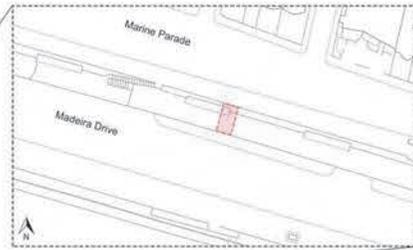


DESIGN PORTFOLIO

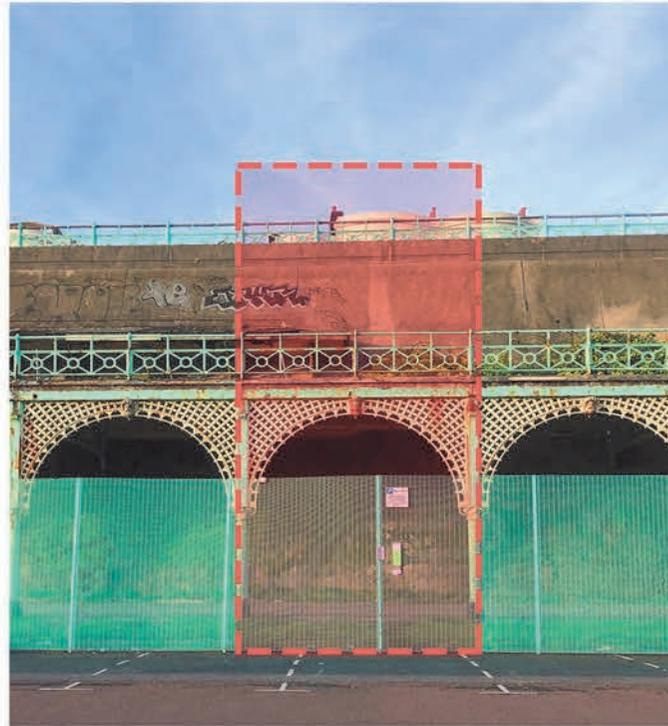
MATS BORGEN

AD 471



THE LOCATION

Madeira Terrace is located at Madeira Drive, which is a road stretching along Brighton's seaside, and east of the Brighton Pier. In addition, the construction is located several meters below the Marine Parade, which is the street above.



The site boundary



The roof structure



The main lattice beam

THE STRUCTURE

Madeira Terrace was built in the 1800s and is composed of 151 arches, which forms a 865 meter long construction. The structure is Grade 2 listed and the oldest cast-iron structure in the UK making it a unique landmark. In 2012, the construction was closed to the public due to its severe condition. The structure is now unsafe to use and in desperate need of repair, as the pictures on the far left shows.



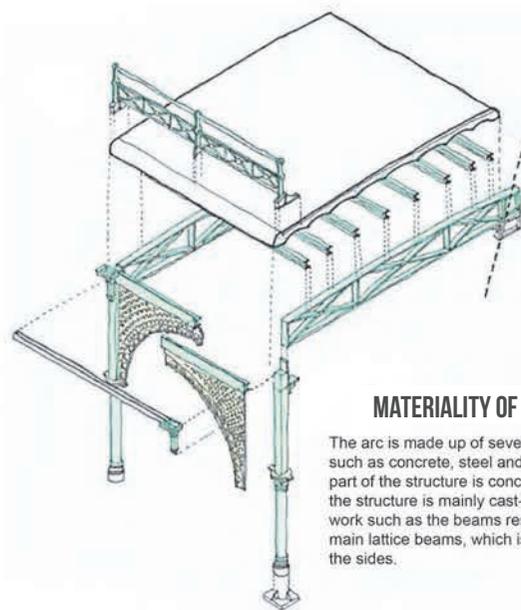
Elevation of the arches



Perspective view of the arches



The beach located in front of the arches



MATERIALITY OF THE ARC

The arc is made up of several different materials such as concrete, steel and cast-iron. The top part of the structure is concrete, and the rest of the structure is mainly cast-iron, except some steel work such as the beams resting on top of the main lattice beams, which is located on each of the sides.



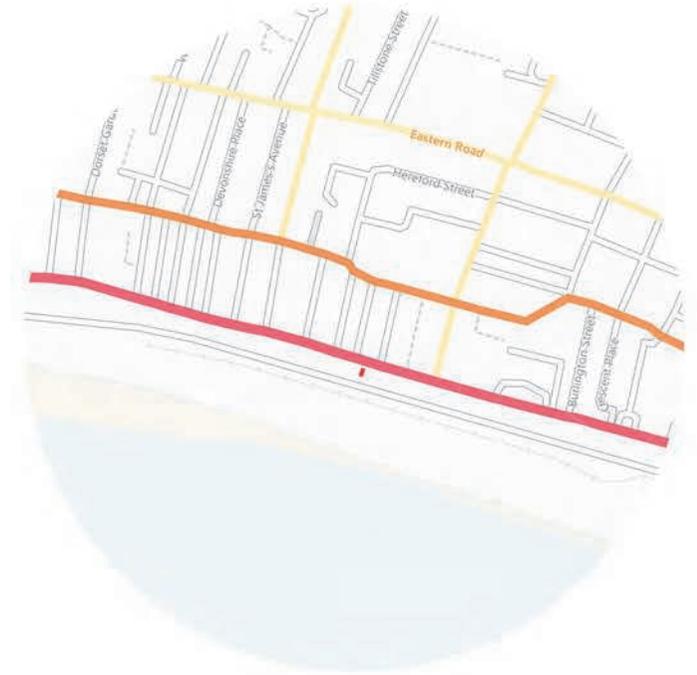
A close up view of the main lattice beam



One of the columns

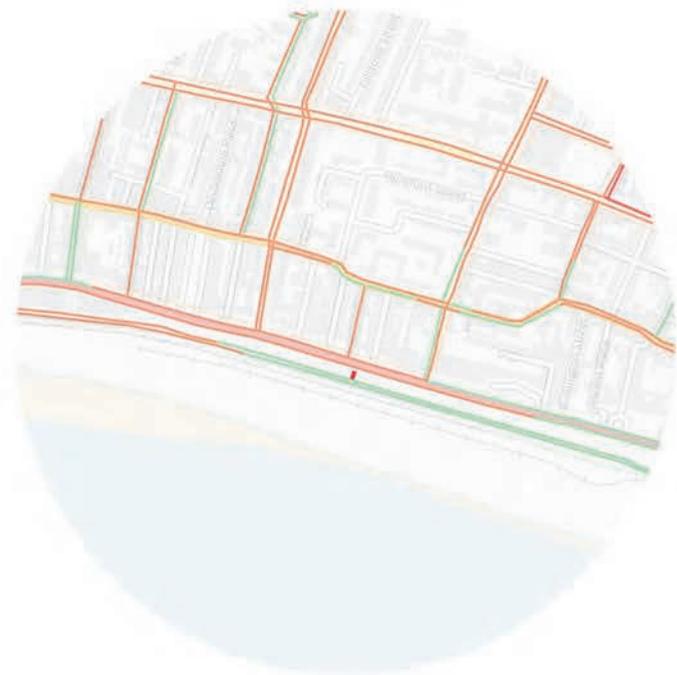


Figure Ground



Street Pattern

SITE ANALYSIS



Traffic



Public Transport

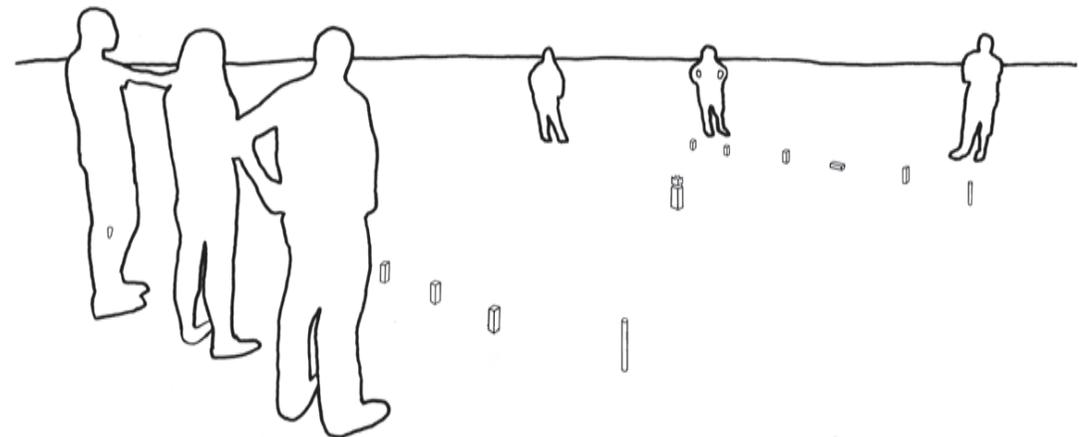
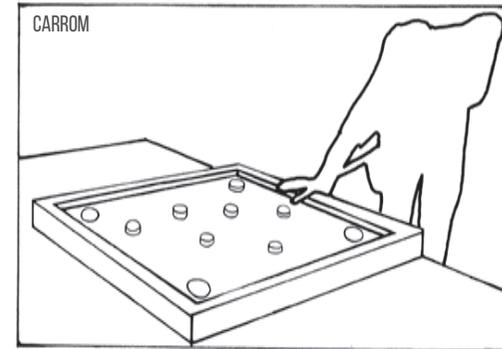
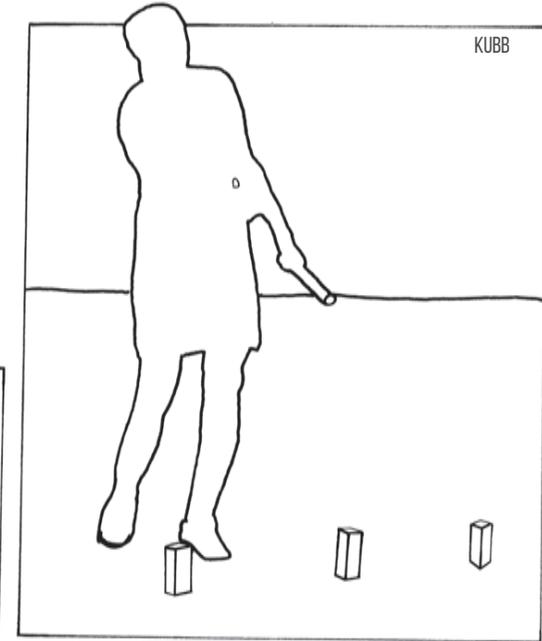
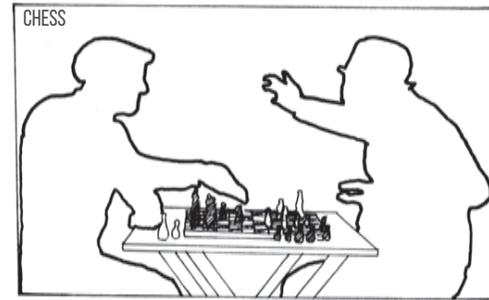
THE MICRO INDUSTRY

The main purpose of the micro industry was to bring people together, to appeal to all generations, both old and young. To make students, parents, teens and elderly come together and socialize with one another. The craft of the workshop was therefore wooden games, since this is something the vast majority of people in one way or another have had some experience with. The wooden games will consist of chess, carrom and kubb. The building will thereby create a unique meeting place for the people of Brighton to socialize and disconnect from the stressful everyday life.

CHESS is a two player strategy board game where each player begins with 16 different pieces, whereas each different piece has its unique moves. The objective of the game is primarily to checkmate the opponent's king, which occurs when capture is unavoidable. The game is played on a 8x8 grid and typically involves exchanging similar pieces, while trying to gain an advantage on the opponent in order to checkmate.

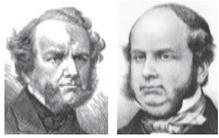
KUBB is an outdoor game where the objective of the game is to knock over several wooden blocks by throwing wooden batons at them. The game has its origin from the Viking era, and can be played by up to twelve people divided into two teams. Play takes place on a rectangular playing field where five wooden blocks are placed on both ends of the pitch, and a "king" in the middle. The game is won by first knocking over all five of the opponents wooden blocks before overturning the king.

CARROM is a two player board game where each player begins with 15 wooden disks known as carrom men. The game starts by placing all the carrom men in a circle in the middle of the board. The objective of the game is to knock all 15 of the players allocated disks into holes located in each corner before the opponent with a stick.



HISTORY OF PLAY

BRIGHTON'S CHESS HISTORY



The club soon after attracted players such as Howard Staunton (Left), one of the best from 1843 to 1851, and historian H.T. Buckle (Right), one of the best for a short period of time from 1849 to 1850

1840

In 1840s, the first Club was formed in Brighton under the inspiration of the flamboyant army-officer-turned-author, Capt. Hugh Alexander Kennedy



In 1952, the Club moved to four Pavilion Buildings

In 1853, the Club saw Kennedy's departure from the town, and short after the club entered into a period of difficulty, marked by falling membership and recurrent quests for new accommodation

In 1858, the Club was offered the South Lobby, an area of the Brighton Pavilion, but voted against the transfer

In 1943, the Club was permitted to return to the South Lobby

In 1863, five years later, the offer was repeated, and this time the advantages of the move were more apparent, and thus voted in favour. Thereby, the South Lobby became the home of chess in Brighton



The following few years, may not have been the most brilliant in the Club's history, but were important in establishing an association between the King of Games and the former 'resort of kings'

The Second World War brought enforced changes to the Club, and the Pavilion was once again requisitioned, this time by the wartime Ministry of Food. The club was thereby forced to move

In 1867, the Club saw its departure due to financial difficulties



In 1933, junior chess benefited greatly when Col. Sir William Thomas Dupree, Bt., left a legacy which provided for a local junior competition with a remarkable prize of £100



In 1870, the Pavilion still retained some links to chess due to the display of 'automaton' 'Ajeeb' at the South Lobby, which was a life-sized model of a chess player

In 1873, a significant development occurred when a chess room was opened a few hundred yards away from the South Lobby located at the new Free Library and Museum



Following the outbreak of the First World War, the Pavilion was requisitioned as a hospital for wounded Indian servicemen, and the chess room therefore returned to Church Street

During the post-war years, the use of the South Lobby was once again withdrawn due to administrative reasons



In 1979, Ray Keene, the grandmaster, organised the first international tournament in the town and these events were held annually until 1985

The following three years, Brighton Chess Club eked out a hand-to-mouth existence in temporary quarters in Howard's Restaurant in Pavilion Buildings

In 1991, the Club moved to the NALGO club in Edward Street

In 1938, the British Championships was held in Brighton

In 1997, the British Championships was held in the Town Hall of Hove

In 1922, the South Lobby returned once again as the home of chess when it became the headquarters of a resurgent Brighton and Hove Chess Club



In 2011, the Club moved to the Avenue Bridge Club in Third Avenue in Hove

In 1888, there was a demand for space, and the chess community needed to move from its public Chess Room at Church Street, thus resulting in the reuniting with the South Lobby

In 1972 and 1977, two British Championships were held in the Corn Exchange in Brighton

In 1970s, the first team reached the final of the National Club Championship on three occasions

In 1976, a room in the King's Apartments became the setting for the first Variable Baseline Chess Tournament ever held in the UK, which was won by a local talent named Dave Springgay



In 1986, the Club's link with the Pavilion came to an end and relocated to the Co-operative Social Club in London Road

In 1994, the Club moved to the Shakespeare's Head in Spring Street

In 1998, the Club moved to the Railway Club in Belmont



2011

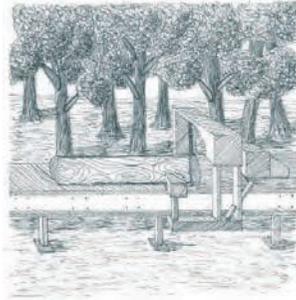
PROCESS DIAGRAM OF A CHESSBOARD



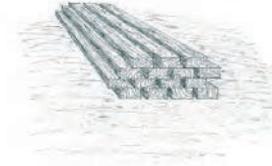
Raw Material



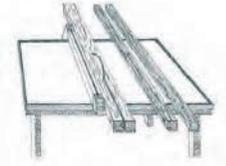
Cutting down a tree



The processing of lumber into planks



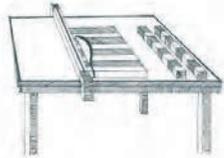
Planks



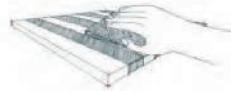
Cutting two different sorts of wooden planks into a squared shape



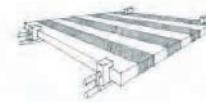
Gluing the planks into a chessboard



Cutting the board into eight planks



Sanding the board



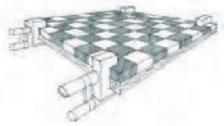
Gluing the planks into a board



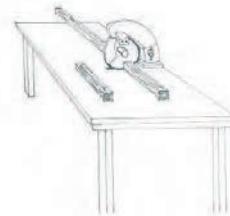
Cutting the two planks into the correct length



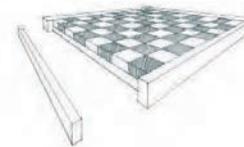
Cutting a board into the same shapes as the chessboard



Gluing the two boards together



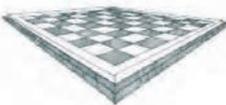
Cutting four new planks



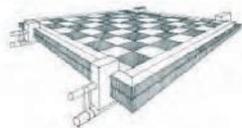
Attaching the planks to the board



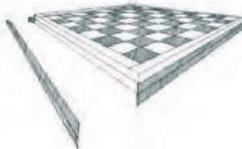
Gluing the planks to the board



Completed chessboard



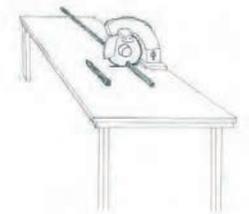
Gluing it all together



Attaching the planks to the board



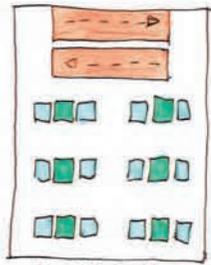
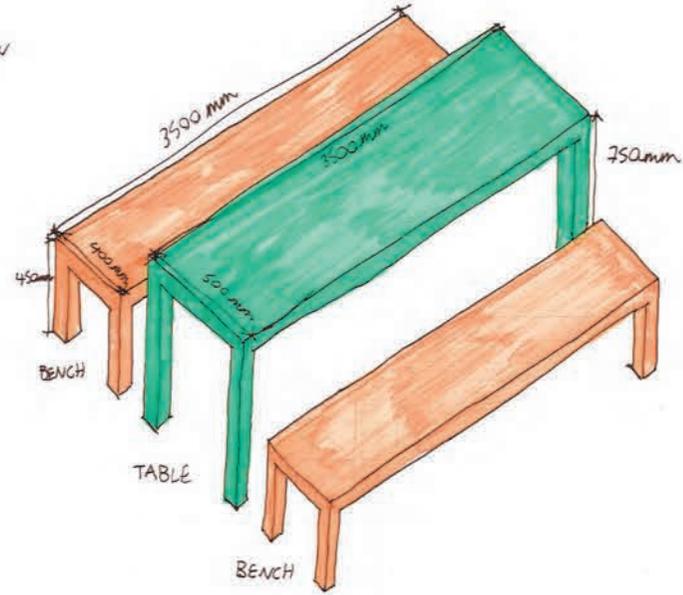
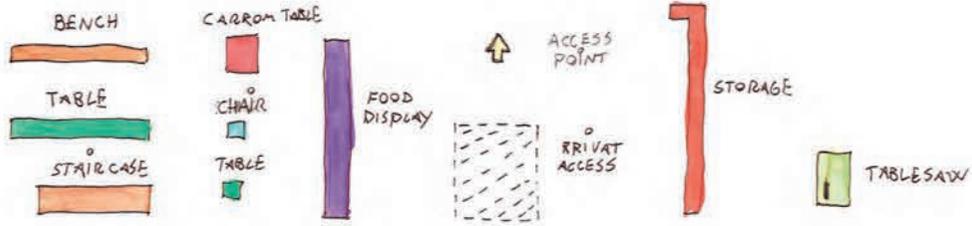
Cutting each of the corners of the planks in a 45 degree angle



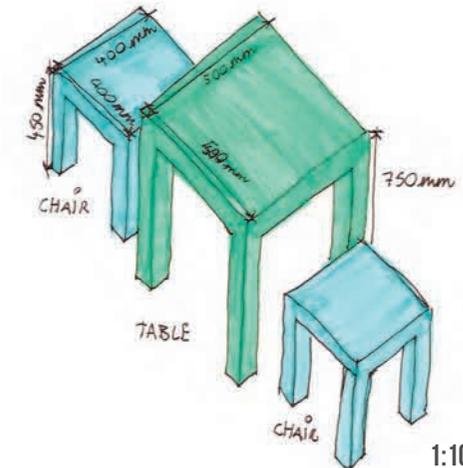
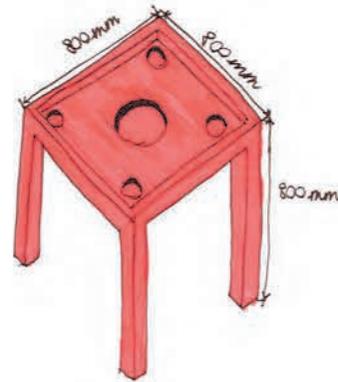
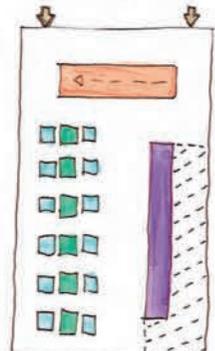
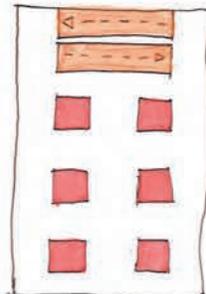
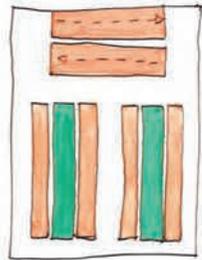
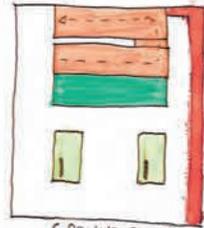
Cutting four planks

FLOOR PLAN CONCEPT

SPACE-PLANNING



IN REGARDS TO SPACE AND FUNCTIONALITY BENCHES ARE A BETTER FIT THAN CHAIRS

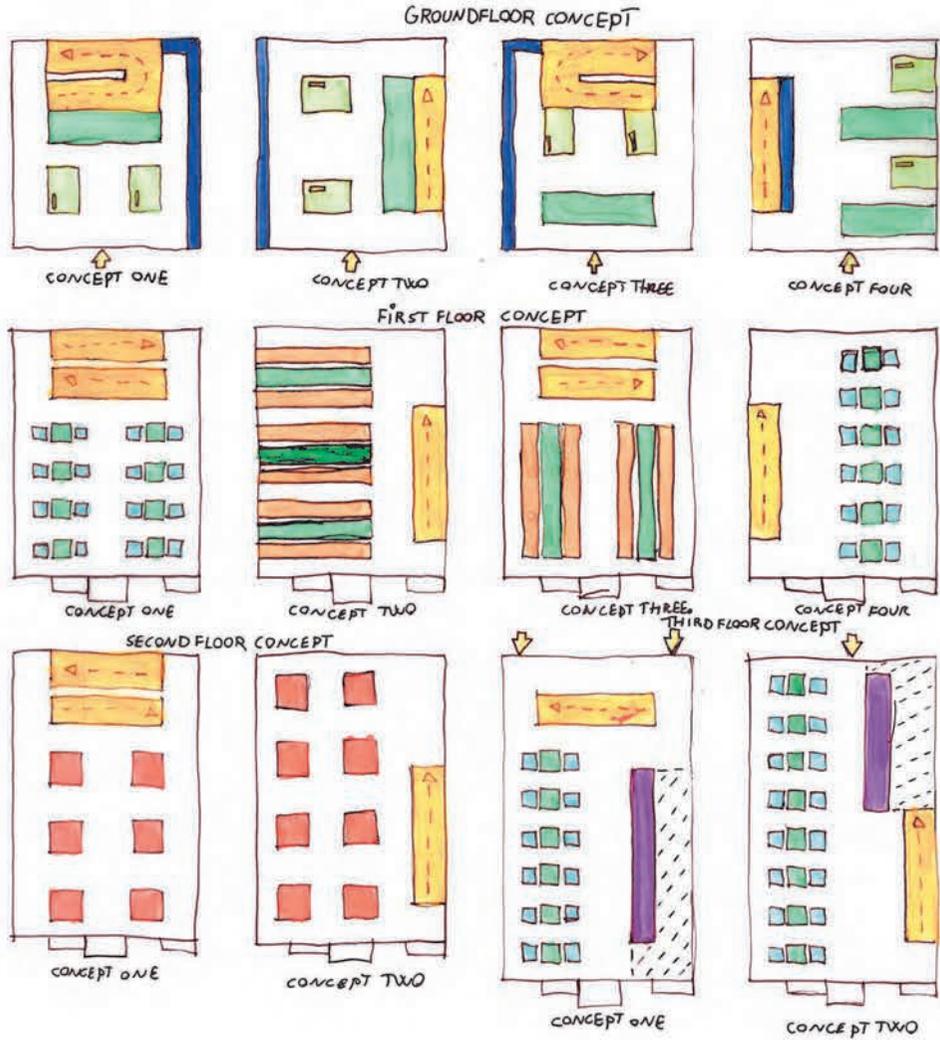


SCALE: 1:100



1:100 PLAN DRAWING

FURTHER SPACE-PLANNING

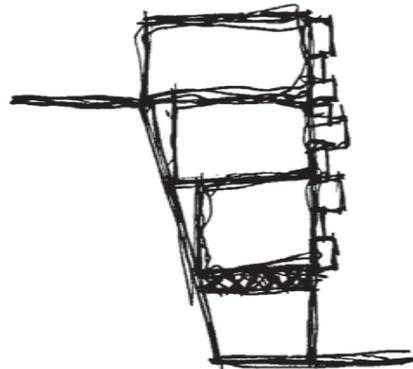
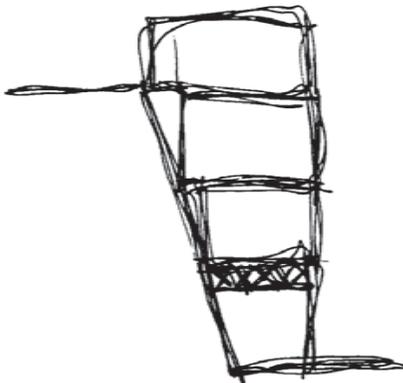
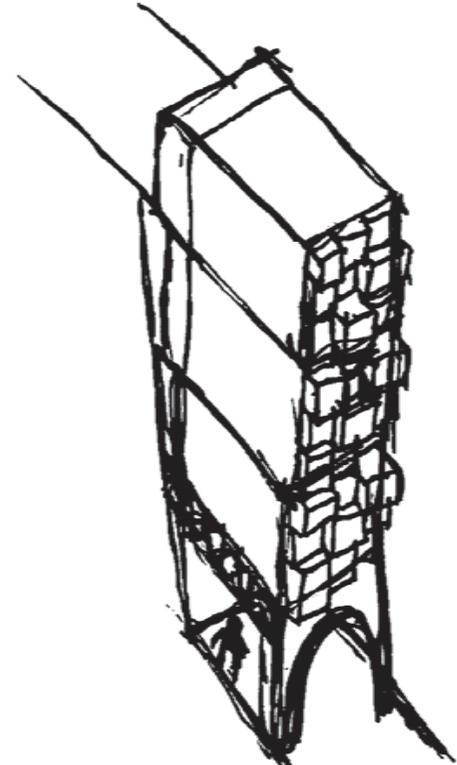
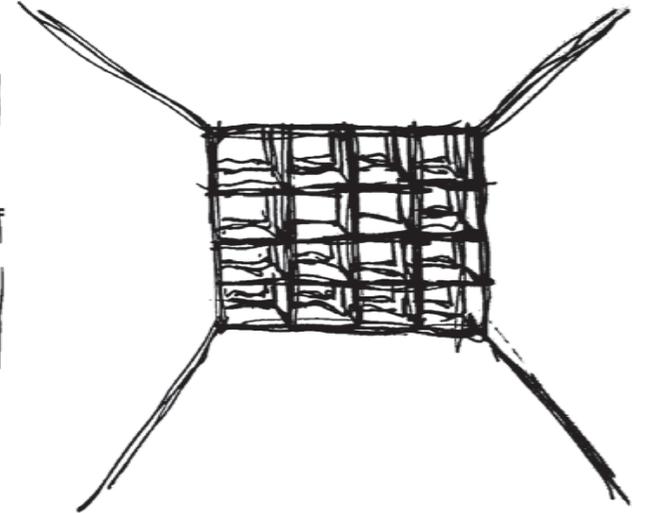
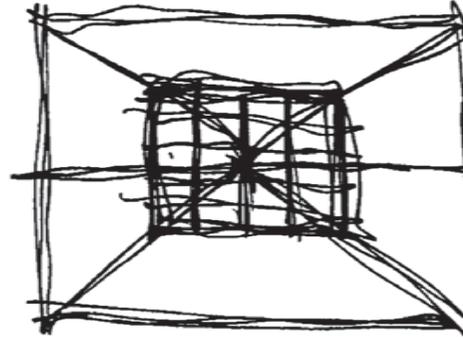
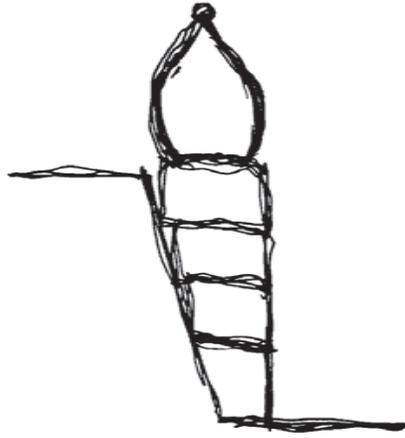
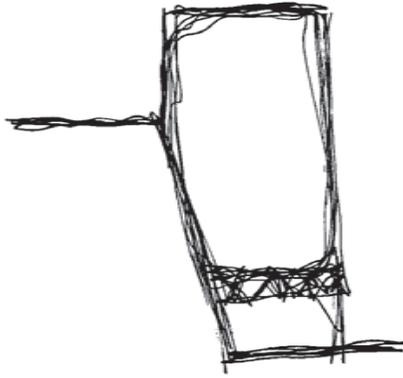


FLOORPLAN CONCEPTS

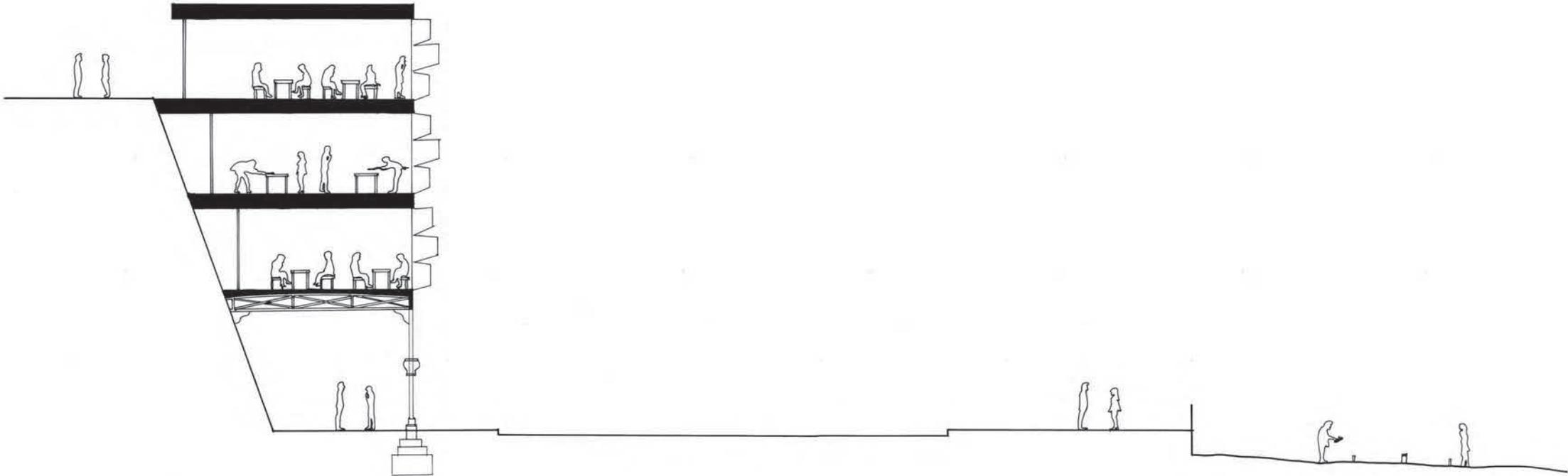
Scale 1:100
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1:100 PLAN DRAWING

DEVELOPMENT SKETCHES

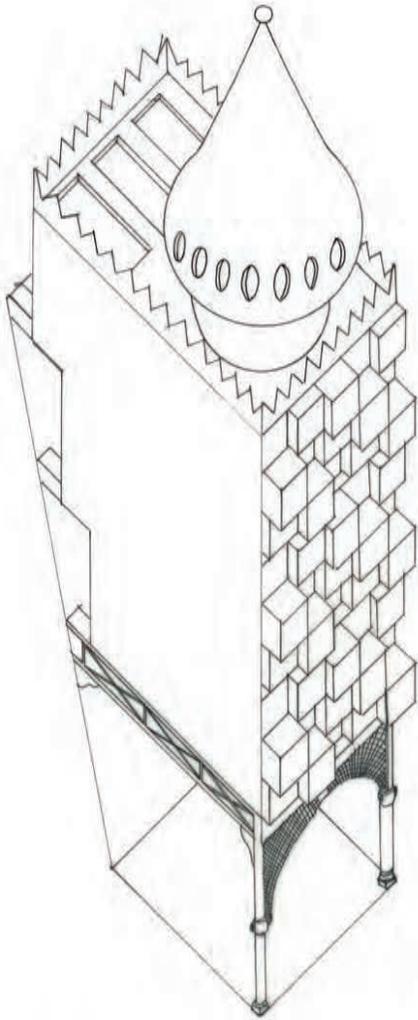


In order to further develop the idea behind this unique experience in which the users would have, I wanted all the windows to be redirected and angled, which thereby would enhance the users experience of the building.



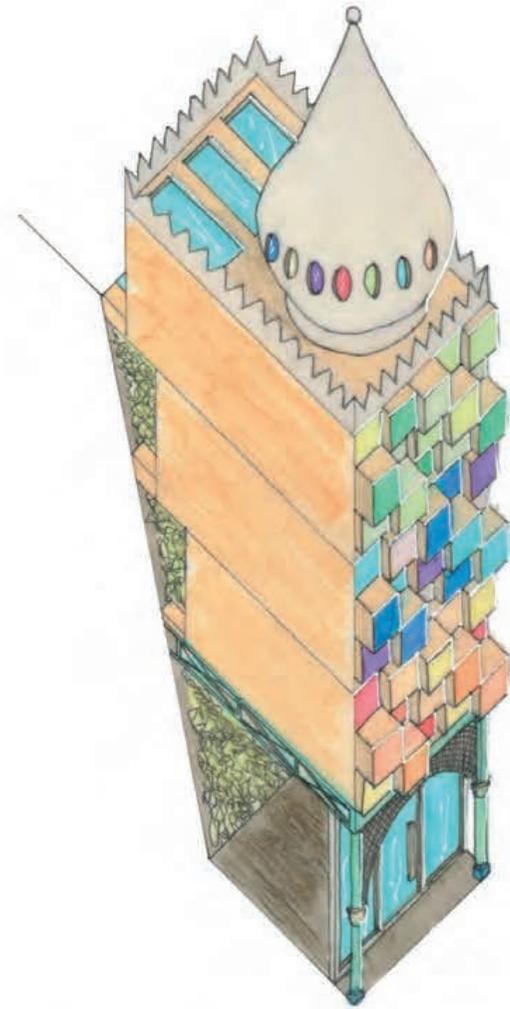
Scale 1:100
0 mm 1000 mm 2000 mm 3000 mm 4000 mm 5000 mm

1:100 SECTION



Scale 1:100
0 mm 2000 mm 4000 mm
1000 mm 3000 mm 5000 mm

1:100 AXOMETRIC DRAWING



Scale 1:100
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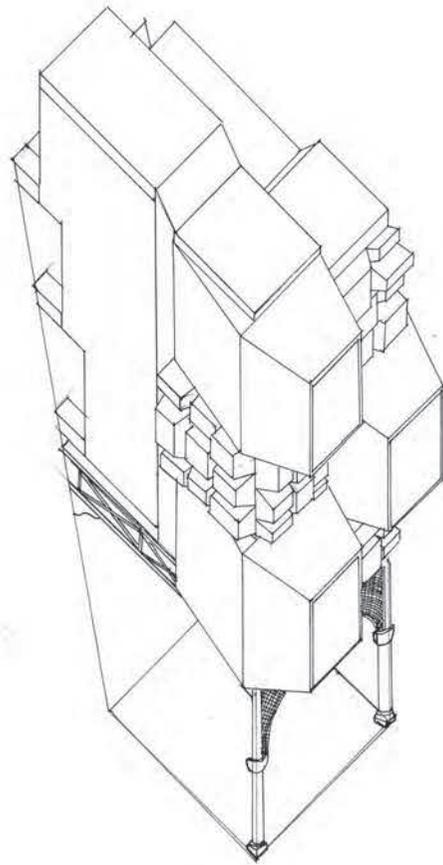
1:100 AXOMETRIC DRAWING



My earlier concepts was based around this idea of having set boundaries where people could play each game. However, in order to create a more cohesive experience for the user, I instead wanted the building to be based around no boundaries. A place where the users could play whatever they want wherever they want, contradicting the first concept. Additionally, the building was divided into smaller floors, which all fitted several people and created the possibility for people to have their own unique spaces, instead of the previous shared one.

1:100 SECTION

Scale 1:100
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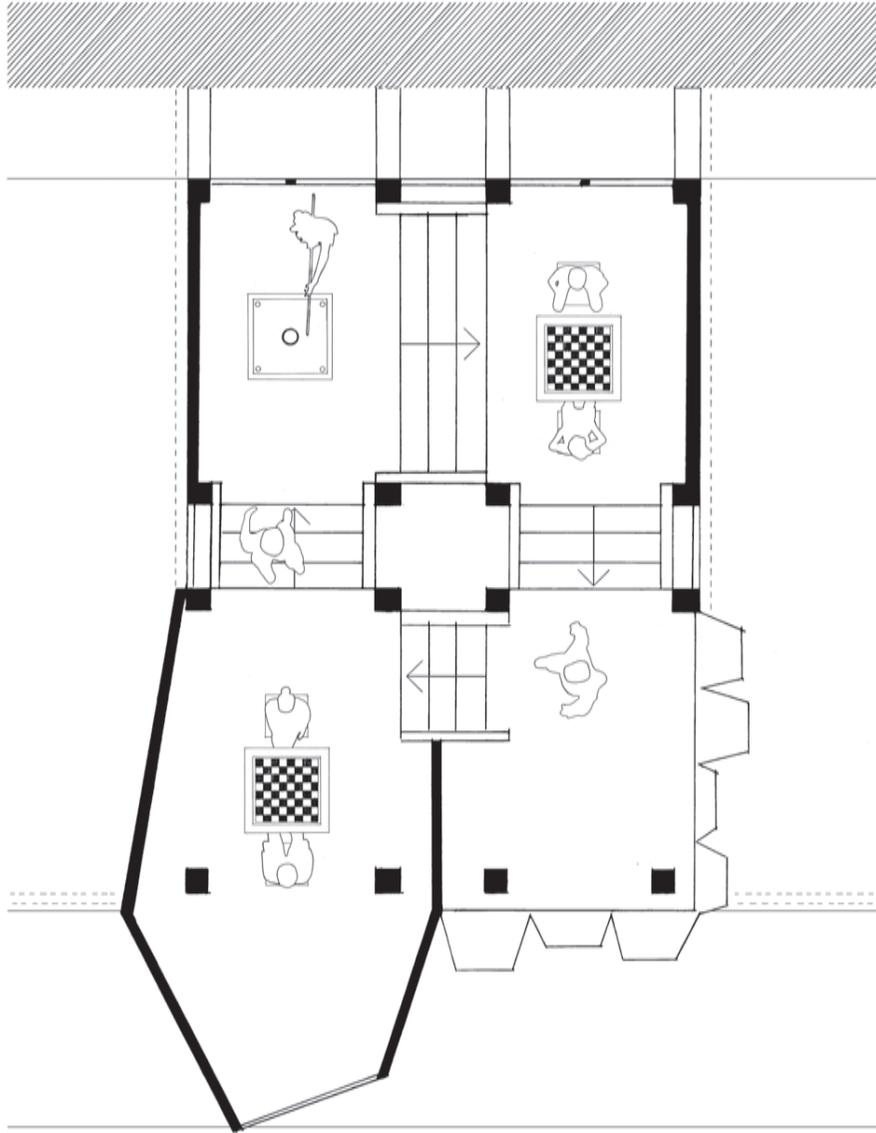


In addition to the new ideas for the building, I wanted to further evolve these concepts, and therefore added these huge window extensions to the building with the possibility to walk and play inside of.

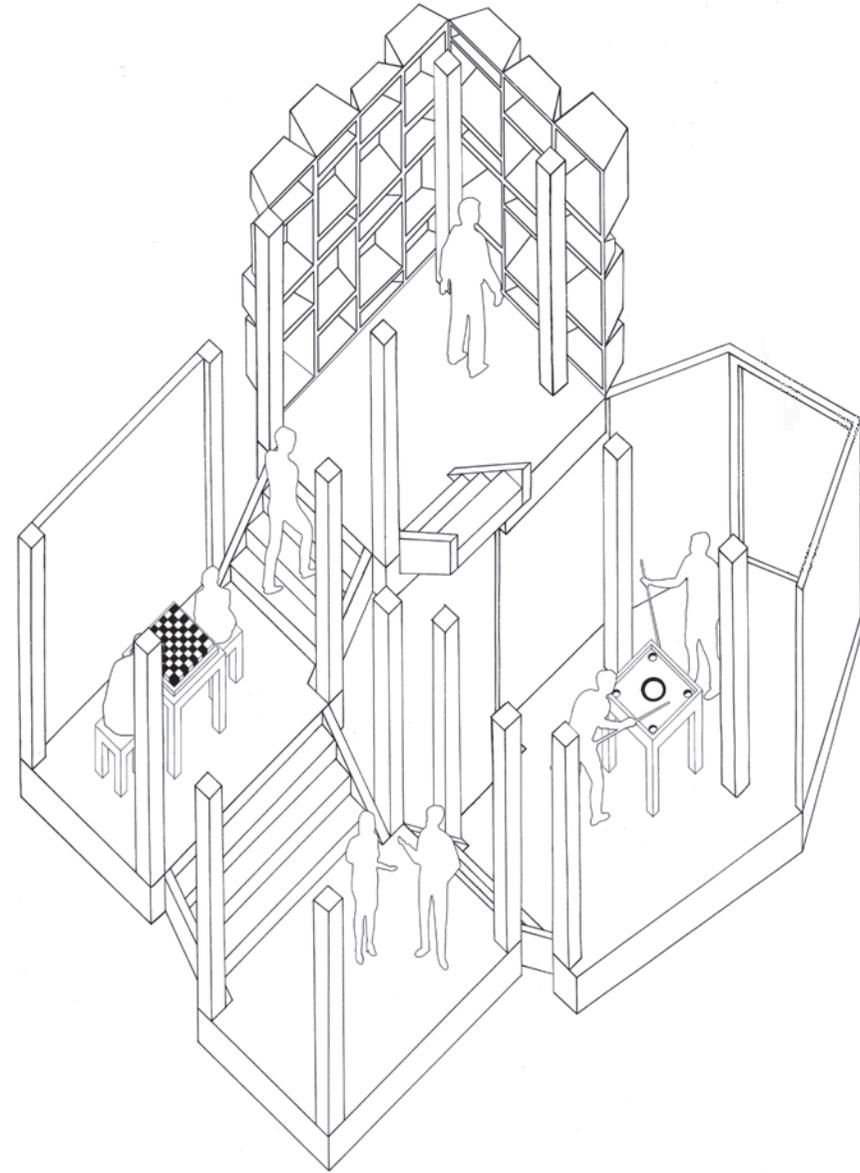
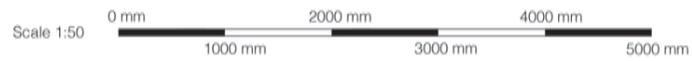
1:100 AXOMETRIC DRAWING

Scale 1:100
0 mm 2000 mm 4000 mm
1000 mm 3000 mm 5000 mm

THE FLOORPLAN



1:50 PLAN DRAWING



1:50 AXOMETRIC DRAWING



MATERIAL ANALYSIS

ENGLISH OAK



English oak is known for its high strength properties and is one of the most reliable timbers to use, superior in both its hardness and durability. In addition, a good resource to use in regards to the framework of the building like the columns and beams as well as the timber joinery. The material is mostly located in central and southern Britain, thereby making it a local resource and a good option to use for the construction. The embodied energy involved in the production and transport of the timber will additionally be relatively low due to the locality.

SWEET CHESTNUT



Sweet chestnut is a local sourced timber which can, for the most part, be found in southern England, and is therefore equivalent to the oak in its low embodied energy. In addition, the timber is also similar to the properties of oak, however it is less hard and tough, but in comparison more lightweight and easier to work. Although sweet chestnut is a good material to use in the construction aspect of the building, it has 20% lower strength properties in comparison to oak, and since the building will contain several floors, maybe not the best suited option for this purpose.

ENGLISH ELM

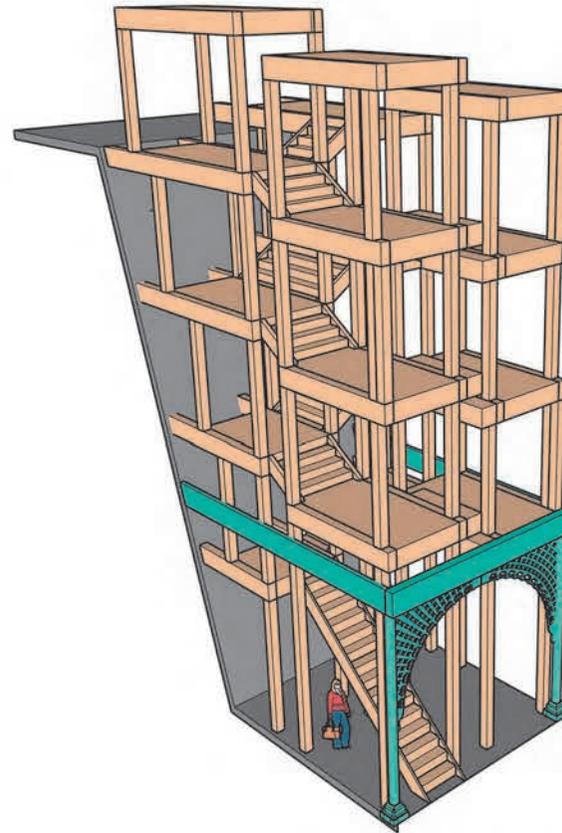


English elm is a strong and durable timber, but does only have 70% of oak's strength properties. However, the timber is still a great material to use for the construction aspect. In fact, the material is actually water resistant and has been used for boat building and water pipes for centuries. Thereby making the material one of the better fits in regards to the locality of the site, since the sea water is constantly interfering with the existing structure. However, in the past English Elm dominated the British landscape, but is now an endangered species due to the ravaged of the Dutch elm disease which started in the 1960s. Due to this, the English elm will not be a sustainable and reliable resource to use for the construction.

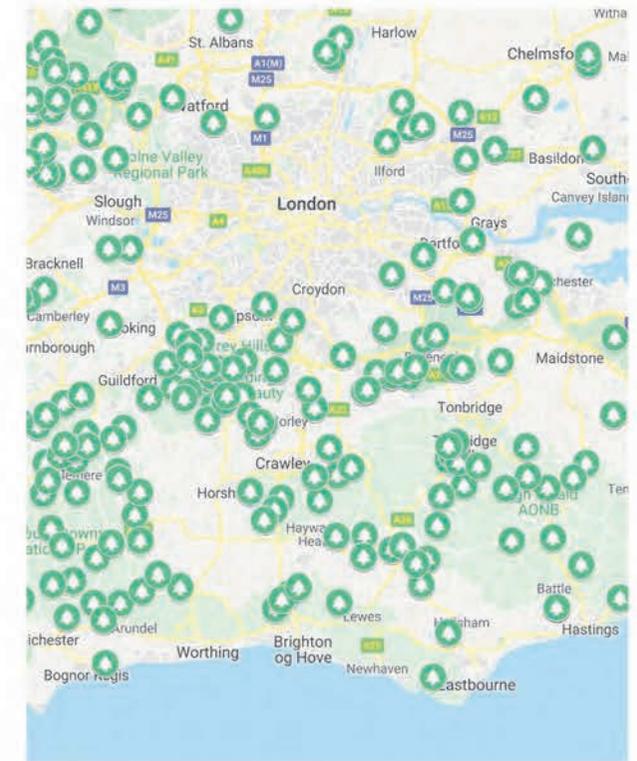
SILVER BIRCH



Silver Birch is the most common species of trees in the UK and is a medium-sized deciduous tree. The timber is a tough and heavy material and when dried, similar to oak in most strength properties. In addition, the material is superior in compression along the grain, stiffness and toughness. However, silver birch is of little commercial value in the UK due to its low height, and in comparison to Europe where the trees can grow much higher. Additionally, the material is not suitable for outside use, and is therefore mostly used for furniture, handles and toys for the inside. Thereby making this material of little use in regards to the construction itself.



The framework of the building will be constructed using local sourced timber. In addition, it will not interfere with the existing structure due to its bad condition.



A map of UK's FSC certified timber suppliers

FOREST STEWARDSHIP COUNCIL

In order to ensure that the selected timber is both a sustainable and reliable resource it needs to meet certain criteria such as: the processes of the timber production needs to be carefully documented as well as coming from a well managed source. FSC is one of the many marks which can guarantee that the timber is both sustainable and reliable, and therefore playing a huge part in deciding which sources to use. In addition, they provide a map of all the FSC certified sellers which is where the material for the construction will be selected from.

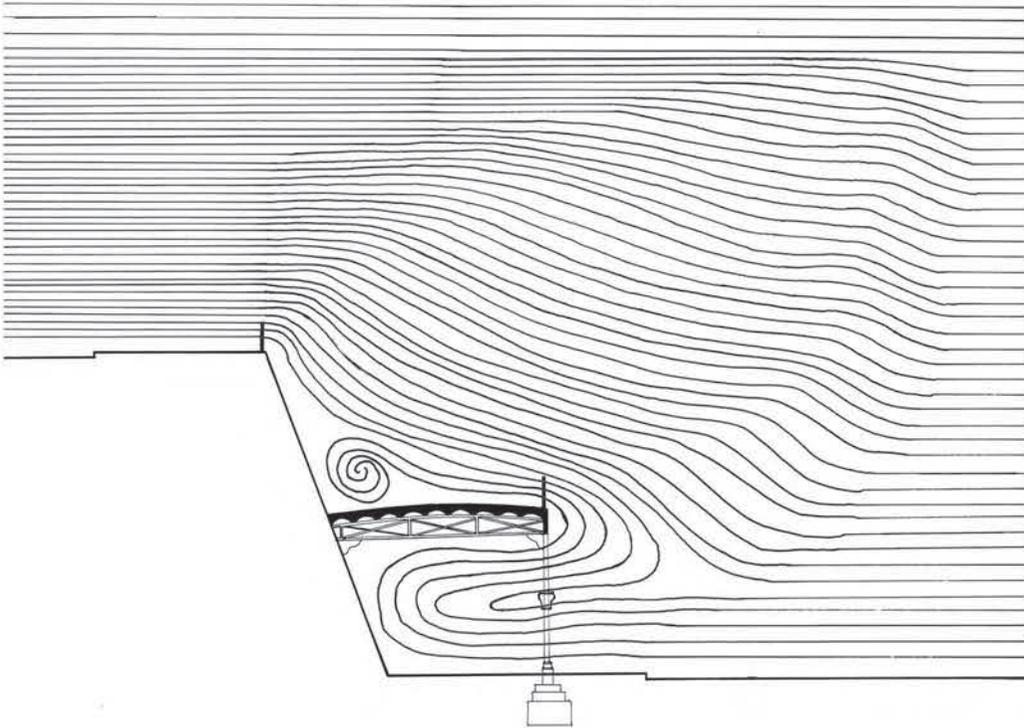
Sources:



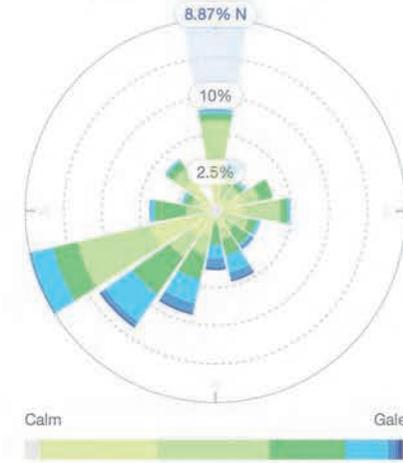
WIND ANALYSIS

As presented in these analysis, the wind will move in a normal speed until it interacts with the arces. Once that occurs, the wind will speed up and move faster. This is due to the natural incline of the location where the wind will need to clime the wall in order to continue forwards. The building will therefore have a excellent location for wind turbines, since the wind will need to clime the building and the speed will be increased, the roof will have high wind speeds, and therefore be perfect for wind turbines.

WIND ANALYSIS IN SECTION



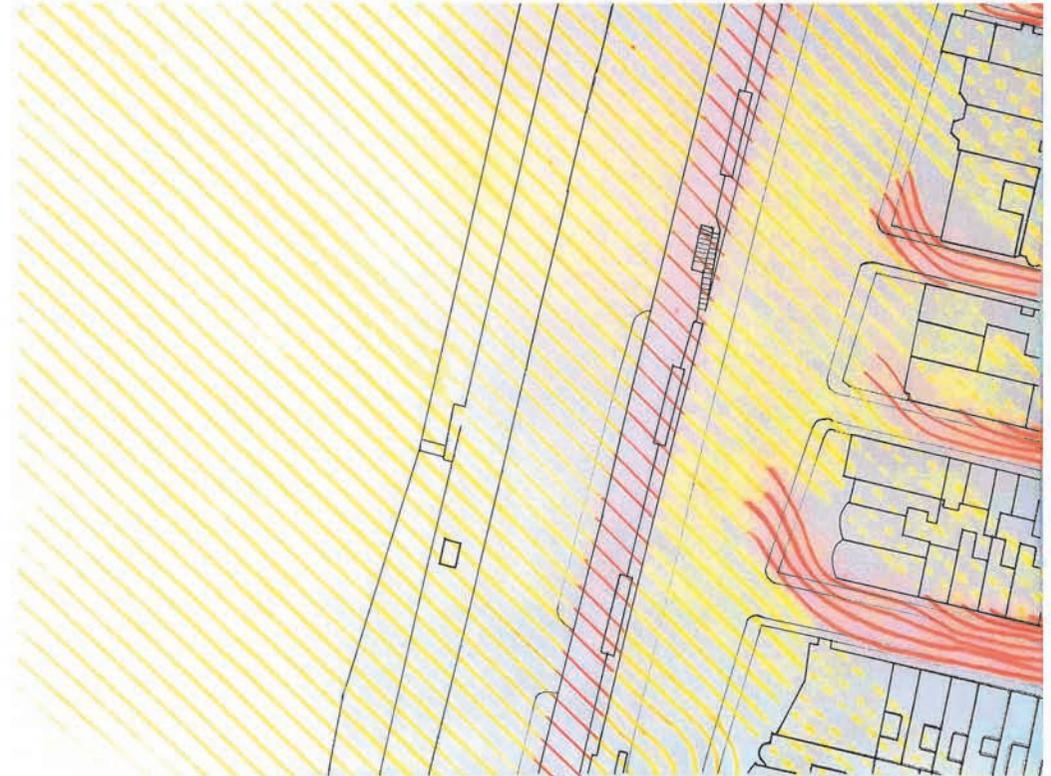
WINDROSE OF BRIGHTON



WIND ANALYSIS IN PLAN

This analysis presents how the wind interacts with the site in plan and where the wind speed is normal and fast. The direction of the wind is south-west since that's where the majority of the wind will come from in Brighton according to the wind rose.

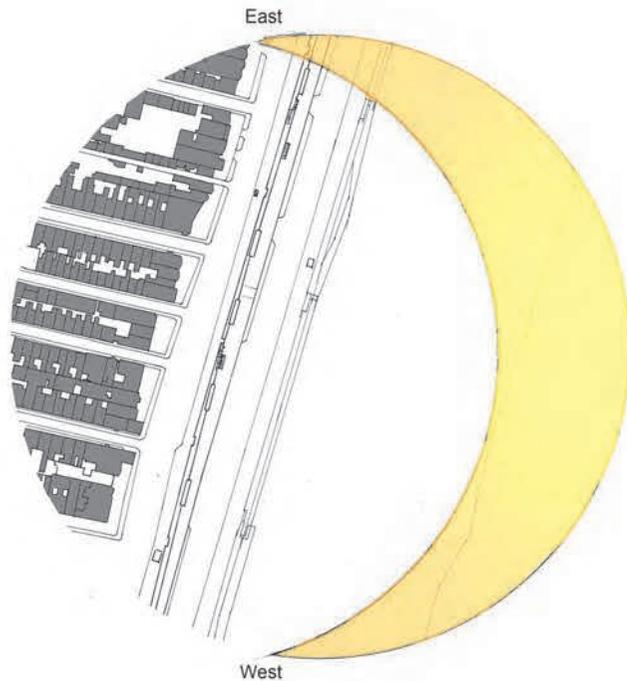
Normal wind speed (Yellow) High wind speed (Red)



SOLAR ANALYSIS

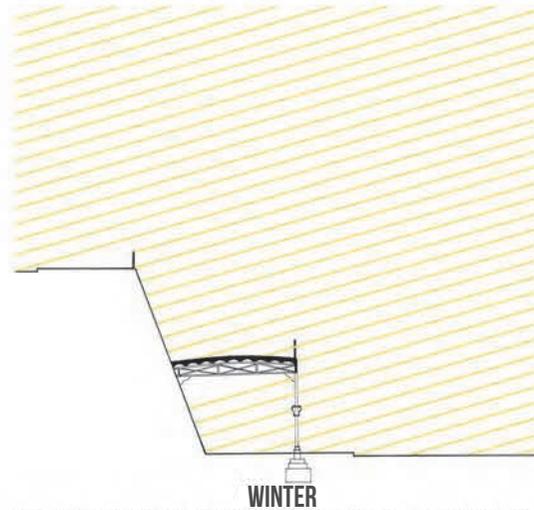
Due to the low position of the sun in the winter months, the sunlight will cause discomfort and dazzle the users of the building. This is clearly visible by studying the shadow analysis, which shows how the sun will interfere with the building at different times of day and different months. The building will therefore need preventive measures such as tinted windows and sun shading in order to reduce the impact of the sun.

In addition, due to the strong sun in the summer months, the building may be overheated during this period, and will need solutions to prevent this from occurring. The building will therefore have mechanical ventilation, which will keep the building at normal temperature.



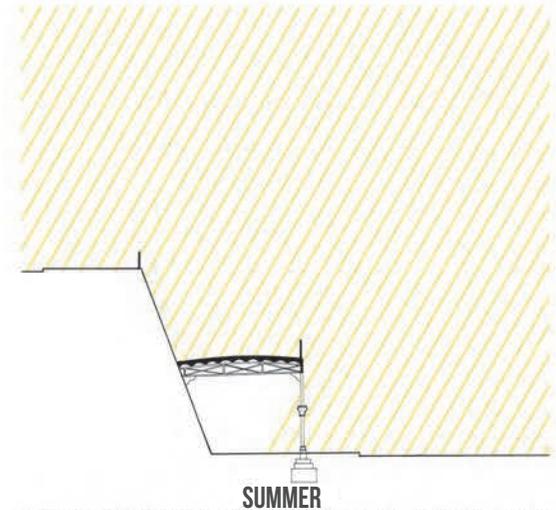
SUN PATH ANALYSIS

The sun rises in the east and sets in the west



WINTER

During the winter months the sun is at its lowest and weakest. The angle of the predicted sun streamlines above is 16 degrees, which is the lowest the sun will be.

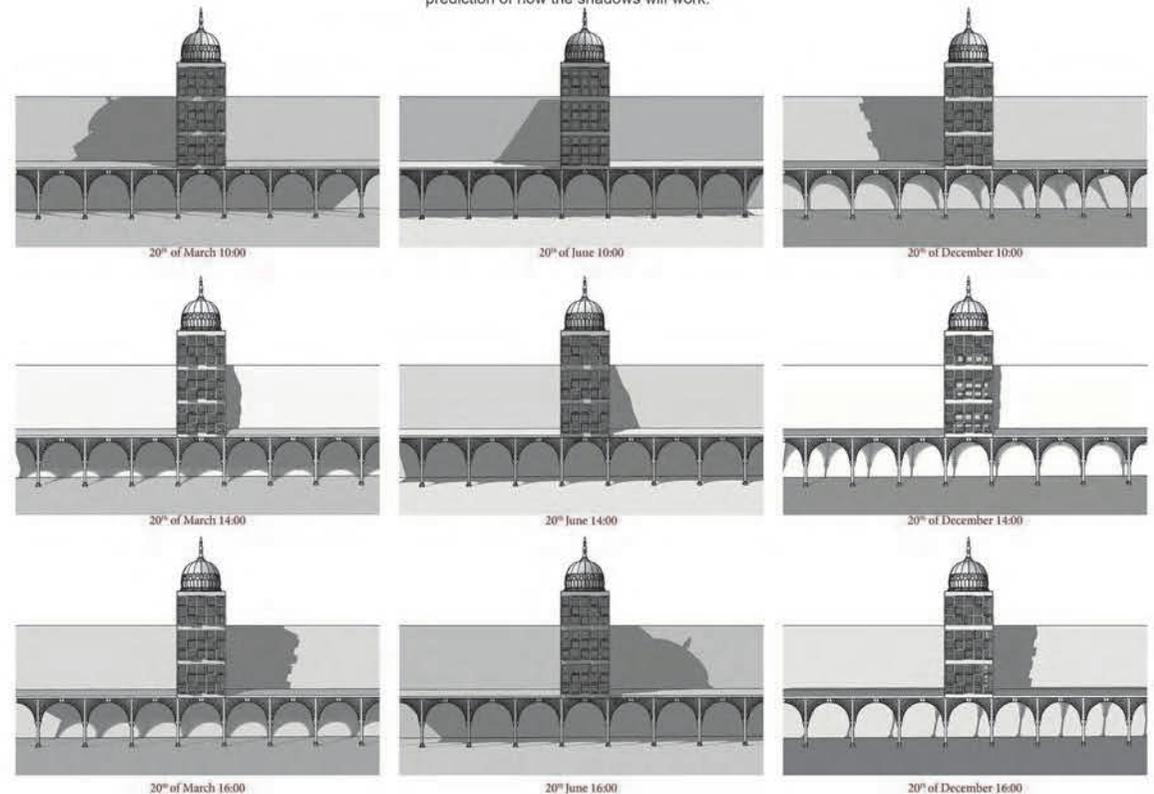


SUMMER

In the summer months the sun is at its highest and strongest. The angle of the predicted sun streamlines above is 60 degrees, which is the highest the sun will be.

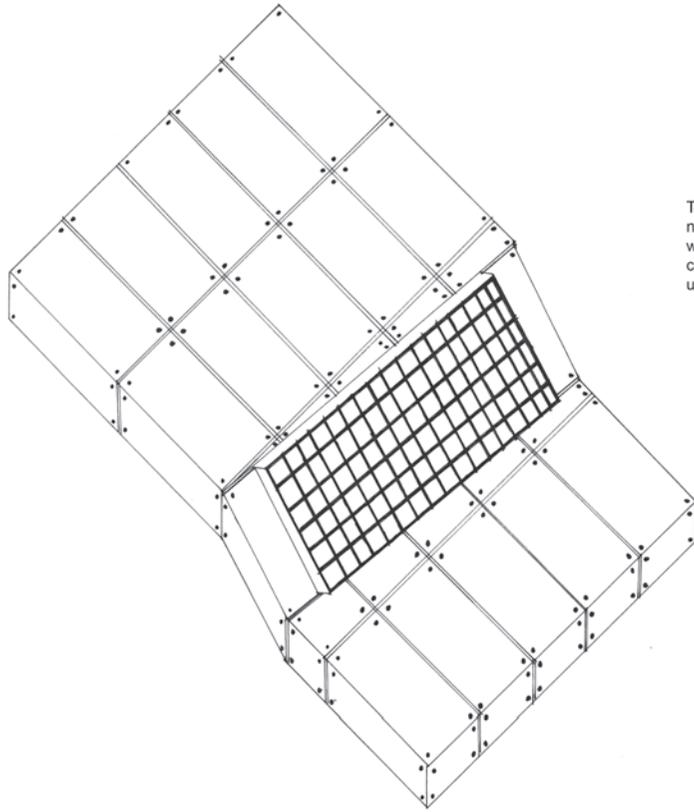
SHADOW ANALYSIS

This analysis is of one of the earlier concept, but since the new building still have somewhat the same frame, the analysis would still give an accurate prediction of how the shadows will work.



MICRO-RENEWABLE

The site has no access to electricity and the building therefore needs to be self-sufficient. Since the location both has great wind speeds and lots of sun, I wanted to analyse and compare sun panels and wind turbines upon each other, and ultimately find out which one would be the better alternative.

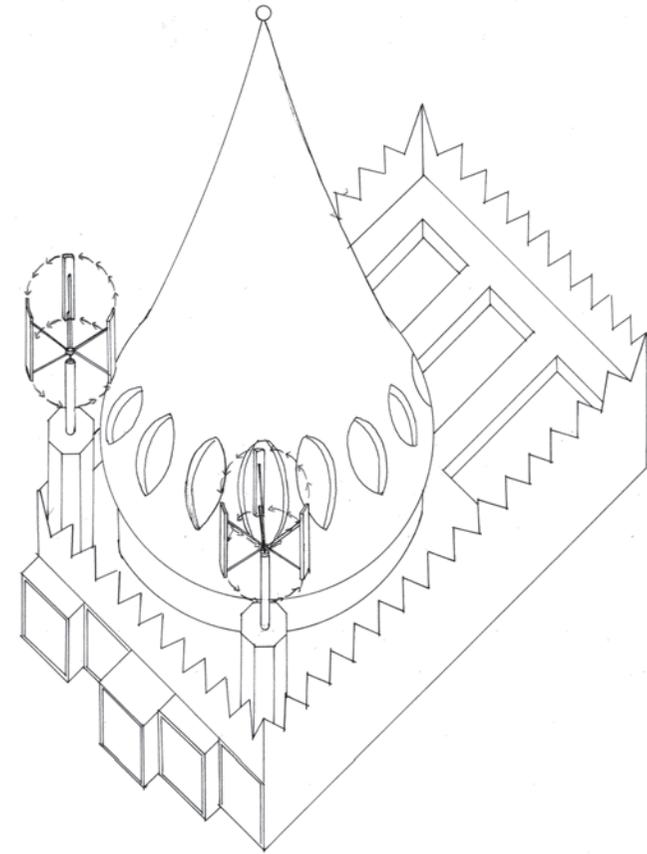


SOLAR PANELS

Solar panels are used to convert light from the sun into electricity and one of the most environmentally friendly and sustainable products to use. However, in order to be as efficient as possible, it needs to be set up correctly. In the UK, the panels need to face dead south and be tilted in a 30-40 degree angle to maximize its potential. The site is facing south-west, which means that the panels on the roof needs to be angled towards the south. In addition, the preferred angle for the panels in Brighton are 35 degrees. The drawing above demonstrates this, where the middle roof is tilted 35 degrees and angled towards the south, while the resisting roof structure is facing south-west.

Even though solar panels are considered a green product, there have been several debates on whether these panels actually are as efficient and sustainable as many people argue. Solar panels are a comprehensive product to produce and requires a lot of energy consumption in the process. However, since the panels will supply such a vast quantity of electricity during its life cycle, and reduce the demand for fossil fuel, its waste and contamination will therefore not be as damaging in return. In addition, the panels are for the most part recyclable, making it a great and sustainable alternative for the building.

An averaged sized solar panel is around 1600mm x 1000mm, which means that the roof's maximum capacity would be around 20 solar panels. Additionally, in order to be self-sufficient, a normal household requires around 16 panels, and although the building is a commercial building, the energy consumption will be comparable, and most likely lower. The building will have great insulation values due to the SIPs, and in no need for constantly heating, which will save energy. Additionally, the main electricity consumption will come from maintaining the workshop and lighting the building. In other words, it is possible for the building to be self-sufficient by utilizing solar panels.

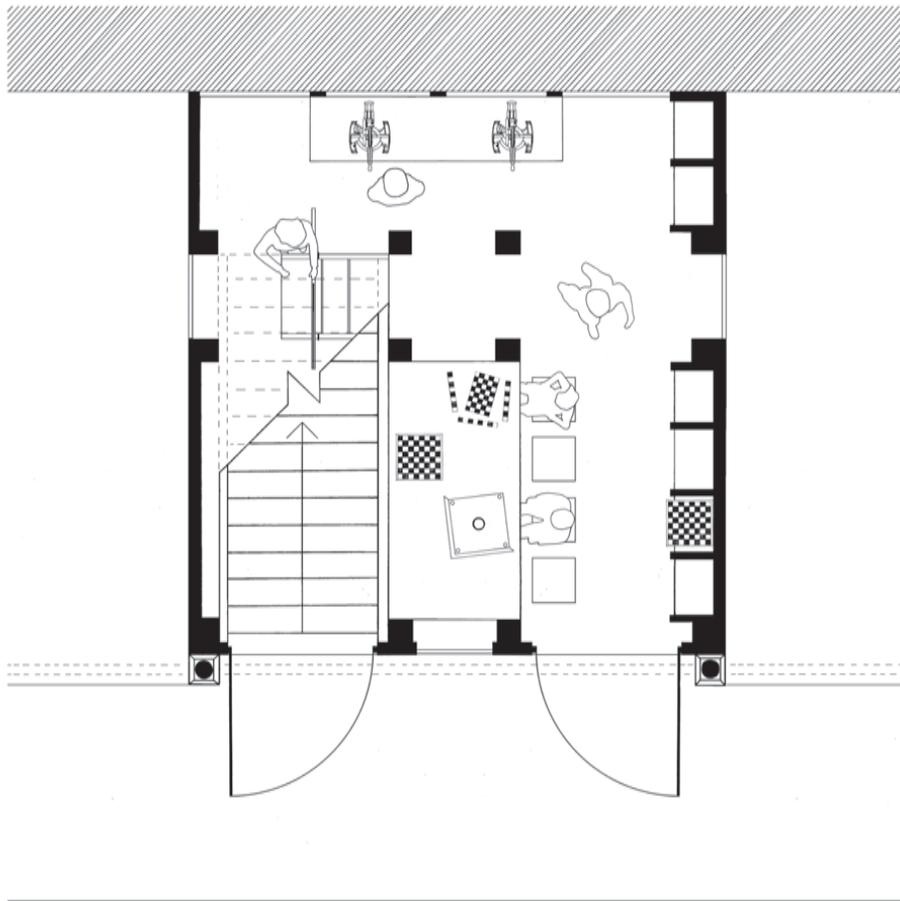


WIND TURBINES

Wind Turbines are used to convert the movement of the wind into electricity and is equally as environmentally friendly and sustainable as solar panels. However, for wind turbines to be as efficient as possible they need to be located where there is a lot of wind. Due to the terrain of the site, there is a lot of wind movement present, and wind turbines will therefore be an excellent option for self-sufficiency at site. However, the wind turbines will need to be facing south-west in order to be as effective as possible since that's where the majority of the wind will come from. In addition, since the building will contain three floors above the arc, it will be a tall construction, and therefore benefit greatly due to great wind speeds at the roof. However, the wind turbines will need to be located at the front of the roof, facing the beach, in order to benefit the most, since that's where the speed will be at its highest according to my analysis.

Wind turbines can for the most part be recycled, even though some blades tends to be more difficult to recycle than others. However, wind turbines are, as solar panels, a great alternative to fossil fuel, and considered a green product.

A vertical wind turbine tends to make a lot of noise, and since the site is located near several residences, there would be no room for a noisy wind turbine to exist. However, a horizontal one is another story, which tends to not make as much noise in comparison. The building would therefore need to use a horizontal wind turbine. For an average household to be self-sufficient, they would need a 1,5 kilowatt wind turbine. The roof contains a lot of space for several wind turbines, but the best alternative would be to place two turbines, one on each of the sides, in front of the building. By utilizing two turbines, the building should be self-sufficient. Additionally, wind turbines would be a more reliable energy source in comparison to solar panels. This is because, although Brighton has a lot of sunny days during the summer months, the rest of the year are characterized by a lot of rainy and cloudy days. However, there are no shortage of wind in Brighton, and wind turbines would therefore be a more reliable source of energy.

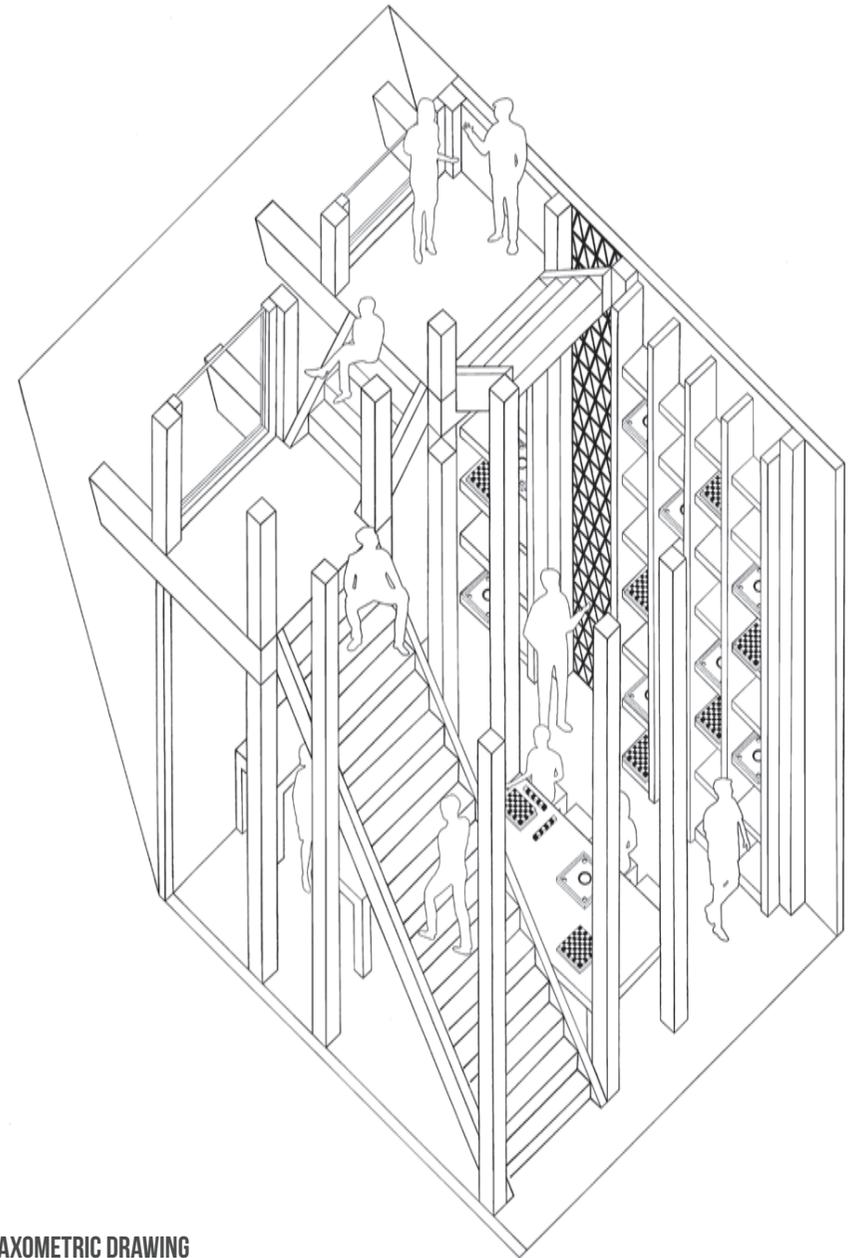


1:50 PLAN DRAWING



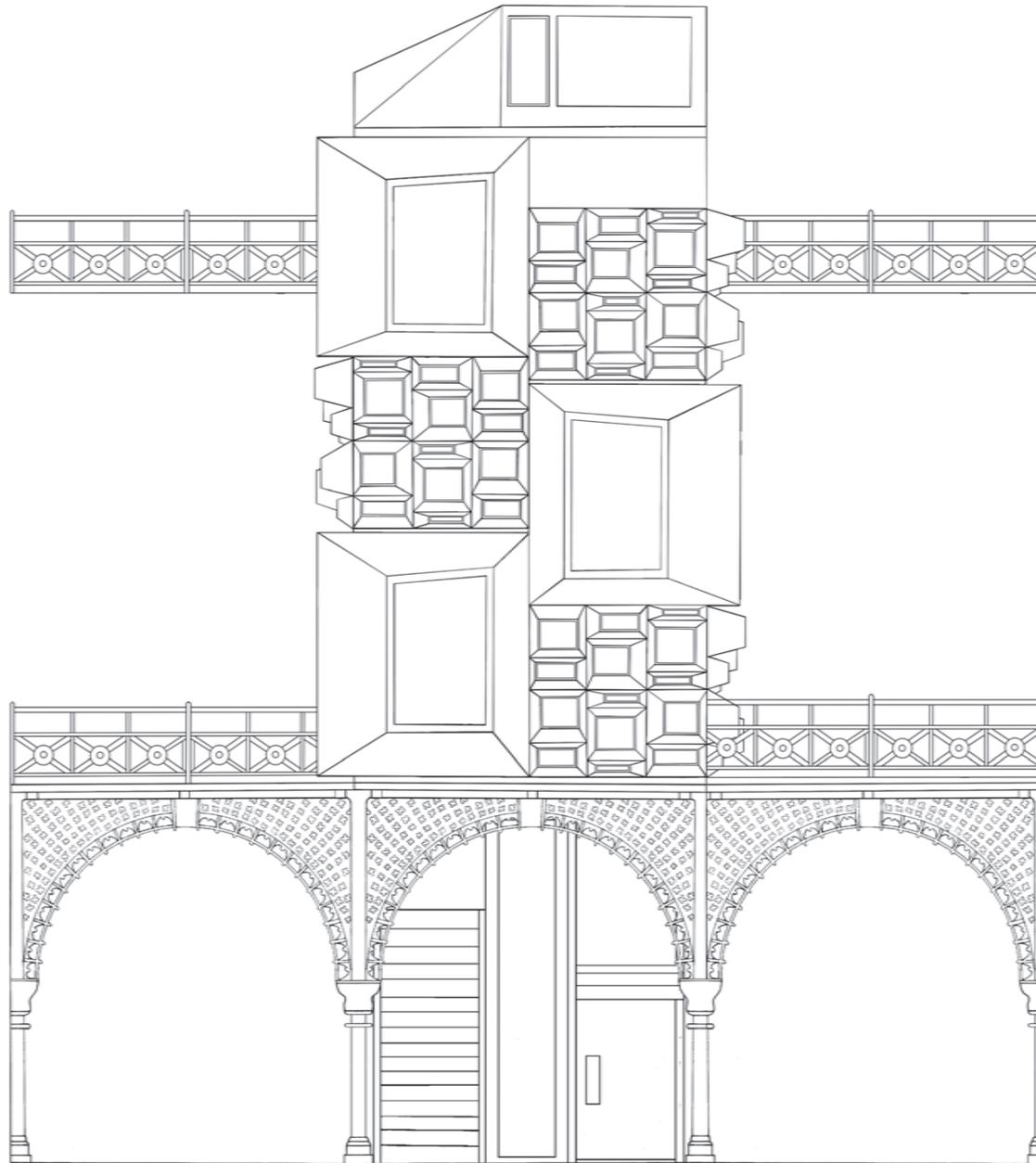
THE WORKSHOP

The idea would be to separate the workshop between a public and a private area. To prevent people from injuring themselves, the mechanical room with heavy machinery like the table saw would be private, while the rest of the workshop would remain public. The making process would thereby consist of the workers cutting the pieces required for each individual game and providing these parts to the visitors for them to put it all together, and afterwards take their newly made games upstairs and enjoy them.



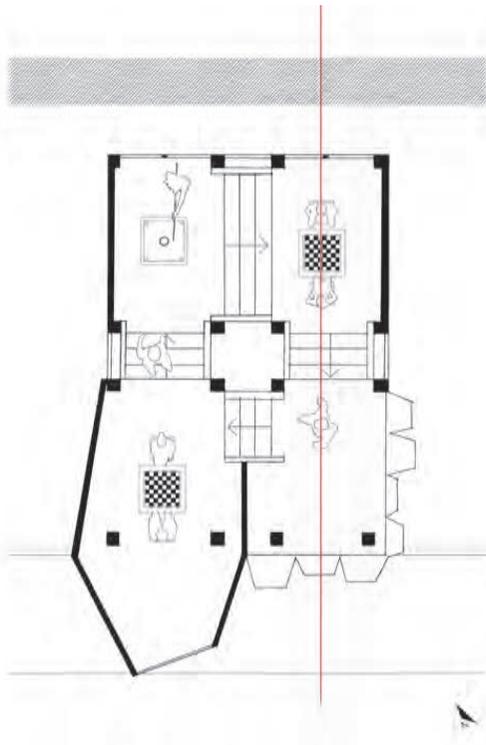
1:50 AXOMETRIC DRAWING



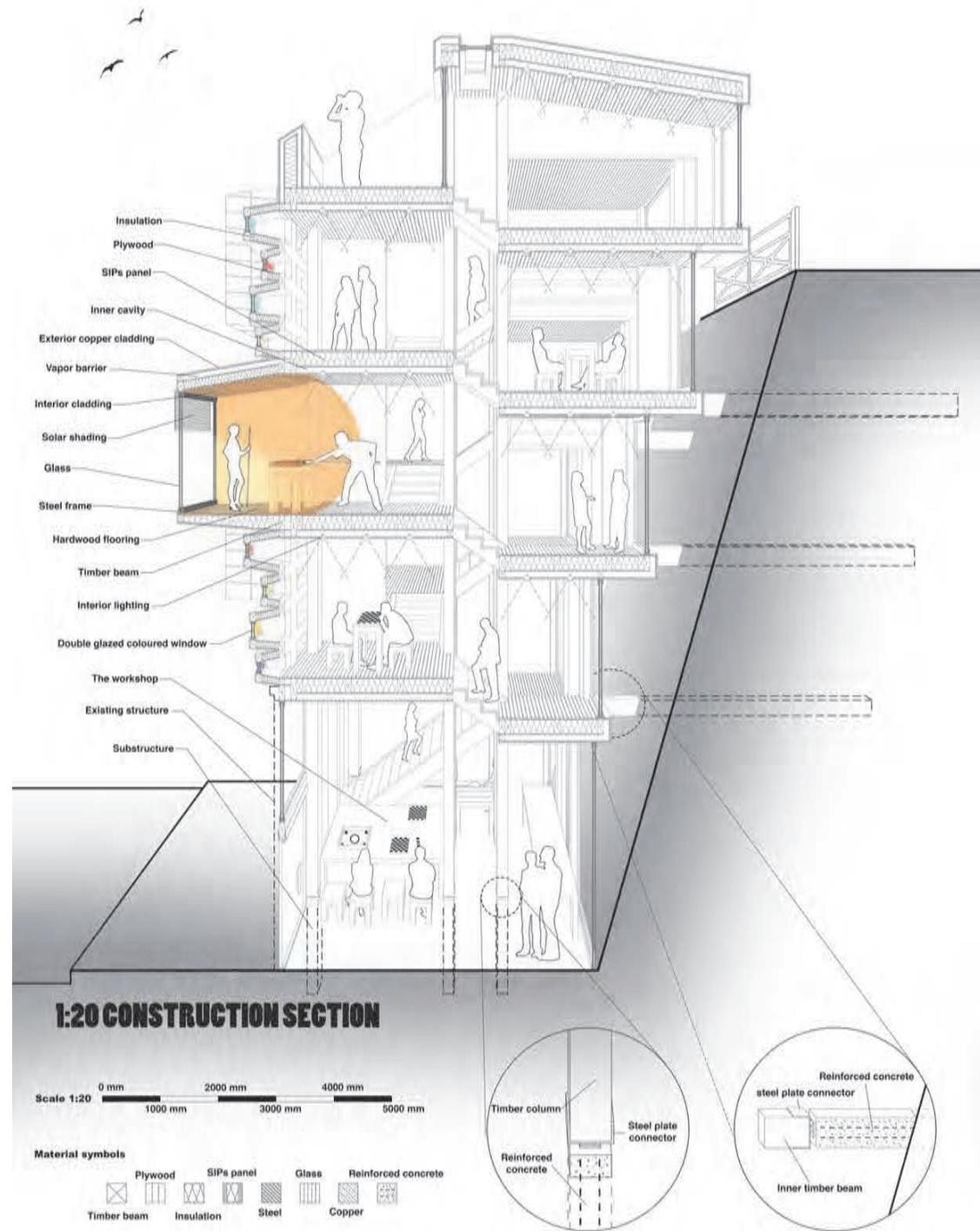


1: 50 FRONT ELEVATION

Scale 1:50
0 mm 1000 mm 2000 mm 3000 mm 4000 mm 5000 mm



PLAN DRAWING OF SECTION CUT





COLLAGE