

The background of the entire page is a white field with a fine, light gray dot grid. Overlaid on this grid are numerous black shapes of various sizes and forms. Some are simple circles, while others are elongated, irregular, or resemble organic, cell-like structures with multiple lobes. The shapes are scattered across the page, creating a complex, abstract pattern.

**Architecture of  
the Forest**



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Architecture of the Forest/Skogens arkitektur

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# Architecture of the Forest

Jonathan Hellsten

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# Architecture of the Forest

Can we develop buildings that hold  
the qualities of the forest?

Sunlight is filtered through the web of branches giving an airy feel to the forest stroll. A soft floor and a light ceiling supported by majestic pillars encloses us in one of the most spectacular places nature has to offer. A homogenous place, yet with variations in scale, texture and spaces. In one hand, an aggregation of small parts into a whole, on the other, clearly differentiated, strong objects.

A journey from a site survey in the southern boreal forest of Sweden to an urban housing strategy aimed for dense cities where greenery is sparse. Spatial qualities is measured and analysed to drive a design that inhabits the same qualities as the forest. Primarily the design is to hold spatial and aesthetic qualities of the forest, giving a sense of being in the forest to urban dwellers. But as a bi-effect it could possibly affect humans psychosocially. Living close to forest areas have proven to effect stress levels, children's cognitive development and expected life length (Kuhn et al. 2017).

1

# Introduction

My interest in doing this project lies in the diffuse nature of the forest. How the forest is perceived as one large envelope and at the same time as many solitary objects in different scales. How spaces float into other spaces. Seemingly open but somehow defined by vegetation and tree trunks. How light alternates between focus and diffused. Tree crowns blending into each other, creating bigger roofs and fading out towards the sky. The list of qualities the forest inhabits goes long and everybody has their own understanding of what the forest is to them. Hopefully this will be a truthful translation of mine.

||



## Problem statement

### Can we develop buildings that hold the qualities of the forest?

In large cities, green areas comes up short against a rising level of need for housing in urban areas. What if they could merge and use the same space? If we could build housing that hold the qualities of the forest, it could become a hybrid of residence and nature. Neither house nor forest but a synthesis of both.

How can we create variation and uniqueness inside a system? Just like the forest has a clear structure but still are able to continuously create variations. Can buildings do that too? If we plant a pine tree, we know what it will be but not exactly how it will look.

How can aggregation of simplicity create complexity? The sum of what many small can create is something we see looking at the forest in many diferent scales. Leafs creating a crown, trees creating a forest. In this project I would like to see how this can happen in a architectural project. What if something very simple could repeat into something complex?

III

## Topicality

There is strong psychological evidence of the benefits of living close to the forest. In a study of urban dwellers it was found that living close to forest land is linked to a better processing of emotions such as fear and anxiety. This would make people living close to the forest better prepared to cope with stress. Other research has linked access to green space to longer lives, lower levels of aggression, and kids' cognitive development (Kuhn et al. 2017).

If we can create a type of housing that hold the qualities of the forest, then living in or close to that site could possibly give the same effects. It has shown to be most effective if you live 250m from a forest area although the effect reaches as far as 1000m. This solution is primarily aimed for cities with low green area. There we can seek to find small, left-over plots leaving holes in the urban weave. Filling these holes with housing that holds the qualities of the forest and spreading its effect on the entire neighborhood. (James et al. 2016)

IV

# Method

## Site Survey

A site survey is carried out in the forest. Dimensions are registered and photos taken. Drawings of the site is developed. Using tools familiar to the architect as section and plan to get basic knowledge of dimensions and spaces.

## Site Analysis

Initial drawings is analysed. Diagrams is developed based on plans and sections to further understand the sites qualities. The qualities analysed in this step is the aim for the final project design to inhabit.

## Information Driven Design

A site for implementation is chosen. Then, data and knowledge from previous steps are used to drive the design. First, using parametric design to create an overall volume, then developing the design by all means necessary... Backtracking to original site survey and analysis is of biggest importance to make sure final design holds the desired qualities.

v

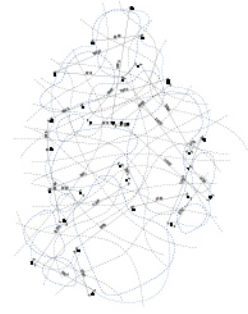
# Process



Forest Research



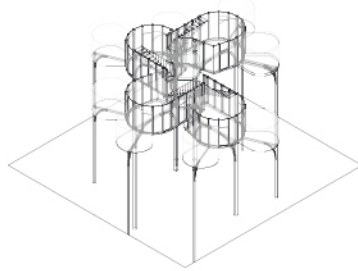
Site Survey



Site Survey



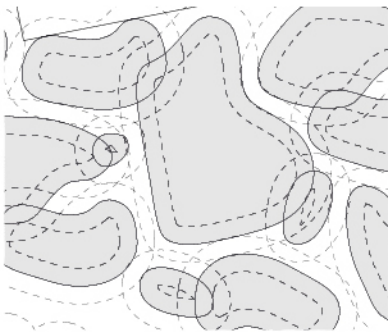
Earlier Design



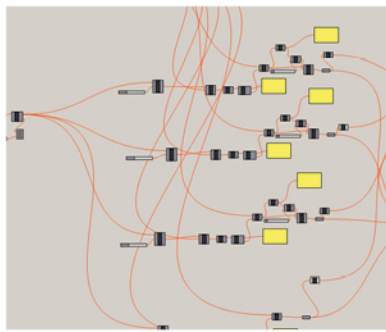
Earlier Design



Watercolour structure test



Earlier Design



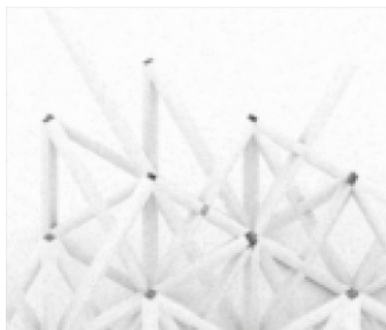
Grasshopper Workshop



Implementation Site



Earlier Design



Dematerializing



Final Design



I

## Forest Research

The project starts with an overall research of the Swedish forest. What types of forest is there, in what specific areas, and how is it layered.

II

## Site Survey

A site survey is carried out in the forest outside Borås. A site of 715m<sup>2</sup> with 27 trees. Dimensions is registered and photos taken. Drawings of the site is developed

III

## Site Analysis

The information is analysed, mainly using plan and section as tools. Diagram by diagram understanding the site and its qualities better.

IV

## Theory

Ideas about the projects start to form and theory is read to feed into the ideas. Theoretical input follows the entire process but this is the primary time for it.

V

## Implementation Site

Searching for a location to realise the project, green area in larger cities are studied. A city with low green area - Milano is selected. 30 small, left-over sites, "urban slots" are defined for the project to be realised in. One of them is chosen to use for developing the design.

VI

## Site Analysis

The site chosen for implementation is analysed. Drawings and model is developed. To keep focus on qualities from the forest, not too much attention should be paid to the conditions of the implementation site.

VII

## Parametric Design

Parametric design with Grasshopper is introduced as a tool for translating the dimensions from the forest into a building volume on the selected site. This period starts with one week of introduction to Grasshopper.

VIII

## Design Development

Final stage is developing the design. This is the longest period and not necessary a linear process. Backtracking to original site survey and analysis is of biggest importance.

VI

# Theory

The theory studied in this project gradually changed as the project progressed. When I started I was very focused on the final design being some kind of system. A translation of the forest that somehow could grow by itself after I set up the rules for it to play by. Therefore it felt natural to start with the book *Project Japan*. A deep dive into the minds of Metabolists and the way they perceive the city. A great book and an interesting period. It did however hold me back quite a bit, struggling with how I could manage to create group form without making a megastructure (as many of the metabolist did). Especially vertical connection points always drew me towards a megaform. I wanted autonomy for my design and wasn't able to achieve it. I also floated away from my main topic of the forest qualities, focusing more and more on "solving" the system...

I was suggested some topics by my tutor and so I went on to read *Architecture Without Architects* and *Investigations Collective Form* by Fumihiko Maki. Very similar to the metabolist in their search for system. Of course Maki being (almost) considered a metabolist. But if the metabolists go futuristic in their search for systems in architecture, these books looked at vernacular architecture.

As the project progressed I returned to reading Fujimotos *Primitive Future* and books by Junya Ishigami. Two architects I've admired over the last couple of years that deal with very similar questions as what I did. They came to me almost as a reminder of the qualities I set out to create in this project. The freedom in the way they both design gave me the key to letting go from some more systematically, mechanical ideas more inspired by metabolism theory.

For this project I've studied two things about the forest that did not come directly from the site survey. First an overall understanding of the forest in Sweden, types, regions etc. Secondary the psychosocial effects living close to nature can give.

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VIII

## The Forest

### **The Beautiful Forest**

Sunlight is filtered through the treetops and enlightens the forest during the day. A soft floor and a light ceiling supported by majestic pillars encloses us in one of the most calming places nature has to offer. A homogenous place, yet with variations in colour, texture and spaces as far as the eye can see.

You choose the paths you wish to walk between the thousands of trees. The ground, suited for walking speed keeps you focused with its variations. Here we can meet and be at the same level as other animals. We tread lightly, knowing that this is a home we share with many others.

The beautiful forest has a place in culture just as the scary one. Many artists have been drawn to the forest through the years. Famous names such as Van Gogh, Rousseau and Lars Lerin have depicted the forest on a different scale of realism.



### **The Scary Forest**

From child stories to adult horror movies, the forest is continuously used as a setting that haunts us. Perhaps this is just an indication of how unused people have become to spending time around the woods, possibly even outside - but the idea of the scary forest is not something new. Maybe it has more to do with the layering of trunks, branches, fog that together creates a diffused image that our mind starts to interpret shapes into.

The fear of forest has cultural roots. Our ancestors stayed out of forests of realistic threats like wild animals, thieves and other unknown dangers which these dark wooded areas posed. These days those threats are not so urgent to most of us. Instead we use tales like Hansel and Gretel, Little Red Riding Hood and the Big Bad Wolf to scare children so they wouldn't venture out alone in dark wooded areas. That fear is later kept alive by movies like The Blair Witch Project, the Mirkwood in LOTR or The Forbidden Forest in Harry Potter

### Mountain birch

In the mountain range before the bare mountain, a type of birch grows. It is a subspecies of glass birch and is adapted to cope with the tough climate in the mountains. In this climate it grows slowly and forestry is not carried out here



### Northern coniferous forest

Most of the Swedish forest is part of the coniferous forest belt that stretches all over the northern hemisphere. In Russia it is called Taiga. In this region, tree species like elm, ash and linden are rare. Oak does not grow here. There are also many and large marshes.

### Southern coniferous forest

Like the northern coniferous forest spruce and pine trees dominate the southern coniferous region. In addition, you will find hardwoods like beech, oak, ash and alm on fertile fields. (Skogssverige. 2004)

### Southern deciduous forest

Here you will find beech, oak and other deciduous trees. Fir did not grow in this region from the beginning, but now it is planted on quite large areas. By the middle of the 19th century, large parts of this region were heaths. Today, the majority of these are planted with coniferous forests.



### BIRCH FOREST

Height: 29m  
 Crown: 2.9m  
 Seasons effect: Changes colour and loses leaves.  
 Light conditions: Sparse forest but the crown spreads out as much as possible. Light during winter.  
 Preferred ground: Humid  
 Roots: Shallow and flat root system.  
 Full-grown: 70 years



### FIR FOREST

Height: 30m  
 Crown: 5m  
 Seasons effect: No  
 Light conditions: Dense forest, therefore doesn't let much light through.  
 Preferred ground: Humid  
 Roots: Shallow.  
 Full-grown: 150 years



### DECIDUOUS FOREST

Height: 40m  
 Crown: 4-13m  
 Seasons effect: Changes colour and loses leaves.  
 Light conditions: Sparse forest but the crown spreads out as much as possible. Light during winter.  
 Preferred ground: Humid and nutritious soil.  
 Roots: Strong taproot with thick supporting roots.  
 Full-grown: 150 years



### PINE FOREST

Height: 30m  
 Crown: 5m  
 Seasons effect: No  
 Light conditions: Sparse forest, a lot of light passes through.  
 Preferred ground: Dry  
 Roots: Strong taproot  
 Full-grown: 150 years

(Skogeniskolan 2016).



**Fir**

The wood has a very versatile use, mainly as raw material for pulp, buildings and several chemical products.



**Pine**

The wood has a dark and non-corrosive core with lighter surface. Common saw timber is used for buildings and furniture, smoother wood for pulp and wood fiber boards



**Elm**

The splint is yellowish and the core is dark brown. The wood is hard, slippery and has a high resistance to rot. Used among other things to veneer for the manufacture of deliciously beautiful furniture.



**Ash**

Ash is a hardwood and is hard, dense, and very strong but elastic. Extensively used for making bows, tool handles, baseball bats, hurleys and other uses demanding high strength and resilience.



**Oak**

The core is hard and rotitive. The wood is perfect for manufacturing, among other things, veneers, furniture, parquet floors and boats

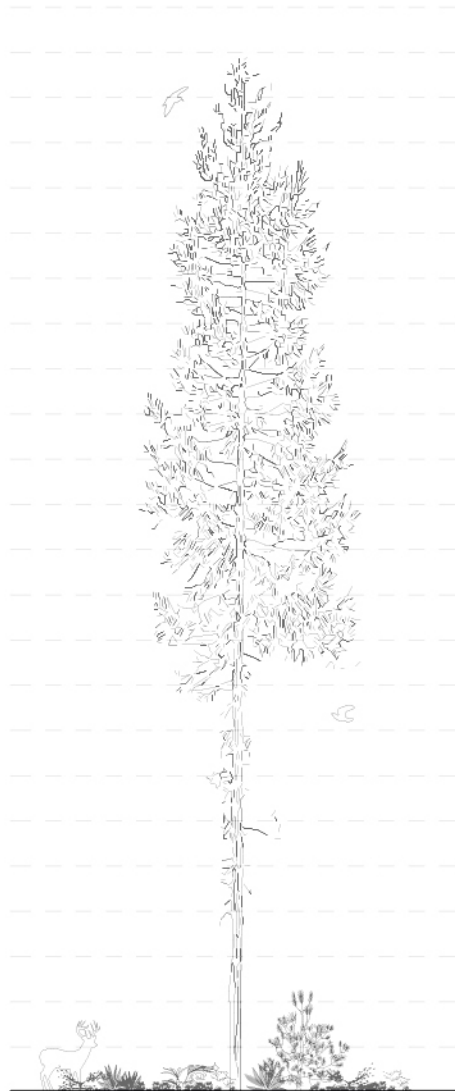


**Beech**

Light, hard, solid and straight fiber fabrics make furniture, parquet, toys and glass sticks. Weaker wood is used for paper production.

(Skogeniskolan 2016.)

- +3 Tree Layer
- +1-3 Bush Layer
- +0.5 Field Layer
- +0 Bottom Layer



**Bottom**  
The bottom layer consist of lichen and moss.

**Field**  
Grass belongs to the field layer together with herbs, fern, equisetum plants etc

**Bushes**  
The bush layer consist of trees and bushes below 3m.

**Trees**  
The tree layer is everything above 3m.  
(Bioesurs. 2017)

## Forest Layers

VIII

## Site Survey



HESTRA PARKSTAD  
BORÅS  
57.728515, 12.890074

Site Overview

32

2018.06.18



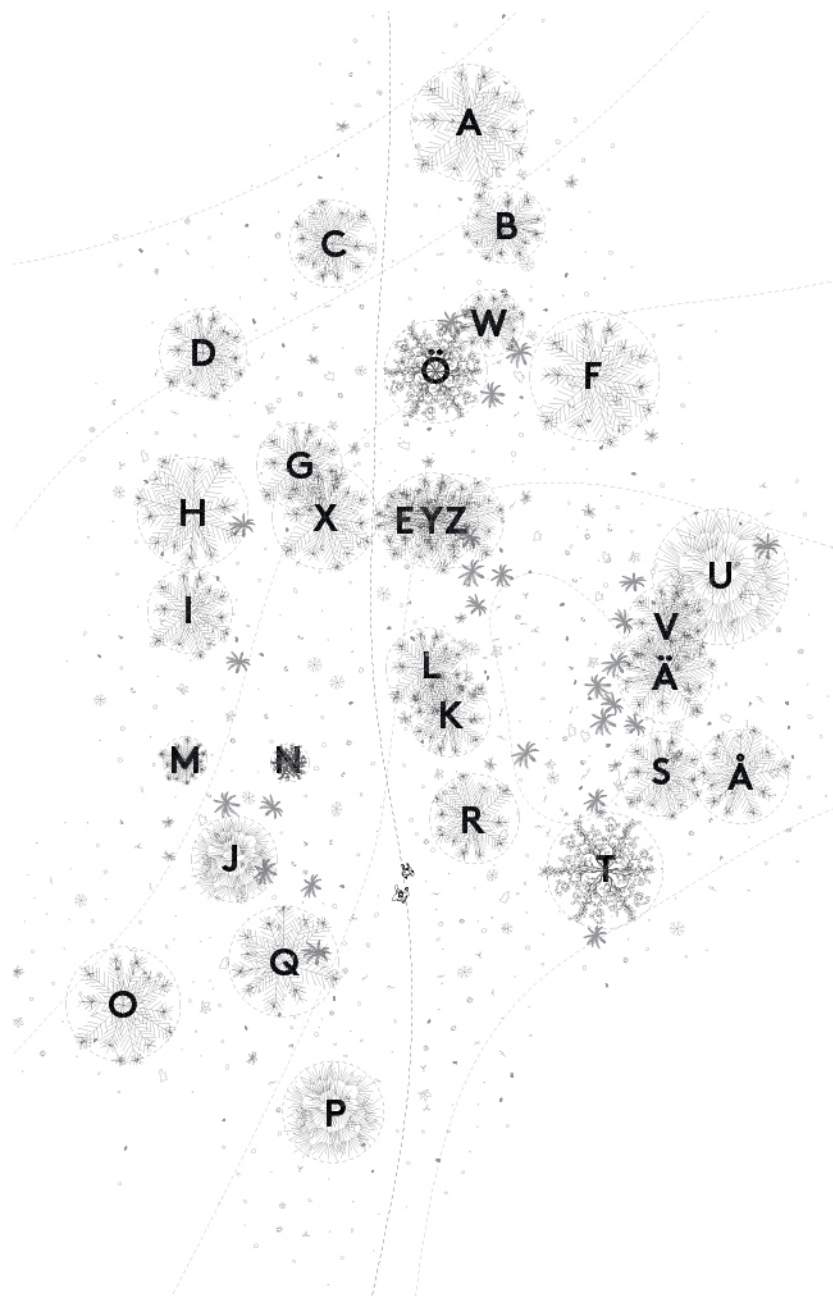


Site Photos



The surveyed site is 715 m<sup>2</sup> and contains 29 trees.

Axonometric



A walking path runs straight through the site



**A**



**B**



**C**



**D**



**E**



**F**



**G**



**H**



**I**



**J**



**K**



**L**



**M**



**N**



**O**



**P**



**Q**



**R**



**S**



**T**



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**V**



**W**



**X**



**Y**



**Z**



**Å**



**Ä**

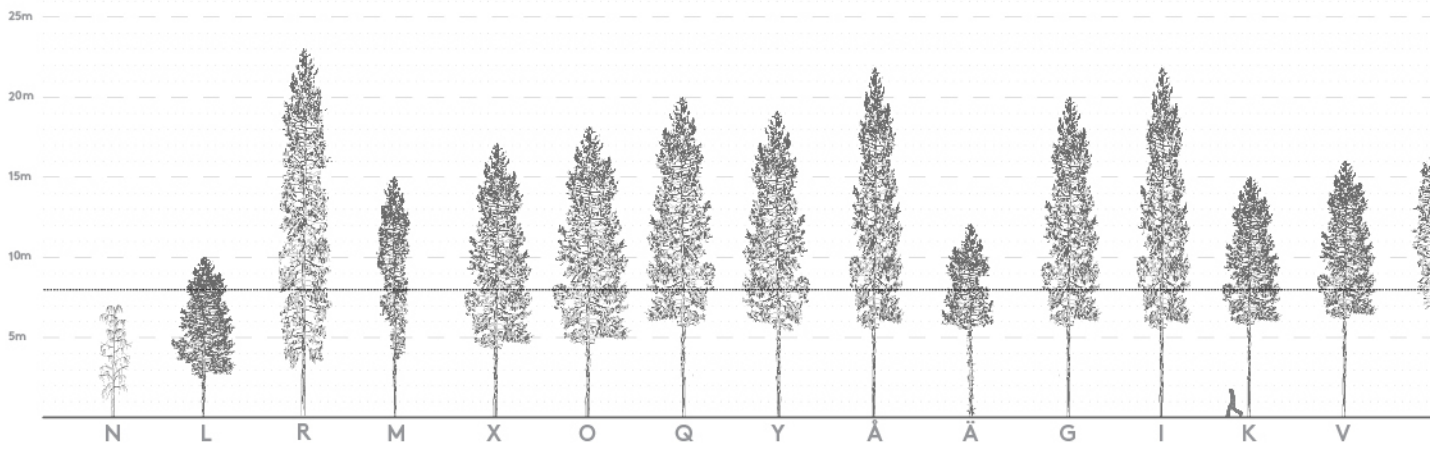
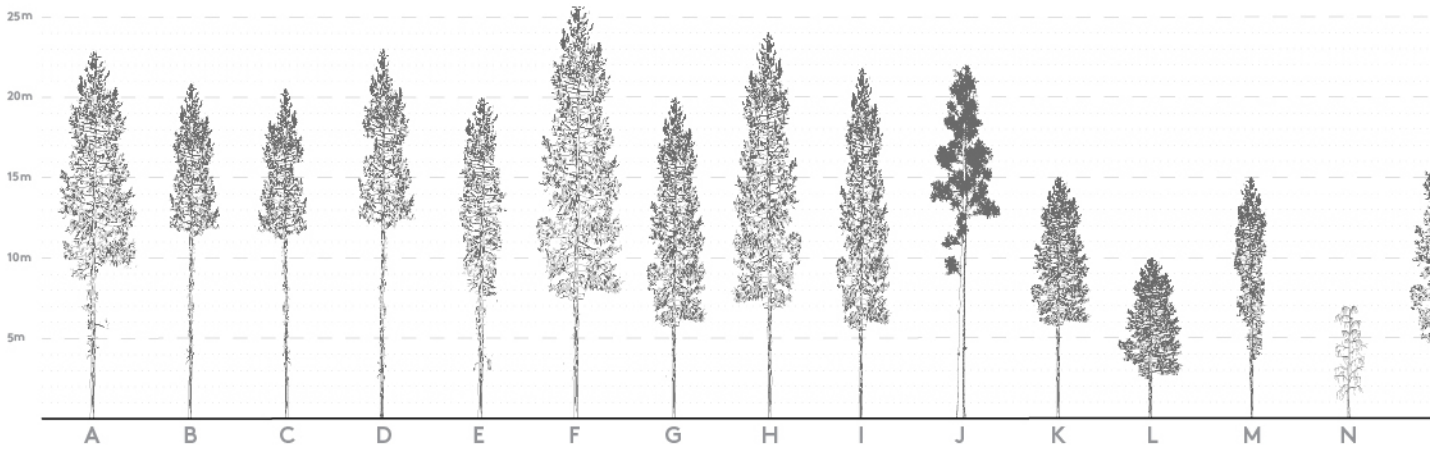


**Ö**

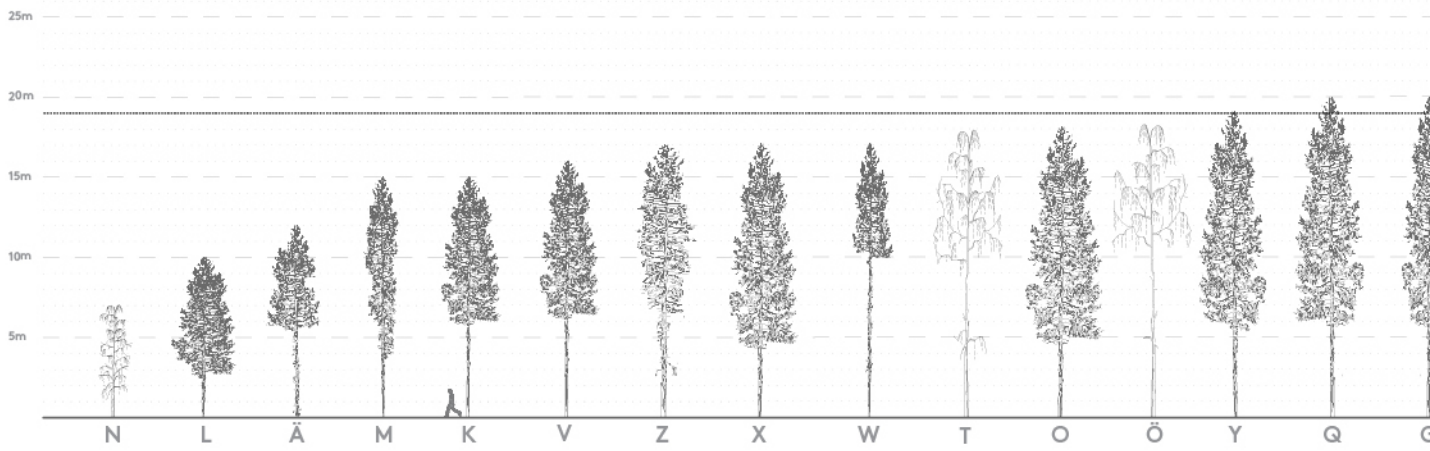
Crown Size Survey



Section A-A & B-B

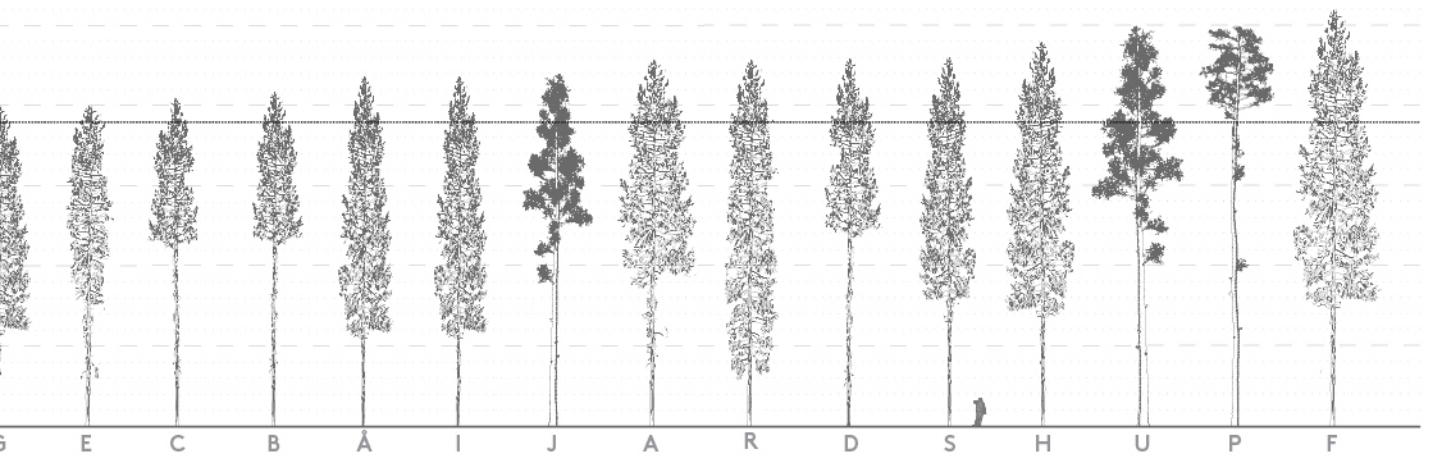
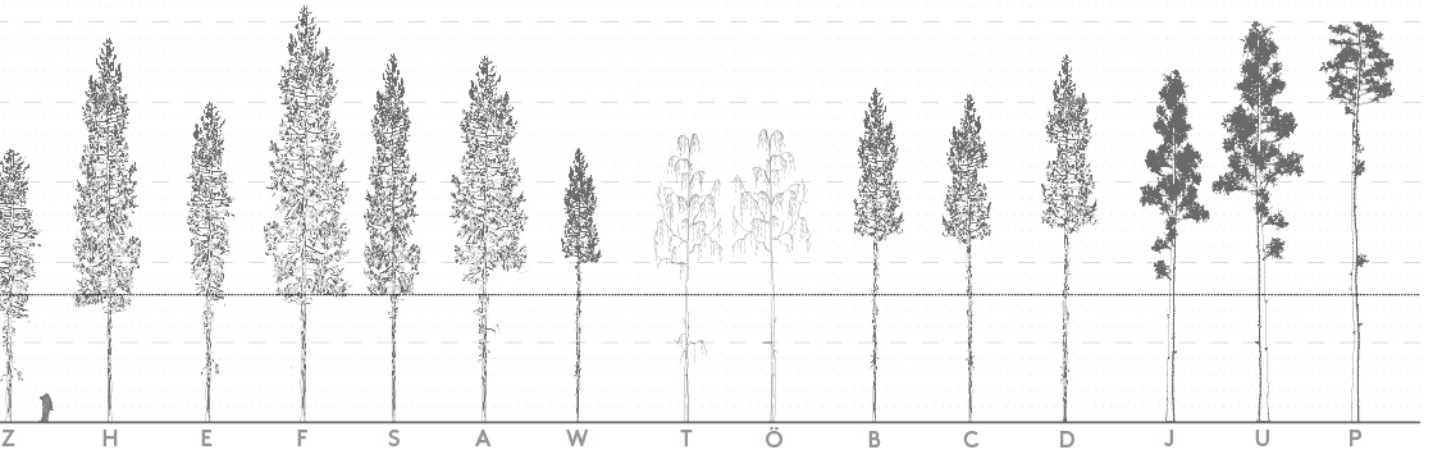
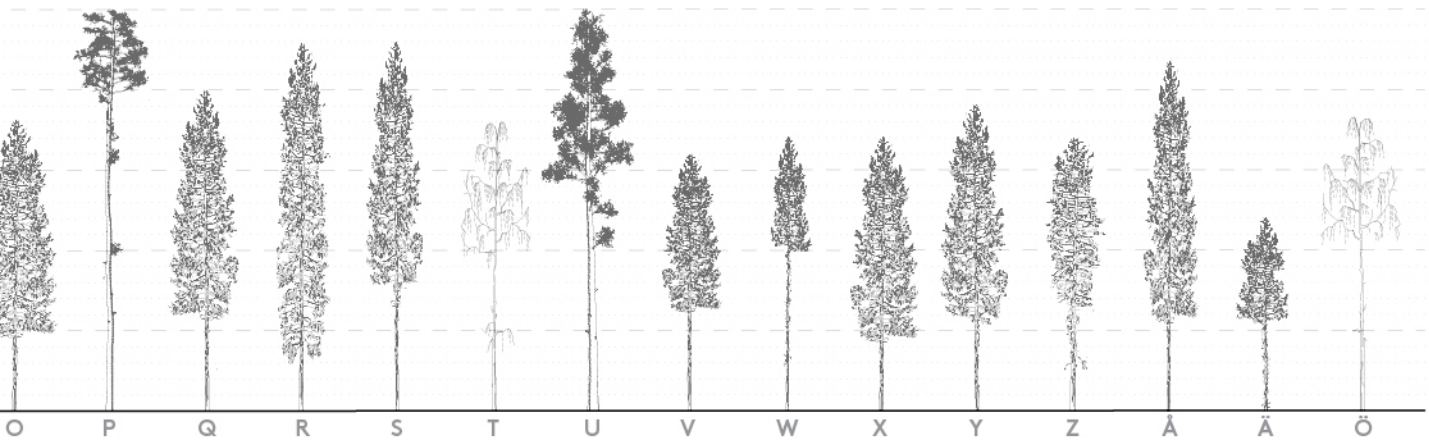


Bottom of Crown



Top of Crown

Tree Elevations



Tree Elevations

VIII

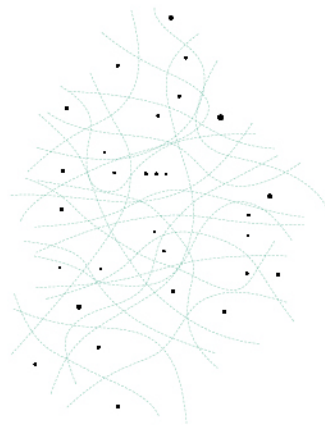


## Site Analysis



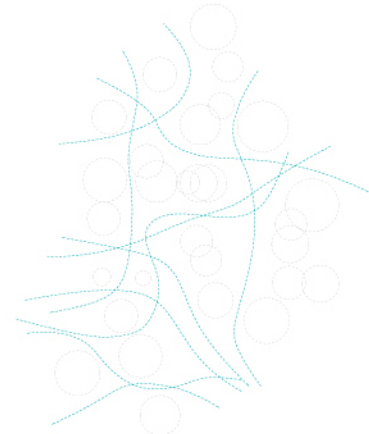
**Density**

Density of the surveyed site is 1 tree per 26.5m<sup>2</sup>



**Flow +1m**

Horizontal connections are possible almost everywhere in every direction



**Flow +8m**

Some possibilities for horizontal flow.



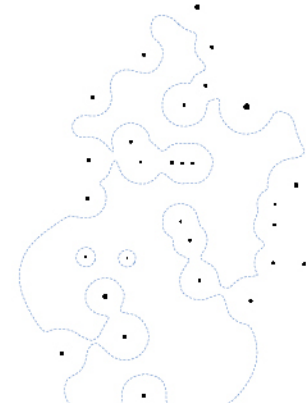
**Enclosed spaces**

Small pockets of spaces become semi-defined by the trunks



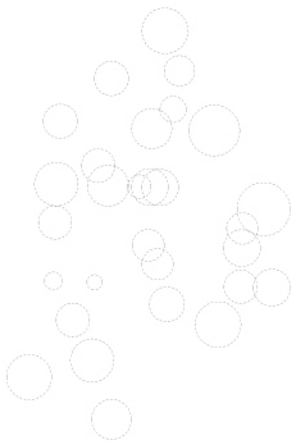
**Space +1m**

On the ground space is completely open



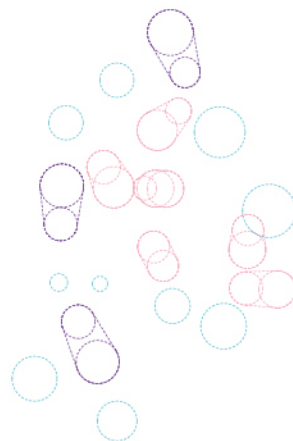
**Space +8m**

8m up is where the crowns in general are widest. Space is pushed together



**Size Crown**

Crown diameter vary from 1m-5m



**Crown Blending**

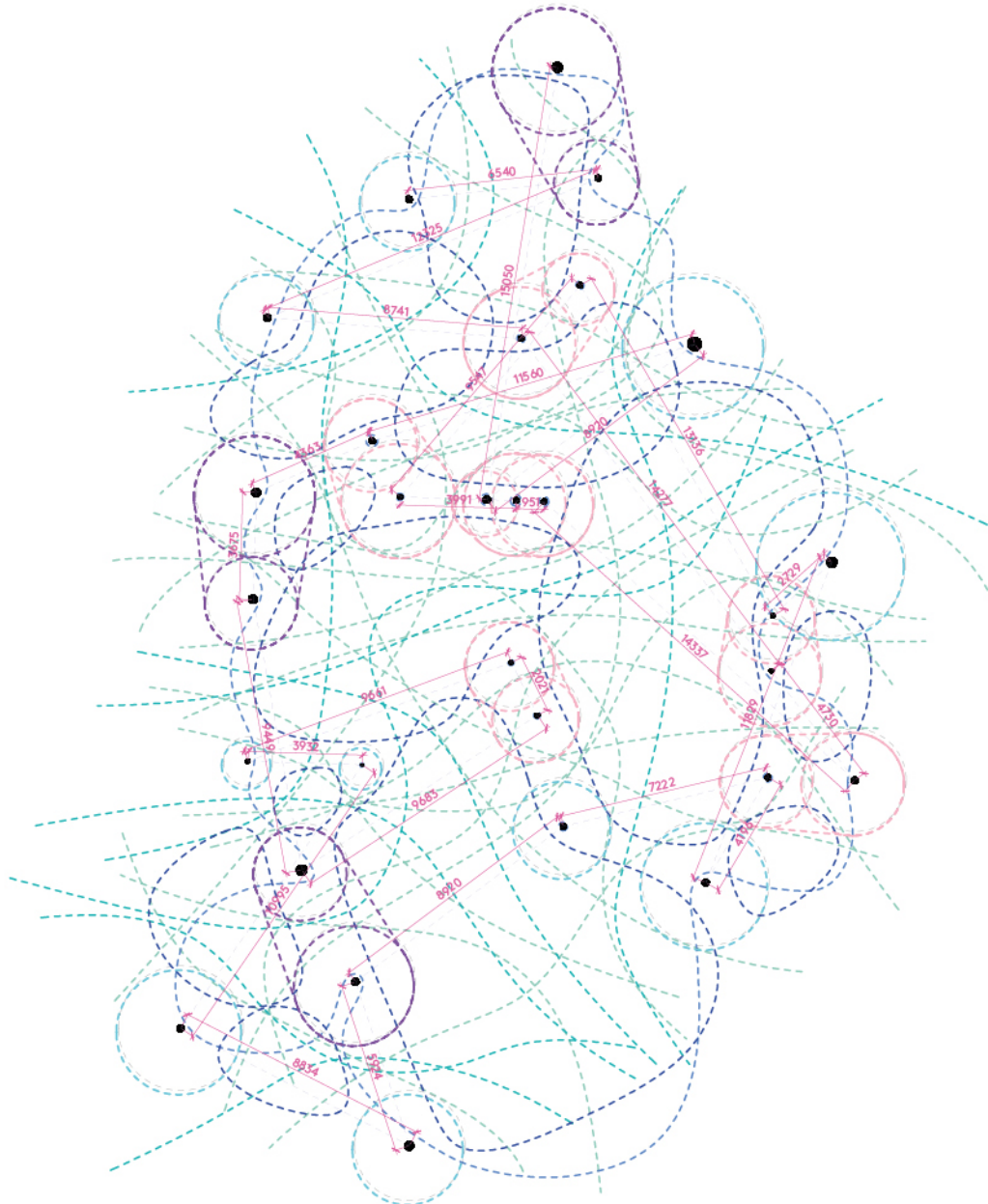
When tree crowns come close to eachother, they blend into bigger volumes.



**Sun Exposure**

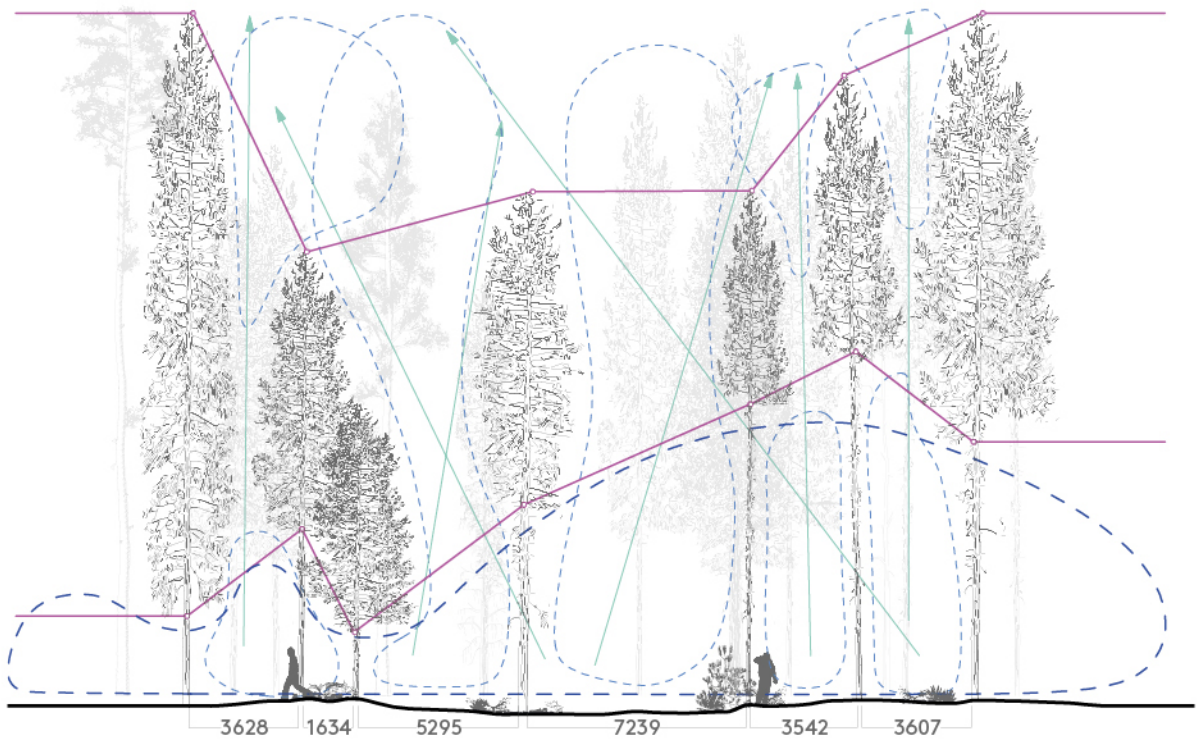
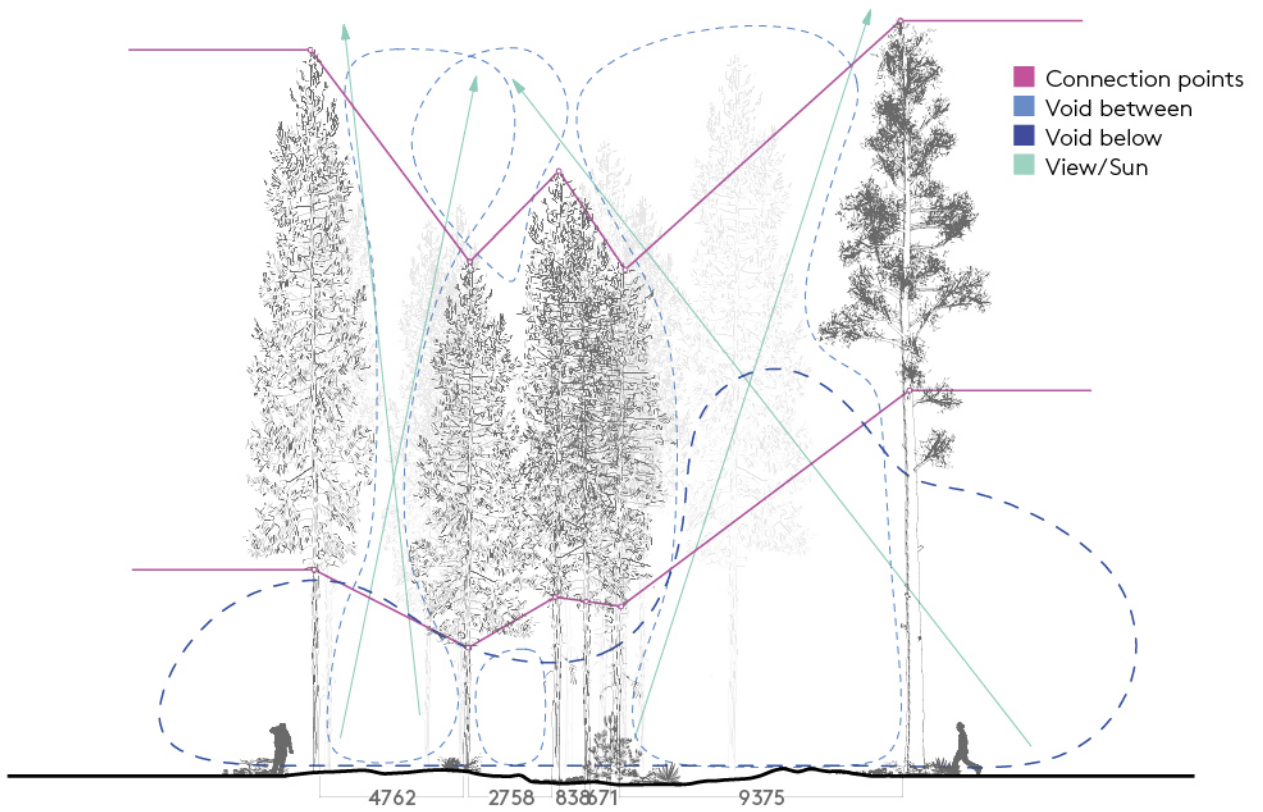
The sun is both filtered but also focused between tree crowns

**Plan Diagrams**



Together it adds up to a complex image. An abstraction of the forest that also inhabits its chaotic nature.

It also tells the story about how we can perceive the forest in different layers. As a whole - blended together into a huge mess. As solitary objects - trees that stands by themselves.



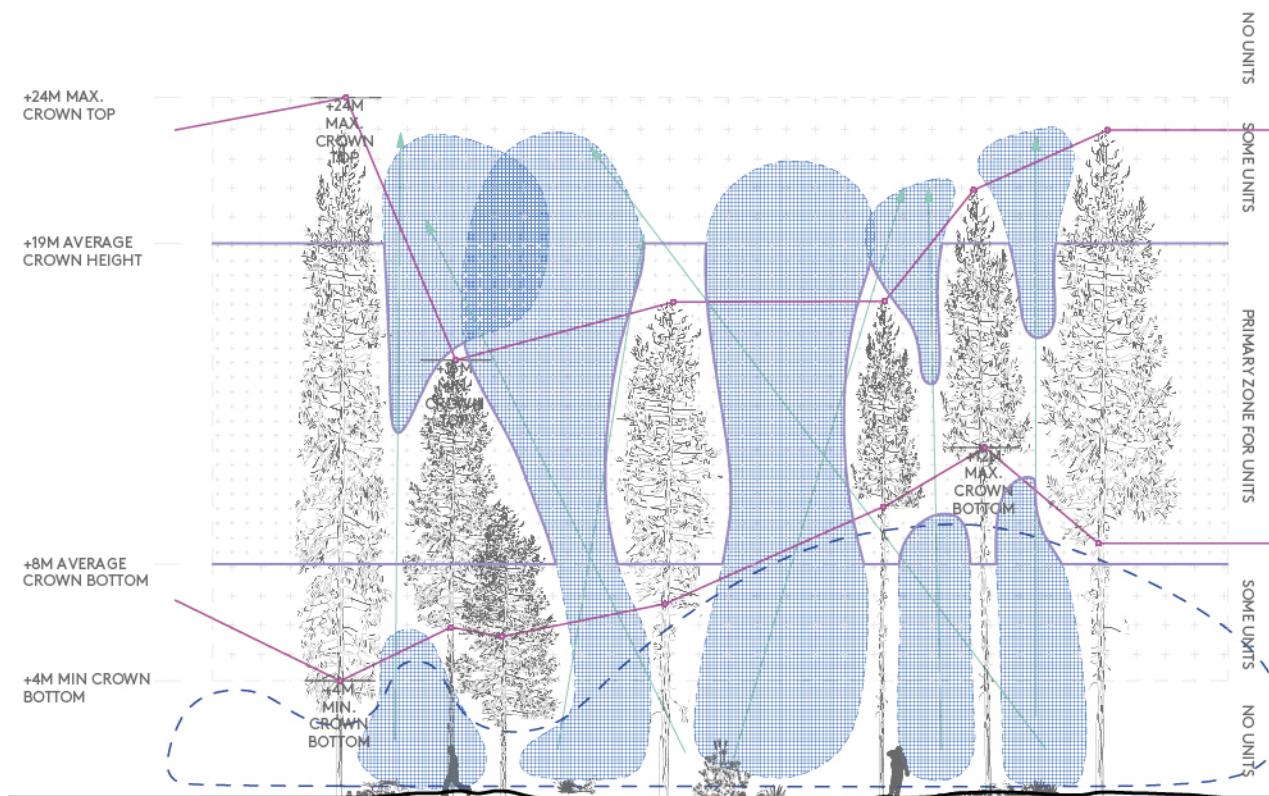
Section Diagrams

The height of the top of the crown and the bottom of the crown vary a lot. Usually they co-relate but not always.

Even though space below the crowns is well defined there is almost always a visual connection towards the sky. Some openings in the forest-ceiling allows light to come through to the plants closer to the ground.

Between trees "space-bubbles" occur. Sometimes separated when the crown becomes wider at the centre, sometimes connected from the ground all the way to the sky.

From previous sections and looking at the data we get an understanding of how the project will look. To follow the forest section, our housing units will mainly be in the area between 8-19m. The project will reach a maximum level of 24m.



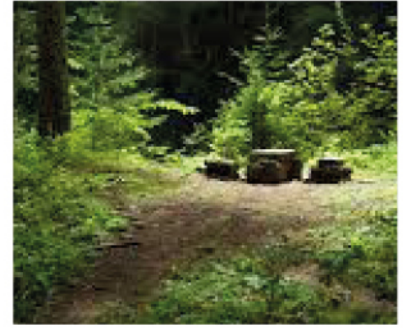
Section Diagram Summary



Free flow



Light concentration



Clearings



Tactility



Verticality



Blending



Filtering light



Dematerializing



Pockets of space

Qualities

# Summary

Together with qualities and dimensions from the site analysis, there is also other tangible qualities that we experience in the forest. The tactility of the leaves, the dematerializing when a stem turns into a branch that turns into a leaf.

All of these qualities will have to find its place in the project. Sometimes in direct ways and sometimes in more abstract.

VIII



Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Vienna	620,16	620,16	620,14	620,15	620,15	620,16	620,14	620,15	620,15	620,16	620,14	620,16
..	..	..	..	..	..	..	..	..	..	..	..	..
Brussels	738,43	738,42	738,42	738,42	738,44	738,43	738,42	738,44	738,43	738,44	738,43	738,44
..	..	..	..	..	..	..	..	..	..	..	..	..
Vancouver	244,49	244,49	244,50	244,51	244,50	244,49	244,49	244,49	244,50	244,50	244,50	244,49
Zurich	334,87	334,86	334,87	334,87	334,87	334,87	334,87	334,87	334,87	334,86	334,86	334,87
Prague	504,45	504,45	504,45	504,44	504,44	504,45	504,44	504,45	504,45	504,46	504,45	504,44
Berlin	906,29	906,30	906,27	906,29	906,27	906,30	906,30	906,31	906,28	906,31	906,30	906,31
..	..	..	..	..	..	..	..	..	..	..	..	..
Copenhagen	761,82	761,82	761,82	761,83	761,83	761,82	761,83	761,83	761,82	761,81	761,83	761,83
..	..	..	..	..	..	..	..	..	..	..	..	..
Madrid	171,53	171,54	171,49	171,52	171,50	171,50	171,51	171,54	171,52	171,52	171,48	171,53
..	..	..	..	..	..	..	..	..	..	..	..	..
Helsinki	115,92	115,91	115,92	115,92	115,92	115,91	115,92	115,92	115,91	115,92	115,92	115,92
..	..	..	..	..	..	..	..	..	..	..	..	..
Paris	1070,50	1070,53	1070,45	1070,50	1070,45	1070,53	1070,51	1070,51	1070,54	1070,47	1070,54	1070,53
<b>Milan</b>	<b>93,18</b>	<b>93,16</b>	<b>93,14</b>	<b>93,17</b>	<b>93,17</b>	<b>93,17</b>	<b>93,18</b>	<b>93,15</b>	<b>93,17</b>	<b>93,15</b>	<b>93,14</b>	<b>93,18</b>
Turin	423,73	423,73	423,73	423,74	423,74	423,73	423,74	423,74	423,74	423,73	423,74	423,73
Seoul Incheon	133,37	133,26	133,33	133,38	133,20	133,23	133,26	133,30	133,37	133,26	133,19	133,41
Mexico City	538,13	538,18	538,17	538,12	538,19	538,22	538,20	538,13	538,20	538,24	538,22	538,16
Amsterdam	508,09	508,10	508,09	508,11	508,10	508,10	508,10	508,09	508,10	508,10	508,11	508,11
Oslo	376,51	376,51	376,52	376,51	376,51	376,51	376,51	376,52	376,51	376,51	376,51	376,51
Lisbon	183,54	183,52	183,52	183,53	183,54	183,53	183,53	183,52	183,53	183,53	183,54	183,53
Stockholm	231,41	231,39	231,41	231,41	231,41	231,39	231,41	231,40	231,40	231,41	231,41	231,40
Gothenburg	262,53	262,52	262,53	262,53	262,52	262,53	262,53	262,53	262,53	262,53	262,52	262,53
Malmö	570,56	570,56	570,56	570,56	570,57	570,56	570,57	570,56	570,56	570,57	570,57	570,57
London	435,97	435,98	435,97	435,95	435,92	436,00	435,95	436,01	435,94	435,97	436,00	436,03
San Francisco	162,29	162,25	162,28	162,30	162,25	162,27	162,28	162,29	162,30	162,30	162,30	162,30
New York	658,35	658,43	658,34	658,41	658,32	658,39	658,30	658,37	658,43	658,34	658,40	658,30

City Scale

Green area per capita is calculated from Green area per million people and city population data source from OECD.



**When choosing a site for the project, it was important to consider the qualities that a piece of forest could give to an urban situation. Primarily the spatial and aesthetic qualities analysed in the site survey but possibly as a bi-effect, a psychosocial effect on people living close to the site.**

**The decision was therefore based on the green area per capita comparison shown on the previous page. Milano - a city with extremely low green area would be the location for this project. Other cities for consideration were Düsseldorf, Valencia, Marseille. The same strategy and project could be implemented there with same effect.**

**I defined a set of 30 "Urban Slots" where the design is to be implemented. Via Brisa is the site where the design will be developed and presented,**

**Every site has a range of effect of 250m (or 3 min walking distance). This means that if the design is done in a sufficient amount of sites the entire city is able to benefit from it. The city is upgraded into a place where everybody comes in connection with green areas or building-forest hybrid areas.**

Milano

50



Via Brisa



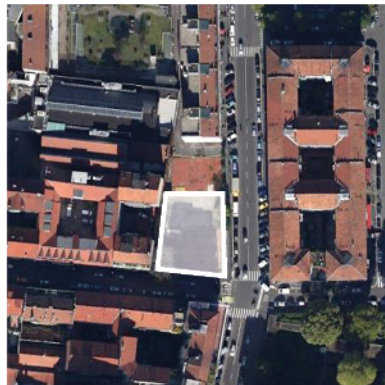
Via Caldo Goldoni



Piazza Santo Stefano



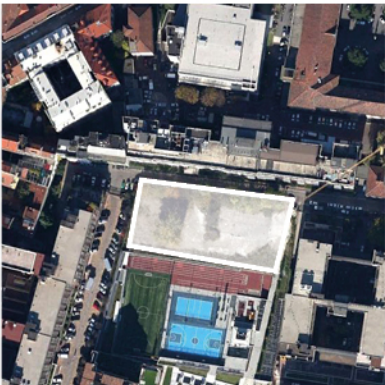
Via Dei Pellegrini



Via Bezzecca



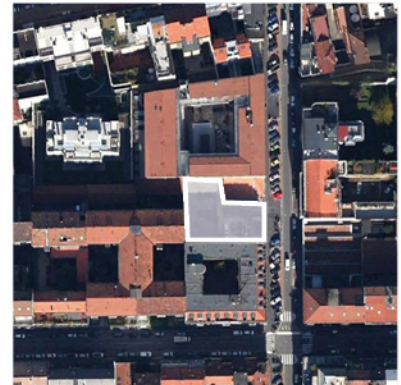
Via Dell'Unione



Via Fatebenesorelle



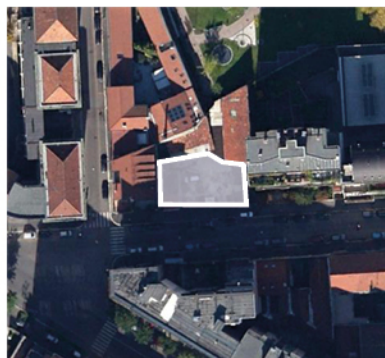
Via Fra Luca Parcioli



Via Garofalo



Via Pietro Custodi



Via Trebbia

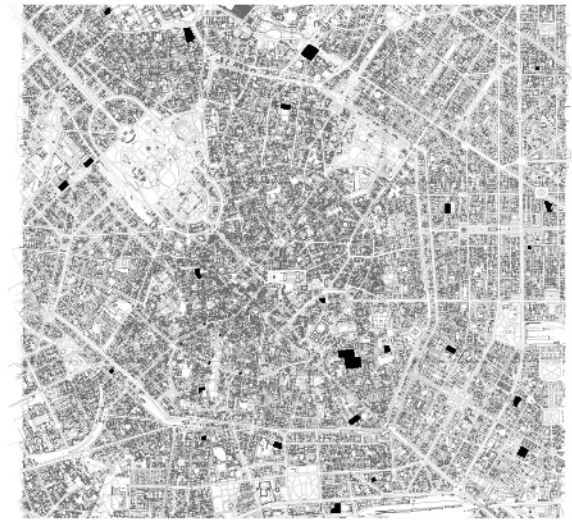


Viale Bligny

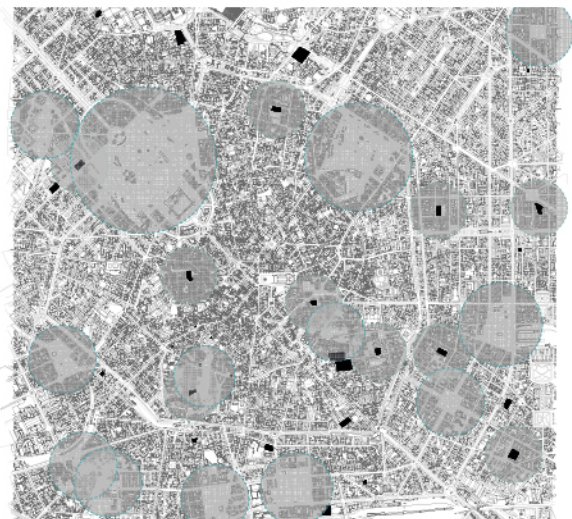
Urban Slots



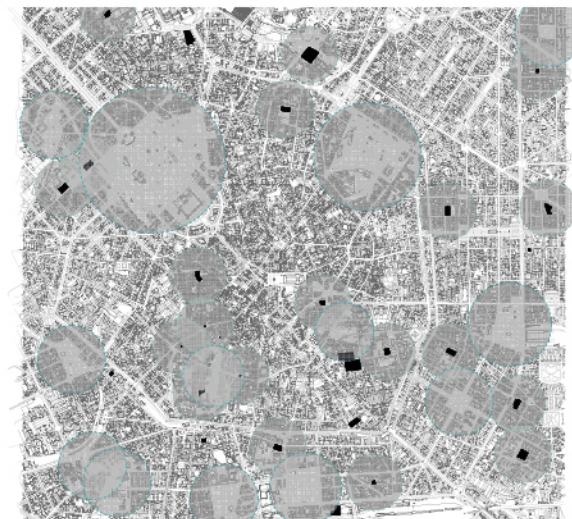
Existing green areas



30  
Possible sites



Phase I



Phase II

By analysing existing green area we understand where interventions is unnecessary. After defining the sites, the design is realized strategically in sites far from each other. Even though the effect is strongest in a 250m radius its effective up to 1000m.

#### Steps of Intervention



# Milano Upgraded

Full Intervention

VIII

## Design Development



Via Brisa

- Landmarks
- Important paths
- Metro

Chosen Site





Giardino di via Palestro

Villa Comunale

Parco Sempione

Brera

Castello

Quadrilatera della Moda

La Scala

San Babila

Vittorio Emanuele

Duomo

Via Brisa



Torre Velasca

Ca'Granda

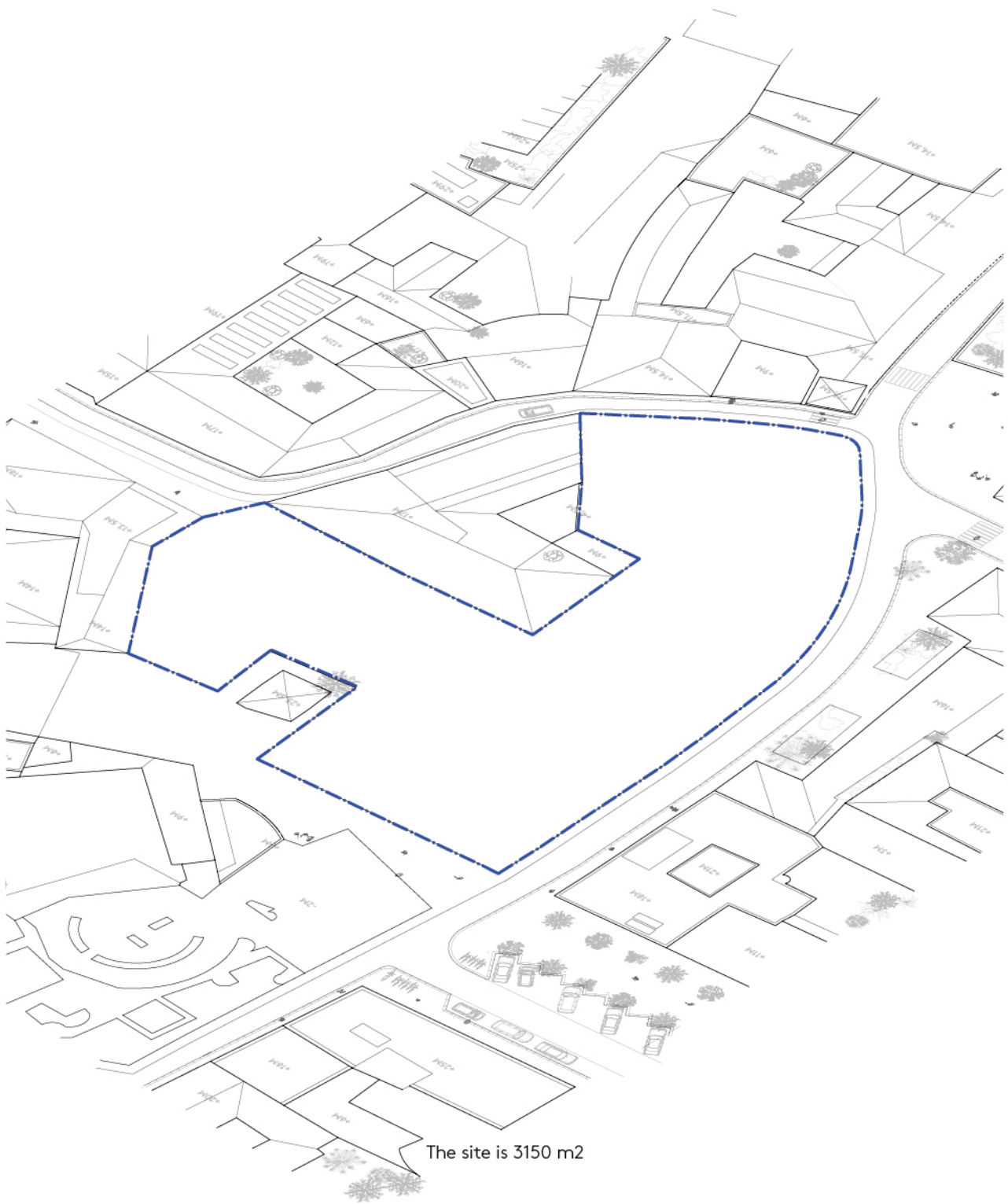
S. Lorenzo Maggiore

Parco delle Basiliche

Context

Porta Ticinese

Porta Romana



## Site Introduction

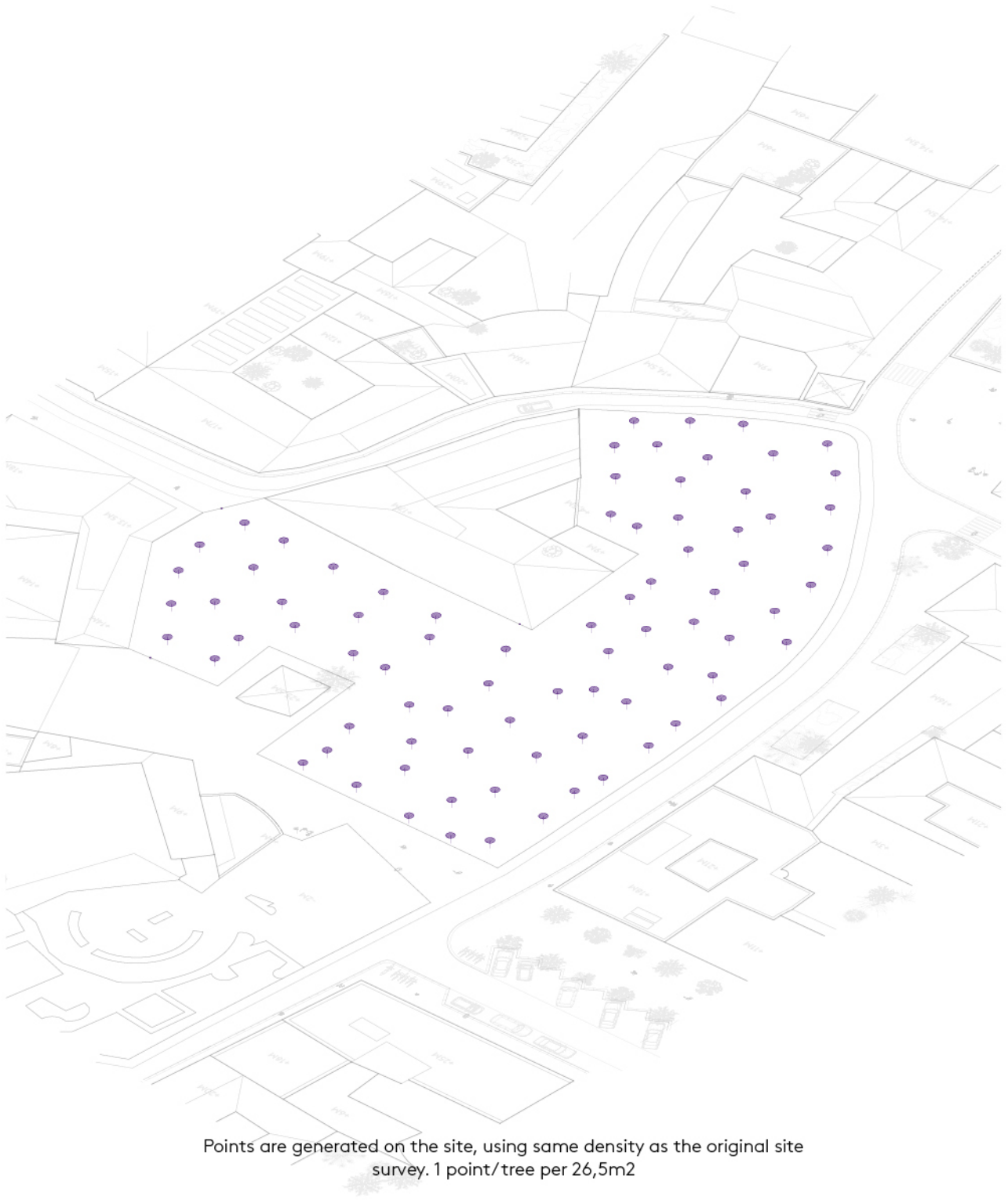




- Site
- Vegetation
- Paths
- Landmarks

Site Analysis





Points are generated on the site, using same density as the original site survey. 1 point/tree per 26,5m<sup>2</sup>

Density Points

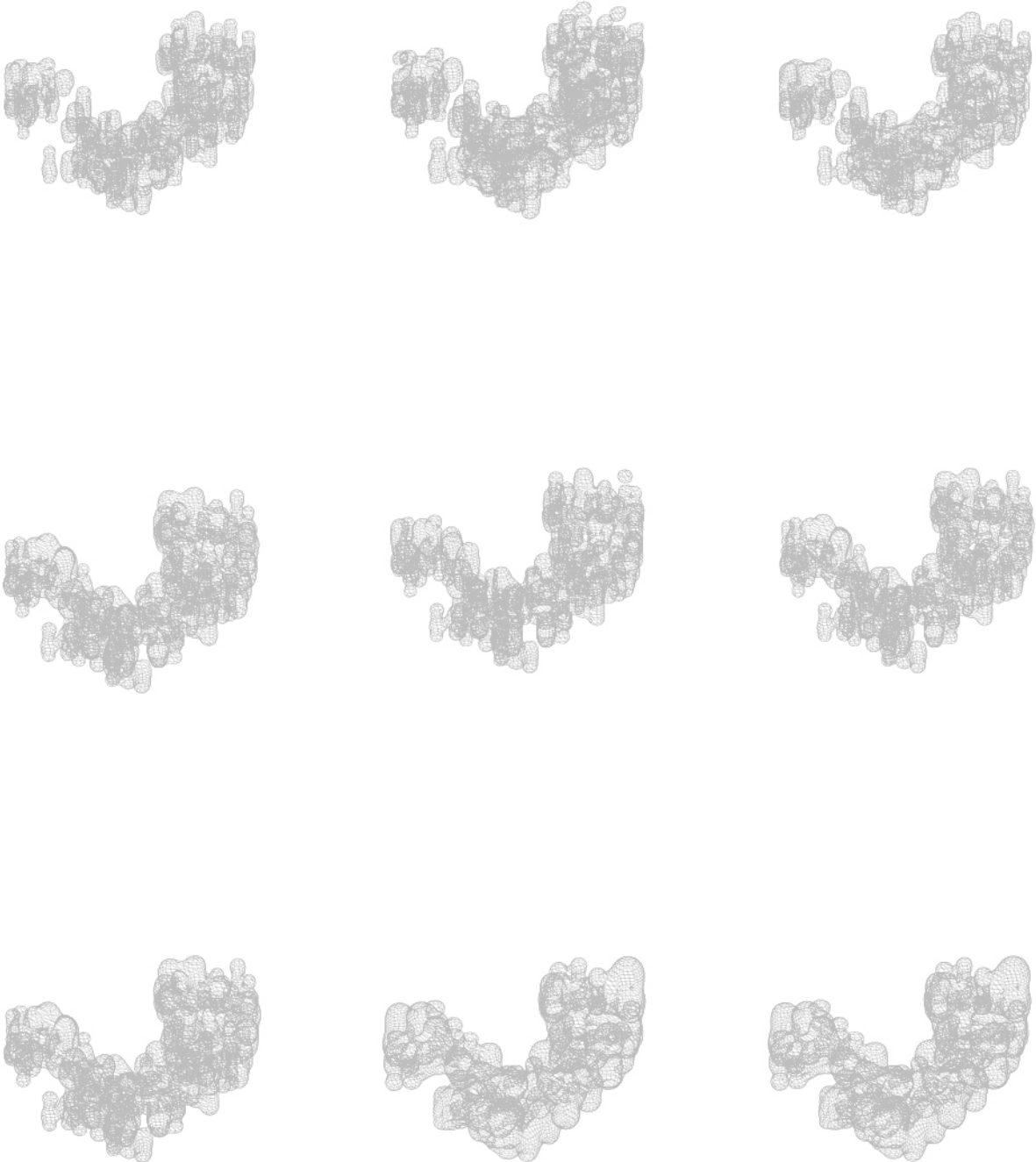




Points taken from the trees in the site survey is moved to the site and paced on a density point. Every tree that where analysed has around 5 points going from bottom of crown to the top. Since this site is about three times larger than the survey site, every tree is used three times.

#### Survey Tree Points

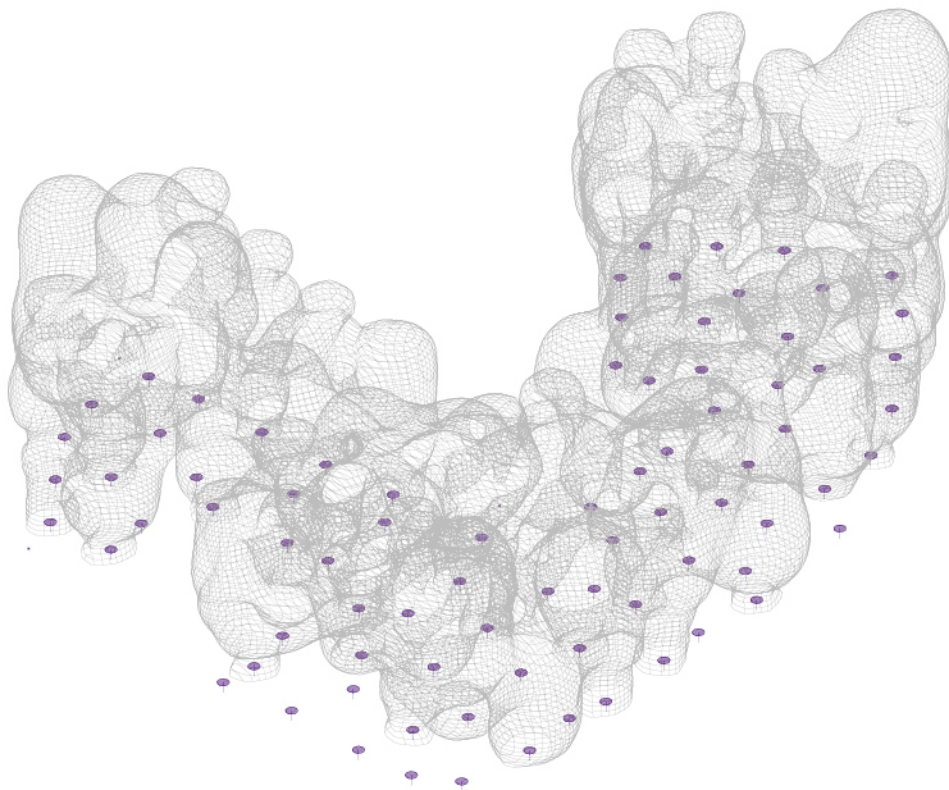




Now we can use these points to generate a forest volume. Depending on the strength of the blending we can end up with a result that's very sparse or very dense. We need something large enough for housing and sparse enough to recreate light qualities and voids from forest.

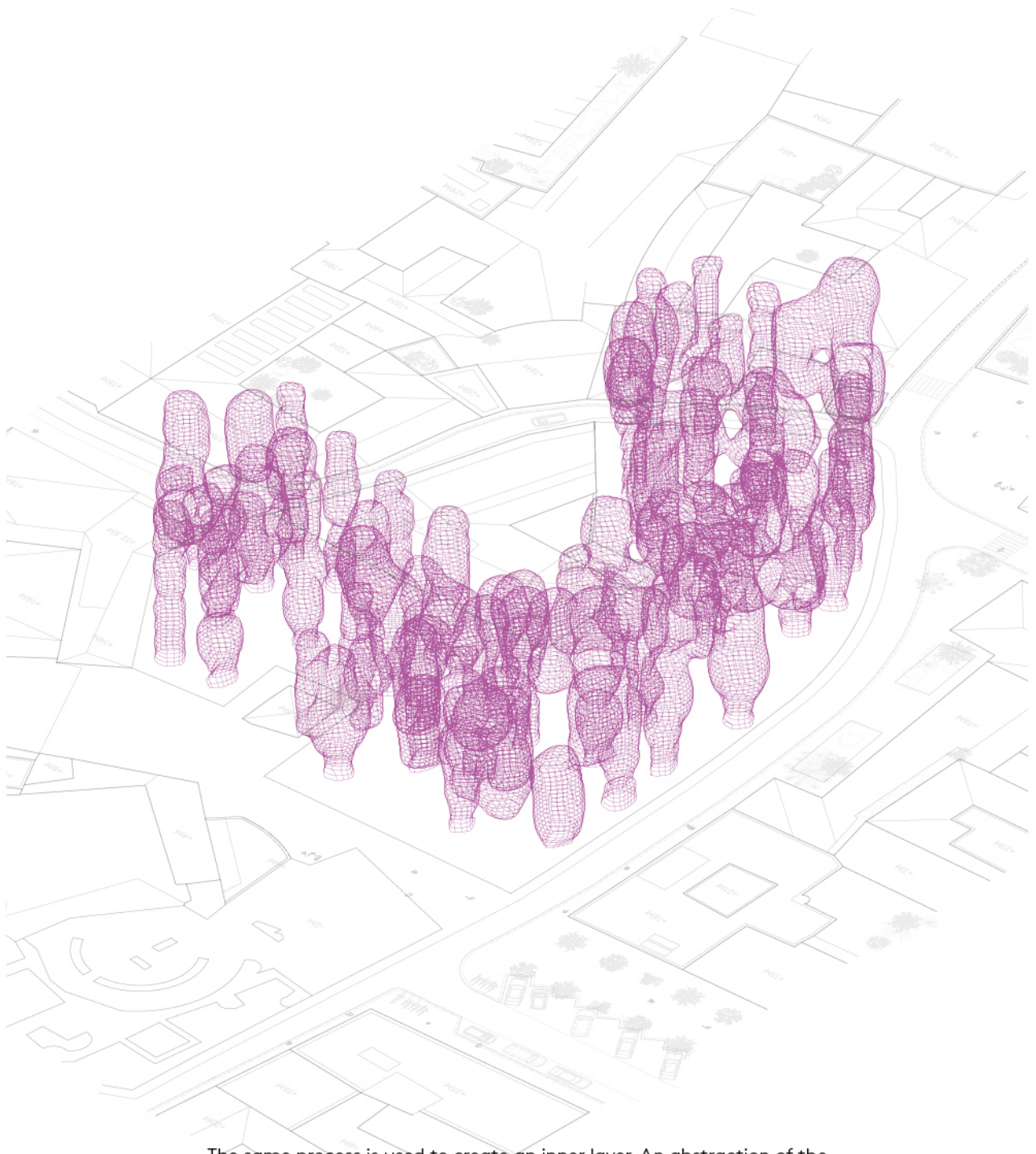
#### Volume Iterations





The final volume is corresponding to the density of the forest and the radius of the trees. This creates a complex volume that blends together in different heights, leaves gaps and views. Very much like the trees in the forest.

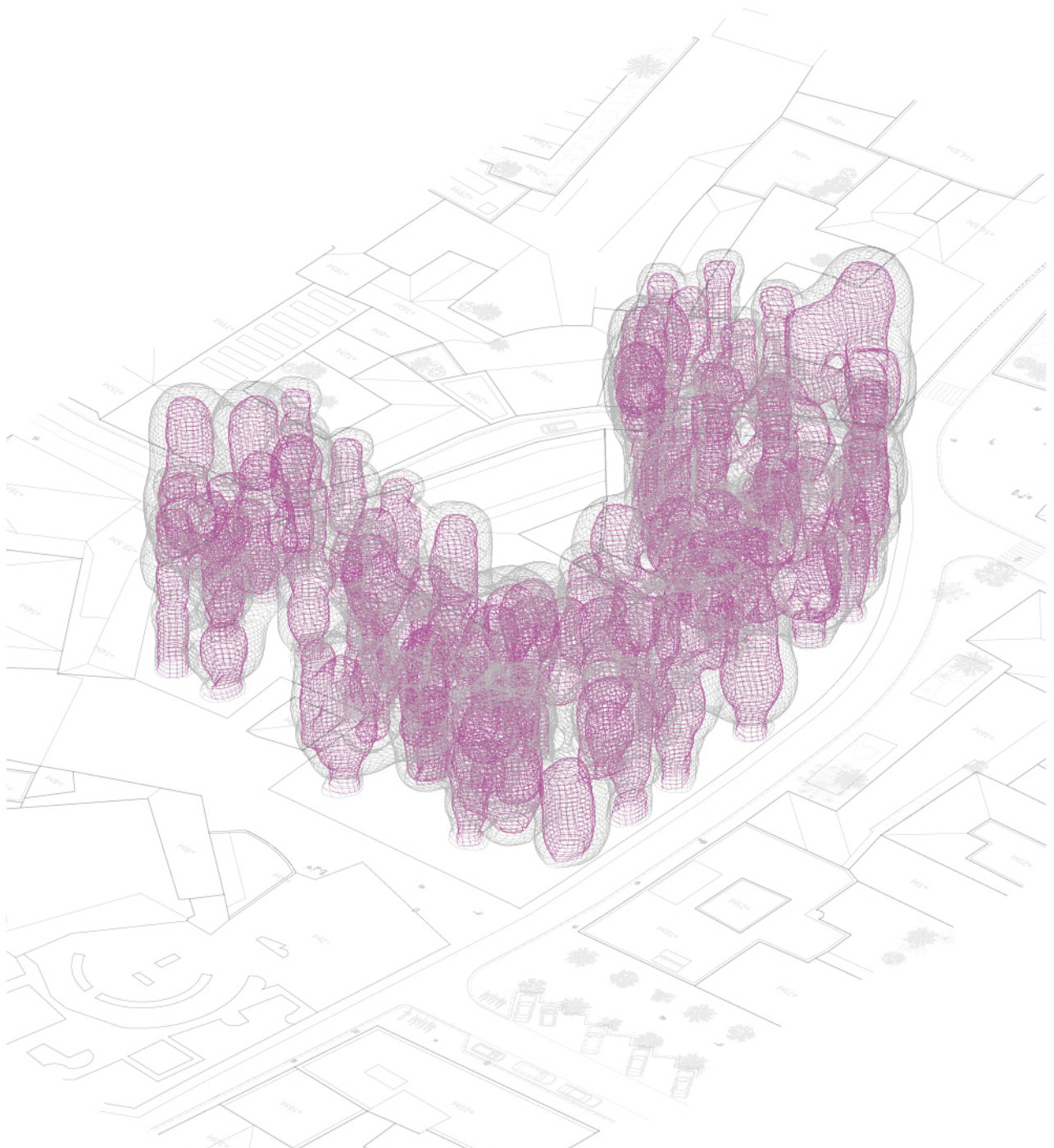




The same process is used to create an inner layer. An abstraction of the solitary, vertical elements that trees are, this layer doesn't blend as much as the outer layer. This will be the actual housing volumes. Maximum 3 vertical volumes blend together to create reasonably large residences.



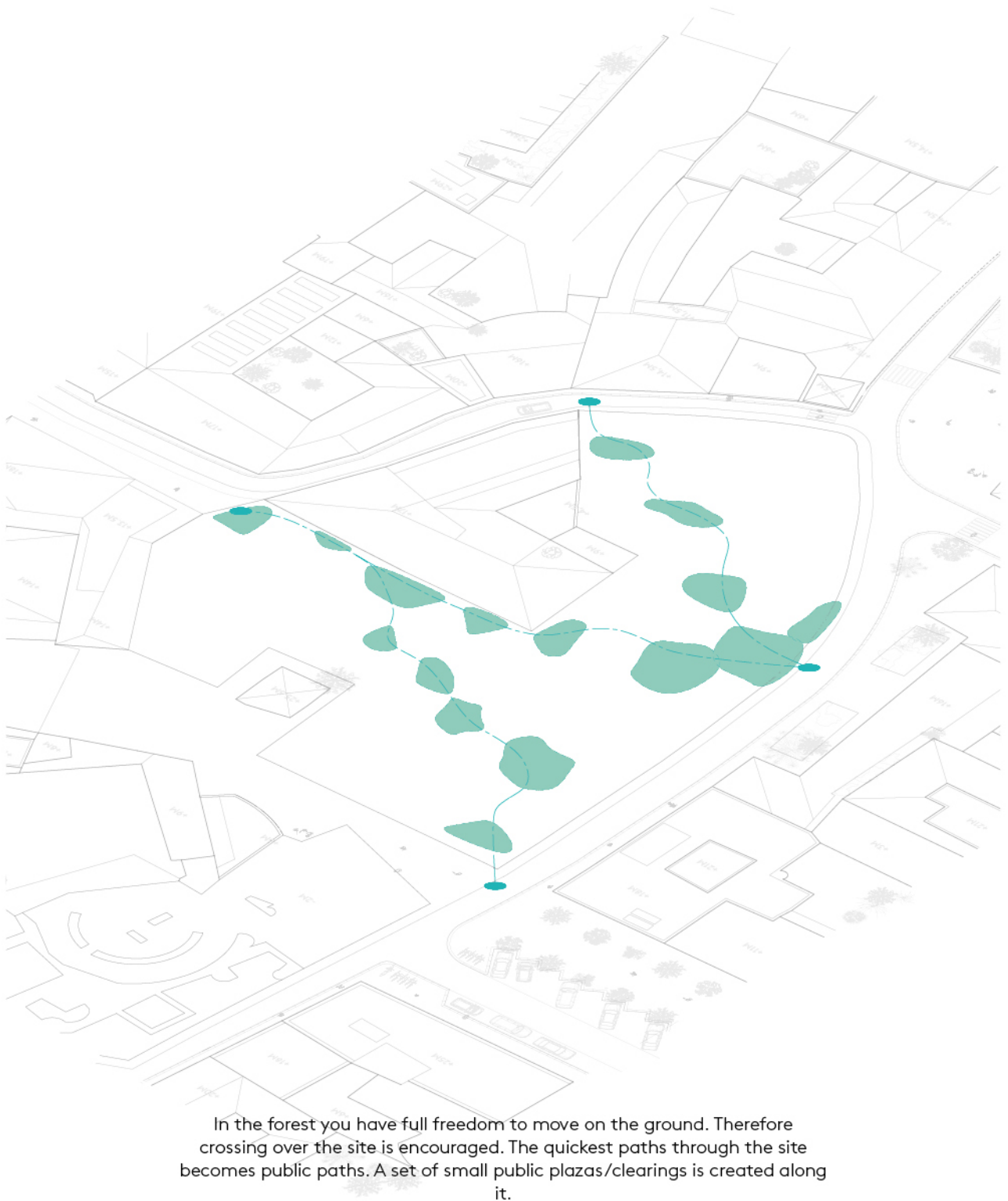




Together with the exterior volume it creates the entire picture of the forest as a two layered structure. The large, horizontal volume you experience from a far. And the solitary, vertical objects you experience up close.

Double Layer





In the forest you have full freedom to move on the ground. Therefore crossing over the site is encouraged. The quickest paths through the site becomes public paths. A set of small public plazas/clearings is created along it.

Primary paths & Public spaces





Semi-public spaces and secondary paths completes the pedestrian web.  
From this we understand how entrances should be arranged.

Secondary paths & Semi-public spaces





Vegetation grows where the envelope meets the ground and is designed to help differentiate between public and semi-public areas and paths.

Green Areas

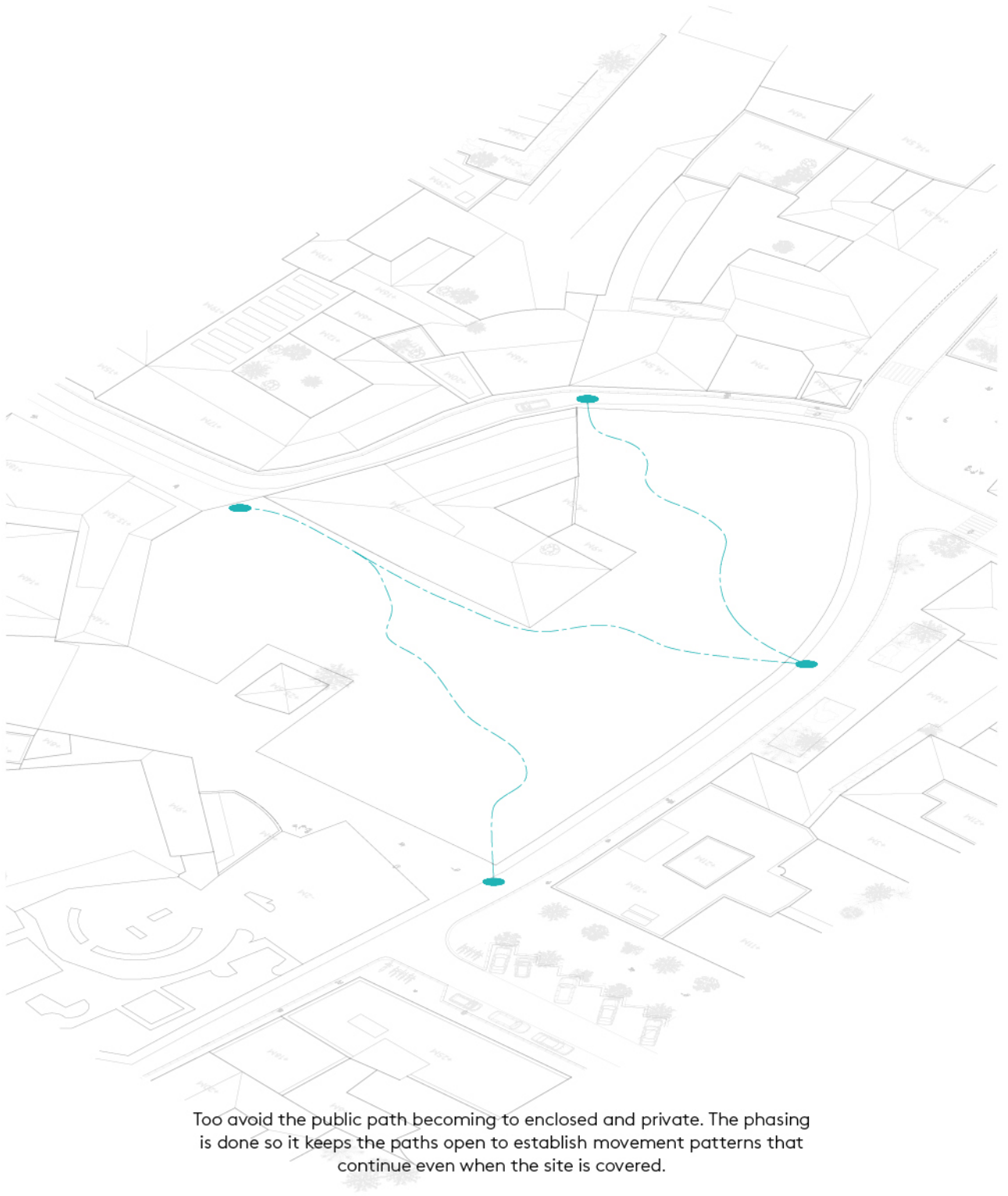




Entrances from semi-public spaces.

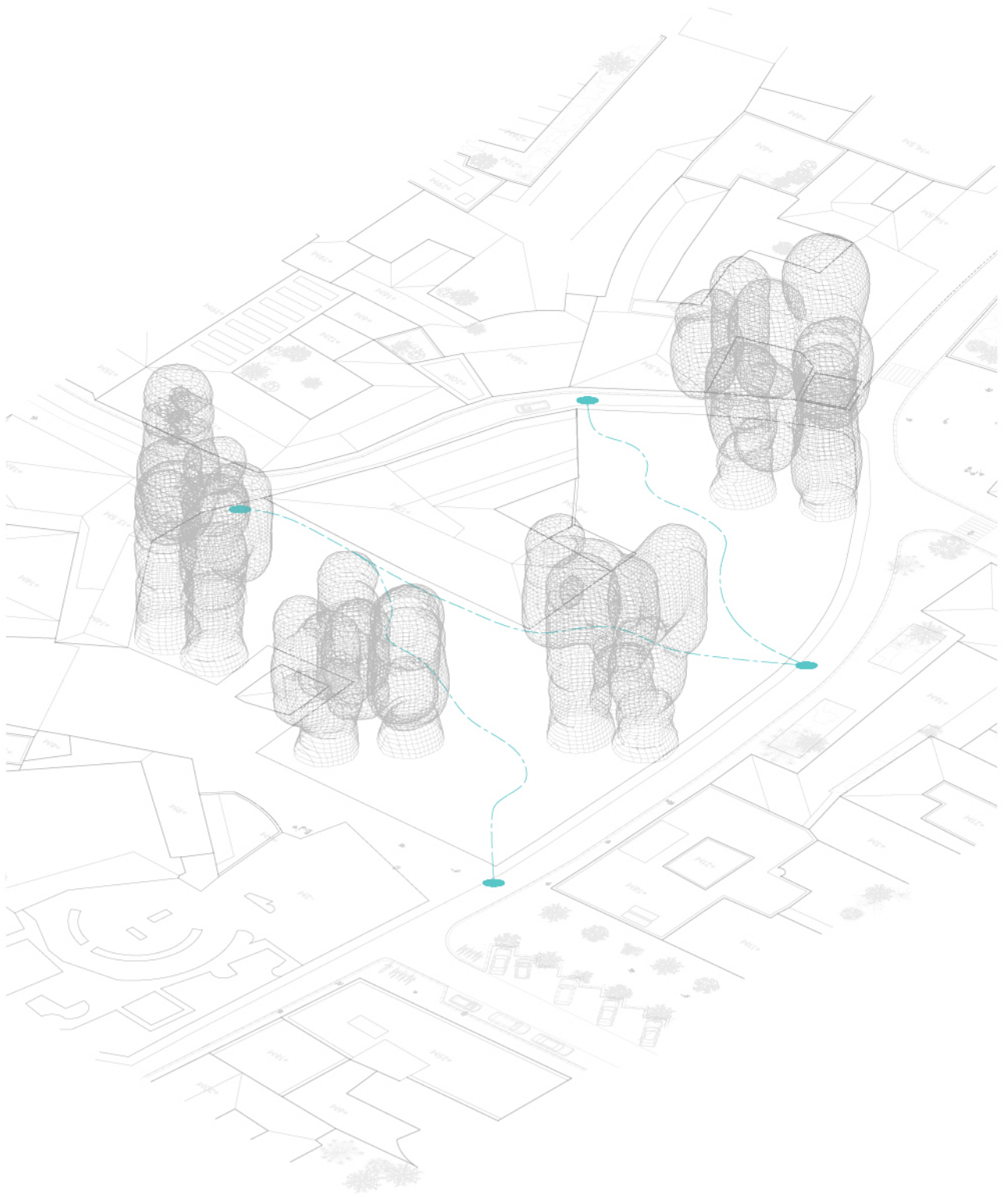
Entrances





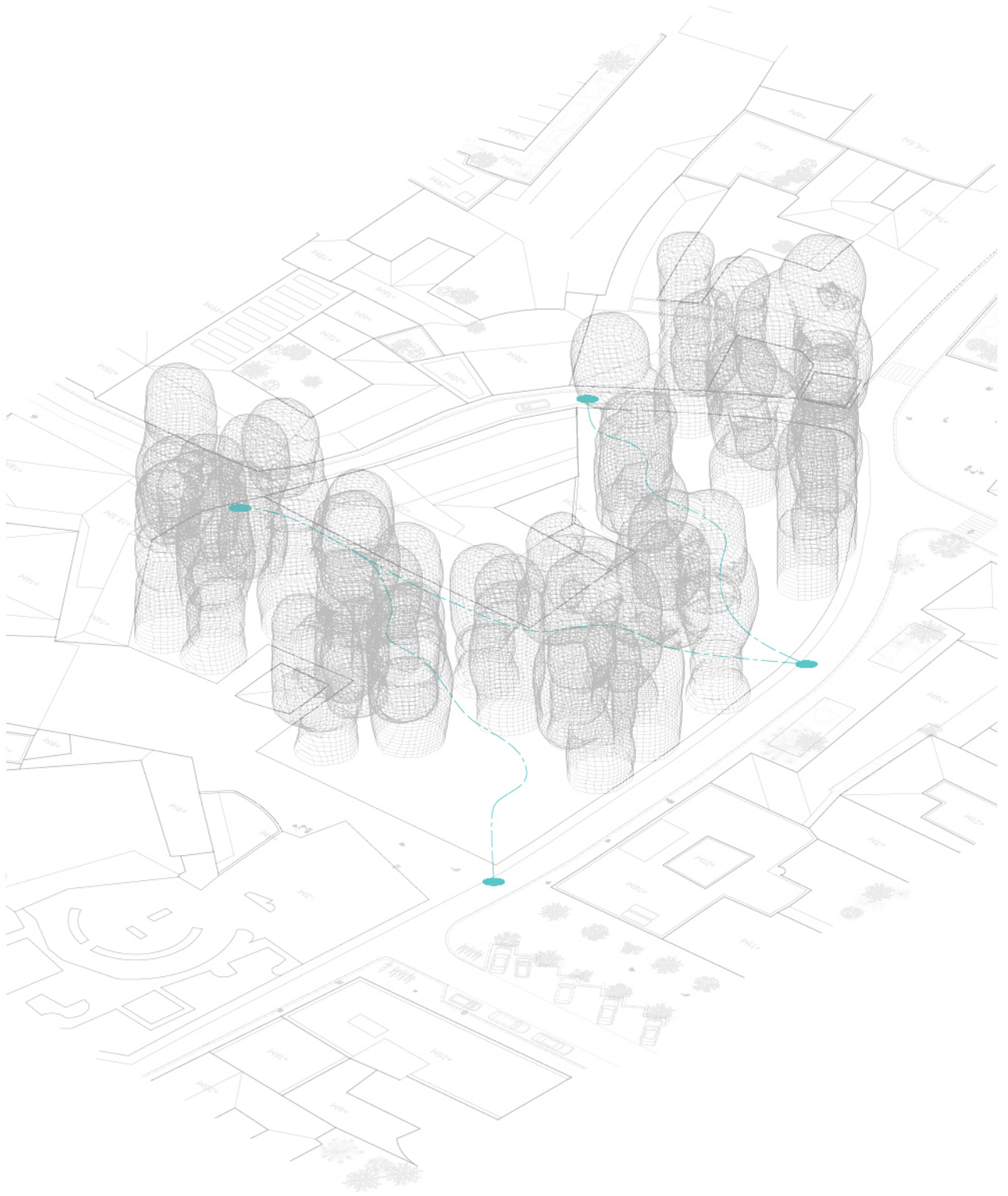
## Phasing





Phase I

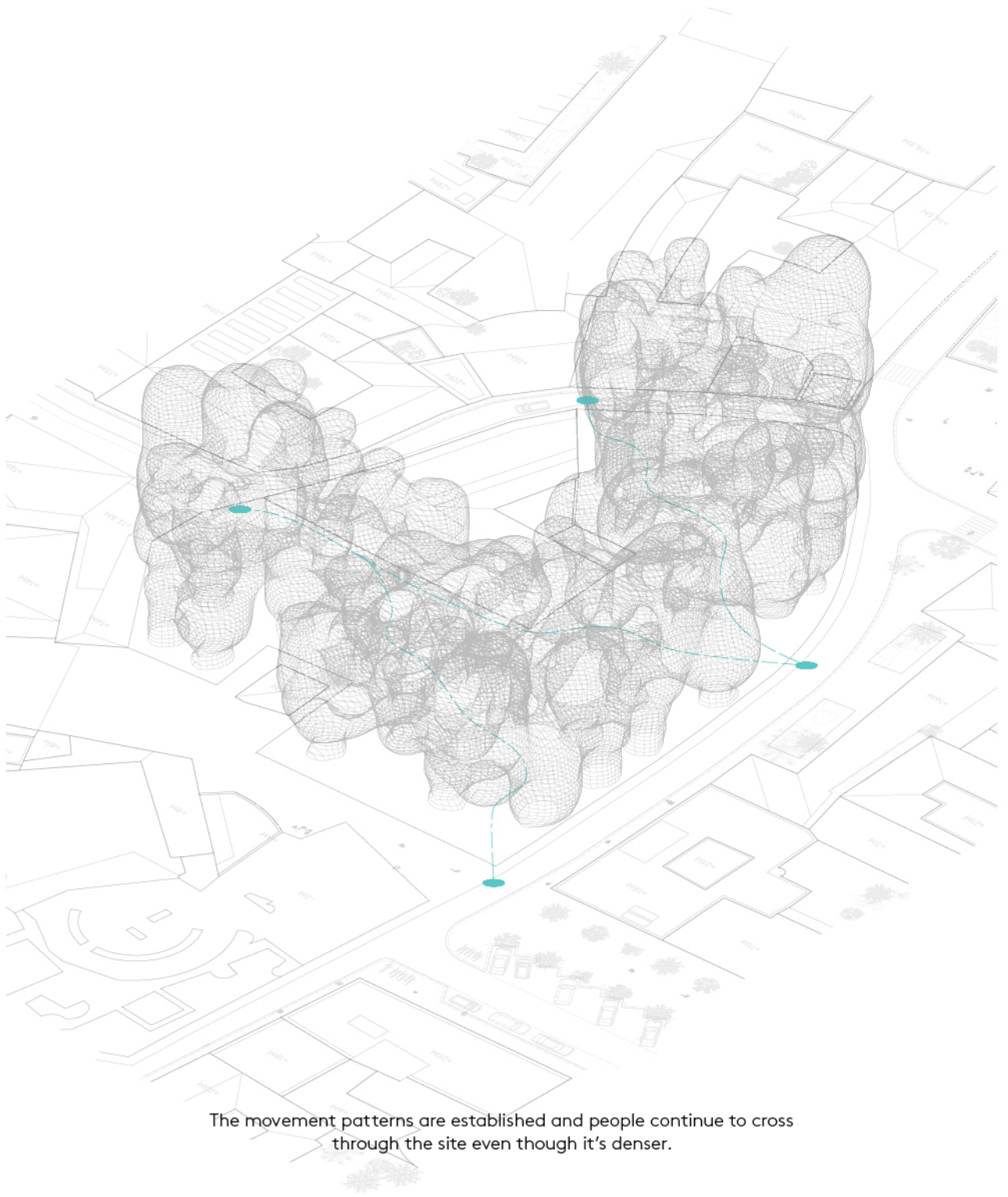




Phase II







The movement patterns are established and people continue to cross through the site even though it's denser.





## Dematerializing

Just as many leaves creates a crown or many trees creates a forest, the project could play on that effect of many things gathering into a whole. Equally, towards the outer borders, the project could achieve a dematerializing effect similar to what you see looking at the borders of a tree crown.

Many small parts will also filter the light similar to how it would look in the forest. The overall shape takes care of occasionally focusing the light into clearings.

Between the forest envelope and the inner housing volumes the construction is created out of 6x6x700mm sticks.



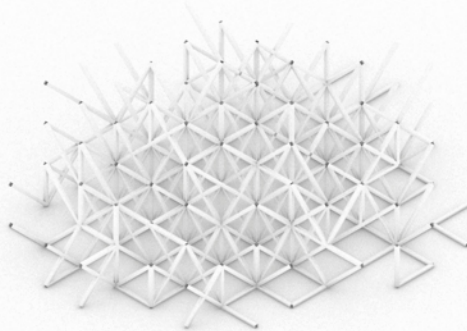
1



10



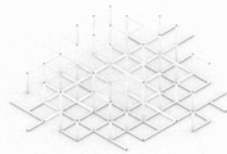
50



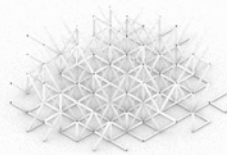
250

A simple stick. At what amount does it reach the messy, tactile feeling of the forest?

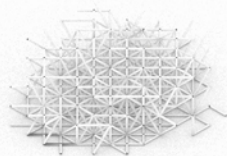
Construction Aggregation



Squares

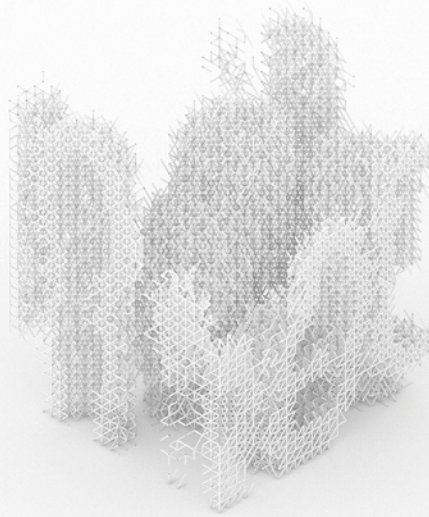


Squares + Diagonal

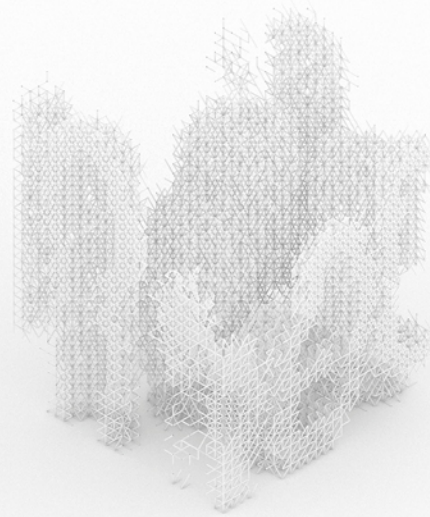


Squares + Diagonal + Cross

Study on how intense the lattice needs to be to create the wanted effect. Only squares looked much like a grid. Squares + Diagonal + Cross overdid it structurally. Squares + Diagonal was selected.



8 cm



6 cm

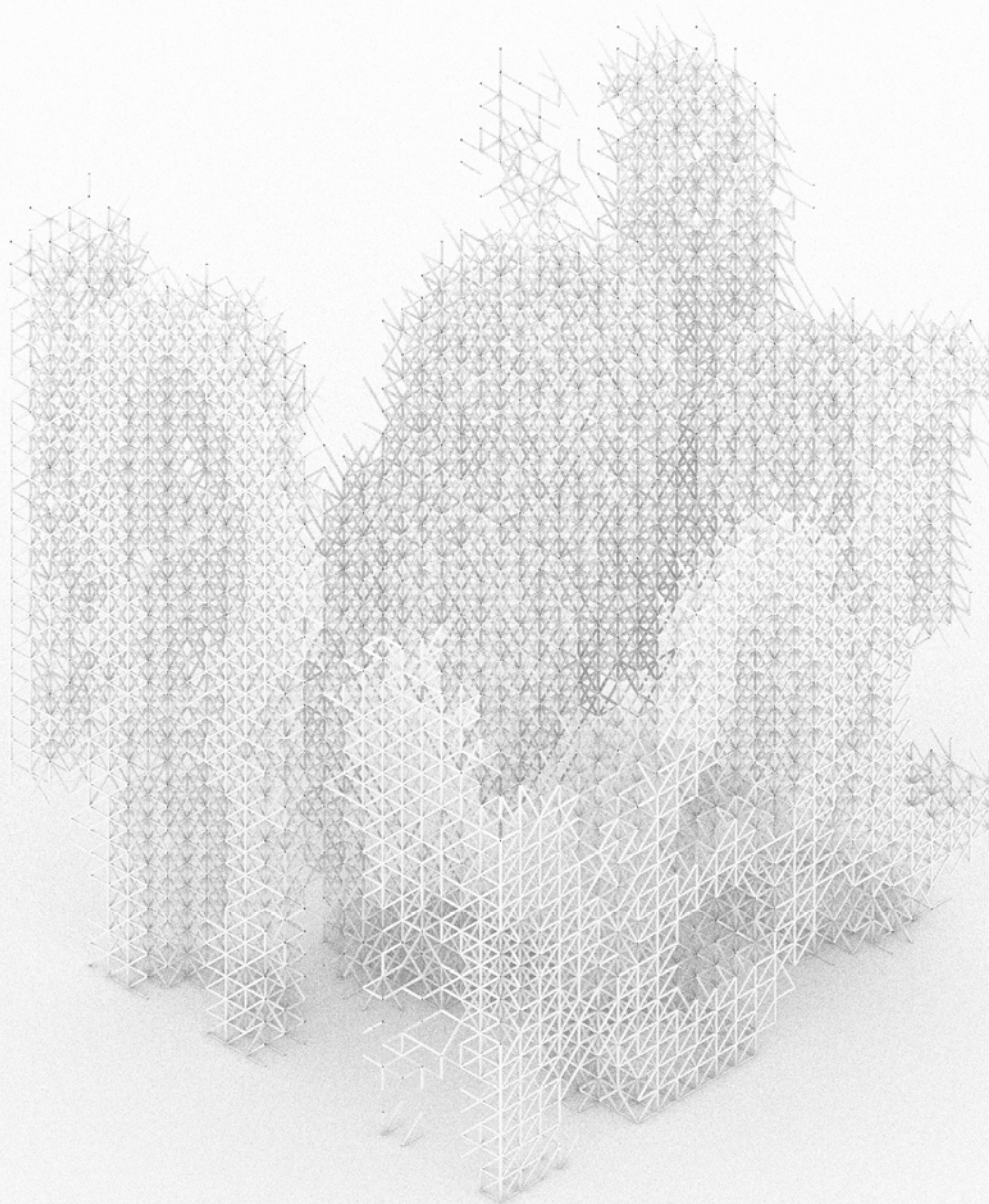


4 cm



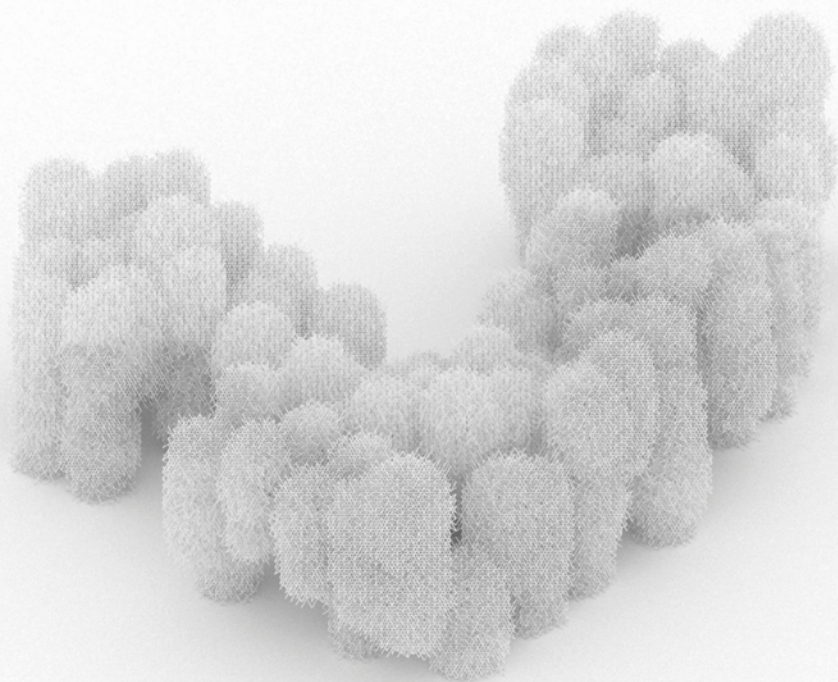
2 cm

Study on thickness of sticks. 6cm was decided after studying the appearance and looking at references.



Final version of the construction lattice.  
A rectangular grid, following the volume and fading towards edges.  
Creating something soft and very alive.

Final Construction



Full construction

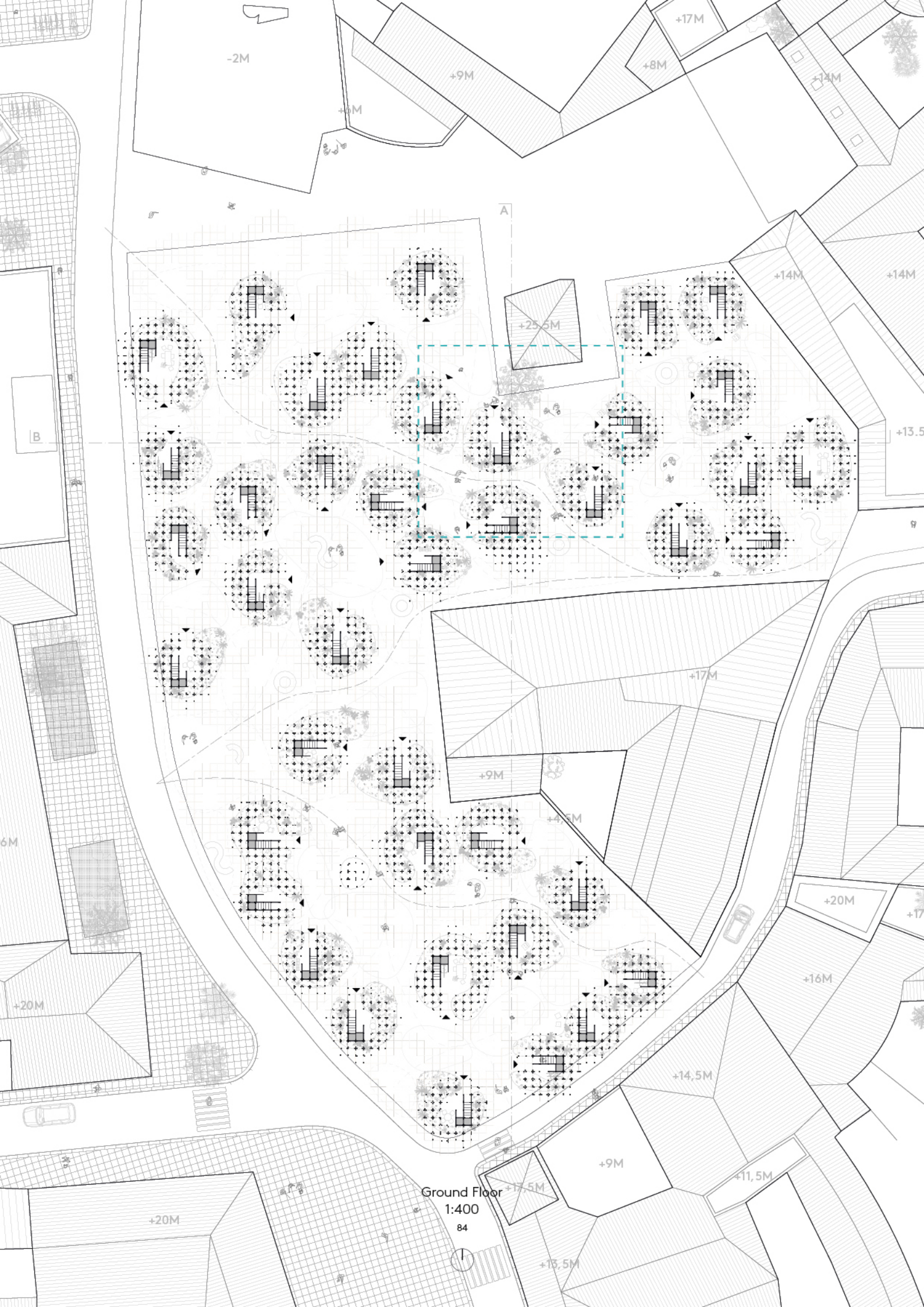




Perspective Dematerializing

VIII

# Design Proposal

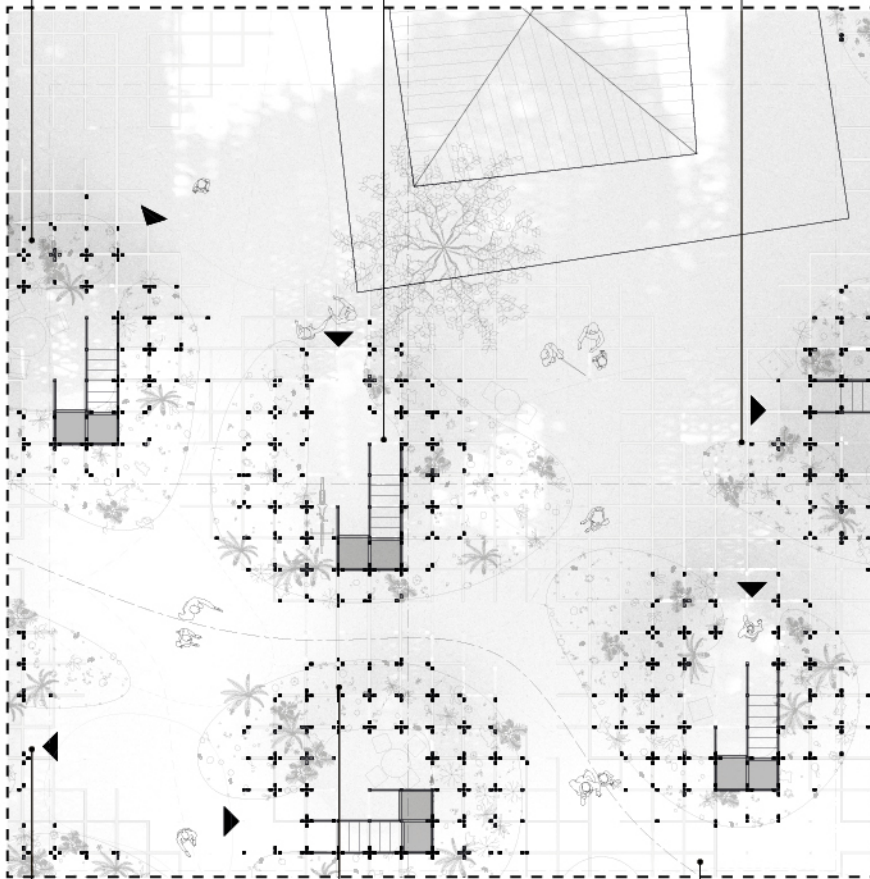


Ground Floor  
1:400  
84

Where the construction is too dense for people to move, vegetation takes over and creates green areas. Thus the construction is rooted in the greenery and grows as an extension of the vegetation itself.

On the ground floor there is space for outdoor furniture, keeping your bike etc. You also have the possibility to annex a part of the semi-public areas - depending on what level of privacy you want.

In some areas light becomes focused. In others diffused



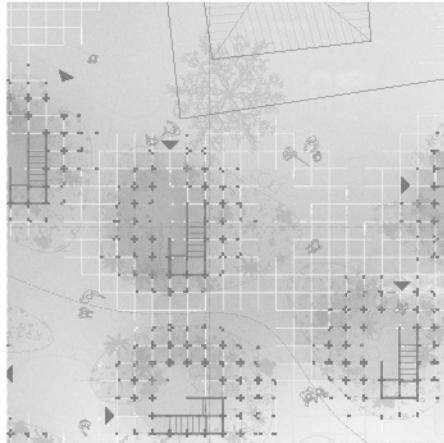
Generally, 2-3 residences share one semi-public space

The outline of the green areas is designed to help differentiate between public and semi-public areas and paths.

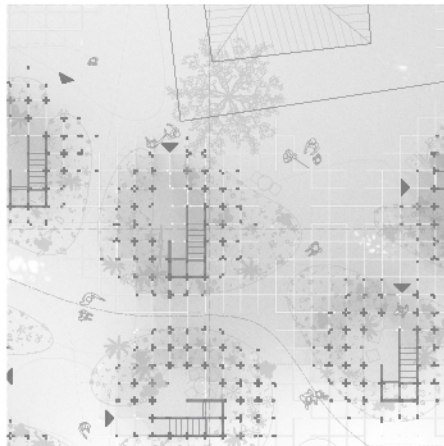
Public paths follow the quickest routes through the site. A set of small public plazas/clearings is created along it.

Ground Floor  
1:100

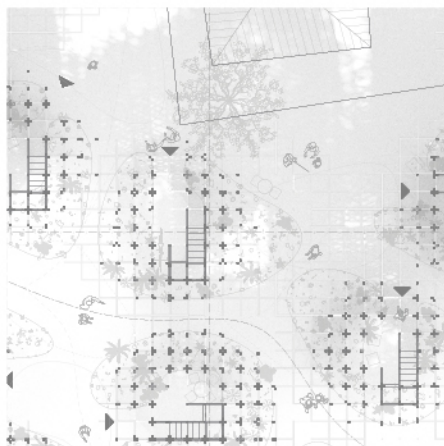




08:00



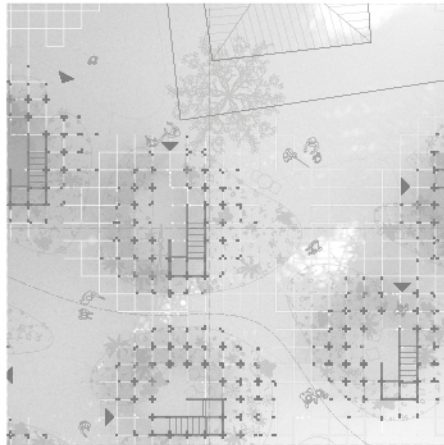
10:00



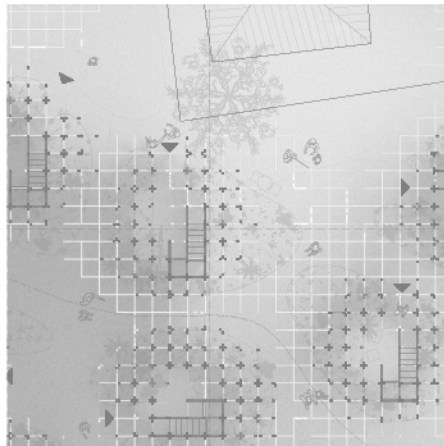
12:00

### Shadow Studies

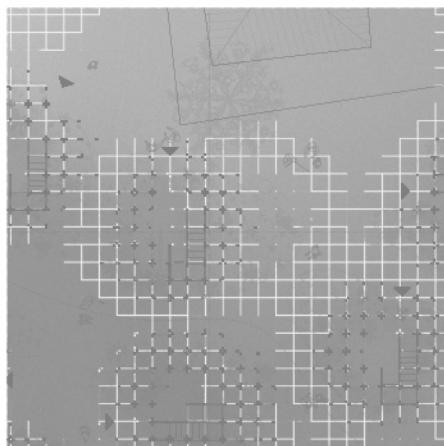




14:00



16:00



18:00

### Shadow Studies



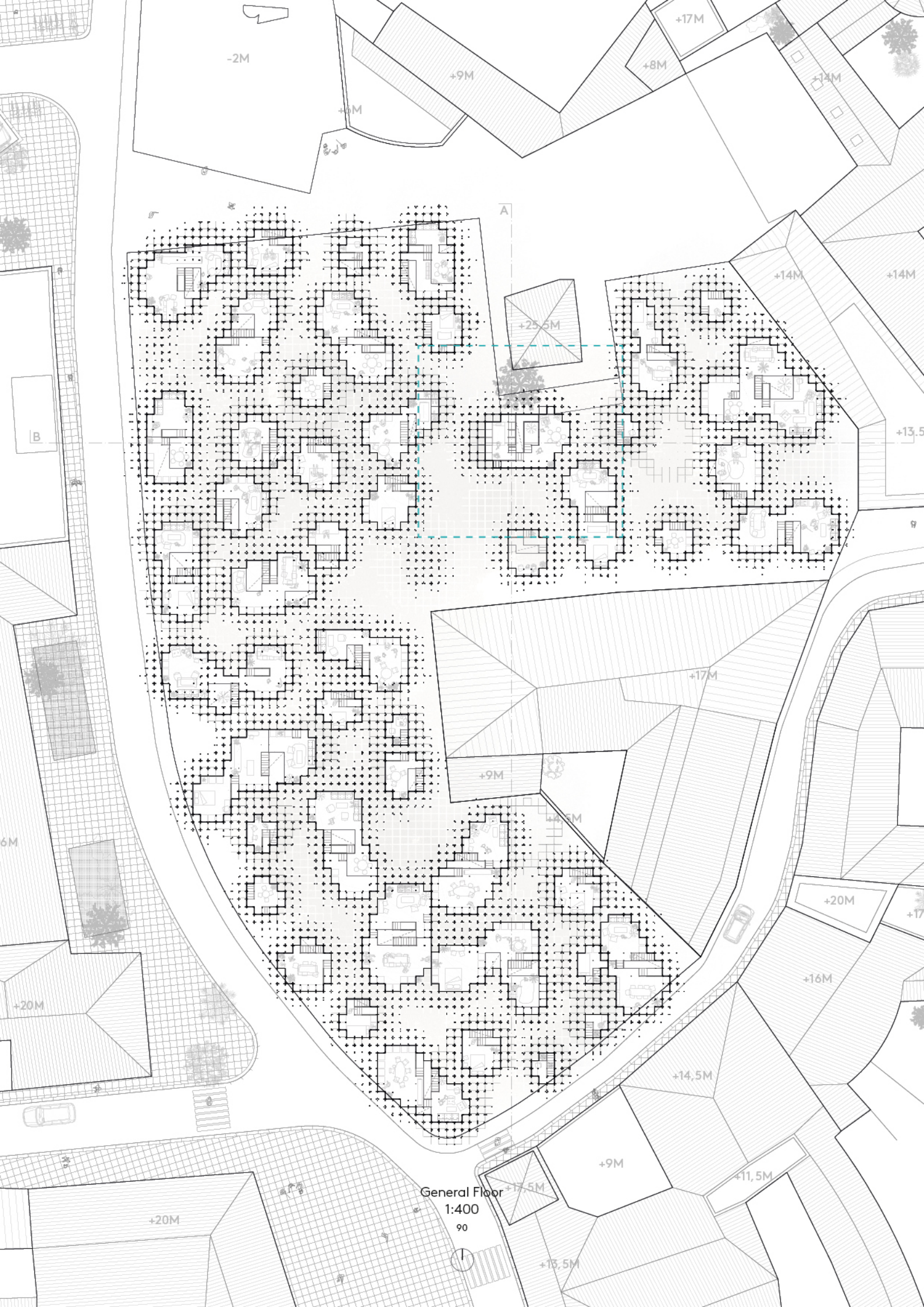


Ground Floor Perspective Day





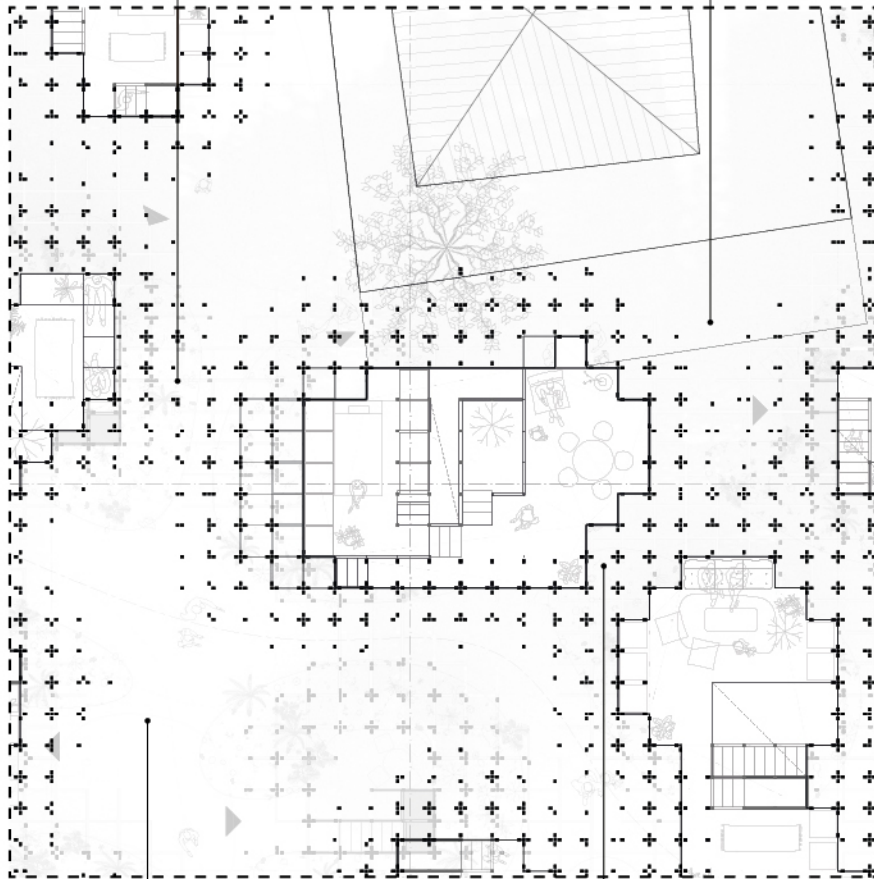
Ground Floor Perspective Evening



General Floor  
1:400  
90

The lattice seamlessly blends between residences

Towards voids the lattice dematerializes



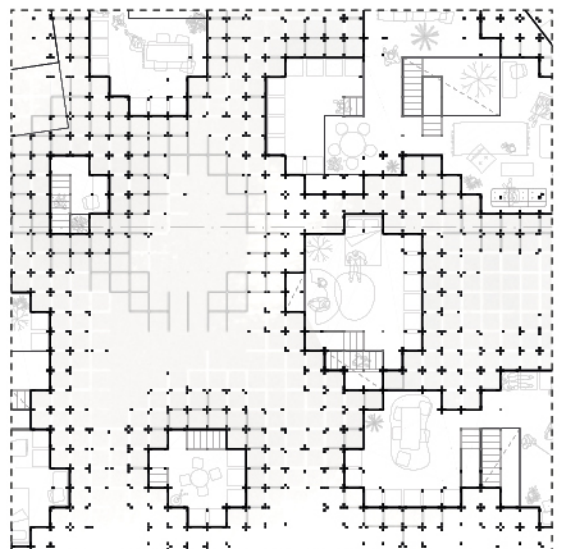
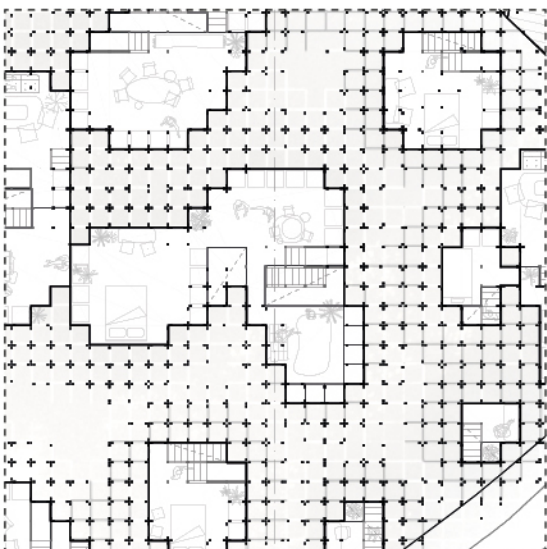
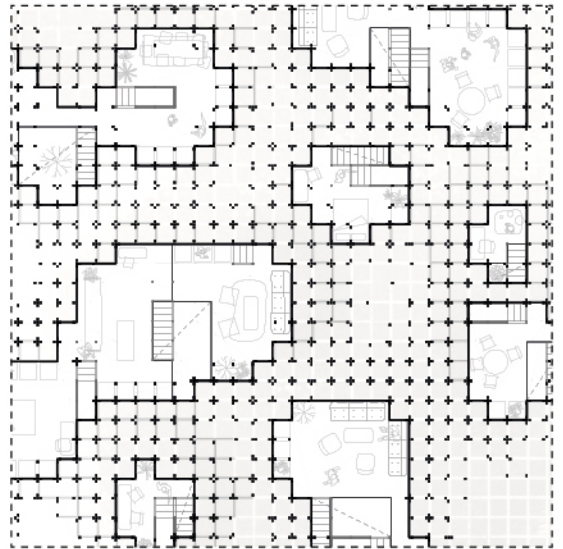
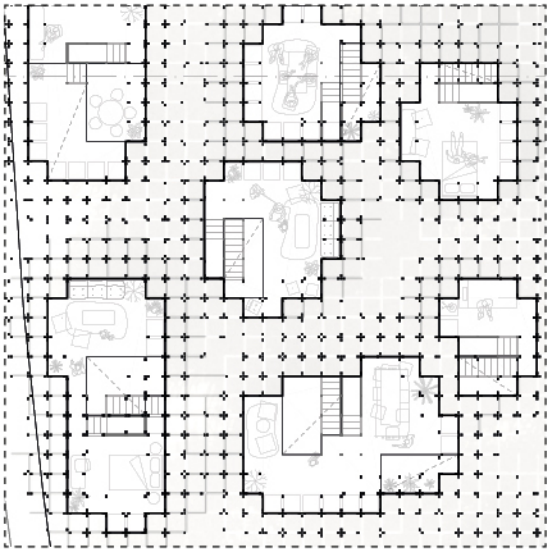
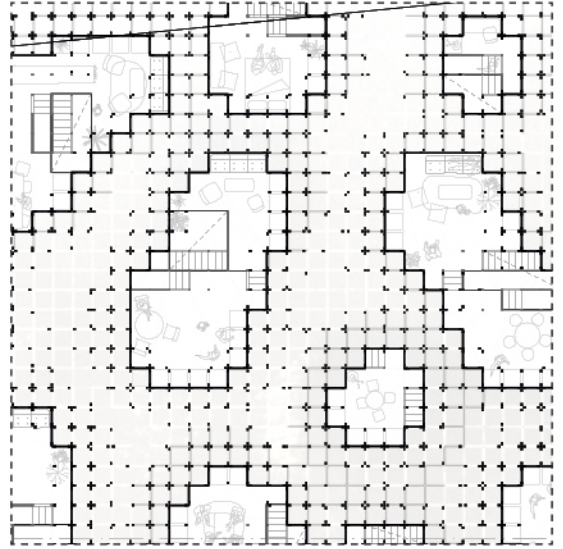
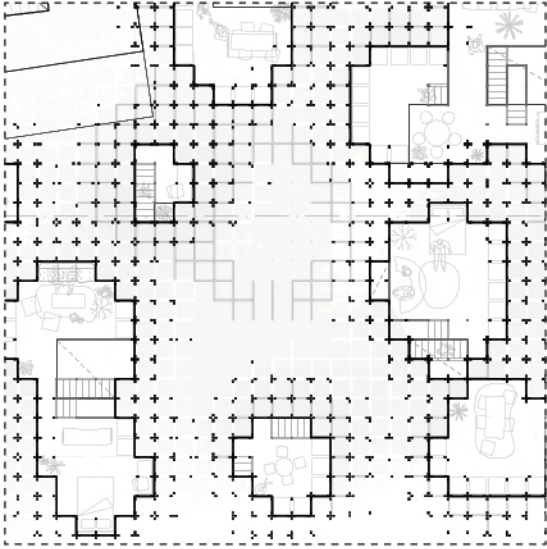
Some voids extend all the way through - letting light in and offer views to the sky

Privacy between residences are kept even though they sit closely. The construction diffuses and filters and creates a buffer layer between neighbours

General Floor  
1:100

91

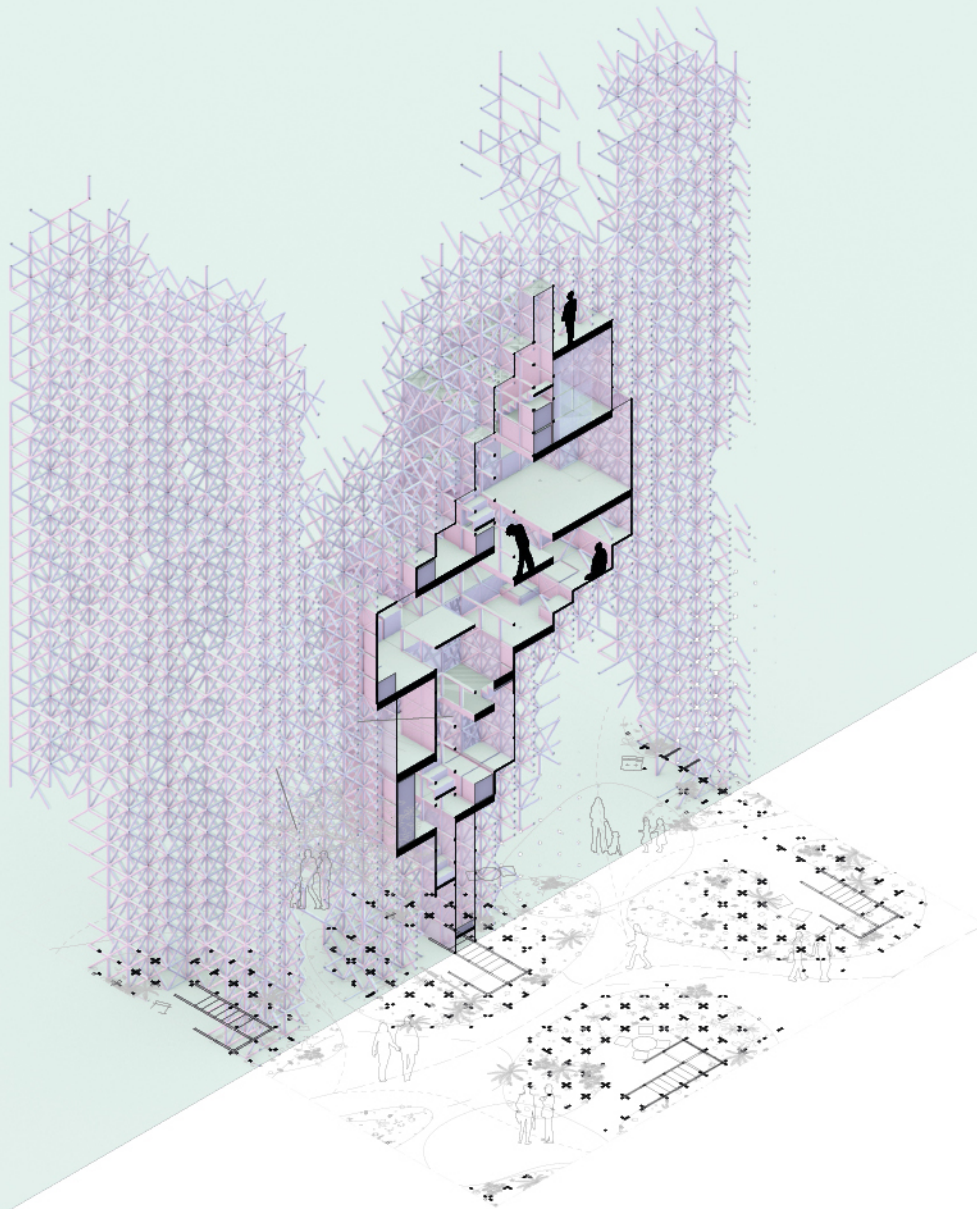




Scenes of Variation



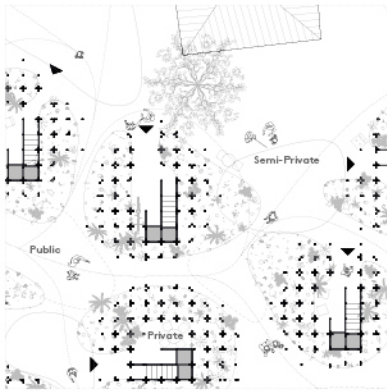




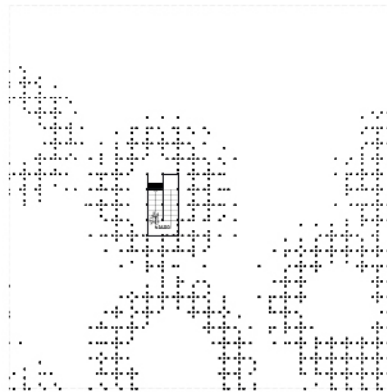
The inner housing layer is turned into residences. The qualities focused on is transparency and levels. A central void goes through the building. Like looking up through a tree crown, the levels are arranged around it so that you can climb your way through the residence from branch to branch.

Axonometric/Section

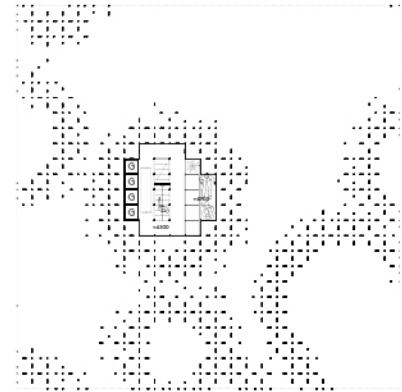




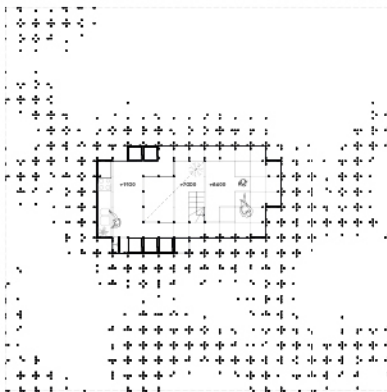
+0m  
Garden



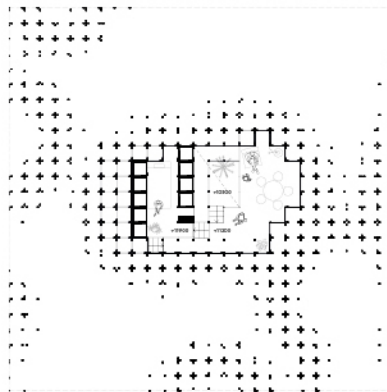
+3m  
Entry



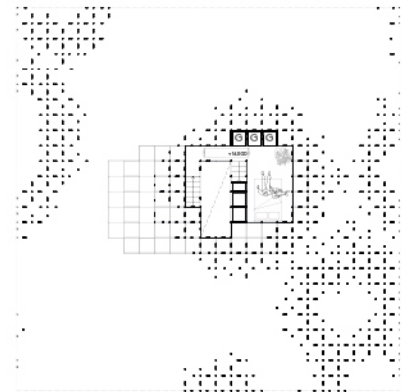
+6m  
Entrance



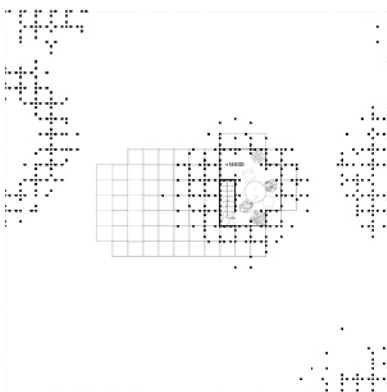
+9m  
Kitchen & Living Room



+12m  
Dining & Bedroom



+15m  
Master Bedroom



+18m  
Rooftop Terrace

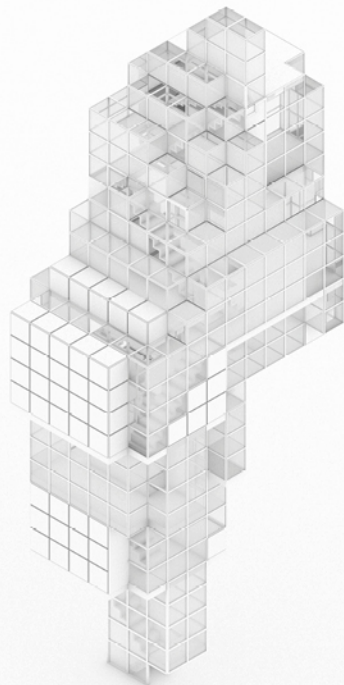
On the ground floor there's a small private area for outdoor furniture, bike storage etc. Sitting down here, you are surrounded by the vegetation that blends with the construction lattice. A private area but with diffused visual connection to the surrounding.

On the top floor you break through from the tree crown. You can look out over the forest, over the city.

This is a private place even though it offers the only unfiltered views of the residence.

## Housing Plans

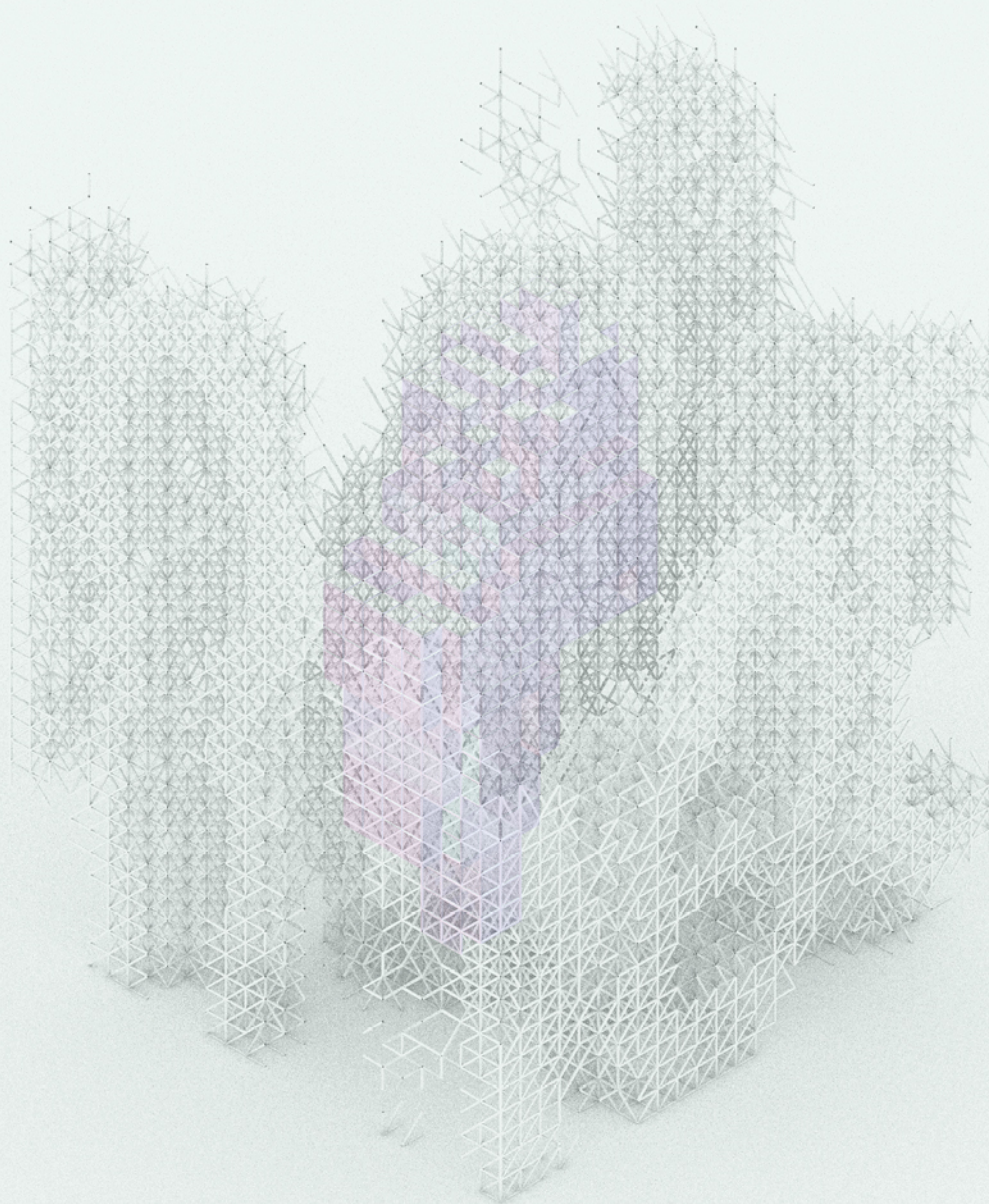




Facade is focused on giving the interior rooms the type of diffused light you get in the forest. Therefore most of the facade is made up of semi-transparent panels. They let light in but they also highlight the shadow play created when sun falls on the construction. It also naturally syncs your life with nature by being heavily impacted by the changes of exterior light conditions. Windows are placed where suited and a solid panel is used only when needed.

Facade



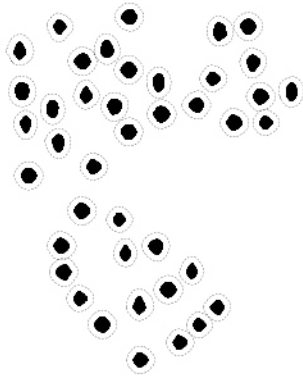


Embedded in the nest of construction, transparency is not an issue. Even when neighbours come close to each other, the construction always creates a buffer zone. Filtering and diffuses views and light before reaching the residence.

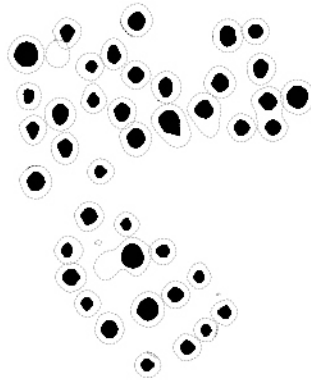
Diffuse



Interior Perspective



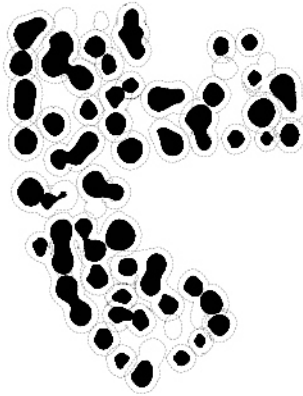
+0m



+3m



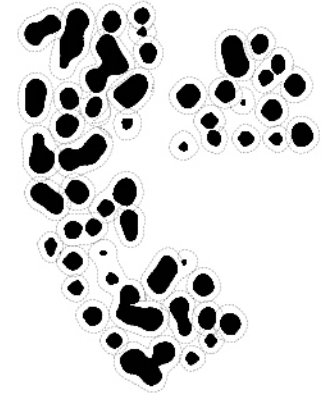
+6m



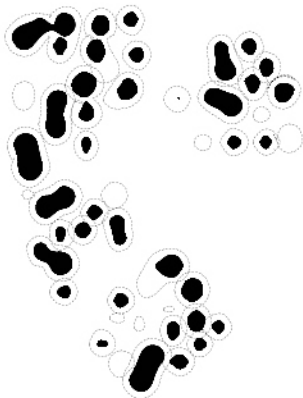
+9m



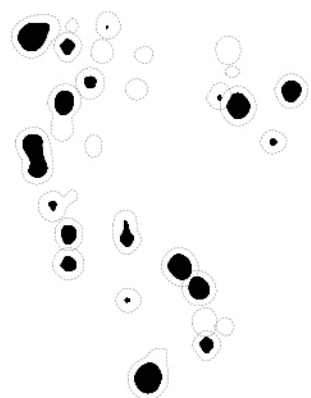
+12m



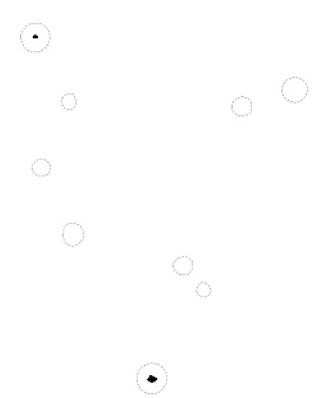
+15m



+18m



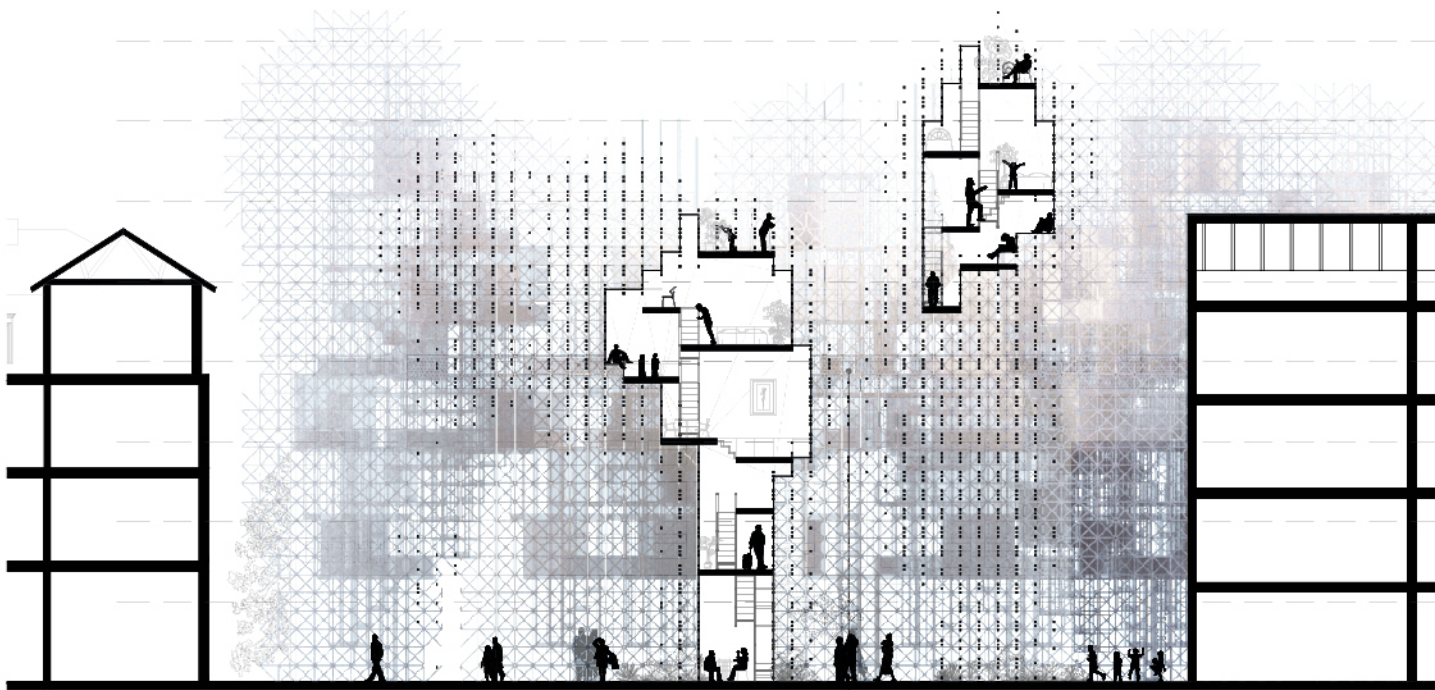
+21m



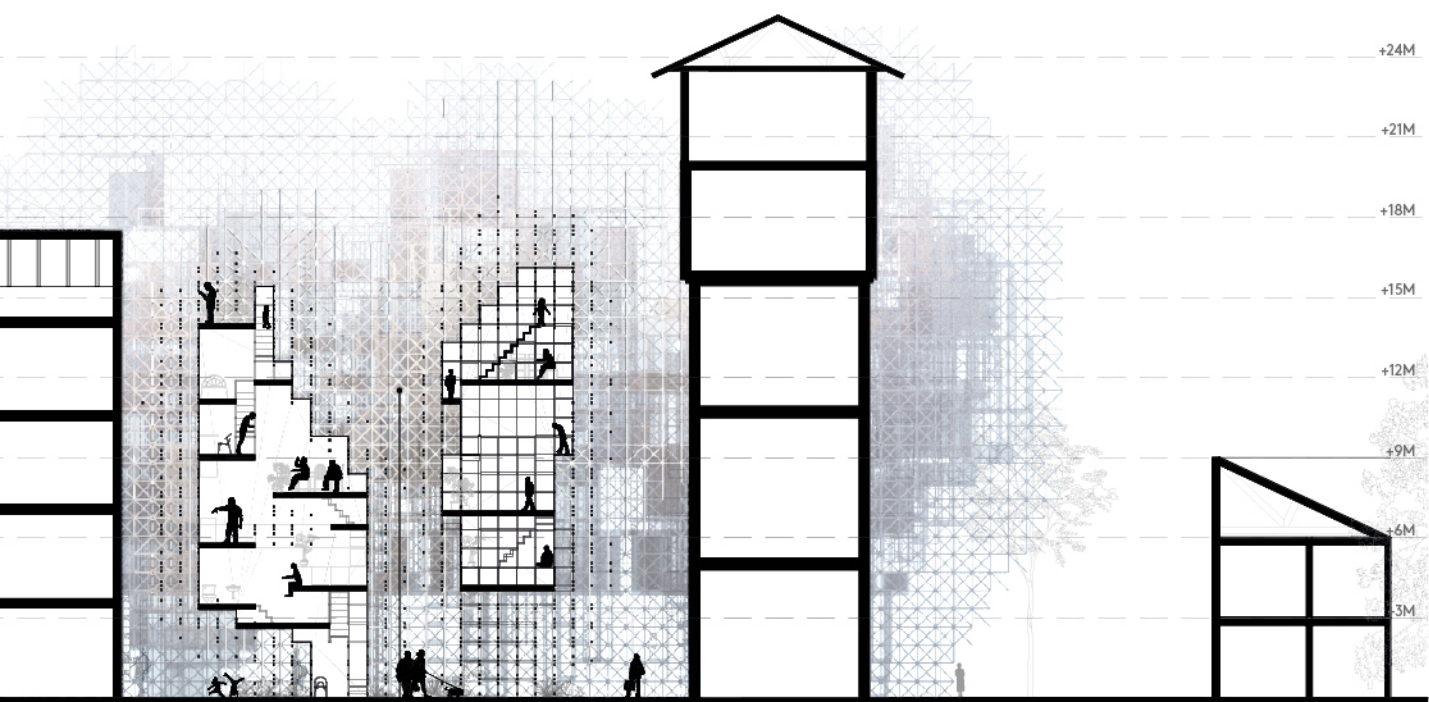
+24m

Floor Plans



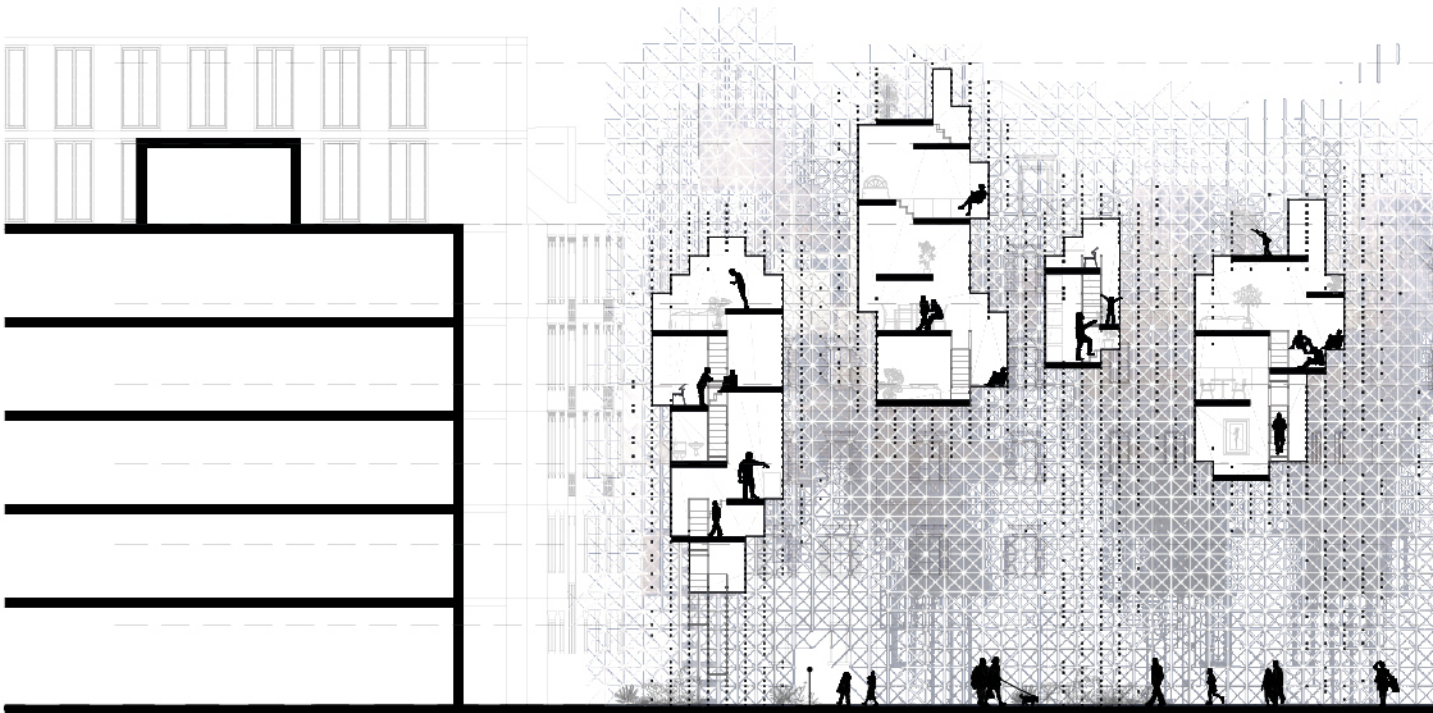


Some voids extend all the way through - letting light in and offer views to the sky



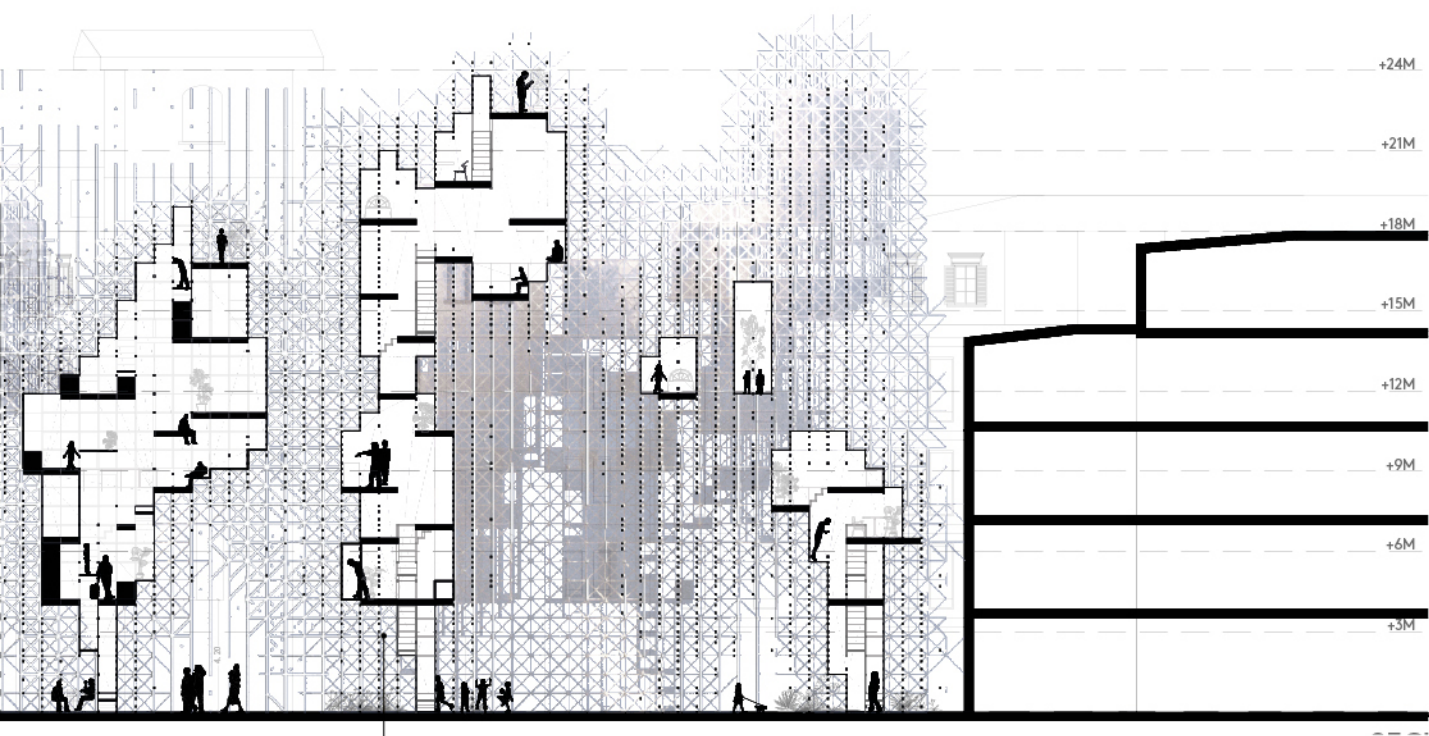
Privacy between residences are kept even though they sit closely. The construction diffuses and filters and creates a buffer layer between neighbours





The ground floor is open to create a free flow through the site.

Section B-B  
1:400  
102



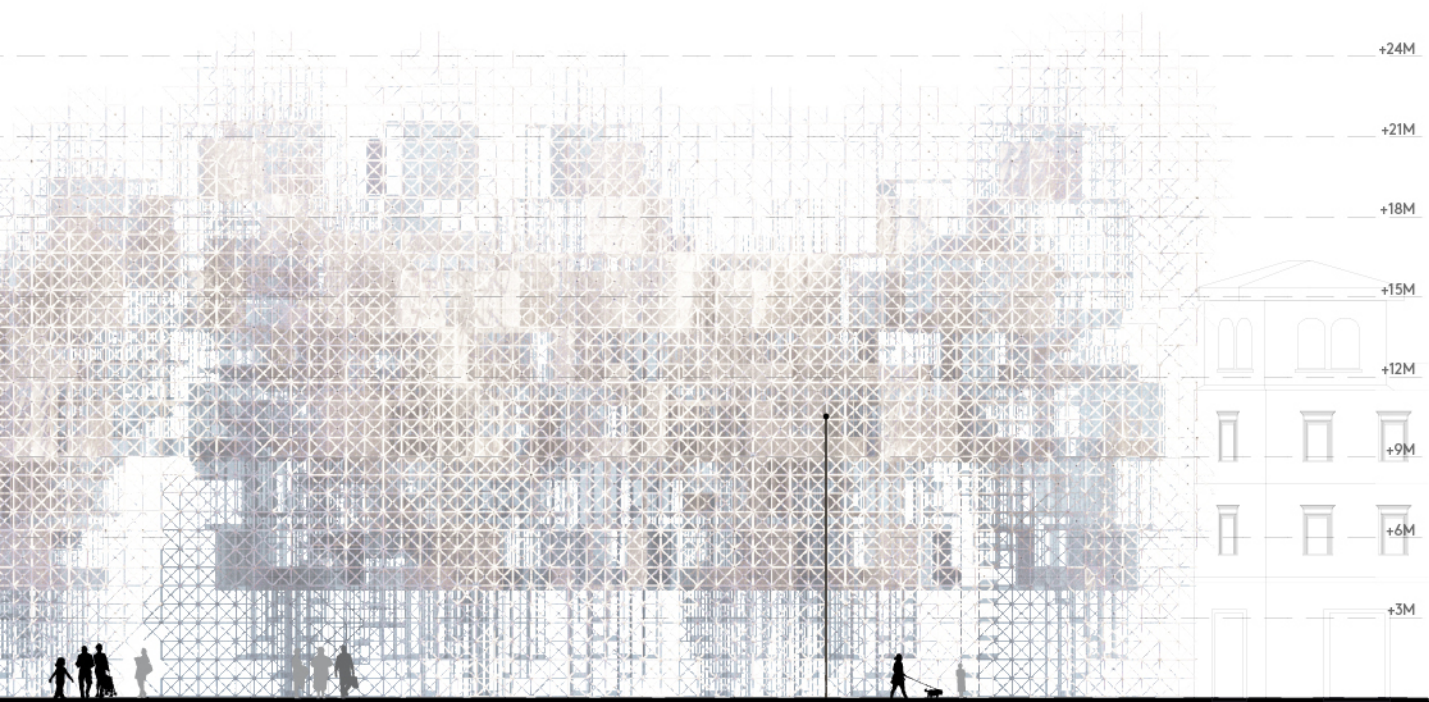
Just like a tree, the residences  
are very much solitary units.  
Completely independent but still  
blending into something bigger



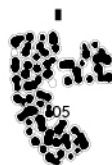


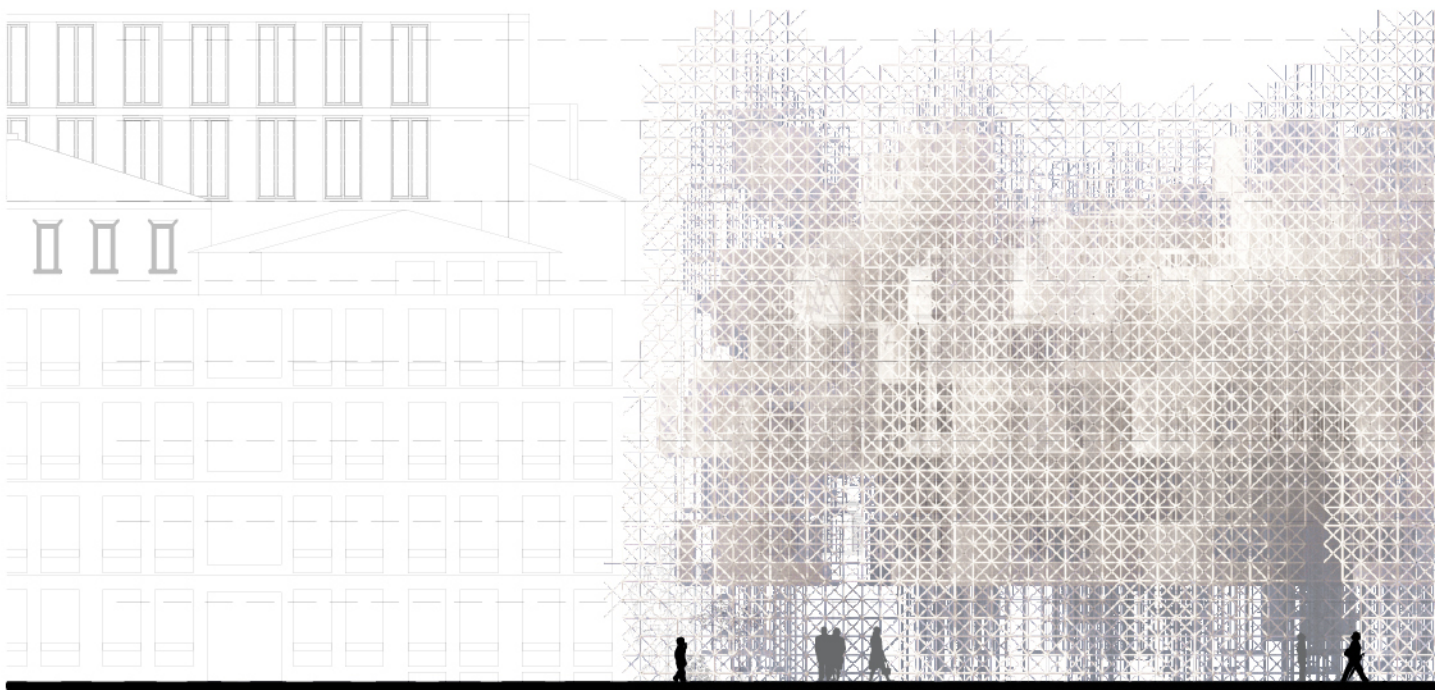
From far - the perception  
of one big volume  
constructed out of smaller  
parts.



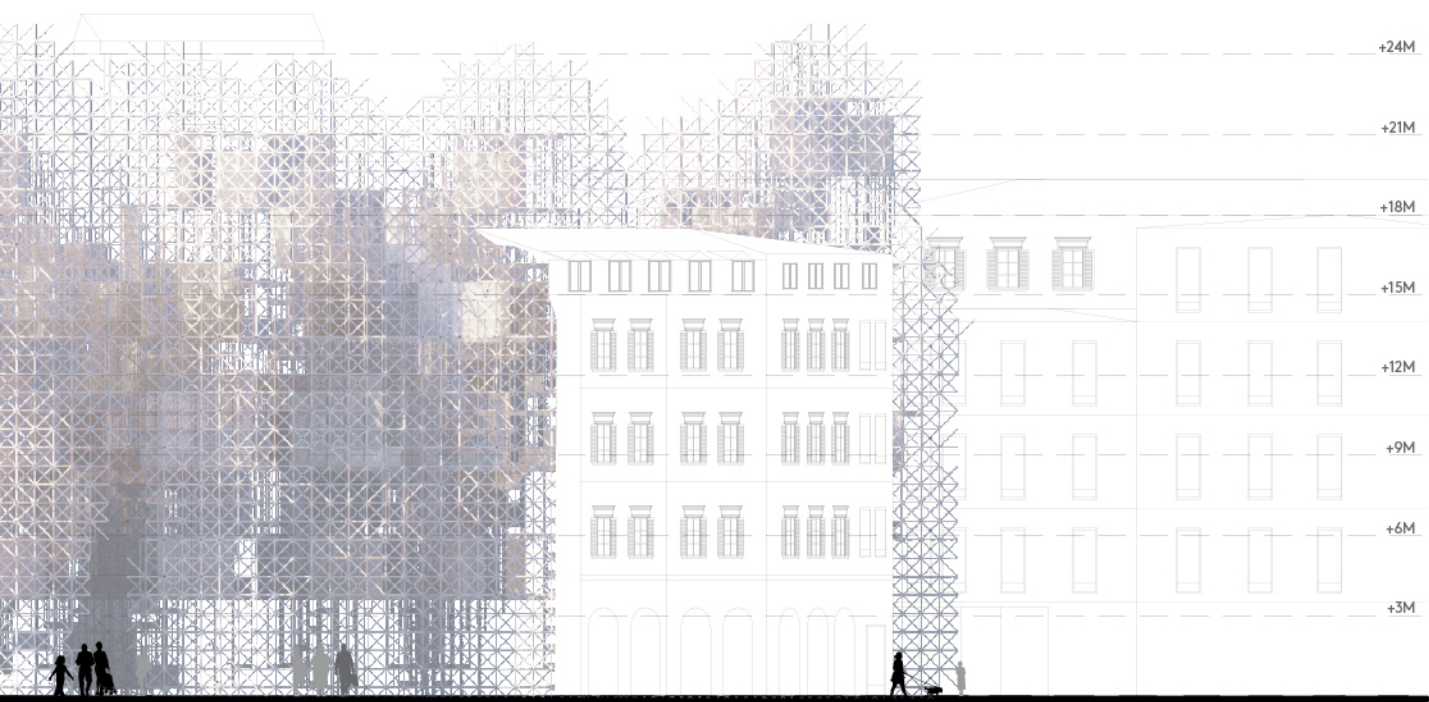


Close up - differentiating into solitary objects. The exterior construction layer and the interior housing layer



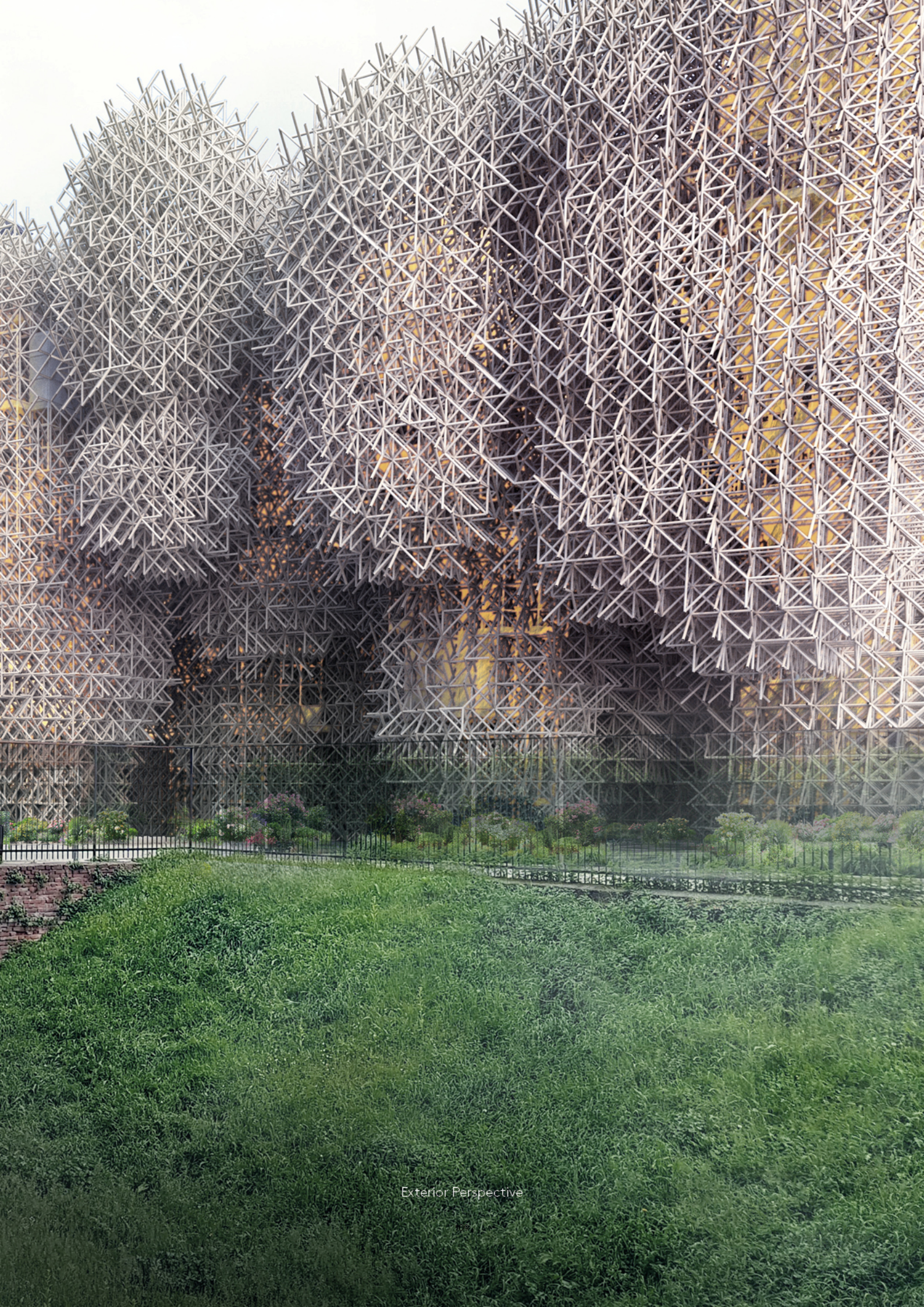


Elevation South  
1:400  
106

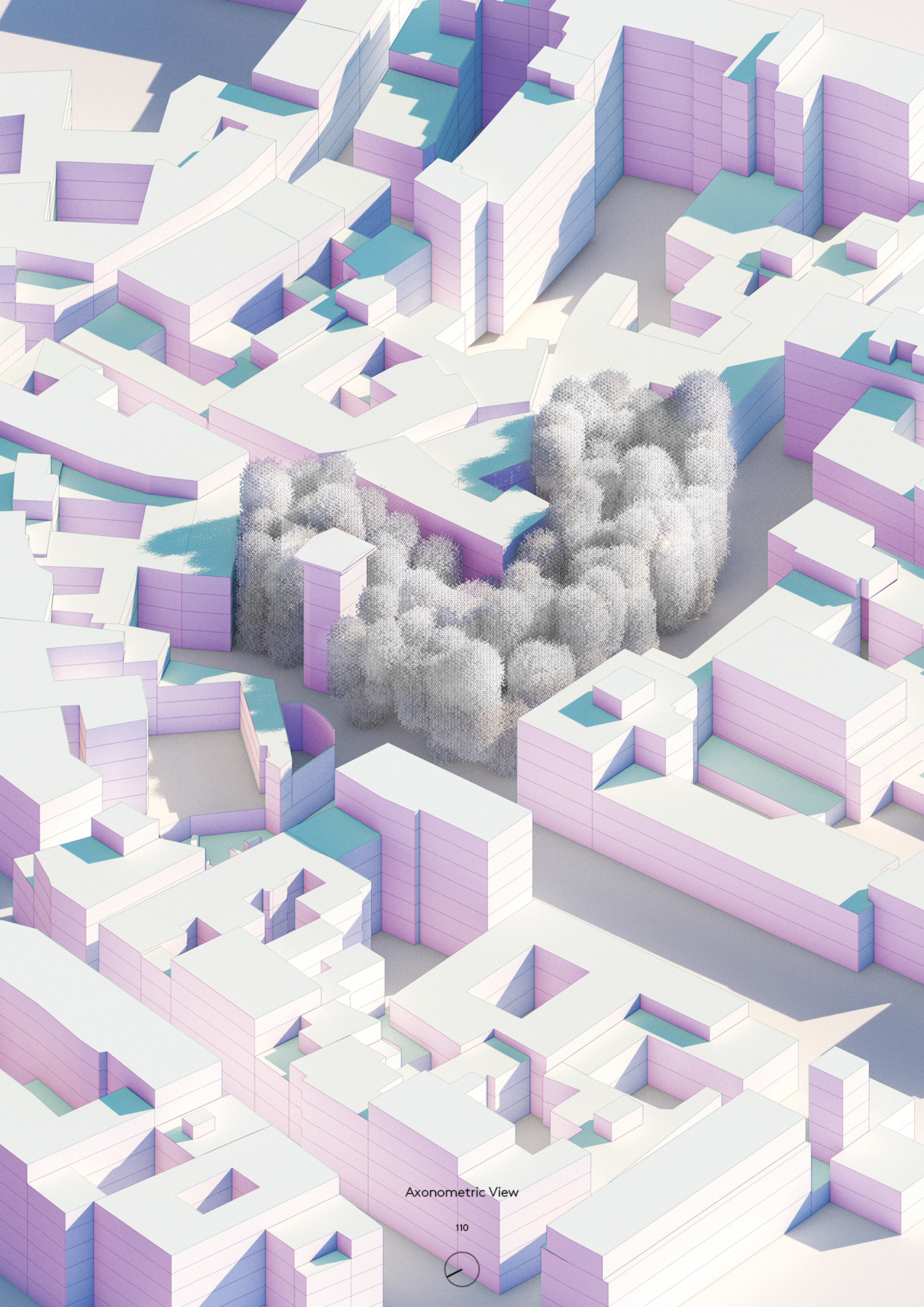




Exterior Perspective

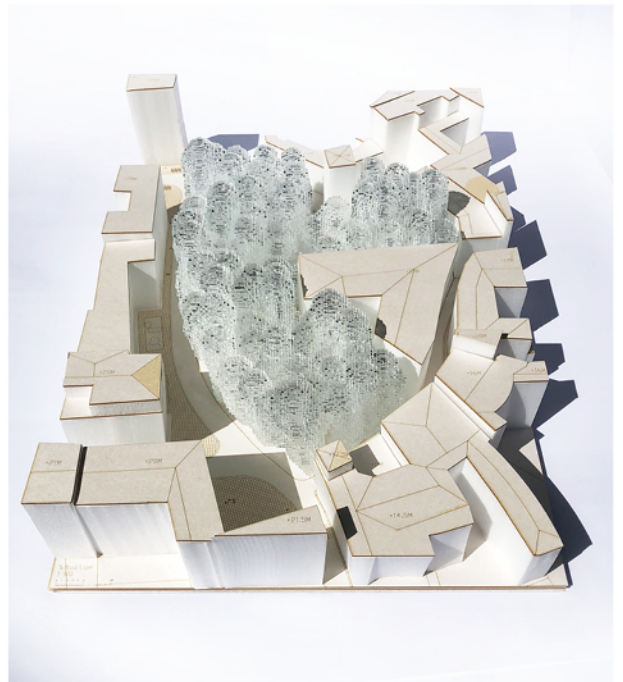


Exterior Perspective



Axonometric View





Model Photos



Model Photos



## Reflection

To summarize this exploration of the architecture of the forest, I feel that it has in some ways been quite successful. When looking at the spatial qualities, I believe a lot actually is there in the final project. Especially the interplay between sunlight and the construction lattice became, in my opinion, very strong. During the critique we discussed movement. How trees are effected by wind and how the construction could have inhabited a similar effect. If I would to continue on this project at some point, this is something I would like to develop together with a solution for the construction. It was a deliberate choice not to go into construction since I would like to have been able to explore it more than I had time to at that point. Having a solution for the joint between the wooden sticks, how they sit in the ground etc. would help to connect the project more to reality.

As for the psychosocial effect of the forest it was and still is more a hope of something that could be a by-product of answering my thesis question. During the critique I got some references that I wish I would have known earlier. It could perhaps have helped me to make it more concrete what in the forest that actually affect us. Still there is some things we could try to estimate. Would it help decrease ambient noise? Perhaps, leaves help with that by shattering soundwaves, the lattice could do something similar. Do you perceive it as green? No. Does it give an open area for activity to take place? Yes, much more than a conventional housing block. Does it take care of carbon dioxide? No, but it could be studied as part of developing the construction. It would be interesting to take the project as it is now and try to measure its effect on the neighbourhood. As it stands now the spatial and aesthetic qualities is clear but the psychological effects are just hypothetical.

But maybe the psychosocial part always was a detour. It was for me a way to make an argument for why I should make this project and where to put it. It was also a way to root in the current time and merging the need for urban housing with the issue of stress and mental health. Perhaps the spatial and aesthetic qualities would have been enough. That's what the thesis questions is about and what the final project is responding to.

A deliberate choice in the project was to not pay too much attention to the context of the implementation site. This was done since I didn't want my attention to drift from my main thesis, the qualities of the forest. I don't necessarily think it was a mistake at that point in the process but looking at it now it was maybe a decision I wouldn't need to have been so clear with. If I would let the context and qualities of Via Brisa play a slightly bigger part then I did it probably wouldn't have affected the project negative but ground it better in reality.

This leads me into the biggest discussion I've had with my self during the project. The issue of staying true to the data versus using my knowledge as an architect (on other words designing). It has been a test on how to use data and not being controlled by it. There was a lot of times were I felt stuck because I didn't want to disturb what I saw as a true translation. Therefore it was somewhat of a relief when the project came closer to an end and decision had to be made and I was able to release myself a bit more. As I wrote earlier, inspiration from Junya Ishigami and Sou Fujimoto also helped me here. To understand that everything doesn't have to be exactly like the data but sometimes a more freely designed abstraction.

Another problem with working with data is ending up using averages. In the beginning after I've done the site survey I started using averages for everything. The idea then was that it would give a truthful translation as the forest as a whole. The problem is that it takes away all the fine little variations and abnormalities that give the forest its chaotic calmness.

In the end, I'm happy with the project and the process. I got to research something that for me should be closely linked to architecture. I also got to learn a new software that I've been wanting to use for some time, Grasshopper. The discussion during the critique took one step closer towards realism then what I did with this project. For me this was a perfect way to evaluate it, not too far from the realm that I've been working in but still trying to pushing it closer to the professional world of architecture. If I would continue with the project I have a lot of clues on how to develop this project and perhaps give Via Brisa and the rest of Milano a new form of architecture.

# Architecture of the Forest

Jonathan Hellsten