

MATTER OF TIME

MATTER OF TIME
Agnes Gidenstam

Master Thesis in Architecture and Urban Design
Matter Space Structure Studio
07 February 2017

Examiner: Morten Lund
Tutor: Kengo Skorick



CHALMERS
UNIVERSITY OF TECHNOLOGY

MATTER OF TIME

A Study of Transformation, Memory and Traces

Thank you,
Rickard and Naima.

INDEX

| | |
|---|--|
| 9 11-13 | ABSTRACT BACKGROUND |
| 15 | CHAPTER ONE PERCEIVING MOMENT |
| 16-17 18-19 20-21 22-23 24-31 | DISHU: GROUND CALLIGRAPHY SUBJECTIVE TIME THE SPECIOUS PRESENT TEMPORAL ILLUSION SALT INSTALLATION |
| 33 | CHAPTER TWO PERCEIVING SUCCESSION |
| 34-37 38-41 42-49 50-51 | KATSURA IMPERIAL VILLA THE SCREEN LAYERING EXPERIENCES MODEL EXPERIMENT |
| 53 | CHAPTER THREE TRANSFORMING MATTER |
| 54-55 56-59 60-65 | TRACES MEMORY WITHIN MATTER SALT BLOOMING |
| | CHAPTER FOUR TRANSFORMING STRUCTURE |
| 68-69 70-73 | DRAWING CHANGE CONTINUOUS COMPLETION |
| 74-75 78-79 | CONCLUSION BIBLIOGRAPHY |

INTRODUCTION

ABSTRACT

MATTER OF TIME

A Study of Transformation, Memory and Traces

9

The beauty of time is rarely a subject in contemporary architecture. The recently completed state of a building is the ideal state. That is what is being sold and that is what dominates publications and architectural discussion. A good project is a project that resists time, though however resilient, the passage of time will show sooner or later. In this project I explore the opposite of resistance; I investigate a design that is dependent on the passage of time in order to reveal its full potential.

I studied philosophical theory, neuroscientific research and architectural precedence in order to understand how the notion of time and spatial experience are interrelated.

Based on my findings I chose to direct my focus towards how to give a structure temporal qualities; qualities in a past, a present and a future.

This project consists of a series of investigations about a transforming architecture. Instead of trying to avoid the fact that time is passing this project aims to appreciate the moment.

If architecture is designed to evolve with time, every moment of a buildings life will be appreciable instead of just being a step further away from its perfect state.

Examiner: Morten Lund
Supervisor: Kengo Skorick

BACKGROUND

This project started with a desire to take a step out of the quick stream of information and images that is characteristic for modern communication. A stream of information where instant understanding and satisfaction is a must, if not, attention is lost. These premises applies to our society in general and it appear to me that they also dictate a large part of the architectural discussion. The high speed of our architectural consumption limits understanding and appreciation to two-dimensional fragments of built space. Architectural identity is communicated and sold with simplified concepts and diagrams and the physical reality that is represents adjust to its description. Juhani Pallasmaa argue that a hurried design is the result of a gradual quickening of time in modern architecture. He explains further that:

“This architectural hurry is expressed in two opposing ways: in the overwhelming number of motives on one hand, and the forced simplicity on buildings intended to impress us through one single simultaneous image on the other.”¹

It seem as if we try to separate architecture and time, and that we have done so for a while. In the 15th century Leon Battista Alberti stated in his publications the idealization of great buildings as perfect in the finalized drawings and models and that nothing should compromise the original design. Ultimately that:

“Nothing may be added, taken away or altered, but for the worse”-ever.

He manifested the immutability of a building as a measure of its perfection. In the mid 15th century this was a controversial teaching. Architecture and design followed a tradition where there was no clear line between design and construction. A comprehensive design did not exist at the beginning of construction any more than did the building itself, meaning that not even for the designer was the intentions of the design complete. Alberti rejected this method opening an unbridgeable chasm between designing and building.²

¹ Pallasmaa, Juhani. Inhabiting time. Architectural Design. John Wiley & Sons Ltd. UK. 2015. 54
² Trachtenberg Marvin. Building outside Time in Alberti's "De re aedificatoria". Anthropology and Aesthetics. 2005; 48:123-134

The heritage of Alberti is deeply embedded in our architectural culture; a culture where architecture is generally considered fulfilled before it has begun serving its purpose as a building.

The ideal of a perfectly static architecture is unrealistic. Time and unforeseen circumstances affecting a building can be fought but never fully defeated. Weather and tear will change finish and performance, need and societal change will transform program and use. The transformation and maturing of a building is part of its existence and time and matter are intertwined in the experience of a building.

This project is an exploration of the relation between notion of time and notion of space. An investigation of how space can be used to enhance our notion of time and how our understanding of time add to an architectural experience. When claiming things about such a complex matter the risk is that people agree, or disagree, without really understanding what was suggested. Therefore it has been very important for me to support my claims with an experiential aspect. If I can make people feel themselves the mechanisms of transformation and memory, I will not only be able to convince and invite people into my realm of thought but their experience will also prove or refute my claims.

PERCEIVING MOMENT

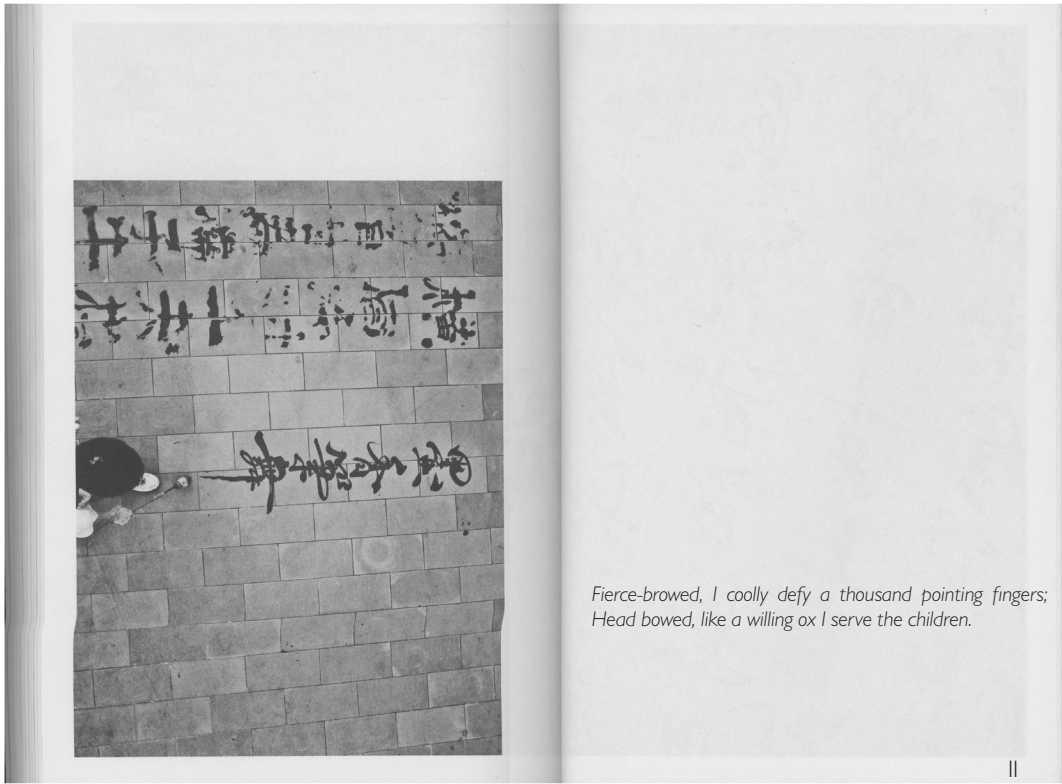
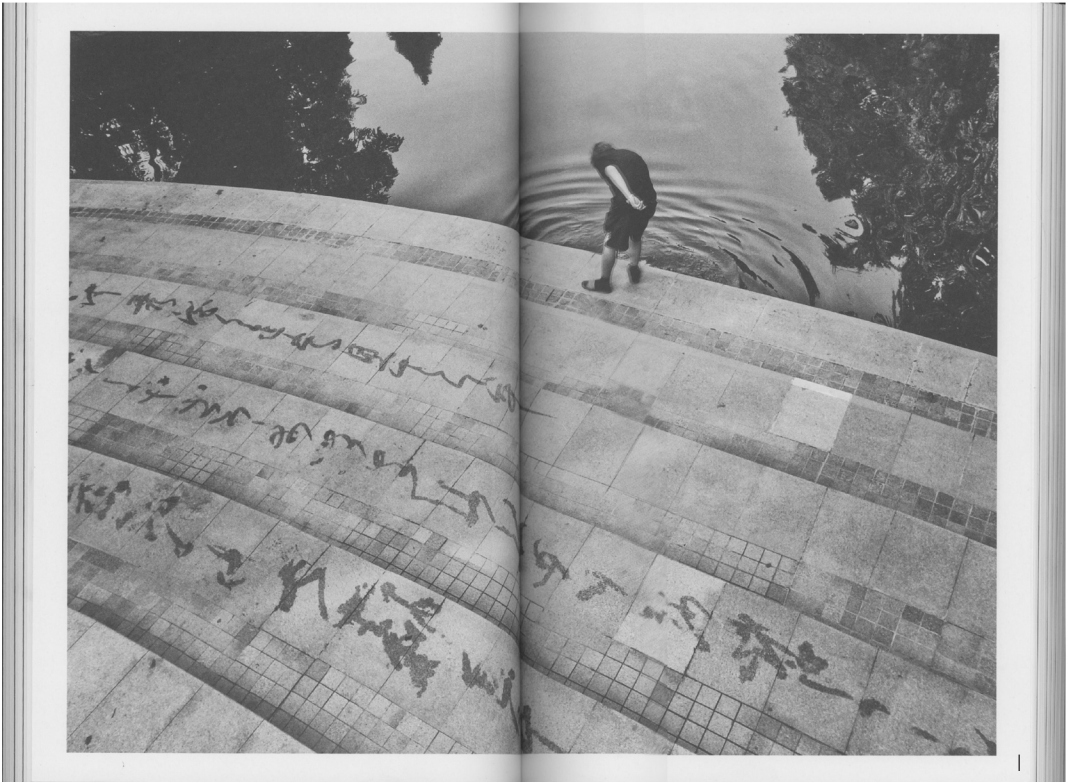
CHAPTER ONE

DISHU

Inspirational phenomena

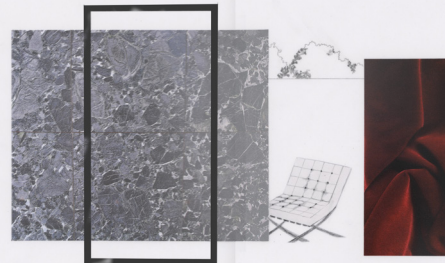
Two men draw ground calligraphy, Dishu, a common activity in streets and parks in China. Clear water is used as ink and when a sign is done it glares for a moment before it starts to evaporate and slowly disappear. Dishu is an ode to impermanence. The practice celebrates the here and now, and the laws of change.¹

¹ I, I, II Chastanet F. Dishu, Ground Calligraphy in China. Document Press. 2016. 11-18, 58, 157-158



Fierce-browed, I coolly defy a thousand pointing fingers;
Head bowed, like a willing ox I serve the children.

SUBJECTIVE TIME



Time and consciousness are interwoven on several levels. In our everyday lives it is natural to conclude that consciousness exist in time. It is just common sense to assume that our human existence is ruled by and flowing alongside time. But time can also be said to exist within the human consciousness which makes time a subjective experience.

If time is subjective can we then design how we experience it? Is it possible to slow down our notion of time with spatial features? Trying to answer this question I had to gain understanding of how we perceive temporal length. I looked towards philosophy and neuroscience and found theory about phenomena able to cause an extension of experienced time.

Suite of experiences on a distorted time line. A walk through the Barcelona Pavilion illustrated through event, experiential dignity and sequence.

THE SPECIOUS PRESENT

Research on philosophy

20

The prototype of all conceived time is the specious present, the short duration of which we are immediately and incessantly sensible. Saying that we can perceive time invites objection. If time is something different from events, we do not experience time as such, rather we experience time through changes or events occurring in time. But arguably we do not perceive only the events but also their temporal relation. Lets say that you watch a person outside a cafe on the other side of the street. This person takes a sip of coffee and then lights a cigarette for a smoke. These events are following one another, and it seems reasonable to say that we perceive them as a suite, but this is when it gets complicated. Perception is locked to the momentary state of now which causes a paradox in the notion of perceiving an event as occurring after another. How can we perceive a relation between the events without not simultaneously perceiving the events themselves? If we wanted to construe perceive narrowly, without taking in any element of

memory, we would have to say that we do not, after all perceive events as following one another, but then we would get no further, so what we have to do instead is to make a broader reading of perception.¹The term the specious present was introduced by psychologist E.R Clay but the best known characterization of it was due to William James 1842-1910.

"We are constantly aware of a certain duration - the specious present - varying from a few seconds to probably not more than a minute, and this duration (with its content perceived as having one part earlier and one part later) is the original intuition of time."

James suggests that the specious present is the duration of time itself, picked out as the object of a certain kind of experience. The specious present is a duration that is perceived both as present and as temporally extended. Still we need to remember that the objective present is duration-less, the ambiguity of the specious present

is that something extended, containing a sooner and a later part is experienced as present. An example of this is when we hear a phrase of music. The experience of a short phrase is that it is present, and yet - because it is a phrase rather than a single chord - we also hear notes as successive, and therefore as extending over an interval. Another example is the hand of a watch. A continuous flowing second-hand moves around the clock face, we do not register where the hand is at a certain point and compare it to where it was a moment ago. We register the flow of movement and it is present. That leads to the following argument:

What we perceive we perceive as present.
We perceive motion.
Motion occurs over an interval.

Processes going on in a state of change, are suggested to be perceived as successive or as events of pure motion and are therefore able to cause an extended sense of the present moment.

21

¹ Le Poidevin, R. The Experience and Perception of Time. The Stanford Encyclopedia of Philosophy Edward N. Zalta (ed.). 2015
URL = <<https://plato.stanford.edu/archives/sum2015/entries/time-experience/>>.

TEMPORAL ILLUSION

Research on neuroscience

Temporal illusions are a construction of the brain and has proven to be quite easy to manipulate.¹ Time perception appears to function through a collaboration of different neural mechanisms that normally work together but can by themselves cause a distortion in our notion of time. Duration distortions are often triggered by the properties of the current stimuli. Research made early last century show that motion can cause a temporal dilation where time is perceived as longer.² In research done in 1995 the effect of stimulus motion in relation to time perception was the subject once again. Various experiments were made where subjects got to look at objects in different constellations and motion. Each experiment where the subject observed motion he or she perceived time as extended.

These observations also provided information that led to the conclusion that the number of events is essential to the experience of duration. Each event or specific setting in a sequence is perceived with its own dignity and provides data for our brain. Based on how many different scenes our brain registers it estimates time. Though we should not ignore that movement is not the only factor for time perception, after all we are capable of estimating non-dynamic temporal experience. It appears that movement functions more as an intensifier to our primary notion of time. Also the magnitude of the stimulus has an impact on time duration. More, louder, brighter seem to have the ability to prolong time.³

1 Eagleman DM, Tse PU, Buonomano D, Janssen P, Nobre AC, Holcombe AO. Time and the brain: how subjective time relates to neural time. *J Neurosci*. 2005;25:10369–10371

2 Brown JF. Motion expands perceived time. On time perception in visual movement fields. *Psychologische Forschung*. 1931;14:233-248

3 Eagleman DM. Human time perception and its illusions. *Curr Opin Neurobiol*. 2008 Apr; 18(2): 131–136.

The predictability of an experience is another important aspect when it comes to dignity and length of a temporal interval. A sequence with a low grade of predictability is suggested to cause a subjective time extension.⁴ Motion, intensity, and predictability can cause a temporal illusion. With these tools it should be possible to emphasize time in a spatial experience.

4 Pariyadath V, Eagleman DM. The effect of predictability on subjective duration. *PLoS One*. 2007 Nov 28; 2(11):e1264.

SALT INSTALLATION

Full scale experiment

The Salt Installation is an experiment on whether or not it is possible to change our perception of time with spatial features. The idea is based on philosophical and neuroscientific theory about how movement affect our mind. It is also inspired by the temporality of Dishu, ground calligraphy.

In a sparsely lit room black boxes hang in the ceiling. Two perforated laths in the bottom of each box are aligned as I pull a string hanging from each box. Salt starts pouring out from the boxes, the white crystals reflect the dimmed light in the room and the dense white

rays look like a screen. The room is filled with the murmur of salt hitting the inclined surface of three pairing boxes on the floor.

The space generated is highly ephemeral in character. With a very basic understanding of physics it is clear that the boxes in the ceiling cannot contain salt in such amount that it will last forever. When hitting the boxes on the floor the salt slide down a slot that hides it from sight. This makes it hard to judge how much salt that has poured out. The movement itself is the only measurable entity. The three boxes run out of salt, simultaneously, after four minutes.







When the installation was over I asked people for an estimation of how long it lasted. Everyone that got the question guessed a duration longer than the actual four minutes.



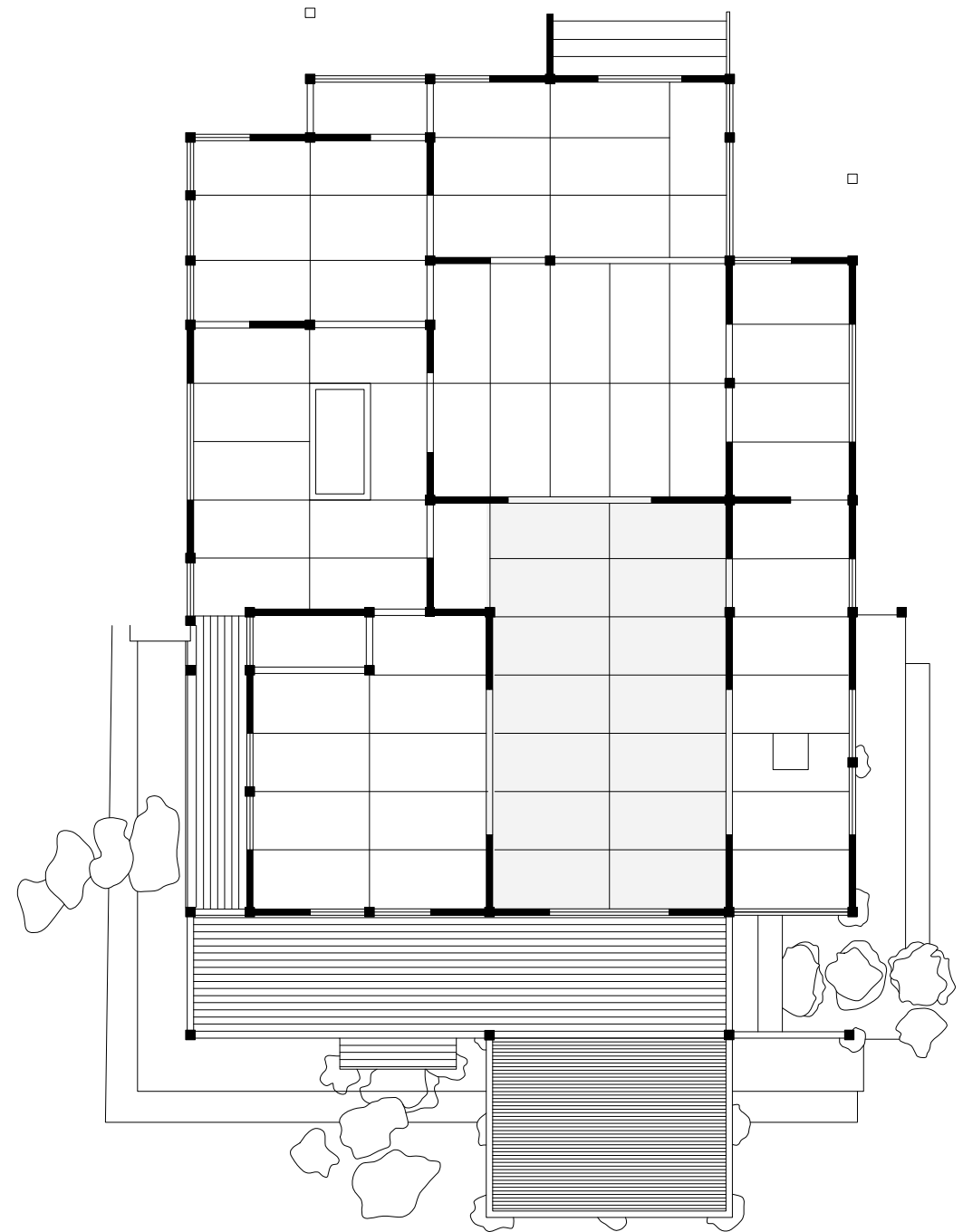
PERCEIVING SUCCESSION

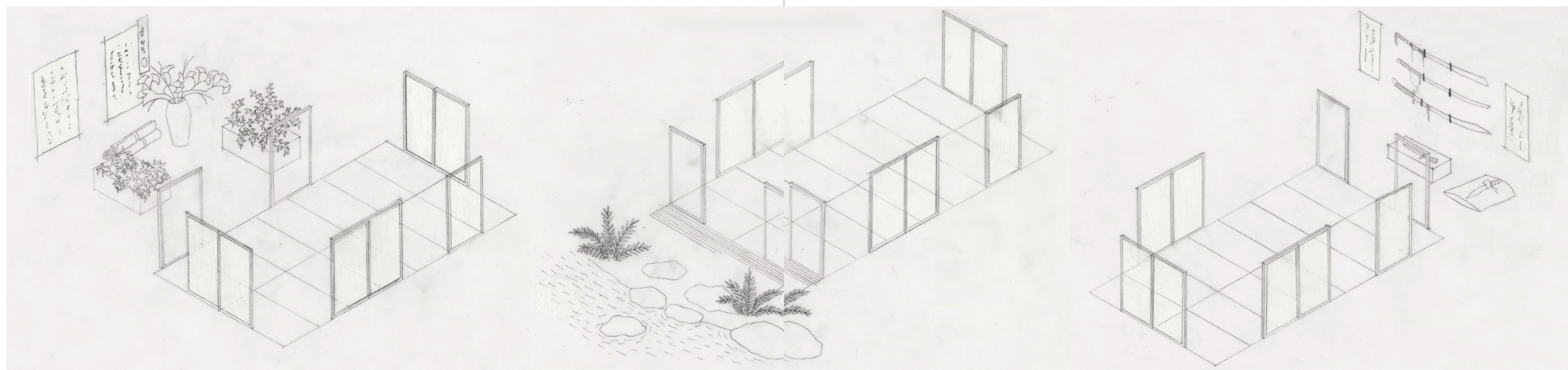
CHAPTER TWO

KATSURA IMPERIAL VILLA

Inspirational precedence

Katsura Imperial Villa outside Kyoto was built during the first half of the 17th century. It was commissioned by two princes of two generations of the Hachijo Imperial Family. The Old shoin is the first part of the villa to be completed. Later the Katsura grows and becomes a large system of courtyards and buildings. The rooms in the shoin are divided by paper screens that makes it possible to change the spatial conditions in different rooms.

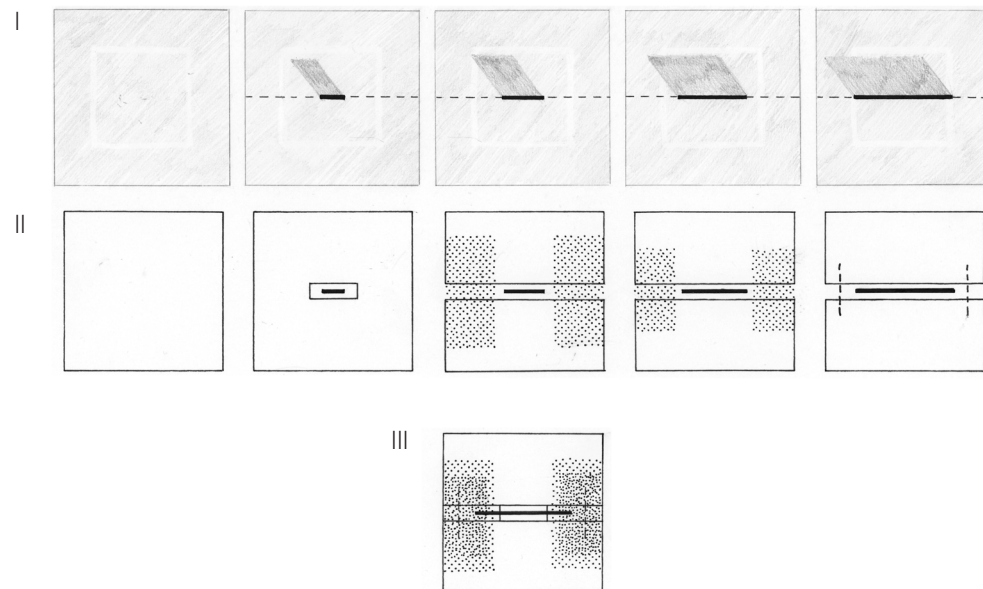




The central room in the Old shoin is an audience room, a tea room. Depending on how screens are arranged the setting for the room changes. On one side there is a room with scrolls and flowers. Open the screens towards the outside and the scenery will be a moon observing platform and a garden. On the opposite side of the garden the screens open towards a sword room. The character of the tea room can change according to occasion or guest.

THE SCREEN

38



Mapping possibilities

Inspired by the Katsura Imperial Villa I continued to investigate the capacity of the transforming space. A structure with a possibility to transform or

move elements enable a multitude of spaces. The diagrams show a range of different possibilities for a set of screens transforming after certain criteria.

39

- I Spatial arrangement: the composition of elements.
- II The Spatial outcome: the character of the resulting spaces.
- III Clarity in character: level of consistency in character for the space. Juxtaposed resulting spaces for all scenario.



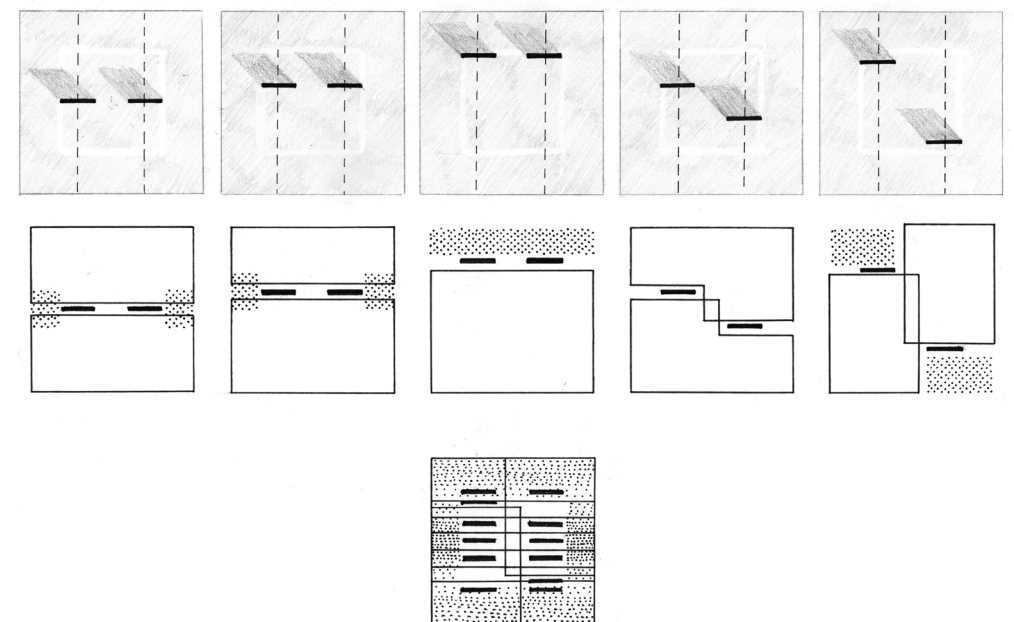
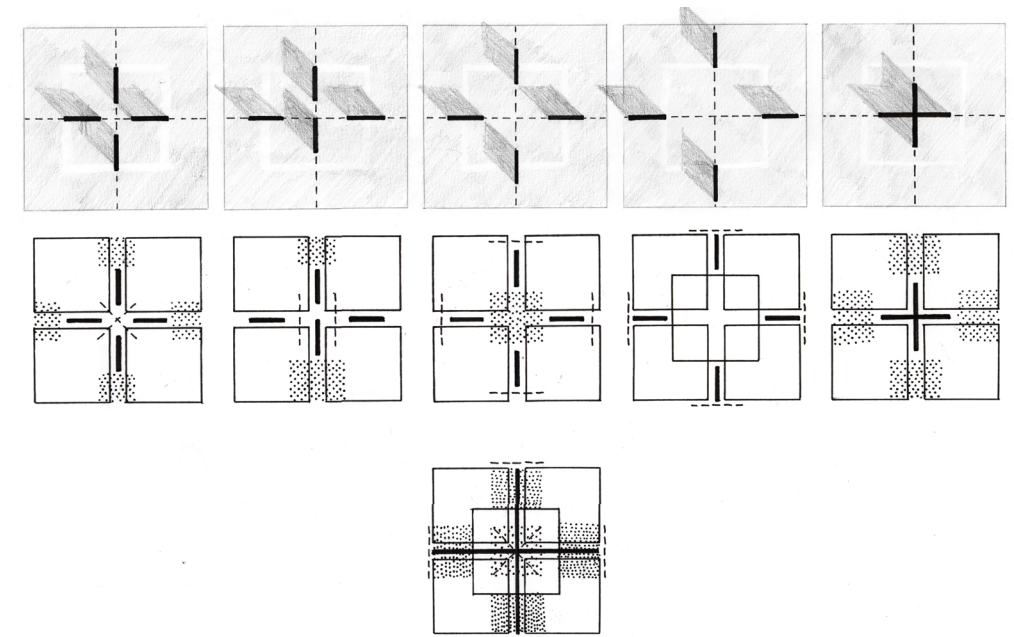
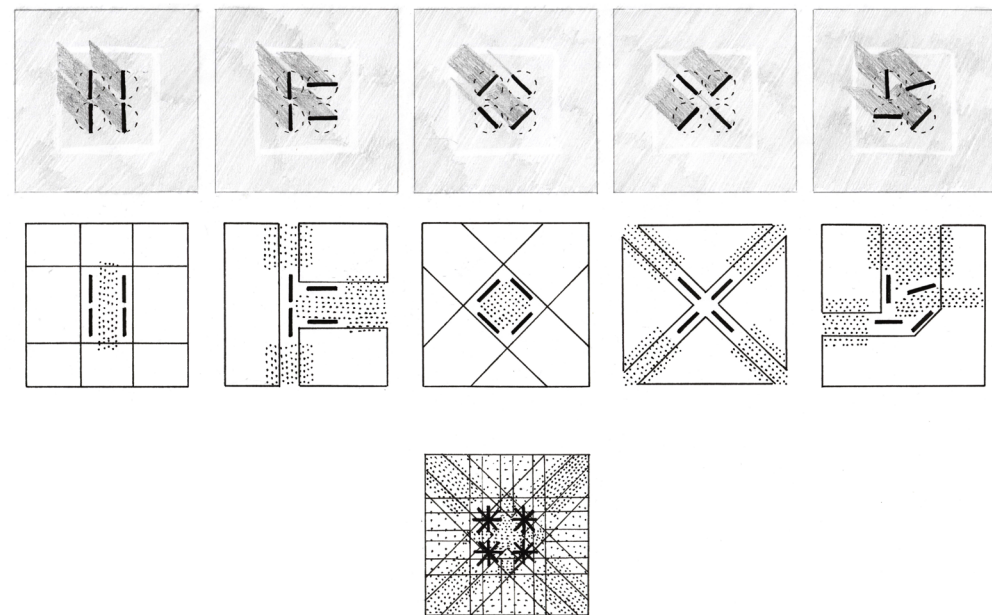
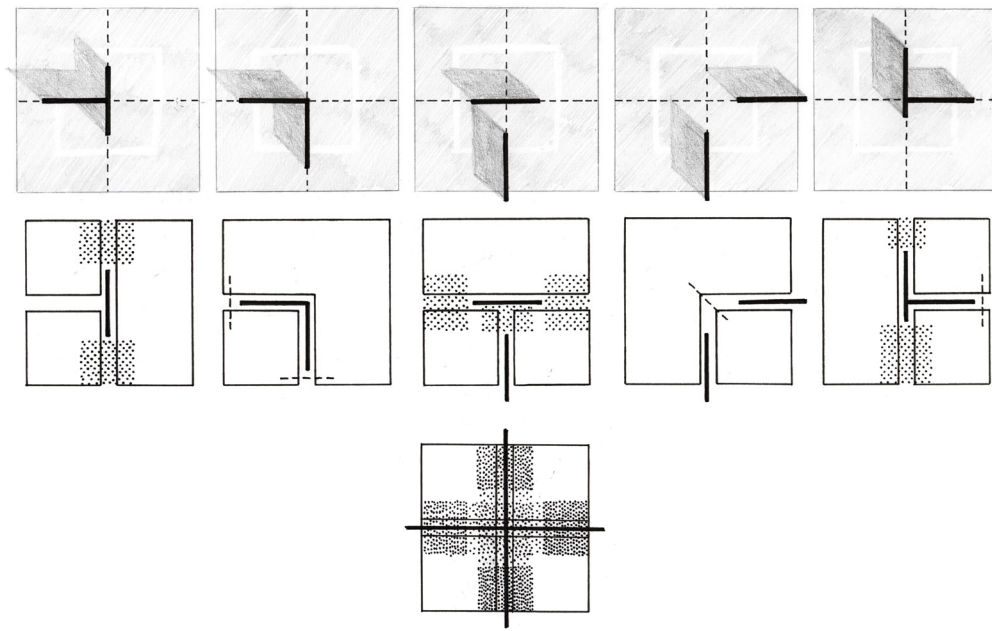
Main space is space that is clearly defined and superior in size.



Secondary space is smaller and less defined than Main space.



Passage space encourages people to keep moving.



LAYERING EXPERIENCES

Research on Philosophy

42

Memory is what defines our understanding of the world. It allows us to learn and evolve. It makes our personalities and it determines how we relate to people or phenomena. In an encounter with architecture our memory plays a most significant part in how we experience space. In order to enhance architectural experience and give it a depth one must approach the complex system of memory.

Memory is explained in two main categories, short term memory and long term memory. Short term memory is the capacity to store information, without processing it, for a limited period of time. It is spanning over intervals as short as a couple of seconds. Long term memory on the other hand has the capacity to store an infinite amount of information for an entire life. Long term memory is often explained with three different categories, the procedural memory, the semantic memory and the episodic memory.

The procedural memory is the part of our memory that is responsible for how we do things, like how to walk or use your voice. It is a system that do not require conscious thought; it consists of automatic sensory-motor behaviours, so deeply embedded that we are no longer aware of them. Procedural memory is attained through repetition and practice.

The semantic memory is a where the information about the world is stored. It is our intellect; the facts, relations, general knowledge and understanding not bound to a particular context. Recalling information from the semantic memory requires a conscious effort.

The episodic memory is autobiographical, it represents events and experiences that occurred at a specific time and place. These memories tend to contain emotional charge and surrounding context.¹

When experiencing space, the procedural memory enables us to walk around and observe. The information attained is stored in our autobiographical memory. The memory of the experience becomes our subjective truth of the space. Subjective since experience is read and filled with meaning corresponding to information from our semantic memory, our intellect. Just think about how space or matter can seem insignificant at the first encounter but after obtaining relevant theory and history, it suddenly appears meaningful and interesting. An architectural experience is influenced by what we already know, which makes it possible to modify and enrich spatial experience.

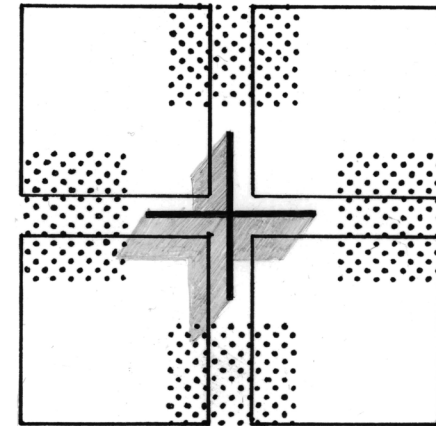
43

¹ Barry, John "The cognitive neuroscience of memory" <http://www.inference.phy.cam.ac.uk/imb86/memory.pdf>

Merging memories

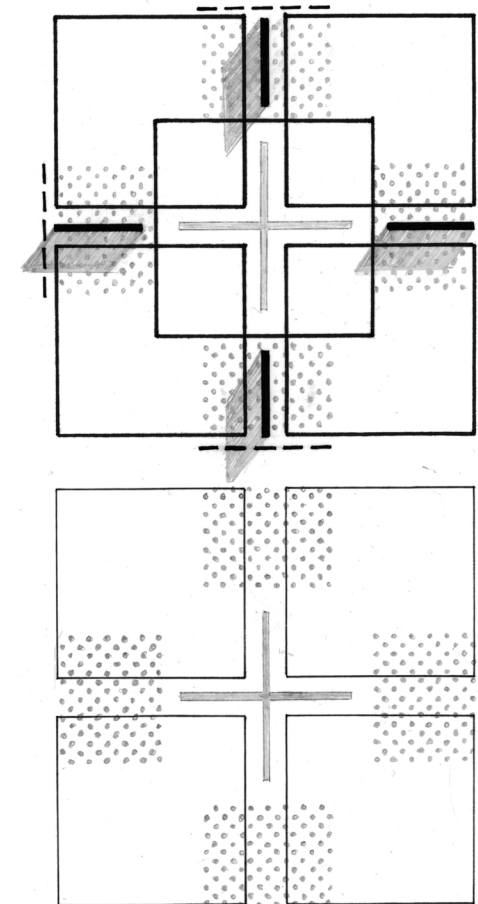
I

The image on the next page is a representation of a simple spatial setting. Four screens meet at a central point generating four main spaces linked in secondary space. When encountering this space the understanding of it is relatively un-layered. When walking through it the composition of elements is registered and remembered in their present state.



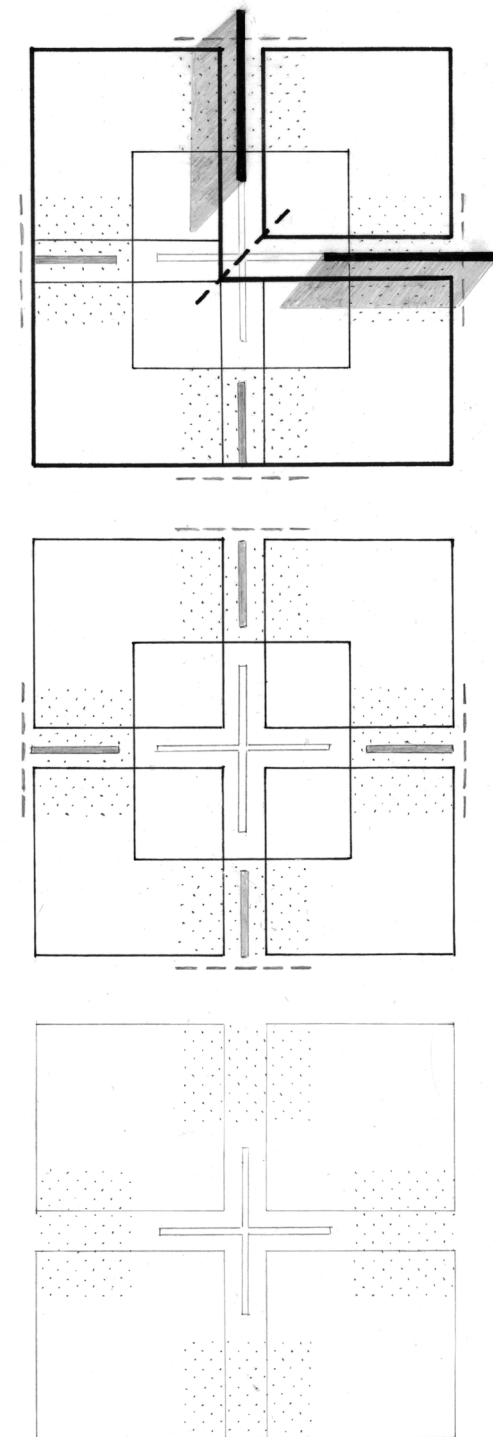
Merging memories II

In the second encounter the experience is juxtaposed the previous experience. The change between the two states is measured and the present state is emphasized since it is different from what you expected. The previous experience is forced to be re-remembered to understand what has happened and therefor it is also re-established in our memory.



Merging memories III

The third encounter consist of three overlapping spatial experiences. Primarily the one occurring but also the two previous ones. The earliest one is getting more vague the further it gets. If that composition would re-occur on the other hand, that memory would be brought back to the surface due to resemblance.

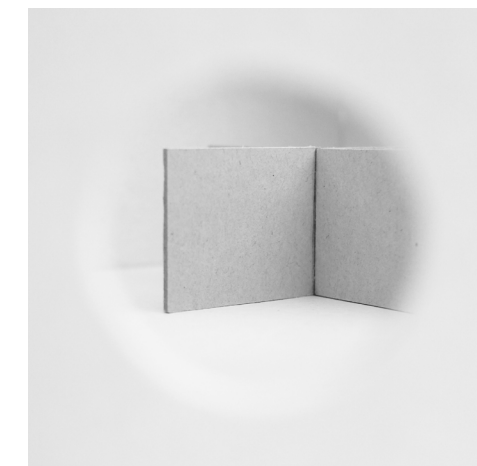


MODEL EXPERIMENT

Exhibition material

As a way to test and explain my ideas about merging memories I used models. Three cardboard boxes with a circular opening through which one can see a simple architecture. In each one there is a new spatial setting corresponding to the diagrams on the previous pages.

PERCEIVING SUCCESSION



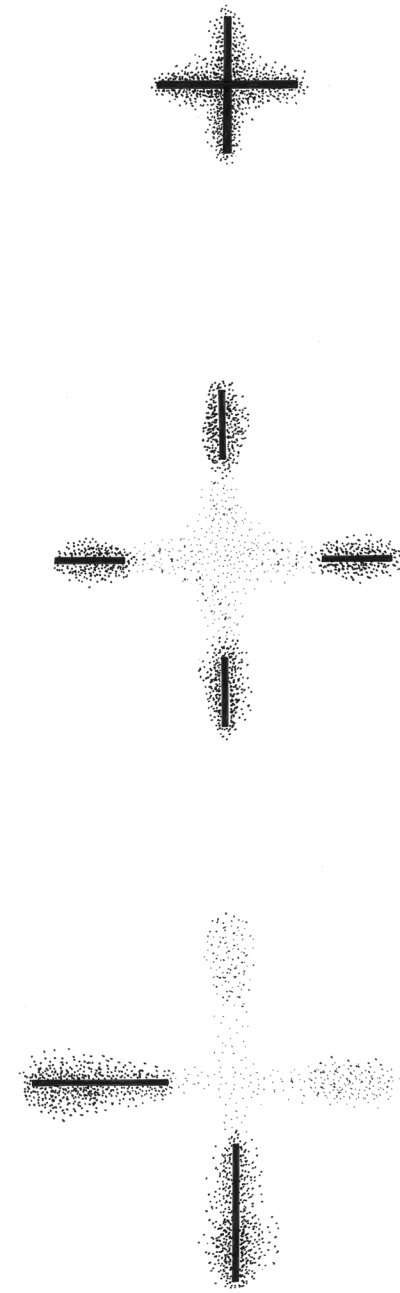
CHAPTER TWO

TRANSFORMING MATTER

CHAPTER THREE

TRACES

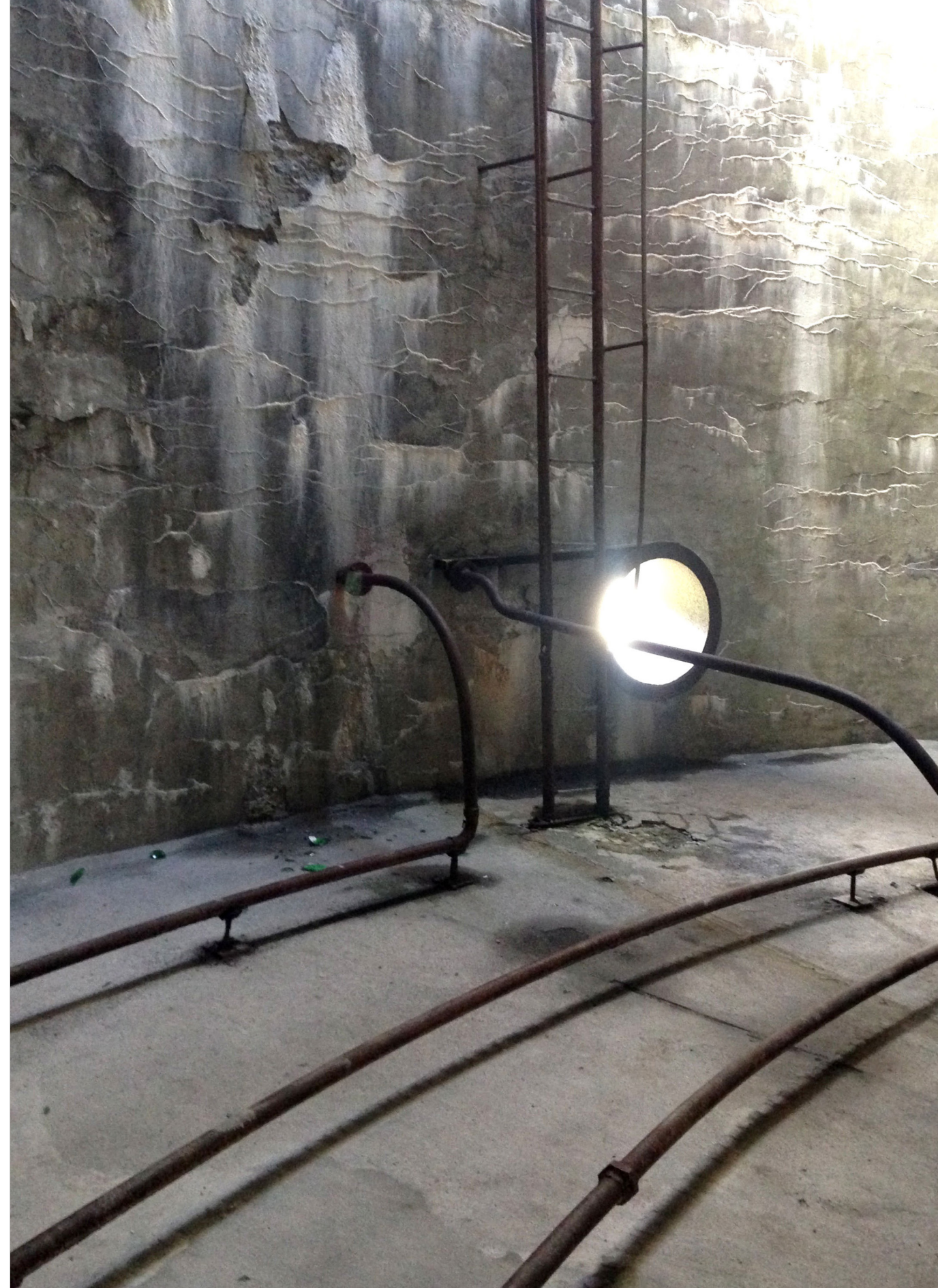
Matter has a memory of its own, it changes with weather, with tear and age. In the transformation lies proof that time passed. Decay can be a problem, but change does not have to be. The memory of matter can be used to support the human memory of a space. The changing features of material adds another layer to an already layered experience.



MEMORY WITHIN MATTER

56

Photograph taken in Djúpavík, Iceland. The wall inside a, since long empty fish silo is covered in efflorescence. The white salt cover migrates from the material and paints crystalline curtains on the concrete.





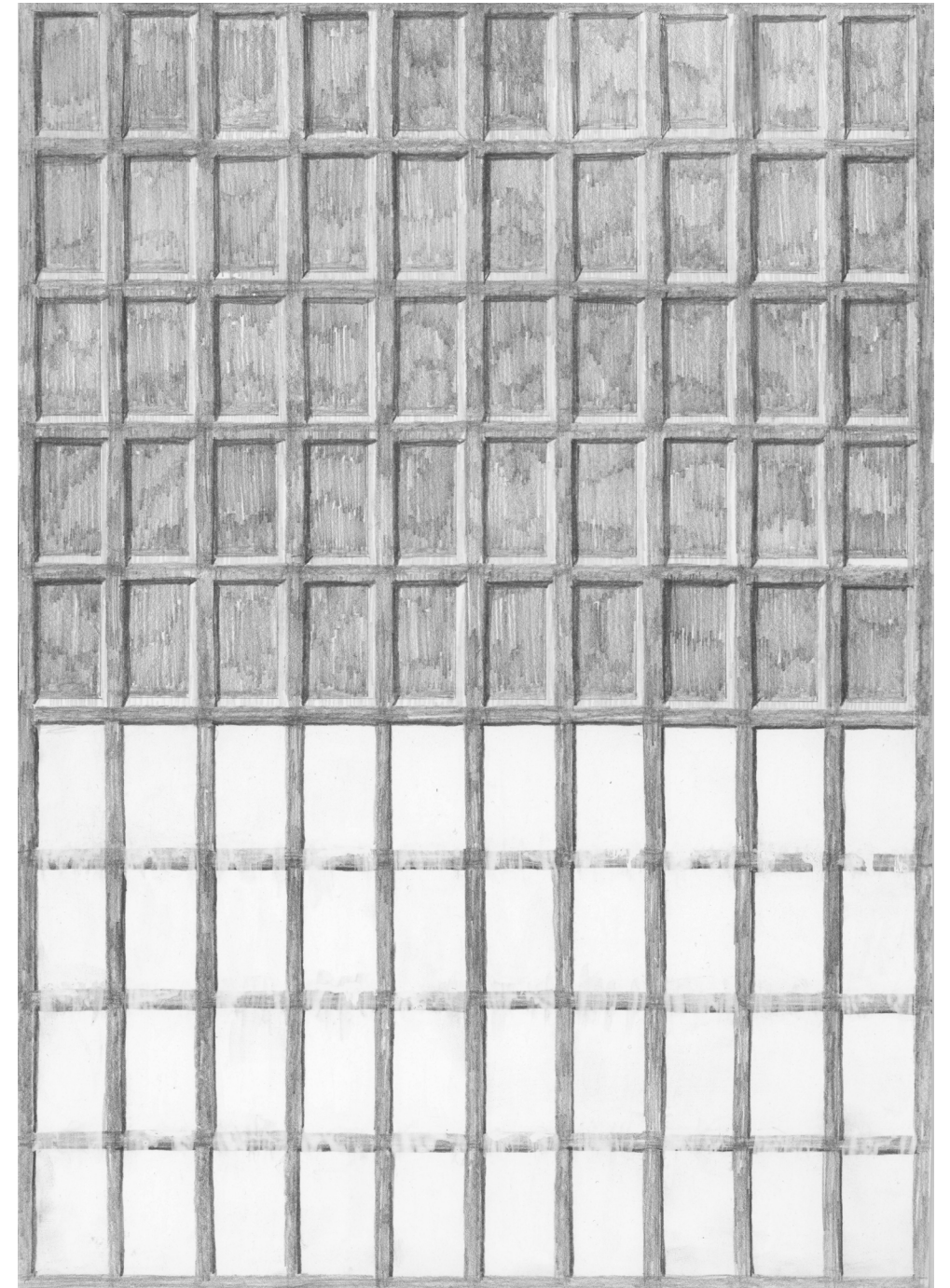
SALT BLOOMING

60

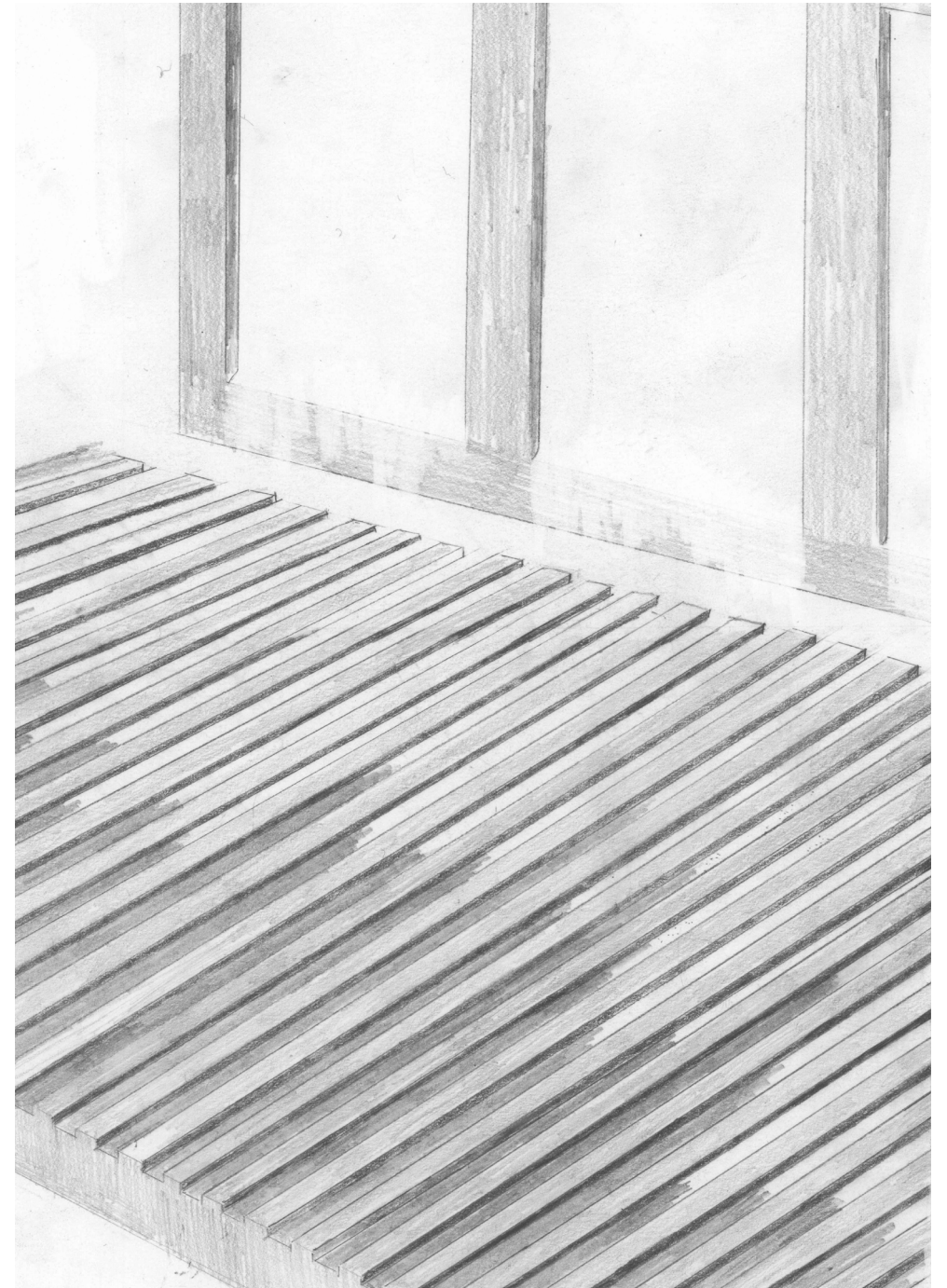
Efflorescence, or salt blooming, is the process when salt exits a porous material and leaves a crystalline deposit on the surface. It is a common problem on buildings made of concrete or brick. It appears after construction and continues to appear for years until the material has run out of salt. The process functions so that the an internally held salt is dissolved in water. The water, with the salt now held in solution, migrates to the surface, evaporates and leaves a coating of salt. This

coating, looking like thin paint with coral-like features is long lasting, but fade with friction and wear.

If moving elements had this feature their previous position could be read from their traces. The salt coating would be a reminder of what was and with time it would, just like a memory, slowly fade. If controlled and designed for, the veil-like (dis)coloration could be a beautiful feature on a building.



61





TRANSFORMING STRUCTURE

CHAPTER FOUR

DRAWING CHANGE

*"Nothing may be added, taken away or altered,
but for the worse" -ever.*

Leon Battista Alberti praised the static. The white model and the finalized drawings where architecture in its perfect form.

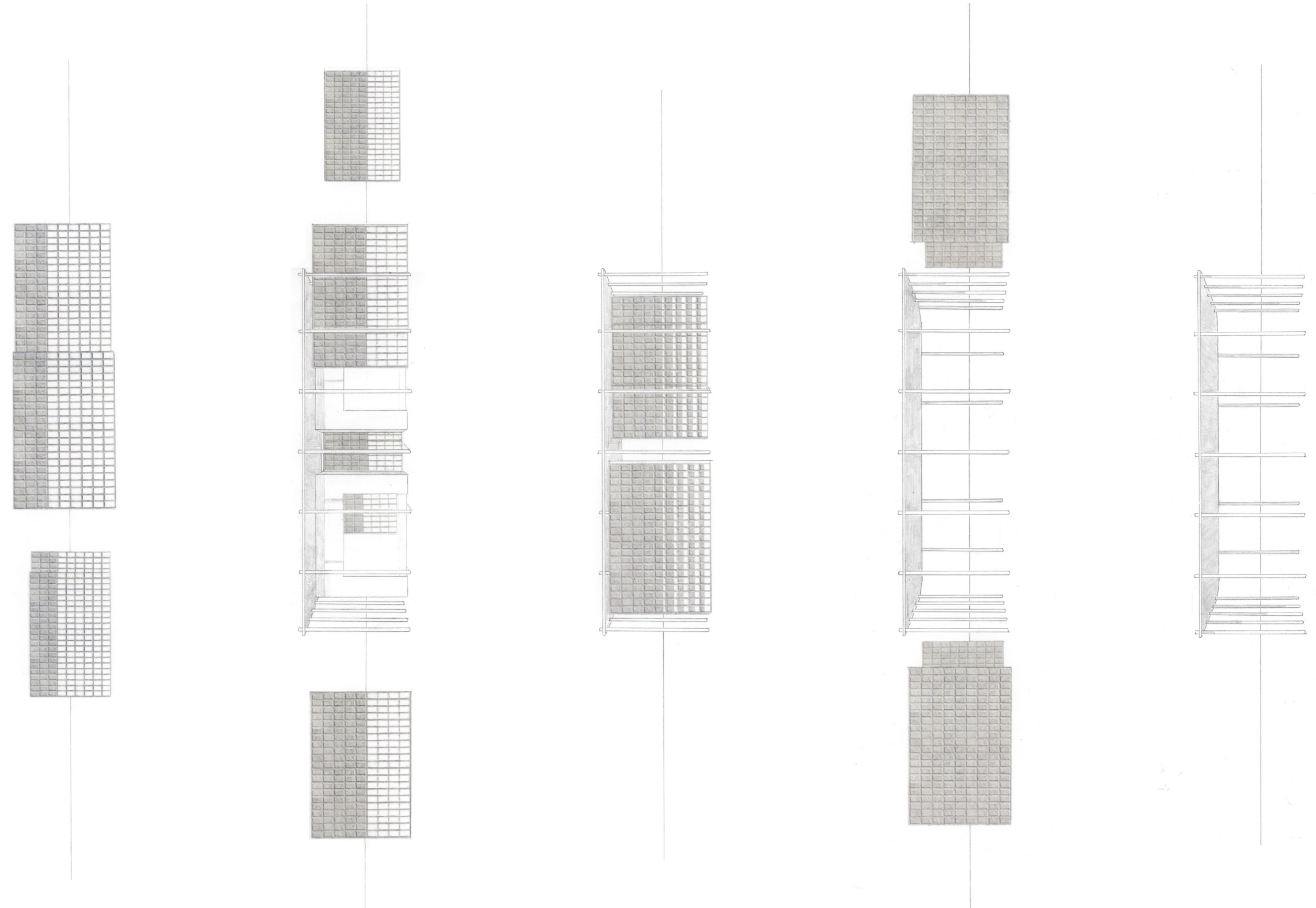
This is a sketch of how to communicate a project that changes. A project that is complete in every state of its life. To the left is a static model of a design. It is a representation of a space and through the model a space can be understood. Though it is only a frozen moment in time, the model does not tell about time. In order to investigate and communicate a project and how it is experienced over time is necessary to allow it to age and transform, already on paper:

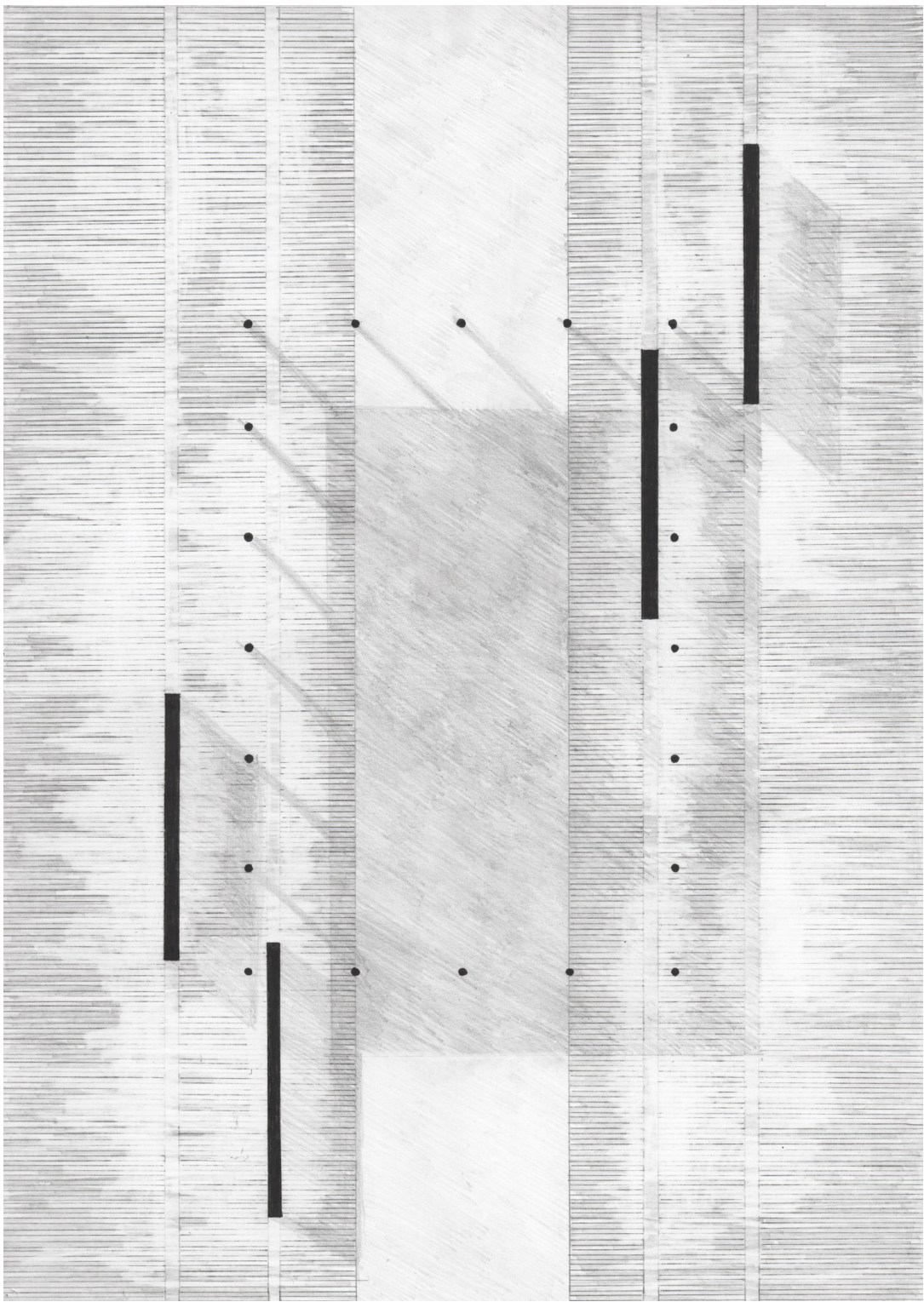
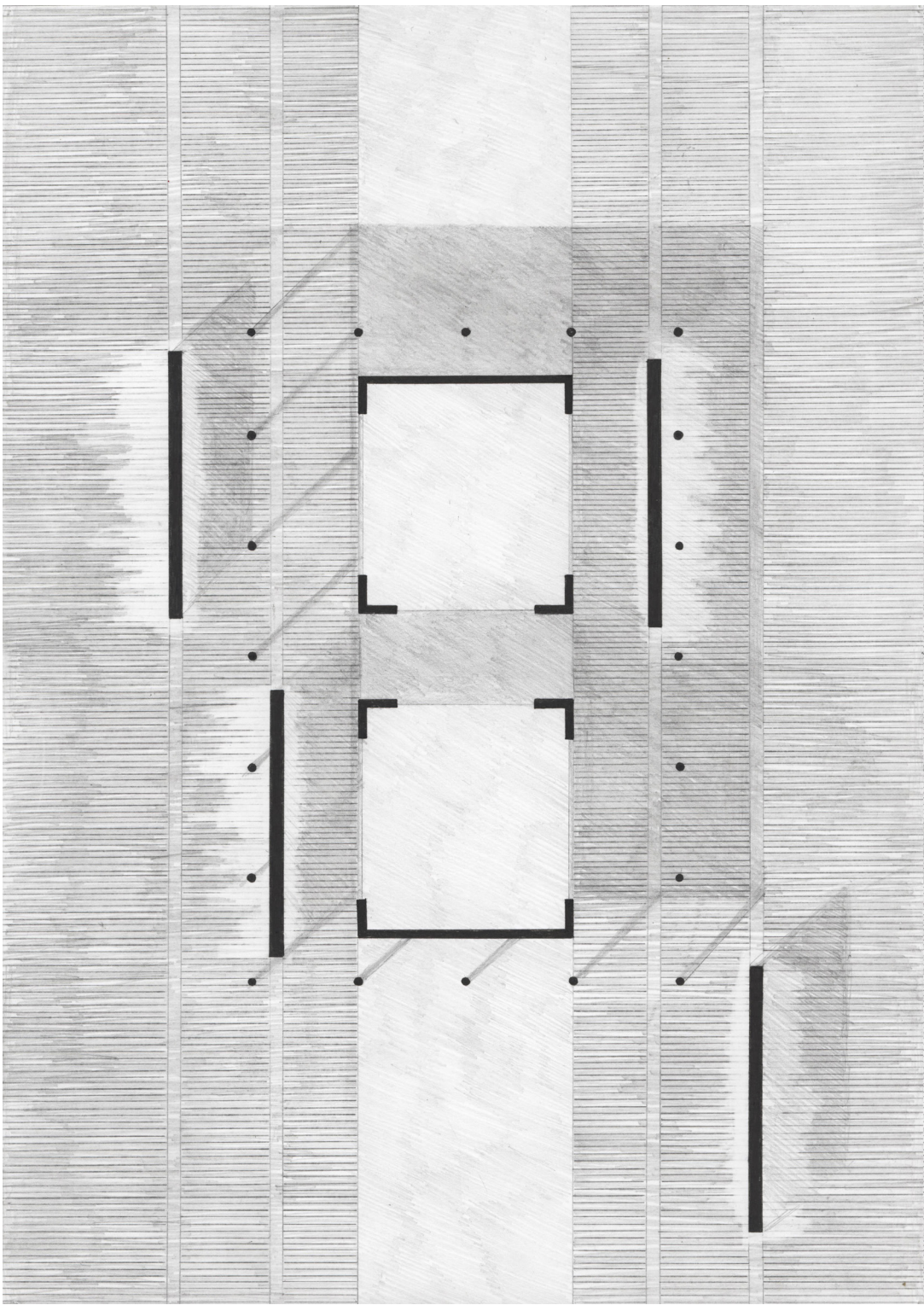
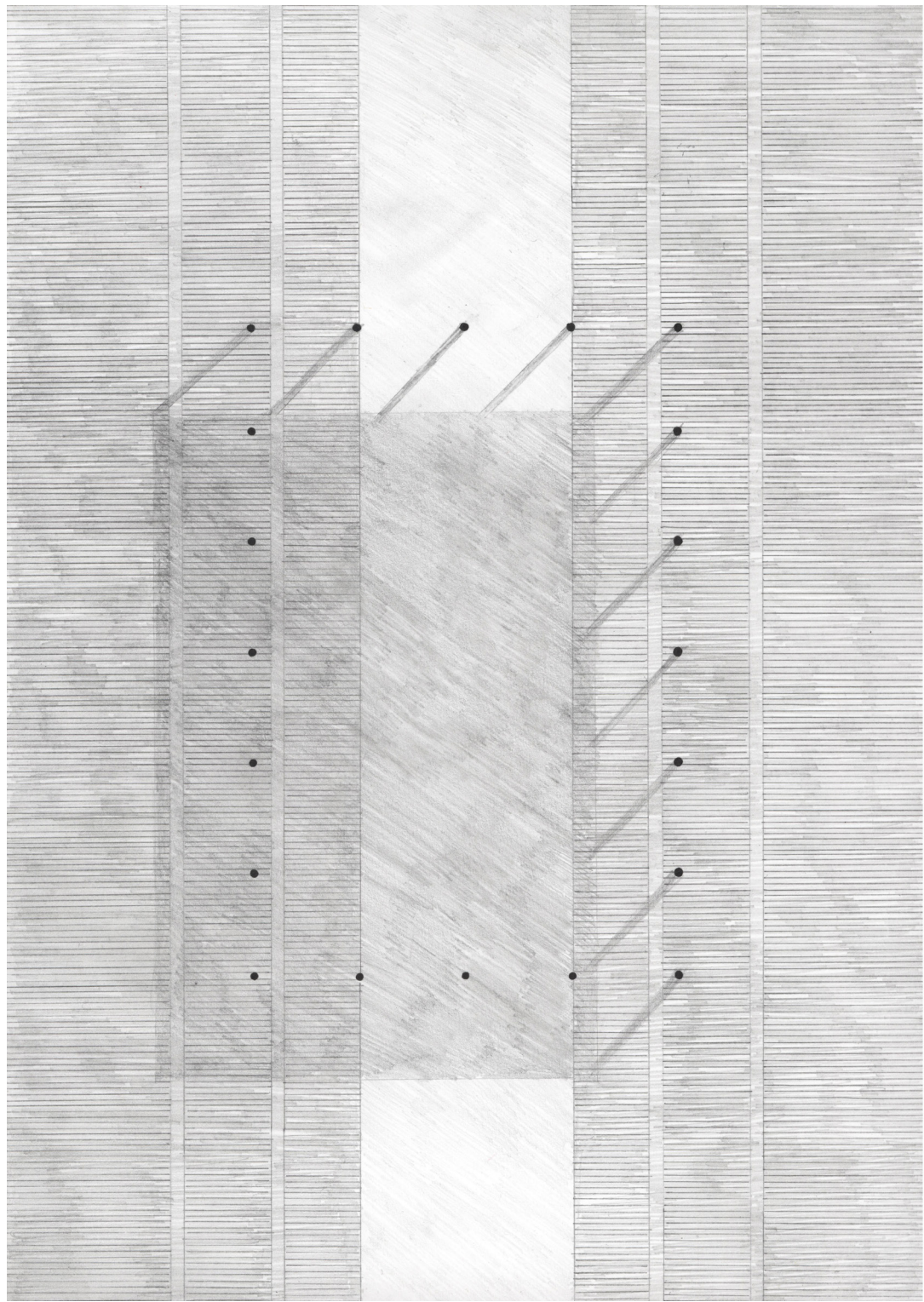


CONTINUOUS COMPLETION

This is a sketch of a pavilion that keep reaching a new state of completion over and over again. It is transforming, partially uncontrolled, and it is supposed to generate a range of different types of spaces throughout its life. A sculptural installation becomes a small gallery that becomes a pavilion that becomes a rain shelter. It is a sketch of a project where time and transformation is used as an opportunity instead of being considered problem.

The transformation follow a linear time line and is a combination of the structural change and the evolving appearance of the ageing material.



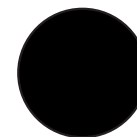


CONCLUSION

In the search for good architecture the process is not always obvious. There are no perfect instructions for how to reach a well functioning, beautiful and resilient result, characteristics that are commonly mentioned in the description of something qualitative. I believe that treating time as a medium is one way to find and explore an architecture that is new and sustainable. Sustainable in the meaning that it is honest in the relation between intended performance and actual performance. In the subjective nature of our notion of time lies an overlooked opportunity to enhance spatial experience. Transformation, memory and traces activate mechanisms in our mind. We can leave it to hazard, or we can choose to design with time as an opportunity.

*"Our senses crave novelty ... If there's no change ... they doze and register little or nothing ... A constant state – even of excitement – in time becomes tedious, fades into the background, because our senses have evolved to report changes"*¹

¹ Ackerman, D. A Natural History of the Senses, Vintage Books (New York), 1990, 305.



BIBLIOGRAPHY

BOOKS

Ackerman, D. A Natural History of the Senses, Vintage Books. New York, 1990

Chastanet F. Dishu, Ground Calligraphy in China. Document Press. Årsta. 2016

Nitschke, Günther "From Shinto to Ando. Studies in architectural anthropology in Japan" 1993. St Martins Press. New York. p.35

Ponciroli, Virginia. Katsura, imperial villa. Electa architecture. Milan. 2005

ACADEMIC REPORT

Okamoto, H. Time, Speed and Perception: Intervals in the Representation of Architectural Space. Massachusets Institute of Technology. Massachusets. 2000

PRINTED ARTICLES

Brown JF. Motion expands perceived time. On time perception in visual movement fields. Psychologische Forschung. 1931;14

Eagleman DM. Human time perception and its illusions. Curr Opin Neurobiol. 2008 Apr; 18(2)

Pallasmaa, Juhani. Inhabiting time. Architectural Design. John Wiley & Sons Ltd. UK. 2015

Pariyadath V, Eagleman DM. The effect of predictability on subjective duration. PLoS One. 2007 Nov 28; 2

Rietmeyer, R. Personal Structures. Time, Space, Existence" DuMont Buchverlag GmbH & Co. KG, Cologne, Germany. 2007

Trachtenberg, M. Building outside Time in Alberti's. De re aedificatoria. Anthropology and Aesthetics. 2005; 48

WEB ARTICLES

Barry, John "The cognitive neuroscience of memory" <http://www.inference.phy.cam.ac.uk/imb86/memory.pdf>

Eagleman DM, Tse PU, Buonomano D, Janssen P, Nobre AC, Holcombe AO. Time and the brain: how subjective time relates to neural time. J Neurosci. 2005

Le Poidevin, R. The Experience and Perception of Time. The Stanford Encyclopedia of Philosophy Edward N. Zalta (ed.). 2015
URL = <https://plato.stanford.edu/archives/sum2015/entries/time-experience/>