DESIGN CHANGING TIME

Exploring design language for embodied
time experience on WageningenUR campus

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Master Thesis Landscape Architecture, Wageningen University

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ABSTRACT

This design research focuses on time, which is a dimension equally important and perhaps more aesthetically relevant as space in the description of reality. My interest in the role of landscape architecture in transformation processes lead to the exploration of positioning time at the forefront when designing. Embodied time is distinct from clock time and expressed in this paper through rhythm and motion. Three knowledge sources were investigated: Unified Field Theory, Representation and Phenomenology. The main thesis statement is that design changes time, as much as it is changed by time. The Grounded Theory Research method was adopted following the premises that understanding of time is important and change in time interpretation changes design behavior. Since time is a metaphor, this thesis is an exploration of design language that would enrich embodied time experience. Research through Designing was used to generate language that would translate the theory into actual design application. The WageningenUR campus was used as test site. By experimenting with diverse media, several approaches to design were explored, recognizing the impact of representation on design outcome. The results of the study show that time awareness can be framed by design: using proper representation technique with a corresponding aesthetic intention. In this case, sense of orientation and comfort, awareness of surrounding stimuli (the often ignored underlying natural rhythms and 'e-motion') and potential individual action were considered for experience of time while walking. Embodied time experience ignores line differentiation. Thus, this study recommends representing and studying time awareness through pattern language of place instead of form language of object.

STATEMENTS

Initial statements to position this work and mark its relevance:

1. Understanding of time is important.

2. Embodied time does not follow clock time.

Thesis statements:

3. Time awareness can be framed by design:

- by using proper representation technique (dynamic, interactive, multisensory)
- with a corresponding aesthetic intention (vivid, feel connected, alive)
- It requires 'living landscape', responsive, interactive and 'adaptive/ open design'

4. Design with time awareness leads to 'engaging aesthetics'.

Such a design changes time, it is not only changed by time.

GUIDE TO THE READER

The first chapter, **Introduction**, begins with the explanation of the starting point for this research and the main intention (*1. Choice of topic*). Then diverse definitions and views of time are presented, highlighting the ones relevant for this paper (*2. Time is a metaphor*). For the research background examples of time perception and their impact in recent history are enumerated (*3. Understanding of time is important*). This is followed by the introduction of the general problem background and the three main sources for time aware design (*4. Embodied time does not follow clock time*). The relevance of this topic is further emphasized (*5. Significance of the topic*) and specific research questions for time aware design are formulated (*6. Research questions*).

In the second chapter on the **Theoretical research**, the 'lens' for framing time in this thesis is composed. Following the structure of grounded theory research (*7. Grounded design research*) the diverse *codes* selected through literature research are grouped in six *concepts* which further relate to two main *categories* proposing to explore time as tension and ease through rhythm and motion, as these are concepts that relate to design language and bodily experience. This part presents an overview of existing discourse and practice in landscape architecture and related fields concerning time, the world view specific for this thesis as well as observations from analysis of the case study area. A further section is dedicated to the research on representation and time (*8. Research on representation*).

The third chapter is elaborating on the process and results of (constructivist) **Research through designing**. *(9.) Naming aspects specific for this thesis*, created a first bridge from theory to design. Then, specifying qualities of these three rhythms and three walking modes made the bridge to design translation: developing the three design strategies each further described by three *(10.) design language* elements specific to this topic and thesis. For this part as well as for the presentation of results, diverse graphic representations were tested and improved *(11. Representation and own design process)*. These are the actual methods used for the research through designing.

The forth chapter presents the **results** of the thesis *(12. Overall and detail design proposals)* to experience scale *(13. Potential experience of moments along the path).*

The last chapter includes the (14.) **conclusions**, (15.) **evaluation** and (16.) **discussion**; looking back at the process and outcomes, assessing and considering future implications.

GLOSSARY

Abductive reasoning is active in creative acts; for instance, in formulating a hypothesis. Charles Sanders Peirce explained: 'The result of deductive reasoning is a fact that is *definitely* true if the premises are true. The result of induction is a *principle* that is *probably* true. The result of abduction is a case that *may* be true' (Johansson, 2004, p.9(38)).

Aesthetic, is derived from the Greek word *aesthesis*, meaning *feeling* or *sensation*, and the word *aisthestai* meaning *to perceive* (Wunderlich, 2010,p.47).

Human agency is 'the temporally constructed engagement by actors of different structural environments – the temporal-relational contexts of action – which, through the interplay of habit, imagination, and judgement, both reproduces and transforms those structures in interactive response to the problems posed by changing historical situations."… the capacity for imaginative distancing, as well as for communicative evaluation, in relation to habitual patterns of social engagement that drives the development of the reflective intelligence, that is, the capacity of actors to critically shape their own responsiveness to problematic situations' (Emirbayer and Mische 1998,p.970-971).

A **circadian rhythm** is any biological process that displays an endogenous, entrainable oscillation of about 24 hours. These rhythms are driven by a circadian clock, and have been widely observed in plants, animals, fungi and cyanobacteria. The term *circadian* comes from the Latin *circa*, meaning "around" (or "approximately"), and *diem* or *dies*, meaning "day". Although circadian rhythms are endogenous ("built-in", self-sustained), they are adjusted (entrained) to the local environment by external cues called *zeitgebers*, commonly the most important of which is daylight. Other factors - such as ambient temperature, meal times, stress and exercise - can influence the timing as well. The biological clock affects the daily rhythm of many physiological processes (Wikipedia).

Complexity = intricacy
Complex = composite; made up of various interconnected parts; (AHD, 2009)

'designing' is used as the 'process of giving form to objects or space on diverse levels of scale' and **'design'** refers to 'the results of a design process'. (Lenzholzer, Duchhart et al., 2013, p.121).

Diversity = difference, variety, heterogeneity; the state or quality of being different or varied (AHD, 2009)

Engagement is an action stimulated by knowledge, experience, emotion, understanding, wisdom.

Experience: 'Tuan reads 'experience' as a compound of both feelings (registering subjective states) and thought (reporting on objective reality), the latter being two related ways of knowing' (1977, p. 10; Rodaway, 1994, p. 5) (Wunderlich, 2008, p.128).

Grounded theory is a general methodology for developing theory that is grounded in data systematically gathered and analysed. Theory evolves during actual research, and it does this through continuous interplay between analysis and data collection; 'constant comparative method' (Strauss and Corbin, 1994).

Phenomenology is a philosophy or method of inquiry. 'Phenomenology involves the understanding and description of things as they are experienced by a subject. It is about the relationship between 'Being and Being-in-the-world' (Tilley, 1994, p.12). 'One of phenomenology's great strengths is seeking out what is obvious but unquestioned and thereby questioning it'(Seamon and Sowers, 2008, p.43).

To **represent:** 1.To stand for, 2. To depict in art, 3. To present clearly to the mind,(The American Heritage Dictionary, 2nd ed.); 4. To bring clearly before the mind, 5. To serve as a sign and symbol of (Webster's 3rd International Dictionary) (from prof.dr. Koh course 'Reflections on landscape architecture practice, 2012).

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Chapter 1.

INTRODUCTION

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1. CHOICE OF TOPIC

This thesis is a follow up on all the knowledge and insight gained, studying at Wageningen University and outside of it (fig. 1-5). My awareness of the potentials and complexity of our profession deepened during these years: Starting with the understanding about the changing role of landscape architects "from performers to enablers and to composers allowing and even expecting spontaneous improvisation' (Koh and Beck , 2006, p. 14-20) and continuing with prof. Koh's lecture on field aesthetics, a lecture that radically changed my view on the potential of landscape architecture and it's comprehensiveness.

Then through own embodied experience (meditation, dance, drawing) I understood what was first an intellectual discovery: butoh dancing as a dance of transformation accepts and explores impermanence, unpredictably, emotion, sensations and connectedness).

Time is a key word in a landscape architect's role in relation to such processes. Through the research done for this thesis (reading, drawing, designing, writing, feeling and experiencing) it can be concluded that design changes time experience just as time changes design. Time perception is in strong interrelation with emotion and space. Design with time awareness alters the music of the place, vary the movement and impacts one's emotions. One cannot predict what emotions will arise, still one can encourage movements on diverse rhythms with complex and dynamic intervals. So landscape design provides ways to experience time and allows people to occasionally slow down or accelerate its pace. I am trying to balance the prevalent impression that we are ruled by clock time, running on a straight line towards an end. By exploring design language for embodied time experience, with the WageningenUR campus as test site, a shift in perspective of how a campus should perform is proposed: 'Feeling' and 'sensing' are encouraged along with thinking. By diverting form following linear time, design that relates to nature's rhythms enables discovery of each one's creativity.

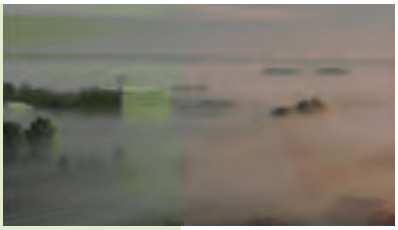

fig.1 Field aesthetics

fig.2 Embodied understanding

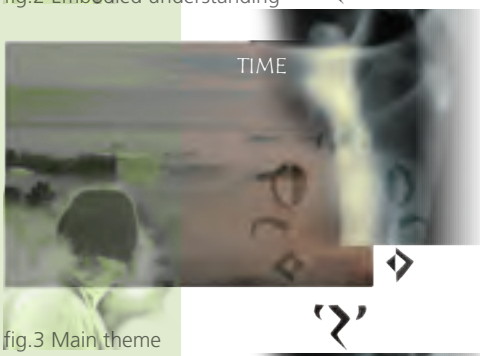

fig.3 Main theme

fig.4 Main statement

fig.5 Design research exploration

1.2. TIME IS A METAPHOR

'Clocks say what time it is but not what time actually is.' (MacLowry, 2011)

'Time is the thing that everyone knows intimately until you ask them to tell you about it.' David Albert (MacLowry, 2011).

The English word *time* originated from Old English *tima* – limited space of time, which is also related to *tid* (Old English for *tide*) relating to division of time. The Latin word for time, *tempus*, originally meant "what is stretched, stretching". Now time indicates: "extent" and "point"; "hour"; "occasion"; "the right time"; "leisure" (OED).

The definition of *time* in the *Lexicon of Garden- and landscape design* emphasizes its dynamic, its rhythm, flow; the internal power in relation to movement; and evolution. (Vroom and Ettema, 2010).

fig.6. Time

A more accurate and sensitive definition and understanding of time is presented in Lakoff and Johnson's *Philosophy in the flesh:*

> Time is a metaphor not to be taken literally. It 'is something created via our bodies and brains [note that both experience and conceptualisation are embodied], yet it structures our real experience and allows us an important understanding of our world, its physics, and its history' (Lakoff and Johnson, 1999, p.167) (fig.6).

Lakoff and Johnson further elaborate on our conceptualization of time through **metonymy and metaphor:**

Our true experience of time is always influenced by our real experience of the abstract domain of events. Therefore, time can be defined by **metonymy**, with "properties of our concept of time [as] consequences of properties of events:
- time is directional and irreversible because events are directional and irreversible; events cannot "unhappen"
- time is continuous because we experience events as continuous
- time is segmentable because periodic events have beginnings and ends
- time can be measured because iterations of events can be counted" (ibid, p.138).

Time is also grasped through **metaphor** of motion in space. Although we have no organ to register global time, the visual system of our brain has an area dedicated to the detection of motion. However, such interpretation of motion is different than the change of location in time used in physics. "Time metaphors are grounded in literal motion-situations, in which the time and motion domains come together in experience" (Lakoff and Johnson, 1999, p.151). We associate time defining events (our bodily rhythms, the movement of clocks…) with motion, either by us or by others.

One common interpretation is **The Moving Time Metaphor**, 'where the observer is stationary and time is moving' (Lakoff and Johnson, 1999, p.140). In this case, the observer's location serves as a reference point for the *preceding* and *following*. A particular illustration is **The Time-Substance Variation** where *the flow of time* appears as a linear moving substance (e.g. a river). A substance can be measured (there can be a lot or a little of it- a lot of time or a little time), so mapping amounts of substance can represent duration of time.

In **The Moving Observer, or Time's Landscape metaphor**, 'the observer is moving and time is stationary' (Lakoff and Johnson, 1999, p.145). "In the moving observer metaphor, the observer is the figure and time is the ground -the times are locations that are fixed and the observer moves with respect to them"(ibid, p.149). Time is conceptualized as a path on the ground that can be measured (long, short, bounded). This metaphor is also central to the cultural tradition of establishing histories and calendars-time lines on which events are spread out. It allows us to visualize change with respect to time as change with respect to space.

These two interpretations are inconsistent mappings, 'they are *figure-ground reversals* of one another', having both as a source domain every day "motion-situations"(Lakoff and Johnson, 1999, p.149, 155). Therefore, it is important to distinguish between literal actions and conceptual systems. Common concepts that we use every day and in terms of which we state our truths cannot be taken as literally fitting an objective reality. Thus, **The Time is a Resource Metaphor,** further particularised as **The Time Is Money Metaphor** (the value of time is represented by money) is an example of a metaphor taken literally. Consequently, by observing cultures in which time is not conceptualized and institutionalized we should remember that time is not intrinsically resource like.

From another point of view, talking about time, the philosopher **Alan Watts** argues that 'time is a social construction', while 'rhythm is (Watts, uploaded 2011). According to him, in nature events' beginning and end cannot be established precisely as there are no separate events, yet we can perceive rhythms. That is, the relationship between occurrences is mutual and not causal; they are parts of the same event. Our society constructed time (clock time) in order for us to synchronize our actions. We started to measure time following a predictable, consistent motion of the earth around the sun, later on replaced by the clock.

Arida (Arida, 2002, p.76) talking about dynamic contextualism states that: 'Space and time are relative, not absolute, realms. They affect and are affected by observation and action. Space and time are interconnected into a relativistic field called space-time. Time itself as a dimension is as important as space in the description of reality. The concept of contextualism is at work in the space-time continuum, meaning any fixed set variables and rules will inevitably lose its certainty as time passes and locations change' (ibid).

1.3. UNDERSTANDING OF TIME IS IMPORTANT

"Time talks. It speaks more plainly than words. [...] Because it is manipulated less consciously, it is subject to less distortion than the spoken language. It can shout the truth where words lie." (Hall,1959, p.1)

A person's conception of time impacts its actions (Lynch, 1976) (fig.7). This can be traced back through history, where the ways to interpret time in art, philosophy and science, shaped our assumptions about and behaviour towards the world:

fig.7. Observer-observed relation

Perspective view brought about a major 'reordering of time as well as of space' (fig.8). Since Renaissance, time in Europe switched from repetitious and cyclical character to a linear, directional one. 'The image of time as swinging pendulum or as circular orbit ceded to the image of time as arrow' (Tuan, 1977, p.122-3) (fig.9-11). By looking at the world through a mathematical grid 'reality is translated from a living temporal process into a set of fixed numerical relations'. 'Linear-perspective vision shifts the artist from the participatory centre to a position of external spectator' with 'disembodied, de-temporalised and stripped of feelings and emotions – atemporal viewpoint and neutral, impartial gaze' (Adam, 1998, p.37-38.

In the 17th century following Descartes mind over body stance, Newton introduces the "absolute time" defined as an uniform flow in absolute simultaneity, disconnected from sense perception, atemporal, unaffected by the transformations it describes. Absolute time and space were separated from environment and context (Adam, 1998, p.40).

This separation was further deepened during the industrial age. The colonial principle was extended from space to time:
- The meaning of distance as experienced through embodied movement through space got distorted by the development in electric communication. The near future fused with the present.
- with electricity 'the night could be colonized' : no longer the realm of darkness, mystery and fear, it became instead an extension to the time of work and pleasure (see Melbin, 1987) (Adam, 1998, p.57).
- Even memory and time got separated when substituting our time-registering with mechanical wristwatches, and our memory with books, tapes and laser disks (Arida, 2002).

By the end of the eighteenth century 'an orientation towards task was replaced by orientation towards time and the more regular, less humane, less natural domain of clock time'. (Thrift, 2001, p.14). Still, an old system of time based on religious prescriptions continued alongside these new systems of

time-discipline and even influenced them (Thrift, 2001, p.15).

In the 19th century positivistic thinking rejected past and history and emphasized ration and order in nature and superiority of human. Moreover, Modernism conceptualized "architecture as space", preferring intellect and vision over the bodily experience. All culminated with the industrial revolution and "the transformation of time into an economic currency" (Arida, 2002, p.115). "Time becomes a quantifiable resource that is open to manipulation, management and control, and subject to commodification, allocation, use and abuse" (Adam, 1998, p.11). Furthermore, new technologies evolved to alter time for countless successor generations of humans and other species as in the case of use of synthetic chemicals, nuclear power, genotechnology (Adam, 1998, p.57).

In addition industrial time imposed over natural, bodily time awareness is a source of stress and crisis of meaning and feeling of alienation (rootedness, connectedness, stability, predictability). However, this 'dissolution of space' had also positive effects: it led to a compression of the world as well as expansion as people could be informed about events in far places of the world.

fig.8. Linear perspective view (linear time)

fig.9-11. Abstraction levels: time of pendulum, time as arrow; time as a number

fig.12. Time in cinema (synchronicity, reversal, etc.)

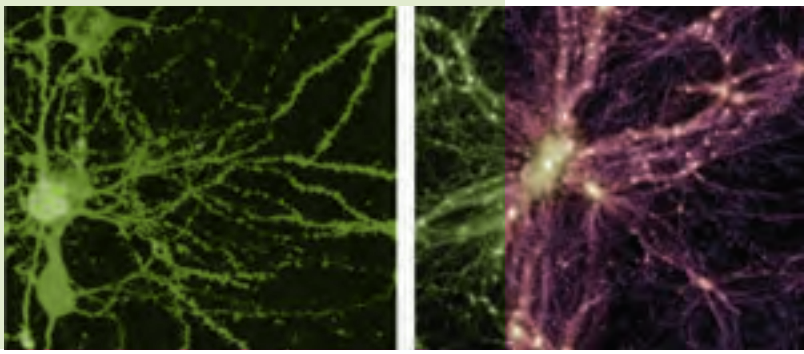

fig.13. Body-universe timescales (resemblance of neuron and galaxy structure)

Thrift emphasizes on the fact that this struggle was only a metropolitan phenomenon (Thrift, 2001, p.17) as the spread of new technologies, (transport, communication, speed, light) was uneven in space and time.

The appearance of cinema towards the end of the nineteenth century challenged the basic qualities of both time and space: more than simple acceleration or collapse, it allowed slowing down, stopping, and even reversing (fig.12). It had impact on the conception of time as continuous or irreversible and 'lent space a radically discontinuous and fragmentary quality the representation of which was also a concern of more elitist artistic movements (for example, Cubism' (Kern, 1983 quoted by Thrift, 2001, p.11).

Contrary to the focus on time as speed and acceleration, in the field of geology attention was directed towards the great age of the earth. Their texts raised awareness of the multiplicity of times running alongside, moving at different speeds and even in different directions (Thrift, 2001). Moreover, 1890s biologists were making the argument that if different organisms 'lived' at different 'speeds' then time itself was relative. This was proven by Einstein's relativity theory in 1905, stating that time space are not divided nor absolute (Thrift, 2001). This shift in thinking was further supported by Niels Bohr Copenhagen interpretation describing the principles of complementarity and particle-wave property and by Heisenberg uncertainty principle. However, these views were still controversial and till today are peripheral paradigms.

In 1954, Mircea Eliade differentiates the sacred times of myths and the profane, linear, historical time. He claims that modern men's anxiety comes from the wish to escape the "terror" of linear time expressed through history and progress, having abandoned the paradise of archetypes and repetition" (Eliade, 1954, p.162).

In the '60, '70 fields as psychology, particularly Gestalt study on perception raise awareness on the importance of time. Post-Modernism in Architecture brings back the dimension of time through heightened historical consciousness. The classical style, relating to human metaphor – body, sensual – is recovered, as well as cultural foundation, regionalism in social sciences. Major acknowledgements are that science is a constructed story, reality is constructed and architecture is culturally grounded, not universal. Furthermore in Phenomenology, time-change is considered embodied and grounded; material-idea separation is challenged. In the same line of thought, Quantum physics emphasizes connectedness (fig.13) and dimension of feeling.

1.4. EMBODIED TIME DOES NOT FOLLOW CLOCK TIME

'Understanding time as a resource to be used like any other means we lose the ability to be it. It is another case of being objectified by our own objectification. Loy p. 276

fig.14. Holistic view

Today we live in an age of recorded data and technological development, having several types of time running parallel to each other: time related to nature cycles and rhythms, industrial time and 'timeless time' of networks. Our times are characterised by unpredictable, accelerating change that can be balanced by flexibility, groundedness and inner peace. The later need community interaction and mutual support as well as grass roots movement. Unfortunately, our environmental discourse is still widely based on the Newtonian (positivistic) view of time as reversible, thus "facilitating risk-taking rather than precaution, and encouraging big science projects at the expense of ecological design" (Adam, 1998, p.42). A broader perspective on time needs to be established and a more bodily engagement with the environment (fig.14).

So, how can we grasp time for design?

This question will be elaborated through this paper, following the assumption that we can grasp time for design through (a) clear understanding of it, (b) by finding adequate language and representation and (c) using adequate medium to design for and with it. This paper will focus on three main sources: (a) Unified field theory (field of potential, time-space, fractal, scale distribution, invisible, energy-information, non-perspectival, observer-observed...), (b) Representation (as communication and modelling), (c) Phenomenology (body, sense, experience).

1. Unified field theory:

Challenging focus on object and clock time.

Unified field theory gives new insight into time; criticizing the imposition of industrial time on contextual, irreversible temporalities of life and the distinction of objects rather than relations.

Lefebvre declares: "Time may have been promoted to the level of ontology by the philosophers, but it has been murdered by society" (Goonewardena, 2008). The industrialized West is trained in perceiving a multidimensional space, while the temporal dimension of socio-environmental life is reduced to the time of calendars and clocks. Nature, the environment and sustainability are essentially multi-dimensional, complex temporal realms (rhythmicity and pace of ecosystems, universe and culture) rather than spatial matters (Adam, 1998). Imposing an abstract and atemporal value on our impermanent reality is an illusion of permanence: 'We are a continuous pattern, though constitution changes' (Watts, uploaded 2012).

A reductionism, scientific approach builds upon and perpetuates 'the instrumental and materialist view of nature. A scientific description of landscape and nature simply kills its spirit, including the 'spirit of the place'. It has 'no better claim to truth than an aesthetic one' (Koh, 2013, p. 8-9).

Unified field theory provides an understanding of time through movement, change and force. Following, experience, process and transition are as important as site analysis of objects. Field Theory and Quantum physics and the emergent Field aesthetic theory are reuniting aesthetic experience and intellectual understanding, recognizing their complementary relationship': 'poetic insights reach inward whereas science looks outward' (Koh, 2013, p.11).

Premise: Time is better understood in pattern language of place through embodied experience.

2. Representation as key in problem solving:

Challenging the use of perspectival view although we understand time differently.

'Representation is understanding something by reproducing it' (Lucas, Mair et al., 2009, p.205). The choice of representation reflects the thinking process, thus one has to be aware of the decisions taken. The way one represents the problem indicates the solution: "solving a problem simply means representing it so as to make the solution transparent."(Simon 1981), p.303). Thus, representation can be used not only as a communication tool but as modelling tool; key in the problem-solving process.

Vision orientated, modernist, functionalist design that deals with form and space neglecting time and body is criticized. 'The bias towards the visual is a misrepresentation of experience as it neglects the emotional content of the non-visual senses. Given that the three components of environmental experience are perception, cognition and emotion, this is a significant deficit in the design process which oversimplifies experience for the sake of expediency (Lucas and Romice, 2008, p.1).

Talking about the 'frozen' Danish landscape Hoyer stated that 'contemporary, everyday modes of experiencing the land are reduced solely to the visual', having a nostalgic and conservative attitude that 'misses a great opportunity to reshape the land as a democratic reflection of modern society and emerging conditions. Landscape ought to be treated as something to be worked with or "evolved", not held as an unchanging image' (Hoyer, 1999, p.70). Arida recognizes that, "man is evolving (psychological change brought by technology and communication evolution) – shifting in needs and values progressively faster than his environment" (Arida, 2002, p.136). We need to find back a balance between these simultaneous running times rather than taking radical directions as anarchic futurist vs. traditionalist new urbanism.

Koh proposes a landscape approach as a way to accept chance happening and redirect our attention towards the nature time: to pulse, breath and land as a living system, and our connectedness to it, concern for life/ material cycles, and concern for healing and sustenance (Koh, 2013, p.33). Representation should encode the forces and movements of time in order to allow engagement, mutual transformation and creation of meaning.

On this matter, Descombes argues that 'both buildings and designed landscapes must not only make the passing of time visible but also make this passage effecting of further potential' (Descombes, 1999, p.80). Both natural and cultural worlds are changing and evolving in time. Thus, 'the character of a specific place is not necessarily native or unchanging but rather always subject to evolution of human agency' (Hoyer, 1999, p.73).

Premise: When designing there is need for zooming in at human scale and use of living material at phenomenological level.

3. Phenomenology:

Problematizing disembodiedness

Time is a key issue of phenomenological approach and one aspect of embodied experience (from discussion with prof. dr. Koh). 'Embodiment is not a secondary experience; the human existence is fundamentally an embodied condition' (Pallasmaa, 2009, p.13.). We can relate to the time of nature cycles through our bodies, due to its change in time at a more predictable rate.

Nature, culture and time awareness are intimately interrelated. Today's loss of time experience of landscape in every day environment disables people's attachment and identification with their surroundings. Furthermore, "by stripping urban space from its relative time dimension, its role as holder of memory (and therefore of identity) disappears" (Arida, 2002, p.115). 'We need to recover that quality of the environment and our design decisions should consider the spiritual need to keep a record of their history and culture (archive of memory) and the practical need of keeping time" (Arida, 2002, p.114).

Through walking time, space and identity interrelate. 'It is argued that the relationship between walking and time is not one of clock-time passing, but is made up of multiple temporalities that emerge out of, and shape, people's experiences on foot (Middleton, 2009, p.1943).

Premise: In relation to every day time-space practices, walking and quality of landscape are important.

1.5. SIGNIFICANCE OF THE TOPIC

"Time is at the essence of human existence and sensibility" (Arida, 2002, p.186). Lynch, further recognises that, "the quality of the personal image of time is crucial for individual well-being and also for our success in managing environmental change, and that the external physical world plays a role in building and supporting the image of time (Lynch, 1972, p.1).

Understanding of the processes around us should be provided by landscape architects as well as guidance and awareness of one's position and power in the larger force field (positioning in space and time). "Might it also be possible to use the environment to teach change instead of permanence-how the world constantly shifts in the context of immediate past"(Lynch, 1972, p.43).

This idea of flow and landscape transformation requires new ways of understanding site conditions, new challenges when discussing form-giving and new representational tools: Introducing time sensitive design for a more engaged dynamic between user and site.

This thesis is about perception of time in present moment at human scale; elaborating on how to experience time in every day aesthetically in relation to rhythms of nature and our nature (no mechanical time: hour, minute – rather show breath, heart beat...): combine visual (fast) perception and haptic (slow) perception. It is a Phenomenological research building upon embodied awareness of time.

The goal is to develop practical design language related to time awareness.

1.6. RESEARCH QUESTIONS

1. What is the relation between understanding of time and approach to nature and own nature?

2. What representation is appropriate for design with time awareness?

3. How can experience and perception of time be supported by design?

4. What is the outcome of design with time awareness?

5. What research and design process did I follow to answer these questions?

fig.15. Summary Chapter I

REFERENCES

AHD (2009). *The American Heritage "Dictionary of the English Language"* published by Houghton Mifflin Company.

Adam, B. (1998). *Timescapes of Modernity: The Environment and Invisible Hazards*, Taylor & Francis.

Arida, A. (2002). *Quantum city*, Routledge.

Descombes, G. (1999). "Shifting Sites: The Swiss Way." in *Recovering Landscape: Essays in Contemporary Landscape Architecture*, Princeton Architectural Press

Eliade, M. (1954). *The Myth of the Eternal Return or, Cosmos and History*. Princeton.

Emirbayer, M. and A. Mische (1998). "What Is Agency?", American journal of sociology 103(4): 962-1023.

Goonewardena, K. (2008). *Space Difference, Everyday Life: Henri Lefebvre and Radical Politics*, Routledge.

Hall, E. T. (1959). *The silent language*, Doubleday New York.

Hoyer, S. A. (1999). "Things Take Time and Time Takes Things: The Danish Landscape." in *Recovering Landscape: Essays in Contemporary Landscape Architecture*, Princeton Architectural Press

Johansson, R. (2004). "Theory of Science and Research Methodology." Royal Institute of Technology. Department of Infrastructures. Stockholm.

Koh, J. (2013). *On a landscape approach to design an eco-poetic interpretation of landscape.* Wageningen, Wageningen Universiteit. Rede

Koh, J. and Beck A. (2006) 'Parks, People and City', Topos, pp. 14-20

Lakoff, G. and M. Johnson (1999). *Philosophy in the flesh: The Embodied Mind and Its Challenge to Western Thought*, Basic Books.

Lenzholzer, S., I. Duchhart, et al. (2013). "'Research through designing' in landscape architecture." Landscape and Urban Planning 113(0): 120-127.

Lucas, R., G. Mair, et al. (2010). "Making sense of the city: representing the multi-modality of urban space." in *Designing for the 21st Century: Interdisciplinary Methods and Findings*, by Inns, T., Gower Publishing Limited

Lucas, R. and O. Romice (2008). "Representing Sensory Experience in Urban Design." *Design Principles & Practices: An International Journal* 2(4): 83-94.

Lynch, K. (1972). *What time is this place?*, MIT Press.

MacLowry, R. (2011). Episode 2: The Illusion of Time. *The Fabric of the Cosmos*. J. Rosen, G. Judd and S. Streeter: four-hour

Middleton, J. (2009). 'Stepping in time': walking, time, and space in the city." Environment and planning. A 41(8): 1943.

Pallasmaa, J. (2009). *The thinking hand: existential and embodied wisdom in arthitecture*, Wiley.

Seamon, D. and J. Sowers (2008). "Place and placelessness, Edward Relph." Key texts in human geography: 43-51.

Simon, H. A. (1981). "Studying Human Intelligence by Creating Artificial Intelligence: When considered as a physical symbol sytem, the human brain can be fruitfully studied by computer simulation of its processes." American Scientist 69(3): 300-309.

Strauss, A. and J. Corbin (1994). "Grounded theory methodology." *Handbook of qualitative research*: 273-285.

Thrift, N. (2001). *Timespace: geographies of temporality*, Routledge.

Tilley, C. Y. (1994). *A phenomenology of landscape: places, paths, and monuments*, Berg Oxford.

Tuan, Y. F. (1977). *Space and place : the perspective of experience*. London, Arnold.

Vroom, M. J. and M. Ettema (2010). *Lexicon van de tuin- en landschapsarchitectuur*. Wageningen, Blauwdruk.

Watts, A. (uploaded 2011). "Alan Watts - Do You Do It, Or Does It Do You?". Retrieved 03.04, 2013.

Watts, A. (uploaded 2012). "The Myopic View Of The World." Retrieved 10.10, 2012.

Wunderlich, F. (2010). "The aesthetics of place-temporality in everyday urban space: The case of Fitzroy Square." in *Geographies of Rhythm: Nature Place Mobilities and Bodies*, by Edensor, T., Ashgate

Wunderlich, F. M. (2008). "Walking and Rhythmicity: Sensing Urban Space." Journal of Urban Design 13(1): 125-139.

Chapter II.

THEORETICAL RESEARCH

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As 'the core of landscape architecture is design and the core of design is theory' (Koh, 2013, p.3, this chapter departs with an exploration on current and past discourse and theory about time in landscape architecture as well as other relevant fields of study.

> A phenomenological research aims at accurately describing a certain experience related to the theme of study and not to generate theories or models (Loy, 2001). As a qualitative research the purpose is of illuminating the phenomena under study and providing understanding (Gehl,1987).

At a first stage, for the theoretical framework, the reporting approach of Grounded Theory was adopted. Data collection was carried out through indirect research (library research, precedent review) and direct research (site analysis). The analysis of information was done by constantly comparing conceptualized data on different levels of abstraction (Creswell, 1998, p.80). Key points were marked with a series of codes through open coding. Next, codes were grouped into similar concepts from which categories were formed (Selective coding) using abduction (see Glossary). The categories relate to the research questions. As this method was used ultimately for design and not creating theory, it was rephrased as a method leading to 'Grounded design'.

Also, for this thesis the designing activity is used as a method for research, practice called 'research through designing' (RTD) (Lenzholzer, Duchhart et al. 2013). From the four different types of RTD strategies according to Creswell's four knowledge claims, this paper will follow the social constructivism research through designing'. This particular frame 'has a clear human-focused culturally grounded perspective in which attitudes, beliefs, interaction and experiences are the subject of research' (Lenzholzer, Duchhart et al. 2013, p.121). It is aimed at answering questions of aesthetics, providing interpretations and meanings (Lenzholzer, Duchhart et al. 2013). For the specific topic of this paper triangulation of data methods (Guba's,1981 model cited by Loy, 2001) was used in bridging theory and design application. The methods adapted and explored are: 'creative' reflection in action – problem setting, process illustration through schemes, own naming, video as research tool, picture comparison, layering, model building, serial images … they will be explained in the sub-chapter on representation and own design process (page. 110).

A 'theoretical "audit trail" is drawn through this chapter to enable tracing 'the course of the research step-by-step via the decisions made and procedures described': from formulating design strategies and later translation into design language and illustration by design proposals (Schön, 1983).

Role of the researcher

In qualitative research 'the researcher is the instrument' (Gehl, 1987). To better grasp time experience and the factors involved in diverse ways to perceive it, I expanded the research for this paper beyond literature study, joining a 'drawing time now' workshop (at Academie van Bouwkunst, Amsterdam), participating at an intuitive intelligence course (at WageningenUR). For the specific design application, as inspiration and also to ground own findings, I joined two participatory design sessions with students as part of project EAT (10 and 15.04.13) and one workshop organized by Alterra for a healthy campus (29.08.13). Pallasmaa writes about the engagement of an architect when designing: 'The foremost skill of the architect is, likewise, to turn the multi-dimensional essence of the design task into embodied and lived sensations and images; eventually the entire personality and body of the designer becomes the site of the design task, and the task is lived rather than understood. Architectural ideas arise 'biologically' from unconceptualised and lived existential knowledge rather than from mere analysis and intellect' (Lucas, 2007-2009, p.15). I could not analyze what I do not understand or what I am not sensitive towards. Therefore, practicing mindfulness, experiencing transformation of space and time through butoh dance, trying out intuitive drawing were part of the learning and inquiry process. I researched walking not by looking at others as much as by observing myself. Understanding how we walk and the relation between body posture and emotions. Of course my own embodied understanding of the topic took a long time to sink in, so in this paper I could not fully explore and apply all the insight gained.

7. GROUNDED DESIGN RESEARCH

A. CODES:

A.a. EMBEDDED TIME IN LANDSCAPE

The ways in which time is framed were grouped as embedded time in landscape and human time awareness.

Time can be read in the landscape in phenomena originally independent of human action, in:

- cyclical rhythms of nature:
processes of growth and decay, diurnal (fig.16), seasonal, moon (fig.17), the changes in the weather, surge of rivers, breeding, nesting and migration of animals
- progressive and irreversible change (fig.18,19):
life cycle, succession, niche
- 'accidental' happening: certain natural disasters

All these indicate 'the ubiquitous presences of non-human entities and energies in and through place' (Edensor, 2010, p.7).

fig.16. Movement of the sun

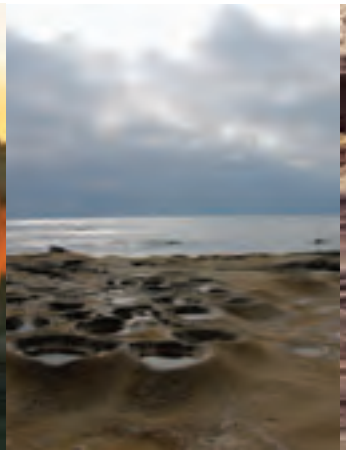


fig.17. Tide pools on the shore of La Jolla

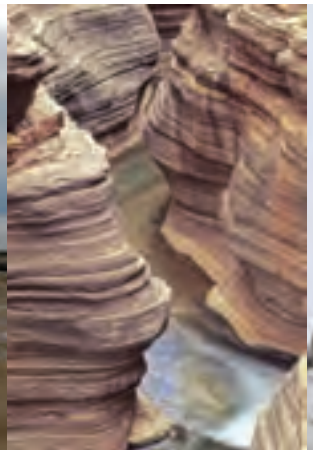


fig.18. Sedimentary rocks

fig.19. Weathering of rocks

HUMAN TIME AWARENESS

Thrift introduces four factors shaping our **sense of time**. The first one is related to our relation to the natural universe: the rhythm of diurnal cycle and season, the rhythms of the body to the turning of the tides. Second, social discipline whether secular or religious is forming our time perception. "Work' time gives shape to 'family' time or 'leisure' time (and vice versa)'. Thus, time acquires full meaning when enacted in the appropriate setting with special arrangements (Thrift, 2001, p.4) (fig. 20-23). Third, a range of instruments and devices impact it by showing the passage of time or by altering our understanding of its nature, direction and duration. Fourth, there are texts seen as means to translate understandings of time in actions to create social meaning (for example the books of hours).

We mainly identify time following the **clock time.** Conversely, `experiential time' is not about quantifying and measuring time but about feeling it (Middleton, 2009, p.1950). It is created by**:** Experience, and knowledge, imagination, type of activity, mood and free will, environmental conditions (visible and invisible: light, colour, sound…), context (traffic…), body energy level (circadian rhythm: synchronicity to cosmic rhythms, and body rhythms: pulse, breath, blinking), different ages of users. Middleton, quoting Hagman (2006, p.72) describes how according to type of activity people experience time loss differently: waiting in traffic jams time goes by slowly, while searching for a parking place one is aware of each second passing. 'Losing countable seconds is perhaps more annoying than losing uncountable hours' (Middleton, 2009, p.1950).

"The heart of our sense of time is the sense of "now" (Lynch, 1972, p.65). This is due to us, in the present, continuously creating images of past and future.

Even language 'expresses the connectivity among people, space and time: I *am (or we are) here; here* is now. *You (or they) are there; there* is then, and then refers to a time which may be either the past or the future. That is why a distant place can seem 'timeless'. This idea of distance in space can also be expressed as ability of human body to 'reach'(perceive) phenomena around himself (Tuan, 1977, p.126) .

Every landscape is time landscape. 'A landscape is a series of named locales, a set of relational places linked by paths, movements and narratives'[…] "It is story and telling, temporality and remembrance. Landscape is a signifying system through which the social is reproduced and transformed, explored and structured - process organized. Landscape, above all, represents a means of conceptual ordering that stresses relations" (Tilley, 1994, p.34). The study of **time landscape** acknowledges the time-space-society relation (Arida, 2002).

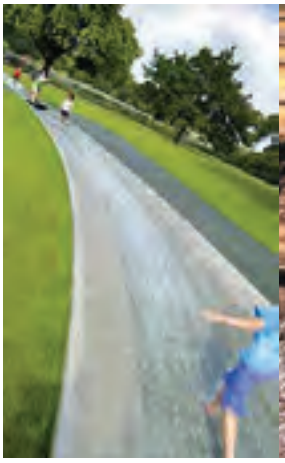


fig.20. Cyclic flow of time

fig.21. Youth and aging

fig.22. Condensed dynamics

fig.23. loosing awareness of clock time

A.b. UNIFIED FIELD THEORY: WORLD VIEW

'(There is) nothing inert in the world' (Lefebvre, Moore et al., 2004, p.17).

Designers' and users' world view is shaping our environment, and the way we see the world: "Humans have always had an impact on nature, just as the environment influences cultural development. The difference to earlier historical periods is one of scale, degree and reach of culturally constituted environmental hazards" (Adam, 1998, p.56). For this thesis the Quantum world view is appropriate as an alternative to the Newtonian world view.

fig.24. We are water

"The quantum world view sees the world as an undivided whole in flow, in movement, where nothing is deterministic and unpredictability is accepted. It 'is dynamic ever-changing in both space-time (quantity) and meaning (quality)' (Arida, 2002 , p.76).

This would allow one the proper attitude to grasp the changes around us and our relation to them, as well as reconnecting to the space-time. The limit between environment and subject becomes fuzzy (fig.24). Field theory regards feelings and force as more important than the material and visible. 'Max Planck, 'father' of quantum theory stated in 1944: 'All matter originates and exists only by virtue of a force' (Braden, 2007). A quantum world view is unifying spirituality and science, recognizing that consciousness, not matter is the ground of all being – (Goswami, 1993, p.2) and, revealing the 'interdependence of spiritual and material phenomena' (Arida, 2002, p.80).

This thesis is very much inspired by the reasoning of Alan Watts and personal research, giving challenging new ways to look at the world. 'All phenomena of life are musical. Every creature is an event upon which the whole universe depends as much as it depends on its total environment' (Watts, uploaded 2011).

According to this world view the attention moves beyond object, to the understanding of change in energy and information. As perception is key in resonating, synchronizing and being "in the wavelength of our world", the quantum world gives new insight into this phenomenon. "In the act of observation, we are transforming the timeless, spaceless world of interference pattern into the concrete and discrete world of space and time" (McTaggart , 2012, p.85). Our perception is perception in field (discussion with prof. dr. Koh). Likewise our felt experience, realm of sense and body cannot be separated from materiality of field, place, here. In the same line of thought Koh introduces 'field aesthetics' (Koh, 2011) as embodied awareness of the world; advancing setting up experience rather than function or form.

A.c. TIME IN DESIGN STRATEGY

This section contains the description of ways in which contemporary landscape architects and land artists investigate, express and work with time (discourse and practice).

Attention to process ordering and process
Landscape takes time. The element of time is vital as the major elements of landscape design are ruled by dynamic changing forces impacting on the maturing of any design (Filor 1994). Designers need to consider the layers of time, the new and the old and recognize the stages of growth: succession, maturation (fig.25). This approach to time is representative for McHargs ecological planning. Similarly in the postmodern practice in landscape architecture, supported by theories of phenomenology and hermeneutics (Berrizbeita, 1999), emphasis was given to setting up biological process and allowing it to shape the landscape through wind and water erosion or plant succession. Next to the functional aspect the aesthetic dimension of these dynamics was considered.

In terms of strategy a shift in thinking rhythmically would be better suited to grasp the 'quickly mutating ecological rhythms that signal impending catastrophe' (Edensor, 2010, p.7).

Attention to (life) cycles is related to phenomena like tide but it is also related to impermanence of material and issues of recycling, regenerating, recurrence. Moreover, all changes exact costs: economic, technical, social, psychological (Lynch, 1972). This can be applied in terms of material determinants, recognizing the interaction of systems and layers, as base for spatial layout. As a consequence, 'familiar urban typologies of square, park, district, and so on are of less use or significance than are the infrastructures, network flows, ambiguous spaces, and other polymorphous conditions that constitute the contemporary metropolis' (Wall, 1999, p.234).

Performative production of space-time
Crang introduces the notion of 'experiential time - space' to point out exactly that the everyday is not a stable image and therefore time space is not a matrix where activities take place, but rather that time-space is created through activity' (Middleton, 2009, p.1948) (fig.26). 'Things are what space is doing right here' (Loy, 2000, p.279). In this case, every day events can be expressed through velocities, directions, turnings, detours, exits and entries and potentiality. 'Performative production of space-time means being-in-the-world in an activity' (Crang, 2001, p.199). Degen writes about affordances, that they are 'not already there, inscribed in space but are activated through peoples' sensory experiences-by the moving through, touching, smelling, hearing seeing of objects and places' (Palipane, 2011, p.14, quoting Degen, 2002). This implies rethinking space, not adding time to space (Crang, 2001, p.204). In the same line of thought, Thrift introduces Latour's reframing of concepts like time, space and action to 'timing', 'spacing', 'acting' (Thrift, 2001, p.28 on Latour 1997a: 179).

Recognizing that contemporary issues are characterised by complexity, uncertainty, instability, uniqueness, and value conflicts (Schön, 1983) leads to the introduction of open-ended design and temporary uses. Urgency and 'immediacy' are considered along with the long term changes. One designs for the now, the in-between and future acknowledging the unfinishedness of the design process. Adaptive design secures evolution and stimulates future interventions by staging and setting up for new conditions, proposing adaptable/resilient strategies and elements. Such interventions 'intensify, diversify and redistribute' the use of space (Koolhaas). In this sense Corner states that by thinking through a program designers reveal the performative dimensions of a project (Corner, 1999). Instruments that would allow this flexibility and multifunctionality would transform the ground plane into a living, connective tissue between increasingly disparate fragments and unforeseen programs (Wall, 1999, p.234).

Timing activities

Gehl (Gehl, 1987) differentiates between three types of activities in public spaces, each having a specific temporal pattern: '*necessary activities* include everyday tasks (e.g.going to work or to school, shopping, waiting for a bus or a friend), *optional activities* happen only if outside conditions allow it (e.g. walking, observing, sitting and reading) and the resulting *social activities* depend on the attendance of other people in public spaces (e.g.conversation, playing, public activities)' (Temelová and Novák, 2011). One can examine and record the structure of user and their activities in relation to the time of the day (morning, midday, evening). Importing the concept of 'niche' from ecology the time-share principle was established for patterns of temporary activities (fig.27).

Following such observations the design can provide 'timing choices' as a chance and awareness to create own time order (Lynch, 1976). 'Users of space should have a way to mark out their own intentions and expectations. 'Individuals should be given both the opportunity and the knowledge to create their own time order (Lynch, 1976, p.75). In this sense the designer needs to fit complementary activities together in time or separate those that conflict (Lynch, 1976). Time experience should be positioned as 'primary layer' and high experience zone and people's attention should be stimulated rather than monopolized (Marot, 2003, p.78 in Hoddinott, 2005, p.52).

Lynch pointed out the need for urban space to display general time of the day in a 'humane and vivid way', indicating timing of publicly accessible activities (Lynch, 1976, p.70). For this a place would need to show perceptible rhythm of events, memorable peaks, moments of calm (Lynch, 1976).

Dealing with change

Devoting attention to change is motivated by our acceptance that our earthly environment is changing despite us and cannot be preserved, but could be conserved (Lynch, 1972). Also, dealing successfully with change requires simultaneously preserving some continuity whether of people, things or places (Lynch, 1972, p.199). Therefore, "the best environment for human growth is one in which there are both new stimuli and familiar reassurances, the chance to explore and the ability to return" (Lynch, 1972, p.204).

In order to uncover the landscape structure record of activity (cultural and natural) one can try to identify elements showing history (whether accurate or inaccurate (Lynch, 1972), look at natural and cultural timescales. The designer needs to pass time on site and explore by carefully and repeating passing through it. Descombes looks at traces as reminders of stages in an continuous changing 'dynamics generated by different sources, forces, activities, events and actors' (Descombes, 1999, p.79). Therefore, 'before we can properly prescribe, we must first learn how to accurately describe—a central aim of phenomenological research (Seamon and Sowers, 2008, p. 45).

A way to represent one's findings in such an analysis is the use of datascapes which analyse measurable forces and allows grasping complexity of the abstract and concrete systems at work. 'These influences may be planning and building regulations, technical and economic constraints, natural conditions such as sun and wind, or legislative measures such as minimum working conditions' (Lootsma, 1999, p.270). Datascapes confront restrictions and potentials, conditions and agents.

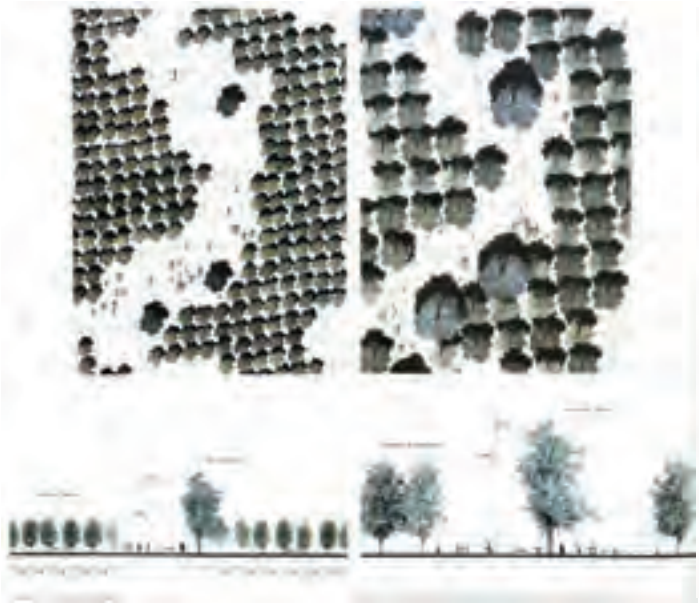


fig.25. Growth and space

fig.26. A framework for symbol-based diagramming of spaces that include movement and use

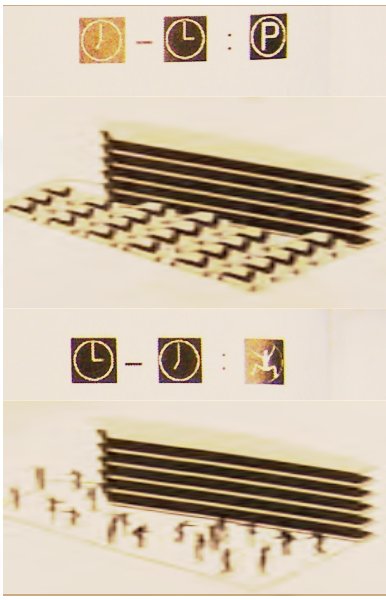


fig.27. Time share

AESTHETIC LANGUAGE RELATED TO TIME

This part explores poetic ways in which designers have integrated time as a design element.

Attention to change in landscape has been expressed through:
- land artist preoccupation with processes of growth and decay
- fascination with ruins and care for their preservation
- appreciation of patina, "appearance of aging" (Saito, 2007)
- the use of palimpsest as image of the layering process in landscape
- an aesthetic that celebrates motion and change - (Spirn, 1998)
- observing behaviour patterns (fig.28)

Attention to ephemerality and impermanence
Ephemerality and impermanence are best represented in land art, which is a 'field based aesthetic practice where art and material processes as well as sensory phenomena are mutually enhancing and complementing' (Koh, 2013, p.14). In terms of time, land art often resonates to the larger order of nature and the universe, also 'positioning humanity in the space and process of nature and culture' (Koh, 2013, p.15). It raises 'our awareness of human's connectedness to landscape processes and nature's rhythm' inviting interaction and immersion instead of distant and disconnected gazing. By making the invisible visible, accentuating inherent qualities, it creates a deeper connection to the place and better understanding of it. Furthermore, it is performing: 'healing, conserving and repairing, revealing the process' (Koh, 2013, p.15).

Maintaining memory
Our way to deal with ephemerality and impermanence is maintaining memory. On the issue of reminding the past, Tilley recognizes that a place is constantly changing in spite of 'ideological attempts to provide 'stability' or perceptual and cognitive fixity to a place, to reproduce sets of dominant meanings, understandings, representations and images' (Tilley, 1994, p.27-28). Every day experiences of landscape become 'biographic encounters' as the passenger can reconnect to the past activities and remember previous event. 'Personal biographies, social identities and a biography of place are intimately connected' (Tilley, 1994, p.27-28). We share the need to connect or confront with our historical peers (Arida, 2002, p.193). When relating to the past the design should discover and web physical and sensual, real and imaginary (Hoddinott, 2005) (fig.29).

Revealing time
Lynch (1972) exemplifies how to amplify or complement natural clues of time by 'dramatizing' change of light, heat, sound, surface with daily cycles (fig.30):
- surface that catches sun and changes characteristics with angle of sun
- plants seasonal change
- exterior light and heat complementary or contrast to natural change
- streetlight dim with passing of night, moon
- night light reverses the shadows of the sun
- acoustic surfaces - amplify sounds of passers-by after hours
- shelters emphasizing season (open-close to outdoor)
- scented candles in Japanese temples emitting a different scent for each period of time

fig.28. Activity patterns

This approach is represented by minimal/subtle interventions to intensify experiential engagement for temporal revelation. New elements stress the ordinary details of the place (Hoddinott, 2005, p.43).

Another way to call out new feelings and meanings is prompted by 'defamiliarisation' of the landscape by disturbing the expected order of a site with the 'minimum of means' (Hoddinott, 2005, p.52). It refreshes one's perception and focuses attention on the way things are composed (Hoddinott, 2005, p.46). Such experience further 'enables the viewer to add something of themselves to the site, weaving a meaningful dimension to the heritage fabric of the area' (Hoddinott, 2005, p.49).

According Descombes 'we can learn a lot about the nature of a site by observing the way a system rearranges itself after disturbance. Disturbance becomes a way to learn about its essence and reveal forces that are or have become imperceptible (Descombes, 1999, p.83). An even subtler assumption he proposes is that occasionally nothing should be added to the 'existing confusion of the site' but rather taken away, in order to amplify certain potentials of the place (Descombes, 1999, p.82-84).

Narrative

' Narrative is a means of understanding and describing the world in relation to agency. It is a means of linking locales, landscapes, actions, events and experiences together providing a synthesis of heterogeneous phenomena. (Tilley, 1994, p.32). Through narratives a place acquires time as it is linked to individual or group experiences.

Time Landscape (1965-1978-Present) artwork by the American artist Alan Sonfist, inserting nature's dynamics back into the urban landscape of the 20st century. It consists of plants that were native to this area in pre-colonial times (fig.31).

fig.29. Imaginative merging of past and present

fig.30. Temporary 'river'

fig.31. Reviving the past

A.d. REPRESENTATION: TOOLBOXES

In general, existing analysis methods and parameters revealing spatial quality and experience were studied in relation to time.

SPATIAL QUALITY

In the article 'Measuring the Unmeasurable: Urban Design Qualities Related to Walkability' (Ewing and Handy, 2009) key concepts in evaluating spatial quality of a place are presented together with guidelines how to analyse and rate each of them.

Five main **concepts** are summarized here with their potential relevance for time experience according to my own interpretation. **Imageability** is about the strong image an observer remembers as a result of passing through a place. For this, patterns, their readability and richness are important. **Enclosure** enables a 'sense of position, of identity with the surroundings hereness' and also relates to the concept of interval. **Human scale** as articulation of physical elements that match the size and proportions of humans is related to time awareness as proximity/ reach of body. **Transparency** refers to agency, as it represents 'the degree to which people can see or perceive what lies beyond the edge of a street and, more specifically, the degree to which people can see or perceive human activity beyond the edge of a street' (Ewing and Handy 2009). **Complexity** is characteristic of most living system and thus crucial in providing condition for action. 'Complexity is related to the number of noticeable differences to which a viewer is exposed per unit time', visual and sensorial richness of a place (Ewing and Handy, 2009).

Table.1. The five main concepts and parameters for analysis

	Imageability	enclosure	human scale	transparency	complexity
shape, colour, size, texture	x		x		x
number of people	x				x
signs of human activity	x			x	x
building set-back		x	x	x	
negative effect of numerous long sight lines		x	x		
street furniture			x		x

Table.1. shows own understanding of the interrelation of these concepts through examples of parameters for analysis.

Temelová and Novák research on daily street life in Prague demonstrates 'how the usage of space is divided between specific groups of users and how public places differ in the way particular social groups use them'. They stress the importance to distinguish **temporalities performed by different users and temporalities produced by diverse functions** (Temelová and Novák 2011).

EXPERIENTIAL QUALITY

The 'Experiential landscape' analysis maps the spatial and experiential dimension to understand how people 'attach significance and value to preferred locations; orientate themselves; develop a sense of homeground or where they belong'. These three categories of experience are relevant for a fulfilled life (Thwaites lecture). The potential for experience is understood 'in terms of distribution of centres, directions, transitions and areas (CDTA) across the site' (table.2.). As explained earlier (in the section about human time perception), experiential quality (fig.32-37) of place impacts one's image of time.

Table. 2. The concept of experiential landscape place

Spatial dimension	Experiential dimension
Centre Subjectively significant location meanings engendering a sense of here-ness and proximity communication.	**Attachment of significance** *Social imageability:* functional use, goals and motivations, physical features, social *Restorative benefit:* being away, extent, fascination, and compatibility *Social interaction* and territoriality: primary, secondary and public territory
Direction Orientation Subjectively significant continuity engendering a sense of there-ness and future possibility	*Movement:* choice, imagination, and attention *View:* landmarks, views and vistas, sequence
The constituents of direction are *kinetic* (enclosure, rhythm, non-engaging facades, ease of movement, clear primary route) and *sensory* (exploration and mystery, view, smell, sound, deflective facades, linearity of floorscape).	
Transition Subjectively significant point, or area, of change engendering a sense of transformation in mood, atmosphere, or function	*Change:* direction and level; entrances, exits and gateways; atmosphere and function
Types of transition are: *threshold* (sudden change), *corridor* (gradual change), *segment* (soft linking spaces), *ephemeral* (transient effects).	
Area Subjectively significant realm engendering a sense of coherence and containment	**Neighbourhood awareness** *Public and private awareness:* private, semisigni private, semi-public, public *Thematic continuity:* rhythm, pattern, co-ordination in texture, space, form, detail, symbol, building type, use, activity, degree of maintenance, topography

fig. 32

fig. 33

fig. 34

Experiential Landscape:
an approach to people, pEople, pLace, sPace

Experiential Place	Type	Symbol	Description
Centre [illegible]	Social Inaccessibility		Red open circle or polygon
	Social Interaction		Orange open circle or polygon
	Restorative Benefit		Green open circle or polygon
Direction [illegible]	Kinetic		Green dashed line. If bi-directional then no arrows. If single directional then arrow marks direction.
	Sensory		Blue dot denotes standpoint, blue asterix denotes objective, use blue line to connect.
Transition [illegible]	sudden change		Two thick red parallel lines
	gradual change		Red polygon, hatch in one direction.
Area [illegible]			Purple open polygon

Note any components associated with 'negative' experiences should be cross hatched in the appropriate colour. Notes can be made in the form of a table to record the context of the local/environmental qualities etc that engender the experiences mapped.

Table 3

fig. 35

fig. 36

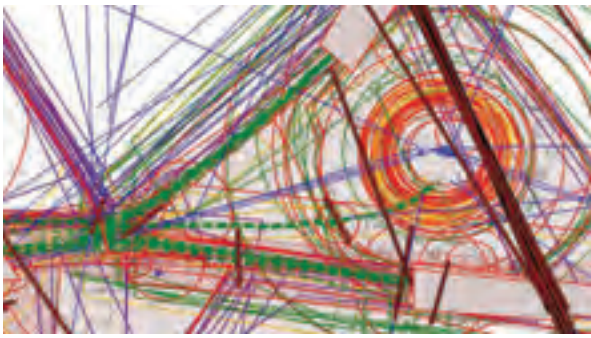


fig. 37

SPECIFIC for the design application on Wageningen UR campus, study was carried out on 'good campus design', still looking for details relevant for time experience.

GOOD CAMPUS DESIGN

The meaning of *campus* in Latin is "a field". In the 18th century it referred to the grounds at the school, later representing the entire property (Balmori et al., 1985 quoted by Helsper, 1988). The campus became a distinctive 'American type of architectural planning and developed as a very recognizable form on the American landscape'(Helsper, 1988). It became a model for city planning.

Therefore, in campus design the university was conceived as 'being a community and a world within itself'(Turner, 1984, p.3 quoted by Helsper 1988), that would display the values and spirit of the time and the incentives for change of society. The campus would symbolise the school's idealism, identity and sense of community (Helsper, 1988). Moreover, it 'reveals the power that a physical environment can possess as the embodiment of an institution's character' (Turner, 1984, p.305 quoted by Helsper, 1988). Its layout and functioning portray the importance of education.

Examples of campus location and underlying values (Helsper, 1988):
- **in the countryside** – monastic ideal of being removed from the profane city
- romantic ideal of the purity of nature

Such a quiet, pastoral setting, removed from the pressure of the city, would help one restore oneself and gain fresh perspective on the surrounding world and flow of events.
- **in the city**
- **at the edge of city**, integrating of domestic life and nature: Colleges should be located neither in the country (divorced from 'domestic life' and 'civilization') nor in the midst of a city with its distractions (Turner, 1984 mentioned by Helsper, 1988).

Layouts of different campus and values (Helsper, 1988):

- **quadrangle** – The first spatial layout of a campus was following the medieval English Universities (Cambridge and Oxford) with an enclosed court design, and central core or space that the campus revolves around (fig. 38). Such a structure would indicate a fairly closed and inward orientation as well as ideals of intimacy and introspection, and a nostalgia for the elitism of the past.

Fig. 38. Wadham College, Oxford, constructed 1610-1613

- hierarchy – At first, every campus had major landmarks, like chapel, library, student centre, football stadium (fig. 39).

- **open quadrangle** - In the mid16th c. the three-sided courtyard layout was introduced to enable more openness to the outside.

Fig. 39. The 'Old Brick Row' of buildings at Yale

- **separate buildings set in open landscape** (fig.40)
This would suggest openness, worldly centre for scientific research, extrovert and expansive, towards community and nature.

- after the American Revolution - a more sophisticated and **unified character, and architectural grandeur** characterized campus design (fig. 41). Beaux-Arts principles as symmetry, axiality, focal points, overall geometric clarity, unity from variety, great scale and secondary axes as subsidiary spaces are adopted.

- The **linear arrangement of buildings**, along a road and ring roads with outlying parking meant to prevent the car to enter the central core, show how circulation began to influence campus planning in significant ways.

- **Park-like setting and informal groupings of buildings** (fig.42): This typology represented integration of democratic life with the influences of nature. It was first proposed by Frederick Law Olmsted reflecting the new democratic impulses in education betw. 1860-1890. The campus had an informal, irregular and picturesque arrangement of buildings in a setting suggesting a rural village or naturalistic park.

- after World War II – two movements can be observed:
1. Traditional
2. Modern – rejecting the past, emphasizing functionalism and flexibility in planning

- Mies van der Rohe (1940) used a basic space module over the whole area, creating an optical rhythm, unity and allowing freedom within its limits
- The Plan for Florida Southern College (fig. 43) by Frank Lloyd Wright 1938 encouraged informal, individuality of the parts: each building should have its own identity with little or no responsibility to the whole.
- Harvard Graduate Centre campus (fig. 44) by Walter Grophius 1949 included international style buildings

- **variety of patterns** – mark new educational requirements and ideals, independent attitude

- **piecemeal growth:** Christopher Alexander's Oregon Experiment (fig.45), a study for the University of Oregon in late 1960 and early 1970 proposed master principle rather than master plan. These master principle were : organic whole, incremental design, participatory design (discussion with prof. dr. Koh).

Fig. 40. College of New Jersey

Fig. 41. Rendering of the master plan for Columbia University

Fig. 42. Frederick Law Olmsted Campus Plan of Smith College, Northampton, 1893

Fig. 43. Early Frank Lloyd Wright conceptual drawing of Florida Southern College Campus
Image courtesy of Special Collections, Florida Southern College Library, Lakeland, FL

Fig. 44. Aerial view of the Harvard Graduate Centre

Fig. 45. Oregon Experiment

Important elements for a good campus design would be (Shepheard, 1977):

gateway plaza
Situated at major pedestrian and vehicular intersections along campus edges to the internal walkways, these mark arrival experience and provide clear image of entrances. They are important for campus identity (fig.46-47).

activity nodes
- social spaces of varying sizes (choice of activity, different character) and layouts: squares and courtyards, garden room , open green (semi-enclosed or enclosed)
– reflection, social encounter, relaxation

attention to planting layout (fig. 48-50)
- block of green – lower trees in centre
- shrubs to signal building entrances and special places
- canopy trees, understory trees, open spaces
- large green and small green with diverse uses, semi-priavte contained spaces (quads and plazas) and special function spaces
- mall – green stripe between buildings used as promenade

attention to pedestrian circulation (fig.51)

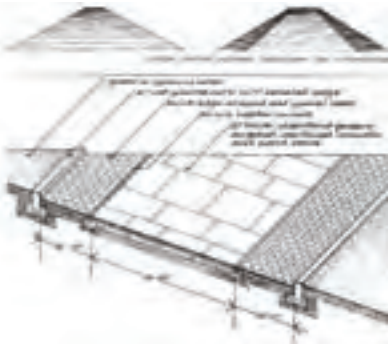


Fig. 51. path detail: smooth centre and rough margins invite central walking and tend to lessen erosion of the grass (Shepheard 1977)

- pedestrian spine
- unstructured learning – path as 'series of vital events'. Walking is the most important mode of experience on the campus (Shepheard 1977, p.71).

attention to transition space and space in between buildings
The character of transitional space 'must reflect the character and function of the buildings and landscapes which they join and of which they are part (Shepheard 1977).
- buildings create spaces rather than floating in space (inside, outside distinguished)
- no rigid specification of one particular land use for an area

edge treatment (fig.52)
- connections to city (exchange) - spaciousness and openness to the world
Rich edges with intimate mix of housing, shops, city life

- planning process should utilize all of the University's diverse resources

Fig. 46. trellis shelter of Harnwell House Plaza

Fig. 47. Entry plazza near Locust Walk Bridge

Fig. 48. The approach to College hall Green from 34th and Walnut

Fig. 49. College Hall Green open meadow and terrace beyond

Fig. 50. Small Green off Smith Walk, between Hayden hall and the Chemistry Building

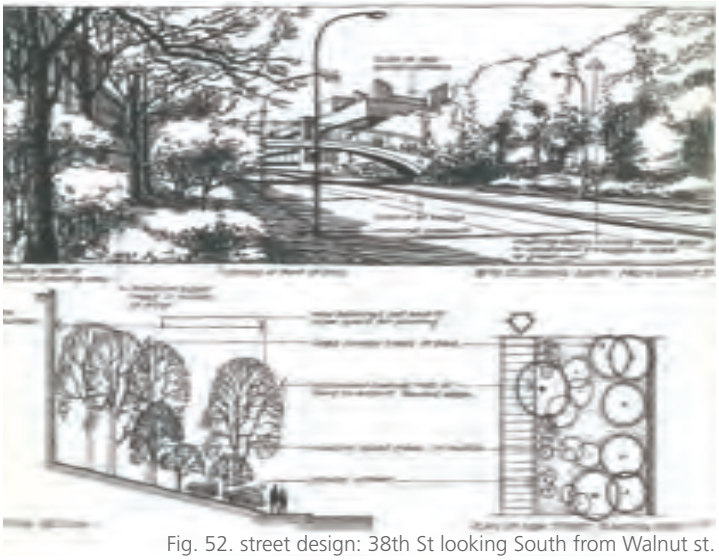


Fig. 52. street design: 38th St looking South from Walnut st.

ADDITIONAL research was done on time in art and multisensory representation.

ART TOOLBOX

The art toolbox was used as inspiration for graphic representation of analysis or other drawings for the research through designing. Effects used in painting to express movement or transformation were studied. The use of these techniques will be elaborated on in the section about research on graphics.

Multisensory representation is an analysis method mentioned as a relevant way to capture experience of a site. Although it was not used for the site analysis in this paper (as it was found at the final stage of thesis work), its ideas were considered in the representation and designing part. This method combines plan drawings and sections with small diagrams at each observation point, which describe the experience according to the different senses. Routes were often understood in section (fig.53), static places on the other hand were commonly rendered in plan (Lucas, Mair et al. 2009) (fig.54). Also, 'each notation is accompanied by a stream of consciousness-style piece of writing.[…] This is contextual, tied to a particular time of day, a particular season, a set of weather conditions' (Lucas, Mair et al. 2009, p.200).

Fig. 53. Notation of a Subway in Dortmund

Fig. 54. Notation of a Square in Dortmund City Centre

The sensory notation priority chart (fig. 55) includes in addition to the commonly studied five senses (visual, aural, tactile, taste and smell), the kinetic and thermal sensation. Taste and smell are grouped as the chemical system.

The thermal sensation depends 'on the relationship between the heat that produces the body's metabolism and the one that dissipates to the environment. If the first is higher, the sensation is hot, and if the second is higher the sensation is cold. All mechanism that increases the heat losses from the body gives a sensation of coldness and the opposite'(Urriola).

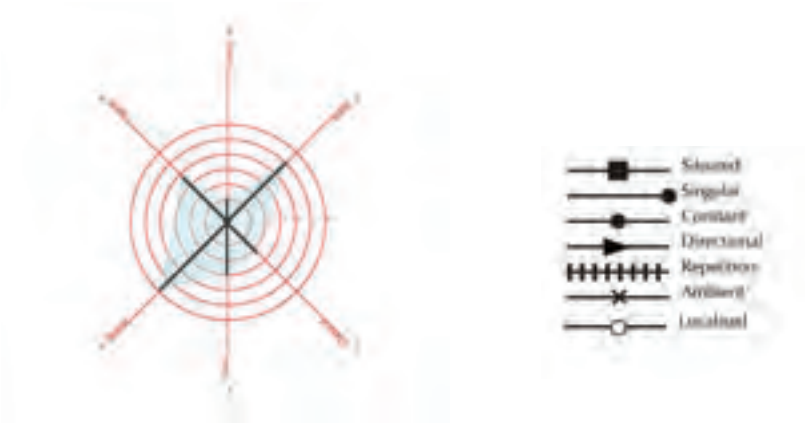


Fig. 55. Sensory Notation Key priority distribution

In order to be more precise and consistent in rating the different sense perception, this table.4. was laid out:

Table 4: Chart for describing the different sense perception

VISUAL	AURAL	TACTILE	KINETIC	THERMAL	CHEMICAL
Dark	High Pitch	Static	Strong	Hot	Weak
Bright	Low Pitch	Mobile	Light	Cold	Intense
Saturated	Quiet	Rough	Free	Dry	Stagnant
Neutral	Loud	Smooth	Bound	Wet	Fresh
Perspectival	Close	Light	Indirect	Natural	Musky
Flat	Reverberant	Heavy	Direct	Artificial	Floral
Intimate	Vocal	Porous	Level	Ambient	Fruit
Vast	Non-Vocal	Resistant	Gradient	Source	Spice
Solid	Natural	Hard	Sustained	Radiant	Resin
Void	Artificial	Soft	Quick	Consistent	Minty
Detailed	Attack	Warm	Crowded	Constant	Oily
Blank	Decay	Cold	Empty	Responsive	

Such a method intends to make experiential and personal analysis more transparent and accurate.

All these different toolboxes influenced the process of defining language and deciding upon design application.

A.e. SITE ANALYSIS

The process of design follows Schön's concept of "reflections-in-action". 'Schon describes as "reflections-in-action", that stage in the design process known to all practitioners when ideas and concepts are tested against site constraints and the requirements of the brief' (Filor, 1994, p.124).

The importance of time in the maturing of projects is discussed, and the need to constantly question and reflect upon the relevance of data and client demands. According to Filor, the designer's own vision is the most important component in the process of design, but it has to resonate to the site character and user requirements (Filor, 1994).

For the site specific design application, analysis of the case study area run parallel to the literature study and impacted the later decision on design strategies and formulating design language.

i. PROBLEM SETTING

The generic site analysis were repeated and improved following the process of problem setting. This is 'an interactive process, where information arising at one particular stage must be tested against facts, goals and issues thrown up at other stages. The pattern is cyclical rather than sequential, like a wheel which is moved clockwise or anti-clockwise as the need arises; 'backwards' to validate a concept against previously established site information, or 'forwards' to monitor a previous, completed project to investigate whether this has achieved its aims in use, and can thus serve as a design precedent' (Walker, quoted by Filor, 1994, p.123) (fig.56). In this way the problem starts to be defined and the solution becomes transparent. Here only the final results are presented. About the rather generic analysis in the section 'Pulse of the campus now' it could be argued that it is divergent from my story; just spatialization of time. However it was useful in grounding the presented starting statements(1. Understanding of time is important; 2. Embodied time does not follow clock time). Time is a thread on which I criticize and bring in value.

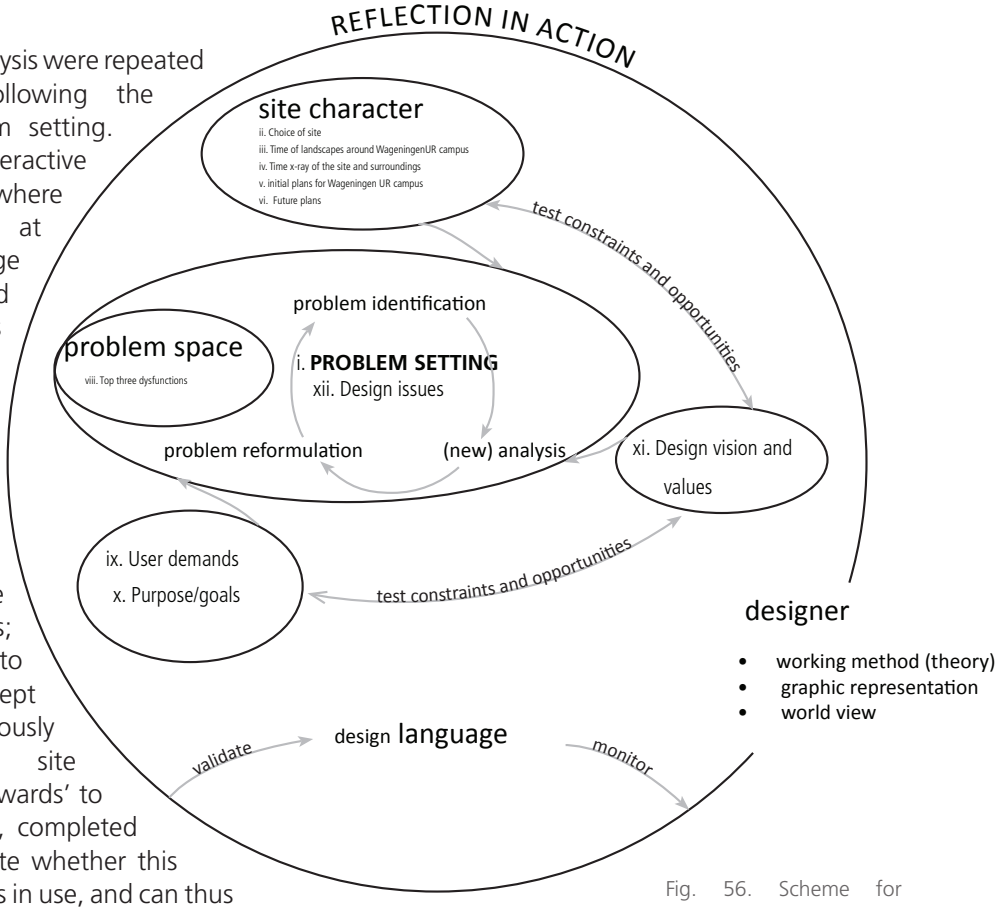


Fig. 56. Scheme for Problem setting process (own interpretation after reading (Filor, 1994).

In relation to the methods and theoretical frame a series of specific analysis were carried out at a later stage (page. 94). This was possible only after 'establishing the constraints or parameters within the Problem Space, clearly identifying those aims or issues which are really vital to an understanding, and hence finding a solution to the defined problems' (Filor, 1994, p.123). 'It is only when the problem to be solved has been identified that pertinent information can be sensibly analysed. Even then the problem is not static, new constraints and opportunities becoming apparent as a particular line is explored. The original problem must then be formulated, and additional information gathered and evaluated' (Rowe, 1987 quoted by Filor, 1994, p.123).

The design test site is the campus of Wageningen University of life sciences, located in the central part of the Netherlands, in Gelderland province, at the north edge of Wageningen city. It is important to mention that the campus design is not the goal of the thesis but it was necessary to have a case study while framing time for design.

ii. CHOICE OF SITE: WAGENINGEN UR CAMPUS

The choice to study the WageningenUR campus is first due to its accessibility and possibility to experience it at various times. It is part of my every day experience for two years already. Many things changed on this campus during my stay and I changed as well, but still I am more familiar to it than to any other place at the moment. Another aspect was the current design of the campus that is very spatial and Euclidian. Furthermore, as a setting for teaching and forming future professionals, it is important what image of time this campus design illustrates and what experiences students staff and visitors are exposed to on a daily basis. The spatial layout and conditions of study, recreation and in general of interaction with other people and nature are key in this sense.

Working and thus being in the 'field' was inspiring and the ability to walk and think in the site to be designed for had an impact on the results.

Fig. 57. New and old campus locations

Wageningen University was founded in 1876 under the name of Rijkslandbouwschool. In 1986 its name is changed to Landbouwuniversiteit and in 2000 it aquires the current name of Wageningen University. The merge with the Van Hall Larenstein in 2004, allowed Wageningen University a broad and diverse development of education and research in the field of natural environment and life sciences. The Dreijen is the old campus of Wageningen (construction started in the late 19th century). After World War II the campus between General Foulkesweg and Ritzemabosweg experienced strong growth. The complex was completed in the 90s. Since 2000 plans were laid out to build a new campus at the north side of Wageningen city, along the Mansholtlaan to Ede (fig.57). Wageningen has 37,575 inhabitants (31st of December in 2010 (CBS, 2011) and a total area of 32.35 km2 (CBS, 2009). From the 7,933 students of Wageningen University in 2012, 2016 were foreign students. Among the 106 nationalities of students large numbers are from China, Germany, Greece and Ethiopia (WageningenURwebsite). This makes the city and university an intercultural hub and raises issues of communication and comfort for diverse cultures.

Fig. 59. Veluwe forest

Fig. 60. Veluwe heath land

Fig. 61. Binnenveld

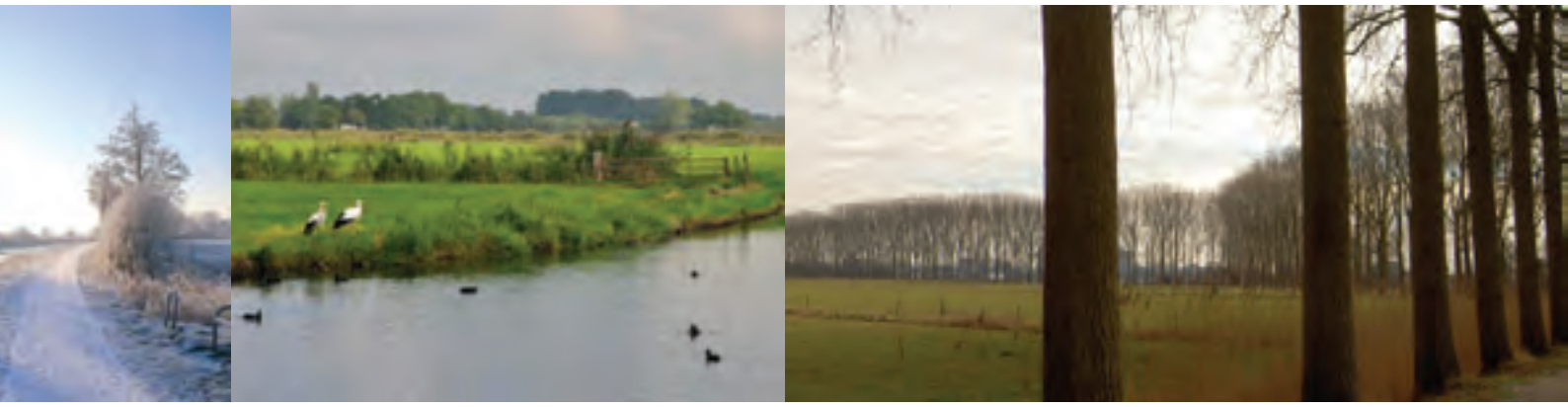
Fig. 62. River flood plains

iii. TIME OF LANDSCAPES AROUND WAGENINGEN UR CAMPUS

The Wageningen UR campus is located at the confluence of four different landscapes (fig. 58) each with their rhythms and peak moments: The Veluwe at the east, the Binnenveld at the West and North side; Wageningen city and the river area at the South. The Veluwe is a sandy ridge covered with forest (fig.59) and heath land. In late summer and beginning of autumn the flowering of the heath is a memorable transformation (fig.60). The Binnenveld, at the West, is a glacier valley formed between the two moraines, Veluwe and Utrechtse Heuvelrug. Its characteristic landscapes are agriculture land with road planting with oak trees and peat valley with open fields and scattered elder trees (fig.61). This area is enliven by the meadow birds. The river area in the south of Wageningen city has the dike as limit between the city and the river. Towards the city, the orchards on clay soil have the harvest time as a special yearly event. Outside the dike, the floodplains consist of meadows with poplars and willows on sand and clay and are characterised by the yearly expansion and withdrawal of the river (fig.62). Some of these features could resonate over the campus site.

Wageningen UR already has a great impact on the development of Wageningen city. Now with the new campus location at the edge of the city, Wageningen inhabitants interact less with the foreign students. The daily rhythms of the city today are marked by movement and flows of people and things following opening hours of shops and cafes and working schedule as well as weather conditions. Weekly, the open market on Wednesday and Saturday and the long shopping day on Friday enliven the centre. Seasonal and annual celebrations and events gather locals and occasionally inhabitants of other cities.

Fig. 58. The four landscapes around WageningenUR campus



iv. TIME X-RAY OF THE SITE AND SURROUNDINGS

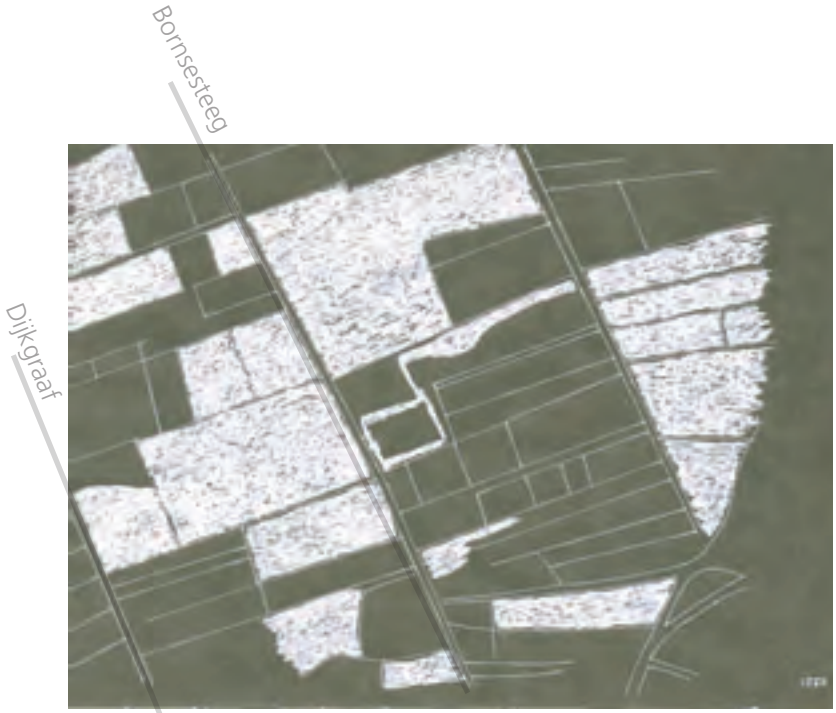


Fig.62. In 1850 the planning area was covered mainly by forest

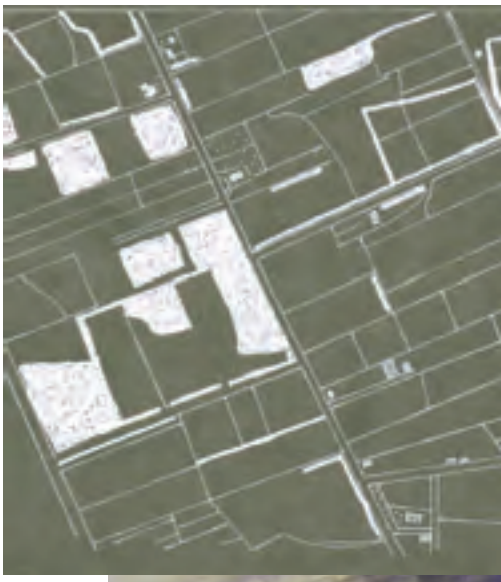


Fig.63. Site map 1869-1932

The site used to be a productive landscape (forest (fig.62)than agriculture (fig.63). This was kept during the time it was occupied by the Landbowuniversiteit (fig.64). Once it became WUR campus the old pattern got erased and replaced by 'park like' consumption landscape (fig.65).

In the Bestemmingsplan it is mentioned that the long lines formed by roads like Rijnsteeg, Bornsesteeg and Dijkgraaf stand out and are a characteristic structure for the northern part of Wageningen. This lines were maintained throughout time (fig.66). There are dynamic natural and human processes which have shaped and will shape the land.

Fig.64. Site map 1950-2000

Fig.65. Site map with new campus

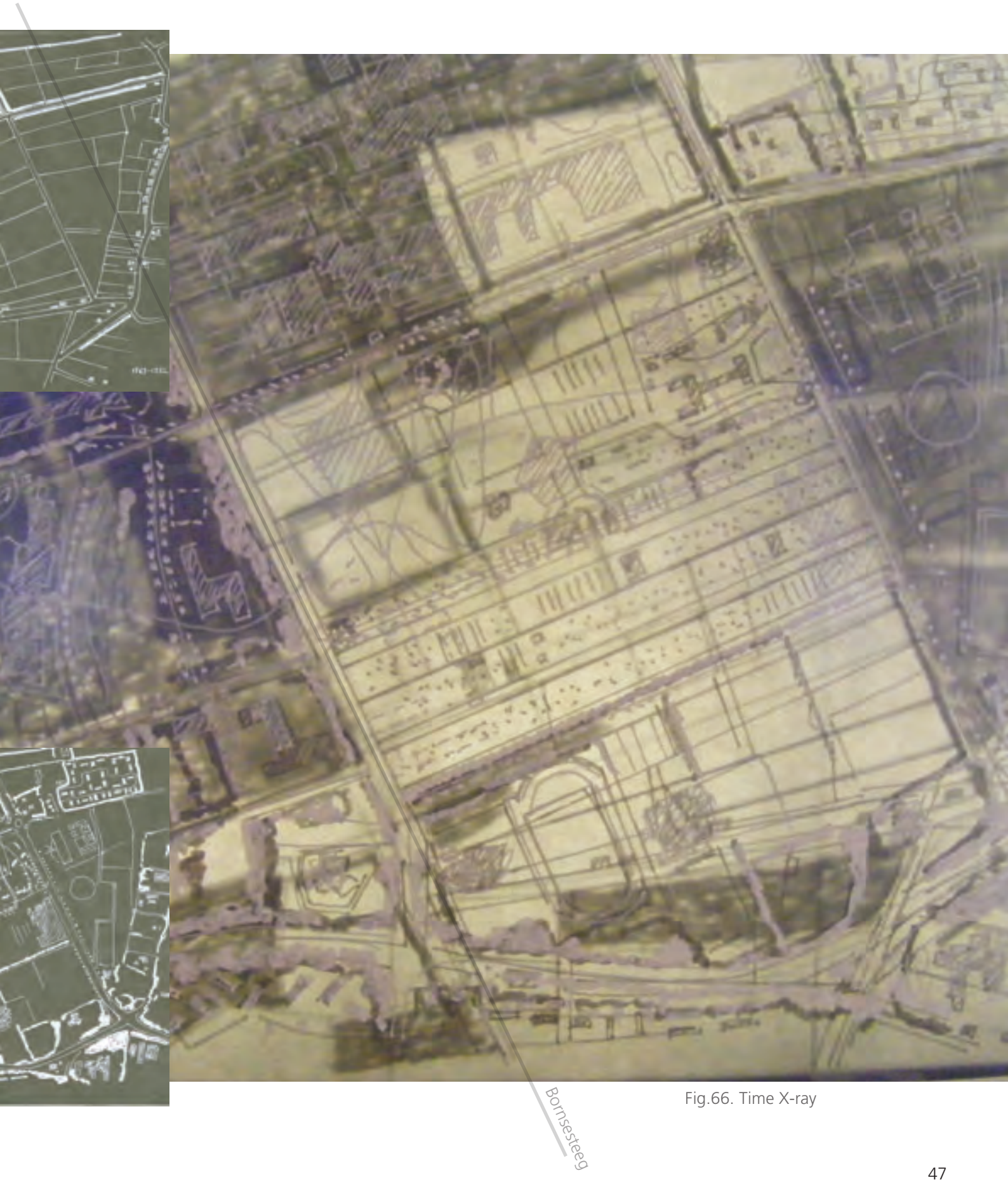


Fig.66. Time X-ray

v. INITIAL PLANS FOR WAGENINGEN UR CAMPUS

Buildings (from Bestemmingsplan):
In the Bestemmingsplan it is stated that the buildings in the central plot of the camps must appear as monoliths, thus they are not having own gardens nor any protuberances in the facades. Only incisions are allowed in the general volume. As a distinctive feature of each building, the façade can consist of only one material next to glass: concrete (Atlas), brick (Forum), steel (Orion) wood (NIOO-KNAW) (Fig.67). The material should be sustainable and age beautifully. 'The buildings in the central area have a character that suits Wageningen and WageningenUR.'

The buildings at the edge of the central plot have their main facades facing the road and are positioned in line. They have each a unique character and appearance as well as different gardens each having different plants. Again materials with natural appearance are preferred on the facades.

Fig.67. Building construction years range from 1950 to 2013

Campus spatial layout

Bureau B+B did the outdoor design for the campus as a park-like landscape: 'The total campus area covers about 60 hectares. The site will become a diverse and rolling park landscape with a number of large lakes. The ponds and canals fulfil an important water management function for the area. The park will be covered with diverse vegetation and accompanying strolling paths over bridges and along the ponds. For example, you will see a 'scent route' with fragrant trees and shrubs. You will also see a 'weeping route' with all sorts of weeping varieties, a fruit corner and a strolling circuit. There will be several lawns for sunbathing and an events site, which will offer the 8500 future residents of the complex opportunities to relax.' (B+B).

Every building at the edge should have its own garden: ecological gardens, guest gardens, healing gardens, and water gardens (fig.68).

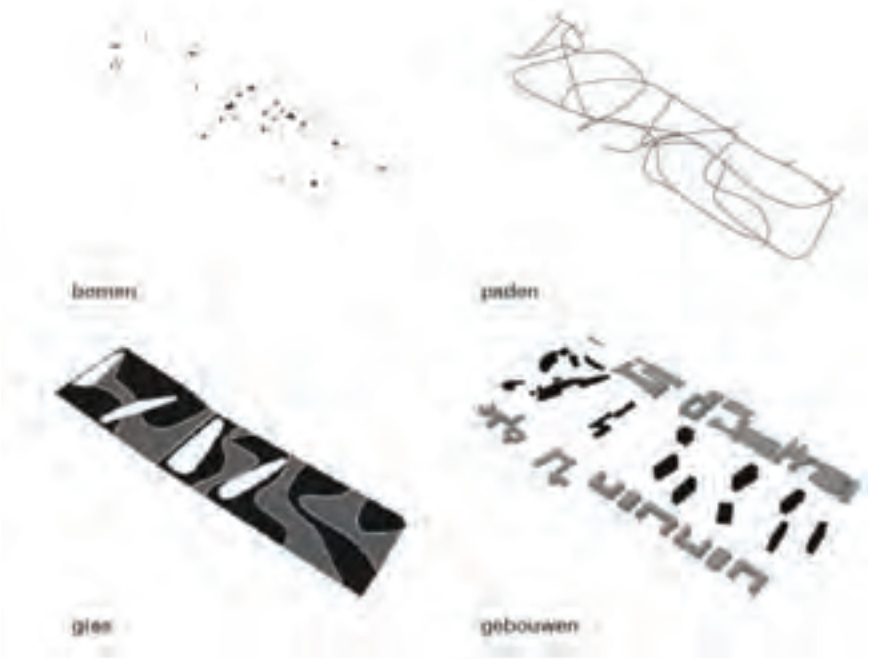


Fig.68. Spatial layout of the campus

Green and nature

All green areas on the campus should be connected. The green structure consists of (Bestemmingsplan) (fig.69):
- different grass areas - areas with short cut grass interspersed with areas of extensive mowed grass and flower meadows;
- various "stepping stones" consisting of low shrubs that are part of the local ecological corridor between East and West. In time, the stepping stones should be brought in relation with the extensive mowed grass and flower meadows;
- the Dassenbos on the east side of the campus is maintained as a quiet enclave where nature is practically undisturbed;
- tree planting with oaks along the main roads is characteristic for the linear green structures in the Binnenveld ;
- there is a green connection to de Blauwe Bergen on the south side of the campus;
- a green connection between the campus through the Bongerd and Leeuwenborch is also envisioned
- the ecological garden around the Lumen building (Natuurtuin).

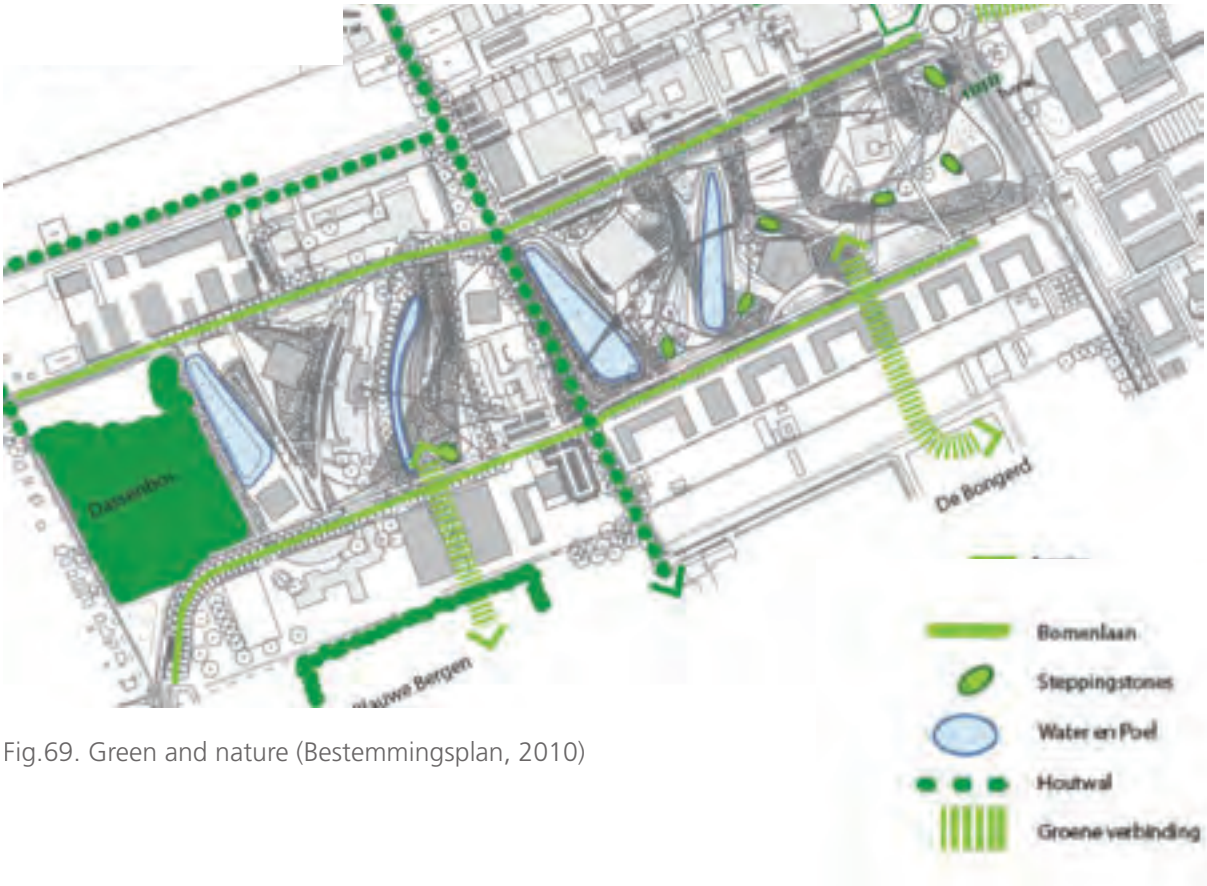


Fig.69. Green and nature (Bestemmingsplan, 2010)

vi. FUTURE PLANS (fig.70)

In the near future a Helix, new building as headquarters of Agrotechnology and Food Sciences Group (AFSG), will be constructed next to Impulse. Also a project had been done for a student Plaza south of Forum. This will be a complex including housing, shops, cafes and cinema. In addition a new bus line will cross the campus in order to have a bus station close to Forum building.

Strategic plan for campus (translated to English from Bestemmingsplan Wageningen Campus document 2010) (Grontmij, 2010):
The Wageningen UR campus would is considered as booster for the regional and national economy. Therefore, the coming years will see an extra focus on the presentation of the campus, to create an inspirational work and study environment.

The 'Food Valley' network of which Wageningen UR is part as a key economic pillar is also mentioned. The objective is the profiling of the region as a 'Food Valley' of world renown with a unique position in Europe on the themes of nutrition, food, agriculture, life sciences and health.

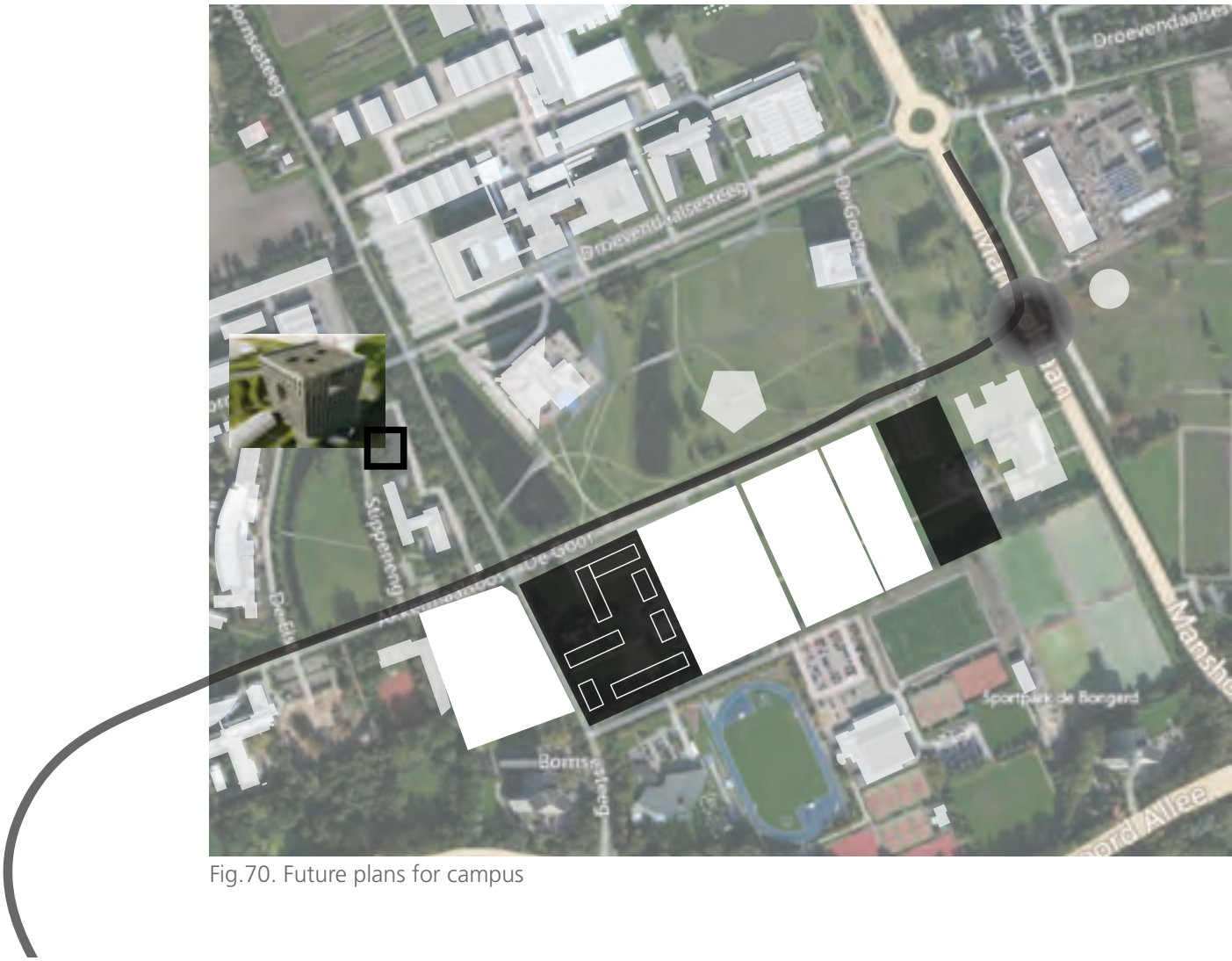


Fig.70. Future plans for campus

vii. PULSE OF THE CAMPUS NOW

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ANALYSIS OF SURFACES (fig. 71)

Out of around 60 ha only approximately 37 ha of the campus is permeable surface. As an improvement for rain water management, healthier environment and richer experience, materials of the sealed parking surfaces can be replaced by permeable ones and vegetation can be planted to improve soil permeability or store and release water.

Permeable = 32,73 ha
ponds and ditches = 4,51 ha
buildings = 10,16 ha
paths and parking = 18,26 ha
Total = 65,66 ha

Fig.71. Analysis of surfaces

ANALYSIS OF SHADOWS, WIND, THERMAL CONSIDERATIONS

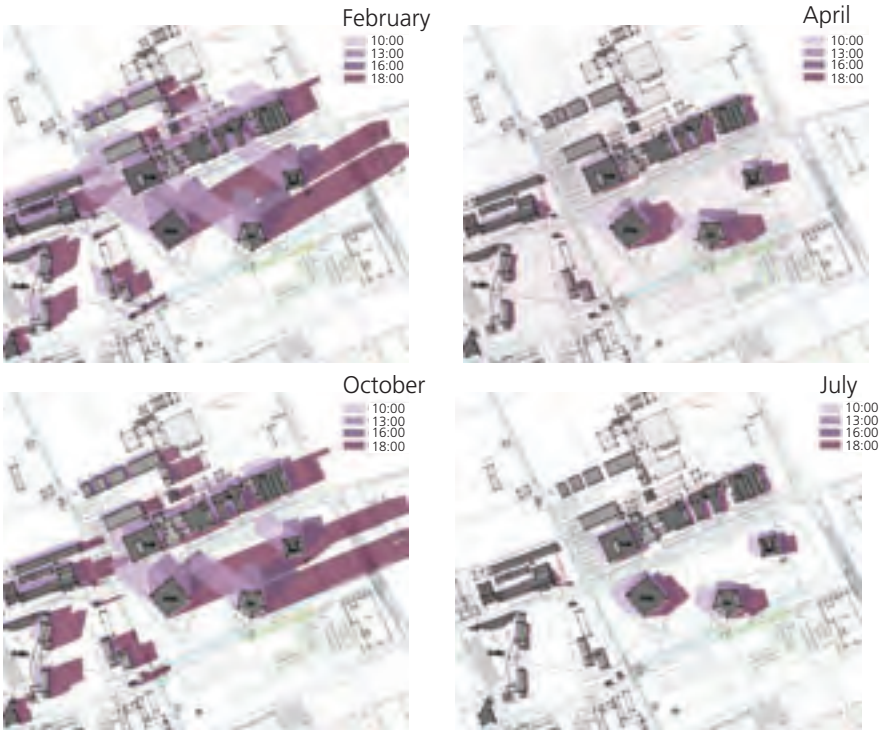


Fig.72. Shadow simulation

Shadow simulation (fig. 72) shows changing conditions on the campus due to season and time of the day. This could be later for used in locating activity areas and choice for species for new planting.

As shadow patterns are not the only factors impacting thermal comfort and microclimate, several other factor were overlapped in analysis as wind direction (South-West), soil quality, weather patterns) (fig.73). There are wind problems especially around Forum and Atlas. This study could have been more elaborated, by using software to determine site specific pattern sin thermal comfort. though this is a highly relevant and interesting aspect, the time was too limited to go in depth.

Fig.73. Overlapping parameters about site conditions

WATER PULSE

Geohydrology
The Wageningen Campus is situated in an area with high water table and seepage from the higher situated Veluwe ridge.

Surface water
The water passage located in the middle of the Droevendaalsesteeg in the direction of the Dijkgraaf is the main drain of the project area. Along the Dijkgraaf water can be drained southward (core Wageningen). To maintain the water level in the area it is possible to let water in from the north (coming from the RWZI in Bennekom) along the Dijkgraaf. The other main drain of the planning area is along the Bornsesteeg, where the water connects through a culvert under the road to the city canal of Wageningen.

Drainage
Three large ponds and broad ditches were constructed for storage and drainage of excess water. The ponds are part of the ecological water structure of Wageningen. Puddles at the ground surface were cause after heavy rain or in winter because of the low degree of permeability of the soil. It is known that by large excavation and construction work the original soil structure was destroyed. The recovery of this is partly possible with work and partly dependent on natural processes that take time.

Landscape vision
Considering the original nature of the site, water is allowed at the surface even outside the ponds but not everywhere. Thus, under normal circumstances, 'paths and roads are dry as well as the manifestation terrain, the space around buildings, under artworks, under sitting mounds and picnic tables'(facilities).

Precipitation
main annual rainfall of 765 ±130 mm

Altitude
the area is inclined from E to W: from approx.NAP 12.75 m to NAP + 7.26 m.

Ground water level (H=highest and L=lowest)

IV = H>0.40m L 0.80-1.20m
III = H<0.40m L 0.80-1.20m

Source: GIS map

Groundwater storage capacity

low
high

Source: GIS map

Water flow direction

shallow groundwater
WSW
deep groundwater
S

Source: Bestemmingsplan, GIS map

Drainage system
retention and detention of rainwater runoff from building roof and hard surfaces

underground pipes
ponds ditches
dams

Source: site observation

Surface water

nutrient poor
nutrient average
nutrient rich

Source: Alterra smart campus experience

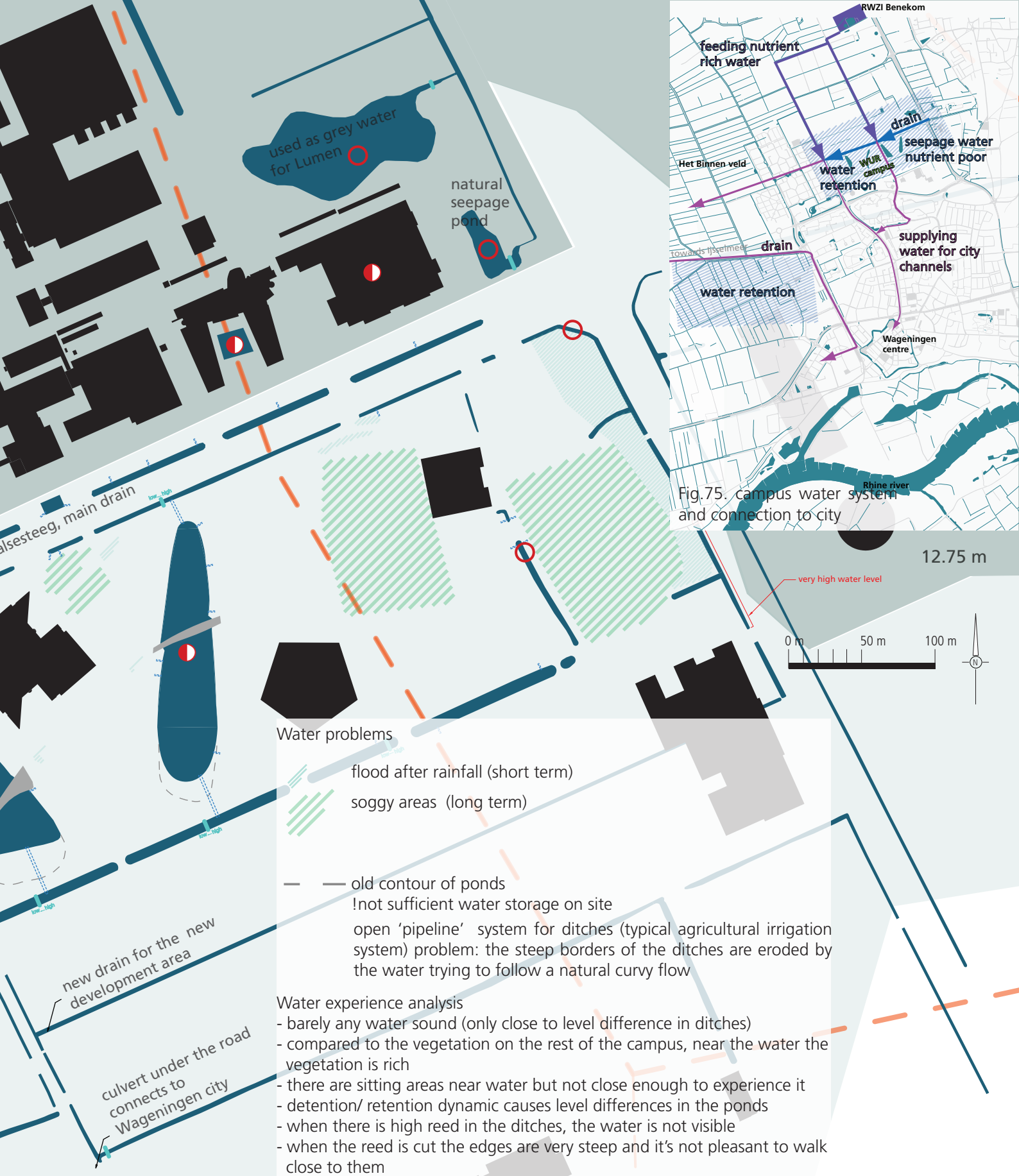


Fig.75. campus water system and connection to city

Water problems

flood after rainfall (short term)

soggy areas (long term)

— — old contour of ponds

!not sufficient water storage on site

open 'pipeline' system for ditches (typical agricultural irrigation system) problem: the steep borders of the ditches are eroded by the water trying to follow a natural curvy flow

Water experience analysis
- barely any water sound (only close to level difference in ditches)
- compared to the vegetation on the rest of the campus, near the water the vegetation is rich
- there are sitting areas near water but not close enough to experience it
- detention/ retention dynamic causes level differences in the ponds
- when there is high reed in the ditches, the water is not visible
- when the reed is cut the edges are very steep and it's not pleasant to walk close to them

Possible improvements:
- add more water surfaces
- slow down the draining process by creating vernal pools next to the ditches (for spawning and breeding)
- design sitting area where one can interact with water

Fig.74. water pulse

VEGETATION PULSE

The site located in transition zone between lower peat lands and upper moraine.

Soil Structure
On site the soil consists mainly of loamy fine sand (specific to ground of streams). In the area of Lumen (north side of the planning area) veldpodzolgronden (field podzol ground) occur. A one meter thick layer of fine sands (cover sand) covers the surface at certain areas. At varying depth humus and peat layers are present in the soil (source: Bestemmingsplan, GIS maps).

Tree species in the old forest areas are:
Quercus robur, Betula pendula, Betula pubescens, Alnus glutionosa

Other dominant species on the campus:
Salix alba, Carpinus betulus, Acer campestre

There are problems of trees dying on campus (study done by COBRA and students).

Fig.76. vegetation pulse

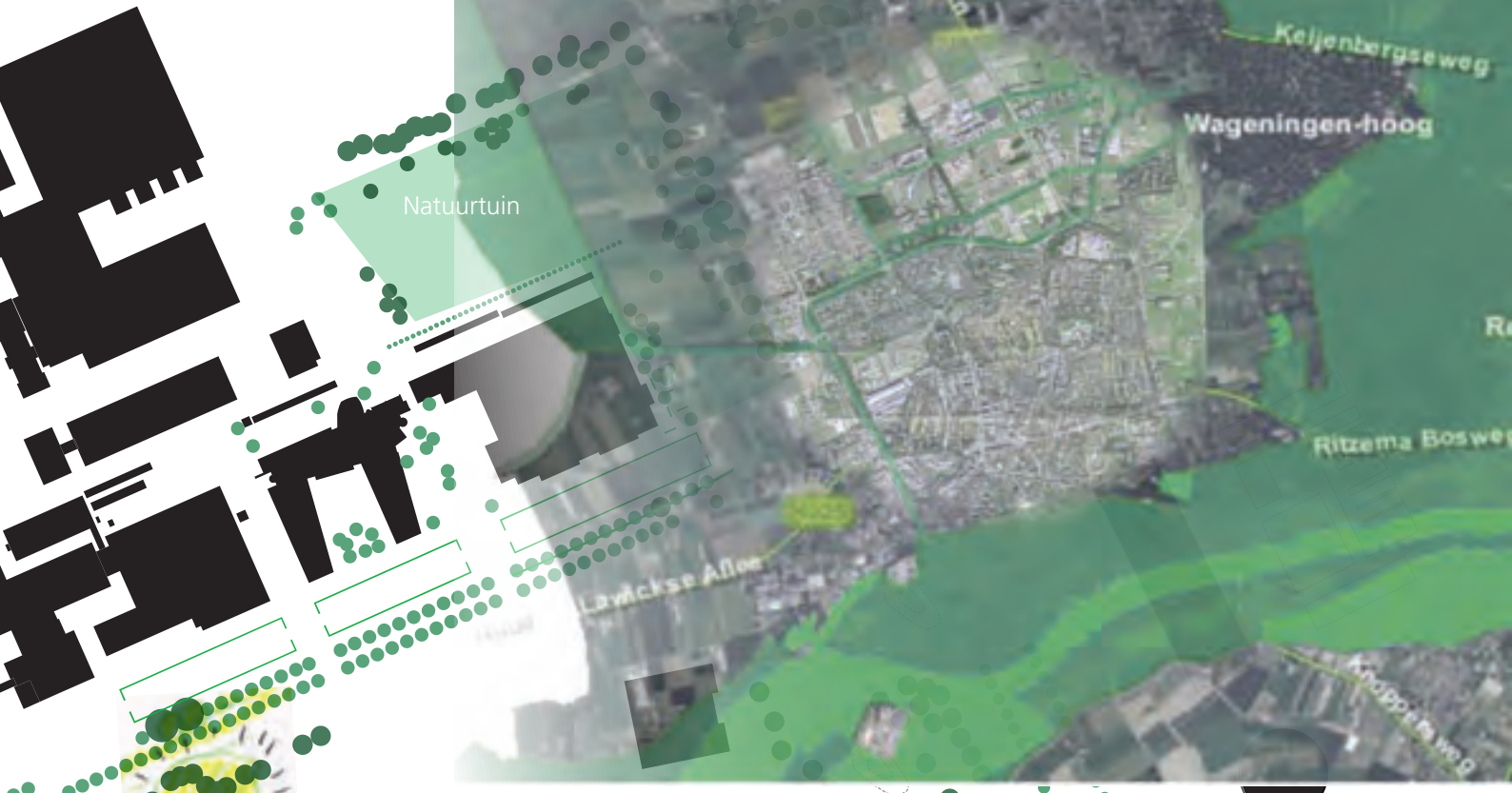


Fig.77. Campus location relative to the EHS (Ecological main structure)

Most of the trees on the campus are deciduous, so the change of season can be observed. Unfortunately from the existing paths one can rarely walk under or near trees. On Droevendaalsesteeg, the trees are next to the car lane leaving people to walk through the parking in the sun. Except for the one group of trees near Forum and near Orion and the Naturtuin there are not enough trees, flowers, bushes: bare lawn occupies most of the campus.

CIRCULATION PULSE

The campus has a key location between city and landscape and along an important traffic route (Mansholtlaan).

Fig.78. Circulation on campus

A ring road around the central lawn of the campus, keeps the car traffic away from this area. However as parking lots are situated around this road the car traffic separates the central lawn from the line of buildings to the north side.

Often the same path is used for bike and pedestrian circulation. This makes walking uncomfortable and does not allow for slower movement and drift. The quality of walking experience is neglected.

ANALYSIS OF SPATIAL QUALITY

Imageability: no recognizable patterns
Forum is the strongest spatial reference

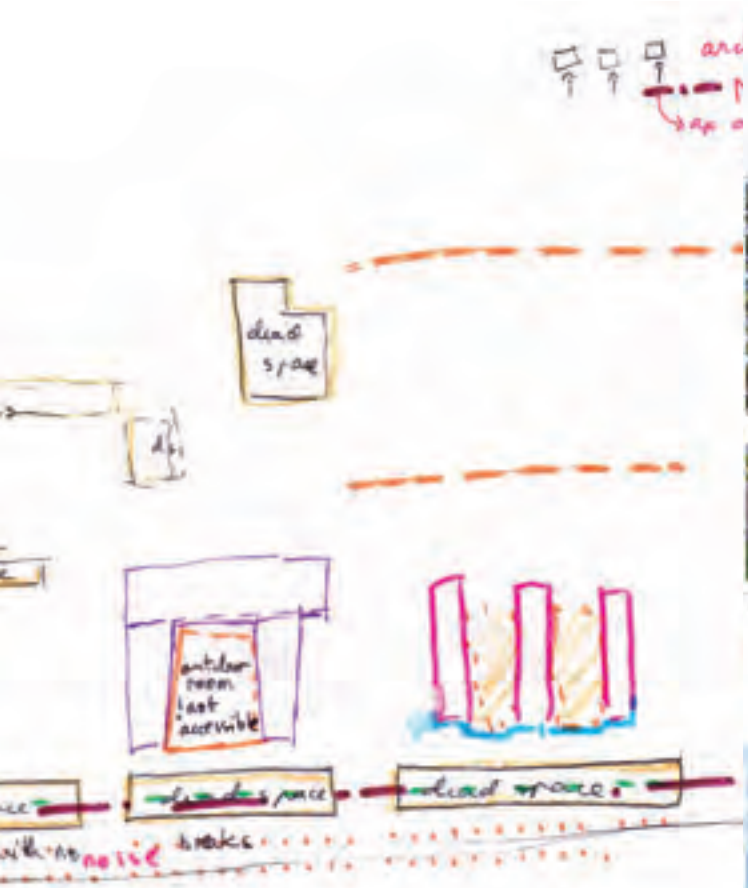
Enclosure: barely any enclosed areas
Distance of pedestrians to facades or street planting
Long sight lines without breaks
Many dead places created by parking lots (also used as paths for pedestrians)

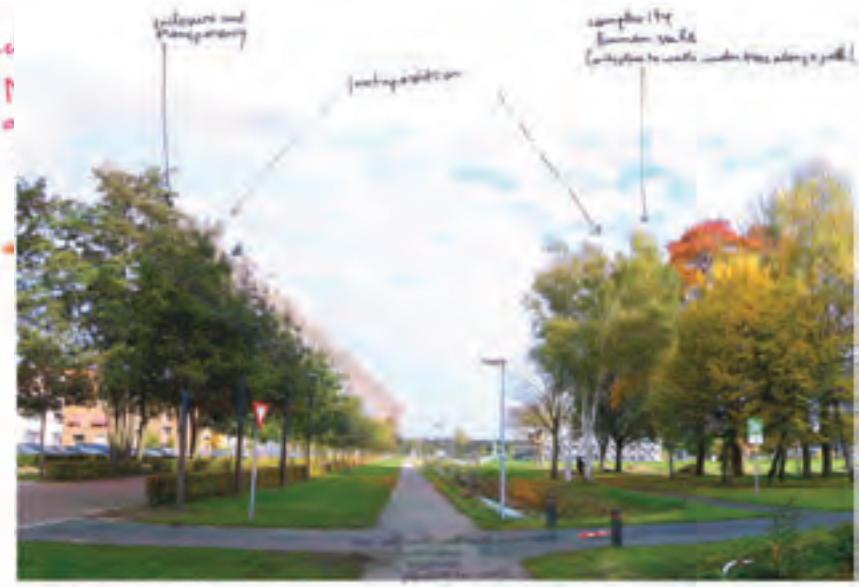
Human scale: Only trees introduce human scale but they are rarely in human reach, the outdoor furniture is too bare

Transparency: No clues about building use (no externalized activities). Lumen is partly a glass house which can link back to agriculture.
Still in general windows at ground level, give a level of transparency.

Complexity: Low complexity on site although there are a variety of building styles and materials and diverse planting.

Fig.79. Analysis on saptial quality





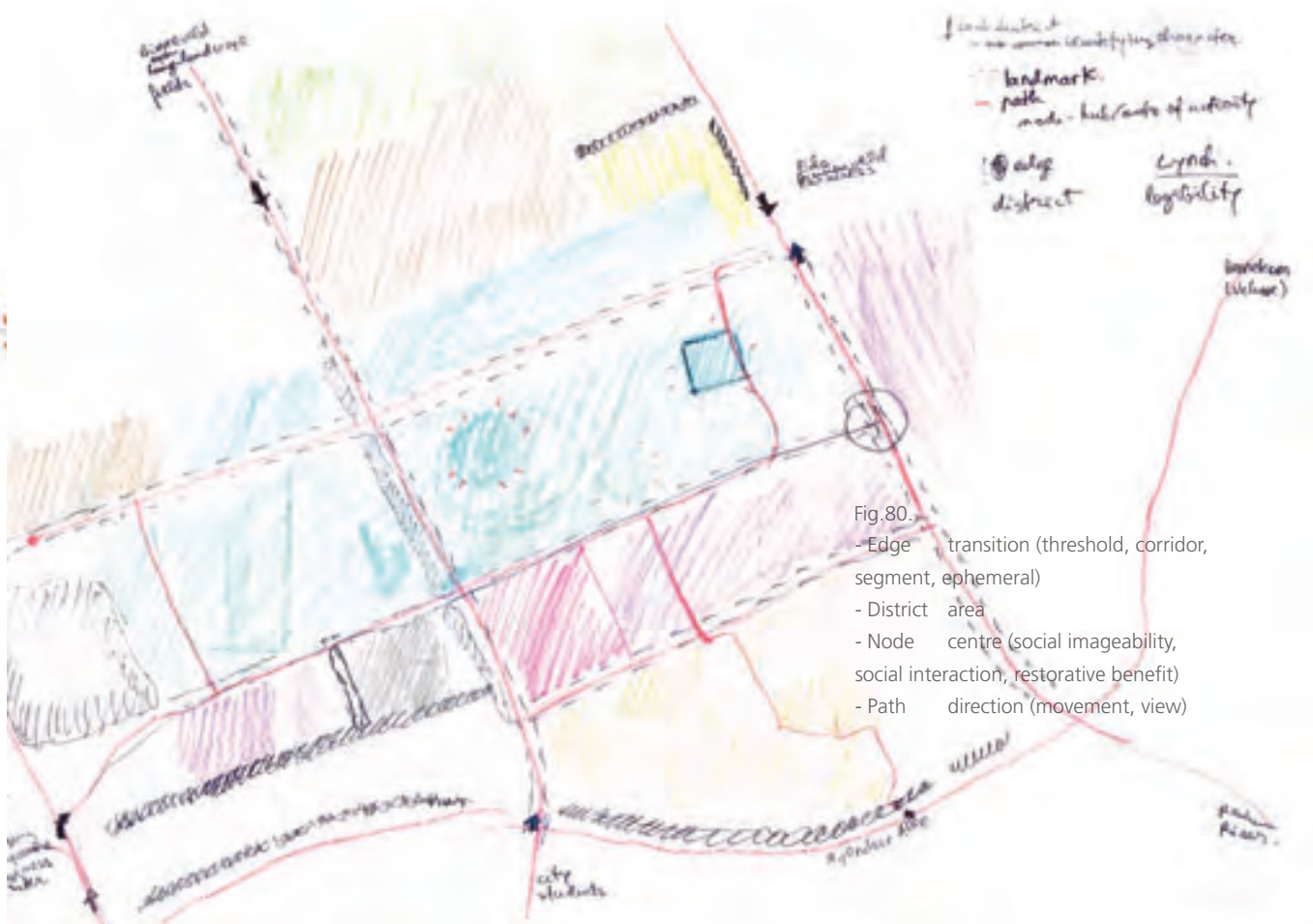


Fig.80.
- Edge transition (threshold, corridor, segment, ephemeral)
- District area
- Node centre (social imageability, social interaction, restorative benefit)
- Path direction (movement, view)

ANALYSIS OF EXPERIENTIAL QUALITY

Centre: Forum is the only centre followed by Impulse

Weak restorative benefit on the campus (only Natuurtuin and the edge to Mansholtlaan)

Direction: restricted options for movement

Few choices, where to walk, not very imaginative, no anticipation.

Low sensory direction (no mystery, barley anything to explore, smell, hear...)

Transition: no corridors

Thresholds are imposed by traffic

Areas: not linked

Fig.81. Analysis of experiential quality

A feature of conscious connection to the surrounding landscapes is represented by the Natuurtuin, at the north edge of the campus. It was realised in 1998, using soil types characteristic of Wageningen and surrounding areas to create diverse environments characteristic for riverine areas and sandy soils. It provides habitat for numerous animals and birds (photos).

Fig.82-83. Natuurtuin

Unfortunately, such an approach and design is not characteristic for the rest of the campus. Many students and staff members experience the campus as a green, open, bear field. Amande de Bresser (Soil, Water and Atmosphere Bachelor's student) declared for the university magazine that 'People really feel a need for more trees, bushes and shelter. It's all too smart and neat. As a result, people experience the green spaces as bare and sober'. 'It's green and looks good but it could be a lot more welcoming. At the moment it looks like a bunch of building blocks dropped in a field' (Kleis, 2013).

Having time experience in focus here are some pictures describing the dominant tendency on campus as 'less of this' and examples of improved situation as 'more of this'. Both are taken from the existing situation on the campus.(fig.84)

In conclusion: the shaping forces of the campus are management, functionality and efficiency rather than natural forces or creativity of staff and students.

Fig.84

FIGURE-GROUND ANALYSIS

Looking at the figure ground of the current campus, it is concluded that there are large voids and large buildings with barely any articulation of facades that would create space at human scale. The few spots that have this quality of in-between indoor and outdoor are marked on the map. Two of them are only visually accessible. Thus, except for the few cases, there is no transition zone between the buildings and the landscape. Architecture is dominant, hard, Euclidian, while outdoor space has no form. It is receiving but not asserting. The current situation lacks human scale, echo, proximity.

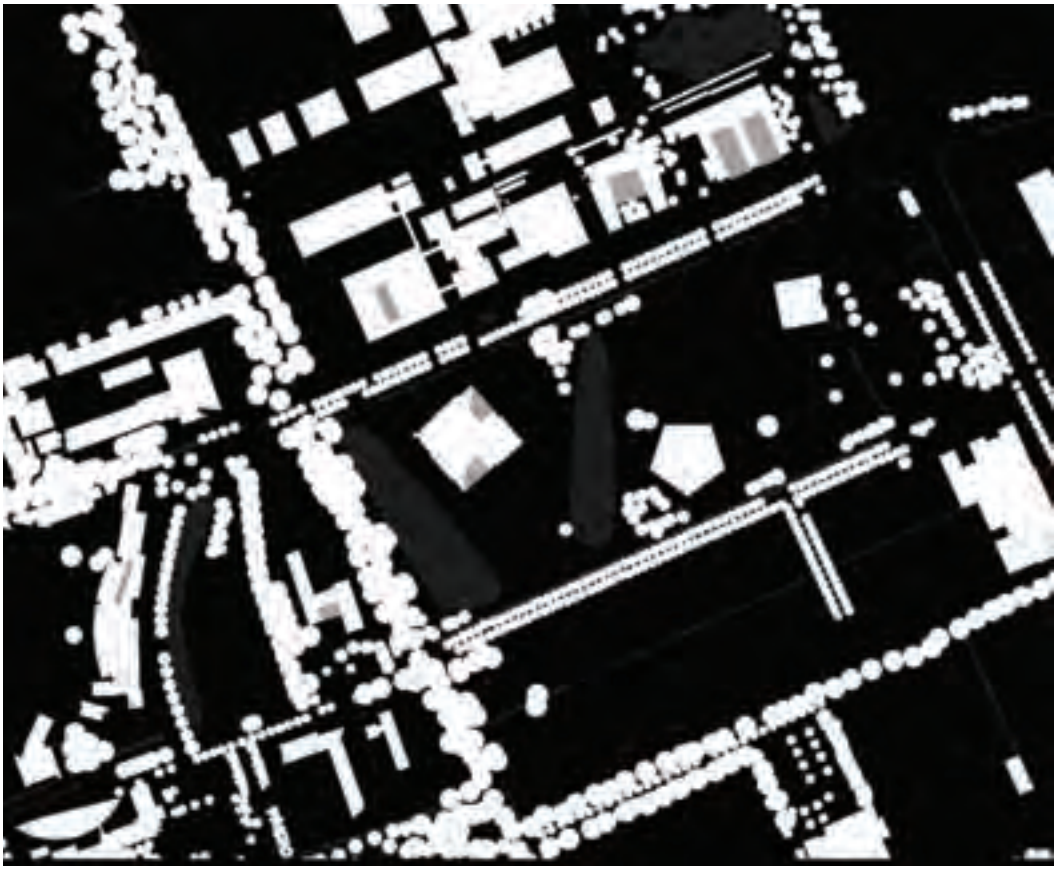


Fig.85. Figure-ground analysis

viii. TOP THREE DYSFUNCTIONS

After the revision of these results and having established the design the three main dysfunctions concerning the current situation of the Wageningen UR campus were formulated. These are according to the main sources for this paper that have been presented in the Introduction chapter (Unified field theory, Representation, Phenomenology).

From point of view of Unified field theory, the current campus design is a statement of mechanistic/ materialist thinking of time; treating objects rather than thinking about people's experience. Few examples are the use of parking lot also for pedestrian walk and access to the buildings and the use of paths simply as lines connecting elements.

From point of view of representation, the existing situation allows only a distanced experience where one is kept away from haptic experience (look but don't touch). It reflects 'decisions about what and who should be visible and what should not, concepts of order and disorder, and on uses of aesthetic power' (Palipane, 2011, p.4). This quote of sociologist Sharon Zukin discussing about the 'look and feel' of cities is true also for this campus design. In the present case the visual quality is emphasized and although there is barely any visual barrier, many physical barriers (ditches and car traffic and parking) control the movement on the campus.

Concerning the buildings in the central plane of the campus: 'Twentieth-century buildings have generally lost their inside/outside connection. Glass walls emphatically do not couple indoors to outdoors; they create informational ambiguity by connecting visually while disconnecting physically and aurally' (Salingaros and West, 1999).

Also similar to our campus which discourages anything protruding from the buildings, keeping activities inside, Palipane describes how in area regeneration shopkeepers are asked to keep their merchandise inside of the shop, while making sure the shopfront is seducing (Palipane, 2011). Thus, alluring sensorial qualities are replaced by visual consumption at 'non-confronting distance' (Palipane, 2011, p.4).

From point of view of Phenomenology the campus lacks proper pedestrian infrastructure in order to be able to explore the landscape (inside and outside of the body). The design for the path system is following other principles than comfort, wayfinding, experiential quality: Walking paths are often shared with bikes and even cars. The walking is not encouraged also due to the long straight lines, few crossings causing detours when getting from one place to the other. There is too little design at human scale along these paths.

Palipane's description of regenerated spaces character shares similarities with the experience on this campus: the 'light sensory experiences': no strong smells, 'tactile smoothness and sleekness of textures', the 'sparse, ordered public spaces and their silence-unless some staged event is organised' (Palipane, 2011, p.4).

treating objects rather than thinking about people's experience (fig. 86)

the existing situation allows only a distanced experience where one is kept away from haptic experience (fig. 87)

the campus lacks proper pedestrian infrastructure in order to be able to explore the landscape (inside and outside of the body) (fig. 88).

Fig.86. Object thinking

Fig.87. New acer hedge planting in front of Lumen – keep people away, avoid bike parking. Distancing to the rich nature behind

Fig.88. Figure-ground analysis

Legend

pedestrian only path

pedestrian and bike path

pedestrian, bike and car path

building entrance

meaning of name
building name
occupying group

lack of clear identity of outdoor space,
no exteriorisation of knowledge inside the buildings

Fig.89. Top three dysfunctions

ix. USER DEMANDS

As this university is a hub of knowledge, grouping diverse studies, I contacted persons (researchers from climate, GIS, water) and Facilities department from different chair groups or student initiatives to share and exchange ideas. There are already initiatives for improving the current campus design:
1. Alterra research on healthy campus experience and smart campus experience

It used the results from the students of the Bachelor honours programme of Environmental Sciences questionnaire about the Wageningen UR campus addressed to student's and staff .

- favourite images: not too dense 'forest', not too empty lawn (open space under trees, grassland)
- wish for more trees, more flowers, more shrubs (orchard)
- Open theatre
- Fountain
- Less parking
- Busstation next to Forum
- Supermarkets
- Sitting areas
- Facilities for working outdoor
- Diverse nature
- Waterworks
- more Wageningen input in campus design

Info from the interview for Healthy campus experience research:

- users appreciate the open view but don't appreciate being seen from all buildings
- Distances seem long because of the long straight walking ways and having to do detours
|(experienced as far rather than being far in terms of meters)
- the campus design is not practical for working outside (no internet, shade for screen)
- Limited outdoor facilities
- No grocery shop on the campus
- Students and staff always go to Forum for breaks
- People speak of the campus as only Atlas, Orion, Forum

2. project EAT participatory design for a campus - academic garden (I joined the board of this project for almost a year)

The main requests for change desired in these projects as well as those mentioned in the meetings with the facility department were also considered in the design experiment:
- connect campus to city
- enrich current vegetation (also edible)
orchard, flowers, vegetable garden, trees, practice knowledge, share knowledge
- image making emphasizing on innovation

x. PURPOSE/GOALS

In relation to the three main user desires mentioned above and the theoretical research, the designed environment should provide:

- Comfort/orientation
- awareness and stimuli for action
- options for action

xi. DESIGN VISION AND VALUES

Before introducing my vision and values for the campus design experiment I quote the vision from the official document about Wageningen Campus:

The mission statements:
Wageningen UR: to explore the potential of nature to improve the quality of life.
Wageningen Campus: Gateway to smart food in a green world.
The vision 2025 of Wageningen Campus:
A vibrant place where students, entrepreneurs and scientists meet. Where one experiences cutting edge innovation with high-end facilities and equipment for all. Where new ideas are born, nurtured and will prosper. You love to bee and buzz at Wageningen Campus. p.8

Strategy
The following strategy has been formulated to achieve the strategic goals and the related KPI's:
I. Ensure access to outstanding research facilities and equipment;
II. Create an inspiring, central interaction and meeting area: IMPULSE!; and
III. Offer dedicated services for companies and institutes at every stage in their life cycles p.10

My own vision is: A singing and dancing campus.

The campus should become livelier and students should experience other types of time and rhythms then those of studying and the linear time. Design with time focus could provide rich learning opportunities for students on a campus. It's supposed to balance approaches of developing intellect and intuition, knowledge by experience and knowledge by learning from others. Creativity should be stimulated and encouraged and the environment should be alert not inert (you enter the place, you change the place) conveying a sense of agency

This campus should be about observing in situ, and learning from nature, since there is so much landscape around. It should not be about sharp separation of buildings and their paths and inaccessible nature areas. The environment should serve as a growing medium and the goal of design should be providing conditions for development and constant feedback.

Koh states that ideally, Wageningen UR campus 'should consist of 'a simple everyday landscape that is educated and educating: a designed landscape, self-aware and self-conscious, embodying intelligence, demonstrating creativity, expressing humility and care' (Koh, 2013, p.2). 'The duty of education is to cultivate and support the human abilities of imagination and empathy, but the prevailing values of culture tend to discourage fantasy, supress the senses, and petrify the boundary between the world and the self' (Palipane ,2011, p. 134).

The following values would incorporate this vision:

tuned in growth
- program ideas that follow other times: ***cyclic time etc.***
- fertile ground - change the campus from a consumption landscape to a production landscape

- embodied and abstract **-** enhance WUR identity of a hybrid relation between research and education by allowing also outdoor practice everywhere on the campus

- ***create*** common ground - opportunity to exteriorize and share knowledge (from gatedness to openess)
- *mutual transformation through* stimuli and *inspiration*

comfortable movement

- positioning in space and time
- ***awaken body- materiality and spirituality***

- innovation **-** enhance the image of WUR as place for creativity and innovation

- serve nature and people - enhance the quality of life for people (students, staff, community...) and nature (ecological connection, integrated systems...)

xii. DESIGN ISSUES:

- **strategic allocation**

Relates to importance of positioning in reach of human senses, enclosure, wayfinding, transparency.

- **inside-outside/ edge**

Important phenomenological concept of designing transition in space and time.

- **in-out of body awareness**

It draws attention to the relation between relation between inner feeling, body sensations and outside environment.

A.f. PHENOMENOLOGY: TENSION AND EASE

From the diverse ways of understanding and interpreting time (in cognitive linguistics, physics, social sciences, landscape architecture, art...), deciding which one to choose as departure for own exploration is subjective. Design cannot be realized following a scientific method.

Since time is a metaphor, to grasp time the idea proposed by Tuan, that time perception occurs through the alternation of tension and ease was adopted:

"We have a sense of space because we can move and of time because, as biological beings, we undergo recurrent phases of tension and ease. The movement that gives us a sense of space is itself the resolution of tension"(Tuan, 1977, p118).

This observation indicates a rhythm that we find in every living being/system; an on/off flickering, the in\out movement of the breath, the high\low pulse of the heart, the speeding and pausing of circulation. These later make time tangible.

B. CONCEPTS

Following the understanding of time through alternation of tension and ease, the first design decision consists in bundling the above presented codes into six main concepts: three rhythms : (1) spatial layout rhythms (Wunderlich, 2010; Ching, 2010), (2) body/nature rhythms (Adam, 1998; Lynch, 1972; Wunderlich, 2010) and (3) social rhythms (Lefebvre, 2004); and three modes of walking: (1) the purposive, (2) the discursive and (3) the conceptual (Wunderlich, 2010, p.125).

A place can be described as a 'temporal milieu' shaped by the rhythmic repetition of and interaction between every day activities, nature cycles and spatial patterns (Wunderlich, 2010, p. 45). Thus, the everyday sense of order and tempo is shaped by all these rhythms and experienced through our bodies. 'Place-temporality is also an everyday aesthetics, made up of both flow and event experiences" (Wunderlich, 2010, 56). 'A sense of flow involves a distorted sense of time, but also a sense of order, regularity and tempo, as is suggested by the patterned practices and events that one unconsciously engages with in everyday urban spaces that synchronise to form a particular tempo. The distinct soundscape of place-temporality possesses a rhythmic balance and qualities of repetition and resonance. […]. Sensual and affective, such place-rhythms offer order, regularity and structure to place-temporality and affect the apprehension of time in urban space' (Wunderlich, 2010, p. 56).

Today the tendency is for ``our biological rhythms of sleep, hunger and thirst, excretion and so on [to be] more and more conditioned by the social environment and our working lives" (Elden, 2004, p. xii quoted by Middleton, 2009, p.1957). However, ``the time of clocks and calendars is but one aspect of the many times that bear on our lives simultaneously" (Adam, 1995, p.16 in Middleton, 2009). After all, ``whilst the existence of clock time facilitates context independence and global standardization, decisions about the timing of even the most habitual actions are made on a unique basis and with reference to a particular context" (Adam, 1995, p.22 in Middleton, 2009, p.1950) (fig. 90-91).

Wunderlich elaborates on three modes of walking, naturally part of everyday temporal practices of place: the purposive, the discursive and the conceptual (Wunderlich, 2008, p.125). 'These approaches to walking can, moreover, be combined experientially in a single walk, highlighting how one facet of mobile practices is the flow of continuous attachment and detachment to place' (Wunderlich, 2008, p.6).

Purposive walking occurs at constant rhythmical and rapid pace'. The attitude is rather worried and directed towards a longed for destination; similar to the one when performing 'necessary activites' (Gehl, 1987, p. 135). It is characterized by 'bodily disengagement: Walking while listening to a walkman or ipod, walking while talking on the mobile phone, and walking while eating (Wunderlich, 2008, p.131).

In opposition, *discursive walking* 'is a spontaneous way of walking characterized by varying pace and rhythm'. 'The term *discursive* is inspired by Michel De Certeau's account of urban walking: "The act of walking is to the urban system what the speech act is to language" (1988, p. 97 in Wunderlich 2008, p.132). It is a discourse between own internal bodily rhythms (biological and psychological) and external paces and temporalities, that is expressed through the walking pace and rhythm. One cultivates comprehensive awareness of the external environment. It 'is a participatory mode of walking, during which we half consciously explore the landscape while sensorially experiencing it passing by' (Wunderlich, 2008, p.132). In this situation the journey becomes more important than the destination.

Conceptual walking (fig.92) is a reflective mode. It is a creative response to our interpretation of place (Figures 11 and 12), or simply a way of gathering information, or critically building awareness of urban environments' (Wunderlich, 2008, p.132). The walker takes a critical stance and becomes a choreographer as the movement occurs following an idea of what to perform. Thus, this walking is a way of "rethinking place as unfixed and site as performed" (Rendell, 2006, p. 149). 'Further examples of conceptual walking are the 'deambulations', the 'detours' and the 'dérive' of the Surrealist and Situationists groups (Andreotti & Costa, 1996; Borden, 2001; Basset, 2004; Ford, 2005), the wanderings of land artists (i.e. Long, Robert Smithson, ppenheim2), and the psycho-geographical expeditions of literary writers (e.g. Sinclair, 1997) and other art groups (e.g. Platform3) (see Careri, 2002 and Rendell, 2006)' in Wunderlich, 2008, p.133).

Fig.90-91. Synchronized ensembles of distinct practices

Fig.92. Conceptual walking

C. CATEGORIES

The six concepts of rhythms and walking modes were combined to form two main categories to express time for this thesis: motion and rhythm. These two reflect another way of looking at tension and ease.

Rhythm and motion are both abstract and embodied. Moreover, music and movement are transient experiences and always bring about change and transformation. Also, 'music and dance free people from the demands of purposeful goal-oriented life' (Tuan, 1977, p129) allowing creative interaction with the environment.

RHYTHM

'All living things internalize and respond to rhythms' (Missana, 2004, p.11).

Rhythm differs from line and directive through the fact that the path of the movement is not prescribed (Gottlieb, 1958). Lefebvre describes rhythm as the 'placement of notes and their relative lengths' (Lefebvre, 2004, p.xi).This would translate in design language as positioning and interval in space, time. For Lefebvre time and space stand together. He emphasis on instant, presence as time-place-expediture of energy: 'Everywhere where there is interaction between a place, a time and an expenditure of energy, there is rhythm. Time, space and use of energy in social relations and relations of alliance brings rhythms in harmony (eurhythmy) or in conflict (arrhythmia) (Lefebvre, 2004, p. 68). Arrhythmia usually raises awareness of some unconscious or ignored rhythm.

From social point of view, rhythms can be considered as the unreflexive habits, schedules and routines structuring the day for a 'collective. They 'rely upon the synchronisation of practices that become part of how 'we' get things done'(Edensor, 2010, p.8). Thus, habits are 'discrete concretization of cultural assumptions' (Edensor, 2010, p.8).

'A disembodied appreciation of rhythms is impossible', as one needs to be aware of own body to sense the external rhythms (Edensor, 2010, p.4-5). 'Lefebvre's focus too frequently turns to epistemological considerations and social disciplining of the body rather than actual embodied experience and its capacity to affect and be affected by a multitude of other rhythms' (Edensor, 2010, p.4-5). The body does not need 'dressage' to recognize certain rhythms'; it transforms place as much as it adapts to it, and it does not continuously follow regular beats. Furthermore, 'dressage' can actually stir improvisation (Edensor, 2010). Crang builds up on Lefebvre's work: 'seeing spatiality as becoming' (p.205), as movement. Still, he challenges the idea of 'orchestration' in favour of time as practice: 'performatively creating time' (Crang, 2001, p.200).

One can 'cut into the standardizations of daily routine an interval' and create own spacing in accordance to the felt nuances of time (Edensor, 2010, p.15). It is an act of engagement with the rhythms of the place as well as bringing in one's own pace, interfering thus with strict rhythmic and spatial order. At every moment people can resonate to the rhythmicity of the situation through breath, gestures, speed of movement and speech.

Thus even linear rhythm is not monotonous; there is a constant shift between attuning to the familiar and the surprising; periods of self-consciousness followed again by unreflexiveness (Edensor, 2010). Morover, Hallam and Ingold argue that in repetitive actions there 'is creativity even and especially in the maintenance of an established tradition (for) traditions have to be worked to be sustained' (Edensor, 2010, p.15).

A way to challenge the prevailing normative rhythms is slow movement: 'This negotiation with everyday rhythms and 'a commitment to occupy time more attentively' (Parkins, 2004: 364) aims to gain enhanced aesthetic or sensory experience and ensure that spaces of slowness supplement fast spaces in public and private domains' (Edensor, 2010, p.17). Therefore, one could actively intertwine the generic routines with his individuality.

WALKING

Walking is a practice of passage, discovery as well as transformation: 'It was by walking that man began to construct the natural landscape of his surroundings. And in our own century we have formulated the categories for interpreting the urban landscapes that surround us by walking through them' (Careri, 2002, p.19). 'Walking is the medium and outcome of a spatial practice, a mode of existence in the world' (Tilley, 1994, p.29).

Wunderlich introduces walking as a 'temporal and rhythmical practice, part of a wider group of place-rhythms that characterize urban places' (Wunderlich, 2008, p.125). She also points out the tendency to ignore in our everyday the aesthetic, creative and insightful potential of this practice (Wunderlich, 2008). Thus, design for diverse walking experiences is encouraged to allow more creative interactions with the environment, relevant for placemaking.
'Walking practices, with their pace and rhythm, together with the temporal character of places imposed by their place-rhythms, influence our perception of time, in terms of its experience and representation' (Wunderlich, 2008, p.137).

'A spatial order of walking can be characterized in terms of an order of possibilities - various ways in which an actor can move, and a series of restrictions, for example walls or other boundaries inhibiting passage' (Tilley, 1994 ,p. 28). Thus, one needs to negotiate with the context and make choices considering the diverse limits.

In addition to stimulation of haptic sense, walking is also a way of knowing, creating and reflecting. 'Our thinking if 'field based'; we think as we interact with the field' (discussion with prof. dr. Koh). In a every day situation we often think of other issues while walking: ``walking allows us to be in our bodies and in the world without being made busy by them. It leaves us free to think without being wholly lost in our thoughts" (Solnit, 2001, p.5). 'All our senses 'think' and structure our relationship with the world, although we are not usually conscious of this perceptual activity…In my view, the sensory and embodied mode of thinking is particularly essential in all artistic phenomena and creative work' (Pallasmaa, 2009, p.17). That is why walking blurs the boundary between leisure and work time.

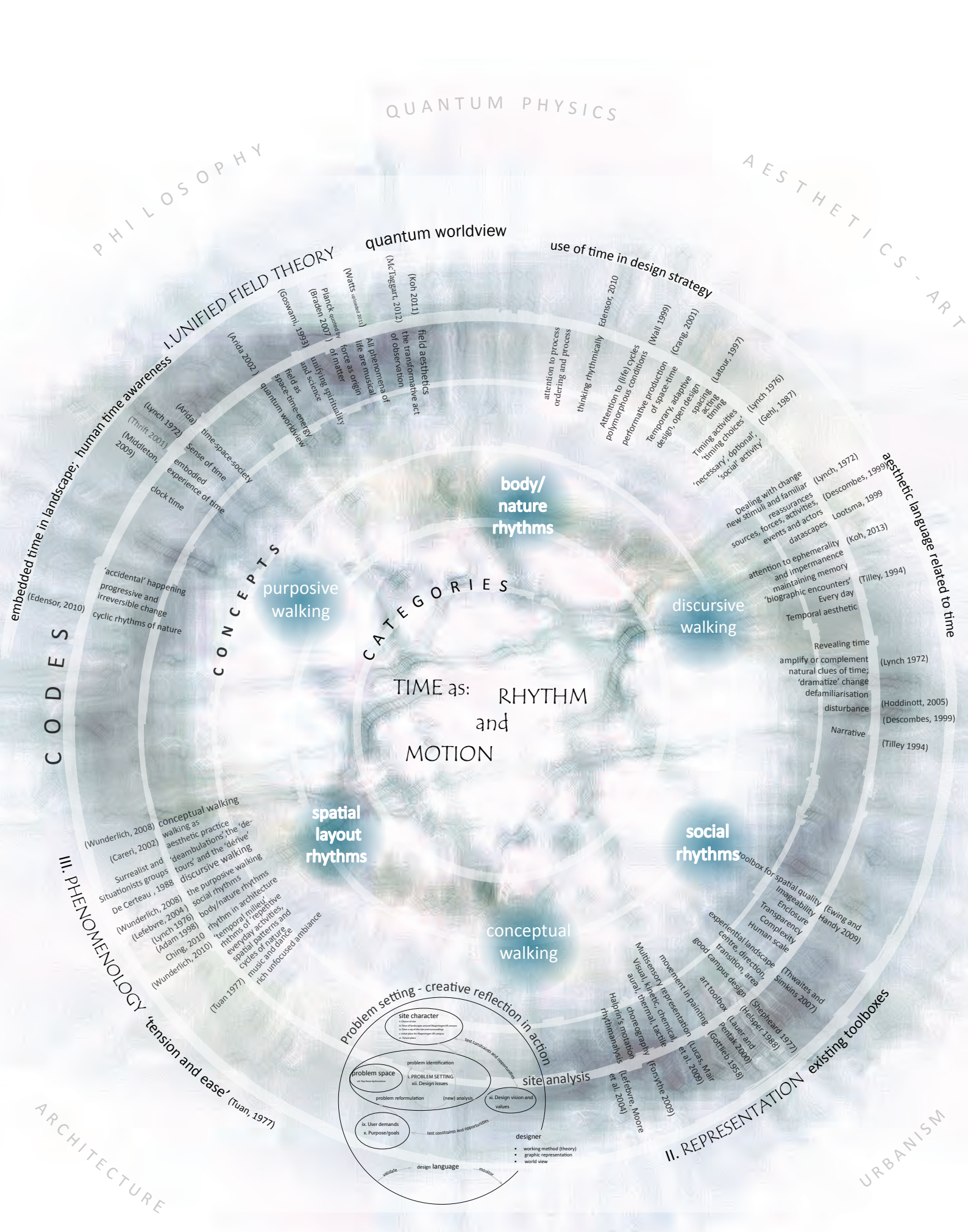


Fig.93. Summary Grounded Design Research

8. RESEARCH ON REPRESENTATION

'Our behaviour is influenced by our conception and image of the world. The language we use influences the way we think. The representations we employ influence and bias the outcome and evaluation of design. After all, both design and science work with representation, not directly with reality' (Koh, 2013,p.5). Representation itself 'necessarily limits the range of our design possibilities" (Treib, 2007, p.XIII). Every representation has a specific stand point, viewpoint, value, intention and context. It is a coded, biased system, not universal nor objective (Lecture of Prof. Koh). More than handling material which already has meaning like text and pictures, when dealing with data the designer makes the statement (Bourquin, et al., 2010, p. 8).

For this design research, an aesthetic way of knowing will be favoured as supporting "both the urge to know…and the impossibility of ever knowing aesthetic phenomena in any ultimate sense"(Lang, 2006).

8.1. PROBLEM SOLVING AS CHANGE IN REPRESENTATION

The way one represents the problem indicates the solution: "… there is a point where interpretation (hermeneutics) and the way of making (poetics) comes so close to each other that they become reciprocal: What we know contributes to what we make, and what is already made contributes substantially to what is possible to know" (Vesely, 2004, p.6).

Raymond's comparison of Lynch's imageability analysis (fig.94) and Gordon Cullen's (fig.95) Serial vision is a good example to highlight the connection between representation and type of problem addressed.

Both Lynch and Cullen recognize the importance of legibility in urban environments, 'but the substantial differences in their theory can be observed in the means of representation' (Lucas, Mair et al., 2009, p. 4). British urbanist Gordon Cullen's serial drawings have a kinaesthetic quality. The 'drawings allow the site to be analysed in terms of the perception of the urban environment, the ways in which spaces reveal themselves to a walker, qualities of juxtaposition, continuity, surprise, progression, and many more temporal metaphors, (Lucas, Mair et al. 2009, p.4). 'Cullen is very much concerned with the individual experience, an almost phenomenological attitude towards space that exploits the single viewer of the perspective drawing (Lucas, Mair et al., 2009, p.5).

In contrast, Lynch 'prefers the top-down plan, with its infinite viewing distance rendering everything equal in the gaze' (Lucas, Mair et al., 2009), p.5). However, he bases this plans on research of locals understanding of their environment (through mental map drawings and interviews). Thus, 'logic and sense that the city makes to its inhabitants paths, edges, nodes, districts and landmarks' prevail (ibid).

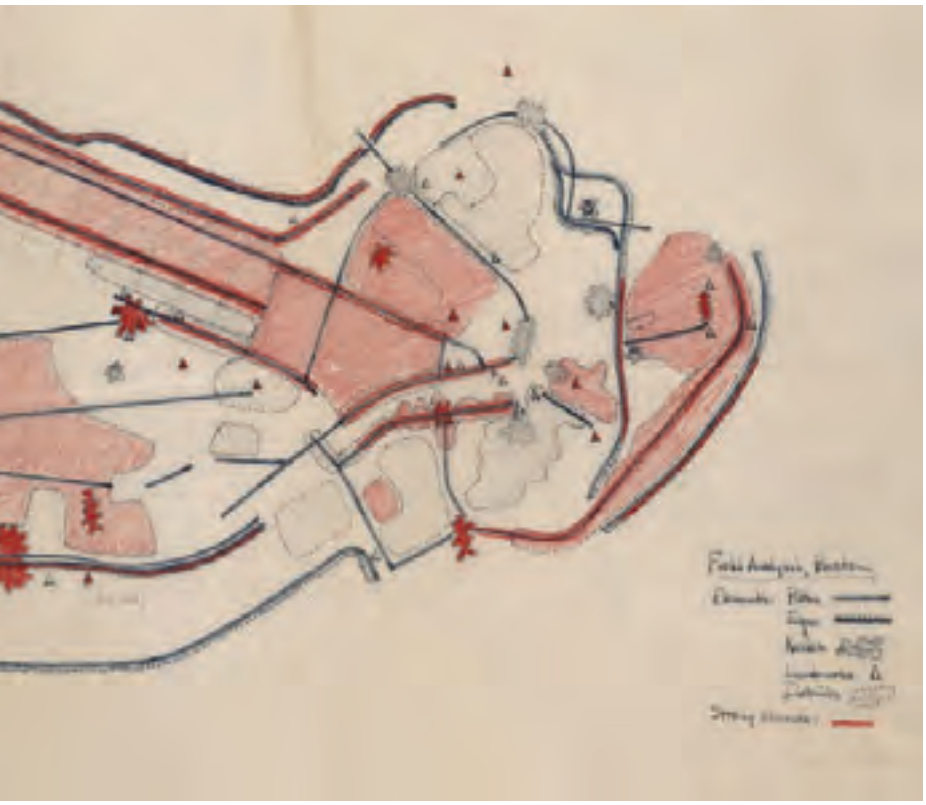


Fig.94. Lynch field analysis

Fig.95. Gordon Cullen serial drawings

8.2. CURRENTLY AVAILABLE, GENERALLY USED METHODS OF REPRESENTATION

This section presents currently available, generally used methods of representation that can be relevant for representing time experience.

Narrative, mental maps or analysing potentials and limitations for action are ways to represent and study walking and time. Narrative is imbedded in walking through a serial movement along a path. Thus, 'an art of understanding of place, movement and landscape must fundamentally be a narrative understanding involving a presencing of previous experiences in present contexts (Tilley, 1994, p.31).

`Mental maps' are ways to study how people compose with own experience, knowledge and underlying characteristics of a place. It 'marks, personal haunts, good guesses and routine paths" which are intimately related to ``the textures of everyday movement in the city, the chance encounters and cross-cutting paths of the urban crowd, the tricky and momentary ways in which people make space" (Middleton, 2009, p.1953).

Latham has reflected on the use of diary-photo and diary-interview approaches in engaging the performance of social life and suggested novel ways of presenting the findings from these by extending the mapping of time-geography. This can be extended to sound diaries to study 'the experience of soundscapes of social life' (Simpson, 2012, p.425).

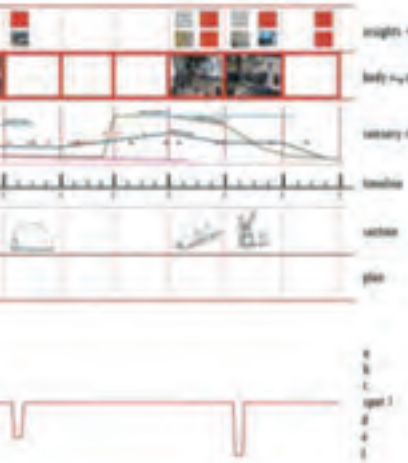
Time-lapse photography is also considered as one option that can aid in the reflection upon the complex and multi-faceted temporal unfolding of everyday practices and the ways in which various rhythms intermingle in and so affect the playing out of the practices (Simpson, 2012, p.425). The observer needs to be 'close enough to be involved with the events unfolding in the street but equally not being swallowed up in the huddle of the audience' (Simpson, 2012, p. 433).

Fig.96. socio-sensory mapping by Palipane

> **'Imagine a film of the landscape, shot over years, centuries, even millennia. Slightly speeded up, plants appear to engage in very animal-like movements, trees flex their limbs without any prompting from the winds. Speeded up rather more, glaciers flow like rivers and even the earth begins to move. At yet greater speeds solid rock bends, buckles and flows like molten metal. The world itself begins to breath. (Ingold, 'The Temporality of the Landscape', Simpson, 2012, p. 164. – p.427).**

Lefebvre's rhythymanalsis tries to grasp the complexity of activity. ``Rhythmanalysis is an attitude, an orientation, a proclivity: it is not `analytic' in any positivistic or scientific sense of the term. It falls on the side of impressionism and description, rather than systematic data collecting" (Highmore, 2005, p.150 in Middleton, 2009, p.1956). Starting from the importance of bodily experience with 'body as metronome', one can be aware of heart beat, breath and sense the energy shift from intense activity followed by pause and strong emotions. Lefebvre associates the rhythm in music (stressed/unstressed, long/short) and the rhythm of activities. Both

can be expressed in terms of beat, measure, frequency and can follow an organic development. He also stresses the importance of the gap between beats. Lefebvre's aim with rhythmanalysis is to call forth understanding of environment's condition and structure through a heightened presence, thus awareness of the connection to it (discussion with Paul Curaton).



One way to translate rhythmanalysis in graphic language for landscape design is Lawrence Halprin's notation system. It was meant to raise awareness of one's presence in the landscape and thus of time (discussion with Paul Curaton).

'Lawrence Halprin has developed a process which he calls 'scoring' (Filor,1994, p.126). 'Halprin initially developed his system to choreograph the anticipated sequential movement of people through open spaces he was engaged in designing (Filor, 1994, p.126). Then, 'Halprin and his colleagues developed a system of workshops which they try to use as a preliminary to all their major design projects. At these workshops, community and bureaucratic groups were involved in hands-on exercises to 'score' events, places, actions and activities in their local environment, that could be considered in the design process (Halprin, 1969; Burns, 1986 in Filor, 1994, p.126). Thus, he tried to mould 'the spatial design to match the movement of people' (Filor, 1994, p.126).

Degan recommends the **socio-sensory mapping** of areas which would give insight into the interplay between spatiality, sociality and cultural meaning of the specific site. She writes, —Focusing on the senses in the configuration of public life reveals an alternative geography of place by offering an insight into narratives, feelings, practices and experiences often hidden from common view (Palipane, 2011, p.5).

Degan describes this through two processes:
1. Analyzing activity rhythms – …the daily movements and the everyday, repetitive spatial practices of the people (ibid.:51).
2. Analyzing sensory rhythms – this entails identifying specific sensory rhythms and observing how the sensescapes they create —…fluctuate in intensity and in their relationships. (Palipane, 2011, p.6).

This information I found at a late stage of my thesis, but it confirmed my own procedure and just reinforced it (see specific analysis). Kelum Palipane (Palipane, 2011, p.6) developed the analysis proposed by Degen focusing on the embodied experience of the researcher (fig.96). However, ther is need to balance own embodied experience on site, with 'insight into the sensory categories of the local users as well the cultural and social significance associated with them' (Palipane, 2011, p.14).

8.3. DRAWING TIME NOW WORKSHOP

The Workshop *Drawing Time Now* (25.01-1.02.13) organised at the Academie van Bouwkunst, Amsterdam, by Noël van Dooren was a research on representation of time (on how to depict time) and explore if it influences the design.

Noël van Dooren intended this workshop as an occasion for students of diverse disciplines to meet and test designing with a score.

The score was introduced as an additional drawing tool next to plan, section, diagram, model and visualization, diagram , collage; it shows how things unfold in time.

According to him scores:
- show all relevant time aspects in design
- show the timescales in which they operate
- show the moments they become manifest
- show the actions in which they are provoked or manipulated or prevented
- show the persons or institutions doing so

The results of the workshop were combined in a booklet, time representations 1-5.

Reflection on the workshop
Just after the workshop I did not have any strong feeling about what representation to use for my thesis. I did not consciously decide to try out any of the tools and methods presented during this workshop. Looking back I see I actually applied many of them, probably influenced by the workshop or due to their universal value.

I learned that time representation is a challenge as we all struggled for a week to do our best. One has to consider restrictions due to topic, mediums, time. Even if we maybe did not provide new graphics, it was clear for all that time awareness is very important and needs to be attended still accepting the uncertainty and imperfection of any solution.

I believe time representation is very specific to the topic, since time is so complex and broad. Even concerning materiality and tools it is very much related to the context of the project to be designed and it' site characteristics As time is a metaphor, it would help for each project to define what time will be about, in terms of analysis, design language and result.

Fig.97.
John Cage – music by moving through space
Cage was a renowned composer, philosopher, writer and visual artist whose interest in East Asian and Indian philosophy led him to abandon intention, memory and personal taste to focus instead on process and chance in music, performance and visual art.

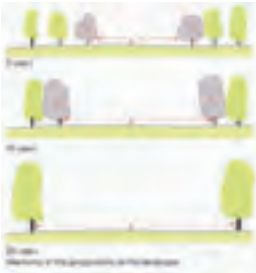


Fig.100.

Student work, Urban woodland design and management course, University of Copenhagen. Anders Busse drawing time now presentation

! keep right proportion during growth of trees

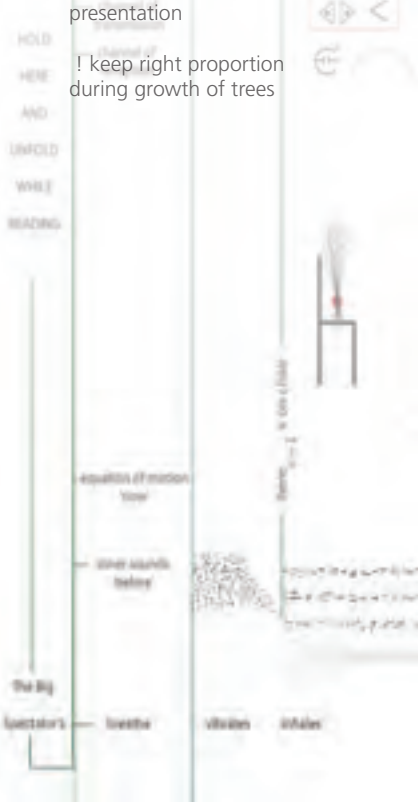
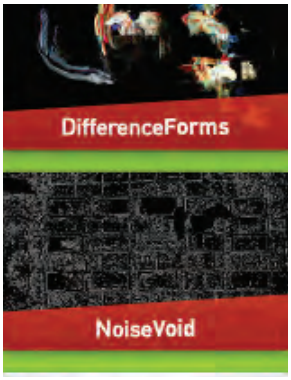


Fig.98.
Jeroen Fabius presentation:
Synchronous objects – Forsythe
Atunement – body aligning with movement in environment
Negative space
Que
Tension between tendency and trigger
Dynamic visual simulations



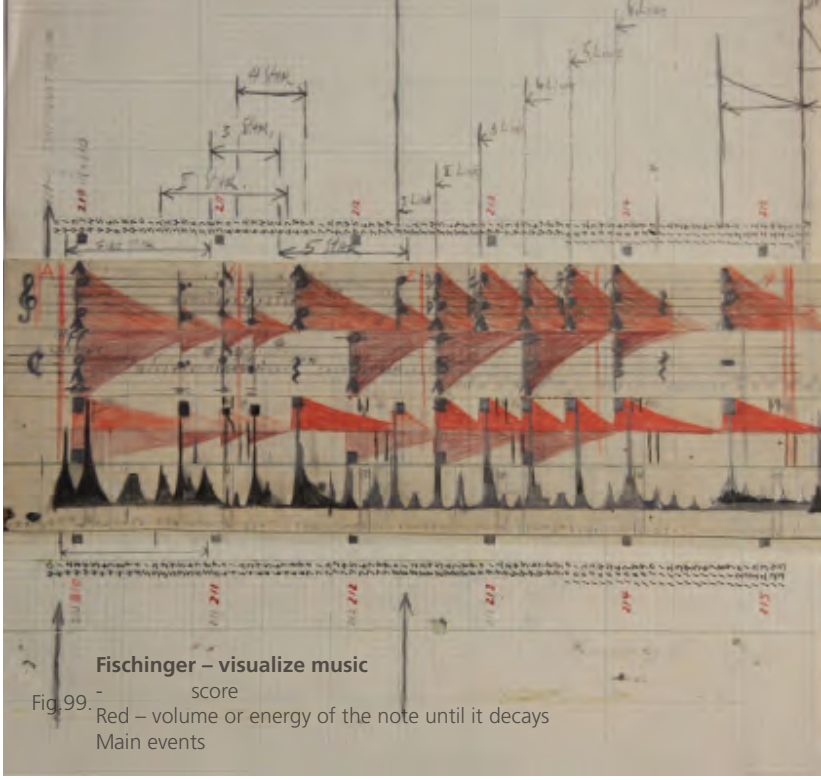
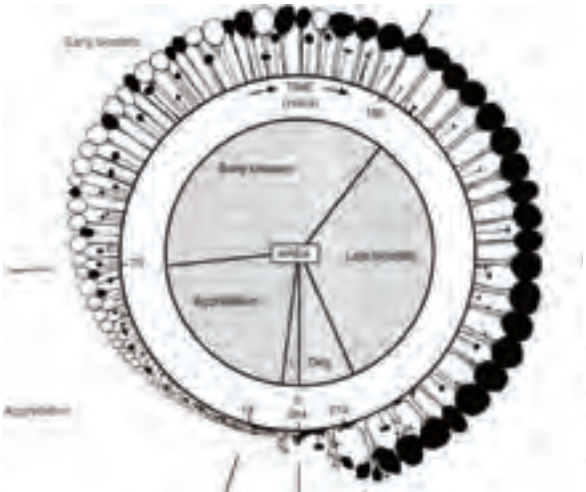


Fig.99. **Fischinger – visualize music**
- score
Red – volume or energy of the note until it decays
Main events



Anders Busse
Fig.101. Old tree forest cycle
Drawing with several timescales –young tree + bush, changing profile proportion (vertical and horiz)
When the trees are mature they can stand on their own without the bushes

Jord den Hollander
We understand time by limitation
Drama

Time is a sequence of stills that you can define
- you don't see fluent things looking back in time, you see stills
- also when you think of the future you think in events

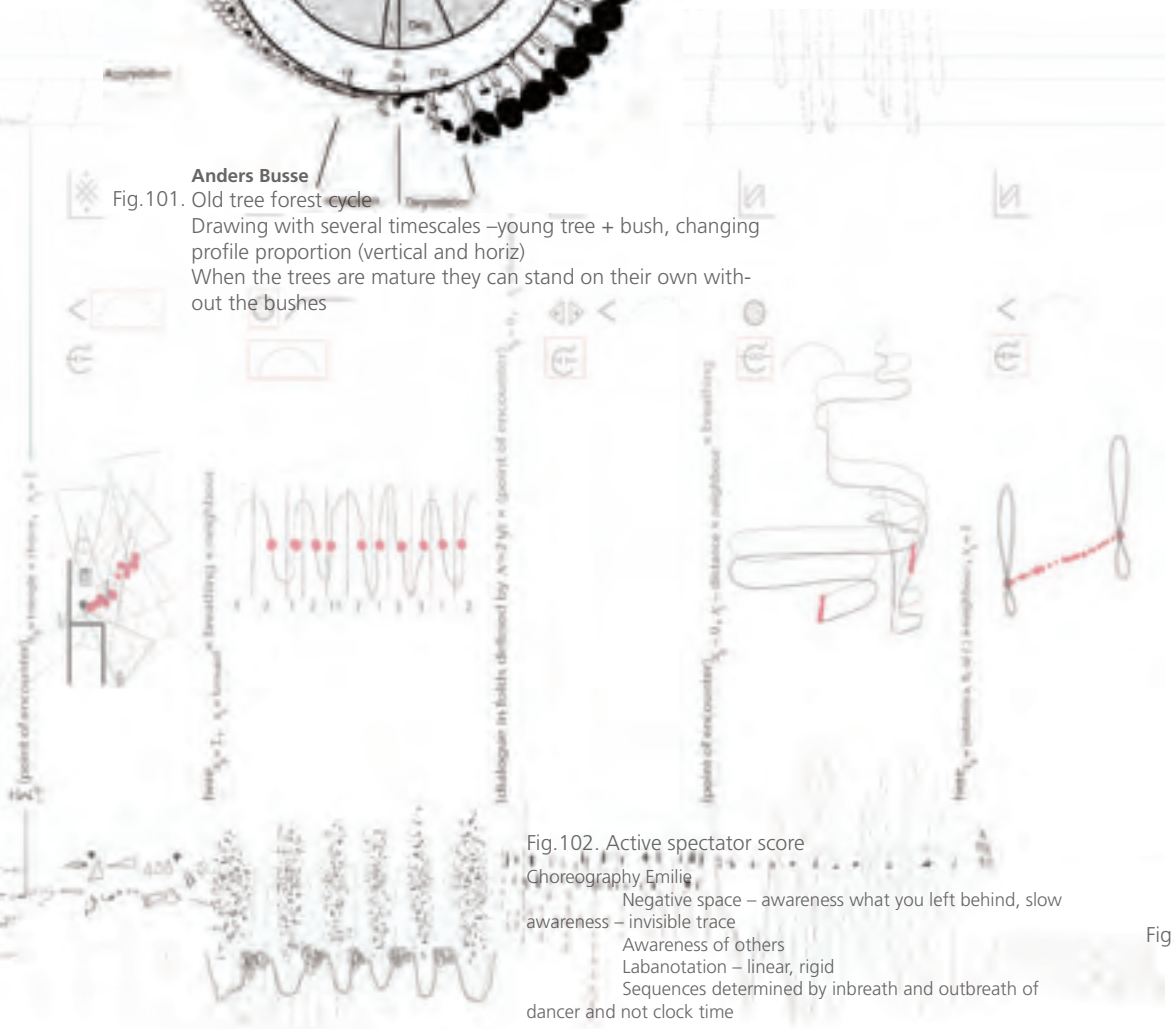


Fig.102. Active spectator score
Choreography Emilie
Negative space – awareness what you left behind, slow awareness – invisible trace
Awareness of others
Labanotation – linear, rigid
Sequences determined by inbreath and outbreath of dancer and not clock time

Roland Gustavsson 1986
Fig.103. planting section depicts also what is gone

8.4. WHY REPRESENTING TIME IS CHALLENGING?

From previous research done for the internship, several limitations of drawing in connection to the complexity of landscape experience were revealed. First concerning spatiality in landscape, a drawing cannot capture the full complexity of an immersed experience without changing or altering it. Moreover, such spatial experience of landscape questions the application of means as Cartesian geometry and algebraic measurement (Corner, 1992).

Another provoking aspect is related to representation and time. "Experience of landscape takes time " (Corner, 1992, p. 147) and is the outcome of a series of actions and everyday confrontations. Furthermore, an experience cannot be described as a one moment in time, from solely one view point, as it unfolds through a continuous flow of preceding and subsequent events (Corner, 1992). Thus, it needs to be situated in time context and explained as such. Also landscape itself is impermanent, in a constant flux of change, thus representing its periodicity and evolution is challenging both the art and intend of the landscape architect.

Moreover, difficulty arises when considering the disparity between substance and materiality of landscape and that of landscape drawing. Although a drawing can suggest qualities of physical landscape, it cannot reproduce the haptic experience of it. It is important to point out that "nothing can reproduce the meaning that comes from the lived experience" (Corner, 1992, 148). The limitations of drawing in this regard are due to
(1) its flatness and being contrived to graphical presentation;
(2) its autonomy (free from the represented place and location);
(3) its invariability and directness (easy to decode);
(4) it being produced out of own materials and substance;
(5) it being experienced optically, entirely focused on the image (Corner, 1992).

Since most of our representation is about form and space, that is about visible, time, a mediated experience, can only be visualized through associative, poetic and even annotated graphics (discussion with prof. dr. Koh). Figural representation (such as plan, map, perspective) is abstracted, situated and not "objective".

The index is introduced as a sign in direct connection to the real object symbolized. Indexical information allows adding the non-visible, instrumental value and precision to an image (information that is reliable, measurable, repeatable). That way the artistic image becomes also scientific.

More than a problem of graphic representation, through this design research I realized we do not easily experience transformation though it is all around us and inside. Most transformation processes occur at a too high or low speed, for us to be able to acknowledge them. Some, processes of change that we can observe at human scale are watching the fire burning something out, observing the snow melting in our hand, seeing clouds move and change shape, or following the moving shadows on the ground. With patience and conscious attention we can observe movements of the plants, soil, the earth, the sun. For the movements of the molecules and atoms that compose these we need special tools that can reveal what our senses are hardly able to grasp. Certain natural processes are 'only slow in relation to our time, to our

body, the measure of rhythms' (Lefebvre, 2004, p.20). That is why we often use slow-motion or time lapse to become aware of transformations and their flow.Watts emphasizes on the fact that we attribute more attention to what attracts our attention. Thus, we attribute a higher degree of reality to the figure rather than background, to elements visibly moving.

Time is a metaphor and experience ignores line differentiation. As Loy sais: 'even as 'I' am neither young nor old, so spring is not an anticipation of summer: it is whole and complete in itself' (Loy, 2001, p.279).

Another challenge arises in the process of drawing itself. We constantly shift attention from our paper to the landscape around us and something moves in between (us, an element, the sun…). During site analysis, comparing photo to own drawing, I realised that we draw things closer, as we experience them. Thus, both photograph and drawing are distorted; the 'drawing is a self-portrait' (discussion with Inga Cholmogorova), recording what moves us and interpreting it through the movement of our hand on the paper. In contrast, the camera shows a distant, neutral image.

Following these observations, the question arises: How can these limitations be partially overcome?

The graphics employed should not be definitive but, evocative, engaging the perceiver (Lecture of Prof. Koh). The quality of experience, what the image makes people feel and why, is what counts most.

Thus, representation should be engaging, showing emotion, and 'encoding the forces and movement of time' (Crang 2001, p. 206 about Deleuze, 1991). The shape outline becomes less sharp, as the visualisation highlights mood and atmosphere. Still, visual details can still be superposed to bring in clarity and focus. Animation and interactive features could enhance the presentation of time.

Subjecting vision to haptic experience (Fig. 43) can control the hastiness of vision. Furthermore, the manipulation of image in order to "slow the viewer's reading of the landscape, allows viewers to experience the image in ways that suggest temporal, physical experience" (Marshall, 2008). In Berensons' view, the work of authentic art stimulates our ideated sensations of touch, and this simulation is life-enhancing (Pallasmaa, 2009, p.103).

In conclusion there is need for a different language to actualize through representation when focusing on time. Time conscious representation would focus on pattern (as 'surface', 'texture', 'patina' indicating a process) rather than object. It would add non visual elements as rhythm and wave. The images created would be non-perspective, not isometric and ambiguity becomes as quality. Furthermore, for this thesis I only adopted existing representation techniques and adapted them according to my specific topic.

REFERENCES

(2011). *Strategic Plan 2011-2014* Wageningen UR.

(2013) *Wageningen campus strategy*
https://www.wageningenur.nl/upload_mm/f/5/5/fd2f5316-a46f-4942-bbbf-2945ca552c6f_Campus%20strategy_2013_08_30_Def.pdf

Adam, B. (1998). *Timescapes of modernity : the environment and invisible hazards*. London [etc.], Routledge.

Arida, A. (2002). *Quantum city*, Routledge.

B+B "*(Nederlands) Campus De Born Wageningen.*" Retrieved 11.11, 2012, from http://www.bplusb.nl/?project=campus-de-born&lang=en.

Berrizbeita, A. (1999). "The Amsterdam Bos: the modern public park and the construction of collective experience." *Recovering landscape: essays in contemporary landscape architecture*: 186-203.

Braden, G. (2007). *Language of the Divine Matrix.* Spiritualità Anima Fisica Quantistica Matrix Divina, Milano.

Bourquin, N., et al. (2010) *Data Flow 2: Visualizing Information in Graphic Design*, Berlin, Die Gestalten Verlag

Careri, F. (2002). *Walkscapes: Walking as an aesthetic practice*, Editorial Gustava Gili, GG.

Ching, F. D. (2010). A*rchitecture: Form, space, and order,* Wiley. com.

Corner, J. (1992). Representation and Landscape. *Theory in Landscape Architecture: A Reader*. S. Swaffield, University of Pennsylvania Press.

Corner, J. (1999). "Eidetic operations and new landscapes." *Recovering landscape: essays in contemporary landscape architecture*: 153-169.

Crang, M. (2001). Rhythms of the city in May J & Thrift N (éd.) *Timespace, Geographies of Temporality*, Londres, Routledge.

Descombes, G. (1999). "Shifting Sites: The Swiss Way." *Recovering Landscape: Essays in Contemporary Landscape Archi tecture*.

Edensor, T. (2010). *"Geographies of Rhythm." Nature, Place, Mobilities and Bodies*. Farnham: Ashgate.

Ewing, R. and S. Handy (2009). "Measuring the unmeasurable: urban design qualities related to walkability." Journal of Urban Design 14(1): 65-84.

Filor, S. W. (1994). "The nature of landscape design and design process." Landscape and Urban Planning 30(3): 121-129.

Gehl, J. (1987). *"Life between buildings." Using Public Space*, New York.

Goswami, A. (1993). *The self-aware universe: How consciousness creates the material world*, Penguin. com.

Gottlieb, C. (1958). "Movement in painting." The Journal of Aesthetics and Art Criticism 17(1): 22-33.

Grontmij (2010). *Bestemmingsplan Wageningen Campus*.

Helsper, H. (1988). *Campus planning and design in the United States*. Denver, University of Colorado.

Hoddinott, W. (2005). "Passing time: a phenomenological approach to heritage design."

Kleis, R. (2013). "Why do we eat lunch at our desk?" Resource 7(21).

Koh, J. (2011). *Field aesthetics for landscape in transition*, Lisbon.

Koh, J. (2013). *On a landscape approach to design an eco-poetic interpretation of landscape.* Wageningen, Wageningen Universiteit.

Lang, K. (2006). *Chaos and cosmos: on the image in aesthetics and art history*, Cornell University Press.

Lefebvre, H., G. Moore, et al. (2004). *Rhythmanalysis: space, time and everyday life*, Continuum.

Lenzholzer, S., I. Duchhart, et al. (2013). "'Research through designing' in landscape architecture." Landscape and Urban Planning 113(0): 120-127.

Lootsma, B. (1999). "Synthetic regionalization: The Dutch landscape toward a second modernity." *Recovering landscape: essays in contemporary landscape architecture*: 251-274.

Loy, D. R. (2001). "A Buddhist perspective on the end." *TimeSpace: geographies of temporality* 13: 262.

Lucas, R. (2007-2009). SENSORY NOTATION
multimodal representation of urban space. AHRC/EPSRC *Designing for the 21st Century*.

Lucas, R., G. Mair, et al. (2009). "Making sense of the city: representing the multi-modality of urban space."

Lynch, K. (1972). *What time is this place?* , MIT Press.

McTaggart, L. (2012). T*he Field Updated Ed: The Quest for the Secret Force of the Universe*, HarperCollins.

Middleton, J. (2009). "'Stepping in time': walking, time, and space in the city." Environment and planning. A 41(8): 1943.

Missana, S. (2004). *The Grip of Culture:* Edward T. Hall.

Palipane, K. (2011). *Towards a Sensory Production of Urban Space: Developing a Conceptual Framework of Inquiry based on Socio-sensory Perception*. The struggle to belong Dealing with diversity in 21st century urban settings. Amsterdam 7-9 July 2011.

Pallasmaa, J. (2009). T*he thinking hand: existential and embodied wisdom in arthitecture*, Wiley.

Saito, Y. (2007). *Everyday aesthetics*. Oxford [etc.], Oxford University Press.

Salingaros, N. A. and B. J. West (1999). "A universal rule for the distribution of sizes." Environment and Planning B 26: 909-924.

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*, Basic books.

Seamon, D. and J. Sowers (2008). "Place and placelessness, Edward Relph." Key texts in human geography: 43-51.

Shepheard, P. F., Olin, L., Franklin, C. (1977). L*andscape Development Plan:*
University of Pennsylvania, Center for Environmental Design, Graduate School of Fine Arts, University of Pennsylvania. .

Simpson, P. (2012). "Apprehending everyday rhythms: rhythmanalysis, time-lapse photography, and the space-times of street performance." cultural geographies 19(4): 423-445.

Spirn, A. W. (1998). *The language of landscape*. New Haven [etc.], Yale University Press.

Temelová, J. and J. Novák (2011). "Daily street life in the inner city of Prague under transformation: the visual experience of socio-spatial differentiation and temporal rhythms." Visual Studies 26(3): 213-228.

Thrift, N. (2001). *Timespace: geographies of temporality*, Routledge.

Tilley, C. Y. (1994). *A phenomenology of landscape: places, paths, and monuments*, Berg Oxford.

Treib, M. (2007). *Representing landscape architecture*, Taylor & Francis.

Tuan, Y. F. (1977). S*pace and place : the perspective of experience*. London, Arnold.

Urriola, E. "Comfort Index, Thermal Sensation and Heat Waves Impact on Peolple." Retrieved 29.10, 2013, from http://www.hidromet.com.pa/sensacion_termica.php?idioma=ing.

Vesely, D. (2004). *Architecture in the age of divided representation: The question of creativity in the shadow of production*, MIT Press.

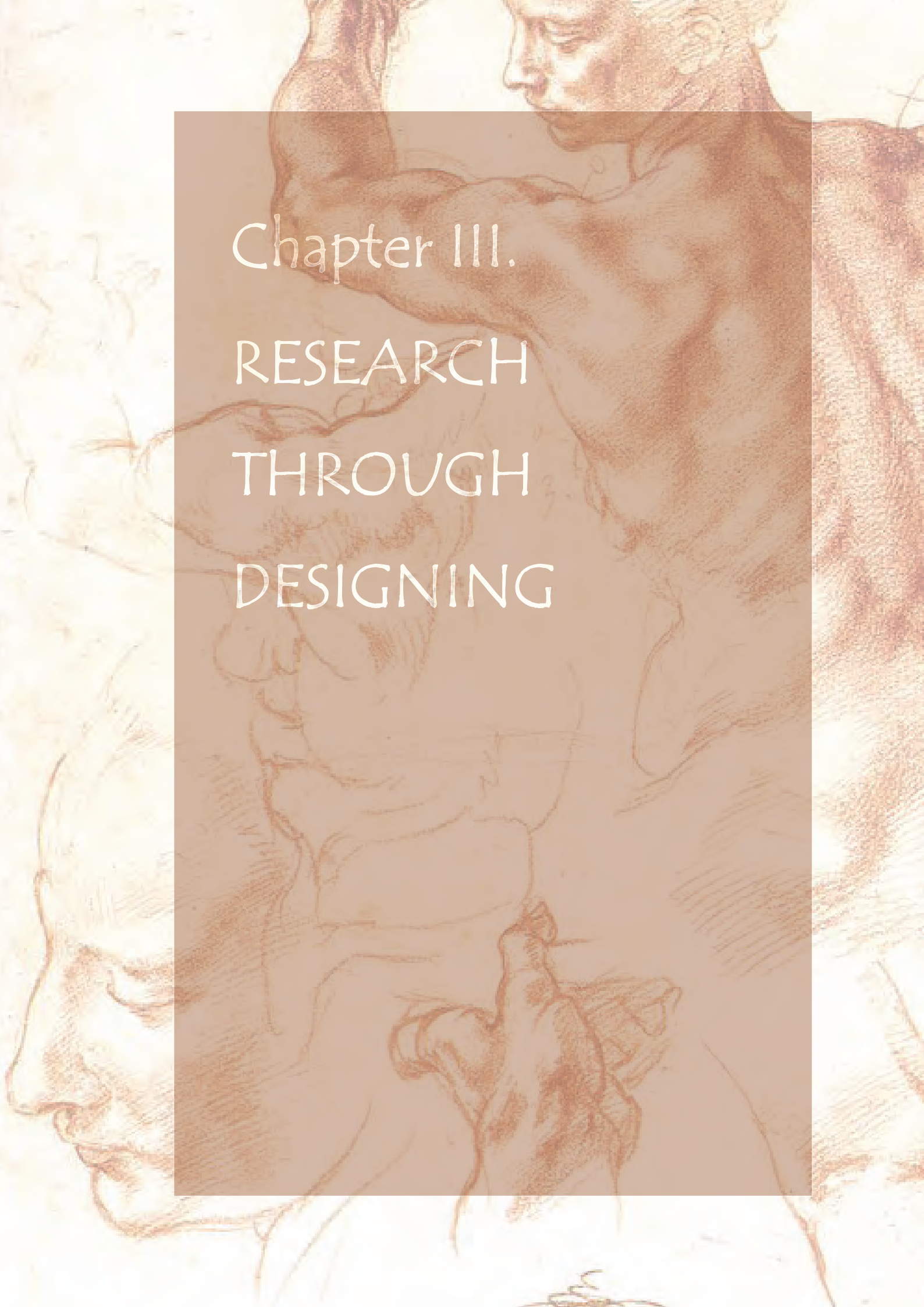
WageningenURwebsite. "Facts and figures." Retrieved 29.10, 2013, from http://www.wageningenur.nl/en/wageningen-university/About-Wageningen-University/Facts-and-figures-1.htm.

Wall, A. (1999). *Programming the urban surface.*

Watts, A. (uploaded 2011). "Alan Watts - Do You Do It, Or Does It Do You?". Retrieved 03.04, 2013.

Wunderlich, F. (2010). "The aesthetics of place-temporality in everyday urban space: The case of Fitzroy Square."

Wunderlich, F. M. (2008). "Walking and Rhythmicity: Sensing Urban Space." Journal of Urban Design 13(1): 125-139.



Chapter III.

RESEARCH THROUGH DESIGNING

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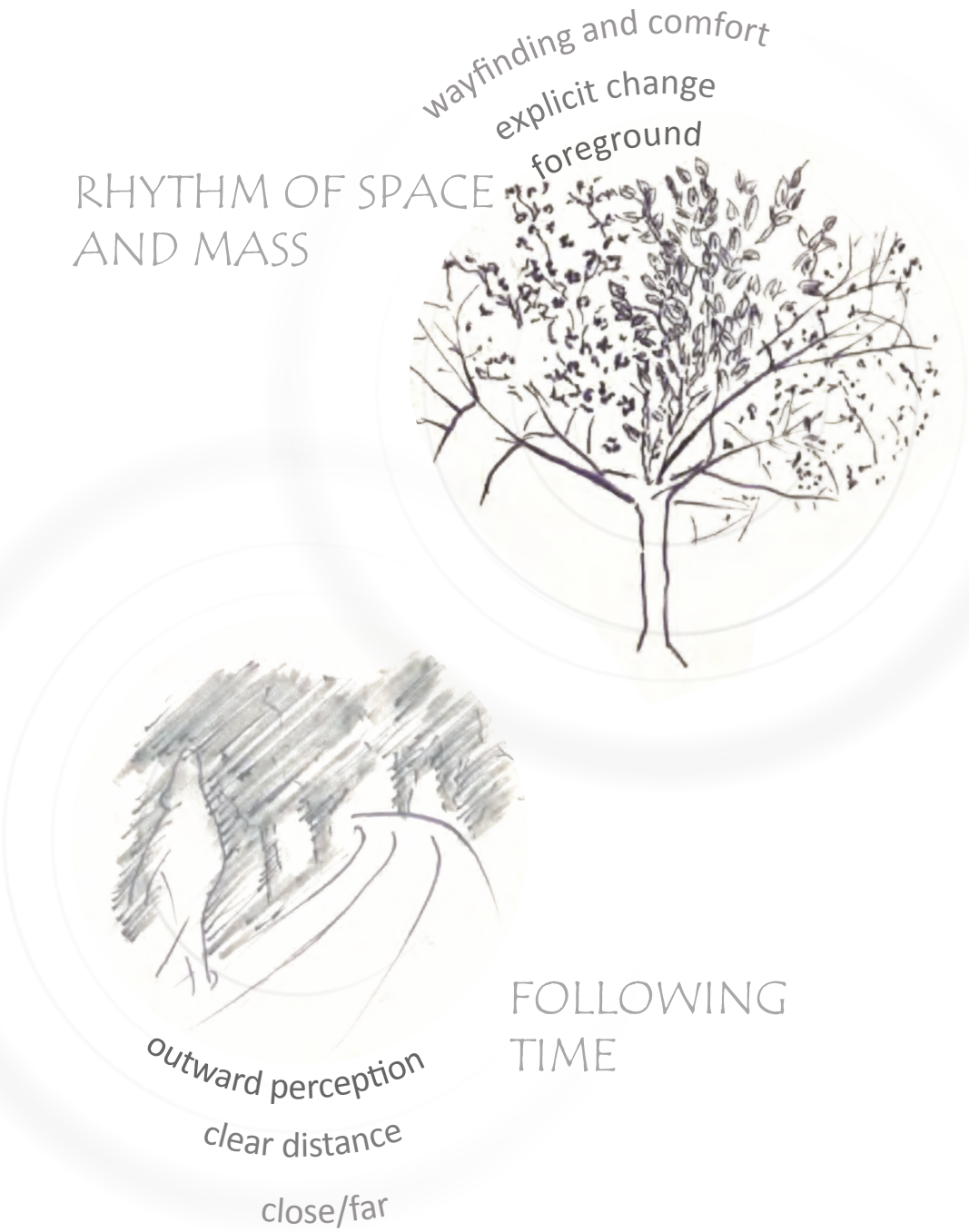
This chapter presents conscious design experiments of dealing with time using social constructivism Research Through Designing (see glossary). This is not a design thesis, as design is used only as a point of illustration. It is not about choreographing or performing, only about observing and enabling: People and nature are unpredictable and not to be ordered. When dealing with time one cannot control, only influence. The design experiments explore language for design that would enrich time experience. It's about training awareness, attitude and attention for the designing process.

9. NAMING ASPECTS SPECIFIC FOR THIS THESIS

The selected concepts (spatial layout rhythms, body/nature rhythms and social rhythms; and three modes of walking: the purposive, the discursive and the conceptual) are coined by other researchers and designers and have a defined meaning and nuance (example Lefevbre's political view). Therefore, I decided to rephrase them according to my understanding and the already stated design vision into three rhythms and three walking modes. Thus this thesis will translate and materialize time perception through (1) the rhythm of space and mass, (2) the rhythm of expansion and contraction, (3) the rhythm of imposed and free choice for action; while walking: (1) following time, (2) attuning time, (3) creating time.

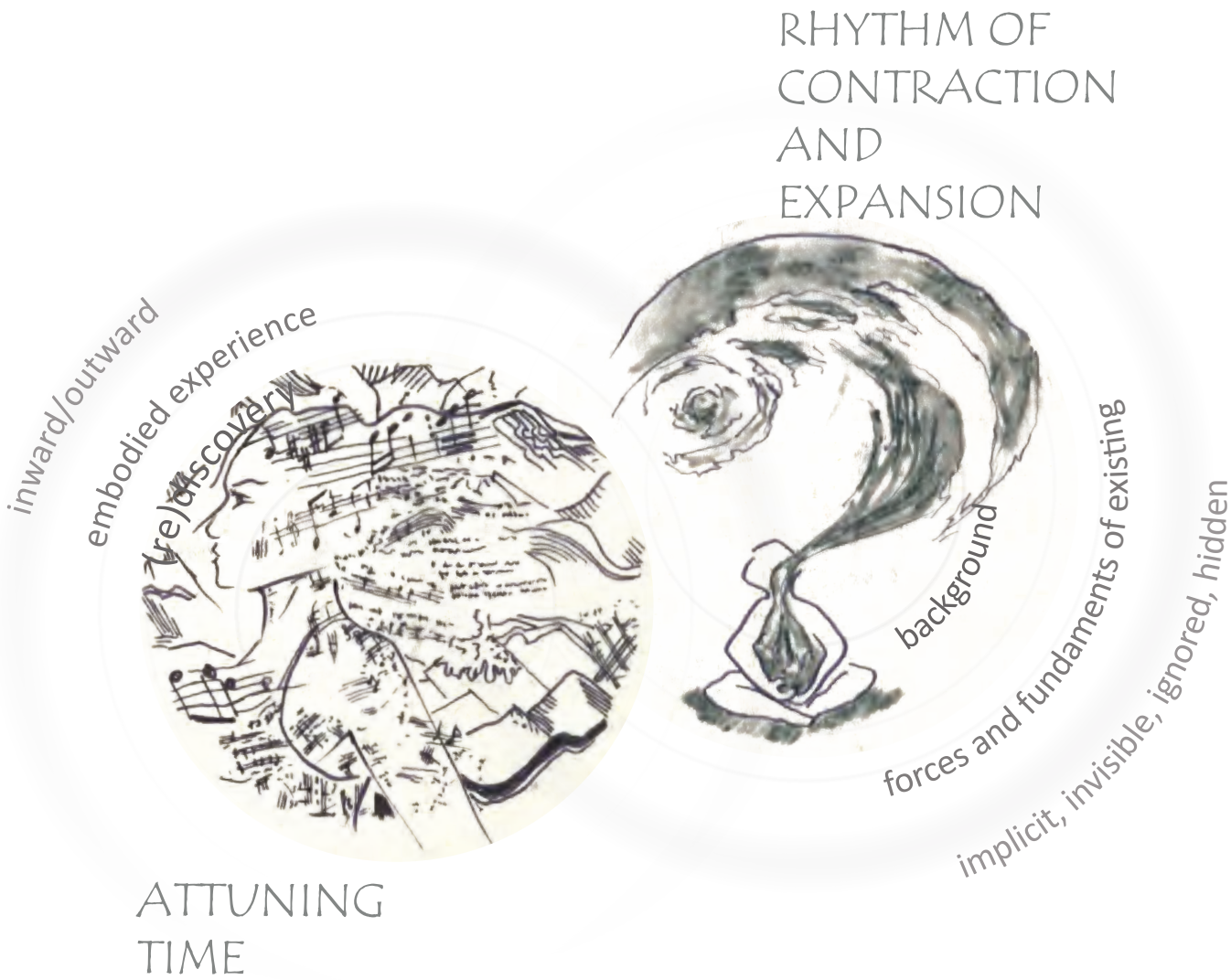
The design is not meant to impose certain rhythms and movements on the land and people, but to create condition that would allow them all to unfold, arise and become visible through embodied experience.

The rhythms proposed have a yin yang quality, the two elements alternating are not opposed but mutually enhancing and complementing: There would be no awareness of tension without ease, as the layout of elements needs an interval to be distinguished, the expansion is followed by contraction and a free choice action arises in response to imposed ones. The transition from one to the other can be sudden or gradual. They can even run parallel. Each rhythm has an affinity with one specific walking type, although it resonates to all three of them.



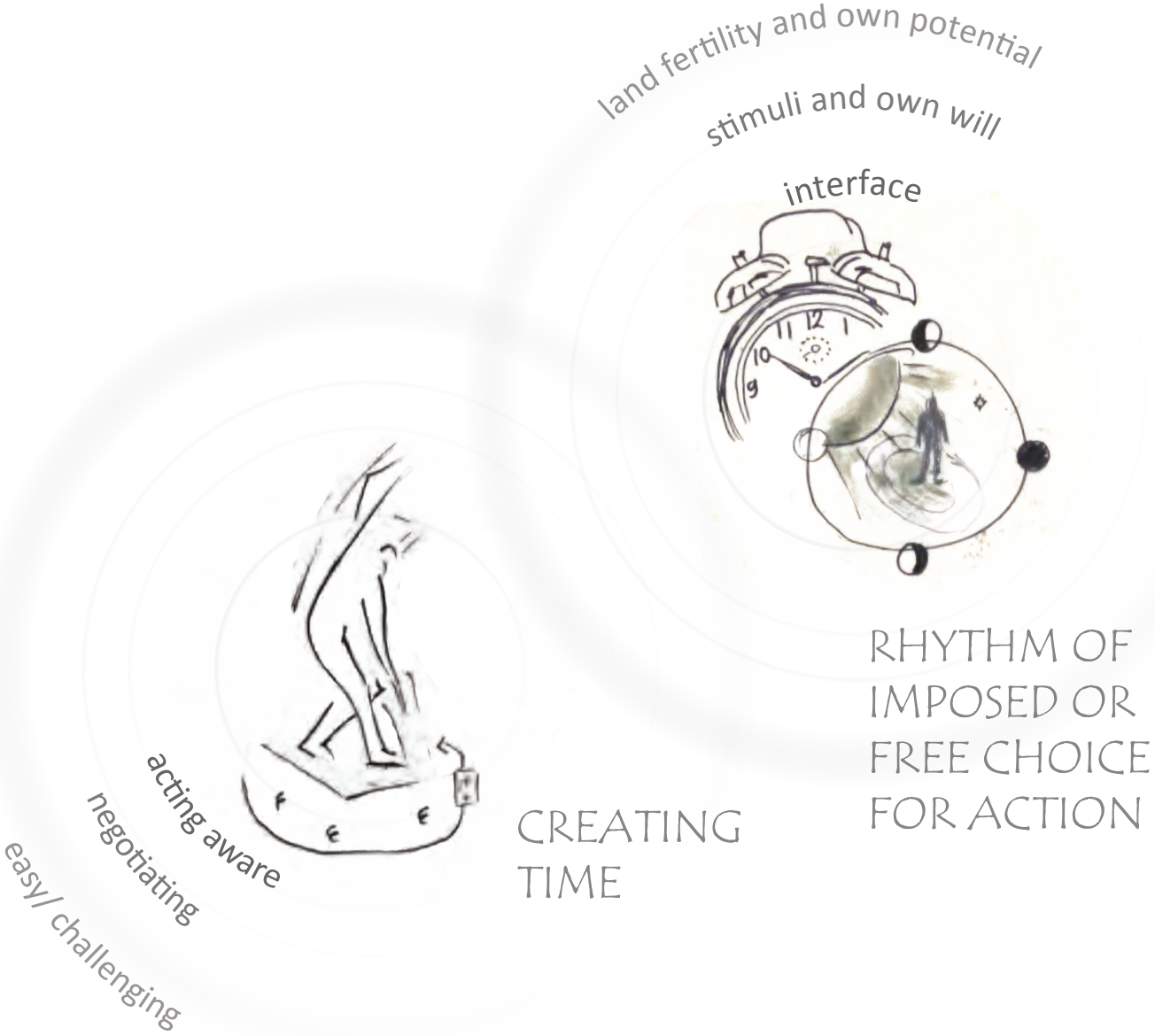
The **rhythm of space and mass** and the **following time walk** concern mainly the *spatial orientation* and *explicit change* in the environment. When following time the outward perception is dominant and the apparent elements (mass) are fore grounded against the empty space. In this case wayfinding and clear spatial layout are important for a feeling of comfort.

Even the rhythm of space and mass is dynamic as the interval can change leaving larger spaces, or filling up gaps, changing of density of vegetation with season, or due to human intervention, as well as the change in height of the ground water level. All this alterations impact the figure background perception, occasionally bringing the background to the fore.



The **rhythm of contraction and expansion** and the **attuning time walk** are more about *resonating* with the present situation. It is an exercise to feel instead of to conceptualize and recognize the rhythms of transformation inside our body and all around. For such an understanding a more concentrated and embodied attitude is required. It's supposed to reveal what is implicit and often invisible or underneath the surface, slow transformations. Furthermore, it gives one feeling of connectedness and expansion beyond one's body.

In attuning time, one starts to walk at a different pace, almost as if trying the different textures of surfaces for the first time and feeling the feedback in sensations on the body. It's a waking up of the awareness towards the environment and also a (re)-discovery of the fundaments of the existing situation. One acknowledges the background rather than the foreground as previously. Following this state, one no longer sees only the path that leads to the planned destination, but also other processes unfolding around. Everything is alive, pulsating at a higher or lower rate. Even the empty space is vibrating, expanding and contracting in a changing way and creating its own music. With this awareness one starts to read potentials in the land as well as in his body. One is surprised by the sudden feeling of rush of blood through the before tensed muscles and amazed by the breath going in and out in pace with the surroundings.



The **rhythm of imposed and free choice for action** and the **creating time walk** are an *active response* to awareness of the present potentials. One can choose to negotiate with the existing conditions or radically change them, still the choice is aware. Considering one's presence as a voice in a discussion with the land, one feels more powerful but also connected, seeing the interactive unity between himself and the rest. Different options of movement, direction, path become visible. As the action arises out of free choice and it feeds one's curiosity or need it makes things happen that would otherwise be ignored or unthought of. Such a process is necessary in one's everyday life to learn from nature and develop own skills.

A landscape design with time awareness should provide for all these ways of exploring. Furthermore, in interaction with these three rhythms and walking types one gets transformed and continues to transform the environment and the perception of time.

The rhythms and walking types are not separate, but qualities of the same. Here they are presented isolated only for explanation. Thus, one design decision can relate to several rhythms and all walking types can happen along the same path. These walking modes are also illustrated using video as research tool (see CD).

9.1. TIME AWARE ANALYSIS ON WAGENINGEN UR CAMPUS

Next to the presented site analysis (see page 42), to apply the developed theoretical frame, specific analysis for time awareness were developed. These bring back in focus the experience at human scale, the everyday situations to build the narrative story line.

RHYTHM OF SPACE AND MASS AND FOLLOWING TIME ON CAMPUS

The rhythm of space and mass as impacted by human force can be observed strongly on the campus when building or removing elements (leaving larger spaces, or filling up gaps):

- building Orion
- tearing down temporary work spaces behind Radix,
- extending the sports centre building,
- emptying plots at the southern edge of the central lawn for new building
- Soil museum built as a new entrance for Gaia and Lumen (fig. 104-5)

fig.104. Entrance to Gaia and Lumen before

fig.105. Entrance to Gaia and Lumen with soil museum

- A dynamic manifestation of this rhythm is the movement up and down of shades at the buildings (at precise times) fig(Lumen shades).

fig.106. 'oudoor room' Gaia before and after. The extended pond needs interface with people.

- Another example is the removal of the trees 'hugged' by Gaia in order to extend the pond (fig.106).

With these two recent interventions this area lost two rich places with human scale.

Furthermore, this can also be reflected in planting schemes and management: an example is the strong rhythmical organization of the rows of hedges on Droevendaalsesteeg, where the plants are constrained to sharply cut green volumes (fig.107).

fig.107. rhythmical organization of living volumes

Time can be revealed at juxtaposition of young and old trees, by street alignment of new trees next to old ones (as on Droevendaalsesteeg (fig.108). Other examples on campus are near Lumen, Radix and Zodiac where new trees prolong existing older tree line (sign of recent extension).

fig. 108. juxtaposition of young and old trees

A more subtle movement is the one of the water table in the ponds (marking the retention and detention after heavy rainfall, resuming to regular height).

The following time is the main and almost only walking mode presently on the campus. It resumes to pacing through straight paths and occasionally become frustrated that there are no short cuts and that cars or bikes can intervene in getting safely and fast to the destination.

Bridge to next rhythm and time analysis :

The growth and decay (pointing to cyclic time and nature time) (fig. 109) of vegetation can be regarded both as a rhythm of space and mass as well as a rhythm of contraction and expansion; still they point out different qualities: While the first is indicating the amount of space and serves as a measurement of change, the latter is about the movement and nature of change.

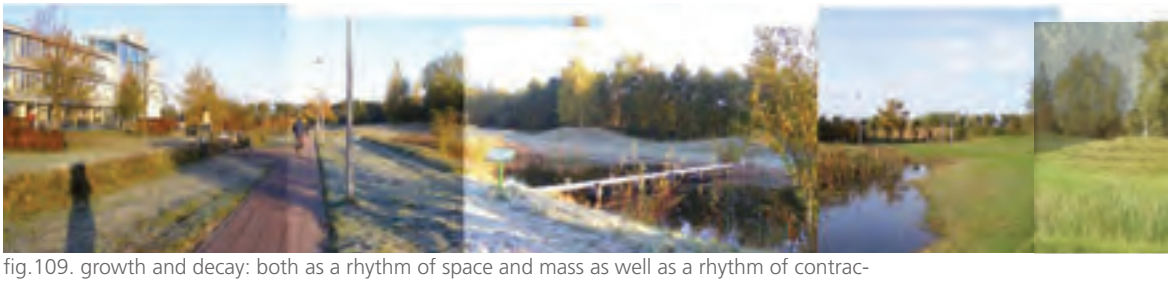


fig.109. growth and decay: both as a rhythm of space and mass as well as a rhythm of contraction and expansion

RHYTHM OF EXPANSION AND CONTRACTION AND ATTUNING TIME ON CAMPUS

Our awareness of change depends on material qualities of surrounding. For such an analysis the same sensitivity as for rhythmanalysis was practiced: being 'more aware of times than of spaces, of moods than of images, of the atmosphere than of particular spectacles' (Thrift, 2001, p.23 about Lefebvre). The rhythm of contraction and expansion depends on surface, spatial extent, feeling, body and weather conditions.

For the campus, elements on site present various degrees of sensitivity to weather factors and various degrees of observable changes during the year.

Parameters of time awareness easily observable at human scale (fig.110-121):

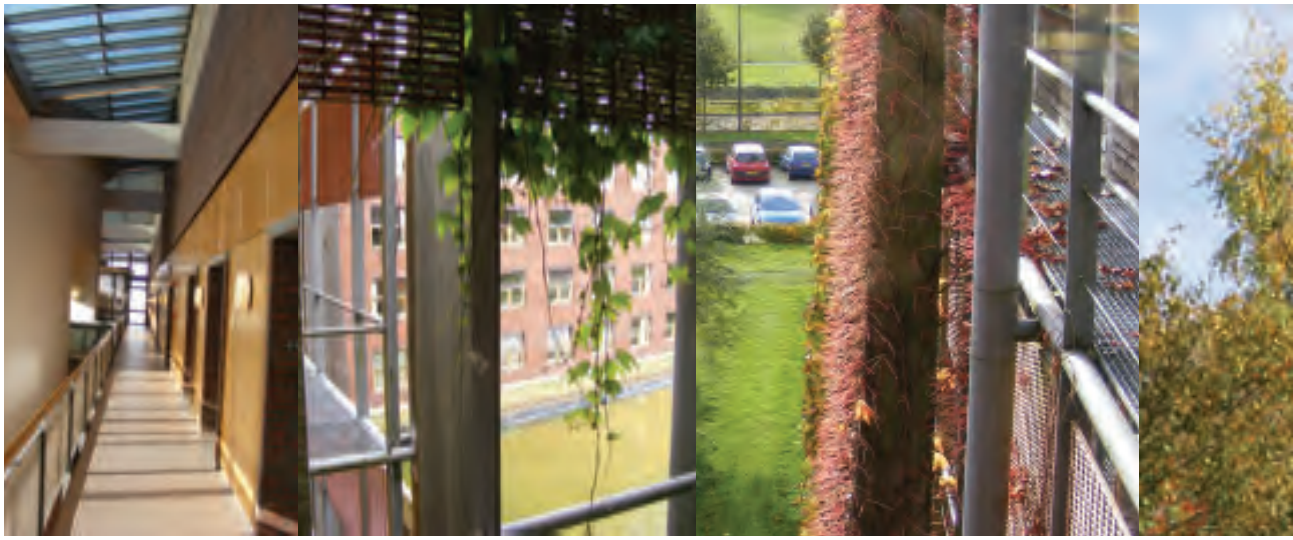


fig.110. sun rays and shadow playfig.. close observation of vine leafs seasonal change

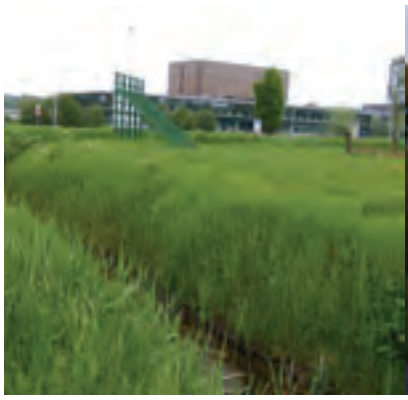


fig.113. vegetation growing and being cut several times a year

fig.114. movement of plants in relation to natural factors or touch
- movement in the sky

fig.117. enjoying last warm rays at sunset

fig.118. ripe time

- experience of thermal comfort patterns and weather features
  for example in summer in afternoon: wind drops, there are more clouds and also higher temperature

fig.111. dramatic autumn colours accentuated by light

fig.112. aging

fig.115. circular movement of water – time passing but not linear (impression of timeless flow)

fig.116. Ground information – wet/dry
- breathing or sealed
- heating up -> trace of sun

fig.119. growth and decay

fig.120. sensitivity of material to aging, weathering

fig.121. texture – ease of movement

There are diverse areas on the campus with specific atmospheres that one can perceive moving through space (observing landscape through own body sensation: temperature, tensions, ease, push , pull, hostile, overwhelming).

fig.122. **'static'** (around the buildings, where people usually stay, are least time sensitive materials

fig.123. **alive but not complex enough** (the central lawn)

Conclusion:
For the campus to be livelier, the rhythm of expansion and contraction could be more present. There is lack of immediacy of experience for attuning time.

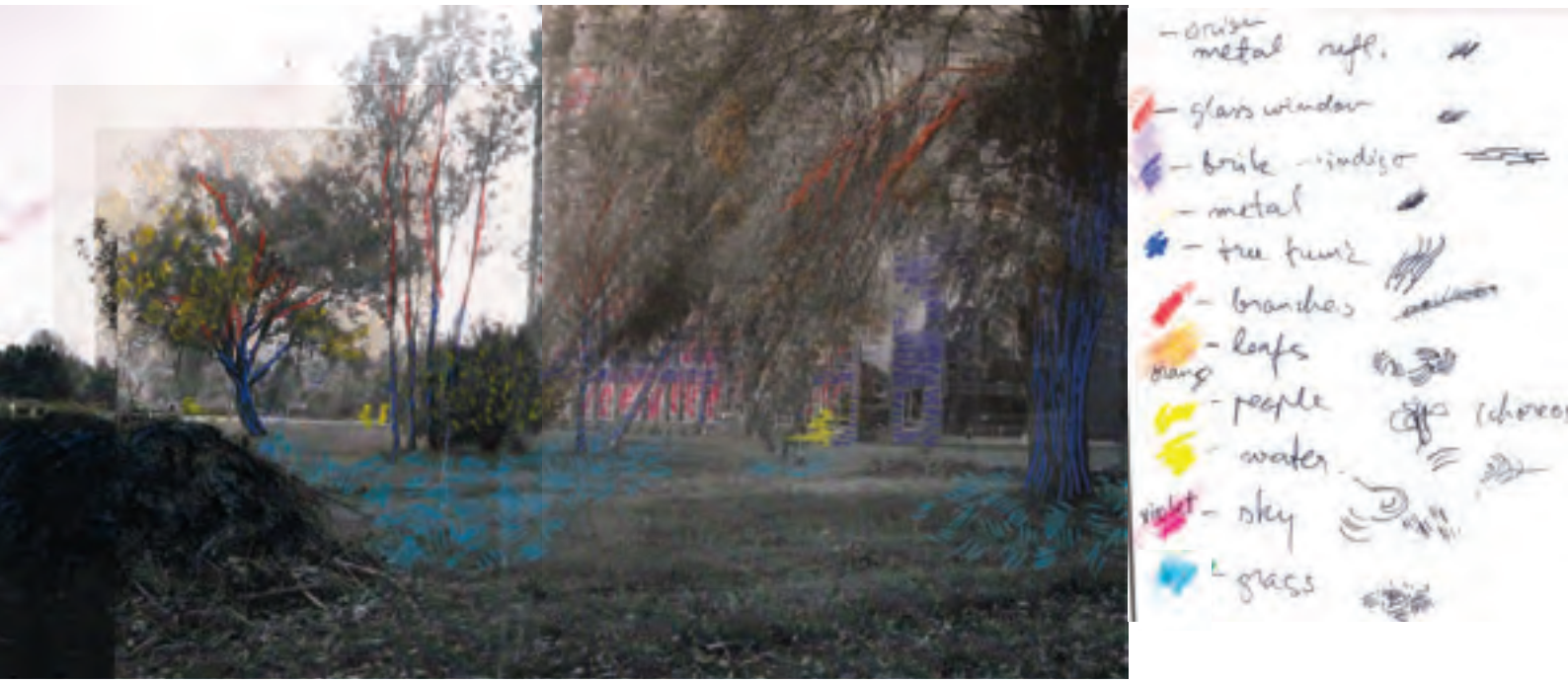


fig.124. **enclosed area with trees**
(near Forum entrance, in Ntuurtuin)

Bridge to next rhythm and time analysis :
A natural way for people to act attuned to the condition is in according to weather conditions. As soon as the day is sunny and quite warm people sit in front of Forum for lunch or even during study time. The light has a strong impact on time perception, mood and atmosphere. These effects are experienced as moments where several elements that cannot be separate create our reality. Also the way of walking and speed is determined by weather conditions.

The colour of materials is constantly changing with the light and according to the surroundings.

fig.125.The shining sun makes everything alive.

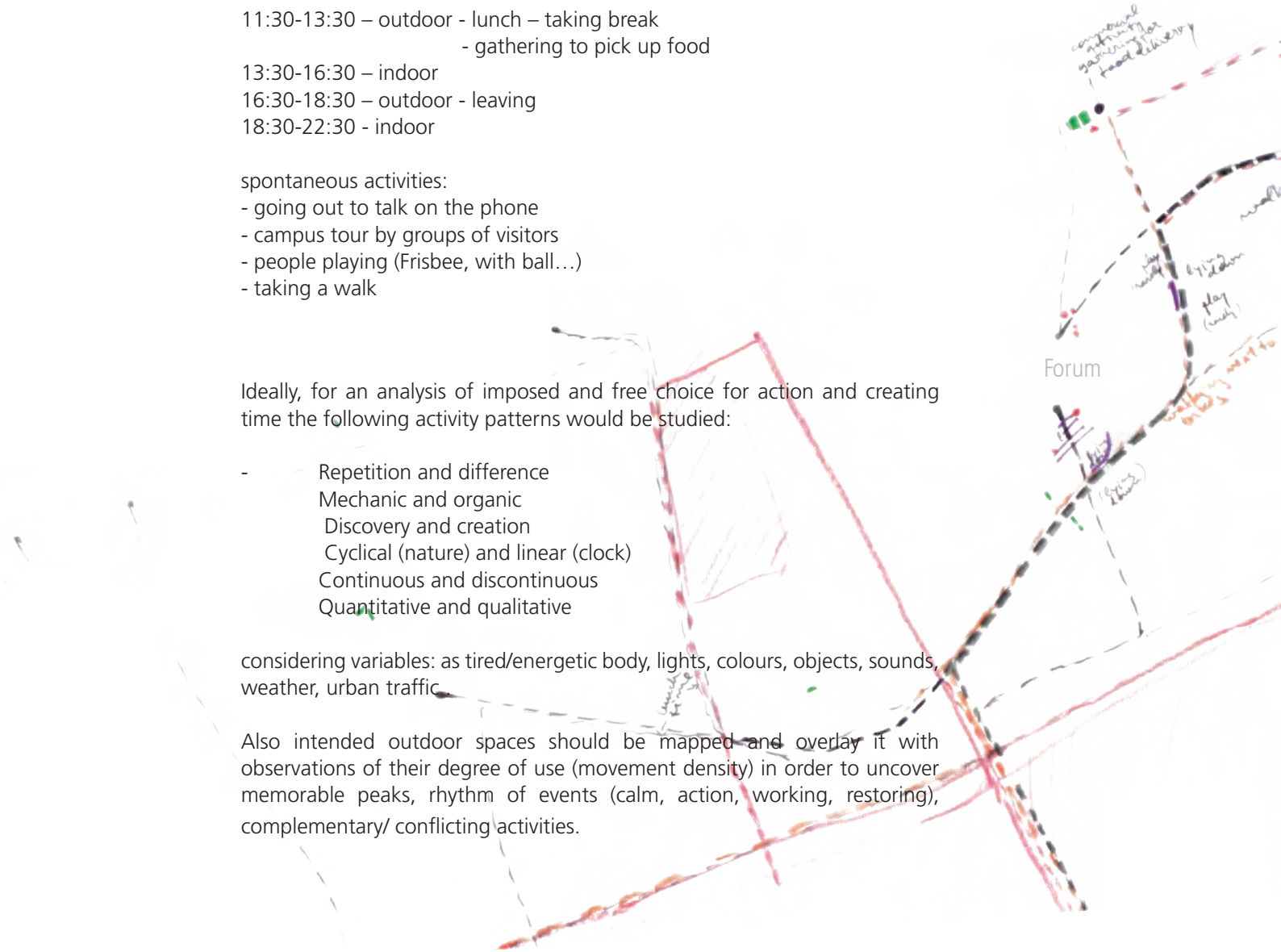
fig.126.Without light all is bleak, there are no shadows, the colours fade out.

RHYTHM OF IMPOSED AND FREE CHOICE FOR ACTION AND CREATING TIME ON CAMPUS

The current activity patterns on the campus indicate the poor condition for outdoor use. The 'time' of the campus is mainly represented by routines following clock time. These barely change (although there are adjustments according to exam week or regular week and time of official vacation). On Saturday and Sunday the imposed rhythms manifest less strong as being in university is optional. In the weekend the campus is empty and quiet and used rather by citizens from outside the university (family with children, people walking dog, fishing). Student's attention turns towards the sports centre, city centre, riverside, forest.

Routine on campus:
7:30-9:30 – outdoor-arriving
9:30-11:30 – indoor
11:30-13:30 – outdoor - lunch – taking break
- gathering to pick up food
13:30-16:30 – indoor
16:30-18:30 – outdoor - leaving
18:30-22:30 - indoor

spontaneous activities:
- going out to talk on the phone
- campus tour by groups of visitors
- people playing (Frisbee, with ball…)
- taking a walk



Ideally, for an analysis of imposed and free choice for action and creating time the following activity patterns would be studied:

- Repetition and difference
  Mechanic and organic
  Discovery and creation
  Cyclical (nature) and linear (clock)
  Continuous and discontinuous
  Quantitative and qualitative

considering variables: as tired/energetic body, lights, colours, objects, sounds, weather, urban traffic.

Also intended outdoor spaces should be mapped and overlay it with observations of their degree of use (movement density) in order to uncover memorable peaks, rhythm of events (calm, action, working, restoring), complementary/ conflicting activities.

fig.126. every day vs staged activity

fig.127. 'blank canvas' no clear paths (shows people's desired linking pattern)

Conclusion:
In terms of movement patterns the social imposed rhythms of clock time prevail on the campus. Concerning creating time, the current campus 'melody' is of rigid rhythmicity, no depth, no surprise, no unexpected occurrence.

Bridge to first rhythm and time analysis:
Imposed and staged activities create also the effect of mass and space. Staged events gather crowds of students for a specific time on a set location (usually the manifestation terrain). Similarly, following the schedule of the bus arriving at Droevendaalsesteeg groups of people arrive and dissipate on the campus at precise times.

fig.128. void and volume rhythm created by people following the imposed bus schedule

9.2. BRIDGE FROM THEORY TO DESIGN STRATEGY

As a step towards the translation of the earlier presented pairs (rhythm and time/walk) into design strategies, their overall qualities are summarized: The *rhythm of space and mass* and the *following time walk* highlight the **foreground**. The *rhythm of expansion and contraction* reveals the **interdependency** of (living) elements and explores inward and outward awareness during *attuning time*. The *rhythm of imposed or free choice for action* elaborates on the **interactive creativity** of observer and landscape through *creating time*. The perception of time is influenced through the easiness and challenge of action in relation to own will.

Short reminder of the main findings from the site specific analysis:

goals:	**user's desires**
Comfort/orientation	- connect campus to city
Awareness and stimuli for action	- richer vegetation (also edible)
options for action	- innovation, image making

design issues:
strategic allocation
inside-outside/ edge
in-out of body awareness

10. DEVELOPING LANGUAGE FOR DESIGN

Three strategies are formulated, in accordance to the above presented rhythms and walking types to indicate and recommend actions:

Framing change
Experiencing material pattern
Enabling diverse patterns of movement and activity

For a designer that serves as observer and enabler specific design language is developed to realize the design strategies. This language does not describe objects and no design toolbox or principles are composed. That is due to the theme of time which cannot follow well defined, precise empirical design.

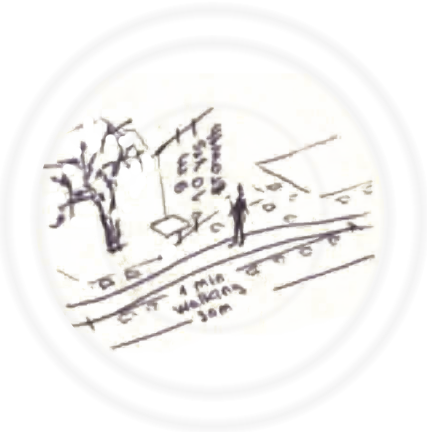
The various design strategies are presented separately with the corresponding design language, each exemplified with reference to a design proposal. The design solutions are a 'combination of the ideal and the practical' resulting from the researcher 'inventing the techniques and models appropriate to the situation at hand' (Schon, 1985, p. 15, in (Filor, 1994).

10.1. FRAMING CHANGE

For the framing change strategy, time is illustrated through measurement of transformation. This can be realised by creating a relative stable reference to contrast change (**interval**); by intervention in key spot to reveal dynamics of different times (**positioning in force field**); by providing various settings with qualities that correspond to different dynamics and reveal the pattern of change (**balance change and continuity**). It mainly relates to the changing rhythm of space and mass and the following time walk.

a. INTERVAL

The language to operationalize this strategy is about designing of interval (in space, in time and way of ordering activities). Interval can be expressed through **distance**: as connective emptiness, space between people, background; as **duration** in between events or even as **break** of an activity. Thus, instead of focusing on the objects when designing, the attention is moved towards the qualities and temporal aspects of the space.



Interval is key in reading the space. Moreover, 'If people lack a sense of clearly articulated space, will they have a sense of clearly articulated time?' (Tuan, 1977, p119). This can be relevant in the interpretation of time in relation to distance in space, which makes own location as reference for the present and faraway places seem 'timeless'(Tuan, 1977, p. 120-1).

design proposal: **Field/transition zone between Forum and outside landscape**

b. POSITIONING IN FORCE FIELD

In design with time awareness one can locate key energy points at junction of processes and movements and provide a stage for an activity that would raise awareness of what is happening there. One still designs objects but the way one positions them shows they are in a dynamic field.

For example the way of positioning a platform at the edge of a pond can reveal usually ignored forces. This idea is inspired from a technique used in painting to suggest movement on a 'static' canvas. Similarly, 'architecture has to slow down experience, halt time, and defend the natural slowness and diversity of experience (Pallasmaa, 2009), p.150). This type of intervention would allow one to be still and silent to become sensitive to the dynamic of place.
design proposal: **Fuzzy water edge**

c. BALANCE CONTINUITY AND CHANGE

In order to frame **change**, one needs to ensure also **continuity**. In the continuous process of site development each period "must be designed to enhance its quality as a time to be lived in" (Lynch, 1972, p. 196). It is important to be able to identify the new and the old and secure certain values of a place. Design spaces should 'maintain a healthy density, a healthy interaction rate and a continuing sense of ethnic identification' (Hall, 1959). Here the balance between continuity and change is referring to the range of qualities a place should have, independent from the changing shape or form of objects that are part of it. For example in the case of a campus, loud and quiet spots, places to be alone or interact with others are needed.

design proposal: **Assuring diversity of activity settings**

The figure background readability can be clear as in the case of the layout around buildings or it can be ambiguous as in the positioning of the water edge at the pond, depending on the interval in the layout. Similarly activities can be synchronized, parallel or separated in time.

10. 2. EXPERIENCING MATERIAL PATTERN

For attuning time and rhythm of contraction and expansion a way to experience time and transformation, is through the use of materials in design and their degree of sensitivity to the forces and processes around to make noticeable the unnoticeable. This understanding and engagement can be explored only through embodied experience: 'by fully experiencing the materiality, the non-materiality becomes evident' (Shinzen Young).

The shape of elements is less important compared to the pattern of aging, feedback to outside and inner forces interacting with it. Such alert quality of materials would indicate 'site/land that is fecund, and landscape as creative agent. Its surface and skin (wall and roof) can be green, breathing, and self-organizing with smart materials and structures' (Koh, 2013, p.17).

d. ENHANCING NATURAL RHYTHMS

A rich nature or contact with nature is a 'mean' of time experience/awareness. Simply being surrounded by vibrant nature, there is time experience. Thus, in areas where there is only impervious surface, or the green is reduced to lawns interventions can bring back or enhance natural rhythms.

design proposal: **Hugelkultur as rich edge/interface**

e. DEGREE OF TIME SENSITIVITY

The choice of material in design can serve environmental processes and human action while also revealing the change brought about by these.

Water is an example of element with a very high sensitivity to movement and change and highly attractive for any living being. The wind, light or beings at its surface transform its appearance. Also it is both transparent and reflecting. Moreover it is dynamic and easily transcends limits as well as different states: creating temporary magic realms as mist, clouds or snow. Once frozen it becomes a platform to walk and play on. Other natural materials (like wood, sand, clay) with specific haptic qualities and textures embody and allow different time experiences.

design proposal: **breathing ground**

f. CONTRADICTING EXISTING RHYTHMS

Contradicting existing rhythms is meant for challenging perception and revealing underlying routines of the present situation: for example, material pattern revealing or contradicting the climatic, natural processes at people's presence. Thus, design elements could exaggerate or contrast the present rhythms.

design proposal: **Time changing installation** (use of artificially alert material)

10.3. ENABLING DIVERSE PATTERNS OF MOVEMENT AND ACTIVITY

This strategy indicates that the movement and activity are stirred both by outside and\or inner stimuli as well as own will. For a lively environment movement of and conditions for land and people are considered. This strategy relates to the rhythm of imposed and free choice for action and creating time walk.

g. TIME AFFORDANCE OF LAND

It is important to recognize time affordance of land in view of future possible activities. There are various times related to affordance of land: time specific to plant species, management, growth and decay, water states/qualities, planting design, fertility time, presence and absence, soggy/dry soil, environmental conditions (light, colour...).

Design proposal: **Stable and flexible/temporary activity settings**

h. EMOTION - CIRCADIAN RHYTHM - SPACE RHYTHM

The negotiation between emotion – circadian rhythm and space rhythm can be stimulated by rhythms that break habit patterns and encourage creativity. Silence, mood, weather experience, memories, free will, atmosphere (physical, emotional), experience, knowledge influences one's incentive and ability to interact with the environment. People adapt or overcome restrictions encountered on the path based on these: 'disruption, hesitation, and being made to wait revealed the temporal dimensions of pedestrian movement' (Middleton, 2009, p.1954).

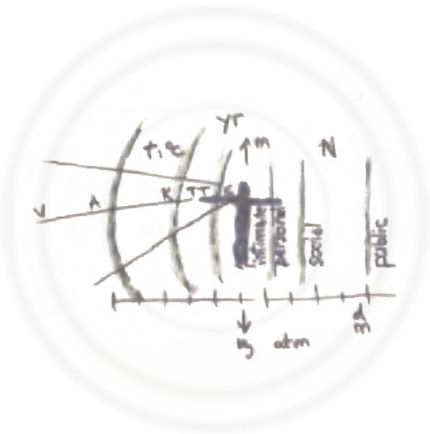
The design should be attuned to people and open to transformation according to their needs. 'Different parts of the day, for example, are highly significant in certain contexts. Time may indicate the importance of the occasion as well as on what level an interaction between persons is to take place' (Hall, 1959, p2).

The site should stimulate some temporary disorder to encourage engagement. Concerning the interconnectedness of time-society-space, "an environment that can easily be manipulated, that invites or that challenges intervention, is an excellent growing medium"(Lynch, 1972, p.221). People learn by doing; furthermore acquiring new ideas, skills or habits of mind triggers further change (ibid, p.222).

Design proposal: Erosion of spatial layout at **Field/transition zone between Forum and outside landscape**

I. HUMAN REACH

IIn contrast to science which usually operates at timescales of micro, macro, seconds and geological and cosmological ones or those of atomic and subatomic events, embodied time is measured by interval between blinking or rhythm of breath.



n general, human scale measurements, are more in the order of:

- Distance: one to two metres (human arm's reach, stride, height)
- Attention span: seconds to hours
- Life span: approximately 75 years
- Mass: kilogrammes
- Force: newtons
- Pressure: one standard atmosphere
- Temperature: around 300 K (room temperature)
- horizontal: left/right; vertical: up/down

To these the sensual perception scales can be added (visual; kinetic; chemical; aural; thermal). The body in motion experiences moments described by forces as mass and acceleration as well as velocity, momentum (Sokolowski, 2000).

Hall (1966) introduces in the book 'The hidden dimension' several measures for space of human interaction, having one's own body as reference. The ***personal distance*** is a normal spacing maintained for non-contact. The ***close phase*** (0.5-0,75 m) and ***far phase*** (0.75-1.2 m) of this dimension are differentiated. ***Social distance*** relates to group awareness (intimate visual details are lost, touch is not expected, conversations can be overheard). The ***social close phase*** is estimated between 1,2-2m and the s***ocial far phase*** between 2m-3,6 m. The ***public distance*** is well outside the circle of involvement (***public distance close phase*** 3-6 -7,6 m and ***public distance far phase*** 7,6 m and more). These dimensions also relate to sharpness of sensorial experience and could be overlapped in mapping richness of experiential zone on site.

These parameters and measures, having the human body as start point are to be considered in design for heightened feeling of agency, and thus for creating time.

design decisions: **Rich interface with nature**

11. REPRESENTATION AND OWN DESIGN PROCESS

For the research through designing, representation was used as design method. This section shows tentative, cautious, searching and experimenting with graphical representation specific to this topic.

Here several stages during the translation process from theory to design are shown:

fig.129. Collage for activity nodes

fig.130. Collage about change of mood and impression of contraction and expansion of space: ENERGY, PRESENCE, EXPANSION

fig.131. First attempts to frame issues

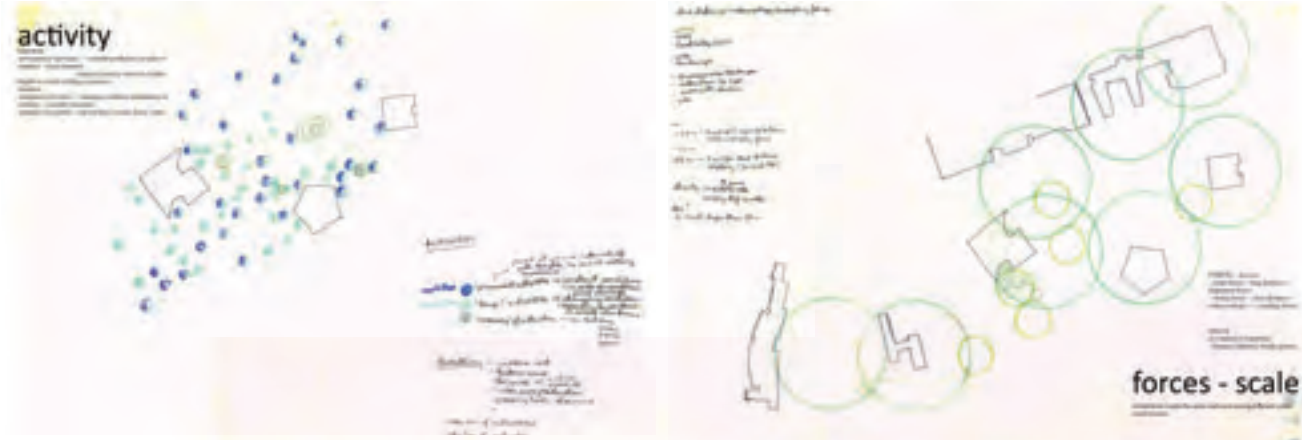
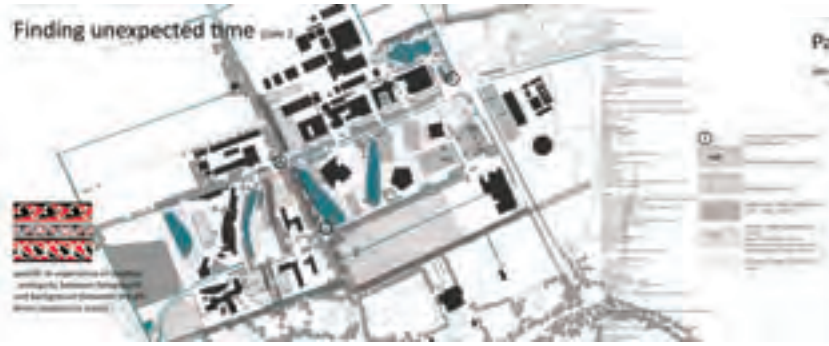
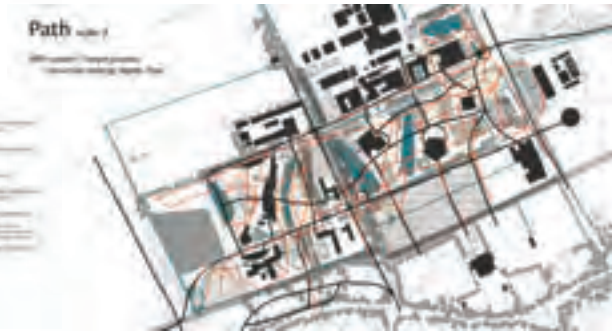


fig.132. First program drawings





11.1. INSPIRATION FOR TIME AWARE ANALYSIS

Why I chose this representation?

For the time aware (specific) site analysis I wanted to express sensitivity of material in our environment.

How I used it or developed it?

I got inspired by Van Gogh's 'Olive trees' drawing and Wolf Kalm's 'Tree color symphony'.

The first one illustrates through quality of lines the movement and speed of transformation of elements (the act draws its energy from the subject itself):

> 'John Berger gives a poetic description of the embodied acts, internalisations and projections that he envisions taking place in van Gogh's drawing process:
> *The gestures come from his hand, his wrist, his arm, shoulder, perhaps even the muscles in his neck, yet the strokes he makes on paper are following currents of energy which are not physically his and which only become visible when he draws them. Currents of energy? The energy of a tree's growth, of a plant's search for light, of a branch's need for accommodation with its neighbouring branches, of the roots of thistles and shrubs, of the weight of rocks lodged on a slope, of the sunlight, of the attraction of the shade for whatever is alive and suffers from the heat, of the Mistral from the north which has fashioned the rock strata. '*(Pallasmaa, 2009, p. 93).

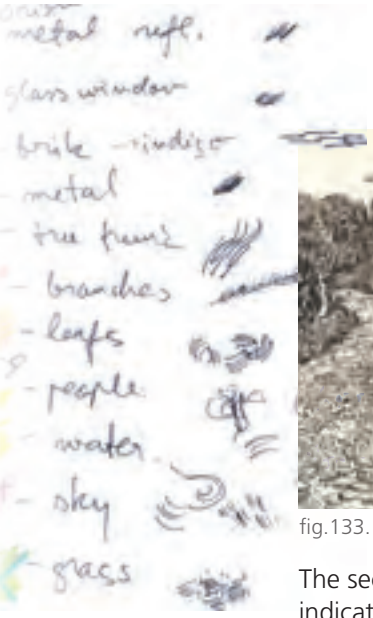


fig.135. own adaptation

fig.133. Van Gogh's 'Olive trees'

fig.134. Wolf Kalm, 'Tree color symphony'

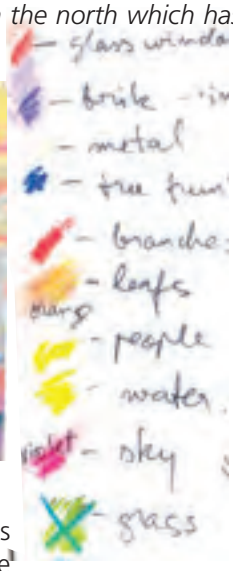


fig.136. own adaptation

The second I used to colour code the sensitivity to time of elements indicating their dynamic of growth, change or aging. The colours are like notes of a melody, representing vibration of elements.

I tried to encode that in the analysis of materials on the campus, ranking their movement, responsiveness to outside factors and speed of transformation.

Time aspect: expression of dynamic of materials, forces.

How useful and effective is it?
It is a good means to illustrate the intended effect.

How accurate is it as tool of measurements and simulation?
In terms of accuracy it can get more or less precise according to interest.

How beautiful and seductive is it as a tool for creativity and communication?
This representation is both seducing and convincing.

11.2. TIME X-RAY

Why I chose this representation?

It is an analysis done to study transformation and traces in the design area.

How I used it or developed it?

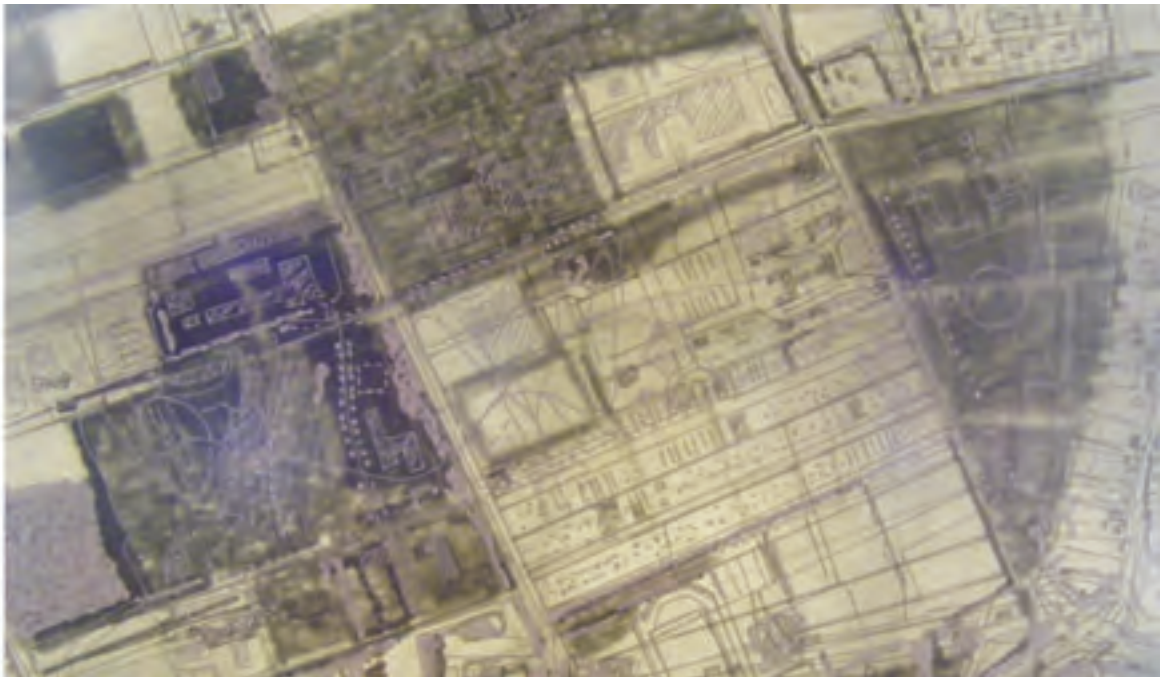
The drawings were realised with white ink on dark coloured transparent paper. all overlapped in one image. By laying them against a light source the same effect as in radiography reading is achieved: the white and the black inverse and in this case the past image comes to the fore. Furthermore, radiography as a technique is a slight blurry visualisation of an overlap of images for the same purpose of reading traces inside the body.

Time aspect: It shows 'layers' of time. This representation is a look under the surface, an overlap of images to recognize past traces still present.

How complete is the representation?
It is a quite accurate representation, following old plans. The scaling and fitting shows some inaccuracy when overlapping. There is moreover a limitation in guessing the factors behind the traces and changes to be observed.

How beautiful and seductive is it as a tool for creativity and communication?
It is a compelling representation and I found the hand drawing was quite appreciated when I made presentations for project EAT.

How to proceed?
For a more complete representation this one could be taken to a next step adding data on actors, forces and actions behind the transformations; creating a datascape, not just an image.



11.3. SCHEMES

Why I chose this representation?

The schemes comprise an in-depth methodological description of the study; allowing transparency. They are meant to explain and illustrate the thinking process from theory to translation in design proposals.

How I used it or developed it?
They track back main steps of the process and mark the bridges from abstract to concrete, from reference study to own understanding.

Time aspect: Process of framing time awareness

How useful and effective is it?
It helped to slowly filter out the information and make it easy to follow.

How I grew? Challenges/limitations
Separating and grouping concepts was quite difficult and it required a lot of re-arrangement.
How accurate is it as tool of measurements and simulation?

The graphic is still open to improvement. The intent was to bring both structure and freedom, to be clear as well as indicate that it can be still changed.

How beautiful and seductive is it as a tool for creativity and communication?
This representation is effective for clarity and to emphasize structure, though it might appear rigid.

How to proceed?
At a later stage I replaced the concentric circles with a spiral to show the actual sequence of reading the diagram and bring in more dynamic. The background picture added later, brings in poetic and indicates the looseness of the structure.

fig.137. earlier version of the scheme on page 77

11.4. MODEL

fig.138. model as research tool

Why I chose this representation?

I used the model as a representation of soft and haptic design, texture, since the plan drawing seemed too rigid. It was also meant for studying effects of void/volume and proportions. I was looking for material quality and sensitive representation.

How I used it or developed it?
I chose paper texture to symbolize permeability and softness. The basins of different sizes were pressed onto the paper, multiplying the building footprint, while down scaling towards human scale. I took a lot of care in the realization of the threes showing the three different stages of growth: each tree is unique and shows structure as well as randomness. Same principle applied for the shrubs. The paths indicate movement having a polished surface, from pressure and friction.

Time aspect: The model shows growth inside pattern (trees and shrubs at different times). It also reveals the designed proportions.

How useful and effective is it?
It was used as a research tool, not for presentation. Therefore, it served just to get to the next step, to test ideas. The intention was to look at texture quality and sensitive representation rather than viewpoints: not about grid but scale, proportion, interface, change.

How I grew?
What I have learned: texture, matter, material counts in representation. It was a problem of representation that the plan drawing seemed rigid, and mechanical. The model showed that the implementation is soft and there are no sharp outlines (rather gradients).

How accurate is it as tool of measurements and simulation?
It looks still top down, can be interpreted wrongly. Thus, it has got the critique of using Euclidian representation and detached view. The pattern might look Euclidian but it is complex.

How beautiful and seductive is it as a tool for creativity and communication?
For me this is a better way to represent my intention than the lines on paper.

How complete is the representation? how to proceed ?
This representation is incomplete. However, time aware design does not exclude top-down perspective and overview, it just sets the main focus on human scale, awareness. It might look static but if one looks closer one can see dynamic.

I followed the advised suggestions of eroding the pattern but keeping the proportions. Embodied experience vision needed to be stronger, so the model could be enriched and complemented with views from embodied experience (show dynamic change, interactive position).

stage I

stage II

stage III

fig.139. shift of volume from down to up

11.5. VIDEO

Why I chose this representation?
The video was used as a research tool, not for final presentation, as an exercise in setting up experience rather than function. It served as a medium to explore rhythms and movement together in action.

How I used it or developed it?
I used music and image to express emotion in relation to observing the formulated rhythms and walking ways.

Time aspect: It shows relation between emotion, motion and change in time perception.

How useful and effective is it?
It served to get to the next step, to test ideas. It was useful for thinking at human scale. Also, I experimented how I can explain the rhythms and walking modes to someone else and that person can embody them.

How I grew?
The video has four versions, done during the research through designing process. With each new version the ideas were more tangible, inspiring and giving confidence. The three versions before the last were used to develop the design, thinking of movement on site and experience. For the final version I was advised to simplify the video and use it only as an illustration of interrelation between body, emotion, action, rhythms of space and way of walking.

How accurate is it as tool of measurements and simulation? It is a subjective representation, but designing is subjective.

How beautiful and seductive is it as a tool for creativity and communication? It is just a tentative representation, hopefully beautiful and getting the intention across.

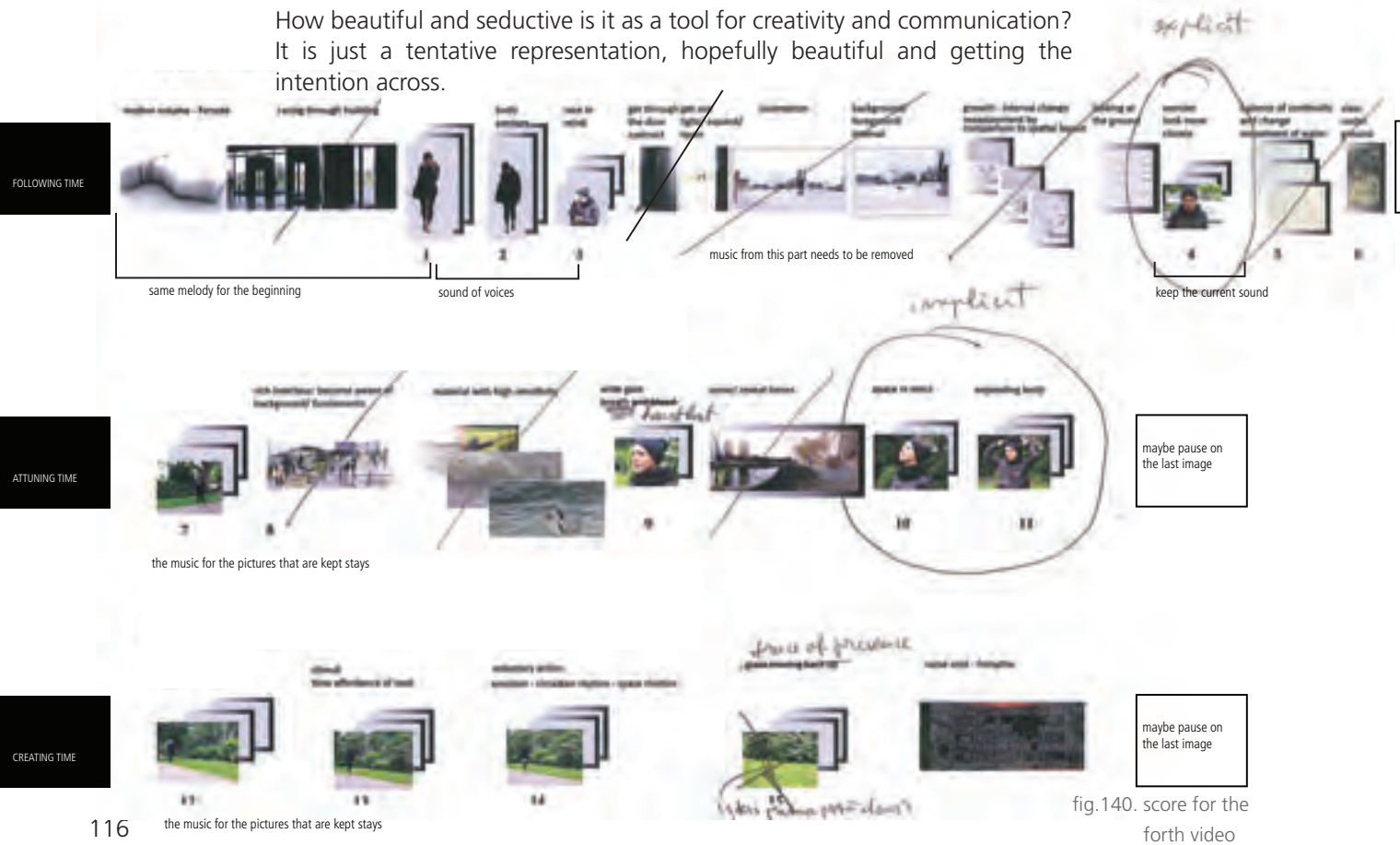


fig.140. score for the forth video

11.6. PICTURE COMPARISON

Why I chose this representation?
Picture comparison helped to illustrate desired situation (see page 63).

How I used it or developed it?
It shows what is already there, on site in comparison to preferred situation (unsatisfying present situation versus better option).

Time aspect: The favoured situation indicates higher sensitivity to process and experience rather than object and visual layout.

How useful and effective is it?
It was communicating clearly and engaging: a straight forward way of making a point concerning what qualities of design with time awareness requires.

How accurate is it as tool of measurements and simulation?
It is quite accurate since it portrays a real situation. It is still important to compare the context of the two opposite pictures. In this case I used many positive examples from the campus itself; good practices that are only too little spread on the site or are getting marginalized.

How beautiful and seductive is it as a tool for creativity and communication?
It can be considered incomplete but it is engaging as the viewer has to imagine himself the final image.

11.7. LAYERS

Why I chose this representation?
This technique was used to explore ways of experiencing, by playing with clarity and fuzziness of perception.

How?
I tried to overlap visible and invisible, suggest movements, confuse and unify figure and background, thus, challenging the selective consciousness of the eyes. Animated GIF's were used to show build up or simplification of impressions.

> *'Of human senses sight is most discerning spatially: the habitual use of eyes leads us to appreciate the world as a spatial entity of well-defined lines, surfaces, and solids. The other senses teach us to appreciate the world as a rich unfocused ambiance. Neither the formal gardens of the seventeenth century nor the "natural" landscapes of eighteenth century make much appeal to senses of hearing, smell, and touch'* (Tuan, 1974, p140).

How I used it or developed it?
For **interval** I did an **accurate collage** to indicate **readability of pattern**. I combined sketch Up 3D perspective with pictures on site and pictures of the paper model. The challenge was to overlap these, as they are each a distorted view and none is more accurate than the other.

This type of representation was considered as not fitting the aim of this thesis, so I did not use it at the end, favouring the more ambiguous illustrations.

fig.141. overlapping perspectives

One of these is the collage for the **fuzzy water edge** (fuzzy collage page 153). Layers were used to represent simultaneity of absence in presence. It shows complexity and dynamic. Also it a way to simulate time memory in space rather than trace of event on space: overlaying images of different seasons, directions, movements while sitting on a 'stable' structure.

How useful and effective is it?
These illustrations were a real challenge considering the balance between legibility and fuzziness to convey the message.

How beautiful and seductive is it as a tool for creativity and communication?
It is compelling and daring. I recommend it along with further exploration on representing memory of event, forces.

fig.142. layers of the fuzzy water edge collage

11.8. DESCRIBING MOMENTS, MOVEMENT AND EXPERIENCE

Why I chose this representation?

In order to describe moments and time experience along a path (see page 148). I overlapped several representation techniques from literature study and research on graphics.

Moments are 'non independent parts that cannot be substituted or be presented apart from the whole' (Sokolowski, 2000). For example the colour red depends on surface, spatial expanse (part that cannot become the whole).

The intention was to simulate how one's focus and emotion changes while walking (forward and backward, alternating clear and fuzzy, speed, attention) and how these alter time perception.

The multisensory analysis technique (see page 40) was used here to describe potential sensory stimuli with higher accuracy. Thus, such indexical information indicates other potentialities besides vision: touch, smell, taste, hear/listen.

Presence and absence, *partial perception* (halo of potentially visible), *empthy intendings* (all thought and felt before actual experience/activity) would ideally be represented through this serial drawings.

For this, I felt the need to add movement and emotion to the studied representation techniques. I studied gesture drawing to show emotion rather than shape. The same person was caught in different attitudes reflected in body posture, way of walking and mood.

All these explorations show tentative graphics that reveal myself and present my values concerning the studied topic.

REFERENCES

Filor, S. W. (1994). "The nature of landscape design and design process." Landscape and Urban Planning 30(3): 121-129.

Gottlieb, C. (1958). "Movement in painting." The Journal of Aesthetics and Art Criticism 17(1): 22-33.

Hall, E. T. (1966). *The hidden dimension*. Garden City, s.n.

Hall, E. T. (1959). *The silent language*, Doubleday New York.

Koh, J. (2013). *On a landscape approach to design an eco-poetic interpretation of landscape*. Wageningen, Wageningen Universiteit. Rede Wageningen Universiteit, 30 mei 2013.

Lauer, D. A. and S. Pentak (2000). *Design Basics* Harcourt Brace Collage.

Lynch, K. (1972). *What time is this place?* Cambridge [etc.], [s.n.].

Middleton, J. (2009). "'Stepping in time': walking, time, and space in the city." Environment and planning. A 41(8): 1943.

Pallasmaa, J. (2009). *The thinking hand: existential and embodied wisdom in arthitecture*, Wiley.

Sokolowski, R. (2000). *Introduction to phenomenology*, Cambridge University Press.

Thrift, N. (2001). *Timespace: geographies of temporality*, Routledge.

Tuan, Y. F. (1974). *Topophilia : a study of environmental perception, attitudes, and values*. Englewood Cliffs, Prentice Hall.

Tuan, Y. F. (1977). *Space and place : the perspective of experience*. London, Arnold.

wikipedia (2013). "human scale." Retrieved 10.30.13, 2013, from http://en.wikipedia.org/wiki/Human_scale.

Chapter IV.

RESULTS

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The design decisions vary in
- speed of execution (fast/ slow)
- difficulty of execution (simple/ complex)
- type of action (removing/ adding)
in order to assure a rich time experience at each stage of the site development. Each design proposal resonates with certain elements of design language at different intensities (selective focus). Like water drops falling on a water surface, the design ideas fuse together. Some expand over others in an unpredictable and continuous way.

12. OVERALL AND DETAIL DESIGN PROPOSALS

12.1. PEDESTRIAN NETWORK

In response to the problem map (page 66) a pedestrian network is proposed for the campus to increase inner connectivity and allow comfortable and diverse walking possibilities. Several gateway plaza will mark the threshold from city to campus or landscape to campus. These areas will comprise facilities for meeting, showcase or performance.

Clear routing will be established through the diverse materialisation of the paths. The **strong/fast connections** are linking buildings and main activity areas. For a stronger connection of the central lawn with NIOO and Stoas Vilentum, a pedestrian bridge will be constructed over Mansholtlaan. Where currently pedestrian and bike traffic mix along the same road, a safe zone for pedestrians will be drawn parallel to the existing one (fig.143). The paths along building facades will be realised with concrete slabs with imprints of grass (fig.144). Thus, while walking at the edge between green and built, the texture of the path merges built and nature.

Slow and weak connections will be marked by paths with highly permeable materials, for tracks that are more about exploring the site, than reaching precise areas. According to soil condition and use, these materials range from grass, wood, stabilised gravel to slightly raised iron grid (where the soil is more soggy) (fig.145). Some of these can be temporary paths (like those cut through the high grass).

The texture of ground can allow diverse speeds and pressures of movement as well as comfortable or challenging walking possibilities.
Activity nodes will be designed at key areas to enliven the campus. Most of them are already present but not functioning according to needs and potential.

For the campus outdoor to be more used and engaging, **stable and flexible/ temporary activity settings** are planned. **Repetition** would be represented by the **activities with fixed settings**. These provide constant conditions, in spite of weather, and are placed at precise spots to enliven the place; outdoor class, sheltered areas. **Variation** is introduced by **temporary or flexible activity spots** where one needs to negotiate with the land in terms of space and time (clock time and cyclic, unpredictable time). An example

would be sitting or lying on the grass at Forum entrance. It is important to enhance potential of existing intimate areas and favourite activity areas. Further temporary action areas could be playgrounds, the water retention basins (page 138), hugelkultur sitting areas (page 135). In the proposed **outdoor shelters**, there could be a storage area for movable elements that can serve as temporary sitting elements at events created by students. The parking areas after working hours and the vacant areas that are going to be developed for research buildings and the campus plaza could serve as informal places for performances. An extra layer of activities could be the 'memory of activities'- that can last days, weeks, hours, years – and can be seen as traces on the land or stored on a virtual map (using GPS).

Some activities can be 'bundled' to heighten liveliness and encounter (place to grow food, showcase, play and learn, create, gathering), as it is envisioned for the Campus Academic Garden and this design research (orchard as people place around main buildings). Thus, learning by doing or daily encounter with nature would become part of the every day campus experience.

Following, **diversity of activity settings** needs to be assured. On the campus there should be a balance between comfortable enclosed places for calm, relaxing , restoring activities, playgrounds sheltered from wind, places for active leisure. For example one can buffer areas that will soon become construction sites while assuring areas where people can find peace and restore (Natuurtuin).

All these decisions at larger scale, lay down the conditions for rich time experience at human scale, while walking through the campus.

PROPOSED PEDESTRIAN NETWORK

gateway plaza's

activity nodes

stable activity settings (outdoor shelters)

building field

bridges

fig. 143. Existing path with dissolving green edge and occasional grass lines (walking next to bikes)

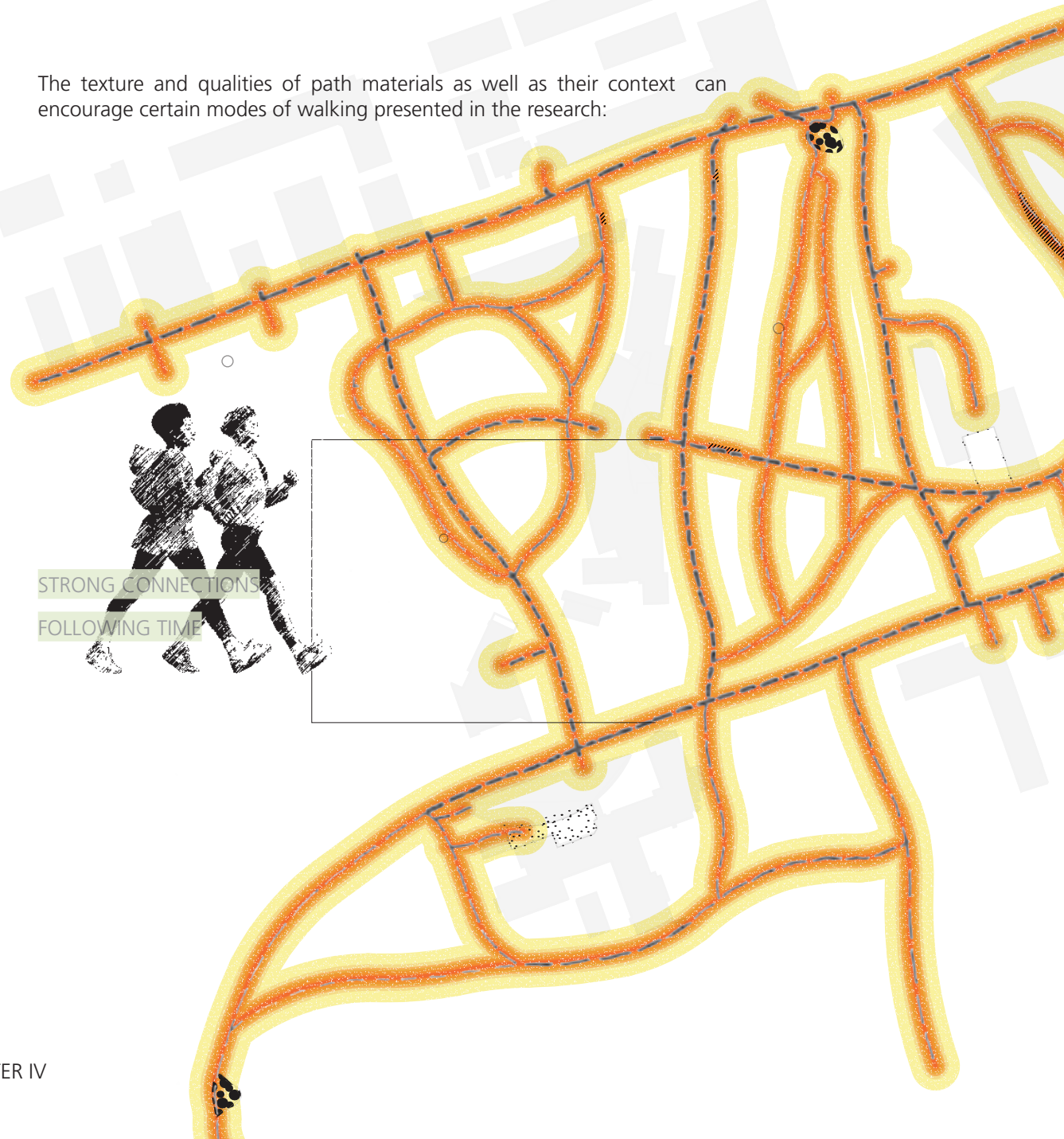
fig. 144. Concrete slabs in the grass with imprints of grass (intense walking on green surface next to building)

0 m
50 m
100 m
N
envisioned area for Campus
Academic Garden
(project EAT)
WEAK CONNECTIONS (fig.145)
Wood, stone stepping stone (Play path)
Grass path (Volume marking void)
stabilised gravel path
iron grid

RICH EXPERIENCE ZONE ALONG WALK WAYS

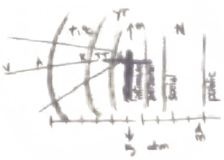
Hall's differentiation of *personal, social and public distance* in relation to ones body was used to map potential rich experience zone along the walk ways. This drawing tries to bring in awareness human scale when designing in plan. The colourful lines show only proportions and values, to illustrate perception along the path network. It is only an exercise of comparing measurements of standards for interaction zone and standard spatial units. In reality the experience zone is distorted according to ones awareness of present moment and potentials around, ones mood, physical abilities.

The texture and qualities of path materials as well as their context can encourage certain modes of walking presented in the research:

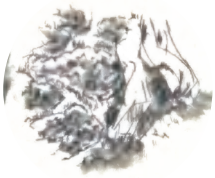


0 m
50 m
100 m
N
rhythms:
push
in
less detail
contract
tight
fast
pull
out
more detail
expand
vast
slow
WEAK CONNECTIONS
ATTUNING TIME
CREATING TIME
intimate
personal
social
public
close
far
close
far
close
far
Hall, Edward T. (1966). The Hidden Dimension
HUMAN SCALE VS. GRAPHIC SCALE
0 m
5 m
10 m
15 m

12.2. PEDESTRIAN PATH ON DROEVENDAALSESTEEG



This design proposal consists of adding a path to existing context to provide access to the existing rhythms which are now too far from human reach. A concrete, fast implementation of pedestrian path that enables a richer time experience, is allowing people to walk on the green stripe between the current parking and the buildings aligned on Droevendaalsesteeg. The path will have a *breathing ground* in order not to reduce the green surface of the campus. Furthermore, following the current layout, the space around this path will expand and contract due to the existing raised structures and openings at level. The existing raised walls with planting above will bring nature time closer to human reach.



Breathing ground would be any surface that is permeable to water and air and that can allow life (nature process and facilitate people's access). In terms of concrete solutions the impermeable surface of the linear parking can be perforated with trees or shrubs and narrow paths. More green parking as already seen on the campus can be implemented on the other parking areas (fig.).

At the level of Gaia the parking of that side could be replaced by planting or partially perforated by green in order to connect the large pond and the central lawn. This would break the sharp separation by the parking lot and car traffic between the buildings and the central plane.

fig. 148. proposed plan

fig. 147. future rhythm of space (adding path and trees and piercing through the parking lot)

fig.146. current rhythm of space in the area between the buildings and the parking

fig. 149. before

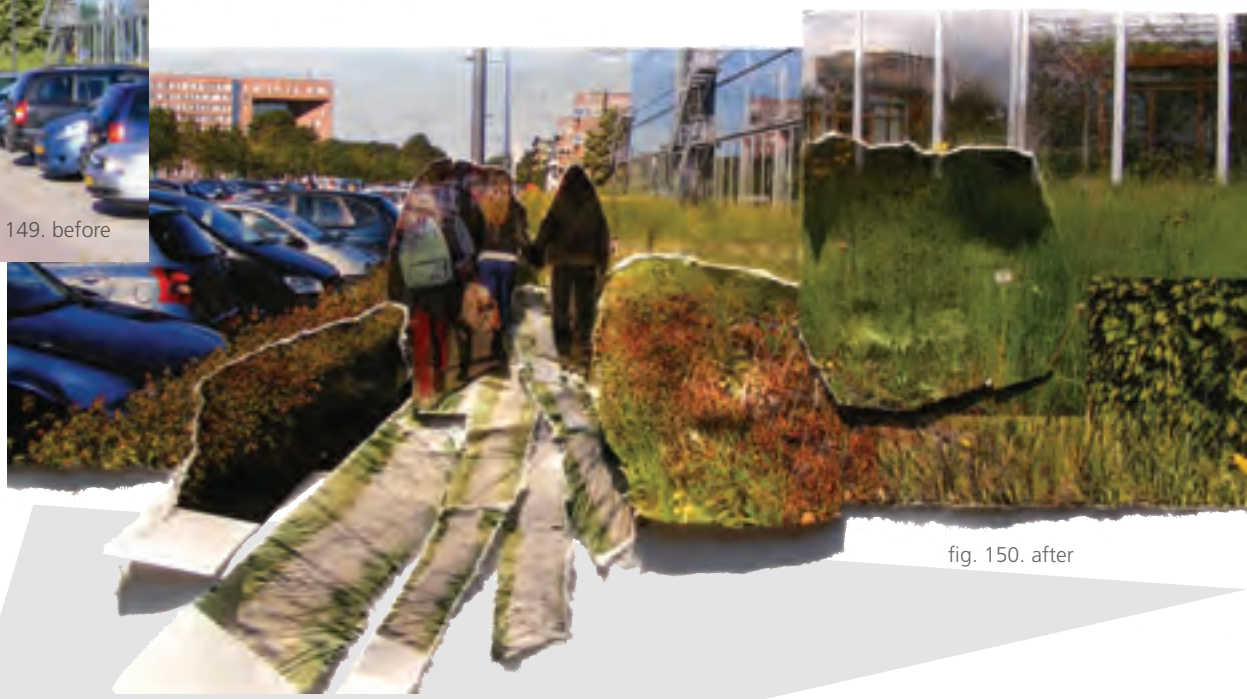


fig. 150. after

green or water surface at different level (higher/lower)

fig. 151. suggestion for breathing ground

walking space

12.3. PLANTING THEMES OVERALL

In the same spirit with the Natuurtuin behind Lumen building, the proposed planting will resonate with species in the landscapes around the campus. This will allow showcase and experience of local landscapes and their rhythms. A linear 'park' will extend the earlier mentioned garden along the edge of Mansholtlaan and even beyond it. It will combine elements of marsh landscape, productive hugelkultur and existing forest spots. Also along Bornsesteeg an arrival corridor will mark the entrance towards the campus. This will be created by reinforcing the planting along this road and extending the present forest edge with edible forest at the side towards Forum. Paths leading through the central lawn towards the future planned academic garden will be bordered by grains, berry bushes or flowers (This idea was also discussed at the project EAT participatory design workshop and the Healthy campus workshop).

These planting schemes will create identifiable areas on the campus with specific textures. It will also create a rhythm. These will become a landmark and an indicator of Wageningen UR as concerned with fertility of land, life quality and diversity. The diverse patterns will be seen from the speed of cars and bikes on Mansholtlaan and experienced on foot along diverse paths.

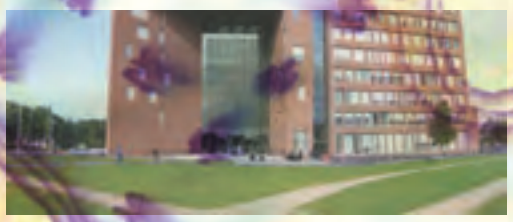
This thesis focuses on time experience at edges and interface with buildings. The planting scheme will create varying rhythms, differentiating campus edges as 'legato' (connecting and slowing) and building vicinity as 'staccato' (abrupt changes with dynamic contrast). This will also be reflected in the density of vegetation: with dense planted edges, opening and wide spacing between planting around buildings. Next to the varied experiences such layout creates, it harmonizes with the architectural, clear features of the built elements and the softer diverse edges of nature: shifting from clear intervals (differentiation) to ambiguity between background and foreground (integration, diffusion). Large areas in between are left as 'blank spots' (open designs) to be developed at further stages.

diffuse clear diffuse

1 2

rhythm legato staccato legato

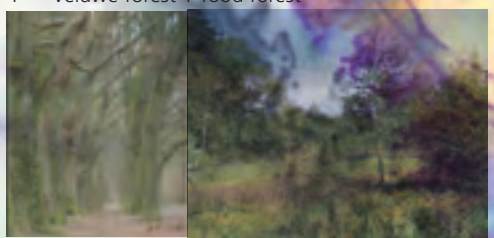
current situation on campus

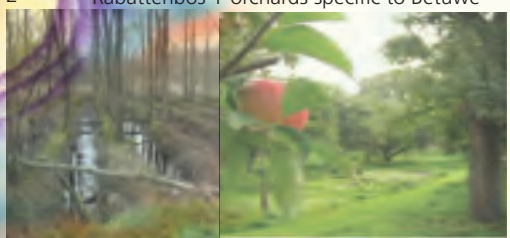


1 Veluwe forest + food forest

2 Rabattenbos + orchards specific to Betuwe

inspiration from surrounding landscapes and edible landscape



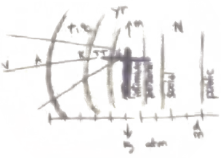


3 Binnenveld landscape + hugelkultur

12.4. HUGELKULTUR AS RICH EDGE/INTERFACE

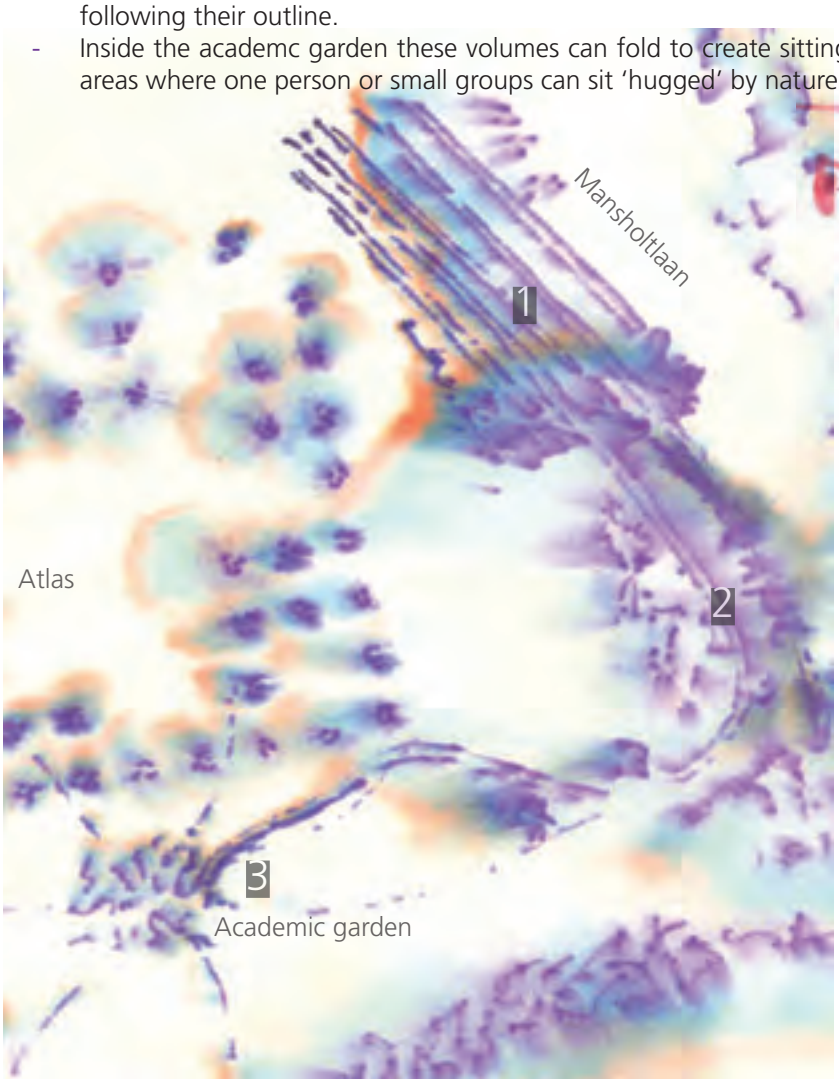
When two ecosystems encounter, the transition zone is most rich. Thus, for a heightened awareness of natural rhythms 'rich edges' would be the lavish, vibrant zones in between orderly fields on the campus. Their richness will balance the apparent 'emptiness' around.

All proposals for rich edge would intend to maximize interface with nature, whether as edible forest edge, hugelkultur, planted ditches, raised beds, planting at interface between indoor and outdoor.



One example of rich edge would be introducing hugelkultur on thewide open space at the entrance from Mansholtlaan. *Hugelkultur*, in German, translates roughly as "mound culture". This design proposal adds a living volume to the current 'emptiness', in order to bring in stronger nature rhythms and enliven the space. Manipulating the ground and creating a longitudinal volume will increase dynamic along path. It's geometry would change according to characteristics of area:

- At Mansholtlaan edge – where it is meant to be perceived by cars, bikes and people walking fast, it will be layed out in typical straight lines
- Next to the winding strolling paths it will become more curved following their outline.
- Inside the academc garden these volumes can fold to create sitting areas where one person or small groups can sit 'hugged' by nature.



Reference images for the diverse experiences along the same living volume:

1 fast walking at Mansholtlaan

2 slower walking and winding strolling paths

3 resting

12.5. FIELD/ TRANSITION ZONE BETWEEN FORUM AND OUTSIDE LANDSCAPE

From the different buildings on the campus the detail design focuses on the indoor-outdoor transition zone of Forum building. This design proposal will underline the main statements of this research as it represents a robust idea among the many other adaptive and more generic design applications. It is about down scaling the building size to human scale, to create interface allowing new and vivid rhythms.

Forum building is the current centre but still lacking rich time experience. Moreover it is mostly an indoor centre. Compared to other buildings, it has an articulation of the facade due to large perforations at main entrances. This creates semi-enclosed places where people can stay outside while being sheltered. However, the space around the building resumes to grass and bike paths, which do not create **a rich interface** between building and outdoor. Salinagros states about building facades: 'The plainer an element is, the more it needs to be surrounded by a structured boundary'. From inside large openings provide views to the outside but these visual connections could be further elaborated at human scale at outdoor. There is need for a tangible dialog with the outside landscape. Therefore the interface between building and landscape should materialise as a 'zone', a 'field' of the building which fuses characteristics of both. The resulting pattern of the 'building field' should become a landmark as well as rich experience zone, by complexity (from spatial quality principles), harmony and threshold experience (experiential quality).

scale distribution

m=1

f=e=2,718

size x: 70 m

nr of times from largest scale to human scale p: 1-8-64-512

pattern erosion

1. hard/soft surface and possibility to perforate
2. proximity to path -> senses
3. erosion by nature
4. erosion by people

Complex structures are interesting to humans as they combine regularity and surprise in a complementary way (Salingaros and West, 1999). These are not too regular or empty nor too incoherent (Salingaros, 1997 in Salingaros and West, 1999). Thus, in creating a transition space from indoor to outdoor of Forum building the universal rule of scale distribution is used as a readable reference for downscaling from the large building size to human scale.

As result of Salingaros' research on urban geometry that is pleasant for people, he concludes that such spatial patterns obey an inverse power-law distribution. This can be observed in nature, where '*interactions are naturally strongest on the smallest scale and weakest on the largest scale' (Salingaros and West, 1999).*
In the case of Forum, the largest scale was considered as the size of the building footprint and the smallest one a size that can be related to human body (human scale). Thus, a universal formula based on natural science was adopted to re-introduce human scale on site without ignoring the in-between scales from the size of the building to that of a person.

The nature processes and human interactions happening inside this pattern can be measured against it. In this sense the interval is key in making the pattern readable. The clear spaces in between elements create a staccato rhythm. Moreover, Forum has scale distribution indoor in spatial organisation and pattern of the roof, but not outside around (fig. 152).

Through this scale factor it is possible to create a linked hierarchy of intermediate scales, connecting the small scale to the largest one.

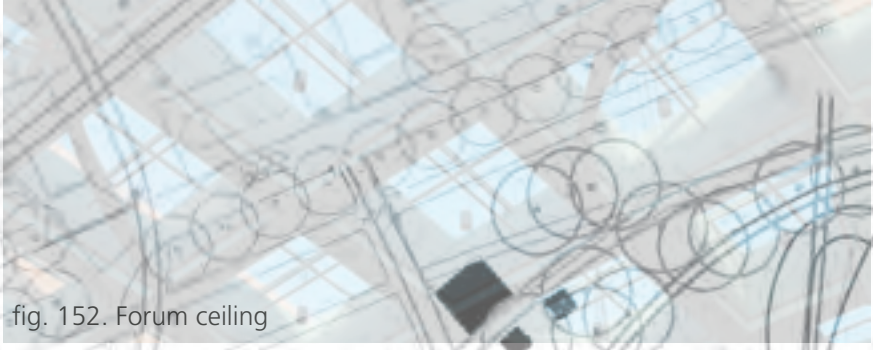


fig. 152. Forum ceiling

In mathematical terms scale distribution is applied by defining levels in design by elements of size *x* repeating a relative number of times *p* following the approximate rule px^m = *constant.* The index *m* typically takes on values between 1 and 2. In the case where *m* = 1 Salingaros (1995, 1998a in Salingaros and West, 1999) argues that the scales are separated by a natural scale value *f* = *e* = 2.718. The ratio between scales in the urban fabric should correspond very approximately to powers of this number, which equals the logarithmic constant.

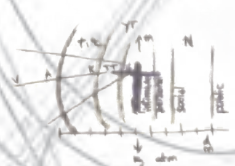
23.4 m – wind sheltered sport fields

7.8 m – fruit trees 'island'

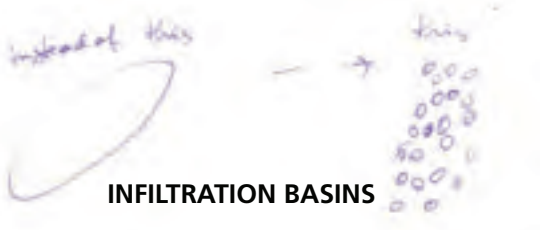
2.6 m – larger drainage puddle

0,86 m – small infiltration basins
depth of puddles: 10 and 20 cm

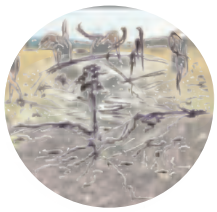
7,8 m – outdoor shelter



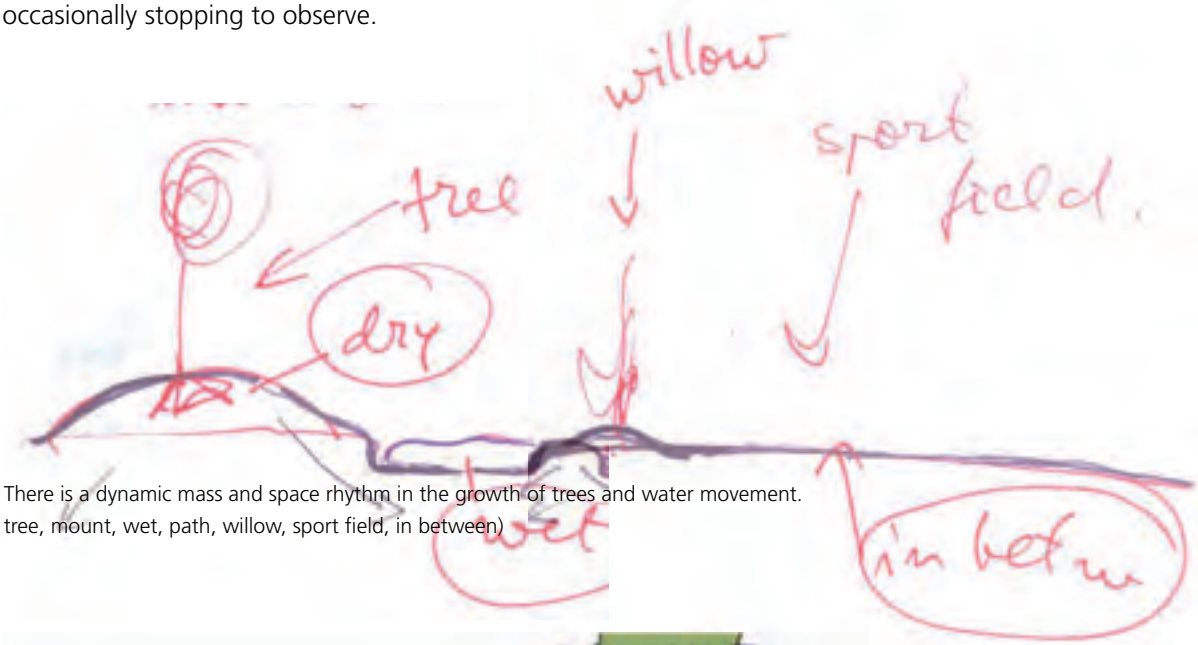
The resulting pattern was materialised according to the needs and as an improvement of current dysfunctions, still checking required sizes for specific functions and negotiating with the current design. By overlapping the pattern with the existing situation a first 'erosion' of it occurs, maintaining it only over the soft surfaces (with a few exceptions, where hard cover could be perforated to allow more green). At a second stage it was eroded considering the rich experience zone along paths inside it. Then nature phenomena and people's use will continue to re shape it. In sum this pattern will consist of: orchard and edible shrubs, water retention and detention, activity space, wind sheltered playgrounds. All help to create potential for a rich time experience at indoor-outdoor transition.



INFILTRATION BASINS



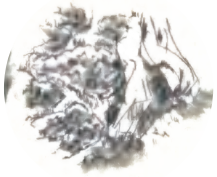
Following the need for more water retention surface on the campus and the aim to prevent stagnant water around buildings, part of the pattern was realised as **infiltration basins**. These are vegetated depressions designed to store runoff on the surface and infiltrate it gradually into the ground. This would improve soil permeability (mentioned as a problem in the official document). Increasing infiltration is good in wet areas with high water table, using soil between surface and water table as temporary storage. The grass surface of the ponds is dry when it is sunny and warm (when people actually use the space). In case of heavy rainfall, the ponds are temporarily storing water until it sinks to the groundwater table. This dynamic can be experienced. Thus, instead of the generic big retention pond next to large impermeable surface, the retention ponds are smaller divisions which also allow other activities besides water management. Installing drainage pipes will increase outflow from the infiltration puddles and is a common practice and economic solution in the Netherlands (meeting with Jan Willem). This is a state of the art approach to water management today in the Netherlands (meeting with Jan Willem): as it is already recognized that land is too expensive and it is too costly to build large ponds for water retention. Therefore, so this proposal will not be an experiment from technical point of view. This pattern of drainage was further eroded according to proximity to the paths going through it. Its dynamic should be experienced by the people passing by and occasionally stopping to observe.



There is a dynamic mass and space rhythm in the growth of trees and water movement.
tree, mount, wet, path, willow, sport field, in between)

fig.153. Infiltration basin (source)

ORCHARDS



With the soil dug from the ponds and by using branches from vegetation maintenance (e.g.: willow branches from Natuurtuin), small mounds will be realised inside the pattern in the lines following the buildings shape. This mounds are necessary for planting young fruit trees, to get a drier strip of land until the tree is stronger. Such a system is called Rabattenbos, and was used in Netherlands already since 1799 (meeting with Jan Willem). As the tree grows the rabatten is eroded and no longer needed. Moreover, this mound, similar to hugelkultur, will create a rich soil layer and will in time improve the fertility of the current soil. The planting scheme will be inspired from the layers of the food forest garden in permaculture (fig.154). At the first stage, the orchard trees will be surrounded by shrub layer, ground cover layer and rhizosphere layer. After five years, when the tree starts giving fruits, the underlayers will be reduced. After ten years the shrub layer will be removed, as the tree has a wider crown and can welcome people to sit underneath it. The growth will thus entail a shift of volume from density on ground to extension of tree crown and freeing the lower part. As an extra benefit, dispersed planted trees mitigate the wind speed around Forum. Concerning the argument that this tree pattern could be rigid, the already existing small trees around Forum will create from the beginning a disorder in the order. Also from the model research, the grid is very open and will not be that confining.

The choice of species for the pattern was done according to the shadow study and knowledge about the weather conditions on site. For the suny areas, apple trees will be planted (Malus domestica 'Elstar' together with Malus domestica 'Alkmene' as pollinator). Hazelnut trees (Corylus avellana) will be plated in the more shaded areas, as two hours of sun exposure in the morning is sufficient for giving fruits. Prunus avium will be planted in the shade. The next layer will consist of Vaccinium corymbosum 'Bluecrop' with 'Blueray' for pollination. As a rhizosphere, Symphytum grandiflorum 'Blaue Glocke' was chosen and Pachysandra terminalis as groundcover. The planting pattern () is the result of studing the shade tolerance and other factors of each plant and the planting density per square meter. The flowering and fructification time vary along the year.

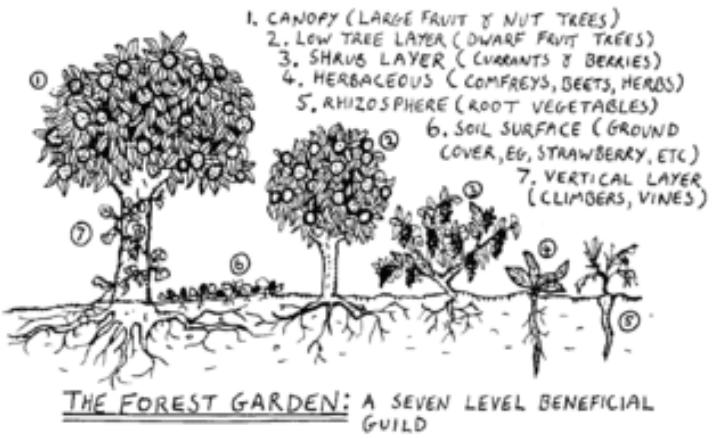


fig.154. The seven layers of the forest garden

trees

- Prunus avium
- Corylus avellana
- Malus domestica 'Elstar'
- Malus domestica 'Alkmene'

shrubs

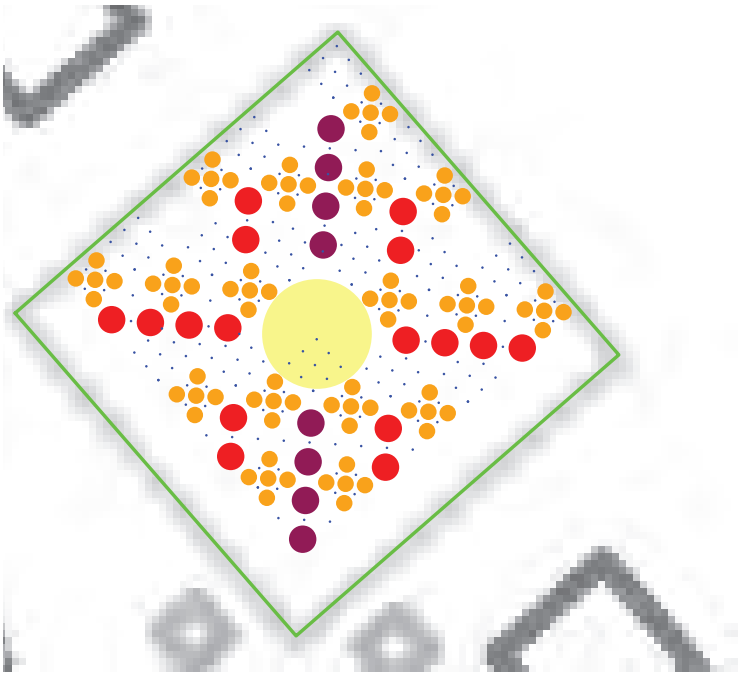
- Vaccinium corymbosum 'Bluecrop'
- Vaccinium corymbosum ‘Blueray’

rhizosphere

- Symphytum grandiflorum 'Blaue Glocke'

ground cover

- Pachysandra terminalis



Droevendaalsesteeg
2560

trees

- Prunus avium
- Corylus avellana
- Malus domestica 'Elstar'
- Malus domestica 'Alkmene'

shrubs

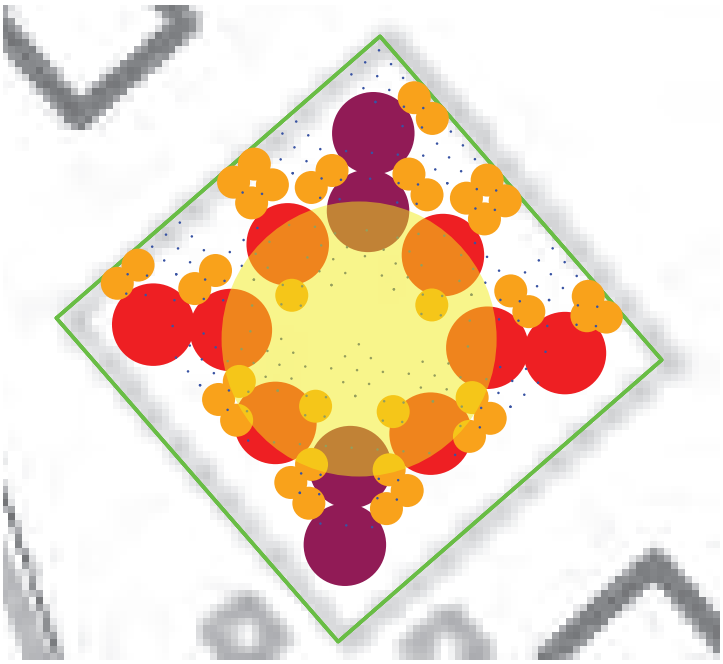
- Vaccinium corymbosum 'Bluecrop'
- Vaccinium corymbosum ‘Blueray’

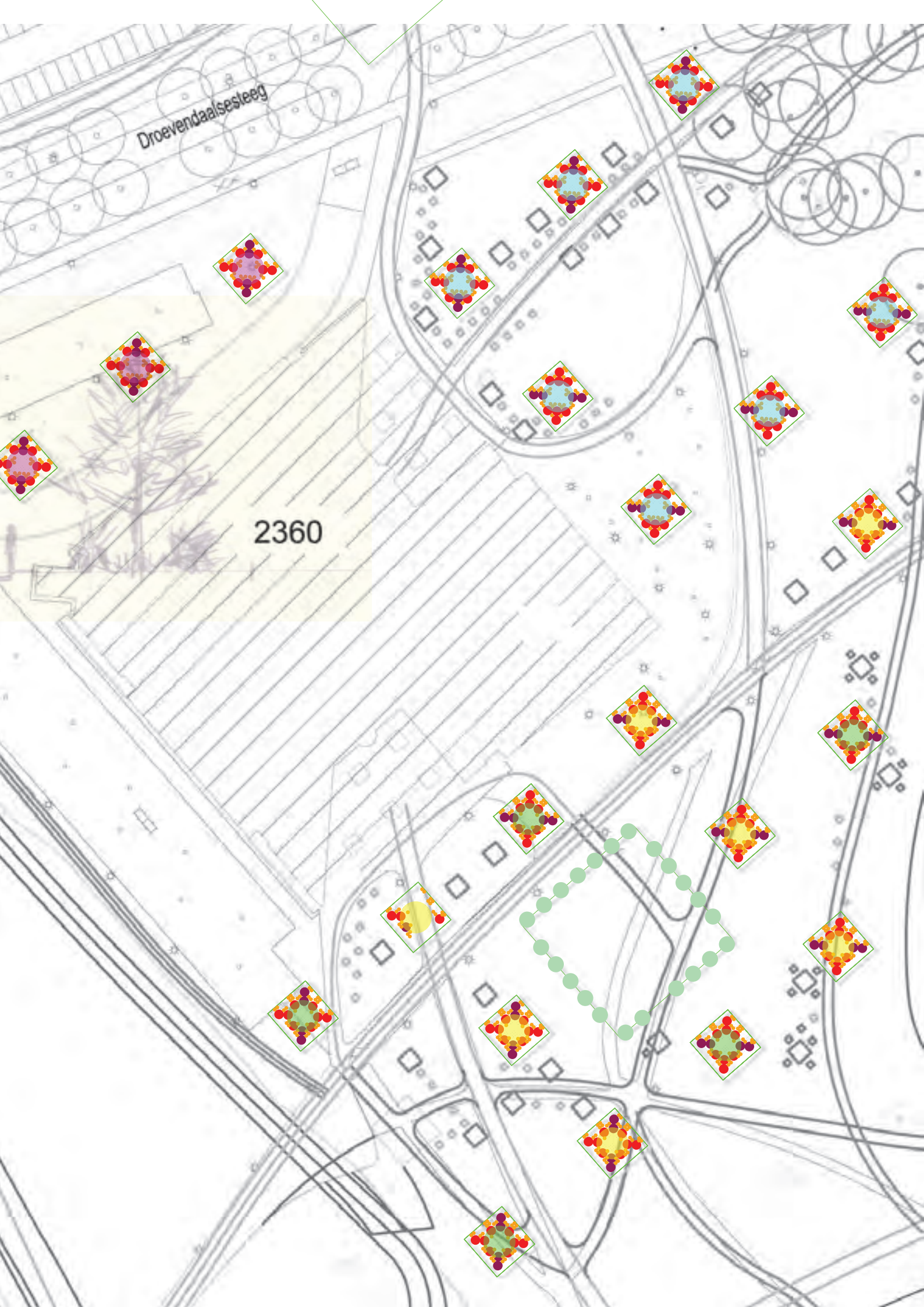
rhizosphere

- Symphytum grandiflorum 'Blaue Glocke'

ground cover

- Pachysandra terminalis




Droevendaalsesteeg
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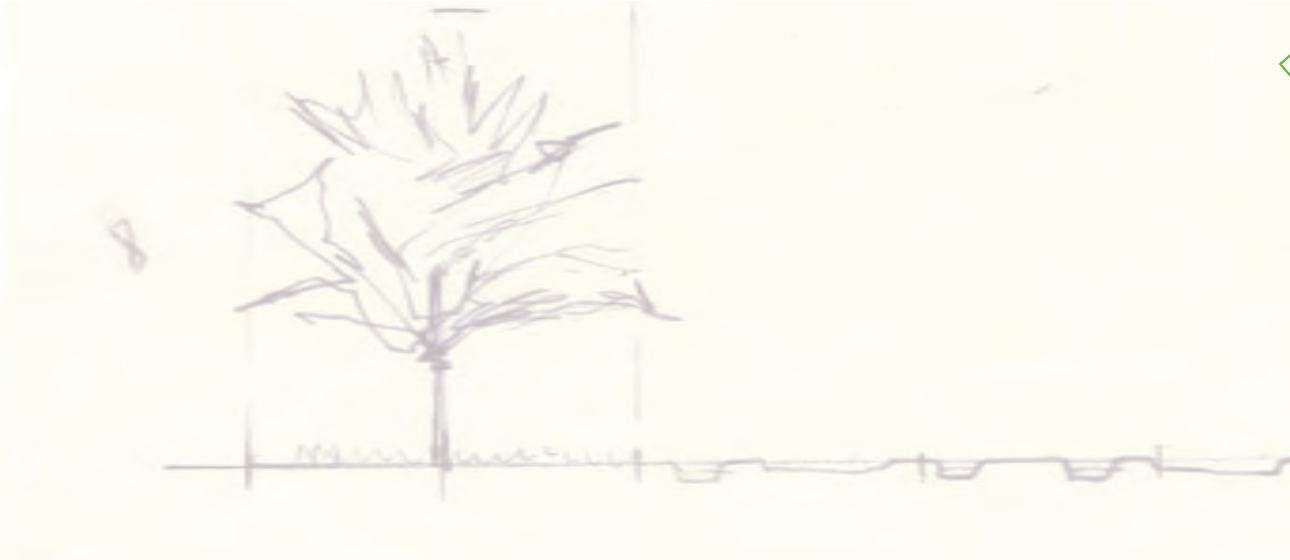
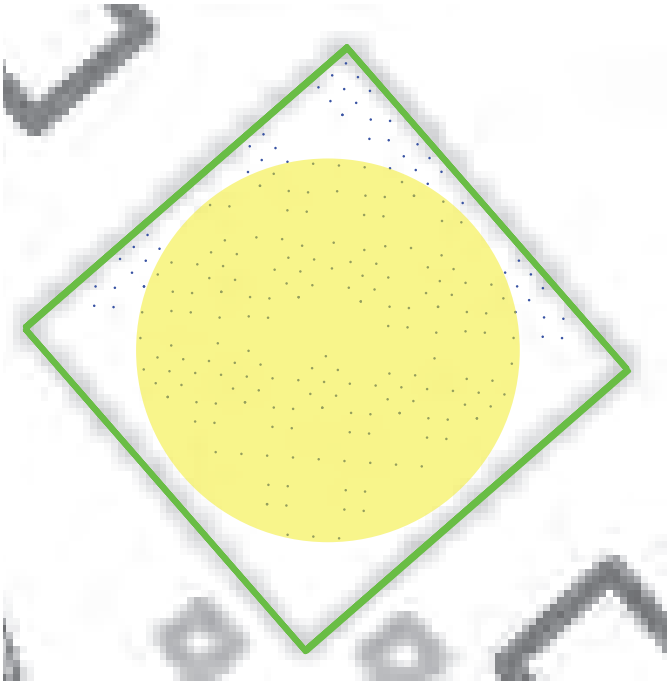
trees

- Prunus avium
- Corylus avellana
- Malus domestica 'Elstar'
- Malus domestica 'Alkmene'

ground cover

- Pachysandra terminalis





Droevendaalsesteeg
2360

To create enclosure outdoor 'rooms' are part of the pattern. These are covered structures to be used as permanent setting for activities and even for classrooms. They could become landmarks. According to weather conditions these structures could be partially opened. Here diverse equipment for outdoor activities can be stored and borrowed by students or staff with their student/staff card as guarantee (idea discussed during the healthy campus workshop).

At human scale everything is not as neutral as it looks on the plan. People have favourite places to meet and stay outside. These choices are shaped by proximity to building entrance, exposition, weather conditions, degree of people using it, etc. Same for this proposal, some places will be loved, others will not be used. These both entail a process of erosion. With the proposed first layout, people can interact (bridge, link several sub divisions of the ground plane. They can showcase in the retention basins, make experiments, relax and lean on it (informal sitting: hugelkuture, gabillons and sitting: benches). These sub-division does not work as a limit, it is open and it can be blurred out or emphasized. Visiting this area one can interpret values as learning by doing or observing in natural context, food production and eating outdoor, studying indoor as well as outdoor.

This proposal is just a try, a literal translation meant as an experiment to be judged and critically analysed. It is a pattern with ordered and dispersed elements and has a soft and subtle implementation. There is diversity and dynamic in and around it, that can be measured against it: like an invisible drawing of well calculated proportions that is still readable in all the dynamic and liveliness.

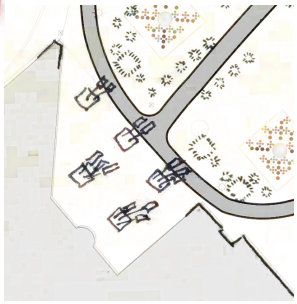
To sum up this design proposal allows ability to 'read' time at an experiential level also providing continuity of the building lines through the simple pattern that can accommodate a variety of elements, some repeating. Proximity, continuity and repetition all create unity (Lauer and Pentak, 2000) as ordered quality to be juxtaposed with variety of the lively vegetation and people, their individualities and playfulness. It is a statement like any land art and it is meant to change and even become erased.

Same principle was applied around Atlas and Orion, without detail working out. Materialization of the calculated proportions will consider the fact that Atlas does not need any drainage around the building and the fact that the square sizes for trees in the pattern are too small. In the case of Orion the

fast technology

12.6. TIME CHANGING INSTALLATION

only restriction to the pattern were the surrounding roads.
Artificially alert materials are introduced for the intensively used areas as building entrances, to bring in a new rhythm where nature rhythms are too slow or monotonous. Also, by contradicting a rhythm it can be brought back to awareness. At the east entrance to Forum that is mostly shaded, smart structures can light up dark, cold areas. Following, own presence could bring warmth to a cold place. The structure will be powered by the energy of people walking over the whole area at the entrance, it would be activated by touch responding through feedback as light. Thus, one brings light or warmth by his own presence. Similarly, smart material could be applied on the ramp to Atlas entrance that changes colour from dark to warm when pressure is applied. Again, human rhythm enlivens the 'natural' rhythm.



12.7. FUZZY WATER EDGE

The fuzzy water edge is meant for awareness of 'fundaments' of the existing situation, it is a place for introspection and restoring, observing, monitoring, feeling. Here the border between land and water, body and environment should temporarily be blurred out. This fuzzy water edge is still a 'static' object but the positioning makes it dynamic; contradicts expectations.

fig. 155)

The design decision of the 'fuzzy water edge' was inspired by a technique used to suggest movement in painting: **to separate elements which belong together**. In Cezanne's paintings, sometimes his colours pass beyond the object's boundary line, sometimes they do not reach it; sometimes his outline continues beyond the coloured area, at other times it does not encircle the colour completely. This technique 'merges figure and ground, asserts the freedom of the artist from convention, and **shows the object in a constant process of formation instead of a finished product**' (Gottlieb, 1958). Same effect can be seen in Picasso's 'Le **Demoiselles d'Avignon'** (fig. 155).

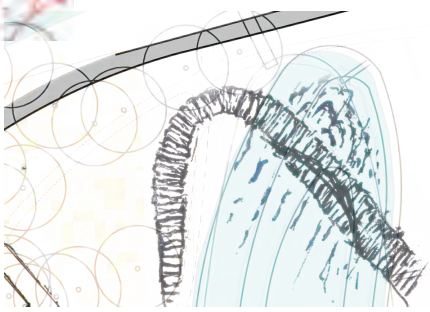
Lauer and Pentak (2000) talk about effects created by **instability of form and void** that lead lead the spectator to experience movement. From Gestalt psychology it is known that 'man is born with an urge for stability and symmetry. An observer is driven to balance all unequally distributed masses in his mind. For him a void in one side of the composition will function as a vacuum which attracts the solid from the other. Bodies in labile positions are forcibly stabilized and contortions rightened'.

The shape of the platform can be inspired by the design of the existing bridges (shape shows contraction and expansion/ tension and ease).

Finding oneself at the junction between land and water, but still occasionally observing the water pass beyond that platform creates a feeling of unfinished process and borderlessness. This is achieved using defamilianization, creating a tension between one's expectations of a platform linking the land and water and observing how water can overpass the 'border'.

Sitting at the water edge the background becomes the foreground of attention (in this case the dynamic and sensitivity of water captures one's attention). The indefinite positioning of the water edge creates a legato rhythm, that being diffuse distorts one's perception of time as directional (same as in dance). One fuses with the movement in the landscape. Here the interval manifests in space as well as in time. It is about duration of activities (the speed of people, the speed of wind, change in leaf colours, change of state of water, movement of birds...) or pause, all in a dialogue with the land.

slower / nature pa



13. POTENTIAL EXPERIENCE OF MOMENTS ALONG THE PATH

Movement in the world always involves a loss of place, but the gaining of a fragment of time (Tilley, 1994, p.27-28)

This section presents a study of potential experiences of moments along the path from the East entrance of Forum towards the central plane and back. The representation uses insights from Hall's *distances;* Lucas and Palipane *multisensory description; gesture drawing,* all through own interpretation.

Every moment is described in terms of location, time of the day, weather conditions, potentiality to touch, smell, taste, hear, to which I felt the need to add information on possible mood and body condition. Thus, action is presented in terms of gestures relating to inward and outward experience. The images incorporate these details and are also illustrating the design proposals and thus exemplifying application of the developed design language. These visualisations further refer to the rhythm and walking modes from the theoretical frame.

d time experience on WageningenUR campus

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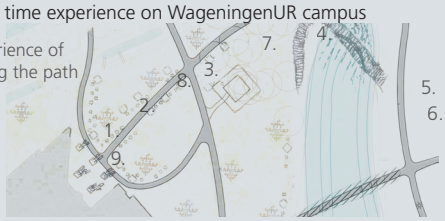
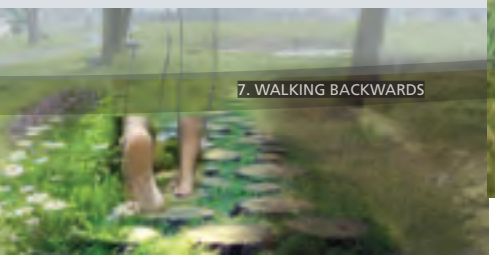
ng the path





1. EXPANSION OF VEGETATION

location: Forum East entrance
time of day: noon
weather: fog, bleak, no strong colours

mood: tense
body: low pulse, shallow breath
gesture: quick look - observe some growth of tree
posture: heavy
movement: staccato

social close
visual: soild
kinetic: growth, bound, empty, quick
aural: background noise

immediate experience - direct
predictable rhythm (event of flowering, fruit harvest, leaf change)

design proposal: Filed/ transition zone between Forum and outside landscape

'people orchard'

CONTRA
regular a

predictable,
continuous
growth of plants

SEMI-OPEN focus on
elements in immediacy

2. BREATH OF WATER

location: Forum East entrance

time of day: noon

weather: after rain, bleak, no strong colors

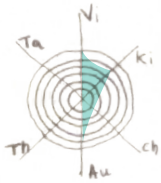
mood: looser

body: low pulse, shallow breath

gesture: surprise to see full ponds, observe sinking

posture: heavy but suddenly present

movement: steps



social close

visual: soild

kinetic: water movement, empty, bound, quick

aural: background noise

immediate experience - direct

ST between
nd irregular
rhythm

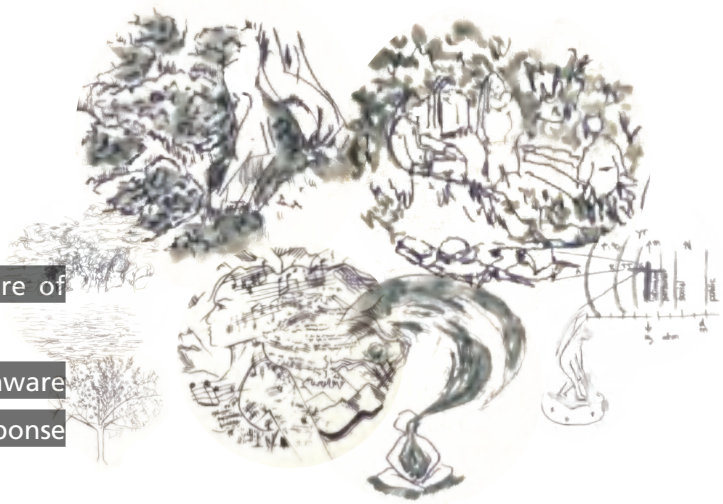
unpredictable
rain, yet
repetitive filling
and emptying of
the basins

3. PRESENCING

location: activity node at Forum east entrance

time of day: noon

weather: rays of sun



mood: livelier, playful

body: higher pulse, deeper, faster breaths

gesture: stretching out

posture: feel presence, body weight, aware of nature time

movement: balancing, making smaller, aware movements - finding ways to move in response to restrictions.

This path encourages playfulness and makes one forget clock time and aware of time experience.

intimate

visual: intimate, detailed

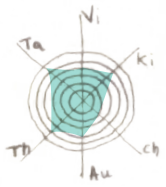
kinetic: free vs bound

chemical: fresh, musky

aural: vocal, natural

thermal: wet, natural, ambient

tactile: mobile, rough/smooth, light/heavy, hard/soft



CONTRAST betwe

intermittent movements

ENCLOSED, focus on elements in immediacy

en

stillness of
the body

4. DIFFUSION

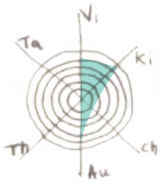
location: pond edge
time of day: noon
weather: sun moving out and in of clouds, flickering light

mood: expansion
body: deep breaths, slow, straight
gesture: pause
posture: centred

movement: immersion, lose focus of linearity (attention inwards)

feel not understand, bring memory into present moment
feel dynamic everywhere (polyrhythm)
liquefying

public far
visual: vast
kinetic: free
aural: reverberant



vast, flow

design proposal: fuzzy water edge

Positioning at water edge

The edge between water and land, walking on ground or walking over water become fuzzy. One finds himself lying over the up-and down pulse of the water level, the expansion of water towards land and it's retreat; the back and forth movement of people over this structure and their vibration, while his own body is breathing in and out, blood pressure going high and low. Both the body and this structure are more like membranes with no clear start and end point, than borders drawn by clear lines.

OPEN, focus on ground level

5. BOUNDLESS

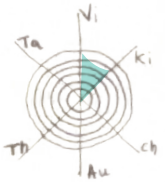
location: central lawn
time of day: noon

mood: relaxed
body: deep breaths, expanded
gesture: stillness, immersion
posture: centred, aware of moment

movement: slow, focus on distance, timeless

public far
visual: vast, void, staurated, texture
kinetic: free, empty

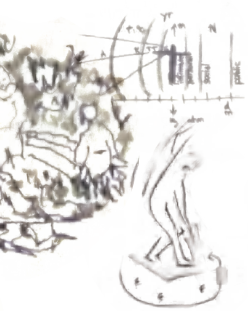
vast, flow



SHIFT

outside-in to

OPEN, focus on horizon



6. SHIFT IN-OUT

location: central lawn
time of day: noon

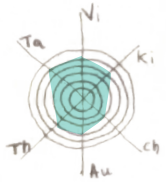
mood: relaxed
body: deep breaths, expanded
gesture: reach
posture: centred, aware of moment
movement: feel what is in immediate distance, step carefully

mix of present and abesnt, potentiality
- choose ways to 'occupy space' create time

from

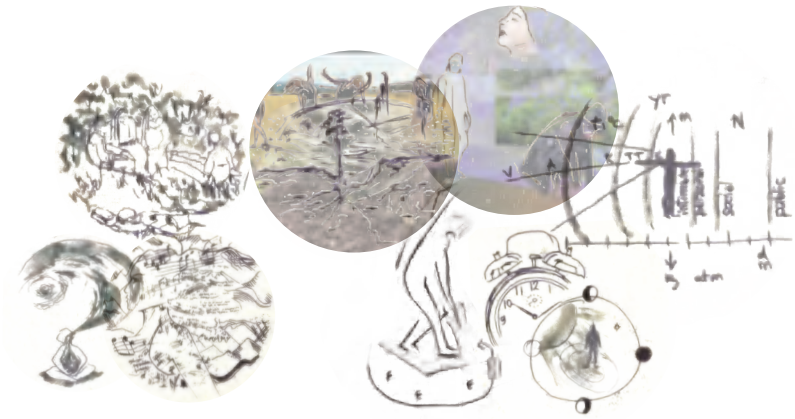
inside out

intimate -> public far
visual: void
kinetic: free, empty
chemical: weak
aural: natural
thermal: ambient
tactile: rough/ soft



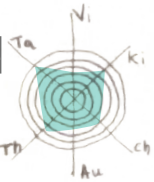
7. WALKING BACKWARDS challenging habitual pattern

location: rich nature
time of day: noon
weather: changing



mood: calm
body: deep breaths, expanded
gesture: balance
posture: centered
movement: slow, careful movement
focus on material, distance, ground
more careful next time

intimate -> social close
visual: detail
kinetic: strong, bound
chemical: intense
aural: reverberant
thermal: natural, radiant
tactile: smooth/rough, porous/resistant, static/mobile

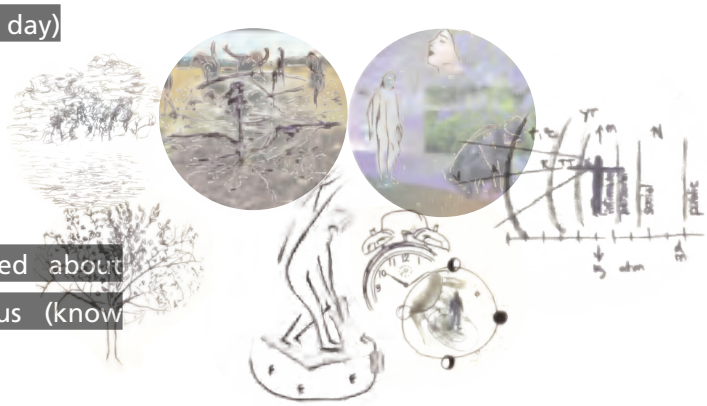


SINGULAR
rhythm

8. IMPROVISATION

location: retention basins
time of day: after noon (different day)
weather: changing

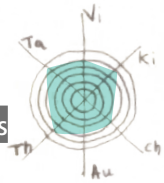
mood: relaxed
body: deep breaths
gesture: pausing being intrigued about potential activities; aware focus (know where to look)
posture: soft, relaxed



SINGULAR rhythm

CONTRAST between open ended and pre-defined feedback

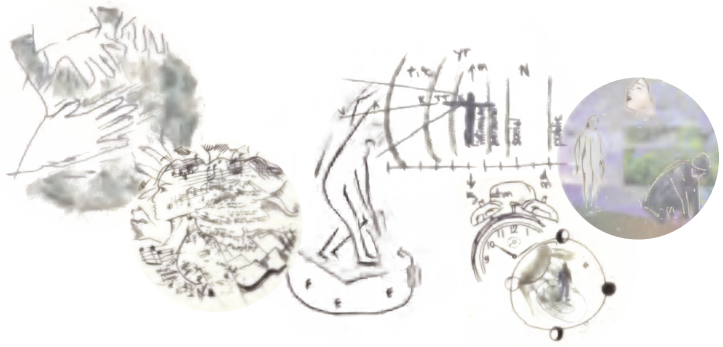
intimate -> social close
visual: detail
kinetic: graded
chemical: smell of grass
thermal: ambient
aural: loud
tactile: soft grass/ hard earth



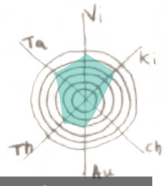
design proposal: Filed/ transition zone between Forum and outside landscape

9. SURPRISE

location: Forum entrance
time of day: after noon
weather: shadow, cold
mood: joyful
body: strong pulse, excited
gesture: touch, step confidently
posture: relaxed
movement: flow, play with installation
empowering and fun



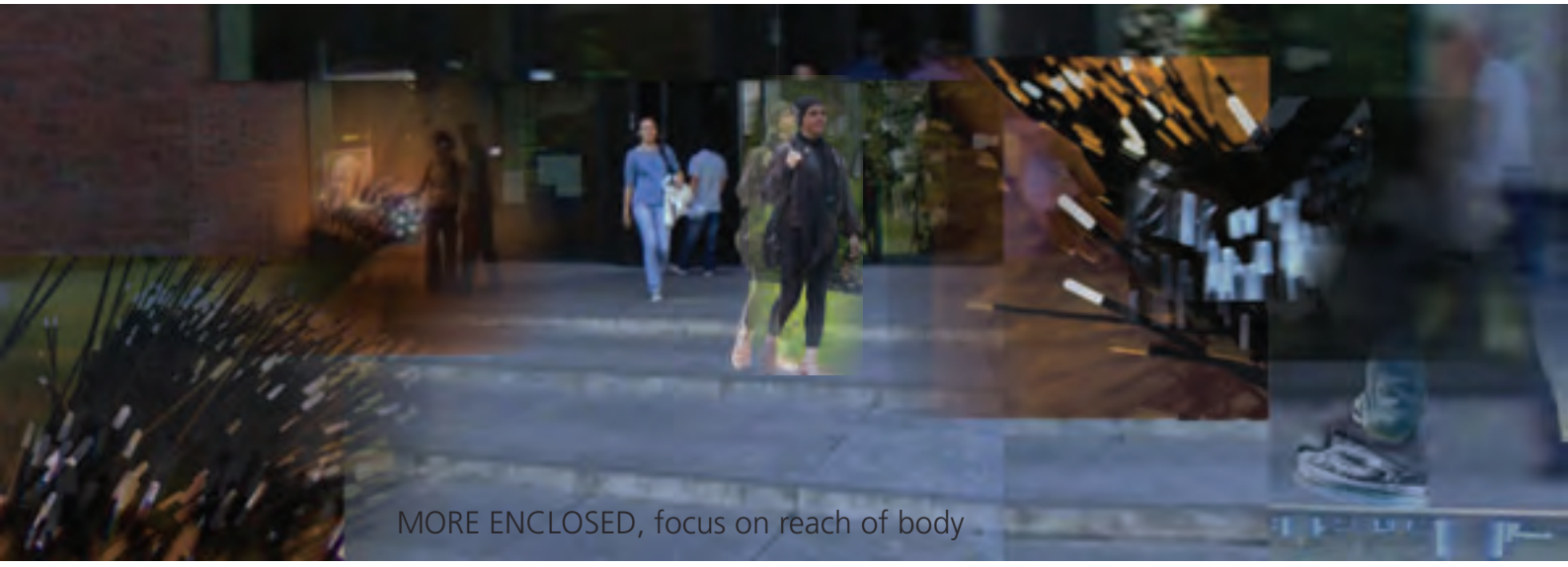
intimate -> social close
visual: bright vs. dark
aural: loud
kinetic: direct
thermal: light gives impression of warmth
tactile: artificial



design proposal: Filed/ transition zone between Forum and outside landscape
Time changing installation

CONTRAST between open ended and pre-defined feedback

SINGULAR rhythm



REFERENCES

Lauer, D. A. and S. Pentak (2000). *Design Basics,* Harcourt Brace Collage.

Salingaros, N. A. and B. J. West (1999). "A universal rule for the distribution of sizes." Environment and Planning B 26: 909-924.

Tilley, C. Y. (1994). *A phenomenology of landscape: places, paths, and monuments*, Berg Oxford.

CHAPTER V.

CONCLUSIONS AND DISCUSSION

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ANNEX 170

14. CONCLUSIONS

Time landscape integrates impermanence and life cycle awareness, both cultural and natural rhythms expressing aesthetics and creativity. A 'timescape perspective confronts industrial and natural temporalities as interactive and mutually constituting forces and shows the fact that each in/action counts and is non-retractable. It encourages thus a more aware, sensitive, cautious, precautionary and sustainable re/action' (Adam, 1998, p.43). Following, it enables us to integrate "scientific and everyday knowledge, and the constitutive cultural Self with the workings of nature. (ibid, p.53)

This thesis work generates new insights for landscape architecture design: using qualitative knowledge, strategies and design language are formulated to make tacit knowledge explicit and procedural and find new creative design proposals.

14.1. ANSWERING THE RESEARCH QUESTIONS

1. **What is the relation between understanding of time and approach to nature and own nature?**

Answered with the first statement: Understanding of time is important.
Change in time interpretation changes design behaviour.

2. **What representation is there and appropriate for design with time awareness?**

Answered with the second statement: Embodied time does not follow clock time.
With time focus, spatial differentiation is ambiguous. Embodied time experience ignores line differentiation (discussion with prof. dr. Koh). Thus, time awareness can be better represented and studied through pattern language of place instead of form language of object. This design research shows exploration of diverse representation ideas and graphics related to time which influenced the design outcome.

Table. What I contribute with: Language and application for time aware design at WageningenUR

Goals	What problem?	What issue?	What design strategy?	Research through designing method
Comfort/orientation	design as treating objects	strategic allocation	Framing change	model, picture comparison, layering
Awareness and stimuli for action	distanced experience	inside-outside /edge	Experiencing material pattern	picture comparison
Fertility/ options for action	lack of the three walking types	in-out of body	Enabling diverse patterns of movement and activity	video, picture comparison, layering

3. How can experience and perception of time be supported by design?

Answered with the third statement: Time awareness can be framed for design
Vivid time experience can be enabled using the proposed design language: with proper representation technique (dynamic, interactive, multisensory) and with a corresponding aesthetic intention (vivid, feel connected, alive) relating to rhythms and pace of movement. It requires 'living landscape', responsive, interactive and 'adaptive/open design'.

4. What is the outcome of design with time awareness?

Answered with the fourth statement: Design with time awareness leads to 'engaging aesthetics'.
Such a design changes time; it's not only changed by time. Time aware design creates a richer, healthier and more harmonious environment.

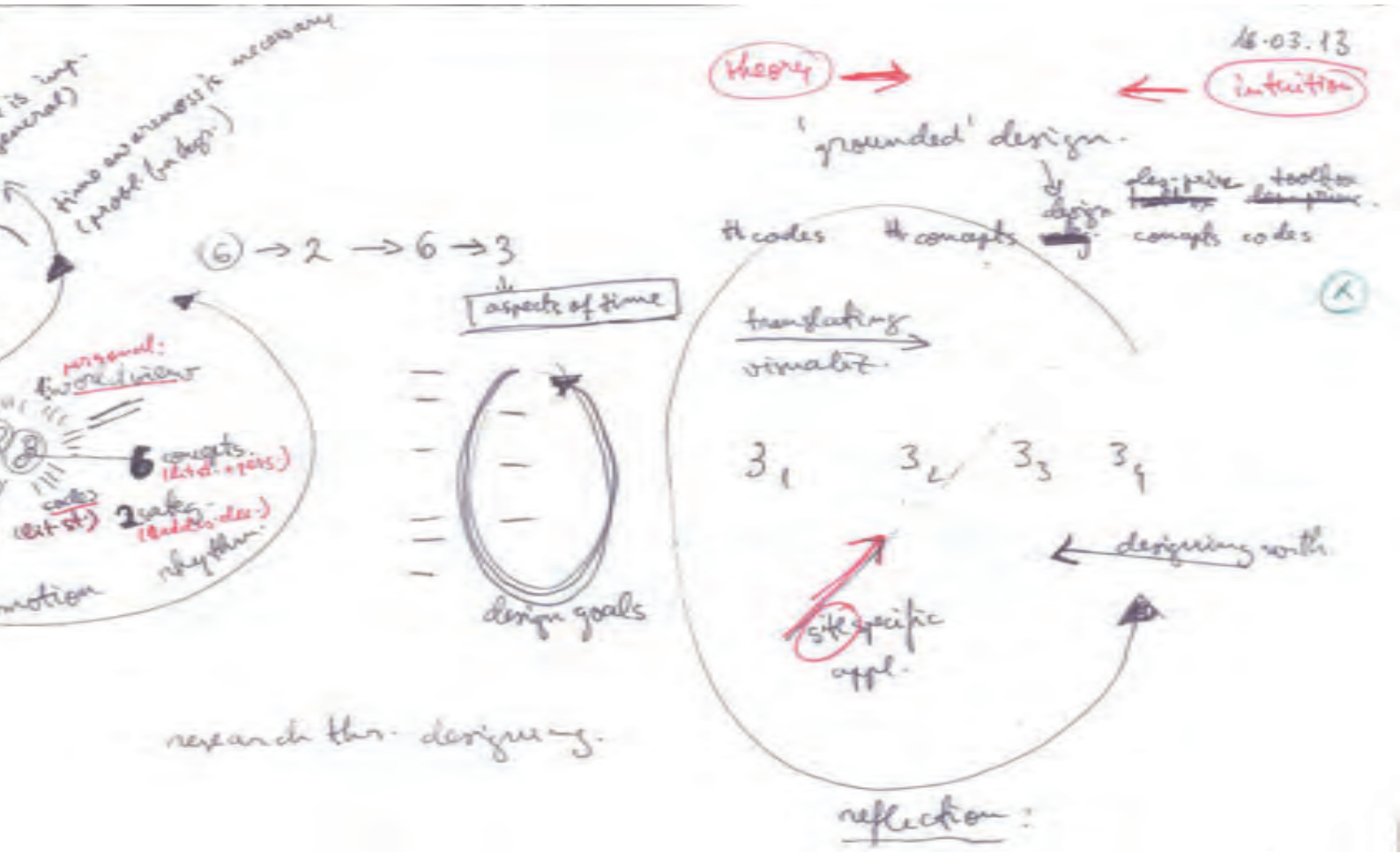
Table Design language and time design proposals

Design strategies	Framing change			Experiencing material pattern			Enabling diverse patterns of movement and activity		
Design language	Interval	Positioning in force field	Balance change and continuity	Enhancing natural rhythms	Degree of time sensitivity	Contradicting existing rhythms	Time affordance of land	Emotion - circadian rhythm - space rhythm	Human reach
Time design proposal									
Pedestrian path on Droevendaalsesteeg					**breathing ground**				rich interface with nature x
Hugelkultur as rich edge/interface				x					rich interface with nature
Filed/ transition zone between Forum and outside landscape	x		assuring **diversity of activity settings**	'people orchard'	**breathing ground**		stable and flexible/temporary activity settings	erosion of spatial layout	rich interface with nature
Time changing art wok						artificially alert material x			
Fuzzy water edge		x							
Experience path							x	x	x

14.2. OWN PROCESS

5. **What research and design process did I follow to answer these questions?**

Time
Time
Time


16.03.13
theory
intuition
'grounded' design.
design
descriptive
toolbox
concepts codes
codes
concepts
(6) → 2 → 6 → 3
aspects of time
translating
visualiz.
3₁ 3₂ 3₃ 3₄
designing with
site specific
appl.
design goals
research thr. designing.
reflection:
movement:
6 concepts
2 codes
rhythm
motion

15. EVALUATION

As Steadman says, "fundamental questions of design can be illuminated not by any attempt to make the process of designing 'scientific', but rather by subjecting the products of design to scientific study" (Steadman, 1979, p. 2 in (Filor 1994) p.123

Table Own evaluation of design proposals

Design proposals	iconic	poetic	practical/ sustainable
Pedestrian path on Droevendaalsesteeg		x	x
Hugelkultur as rich edge/interface		x	x
Filed/ transition zone between Forum and outside landscape	x	x	x
Time changing art wok	x	x	x
Fuzzy water edge		x	x

This thesis is a qualitative study, not about measuring, not objectifiable, impossible to fit in a scientific formula. Precision and repeatability is lost. That is compensated by profound and imaginative outcome. It is based on **explorative, abductive reasoning**. As representation model it is about accepting complexity and not about simplifying and narrowing down. The current work **provides language** to change the way people think and encourage designers to come up with own ideas.

I would add to these points the importance of seeking agreement among co-researchers, experts, and fellow students and peer examination; as, 'the personal, subjective vision must prove its worth against technical and cultural criteria before it can be accepted as a sensible solution to the problem set' (Filor, 1994, p.129). On the criteria of *accuracy and feasibility*, almost every specialist I have discussed with on different topics each suggested me a specific software for simulating/calculating/modelling (whether GIS, calculating thermal comfort related to situation before and after design, water retention capacity and water detention time before and after…). It was a relief to know that we can calculate this, but I decided it is outside my scope to learn all these software and use it for verifying my design. For me a discussion on principles and reasonability of my proposal was enough to make me carry on and look for graphics and evaluation in my reach.

For *credibility* criteria I provide a transparent documentation of the whole process that lead to the result of this thesis. This allows understanding of how and why decisions were made and leaves openness to discussion.

To minimizes distortion from a single data source or from a biased researcher I used triangulation of data methods (so that weaknesses of one method of data collection are compensated by the use of alternative data-gathering methods) and triangulation of data sources (Krefting, 1991).

Miles and Huberman identified four characteristics that are necessary to assess the ***trustworthiness*** of the human instrument (Krefting, 1991):

(a) the degree of familiarity with the phenomenon and the setting under study, (explained in the section 'Role of the researcher (page 23)

(b) a strong interest in conceptual or theoretical knowledge and the ability to conceptualize large amounts of qualitative data, (chapter on grounded theory, page 21)

(c) the ability to take a multidisciplinary approach, that is, to look at the subject under investigation from a number of different theoretical perspectives (chapter on grounded theory, page 21) , and

(d) good investigative skills, which are developed through literature review, course work, and experience in qualitative research methods.

Such trustworthiness is important at establishing confidence in findings (Golafshani, 2003). In chapter III, I reflected on the effectiveness of the techniques that have been employed.

16. DISCUSSION

This research proposes a shift in focus for landscape architecture design. Time is positioned at the forefront and expressed in terms of emotion, force, vibration, movement rather than form. Furthermore, it brings together three sources that are key in sensitive and enduring landscape architecture design: Unified Field Theory, Representation, Phenomenology. The language developed is relevant and applicable. As for the design solutions, these could be further elaborated and improved.

It was difficult to separate the three rhythms and walking types and the according language elements; when talking about time everything is intertwined and interdependent. It is a challenge to address such a complex and broad concept. Still, one needs to accept that (no reason to get discouraged) and work with it; Talking about time one is more connected, aware.

It was easier to design for the first two design strategies as decisions about spatial layout and material choice are more predictable and controllable. The strategies for 'enabling diverse patterns of movement and activity' are rather unpredictable and very much depending on users and other environmental factors. Still, it is essential to consider these as well.

I wish I could elaborate more on ecological processes, material-force (time-conscious policy of material flow), multisensory analysis and rhythmanalysis. For this, the 'cost' (in terms of living quality as well as money wise) of not paying attention to time could be studied. In relation to affordance of land and circadian rhythms, an elaborated study could be carried out on weather extremes on campus and thermal comfort (considering: forces, emotion , movement, speed/duration). Also, there is no closer study to connection to city and campus in terms of activities and time perception.

A very important aspect that has not been included here is the study of how time is perceived by users of the campus – as static, as running fast, as monotonous. This could give ideas on how to balance or improve the main perception.

Unfortunately, I could not incorporate in this work all the contributions of the professionals I met and discussed with on this topic, but they did widen my perspective on the implications of the study and potential expansion.

REFERENCES

Adam, B. (1998). *Timescapes of modernity : the environment and invisible hazards*,Routledge.

Filor, S. W. (1994). "The nature of landscape design and design process." Landscape and Urban Planning 30(3): 121-129.

Golafshani, N. (2003). "Understanding reliability and validity in qualitative research." The qualitative report 8(4): 597-607.

Krefting, L. (1991). "Rigor in qualitative research: The assessment of trustworthiness." The American journal of occupational therapy 45(3): 214-222.

Pallasmaa, J. (2009). The *thinking hand: existential and embodied wisdom in architecture*, Wiley.

ANNEX

A1. EXAMPLES OF CAMPUS PROJECTS

Shenyang Architectural University Campus
From: http://www.turenscape.com/english/projects/project.php?id=324
Project Location: Shenyang City, Liaoning Province, China
Date of Design: January ,2003-Semptember ,2003
Owner/Client: Shenyang Architectural University

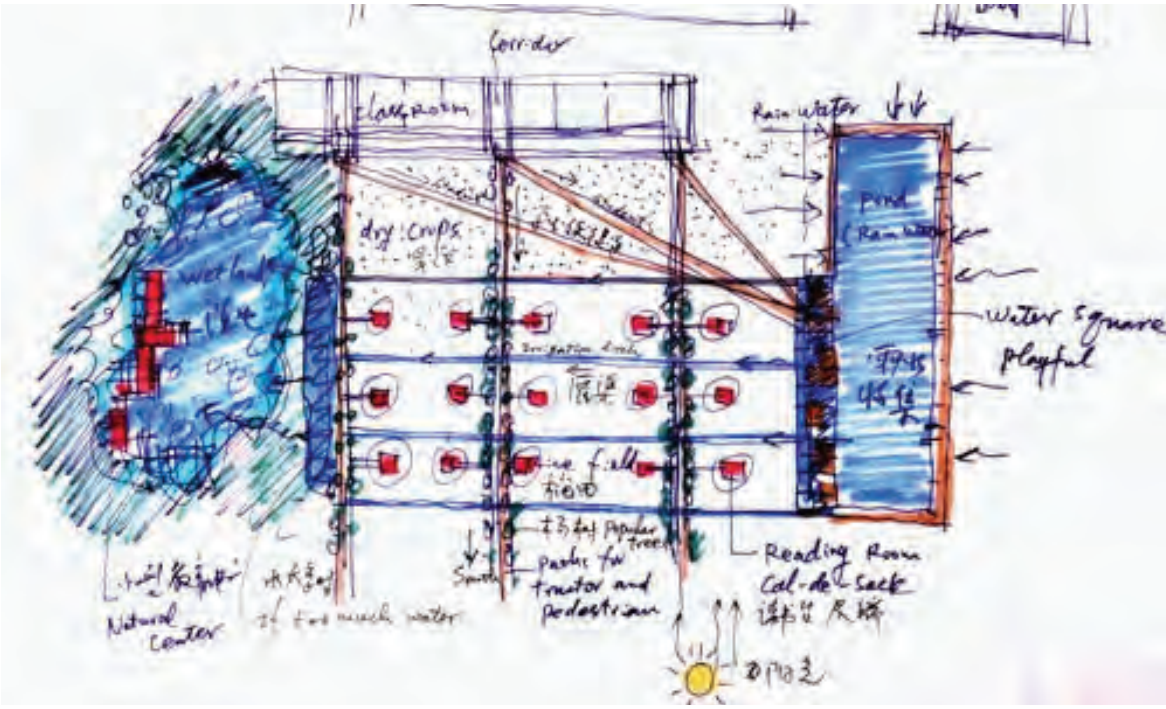
Project Statement
This project demonstrates how agricultural landscape can become part of the urbanized environment and how cultural identity can be created through an ordinary productive landscape.

The concept
Landscape architects working in China must address issues of food production and sustainable land use.

The concept of this design seeks to use rice, native plants and crops to keep the landscape productive while also fulfilling its new role as an environment for learning.
It is designed to raise awareness of land and farming amongst college students who are leaving the land to become city dwellers. In addition, the designer also seeks to demonstrate how inexpensive and productive agricultural landscape can become, through careful design and management, usable space as well.

The major features
(1)The productive campus rice paddy
(2)Other native crops, such as buckwheat grow in rotation across the campus, annually. Native plants line pathways.
(3) The productive aspect of the landscape draws both students and faculty into the dialogue of sustainable development and food production. The farming processes can potentially become a laboratory for students and the faculty as well.
(4)Golden Rice became an university icon: […] the widespread distribution of "Golden Rice" could raise awareness of new hybrid landscape solutions that could both continue old, yet crucial uses such as food production, while supporting new uses, such as the education of China's new architects.

Time aspect: Learning in a living, productive landscape raises awareness of nature time and specific cultural rhythms (combining professional knowledge with knowledge about cultural heritage).


Corridor
Classroom
Rain water
dry crops
wetland
Pond
Water square
playful
Reading Room
Cul-de-sac
Natural Center
Popular trees
paths for tractor and pedestrian

Alnarp

source: Anders Bussen presentation at Drawing time workshop
Alnarp can be compared to an oasis in the middle of the open arable landscape between Malmö and Lund, close to Lomma, Åkarp and Arlöv. Alnarp is not only a campus, it has a landscape laboratory, a gardening laboratory, a rehabilitation garden whose area is fenced and several research buildings including greenhouses.

Alnarp landscape laboratory

- 17,5 ha in size
- 68 forest stand interior types
- 143 tree and shrub species
- 2 ha flower meadows
- 1 km spring with 3 ponds

As part of the landscape architecture study, students learn to assess vegetation state and propose management principles

TU/e Science Park

source:http://www.tue.nl/uploads/media/2012.06.01_Masterplan_DEF_web_standard.pdf

Initially planned at the periphery of Eindhoven, now it is in the middle of the city: a 'inner city' campus with 'outer city' qualities. From a originally inward oriented, monofunctional place, it now strives towards becoming a science park where education, knowledge institutes, living and business can intermingle.

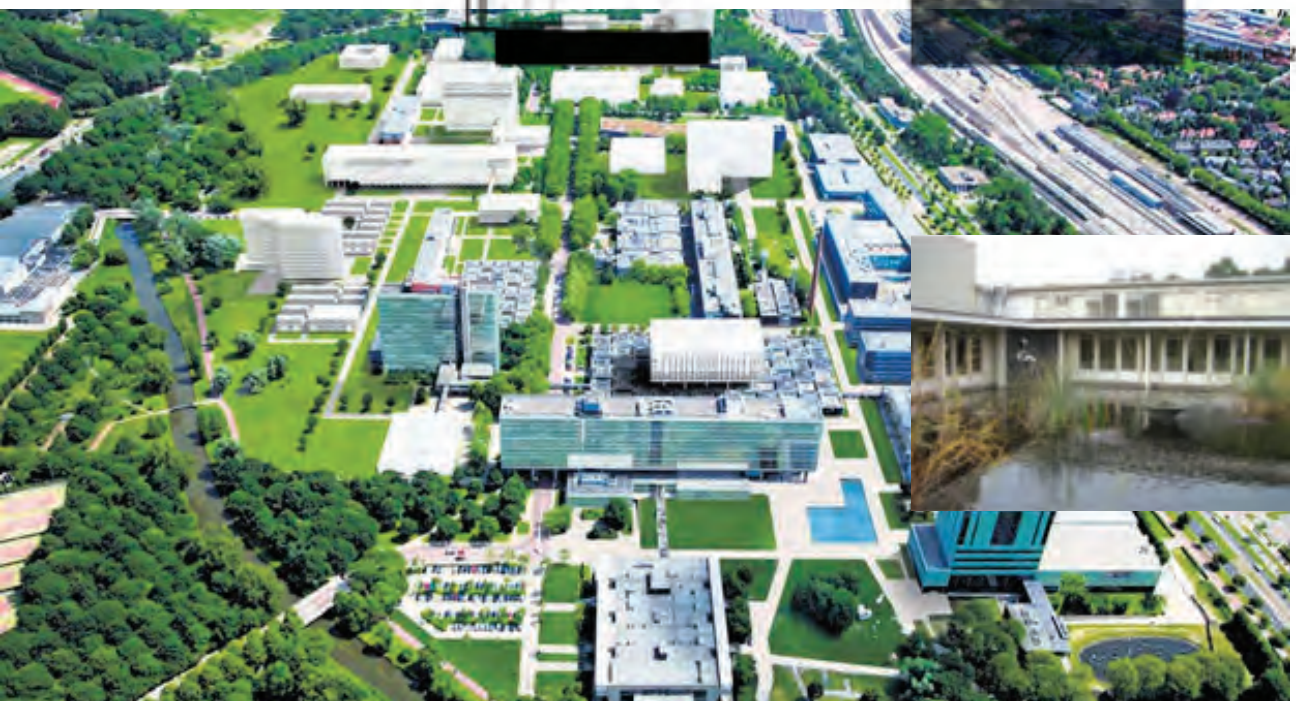
In the new development plans, special care is given to diversity of activity spaces, quality of planting and interface between building and outdoor.

Auditorium, Het Kranenveld

W-hoog, De Wielen

W-laag, De Zaale

Tapijn, De Zaale



Tu Delft

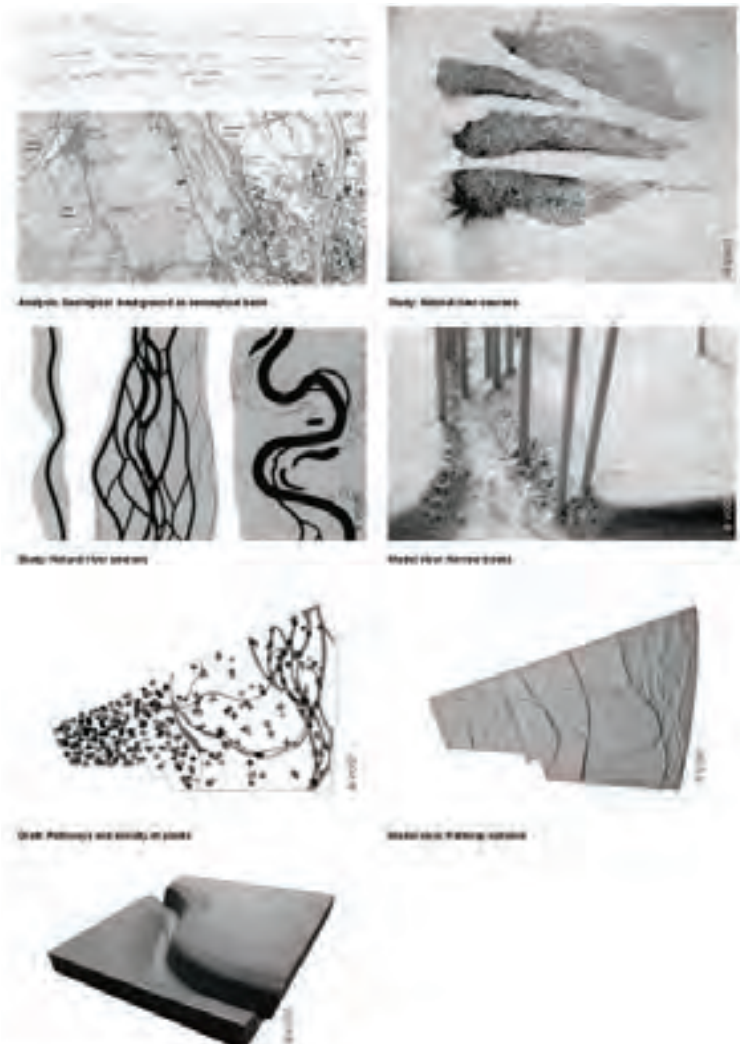
At Tu Delft the roof of the library building creates a living plane (fig.). The change of the linear parking lots into a green strip through the campus created a link and amenity place to gather. It resembles the 'green mall' typical for American campus design.

sources: bing maps, internet

In the two examples of Vogt Landscahaftsarchitekten projects time of the land is depicted in abstracted and artificial constructs. These are reinterpretations of former landscapes specific to the place and inspired by nature phenomena.

Novartis Campus Park, Basel
Client: Novartis Pharma AG, Basel
Period: 2006–2008
source: http://www.vogt-la.com/en/project/novartis-campus-park

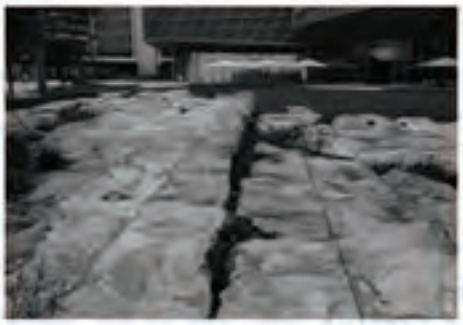
Two hectares of poured concrete, like a new, anthropogenic, geological crust, provide the fundament for a new park landscape and at the same time make it a large scale green roof. The design for novartis Park traces the landscape of Upper Rhine Valley as a composition of the Valley's geomorphic and vegetative phenomena. Slightly falling from the upper terraces down to the Rhine, the park sequentially reconstructs the natural phenomena of the surrounding Rhine terraces on a small scale and merges them by means of design into an atmospheric park landscape. Not only geologically but also botanically it refers to the surroundings, working mainly with the potential natural vegetation. It is a highly artificial construct that spreads out on the roof of the subterranean architectural world between the upper Terraces and the River Rhine: The campus park as a natural theatre.



The Green, Novartis Campus, Basel
Geological Mimesis
source:http://www.vogt-la.com/en/project/green-novartis-campus
Client: Novartis Pharma AG, Basel
Masterplan: Vittorio Magnago Lampugnani, Milan
Architecture: Frank O. Gehry, Los Angeles
Art: Laurie Anderson, New York
Work stages: All work stages
Period: 2006–2010
Area: 6'000 m²

Karst landscape
The exterior design of the Green abstracts the distinctive elements of this form of landscape and reinterprets them in the context and the dimensions of the urban environment.

While the herb layer consists of domestic plants, the shrub layer is planted with garden-plants one would not find in karst. High Ash trees surround the Green, an irritation for the eye used to karst: even though ash trees are typical for this landscape, their growth is sparse there. These subtle irritations within the Green make clear that the natural landscape karst and the Novartis square are not connected by mimicry, but by a geological mimesis: Similar structures have emerged for different reasons and from a different background: Here naturally, there artificially, but inspired by the natural landscape.



A2. DETAIL ON IMPLEMENTATION WATER RETENTION PONDS

From the website:
http://www.susdrain.org/delivering-suds/using-suds/suds-components/infiltration/infiltration-basin.html

An infiltration basin (figure 1) is a dry basin or depression designed to promote infiltration of surface water runoff into the ground. Plants in an infiltration basin should be able to withstand periods of ponding and dry periods and, ideally, maintain or enhance the pore space in the underlying soils via deep rooting systems.

Advantages

Reduces the volume of runoff from a drainage area

Can be very effective at pollutant removal via filtering through the soils

Contributes to groundwater recharge and baseflow augmentation

Simple and cost-effective to construct

Changes in performance easy to observe.

Disadvantages

Potentially high failure rates due to improper siting, poor design and lack of maintenance, especially if appropriate pre-treatment is not incorporated

Comprehensive geotechnical investigations required to confirm suitability for infiltration

Not appropriate for draining pollution hotspots where high pollution concentrations are possible

Requires a large, flat area.

Where component can be used
Residential: Yes
Commercial/industrial: Yes

Performance
Peak flow reduction: Average
Volume reduction: Good
Water quality treatment: Good
Amenity potential: Good
Ecology potential: Good

Quantity
Infiltration techniques:
store runoff by allowing temporary and shallow ponding on the surface; enhance the natural ability of the soil to drain the water. They do this by providing a large surface area in contact with the surrounding soil, through which the water can pass.
The amount of water that can be disposed of by an infiltration basin within a specified time depends mainly on the infiltration potential of the surrounding soil. The size of the device and the bulk density of any fill material will govern storage capacity.

Quality
Runoff is treated in different ways in an infiltration basin. These include:
physical filtration to remove solids
adsorption onto the material in the surrounding soil
biochemical reactions involving micro-organisms growing on the fill or in the soil.
The level of treatment depends on the size of the media and the length of the flow path through the system, which controls the time it takes the runoff to pass into the surrounding soil. Pre-treatment may be required before polluted runoff is allowed into an infiltration basin.

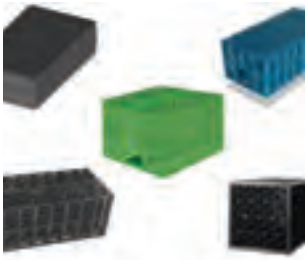
Amenity
Infiltration basins are easy to integrate into a site. They are ideal for use as playing fields, recreational areas or public open space. Infiltration basins can be planted with trees, shrubs and other plants, improving their visual appearance and providing habitats for wildlife. They increase soil moisture content and help to recharge groundwater, thereby mitigating problems of low river flows.

Maintenance
Regular inspections for signs of deterioration in performance, clogging and other blockages
Litter/trash removal
Inlet/outlet cleaning
Vegetation management
Regular removal of sediment from pre-treatment.

General information:
http://www.susdrain.org/delivering-suds/using-suds/sudscomponents/infiltration/infiltration.html

About retention/ detention:
http://www.susdrain.org/delivering-suds/using-suds/suds-components/retention_and_detention/Retention-detention.html
There are software to calculate amount of water retention - needed according to amount of impermeable surface.

There is also an option to insert plastic crates – state of the art system – called the Qbic system from Wavin. (meeting with Jan-Willem de Jong).
Advantage: more control and efficiency
Disadvantage: needs to be cleaned every 12 years?
- the system with crates takes 12 hours max for the water to drain . this can be simulated and calculated
http://www.general-files.org/download/gs496477ffh32i0/Wavin_QBic_Leaflet.pdf.html



For the design proposal around Forum building, due to the depth of the collection areas, the water does not have enough weight to drain and thus connecting drainage pipes are necessary (meeting with Jan-Willem de Jong). There are machines that install the piping which come in different shapes and sizes. Installing drainage pipes in the Netherlands is common.

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References for the figures:

Helsper, H. (1988). Campus planning and design in the United States. Denver, University of Colorado.

Lauer, D. A. and S. Pentak (2000). Design Basics Harcourt Brace Collage.

Lucas, R. (2007-2009). SENSORY NOTATION
multimodal representation of urban space. AHRC/EPSRC Designing for the 21st Century.

Lucas, R. and O. Romice (2008). "Representing sensory experience in urban design." Design Principles and Practices: An International Journal 2(4): 83-94.

Palipane, K. (2011). Towards a Sensory Production of Urban Space: Developing a Conceptual Framework of Inquiry based on Socio-sensory Perception. The struggle to belong Dealing with diversity in 21st century urban settings. Amsterdam 7-9 July 2011.

Schröder, T. (2002). Changes in scenery: contemporary landscape architecture in Europe, Springer.

Shepheard, P. F., Olin, L., Franklin, C. (1977). Landscape Development Plan: University of Pennsylvania, Center for Environmental Design, Graduate School of Fine Arts, University of Pennsylvania. .

Thwaites, K. and I. Simkins (2007). Experiential landscape : an approach to people, place and space. London [etc.], Routledge.

van Meggelen, B. and H. van Blerck (2008). Memory & transformation : 100 days of culture, gardens and landscapes. Rotterdam [etc.], NAi Publishers [etc.].

Weilacher, U. and F. Gloth (1999). Between landscape architecture and land art, Birkhäuser Berlin.