



FARM FIRST

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M.Arch 2 | Studio 2 - AIM715

FARM FIRST

The consumption of alcohol is deeply engrained in the everyday life of British society. There are over 27,000 clubs, 78,000 public buildings, 25,000 restaurants and about 46,000 other places which include shops and supermarkets that are licensed to sell alcohol in the UK. The ease of access to alcohol like wines means that alcohol consumption is not limited to pubs and clubs as it used to be. In a survey of 4,000 people done in 2015, it was found that 60 percent of drinkers chose wine as their preferred choice of alcohol. The popularization of wine consumption represents one of the most significant developments in British drinking culture in almost half a century. This is closely attached to female drinking in the UK. Pubs were not always welcoming to women as they are now. So drinking a bottle of wine at home became more popular with women drinkers which caused an increase in the number of female drinkers.

While alcohol consumption is a common part of the social lives of people of all ages in the UK, binge drinking is largely seen as a young people problem. This is as regards to their public behavior while intoxicated. It is very common that young people go out drinking with the aim of getting drunk and since the term binge drinking is unclear, researchers have begun to use other terms to describe young people's drinking culture. One of these terms is calculated hedonism. This describes young people from different socio-economic backgrounds, trying to manage a "work hard , play hard equilibrium". Their consumption of alcohol is largely a weekend activity where the function of their consumption is to chill out, forget worries, feel self-confident and sociable, experience and enjoy the effects of alcohol in a social setting.

Although excessive consumption can be harmful, it is also associated with pleasure, escape from daily pressures and it represents a key ingredient in celebratory occasions as a symbol of togetherness.

The drinking culture in the UK makes alcoholic beverage industry a billion dollar industry. The interest of this project lies in the manufacturing process of these alcoholic beverages.

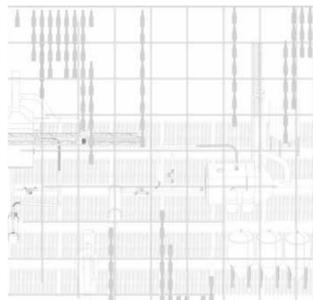
The Project aims to use the manufacturing process to power and develop a self sustaining tower. This would involve the tower housing a farm which produces starch based plants that would be used in a dry-milling process to produce ethanol. The project intends to use this alcohol produced as a form of fuel to generate electricity for the tower while also producing some for the purpose of consumption and sales. By using the method of hydroponic farming, the tower is able to create a vertical farm which would reduce the footprint of the project and reduce the strain on the site.

The project also intends to use the social aspects of this drinking culture to design spaces and accommodation that promote the idea of socialization and community. However it will prioritize the farming aspects of the tower above the other aspects.

Intangible heritage

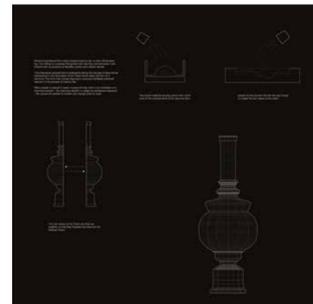
Binge drinking is the projects chosen intangible heritage. drinking is a very huge part of british culture and this part of the project explores why it is such an huge part of the culture and history It also explores why people drink to begin with. While alcohol consumption is a common part of the social lives of people of all ages in the UK, binge drinking is largely seen as a young people problem. Their consumption of alcohol is largely a weekend activity where the function of their consumption is to chill out, forget worries, feel self-confident and sociable, experience and enjoy the effects of alcohol in a social setting. The project expects to use the social aspects associated with drinking in designing the proposal.

there are two aspects of drinking culture that the project intends to look at. One one end there is a social and euphoric feeling that is induced by the chemical reaction which occurs in the brain after consumption, this is mirrored on the other end by the chemical reaction that goes into the production of the alcohol for consumption.



Totem development

This section explores the totem which is a physical object/ representation of the intangible heritage. The totem exploration takes place in stages, with the first stage being a clay exploration of three piece mini totem before exploring the final totem. The final totem was made as a representational form of a samovar. A samovar is a Russian tea making device which embodies the chemical reaction in which the intangible heritage is built on. Clay and plaster are the chosen materials for the totem because they both undergo chemical reactions and change their structure when exposed to certain conditions. this also ties back to the intangible heritage. the process of making the totem is also an integral part of this section of the project. Different methods were explored using the materials chosen. precision in making then totem was ignored so that the process can be enjoyed and a positive reaction can be expelled from the brain as in the consumption of alcohol



Hybrid Totem

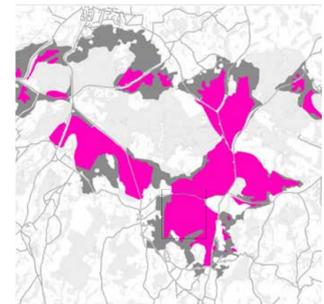
The hybrid totem is a combination of the intangible heritage totem and a precedence study on the robin hood gardens in london. The most notable part of the study was the length of the building and the number of staircases in the building. The distance between one and the other is quite large and this would reduce the chances or possibilities for interaction between residence on opposite sides of the building. So the hybrid totem takes a section of the length of the Robin Hood Gardens which is the middle of the totem and then twists it into a spiral vertically. The rationale is to create a single route through the tower which would promote chance interaction. The physical form of the final totem is then made into a form that represents distillery equipments and then placed below the spiral as place for distilling alcohol which would then be used to power the tower. The top houses a farm that produces crops which are then distilled into alcohol



Site studies

There are two main ecological habitats that make up the forest. They are heathland (60%) and woodland (40%) each of which provides a very different environment for animals to live in. The site is located in the heathlands. Heathlands have defining characteristics such as vegetation dominated by plants of the Ericaceae (heathers) family, dwarf shrub communities, there are usually few trees, sandy acidic soils and at altitudes below three hundred metres. heathlands are a rare type of habitats. The heathlands that still exist are roughly about 15 percent.

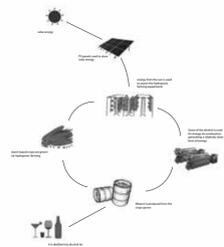
The heathlands are not suitable for farming because of its acidic soil, so this requires alternate means of farming. Hydroponic farming is the means which has been adopted for the project.



Farm strategy

There are natural structures that exist in the forest and the project's specific interest in these systems is to find a way to use some of the principles to as well as incorporating some of the already functioning systems into a functional architectural project without causing harm to the Natural environment.

As a result of the acidity in the soil, the conditions are not suitable for farming. The project will use photovoltaic solar panels to store energy from the sun which would be used to power the equipments required for the hydroponic farm. The farm will produce starch based crops which will then be converted into alcohol for consumption and sales. some portion of the alcohol produced will then be used as fuel for generating electricity which will then be fed back into the tower.



Core/interior spiral development

The proposal intends to employ a spiral core which evolves into a double helical spiral. This provides bracing for itself which gives additional structural support.

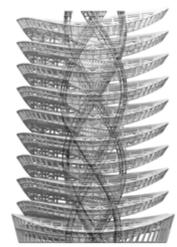
These spirals form the main structural members of the building but also perform the function of a traditional core. A number of the spirals with their turns facing the same direction will serve as paths for trams to travel vertically to different areas of the building. This creates a more scenic route through the building and increases the chances of residence interacting with each other. It is a steel structure which is attached to the body of the tower internally. The spiral is constructed using a space frame.



Exterior Spiral

The external spiral which makes up the body of the tower will be made entirely from timber. the timber structural elements we designed such that the trusses are large enough to span the required distance and also create inhabitable spaces

Just as in the interior spirals, the exterior spiral will employ a single system of construction. however this section will be constructed completely out of timber sourced from the ash-down forest. As mentioned earlier, the trusses would have to be thicker to accommodate inhabitants within them



Design proposal

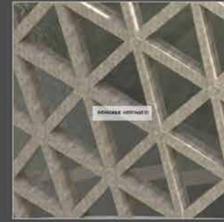
The final proposal is vertical hydroponic farm that houses a distillery at its basement. It's primary function is the farm. The design of the building is in the form of a continuous spiral. This form was chosen not only to promote social interaction as in the hybrid totem but also for its practicality when it comes to the main function. There is a continuous terrace space running along the length of the entire spiral where the farming. because the space flows from top to bottom it creates an opportunity for the transportation of supplies as well as harvested crops up and down the spiral via a rail track. This creates a more efficient means of transportation of the crops down to the basement for distillation.



INTANGIBLE HERITAGE 01



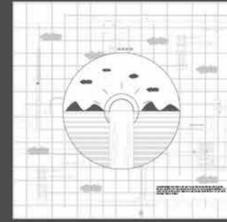
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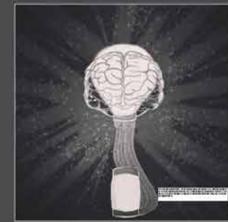
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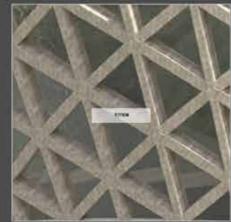
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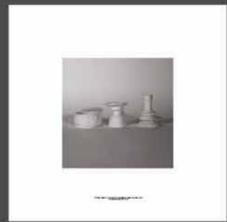
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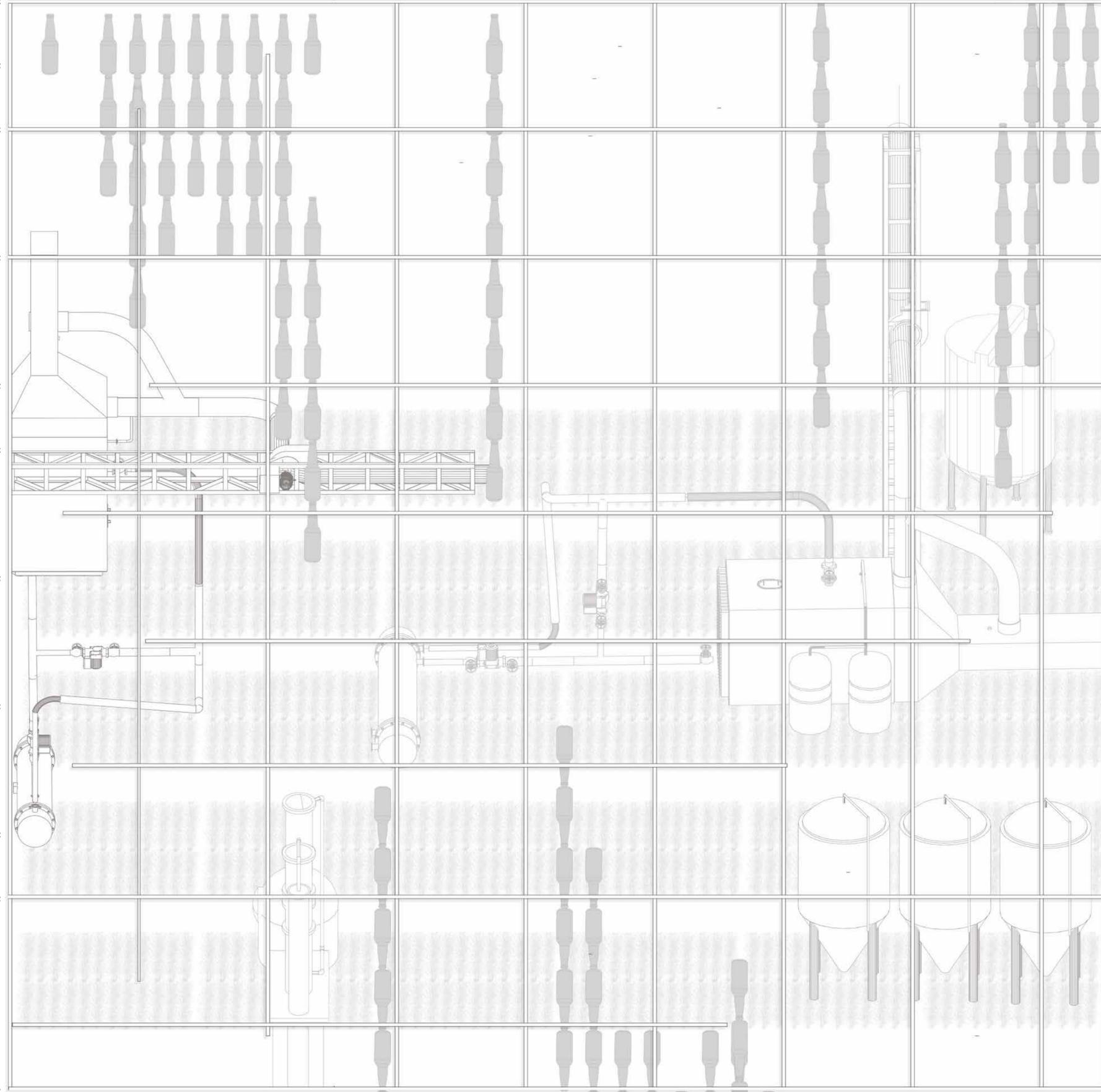
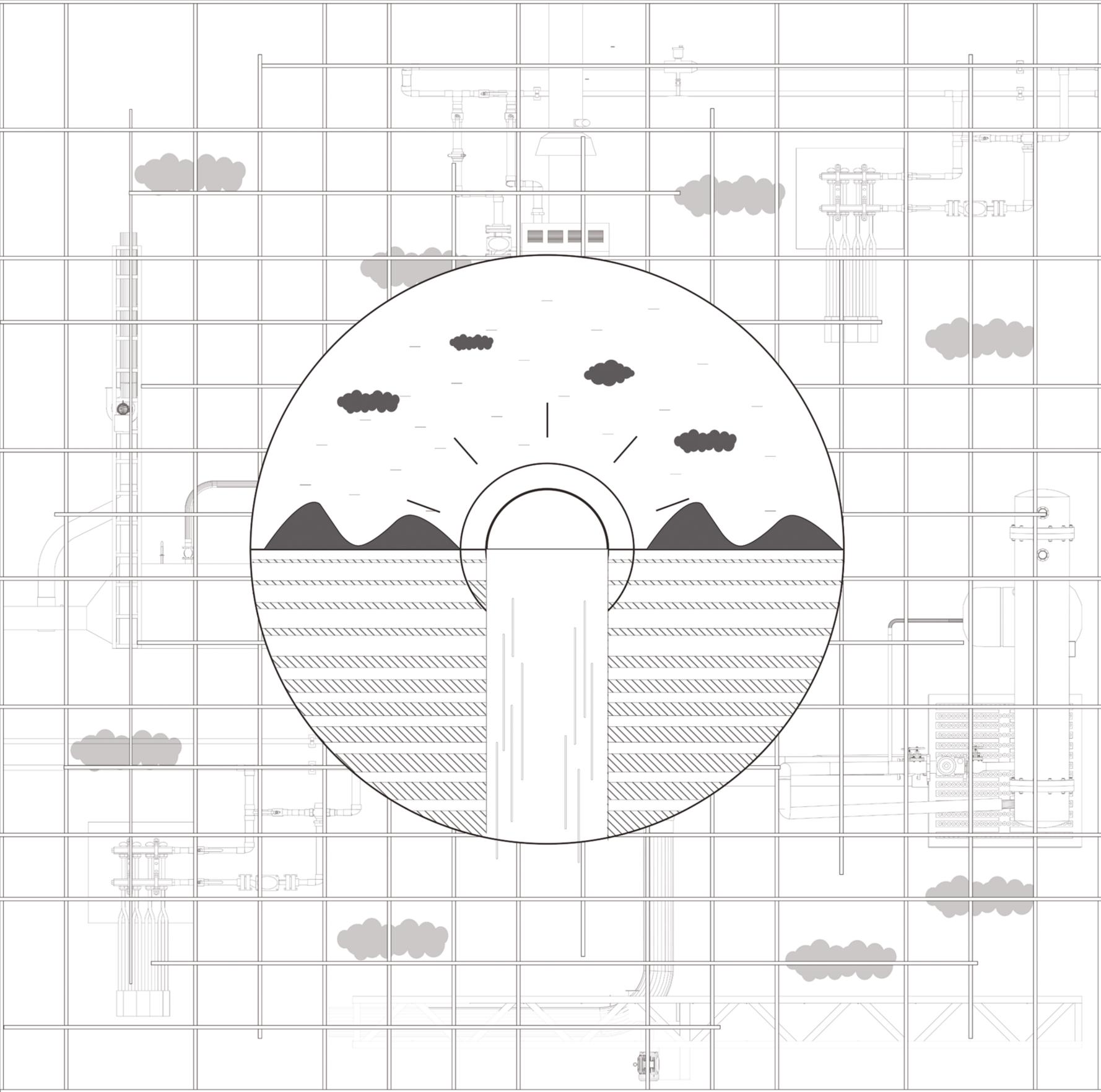
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TOTEM





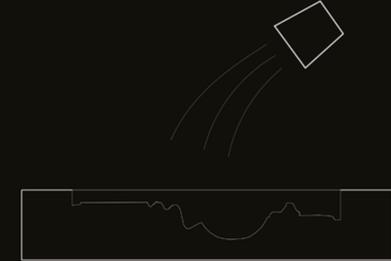
Ethanol is produced from starch-based crops by dry- or wet-mill processing. Dry-milling is a process that grinds corn into flour and ferments it into ethanol with co-products of distillers grains and carbon dioxide.

This chemical process that is undergone during the change of state will be represented in the fabrication of the Totem which takes the form of a samovar. This form was chosen because a samovar facilitates chemical reaction in the process of making Tea.

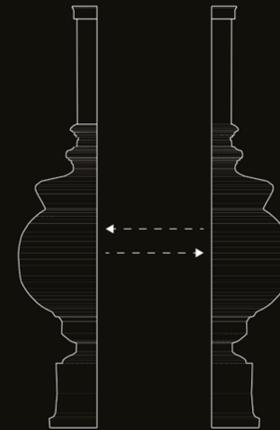
When plaster is placed in water, it gives off heat which is an indication of a chemical reaction. This chemical reaction is called an exothermic reaction, this causes the plaster to harden and change state its state.



The mould made by pouring silicon into a form work of the external shell of the samovar form.

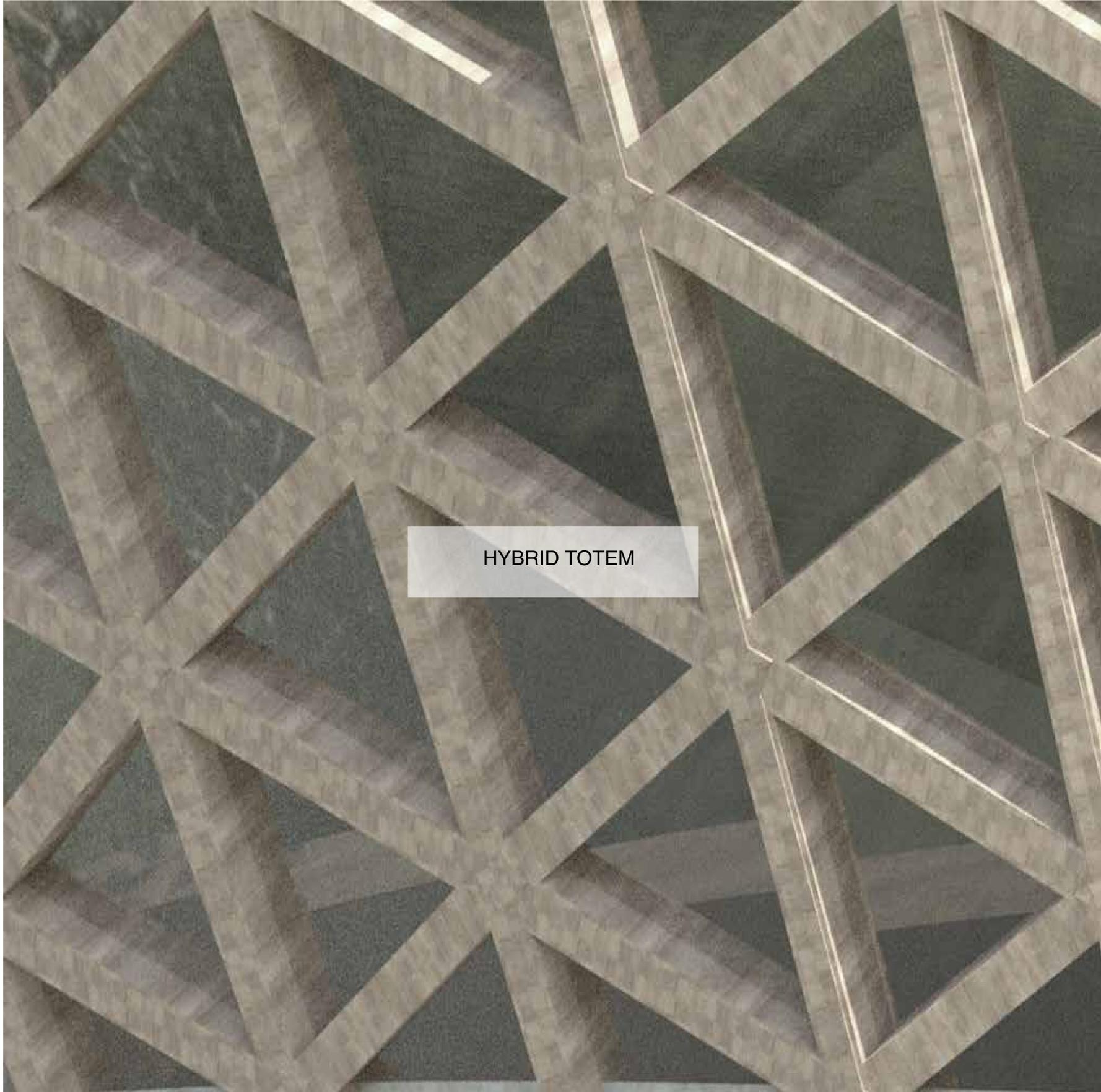


plaster is then poured into the two part mould to create the two halves of the totem



The two halves of the Totem are then put together so that they hardened and become the finished Totem.





HYBRID TOTEM



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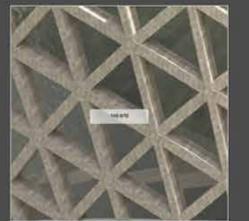
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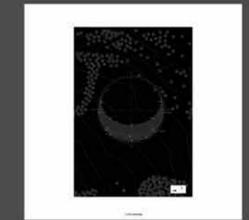
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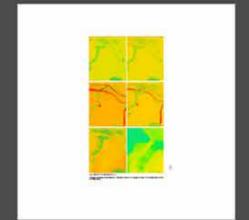
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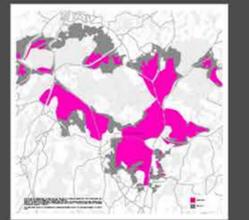
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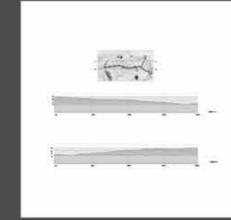
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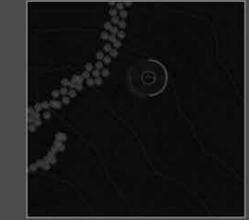
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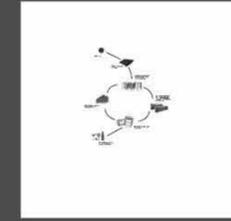
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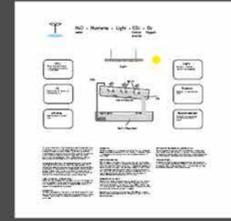
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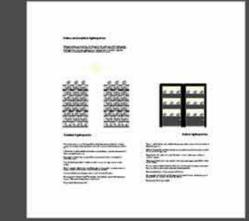
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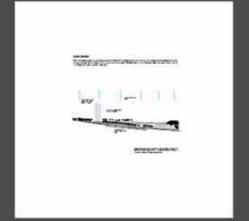
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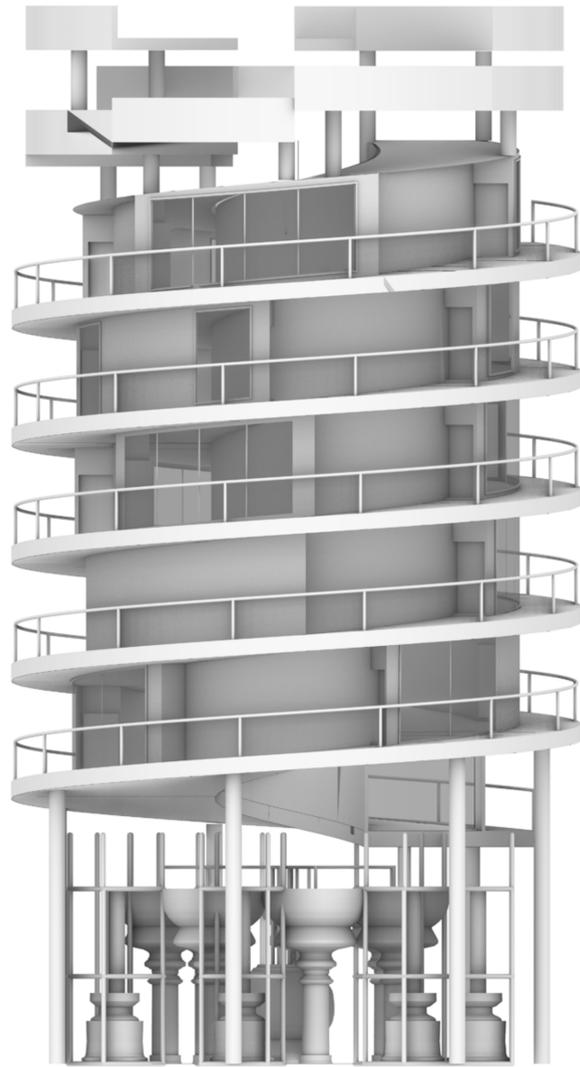
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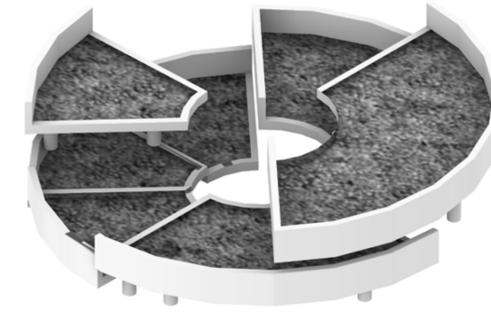
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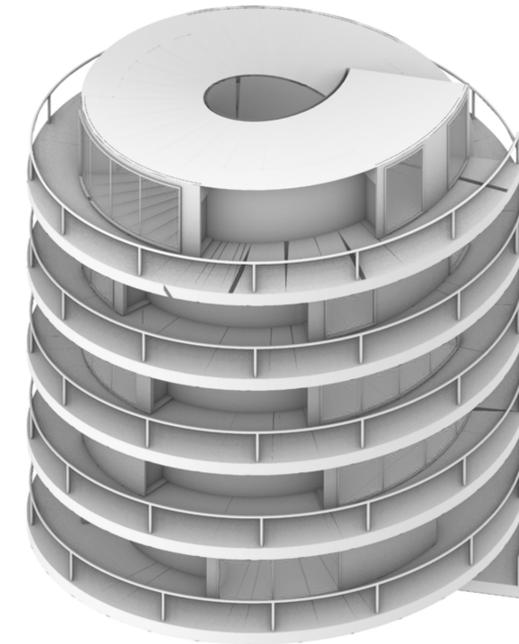
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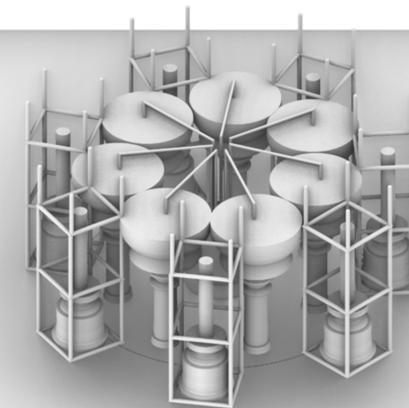
ELEVATION OF THE THREE PART TOWER



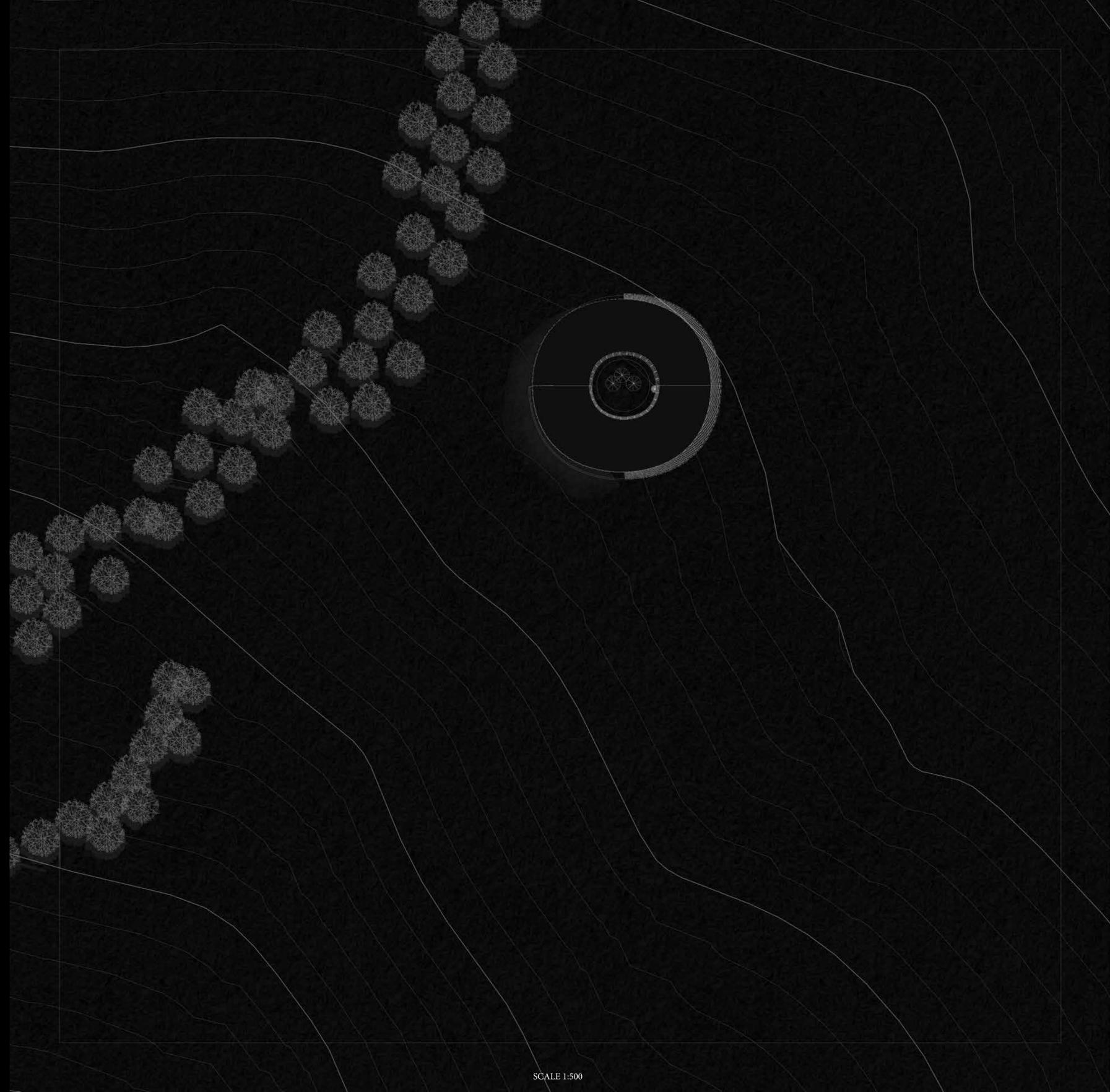
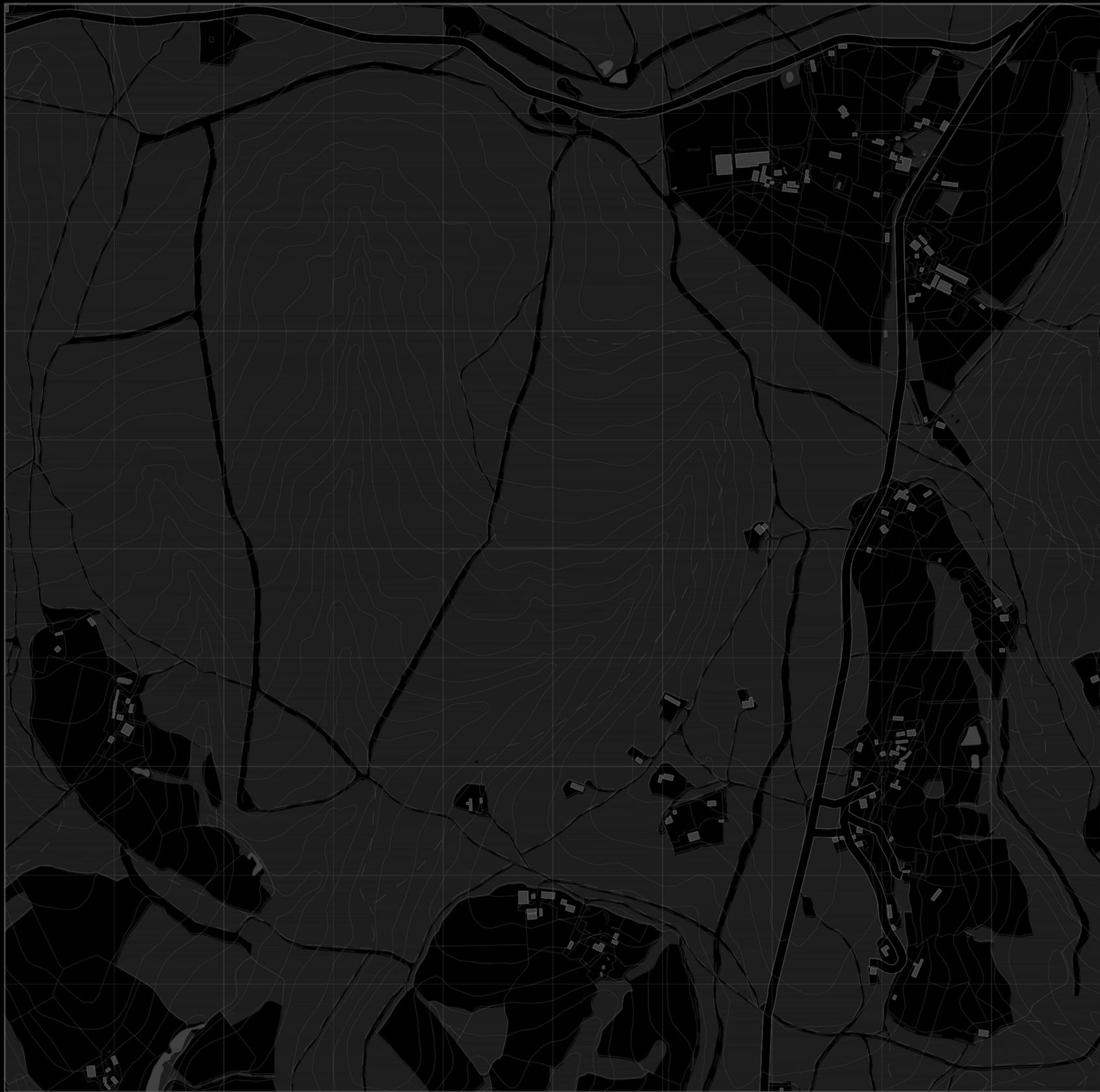
The top part of the tower is a staggered series of spaces which serve as a farm for the crops that are used in the base part of the tower



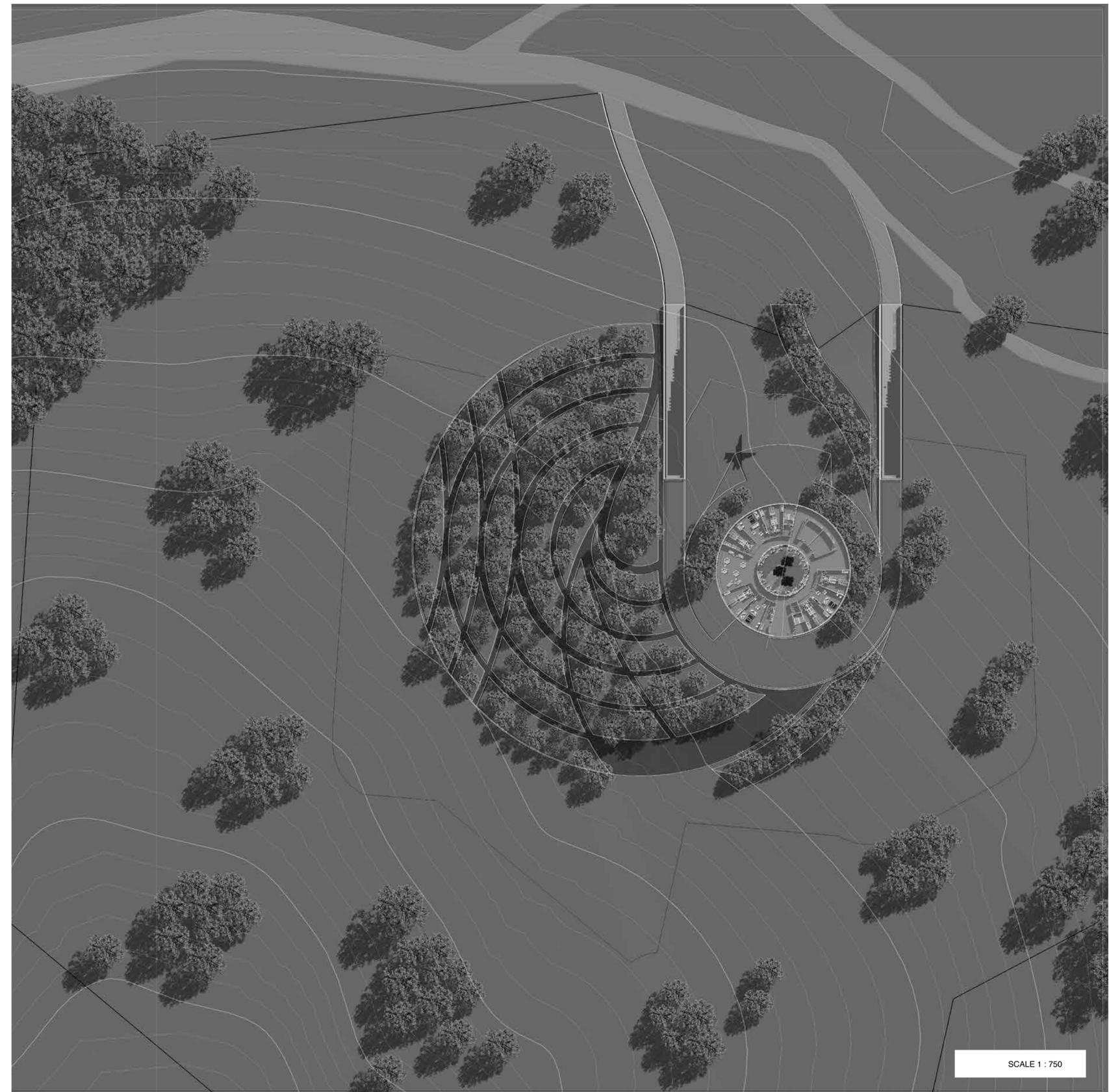
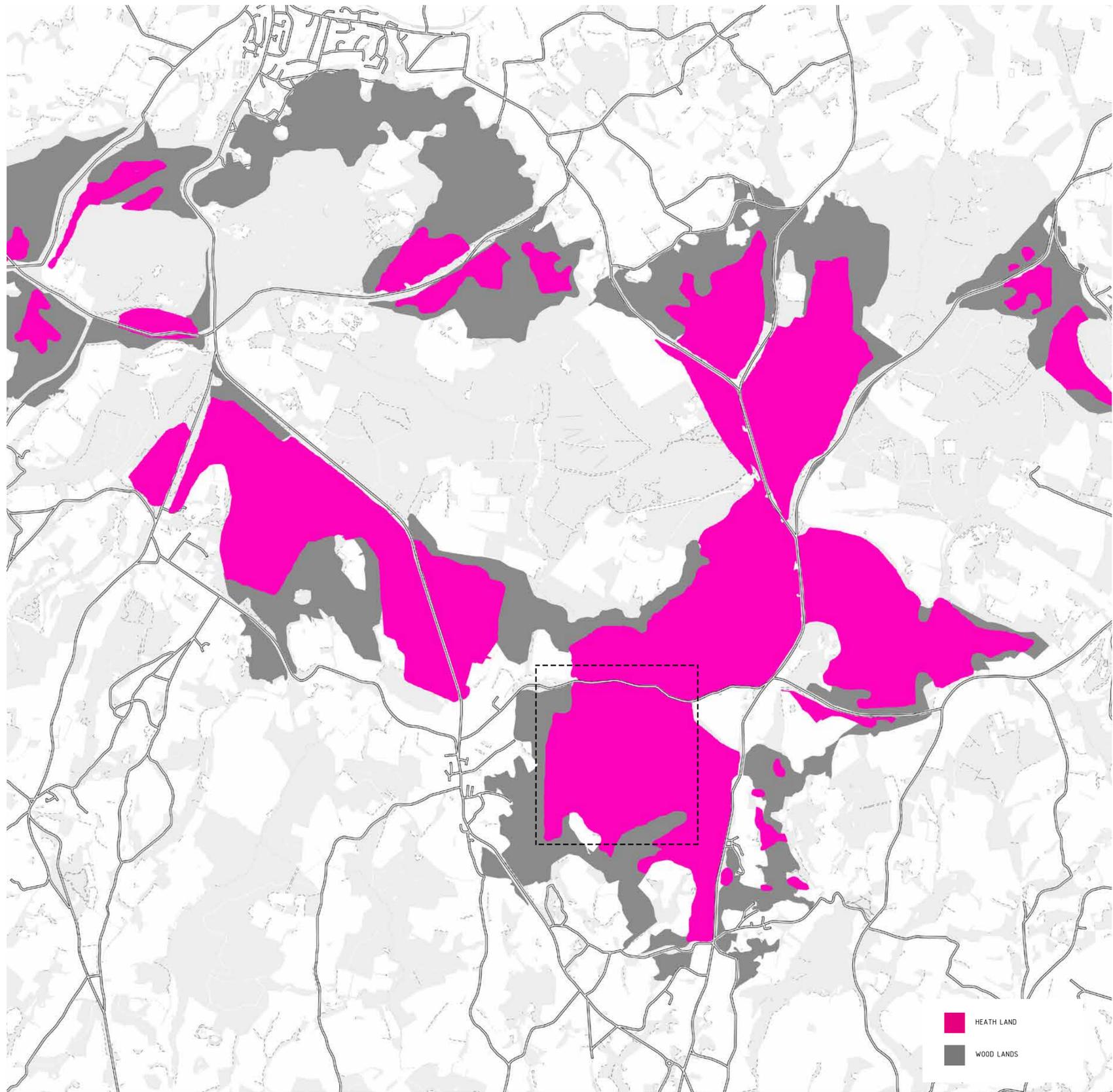
The middle section of the tower houses the accommodations, work space and offices that generates electricity from power the tower.

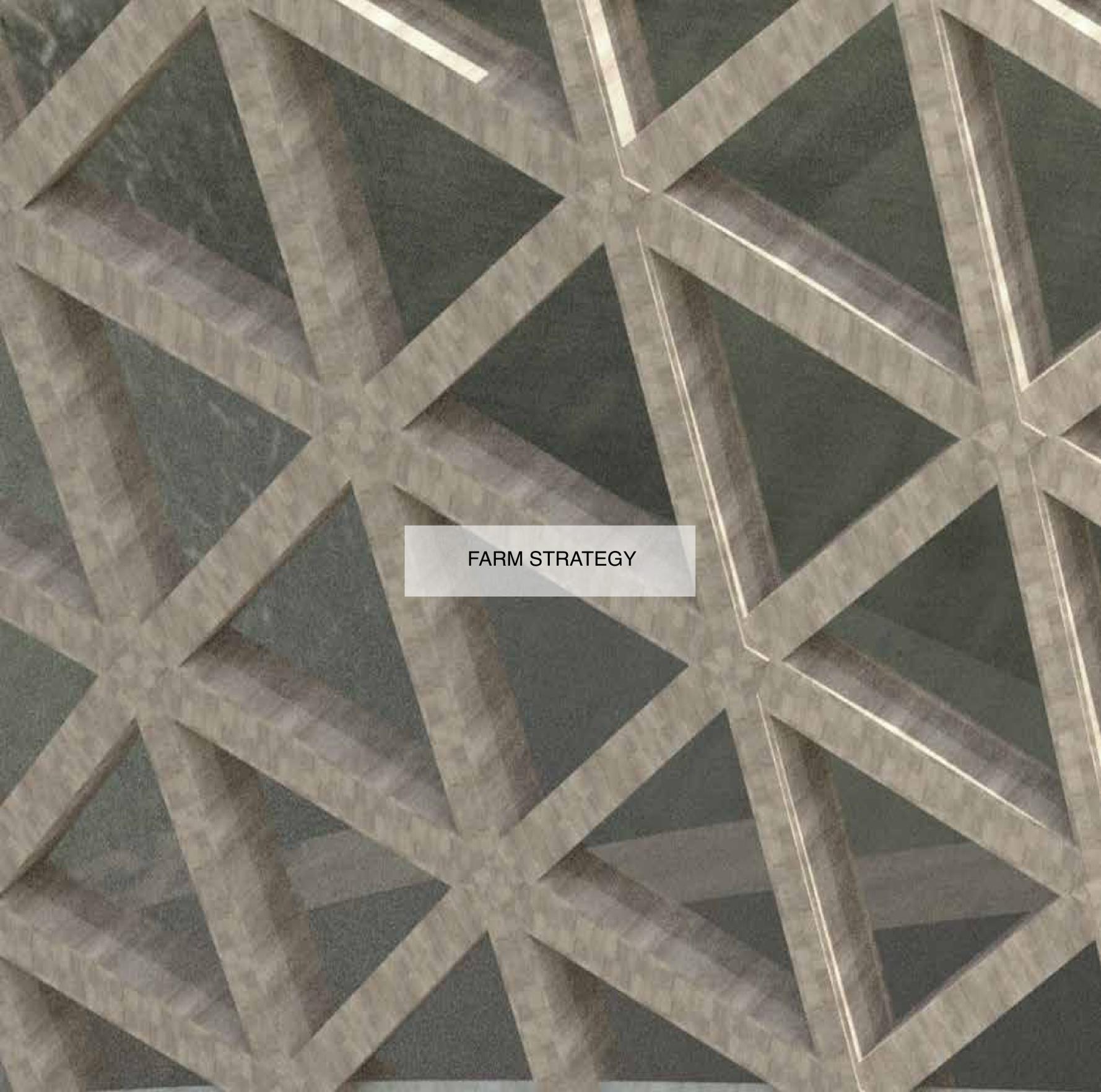


The base level contains the distillery plant which converts the crops grown at the top level into ethanol for electricity.

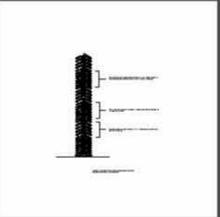


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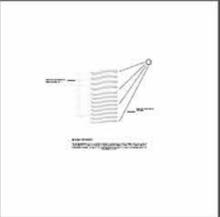




FARM STRATEGY



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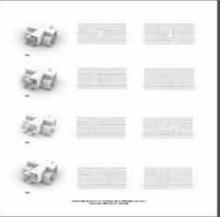
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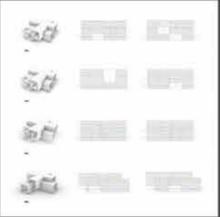
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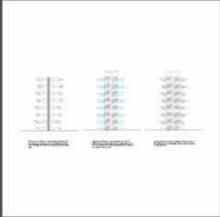
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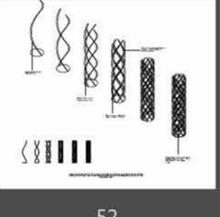
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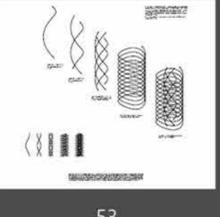
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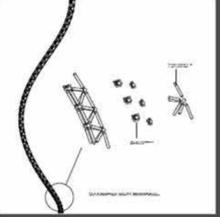
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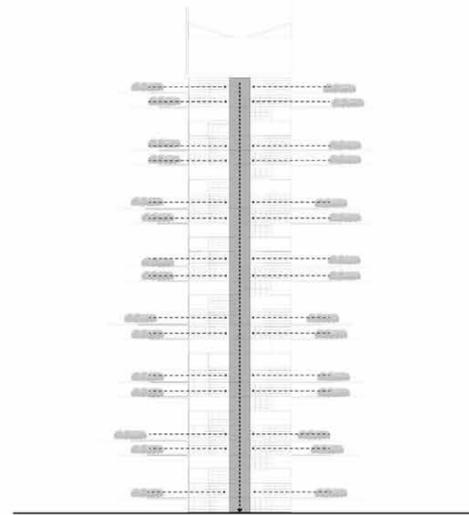
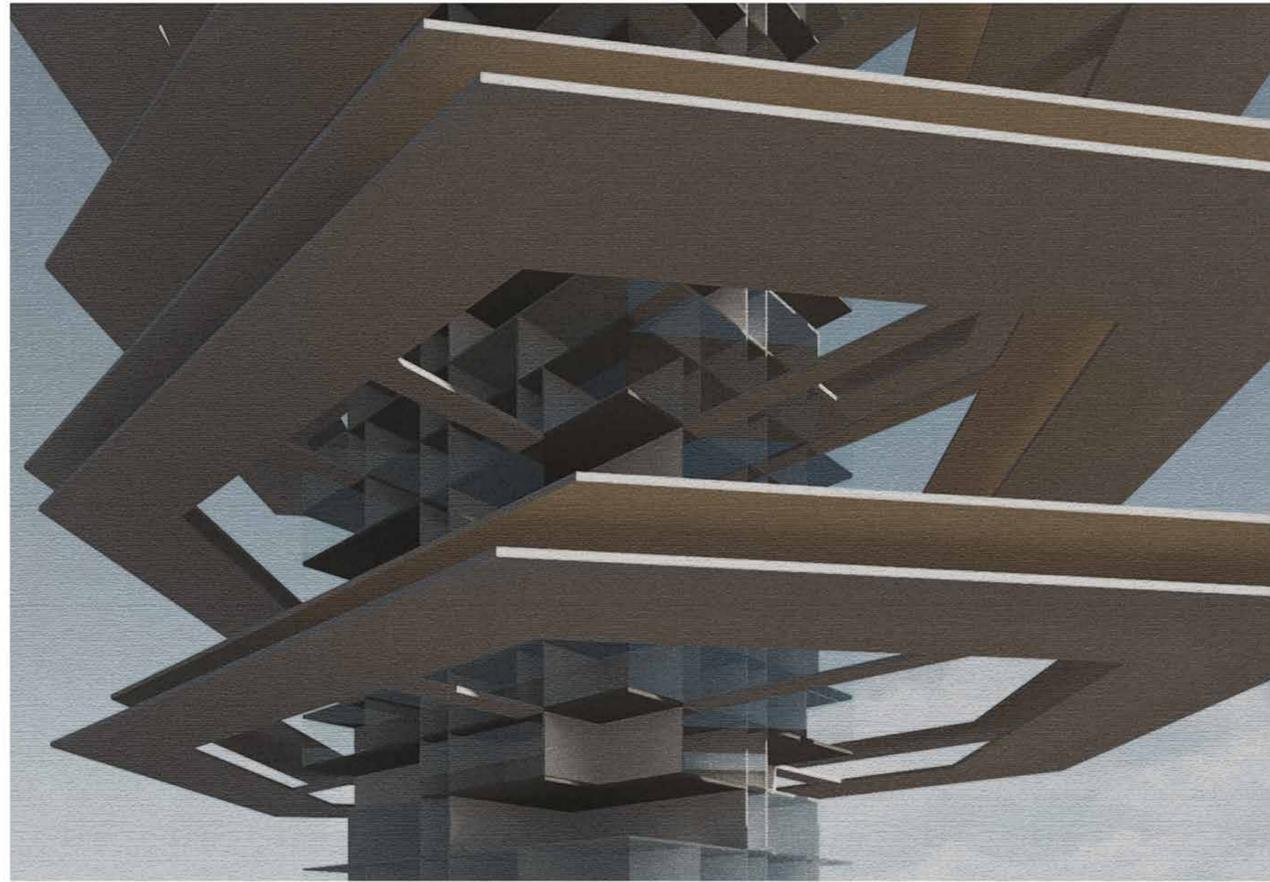
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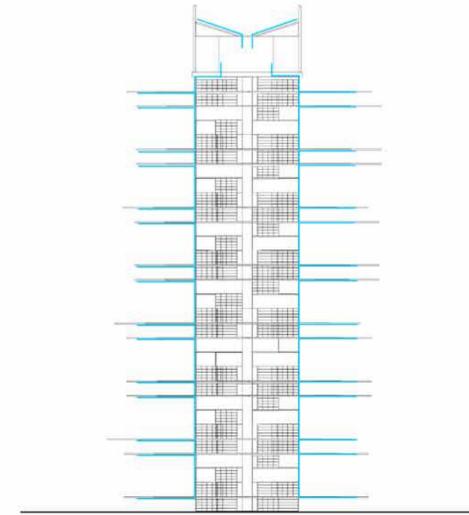
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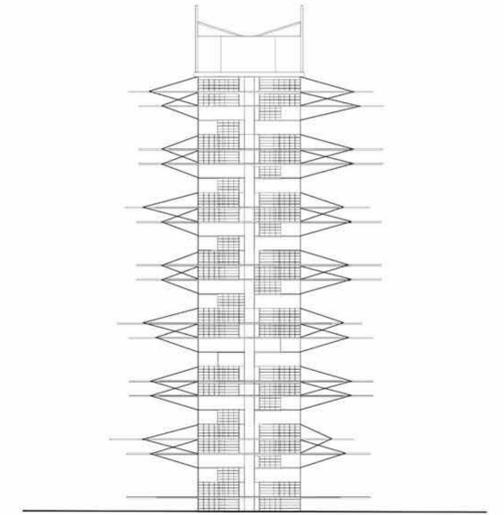
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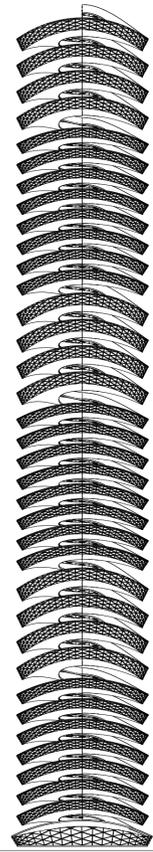
The crops on each platform is transported to the core and sent down an elevator shaft for just the crops. The lift goes directly into the distillery to be distilled into ethanol for power as well as sales.



A system for gathering rain water is located at the top of the building. The water gathered by tis system will be used to water the crops. transportation of water upwards requires more energy than it does to go downwards.



A system of support is required to keep the platforms in place. This will be done using tensile cables which would be attached to the main structure.



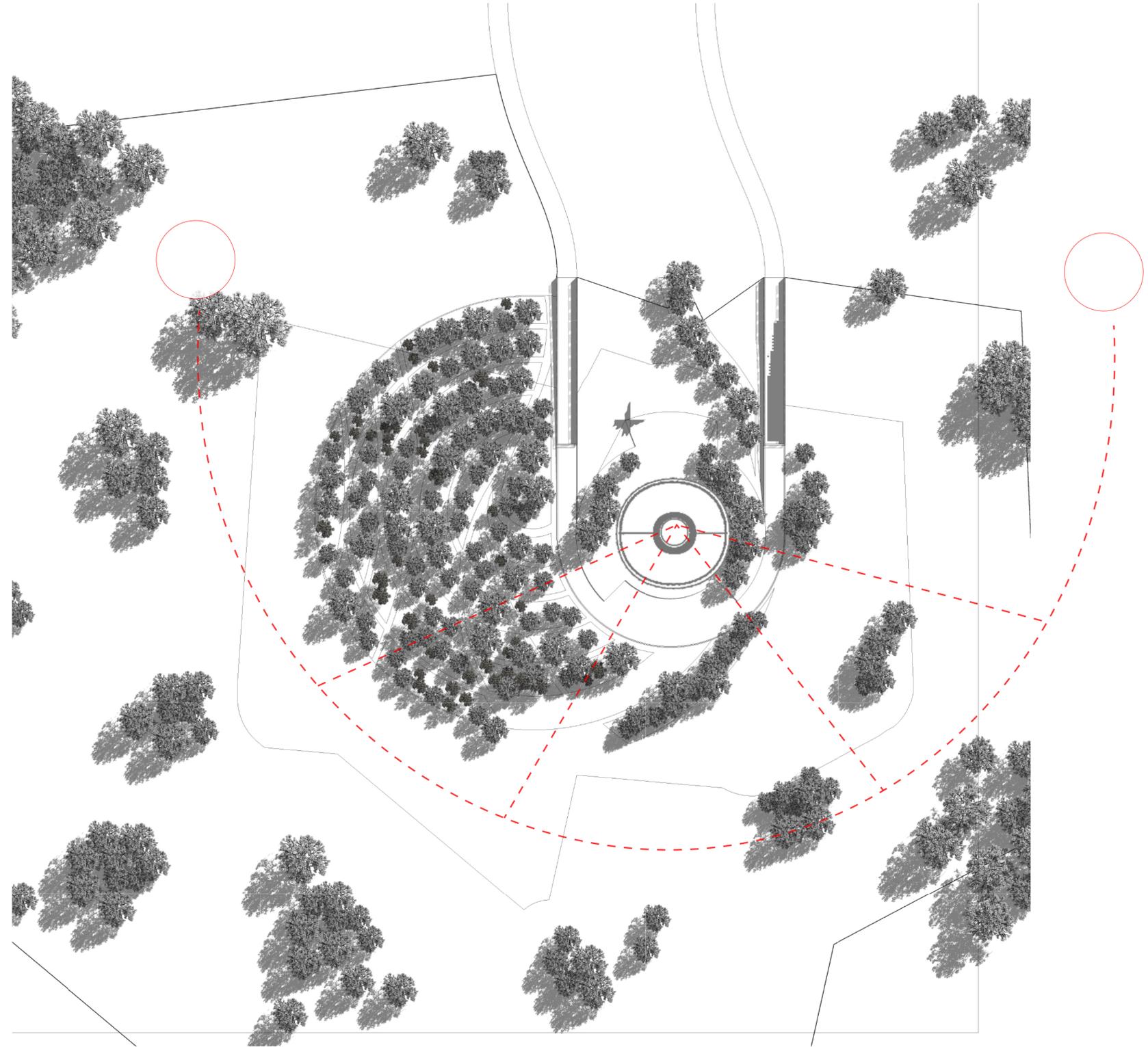
The potatoes which would be grown between the surfix of the tower to produce vodka, this requires less head room for the plants growth, so the section has a reduced height.

This section is the growing area for the grapes, they do not require too much head room, as they will be grown on racks.

The average height of sugarcane is between 10 to 13 ft. This requires an increase in head room of the growing area.

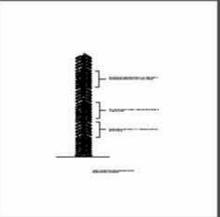
the depth of spaces within the soffit is determined by the heights of the type of crops which are to be grown in the particular area.

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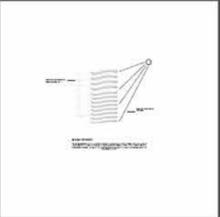


The diagram illustrates the best angles for solar collection on the facade of the building which would be used to power the hydroponic farms

TECHNICAL STRATEGY



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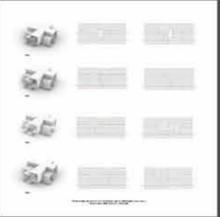
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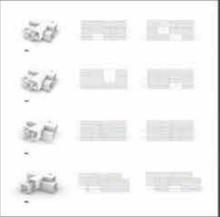
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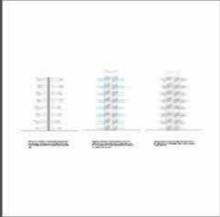
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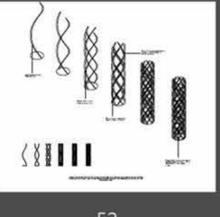
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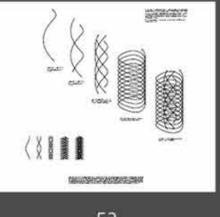
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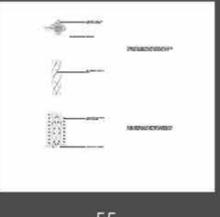
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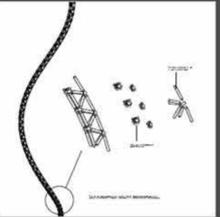
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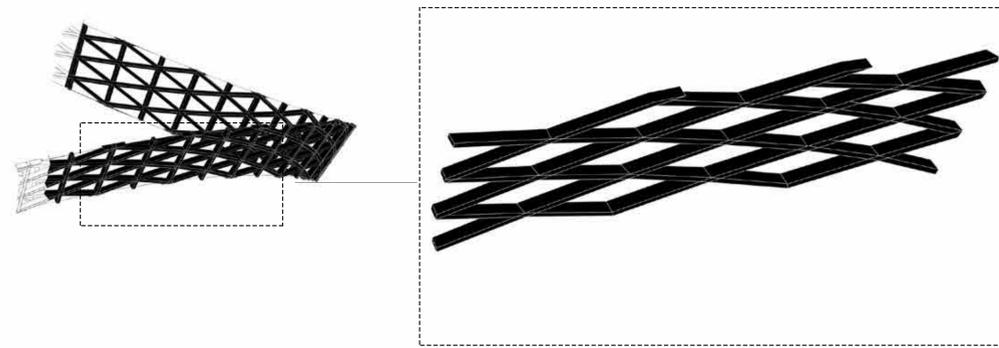
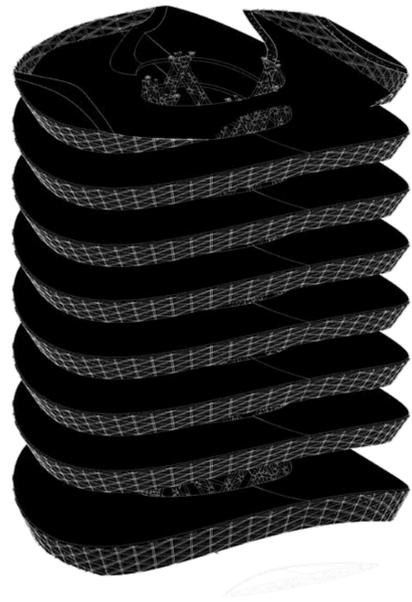
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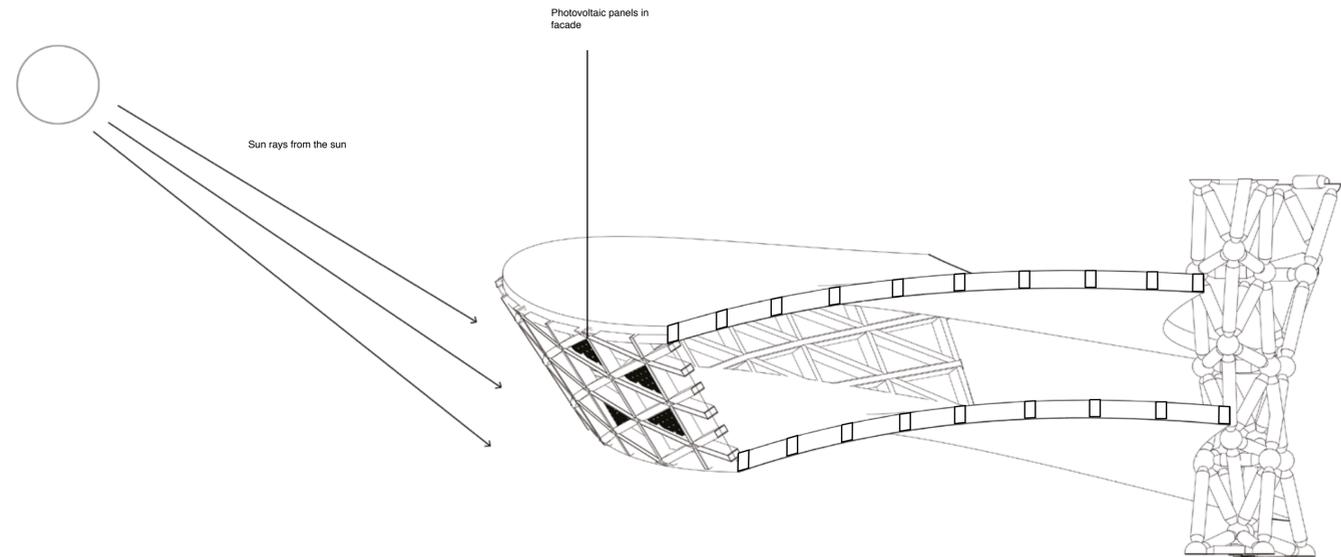
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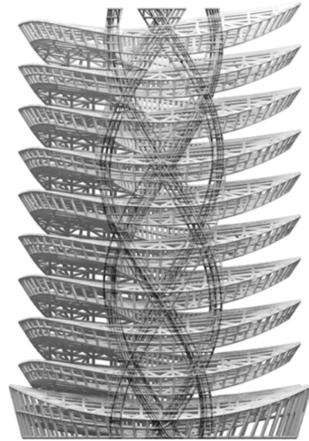
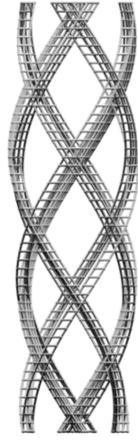
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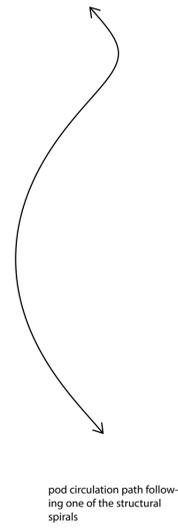
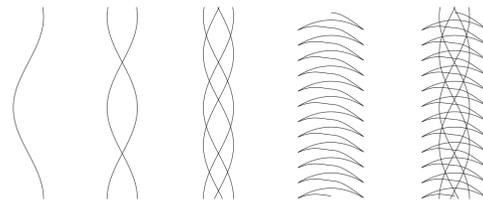
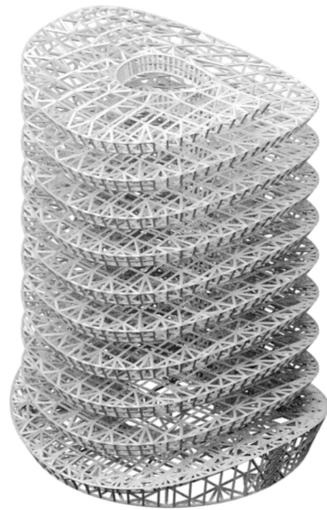
To withstand the torsional load of the building, the facade uses its diagonal members to brace the building and to transmit some of the lateral forces towards the center of the tower. The facade uses the same system of timber construction as the external spiral.



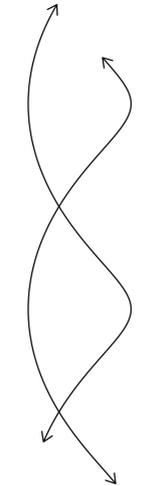
Solar collection on the facade of the tower to produce energy which would be used in the hydroponic farming.



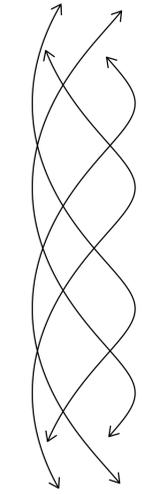
four more spirals are added to the structure with its turns facing the opposite direction. Using the crisscross directionality of the spirals to provide structural stability at its joints where the spirals intersect with each other



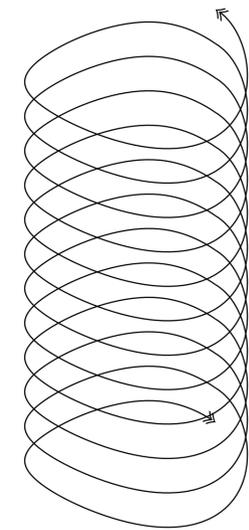
pod circulation path following one of the structural spirals



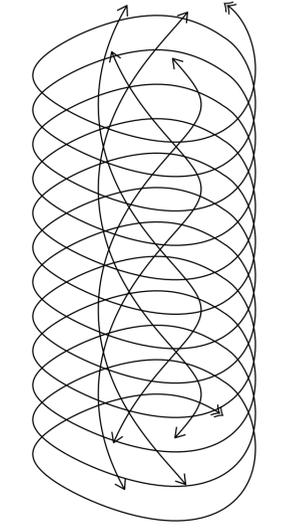
pod circulation path following two of the structural spirals



circulation path following four of the structural spirals going in one direction to avoid intersection

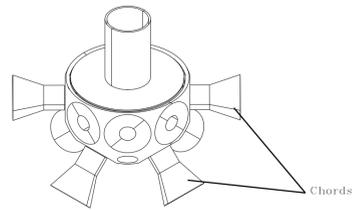
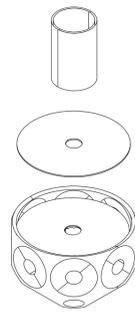
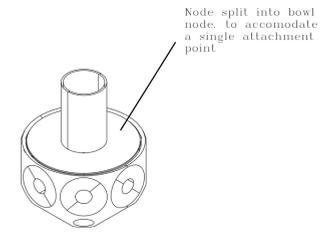
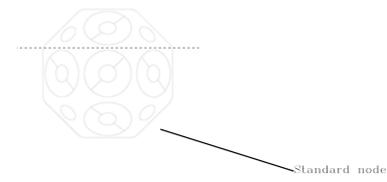


Rail path for the transportation of crops along the surface of the building.

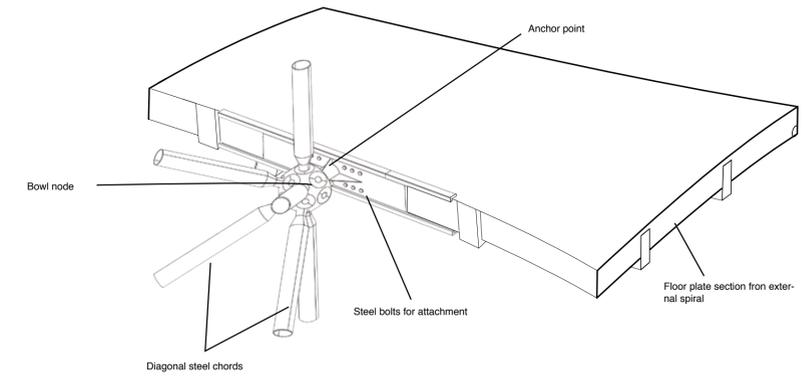
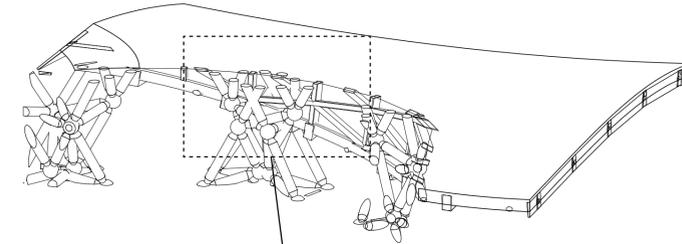


a combination of pedestrian circulation and production circulation

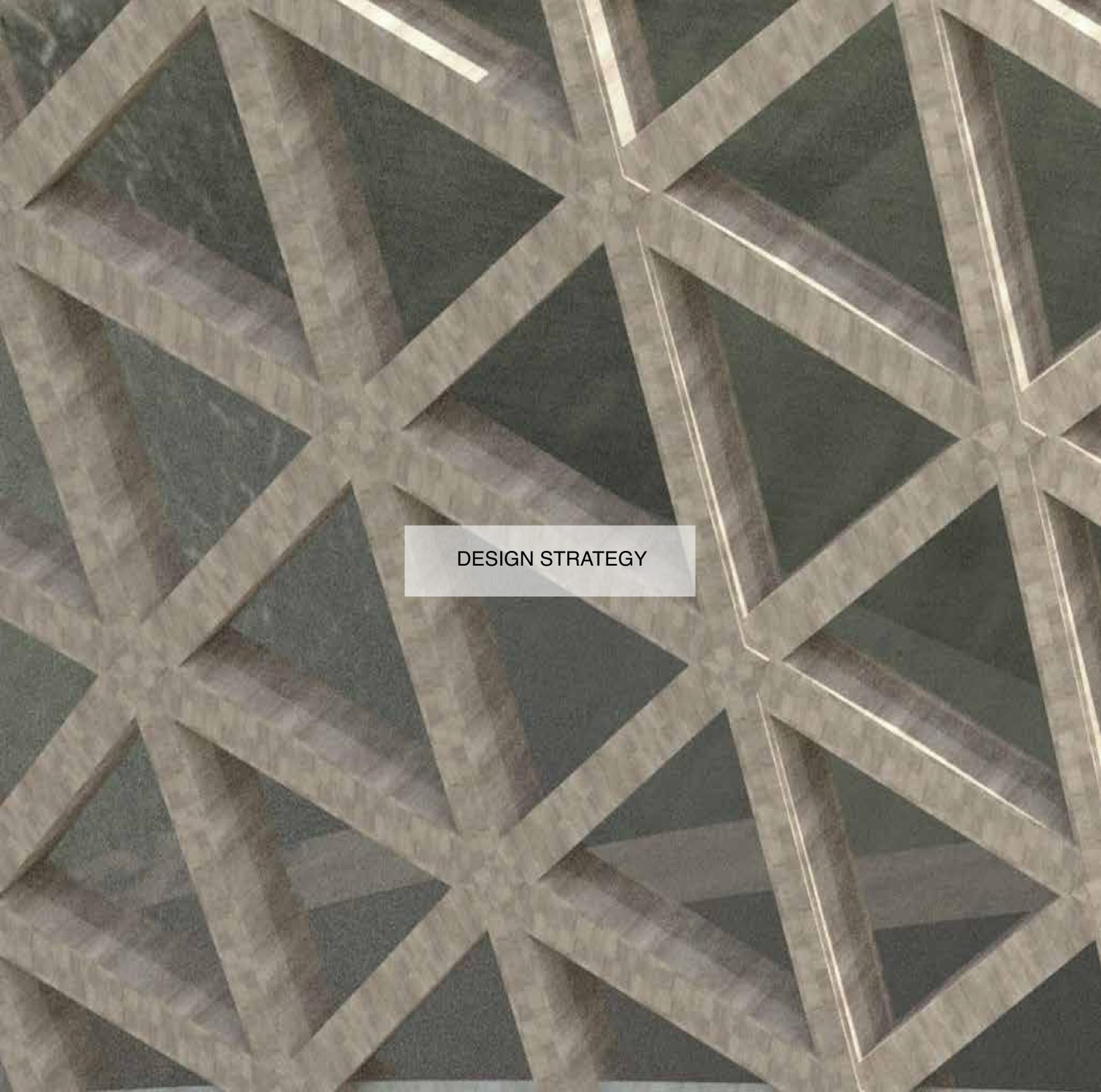
The drawing shows both the circulation path of pedestrian as well as the crops being grown in the spaces between each floor. Pods would be used to transport people along the paths of the circulation spiral. The spirals are all generated in the same direction to avoid intersection which would cause delay in movement. The spiral system provides a more scenic route through the building. The rail path makes it easier to transport crops with minimal effort to the bottom of the tower.



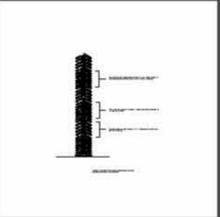
To attach the core/interior spiral to the external core. The nodes needed to be modified so that it has a suitable edge for attachment



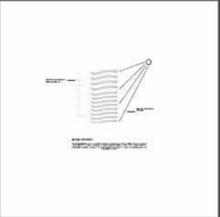
The diagram above shows a detailed connection of the internal spiral to the exterior spiral.



DESIGN STRATEGY



41



42



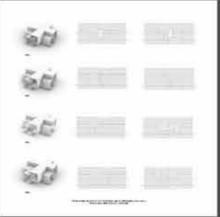
43



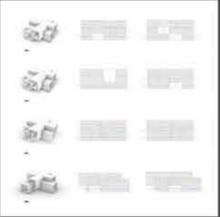
44



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46



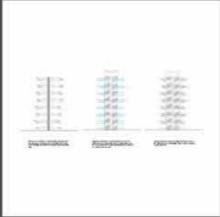
47



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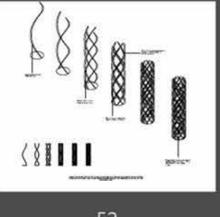
49



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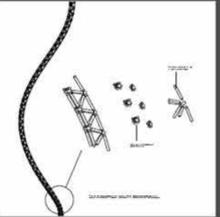
54



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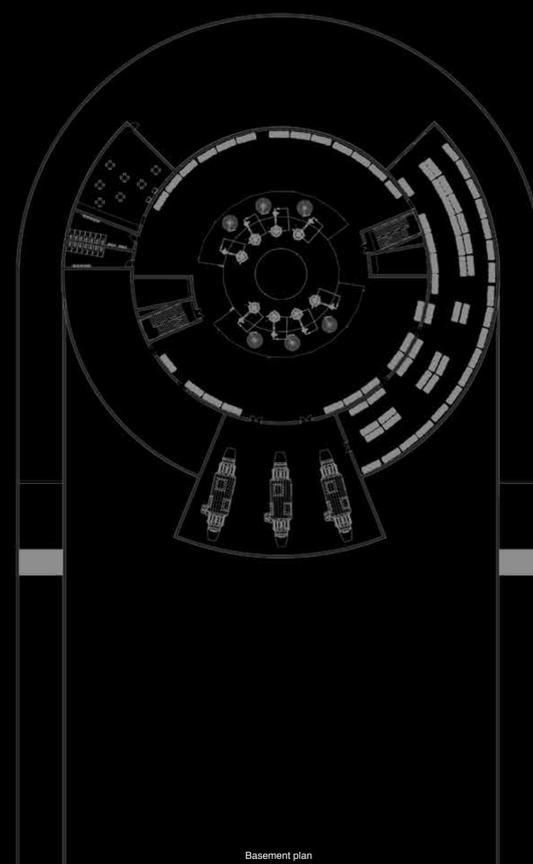
58



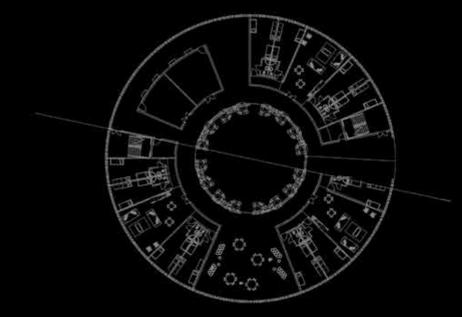
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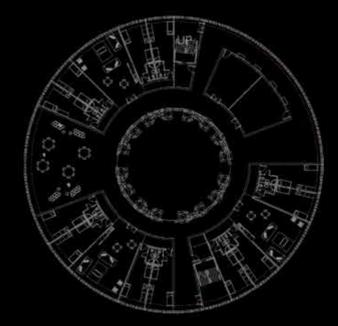
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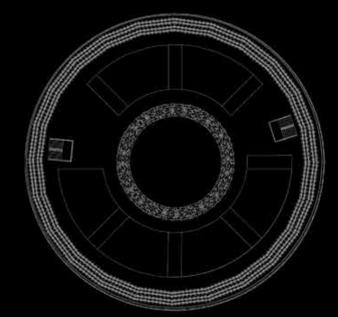
Basement plan



Ground floor plan



Fifth floor plan



Fourth floor plan

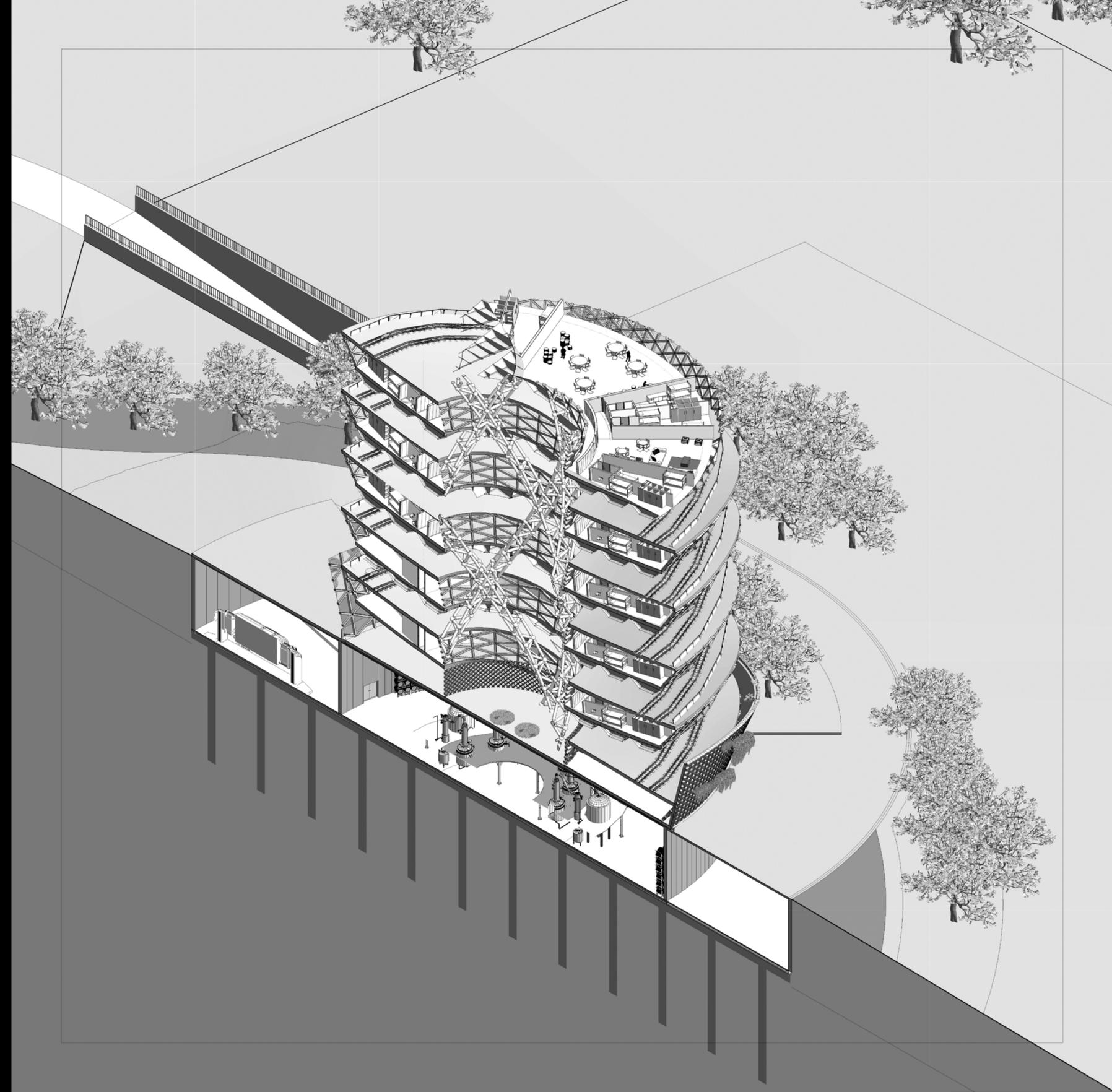
first floor spiral which consists of communal spaces and the accommodation spaces for the staff who intend to work on the farms

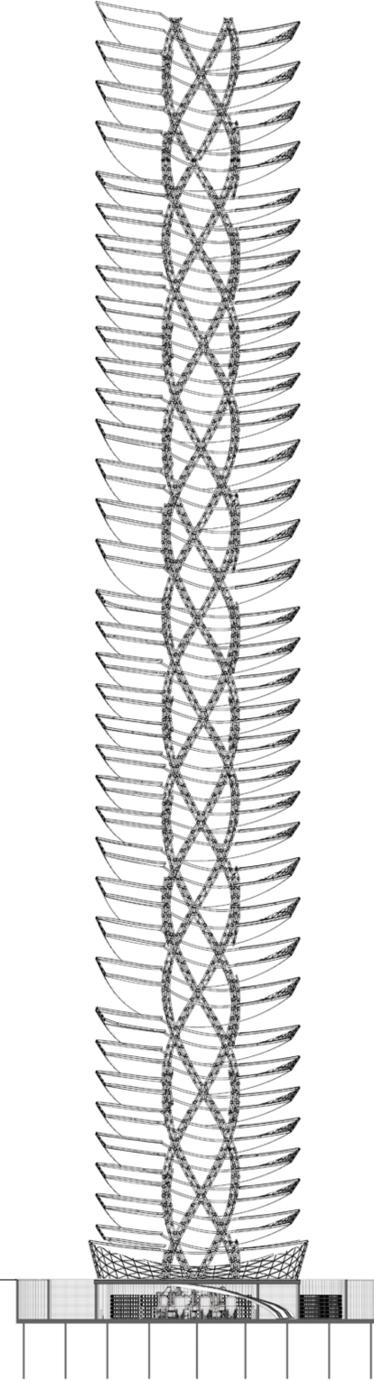
ground floor atrium space

ground floor to first floor spiral enclosure which consists of communal spaces and the accommodation spaces for the staff who intend to work on the farms

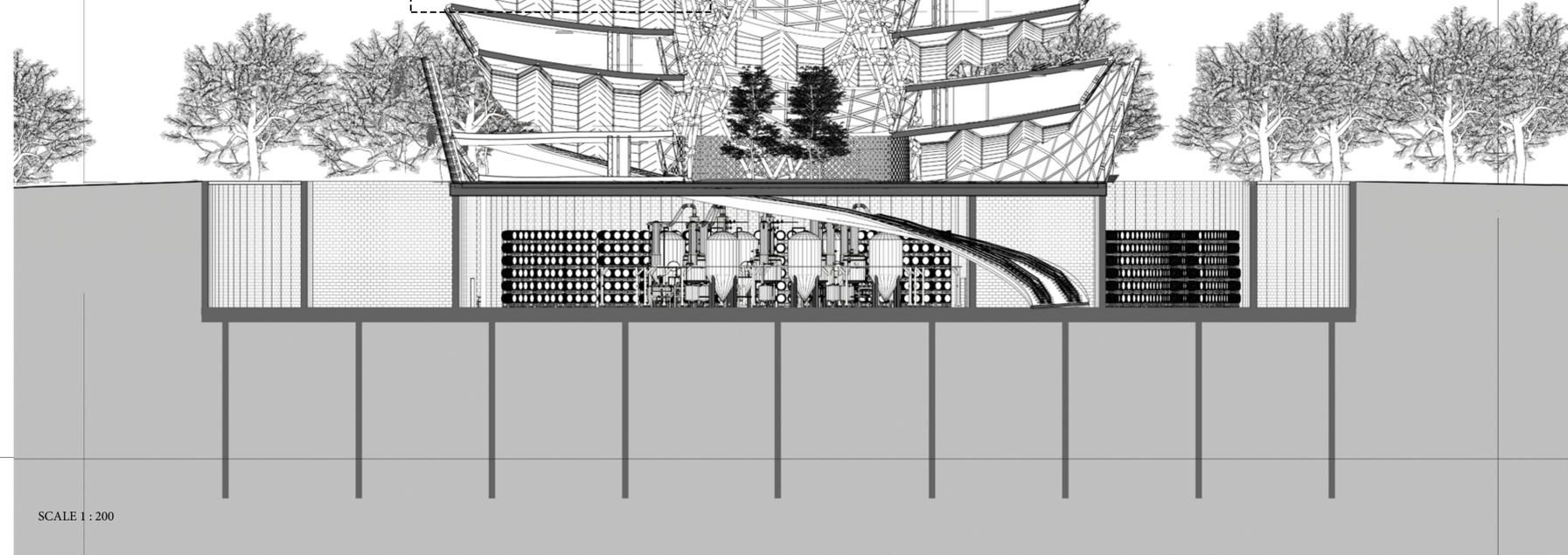
main structural system as well as a circulation system for the tower

The crops harvested from the surfix through hydroponic farming would be transported to the basement of the tower where it would be distilled into alcohol for consumption as well as clean fuel for electricity.

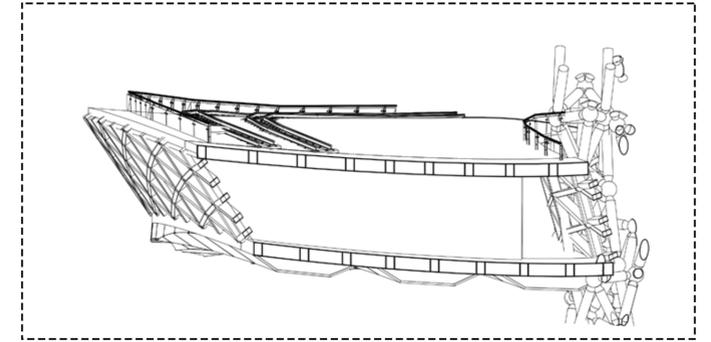


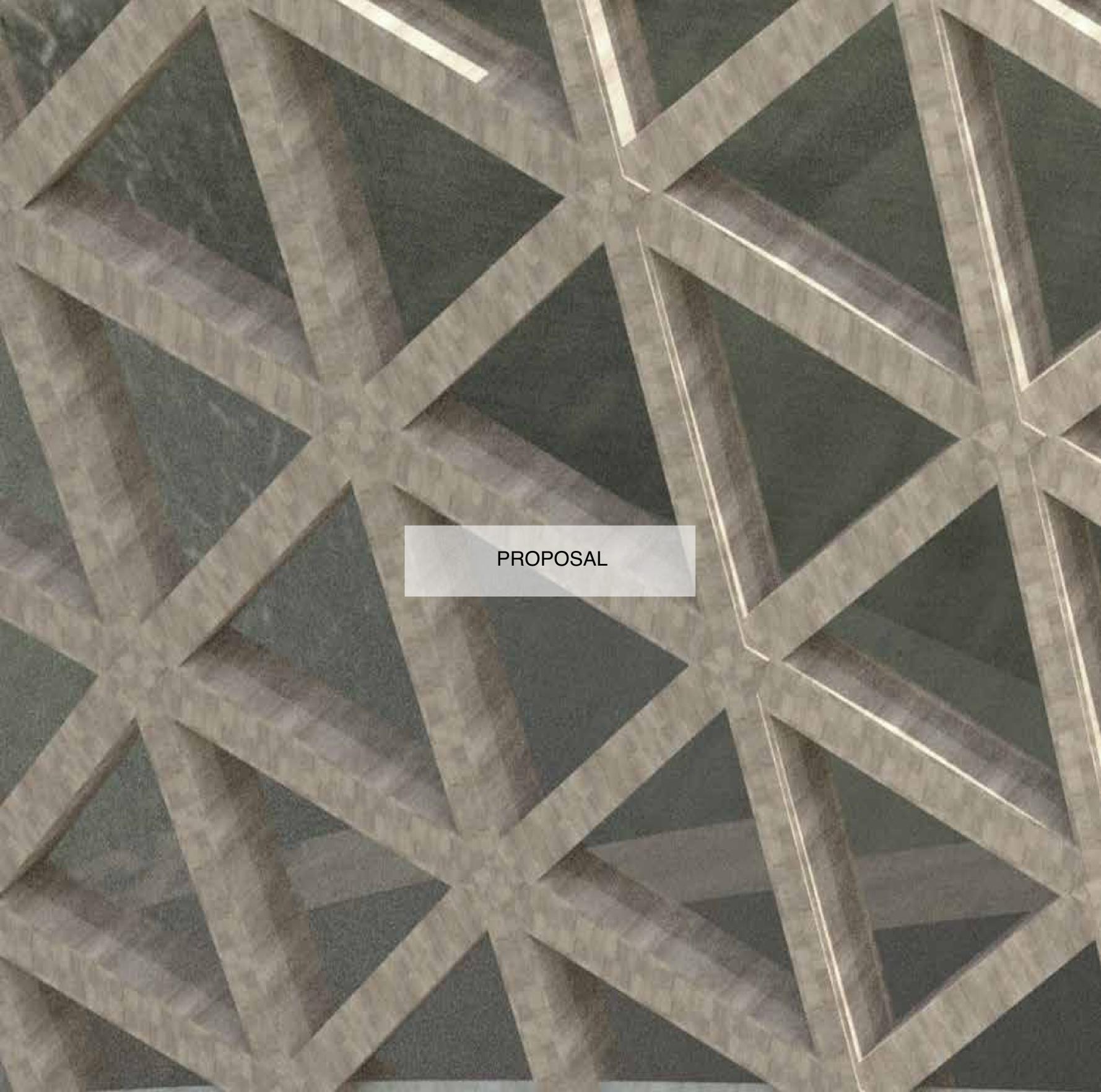


SCALE 1 : 750



SCALE 1 : 200





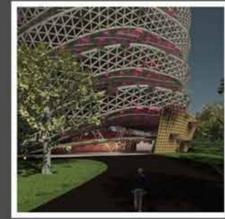
PROPOSAL



81



82



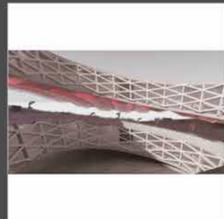
83



84



85



86



87



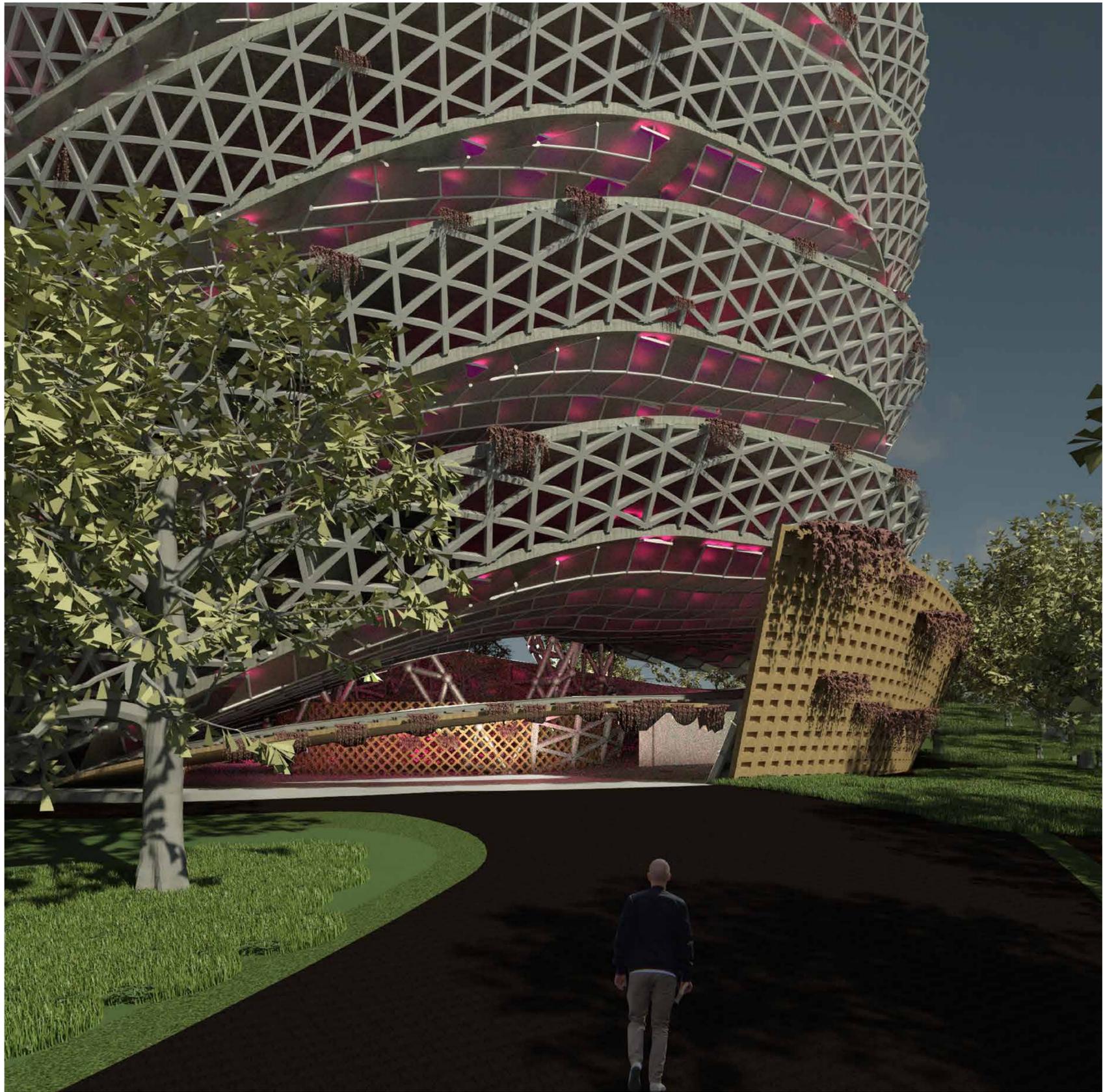
88

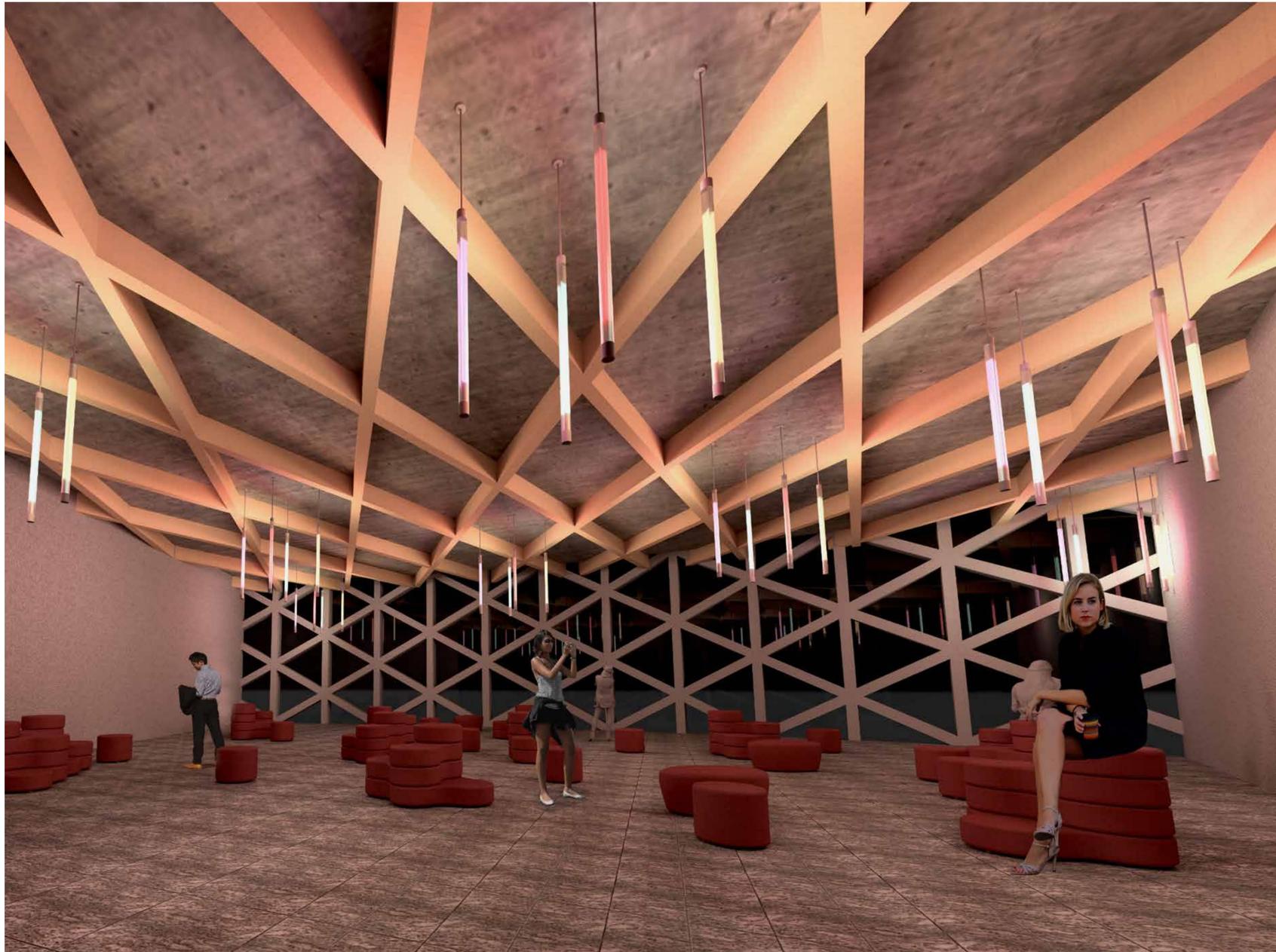


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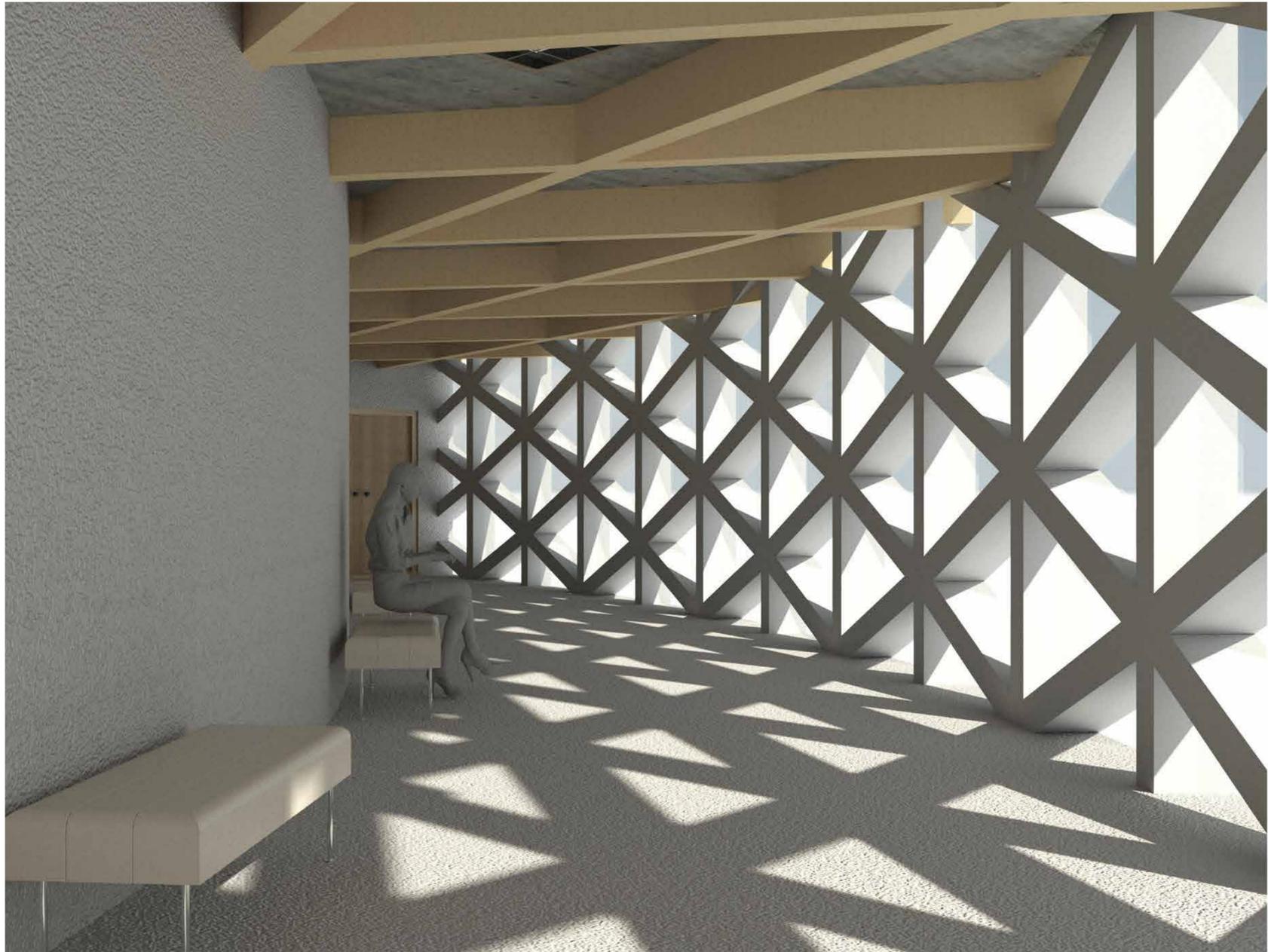


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The lobby



Circulation

