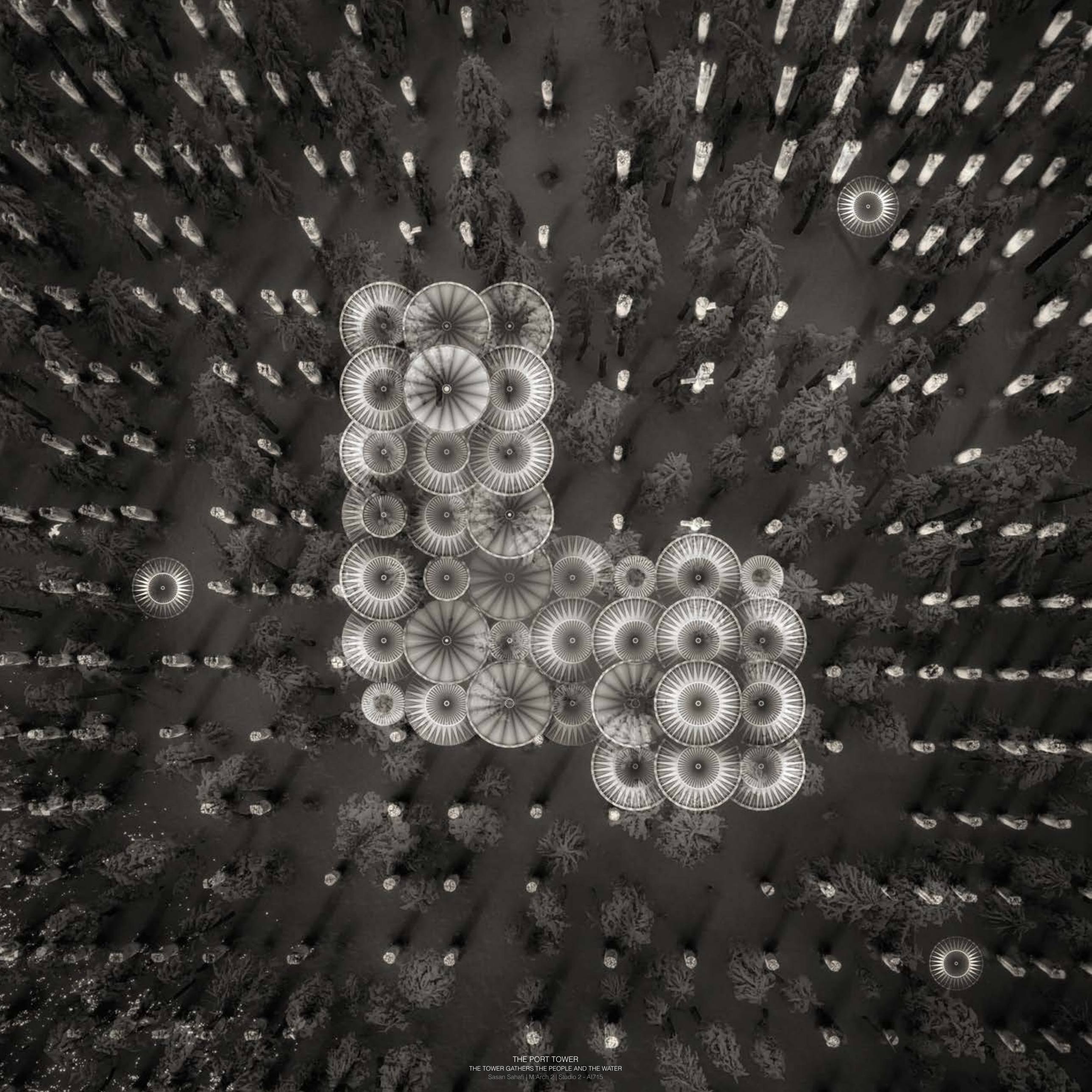

THE PORT TOWER

THE TOWER GATHERS THE PEOPLE AND THE WATER

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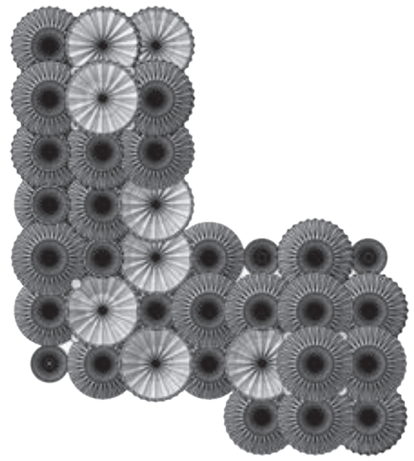

The Port Tower(s) of the Forest

Social polarisation and environmental resource management are two intertwined problems facing our cities of the future. Both are accelerated through rising population, consumption, greed, apathy and ignorance, coupled with the isolation caused by individualism and competition. These are the biggest challenges facing us in designing civic, socially and environmentally sustainable models for city concepts of the future.

The port tower is a model for a new city concept with movement at its core. It provides a new design solution for short term gatherings. The movement from and to other living environments, such as existing towns and cities, will enrich the port tower and also provide a healing mechanism for the existing living environments. With each contribution, the tower itself will evolve, like the rings of a tree, showing the events, and spreading seeds to other parts of society. The more diverse the ‘movers’, the richer the gathering.

The main principle for the tower is ‘gathering’ -environmental and social- providing mechanisms for the gathering of people, technology and environmental resources. The spirit of ‘gathering’ is the sharing of ideas, resources, materials, spaces and experiences. Collecting, using and re-using water sustainably is necessary to have any future on this planet. Through history there are many examples where the absence of resources and climate change have led to the destruction of societal structure and conflicts around the globe. This is why any proposal needs to consider the management of resources.

The Port Tower concept provides an infrastructure for gathering and spreading of environmental resources, and more importantly, the experience of events via the people.

The tower is planned to be a space for short term gatherings and shared use, no one should own property here or occupy it for long durations. This will provide a continuous dynamism by diversifying the users. Alongside the water collecting façade design of the tower, individual water-collecting tower units can spread out into the surrounding forest, to increase the collection of this resource. Social events are also not only limited within the tower, and can take place in the surrounding areas. The use of the land for farming, markets, outdoor activities, and other types of gathering spaces are at the heart of the port idea.

The Port Tower is a vessel that brings together different people in a shared place, to build up experiences and share them back, therefore enriching the cultural fabric of society, like a high street.

The use of designed artefacts have helped to investigate different conceptual models to collect, store and re-use water.
The final artefact provides the idea for the environmental gathering principle of the Port Tower

ventilation hatch

rainwater collector

pulley system

rainwater pipe

1

2

rainwater pipe

rainwater collector

foldable panels

pulley system

ventilation

water vessel

recycled water exit

turbine generator

1 - top
water collector - roof

2 - middle
water collector - facade

3 - bottom
water vessel - cistern

cistern tanks

a

b

c

d

e

f

g

h

I

II

III

3

4-way valve

access - collected water

exit - recycled water

hydraulic piston

float - vessel

collected water

buoyancy force

gravitational force

collecting water

sinking the vessel

draining the vessel

collecting state

floating state

sinking state

pumping state

drain state

ARTEFACT

WATER COLLECTING & RE-CYCLING

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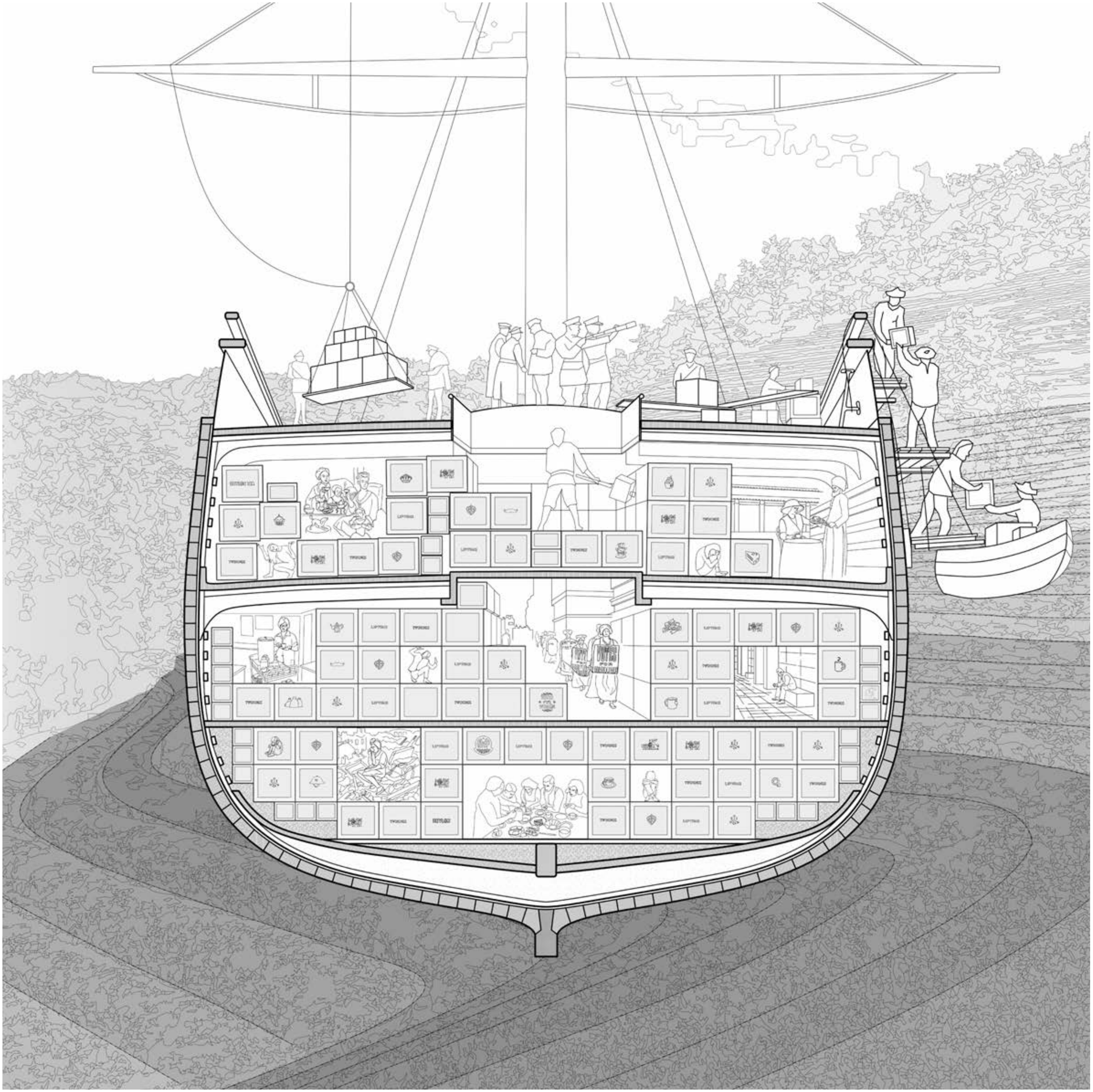

Cultural heritage can shine a light on the social mechanisms - the tea culture in Britain has been transported from destination to destination, is localised and keeps evolving. Although the tea culture may be formed of different social rituals, they all come together around the simple act of tea-drinking.

VESSEL

TEA CULTURE

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Both the environmental and social gathering concepts come together in the idea of a hybrid tower.
By providing transport, infrastructure, habitation, events, mixing of people and sustainable use of resources an opportunity is created.

HYBRID

FACADE & STRUCTURE ELEMENTS

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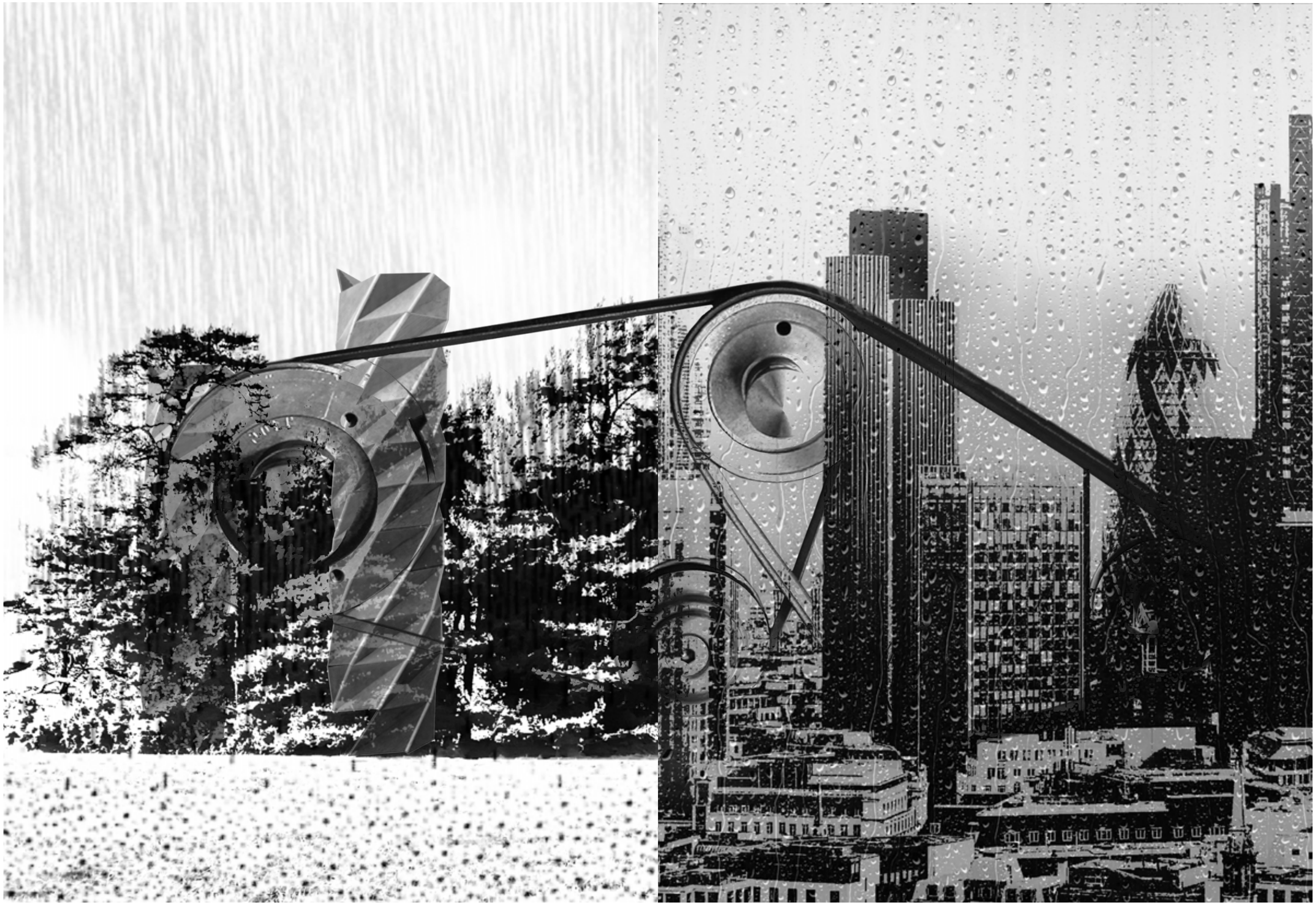
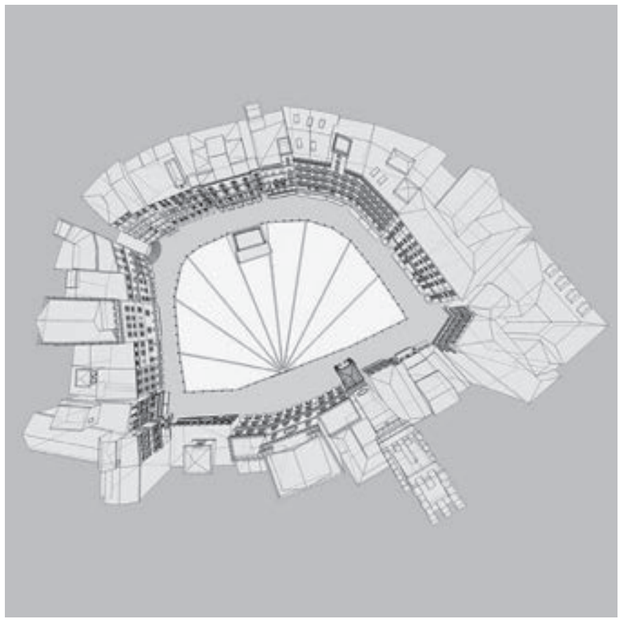
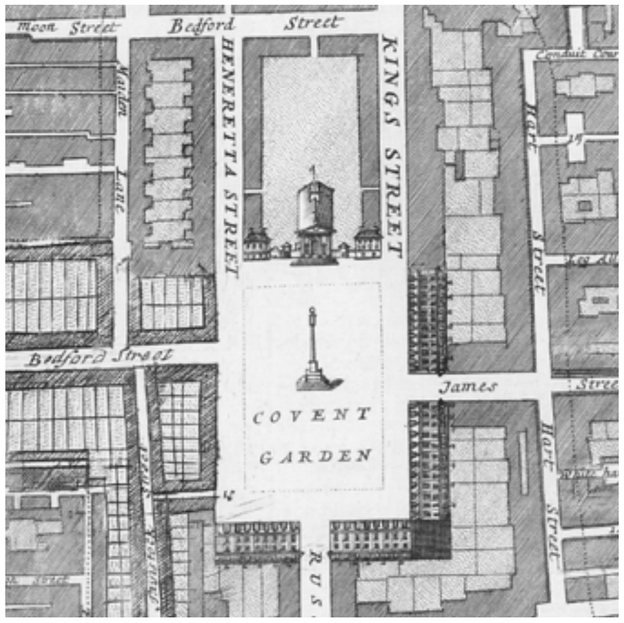
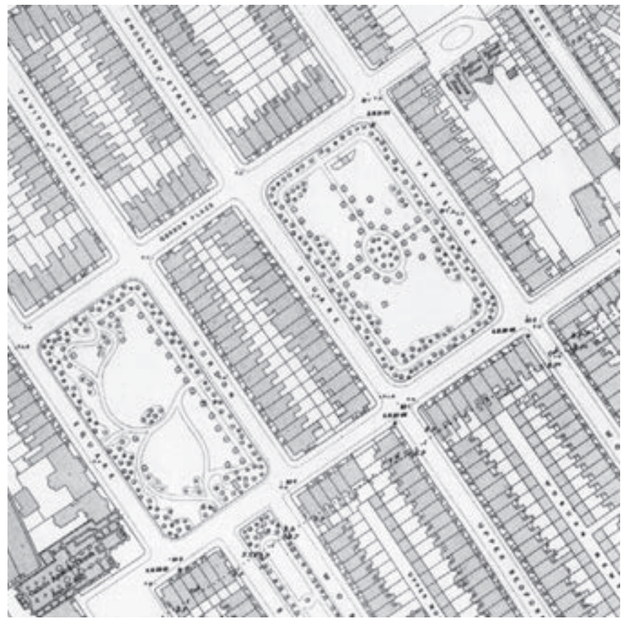


The connection between this hybrid tower in the forest and existing settlements -such as towns and cities- is created by the people gathering for short-term events in the hybrid tower, and taking their experience back to heal their surroundings.



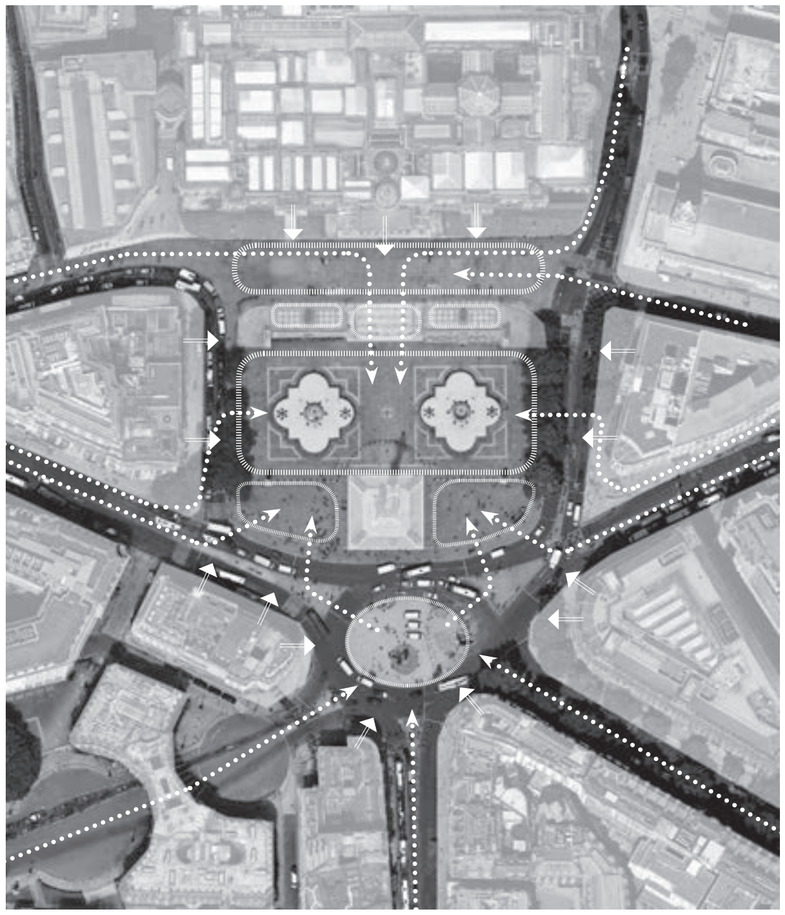


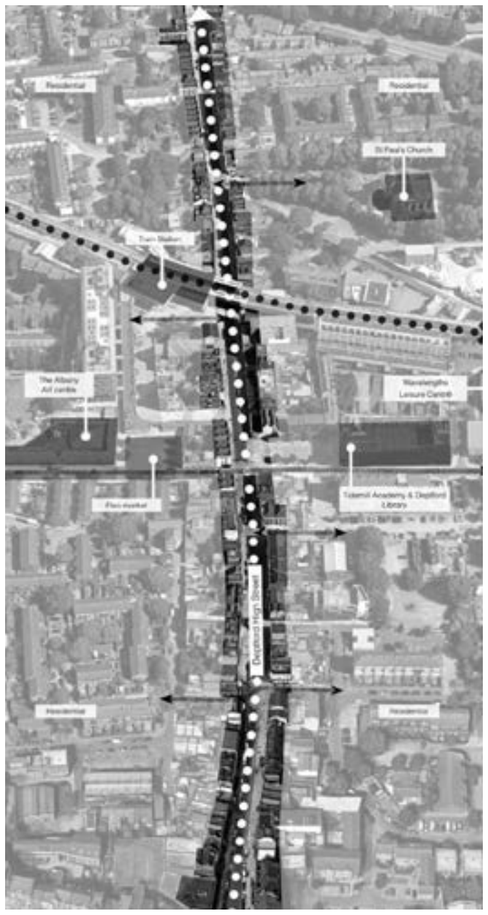


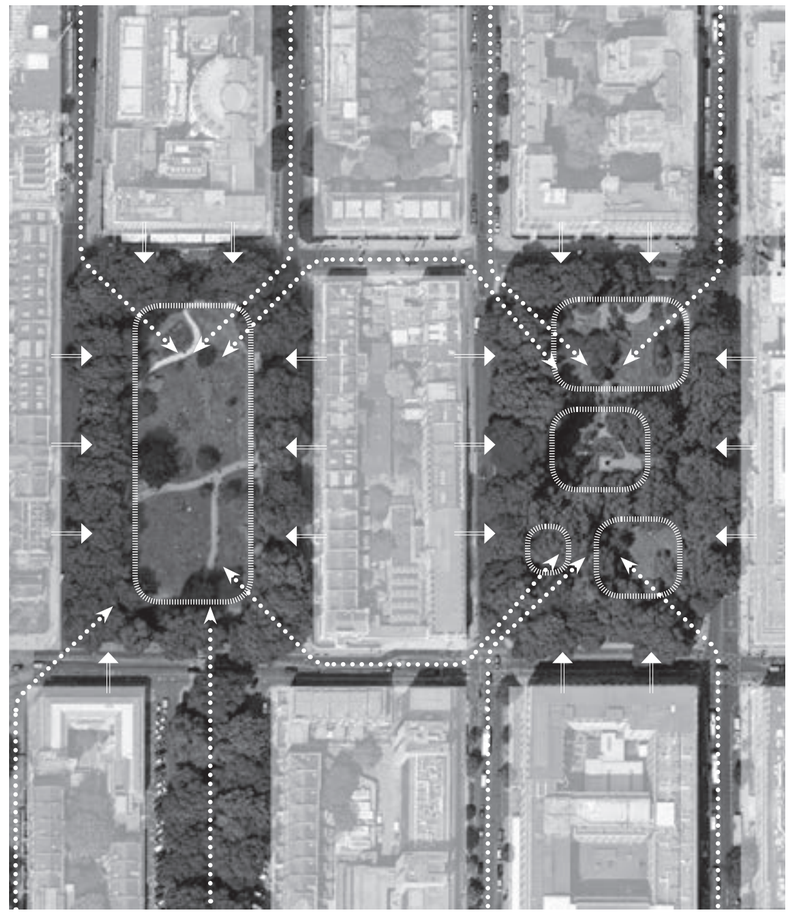
Piazza Del Campo

Covent Garden

Gordon & Tavistock Garden Square





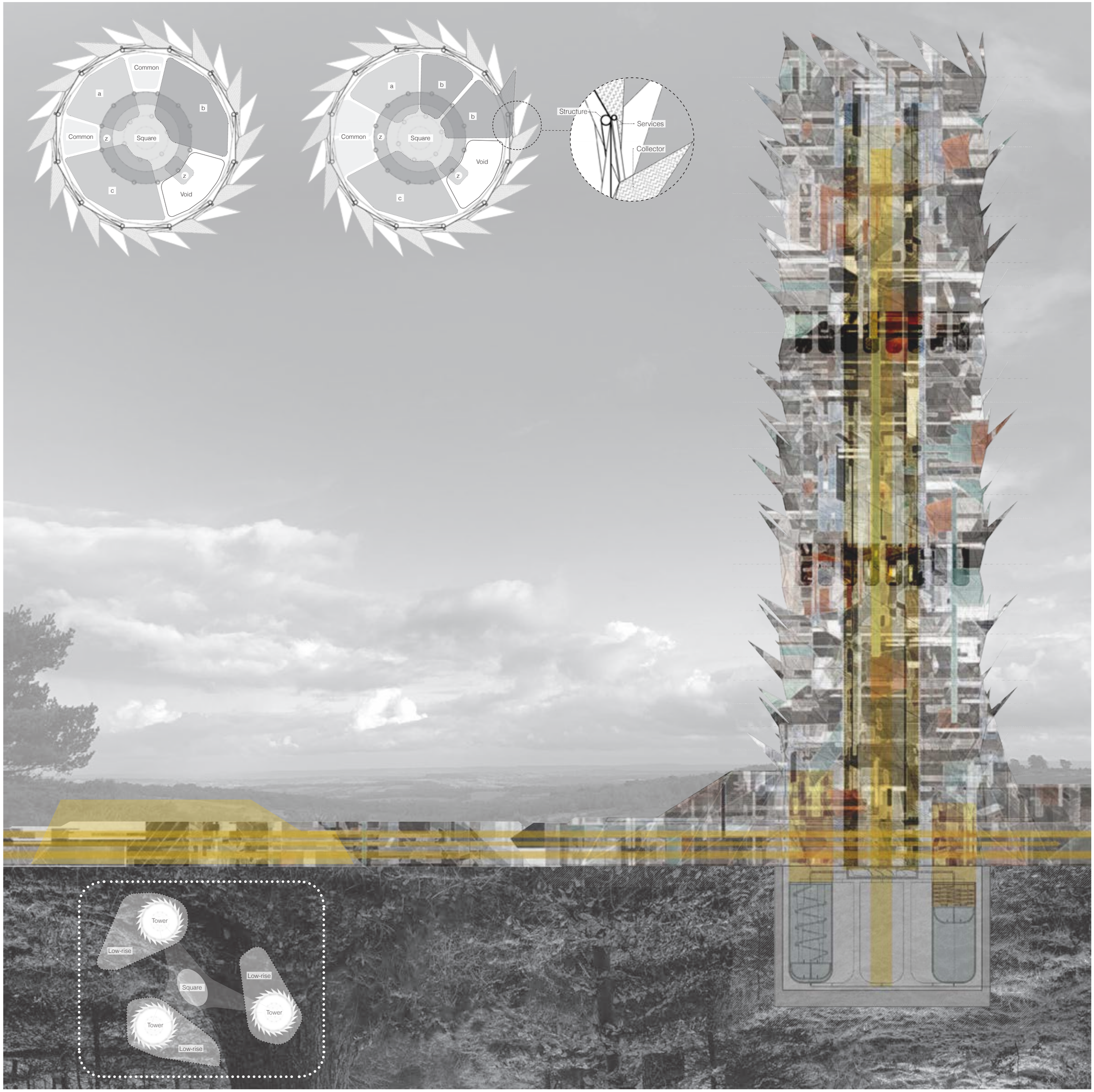


Trafalgar Square

Daptford Street

Gordon & Tavistock Garden Square

High street life and city squares are great examples of gathering in an urban scale which contain dynamism, spontaneity and transfer of experiences and the impact of movement to change and transform a culture into a unique version of itself.



The hybrid tower forms a connection between existing settlements and the forest, contains the idea of environmental and social gathering as well as diversity and dynamism from the movement. The hybrid tower idea is a combination of different towers.

HYBRID TOWER

MECHANISM OF SOCIAL GATHERING

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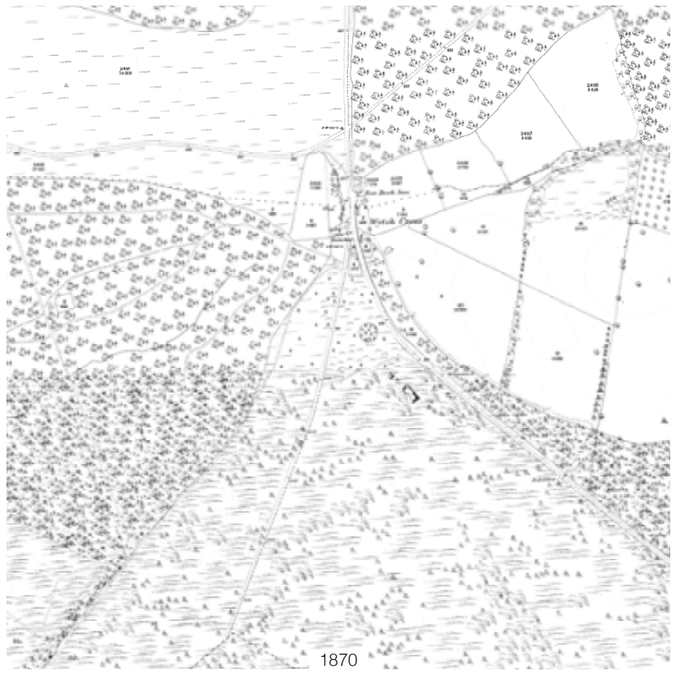

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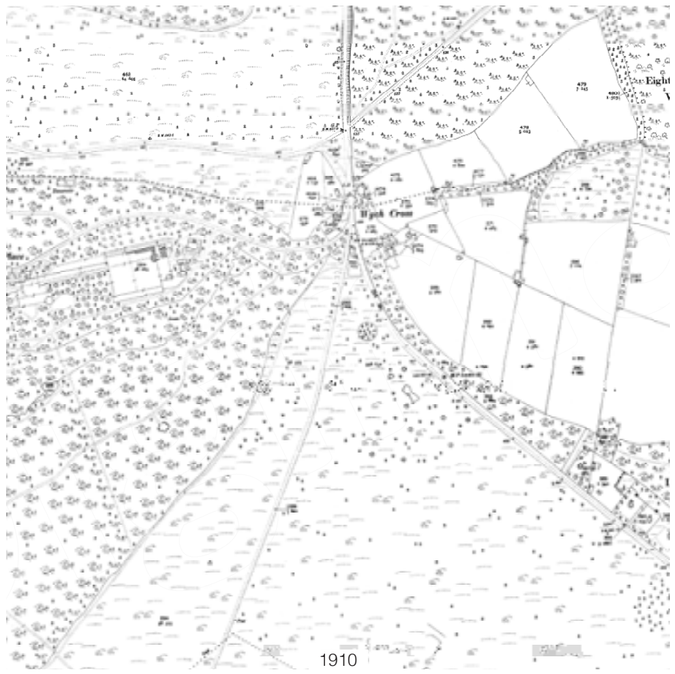

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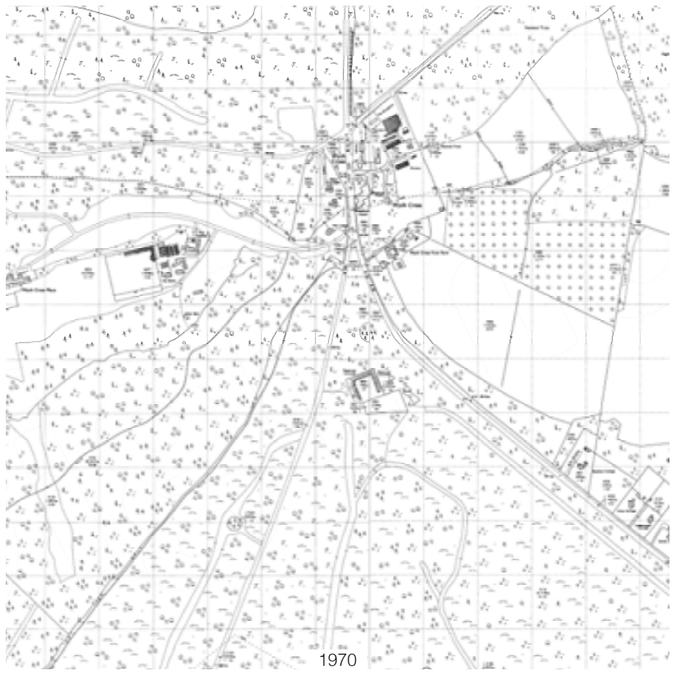
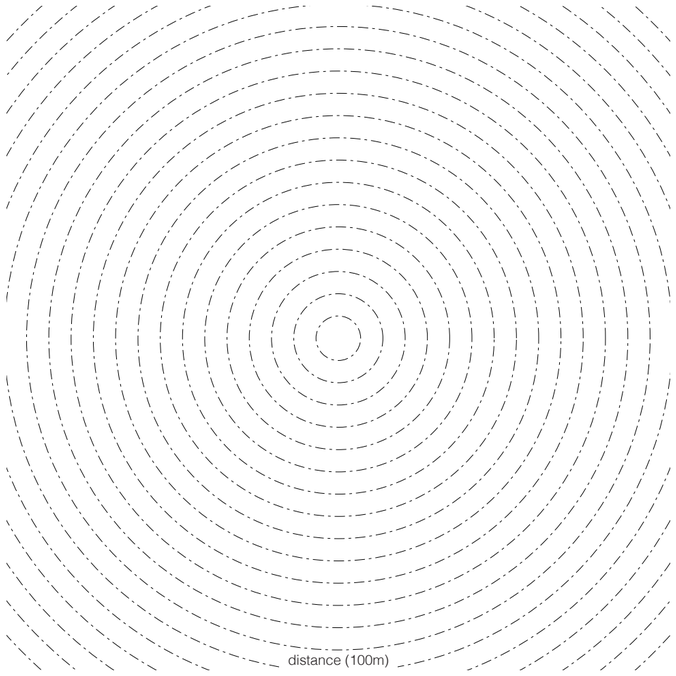
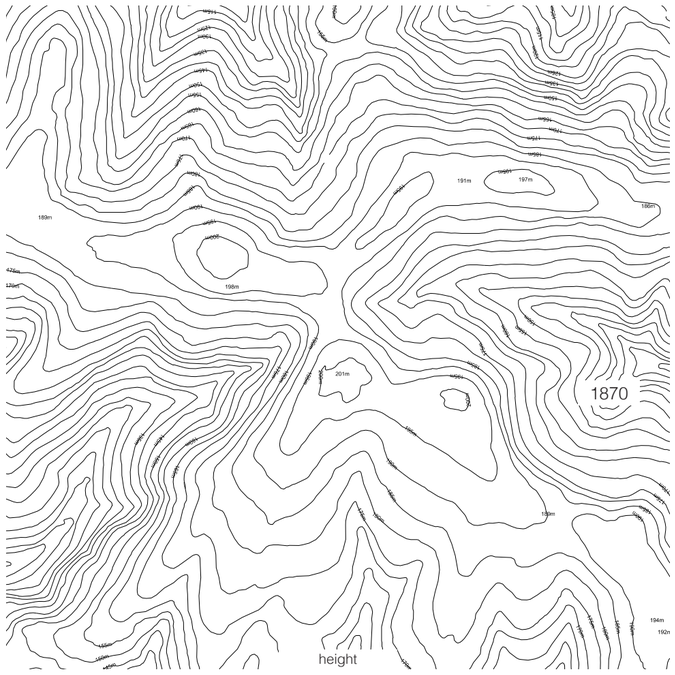


1970



distance (100m)



height

water features

buildings

buildings & roads

landscape

Wych Cross reservoir – which is one of the two covered reservoirs in Ashdown Forest - was chosen as the project site, based on the topographical, transport, site and surrounding facility investigations.

WYCH CROSS

ANALYSIS

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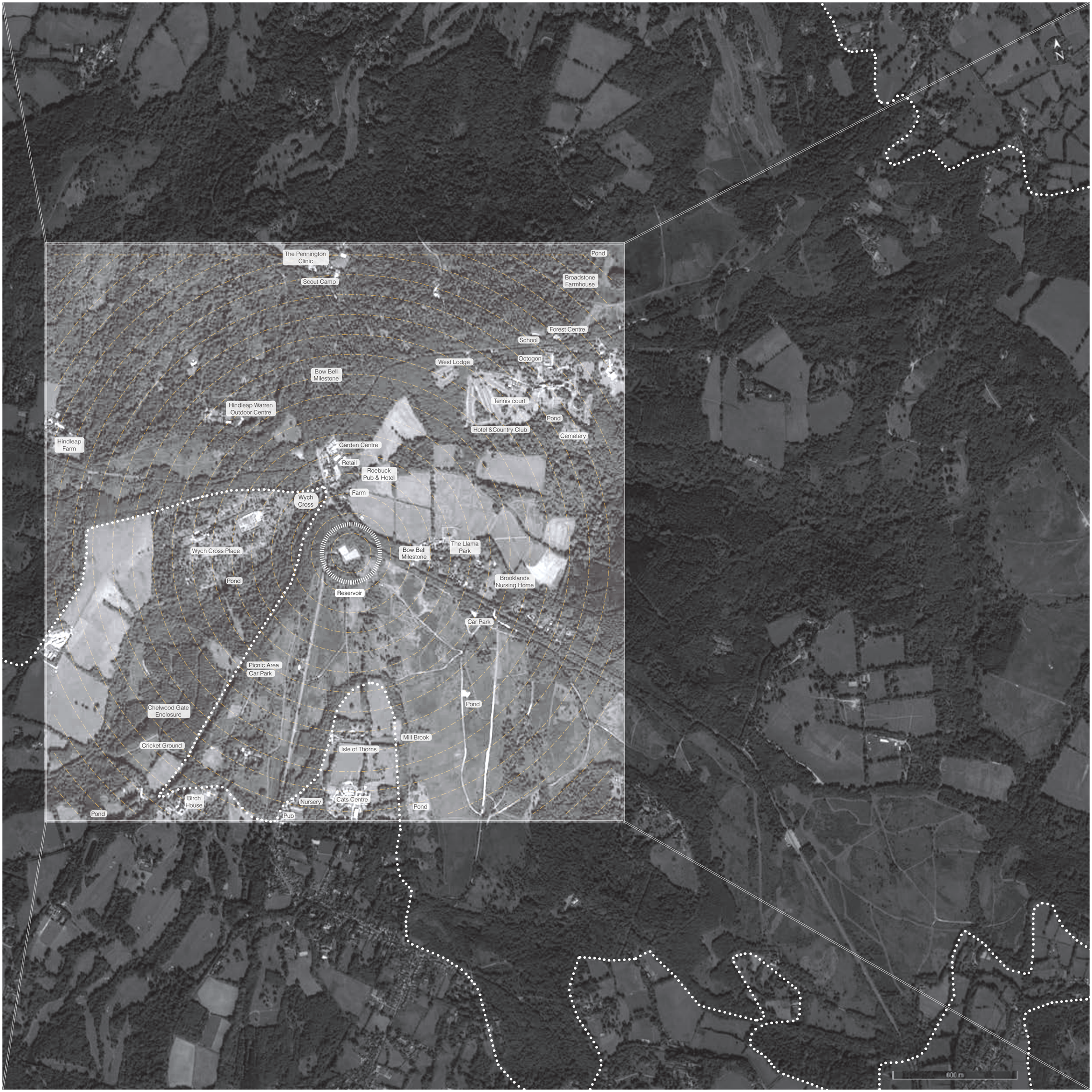

THE SITE

ASHDOWN FOREST - CONTEXT

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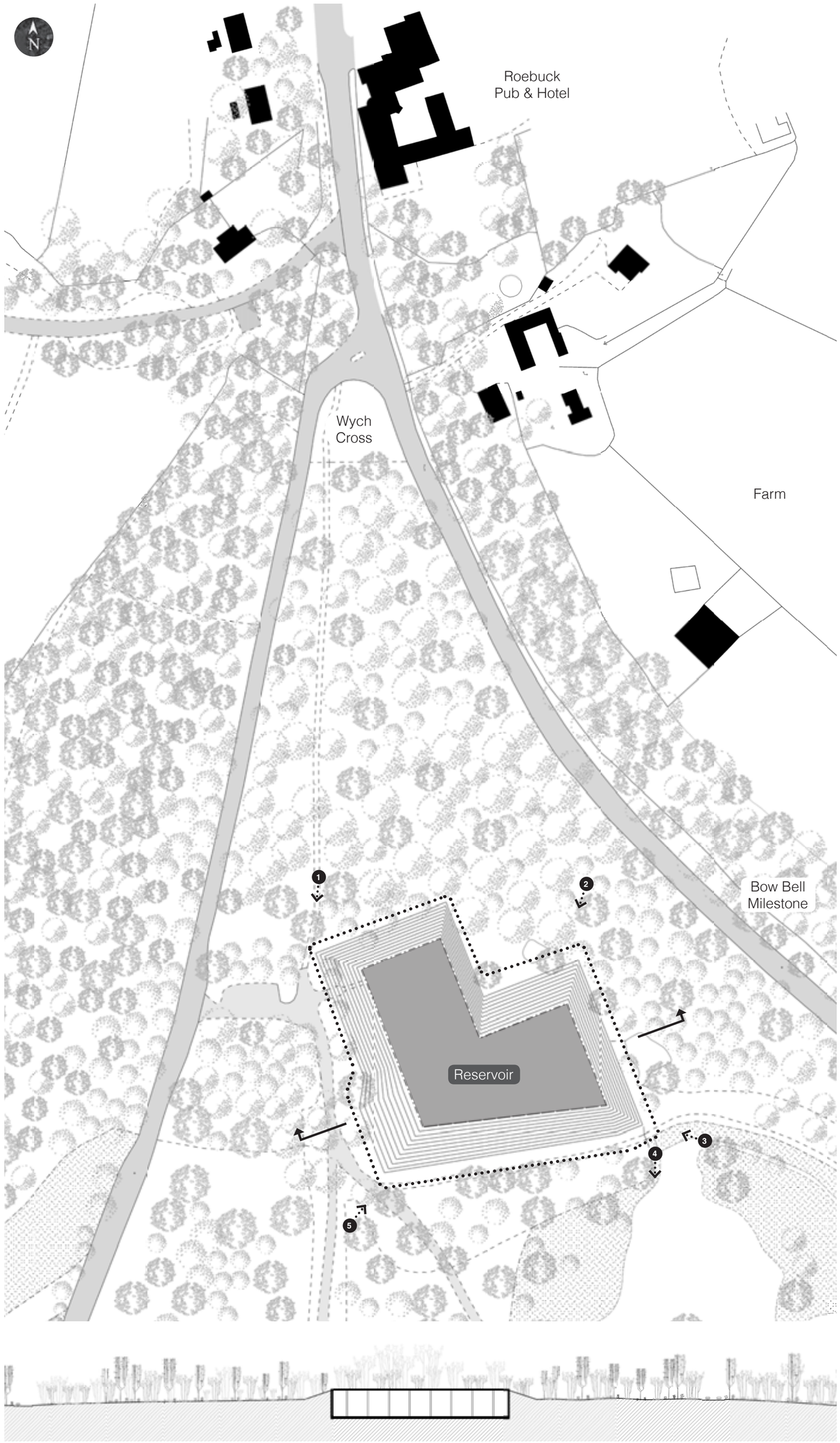
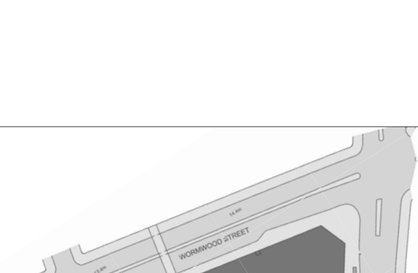
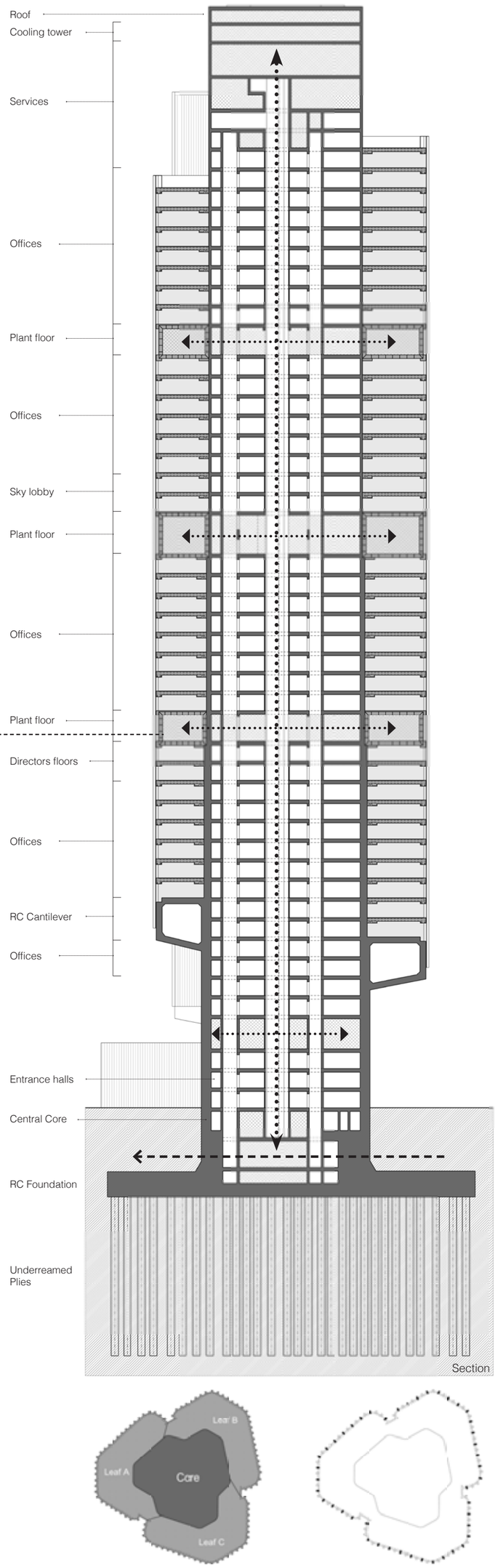


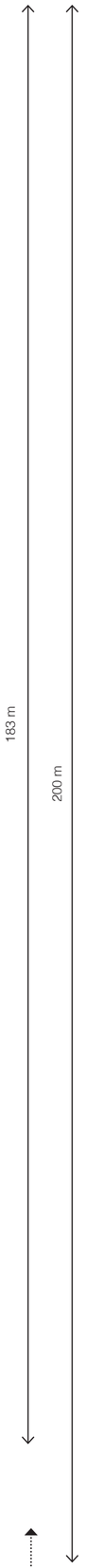
The site is a triangle formed at the junction of two main roads, leading to large towns and cities. Transportation links to cities and towns are essential in the success of this model. The high altitude of the existing reservoir also provides a natural ability to distribute water to surrounding areas.

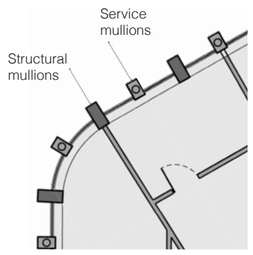
Site Plan

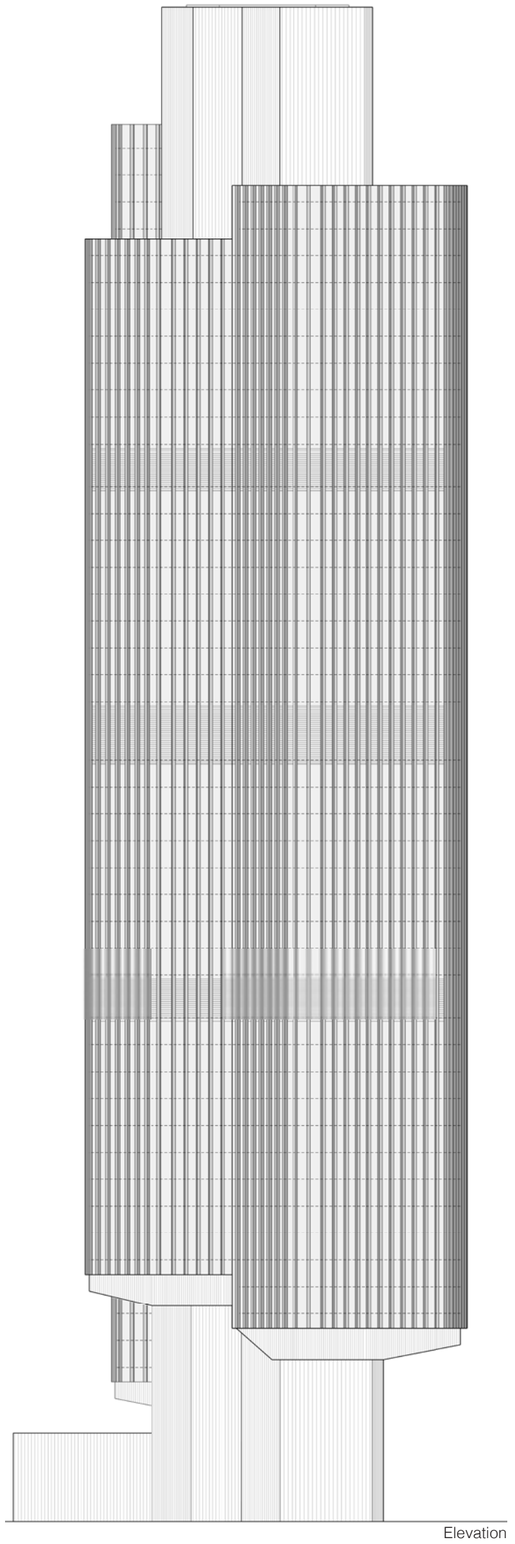

Plant Floor Steel Frame

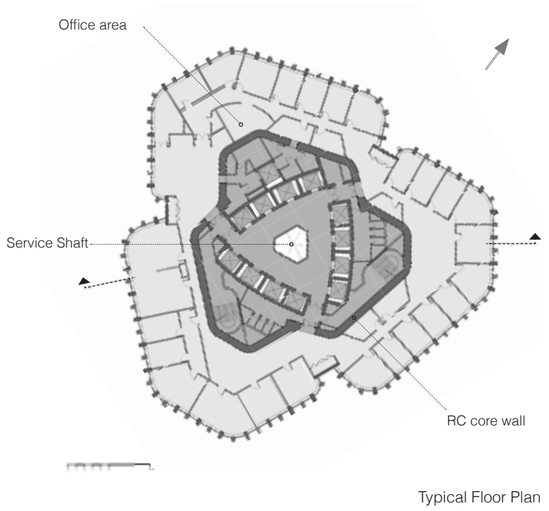


Section






Elevation



Typical Floor Plan

Tower 42 gives an example for the general formation of a tower type building. Although the tower's core is the main vertical structural element, the structural elements of the facade are integrated into the overall structural system. With this example, however, a question is raised on the relationship between the tower and life at the urban level

PRECEDENT

TOWER 42 - NATWEST TOWER

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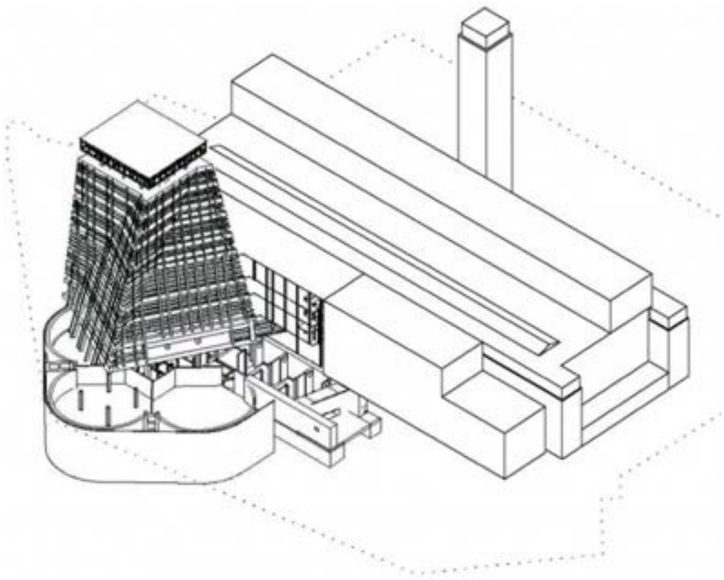
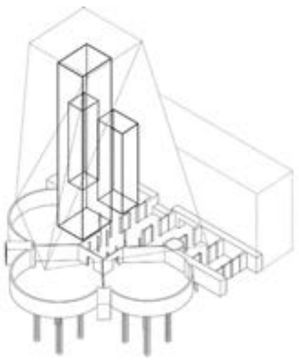
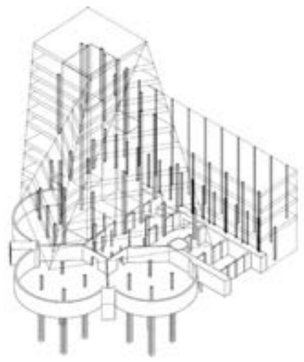


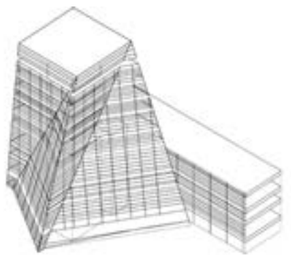


Cores



Columns

Slabs

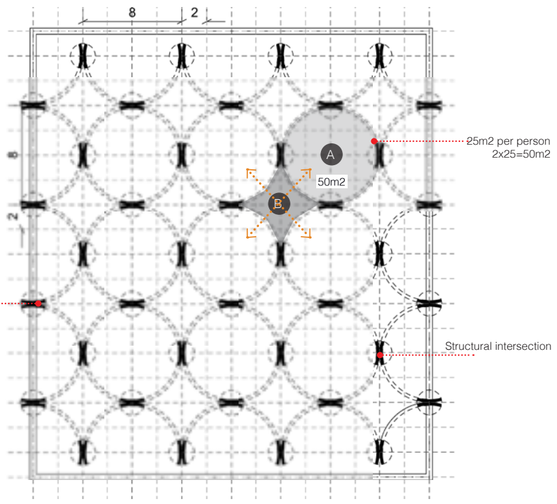


Facade Structure

The Tate Modern Switch house is a good precedent for retaining part of an existing body and making it an integral part of a new tower

The New York water towers are built on top of existing high-rises, with the purpose of providing water. Collectively, these water towers form a unity: ‘the water towers of New York’.

1a



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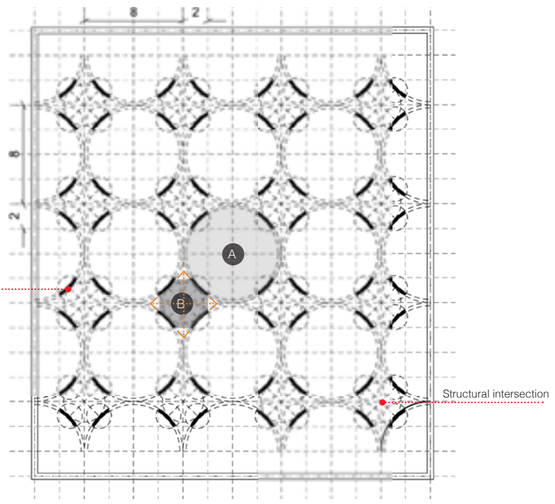

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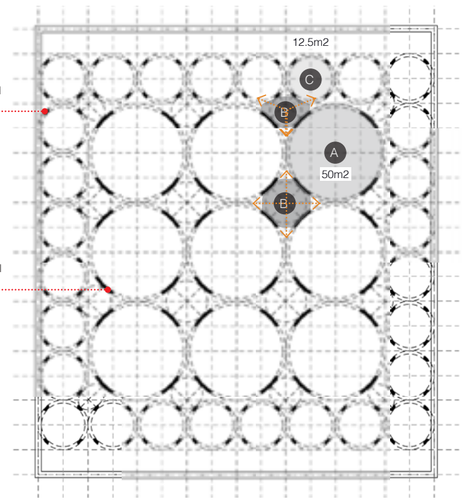

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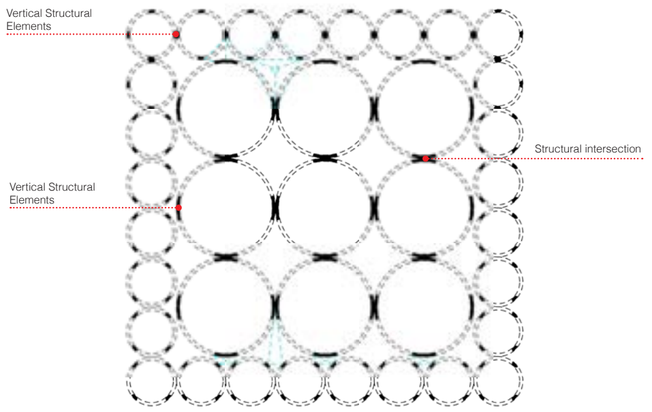
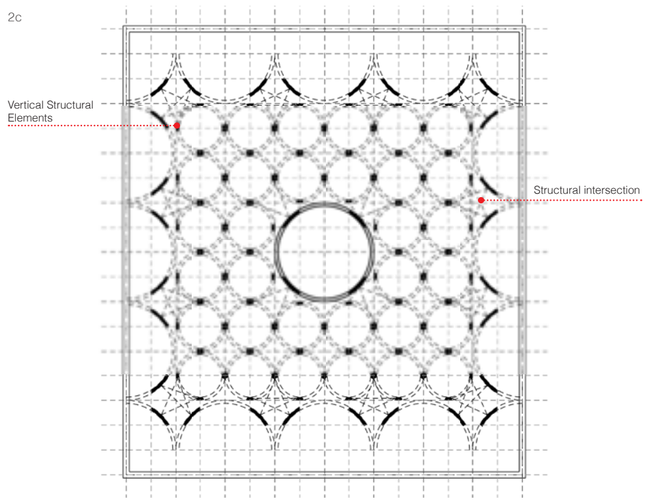
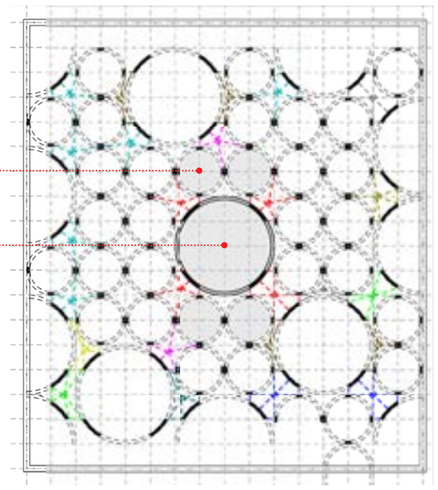


2c



3a



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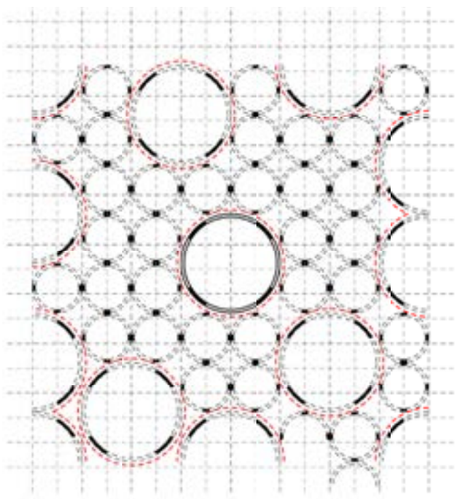

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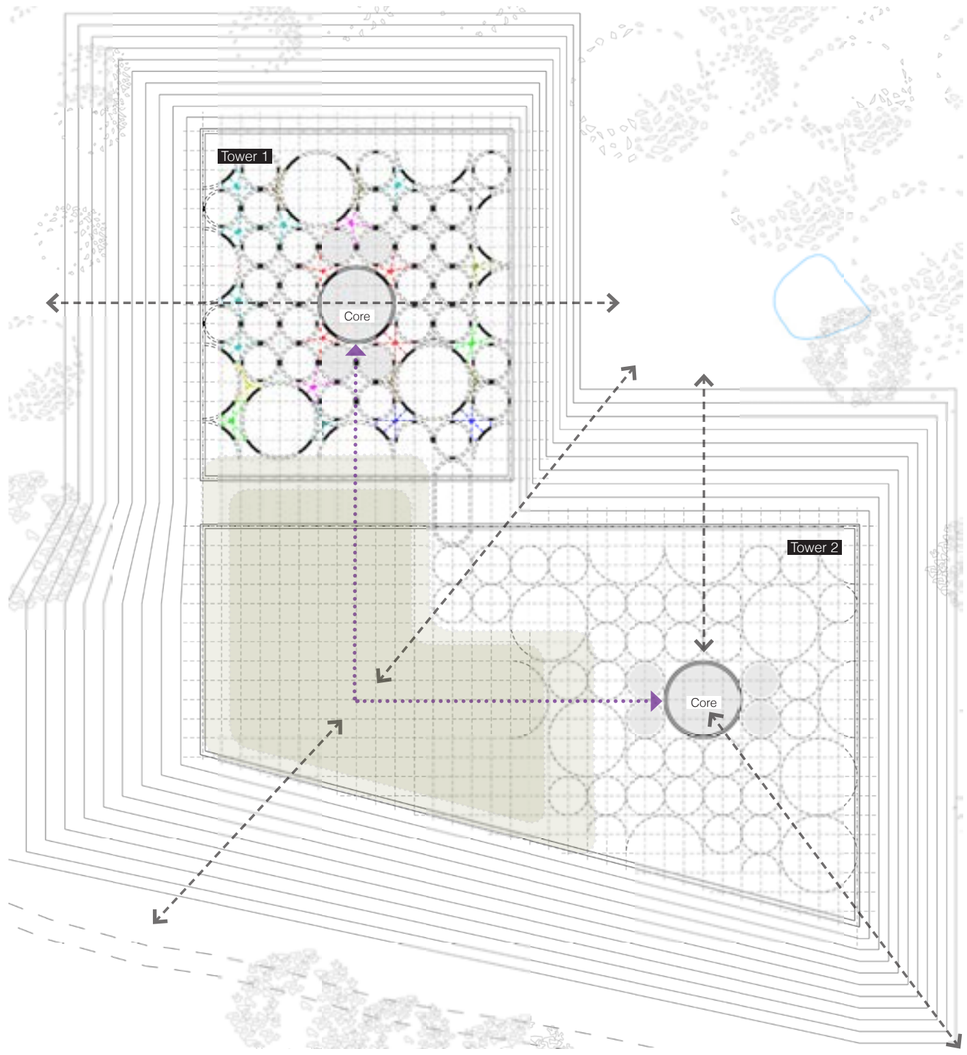

The body of the reservoir will be preserved and become part of the port tower. As part of this investigation, studies were carried out in the horizontal formation of units and the tower's relationship with the site.

TOWER FORMATION

HORIZONTAL UNITS AND SITE STUDIES

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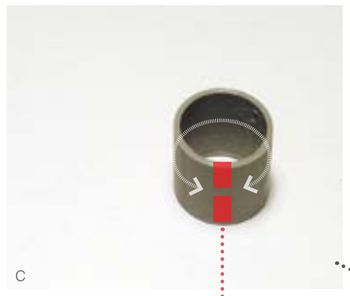

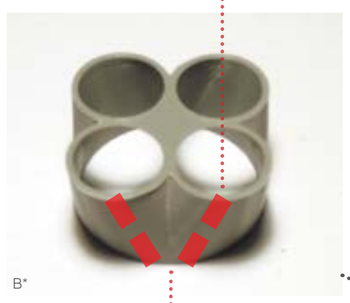

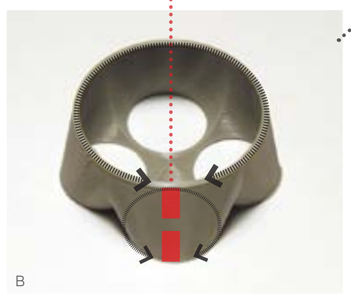

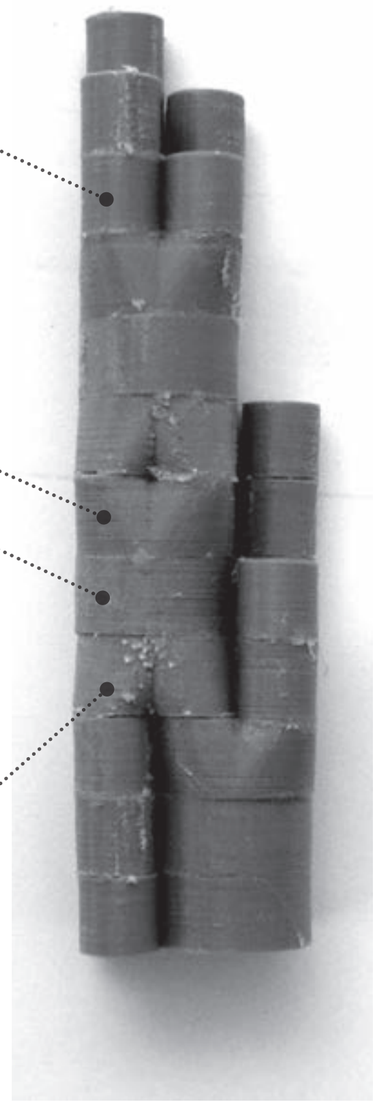

TOWER FORMATION

VERTICAL FORM STUDIES

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WATER TOWERS
ANALYSIS
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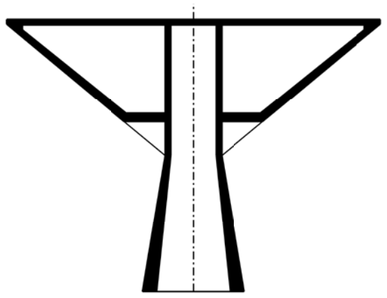
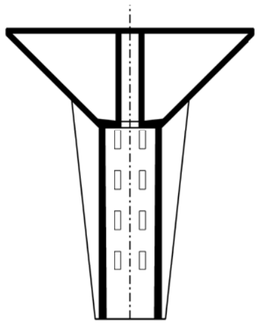
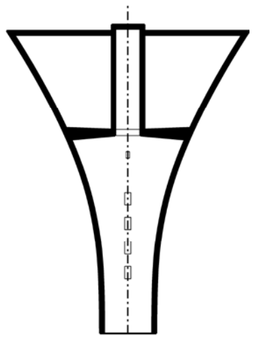
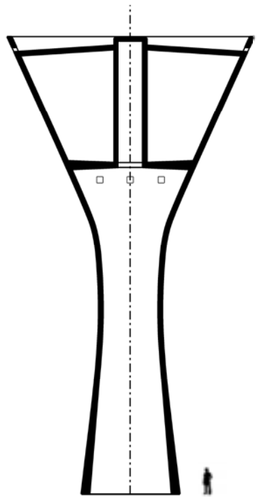
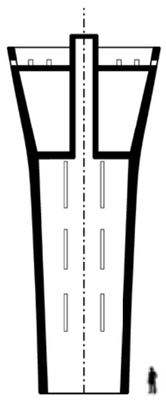
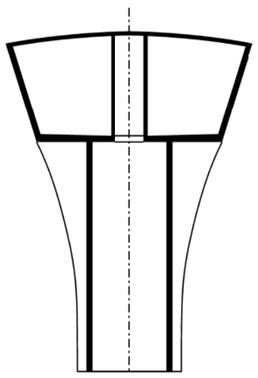
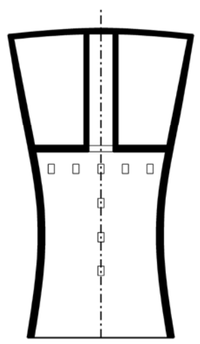
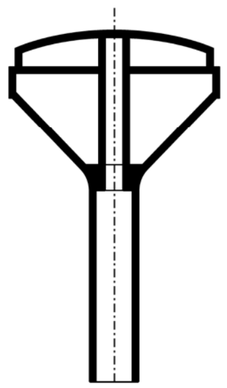
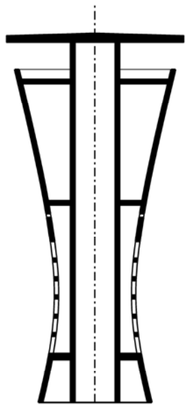
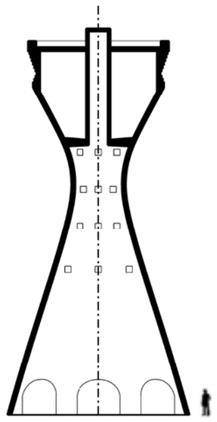
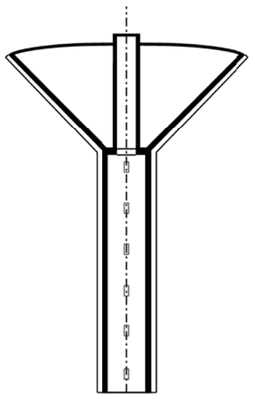
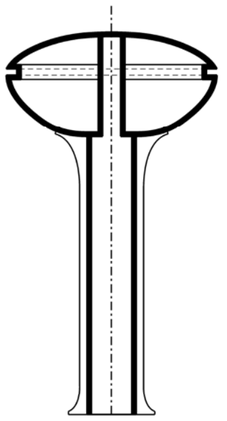
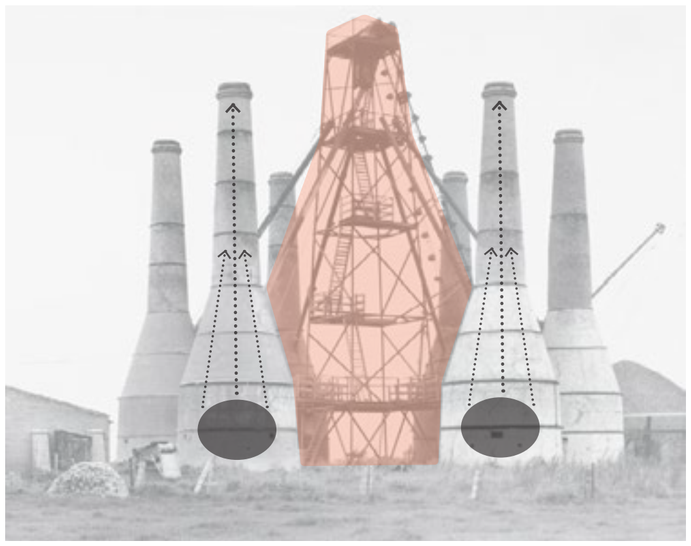
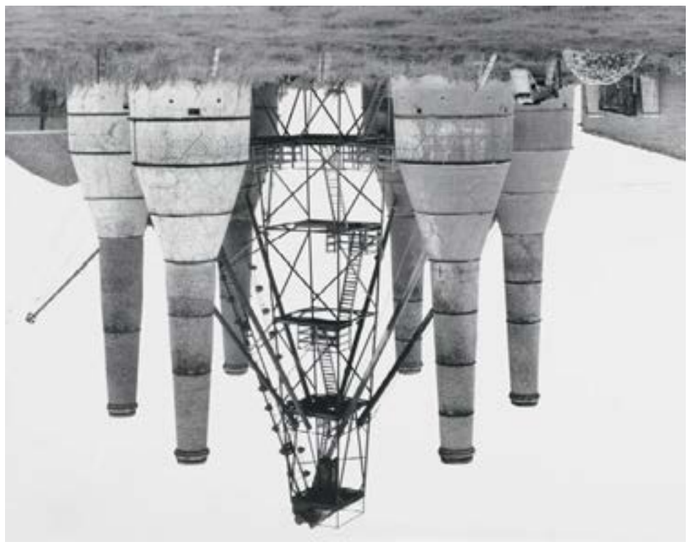
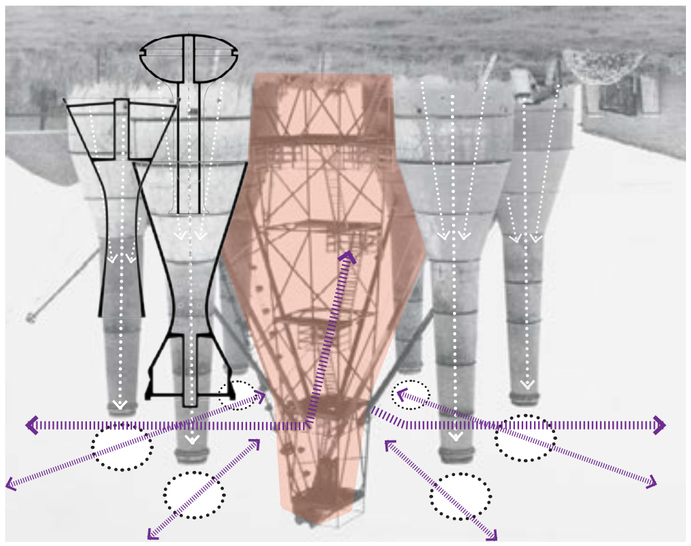
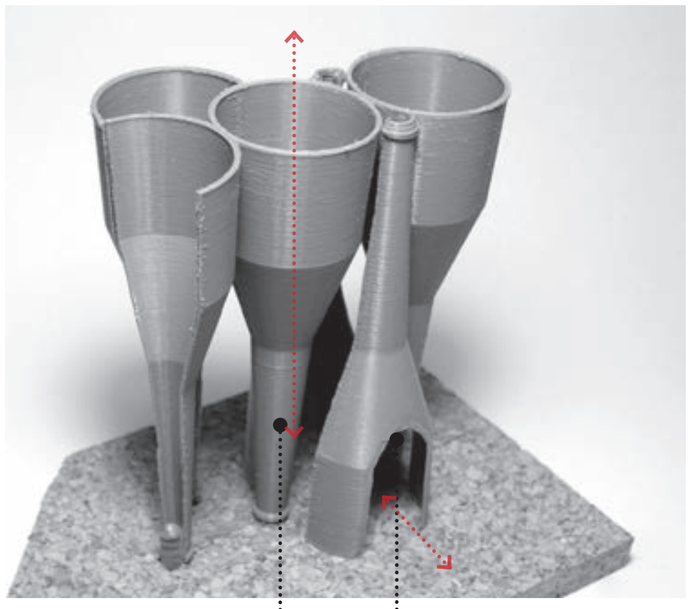













For the vertical form design, concrete water towers were researched in order to understand the concept and formation of the water tower.



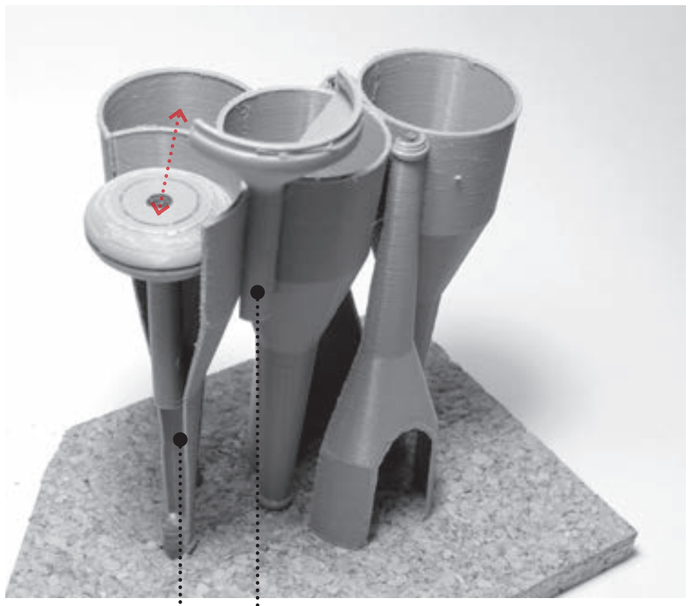






core + inside

void
gathering - community



envelope & void

attached elements
gathering - water

A combination of different tower forms were developed with the aim of water collection and spatial organisation.

TOWER FORMATION
DESIGN RESEARCH
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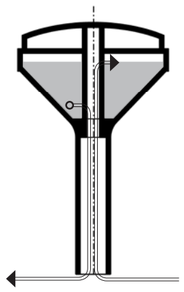

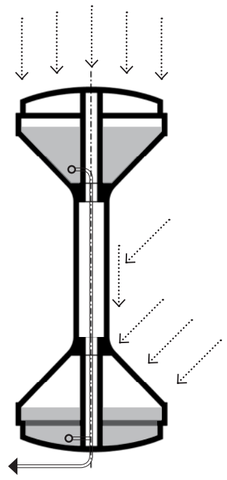

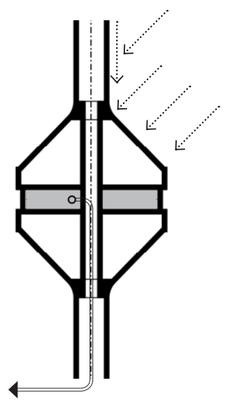

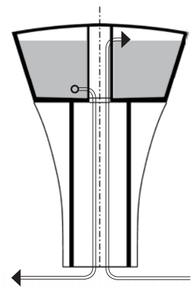

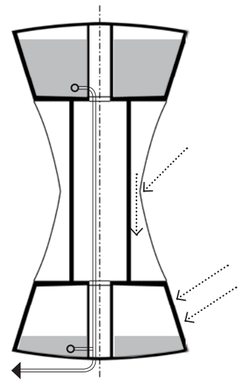

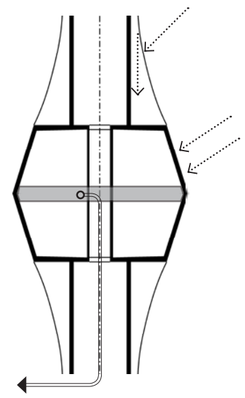

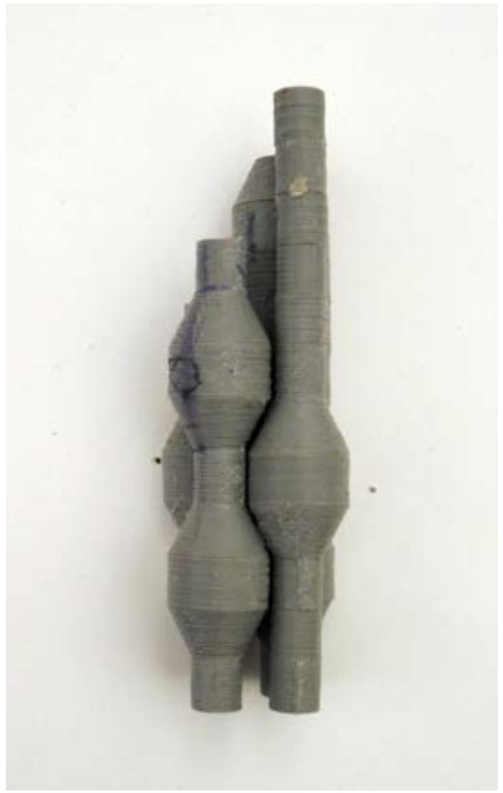

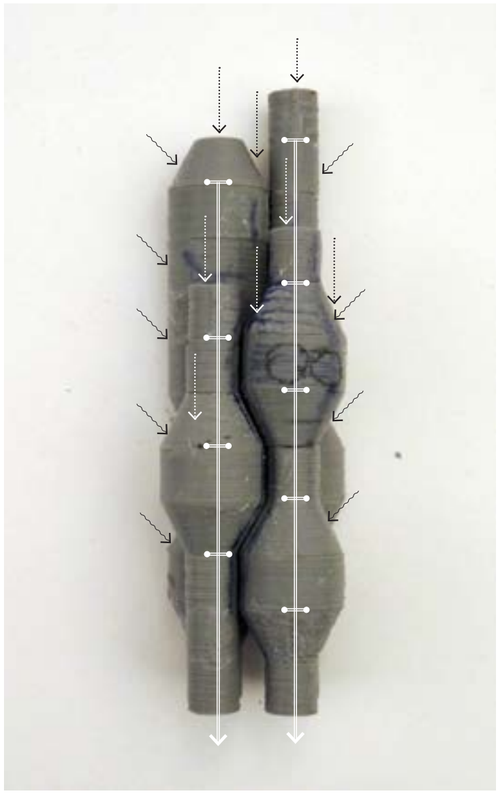

The final form decision is a cylindrical shape with conical connectors, which provides a transition between units, good surfaces to collect the water, modulation of the space and a diversity of the towers.

TOWER FORMATION

FINAL FORM & ARRANGEMENT

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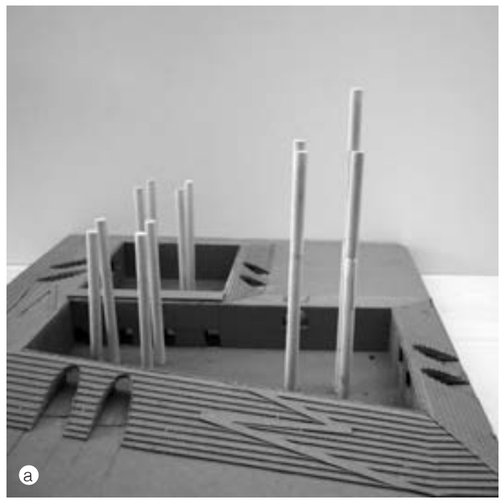
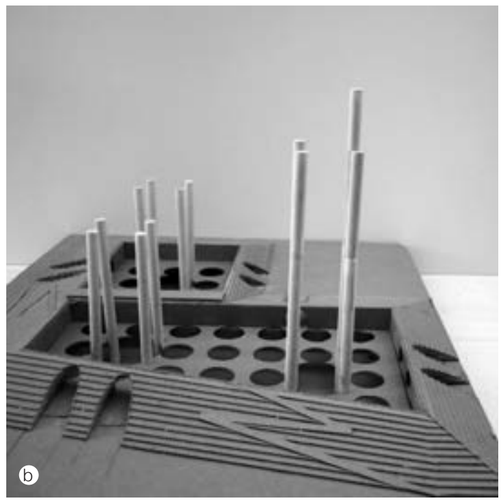
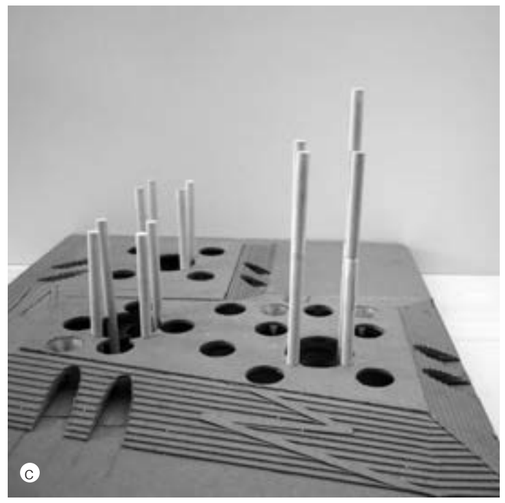
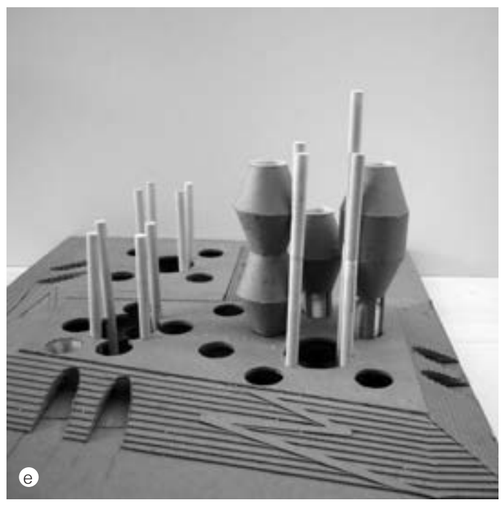
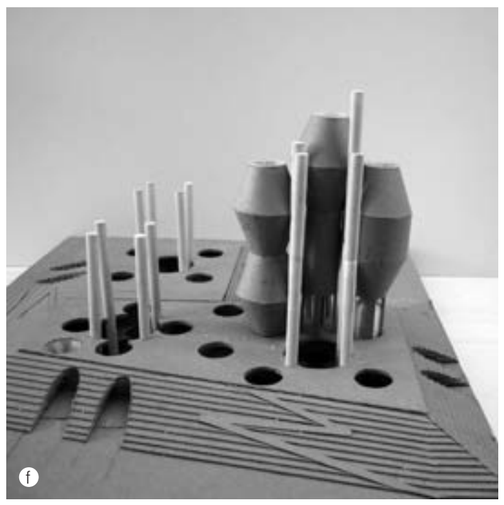
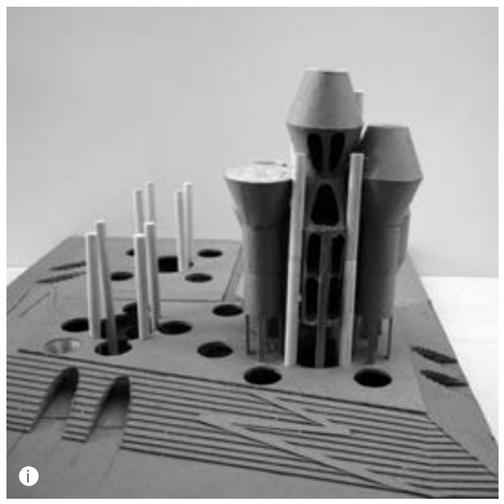


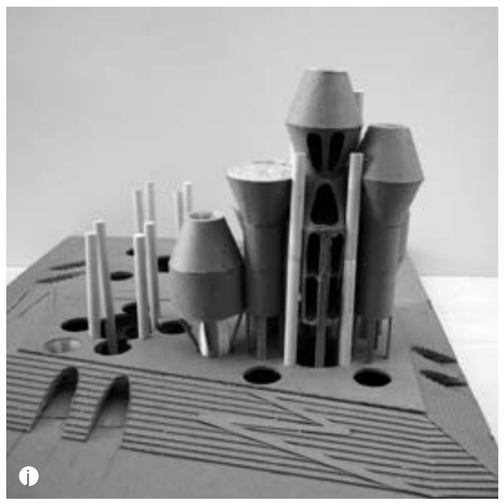


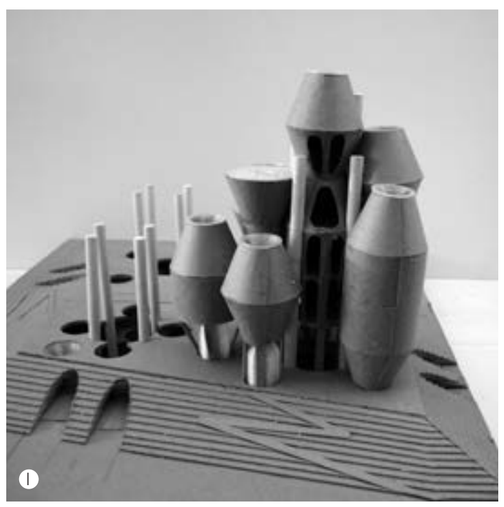


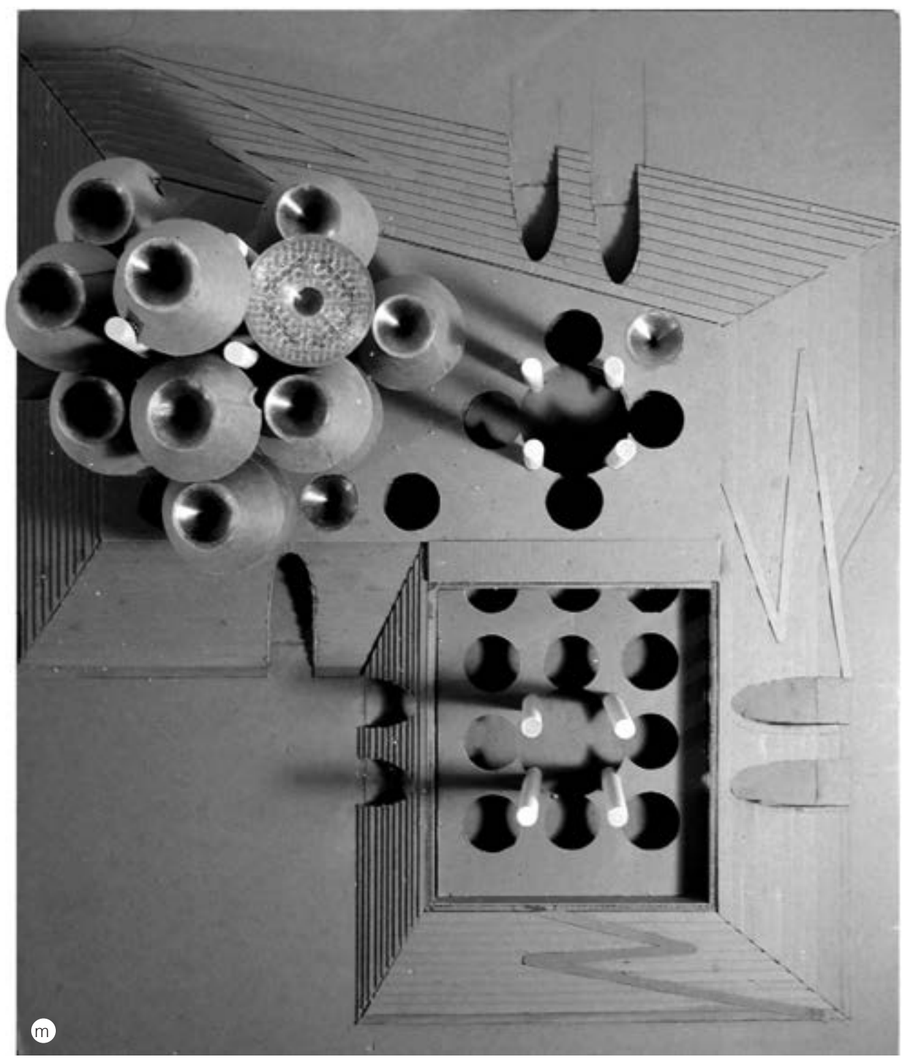




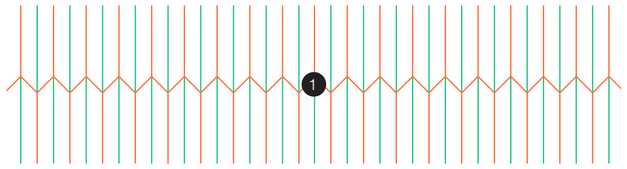


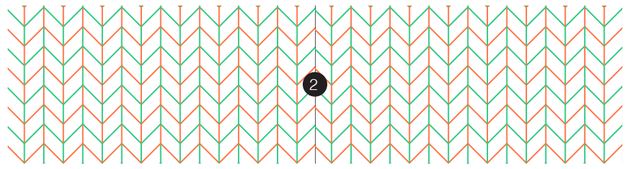


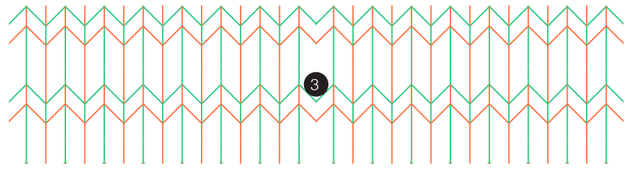


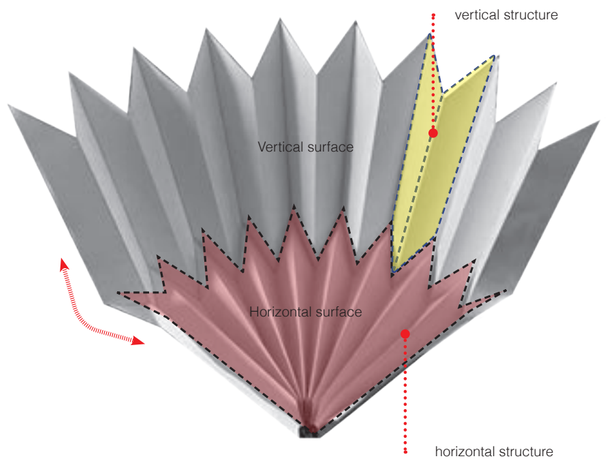


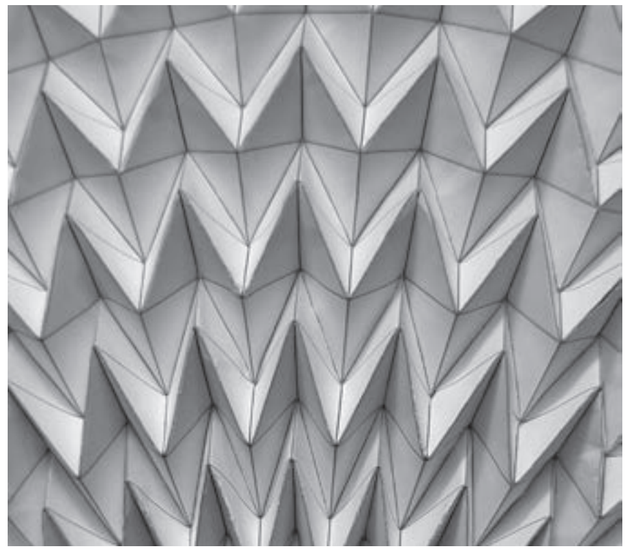
The combination of the towers, their formation, and relationships with the tanks below within the context of the site.

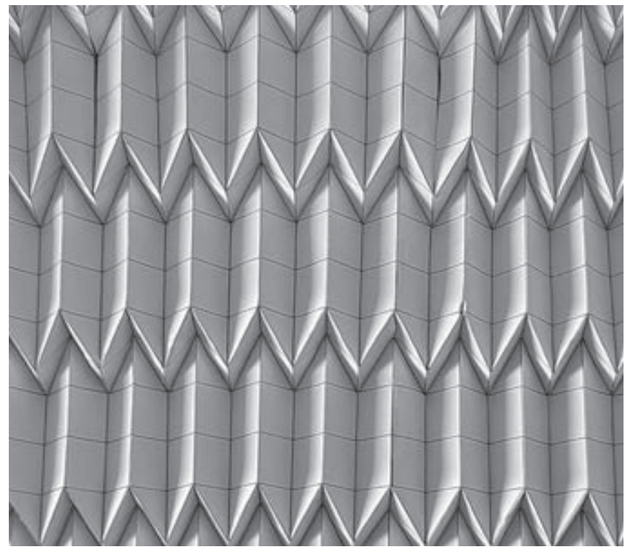


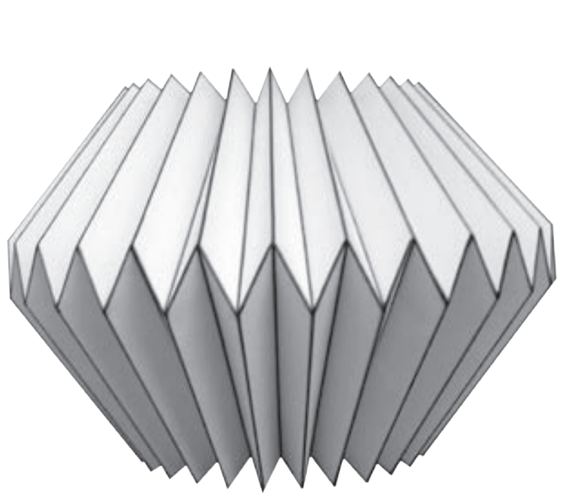


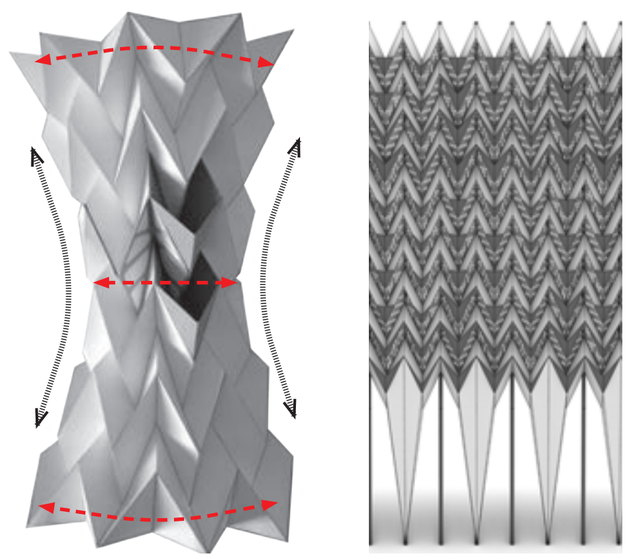


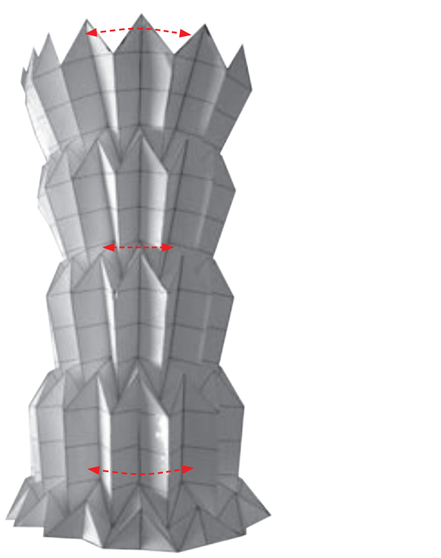


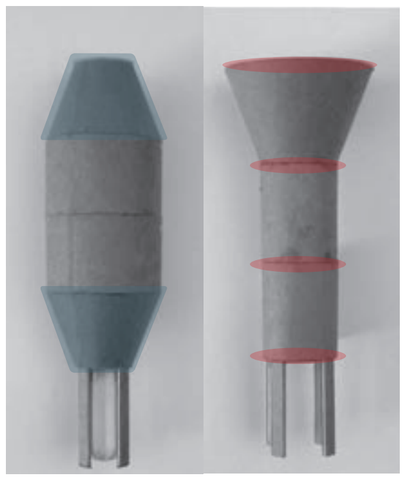


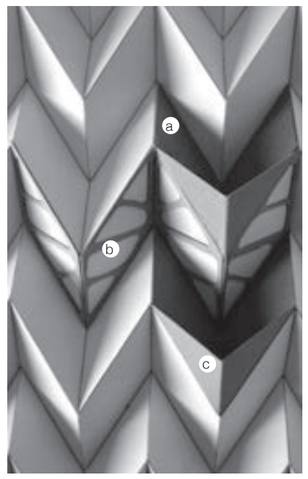












Designing a façade that will collect rainwater is part of the research for the port tower. Alongside other investigations in the elements for the building envelope, various paper folding techniques helped to find a modulation for the façade. This triangular formation contributes to the structural integrity of the tower.

ENVELOPE

FACADE ELEMENTS STUDY

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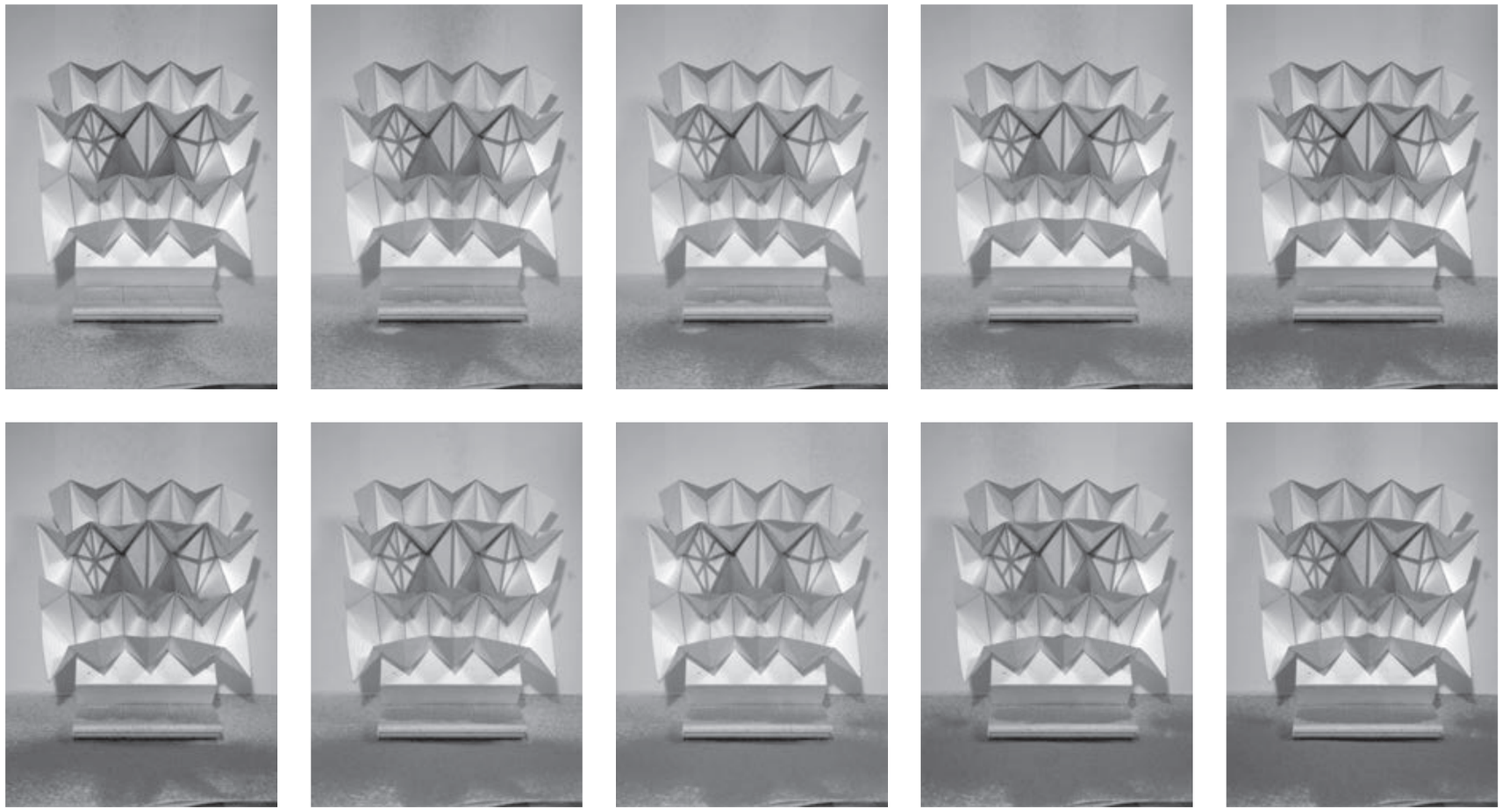
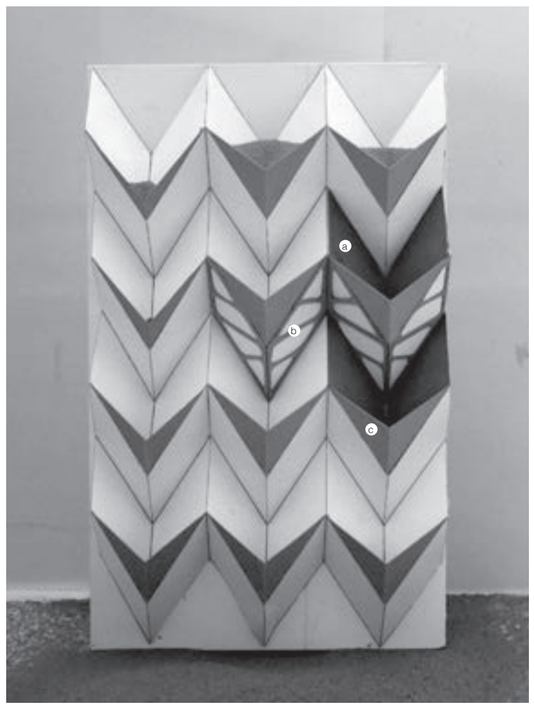
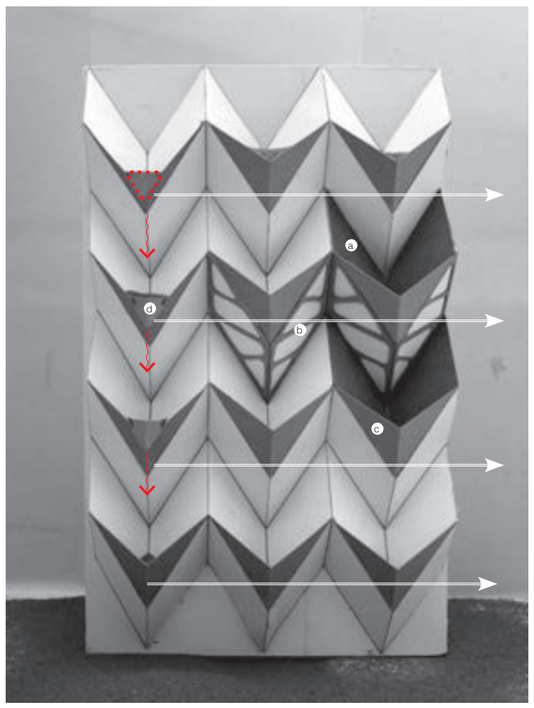
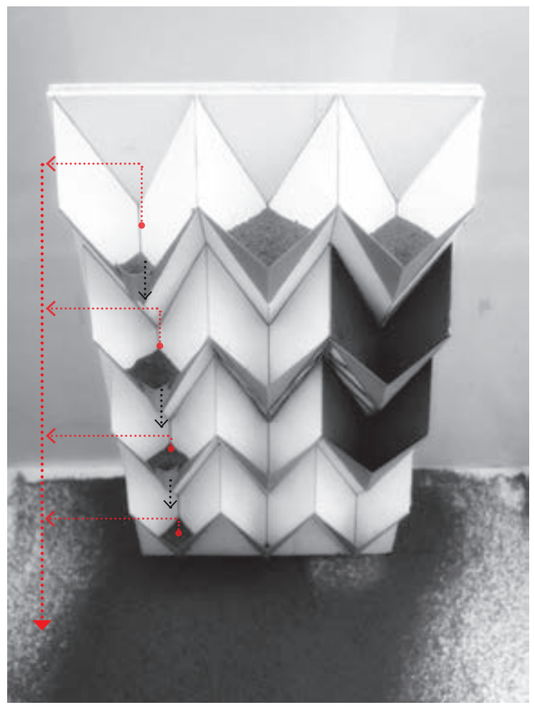
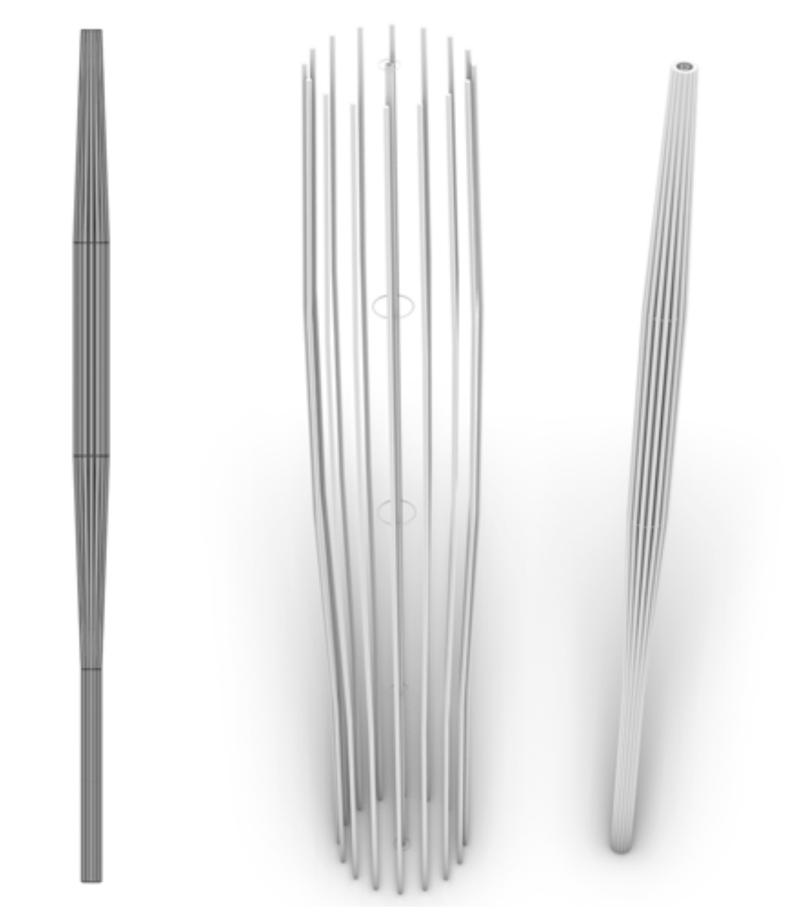


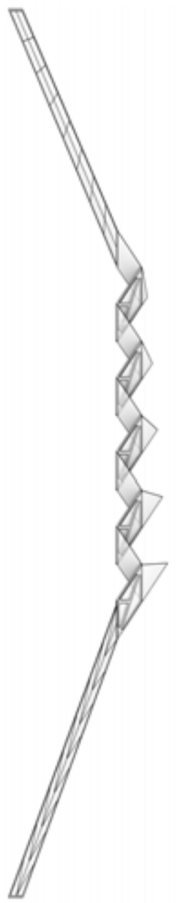


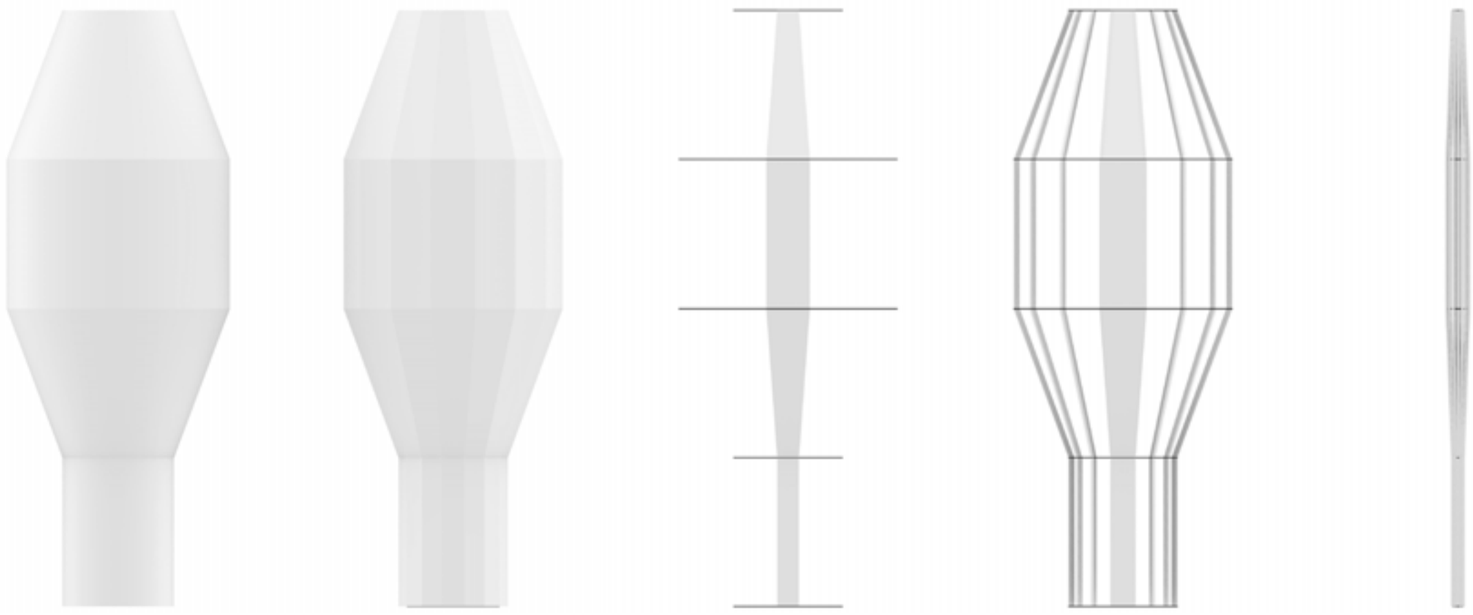


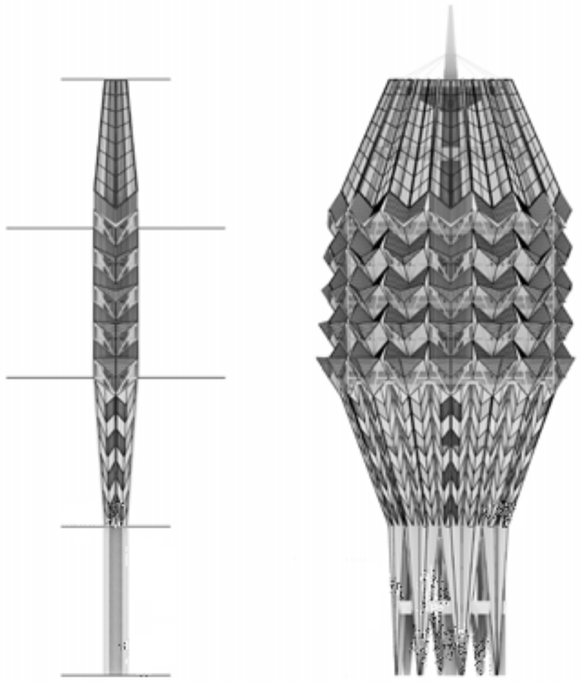


These were developed further to convert these ideas into the building-scale façade by changing the elements, adding water collectors, basins and varying the transparency of the surfaces. The experiments demonstrate that varying the size of the basins can increase the way that the water is collected and transferred between elements.









The use of these elements should be varied across the different angles of surfaces, vertical surfaces could have more basin pockets while the conical surfaces would hold a trough-shaped geometry. Each tower envelope is divided into 16 segments, with a vertical timber structure integrated into the façade, and a central timber column formation.

ENVELOPE & STRUCTURE

FACADE & STRUCTURAL ELEMENTS

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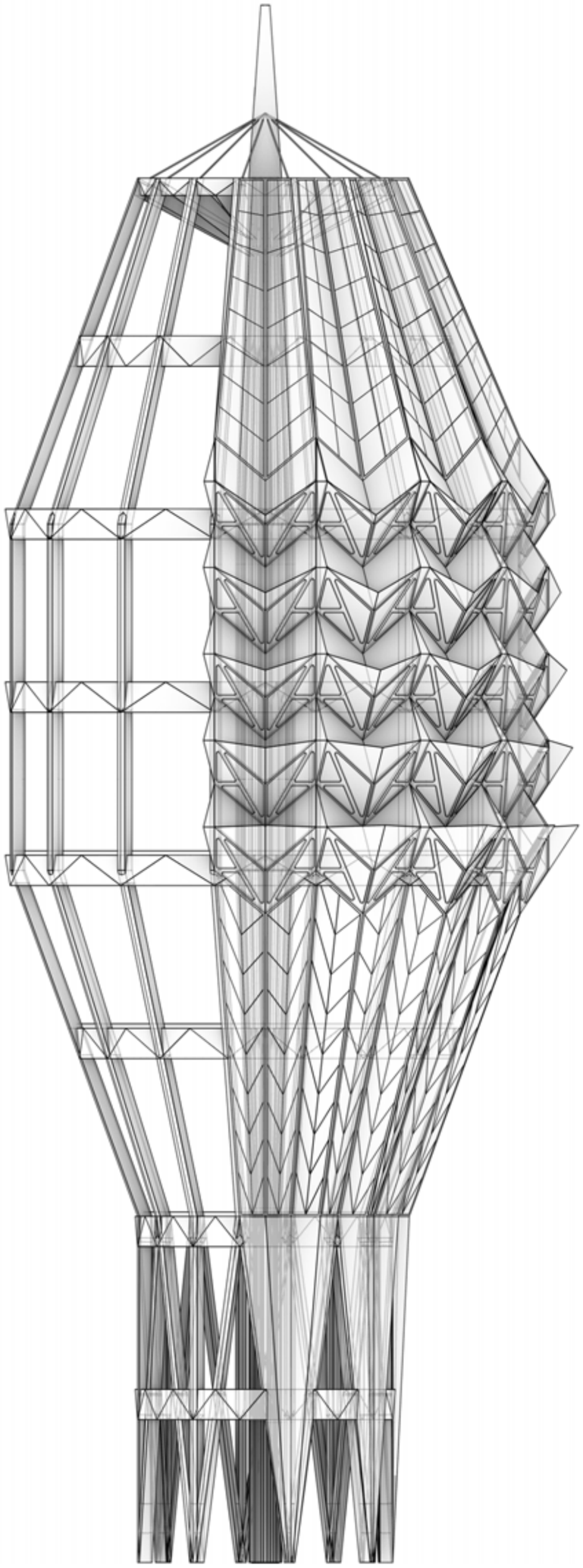
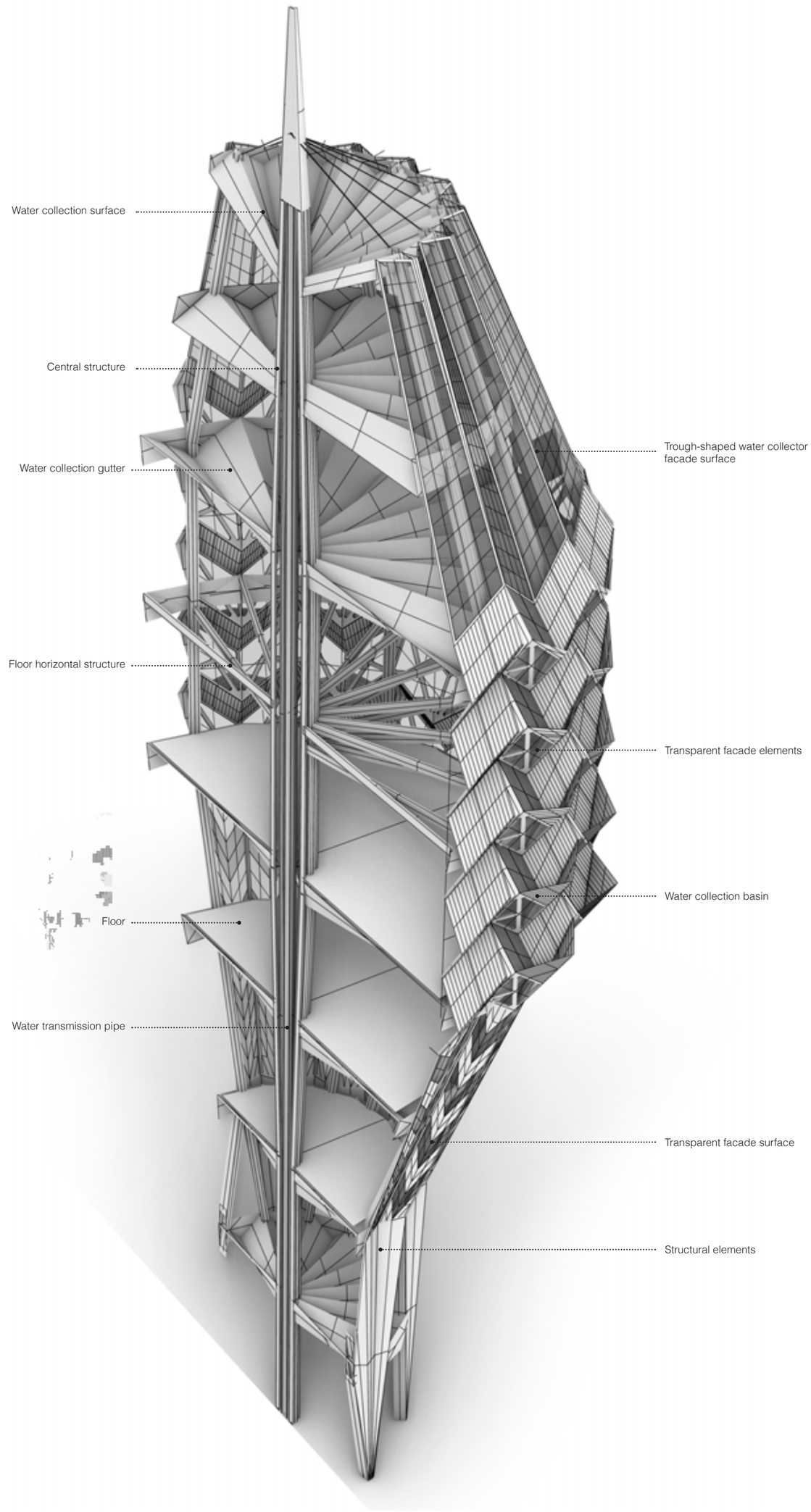
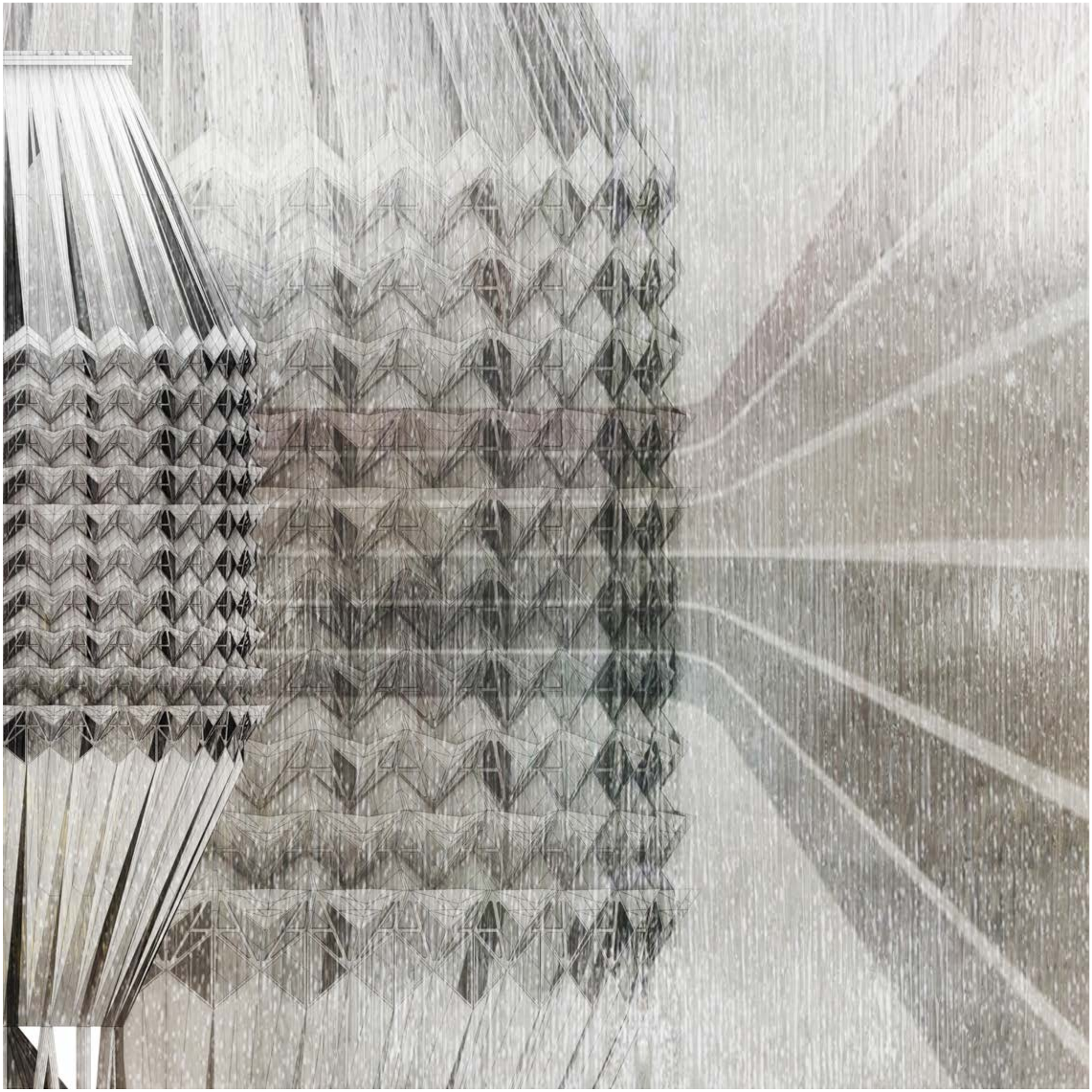




Within the central column formation is a water transmitting system. The horizontal structure also contains the elements to transmit the water from the façade to the core of the unit.



FACADE

FINAL PROPORTIONS OF THE TOWER UNIT

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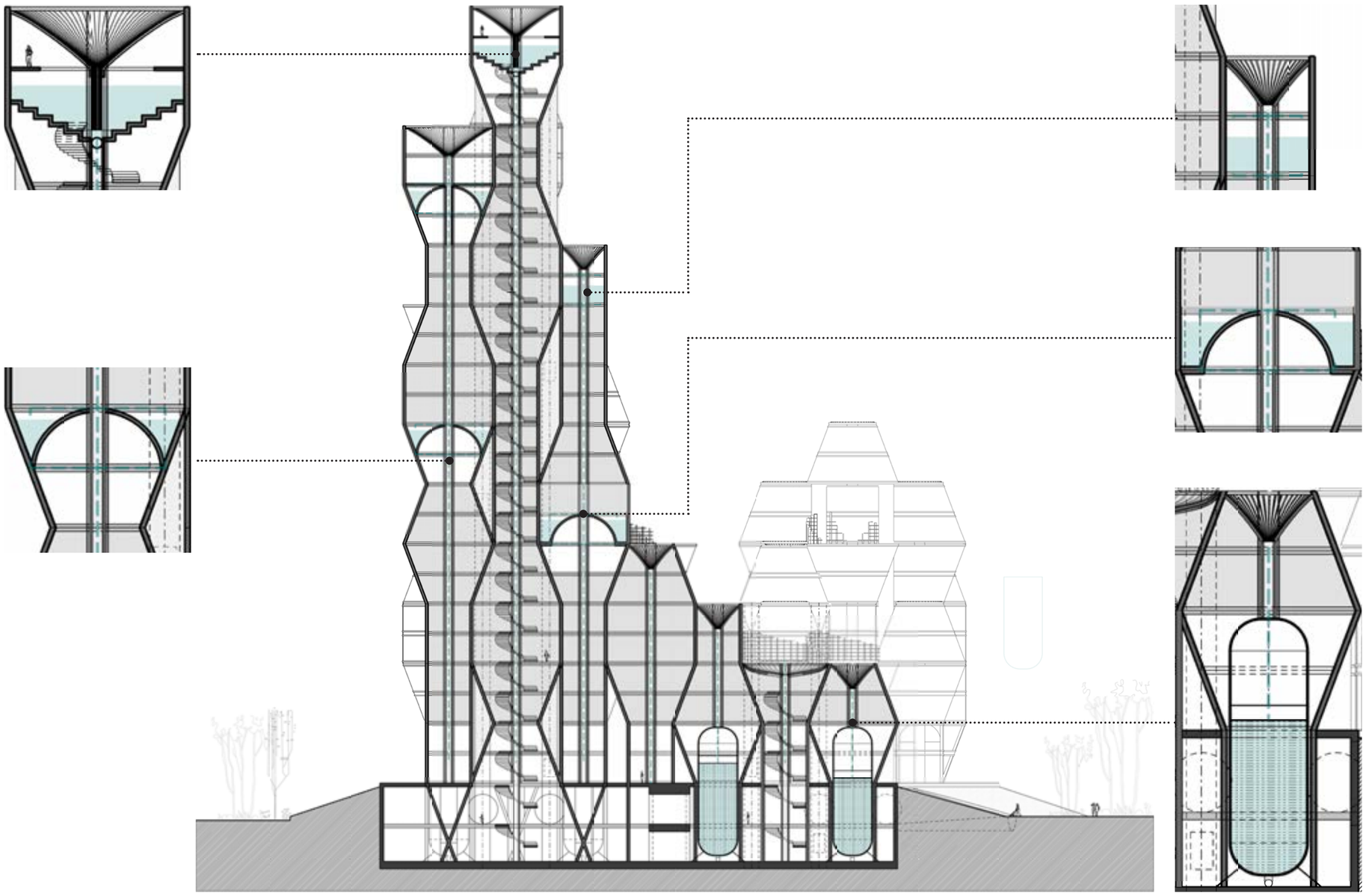
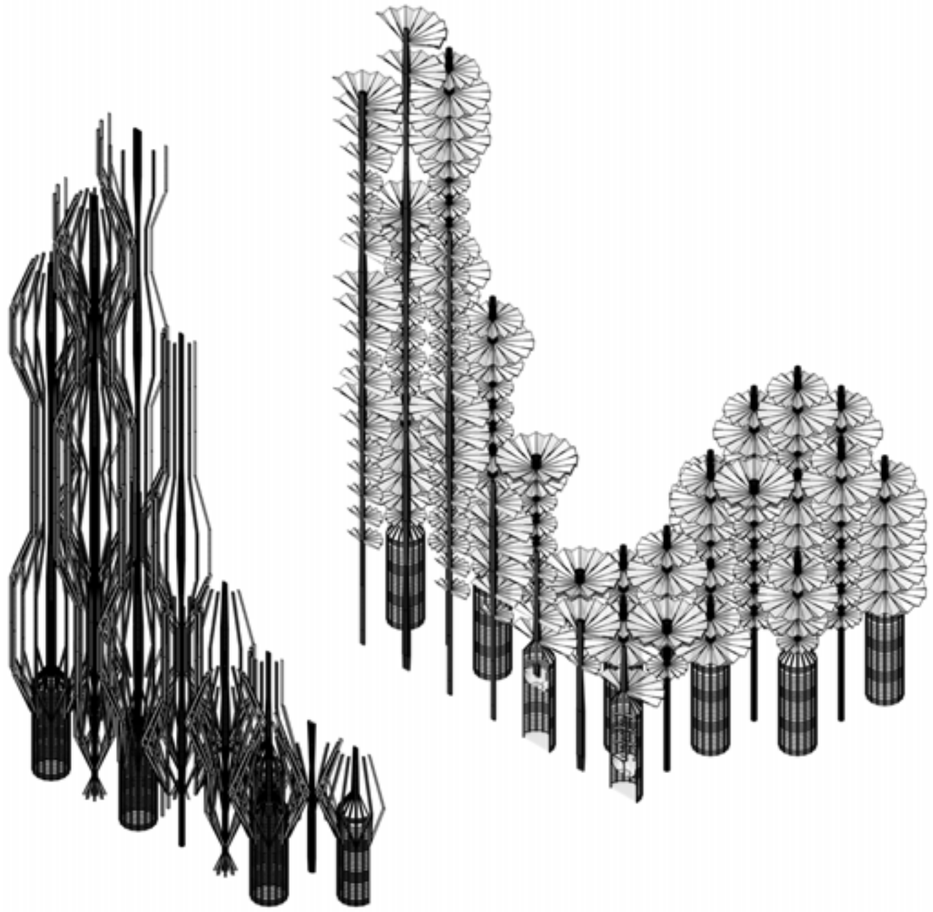
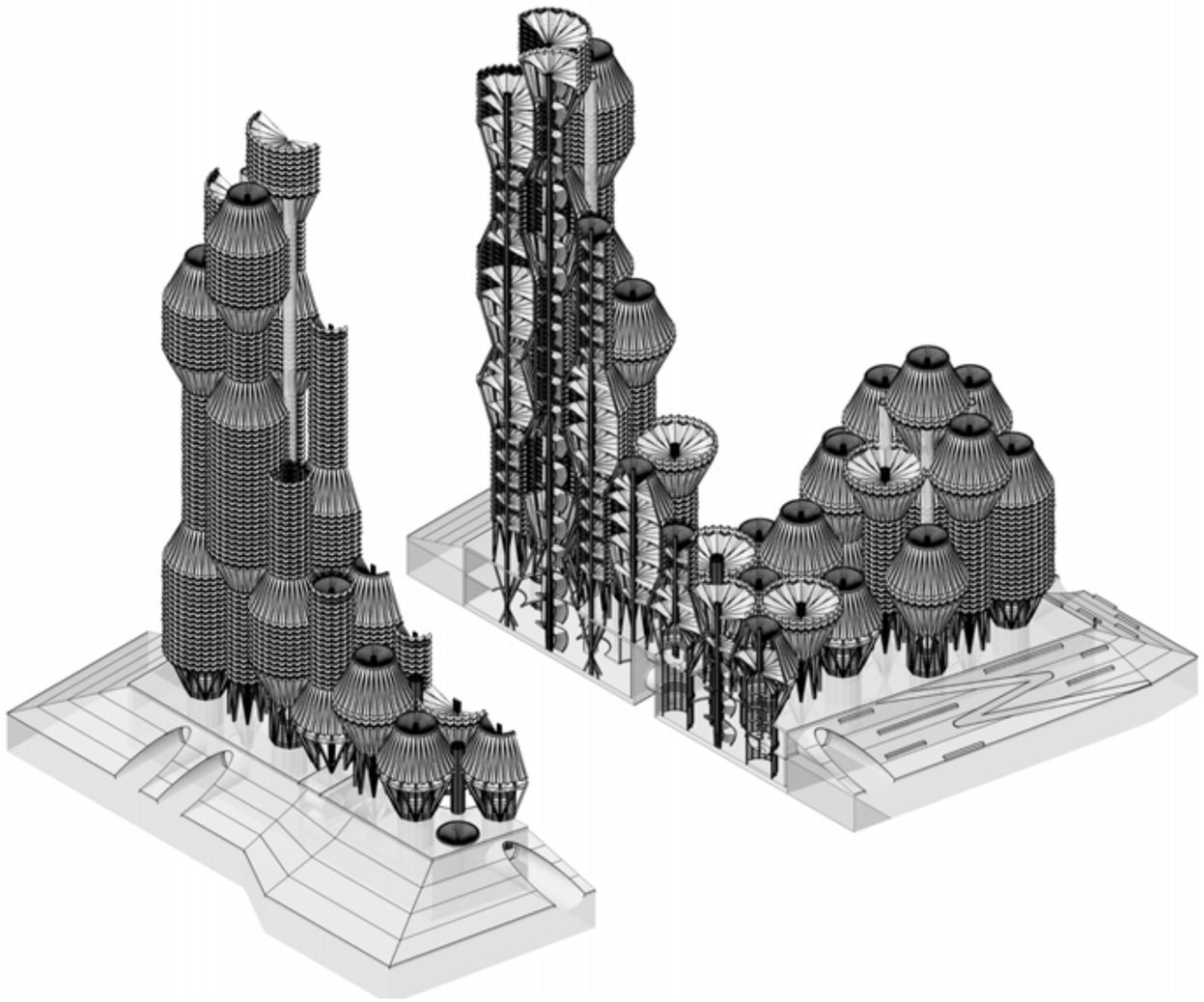


As well as storing most of the collected water in the tanks below the towers, additional water storage is planned in parts of the towers for daily consumption.

WATER STORAGE

CROSS SECTION





The structural elements, water systems and envelope of the port tower in context of the site

SECTION PERSPECTIVE

COMPONENTS

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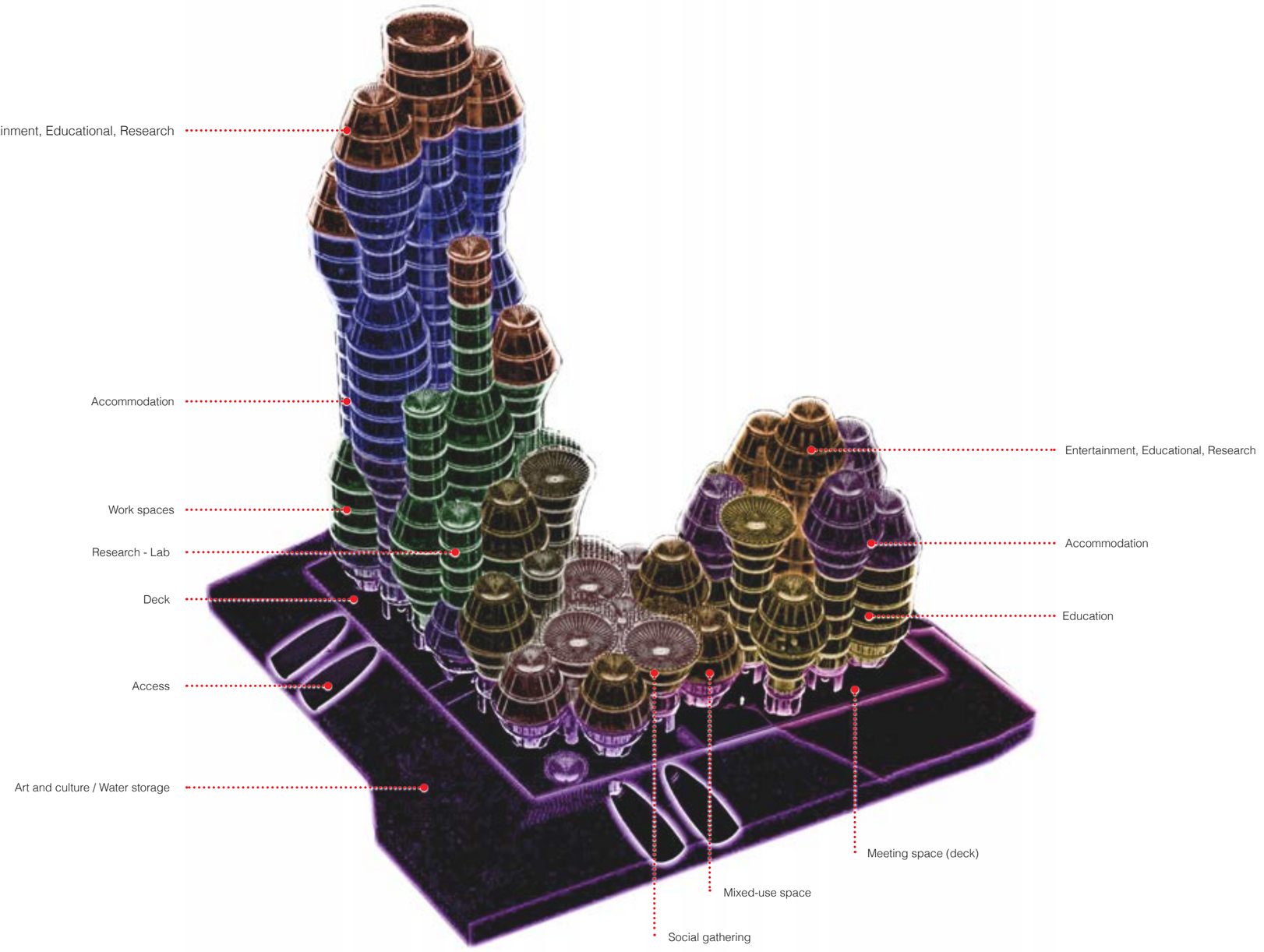
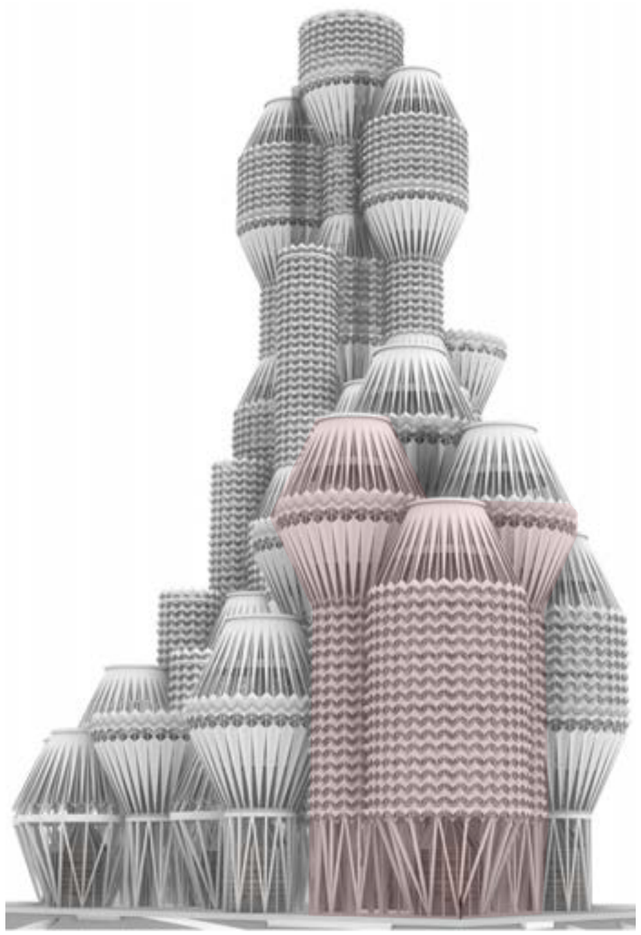
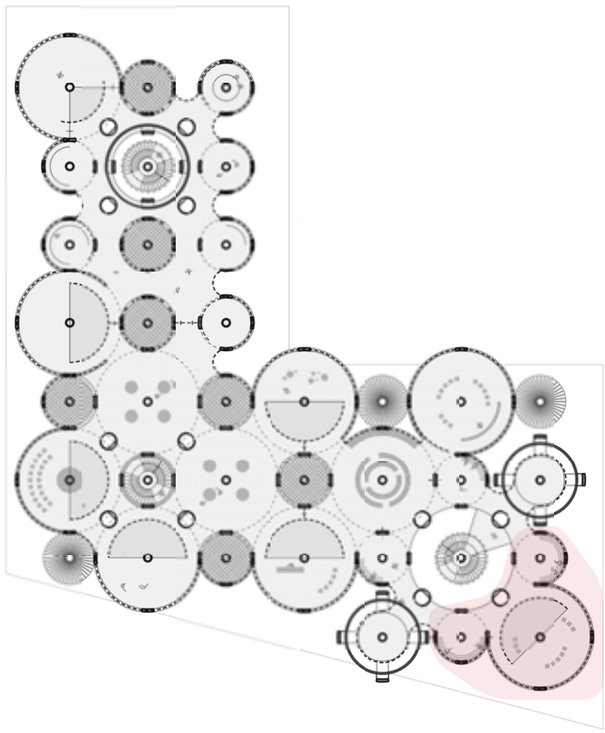


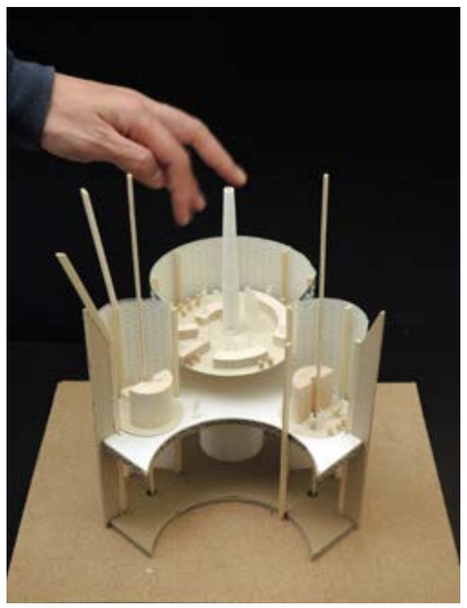
The programme of the tower aims to provide a diversity of events through its design. This programme contains the opportunity and framework for different types of gatherings

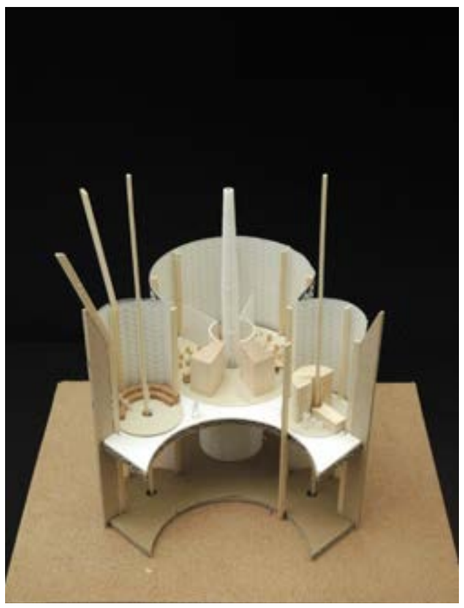
The Torre de David in Caracas is a good example to show how people can convert an abandoned building, with no specific programme and modify the infrastructure to suit their own use. This type of people-led spontaneous occupation and events shows parallels to that of a high street.

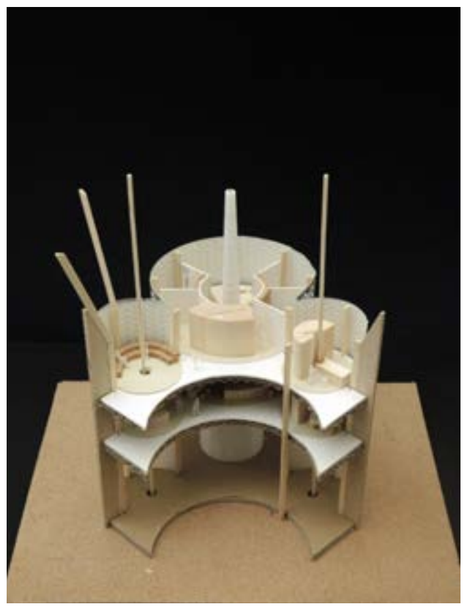




The idea from the Torre de David precedent -that the people can shape their own surroundings like a high street in a city- could provide a flexibility for a change of use, giving a people-led diversity and dynamism.







A combination of functions such as education units, labs, residential units and shops were considered in the scale of the tower units, in circular formation and modulation. These are interchangeable and serve to demonstrate the possible uses of the space. This could provide a guide for people to shape their own environment without a fixed programme.

PROGRAMME

FLEXIBLE PROGRAMME PROPOSITION

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a- wych cross
b- existing trees
c- proposed planting areas for trees
d- road
e- paths
f- access to site
g- the old covered reservoir
h- the port tower
i- entrance
j- performance area
k- the street
l- congregation areas
m- market area
n- water collecting tower units
o- allotments
p- outdoor workshop

Individual water-collecting tower units spread out into the surrounding forest, to increase the collection of this resource.
Social events not limited within the tower, and taking place in the surrounding areas. The use of the land for farming, markets, outdoor activities, and other types of gathering spaces are at the heart of the port idea.

SITE PLAN

b- existing trees
c- proposed planting areas for trees
d- road
e- paths
f- access to site
g- the old covered reservoir
h- the port tower
i- entrance
j- performance area
k- the street
l- congregation areas
m- market area
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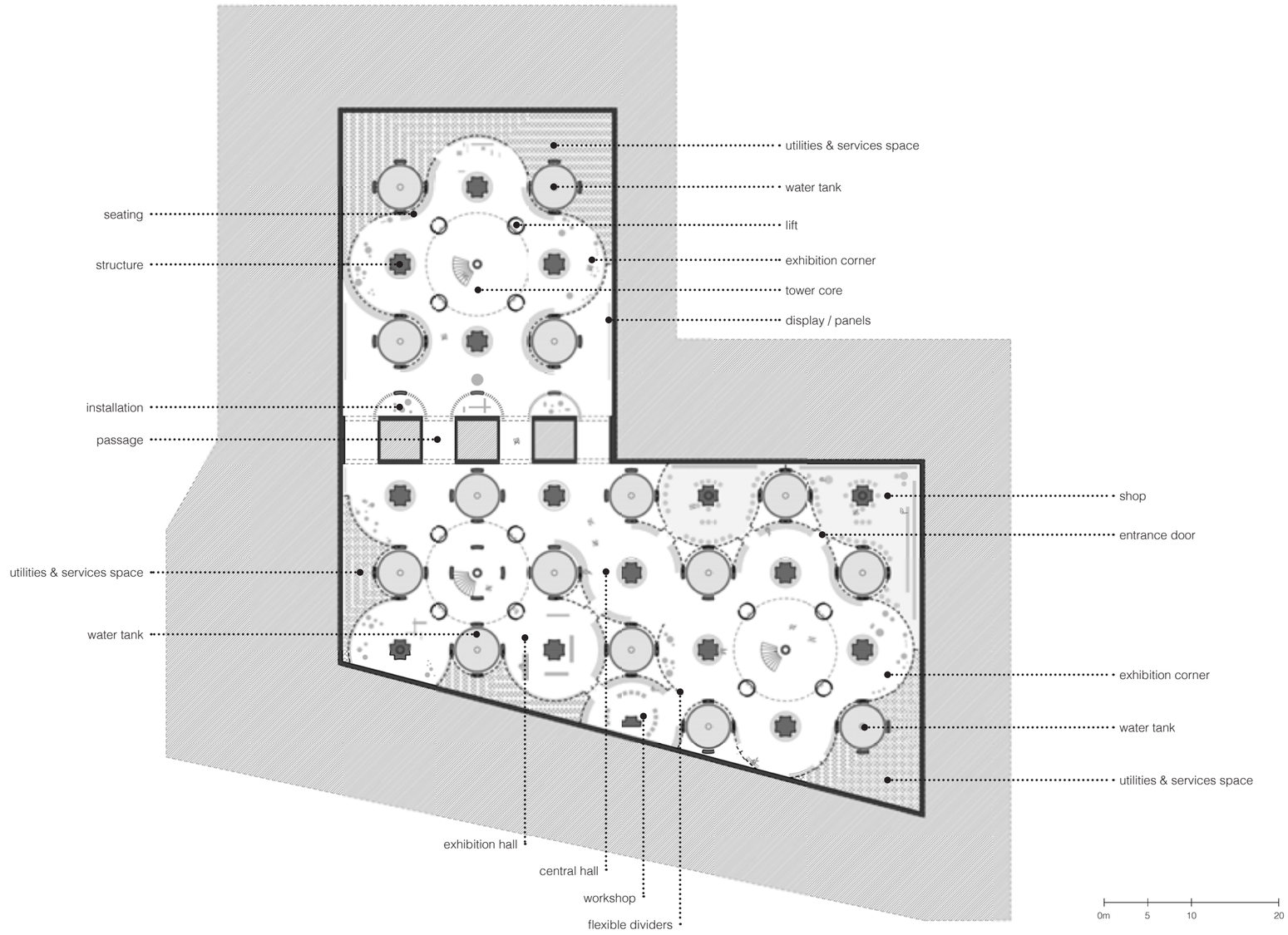
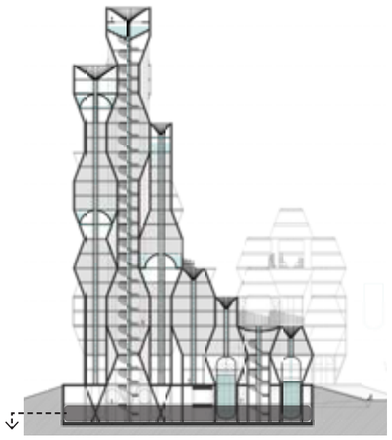
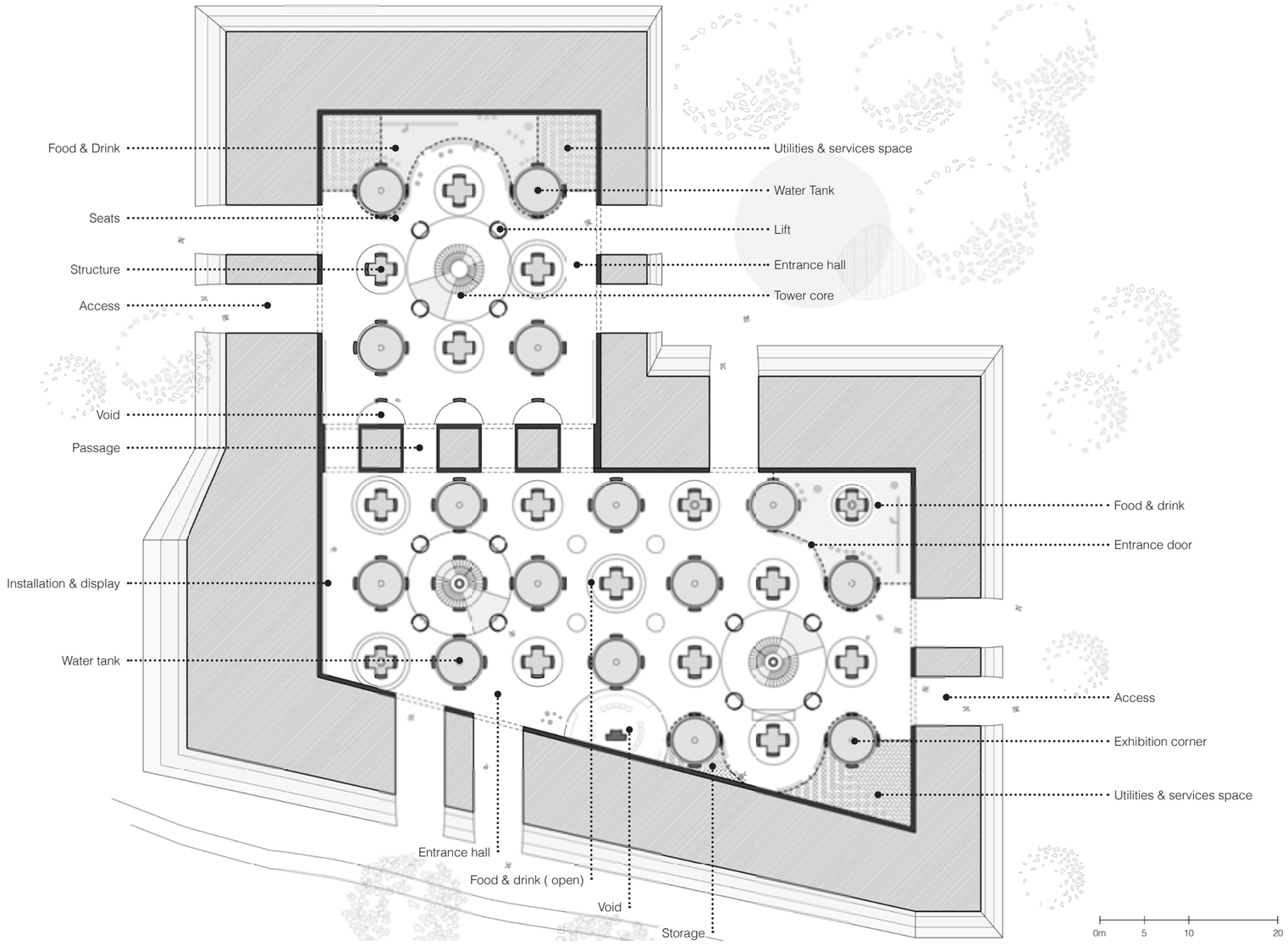
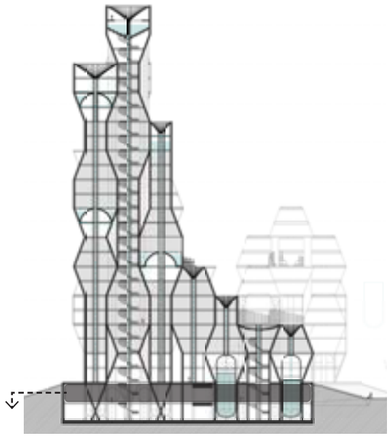
SITE PLAN





Basement Floor Plan
Gallery level





Lower Ground Floor Plan
Entertainment & circulation level

PLANS
BASEMENT & LOWER-GROUND PLAN
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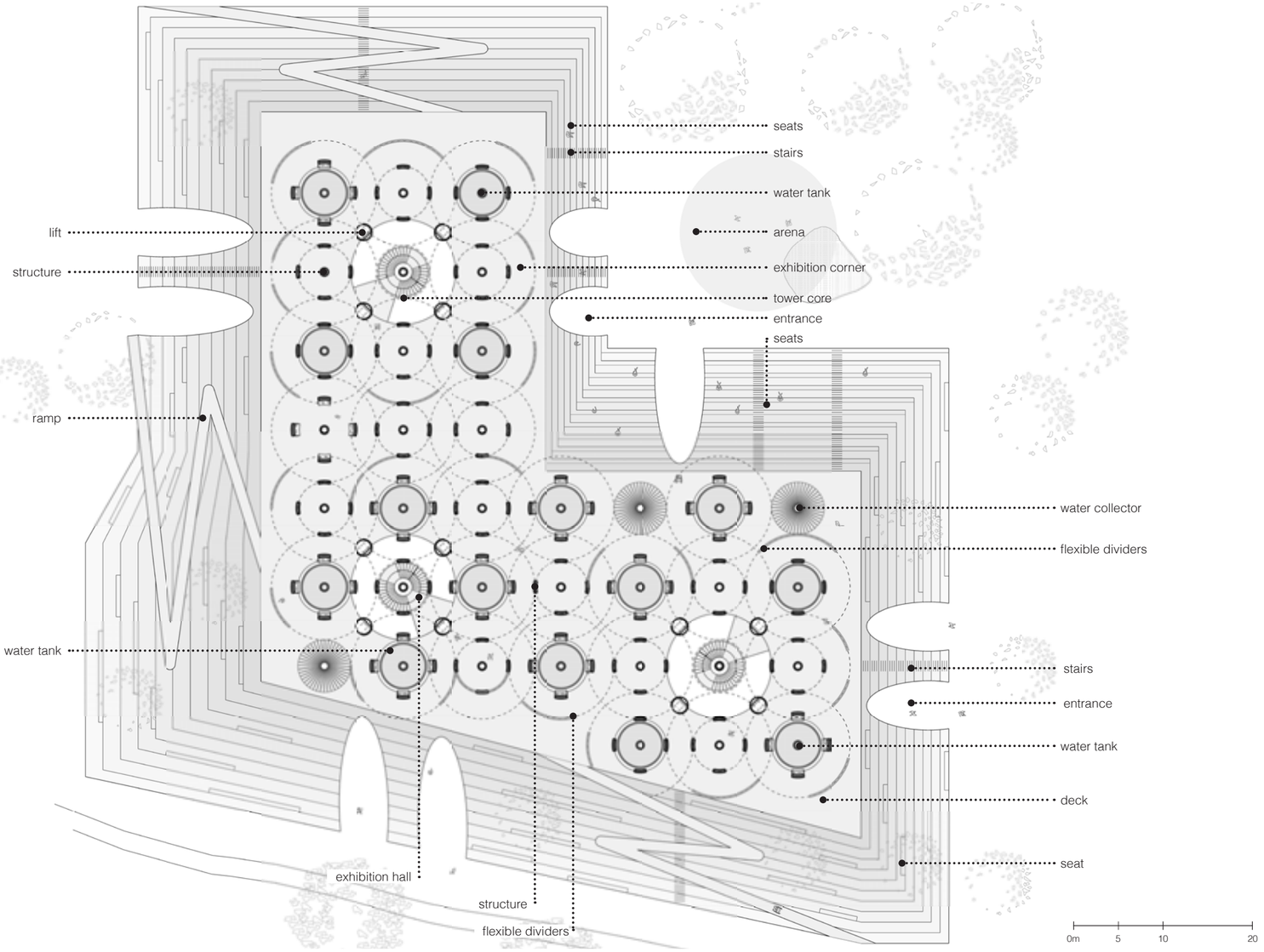
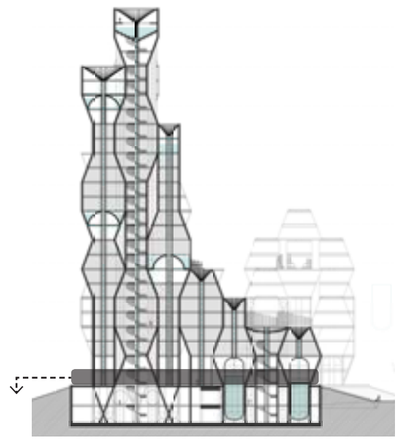
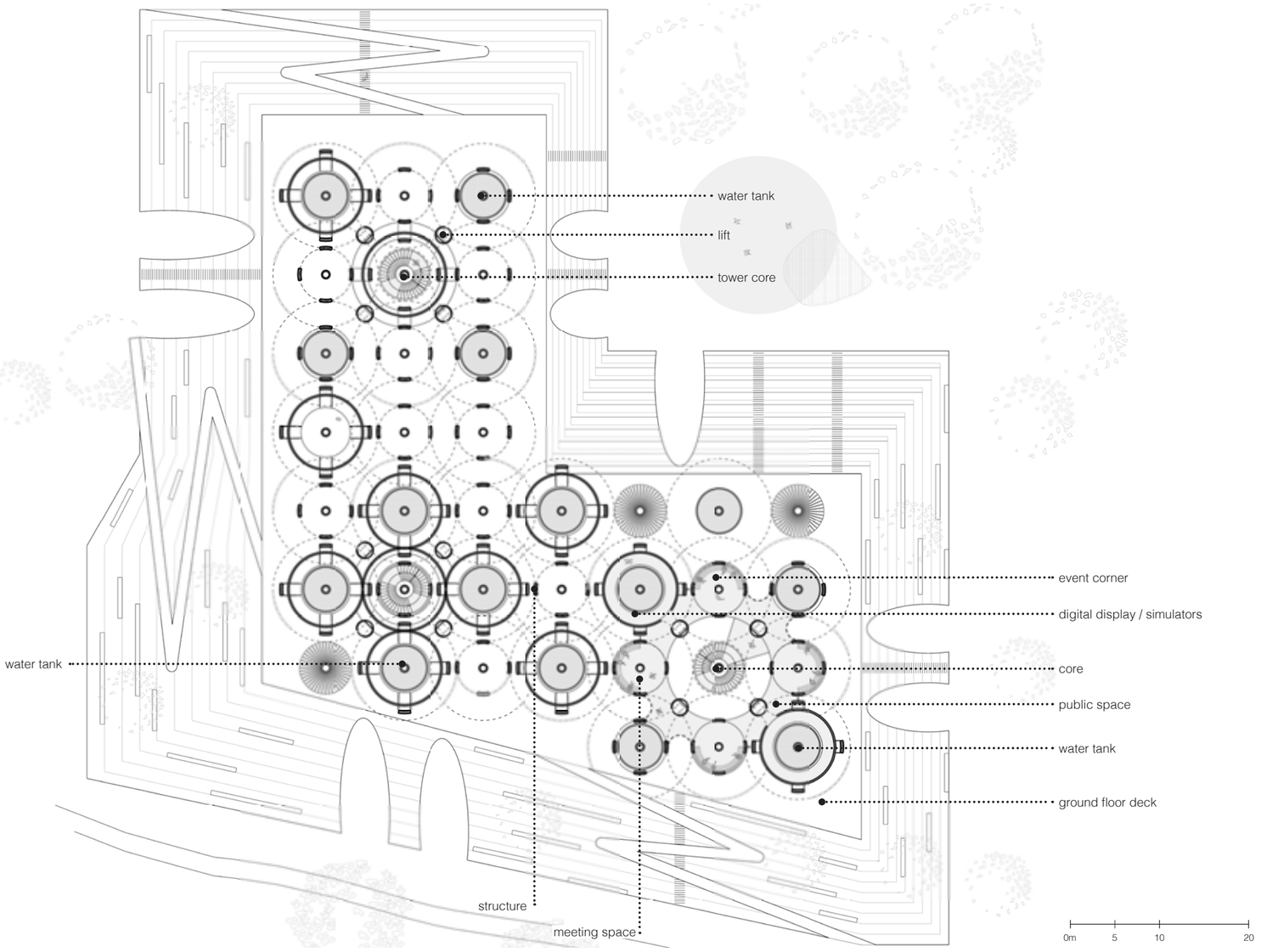
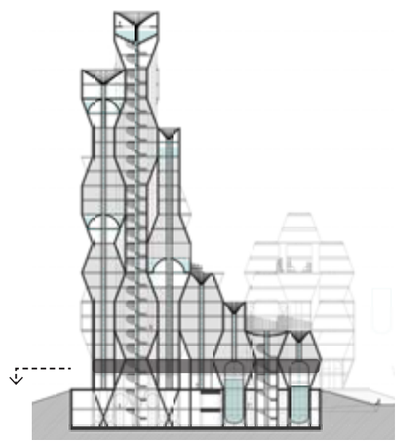




Ground Floor Plan
Social gathering level





+4 Floor Plan
Education tower

PLANS
GROUND & +4 FLOOR PLAN
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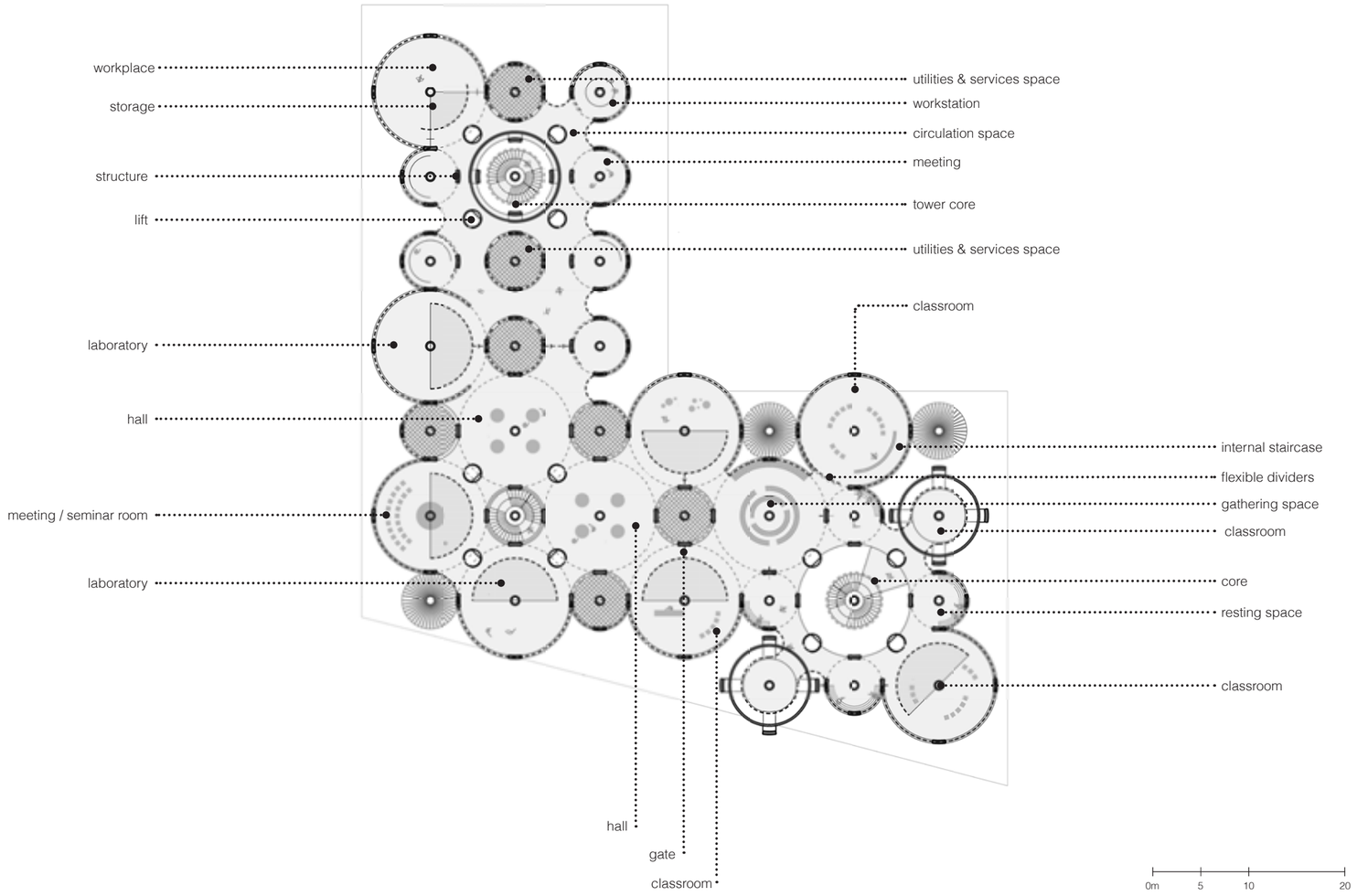
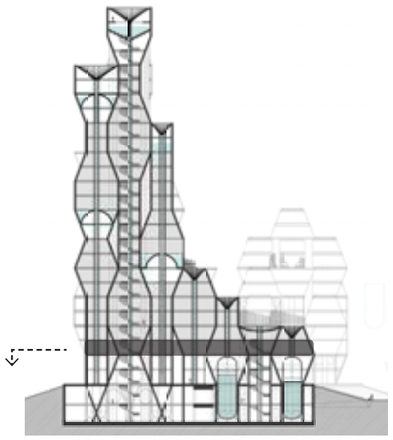
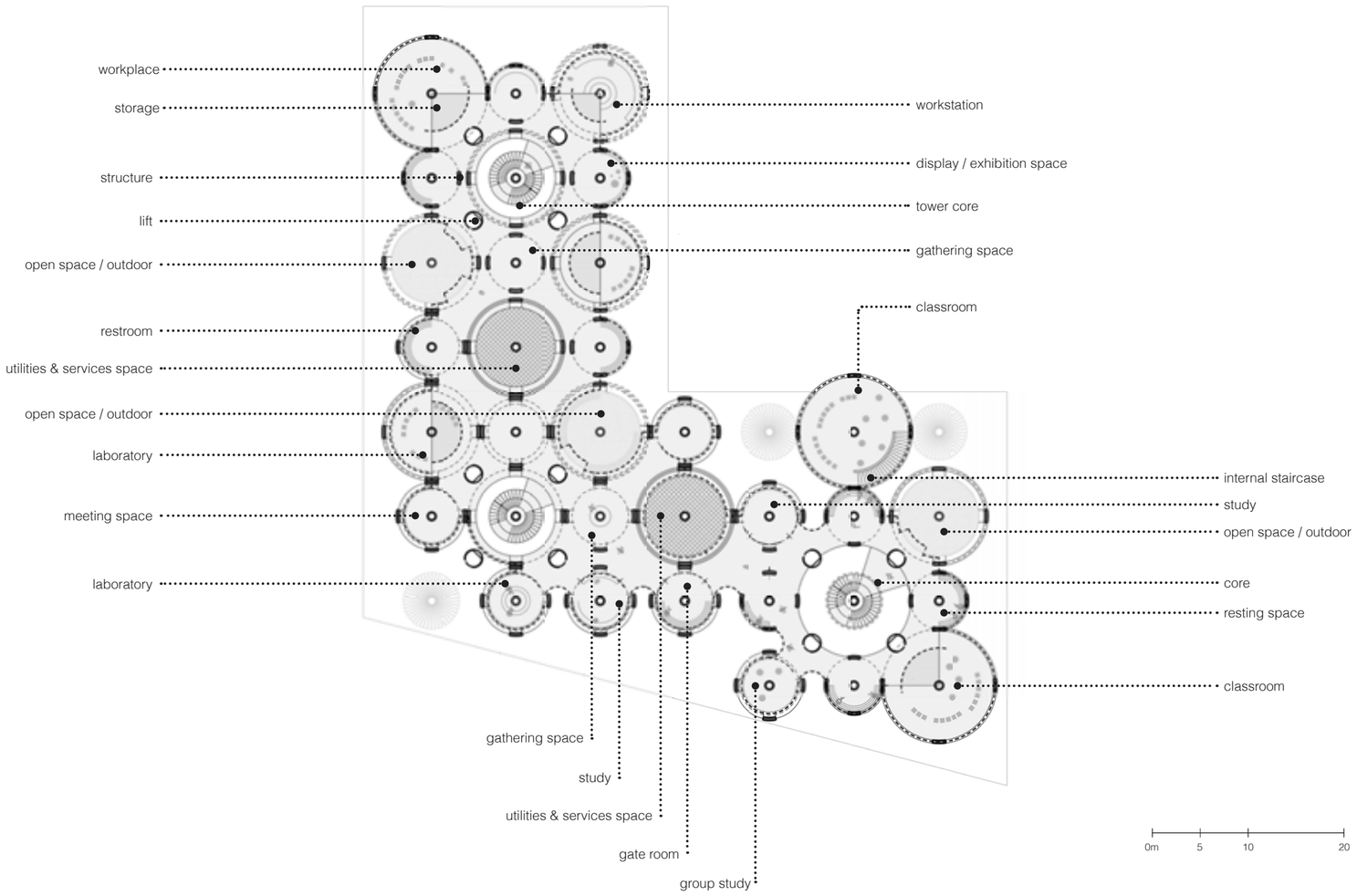
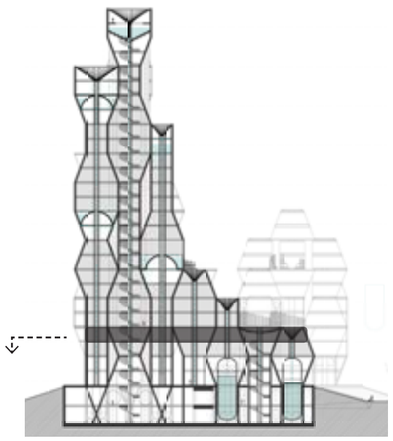




+8m Floor Plan
Mixed-use





+12m Floor Plan
Mixed-use

PLANS
+8 & +12 FLOOR PLAN
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SECTION

PERSPECTIVE SECTION

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ARTISTIC VISUALISATION

GATHERING OF WATER AND PEOPLE

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ARTISTIC VISUALISATION

VIEW OF THE TOWER

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ARTISTIC VISUALISATION

GENERAL VIEW

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MODEL

TOP VIEW

VIGNETTE

LIFE IN THE TOWER

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VIGNETTE

GATHERING WATER AND PEOPLE

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VIGNETTE

PEOPLE-LED GATHERING

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VIGNETTE

THE BARBER SHOP

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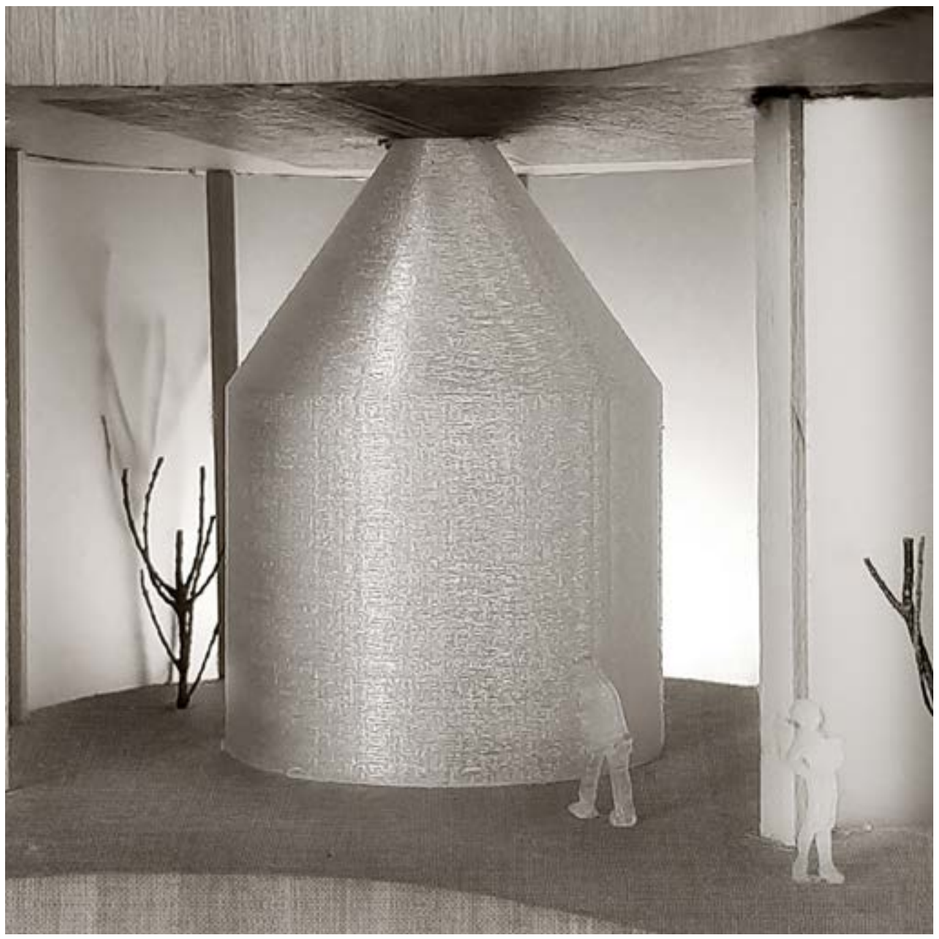

VIGNETTE

COLLECTION

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