(inner) climate & environmental subtlety
research booklet

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1 introduction: problems & theoretical framework

problem statement:

There has always been a dilemma. The need for keeping the weather out, sheltering and climatization of buildings, are met with a longing for the outdoors, for contact with non-human elements.

The dichotomy of humans and nature has been established since civilisation with the first houses and villages, when "lines began to be drawn on lands". Lines separated interiors and exteriors, ownerships, humans and nature, the "civilized" and the "savage" (Aureli et al., 2019). Nowadays, many buildings we see in Western Europe adopt the same anthropocentric visions. They utilise a generous amount of material to ensure an extremely high standard and comfort (Barber, 2020). Modern architecture draws a line between human and nature, figuratively and literally. The soil is covered with slabs, and the rain is blocked by the roofs. The interiors are warmed up/cooled down to precisely 20 degrees and one enjoys the convenience of not having to think about climate. As a result, nature becomes distant and intangible. Although energy efficiency is crowned as sustainable, the higher comfort standard ultimately leads to higher energy consumption (Hill, 2012). And to achieve the standard, buildings are equipped with machines, installations, and devices, which cause additional damage as the earth is exhausted of minerals and precious metals. The friction created by nature is "smoothened over", producing an "easy unity of exclusion" rather than "difficult unity of inclusion" (Venturi, 1966, as cited in Hill, 2012). Buildings are made to be large devices that cut out any connection with the outside when a small sensor tells them to. Buildings thus prevent us from detecting a complete spectrum of non-human elements (Bennett, Aureli et al., 2019), focusing on the visual and showing a disinterest in the other senses (Hill, 2012).

The Friche Josaphat site again brings this dilemma to the foreground: the presence of the ecologically flourishing brownfield confronts architects and planners with the opposition of the

"This vision and production of the air-conditioned future also imagined a specific kind of human, occupant, inhabitant, or user"
– Barber D. A., 2020

constructed and the nature. Situated between the pressure of ecological value and land value for development, the studio site inspired the curiosity of how nature and humans coexist in the Anthropocene.

"They occupy but they do not dwell."
-- Richard Sennett, 2018

Under the greater context of the anthropocentric development, modern human's technosolutionism, and the prioritization of efficiency and endless growth, how does one once again dwell with nature? **This thesis explores the role of architecture in intermediating the nuiance of micro-climate and that of human behavior.** Architecture can perhaps take part in responding to the environmental crisis not by constant advancement in technology, but in shaping the habits and minds of the human (Decroos et al., 2020).

"become passive consumer of spectacles."
– René Boer, 2022

methodology:

The research mainly comprises up-close fieldwork, ranging from photography, interviews, and drawings. Besides graphic and drawings, this book present the research using a mix of direct quotes from both literature and interviews. The combination of these media intend to create new associations in audiences' minds, and intersecting the academic world with the daily sciences.

"Think of themselves in an antagonistic relationship with an environment redefined as savage and which from now on had to be controlled and dominated."
-- Paul Shepard

"That's human. Its stupid eh? Instead of building here and leaving nature there, we destroy and then we plants some flowers which I put in the house and then I add some bonsais. No but that's the architecture of tomorrow: nature is there and we adapt."
-- Roy from Schaerbeek, 2023

theoretical framework:

A great deal of literature and precedents have addressed building and climate. However, the aspect of use, engagement, habit etc. remains less explored. As humans are often portrayed as passive, sedentary users inside a building. Several authors have discussed, although not using the same terms, a similar topic, and what the positive counterpart can look like to the aforementioned antagonistic relationships. Numerous designers and authors have discussed the topic of architecture's role between human and nature.

J. Hill (2012) talks about weather and architecture while being inspired by the Smithsons. Alison & Peter Smithson attempted to reconnect with nature through architecture, resulting in the design of the Upper Lawn Pavilion. With some loss in comfort, one who lives in the pavilion experiences nature and weather to a fuller spectrum (Hill, 2012). From a pure functionalist point of view, it might be imperfect, but it is a strong statement regarding human's "reverence for the natural world". (Hill, 2012). Hill argues for an "active rather than sedentary engagement with the environment." Buildings become a "register of climate", emphasizing its effect on materials, impact on use conditions, and highlighting the hybrid aesthetics created by man-made objects and the elements.

Traditional Japanese houses, regardless of being built in a cold climate, are not insulated nor double-glazed all-round as opposed to Western principles of sustainable buildings, despite having lower energy consumption (Knowles, 2023). Many characterize completely open spaces towards the outside. The heated dining table is the only warm place in the house, and residents would live more collectively during colder months. The flexible layout of this architecture shrinks and expands the living space with natural patterns. This position towards nature and fluctuating lifestyle, in this case, is expressed with an adaptive architecture (Knowles, 2023). Similar to a fireplace being the warm spot in the living room, or a bonfire, the warm space creates fond images for Western cultures alike.

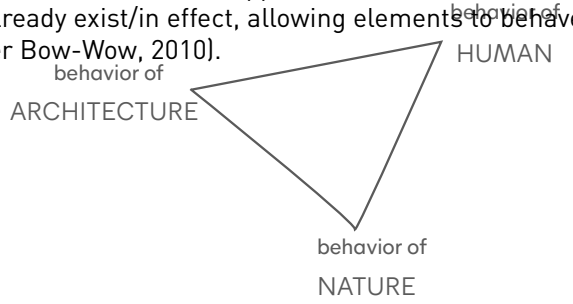
Barber (2020) extensively talks about the phenomenon of air-conditioning as the manifestation of the human nature dichotomy,

and what modern architecture looked like before air-conditioning. The book highlights architectural elements for manual and passive climate control without devices. Notably, it asks the question if architecture can induce human habits and change human attitudes towards energy and fossil fuels through engagement with climate. Such engagement can be, for example, occupants manipulating sunshading devices by hand. When people's consciousness of nature becomes so strong, the engagement with it will then be integrated into one's daily actions (Barber, 2020).

Different authors such as Heidegger (1927, as cited in Auret. H, 2019), Sennett (2018) and Whyte (1980) highlight the existential and social significance of humans as carers, makers, and dwellers. This again highlights human's as an active figure inside architecture.

Hawkes et al. (2002) take a technical approach to climate responsive architecture while recognizing human, comfort, and space as variables. They advocate for a "selective environmental control" rather than an exclusive form of control, with envelope of much higher permeability. There is also a far greater tolerance for variation inside a "free-running" building (which climatizes through form and fabric).

Behaviorology studies the intertwining relation of human behaviors, natural laws (behaviors of nature), and (behaviors of) architecture, aiming to achieve a new kind of 'organic' architecture (Atelier Bow-Wow, 2010). Tsukamoto and Kaijima introduced time scale when observing behaviors and rhythms. They further argue that form should support or be consistent with behaviors that already exist/in effect, allowing elements to behave optimally (Atelier Bow-Wow, 2010).



2 fieldwork: seasonality of friche josaphat

Visiting the site during different months highlights the site's sensitivity to climate., a real phenomenon inside a hardened and grey city. It behaves wildy differently each season, with winter being the most playful. Stepping over the marsh and puddles is like playing a game, bringing one back to childhood. When it freezes, the game is added with an extra crunchy touch.

2 fieldwork: sheltering in friche josaphat

Yes, a greenhouse. I made it by myself.
It's like in heaven, isn't it?
-- garden owner, 2023

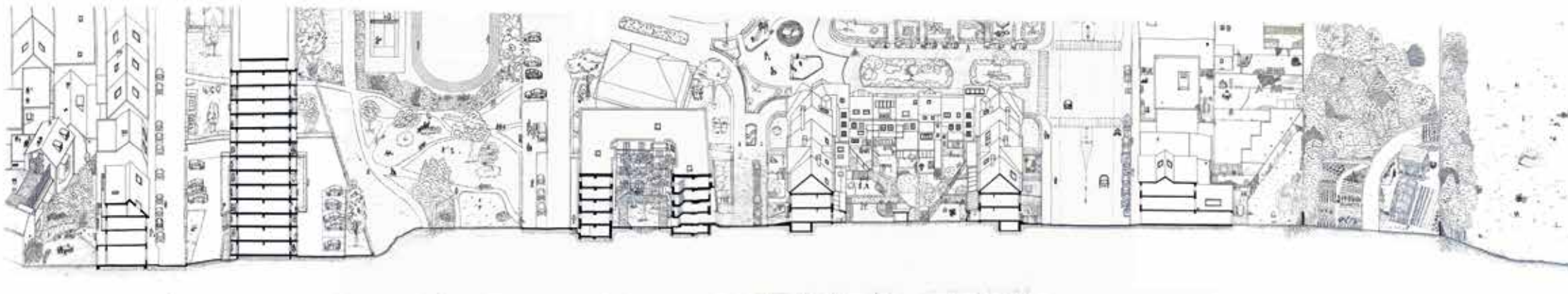
Under the radar of architects and planners, are the numerous structures the dwellers of Friche Josaphat have built for themselves. Structures in an around the Friche is a manifest of sufficiency and practicality. Here one can distill a few different degrees of sufficiency regarding the sheltering property of architecture. R in reduce.

2 fieldwork: lived boundary around friche josaphat

During the first quarter, the theme around in-between space first appeared in the group work. In the garden city Terdelt, one finds the front gardens as such an in-between space. Once moving to the more private domain, the greenhouse or wintergarden, almost present in every house we entered, create another intersting boundary with the outside world.

The wintergardens usually has another degree of sheltering than the rest of the house. It is more susceptible to natural elements.

Sun shines through, rain makes more sounds. Rhythm of the climate and nature heavily influences what happens inside the spaces, according to observation of artefacts and use. At the same time, these in-between space is a regulator of privacy, identity and dweller's social relation with the neighborhood. This is the first glance into how in-between spaces intermediate the three behaviors of human, nature and architecture.



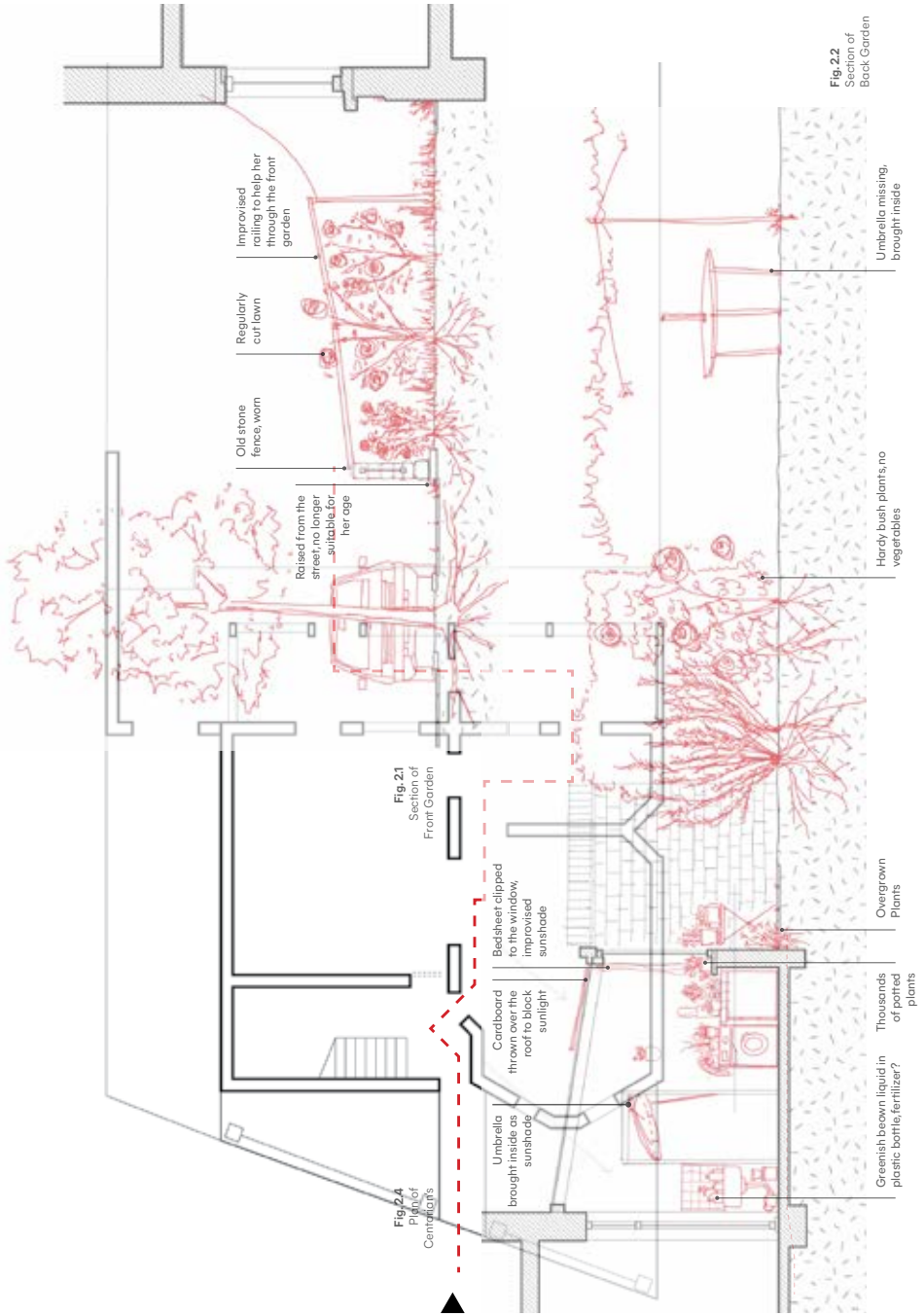


Fig. 2.1 Section of Front Garden

Fig. 2.2 Section of Back Garden

Fig. 2.4 Plan of Centrefolds

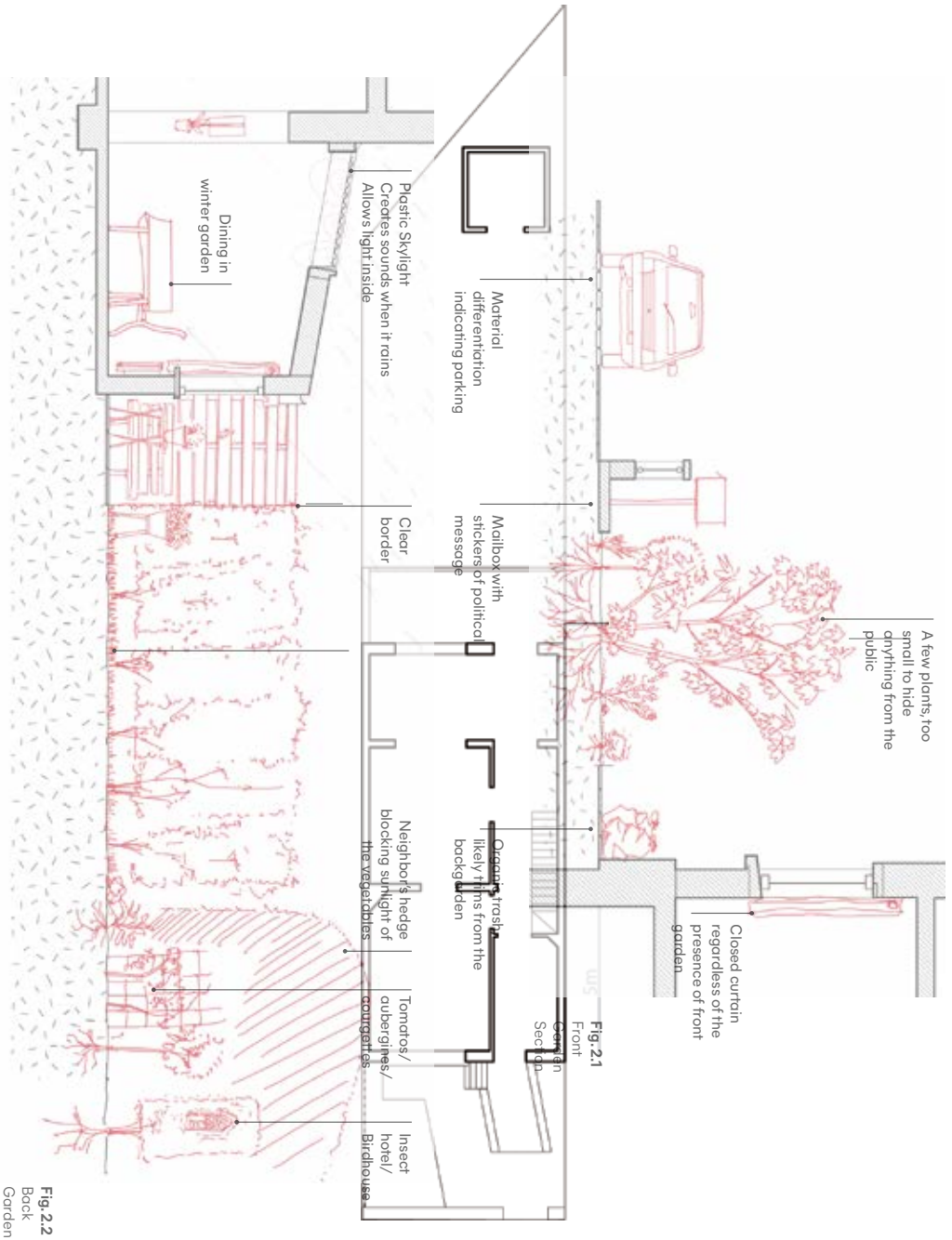
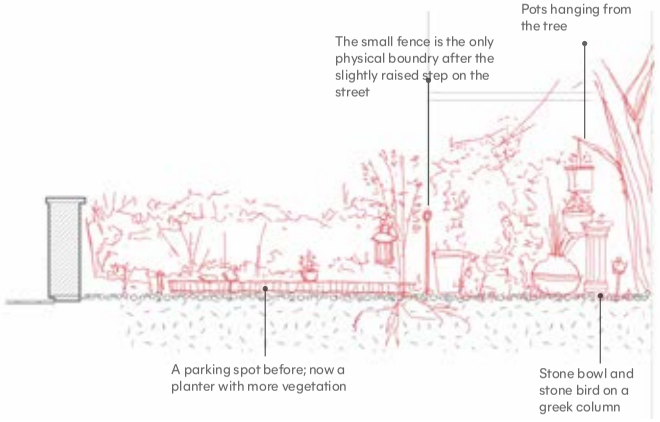
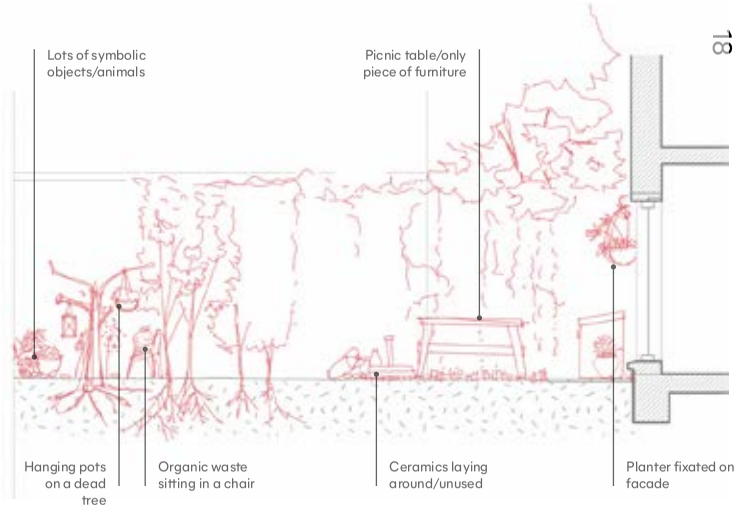


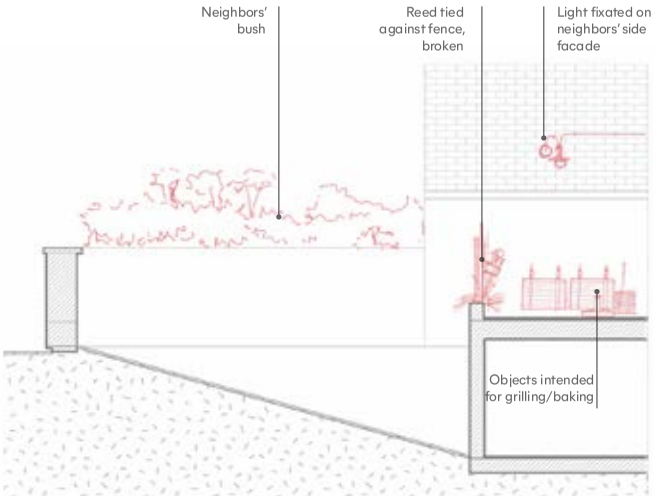
Fig. 2.1

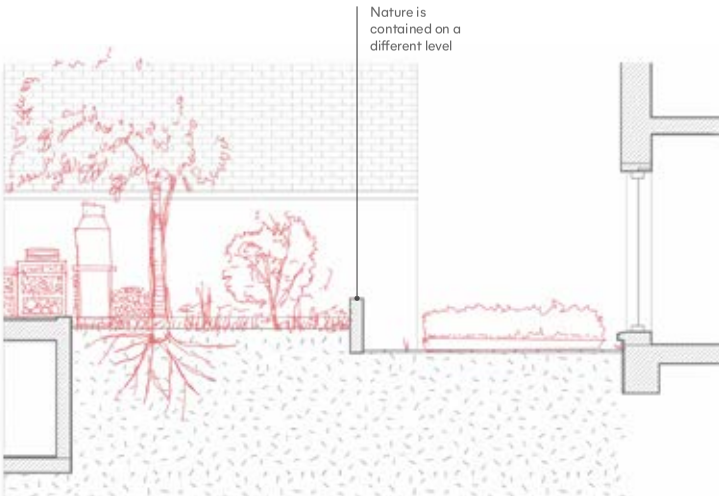
Fig. 2.2

Fig. 2.3
Plan of the Italian Couple's Hosue


Pots hanging from the tree
The small fence is the only physical boundry after the slightly raised step on the street
A parking spot before; now a planter with more vegetation
Stone bowl and stone bird on a greek column

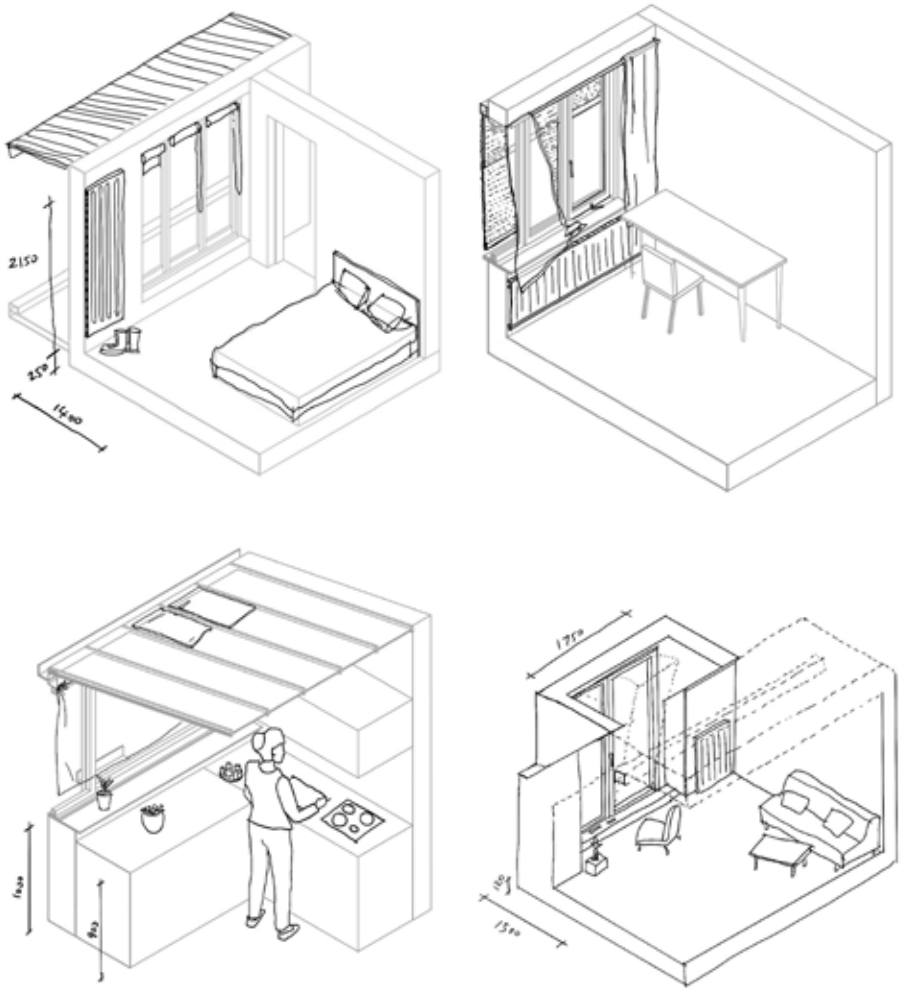

Lots of symbolic objects/animals
Picnic table/only piece of furniture
Hanging pots on a dead tree
Organic waste sitting in a chair
Ceramics laying around/unused
Planter fixated on facade


Neighbors' bush
Reed tied against fence, broken
Light fixated on neighbors' side facade
Objects intended for grilling/baking


Nature is contained on a different level

windowscape

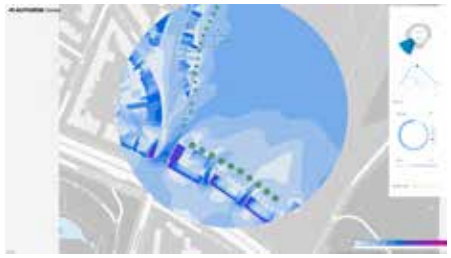
Due to my interst in the in-between spaces, I carried out a serie of drawing studying windows as such space. Such architectural and interior elements include balcony, wintergarden, shutters, curtains, window sills. Observed is also a strong need for user control on manipulating inner climate and ambience, even when the architecture is not tailored to these desires. This friction sparks improvised solutions, as depicted in the windowscape drawings.



photographs collected from espace kessels, Brussels

2 fieldwork: micro-climates of friche josaphat

Wind from South-west



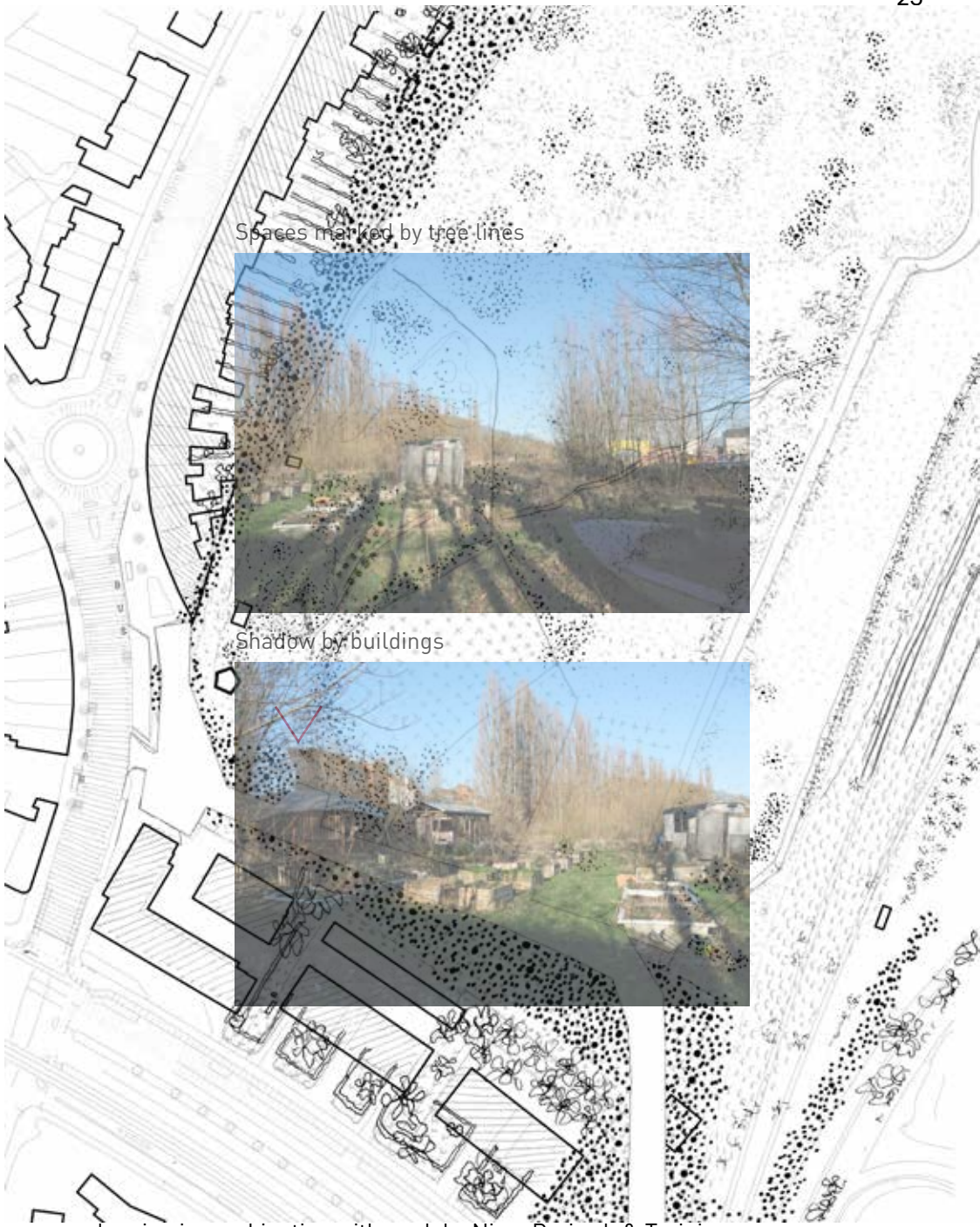
Wind overall comfort

Sunlight hour 1st Feb.

Sunlight hour 1st July.

The existing terrain, vegetations and buildings are factors for micro-climate. Buildings on the south of the site causes higher wind speed and cast shadows. The tree lines act as a shade in the summer and let light through in the winter. The circus ground is encircled by additional trees, while sitting half a meter lower, creating a threshold.

simulation using Forma



drawing in combination with work by Nino, Prajwal, & Tarini

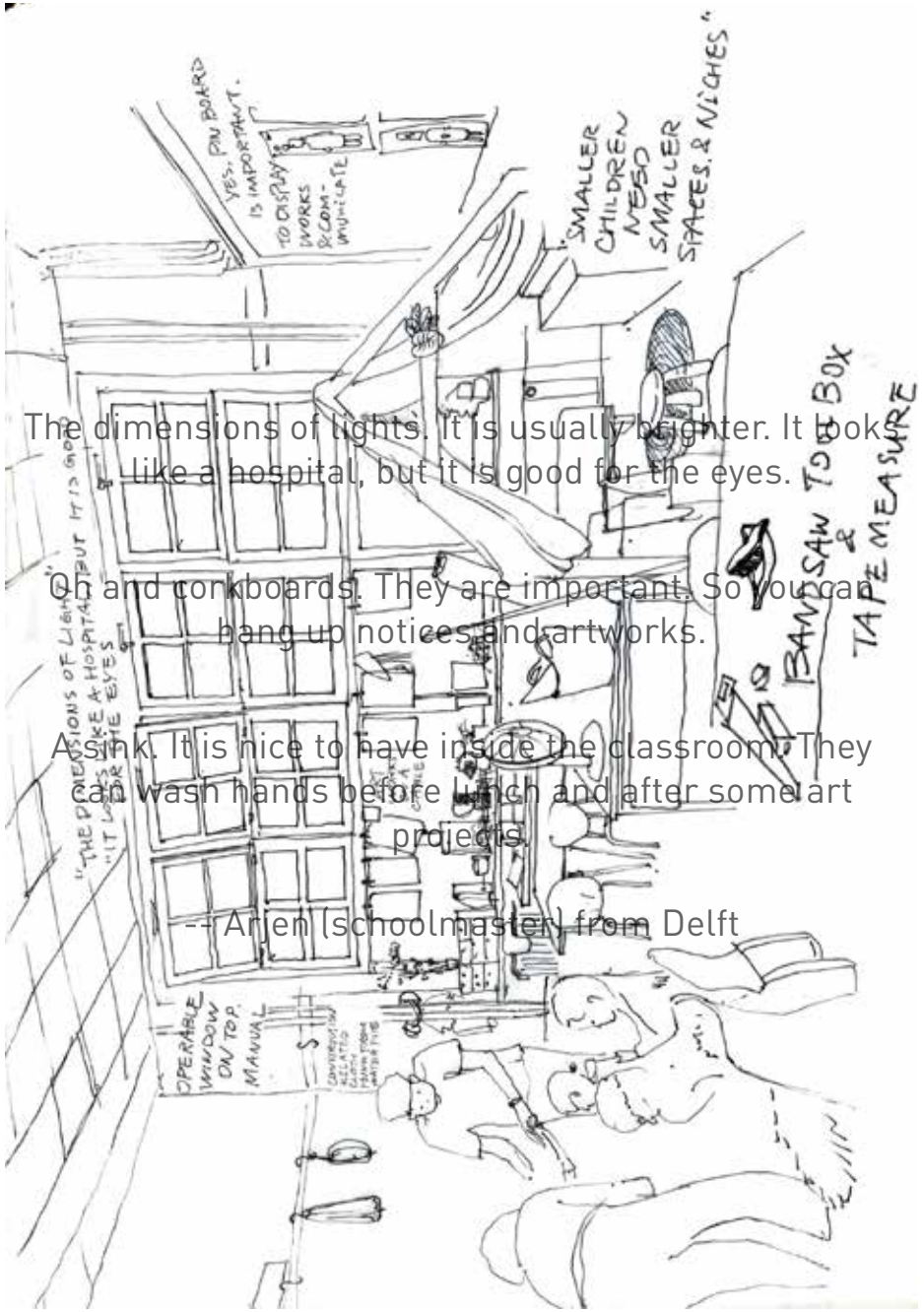
3 fieldwork: micro-climate of a primary school

large vs. **small** spaces
collective vs. **individual**
loudness vs. **silence**
agitated vs. **calm**
discovery vs. **comfort**
freedom vs. **boundary**
active vs. **static**
light vs. **dark**

In this research, the concept of micro-climate is extended to the micro-environments and atmospheres within the primary school. Through interviews and fieldwork, I developed a set of duo's. The duo's of adjectives above are describing atmospheres, moods, emotions, activities, and tangible physical spaces within a primary school. Sometimes these atmospheres are already materialized inside the primary school, while others give potential to new designs.

Another extremely sophisticated control action was observed when teachers would manipulate the envrionment of a classroom to create an appropriate ambience for a particular lesson, but, in contrast, a cosy, womb-like state was created for story telling to young children... the observation reveals a level of environmental subtlety that has not been comprehended by orthodox comfort theory.

-- Hawkes & McDonald & Steemers, 2002

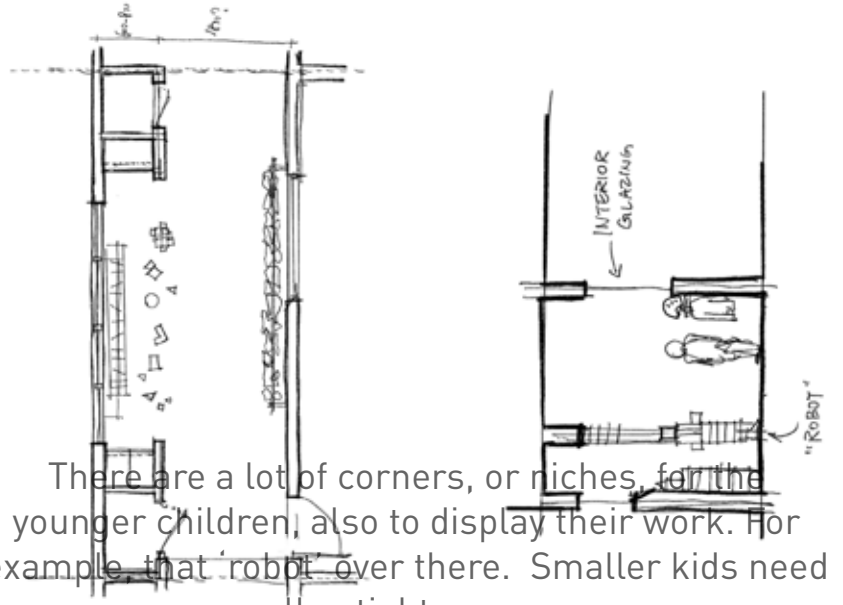


The dimensions of lights. It is usually brighter. It looks like a hospital, but it is good for the eyes.

Oh and corkboards. They are important. So you can hang up notices and artworks.

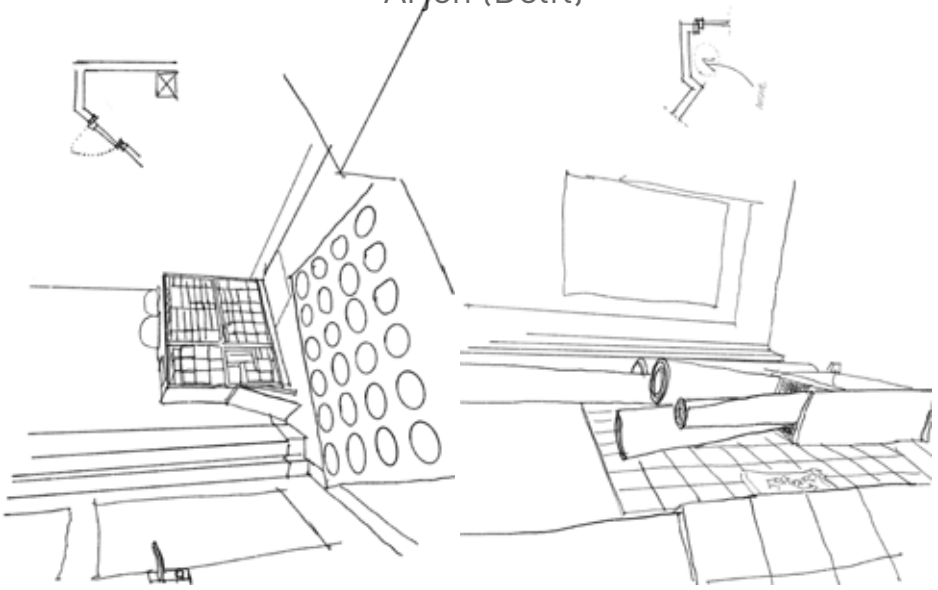
A sink. It is nice to have inside the classroom. They can wash hands before lunch and after some art projects.

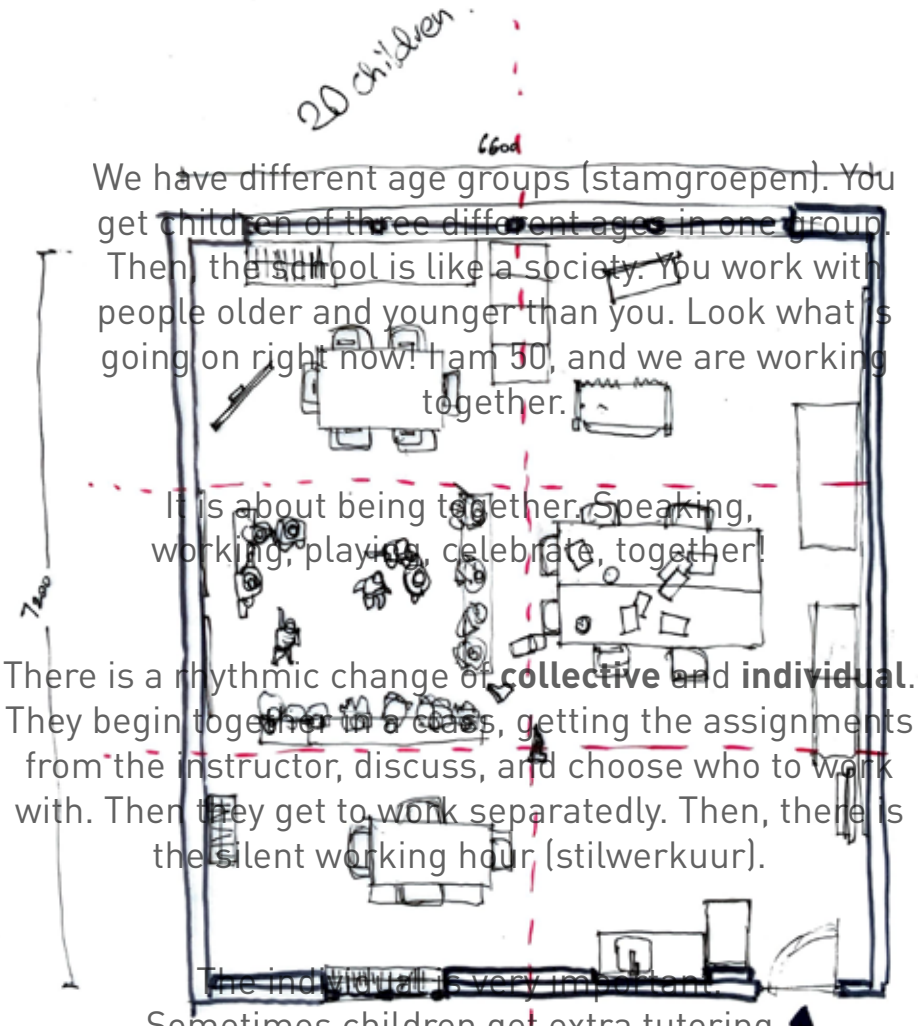
-- Arjen (schoolmaster) from Delft



There are a lot of corners, or niches, for the younger children, also to display their work. For example, that 'robot' over there. Smaller kids need smaller, tighter spaces.

-- Arjen (Delft)





rough plan of a classroom during a class

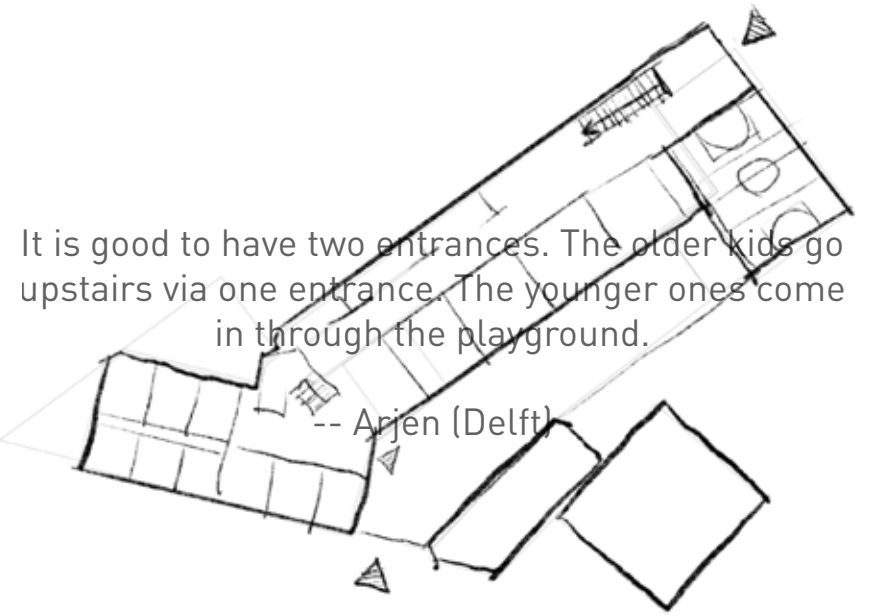
We have different age groups (stamgroepen). You get children of three different ages in one group. Then, the school is like a society. You work with people older and younger than you. Look what is going on right now! I am 30, and we are working together.

It is about being together. Speaking, working, playing, celebrate, together!

There is a rhythmic change of **collective** and **individual**. They begin together in a class, getting the assignments from the instructor, discuss, and choose who to work with. Then they get to work separatedly. Then, there is the silent working hour (stilwerkuur).

The individual is very important. Sometimes children get extra tutoring (bijles). Extra attention for individual. You would then also need extra space for this purpose.

Delft Oostpoort primary school



rough plan of primary school Oostpoort

It is good to have two entrances. The older kids go upstairs via one entrance. The younger ones come in through the playground.

-- Arjen (Delft)

Delft Oostpoort primary school

Parents have an active role in the school and the education. It is expected from them. When we enroll the children, we made it clear that the parents also become part of the school. We are not only taking in the children, we are also taking in the parents.

-- Arjen (Delft)

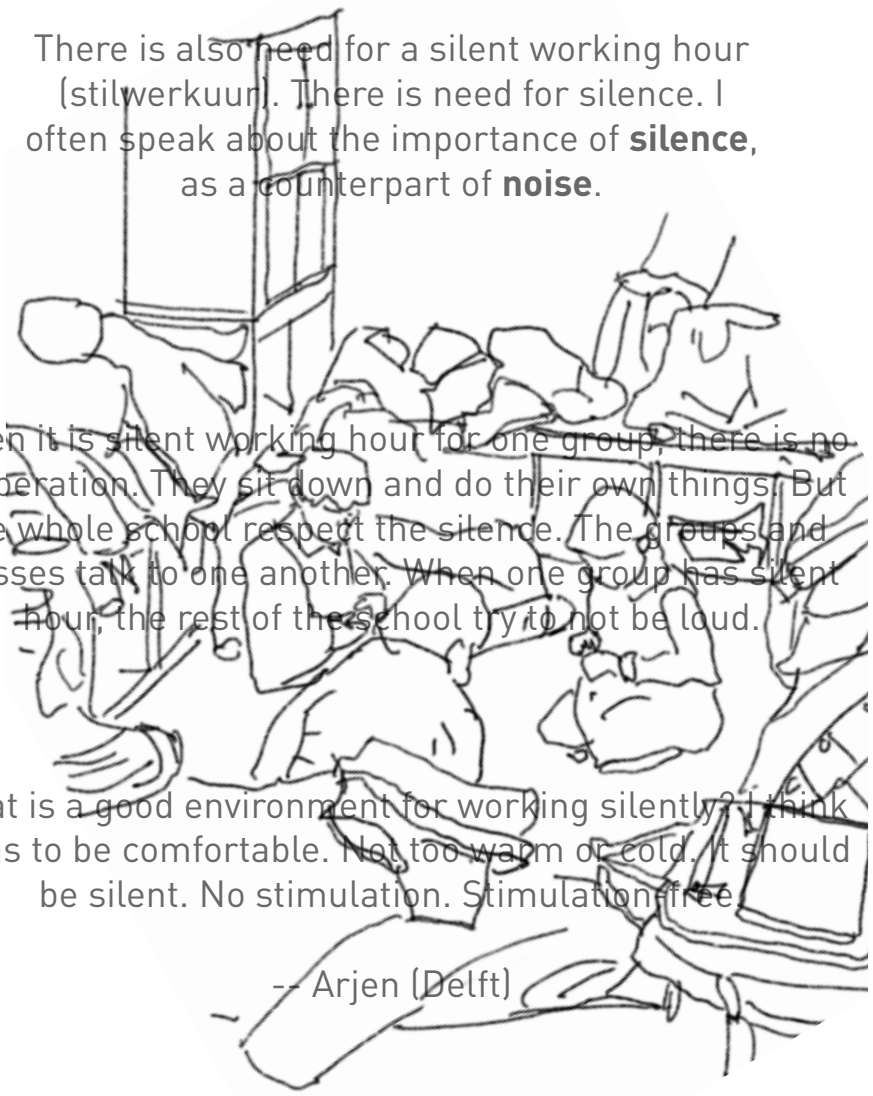
Primary schoolHendrick Concience, Brussels

When you have such a location (Friche Josaphat), I wonder how often the school visits it? Children needs discovery spots. Outdoor classes could also be a good idea. Smaller kids don't understand a whole lot, but they always benefit from a rich environment.

-- Arjen (Delft

Primary schoolHendrick Concience, Brussels

There is also need for a silent working hour (stilwerkuur). There is need for silence. I often speak about the importance of **silence**, as a counterpart of **noise**.



When it is silent working hour for one group, there is no cooperation. They sit down and do their own things. But the whole school respect the silence. The groups and classes talk to one another. When one group has silent hour, the rest of the school try to not be loud.

What is a good environment for working silently? I think it has to be comfortable. Not too warm or cold. It should be silent. No stimulation. Stimulation free.

-- Arjen (Delft)

Today they are going to a library. A library that is cooperating with us.

They start reading exercises when they are 6. The toddlers do puzzles, games and so on.

All year-round children makes little projects, booklets, posters, and writings. It does somewhat change with the seasons. In spring, for example it will be more about birds and things.

-- Arjen (Delft)

Gardening is also a good idea. For kids that are 10-11 years old. Because the 12-year-olds need to prepare for the middle school entry. The smaller children, toddlers, can also garden. However, they don't have much time and space conception. If they see a snail on the ground before they leave their home, and another snail on the ground when they reach school, they would think the snail has followed them the whole way. So for them, they will not understand the growing aspect of the plant. The tactical aspect, though, the digging, the insects, is great for the toddlers.

-- Arjen (Delft)

Primary school Hendrick Concience, Brussels
Primary school Communal No. 17 Brussels

Building a structure together? That is also very possible. They will learn to cooperate. But the toddlers won't last very long in such a project. They will quickly get tired, or distracted.

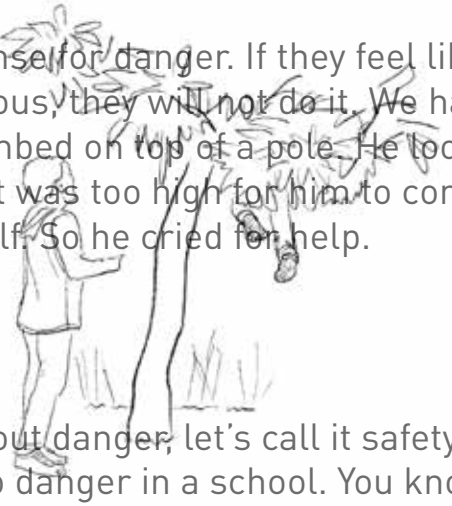
Chalk & tiles

It's about being life-like. Building something, doing, instead of learning from books. We also get help from parents, about science.

Playing with a broomhead.

-- Arjen (Delft)

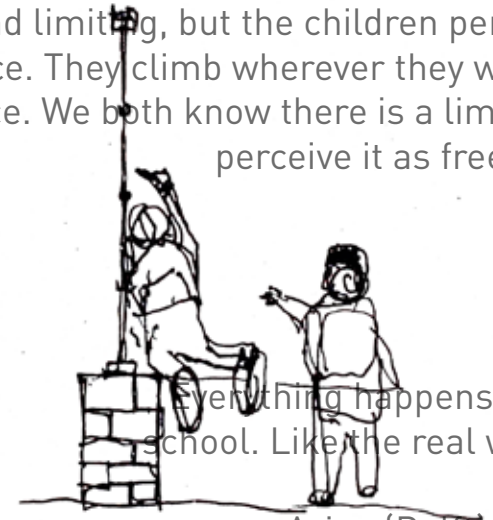
Delft Oostpoort primary school



Children have a sense for danger. If they feel like something is dangerous, they will not do it. We had a kid one time who climbed on top of a pole. He looked down and decided it was too high for him to come down himself. So he cried for help.

Parc Albert, Brussels

Rather talking about danger, let's call it safety. Because there is no danger in a school. You know the fences around the playground. We call it freedom vs. boundedness. Or a "fake freedom". It is safe, and limiting, but the children perceive it as a free space. They climb wherever they want to, even on the fence. We both know there is a limit, but the children perceive it as free.



Everything happens in a school. Like the real world.

-- Arjen (Delft)

Delft Oostpoort primary school

There is also such thing as "excitement level". Sometimes a kid is agitated. Some schools classify this level with colors, from green, most calm, to red, most agitated. When a children is at an orange, let's say, the teacher would ask him/her, would you like to go to the green corner for a while? That is the calm corner.

Terdelt, Brussels

The children have projects, and cognitive courses. These are the writings, readings, the ones you know already. The younger children learn with tactility. Something they can touch and play with.

-- Arjen

Delft Oostpoort primary school

"a concern for the visual and a disinterest in the complete experience of nature"
– Hill J., 2012

Primary school Communal No. 17, Brussels

But again, it is about being in the real world. Learn about the seasons by experiencing them, and not reading it off a book.

-- Arjen

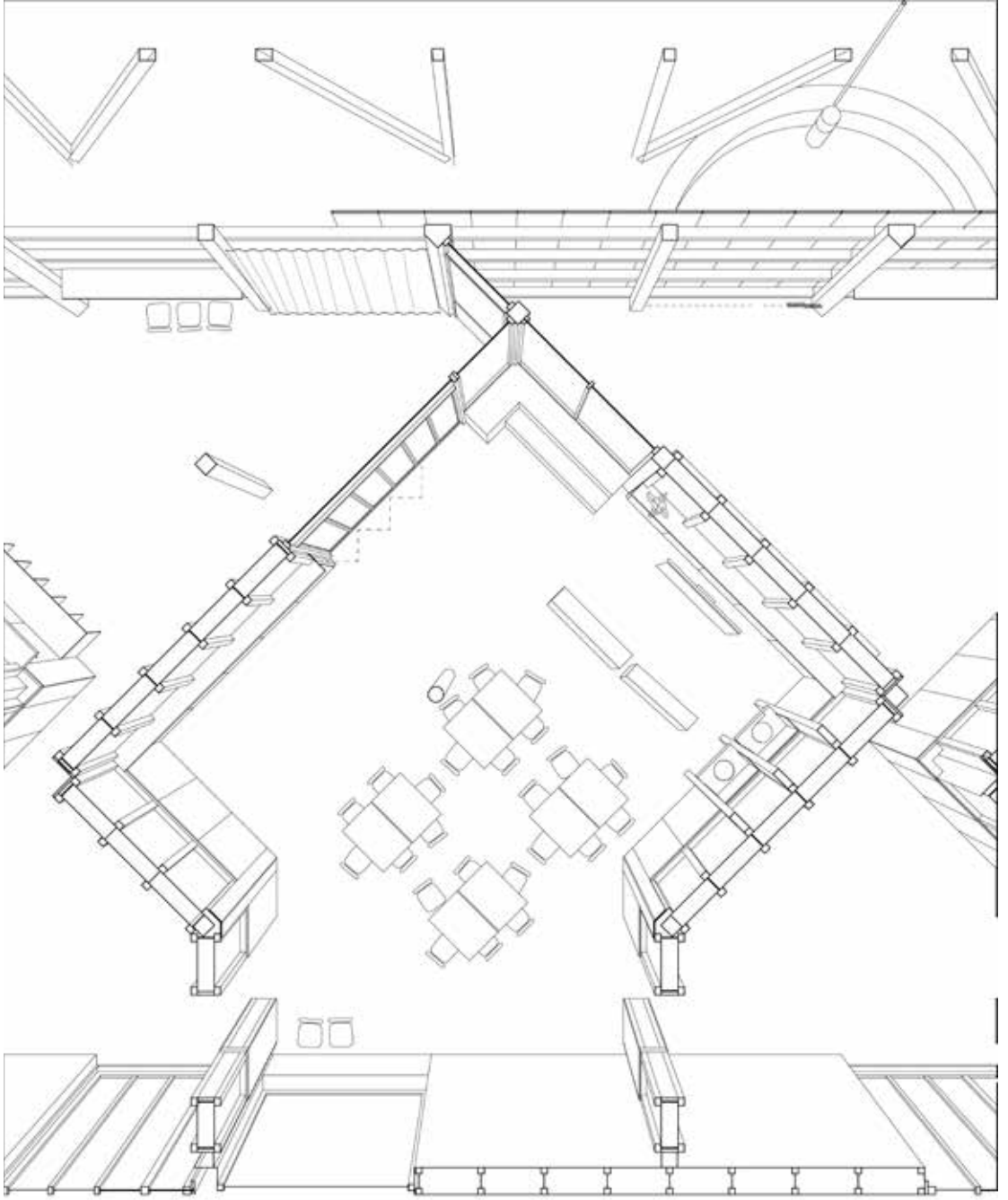
Primary school Communal No. 17, Brussels

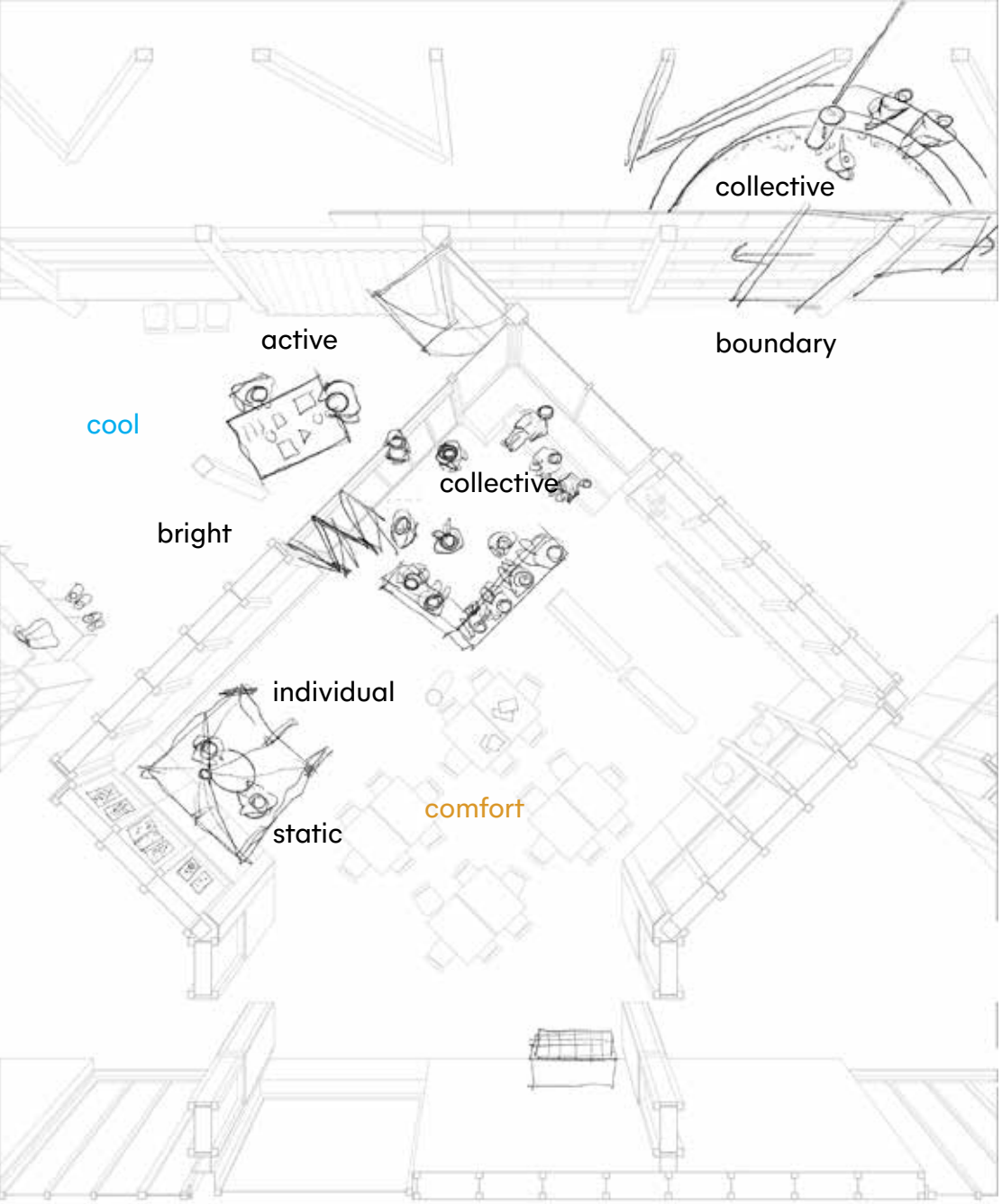
5 intergration

The result of the research of the primary school and classrooms is then applied to the design project.

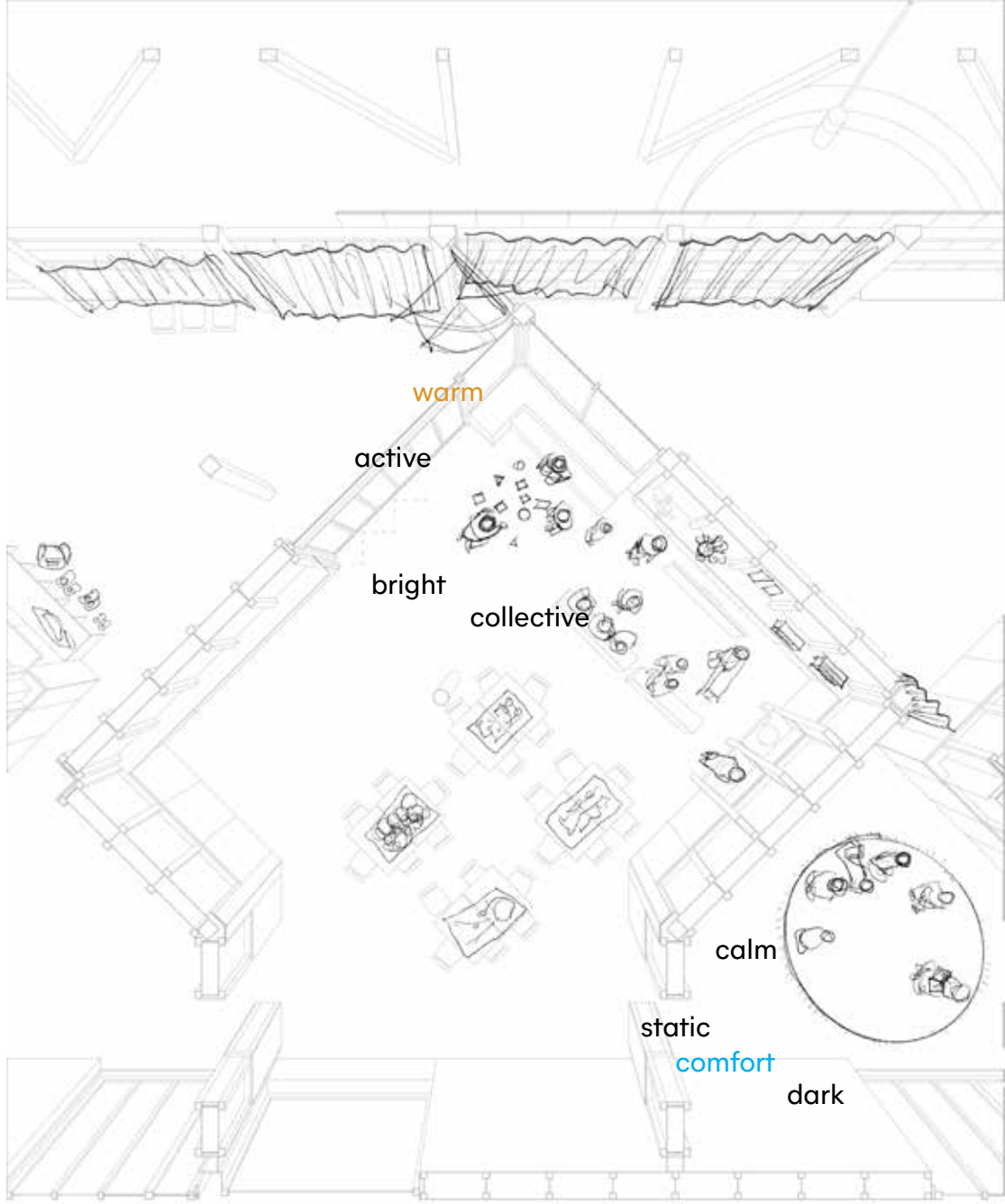
The drawing format chosen is a perspective floorplan, which shows the layout, the space, but also the human activities inside, the landscape outside, and the construction that enable the activities.

This plan is then filled in with conclusions, atmoshperes, and quotes resulting from the research. This drawing will explore how the floorplan and use changes through different weather conditions and seasons. It becomes a mean to test the design, but also form basis for further redesigning and improvement.





In situation where the 'greenhouse' side is a bit cold, active education takes place such as group play. If it becomes warmer, the folding glass door opens completely, and the collective space move to the semi-outdoor. The classroom itself is left with more individual, static activities, and a stimulation-free environment.



In hot weathers, the blinds are down, and the facade looks like a boundary. Children move inwards. The classroom becomes the collective space, with lots of light, supporting visual activities. While the back rooms become more comfortable due to its cooler temperature, it becomes a womb-like space perfect for a story-reading.

5 reflection

Looking back, the exploration of my graduation project started with the question of aesthetics. I asked myself the question of why certain types of buildings, images, materializations speak to me more than others. Instead of crediting all of this to "a matter of taste", I began the search of what lies behind my resonance with the kind of aesthetics. Just as argued in Ecology & Aesthetics that aesthetics is, in the end, an ethical question, it became clear that the answer I was looking for was an ethical position that I subconsciously took (for granted). The following month-long literature study is a search and connecting the dots, which then helped me formulating my position in the architectural discourse.

Like many other students, I was drawn to "frictions", which are the points where users of the city and architecture materialize their agency and will. Human traces, appropriations, and use seem to be the themes of many of my site observations during the first quarter. And especially what kind of architectural space accommodates this kind of agency. In the first quarter, I was particularly interested in private homes in the Garden City, observing how similar houses set the stage for drastically different desires and needs. I was enchanted by the communal gardens, growing out of the tiny gap between the city and the Friche. Humans are like plants, and the city is like stones. If we just leave a small "space in between", life can thrive. Reading into the Smooth City, I learnt about the effect of capital on diminishing such agency and will. Smooth city prioritizes efficiency and the transfer of information & capital and exacerbate inequality. Reading into Richard Sennet and William H. Whyte's urban theories, I couldn't help but notice that many authors are advocating a similar image but through different perspectives.

What other perspectives can this same smoothening be applied to? This was the first turning point in my search for a topic. Being confronted with the climate & energy crisis and global inequality, I came to the conclusion that the problem of "smoothening" is the same mindset and phenomenon that is sustaining our problems, meaning that frictions in modern human life are not confronted but smoothened over, usually with the help of capital and technology. When there is a surplus, there is a deficit. The consequence of the smoothening is imposed on the less powerful side of this balance sheet. Behind the thousands of sensors equipped in a LEEDS-certified building are the exhausted mines and exploited labourers. Everything is connected, I realized, which coincides with the already long-established ecological school of thinking in architecture.

With the strong studio theme of nature and ecology, I took another step and studied architecture's effect on smoothening local climate at the expense of global climate. At this point, my vision for what my research can become is still vague. Perhaps I was so caught up in critiquing instead of turning it into something more productive.

D. Barber and J. Hill both advocated for a different kind of architecture that enables a different relationship with the climate and fossil fuels. Barber questioned the idea of comfort as taken for granted. Hill talked about climate and weather as an experience and the reverence for the natural world. A permeable building instead of a hard shell became my vision for what I want to create. However, to what degree should buildings be vulnerable to climate and nature? Even with the energy crisis as the flag of morality, how far can one go without becoming a romanticizer of friction?

The group study during quarter 1 showed me my first interest in in-between spaces, that is the wintergardens and backyards we have studied. They are daily examples of a more permeable space facing towards climate and nature, in the context of Brussels. I then read about traditional Japanese houses, regardless of being built in a cold climate, are not insulated nor double-glazed all-round as opposed to Western principles of sustainable buildings, despite having lower energy consumption. At this point, I am getting hints of what the architecture of my creation would look like, a core and a permeable shell, with space in between. However, I still struggle to produce new insights. How can these theories and precedents go beyond being a reference? Atelier Bow Wow inspired me to produce a series of window behaviorology drawings, trying to see

windows as an important intersection of humans and climate. I did not get any information other than human's need to operate and take charge of their comfort, and how architecture sometimes fail to accomodate that.

At roughly the same time, I decided to design a primary school for the design location. No better place to design for a new mindset and new habits than a primary school, I thought, enthusiastically.

This design decision gave me a new research direction. I decided to step foot into a primary school and see if I could find something. I hadn't given up on my search for human interaction with climate, but this vague definition did not help me get the insights I wanted. Through observations, photographs, and interviews with the schoolmaster Arjen, I learnt many things which have nothing to do with the climate or architecture. I learnt about pedagogical visions, daily activities, classes, and even the cognitive abilities of children of different ages. At first, I was almost disinterested in this information. I tried to ask him questions based on my presumptuous thoughts, ones like "Do children's activities change with the season" or "Do you think that some education activities can take place in cooler/warmer spaces".

This is when I realized that the interwoven triad of architecture, humans, and nature, so embedded in Atelier Bow-Wow's drawings and research, came from the study of each separately. This became a valuable framework for my project, where I studied the three separately, and in an attempt to weave them back together. This is what the project is about, research of real primary schools in Delft and Brussels, a site study of local climatic and natural elements, and at last, an architectural project that brings them together.

My earlier exploration of the problem of smoothening, was it still relevant? The way I see this project, it is one of the answers to what a non-smooth solution looks like to the big questions of climate and energy. By recognizing the diversity and nuance in daily activities, we can create different in-between spaces that

accommodate these nuances. The built environment becomes an oscillating experience through time and space, instead of one big smooth surface that upholds a universal standard. The selective approach to comfort, climate, and atmospheres, therefore, becomes productive for specific human activities and reduces overall consumption.

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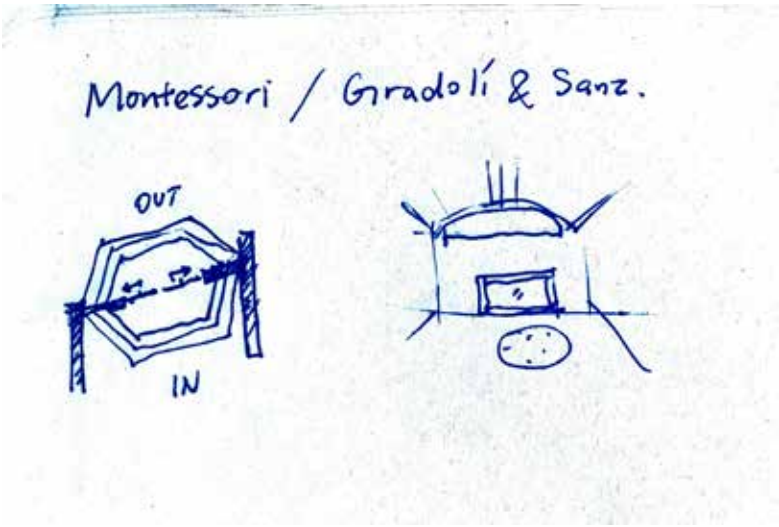
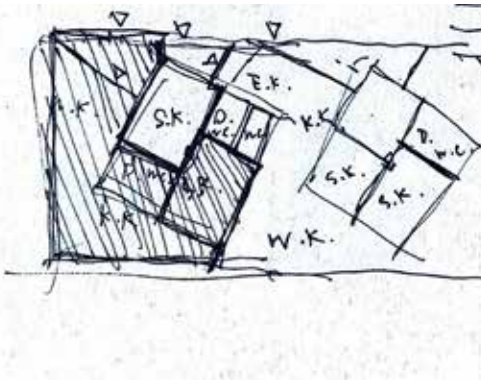
appendix: reference studies

montesorri school/ grandolí & sanz

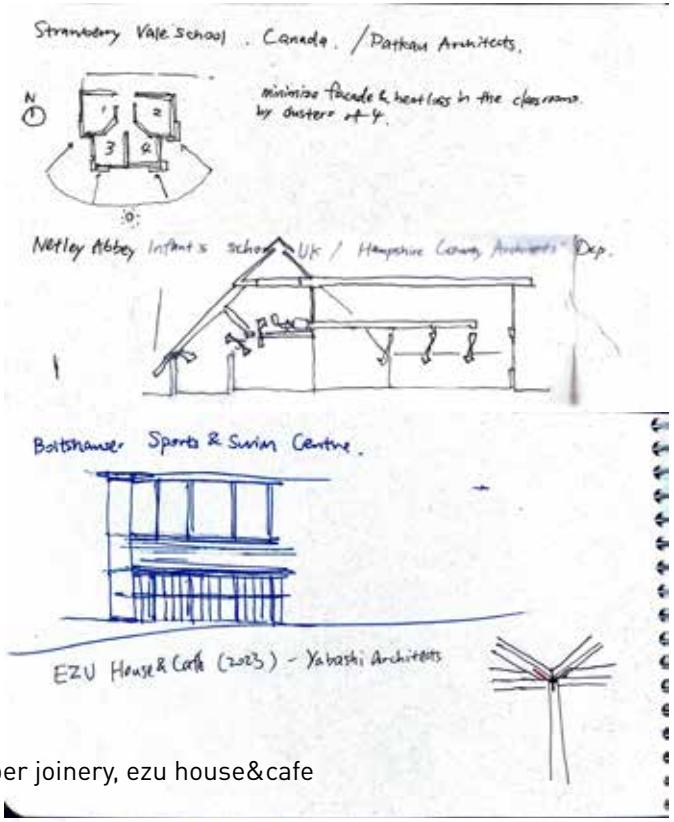


grillo-vasiu-papadimitriou
housing with rotated square floor plan

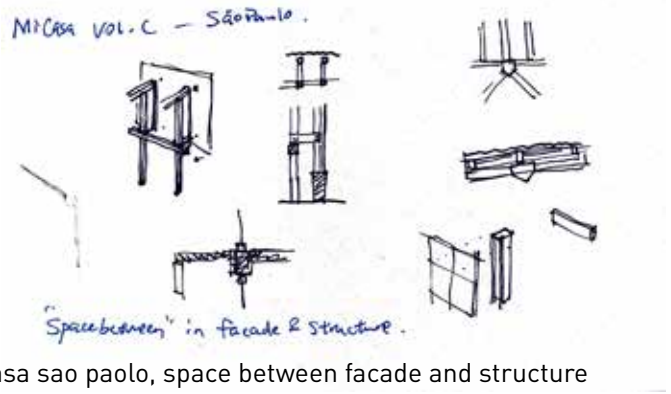


strawberry vale school, case study on sunlight and heat

netly abbey infant's school, case study on natural ventilation



timber joinery, ezu house&cafe



micasa sao paolo, space between facade and structure

appendix: embodied study of inner comfort

22.3C 46%RH

crowded studio space downstairs, winter

21.7C 47%RH

crowded cantine, winter

21.5C 52%RH

crowded cantine, winter

21.2C 52%RH

less crowded cantine, winter

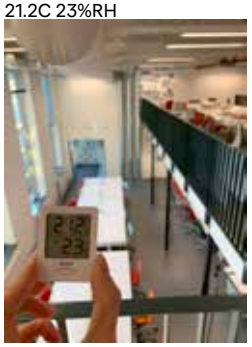
22.3C 48%RH

model hall, winter

22.9C 46%RH

crowded studio, winter, rainy

21.2C 23%RH



empty studio, winter, sunny

19.8C 36%RH

arriving early morning in the studio, winter

22.5C 33%RH

18.4C 39%RH

double height studio space, ceiling vs. ground temp. (window open)

appendix: selected quotes from literatures

"We humans are thrown to earth, wandering where we do not belong, struggling to embed ourselves." – Heidegger. M, 1927, as cited in Auret. H, 2019

"Lines began to be drawn – on the land and in human minds. With the first houses and villages, previously non-existent borders and distinctions emerged: those that discriminated between interior and exterior spaces, and that which opposed the human domain to a 'nature' that was now kept at a distance." -- Marie Cazaban-Mazerolles & Julien Claparede-Petitpierre

"Think of themselves in an antagonistic relationship with an environment redefined as savage and which from now on had to be controlled and dominated." -- Paul Shepard

"This vision and production of the air-conditioned future also imagined a specific kind of human, occupant, inhabitant, or user" – Barber D. A., 2020

"They occupy but they do not dwell." -- Richard Sennett

"become passive consumer of spectacles." -- René Boer, 2023

"Imposed or self-imposed erasure of complexity, and the collective process of becoming." -- René Boer, 2023

"Easy unity of exclusion" rather than "difficult unity of inclusion" – Venturi, 1966:16

"a concern for the visual and a disinterest in the complete experience of nature" – Hill J., 2012

"Preventing us from detecting (seeing, hearing, smelling, tasting, feeling) a fuller range of the non-human powers circulating around and within human bodies." -- Jane Bennett

"Humans are the ones who cultivate or take care of things." – Heidegger. M, 1927, as cited in Auret. H, 2019

"Making derived from dwelling ... The care ... show that people have taken ownership." -- Richard Sennett, 2018

"In a spirit of modesty." -- Richard Sennett, 2018

"Continually constructed through the varied perceptions of those who engage it ... a habitat waiting to be." -- Dirk van den Heuvel, Janno Martens, Victor Munoz

"A city that continues to give form to desires." – Calvino I., 1997

"Address the power of unplanned nature." -- Ernst van der Hoeven

"A crossroad enabling interactions, as an interface connecting multiple environments." -- Junya Ishigami, 2019

"a tree, a mediating element between the small-scale world of insects, the scale of the human body, that of larger animals, and the territory" -- Junya Ishigami, 2019

"It is no longer possible to experience the first nature as an independent entity devoid of human intervention" – Hill J., 2012

"complex combinations of the new and the old, the natural and the man-made; each has its respective energies and weathers, which inform and affect one another" – Hill J., 2012

"some loss in environmental comfort is amply compensated by, and even necessary to, a more complete experience of nature and weather". – Hill J., 2012

"energy efficiency does not lead to a reduction in energy use because comfort standards may rise as a result. active rather than sedentary engagement with the environment." – Hill J., 2012

"A sustainable culture of repair and reuse means recognizing that resource on earth is limited." – Hill J., 2012

"As a register of climate and weather, a building is a means to understand, expose and develop the nuances of regional and local contexts, especially when and where they impact on conditions of use." – Hill J., 2012

Barber D., 2020

"can architecture induce habits that activate a different relationship to fossil fuels?"

"Habit occurs, at least in some instances, when it becomes spatialized, instantiated, built – in a word, when it becomes architecture"

"Habit occurs when understanding becomes so strong that it is no longer reflected, when an action is so free that it anticipates and escapes will or consciousness, or when a being's repeated actions assuage its own needs."

"The building becomes an object of study as a space for habitual engagements with climate"

appendix: selected quotes from site interviews

People are moving away from nature, now they are
being led by machines Do you want to drink something?

"That's human. Its stupid eh. Instead of building here and leaving nature there, we destroy and then we plants some flowers which I put in the house and then I add some bonsais. No but that's the architecture of tomorrow: nature is there and we adapt." -- Roy from Schaerbeek

I try to recycle and not waste. I try to not overconsume water or electricity. I don't have a particular relationship with nature. I know there are people who are very close to it. I try to respect it as I think it's the future.

Who does not like nature. I come from Africa and we grew up in nature. There, pre primary was in nature. Our school was in the forest where we played and then we came back.

. I spent time with children who were watching
the forest on TV and they had the forests outside.

appendix: selected quotes from primary school interview

The dimensions of lights. It is usually brighter. It looks like a hospital, but it is good for the eyes.
All year-round, children makes little projects, booklets, posters, and writings. In spring, for example, it will be more about birds and things.
It's about being life-like. Building something, doing, instead of learning from books. We also get help from parents, about science. Here is a model of the windmill and how it pumps water.
The younger children learn with tactility. Something they can touch and play with.
The children have projects, and cognitive courses. These are the writings, readings, the ones you know already.
It is good to have two entrances. The older kids go upstairs via one entrance. The younger ones come in through the front.
There are a lot of corners, or niches, for the younger children, also to display their work. For example, that 'robot' over there.
Oh and corkboards. They are important. So you can hang up notices and artworks.

We have different age groups (stamgroepen). You get children of three different ages in one group. Then, the school is like a society. You work with people older and younger than you. Look what is going on right now! I am 50, and we are working together. It is about being together. Speaking, working, playing, celebrate, together!
There is also need for a silent working hour (stilwerkuur). There is need for silence. I often speak about the importance of silence, as a counterpart of noise.

A sink. It is nice to have inside the classroom. They can wash hands before lunch and after some art projects.
Parents have an active role in the school and the education. It is expected from them. When we enroll the children, we made it clear that the parents also become part of the school. We are not only taking in the children, we are also taking in the parents.
Today they are going to a library. A library that is cooperating with us.
It is comfortable and warm in here. (23C). But of course it is colder in the gym hall. It is a bigger space that is more difficult to warm up.
There are always social trends. And the social trends come inside the primary school too. The one now, as you probably can guess, is inclusivity. The idea that everyone is welcome.

When you have such a location (Friche Josaphat), I wonder how often the school visits it? Children needs discovery spots. Outdoor classes could also be a good idea. Smaller kids don't understand a whole lot, but they always benefit from a rich environment.

What is a good environment for working silently? I think it has to be comfortable. Not too warm or cold. It should be silent. No stimulation. Stimulation-free.

Gardening is also a good idea. For kids that are 10-11 years old. Because the 12-year-olds need to prepare for the middle school entry. The smaller children, toddlers, can also garden. However, they don't have much time and space conception. If they see a snail on the ground before they leave their home, and another snail on the ground when they reach school, they would think the snail has followed them the whole way. So for them, they will not understand the growing aspect of the plant. The tactical aspect, though, the digging, the insects, is great for the toddlers.

Building a structure together? That is also very possible. They will learn to cooperate. But the toddlers won't last very long in such a project. They will get tired, or distracted, very quickly.
But again, it is about being in the real world. Learn about the seasons by experiencing them, and not reading it off a book.

The individual is very important. Sometimes children get extra tutoring (bijles). Extra attention for individual. You would then also need extra space for this purpose.
They start reading exercises when they are 6. The toddlers do puzzles, games and so on.

Children have a sense for danger. If they feel like something is dangerous, they will not do it. We had a kid one time who climbed on top of a pole. He looked down and decided it was too high for him to come down himself. So he cried for help.
Rather talking about danger, let's call it safety.
Because there is no danger in a school. You know the fences around the playground. We call it freedom vs. boundedness. Or a "fake freedom". It is safe, and limiting, but the children perceive it as a free space. They climb wherever they want to, even on the fence. We both know there is a limit, but the children perceive it as free.
Everything happens in a school. Like the real world.
Look. They put everything in this box. Their lunch, bags, jackets.

There is a rhythmic change of collective and individual. They begin together in a class, getting the assignments from the instructor, discuss, and choose who to work with. Then they get to work separatedly. Then, there is the silent working hour (stilwerkuur).

There is also such thing as "arousal level". Sometimes a kid is agitated. Some schools classify this level with colors, from green, most calm, to red, most agitated. When a children is at an orange, let's say, the teacher would ask him/her, would you like to go to the green corner for a while? That is the calm corner.
When it is silent working hour for one group, there is no cooperation. They sit down and do their own things. But the whole school respect the silence. The groups and classes talk to one another. When one group has silent hour, the rest of the school try to not be loud.