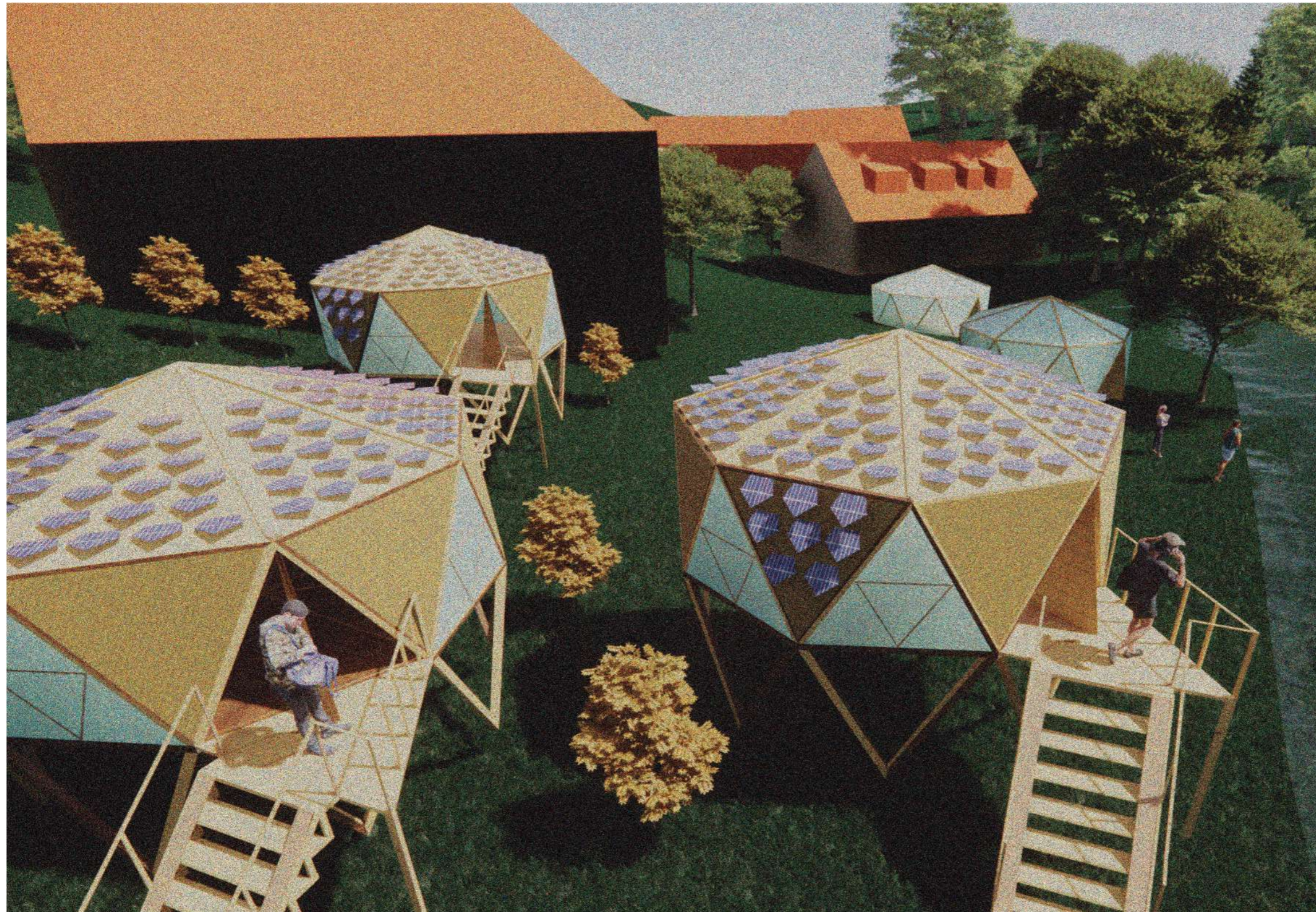


Ecotourism

Self-sustaining resort



Nino Margania
Wertig & Kopecky studio
AD6

Content:

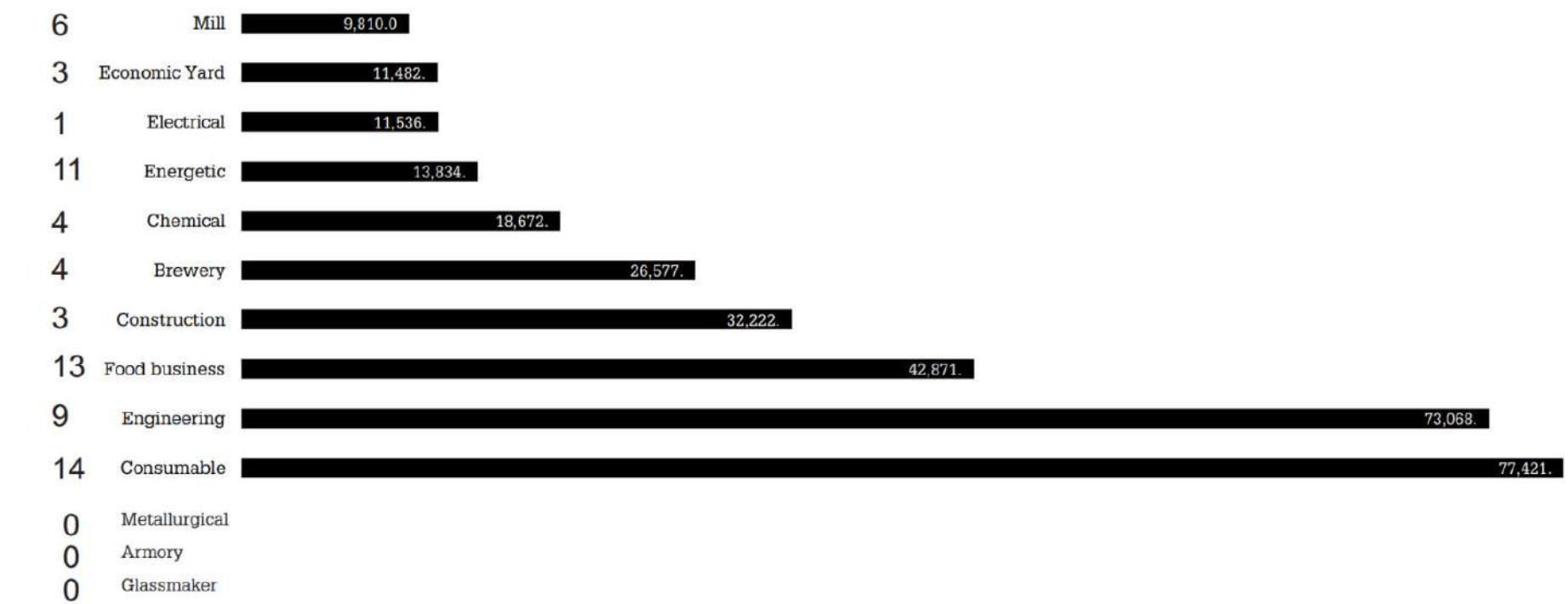
- Data
- Location
- Site analysis
- Site plans
- Concept development
- Typologies of the new constructions
- Connectivity between new the architecture
- Section drawing
- Materials
- Plan drawing of the new structures
- Elevations
- Structural details
- Building technologies
- Section drawing
- Visuals
- Technical report

Data

Industrial buildings in Prague



Number of houses



Location

0.0182864N, 14.4808106E

The site is located at 35, K Borovičku 492, 148 00 in Kunratice, Prague. Kunratice is located at the south of Prague and while its first written record was in the 13th century, the village became part of Prague in 1968. The area still functions as a suburban neighborhood, with schools and kindergartens and mainly private housing.



Site analysis

Context

The urban characters of the surroundings can mainly be characterized by private houses and schools. Constructions that are nearest to the site include rather small wooden construction houses with green houses that are specific to that area.

Terrain description:

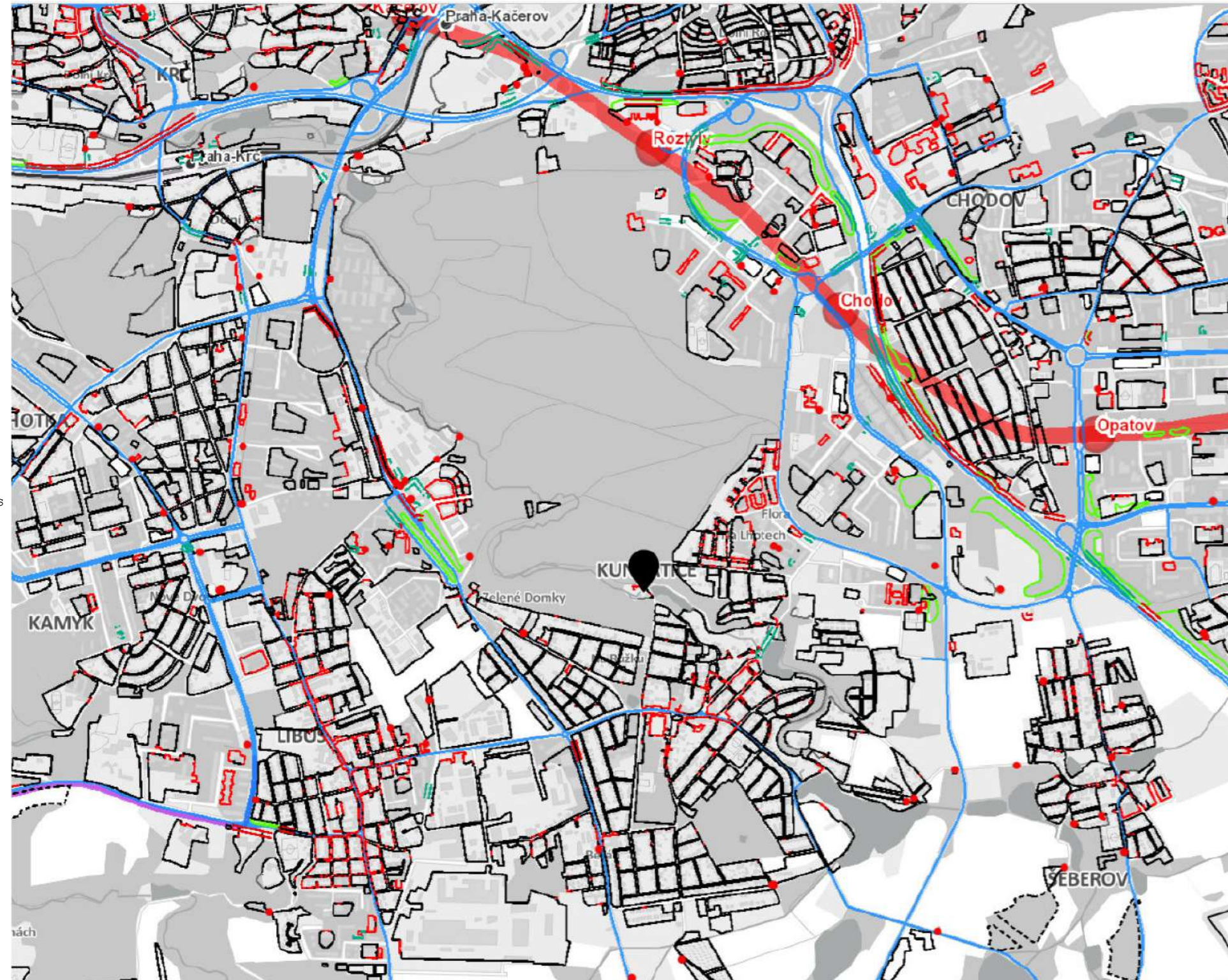
Terrain of the site is crucial for the overall character of the project, since it mainly includes a steep forest at the base level of which is the location of the main site. Additionally, its terrain is all forested and green and has a rich soil for farming. The terrain of the site includes two main water streams that further connect to a pond at the east of the site that is crucial for the water mill building that the project includes.



Site analysis

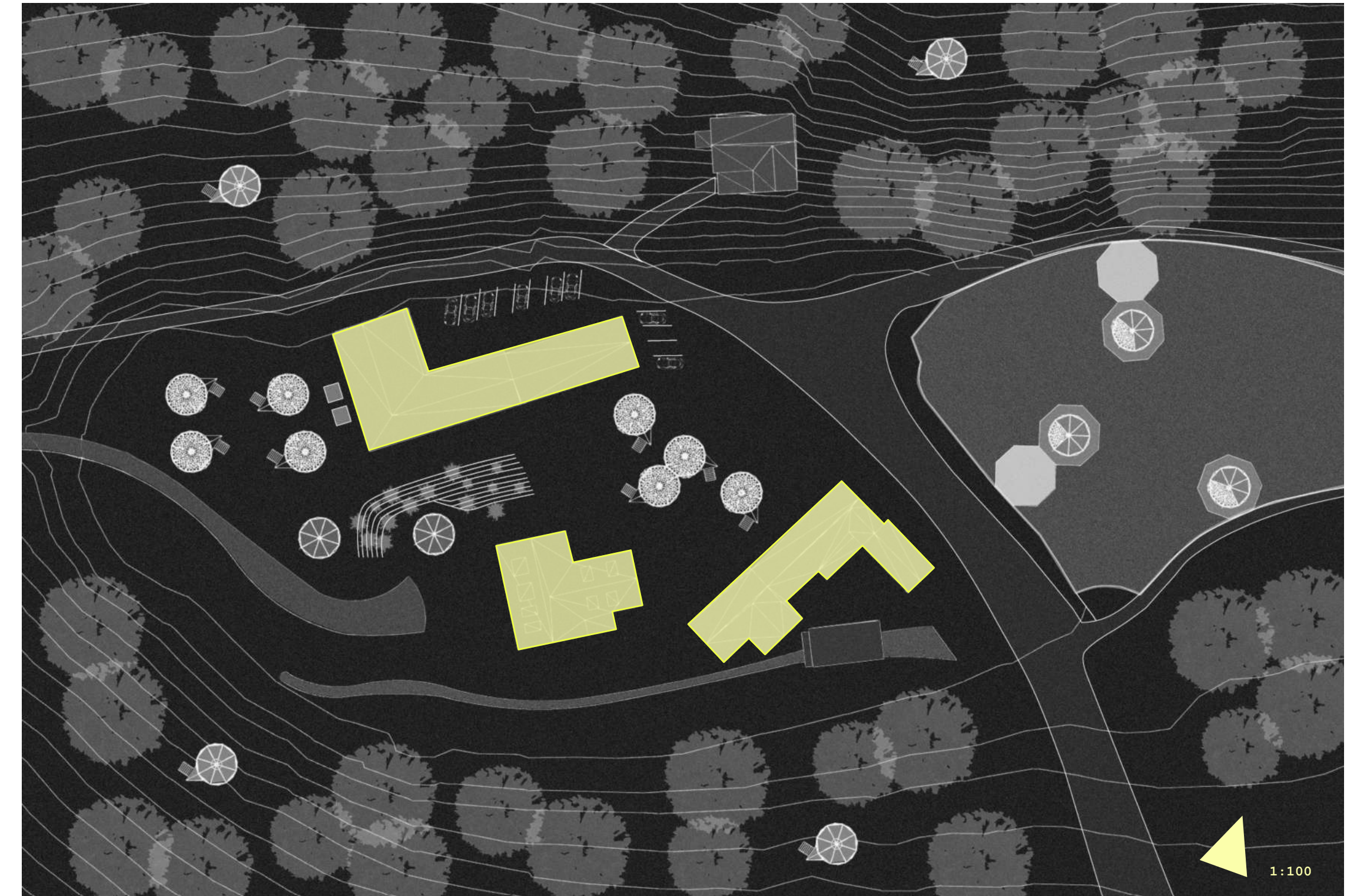
Accessibility

In terms of transportation, the site is mainly accessible by the metro line C and buses that frequent the area. To get to the destination, after a bus, one must take a hilly path that follows private houses and will end up precisely at the main entry. Other entries to the site are mainly through the forest paths or through a narrow road along the pond. It is secluded for privacy however is quite easy to reach.



Site plan

Existing buildings



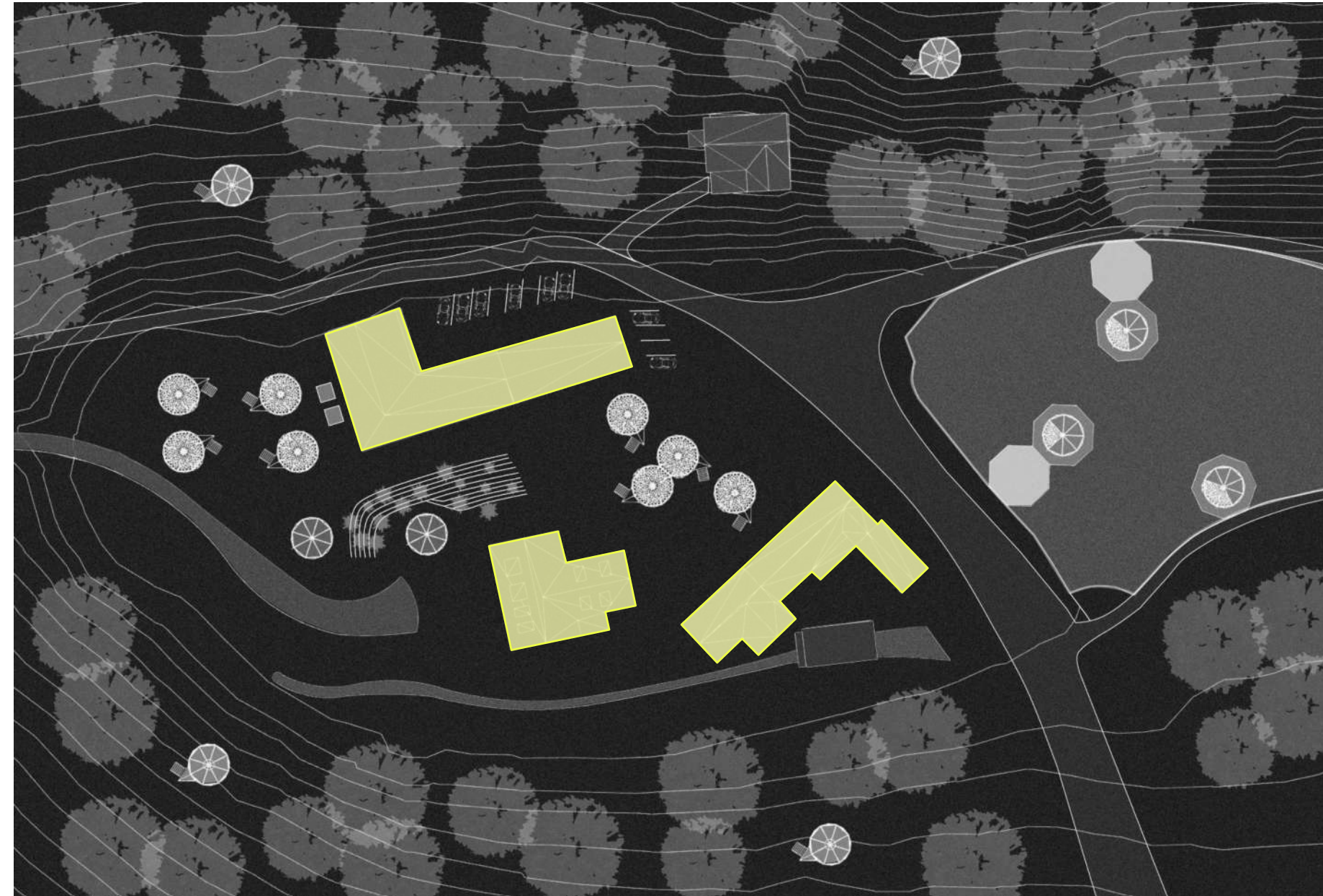
Site plan

State of the existing buildings

Currently, the owner of the site who lives in a smaller house in between two buildings, lacks the funds to refurbish the site and continue with minor reconstructions.

Except for his home, the two buildings are defunct and out of use. One of them includes a water mill that was built in 1760s while the other one used to be a guest house.

Due to their size and a good enough condition, Buildings can host certain programs however they would need external construction work to overall improve and brick life back to the site.



Site plan

General plan



Site plan

Programs

In terms of transportation, the site is mainly accessible by the metro line and buses that frequent the area. To get to the destination, after a bus, one must take a hilly path that follows private houses and will end up precisely at the main entry. Other entrances to the site are mainly through the forest paths or through a narrow road along the pond. It is secluded for privacy however quite easy to reach.



Plans of the existing buildings

Building 1 - Estimated program placement



Ground floor



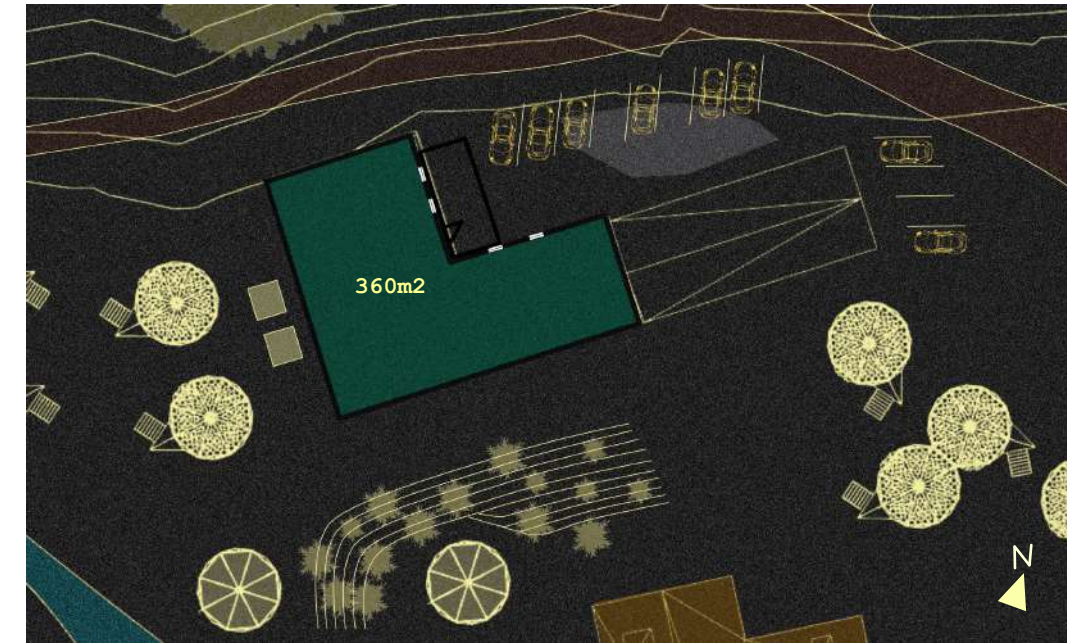
Second floor



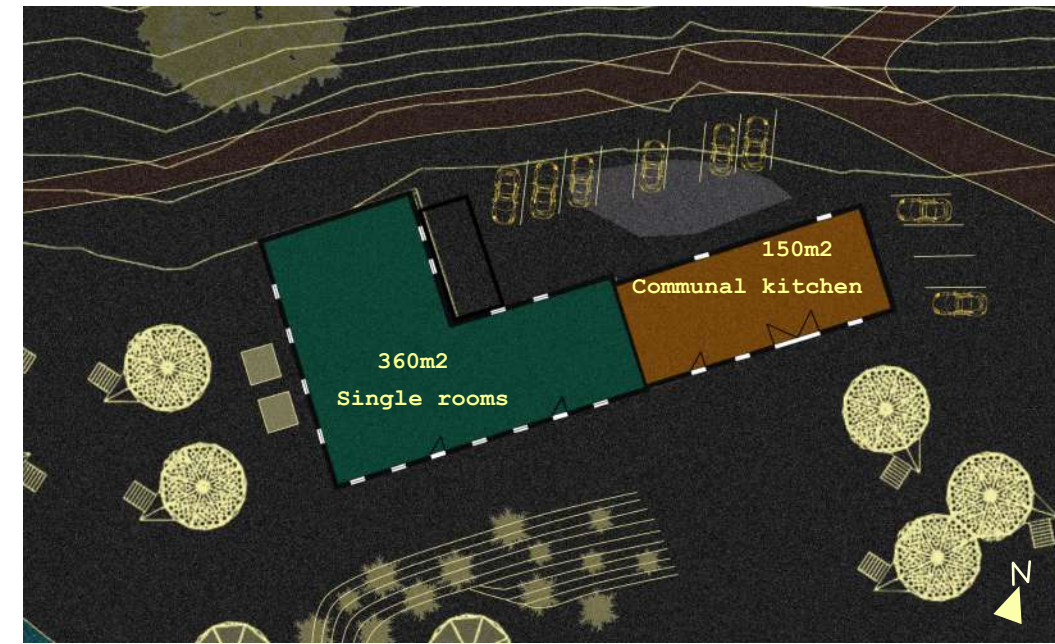
Third floor

Plans of the existing buildings

Building 2 - Estimated placement of a guest house program



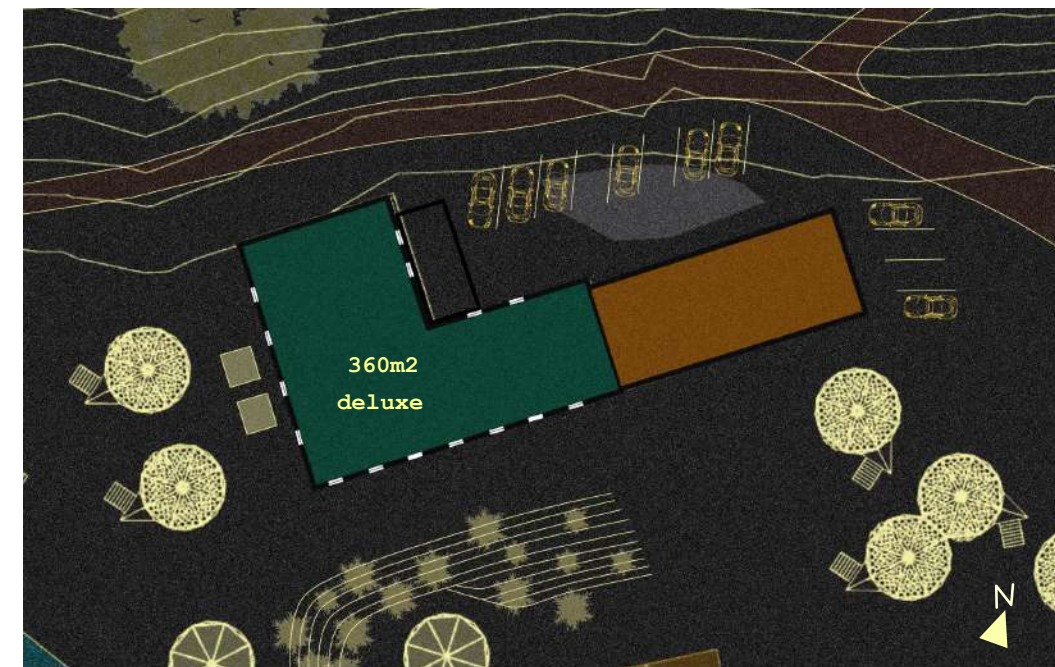
Basement floor



Ground floor



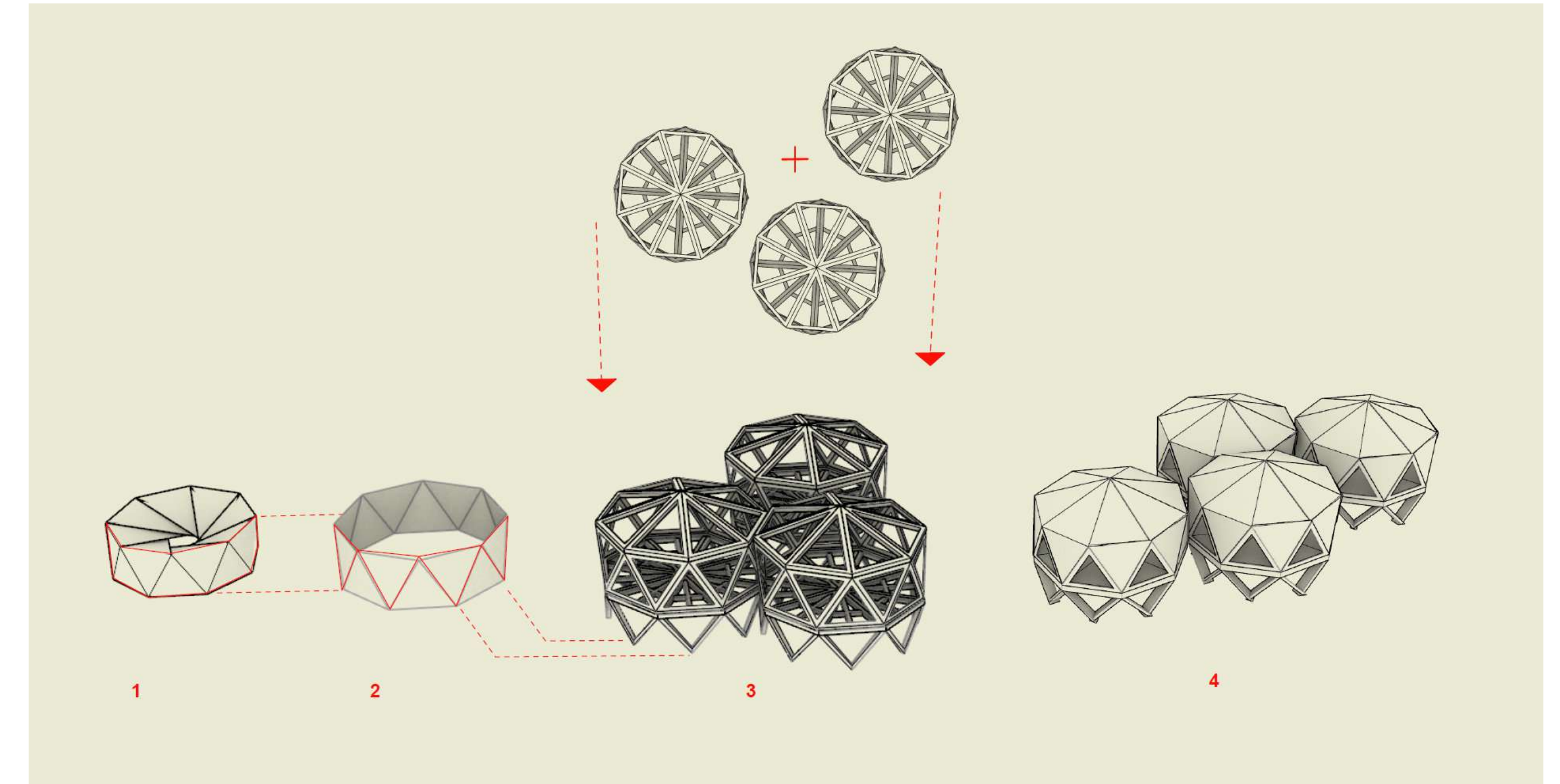
Second floor



Third floor

Concept

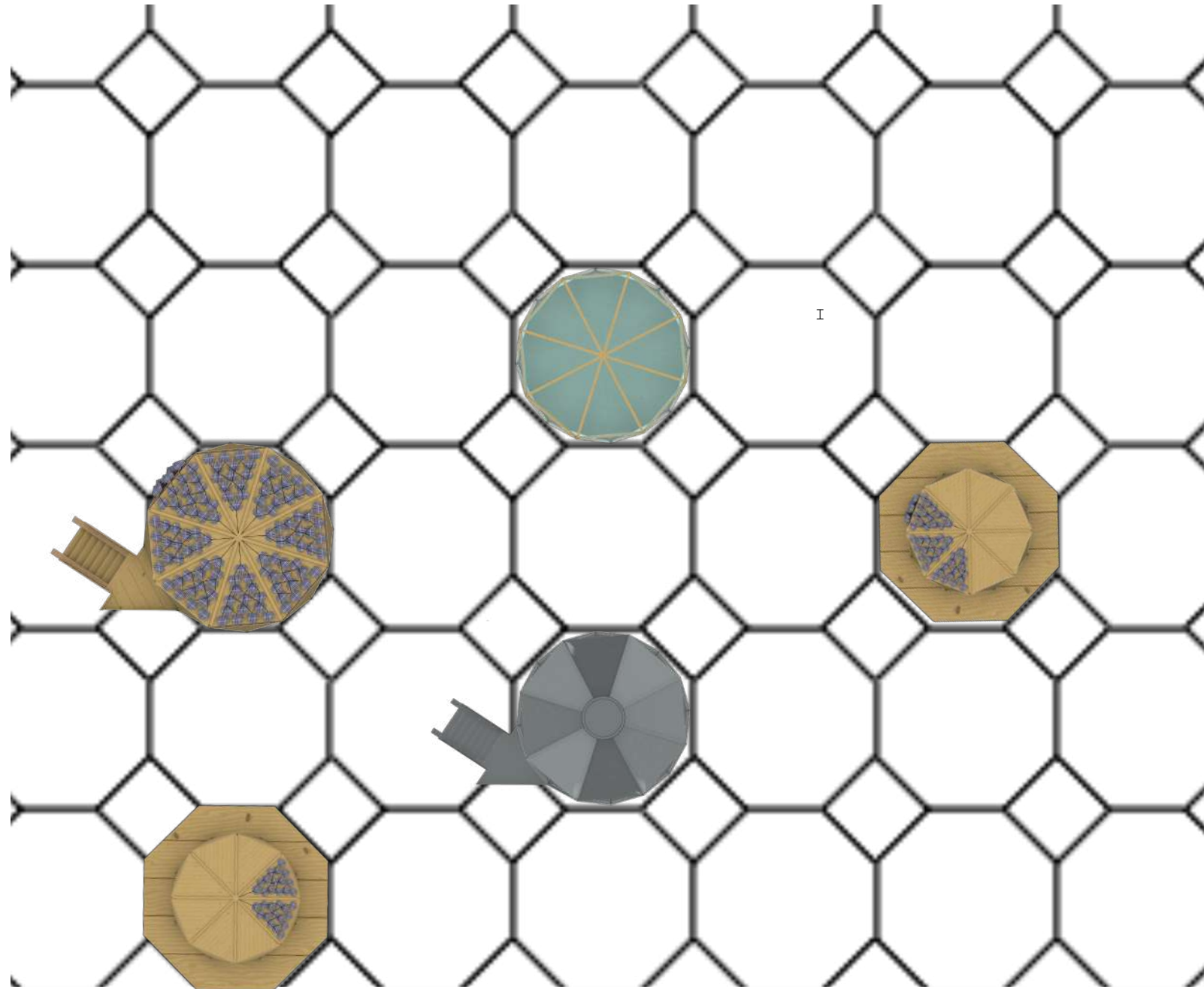
New structures - development of the volume



New structures

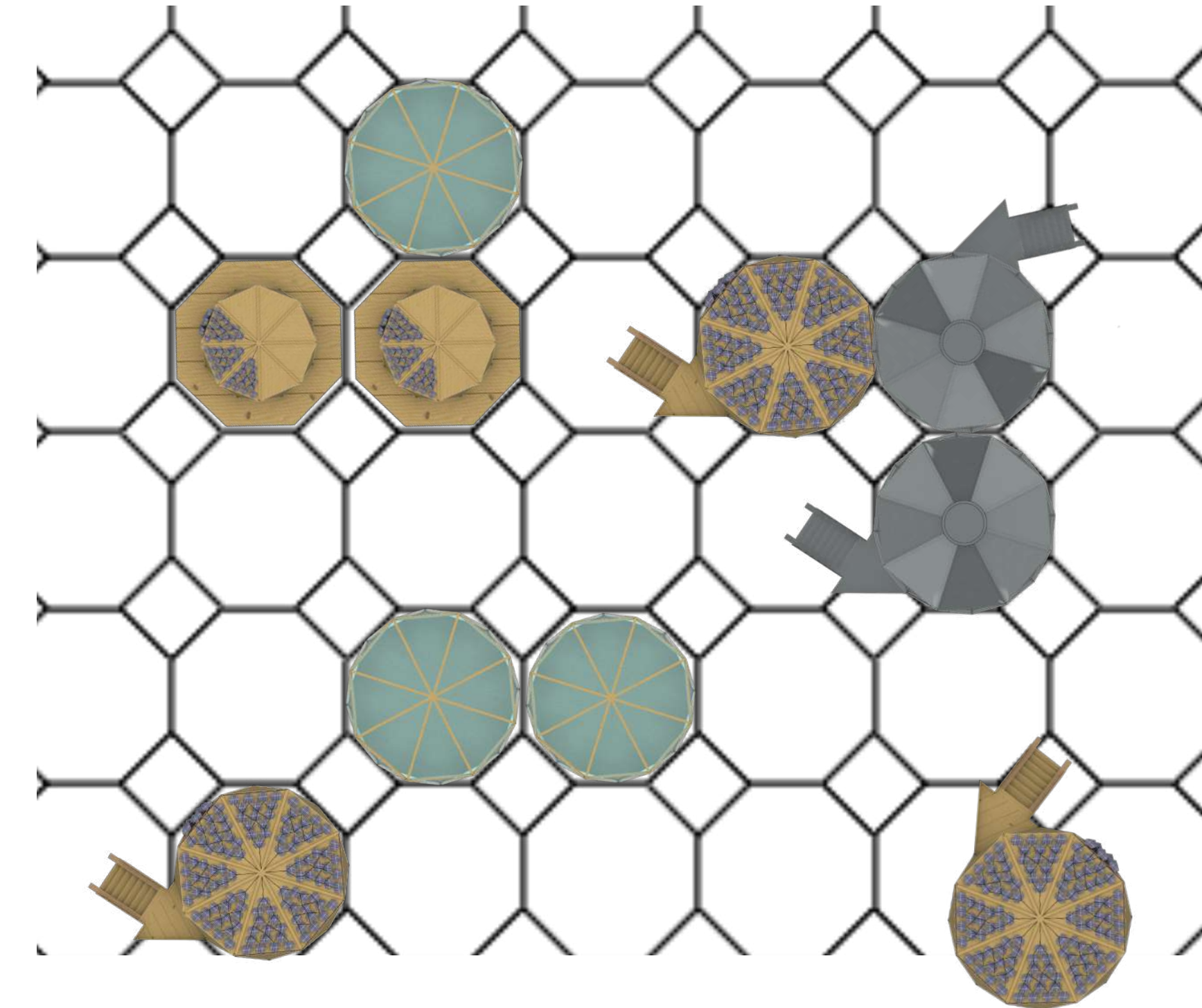
Adaptability - through symmetry

The new constructions differ in materials, functions and height however have the same planar dimensions and framing around which the structures form. Such symmetry and mimicry allowed for the framing to produce mentioned variety. With that, the structures can be placed in an octagonal grid-like pattern, join, dis-join or relocate. Such a scheme can be easily applied to the actual site as well.



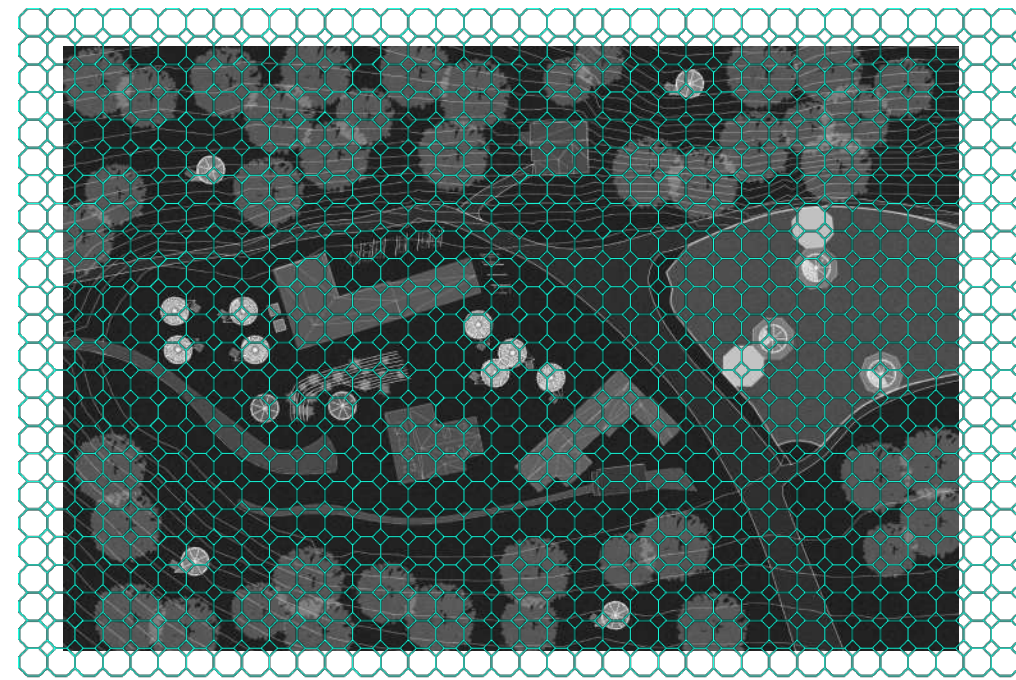
New structures

The placement variations through the grid



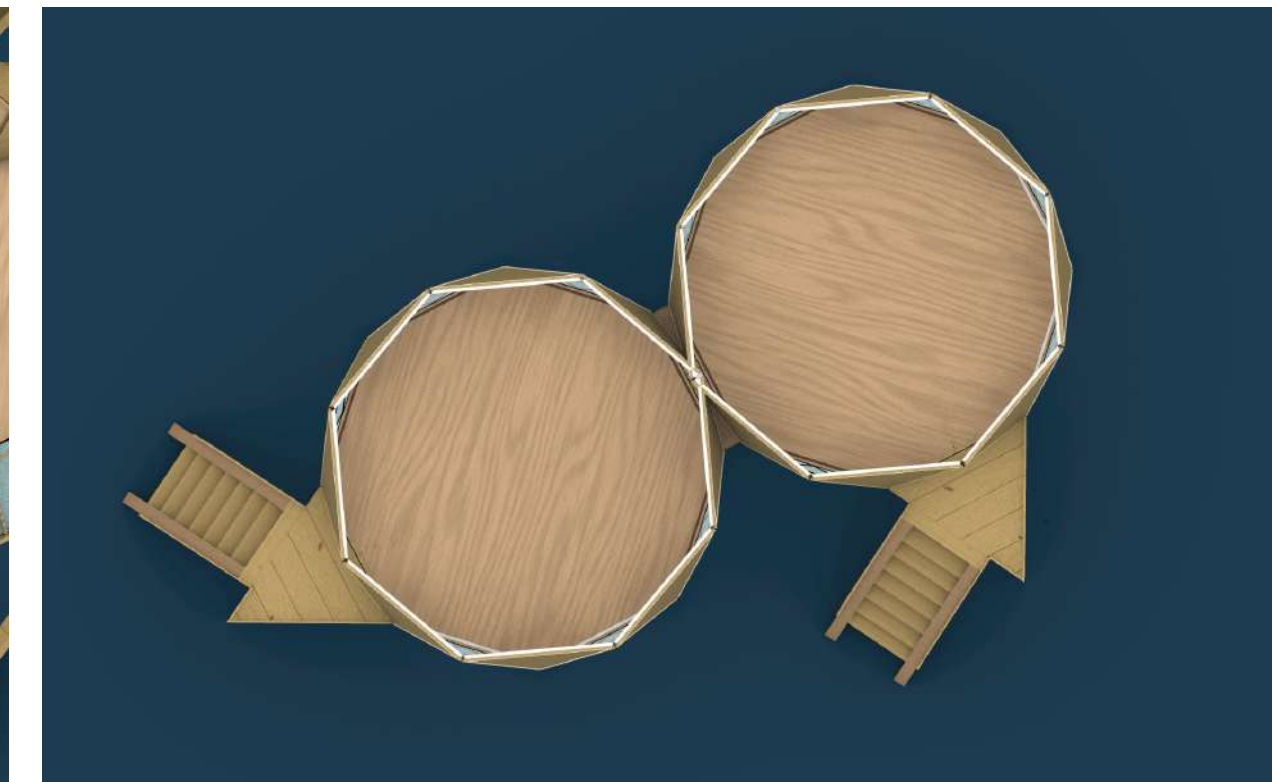
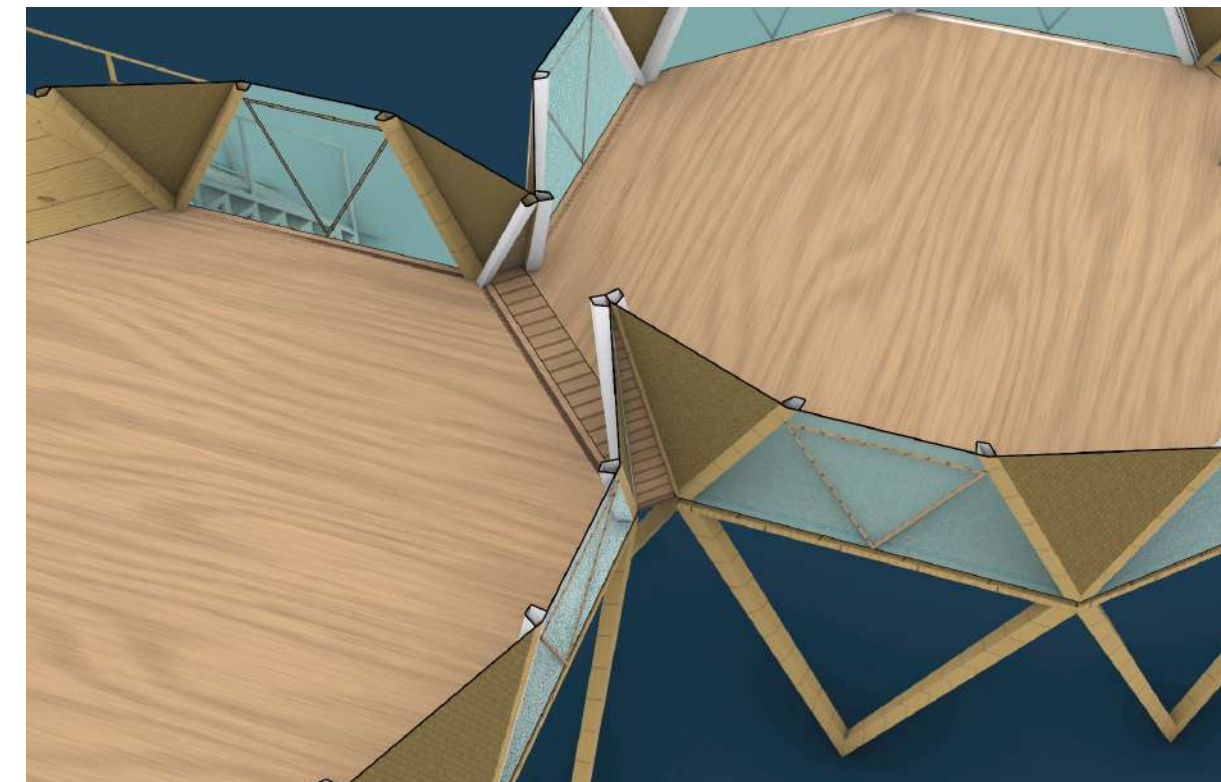
New structures

Grid implementation



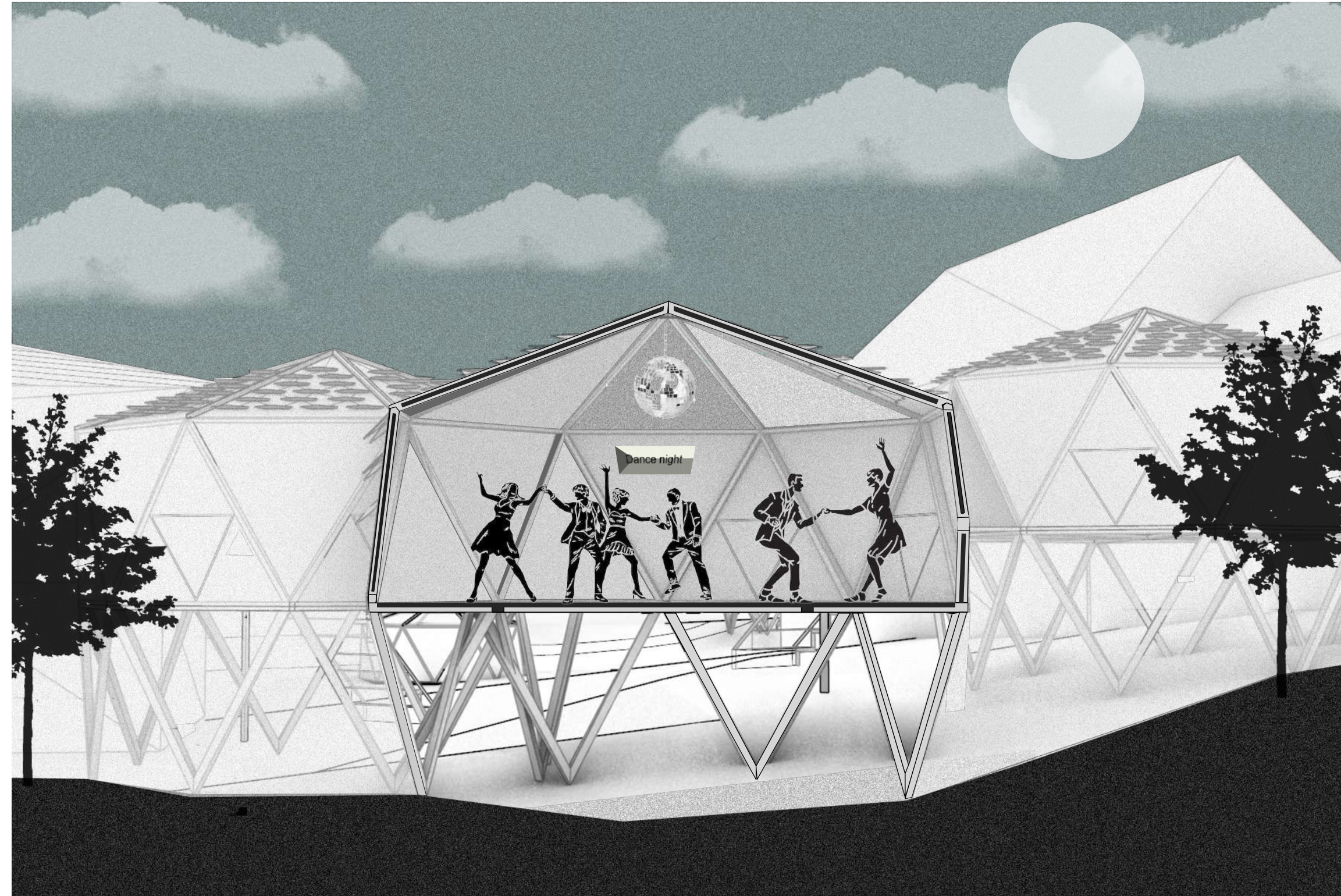
New structures

Connectivity



Due to the mimicking geometry it only takes three additional boards to join the similar structures together, double the area and expand in accordance to the changing needs of a particular program or an activity taking place in the structure.

Section drawing
1:100



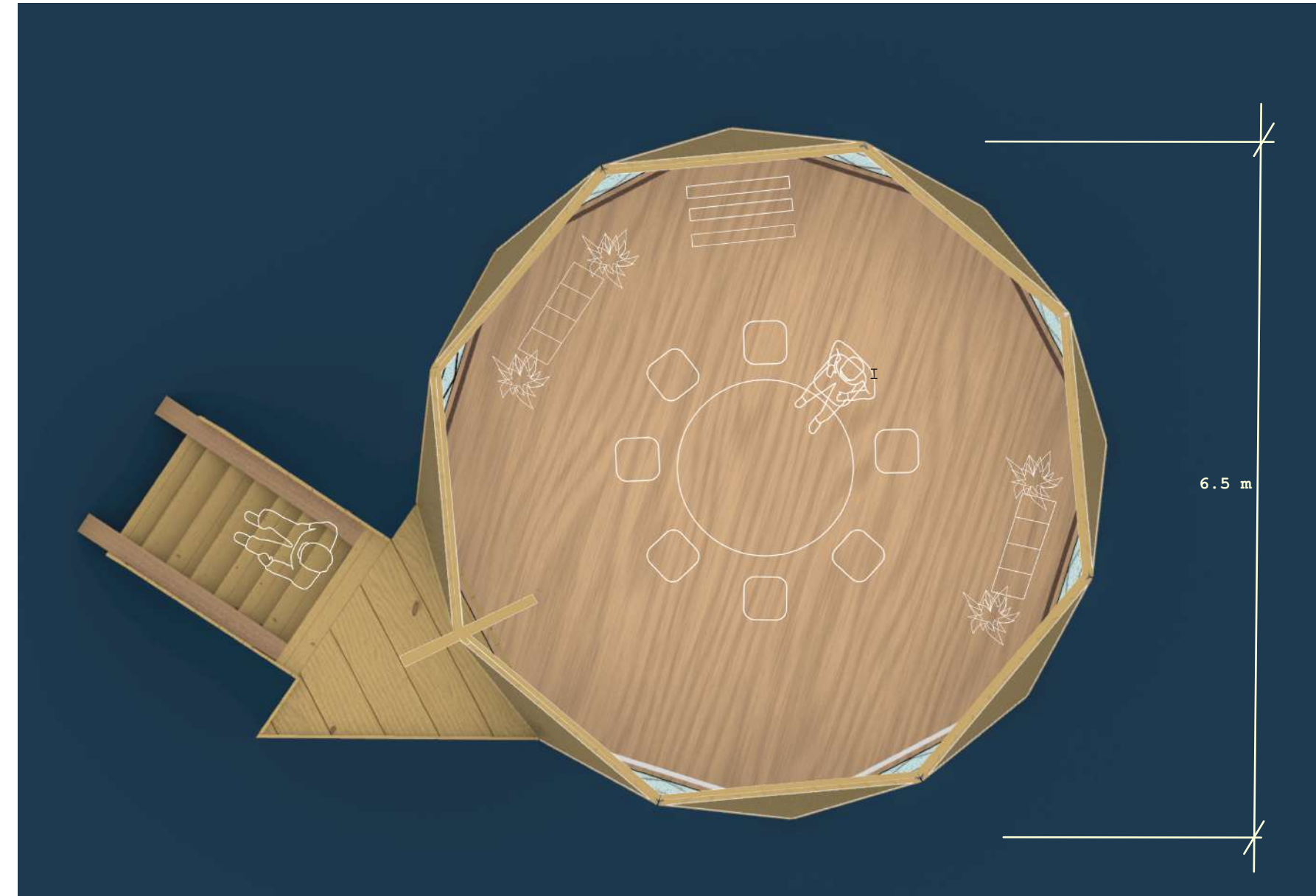
Structure typologies



Floor plan

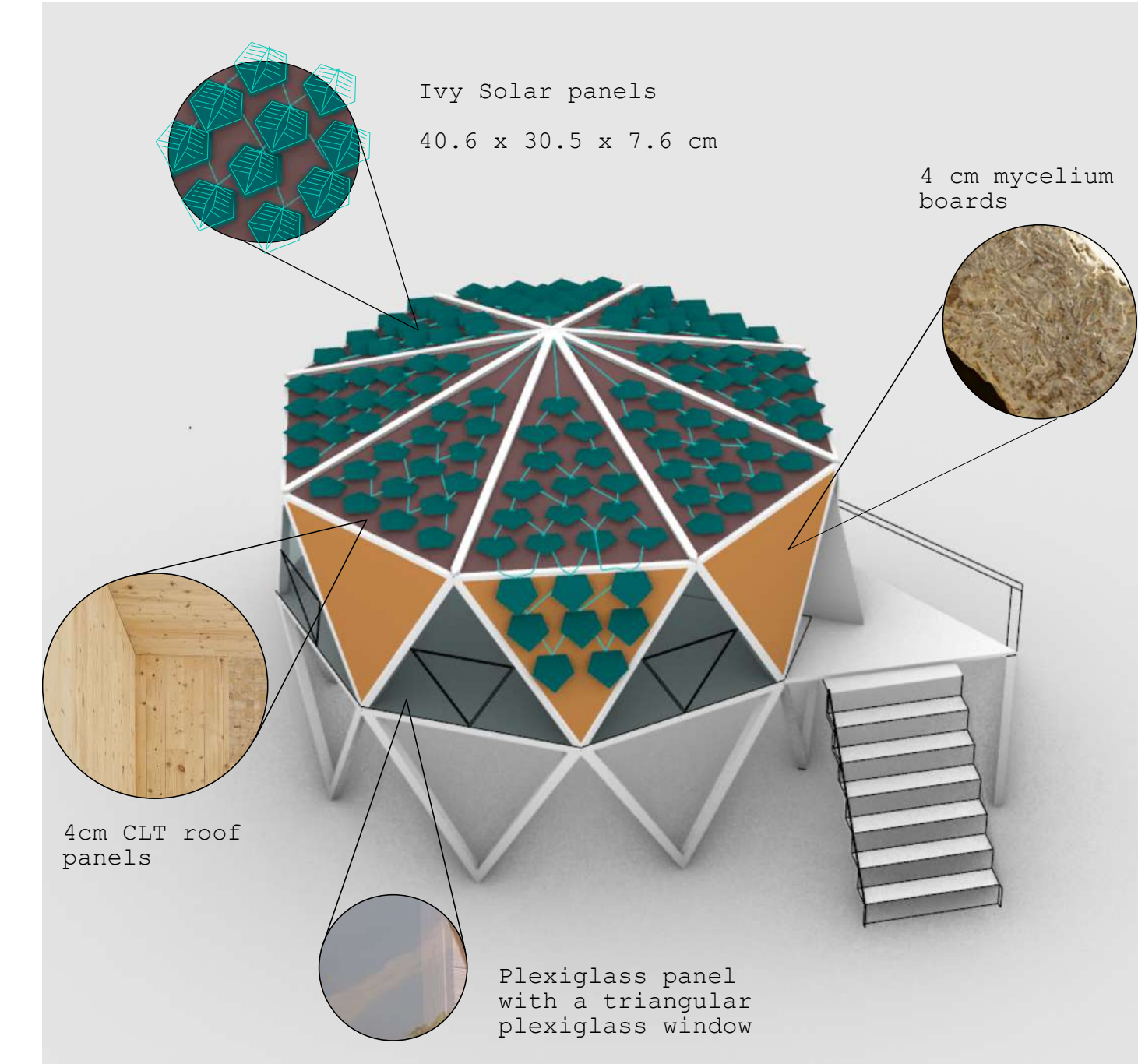
Timber structure study

Additional benefit of the structure is its size which fits many activities. These particular timber structures do not acquire permanent functions as they can be used for many purposes, not necessarily to the ones connected to the specific location.



Materials

Main new structure



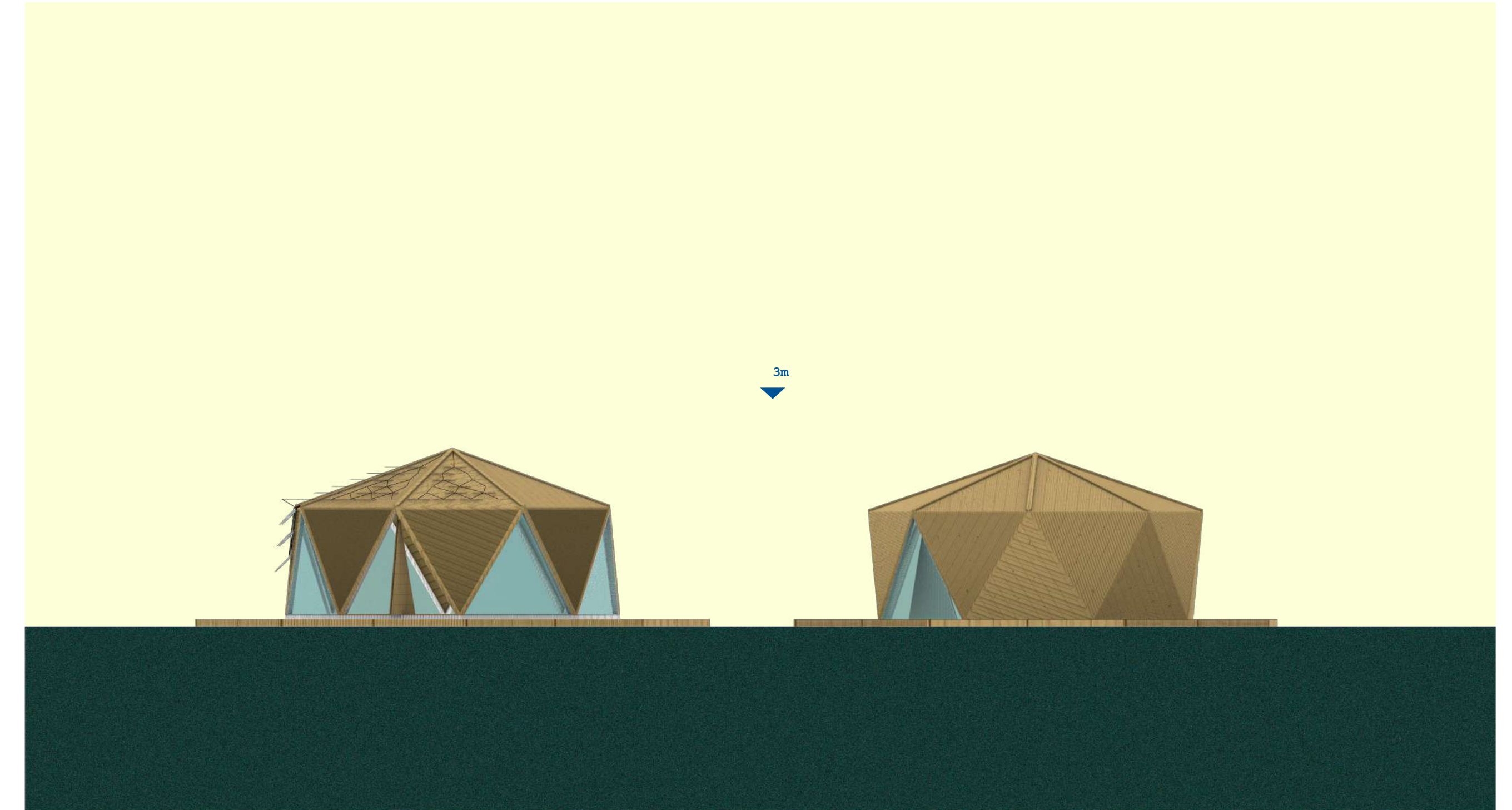
West Elevations

Structures on the ground



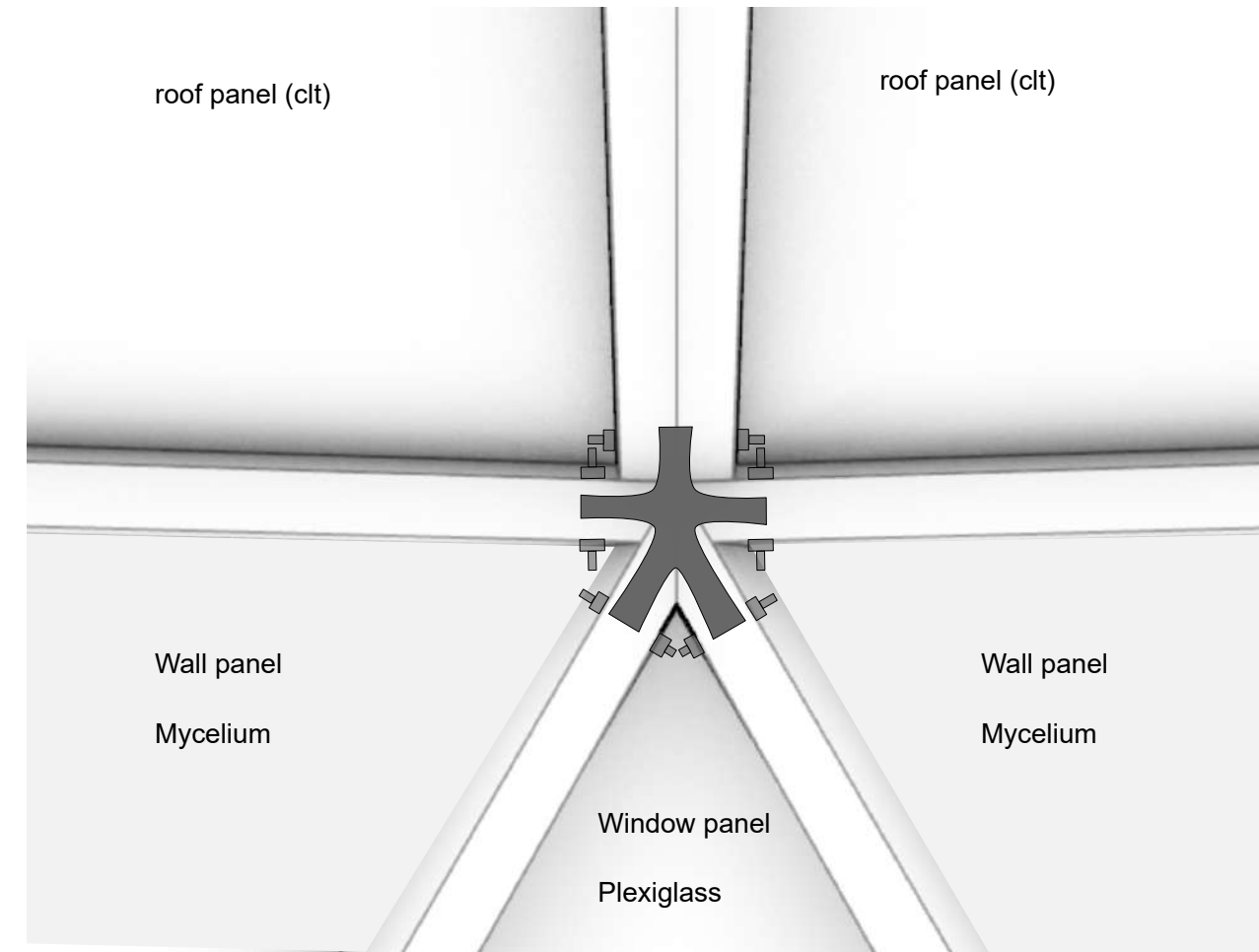
Elevations

Structures on water

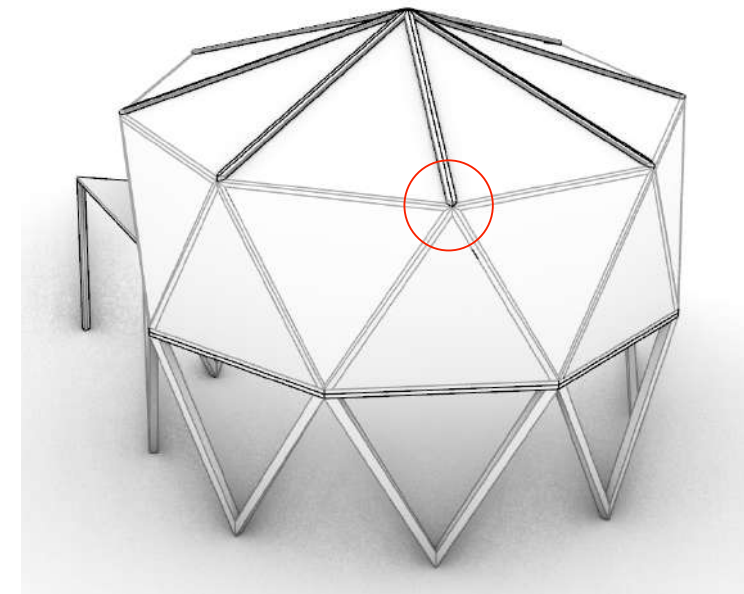


Technical details

Panel to frame connection

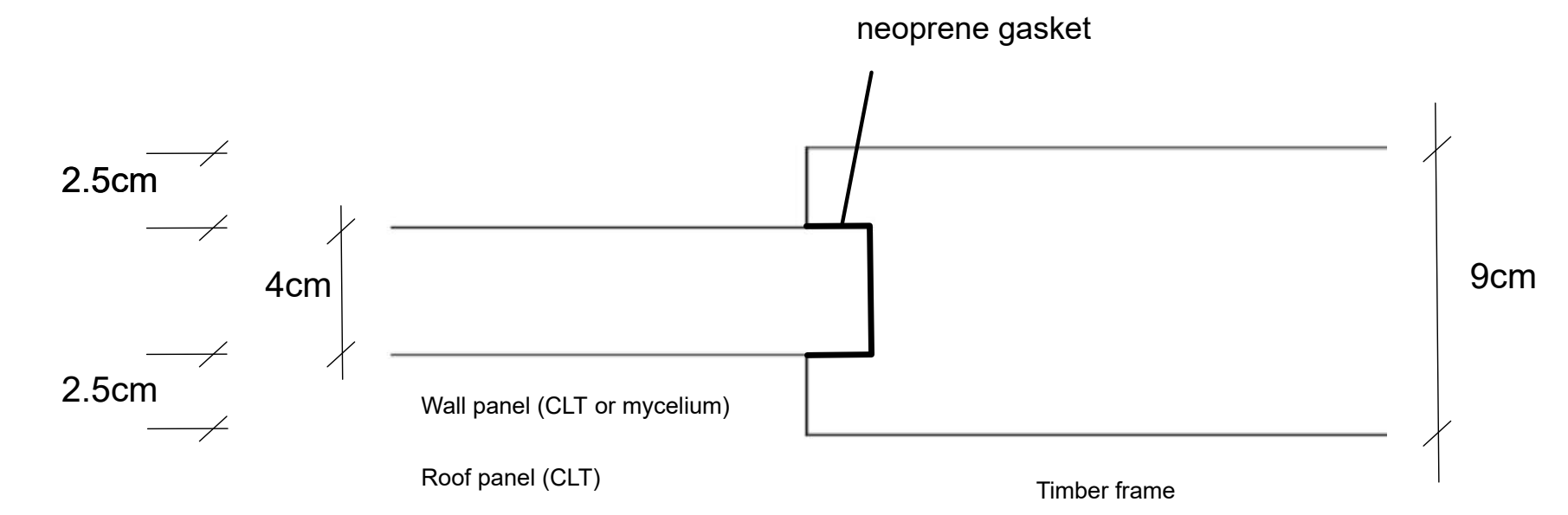


Timber framing joints , interior 1:10



Panels to frame connection

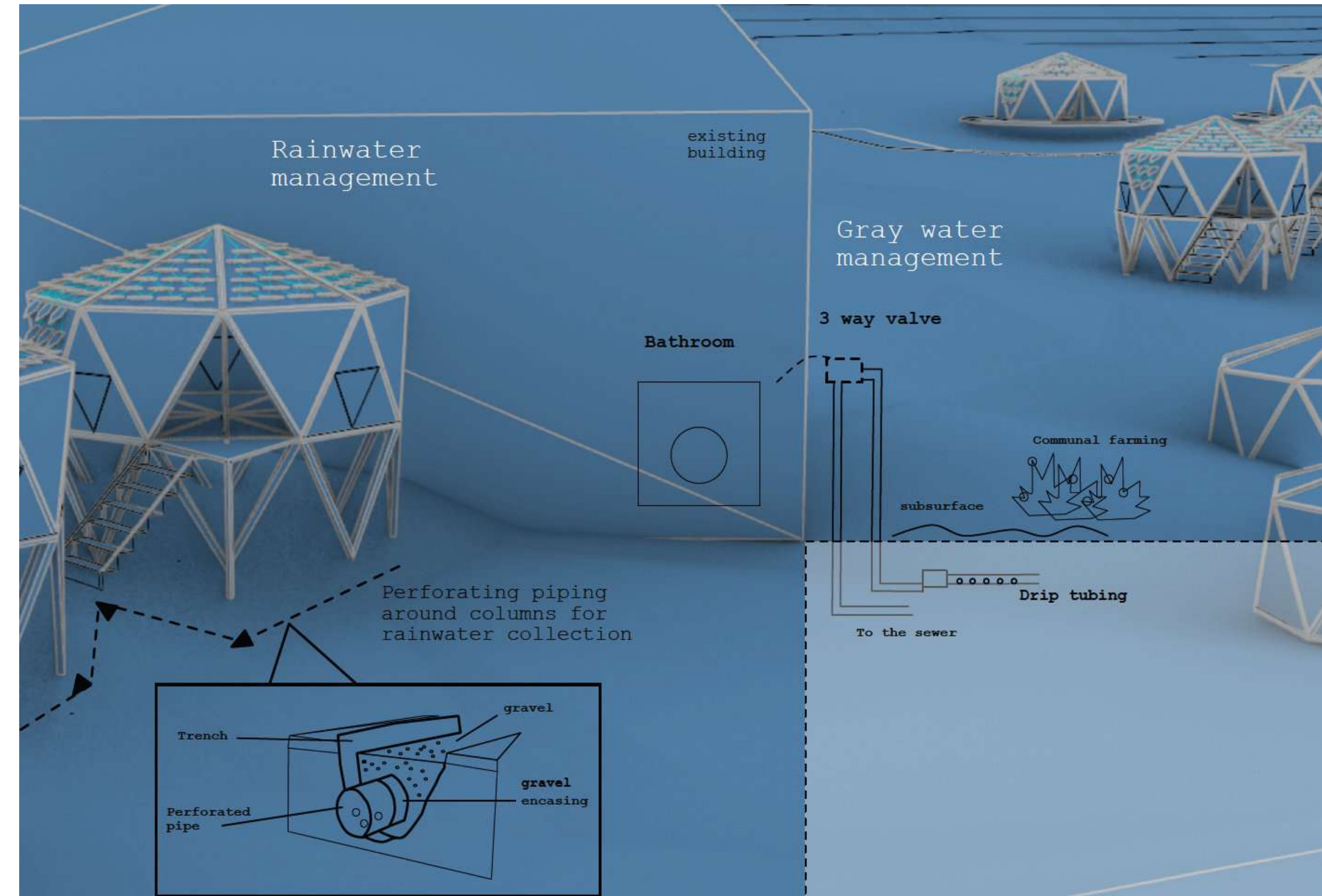
Timber frame and triangular panel connections



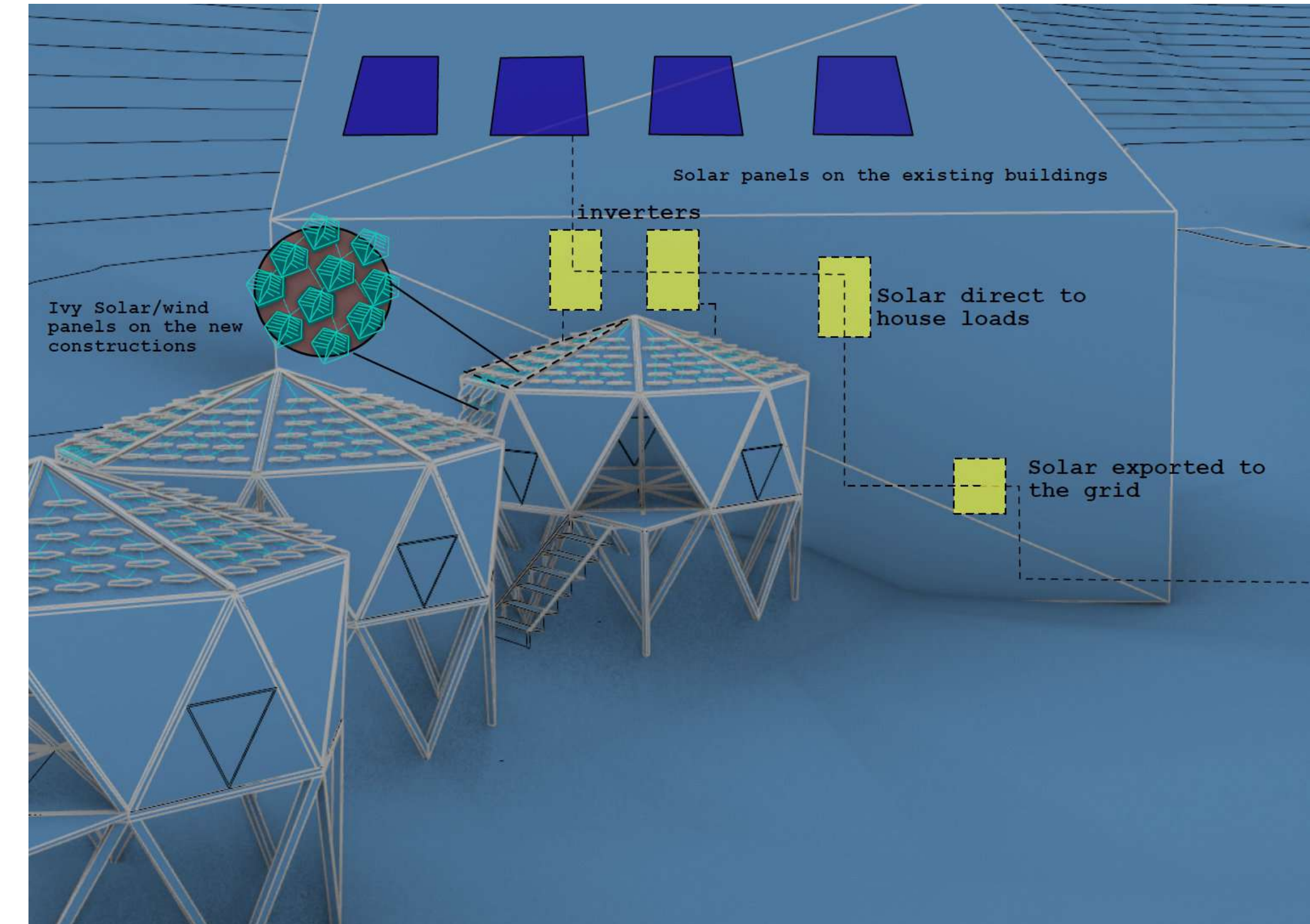
Drawn principal works the same way for all triangular panels except for the floors

1:10

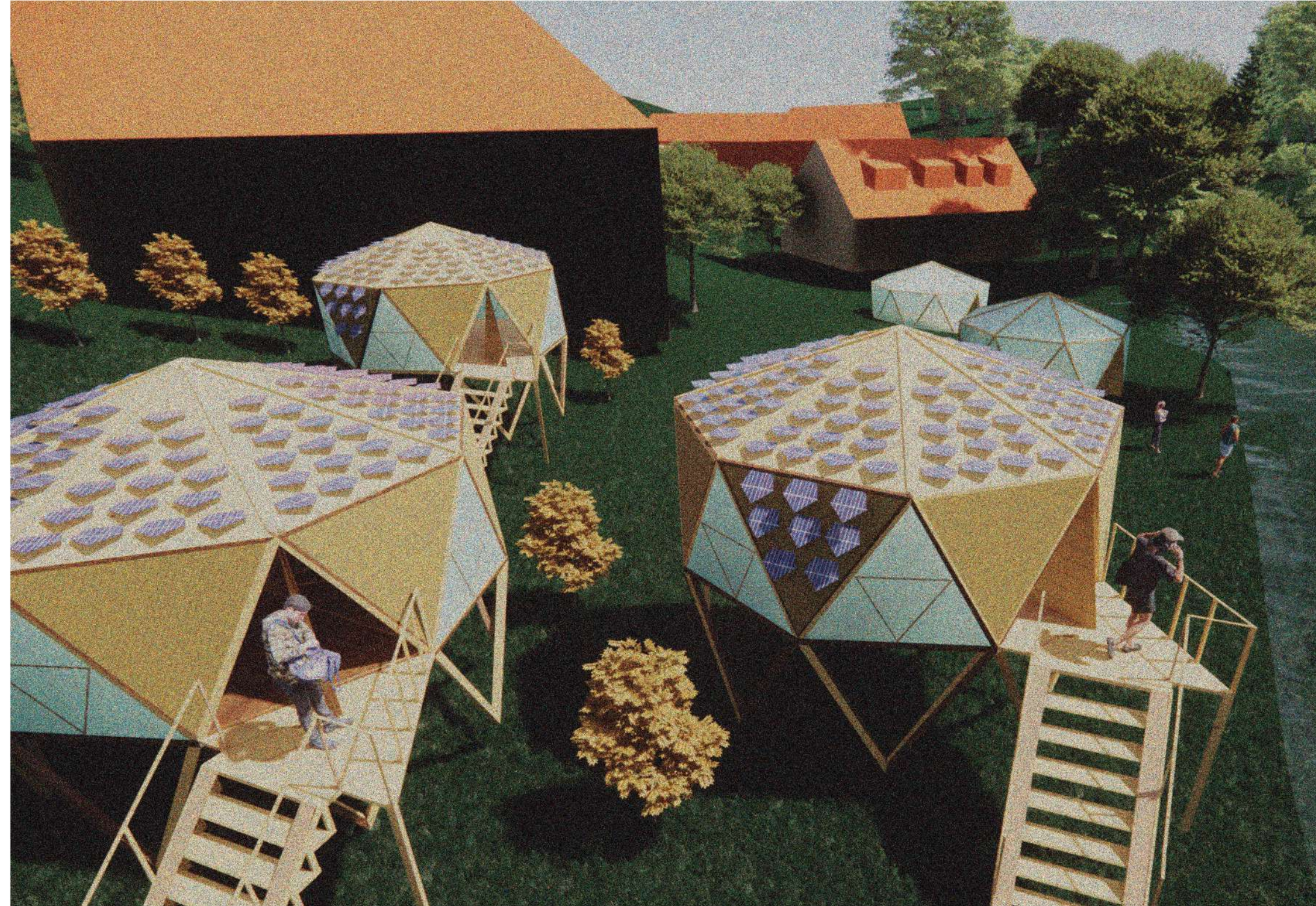
Water management



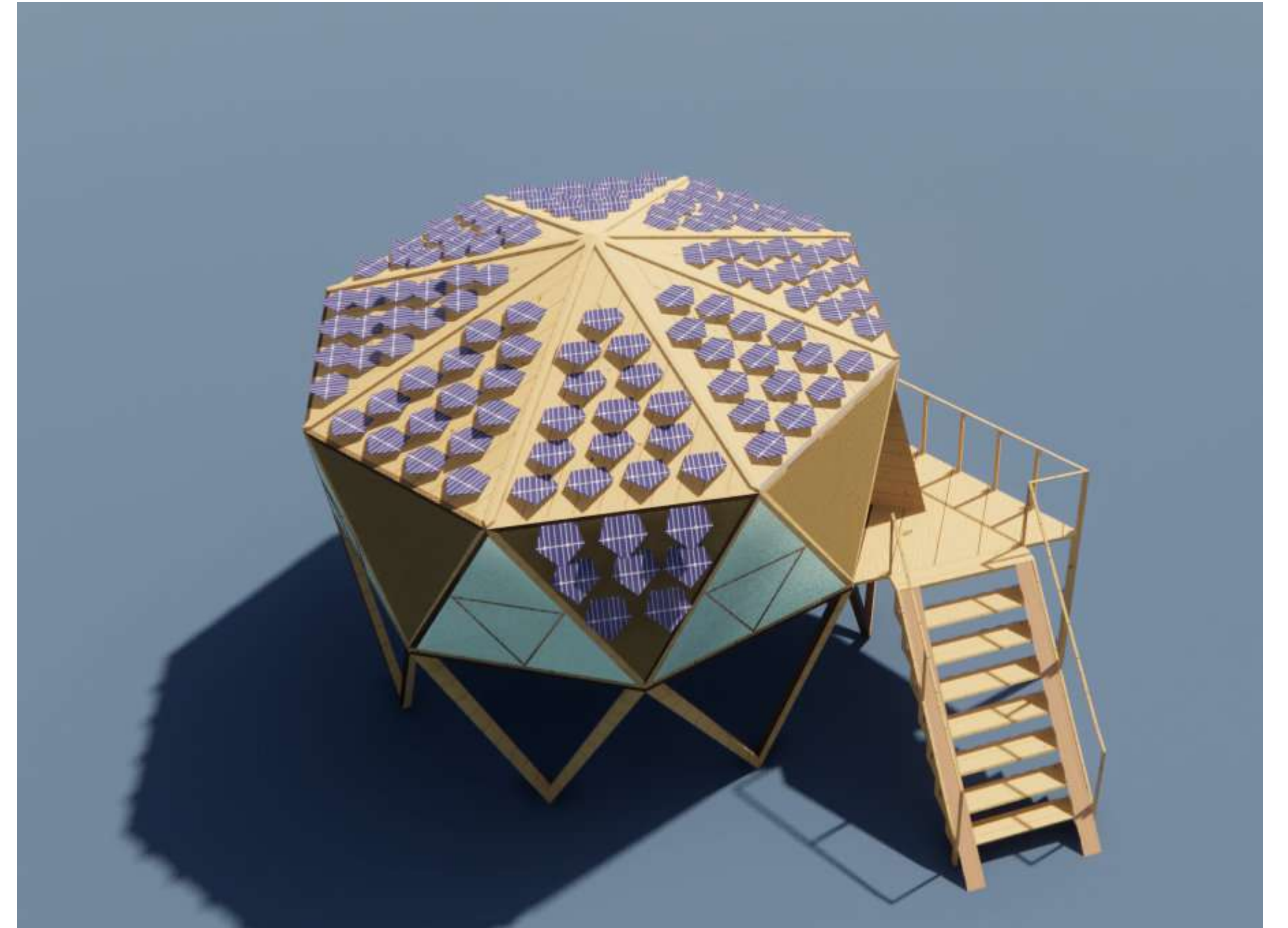
Electricity



Visuals



Visuals



Technical Report

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2.4 Existing buildings and their relationship to the site

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6.2 New additions

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8. Sources

1.1 Project Brief:

" "A long-term empty house is a problem for its locality, it attracts negative social phenomena, deteriorates the quality of living of the neighbors, and also reduces the value of the surrounding properties. New and new areas are being built up, and it is not only in a city center that empty properties are waiting to be used. No one knows how many dilapidated properties there are in cities, because no database of vacant properties has existed until now". Says Empty Houses platform.

The project is thus divided into two parts. For the first 3-4 weeks, students analyze the phenomenon of empty houses in Prague (they classify the buildings into categories, estimate the approximate area occupied by each category, where each empty house is located, etc. They then compare the data with examples from other cities in the Czech Republic or abroad. This information will be used in the design phase. "

1.2 Purpose of the project:

The main aim of the particular project is to adaptively reuse the currently out of use site and the buildings it contains. Said site belongs to the category of Industrial buildings, specifically Mill buildings, as researched during the first phase of the semester.

1.3 Location:

The site is located at 35, K Borovičku 492, 148 00 in Kunratice, Prague. Kunratice is located at the south of Prague and while its first written record was in the 13th century, the village became part of Prague in 1968. The area still functions as a suburban neighborhood, with schools and kindergartens and mainly private housing.

1.4 Coordinates:

50.0182864N, 14.4808106E

2.Site Analysis:

2.1 context:

The urban characters of the surroundings can mainly be characterized by private houses and schools. Constructions that are nearest to the site include rather small wooden construction houses with green houses that are specific to that area.

2.1 Terrain description:

Terrain of the site is crucial for the overall character of the project, since it mainly includes a steep forest at the base level of which is the location of the main site. Additionally, its terrain is all forested and green and has a rich soil for farming. The terrain of the site includes two main water streams that further connect to a pond at the east of the site that is crucial for the water mill building that the project includes.

2.2 Accessibility:

In terms of transportation, the site is mainly accessible by the metro line C and buses that frequent the area. To get to the destination, after a bus, one must take a hilly path that follows private houses and will end up precisely at the main entry. Other entries to the site are mainly through the forest paths or through a narrow road along the pond. It is secluded for privacy however is quite easy to reach.

2.4 Existing buildings and their relationship to the site:

Existing buildings of the site include a water mill building with a housing extension, an old building similar to a guest house and a private house belonging to the owner of the territory.

Buildings were first built in the 1760s however had been renovated afterwards so that now they share the same characteristics as the more recent houses of the neighborhood.

The three buildings are positioned in a triangular manner with a large empty space in between. Their main connection to the area is that they are right at the beginning of a hiking trail following through the Kunratice forest, thus creating a strategic placement.

2.5 Context of the new constructions on the site:

The new constructions work with the existing buildings to make the whole site functional. As part of the idea of eco-tourism they are made as temporary lightweight structures. Their construction is adaptable for various functions, most of which do not require complex building technologies or details. To bring life back to the site these temporary structures will enable activities that could generate enough monetary gain for the owner to be able to keep on maintaining and renovating the site which at this moment requires large amounts of funding.

Concept:

3.1 New functions given to the existing buildings:

Out of the two existing buildings that will be reworked, one of them is a water mill constructed in the 1750s with a small housing addition that was constructed later. The building structure will remain the same however the housing addition that has an open floor plan, will provide space for a museum about traditional milling practices and sustainable utilization of local natural resources.

The second existing building, used to be a guest house which is currently out of use. The current layout provides canvas to reuse it once again as a guest house. It will be one of the versions of accommodations on the site. Guest rooms will vary in size and luxury, providing assorted pricing options. The building will also include a communal kitchen and an outdoor parking area next to it.

3.2 New constructions and programs:

Locations of the new constructions are not permanent, due to their sight weight and assembly methods, they can be moved around if and when programs of the site change or are to be moved elsewhere. Additionally they are of the same dimensions and could be placed next to each other and connect through a simple opening of a wall. Main programs of the new constructions include, workshops, a yoga studio, greenhouses, outdoor camping rentals, saunas, artist huts, fishing huts. The workshops that can be placed in these constructions and that are important to ecotourism and the locality, are - waste reduction and recycling workshops, wildlife conservation workshops, program for nature conservation and sustainability talks, yoga practice program, traditional crafts and artisan workshops and lastly, a culture immersion workshop.

4.1 Introduction of the overall construction methods:

Sizes and building principles are almost the same for all new structures however they vary in materials, base compositions and locations. Structural detailing was solved for the most common typology of the structure done on the site after which the principles were applied to the remaining structures for different purposes. Meaning that the detailing was done for 1 type on the basis of every detail that serves as a prototype for the rest of the structures of different programs. In terms of the existing buildings, they do not undergo constructional changes.

4.2 Materials and construction of the existing buildings:

Main materials of the existing building include bricks and plastering.

Most of the information regarding its structural details are unavailable, however

However, one can deduce that they are both 3 floors, and are L shaped. With heavy foundations placed on the steep edges of the site.

4.3 Materials for the main type of construction:

Materials of the structure are: timber, CLT, mycelium and plexiglass.

4.4.1 Structural composition of type 1 - timber framing

Main load bearing element of the structure is a timber frame into which a wall, roof, window and floor panels are placed. The triangular wall frames and panels are placed at specific angles which increases the load bearing capacity of a building, inspiration of which came from a The timber frame structure is made through triangular frames all of which are 90mm thick. Accordingly, the wall, roof, window and floor panels are triangles.

4.4.2 columns:

The structure stands on V-shaped timber columns 2m above ground, its triangular shape is of the exact dimensions as the wall frames, which helps avoid buckling, tension and compression.

4.4.3 flooring:

On top of the columns the floor slab is placed onto 8 triangular timber frames which results in an octagonal layout. The triangular panels of the flooring are made out of 2.5cm thick CLT boards.

.4.4 Walls and windows:

The wall panels of the structure consist of mycelium and plexiglass panels. Walls and window panels are placed one after the other. Walls are made out of 4cm thick mycelium boards with a lightweight moisture protecting coat. The window panels are made out of 1cm thick plexiglass.

4.4.5 Entrance:

Entrance is created through the addition of a horizontal triangular panel as a platform stemming out from a floor slab on top of which one of the wall panels pivots as a door.

4.4.6 Roof:

The roofing is similar in triangulation however its dimensions are different in the height due to the roof being pitched. Roof panels are made out of CLT boards of 4 cm thickness.

4.5 materials and basic structures of the rest of the new structures:

Despite the mainly analyzed construction, the rest includes greenhouses, floating saunas, fishing huts and artists huts on the pond and metal constructions in the forest.

Greenhouses would be made through the same shape and sizes as the main structure however without columns and with polycarbonate panels all around. Floating saunas would be made entirely out of timber once again mimicking the triangular shape of the rest of the structures however with heavier insulation and a deck around. Floating huts would have the same floating principle as saunas and would also be composed of timber panels however similar to the weight of workshop and camping constructions. Constructions in the forest would be made out of metal however the structure would have a metal movable framing instead of walls and be open. Its roof would be made out of metal triangular panels, however have a chimney-like tube stemming from its top, to allow fire pits inside and a new type of a zone for hikers and forest visitors.

5.MEP

5.1 Plumbing:

Existing buildings have a few bathrooms' gray water of which can be used for a watering supply of a communal garden and greenhouses. Washing machines must be connected to the system through a 3 way valve. First part of the valve connects to the sewer, the second to the piping for the garden and the third that connects both to the washing machine. Perforated piping along with in-line emitters will be used as a connection to supply water to the garden. On top of the soil there would be a subsurface on top of which the farming would take place.

Additional sources of water would be provided through rainwater harvesting. The new structures would have perforated piping around its column bases covered with gravel. Same system will be used around the existing buildings to fully utilize all structures for rainwater collection. Overall, the new structures house programs that do not require mechanical water supply.

5.3 Ventilation:

New structures would be ventilated through plexiglass windows that are all around the structure. Hence, no need for mechanical ventilation. The small scale of the temporary structure helps in avoiding additional mechanical interventions.

5.4 Electricity and lighting:

Lighting and electricity can be supplied through the usage of ivy solar panels that will be placed on the roof and the walls of the new structures. Such panels allow for both wind and solar power generation, adaptive placement on the building and better manipulation of its shapes and sizes than a singular large panel. Ivy solar panels also go well with the temporary character of the structures and their lightweightness. The generated energy would connect to these houses and its excess would connect to the supply of the existing building through the batteries underground. However typical panels with dimensions of approximately 160 cm by 100 cm would be used on top of the existing buildings. In theory, however, due to the limited amount of information about the interior and details of the existing buildings, the water mill would also take part in the generation of additional energy.

5.5 Heating:

Heating of the new structures is also done only through the usage of specific materials for the panels without the need for mechanical elements. Mycelium and CLT boards for the workshop and camping structures provide enough insulation for its small volume.

6.Sustainability

6.1 Adaptive reuse of the existing structures:

Currently out-of-use existing buildings would be functionally transformed into programs that would increase its frequency of usage while keeping the building. The changes of the overall site would be done through the new constructions that stand on their own however provide resources and bases for the regeneration and repurposing of the site.

6.2 New additions:

New additions to the project include structures workshops that can provide resources for the site's maintenance and communal gardening and greenhouses that also provide necessary elements to set the eco-tourism of the site in motion. Such provisions include, growth of vegetables that can be consumed or waste of which can be used as biofuels. Additionally the greenhouses will not only have consumable plants, but mushrooms specifically grown for the creation of mycelium that is being used for the walls. Agricultural waste will play a crucial role as well in assuring the integrity of the mycelium blocks. Creation of such materials, especially on site, assures a high-level of sustainability and promises for regeneration and reuse of projects.

Construction and the scale of the new additions also allows for the prefabrication of its entirety and can guarantee its assembly manually. Such variety of possibilities of the structures does not limit their location or material variety, if needed they can be rearranged differently or stacked next to each other forming a double space and generally adapt to quite many conditions.

Conclusion:

All in all, the project addresses the private defunct site through utilizing natural resources of its environment, creating eco-touristic destinations with self-sustaining elements, variety of activities and affordability. Overall, such minor interventions help battle the polluting hotel industries and construction practices while breathing life back to the site and creating a new hotspot at the South of Prague

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<https://mast.dk/>

Ecotourism

Self-sustaining resort

Thank you!