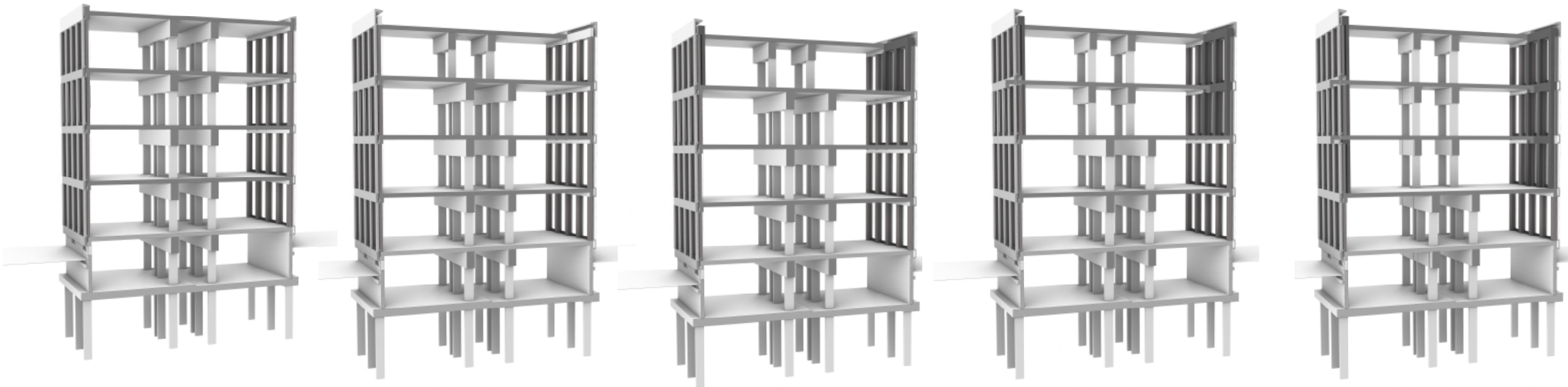
STRENGTHEN STRUCTURE, REMOVE FLOORS

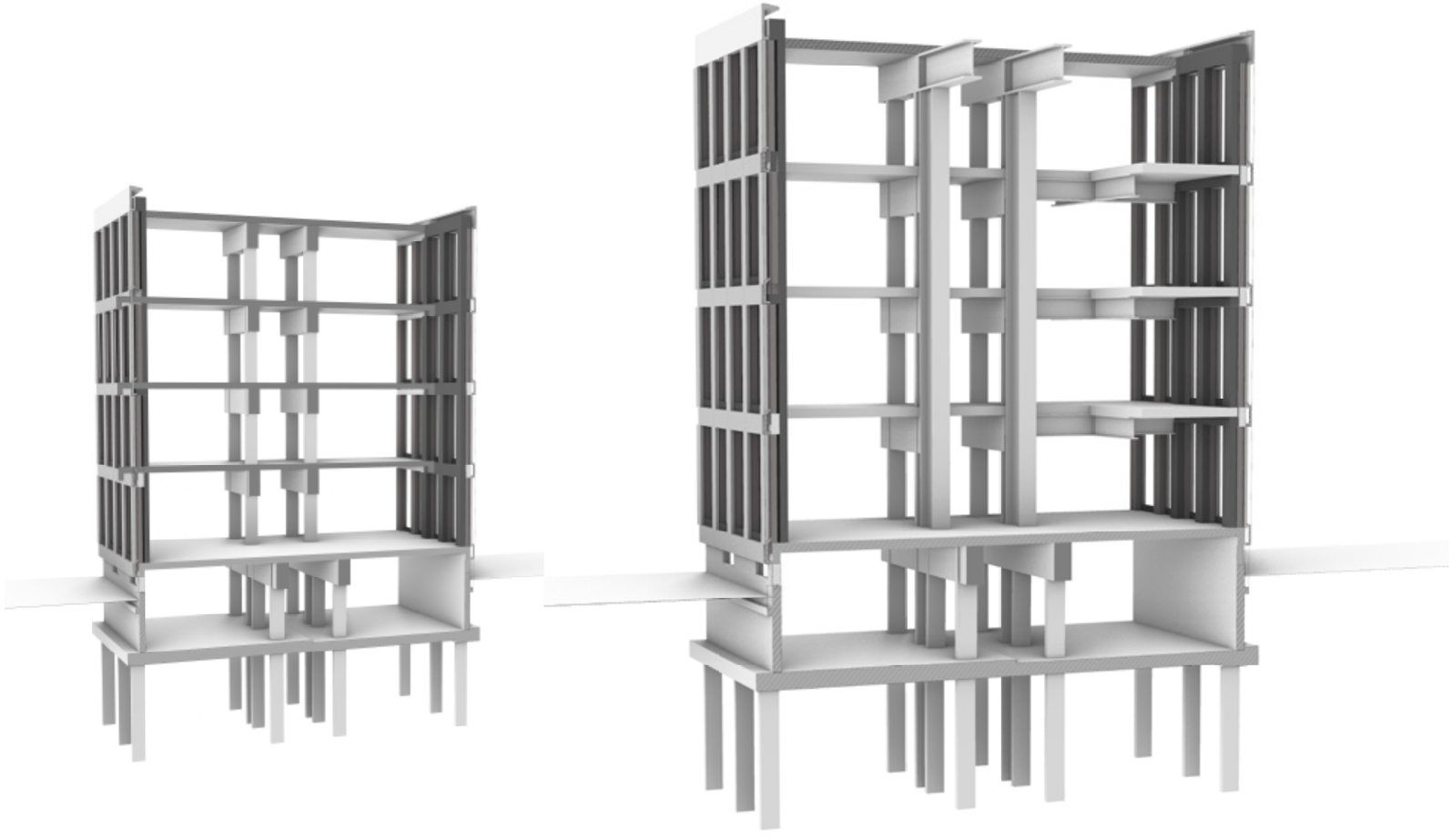




1. OPEN STRUCTURE - ENTRANCE

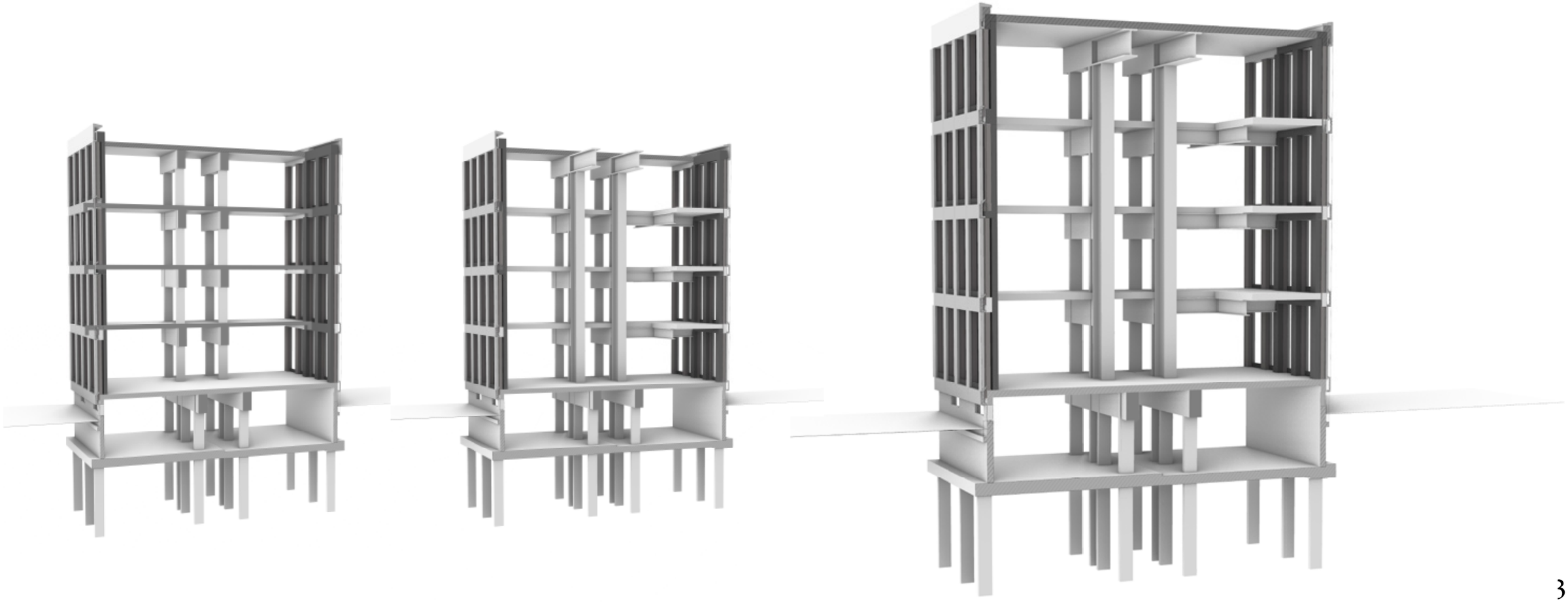
SMALL NEW CONSTRUCTION





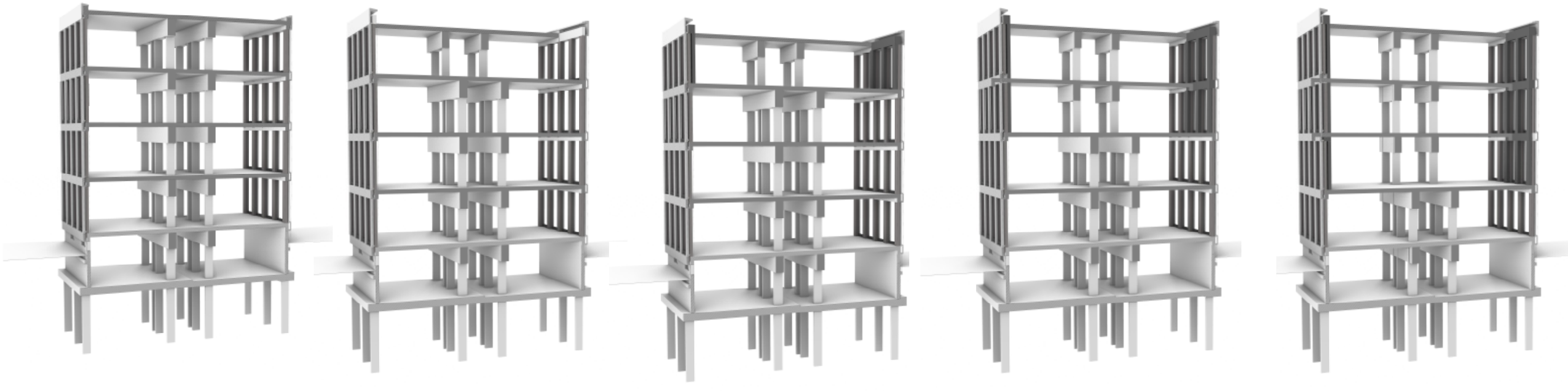
1. OPEN STRUCTURE - ENTRANCE

ROOF



1. OPEN STRUCTURE - ENTRANCE

CLAY CLIMATIZED ZONES



INTERVENTIONS
DESIGNGING FOR NATURE

0. EXISTING

1. OPEN STRUCTURE

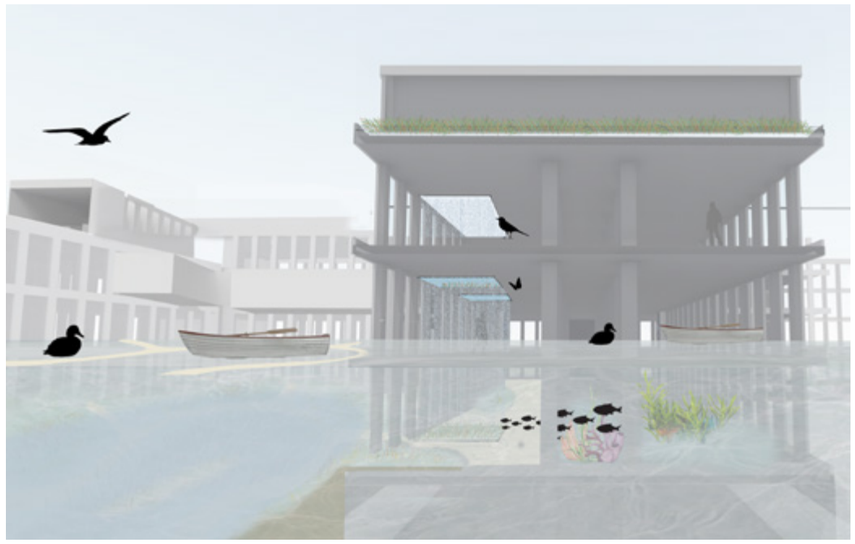
2. LANDSCAPE

3. CLAY CLIMATIZED ZONES

4. ROUTING

5. USE

INTERVENTIONS
THINKING OUTSIDE OF THE BOX



0. EXISTING

1. OPEN STRUCTURE

2. LANDSCAPE

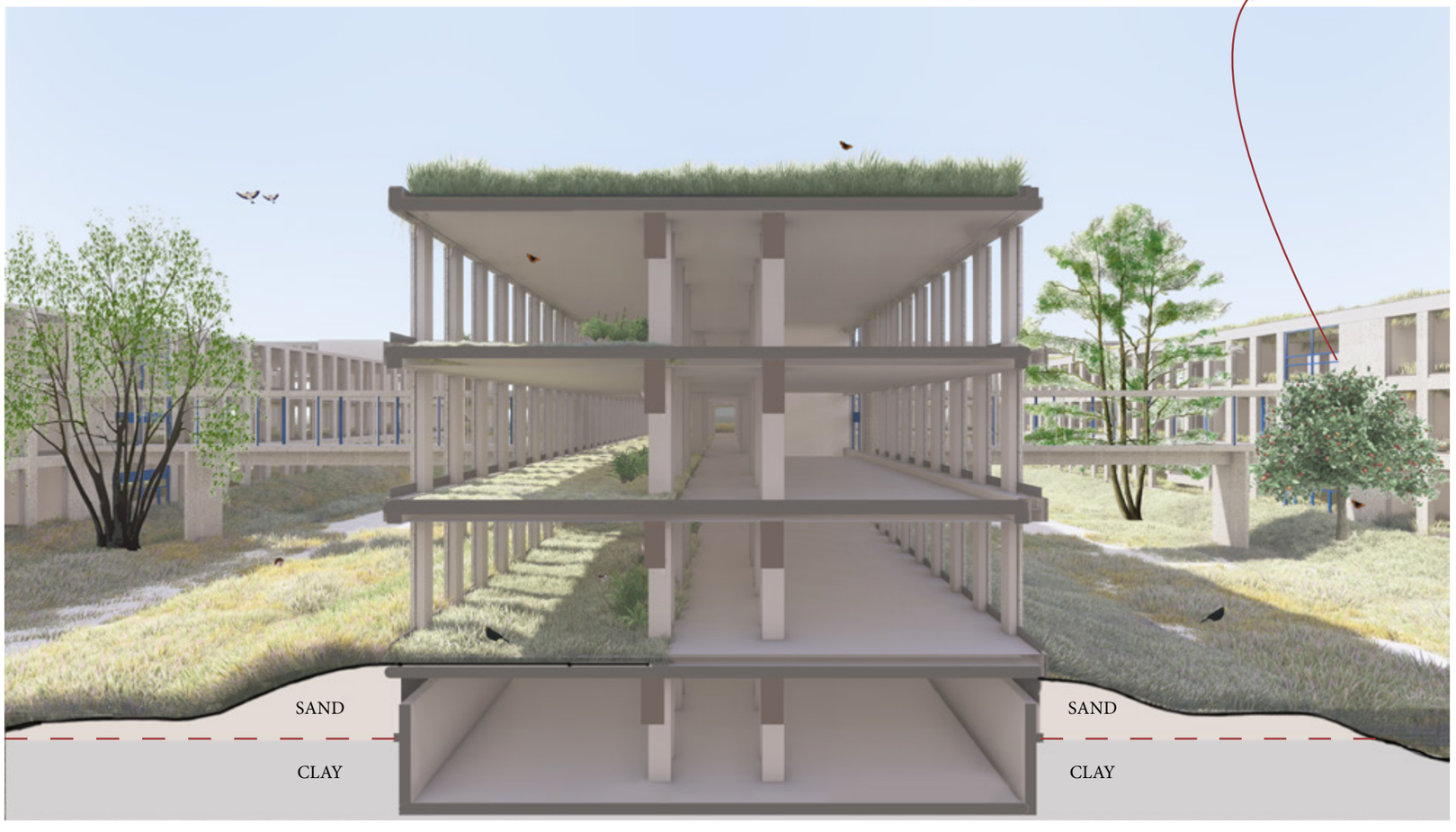
3. CLAY CLIMATIZED ZONES

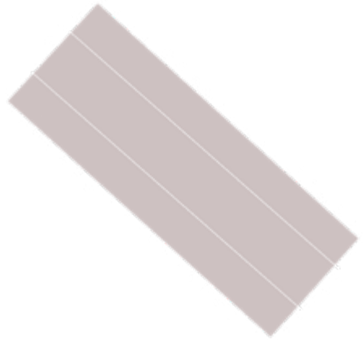
4. THE EXPERIENCE OF ROUTING

5. THE EXPERIENCE OF INTERIOR

2. LANDSCAPE - GENERIC

ECOLOGY MANAGER

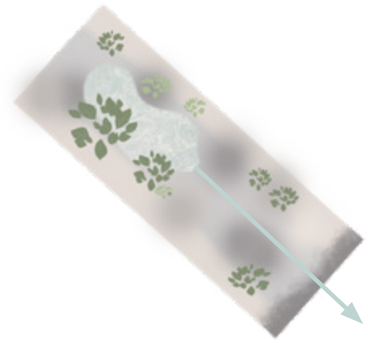




1.STONY, PARKING PLACES

3.DIGGING: CLAY LAYER, DIKE

3.DIGGING: CLAY LAYER, DIKE



4.HELOFYTEFILTER

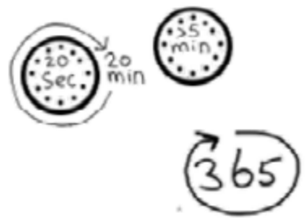
2. LANDSCAPE - GENERIC

GIVING PROTECTION TO PEOPLE AND ANIMAL

2. LANDSCAPE - GENERIC
SHORT YET WELCOME DISTRACTIONS

SHOWING NATURAL PROCESSES

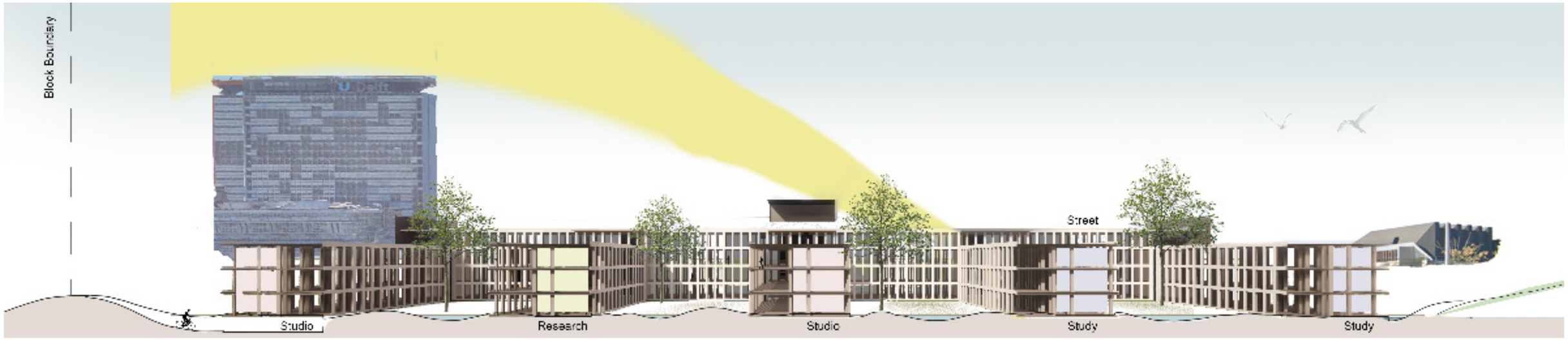
Studies have shown that exposure to the stochastic movement of objects in nature and natural sounds and scents supports physiological restoration. (Terrapin Bright Green, 2014)

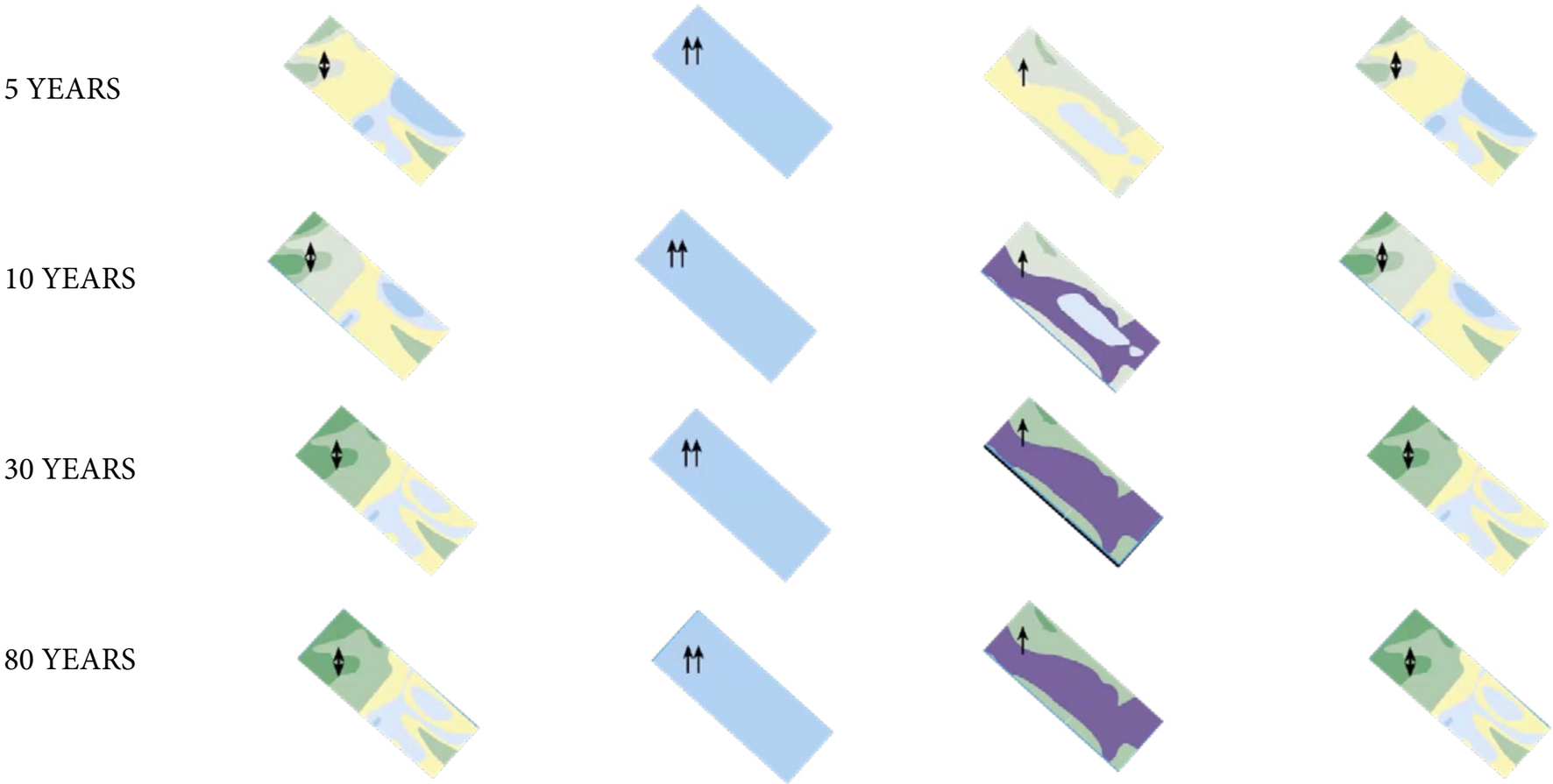


SHORT VS. LONG EXPOSURE

2. LANDSCAPE - GENERIC

SUCCESSION STRATEGY, THE BEAUTY OF CHANGE





2. LANDSCAPE - ENTRANCE

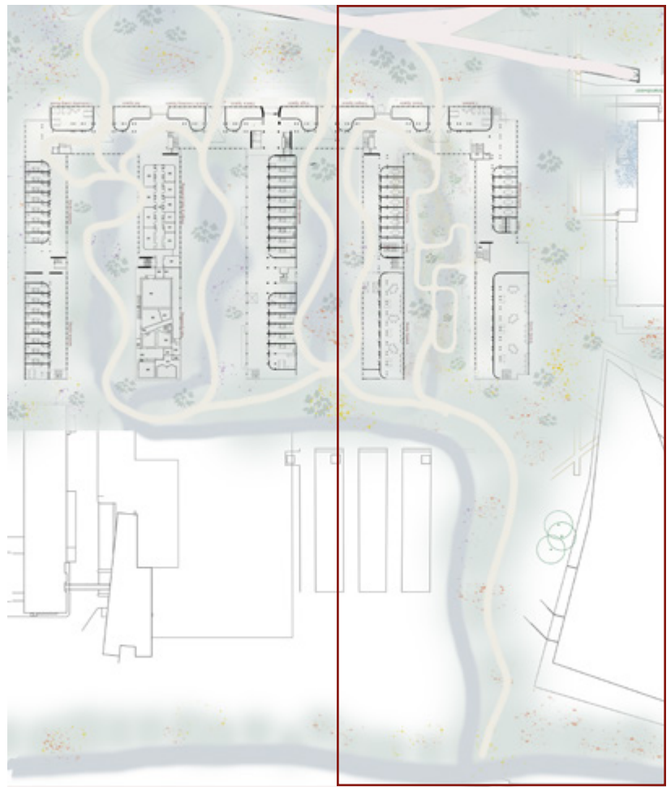
CAMPUS AS A LANDSCAPE, BUILDING AS A PARK

SHOWING NATURAL PROCESSES

CLEAN FLOWING WATER

Workscapes of the Future (2023)

THE STRONGEST SENSORY EXPERIENCE ARE ASSOCIATED WITH WATER, IN PARTICULAR FLOWING WATER WITH SOUND, MOVEMENT AND REFLECTION

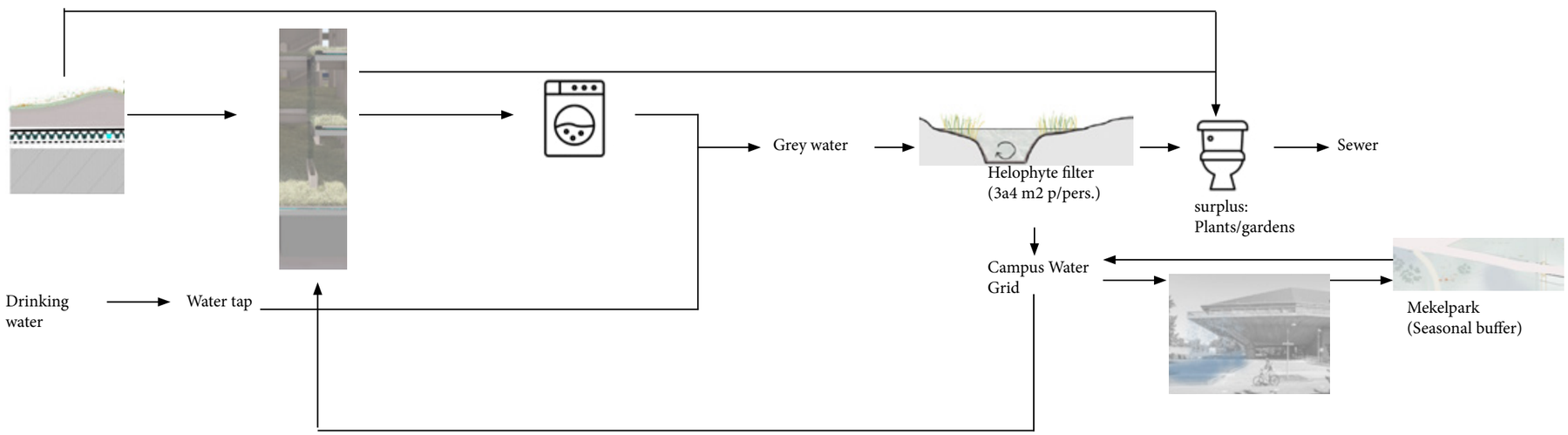


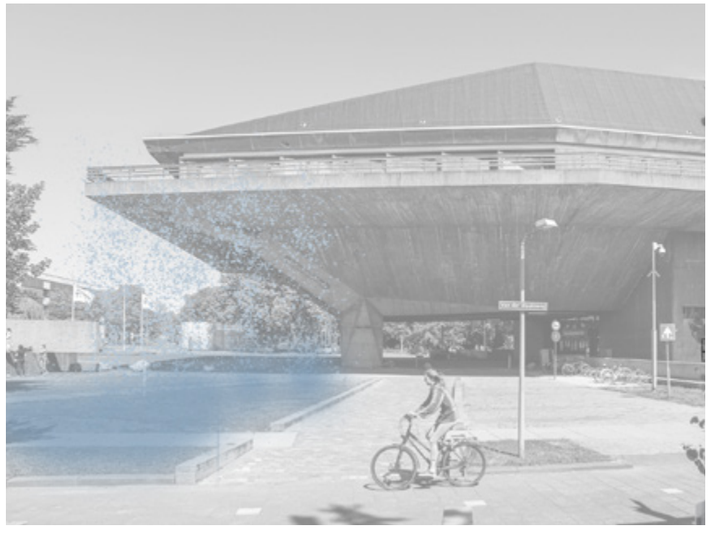
2. LANDSCAPE - ENTRANCE

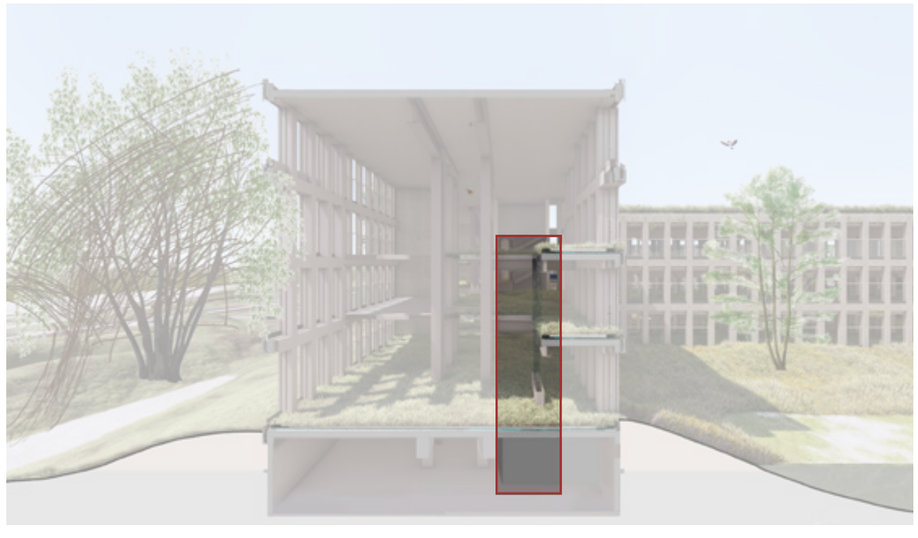
CREATING AWARENESS, SUITED TO CONTEMPORARY SITUATION

SHOWING NATURAL PROCESSES

CLEAN FLOWING WATER







INTERVENTIONS

0. EXISTING

1. OPEN STRUCTURE

2. LANDSCAPE

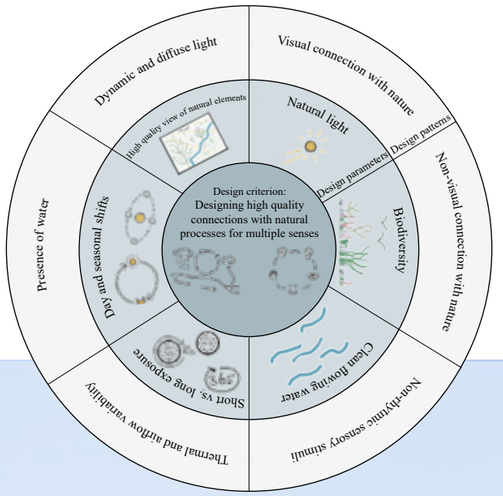
3. CLAY CLIMATIZED ZONES

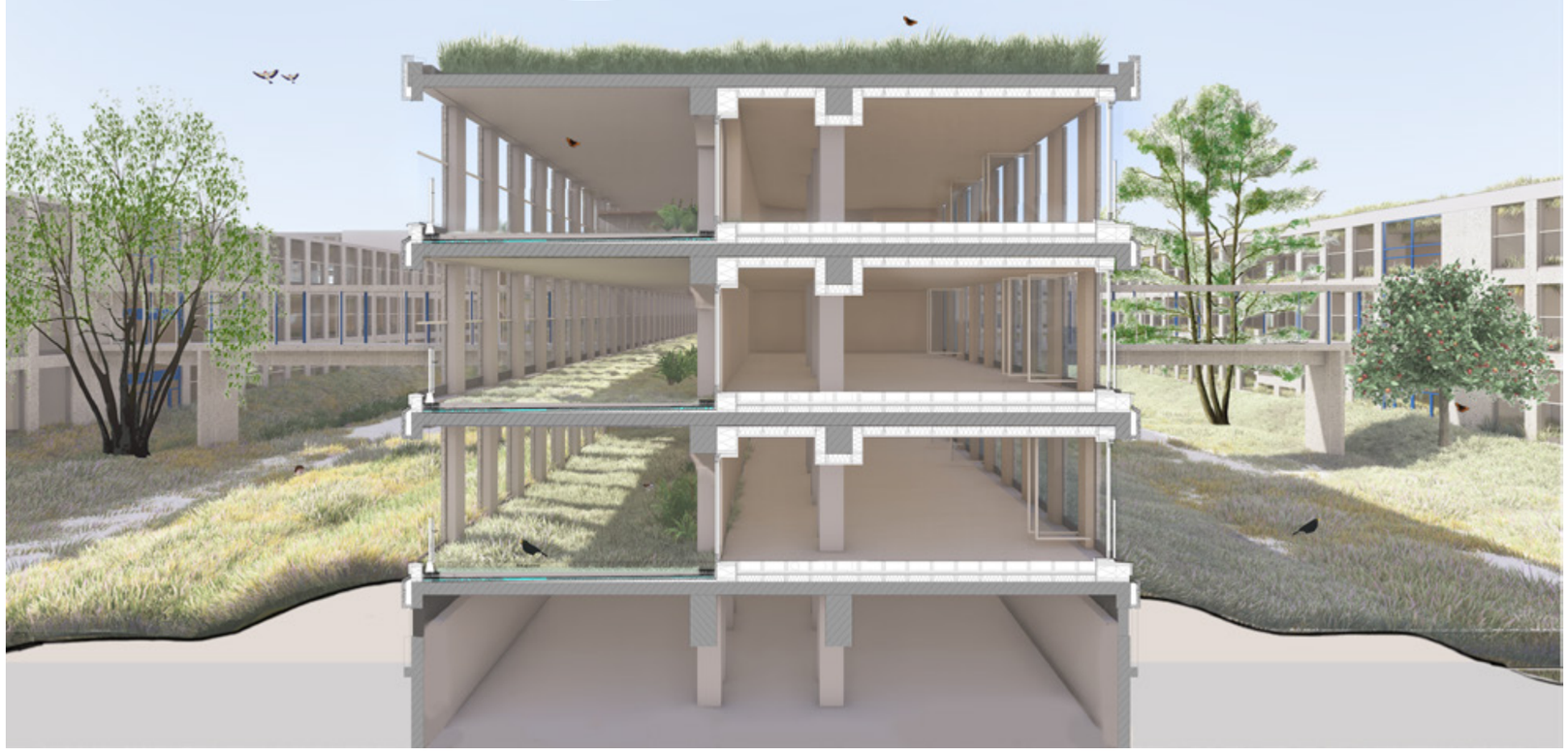
4. ROUTING

5. USE

3. CLAY CLIMATIZED ZONES - GENERIC

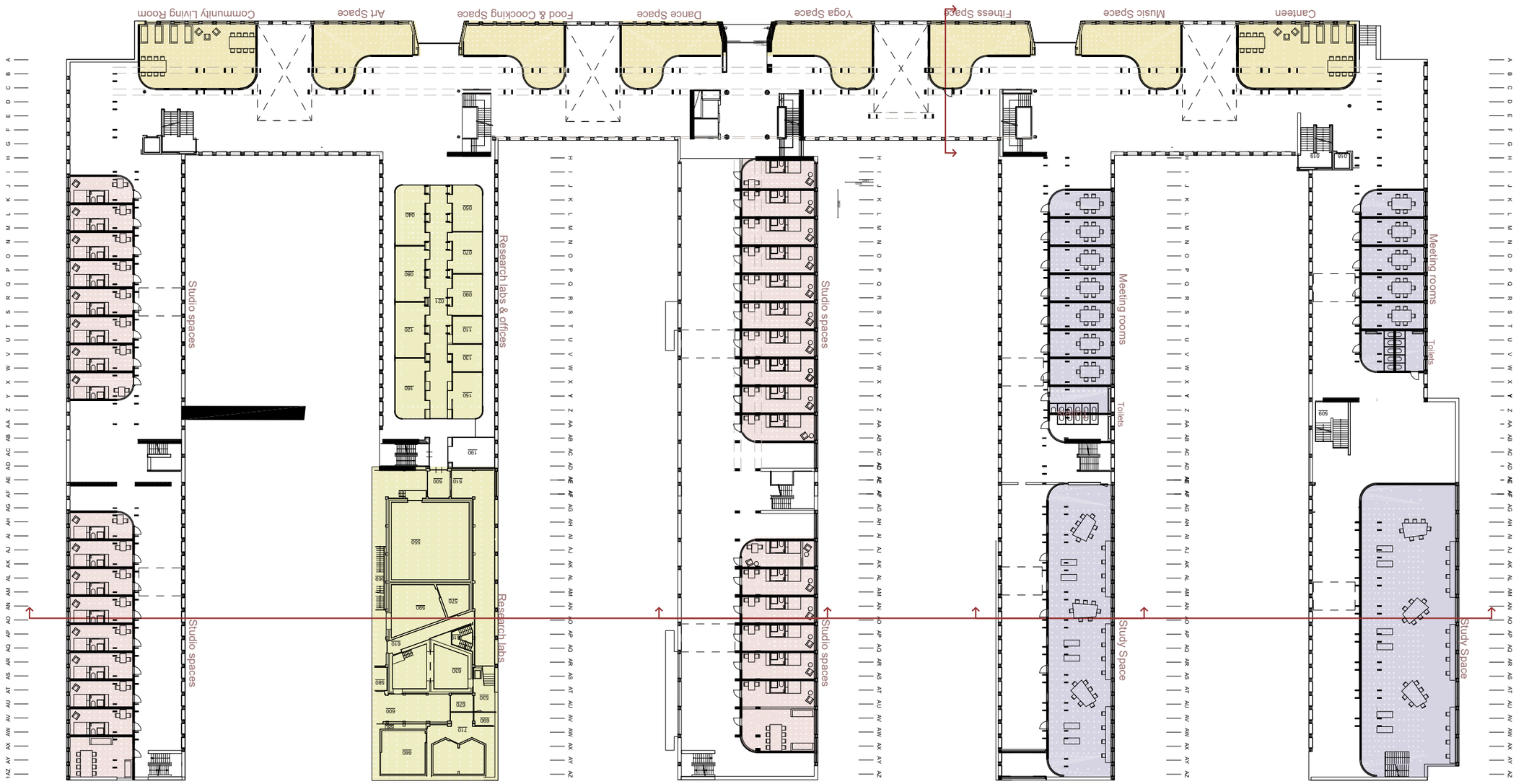
LEARNING TO LIVE WITH THE WEATHER





3. CLAY CLIMATIZED ZONES - GENERIC

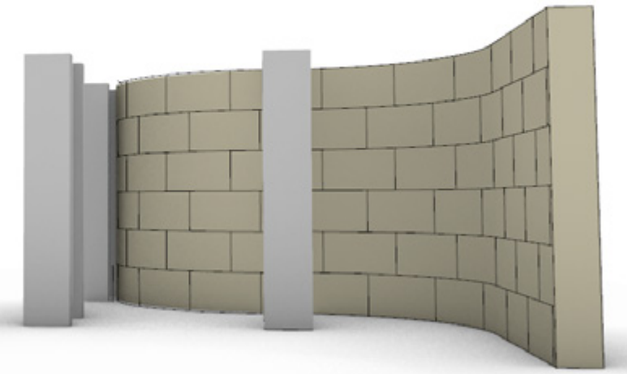
FREEDOM IN THE GRID



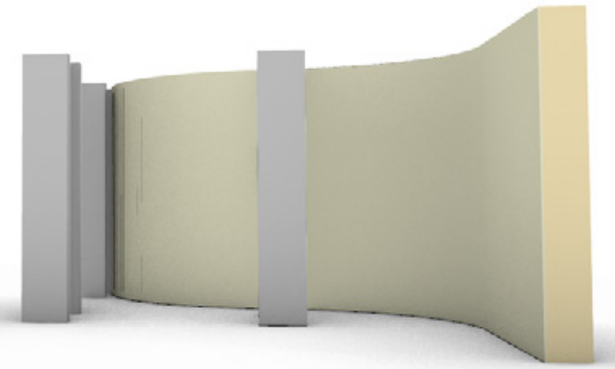
STREET RESEARCH STUDIO STUDY

3. CLAY CLIMATIZED ZONES - ENTRANCE

LOCAL AND NATURAL MATERIALS



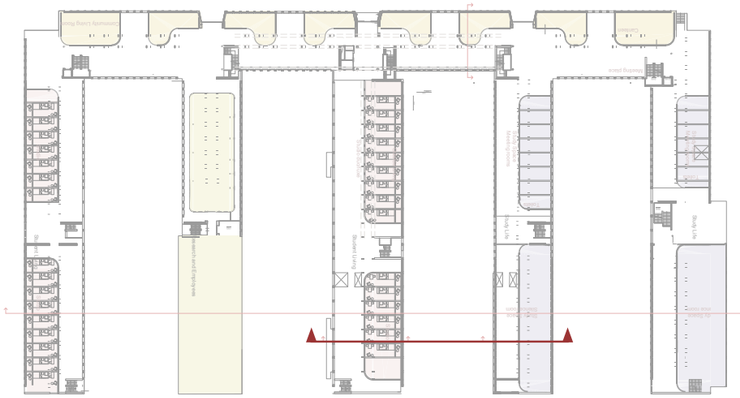
LIGHT EARTH (60%) + WOOD FIBRE (40%) INSULATION

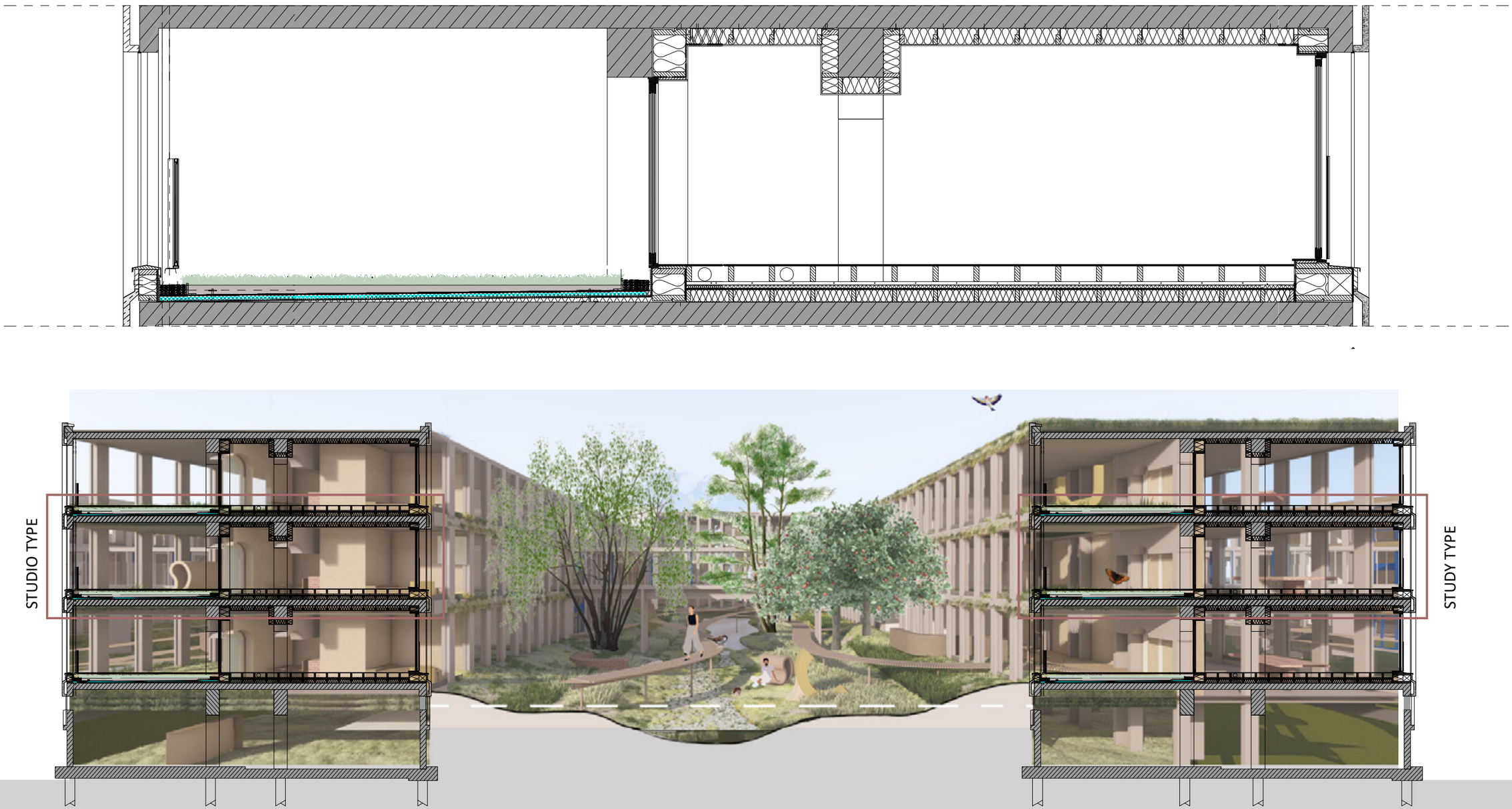


EARTH PLASTER

3. CLAY CLIMATIZED ZONES

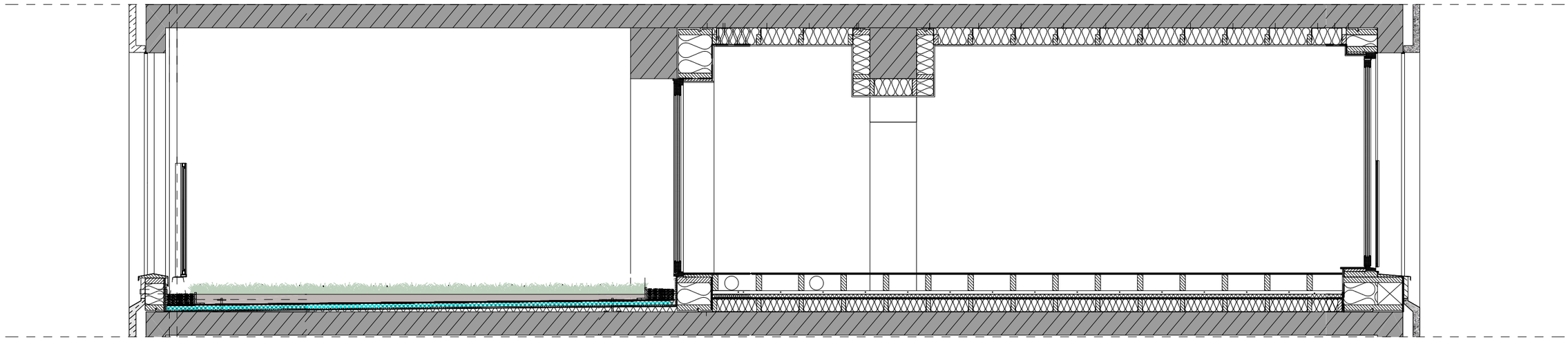
GENERIC FOR FLEXIBILITY AND CONSISTENCY

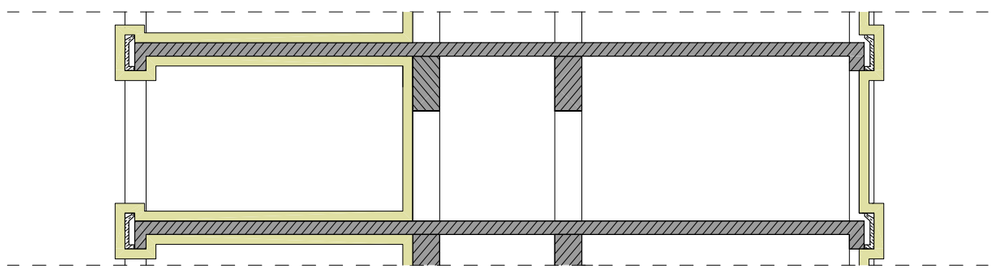


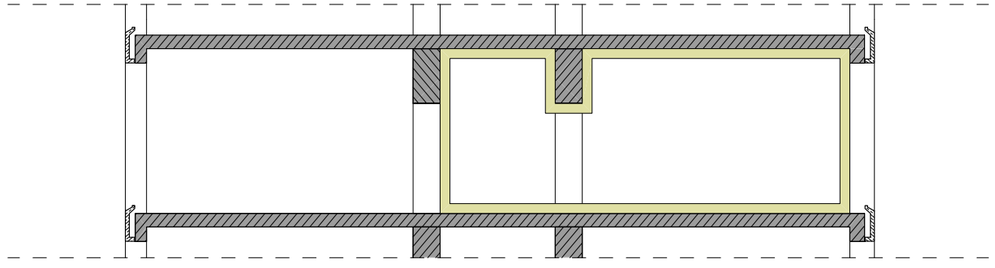


3. CLAY CLIMATIZED ZONES

GENERIC INSULATION OPTIONS

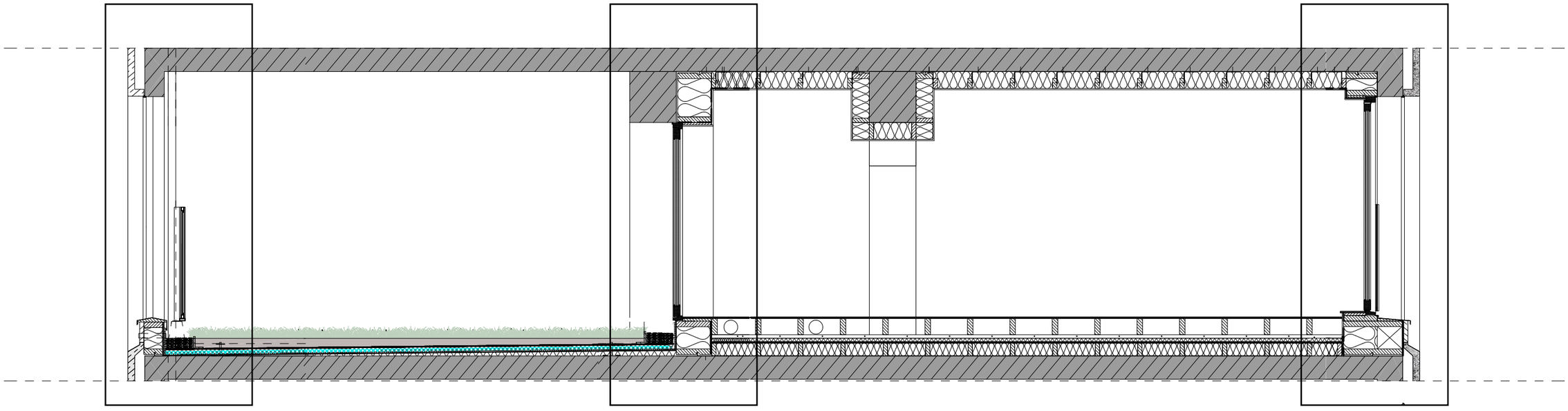






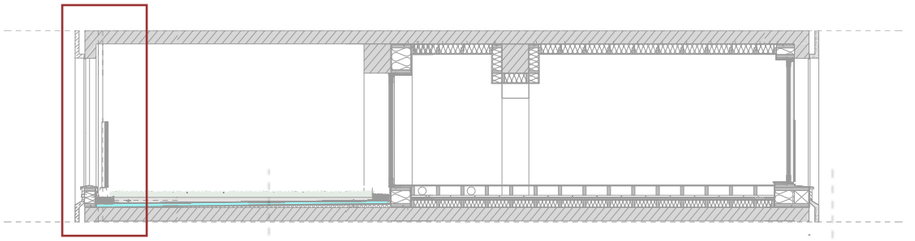
3. CLAY CLIMATIZED ZONES

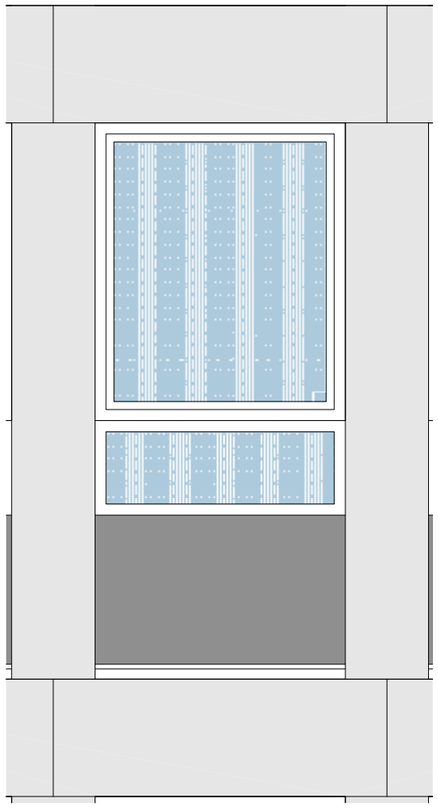
GENERIC

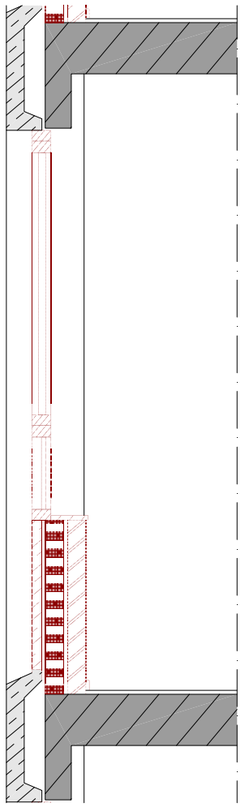


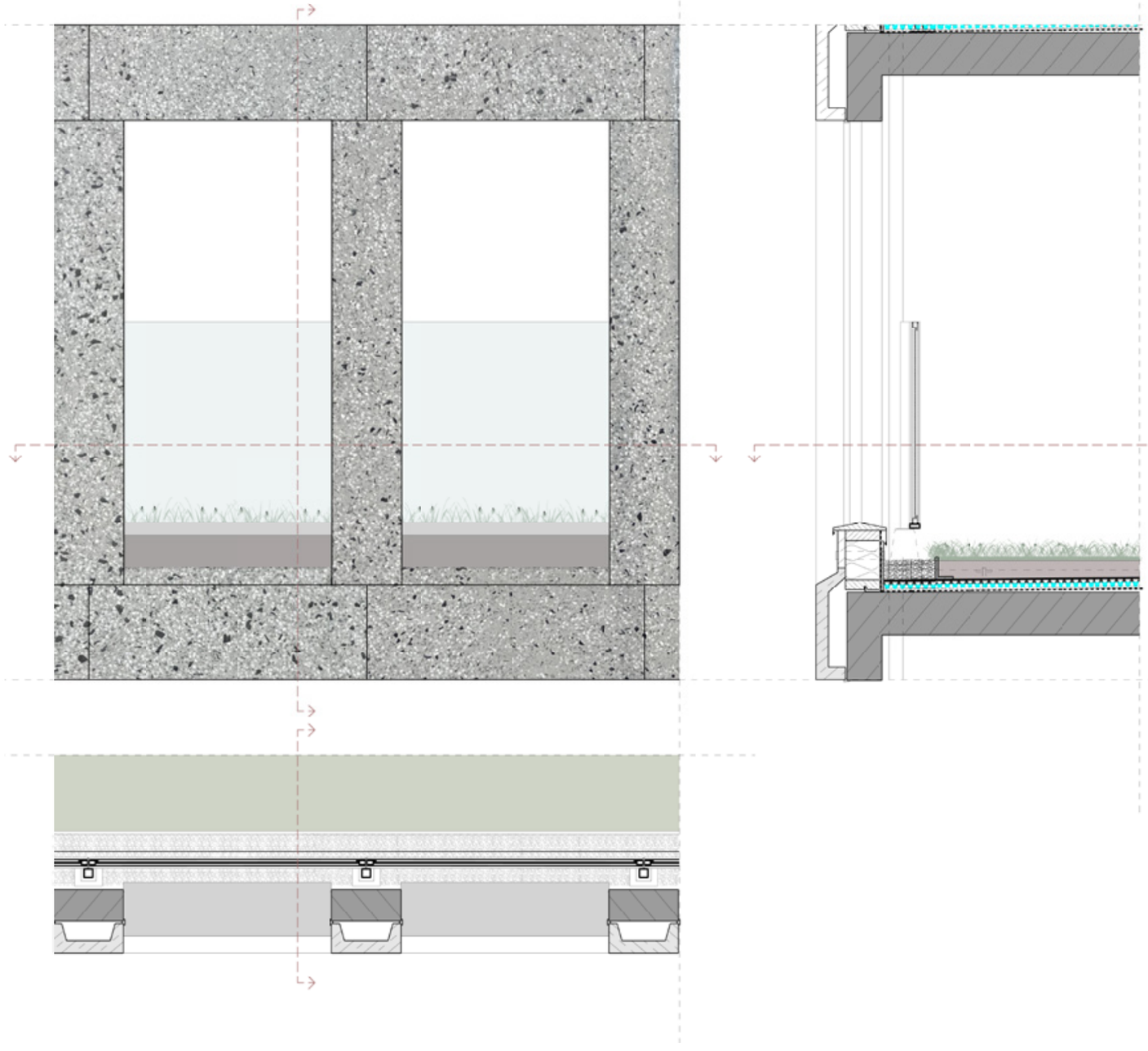
3. CLAY CLIMATIZED ZONES

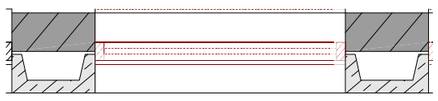
FRAGMENT 1A. SOUTH FACADE





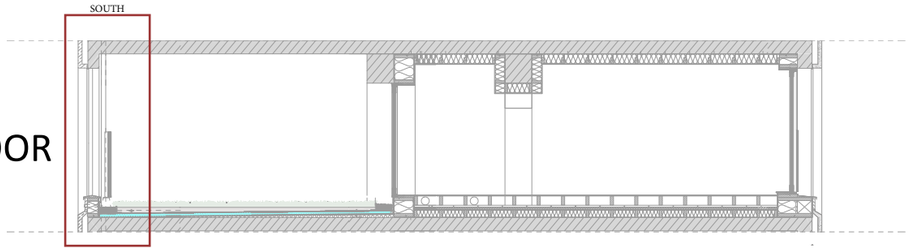


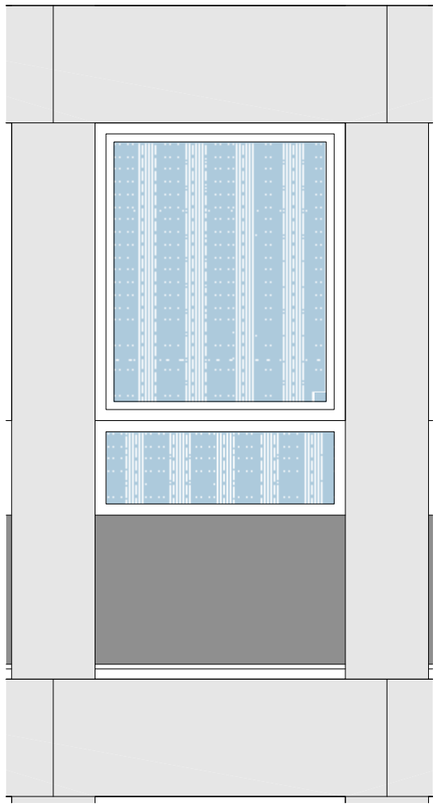


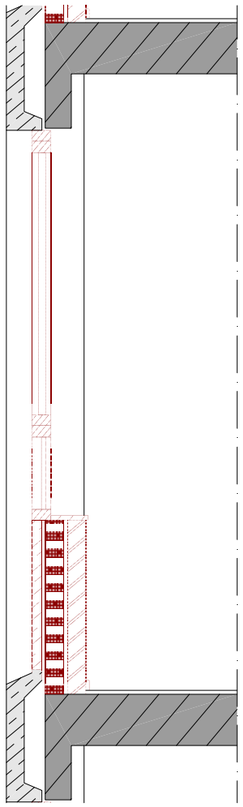


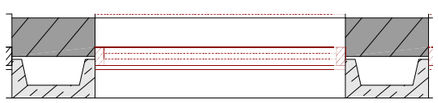
3. CLAY CLIMATIZED ZONES

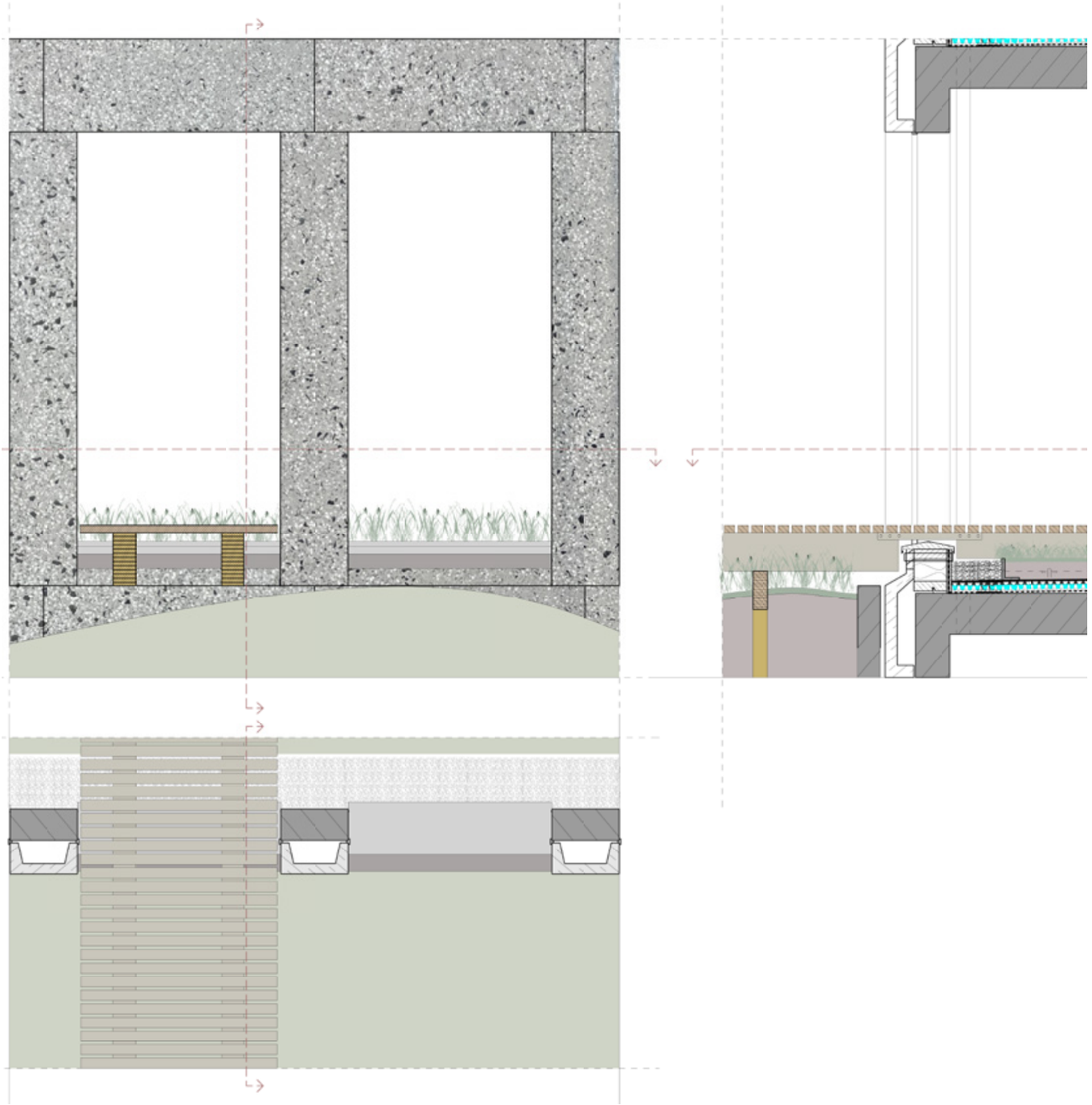
FRAGMENT 1B. SOUTH FACADE - GROUND FLOOR





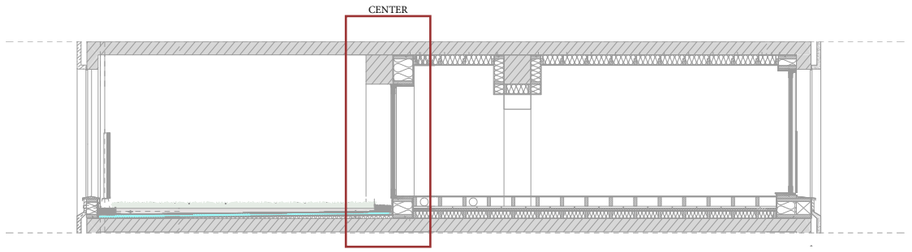




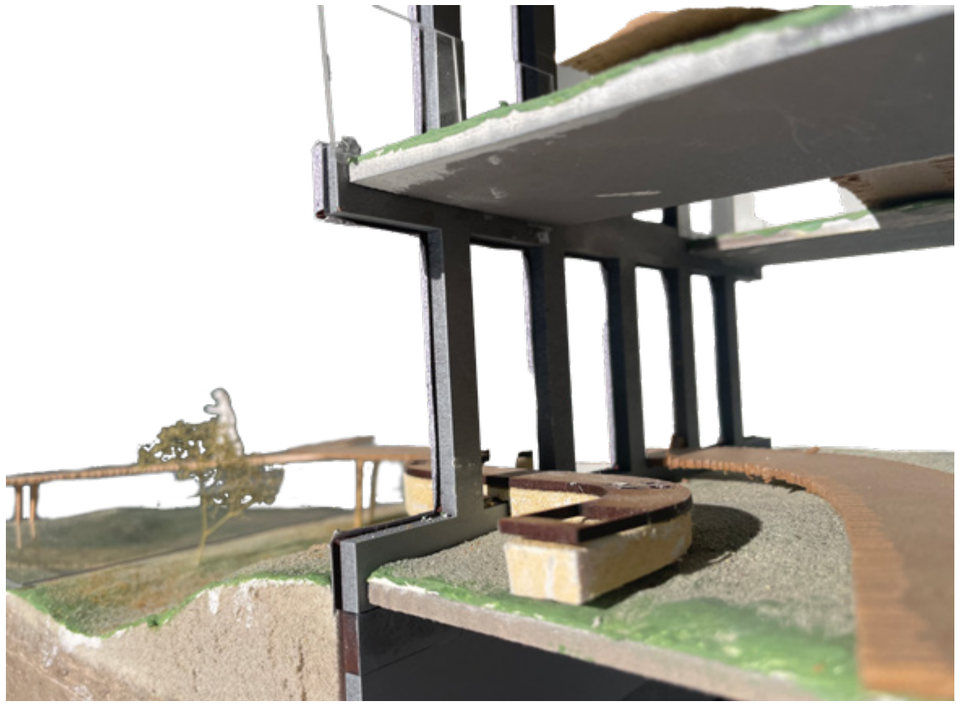


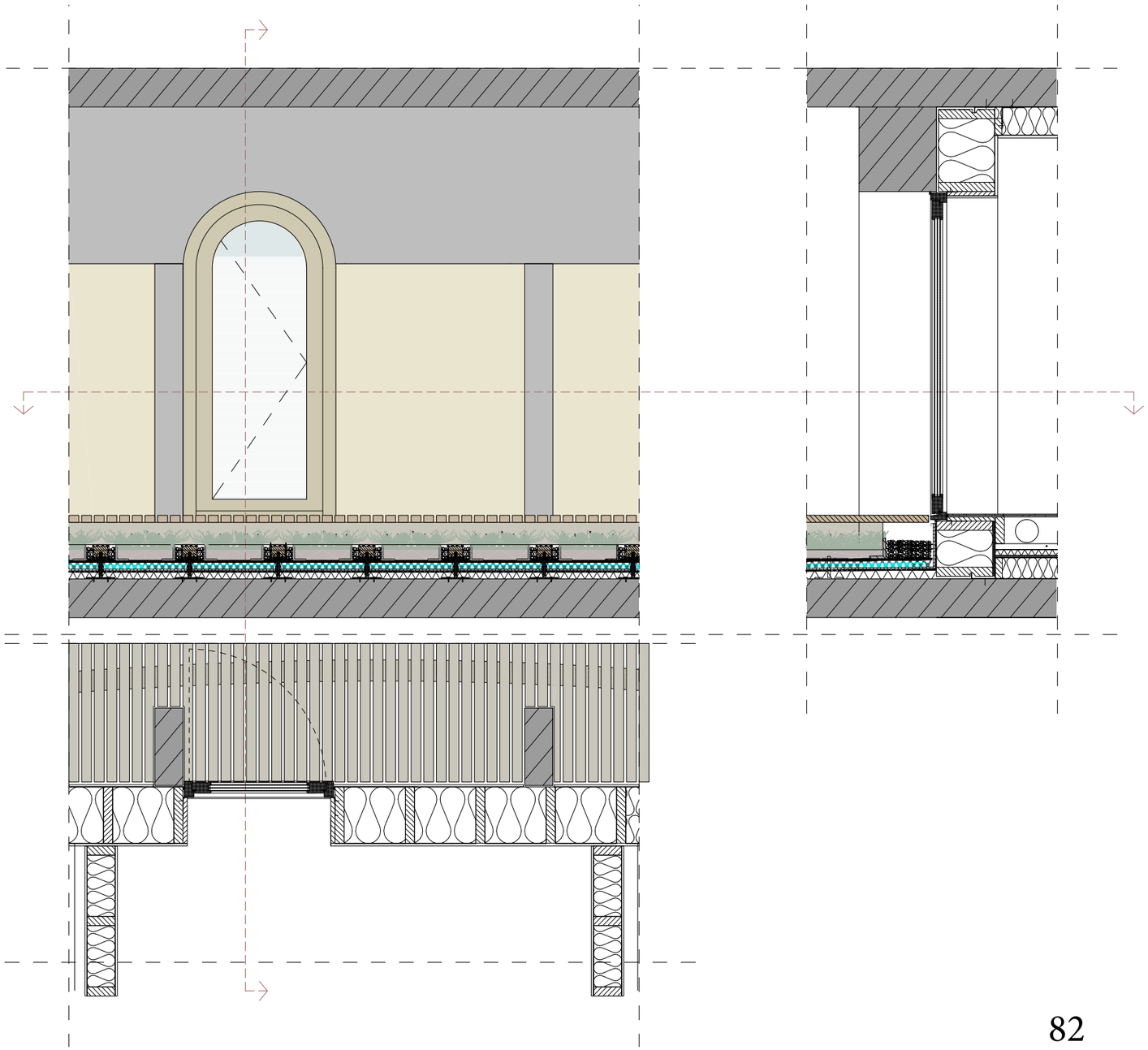
3. CLAY CLIMATIZED ZONES

FRAGMENT 2. CENTER



ENERGY AWARENESS

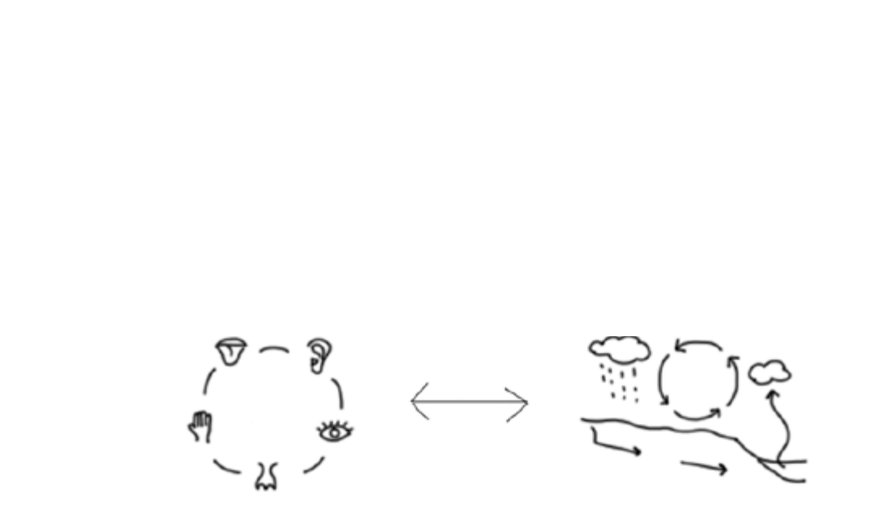


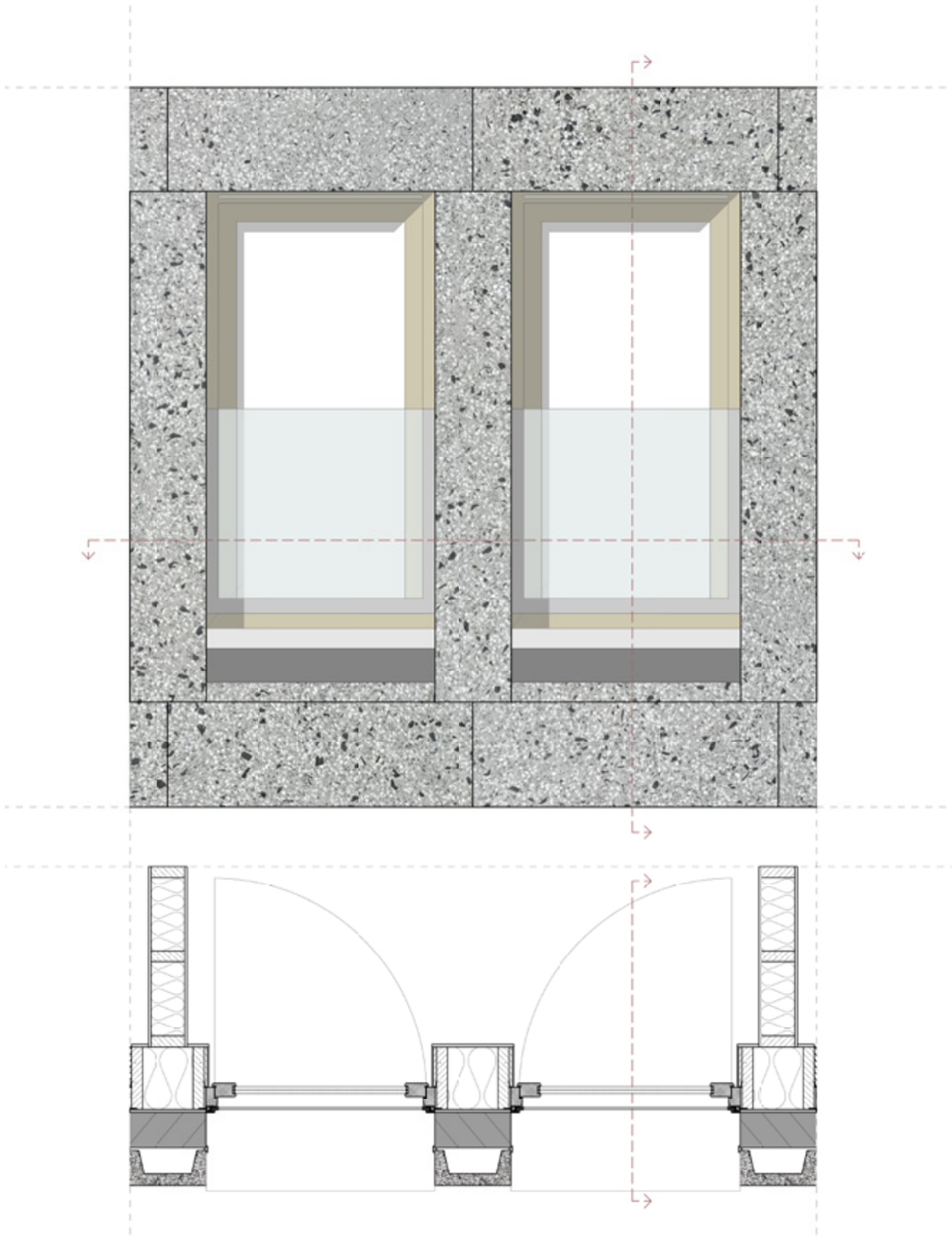


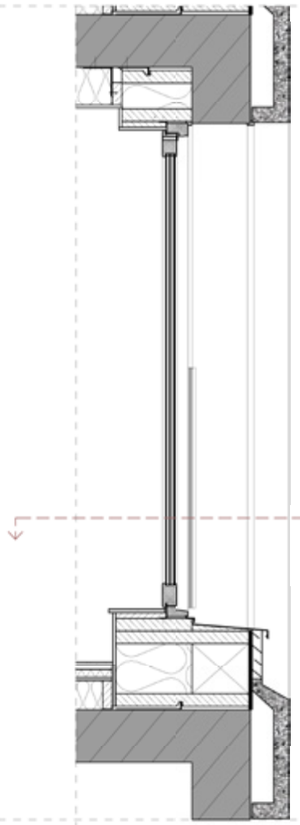
3. CLAY CLIMATIZED ZONES

FRAGMENT 3. NORTH

WATERMINT







INTERVENTIONS

0. EXISTING

1. OPEN STRUCTURE

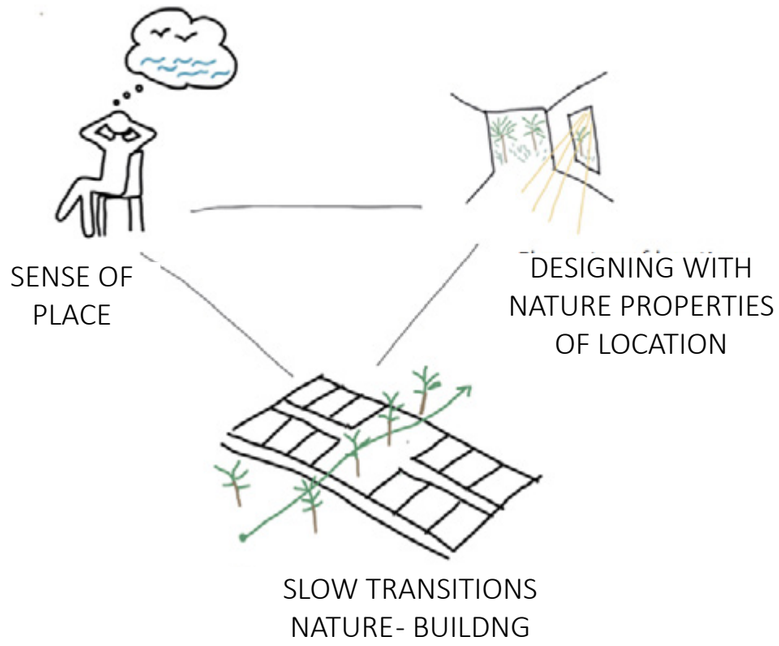
2. LANDSCAPE

3. CLAY CLIMATIZED ZONES

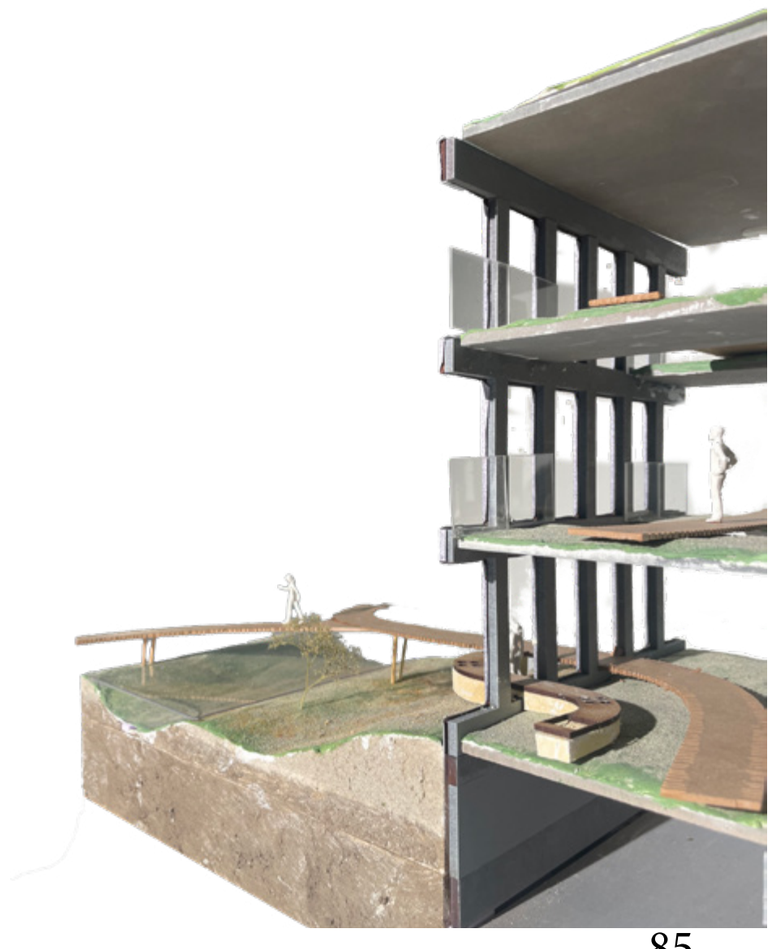
4. ROUTING

5. USE

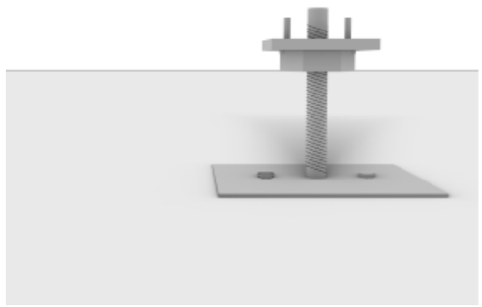
4. ROUTING - GENERIC

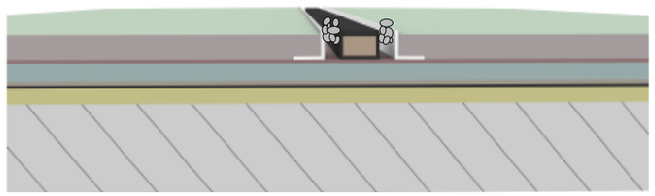


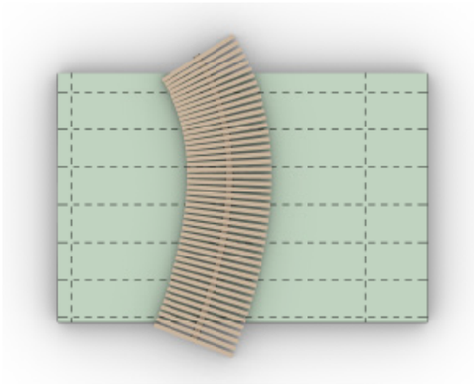
STRESS RELIEF

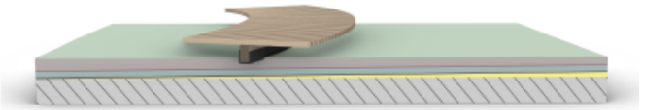


4. ROUTING - GENERIC
FREE FORM DECKING PATH



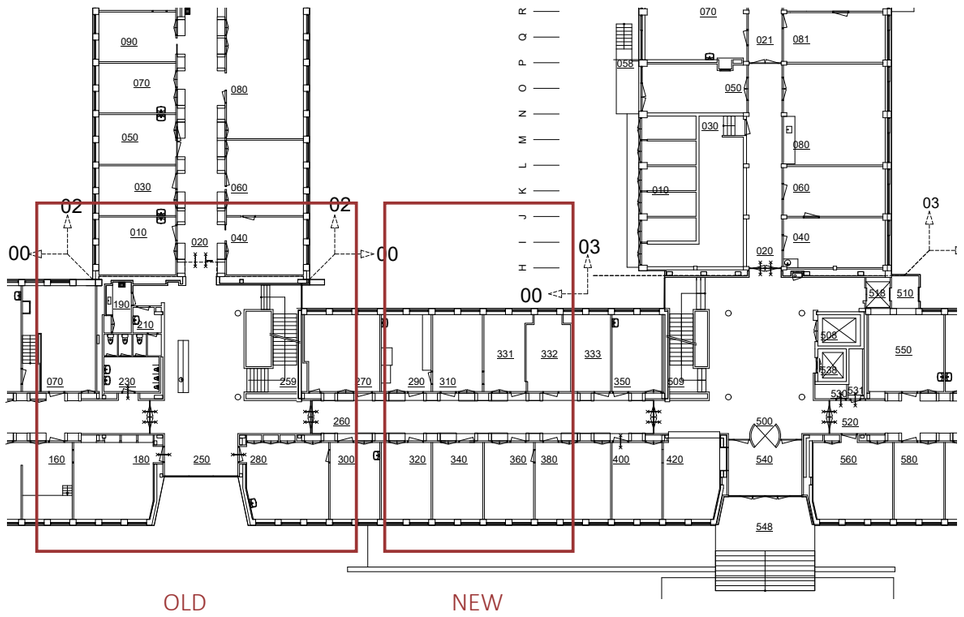




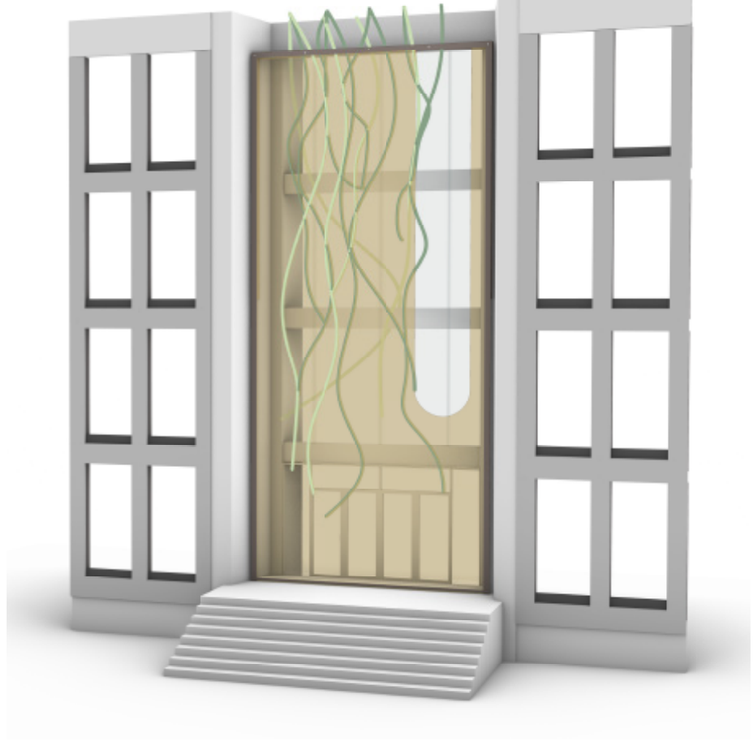


- STEEL
- GRASS
- SUBSTRATE
- FILTER
- WATER
- ROOT BARRIER
- BITUMEN
- ISOLATION
- CONCRETE

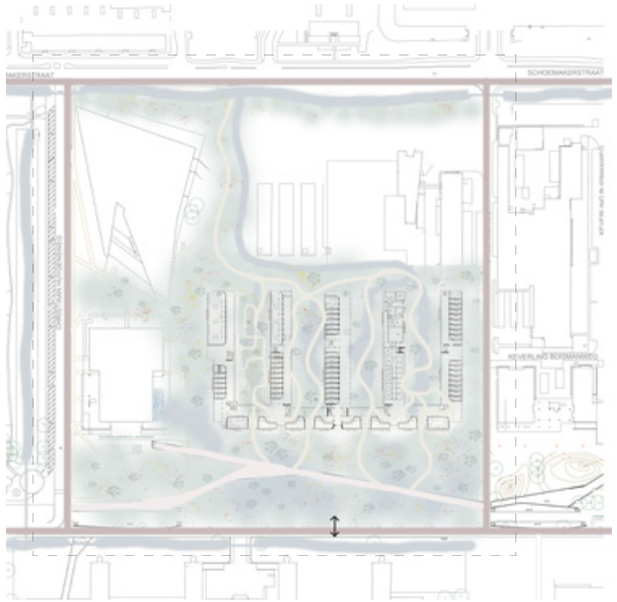
4. ROUTING - ENTRANCE

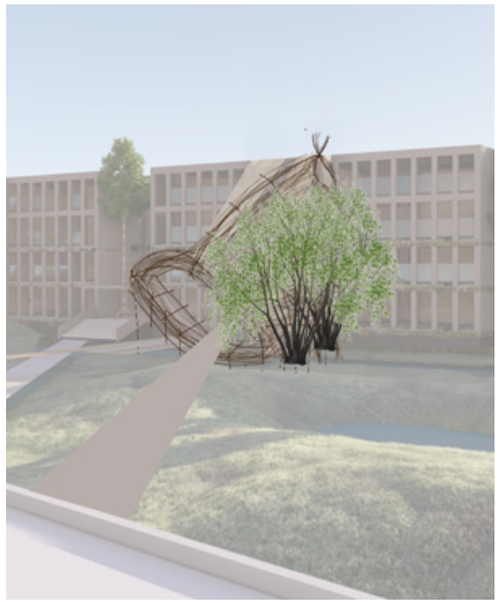


OLD NEW



4. ROUTING - ENTRANCE
WILLOW WEAVING





PATRICK DOUGHERTY

CONCEPT

0. EXISTING

1. OPEN STRUCTURE

2. LANDSCAPE

3. CLAY CLIMATIZED ZONES

4. ROUTING

5. USE

5. USE - GENERIC

A RANGE OF SPACES AND EXPERIENCES

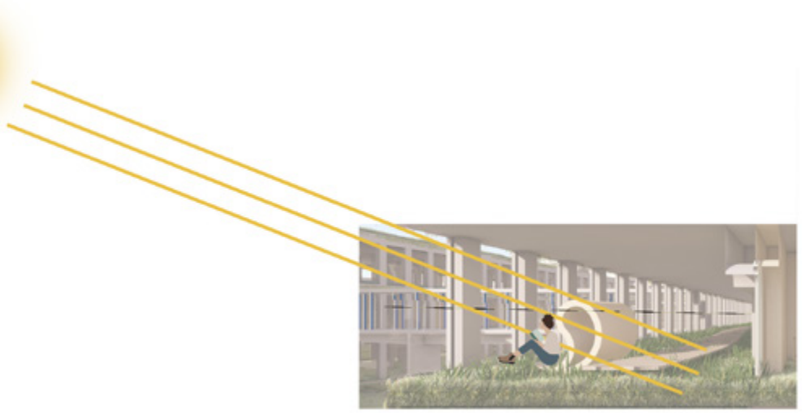
RETHINKING ACTIVITIES

STRESS RELIEF

FACTORS:
WIND
SUN
CLOTHING
MOVEMENT

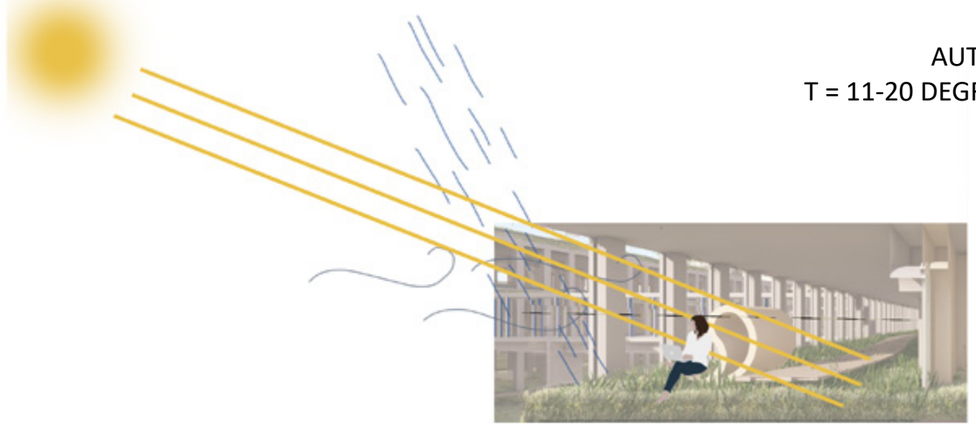
5. USE - GENERIC
CLIMATE COMFORT

LEARNING TO LIVE WITH THE WEATHER

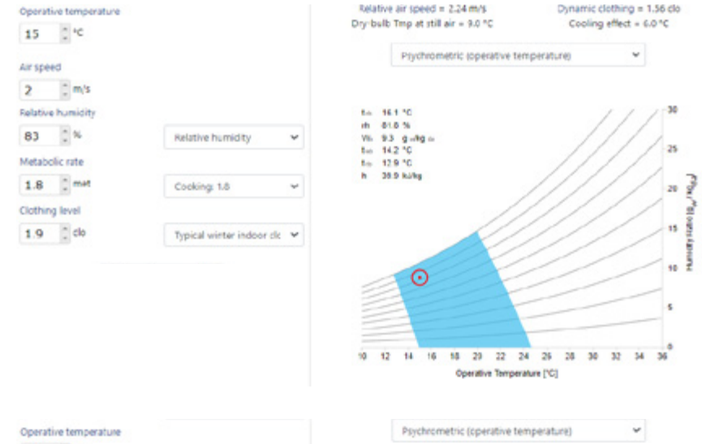


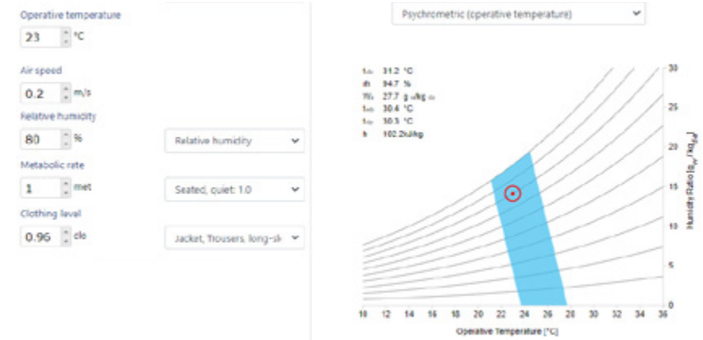
SPRING (MARCH 21)
T = 3-10 DEGREES, SOLAR HEIGHT: 38 DEGREES

SUMMER (JUNE 21)
T = 10-20 DEGREES, SOLAR HEIGHT: 61,5 DEGREES



AUTUMN (SEPTEMBER 23)
T = 11-20 DEGREES, SOLAR HEIGHT: 38 DEGREES

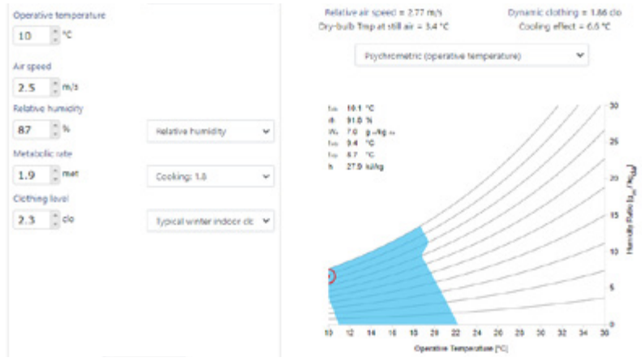




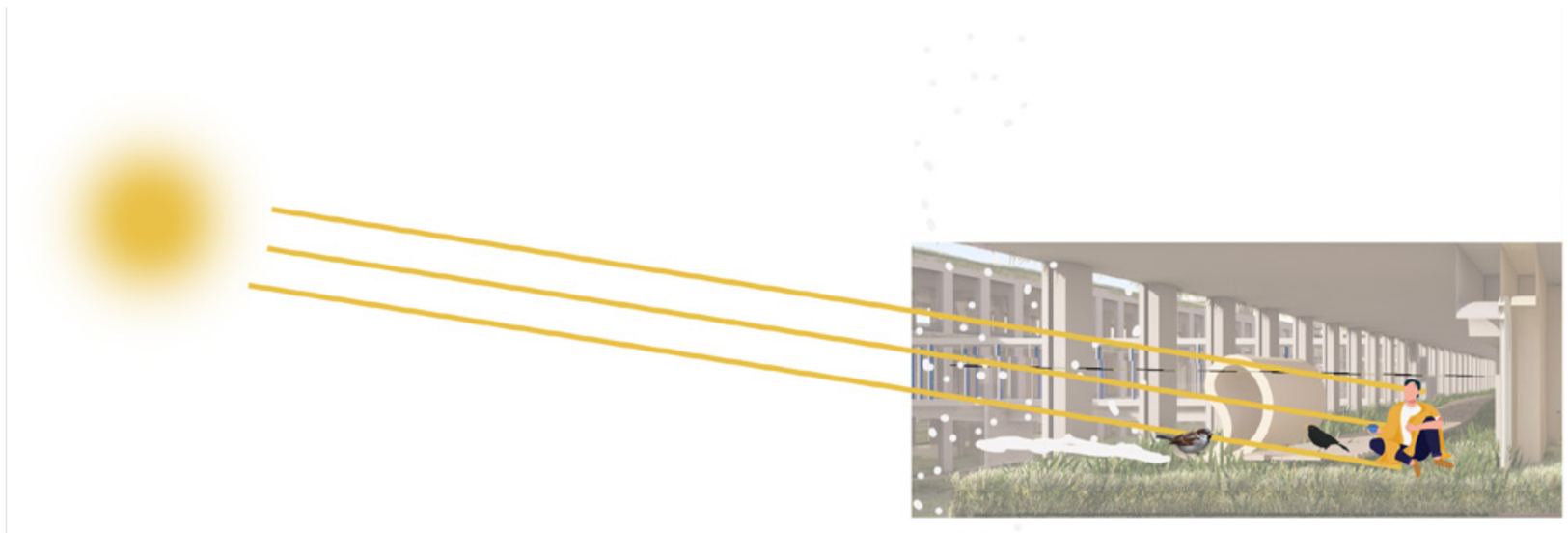
CBE THERMAL COMFORT TOOL, PMV METHOD

5. USE - GENERIC
CLIMATE COMFORT

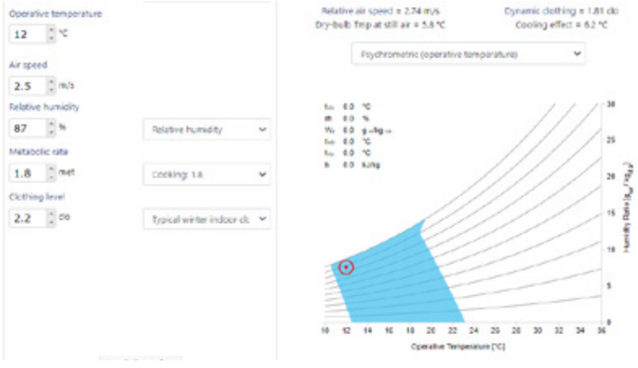
LEARNING TO LIVE WITH THE WEATHER



WINTER (DECEMBER 22)
T = 2-7 DEGREES, SOLAR HEIGHT: 14,5 DEGREES



Critical! Awareness of clothing level
and encourage people to exercise

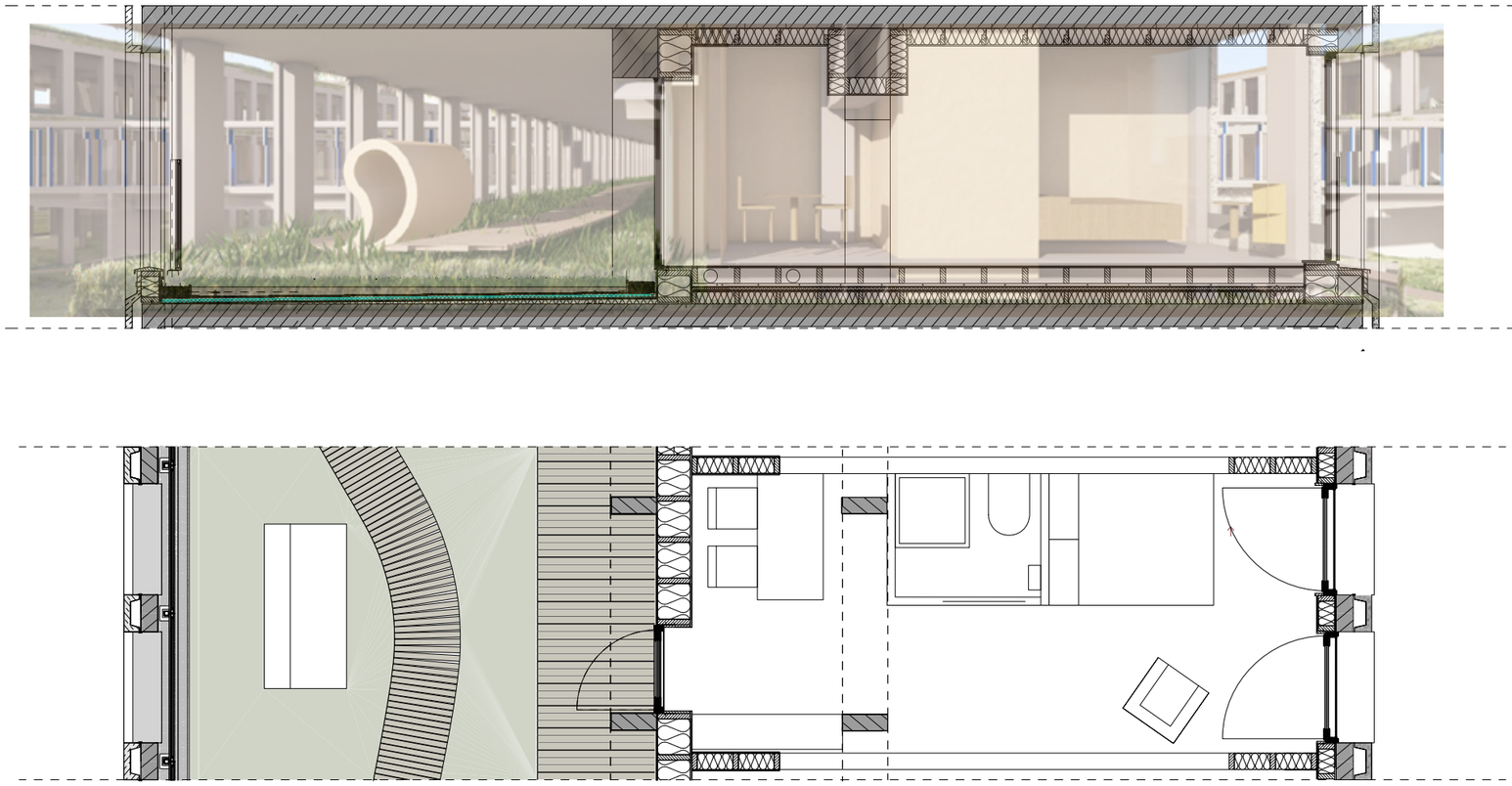


5. USE - GENERIC

LIVING - CHOOSE WHEN TO LIVE TOGETHER AND WHEN TO LIVE ALONE

RETHINKING ACTIVITIES

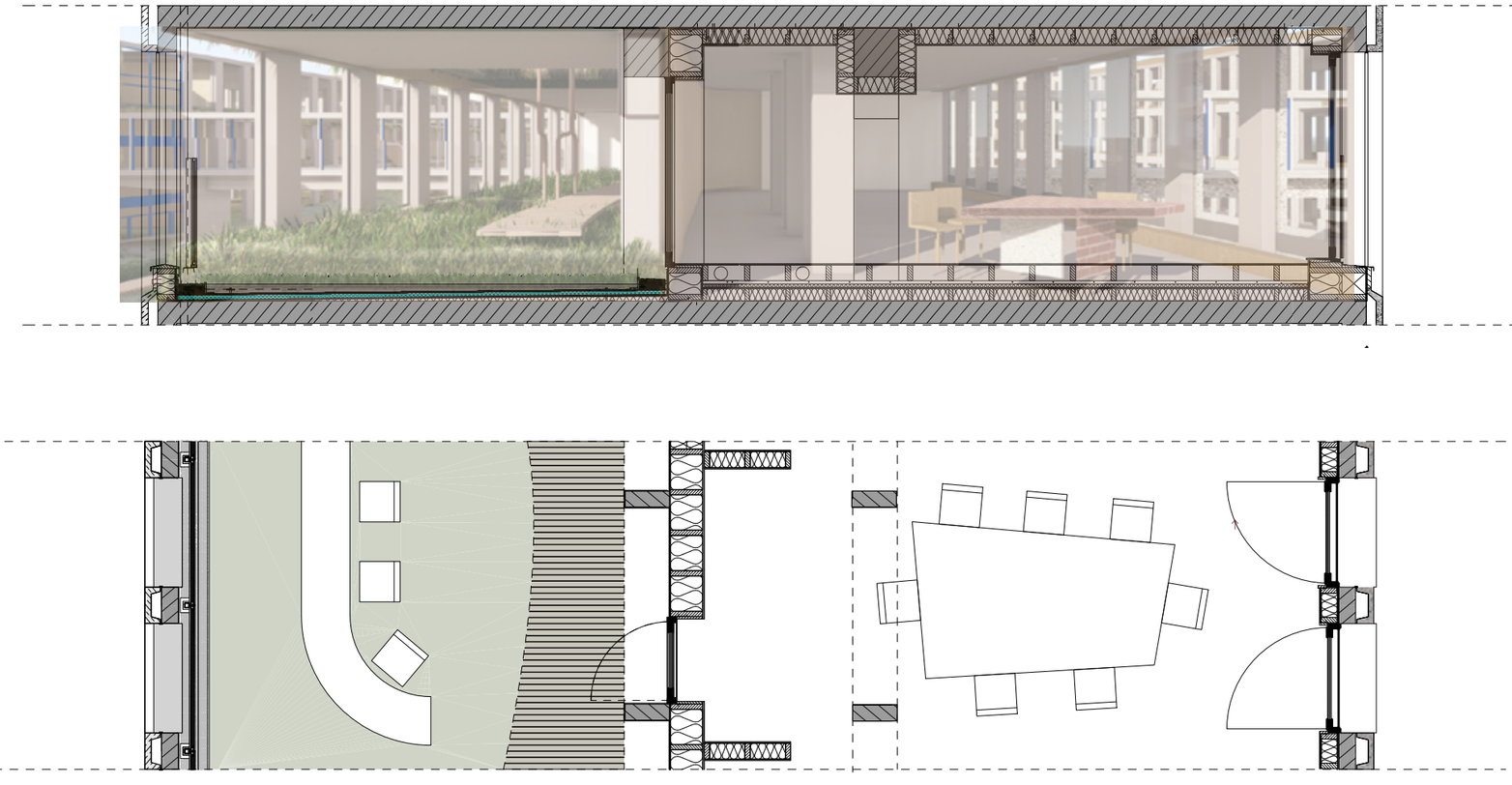
STRESS RELIEF



5. USE - GENERIC
STUDY - CHOOSE WHERE TO WORK

RETHINKING ACTIVITIES

STRESS RELIEF



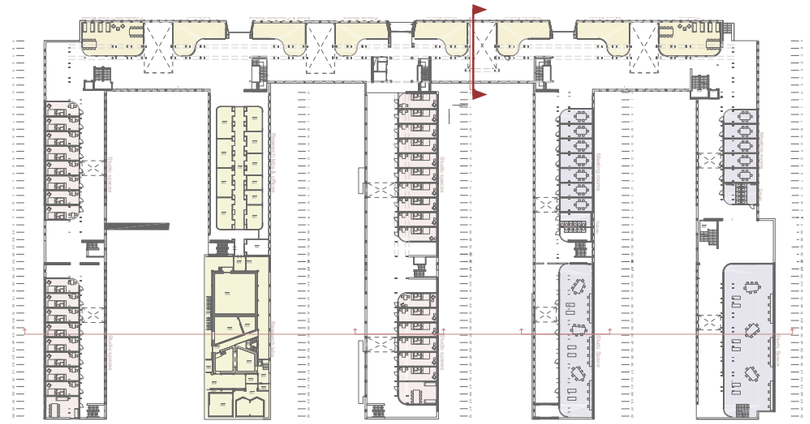
5. USE - ENTRANCE

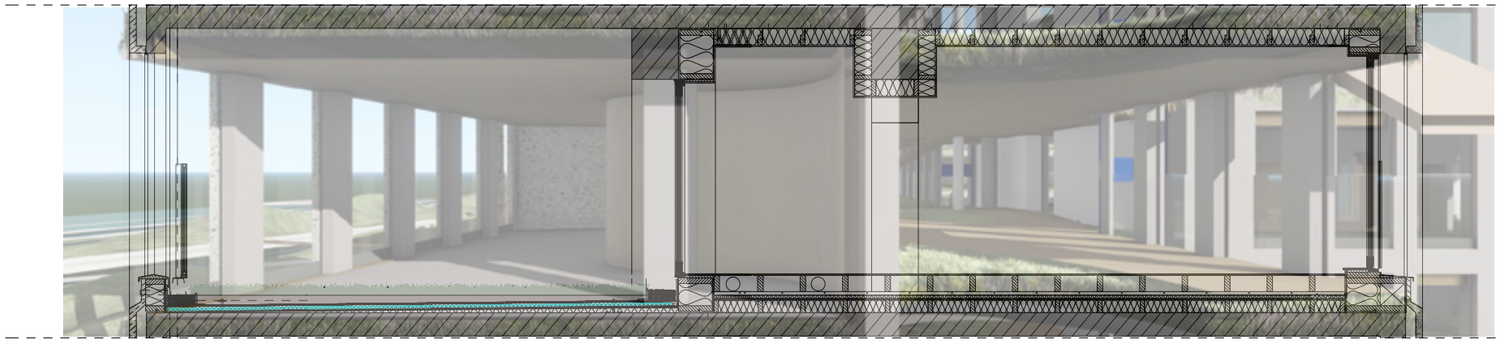
STRESS RELIEF

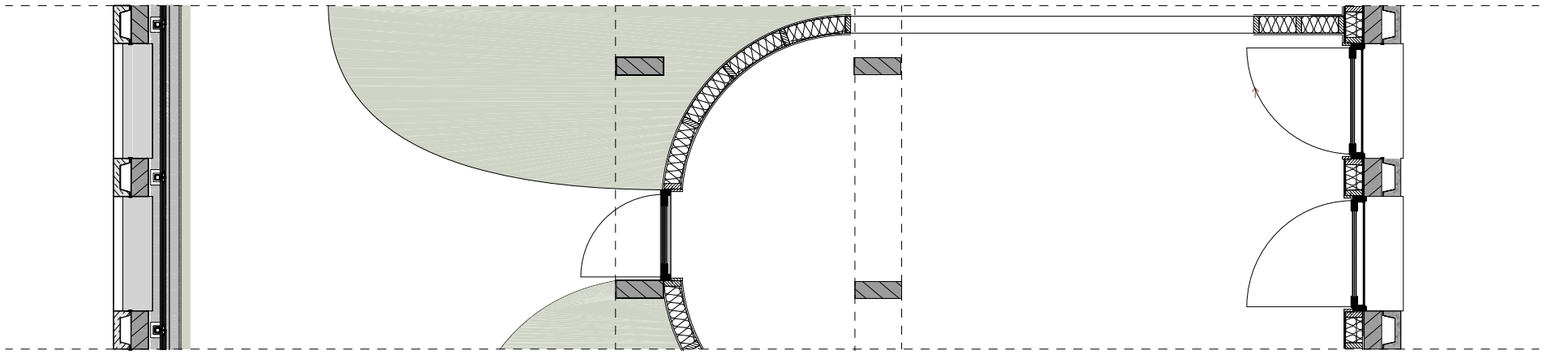
5. USE - ENTRANCE
STREET - FOR SPONTENEOUS MEETINGS

RETHINKING ACTIVITIES

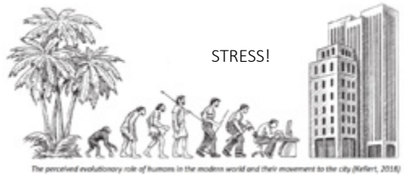
STRESS RELIEF





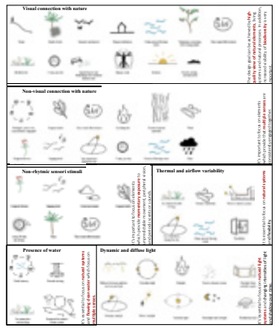


SUMMARY

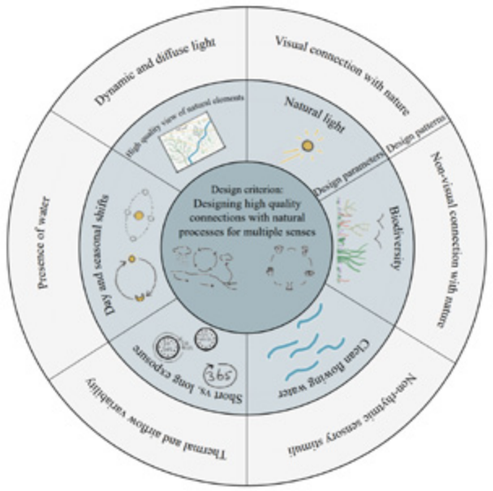


The perceived evolutionary role of humans in the modern world and their movement to the city (Kellert, 2018)

MENTAL HEALTH PROBLEMS
THROUGH ISOLATION FROM NATURE

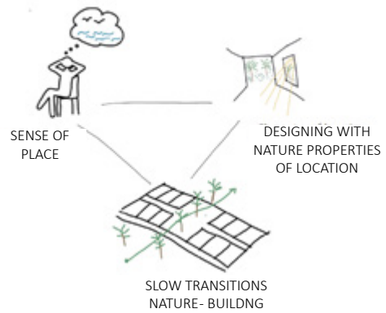


PSYCHOLOGICAL LITERATURE ->
DESIGN PARAMETERS FOR ARCHITECTS



TOOL FOR ARCHITECTS

RESEARCH



RETHINKING LANDSCAPE - INSIDE BOUNDARIES

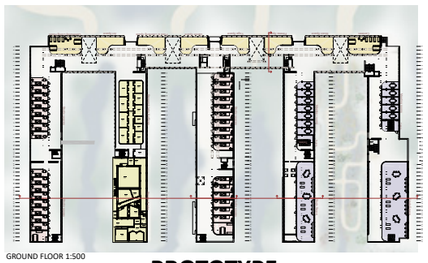
PERCEPTION

SUSTAINABILITY

MATERIALS

CLIMATE DESIGN

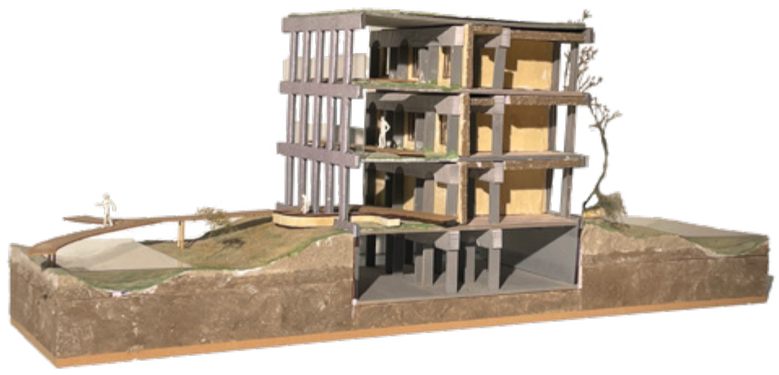
AMBITIONS



PROTOTYPE

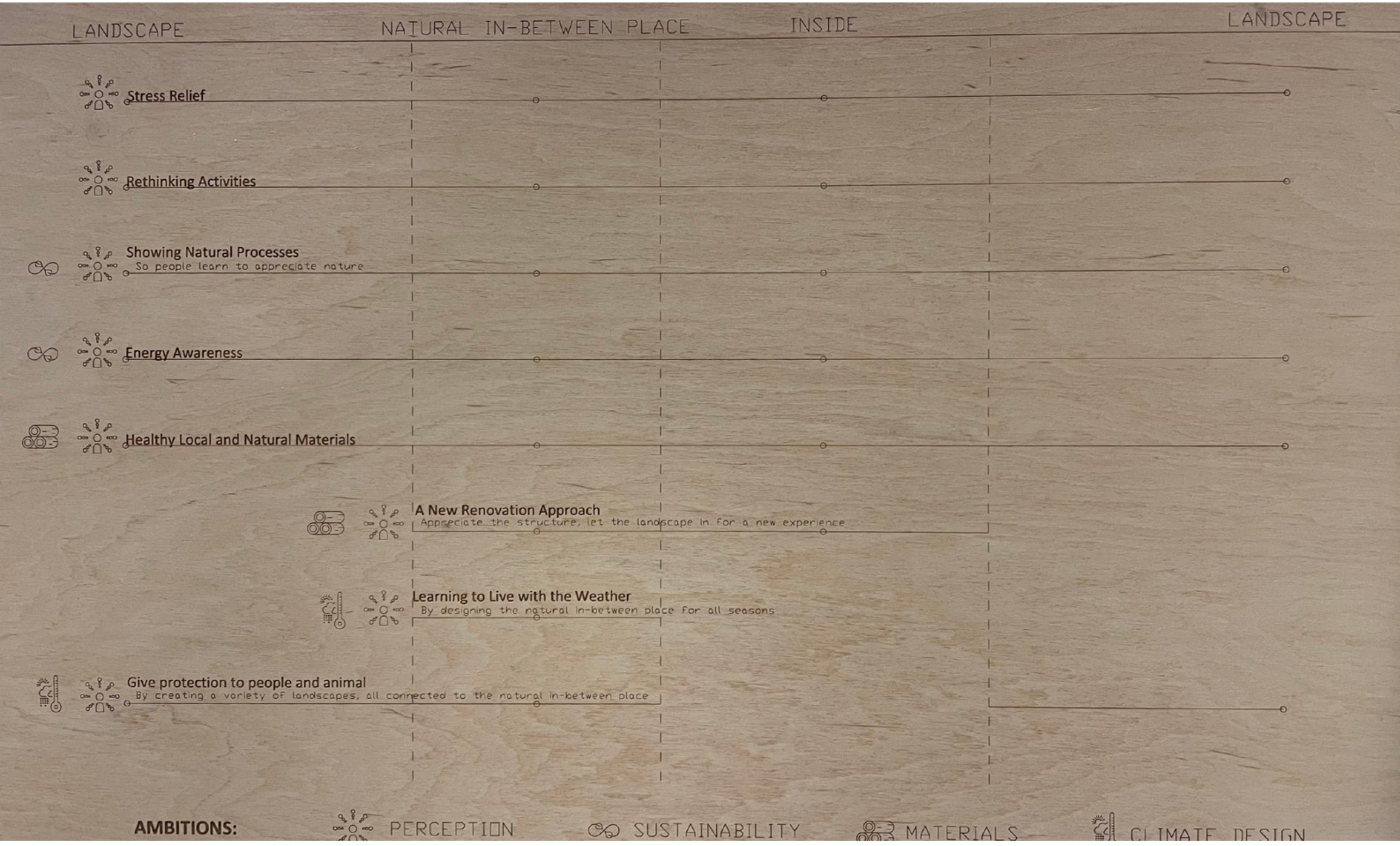
INTERVENTIONS

DESIGN

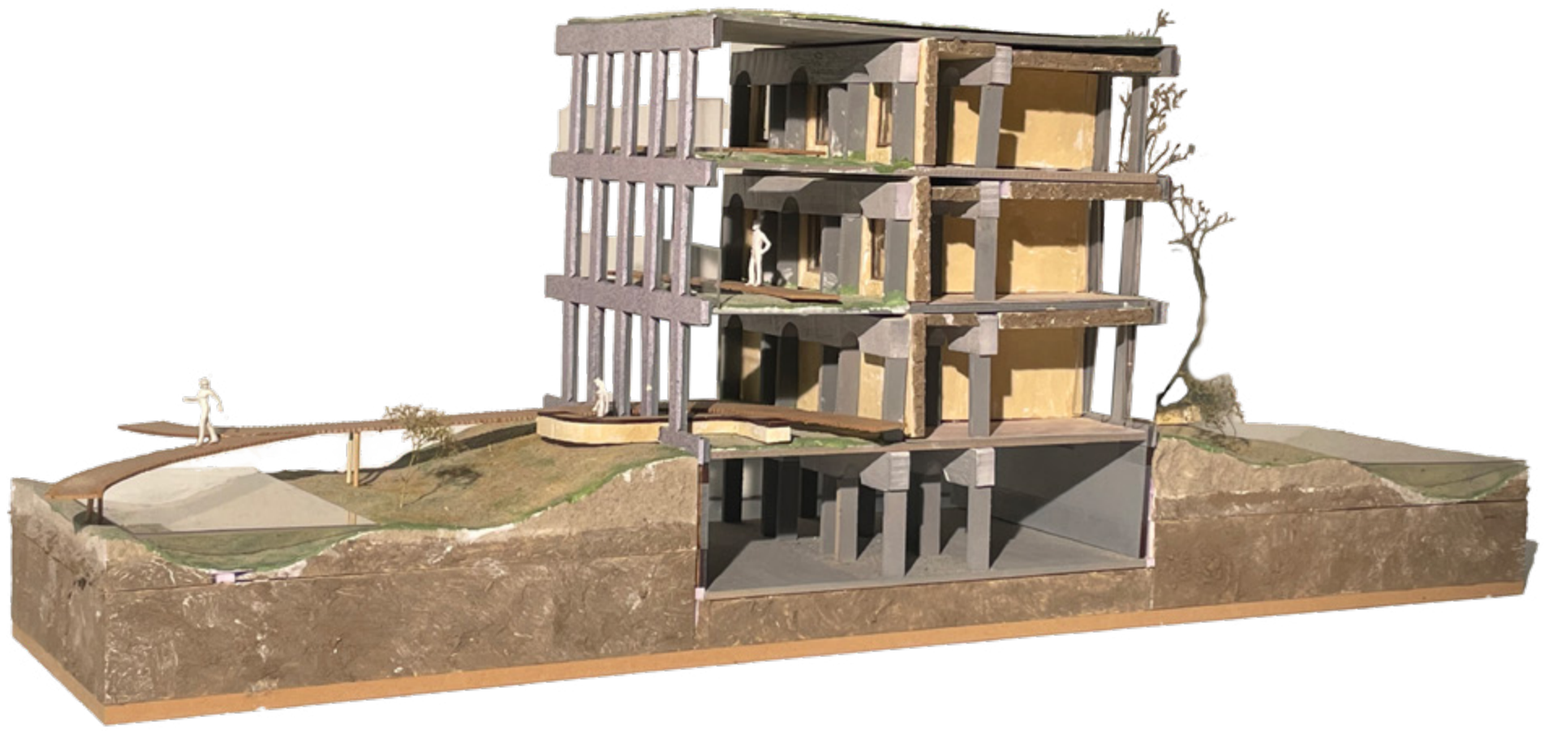


OUTCOME

AMBITION BOARD



AMBITION BOARD



AMBITION BOARD

LANDSCAPE

NATURAL IN-BETWEEN PLACE

INSIDE

LANDSCAPE

Stress Relief

Rethinking Activities

Showing Natural Processes

So people learn to appreciate nature

Energy Awareness

Healthy Local and Natural Materials

A New Renovation Approach

Appreciate the structure, let the landscape in for a new experience

Learning to Live with the Weather

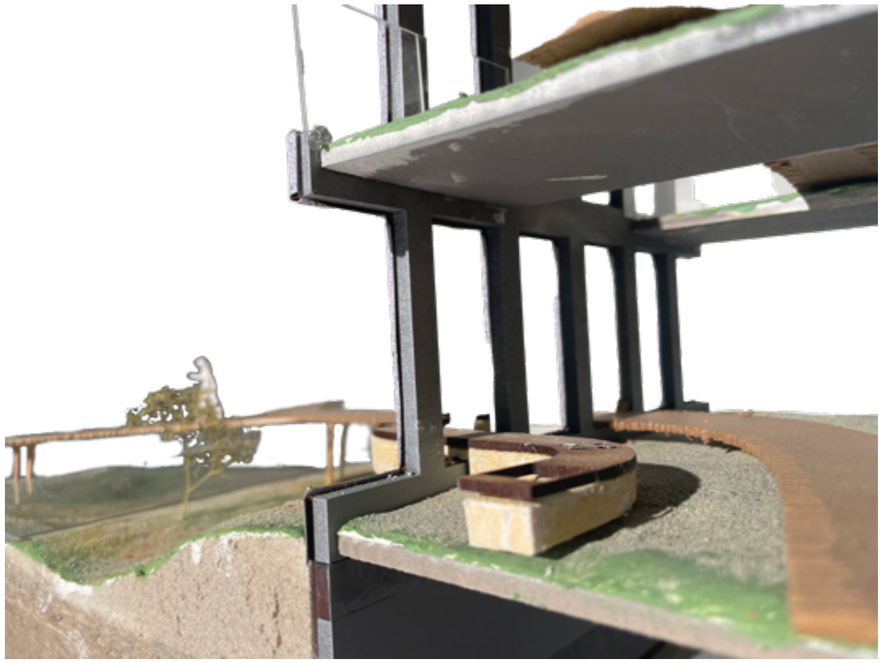
By designing the natural in-between place for all seasons

Give protection to people and animal

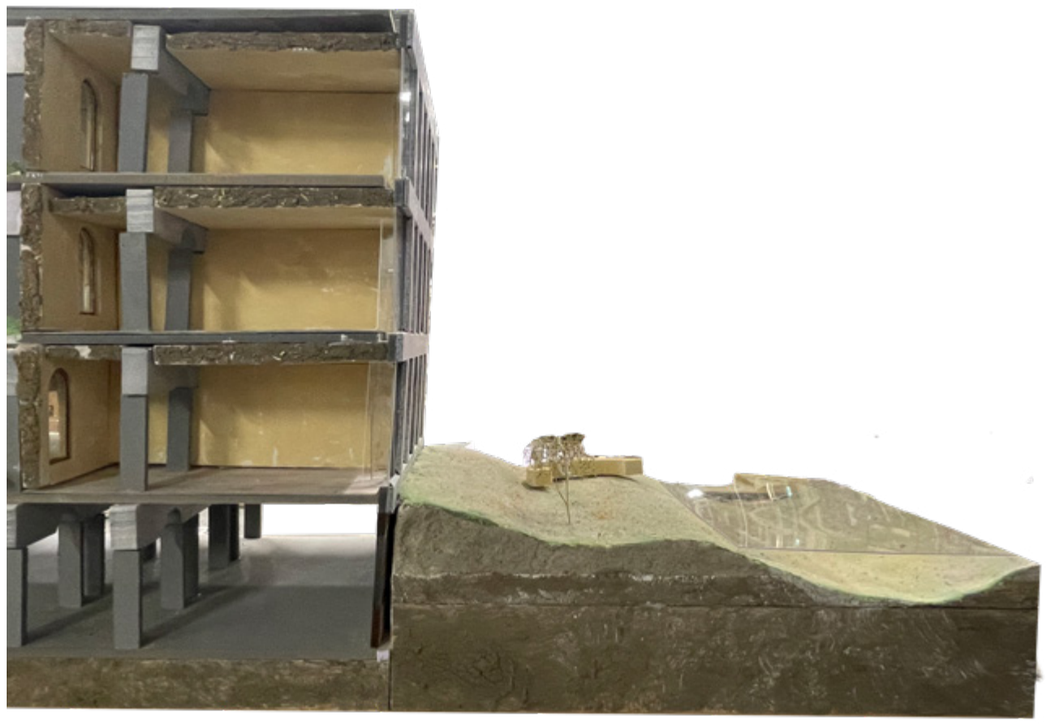
By creating a variety of landscapes, all connected to the natural in-between place

AMBITIONS: PERCEPTION SUSTAINABILITY MATERIALS CLIMATE DESIGN

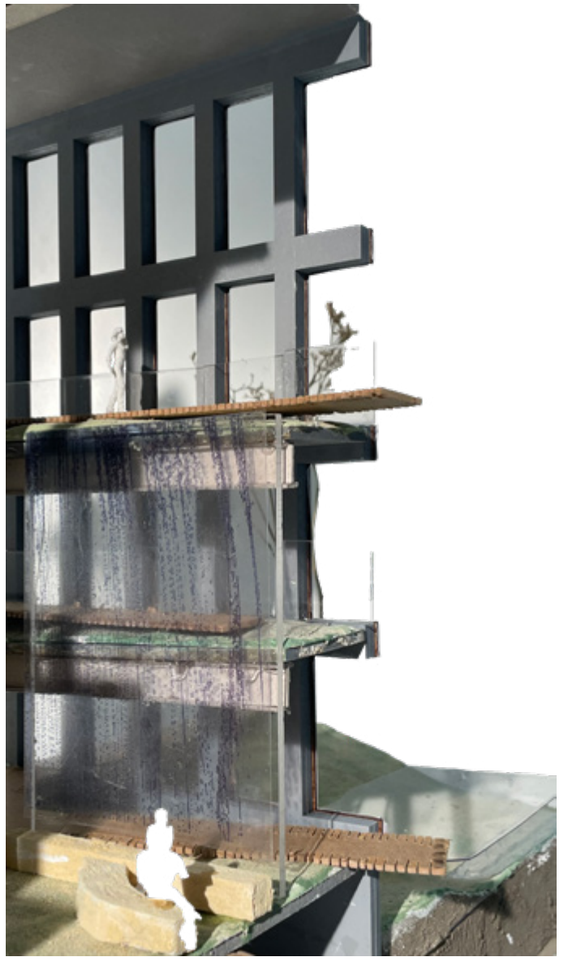
AMBITION BOARD
STRESS RELIEF



AMBITION BOARD
HEALTHY LOCAL AND NATURAL MATERIALS



AMBITION BOARD
SHOWING NATURAL PROCESSES



THANK YOU FOR LISTENING!

THE NATURAL IN-BETWEEN FOR STRESS RELIEF THROUGH BIOPHILIC DESIGN