THE ELOWEN PROJECT

Can access to sports therapy spaces, support recovery during the wait time for counselling?

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MARCH 2

STUDIO TWO
PRAXIS

ELOWEN

***(noun)* [eh-LOH-en]**

1. Elm Tree [from Cornish Origin, *elew*]

Symbolism:
1. implies a connection to nature and a sense of grace
2. wisdom, protection, and resilience.

Acknowledgement

I would like to thank the following people for their help and contribution to my project:

My tutors, Chris Maloney and Debapriya Chakrabarti, for their time and support during this project.

The B.15 workshop team during my model making experiments.

All guest architects, engineers and landscape designers who visited and gave their advice and input to my project.

The masters of engineering students at University of Manchester, Zach Addison and Henry Macusland for their advice and 3d printing expertise.

My piers, current and past, for their support, ideas and a great final year!

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Studio One

Summary

Counselling waiting lists

66.5%

(Baker and Kirk-Wade, 2025)

Of those referred to talking therapies for depression and anxiety in 2022/23, 66.5% were women
The number of women referred outnumbered men in every local area of England. (Baker and Kirk-Wade, 2025)

In 2020, the BBC reported that over 6,000 people were on a waiting list for Rape Crisis services in England and Wales.

(BBC News, 2020)

6000 People

14,000 People

(Smith, 2023)

In 2023, this figure had risen and Jayne Butler, chief executive of Rape Crisis, claimed there was now 14,000 people on the waiting lists

1 year

SARC:
Sexual Assault and Rape Clinic, Women and Children only

For women waiting for counselling through sarc clinics, it could be up to a year wait.

St Mary's Centre
Sexual Assault Referral Centre

For Trafford, The SARC centre to use is ST Mary's for the entire Greater Manchester area

St Mary's Centre has an average wait time of 6 months for accessing counselling after the initial assessment

6 months

The hypothesis:
The use of sport as a therapy to help mental health and wellbeing

Location:
In Suburban Environments such as Trafford

Can access to sports therapy spaces, support recovery during the wait time for counselling?

Through the use of the space and applying Biophillic principles to design

The User:
Women on waiting lists for therapy/ counselling

The Problem:
Long waiting times being detrimental on mental health

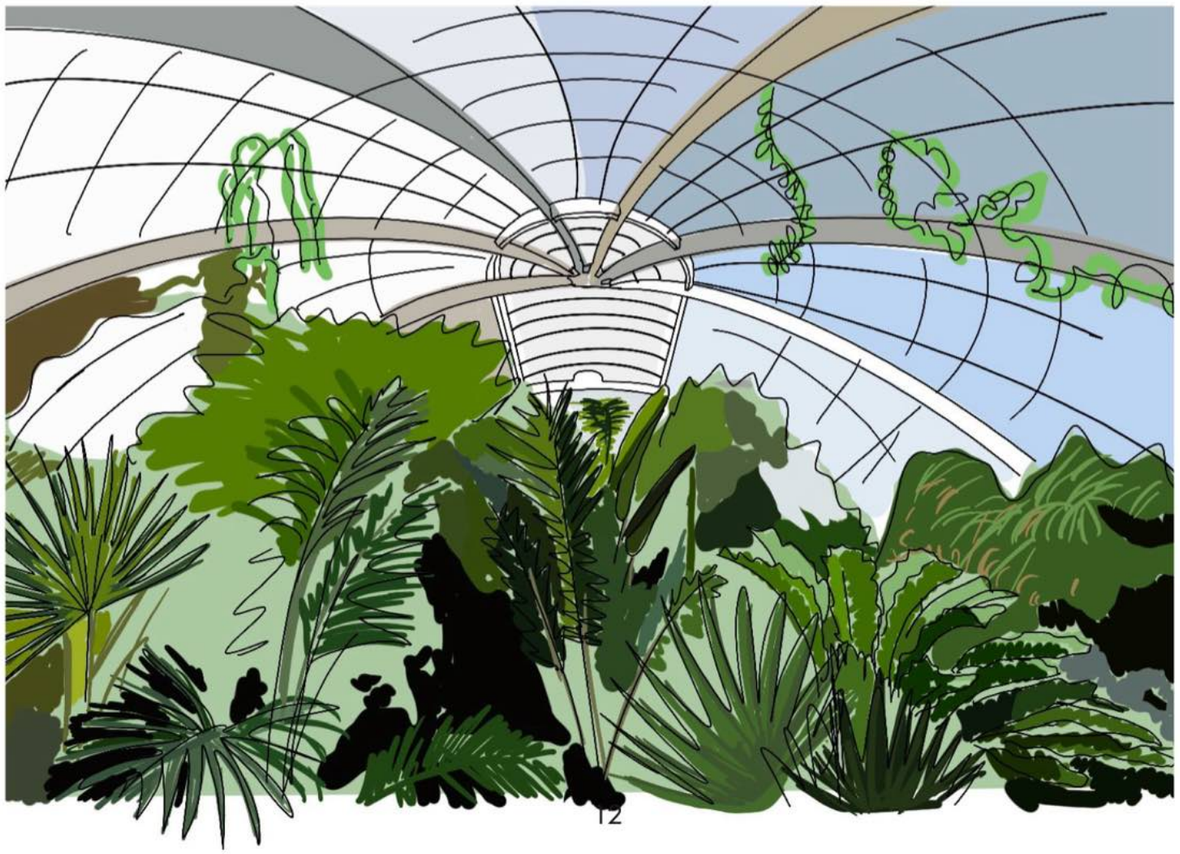
Brief

Sport as a healthcare centre for women on sarc counselling wait lists

A space for light movement sports to start the sport journey

Provide social space for people going through similar things of waiting to talk to each other and vent

Biophillic design to bring Trafford leisure back to its botanical history



Sustainability and the Environment

What is the impact of my concept idea on the environment?
What are my initial sustainable design objectives?

Potential for increase in energy consumption:

- use of lighting
- use of electrics
- ventilation

Can I solve this through passive lighting and ventilation, increasing the sunlight?

Addition of green space

Increasing biodiversity

Improve air quality of the area by providing more green space

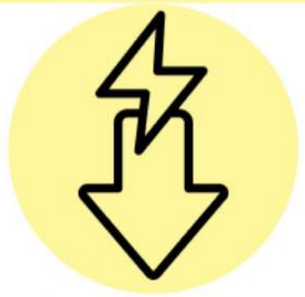
Water run off effects and the canal?

Potential for more traffic to the site:

- Increase emissions from cars
- Increase sound pollution for surrounding homes
- Increase light pollution

3 main sustainability goals for S2&3

The use of locally sourced materials where possible



The use of passive techniques to reduce energy consumption

Connect the users back to nature through the materials and design

The UN Sustainability Goals:

These goals are an action for:
- People
- Planet
- Prosperity
- Peace
- Prosperity
- Peace
- Partnership

The SDGs are a shared blue-print for improving human well-being and protecting the Earth.

Good Health and Well-Being:

The main element behind my project is improving mental health and wellbeing as well as physical fitness. This aligns with sustainability goal 3.

Reduced Inequalities:

The space is designed for those who suffer with mental illness and require help. I will be looking at what is most beneficial for their well beings, and creating a space that is welcoming. This can also include those with physical disabilities.

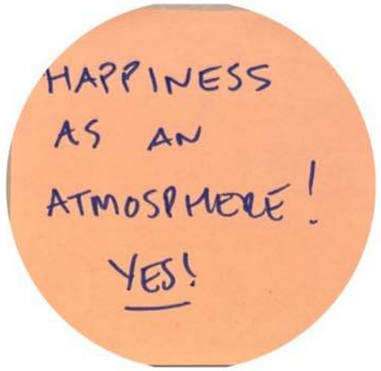
Gender Equality:

Focusing on female support and providing a space for women to feel safe will reduce the current inequality of leisure centres. I will also look at how to design for a woman rather than for a man for these spaces.

Sustainable cities and communities:

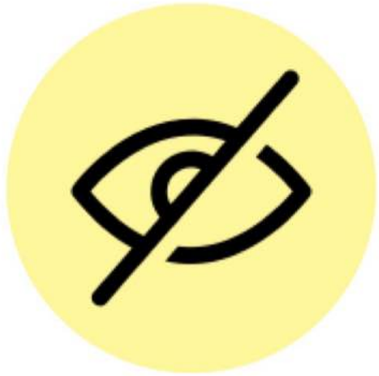
The space will use Biophillic principles to create a sustainable space within the local community. The site itself, will create communities from those who want to socialise and be with others who are in the same situation as them

Plan for studio 2



Emotions and sketching workshop

Movement

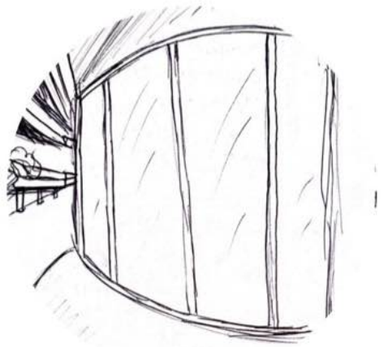


Privacy

Play

Resolution

Feasibility precedent studies



Silent Exhibition

External Tutorial

Review Presentation

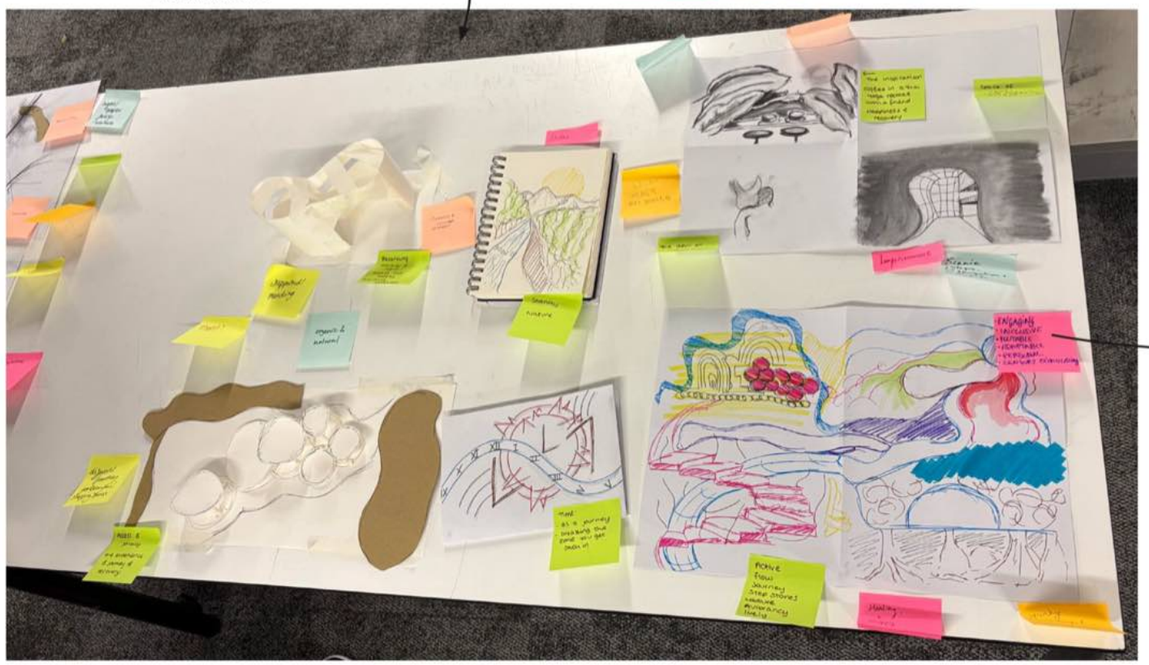
Context

Drawing Workshop

What we did:
In this workshop we explored the feeling and emotions we wanted our building to portray to visitors, whilst also using different means to physically draw and model rather than using digital means.

Word map of emotions to represent

My Work in Silent Exhibition



Post It Note Comments:

The aim of task:

To represent the emotions on how we wanted our spaces to make people feel, drawing conceptually and avoiding the literal representations. This would help define a brief in a sense of emotions and have a deeper understanding of what our spaces may provide to the community

What I took from the task:

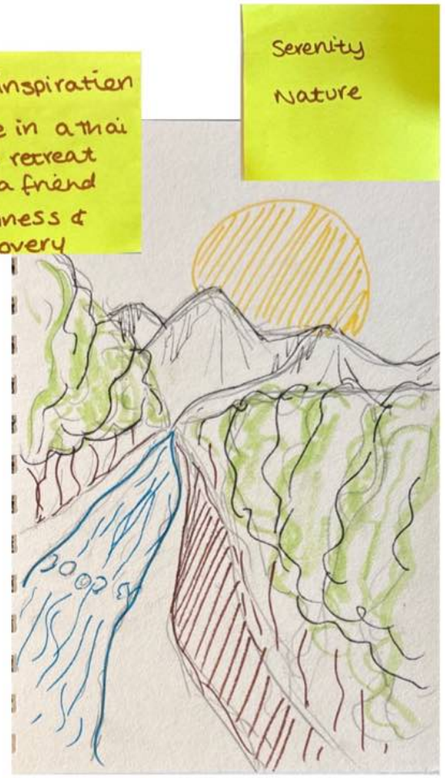
I found not drawing an object or literal space, and instead drawing feelings, very hard due to the way our brains make us think functionally about architecture. It did however make me think about how my user may be feeling going into the space after a trauma and how I want my space to contrast these negative thoughts.

Drawing Workshop Key Drawings

Koh Toa, Thailand, Charcoal drawing

To start with, I thought of places that made me feel calm, peaceful and rested. These were literal representations of those emotions for me.

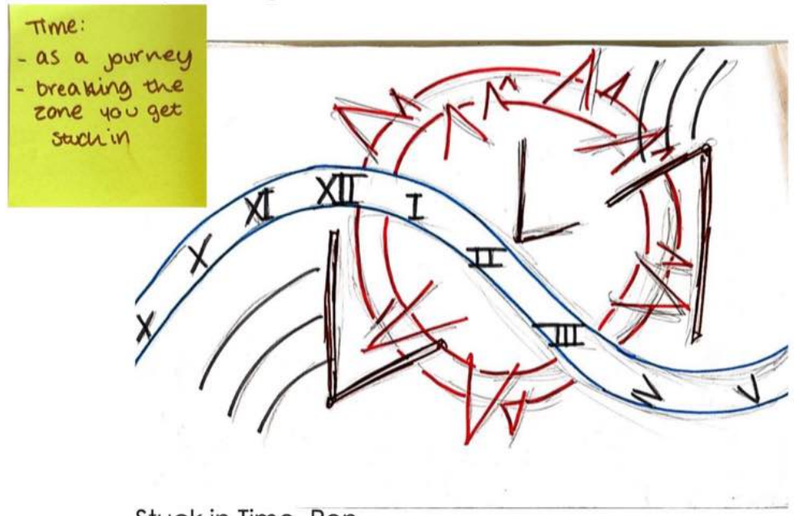
I then drew, nothing in particular, but just feeling those emotions, to create this abstract piece with flowing lines and bright colours.



Mountain Scape, Pen and highlighter

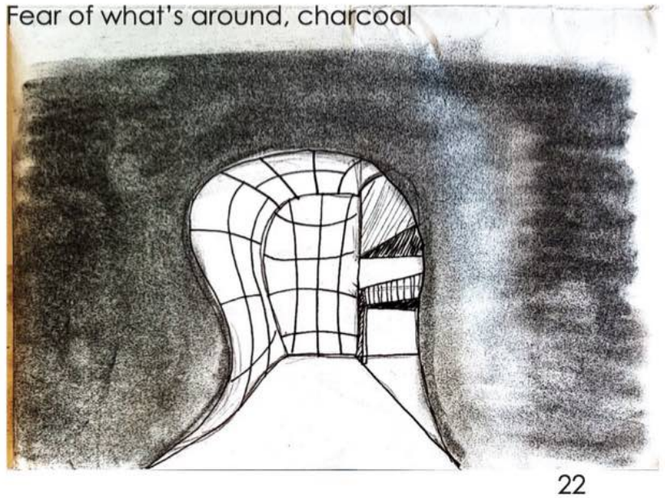
Making concept models helps me to think spatially of what these emotions have got my inspired by, for instance I wanted to create levels and excitement throughout my building

This model was to think about how a space could feel to someone who has experienced trauma, closed off, trapped, but also private. Light can get into the building whilst keeping peoples stares out.



Stuck in Time, Pen

Alone with the dark thoughts, pen



Fear of what's around, charcoal

Following the model, I continued to think about how the people coming into my design would be feeling after experiencing a trauma.

Stuck in time, just waiting for help.

Scared about what's around them, new places, what's around the corner.

Key emotions and Drivers of the Project

Based on the workshop, I wanted to explore the emotions that can be felt by someone experiencing trauma and how to counteract these.

The feelings that someone experiencing trauma may be facing based on a personal experience.

Stuck

Scared

Alone

With our bodies and minds connected, one of the best things we can do for our mental health is regular movement, (mental health foundation, 2026)

"For too long women have internalised the belief that our bodies are things to be looked at- instead of lived in" (Given, 2024)

If they feel stuck, I want them to move

If they feel scared, I want them to feel safe

If they feel alone, I want to give them a community

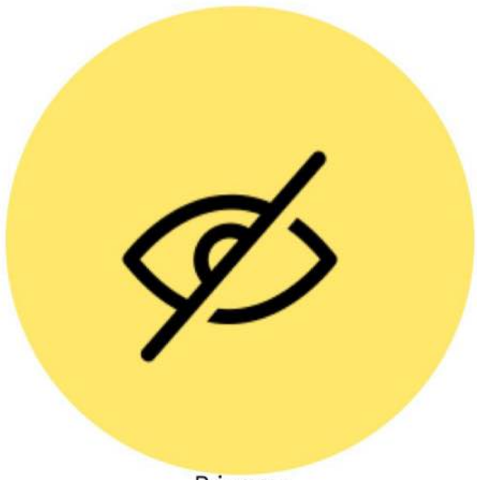
Why is play important for adults?

- Boosts your wellbeing
- Helps cope with stress
- Boosts your physical health
- Builds relationships and connections

(Des Marais, 2012)

My drivers for this project to focus on and inspire my design process

Movement



Privacy

Play

I will use these drivers throughout my project, to direct my research and design ideas. I will focus on them in sections in this portfolio going forward.

Feasibility through precedent study

Focusing on the drivers discovered, I will look into precedents that have shown examples of how this could be feasible in my space.

Privacy

Inspiration for- Zoning and Landscape

Bukit Canberra, Singapore
Ramboll Studio Dreiseitl

The use of zoning in the design to allow people to experience nature in different ways as well as allow for different types of habitats and vegetation

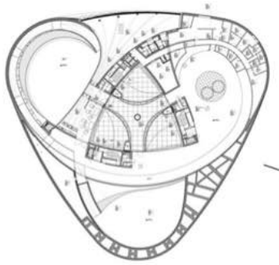
Play

Inspiration for- Textiles and play in a space

Children health and support centre, Kitakami, Japan

The waiting area is designed to be active, using textiles and ropes to soften the space and allow for flexibility

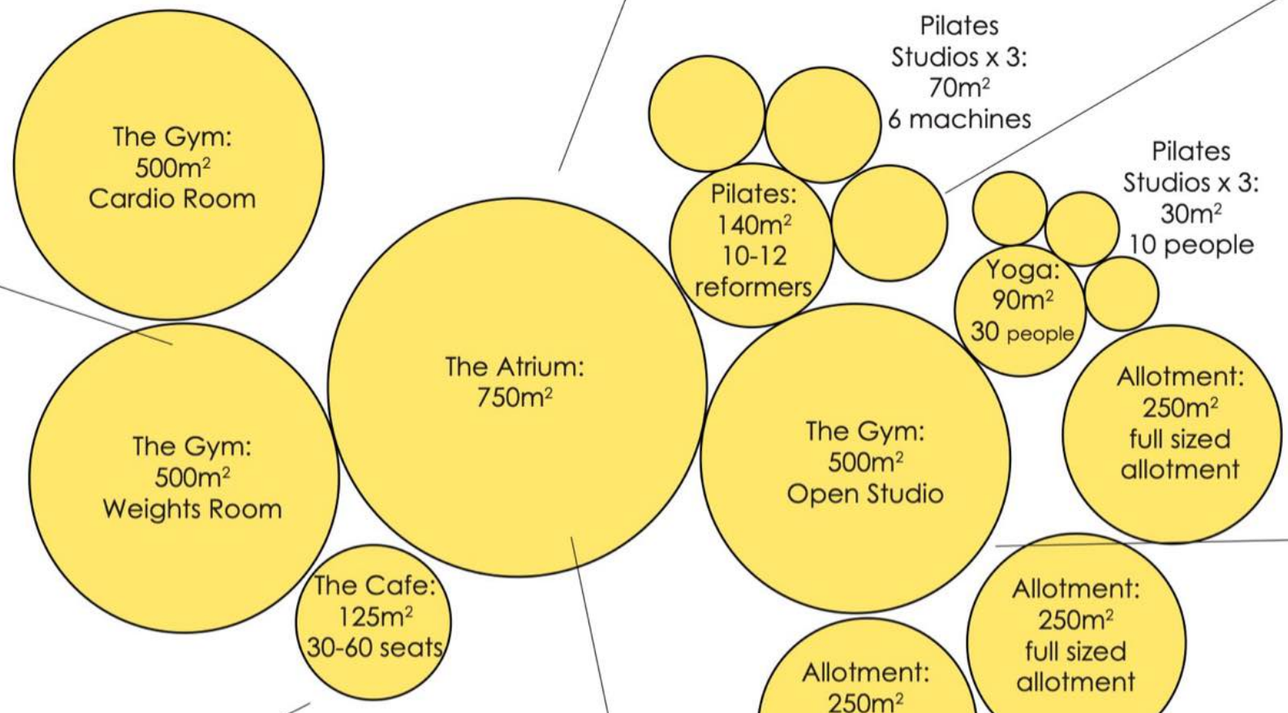
Movement



Inspiration for- Movement

Mercedes Benz museum, Stuttgart
Unstudios, 2006

Featuring a double helix structure inspired by a clover leaf pattern. No straight walls to allow for a flowing space.



Areas of required spaces:
Scale @ 1:500

Movement

Inspiration for- Flow, movement and accessibility

Enabling Village, Singapore
Salad Dressing

Inclusive design to heal and strengthen, focusing on accessibility and bringing people back to nature

Play

Inspiration for- The form

Zaha Hadids Style

Not a particular space, but inspiration by the style of flowing forms often seen in Zaha Hadids work.

Privacy

Inspiration for- The Atrium

Malpensa Hospital, Italy
Zaha Hadid Architects, 2025-30

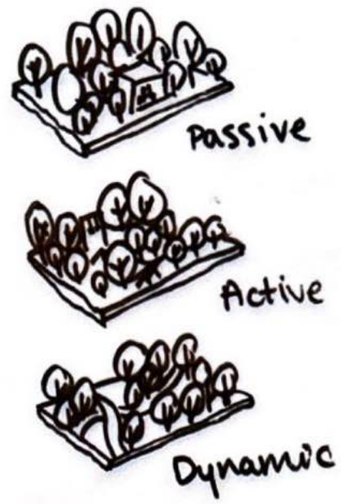
Atrium use of light, interior comfort, materials such as textiles and prefabricated construction technique

Bukit Canberra, Singapore
Ramboll Studio Dreiseitl

The use of zoning in the design to allow people to experience nature in different ways as well as allow for different types of habitats and vegetation

A sports and community hub in a 12 hectare wooded site

The trees act as a barrier to hide the site, in line with what I want to introduce into my Site. This is helped by the use of zoning for plants and where people can walk or not access.



The zoning and coverage of the trees works in the Singapore climate, due to it's high humidity and plentiful rainfall. The types of trees and foliage is also different to that we can find in the UK. If we were to implement a similar zone planting system here or want the same coverage and privacy, UK native trees would be needed and an understanding of what the space will look in the multiple seasons.

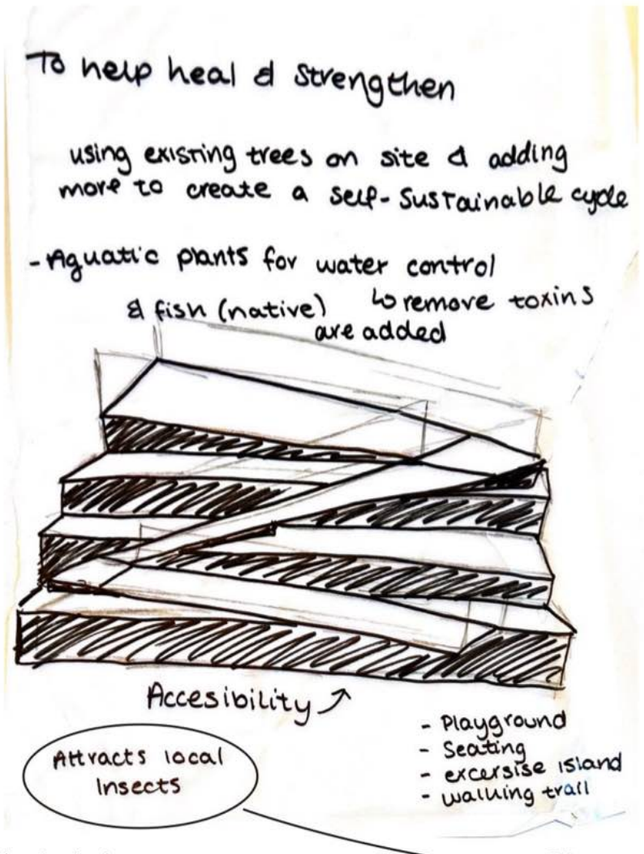
	Singapore	**UK**
Average Rainfall per Yr	2,200 mm	1,200mm
Seasons	2 monsoon seasons	4 seasons
Hottest Yr Temp Degrees Celsius	33	23
Lowest Yr temp Degrees Celsius	24	2
Average Humidity	82%	50%
Foliage and Trees	- Angsana -Chengal Pasir -Tembusu -Raintree	-Oak - Silver Birch - Ash

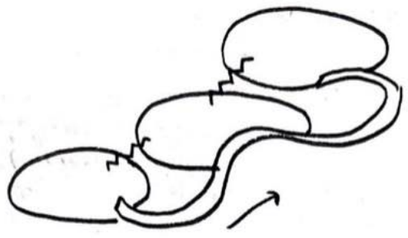
Enabling Village, Singapore
Salad Dressing

Inclusive design to heal and strengthen, focusing on accessibility and bringing people back to nature

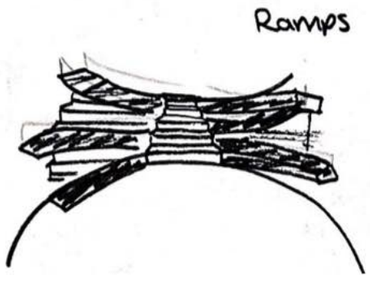
Inclusive bio-diverse oasis, providing garden and wondering spaces.

The designs in this landscape were built for accessibility, something I will explore further. As the type of movement will be effected by someone's mobility, I will want to integrate ways to make the space accessible as well as different ways to explore the space and get around.

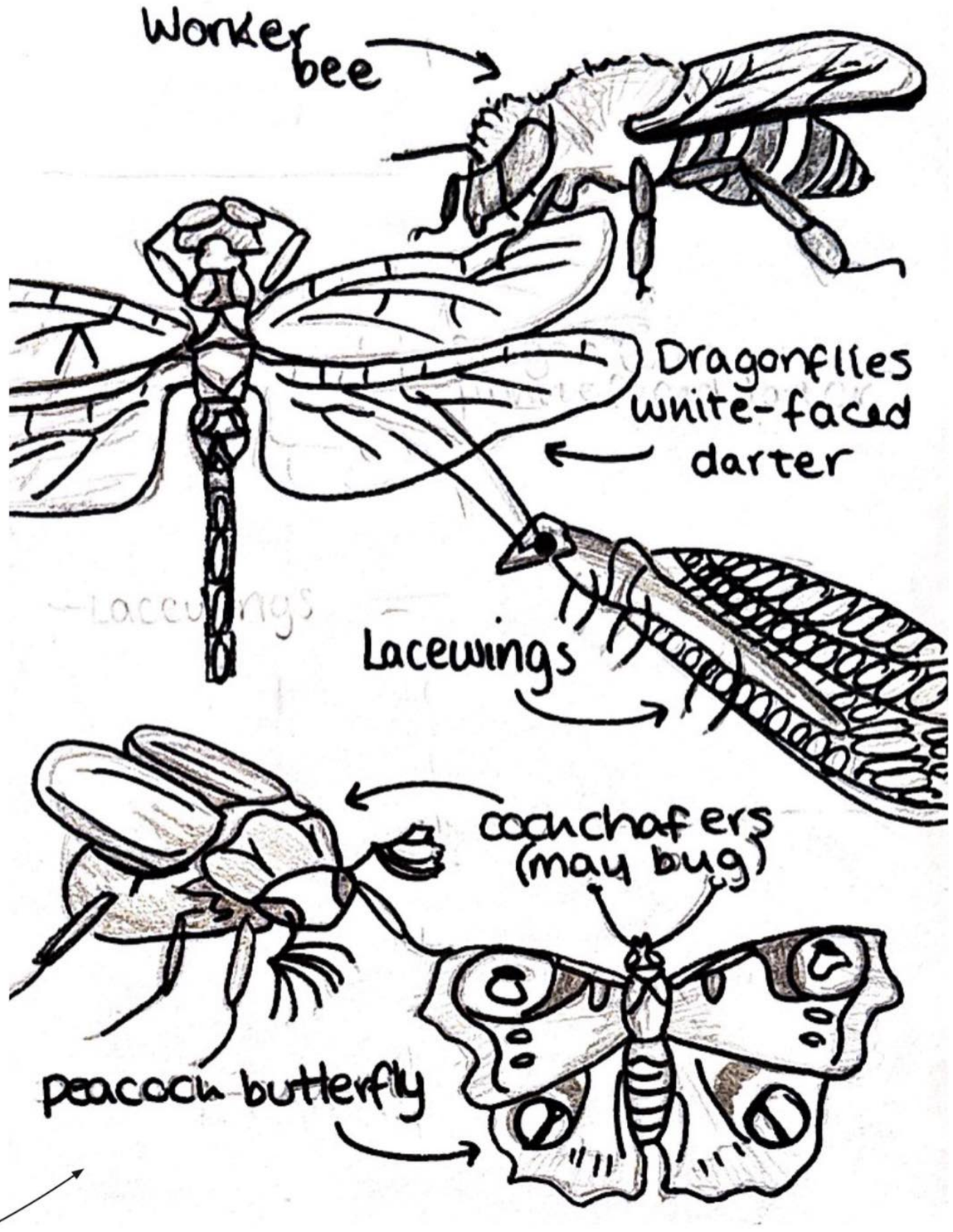




Accesibility



Biodiversity in Stretford, Manchester



Malpensa Hospital, Italy
Zaha Hadid Architects, 2025-30

Atrium use of light, interior comfort, materials such as textiles and prefrabricated construction technique

Healthcare facility that provides services to approximately one million local residents.

Key features of the design:
- Flexibility
- Effective
- Efficiency
- New Technologies

Outdoor Spaces and rooftop gardens will be prominent for all patients to have vistas of the gardens.

Sunlight, opens spaces

Comfort of interior:
- Proportional
- Light control
- Acoustics

For staff wellbeing too

Materials:
- Wood
- Textiles

Forest:
- Preservation of existing
- Introduction of wetlands
- Stormwater use

Renewable energy sources

Construction and Materials:

Aluminium rainscreen panels:
- For planting
- Solar control
- Durability
- Low Embodied Carbon

Internal materials will include wood and textiles.
Textiles are used because:
- Soften the spaces
- Form of Privacy
- Flexible
- Acts as an acoustic barrier

I will like to explore textiles further, as the flexibility and privacy functions would be beneficial to my site.

Prefabricated Construction:
- Shorter Production
- Limited Material Waste

More on Prefabricated Construction:

Off- site manufacture:
- Protected from weather
- Specialisation
- Precision
- Reduce waste

Off- site assembly:
- Modular
- Quick
- Easily Connected

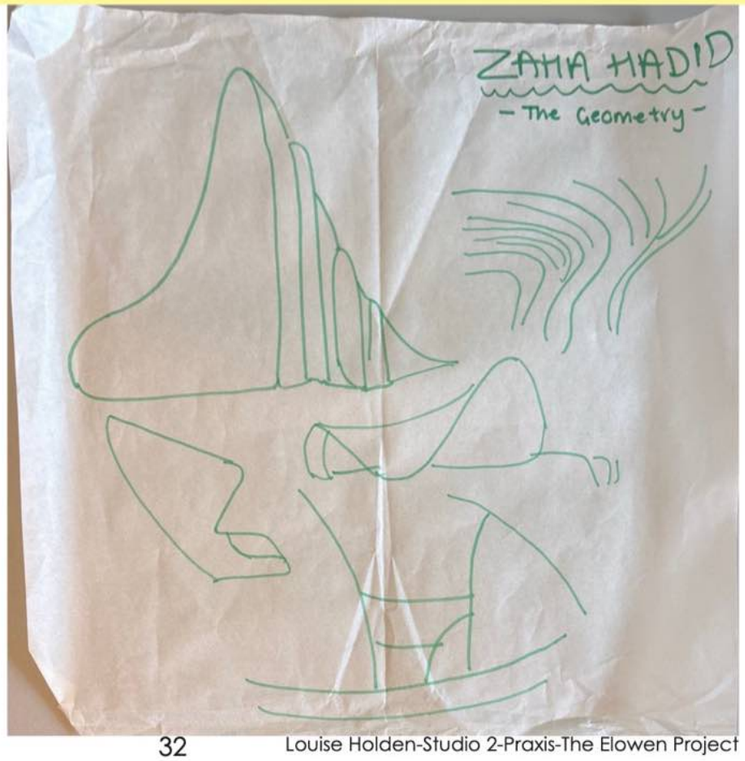
Pros:
- Speed
- Quality
- Safety
- Cost-effective
- Sustainable

Requires:
- Cranes for assembly

Zaha Hadids Style

Not a particular space, but inspiration by the style of flowing forms often seen in Zaha Hadids work.

I am inspired by the curves and how the building shows movement through this flow.



Children health and support centre, Kitakami, Japan

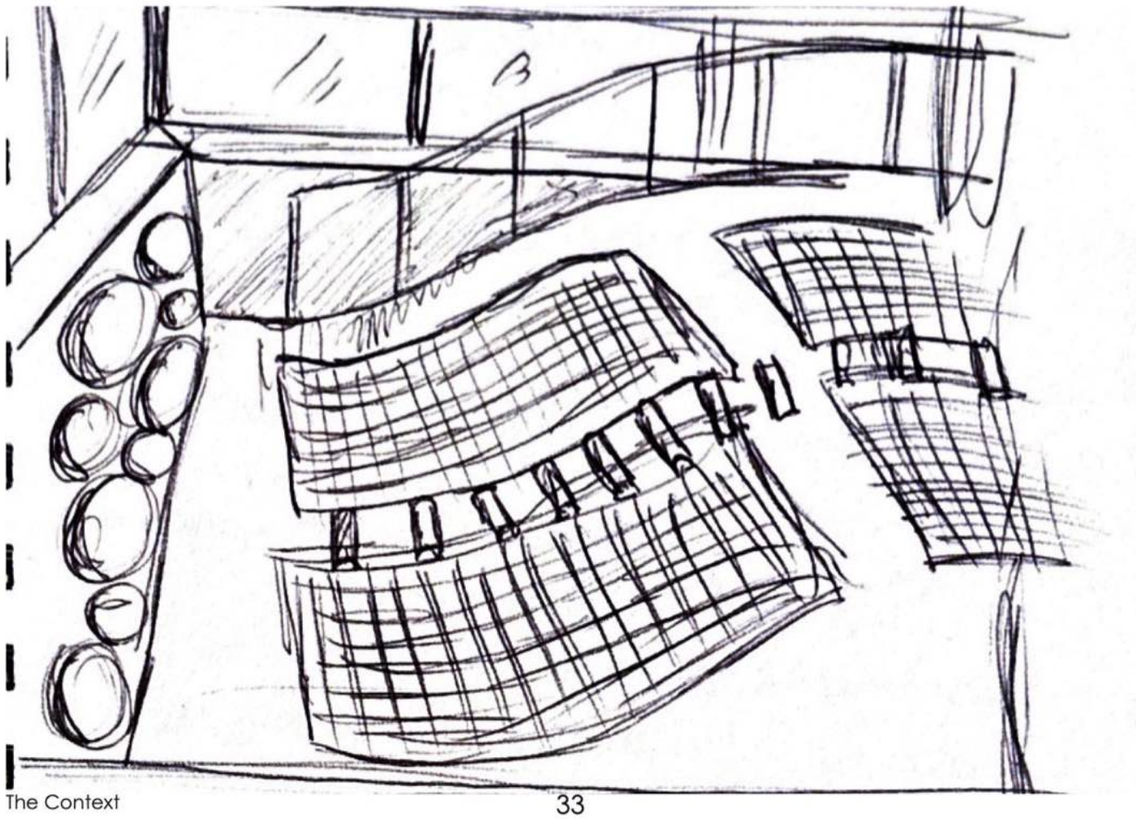
The waiting area is designed to be active, using textiles and ropes to soften the space and allow for flexibility

health and childcare support center, Repurpose of an existing building.

Undulating ceilings and floors provides a fun and unusual floor for the playground

The playground used textiles and ropes to soften the space.

The ceiling is illuminated across the entire surface, creating a play with shadow and light that lends a sense of depth to the complex.



Open entrance space, with curtains as partitions. Tall ceilings to allow for emergency vehicles.

Multiple seating options of different heights allow for all needed whilst waiting.

Section shows how the building waves, different floor levels and textures allow for play.

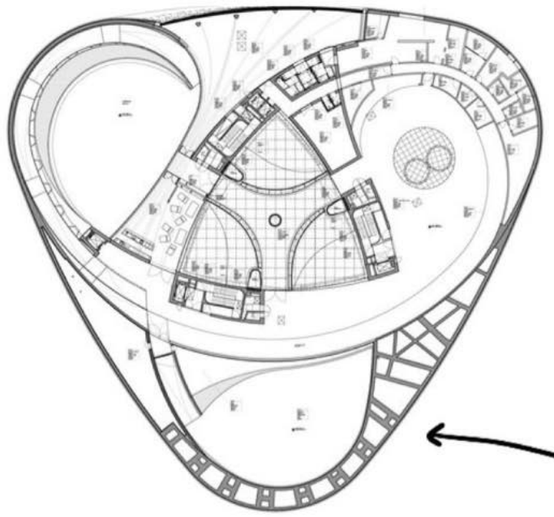
The wave form is followed outside with the exterior of the building.

Mercedes Benz museum, Stuttgart
Unstudios, 2006

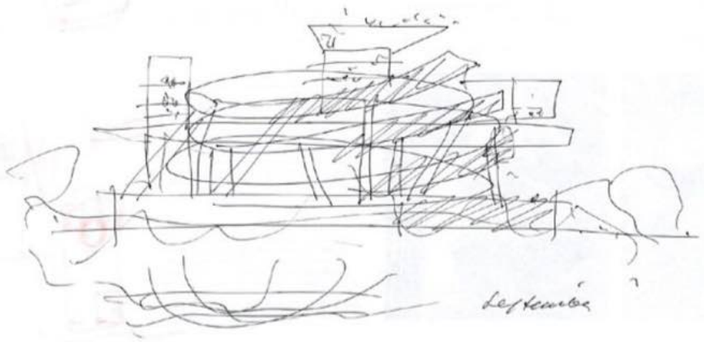
Featuring a double helix structure inspired by a clover leaf pattern. No straight walls to allow for a flowing space.

Design aims :- Showcase egineering
- new tech
- flowing design

automotive engineering
exterior - aluminium & glass
structure - Steel & concrete



Sketch Style:



motorsport
Capitalism

"The twists" - prestressed concrete
↓ Incorporating 2 turns
each twist up to 750 tonnes of CO_2
Environmental factors:
- light
- ventilation -reduced energy use

curved geometry → Open Spaces, no straight walls ↓ lies

Day & Night Contrast

Fire Safety

144

In case of fire, smoke is extracted through a 'tornado' and released via 144 air nozzles at the top of the atrium.

Structure

100

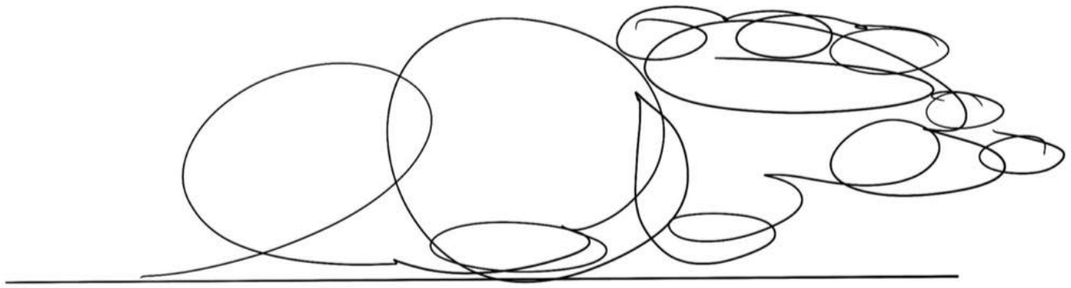
As a key load-bearing structure, the twist supports exhibition levels spanning more than 100 feet.

3

The structure of the building is based on a mathematical clover-leaf form consisting of three overlapping circles.

Circulation Concept model

In response to the Mercedes Benz Museum



Inspired by the sketch style for the Mercedes Benz museum, I created a sketch on what I imagined so far my space to look like, focusing on flow and movement through the space. This inspired me to create a model, using thread to physically represent the pencil line in this sketch.

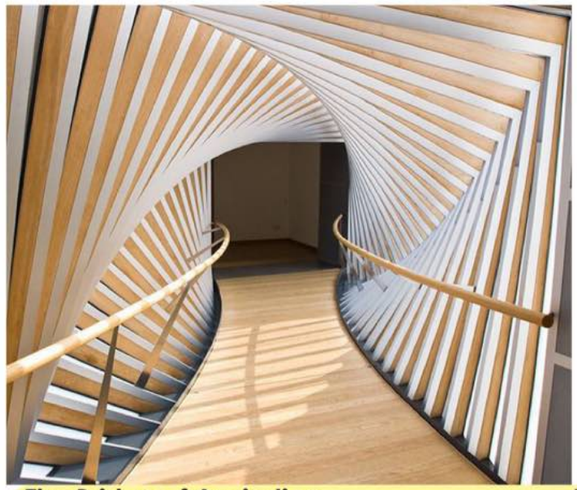
1:500, laser cut Black MDF, Concept model

This thread shows the movement through the building, potential to weave around and circulate, using ramps for accessibility

Movement

How can architecture make people move?

Movement Concept model



The Bridge of Aspiration
The Royal Ballet School, London

"Elegant, strong and fluid the bridge evokes the qualities of ballet" (McKenzie, 2013)

The bridge is not only designed to be aesthetic from the outside but follow the movement of dance internally.

An aluminium spine beam supports a concertina of 23 square portals with glazed intervals to let in the light. These rotate in sequence for the skew in alignment, performing a quarter-turn overall along the length of the bridge.

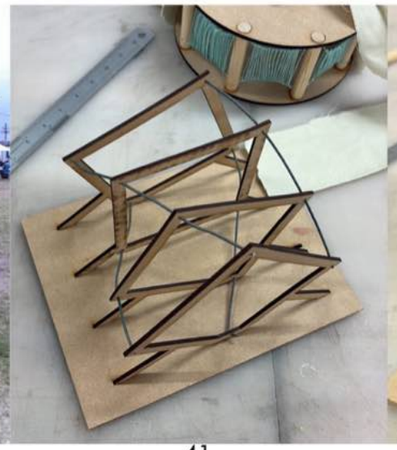
My Concept of the model

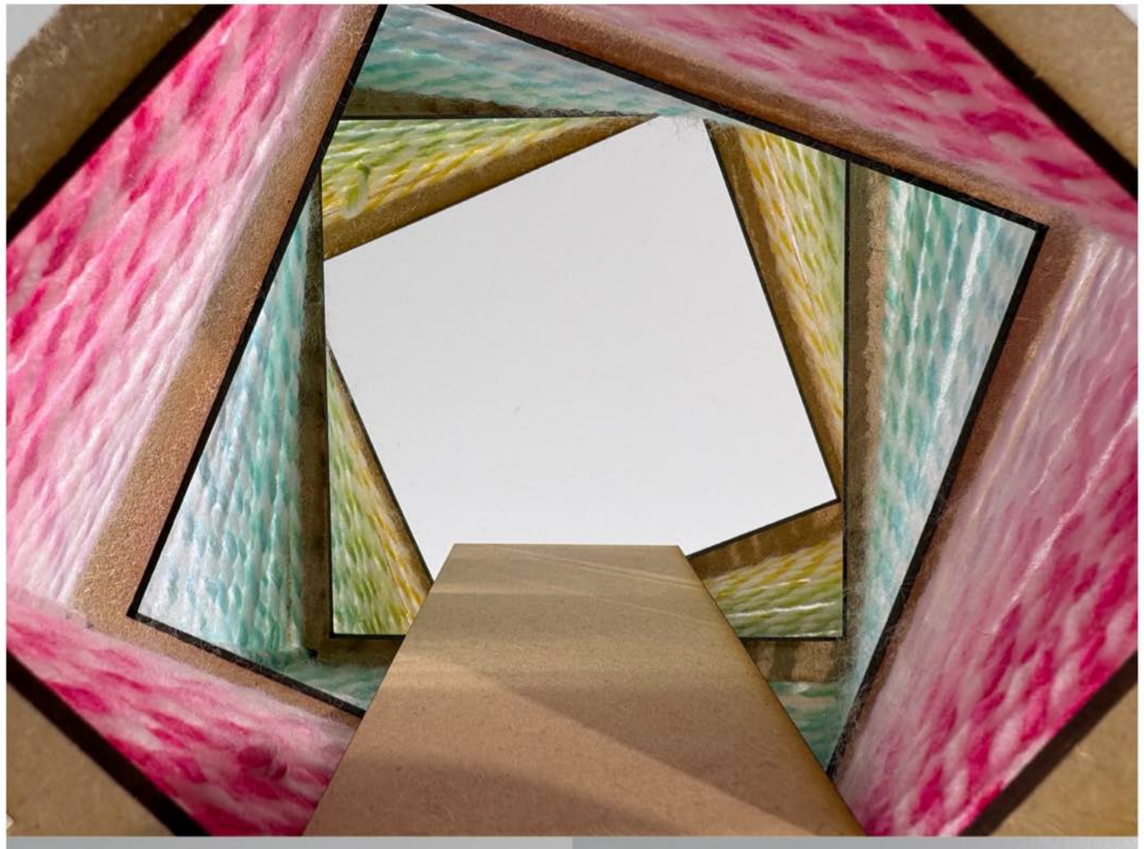
To follow the idea of the Ballet School, and create a tunnel to walk through.

Instead of 23 square portals, I used 4, accompanied by coloured wool to extend the effect of more panels being used.

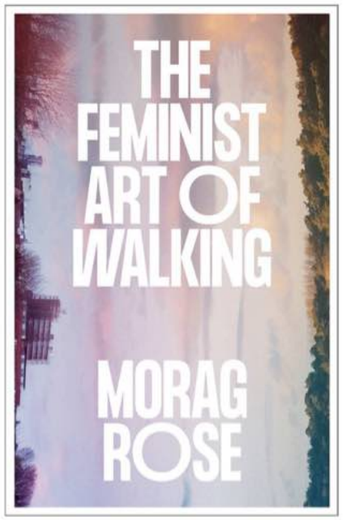
The idea was to see if this is something that would encourage people to walk through and explore, but the outcome was a mixed response. From friends to comments at reviews, some people would be curious to explore, others would find this 'too trippy'. Not the desired effect for those on SARC lists.

Sculptures by the Sea,
Sydney 2012





The Feminist Art Of Walking



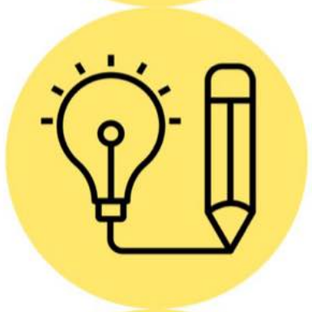
The feminist art of walking talks about the way one can experience spaces through different forms of observation. In particular, it notes how spaces are designed for men, and how someone who identifies as women or anyone with a disability may find these spaces inaccessible.

Morag Rose started a non- profit walking group (walking by whichever way that means to someone, wheelchair, walking stick etc...)called the Loiterers Resistance Movement where they would experience the streets of Manchester once a month. With interests in psychogeography, public space and the hidden stories of the city.

The Feminist Art of Walking
Morag Rose

"I am a Loiterer..."

Walking Is Political, Embodied, and Intersectional
Morag Rose argues that walking must be understood through an intersectional feminist lens that recognises how different people experience space differently and why access to public places isn't equal for all. Walking is shaped by power, race, gender, class, disability and urban design — meaning some bodies are welcome in public space and others are not.



Walking as Creative Practice and Resistance
Walking is often seen as an act to get from A to B, but Rose sees walking also as an artistic and political act. From Roses experience of loitering and the use of psychogeography 'wandering, dérives, and communal explorations can disrupt capitalist, exclusionary cityscapes and reclaim streets as shared, creative space.'

Belonging, Community and Reclaiming Public Space
A core theme throughout the book is that public spaces should be for everyone. Morag Rose emphasises the value of collective, thoughtful wandering as a means to reconnect with place and challenge narratives that tell some people they don't belong. From the LRM, walking together, sharing experiences, and creating inclusive routes builds 'belonging, solidarity and community.'

The Plan:

To walk around Lacy Street and the surrounding area to observe aspects of my site. Two participants, one man and one woman, to see how the results vary based on gender.

Round 1: The colour round

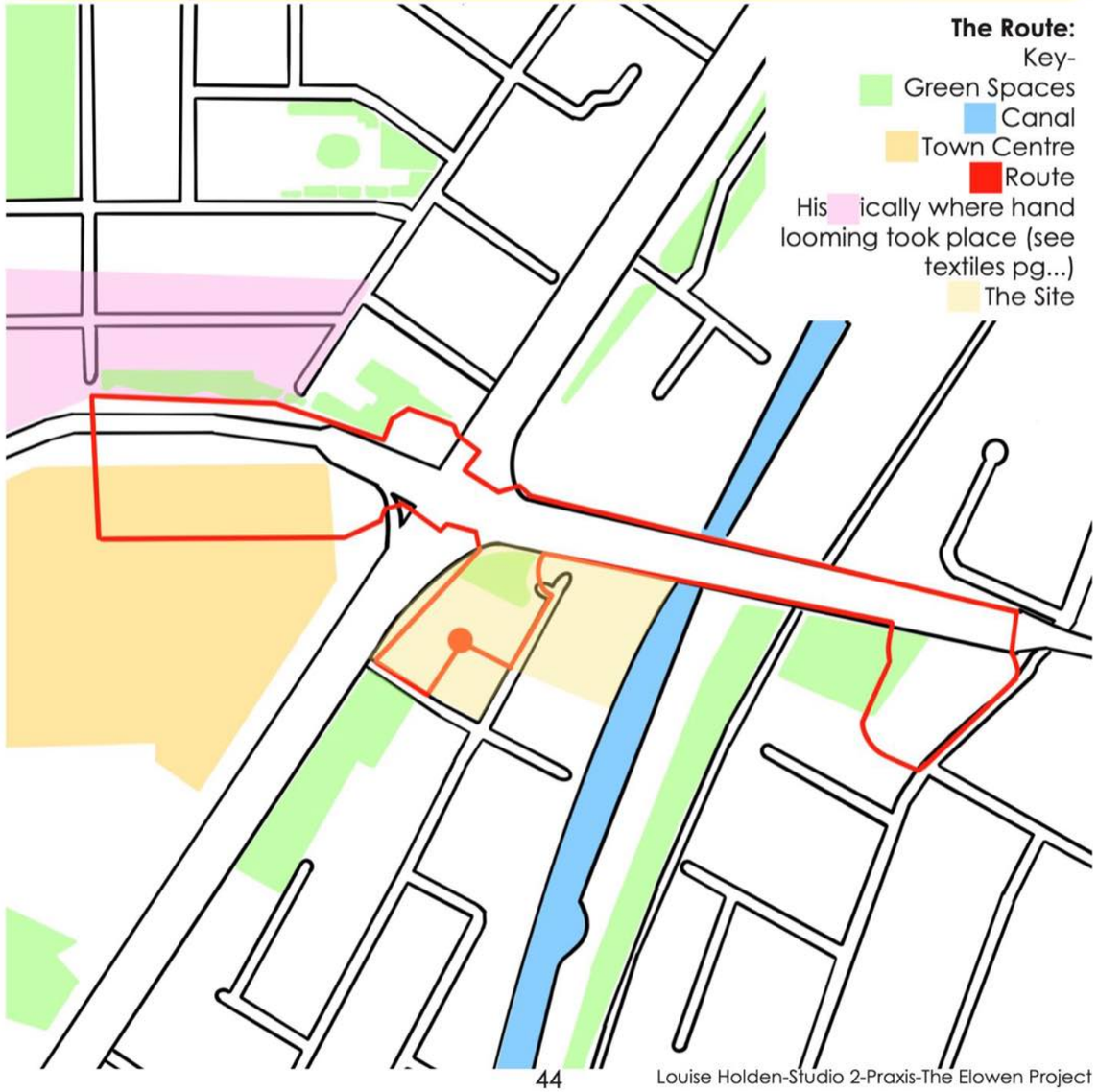
Each person looks out for a colour and takes a photo of everything they see that is that colour- aim is to look closer at the sight and have a deeper observation of the little things

Round 2: Observation drawings

Each person does little quick sketches that they observe, key aspects of the place or thing that are prominent in the surroundings

Round 3: The Accessibility

Each person looks out for accessibility features, what is the ground texture like? what is the street lighting like? how accessible is the site to the surrounding area



Round 1: The colour round

Taking photos of and focusing on just one colour allows you to really look at your surroundings, rather then glazing over and seeing a bigger picture.

Male Perspective

Why This Colour?

"Living in Manchester, I have found the area to be rather grey due to the weather and the architecture. I have often commented on the lack of green spaces so I wanted to see how much green I could notice"

On Reflection

"Most of the green was artificial and controlled within pots and borders like it was an after thought rather then intentional design. There were many trees about but due to the time of year they had no leaves or colour to them. Green was used in signage and lights as a universal colour for go or safety"

Female Perspective

Why This Colour?

Yellow for me is a positive colour, representation of happiness and brightness. For my project, these are some feelings I want to embrace and bring through in my design. I was curious what would be yellow in a urban environment, and on a cloudy day without the sun, what else portrayed this colour?

On Reflection

I saw yellow in a lot of building works and waste items, such as the salt bin, safety tape or foam wrapping the scaffolding. In this way I saw the site and surrounding area as worn out and need of renovation. The Town Centre however was a lot more vibrant, yellow buildings, large yellow paths to lead the way.

The Summary:

Comparison of results

Both results showed the colours were mainly used for signally such as traffic lights, warning tape or bins. The regenerated town centre used both colours which was exciting. The surrounding area lacked colour which could help with the appeal of Stretford.

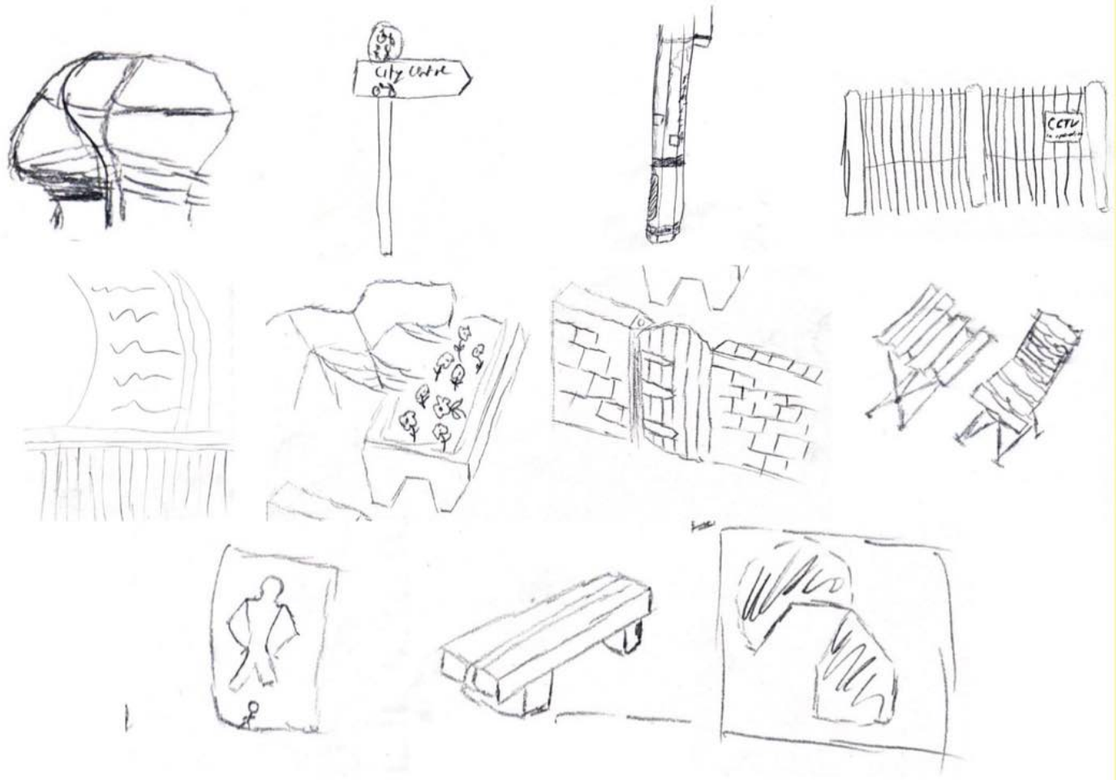
What could this mean architecturally?

Using these colours and understanding what they mean to help signal a walkway throughout my site could help with visibility. Adding colour to my design will appear more inviting and vibrant, and could help with the regeneration of the area.

Round 2: Observational Sketches

Now we have walked around and looked closer at the site, we started to draw things that stood out to us around the area. Are observations different based on gender?

Male Perspective



What did you observe?

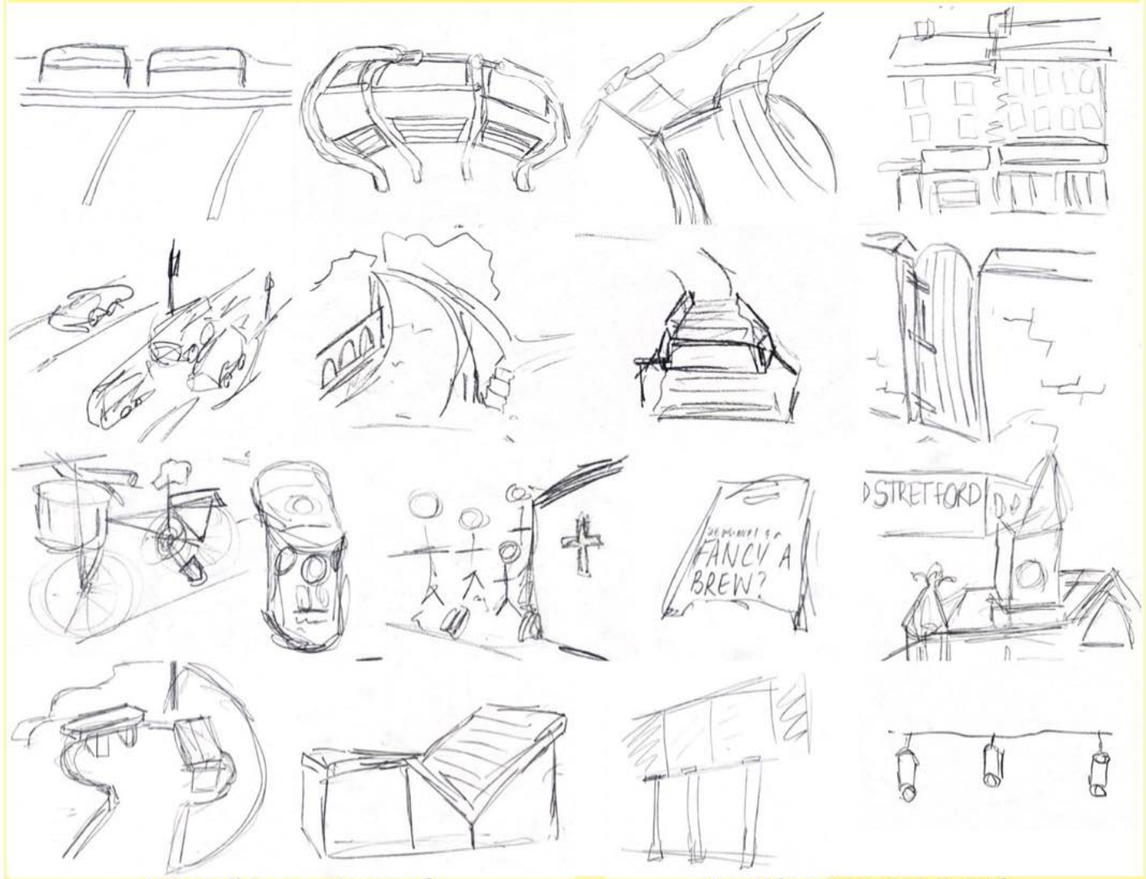
"The area was very gray, not a lot of natural spaces and traffic was a key element, pedestrians come second to cars in this area. There was a huge difference between the regenerated areas and those down the road that are more run down."

Anything that stood out?

"A lot of seating and benches about to allow for rest. Traffic is very loud, cars beep constantly, making me question the traffic management of the area"

"My drawings were of the infrastructure that I found easier the draw, solid objects that could be conveyed with straight lines"

Female Perspective



What did you observe?

I realised my observations were on a pendulum, on one side I noticed things that scared me and on the other I noticed things that excite me. From shading structures and back alley meetings of young people, to the coffee shops and calm seating areas. I also observed means of transport, cars, boats, bikes and pedestrian walkways.

Anything that stood out?

I found the difference between the regenerate town centre and the housing area down the road, emotionally made me feel safe or unsafe. The town centre had larger paths and clear lanes, I felt more open and observed by others, whereas the smaller paths I could not wait to get away from, and I found myself looking over my shoulder.

The Summary:

Comparison of results

From a male perspective, the things observed were those of actual physical infrastructure, from a female perspective it was more emotional, what triggered fear or excitement. The area was more than what was there, it was about what those things could mean, what could happen?

What could this mean architecturally?

Smaller corridors and paths to access the site would not be appropriate for my target user. Larger access route would be needed, along with a way to shelter from the noise of the traffic, making the site more pedestrian and cycle friendly would help towards getting people moving.

Round 3: Accessibility

Good accessibility
Idea but not execut-
Bad accessibility

Male Perspective


Mud and drop curbs

Pavement Collapse

Steep drop

Good Signalling


Barrier between road and footpath


Resting point

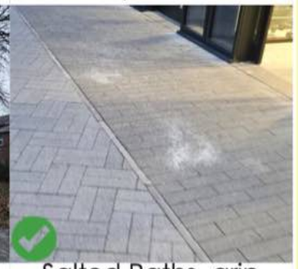

Combined cycle/ footpath


Ramp to tram


Pedestrian Crossing


Car in bike lane


Shelter from sun


Salted Paths- grip

Addressing Biases

"I am a fully abled young white man, I find the world to be accessible for me. I cycle and walk wherever I can so these things stood out to me, such as bike lanes and pedestrian crossings. I do find I get hot during summer and I need to stay out of the sun so places of shade and rest were also things I find useful"

On Reflection

" While I can get around paths easily, it's easy to notice those in a wheelchair may struggle to get around on these pavements. Whilst the infrastructure for wheelchair access is there, it seems to be there more as a tick box exercise rather than actually being accessible. Cycle lanes were inconsistent and cars made it more dangerous"

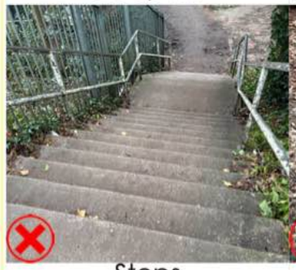
Female Perspective


Steep hill


Signage and direction


Uneven ground


Tactile Paving


Steps


Muddy ground

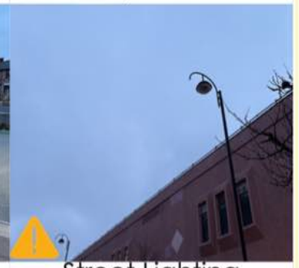

Street lighting

Transport Links


Pedestrian crossing


Clear paths and lanes


Ramp and steps


Street Lighting

Addressing Biases

After reading 'the feminist art of walking' I had the idea to look for wheelchair routes and those with less mobility, how would they get about my site and the area. As a woman I was also interested to see what lighting was around the area, where might be unsafe to walk and how close are the transport links.

On Reflection

Clear signage could be found around the area and pedestrian crossings made it clear where you were suppose to walk. However I found those less mobile would struggle to commute to the site unless they came from the regenerated town centre, due to uneven paving and muddy ground. Street lighting could be found but as it was getting dark, it showed no signs of turning on.

The Summary:

Comparison of results

Both results noted the access for wheelchairs or those with mobility issues are not successfully accounted for around the site. Positively transport links and pedestrian crossings around the site are successful and allows for safe access.

What could this mean architecturally?

Including infrastructure such as seating, shelter, signals that was seen to be successful would benefit the site. Well lit paths, even ground, drainage for weather and wheelchair accessible ramps would improve the areas overall accessibility.

Conclusion of 'the art of walking'

Final notes and additional comments on my experience doing this task and extra research points that came from it.

The things that are hidden:

Go away Green

Whilst analysing the colours and exploring where they were used, we were reminded of 'Go away green' and how it can be used in the urban environment

What is go away green?
"Go Away Green was formulated by Disney to "erase" backstage buildings and camouflage construction walls from your sight." (Paris, 2024)

The Underpass

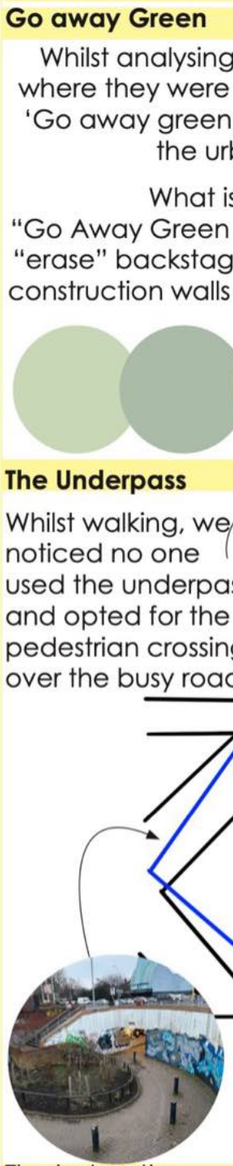
Whilst walking, we noticed no one used the underpass, and opted for the pedestrian crossing over the busy road

So we did a time experiment...

Person A crossed above ground

And the winner was... Person B!

The underpass was not accessible for those in wheelchairs



Person B used the tunnels

Parts were shut off and old routes closed

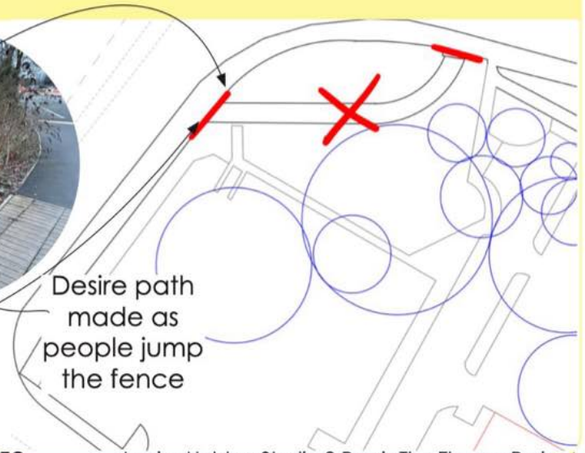
The lost path

As circulation around my site is important, I wanted to access all surrounding paths, however one path is no longer viable

Old lamp post

reminesce of the old path, now overgrown

Desire path made as people jump the fence



Desire Paths

After exploring the accessibility through the site, I have looked into desire paths and ideal route through the site

Desire Paths- "Landscape architects look for places where people have worn the grass thin by cutting across lawns and fields and formalize them by levelling them and paving them or putting down gravel, wood chips or some other material" (Doctorow, 2025)

Providing the ideal footpath

And providing ideal accessible routes

Desire Path on site

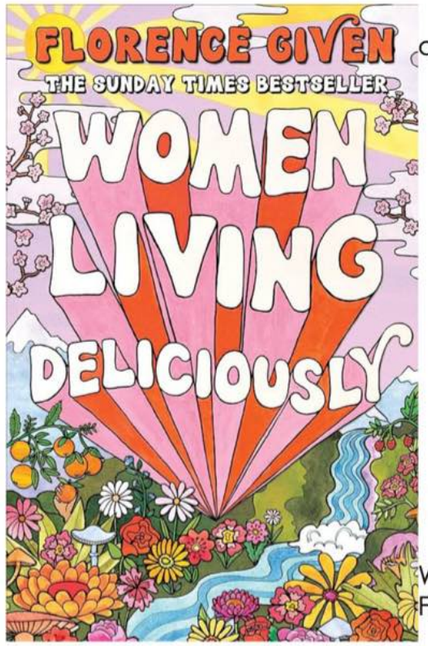
Existing path

Nearest bus stop

Privacy

Privacy

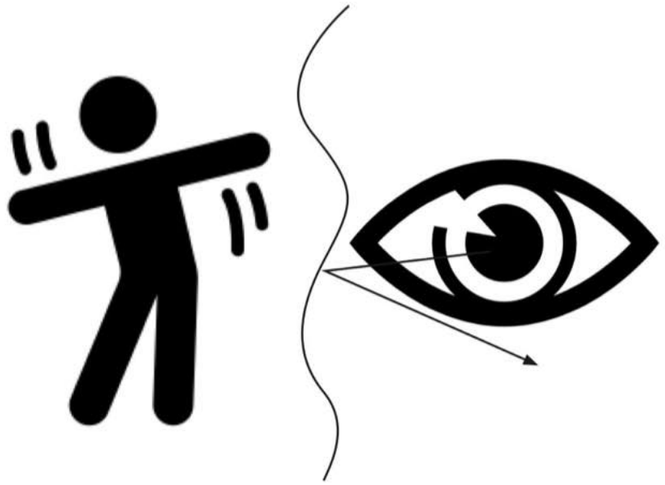
Why is privacy important?



"For too long women have internalized the belief that our bodies are things to be looked at- instead of lived in."

This speaks about the ideology that women often feel they must look and move a certain way to be considered "pretty" or up to standard for modern society. Women who have experienced trauma often have low self esteem, or dissociation from their bodies. (Noble, 2022) This can lead to wanting to hide or cover their bodies.

Women Living Deliciously, Florence Given

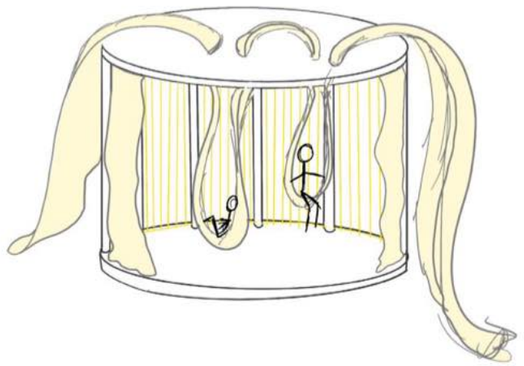


It is important for my design to allow for those who have experience trauma to be able to move their bodies in privacy

Textiles Concept model

Inspiration

Inspiration taken from Aerial yoga, a yoga that uses fabrics hanging from the ceiling to move

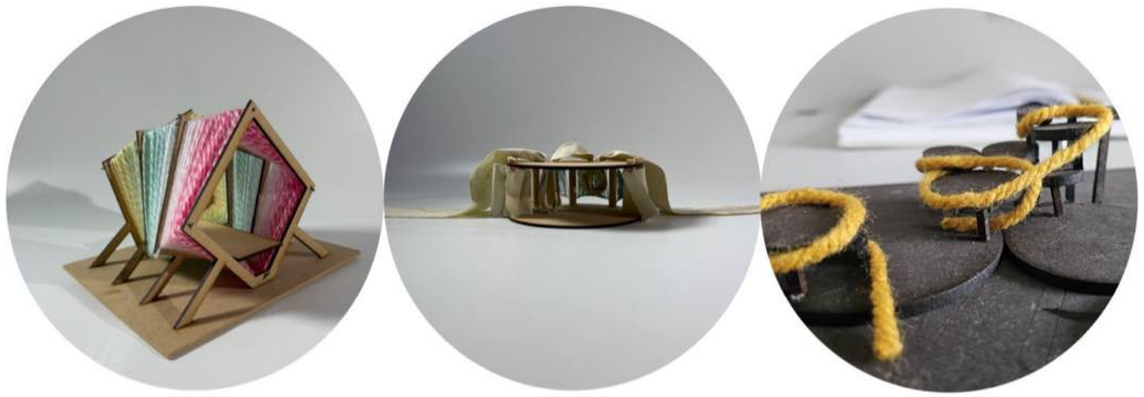


The concept:
a studio space, 1:50 scale of a yoga studio, with curtains and walls of textiles

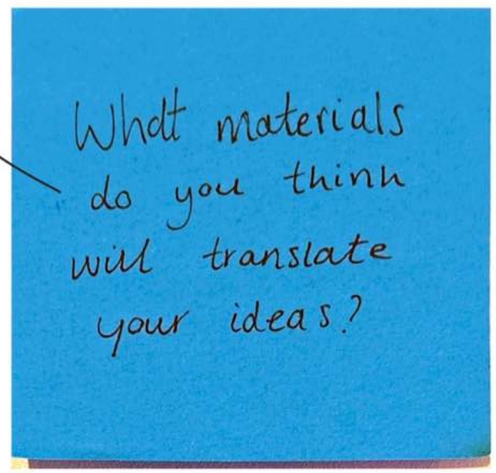
The process of making the curtain so it can be opened and closed.

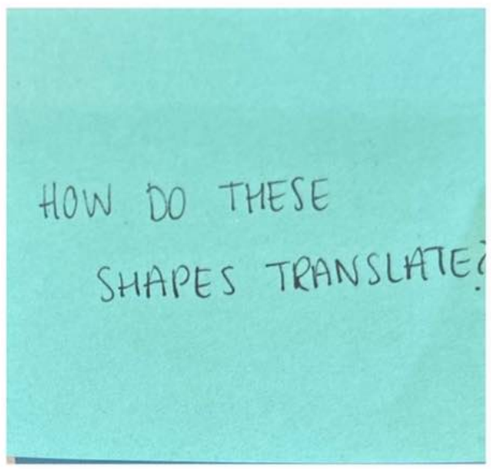
Studio Silent Exhibition:

The silent exhibition at the start of the semester, allowed us to explore our ideas so far. I presented sketches, models and my emotion sheets.



I got a lot of interest in my models, and particular in the use of threads and textiles. This is something I would like to look into more, as I could see the possibility of it being moved and changed based on need, as shown by the precedent study. This was in opposition to common material used such as wood and brick which are static materials.





Textiles

What are textiles- definition?

Any filament, fibre, or yarn that can be made into fabric or cloth, and the resulting material itself.

The term is derived from the Latin textiles and the French texere, meaning **"to weave,"** and it originally referred only to woven fabrics. It has, however, come to include fabrics produced by other methods. (Whewell, 2025)

Types of Fibres that make textiles

Wool

Animal fibre forming the protective covering, or fleece, of sheep or of other hairy mammals

Nylon

Any synthetic plastic material composed of polyamides of high molecular weight

Polyester

A class of synthetic polymers built from multiple chemical repeating units linked together by ester groups

Cotton

Any of several economically significant species of plants of the genus Gossypium

Silk

Animal fibre produced by certain insects and arachnids as building material for cocoons and webs

Linen

Made from the flax plant

History of textiles

English History

5000 BC
Earliest evidence for the form of weaving.

Earliest form of textiles were nets. Formed from a single thread in a similar technique used to make baskets

Cotton, silk, wool, and flax fibres were used as textile materials in ancient Egypt

3000 BC
India started to use cotton
China used silk

400 BC
Egypt using linen and wool to make tapestry's and indications of using a highly developed weaving craft

400 BC
Evidence of printed and dyed textiles in India

200 BC
Evidence of dyed textiles in Roman ruins

500 AD
Turkish tribes were skilled in the manufacture of carpets, felted cloths, towels, and rugs.

873 AD
Beautiful fabrics were produced in the palace workshops at Palermo, Sicily. About 1130, skilled weavers who came to Palermo from Greece and Turkey produced elaborate fabrics of silk interlaced with gold.

1200-1400
English textiles were mainly of linen and wool, and the trade was influenced by Flemish fullers (finishers) and dyers.

1315
Florentines captured Lucca, taking the Sicilian weavers to Florence, a centre for fine woven woollens from about 1100. Florence is believed to be producing velvet at this time.

1266
French conquer Sicily, many weavers move to Italy and settle in Lucca

1455
Silk was being woven in London and Norwich

1480
French manufacturing of woven silks began. Lyon eventually became the centre of silk manufacturing in Europe

1500's
A prosperous industry in velvets and brocades was also established in Genoa and Venice.

1685
Many weavers to move to England, settling in Norwich, Braintree, and London. Some 3,500, lived in Spitalfields, a London settlement that became the chief centre for fine silk damasks and brocades.

1564
Queen Elizabeth I granted a charter to Dutch and Flemish settlers in Norwich for production of damasks and flowered silks.

1790
The French revolution put a halt to the work of the weavers of Lyon

1590-1790
French manufacturing of textiles flourished. French patterned fabrics showed a distinctive style based on symmetrical ornamental forms, lacelike in effect

1760 - 1815
The industrial revolution greatly accelerated the growth of the mill system, textiles became mechanical

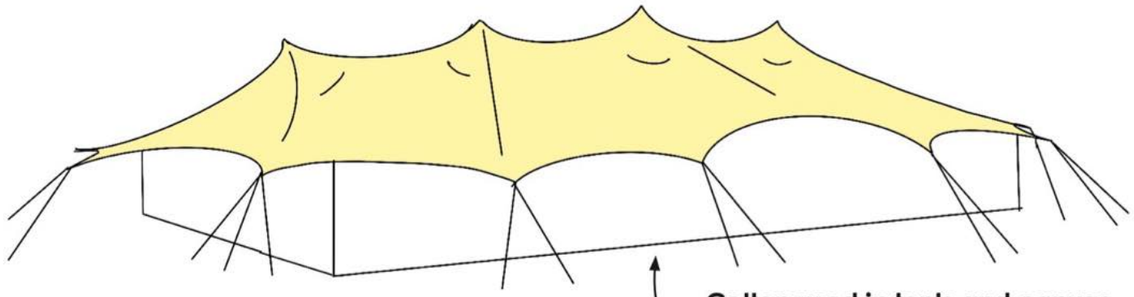
Textiles- Properties

Focusing on the 4 natural fibres of textiles, what material properties do they have?

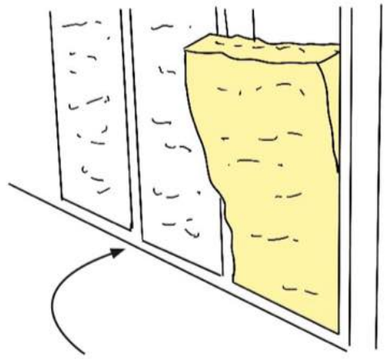
	Common properties	Common Uses
Cotton 	• Softness and Comfort • Absorbency • Durability and Strength • Breathability • Hypo-allergenic • Versatile • Insulating (Kensington, 2024)	• Clothing • Towels • Curtains • Upholstery • Canvas • Tents • Sails • Bandages
Wool 	• Natural • Renewable • Biodegradable • Breathable • Naturally Elastic • Odur and Stain Resistant • Active Fibre • UV resistant • Fire Resistant (Woolmark, 2025)	• Knitting and other textile uses • Beehive insulation • Soundproofing • Medical applications • Mushroom cultivation • Oil spill clean up • Bioplastics • Wind turbine blades (Country Collection, 2024)
Silk 	• Strong • Elastic • Flexibility • Absorbent and Fast drying • Breathable • Antibacterial • Shiny and Soft • Biodegradable • Hypo-allergenic (Patra, 2023)	• Clothing • Bed sheets • Upholstery • Wallpaper (Biddle Sawyer, 2024) • Parachutes • Bike tyre internal casing (Dalston, 2022)
Linen/ Flax 	• Good Tensile strength • Hygroscopic • anti bacterial • very high durability • Humidity resistant • Smooth and silky (University of Arts London, 2026) • Sustainable • Biodegradable • Low waste (Wild Linens, 2026)	• Clothing • Cushion • Curtains • Sandals (Wild Linens, 2023) • Temporary Pavilions and emergency structures • Car Panels (Thompson and Thompson, 2016) • Bank notes (Safilin, 2021)

Textiles- Where can it be used outside of clothes?

"Textiles served as humanity's first architectural elements" (Gattupalli, 2025) the use of textiles is believed to pre-dating ancient construction methods like stone masonry. The relationship between textiles and architecture has been used as a precedents from prehistoric settlements to modern skyscrapers.



Cotton used in tents and canvas

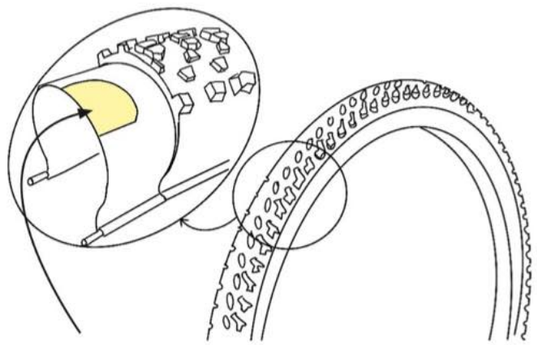


Wool in sound proofing and insulation

Wool
Sorting
↓
Baleing
↓
Thickening
Insulation

Wool
Woven into fabric
↓
fabric wrapped onto bamboo blade
↓
Additional adhesive is added to coat
Turbine Blade

Wool used in wind turbine blades



Silk in bike tyre internal casings

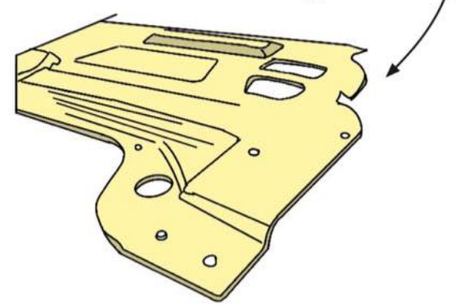
The silk fabric is arranged in layers of parallel threads, with each layer running perpendicular to the next

these silk casings are often hand-glued to the tread without the high-heat vulcanization process, preserving the natural, superior flexibility of the material.

Flax composite in car panels

Made from Biotex Flax/ Polypropylene

60% lighter then steel with same strength



History of Manchester and Textiles

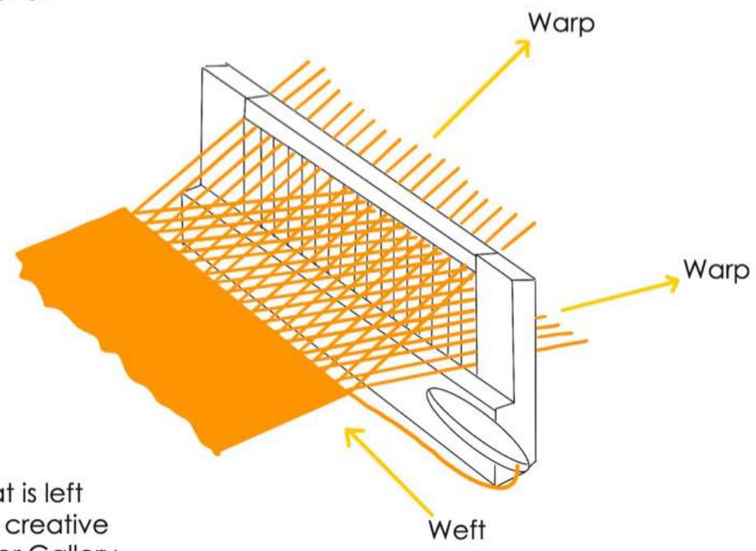
Manchester Art Gallery

The Warp/ The Weft/ The Wake- Holly Graham

This title of the art exhibitions in Manchester art Gallery is in reference to the act of weaving textile fabric.

Warp threads run vertically stretched tight across a loom to form the fundamental structure of woven fabric

Weft threads move horizontally through the warp threads to create woven fabric's character and qualities



Wake is in part a reference to what is left behind after and as a result of this creative collaboration between Manchester Gallery and Holly Graham

Textiles and Tall tales

March 2024, Holly led a series of workshops to explore Manchester's textiles history, drawing on the patchwork examples and pattern books at Platt Hall

Peoples personal reflection on their connections to cotton within Manchester

"I don't know if you've noticed the metal edges to the pavements in the middle of Manchester. It was to stop the cotton carts damaging the pavements because if they hit the curbs they'd damage the pavement."

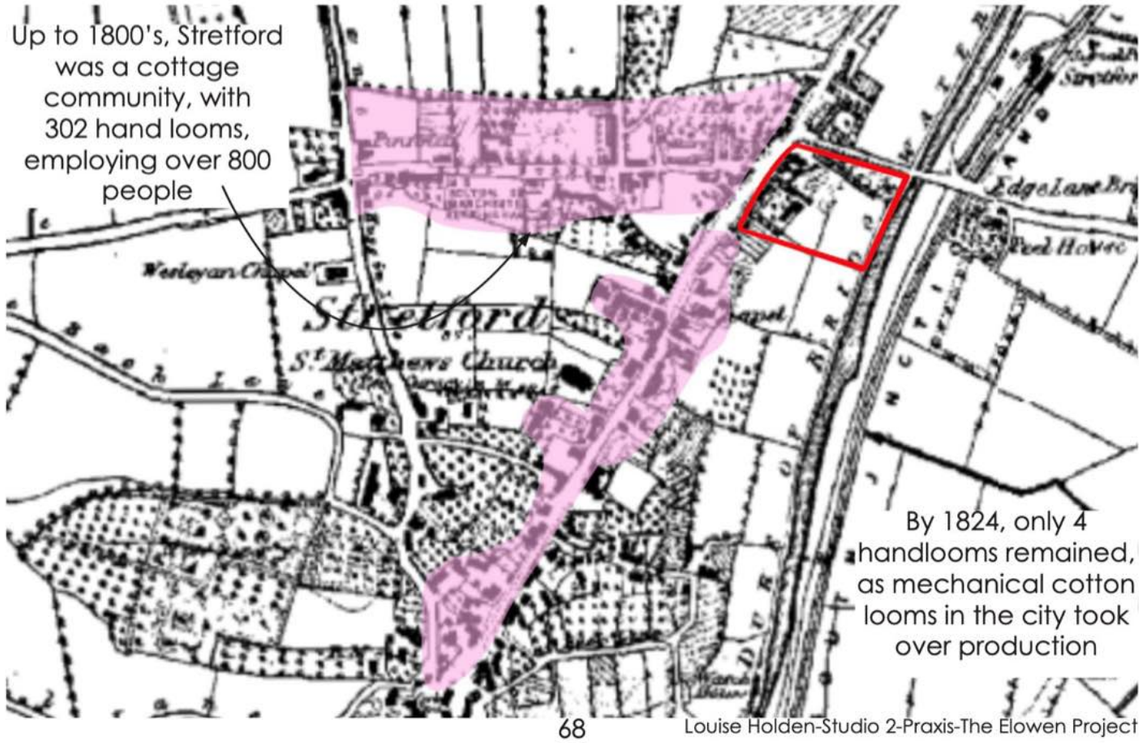
Natalya
As a visual artist, Natalaya loved to collect fabrics to reuse and recycle, and how they emotionally have different connotations

Nazia
Exploring how your hometown can influence what you choose to wear, and having a love for Manchester- feeling understood

Sally
How Manchester's cotton industry is embedded in the cities architecture and her family ties to textiles, passing down the generation

Rizwana
Reflecting on her fathers experience of working in the cotton industry. How items of clothing are important to her due to the memories

Stretford and Hand Looming



Outrageous Women- Desi Grannies

Marriage Religion and Culture
Imperial War Museum, Media City

On a visit to the imperial war museum, I came across an exhibition which caught my eye due to the use of textiles as a canvas for this art form.

Created by a local group of Indian Punjabi women known as 'The Desi Grannies', this unique display of artwork explores family, marriage, religion, and the role of women within their culture.

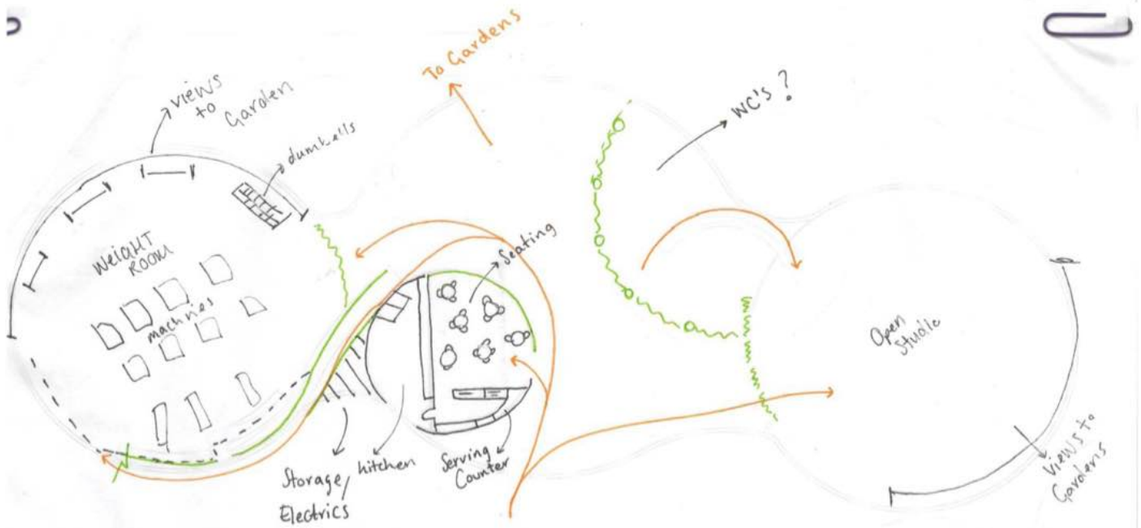
Using a dupatta - a long scarf, traditionally worn by Indian women around the head, neck and shoulders – as a canvas.

Through this project they have discovered their voice to creatively express who they really are.

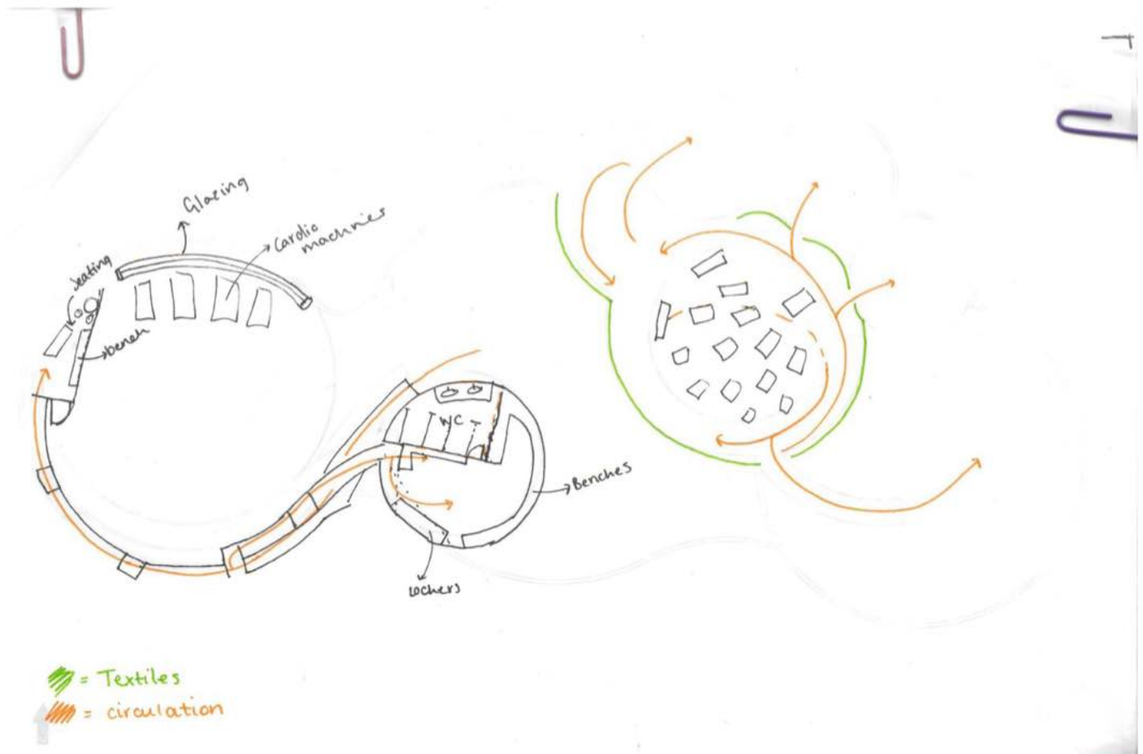
This display reminded me of the other ways in which women represent their emotions and life's and different types of textiles that can be used, such as an everyday item.

Initial concept idea

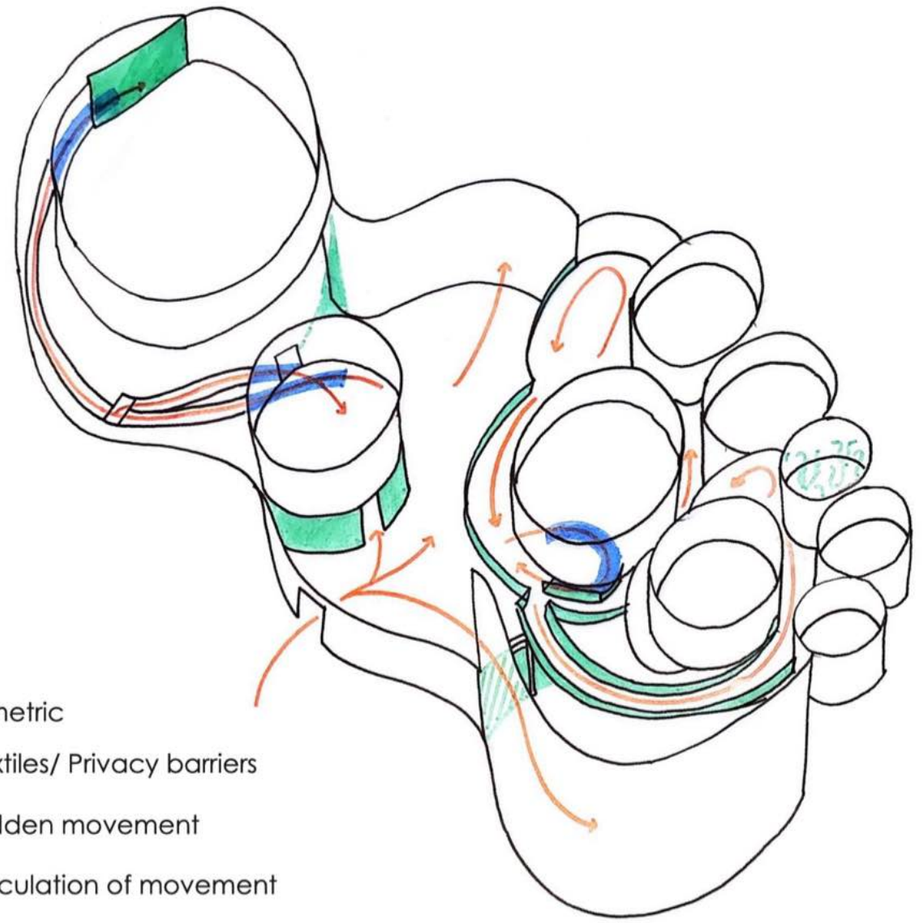
Putting the thought of movement and privacy into a spacial plan to start mapping out how the space could work



Ground Floor plan

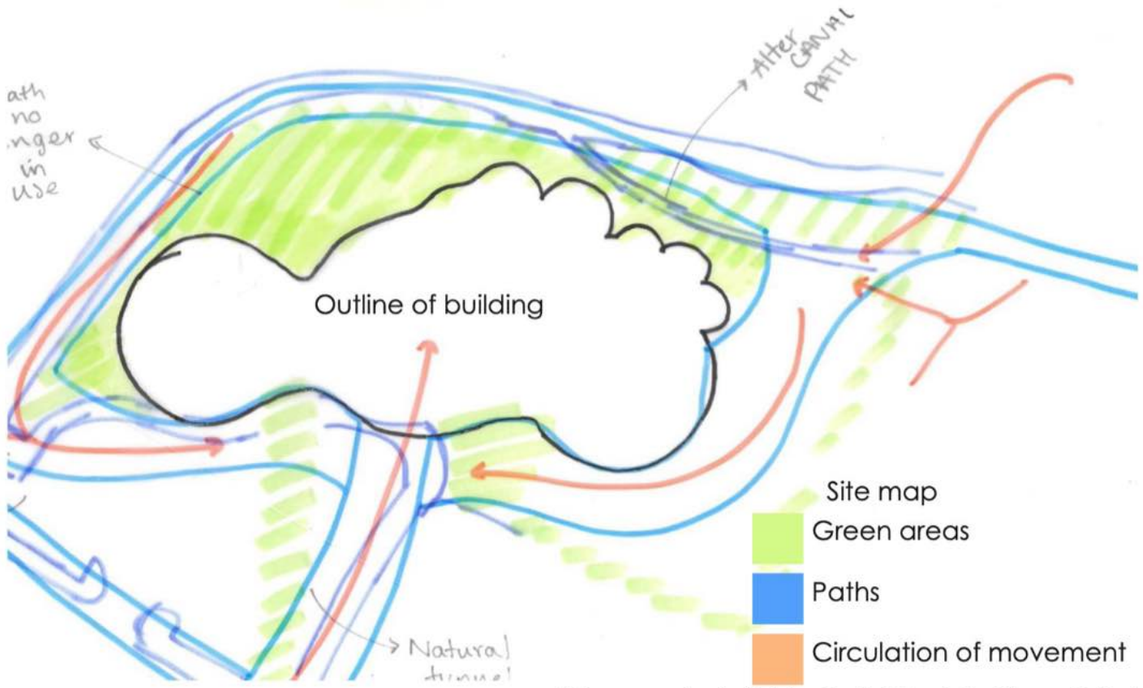


Second Floor plan



Axonometric

- Textiles/ Privacy barriers
- Hidden movement
- Circulation of movement



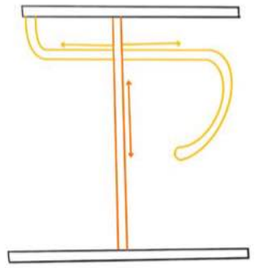
Feedback Session

with Sarah Wigglesworth, Kevin Singh and Rachel Sara

We had the opportunity to sit down and have a tutorial with Jane Sara, Sarah Wigglesworth and Kevin Singh, to get a fresh perspective on out projects so far. I used this opportunity to talk about the movement through my plan and ideas around textiles for privacy so far. I found the tutorial to be inspiring, with lots of ideas after to try and compile onto paper but I had 3 main takeaway points.

3 Main Takeaways

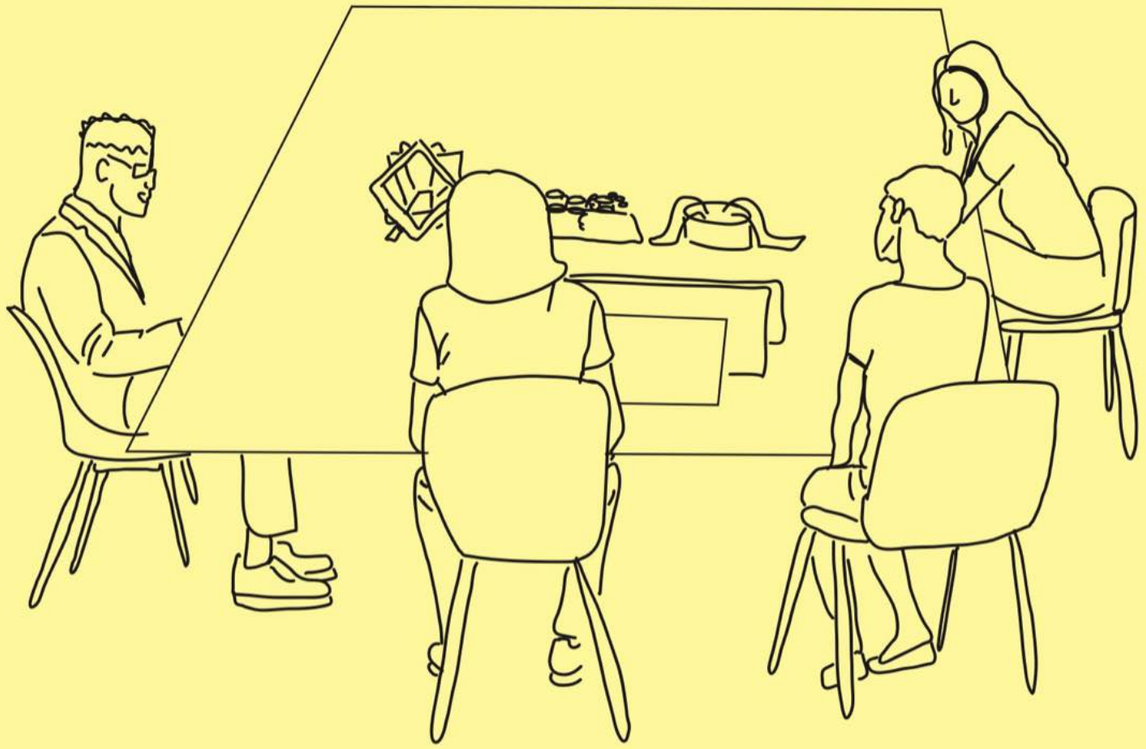
Play:
Up to now I have been holding back on playful things in my design whilst I gathered concept ideas. From here on, I want to look at the fun ways to go around my building. Ideas were discussed such as ways to climbing over the building, entrances that require multiple participants to open and ways to climbing around the inside of the building to go up and down the stairs, but in a more fun way!



Weaving and textiles in a metaphorical manner:
As well as looking at textiles in the literal sense for the material, it was suggested to look at how the textiles weave together and use that to metaphorically weave my building together. I liked this idea so will continue to look at this next to gain a better understanding around the site before I add playful features.

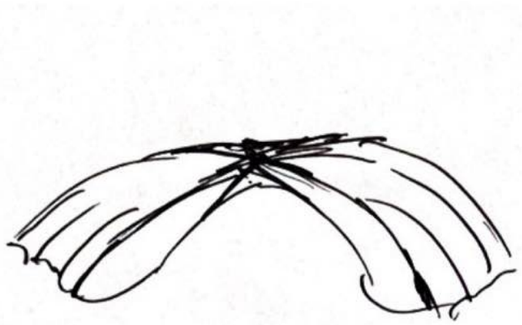
Precedent Studies:
Suggested Precedent Studies include:

- Alex Holland- climbing over modernist buildings
- Promenade, Le Corbusier
- Laban Centr, Herzog De Meuron
- Dutch Embassy, Rem Koolhaus
- Lincoln Centre, Weiss/ Manfredi

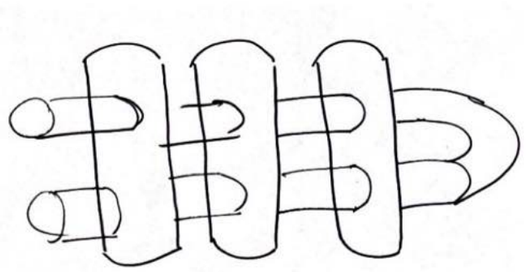


Conceptual ideals

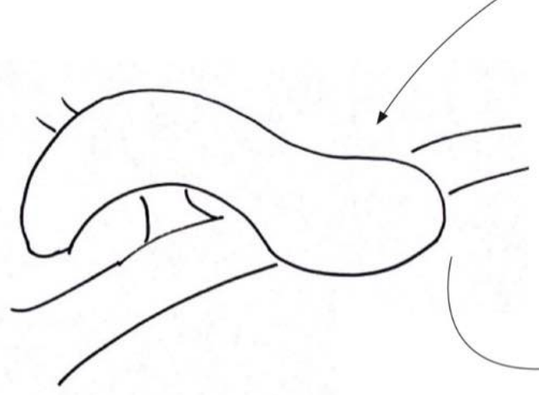
Building on what I have learnt about handlooming, and focusing on accessibility through the site, using the desire paths noticed on the exploration



Exploring the flexibility of textiles

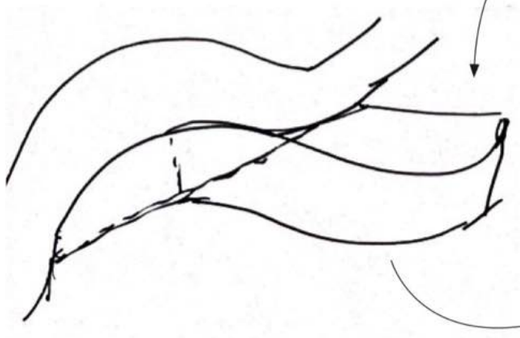


Using the idea of weft and warp threads



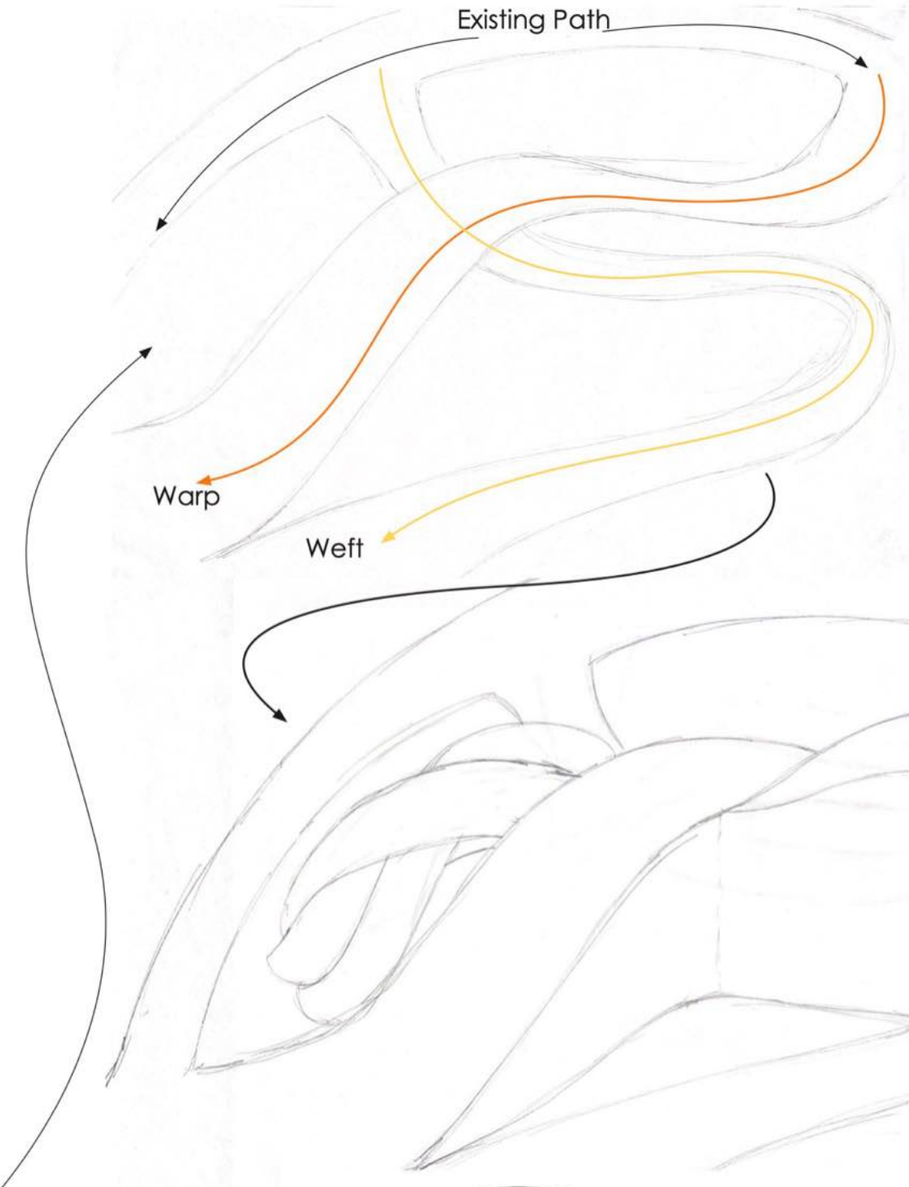
Flexibility over desire paths

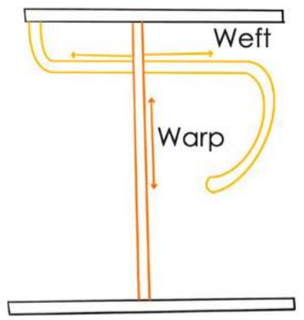
Weaving of the building over the desire paths

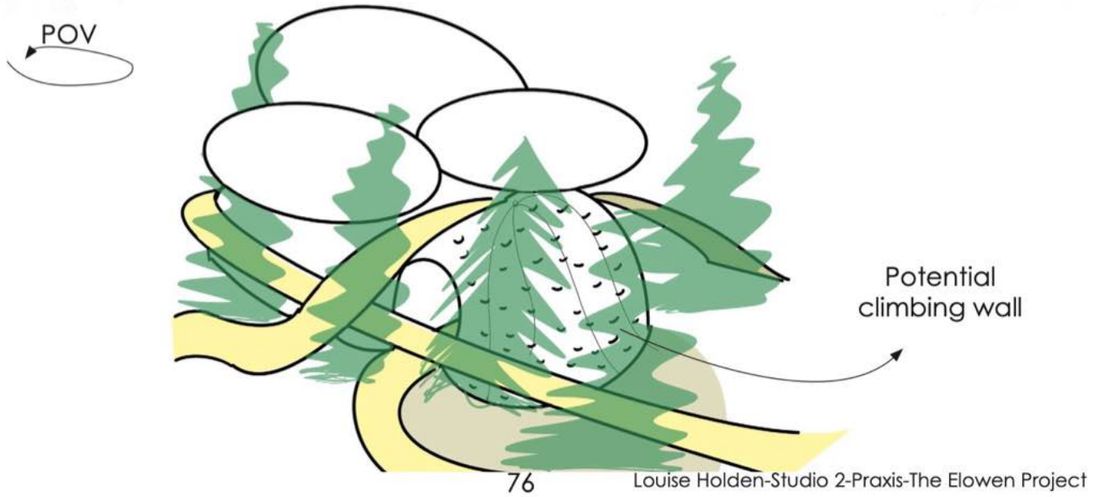


Introducing a structure under the path, making the desire path more of a journey

Combining the paths over and under the building, weaving

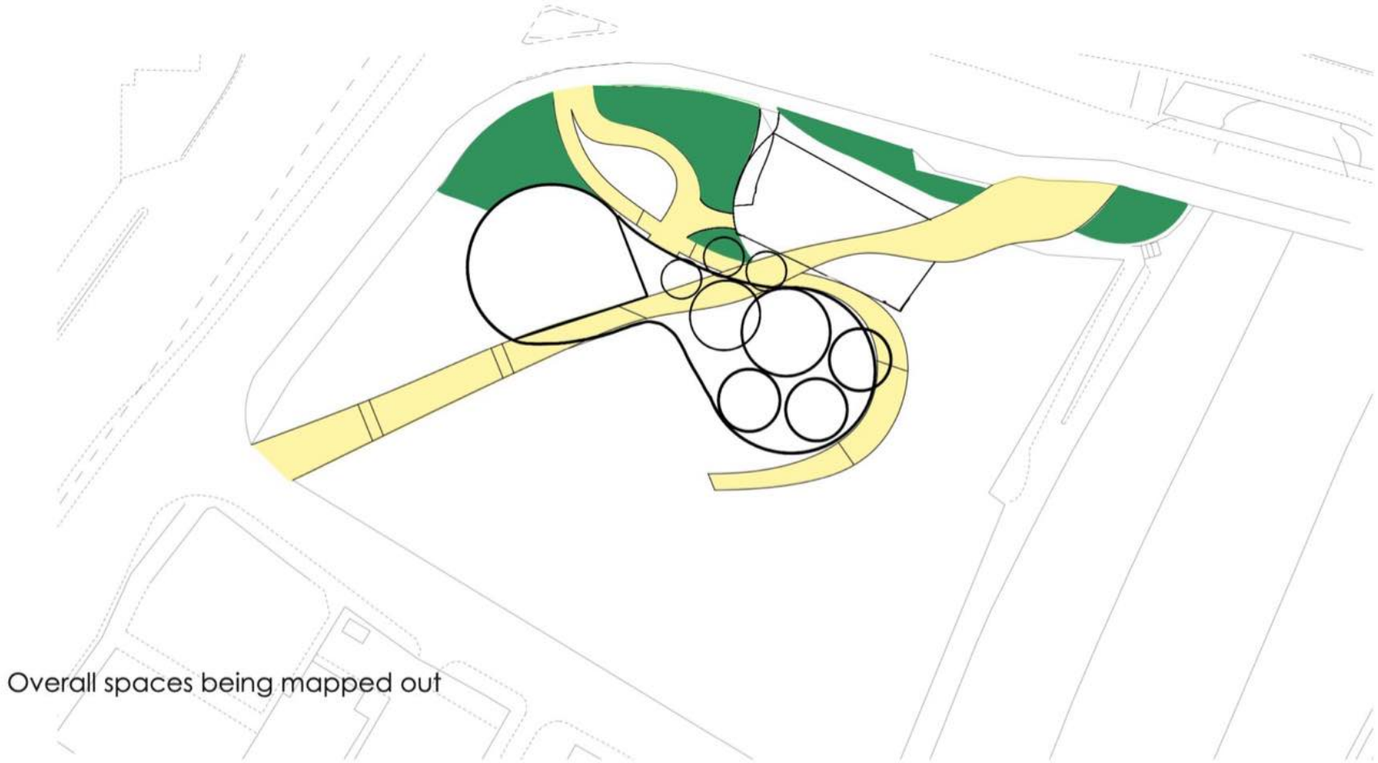




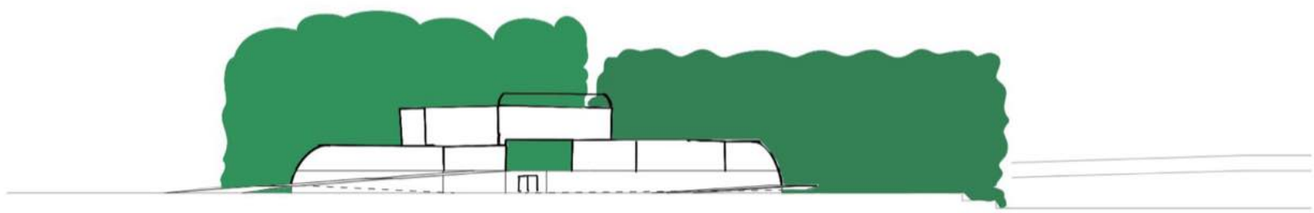


Concept of spatial placements

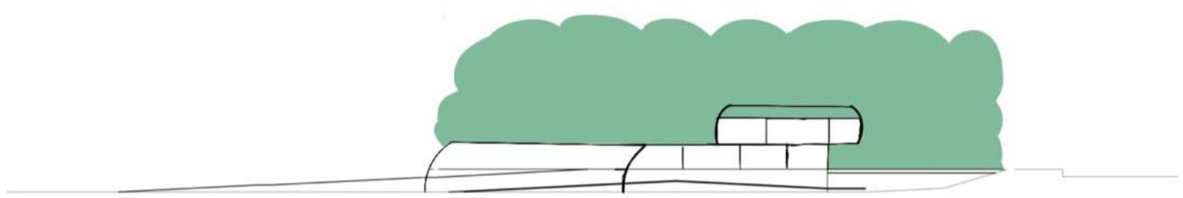
Testing the size of the spaces in the mapped out area, working around the weave

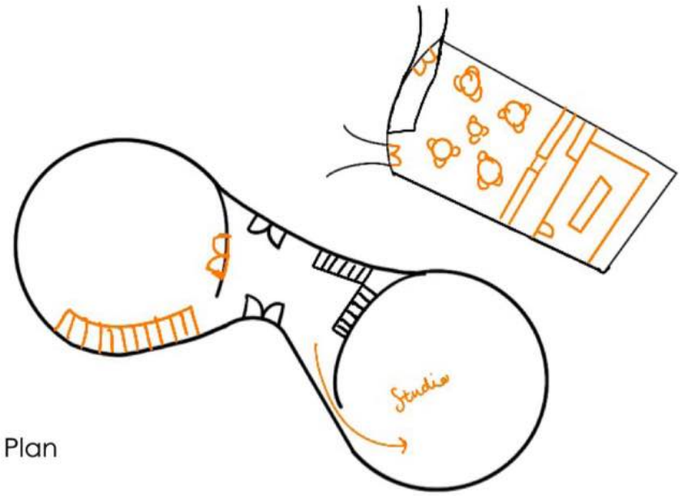


Overall spaces being mapped out

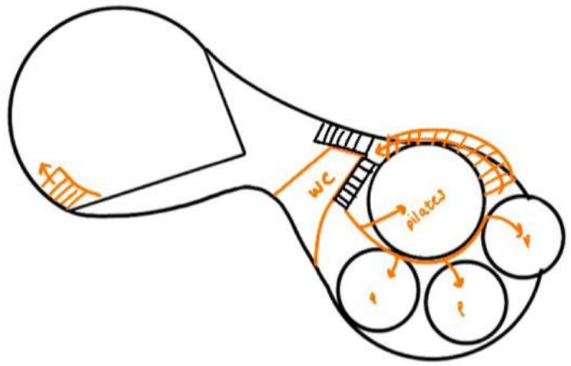


Elevations to work out paths heights and if the 1:20 ramp would fit in the space

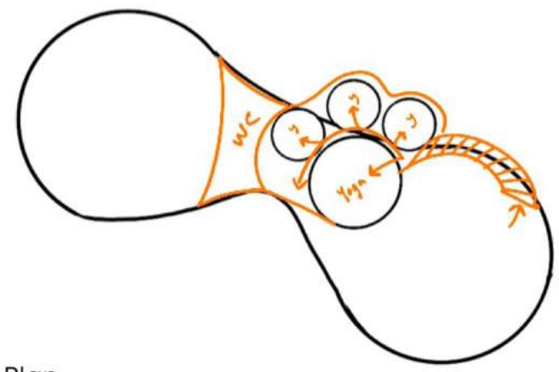




Ground Floor Plan



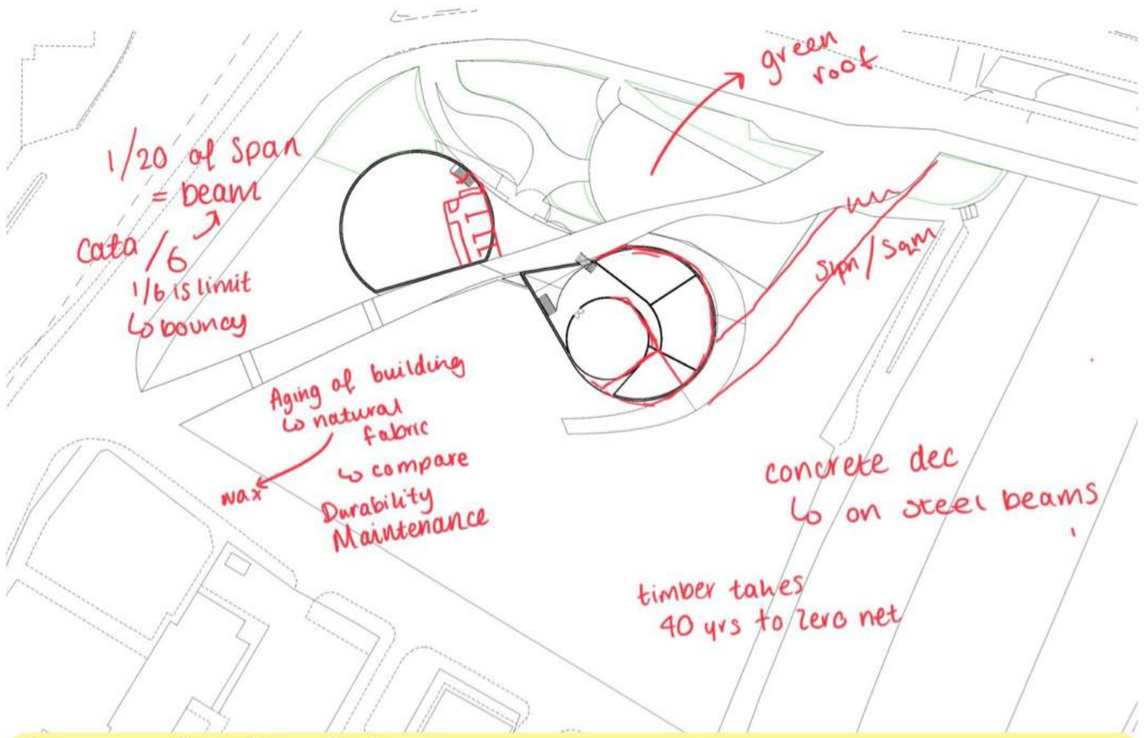
First Floor Plan



Second Floor Plan

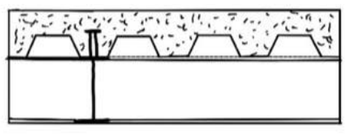
Concept Development

Developing my spatial plans and talking to a visiting engineer on things to consider in my design.

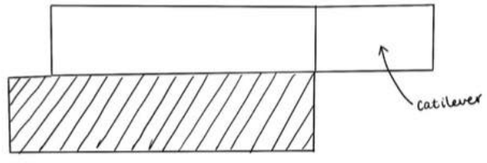


In conversation with an Engineer

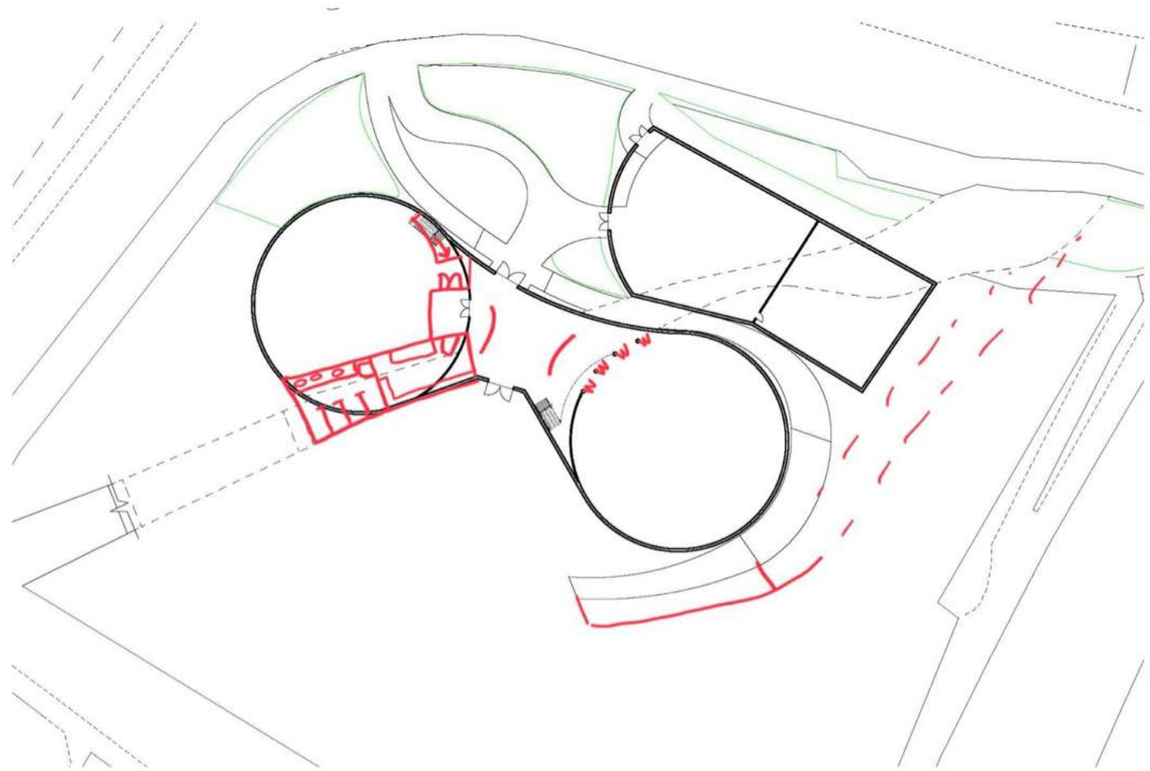
It was suggested for my path over the green roof of the cafe, and for the elevated path, to use a concrete dec on steel beams.

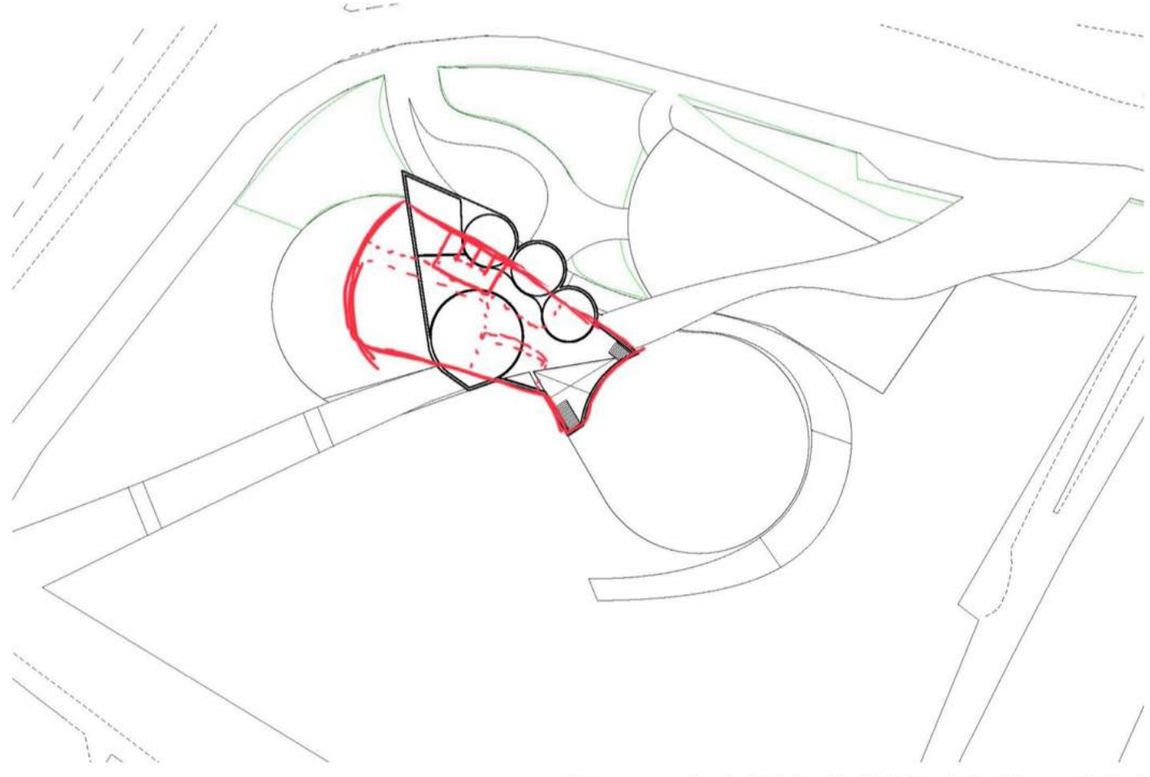


If any of the building was cantilevered, such as the top floor, The limit of base to cantilever is 1/6, but that is the max limit as it can be bouncy, therefore pillars may work best here



Natural fabrics would age and have less durability than synthetic fabrics on an external layer. This would factor into choice if the external walls needed replacing every 5 years

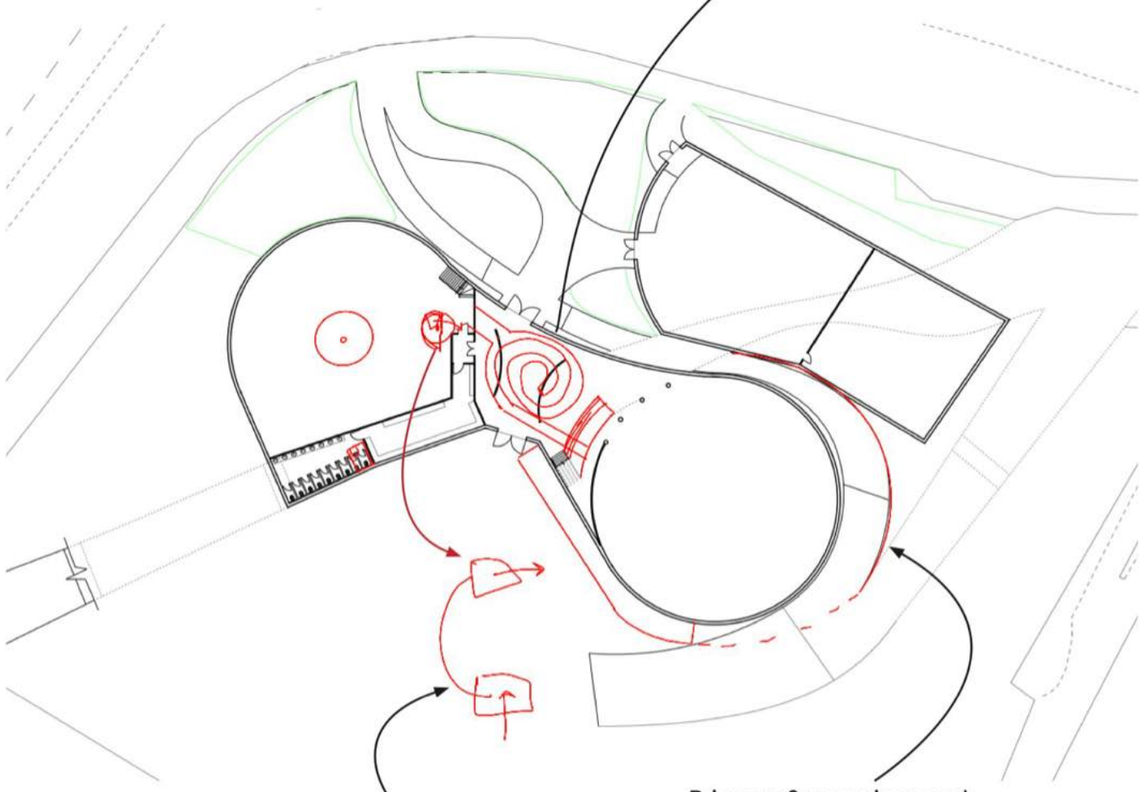




Play

Concept with Play

Adding ideas of play around my plans to develop the idea to be more fun. In particular looking at routes around my building that are accessible



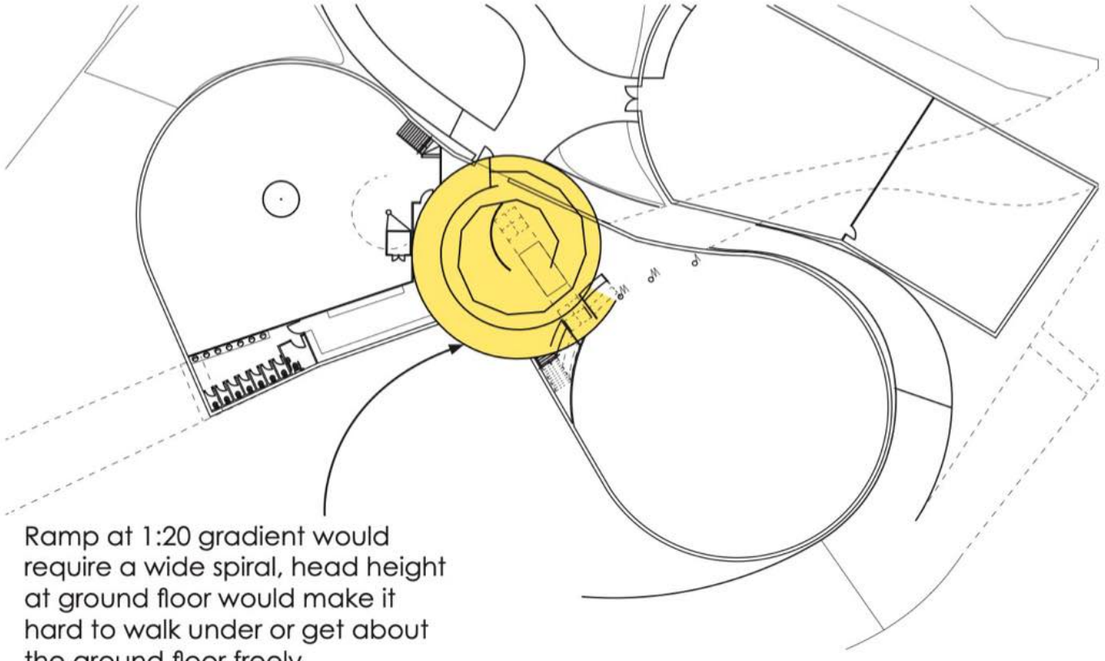
See on next page for the idea of the fireman pole with a platform for those with mobility issues

Privacy Screening such as the textile one on King Farhad library

Precedent of central ramp

Using the idea of universal design, which makes technologies and approaches accessible for everyone, to eliminate barriers to inclusivity (Lambini, 2025).

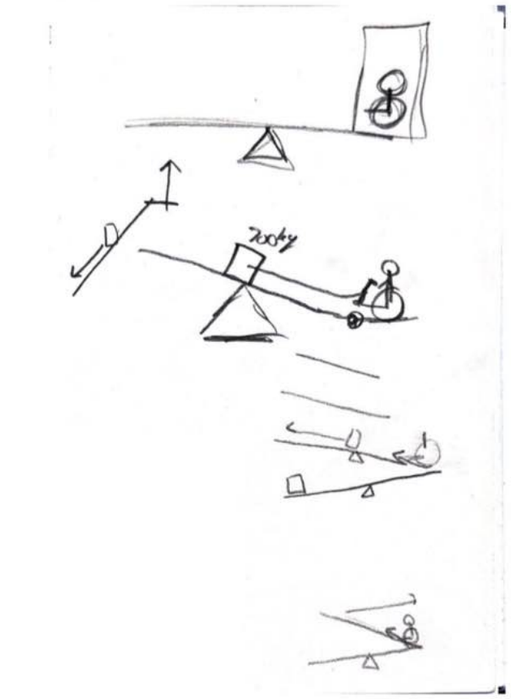
Why the ramp wouldn't work in this scenario

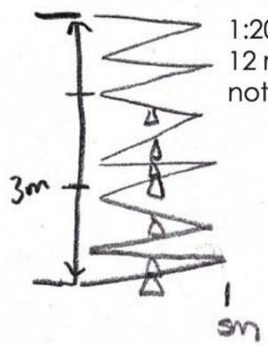


Ramp at 1:20 gradient would require a wide spiral, head height at ground floor would make it hard to walk under or get about the ground floor freely

What's more playful than a ramp?

The See-saw

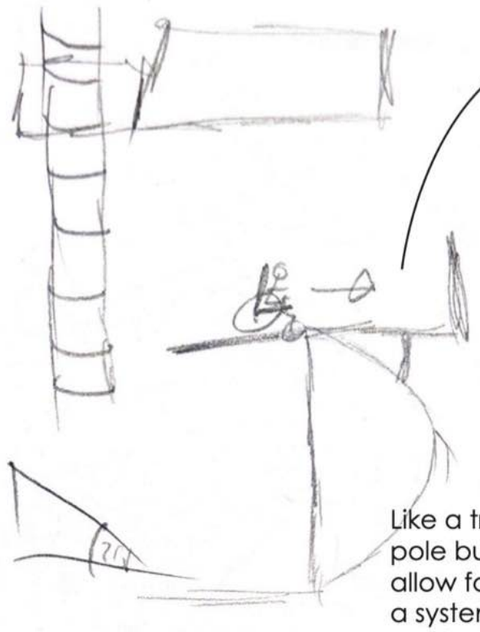


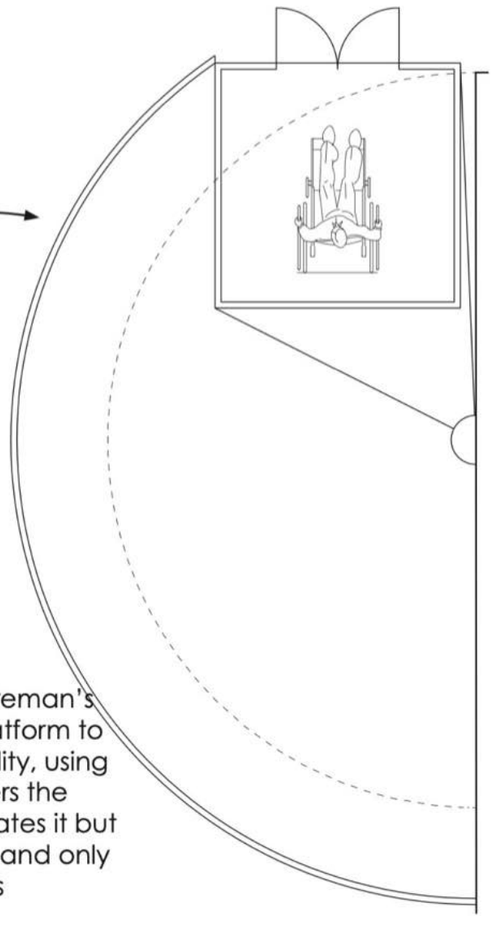


1:20 ramps
12 ramps required
not practical

This idea was that the visitor would use a pulley system to pull the ramps causing them to tilt and landing on the platform above. Under building regulations, if this was class as a ramp it would require too many to be practical.

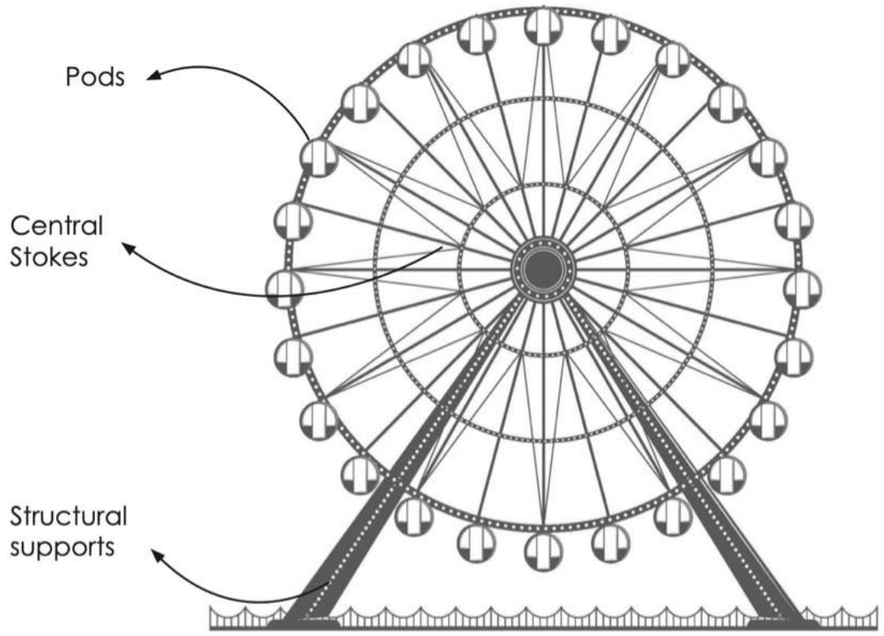
The Fireman's Pole





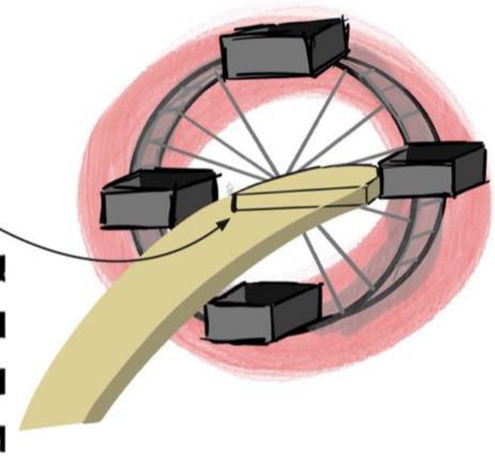
Like a traditional fireman's pole but with a platform to allow for accessibility, using a system that lowers the platform and elevates it but at a gentle speed and only rotate 180 degrees

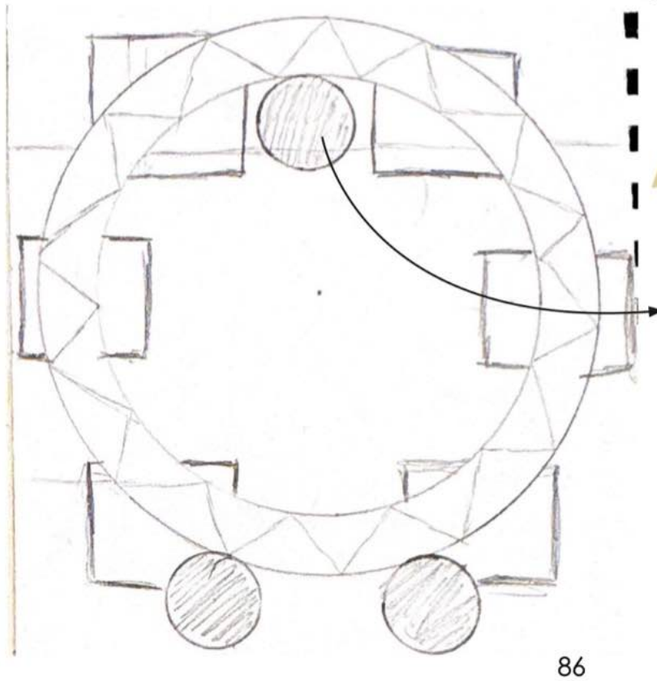
The Ferris Wheel



How would a Ferris Wheel in a Building work?

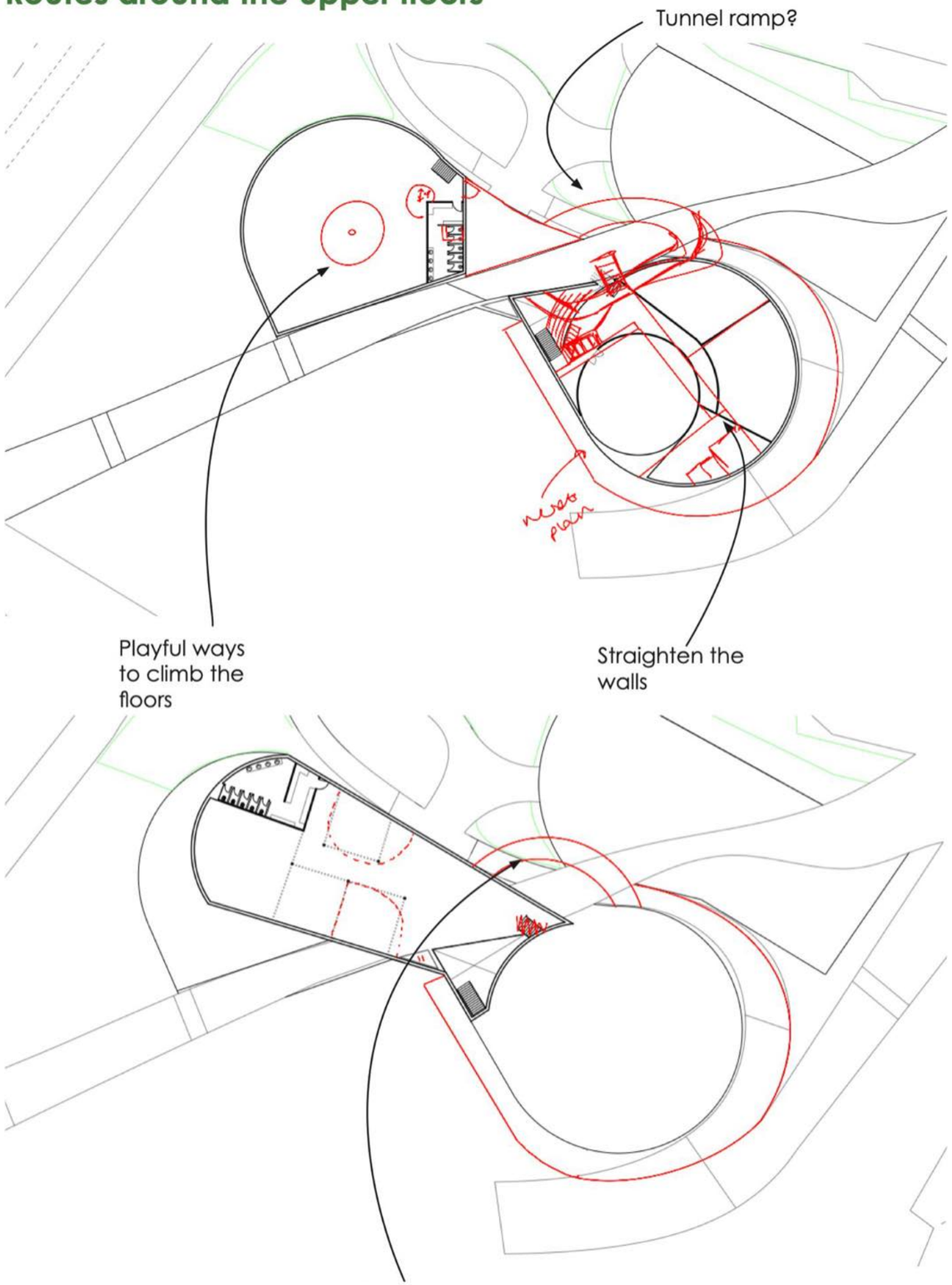
Unlike a normal Ferris wheel, with spokes towards the centre, the Ferris wheel in this building will need to be engineered differently due to the ramp running through the centre of the building





Each floor has supporting runners to support the weight of the wheel so the internal stokes are not needed

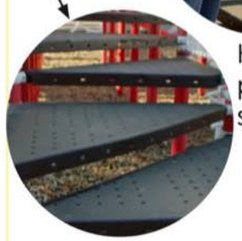
Routes around the upper floors



Harpers Playground

Harpers playground was designed by a dad who's daughter was unable to use commercially built playground as they did not allow for accessibility

Handles to pull up onto stairs?



(Harper's Playground: Because everyone deserves to PLAY, 2020)

Sensory as well as physical play equipments

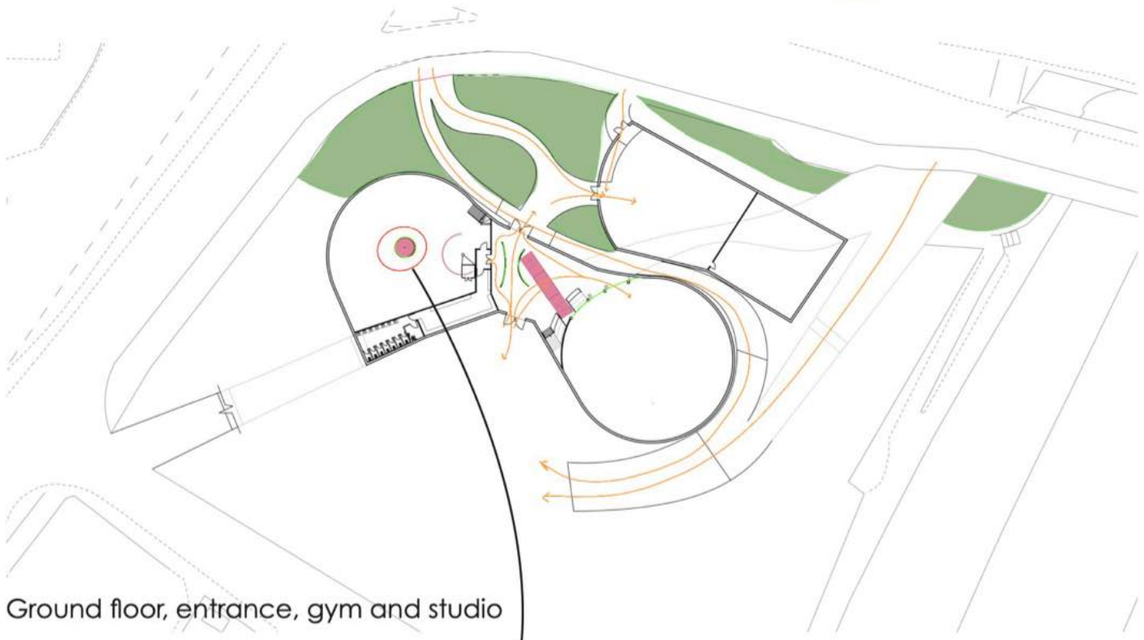
Harpers hill:
Artificial grass that you can slide down safely.

Simple design that is popular with the children and adults

Sequencing the layout

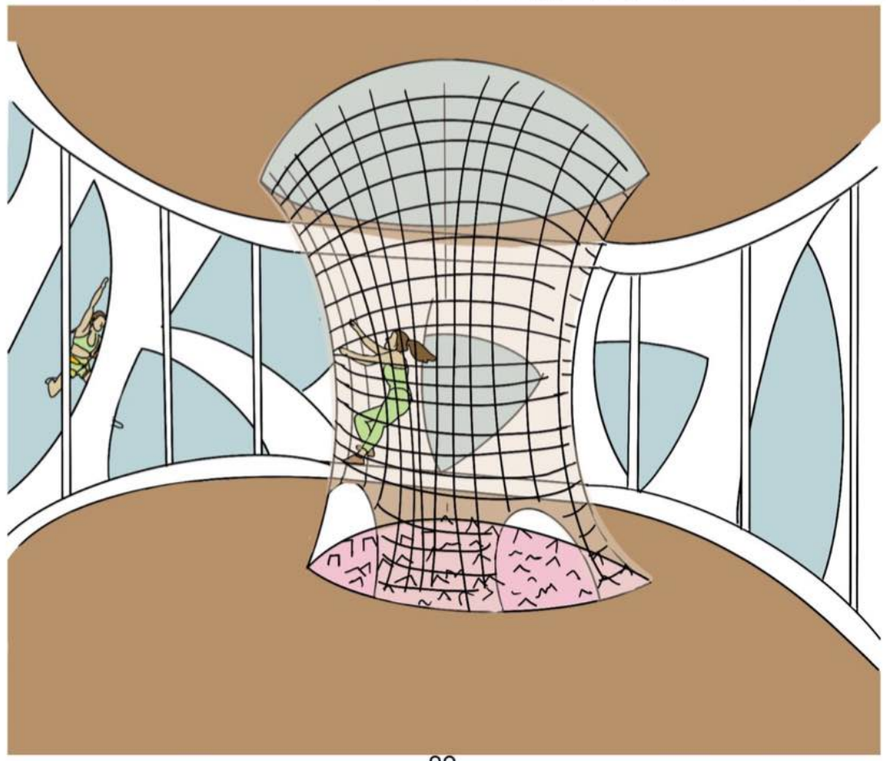
Exploring how someone may explore the building and what views they may see, as well as key elements in the design so far

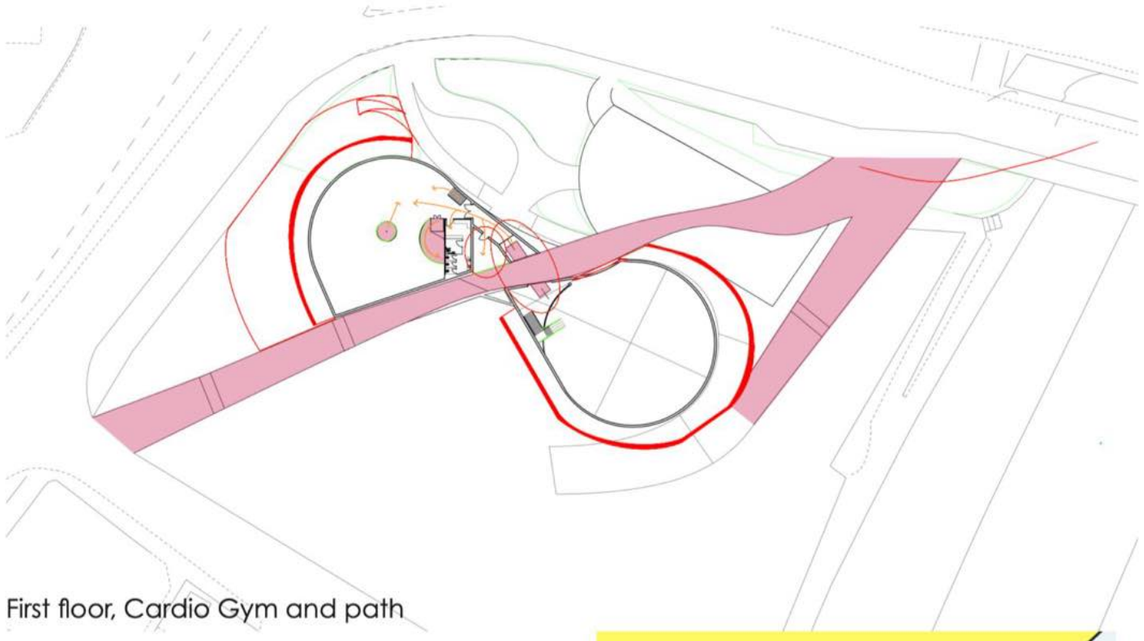
- Greenery
- Play
- Circulation
- Textiles



Ground floor, entrance, gym and studio

Inside the gym, a playzone for climbing





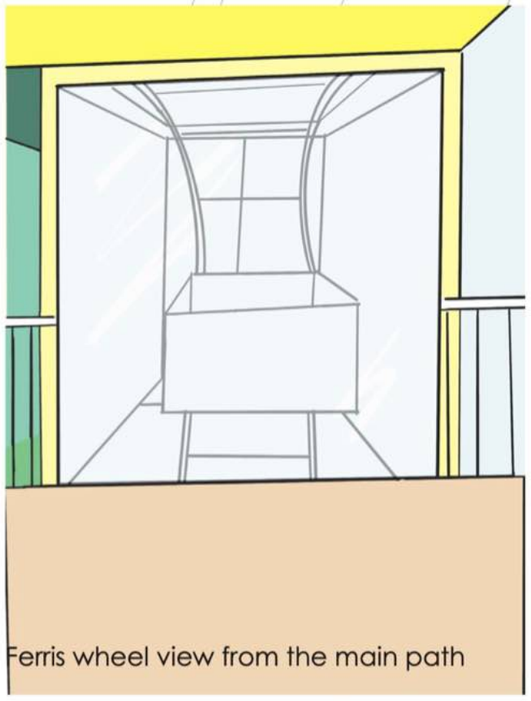
First floor, Cardio Gym and path

Climbing over modern buildings

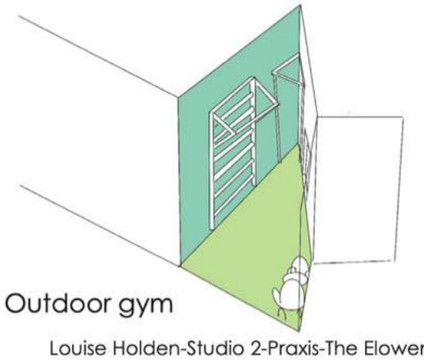
Alex Honnold, known for free climbing skyscrapers and modern buildings. A unique way to explore architecture, but a fun way to get around a building. What is people could climb my building?

Making climbing accessible

Climbing can be accessible and is encouraged by climbing groups. Adapting a climbing wall to hold a hoist, the wall can be adapted for any needs. I'd like to include a climbing wall that can facilitate this onto my design.



Ferris wheel view from the main path



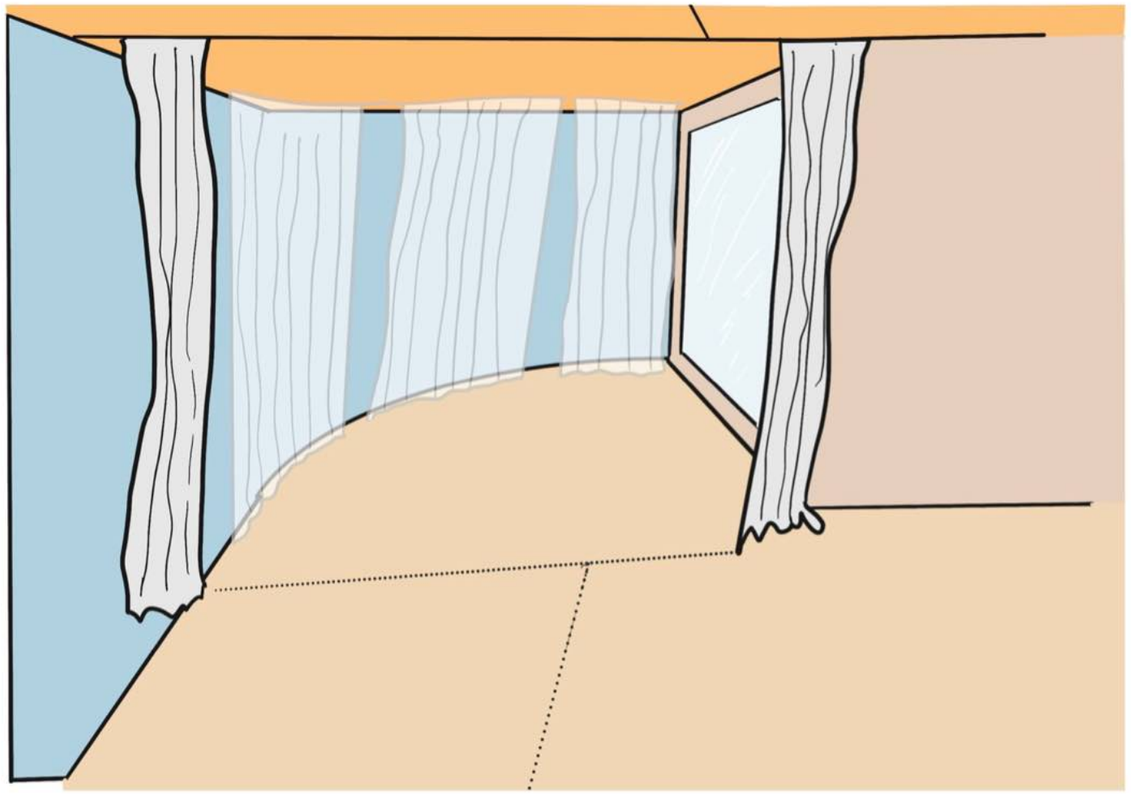
Outdoor gym

Sequencing the layout

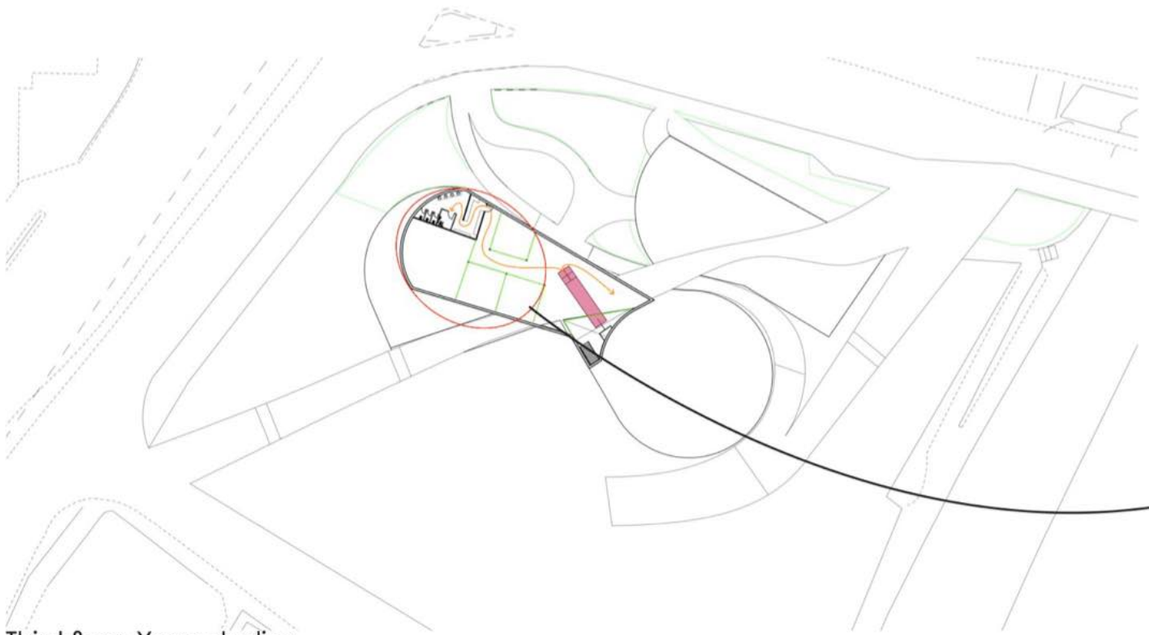
Exploring how someone may explore the building and what views they may see, as well as key elements in the design so far

Second floor, Pilates studios

Walls to be made from textiles like the concept model, where you can see in and out but vision is obscured, this also means there won't be any corridors that don't have people seeing what's happening at all times, active surveillance



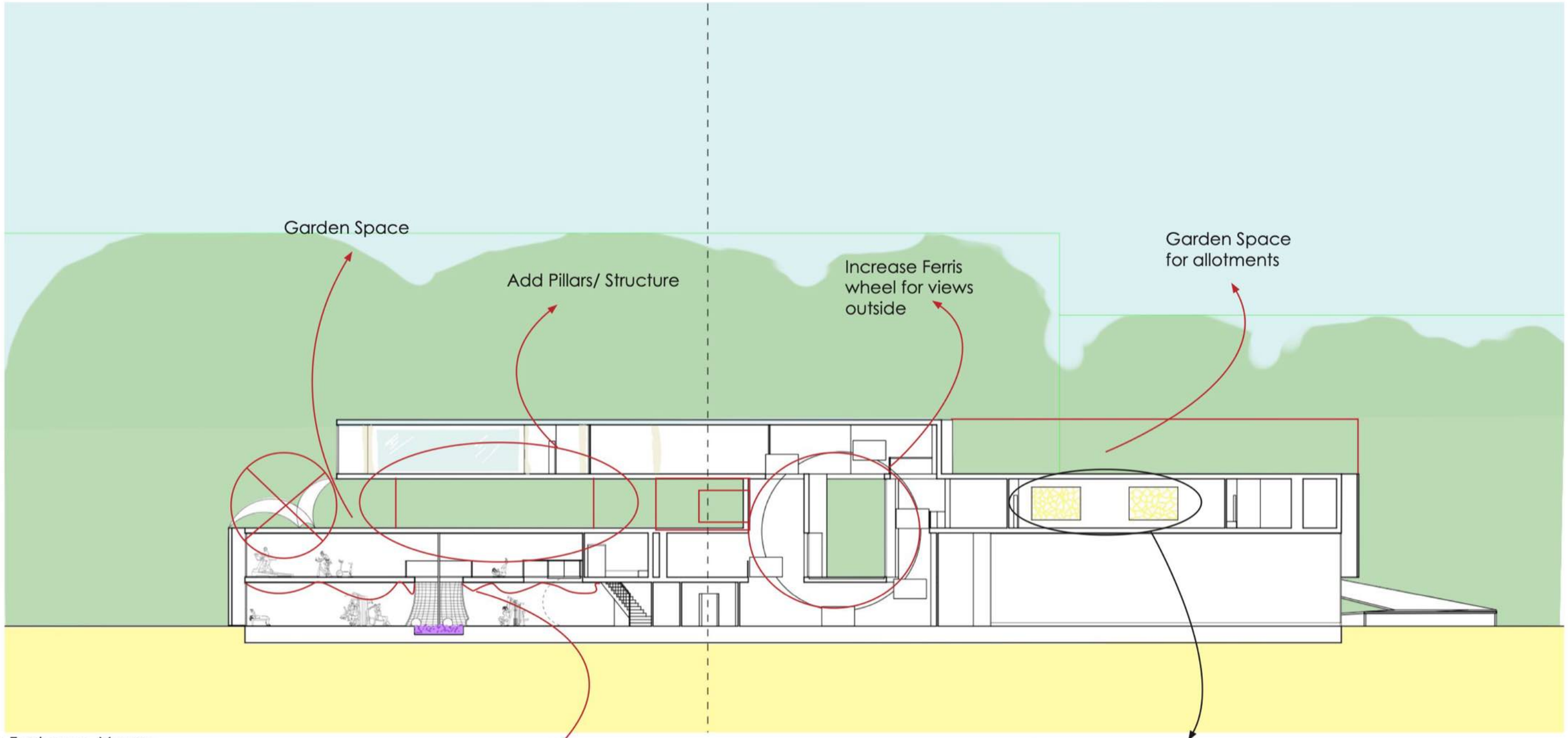
Walls in the yoga studio floor to be made of curtains, to diffuse the light and have the soft comfort feeling, as well as allowing the space to be flexible and open the studio to larger or smaller classes as needed



Third floor, Yoga studios

Conceptual Section

A section of the building so far to show how the Ferris wheel will slot in, as well as other items of play.



The Funhouse, Vegas
Justin Flom
Inspiration from the funhouse, famous on instagram on creative ways justin made to get around his house to make it fun for his family



10m 25m

Scale @ 1:500

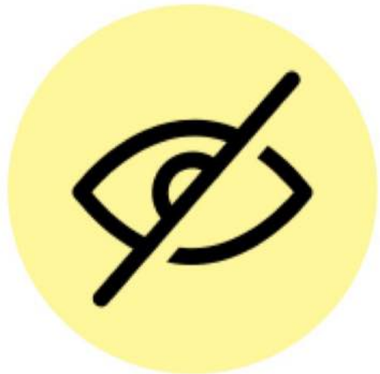
Drivers Summary

What are my drivers based on the research I have done.

Movement

Movement for this project is about accessibility and the freedom to move around the site.

I looked at how different people view the site, and how we can make architecture to be accessible as well as follow desire paths through the site.



Privacy

Privacy for this project is about the freedom to live in our bodies without being stared at.

I looked at flexible ways the spaces can be changed for individual needs and doing this through the use of textiles as a representation for flow and privacy.

Play

Play for this project is about the way we get around the building learning to trust our abilities and have fun.

Fun ways to get around the building in a accessible way is more than just a ramp, it includes an accessible Ferris wheel, a climbing net, fireman's pole.

Environmental Factors

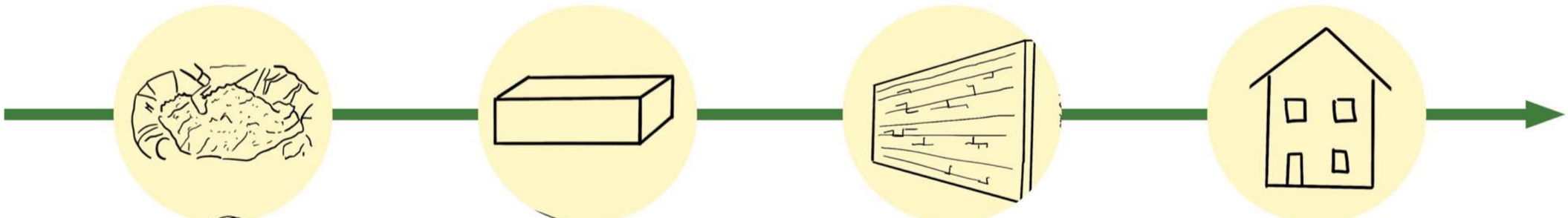
Deconstructivism:

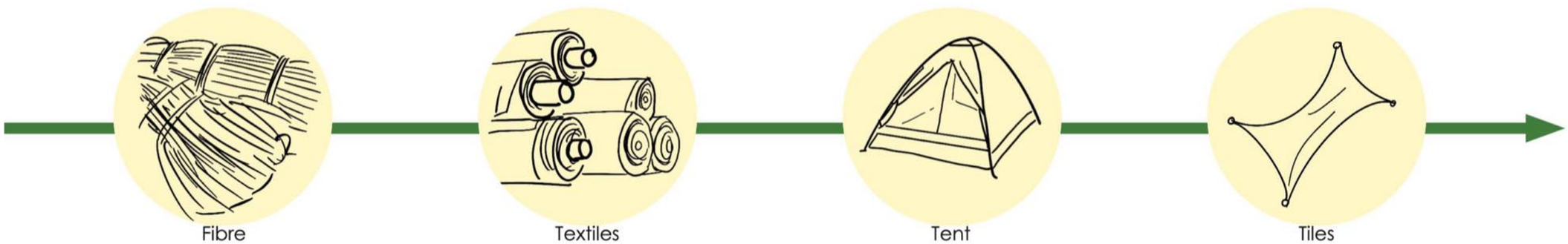
What is Deconstructivism?

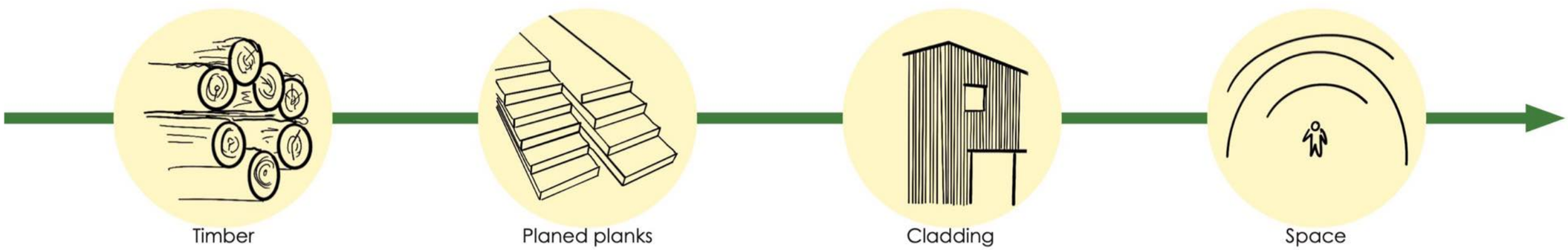
It is known as a postmodern architectural movement emerging in the 1980s, characterized by fragmentation, non-rectilinear shapes, and the distortion of structure. However, direct meaning is to the breaking down, or demolishing of a constructed structure, whether it being for structural reasons or just an act of rebellion (Stouhi, 2020).

Opposing Nikolaus Pevsner's view, a building can be architecture, but not all architecture can be a building.
A building requires a location, whereas architecture can be moveable.

Material	Product	Architecture	Building
the substance or substances of which a thing is made or composed. anything that serves as crude or raw matter to be used or developed. (Dictionary.com, 2026)	usually something that is produced by an industrial process. (Cambridge Dictionary, 2026)	Architecture in this project is a space, a development from the product to an item that is usable to people	A building is a development from architecture, with a set location, providing shelter and a function.



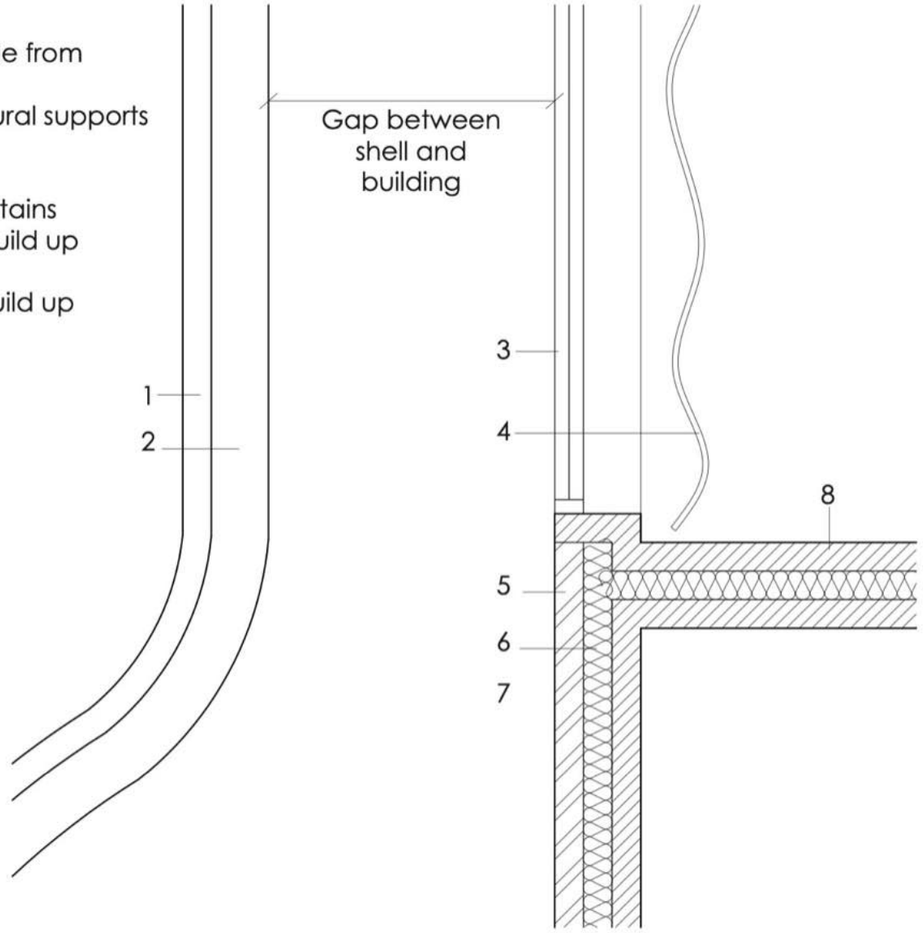




Choosing Materials

1:20 Detail of a 'Standard' Wall build up

1- Shell, made from textile tiles
2- The structural supports for the shell
3- Glazing
4- Textile Curtains
5- External build up
6- Insulation
7- Internal build up
8- Flooring



What will be covered in Environmental factors?

Thermal

Thermal Comfort:
- Requirements for the space and for women
- Humidity

Thermal Insulation
- K, R and U values

Breathing
- Ventilation
- Air Movement

Acoustics

Acoustic properties:
- Frequency, Loudness and Reverberations

Sound and the ceiling
- What shape ceilings reduces echoes in larger spaces

Acoustic insulation:
- Noise reduction coefficient
- Sounds insulation
- Acoustic isolation

Daylight

- Biological factor
- Daylight Factor
- Glare and diffusion

What are the aims:

To research and understand the material choices for my building to make suitable choices

To use materials to further my drivers of Move, Privacy and Play

To find environmentally sustainable and locally sourced materials

Thermal Comfort

What are the required temperatures for my spaces?

The recommend temperature for spaces in my building as follows:

Yoga- 21-24 degrees Celsius
Pilates- 18-20 degrees Celsius
Weights Gym- 18-22 degrees Celsius
Cardio gym- 18-20

Cafe- 20-23 degrees

But is this specific to women (my user) or to all the population? (or just men!)

What are the required temperatures for women?

Headlines from newspapers and articles

women are comfortable at a temperature 2.5C warmer than men

Temperatures of spaces based on women's needs:

Yoga- 22.5- 26.5degrees Celsius
Pilates- 20.5- 22.5 degrees Celsius
weights Gym- 20.5- 22.5 degrees Celsius
Cardio gym- 20.5- 22.5 degrees Celsius

Cafe- 22.5-25.5 degrees

Temperatures of spaces based on women's needs and the activity:

Yoga- 22.5- 26.5degrees Celsius
Pilates- 20.5- 22.5 degrees Celsius
weights Gym- 19- 22.5 degrees Celsius
Cardio gym- 18- 20 degrees Celsius

Cafe- 22.5-25.5 degrees

What this means for material choice?

The spaces will require more insulating, through surface materials and insulation. The shell will also act as a second skin to heat the building naturally.

The aim is to require less heating and keep the building warm through other means.

Humidity and leisure Spaces

Humidity in gyms from warm active breathing people during the day can settle over the night and lead to misted and water covered windows and surfaces in the morning. In addition to this humidity can:

- cause mold to grow rapidly
- Damage gym equipment
- Cause rust build up

An ideal range for humidity in between 40-60%, with humidity over 70% and under 30% causing issues to the building and health issues in users.

What this means for material choice?

In addition to the usual materials:
- Vapour Barriers
- Waterproof membranes
- Damp proof linings

materials should be breathable, moisture resistant and a ventilation system such as a dehumidifier should be used.

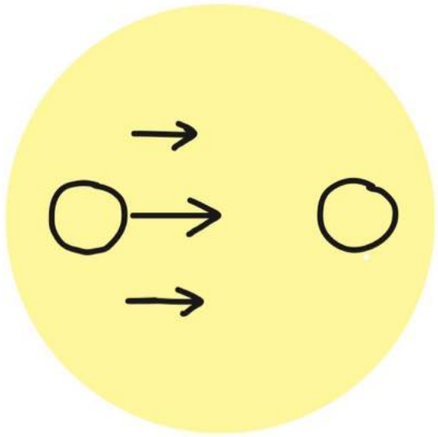
Wood, clay and hempcrete act as a passive buffer against high humidity

Hot yoga

Infrared heating system used

In addition to ventilation and HVAC systems, hot yoga studios should also incorporate moisture-resistant materials and surfaces to prevent damage and promote their health and cleanliness.

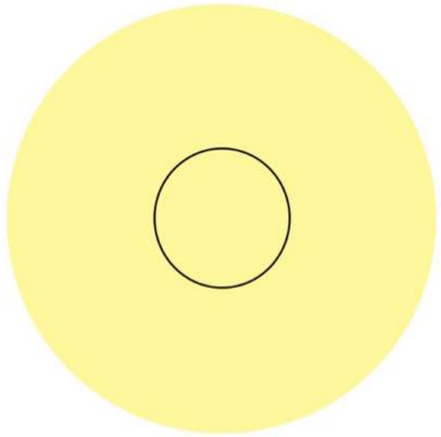
Thermal Insulation



K Value

Rate at which heat is conducted through a particular material under specified conditions- it's thermal conductivity

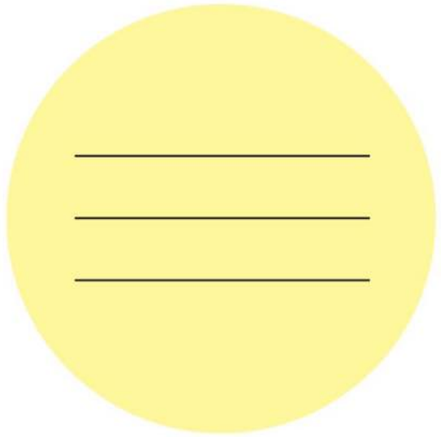
Measured in watts per meter kelvin (W/mK)



R Value

The thermal resistivity of a material, the reciprocal of thermal conductivity and is dependent upon its thickness

Measured in R= t/K



U Value

The ability of a material or set of materials to transfer heat energy from one side to the other, thermal transmittance

Measured in watts per square meter per degree centigrade(W/m2K)

Summary:

For exterior material, a low K value, Higher R value and low U-value. Based on this a Timber exterior would be ideal. Ideally a locally sourced timber would be used. Going forward, I would like to look at exterior timber precedents.

For insulation, a low K value, high R value and low U- value is ideal. Of all the insulation choices, the materials were close. XPS does perform better but not significantly and preferably for this project I'd like to use natural materials such as sheep's wool.

For the Interior Material, it is the same as above preferences, making timber and carpet the better choices. For the sports space, a timber material would be preferred as carpet could get worn easily and not provide the right surface for a workout.

Additional factors in my design such as textiles and glass will help to maintain warmth in the space, whilst allowing for ventilation such as the breathability of the curtains

Potential Material Choice:

Exterior	K Value	R Value	U Value
Brick	0.77 W/mK	0.44 to 0.80	2.0 to 2.7 W/mK
Timber	0.14 to 0.197 W/mK	0.7 to 1.3	2.0 to 3.0 W/m²K
Textiles- Polyester	0.04 to 0.05 W/m·K	<0.02	4.4 W/m²K

Insulation	K Value	R Value	U Value
Sheep Wool	0.04 – 0.045 W/mK	2.5 – 2.86	0.35 – 0.4 W/mK
Mineral wool	0.035 – 0.045 W/mK	2.2 – 2.86	0.35 – 0.4 W/mK
XPS	0.029 – 0.035 W/mK	2.86 – 3.45	0.29 – 0.35 W/mK

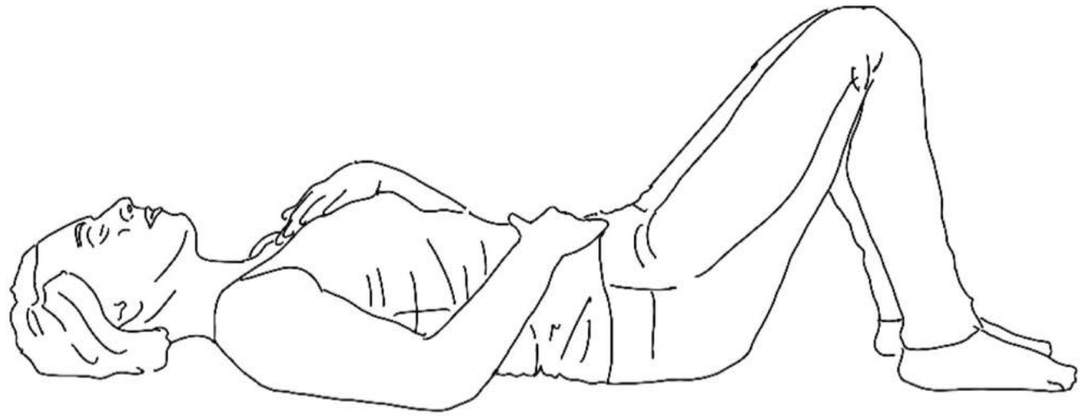
Interior	K Value	R Value	U Value
Timber	0.12 – 0.16 W/mK	0.16 – 0.21	4.8 – 6.4 W/mK
Block& Plasterboard	0.17 – 0.25 W/mK	0.05	20W/mK
Carpet	0.04 – 0.06 W/mK	0.2	5 W/mK

Additional factors	K Value	R Value	U Value
Textiles	0.04 – 0.06W/mK	0.083	8-12 W/mK
Glass	0.7 – 1.0 W/mK	0.33	2.8 – 3.0W/mK
Shell	0.3 – 0.5 W/mK	0.02 – 0.033	30-50 W/mK

Breathing

How can the building breathe?

Breathing in yoga and pilates



Diaphragmatic breathing in Pilates is used to stabilise your core and lower muscles, this protects us from injuries (Manheim,2023).

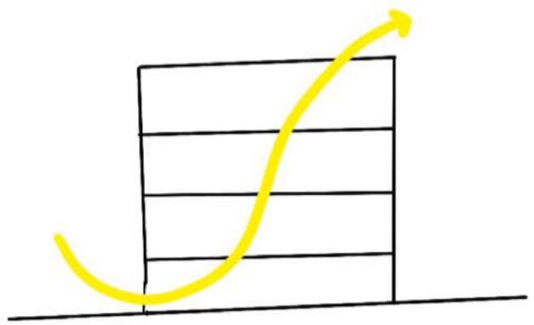
Breathing is an essential part of yoga and pilates and therefore I think my project should also reflect this, providing air flowing and breathable materials and spaces.

Air Movement

A breeze around 50cm per second provides equivalent temperature reduction of around 3 degreed Celsius

Ventilation is normally measured by the number of times that the air in the room is completely replaced in one hour.

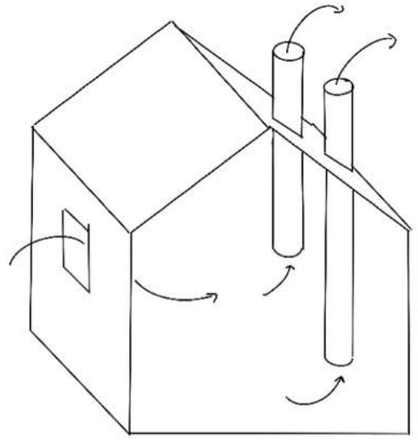
Cross ventilation could be added to my design, ensuring the windows and ventilation allows for air flow to move through the building



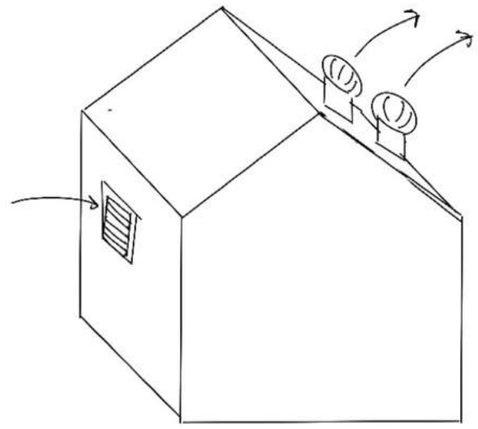
Ashtanga Yoga Chile, DX Arquitectos

In this yoga studio, cross ventilation was used through lower windows and flowing up to higher windows. Timber was used to absorb the moisture from the humidity of the activity. Additionally the high windows avoid direct sunlight which could heat the space up further.

Ventilation- Passive vs Active



Passive
Uses natural airflow without mechanical intervention. This could include vents and windows.



Active
Mechanical ventilation systems to move air. This includes air conditioning and dehumidifiers.

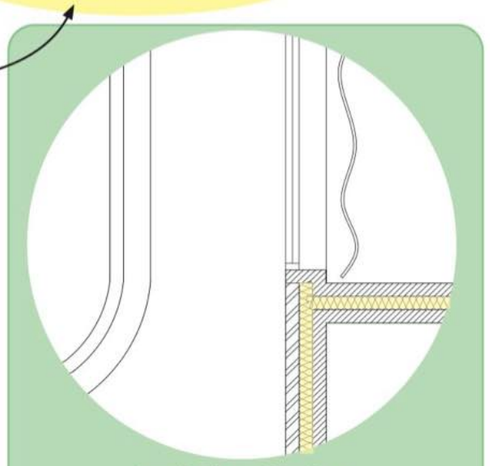
What this means for my design?
Referring back to the humidity spoken about earlier, to ensure the building removes excess damp, a dehumidifier should be used. However, I want my building to run as passively as possible so the active methods of ventilation are back up. This will reduce energy consumption of the building, increase indoor air quality and maintain a healthy temperature for women.

Roof ventilation will be used to as passive ventilation for the rising heat

To be fitted as per building regulations Part L- 6.47-6.53

The insulation will need to be efficient at maintaining heat as well as moisture resistant to allow for the humidity to be controlled passively.

Windows on the higher floors will be used for cross ventilation through the building



Insulation Choice

Sheep's wool insulation is a natural insulation, which is moisture resistant and holds the same insulation qualities as traditional mineral wool.

Acoustic Properties

What needs to be acoustically considered for my project?

Frequency

Frequency refers to the number of complete waves or cycles that occur in a specific unit of time, typically measured in hertz (Hz), where one hertz equals one cycle per second. (Renneboog, 2019)

Each organ resonates at a unique range for healing:

Brain: 72–90 Hz
Heart: 67–70 Hz
Liver: 55–60 Hz
Lungs: 58–65 Hz
Kidneys: 50–60 Hz
Stomach: 58–63 Hz

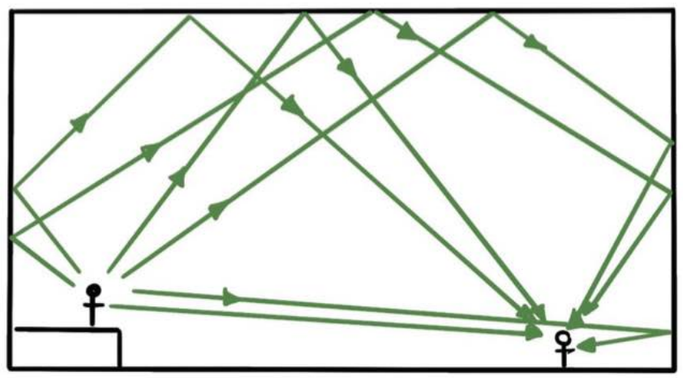
Loudness

Loudness, in acoustics, attribute of sound that determines the intensity of auditory sensation produced. (Britannica, 2026)

Quieter

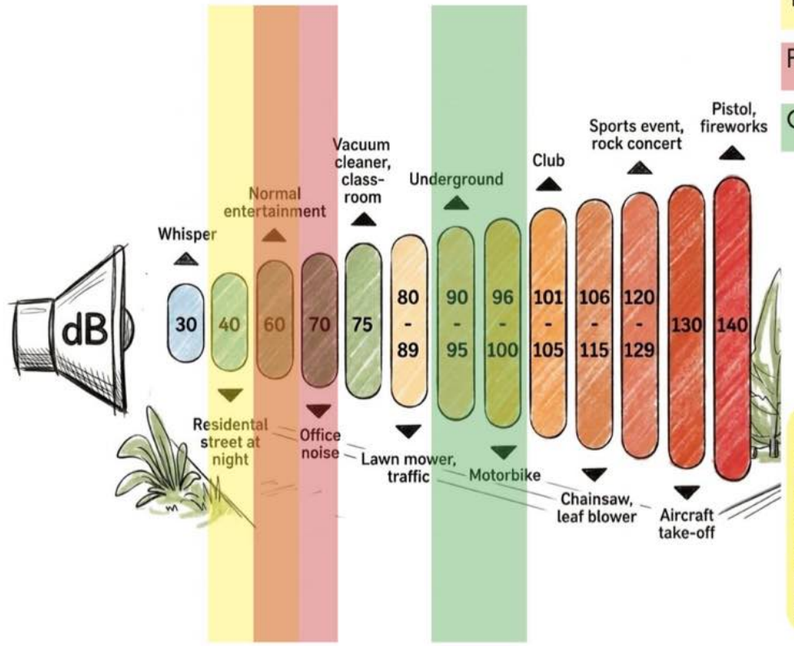
Louder

Reverberation



Reverberation is the collection of reflected sounds; reverberation time is how long it takes for these reflected sounds to lose energy and disappear. (Muffle, 2026)

Typical noise thresholds- loudness



Yoga Studios- 40-60db

Pilates Studios- 50-70db

Gyms- 90-100db

In the yoga and pilates studio, I want to create a calming atmosphere, so I will need to explore materials that will reduce the loudness and allow for that calm.

Typical noise thresholds- Reverberation time

Typical Reverberation Time	r/t secs
Outdoors	0.0
Bedroom / Living room	0.4
Cinema (recommended)	1.0
Glyndebourne Opera House (new), UK	1.3
Royal Festival Hall, London, UK	1.4
Concert Hall (recommended)	1.5
Carnegie Hall, New York, USA	1.8
Church (recommended)	2.0
Musiksvereinsaal, Vienna, Austria	2.05
Symphony Hall, Boston, USA	2.2
Symphony Hall, Birmingham, UK	2.4
St Paul's Cathedral, London, UK	12.0

(McLean, 2013)

Yoga Studios- 0.5-0.8 sec

This is to create a peaceful environment where gentle whisper instructions can be heard. Music can be low and ambient rather than loud in this environment

Pilates Studios- 0.6-1 sec

This should be followed due to less vibrations and allowing users to hear instructions clearly

Gyms- 1.5- 2 secs

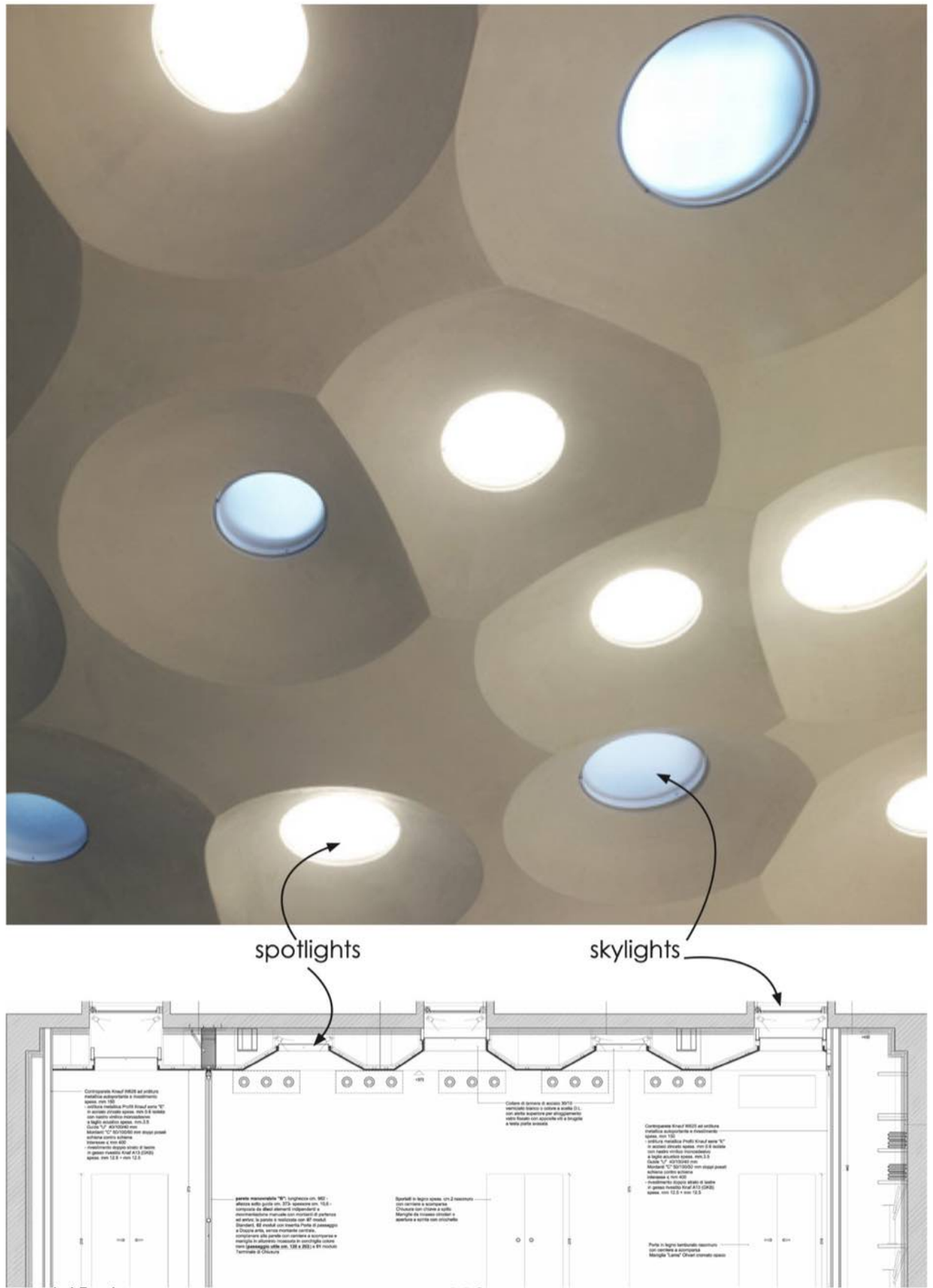
At this level normal conversation can be heard, high volume music. Sound absorption is most important in this space

Sound and the ceiling

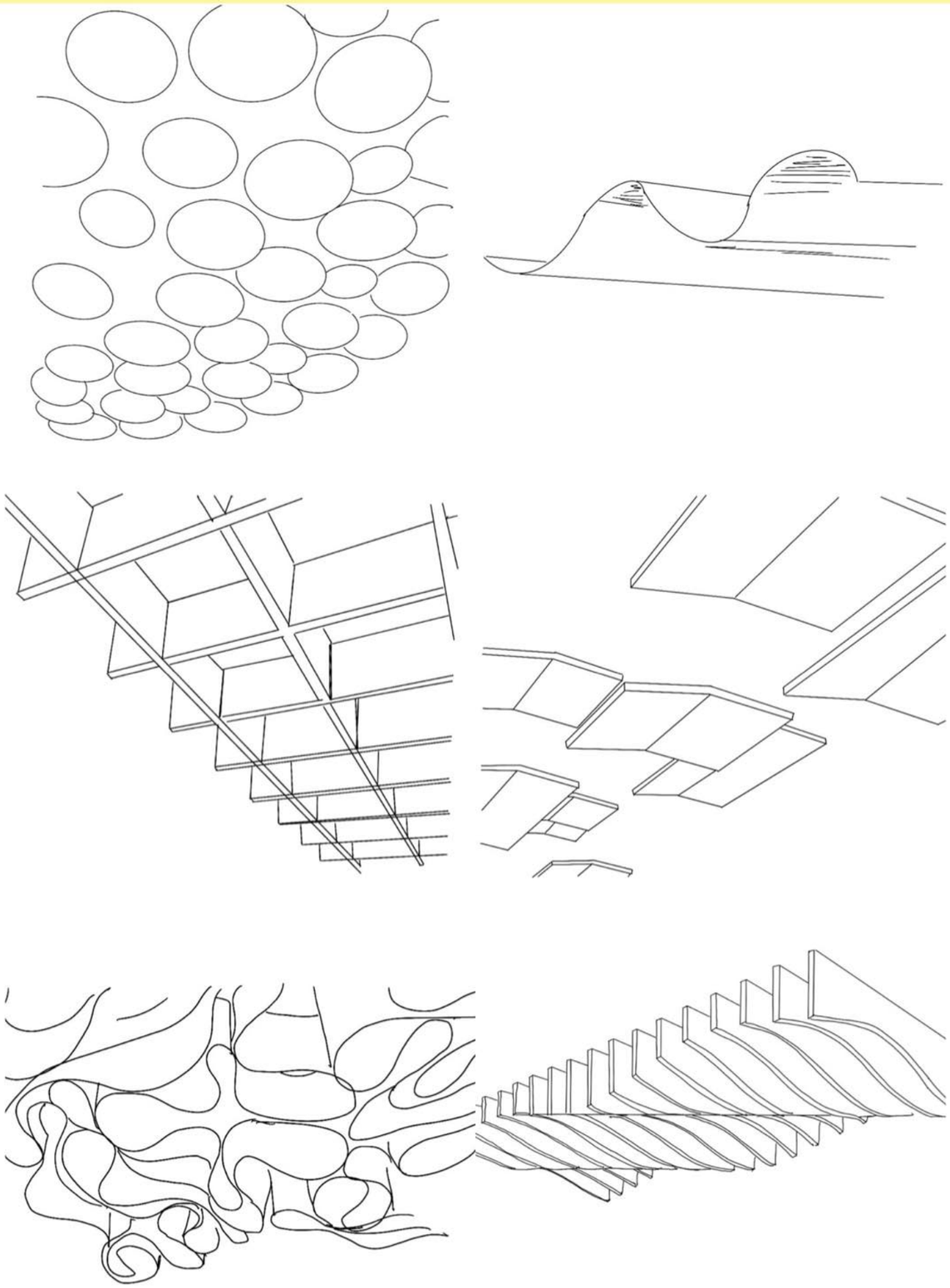
Zona K, Pietro Bagnoli and Franco Tagliabue

The space is used for events and exhibitions as well as for drama rehearsals and performances.

The bubbled ceiling over the main hall is comprised of suspended cones that regulate acoustics, whilst concealing electrical cables and ventilation passages.



Potential noise reducing patterns



Acoustic Control

How can acoustics be controlled for the level required in the space?

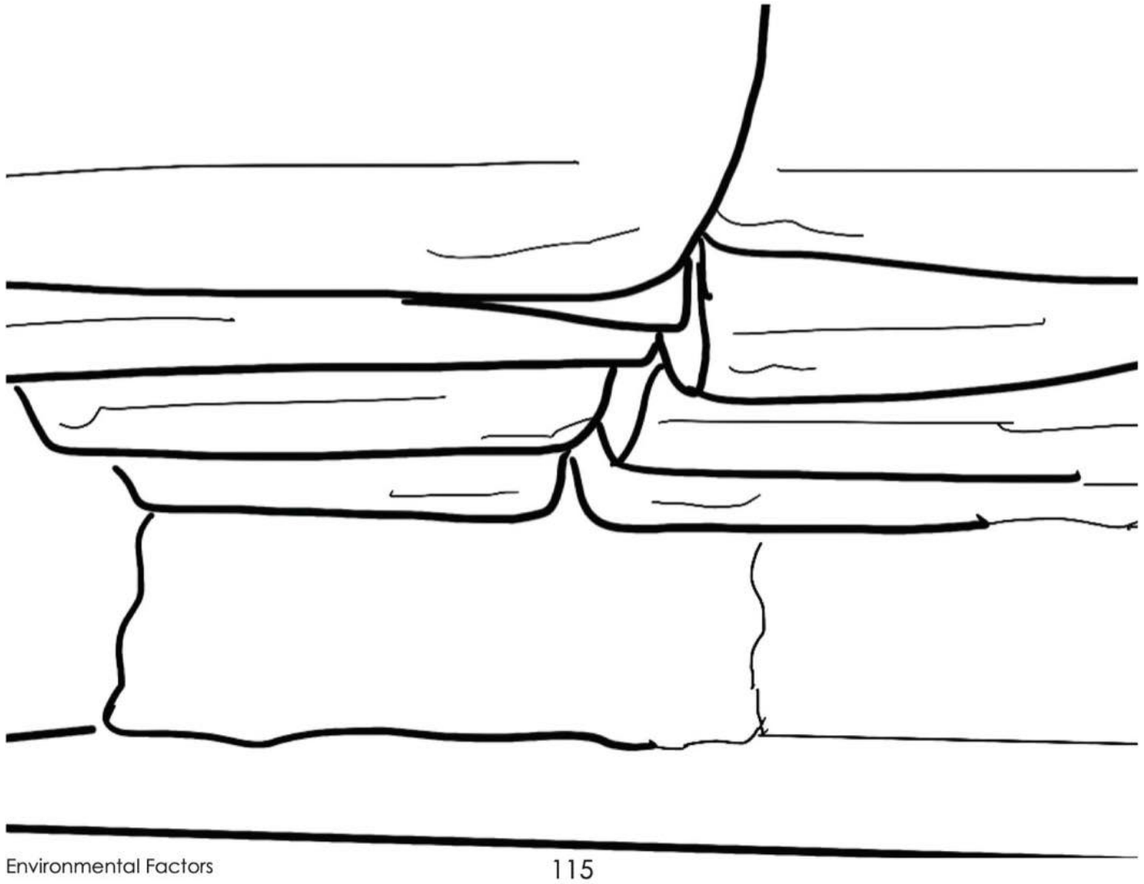
Noise reduction coefficient and reflection

Noise Reduction Coefficient	(NRC)[4]
Brick	.00–.05
Carpet (with underlay)	.30–.55
Concrete (smooth)	.00–.20
Glass	.05–.10
Plaster	.05
Plywood	.10–.15
Rubber on concrete	.05
Seating occupied	.80–.85
Seating unoccupied	.30
Steel	.00–.10
Terrazzo	.00
Wood	.05–.15

A materials ability to absorb sound is described as its absorption coefficient, a perfect absorber would have a coefficient of 1 and a perfect reflector would be 0. The NRC is the measurement of absorption across a range of frequencies.

Plywood and textiles absorb sound to reduce reflection through the space. This would make plywood an ideal material for the internal space. Curtains are to be used as partitions which will help with noise control and buffering sound in the space

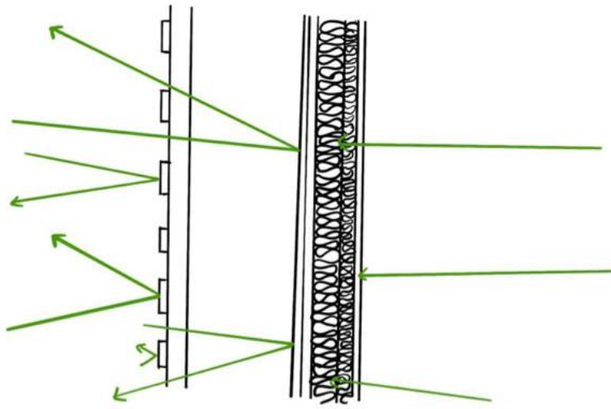
To further increase noise control in the quieter yoga and pilates spaces, the textile material can be draped from the ceiling. this will aesthetically flow with the design and the use of the space whilst practically reduce reflection of sound.



Sound insulation

Glass fibre in the shell tiles can act as sound insulation to stop the outside road noises getting inside the building

Timber exterior cladding, hardwood, can also be used as an extra layer against sound from external sources

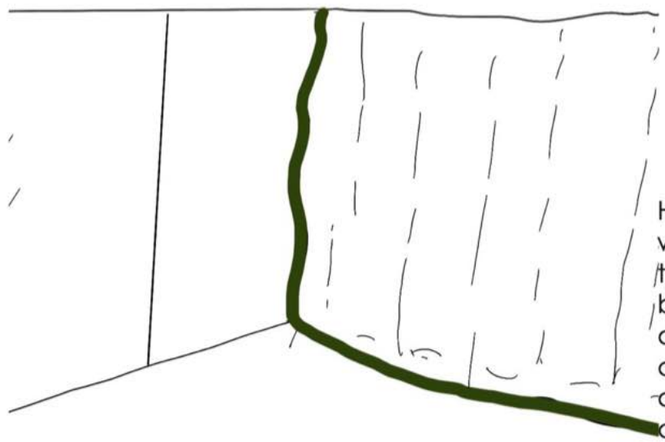


Dual panel internal walls with insulation will reduce noise flow in the building

Double insulation layer is a light weight solution to sound insulation whilst allowing the building to still breath

Acoustic isolation

Like thermal bridging, acoustic barriers can be installed in rubber to stop sound leaking out of spaces



However if this was used then the space would be less flexible and open. To create a sense of atmosphere and community, my project will be buffered but not isolated to one space

Daylight

Biological effect

Daylight sends signals via the novel photoreceptorto the biological clock that regulates the circadian rhythm.

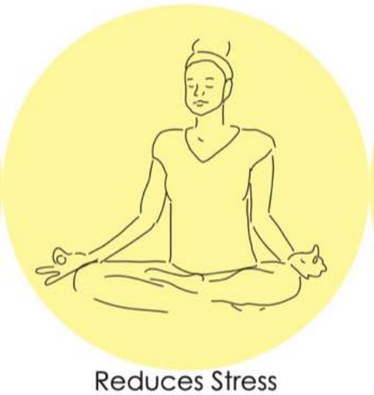
Light can:
- trigger the release of cortisol, the stress hormone
- trigger the release of melatonin, the sleep hormone

This helps with human functioning

Helping women with trauma

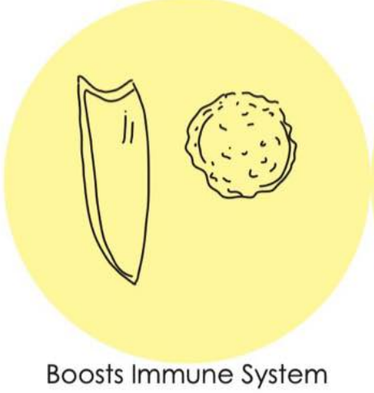
Participants with PTSD and panic disorder who received morning light therapy and CBT had:
- a significantly greater reduction of depression and anxiety symptoms
- improved sleep quality
- improved mood

Enhances Sleep Patterns



Reduces Stress

Strengthens Bones



Boosts Immune System

Elevates Your Mood

May Reduce the Risk of Melanoma

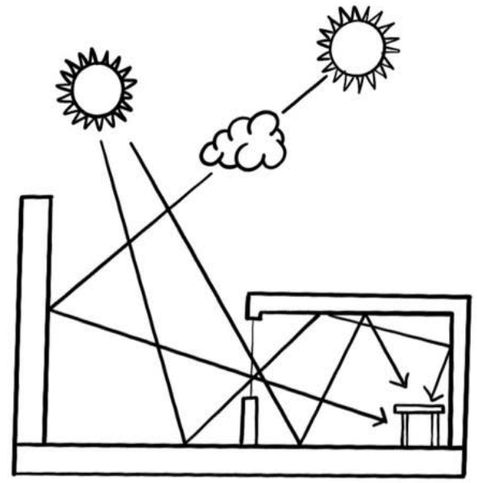
Daylight Factor

There are two components to natural light - direct sunlight and diffuse sunlight.

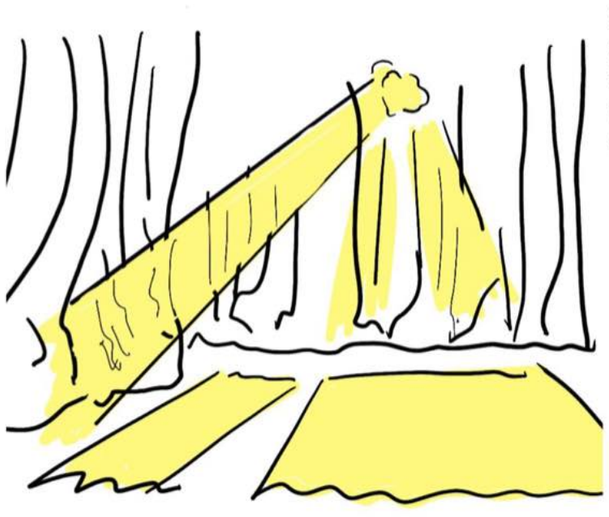
The overall daylight factor is made up of 3 components:
- The sky component
- The externally reflected component
- The internally reflected component

To maximise the internal sunlight reflection surfaces should be as light as possible:
- 70% reflectance's for ceilings
- 50% reflectance's for walls
- 30% reflectance's for floors

Increasing height of window ensures the back of the room is well lit

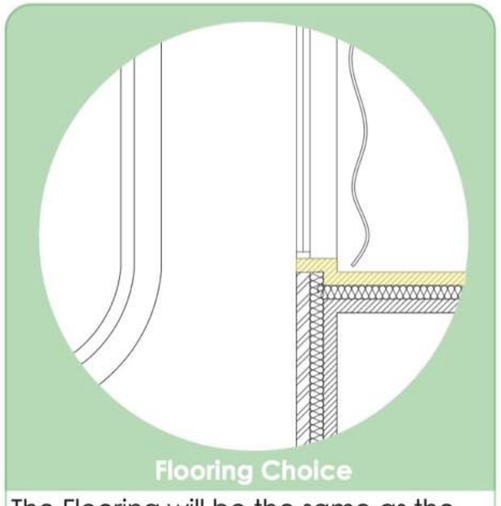


Glare and diffusion



Glare can occur from any direct source of light. The space could be softened to allow for light to fill the space whilst reducing glare to reduce risk of accidents occurring

I want to use textiles in my design to help diffuse the light through the space. This can flow from the partition curtains to cover the windows. This type of translucent curtain will add a layer of privacy to the space, whilst making it calming and soft with the light.



Flooring Choice

The Flooring will be the same as the walls and ceiling- a light Plywood. This is because it will help diffuse the light softly through the space

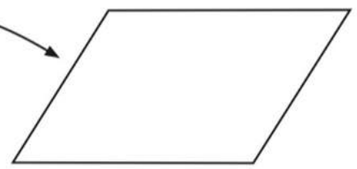
The Facade

King Fahad National Library
Gerber Architekten

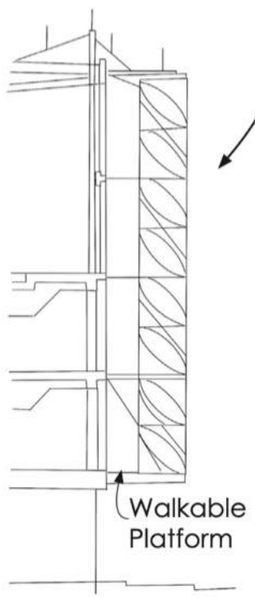
The square new building is covered by a **filigree textile façade** following traditional Middle Eastern architectural patterns and linking them with state of the art technology.

At night, the building lights up to be a beacon of the area

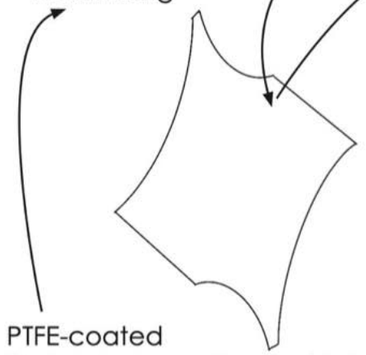
It is a cladding made up of rhomboid textile awnings, marked by its play with revealing and concealing.



Rhombus shaped textile pieces attached to the exterior of the building, therefore is not structural

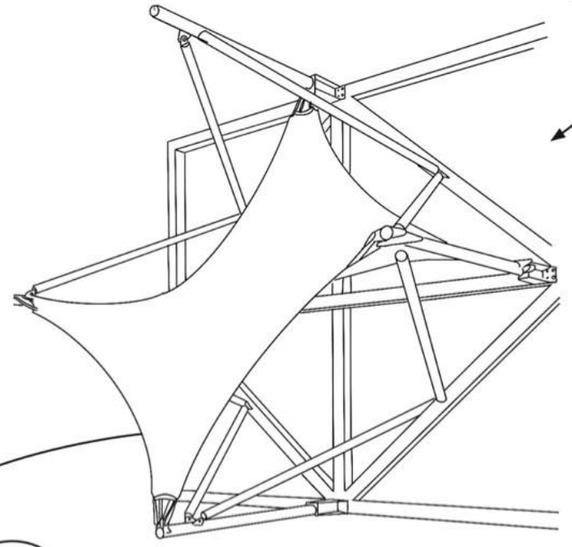


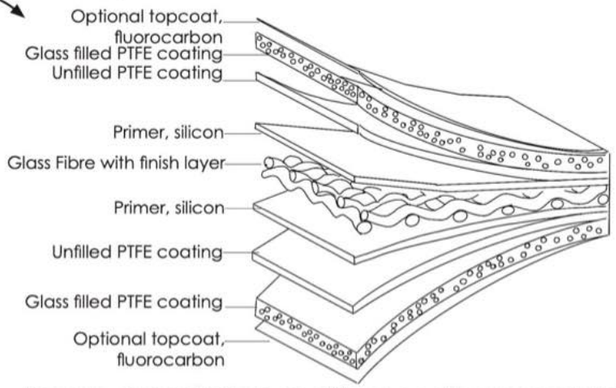
- Extreme Thermal Resistance
- Exceptional durability
- Waterproofing and Weathering



PTFE-coated (Polytetrafluoroethylene) fabric

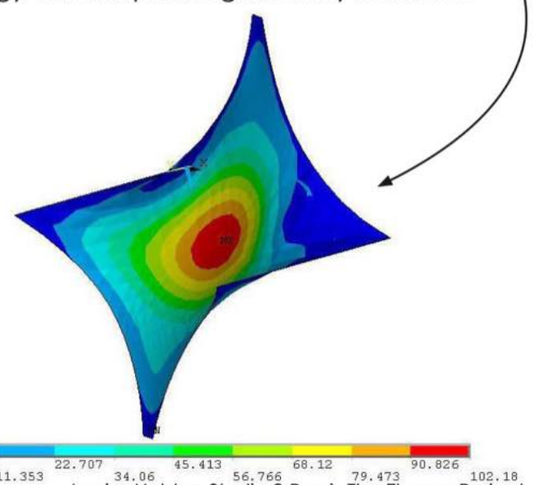
Inserted white membranes, supported by a three-dimensional, tensile-stressed steel cable structure



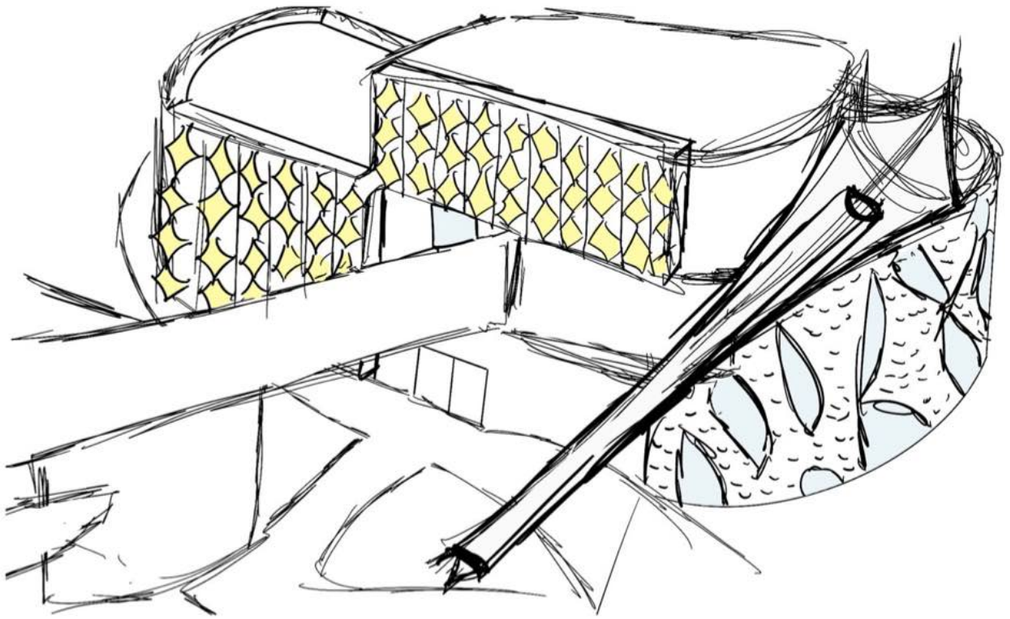


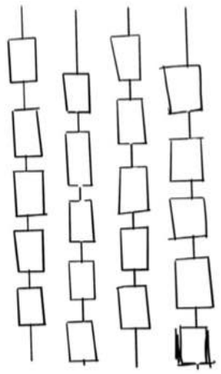
Layered ventilation and floor cooling meant this façade helped with ventilation and cooling for the building.
In this way, thermal comfort is increased and energy consumption significantly reduced.

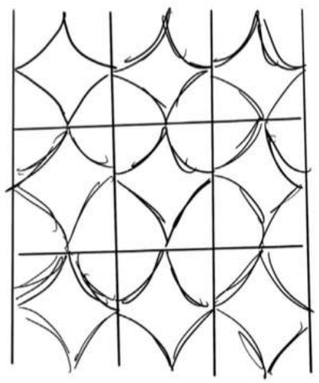
Protection from the sun with maximum light penetration and transparency and interpret the Arabian tent structure tradition in a modern, technological way

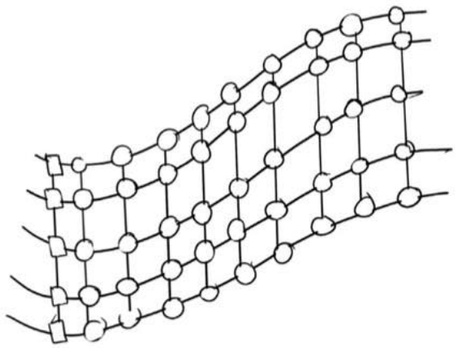


Making the Building move

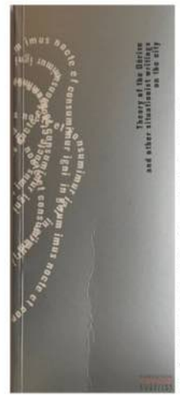








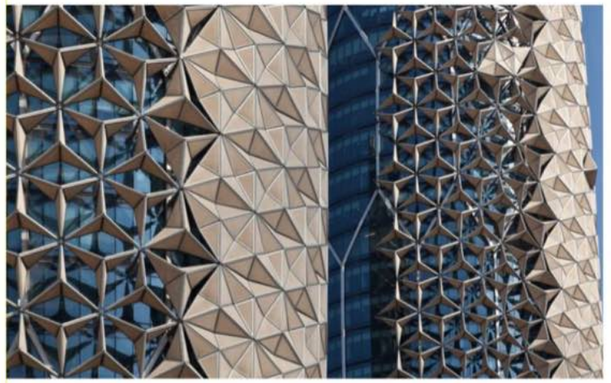
Different patterns inspired by tiles of other facades that could be used on the shell



Theory of the Derive and other situationist writings on the city

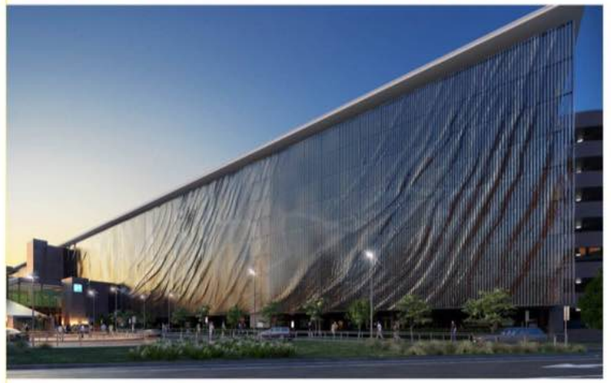
This reading speaks about how our cities have gone static, with historical landmarks stuck in the past and modern architecture too simplified. The Decor of architecture doesn't change, so my thoughts were how does a building become kinetic, and how can the decor change, not just in periods of time (month by month) but constantly?

Kinetic Architecture



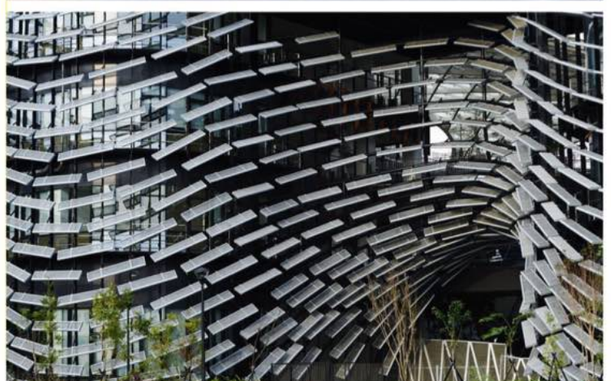
Al Bahar Towers, Abu Dhabi

To move with the sunlight to act as a shade



Brisbane Airport, Australia

Aluminium panels to shake with the wind, forming a building that looks like it have ripples



Industrial Technology Research Institute, Taiwan

To from a wave second skin, to hide the facilities and to allow for expansion as research progresses

All can be used to react to climate as well as the location to where the site is

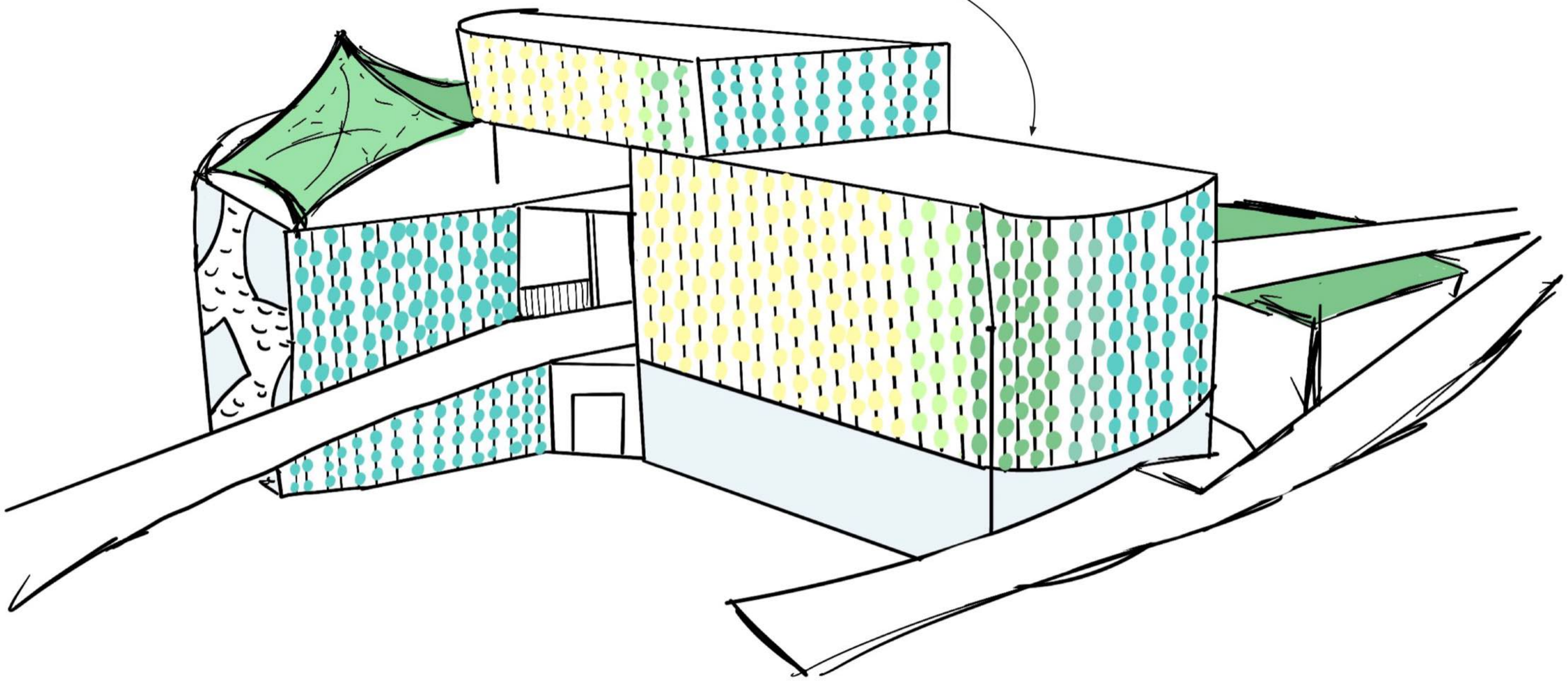
My Design as a Kinetic Space

Manchester is known for its wind and rain, and often lack of sunlight. But this can be used to help my building change dependent on weather...

The sun moves around the building, changing the colour on the photo chromic tiles. Different levels of sunlight and times of day will change the way the space looks

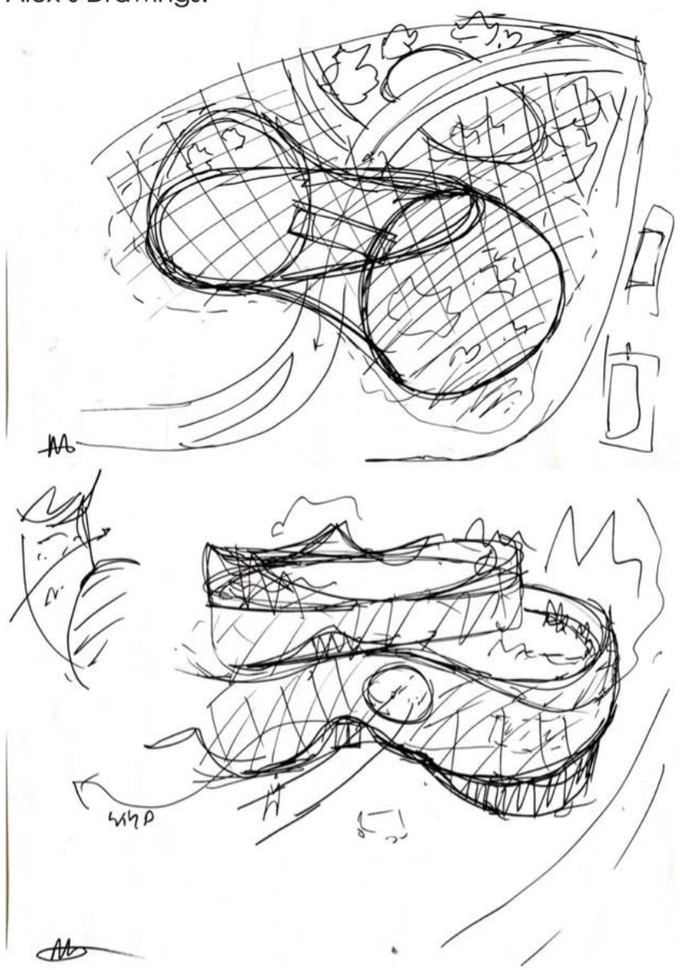
Tiles that shake in the wind to create wave shapes and gentle chiming sounds. It will visually change as well as acoustically come alive.

The tiles will also be activated by rain, changing colour with the rain droplets. Therefore, depending on how heavy or the direction of the rainfall, the tiles could be speckled or drastically different from the other side of the building



In Conversation with...

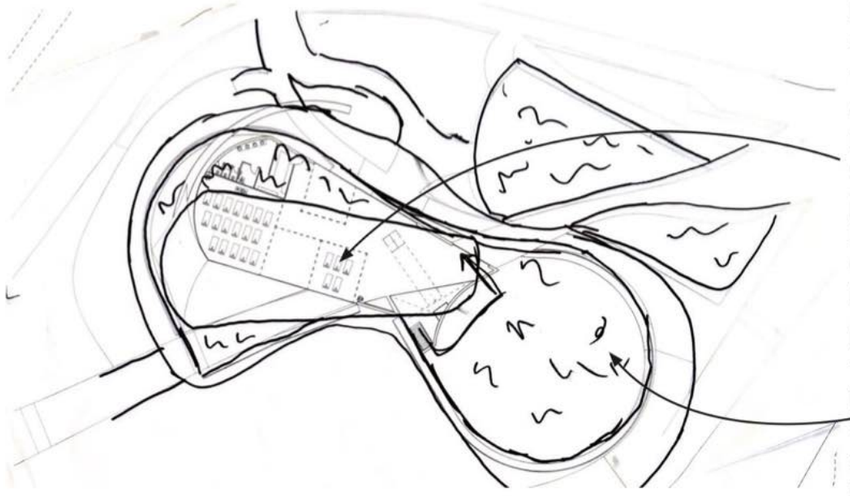
Alex's Drawings:



In conversation with Alex, a former student alongside me in Praxis, we spoke about how my idea came about in an organic way, and therefore this should reflect on the environment too. I want my building to be hidden among trees, reveal the windows for people to peer in where privacy isn't necessary.

In order to do this, the second shell structure should go around all the walls of the building, and follow the organic lines. Allowing gaps on the roof for garden areas to pop out the top, further blending the building into the background

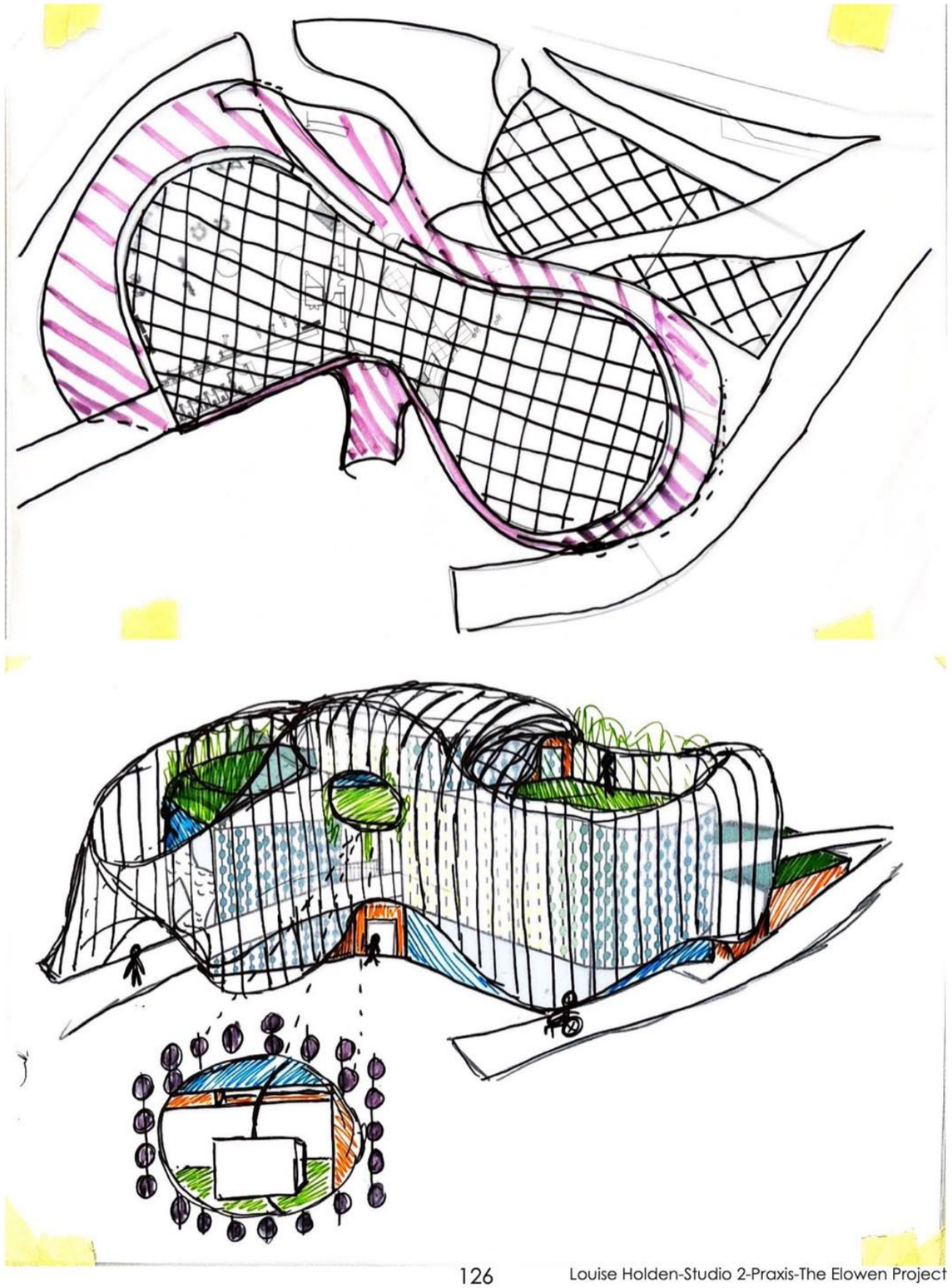
My Drawing:



It was also suggested to rotate the top floor to increase the organic flow of the building, after further drawings this was not possible due to size requirements, I also didn't think it was necessary.

I did however include the green roofing idea, where a garden or allotment can be seen through the second shell

In conversation with my tutorial group

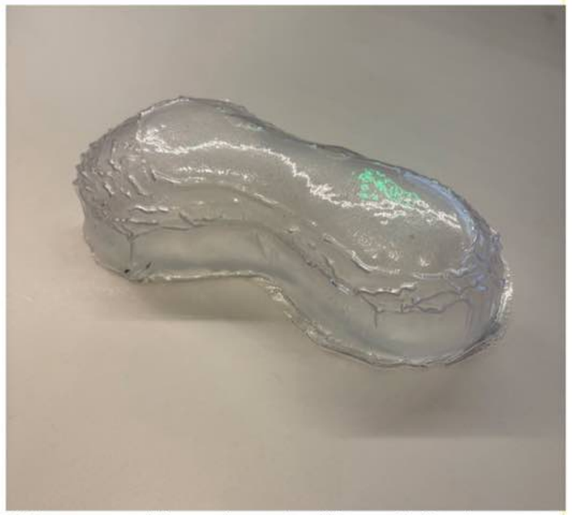


The Second Skin- Model

Wire mesh on a wire frame, with MDF based and plywood for the solid building.
Made at 1:500

Experimenting

Initial attempt of making a shell with foam and vacuum former, didn't go to plan. The foam shrunk and wrinkled



This caused the clear shell to wrinkle too and shrink to the wrong scale. I also couldn't mould this easily to create the indents

I used an mdf board, which I drilled hole to hold a wire structure, this showed me a shell would need to be held up with structural steels. For the shell, I used a thin mesh wire to get the effect of the obscured vision which you would get with the tiles. The wire mesh was easy to mould so I could fold it over the structural wire and cut out the wholes to show where there will be no shell, to further this I would extract more holes in the shell

The Review

For my review, I decided to lead with a 12 minute presentation on the context development and drivers for my design project. This then followed with a tutorial style approach to explain my plans of working so far.

Key takeaways

Design Analysis

Positives included:
- Accessibility was consider throughout and not as a second thought

To improve:
- Creating a map of privacy, such as in a axo would be useful to see where people can and can't look in

Design Resolution

Positives included:
- Clear plans and approaches to design such as the use of play

To improve:
- Indicate the materials used on plan or axo
- Increase the amount of smaller spaces for private moments
- Introduce a space for children

Design Development

Positives included:
- The design links well to research and the drivers throughout

To improve:
- Diagrams to explain the program, connections and design drivers

Design Communication

Positives included:
- The process is well presented

To improve:
- Communicate on drawings the child zones, privacy areas and other key features such as design drivers.

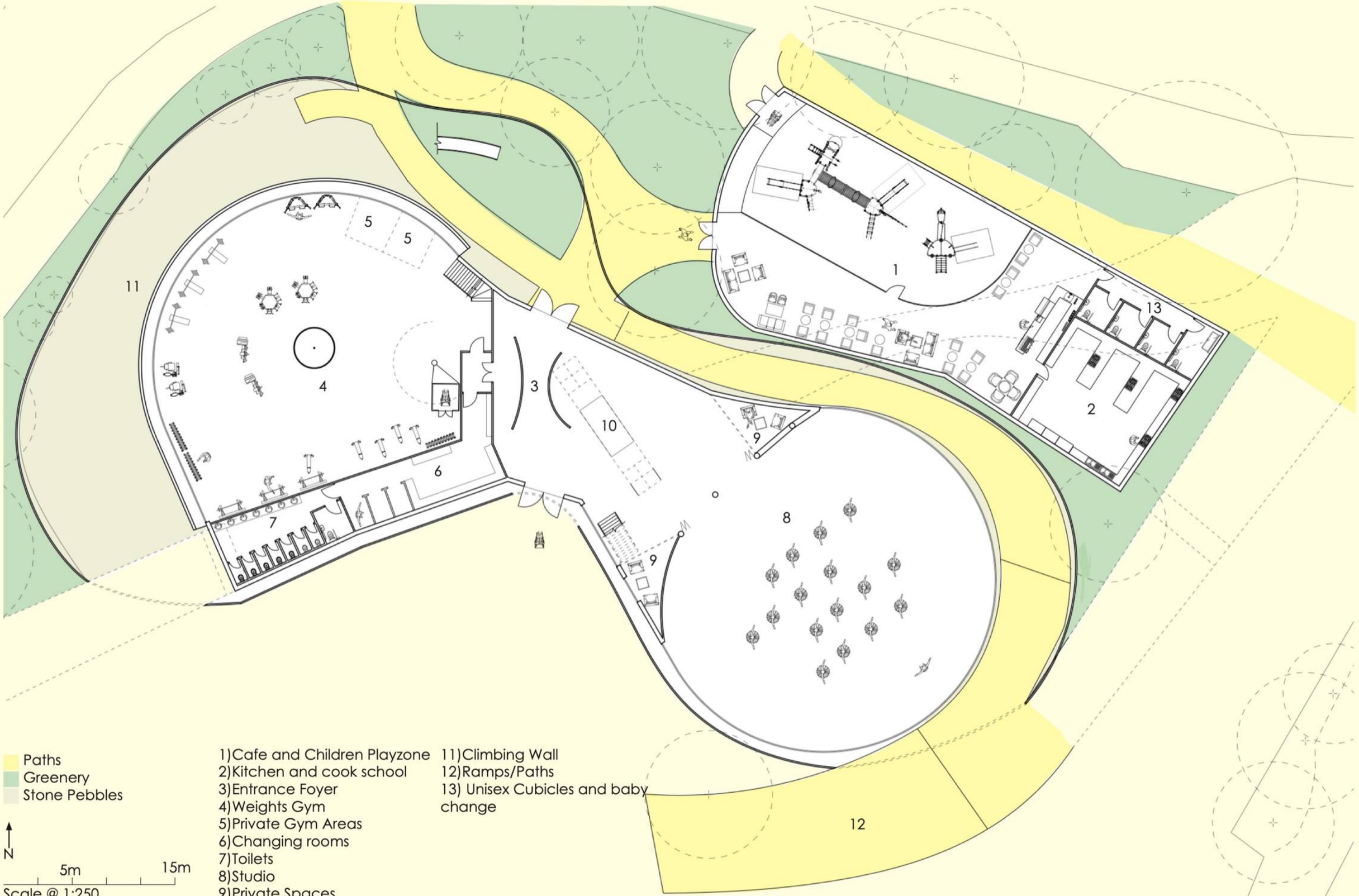
The Facade

From this I would like to:

- Create an Axonometric to show my drivers of the space and the privacy factors that is being used
- Use a section to show the elements of play in the design
- Add spaces for smaller private rooms on each floor
- Add spaces for mums of newborns, such as changing and toilet spaces
- Add spaces for child care centre so a mother can use the centre for an hour whilst the child plays
- Create diagrams to show zoning and key features

I enjoyed the overall experience as I felt everyone was engaged in my project, asking me questions after the presentation time and telling me about more ideas. I was inspired to see the other projects, primarily landscape based, as this was different to what I was doing with my project.

The Resolution



Paths
Greenery
Stone Pebbles

N

5m 15m

Scale @ 1:250

Ground Floor Plan

1)Cafe and Children Playzone
2)Kitchen and cook school
3)Entrance Foyer
4)Weights Gym
5)Private Gym Areas
6)Changing rooms
7)Toilets
8)Studio
9)Private Spaces
10)Ferris Wheel
11)Climbing Wall
12)Ramps/Paths
13) Unisex Cubicles and baby change

Paths
Greenery
Stone Pebbles

N

5m 15m

Scale @ 1:250

First Floor Plan

1)Cardio Gym
2)Changing Room
3)Toilets
4)Stairwell
5)Private Gym Areas
6)Private Spaces
7) Ferris Wheel Exit

Paths
Greenery
Stone Pebbles

N

5m 15m

Scale @ 1:250

1) Large Pilates Reformer Studio
2) Smaller Reformer Studio
3) Mat pilates studio
4) Balcony Area
5) Private Space
6) Changing Rooms
7) Toilets
8) Garden Area
9) Slide

Second Floor Plan

Paths
Greenery
Stone Pebbles

N

5m 15m

Scale @ 1:250

Third Floor Plan

1)Large Yoga studio
2)Smaller yoga studios
3)Private space
4)Changing rooms
5)Toilets
6)Ferris Wheel Exit
7) Rooftop Allotment

Route from town centre

EDGE LANE

Route from tram stop

Route from Bus stop

CHESTER ROAD

B

C

B

Route from main road

A

A

NEWTON STREET

BRIDGE
WATER
CANAL

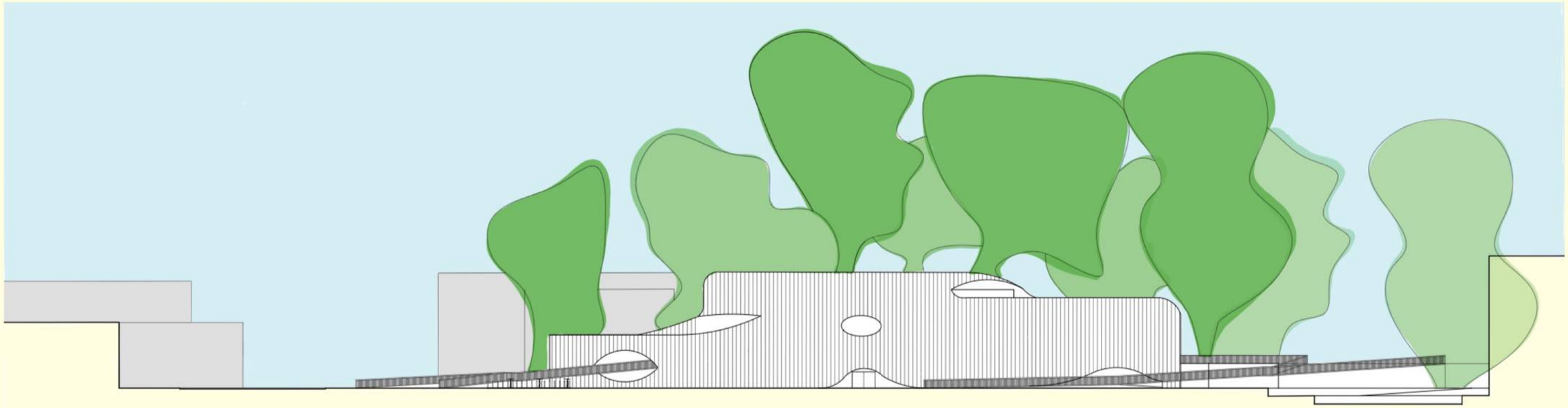
N

10m 25m

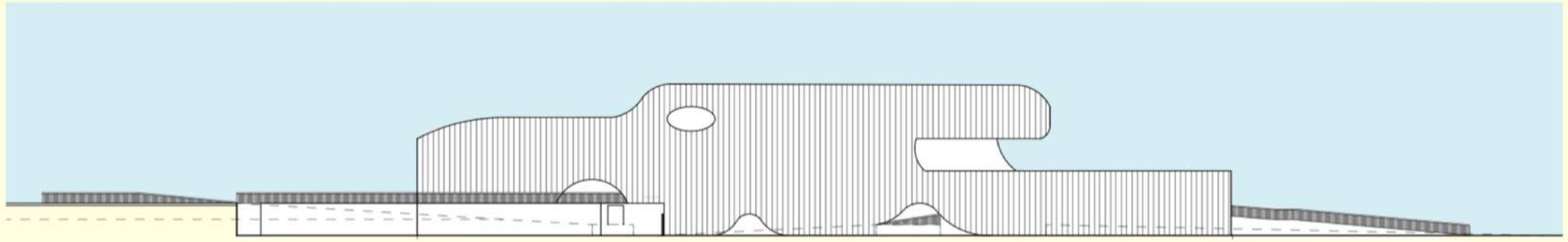
Scale @ 1:500

Site Plan

- Paths
- Greenery
- Stone Pebbles
- Canal
- Bike lane
- Trees
- Points of interest
- Shell/proposal



Elevation A-A, North



Elevation B-B, South East, X-ray though the

10m 25m

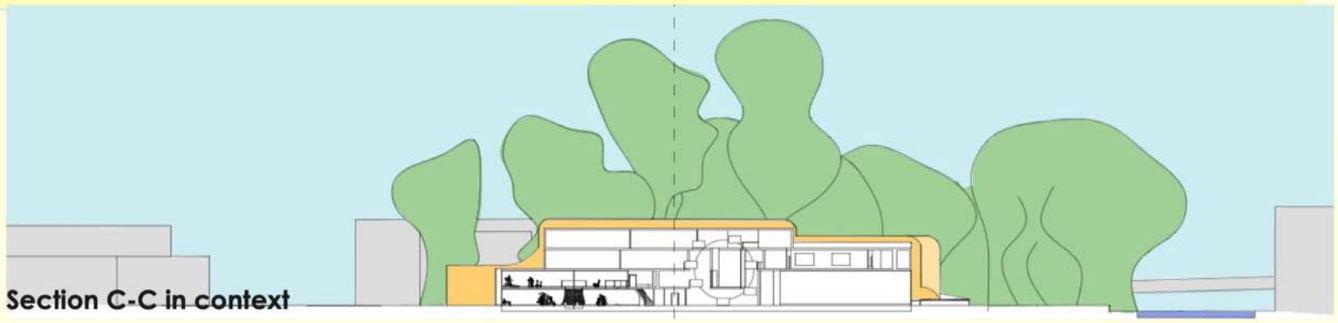
Scale @ 1:500

Elevations

10m 25m

Scale @ 1:500

Section C-C



Section C-C in context

Getting to the centre

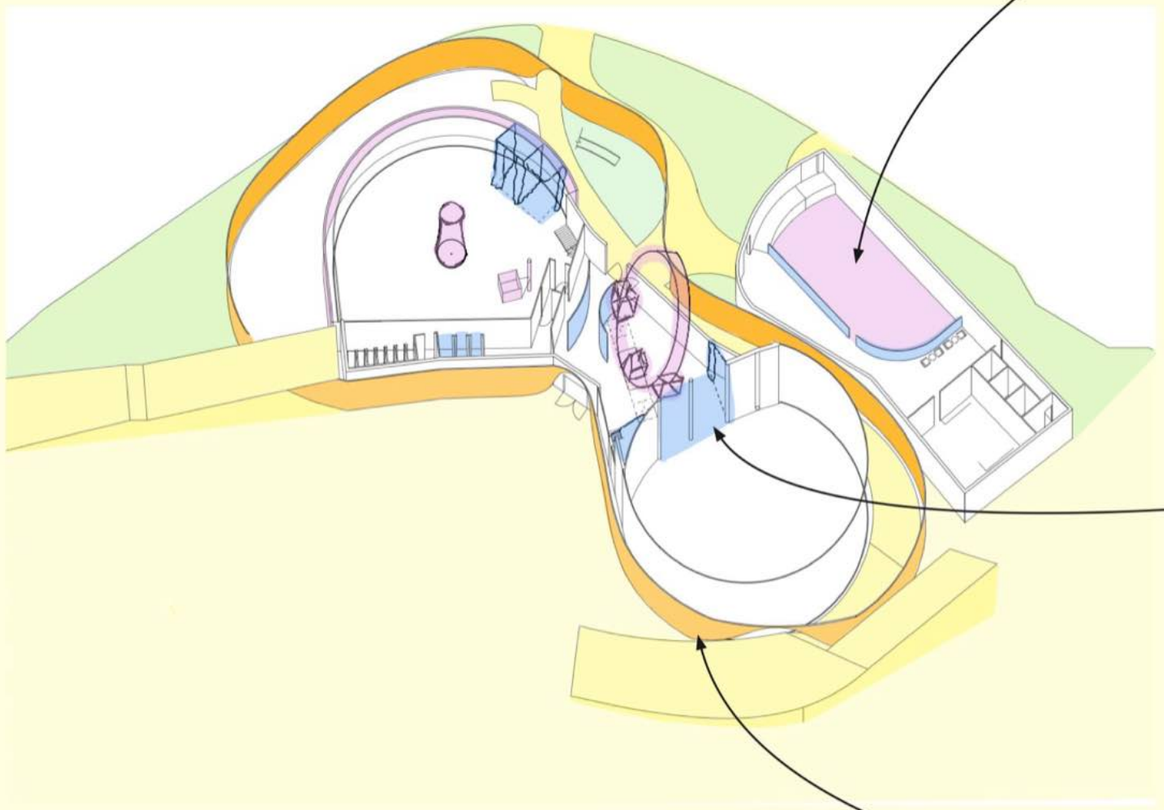
Stretford Bus stop outside the centre

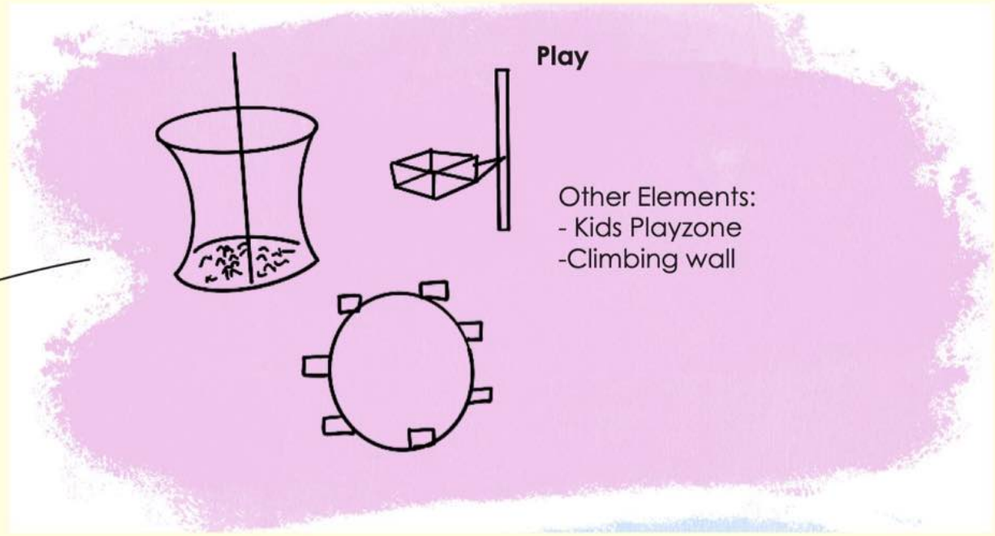
An Example Poster

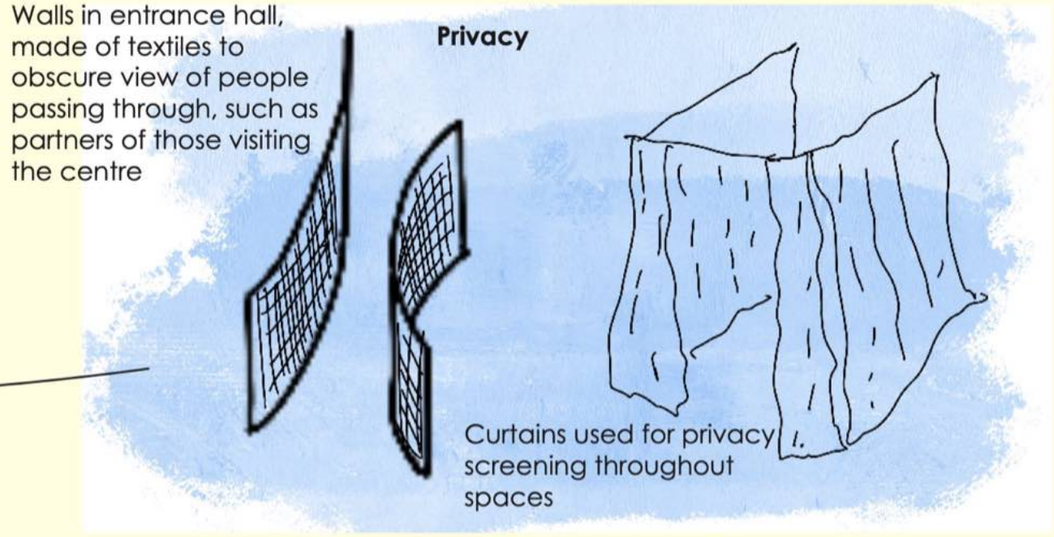
Stretford Info Boards

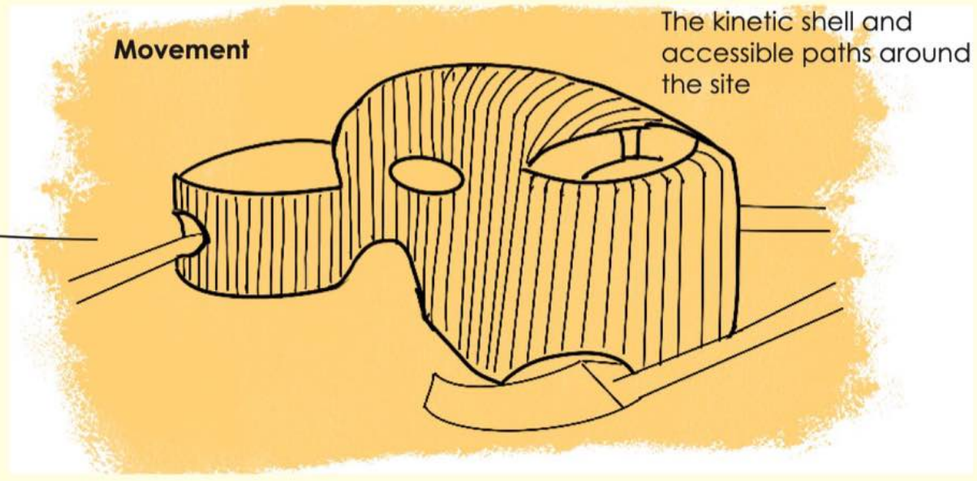
The entrance sequence to the building should start with clear signage and posters from relevant bus stops and the tram station across the road. These should show how to access the building and let women know what to expect on their visit. This helps create a welcoming atmosphere and take away any fear of the unexpected.

Ground Floor Axonometric









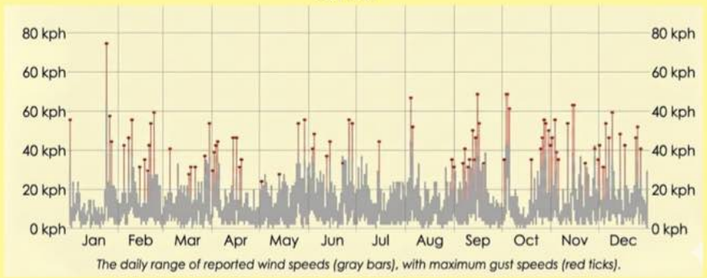
Axonometric and Environmental Factors

Town Centre

North

Sunlight Path

The Wind- Manchester Airport Wind History



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Average 9.8mph

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Average 16mph

(Weather Spark, 2025)

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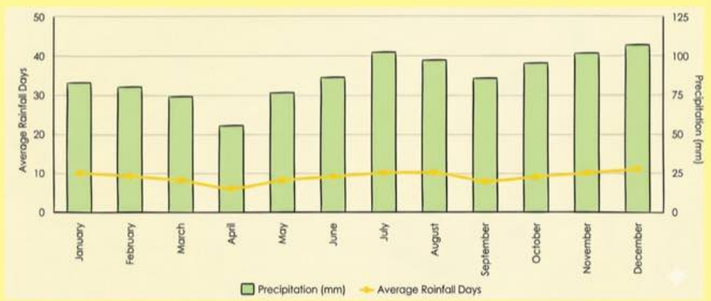
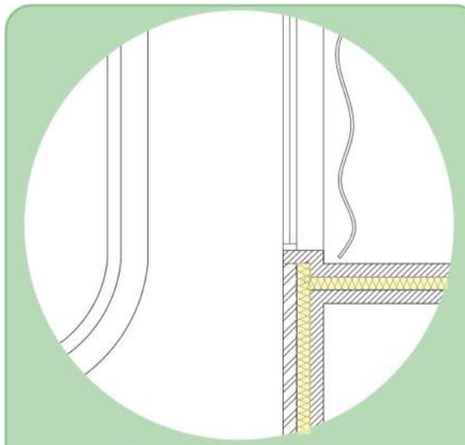


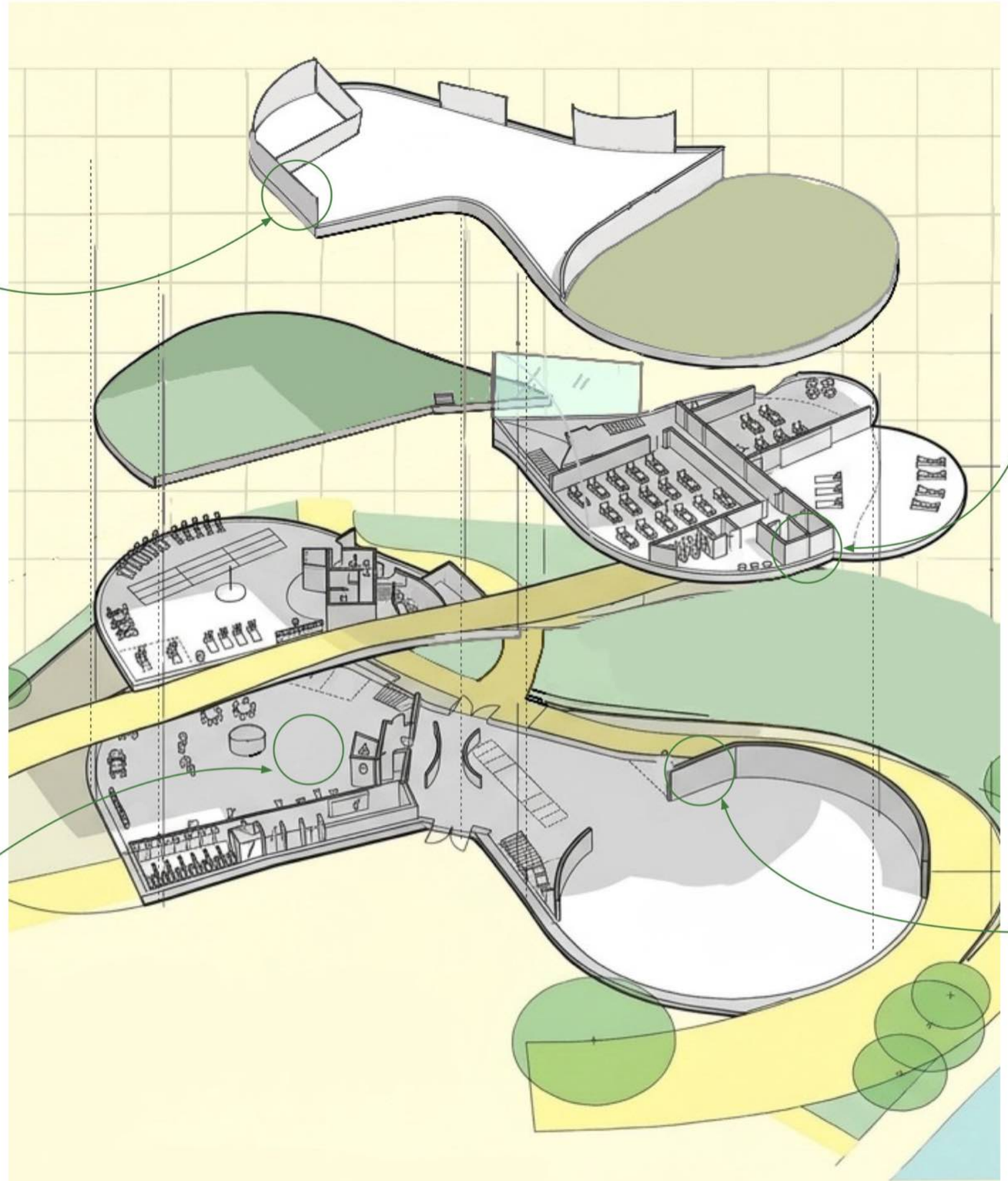
(World Weather Online, 2025)

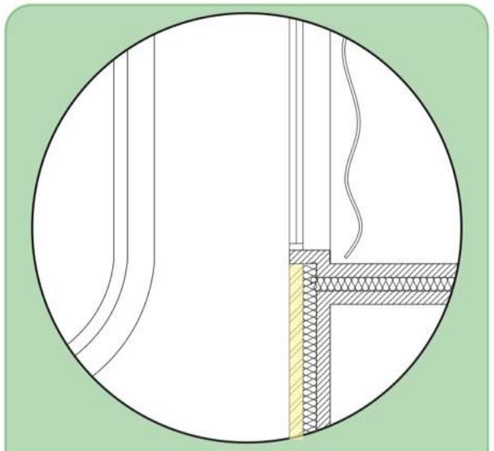
Exploded Axonometric



Insulation Choice

Sheep's wool insulation is a natural insulation, which is moisture resistant and holds the same insulation qualities as traditional mineral wool.





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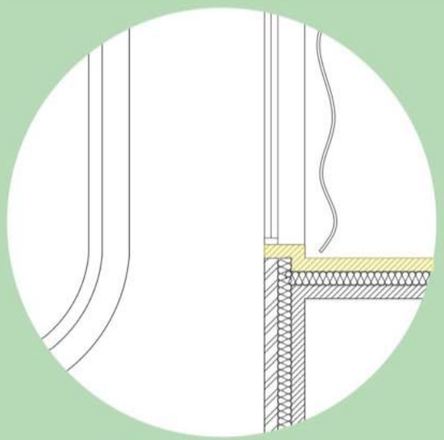
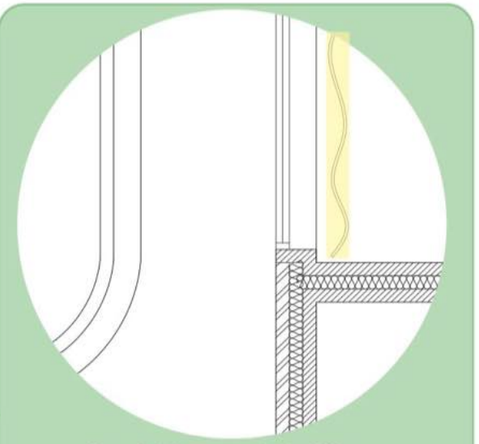


Flooring Choice

The Flooring will be the same as the walls and ceiling- a light Plywood. This is because it will help diffuse the light softly through the space



Furnishing and Partitions

I want to explore the use of textiles for privacy and softness of the space. As well as the flexible use of it for partitions

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THE ELOWEN PROJECT

Can access to sports therapy spaces, support recovery during the wait time for counselling?

LOUISE HOLDEN
23696640
MARCH 2

STUDIO THREE
PRAXIS

ELOWEN

***(noun)* [eh-LOH-en]**

1. Elm Tree [from Cornish Origin, *elew*]

Symbolism:
1. implies a connection to nature and a sense of grace
2. wisdom, protection, and resilience.

Acknowledgement

I would like to thank the following people for thier help and contribution to my project:

My tutors, Chris Maloney and Debapriya Chakrabarti, for their time and support during this project.

The B.15 workshop team during my model making experiments.

All guest architects, engineers and landscape designers who visited and gave their advice and input to my project.

The masters of engineering students at Univoersity of Manchester, Zach Addison and Henry Macusland for their advice and 3d printing expertise.

My piers, current and past, for their support, ideas and a great final year!

Contents Page

Studio 2 Recap

Summary

What is the Elowen Project so far?

The problems from Studio 1

Problem 1

In 2020, the BBC reported that over 6,000 people were on a waiting list for Rape Crisis services in England and Wales.

(BBC News, 2020)

6000 people

14,000 people

In 2023, this figure had risen and Jayne Butler, chief executive of Rape Crisis, claimed there was now 14,000 people on the waiting lists

(Smith, 2023)

For women waiting for counselling through sarc clinics, it could be up to a year wait.

1 year

Problem 2

Sport has become unattainable for the normal person. There are less leisure centres for the population demand. Sport has also become a means for capitalist gains, expensive memberships (Existing sports facilities in Stretford), expensive match tickets (Manchester United Football), expensive participation (Manchester Marathon).

Sport is used by the NHS as a means of therapy, however it is currently not utilised as much as other forms. But sport can be used for good, to improve mental health. So why don't we use it?

The Question

Can access to sports therapy spaces, support recovery during the wait time for counselling?

The Proposal from Studio 2

The main drivers for my project:

Movement

Movement for this project is about accessibility and the freedom to move around the site.

I looked at how different people view the site, and how we can make architecture to be accessible as well as follow desire paths through the site.

Privacy

Privacy for this project is about the freedom to live in our bodies without being stared at.

I looked at flexible ways the spaces can be changed for individual needs and doing this through the use of textiles as a representation for flow and privacy.

Play

Play for this project is about the way we get around the building learning to trust our abilities and have fun.

Fun ways to get around the building in a accessible way is more than just a ramp, it includes an accessible Ferris wheel, a climbing net, fireman's pole.

What are the aims of the Studio 3?

To explore material options for my project and make an informed choice of what materials to use

To look into environmental factors that effect my building and how this effects material choice. Making sustainable choices for the environmental response

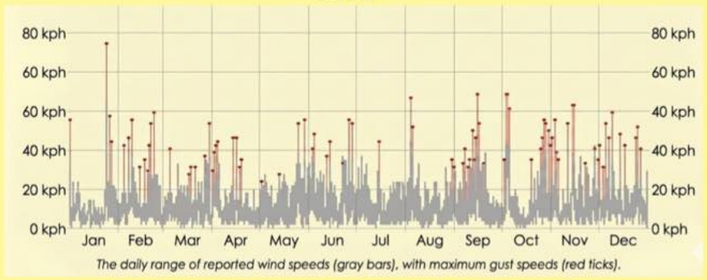
To create a set of drawings to represent the scheme and are building regulation compliant

Axonometric and Environmental Factors
Recap from Studio 2

Town Centre

North

The Wind- Manchester Airport Wind History



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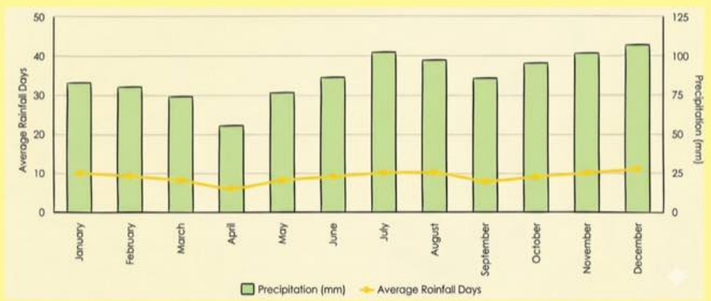

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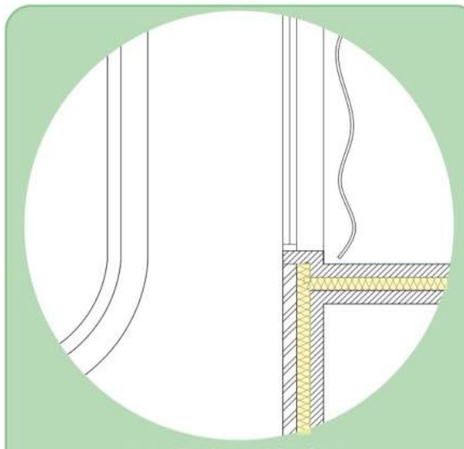
Sunlight Path

Exploded Axonometric
Recap from Studio 2



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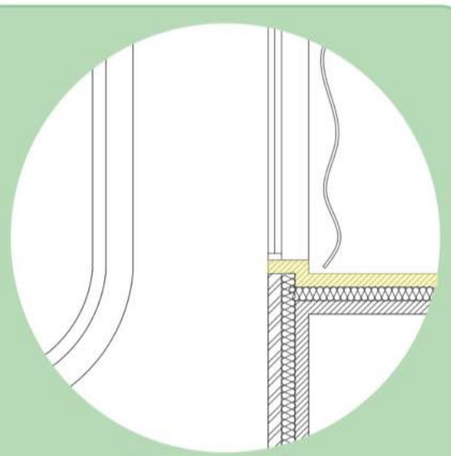

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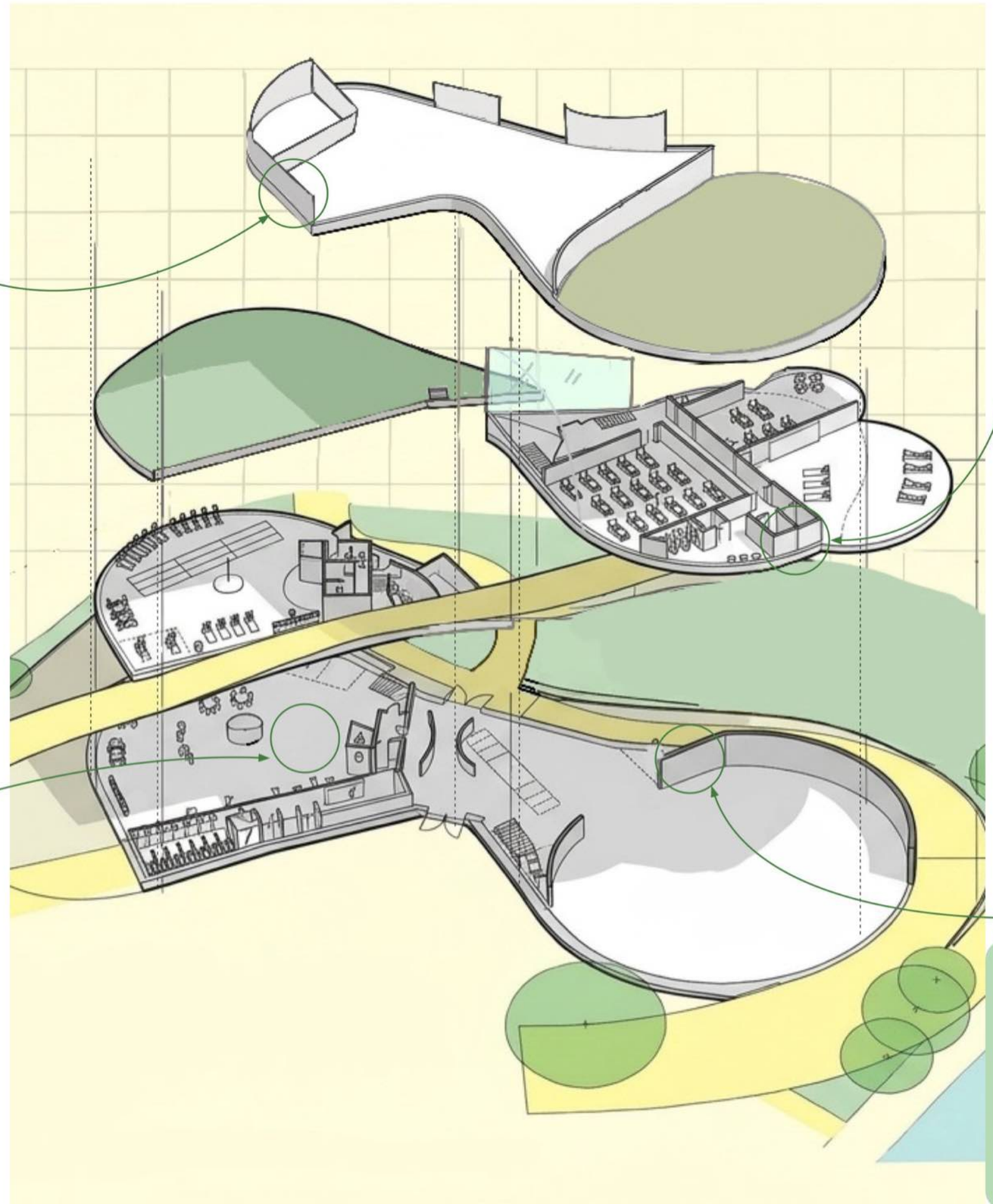

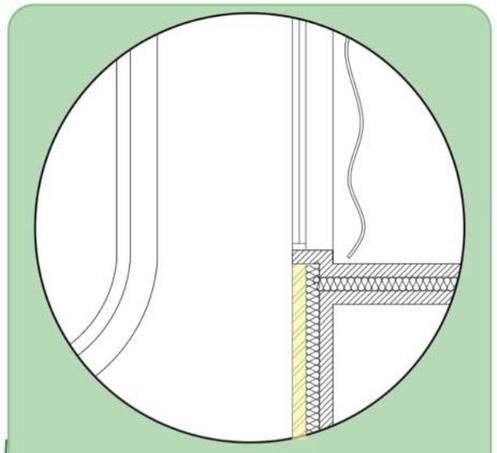

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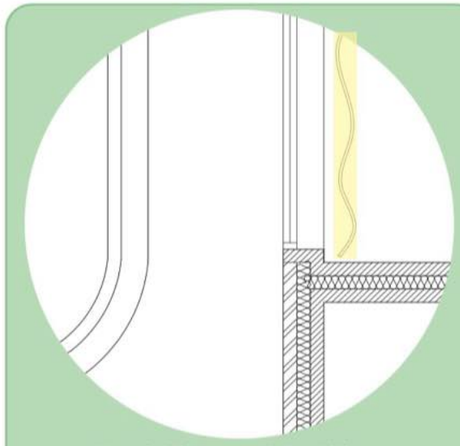


Furnishing and Partitions

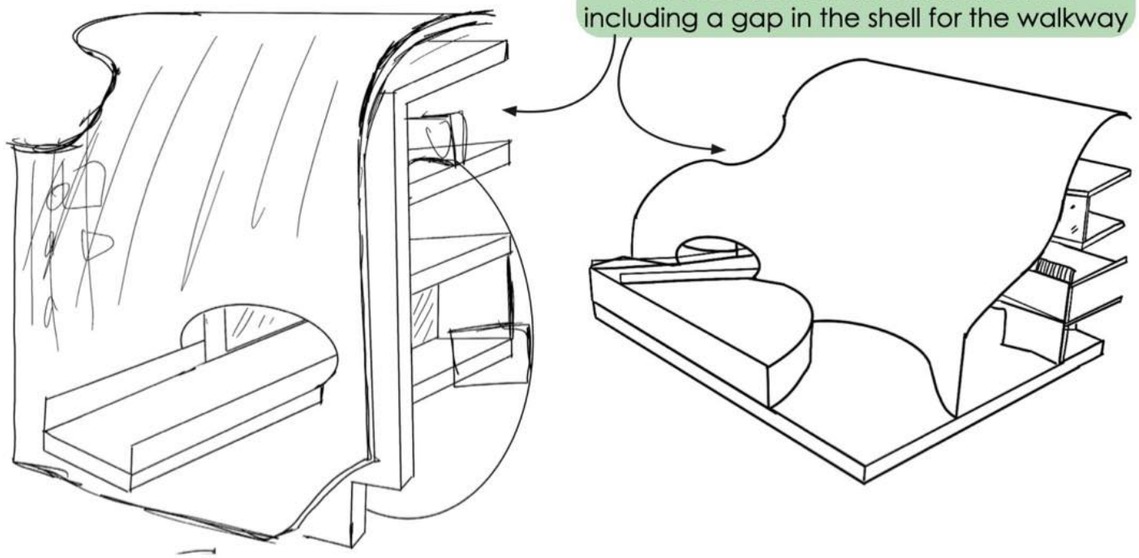
I want to explore the use of textiles for privacy and softness of the space. As well as the flexible use of it for partitions

In Studio 3, I want to explore details to fill this detail with the correct materials to get a finalised 1:20 detail. I will do this through exploring environmental factors such as thermal, lighting and acoustic, to make an informed specific choice on materials, one factor at a time. I will then explore this material further through model making and construction techniques.

Material Exploration

Through Model Making

Model Making- The Plan



What are the aims of the model?

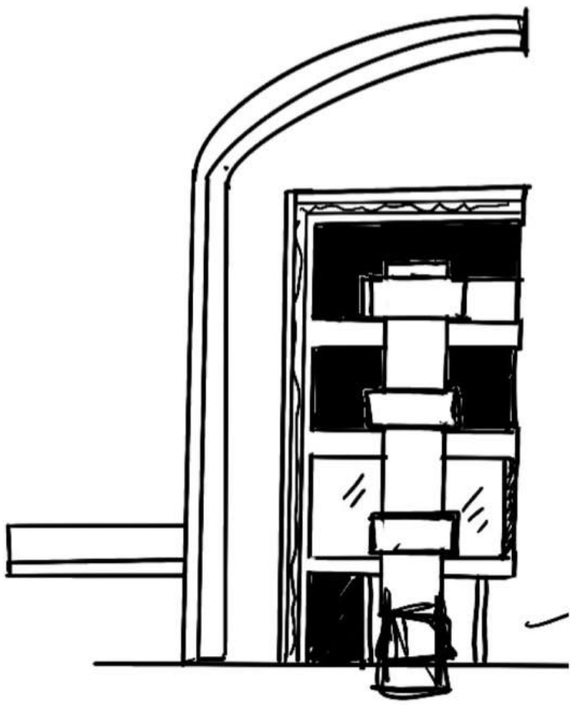
1) **Material exploration** - this means understanding the materials I am using, how they would be constructed and the treatments needed for maintenance

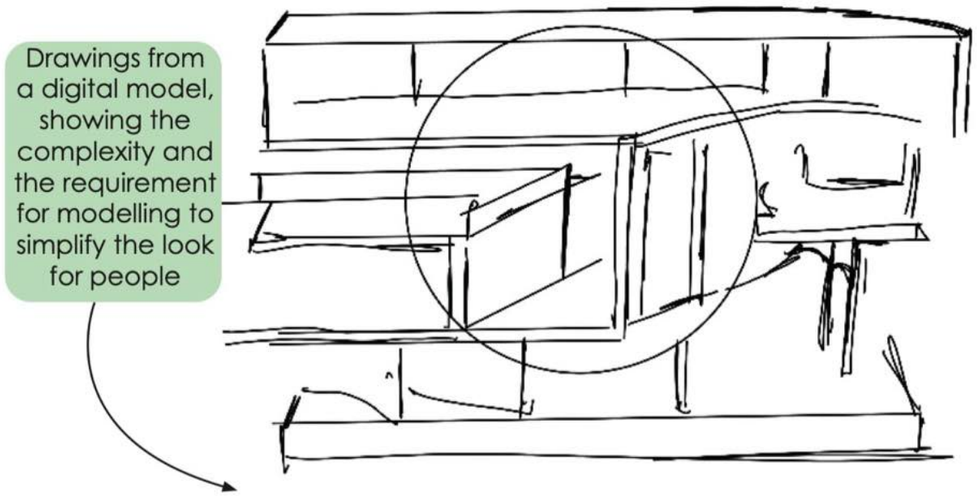
2) Represent the **3 key elements**, movement, privacy and play and show through physical form how these might present

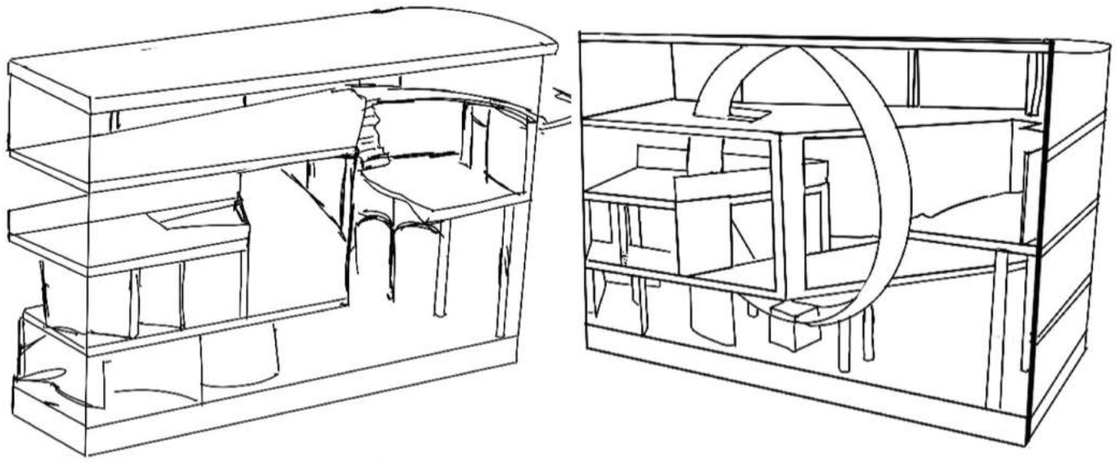
3) To show how **the shell** would look over the building, how the tiles change colour and move

4) To understand the **environmental factors** that could effect my building such a thermal, acoustic and lighting

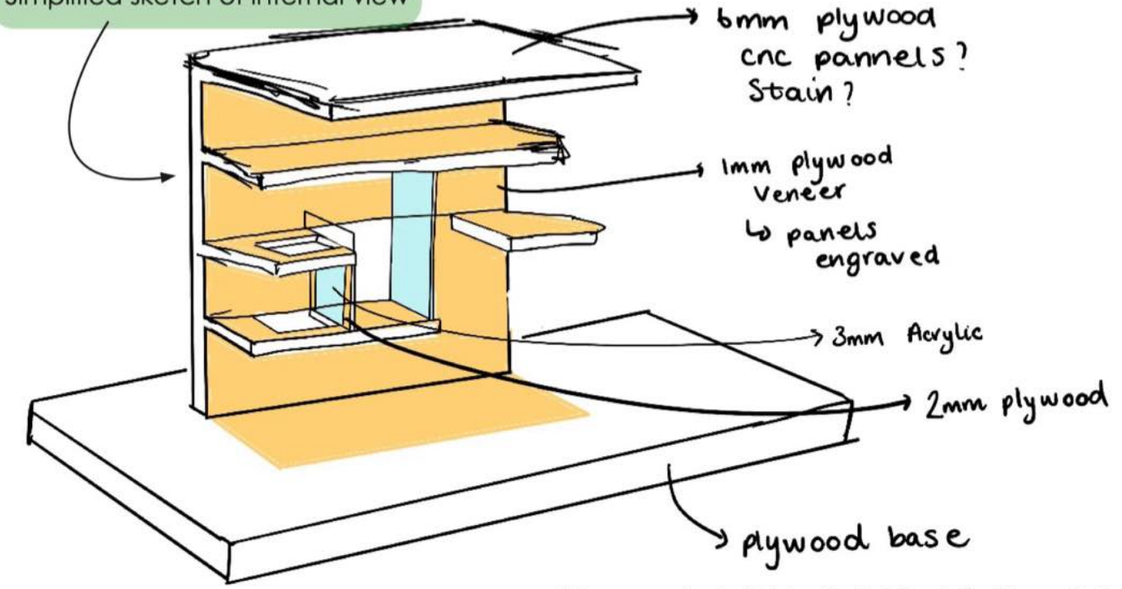
5) To have a **3d representation** of my project







Simplified sketch of internal view



Thermal Comfort- S2 recap

What are the required temperatures for my spaces?

The recommended temperature for spaces in my building as follows:

Yoga- 21-24 degrees Celsius
Pilates- 18-20 degrees Celsius
Weights Gym- 18-22 degrees Celsius
Cardio gym- 18-20

Cafe- 20-23 degrees

But is this specific to women (my user) or to all the population? (or just men!)

What are the required temperatures for women?

Headlines from newspapers and articles

Women are comfortable at a temperature 2.5C warmer than men

Temperatures of spaces based on women's needs:

Yoga- 22.5- 26.5degrees Celsius
Pilates- 20.5- 22.5 degrees Celsius
weights Gym- 20.5- 22.5 degrees Celsius
Cardio gym- 20.5- 22.5 degrees Celsius

Cafe- 22.5-25.5 degrees

Temperatures of spaces based on women's needs and the activity:

Yoga- 22.5- 26.5degrees Celsius
Pilates- 20.5- 22.5 degrees Celsius
weights Gym- 19- 22.5 degrees Celsius
Cardio gym- 18- 20 degrees Celsius

Cafe- 22.5-25.5 degrees

What this means for material choice?

The spaces will require more insulating, through surface materials and insulation. The shell will also act as a second skin to heat the building naturally.

The aim is to require less heating and keep the building warm through other means.

Humidity and leisure Spaces

Humidity in gyms from warm active breathing people during the day can settle over the night and lead to misted and water covered windows and surfaces in the morning. In addition to this humidity can (Crisall, 2025):

- cause mold to grow rapidly
- damage gym equipment
- Cause rust build up

An ideal range for humidity in between 40-60%, with humidity over 70% and under 30% causing issues to the building and health issues in users (Soria, 2024).

What this means for material choice?

In addition to the usual materials:
- Vapour Barriers
- Waterproof membranes
- Damp proof linings

materials should be breathable, moisture resistant and a ventilation system such as a dehumidifier should be used.

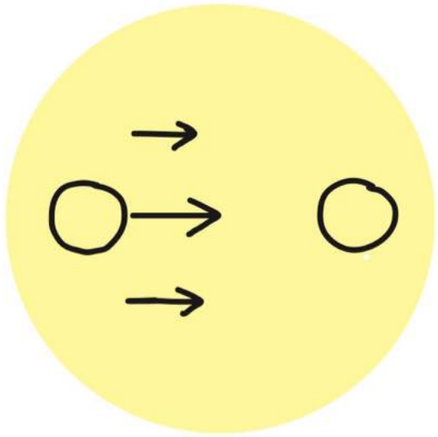
Wood, clay and hempcrete act as a passive buffer against high humidity

Hot yoga

Infrared heating system used

In addition to ventilation and HVAC systems, hot yoga studios should also incorporate moisture-resistant materials and surfaces to prevent damage and promote their health and cleanliness.

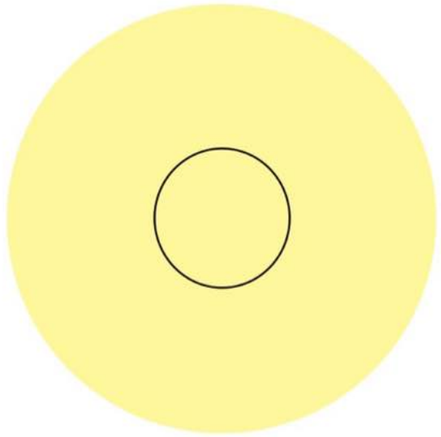
Thermal Insulation- S2 recap



K Value

Rate at which heat is conducted through a particular material under specified conditions- it's thermal conductivity

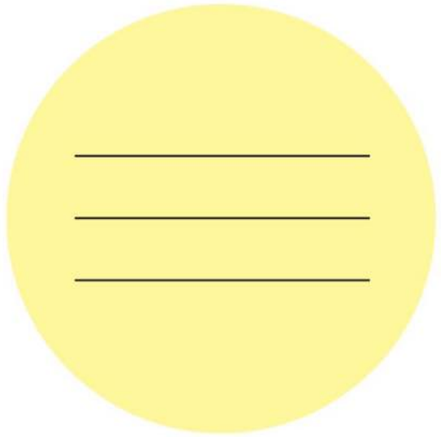
Measured in watts per meter kelvin (W/mK)



R Value

The thermal resistivity of a material, the reciprocal of thermal conductivity and is dependent upon its thickness

Measured in R= t/K



U Value

The ability of a material or set of materials to transfer heat energy from one side to the other, thermal transmittance

Measured in watts per square meter per degree centigrade(W/m2K)

Summary:

For exterior material, a low K value, Higher R value and low U-value. Based on this a Timber exterior would be ideal. Ideally a locally sourced timber would be used. Going forward, I would like to look at exterior timber precedents.

For insulation, a low K value, high R value and low U- value is ideal. Of all the insulation choices, the materials were close. XPS does perform better but not significantly and preferably for this project I'd like to use natural materials such as sheep's wool.

For the Interior Material, it is the same as above preferences, making timber and carpet the better choices. For the sports space, a timber material would be preferred as carpet could get worn easily and not provide the right surface for a workout.

Additional factors in my design such as textiles and glass will help to maintain warmth in the space, whilst allowing for ventilation such as the breathability of the curtains

Potential Material Choice:

Exterior	K Value	R Value	U Value
Brick	0.77 W/mK	0.44 to 0.80	2.0 to 2.7 W/mK
Timber	0.14 to 0.197 W/mK	0.7 to 1.3	2.0 to 3.0 W/m²K
Textiles- Polyester	0.04 to 0.05 W/m·K	<0.02	4.4 W/m²K

Insulation	K Value	R Value	U Value
Sheep Wool	0.04 – 0.045 W/mK	2.5 – 2.86	0.35 – 0.4 W/mK
Mineral wool	0.035 – 0.045 W/mK	2.2 – 2.86	0.35 – 0.4 W/mK
XPS	0.029 – 0.035 W/mK	2.86 – 3.45	0.29 – 0.35 W/mK

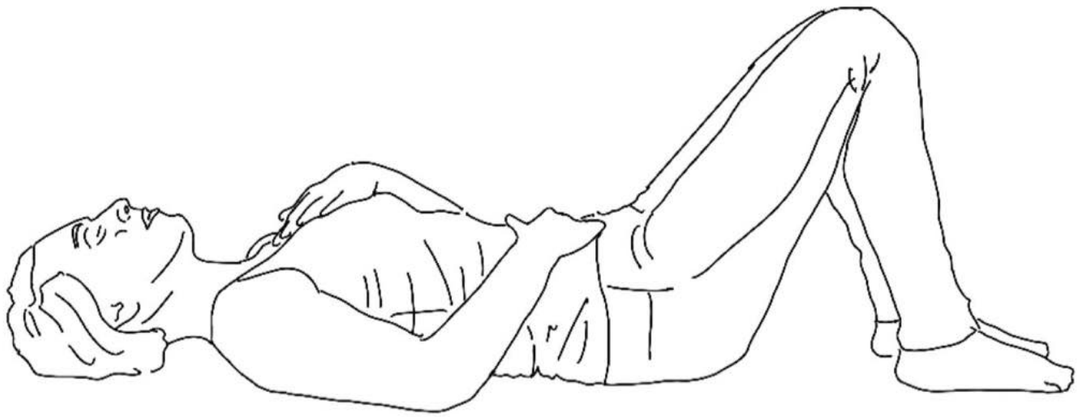
Interior	K Value	R Value	U Value
Timber	0.12 – 0.16 W/mK	0.16 – 0.21	4.8 – 6.4 W/mK
Block& Plasterboard	0.17 – 0.25 W/mK	0.05	20W/mK
Carpet	0.04 – 0.06 W/mK	0.2	5 W/mK

Additional factors	K Value	R Value	U Value
Textiles	0.04 – 0.06W/mK	0.083	8-12 W/mK
Glass	0.7 – 1.0 W/mK	0.33	2.8 – 3.0W/mK
Shell	0.3 – 0.5 W/mK	0.02 – 0.033	30-50 W/mK

Breathing- S2 recap

How can the building breathe?

Breathing in yoga and pilates



Diaphragmatic breathing in Pilates is used to stabilise your core and lower muscles, this protects us from injuries (Manheim,2023).

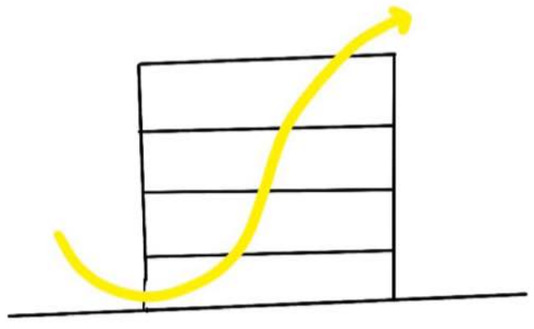
Breathing is an essential part of yoga and pilates and therefore I think my project should also reflect this, providing air flowing and breathable materials and spaces.

Air Movement

A breeze around 50cm per second provides equivalent temperature reduction of around 3 degreed Celsius

Ventilation is normally measured by the number of times that the air in the room is completely replaced in one hour.

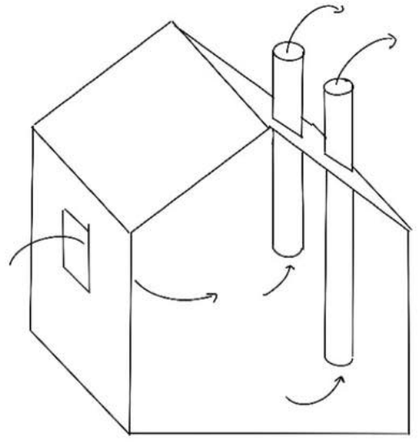
Cross ventilation could be added to my design, ensuring the windows and ventilation allows for air flow to move through the building



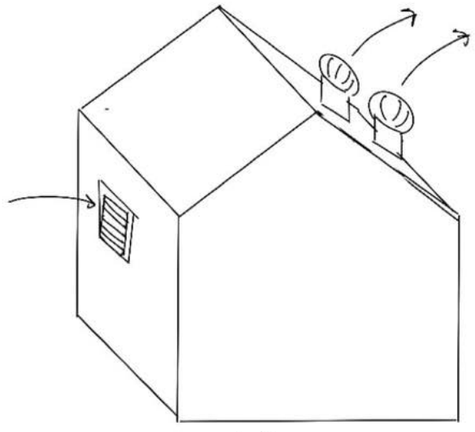
Ashtanga Yoga Chile, DX Arquitectos

In this yoga studio, cross ventilation was used through lower windows and flowing up to higher windows. Timber was used to absorb the moisture from the humidity of the activity. Additionally the high windows avoid direct sunlight which could heat the space up further.

Ventilation- Passive vs Active



Passive
Uses natural airflow without mechanical intervention. This could include vents and windows (Yichen, 2025).



Active
Mechanical ventilation systems to move air. This includes air conditioning and dehumidifiers.

What this means for my design?

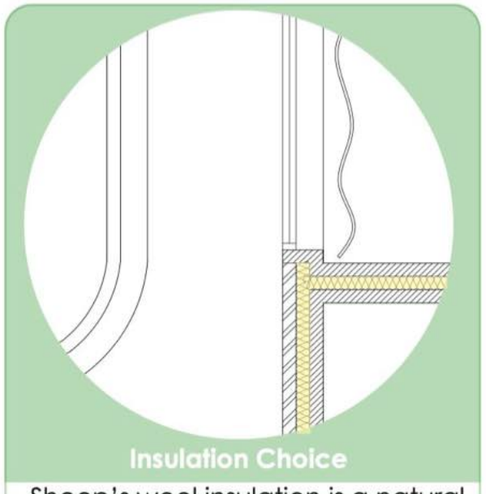
Referring back to the humidity spoken about earlier, to ensure the building removes excess damp, a dehumidifier should be used. However, I want my building to run as passively as possible so the active methods of ventilation are back up. This will reduce energy consumption of the building, increase indoor air quality and maintain a healthy temperature for women. Passive ventilation reduces the pollutants and heat pushed into the local microclimate, managing the local air quality.

To be fitted as per building regulations Part L- 6.47-6.53

Roof ventilation will be used to as passive ventilation for the rising heat

The insulation will need to be efficient at maintaining heat as well as moisture resistant to allow for the humidity to be controlled passively.

Windows on the higher floors will be used for cross ventilation through the building



Insulation Choice

Sheep's wool insulation is a natural insulation, which is moisture resistant and holds the same insulation qualities as traditional mineralwool.

External Timber Precedent

River and Rowing Museum- Oxfordshire
David Chipperfield Architects

The upper spaces are clad with untreated green oak timber chosen because:

- the oak hardens and weathers well with age
- the use of English timber over bamboo and imported timbers to keep it locally sourced
- Suited the location or rural England

What does it mean to weather naturally?

- No need for chemical treatment
- Low maintenance so low running costs
- Durable
- Sustainable

Why this timber would be good in Manchester?

Using English timber would reduce the carbon footprint of the project by keeping materials locally sources. The climate in Stretford, Manchester is unpredictable, so green timber would provide the flexibility to adjust to the climate and reduce potential splitting from moisture absorption

What is "green" timber:
freshly sawn timber, meaning it has a higher moisture content. This is used over kiln dried timber because:

- More cost effective
- Reduces potential expansion of the timber if it absorbs moisture and therefore potential cracking when the timber shrinks back down
- Joints will get tighter and stronger when the timber shrinks
- More flexible to initial climate changes and adjustments

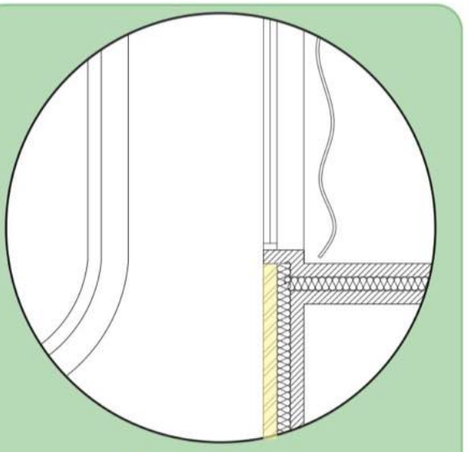
Vertical Vs Horizontal Cladding

Horizontal Boards:

- Easier installation and therefore lower cost
- Traditional visual aesthetics

Vertical Boards:

- Help with allowing rainwater to run straight down
- Prevents moisture from building up behind the cladding



External Choice

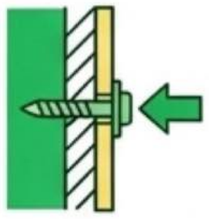
Untreated Green English Oak will be used on my design due to thermal properties of timber cladding, as well as the low maintenance material that ages well. The timber exterior will push Biophillic principles and connect the building to the surrounding nature. Vertical cladding will help with the rain runoff

Oak Timber- Model Making

Initial conversations :	Decision:
Conversations with the workshop technicians spoke about what materials to use and how to best represent the timber exterior cladding. The choices were: • CNC onto plywood- but the lines would be too thick • laser cut plywood and then stain the wood grey (weathered look)- however burn marks would show • Use a block of oak and cut down into smaller strips- this would require more time	I decided to cut down the oak block into smaller pieces. First it was cut for me, into 4mm strips wide and then I took it to the bandsaw to cut these into 3mm strips depth. These were then sliced into 60mm long strips Once the strips were cut, I used wood glue to layer the strips onto the plywood interior in a vertically clad way to create the exterior wall panels. As per the choice, the material is untreated.

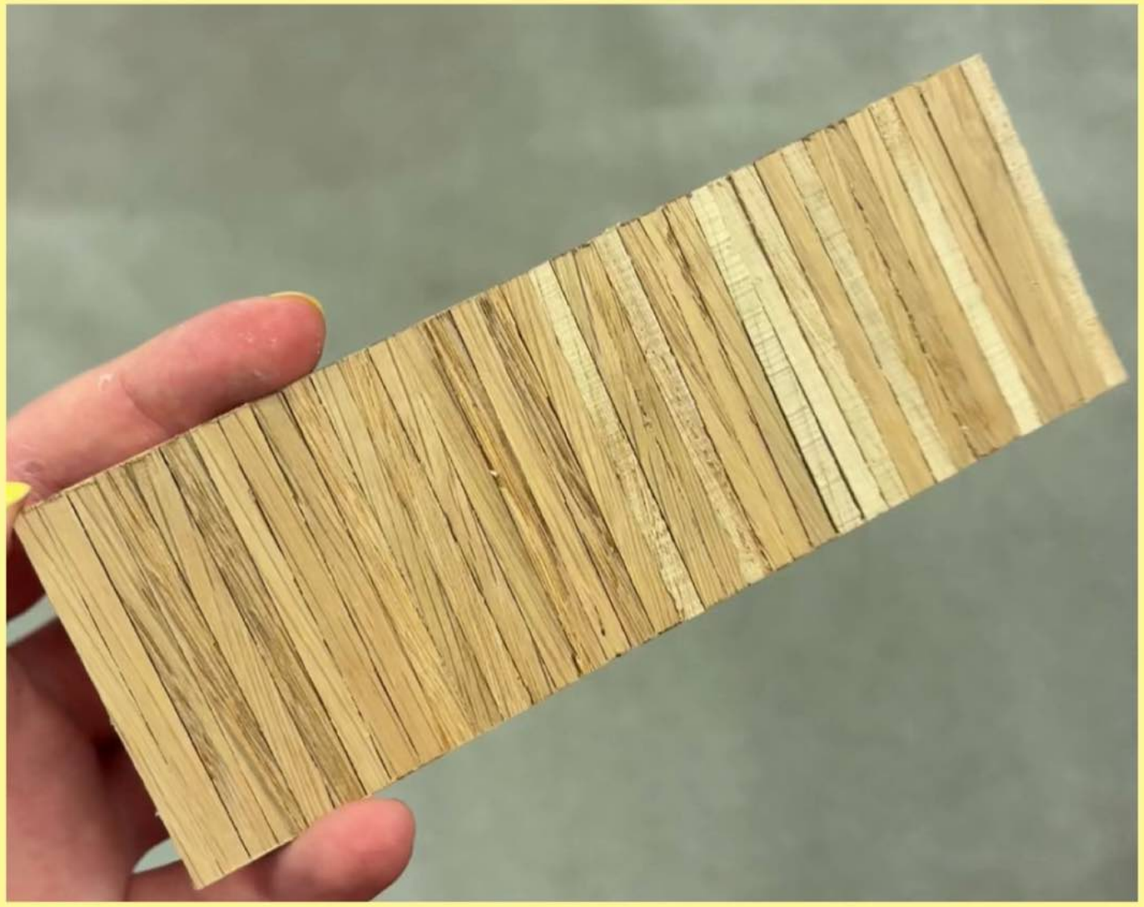
Questions and Further research from this:

How do the panels fit together at 1:1 scale?



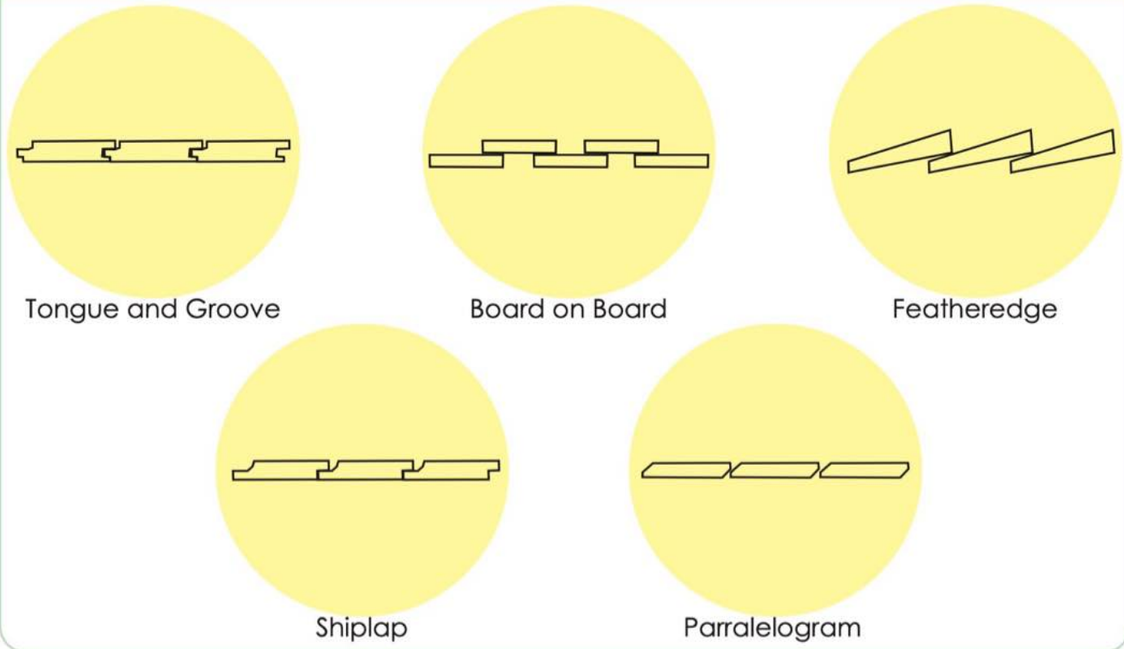
How does the cladding fix to the wall?

What construction method is used to fix the cladding?

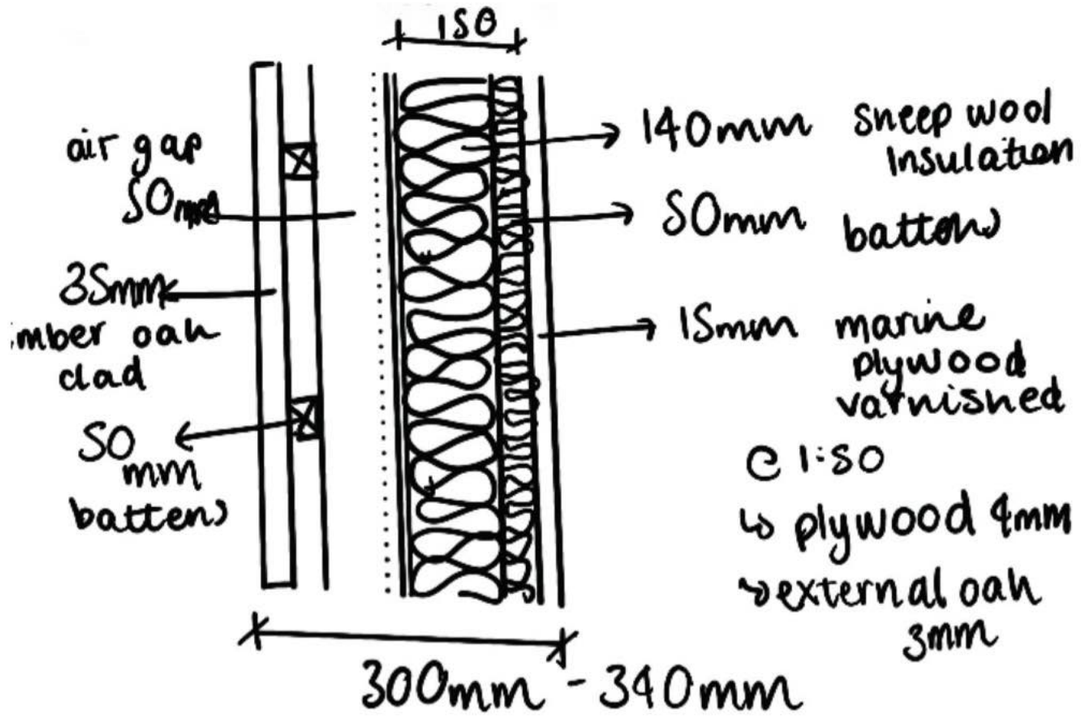


Oak Timber- Construction

How do the timber claddings fit together at 1:1 scale?

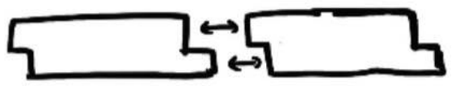


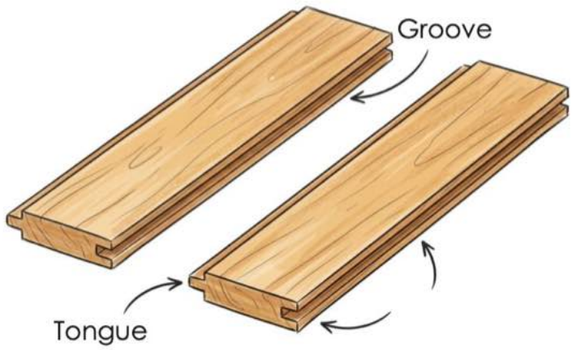
How does the cladding fix to the wall?



Chosen timber cladding construction

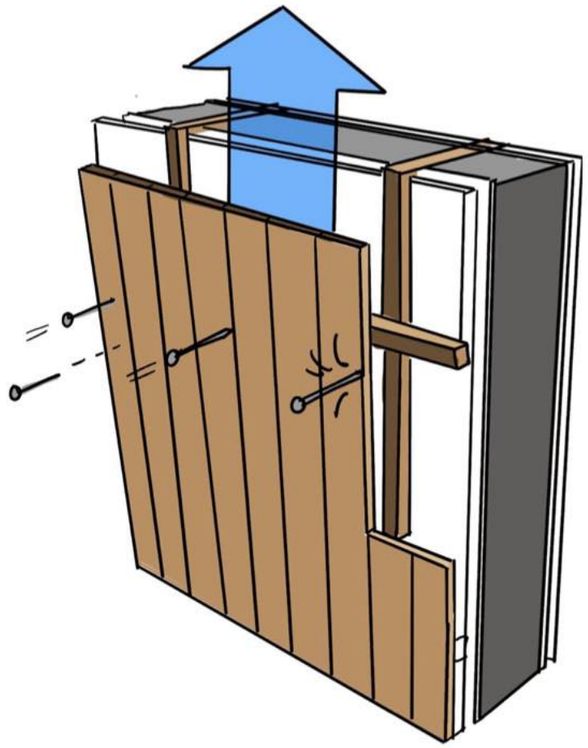
For vertical cladding, I have chosen to use the tongue and groove joint, as with the Green oak timber, the joints will get stronger and tighten when the moisture shrinks from the panels





After the planks are slotted together, nails are used to fasten the vertical panels onto the batten frame.

The batten frame will go in both directions on top of the insulation. This allows for air gaps and the moisture barrier.



Acoustic Properties- S2 recap

What needs to be acoustically considered for my project?

Frequency

Frequency refers to the number of complete waves or cycles that occur in a specific unit of time, typically measured in hertz (Hz), where one hertz equals one cycle per second. (Renneboog, 2019)

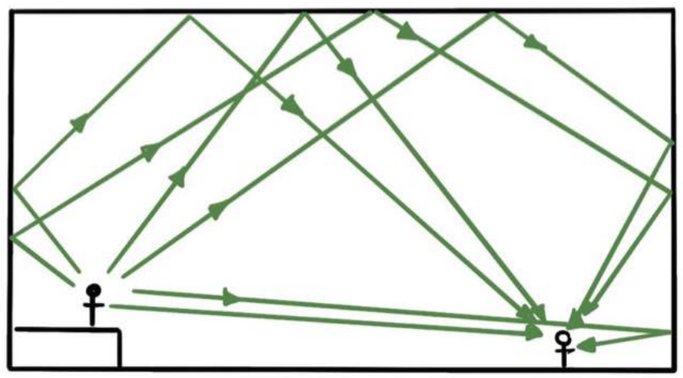
Each organ resonates at a unique range for healing:

Brain: 72–90 Hz
Heart: 67–70 Hz
Liver: 55–60 Hz
Lungs: 58–65 Hz
Kidneys: 50–60 Hz
Stomach: 58–63 Hz
(Bamber, 2025)

Loudness

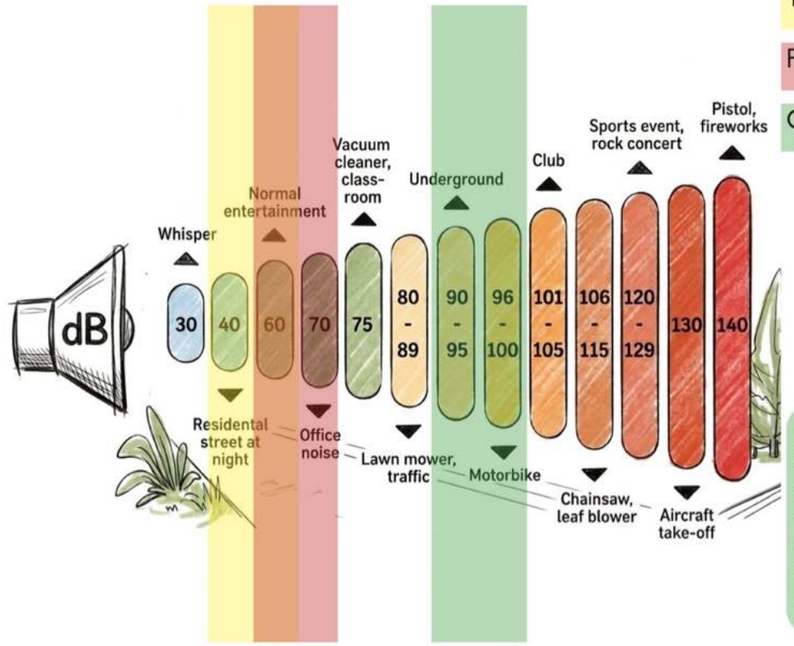
Loudness, in acoustics, attribute of sound that determines the intensity of auditory sensation produced. (Britannica, 2026)

Reverberation



Reverberation is the collection of reflected sounds; reverberation time is how long it takes for these reflected sounds to lose energy and disappear. (Muffle, 2026)

Typical noise thresholds- loudness



Yoga Studios- 40-60db

Pilates Studios- 50-70db

Gyms- 90-100db

In the yoga and pilates studio, I want to create a calming atmosphere, so I will need to explore materials that will reduce the loudness and allow for that calm.

Typical noise thresholds- Reverberation time

Typical Reverberation Time	r/t secs
Outdoors	0.0
Bedroom / Living room	0.4
Cinema (recommended)	1.0
Glyndebourne Opera House (new), UK	1.3
Royal Festival Hall, London, UK	1.4
Concert Hall (recommended)	1.5
Carnegie Hall, New York, USA	1.8
Church (recommended)	2.0
Musiksvereinsaal, Vienna, Austria	2.05
Symphony Hall, Boston, USA	2.2
Symphony Hall, Birmingham, UK	2.4
St Paul's Cathedral, London, UK	12.0

(McLean, 2013)

Yoga Studios- 0.5-0.8 sec

This is to create a peaceful environment where gentle whisper instructions can be heard. Music can be low and ambient rather than loud in this environment

Pilates Studios- 0.6-1 sec

This should be followed due to less vibrations and allowing users to hear instructions clearly

Gyms- 1.5- 2 secs

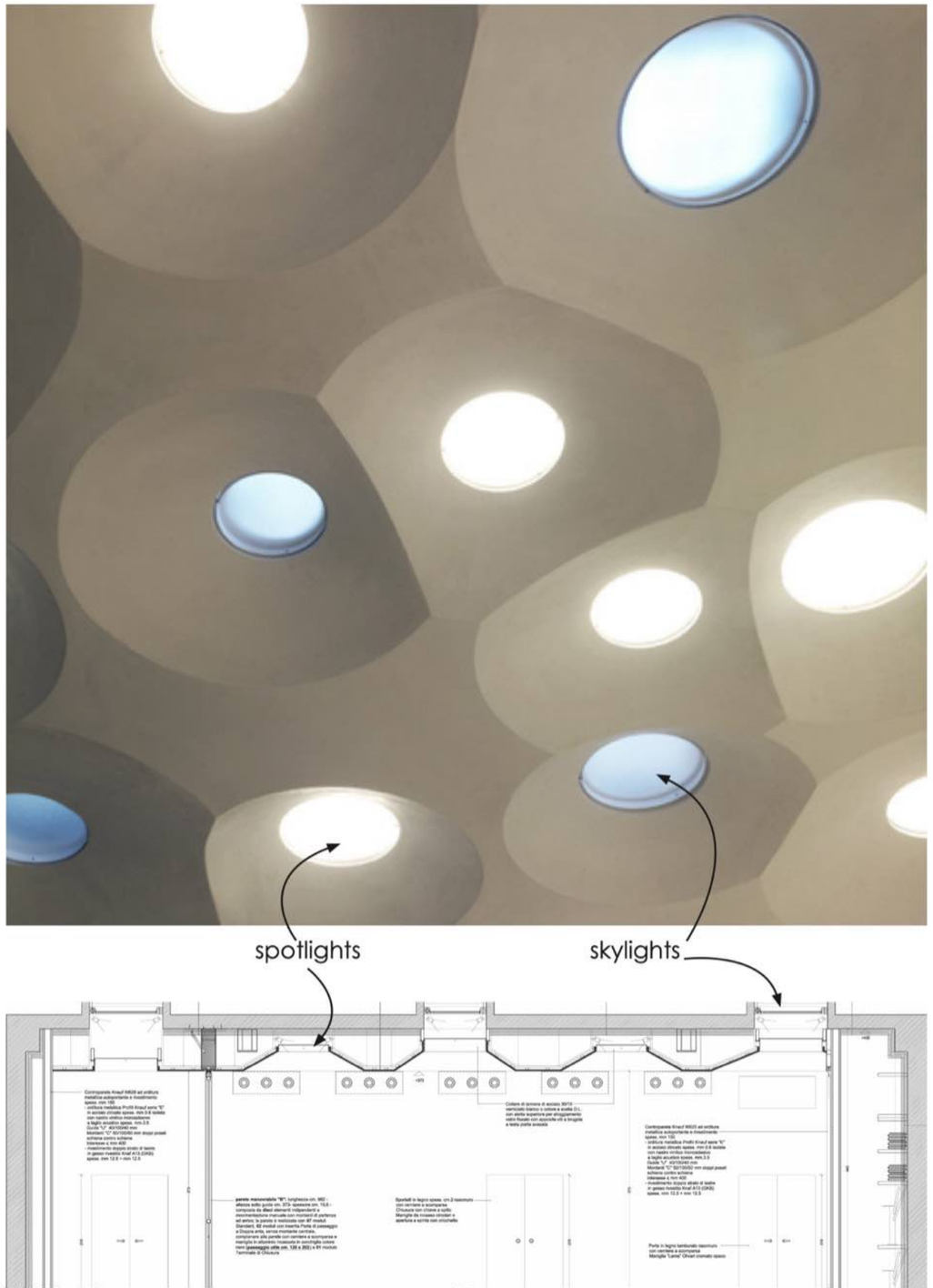
At this level normal conversation can be heard, high volume music. Sound absorption is most important in this space

Sound and the ceiling- S2 recap

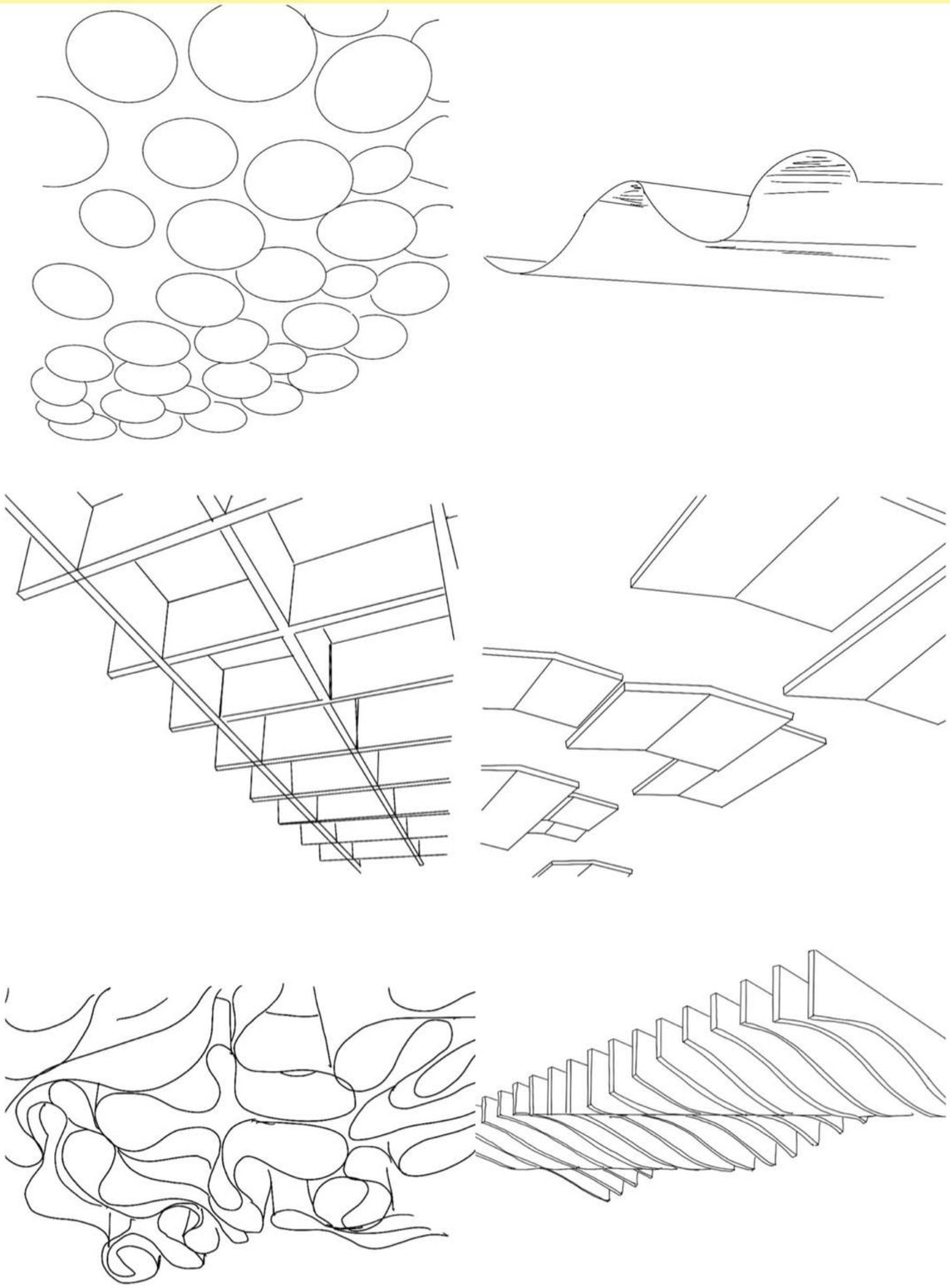
Zona K, Pietro Bagnoli and Franco Tagliabue

The space is used for events and exhibitions as well as for drama rehearsals and performances.

The bubbled ceiling over the main hall is comprised of suspended cones that regulate acoustics, whilst concealing electrical cables and ventilation passages.



Potential noise reducing patterns



Acoustic Control- S2 recap

How can acoustics be controlled for the level required in the space?

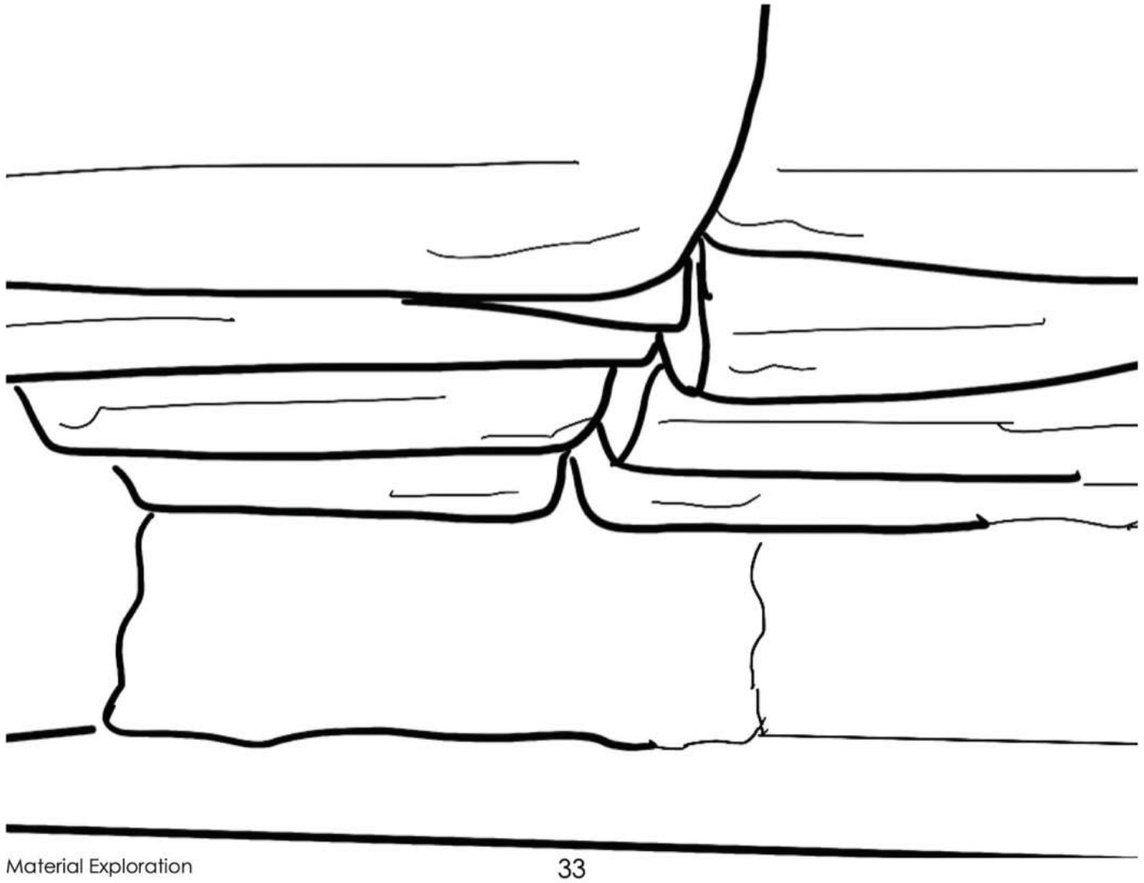
Noise reduction coefficient and reflection

Noise Reduction Coefficient	(NRC)[4]
Brick	.00–.05
Carpet (with underlay)	.30–.55
Concrete (smooth)	.00–.20
Glass	.05–.10
Plaster	.05
Plywood	.10–.15
Rubber on concrete	.05
Seating occupied	.80–.85
Seating unoccupied	.30
Steel	.00–.10
Terrazzo	.00
Wood	.05–.15

A materials ability to absorb sound is described as its absorption coefficient, a perfect absorber would have a coefficient of 1 and a perfect reflector would be 0. the NRC is the measurement of absorption across a range of frequencies.

Plywood and textiles absorb sound to reduce reflection through the space. This would make plywood an ideal material for the internal space. Curtains are to be used as partitions which will help with noise control and buffering sound in the space

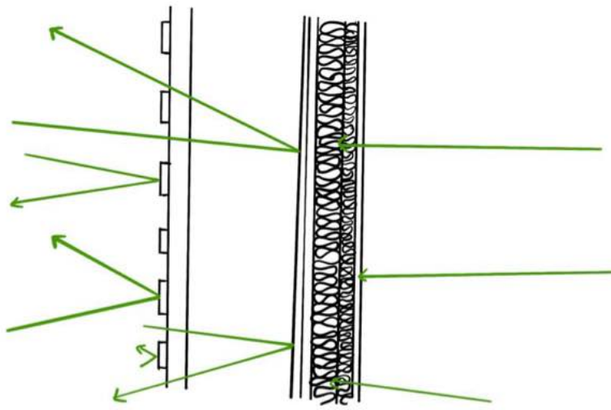
To further increase noise control in the quieter yoga and pilates spaces, the textile material can be draped from the ceiling. this will aesthetically flow with the design and the use of the space whilst practically reduce reflection of sound.



Sound insulation

Glass fibre in the shell tiles can act as sound insulation to stop the outside road noises getting inside the building

Timber exterior cladding, hardwood, can also be used as an extra layer against sound from external sources

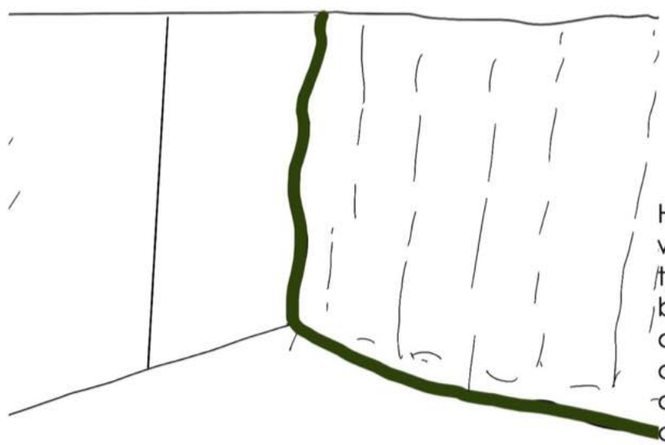


Dual panel internal walls with insulation will reduce noise flow in the building

Double insulation layer is a light weight solution to sound insulation whilst allowing the building to still breath

Acoustic isolation

Like thermal bridging, acoustic barriers can be installed in rubber to stop sound leaking out of spaces



However if this was used then the space would be less flexible and open. To create a sense of atmosphere and community, my project will be buffered but not isolated to one space

Interior Plywood Precedent

The Hermitage Cabin, Italy

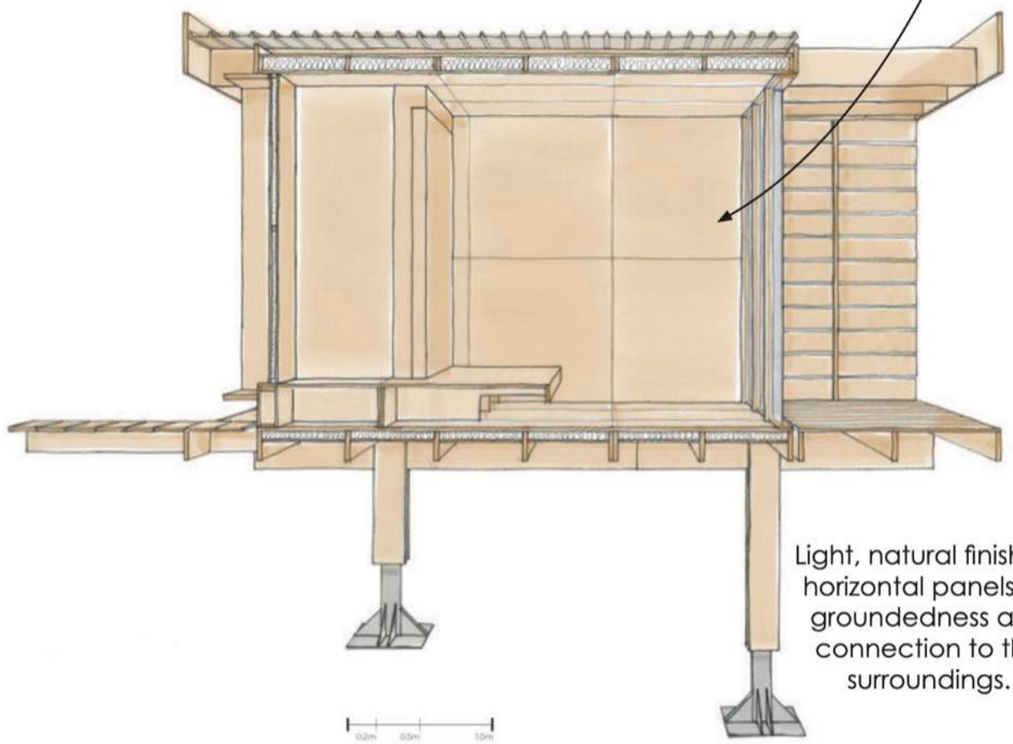
Ilabb Studios

a tree native to West Africa

Okoumè marine plywood panels was used in this construction because:

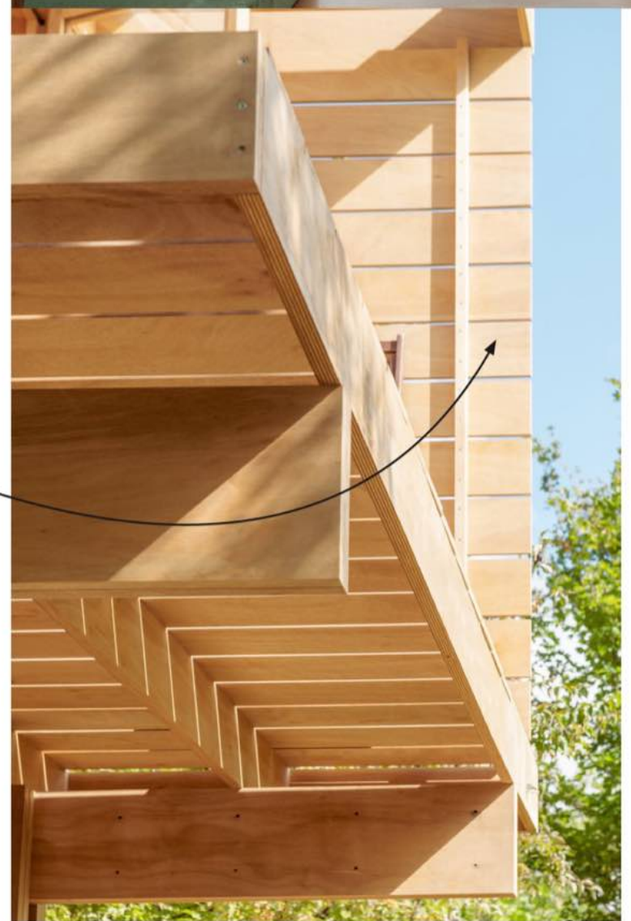
- High resistance to weathering
- Can be pre-assembled and bought to site
- Easy to install
- Natural colour of Okoume marine plywood is a red/ brown so no stain was needed

Clear Varnish was used to protect the marine plywood from moisture but allow the natural colour to show



Light, natural finish on horizontal panels for groundedness and connection to the surroundings.

Can be used as a yoga studio



Types of Marine Plywood

Okoume

Not locally sourced

From West Africa, light weight easy to work with

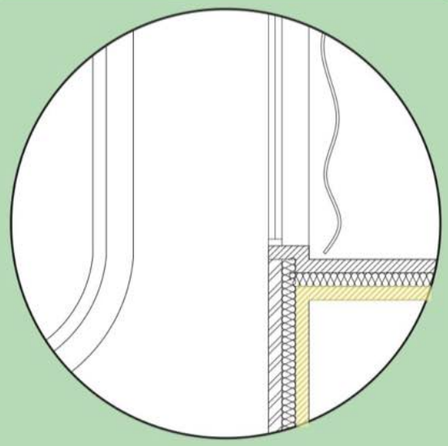
Mahogany

Too dark for a studio

From UK, High moisture resistance Durability

Douglas- Fir

UK grown softwood Rot and Decay resist-ance



Internal Choice

My Project will use Douglas Fir (UK) Marine Plywood for the interior walls and ceiling. It will be clear varnished to protect the wood from moisture, whilst allowing the natural light wood colour to show through, connecting the mindfulness of the spaces back to nature.

Daylight- S2 recap

Biological effect

Daylight sends signals via the novel photoreceptor to the biological clock that regulates the circadian rhythm.

Light can:
- trigger the release of cortisol, the stress hormone
- trigger the release of melatonin, the sleep hormone

This helps with human functioning

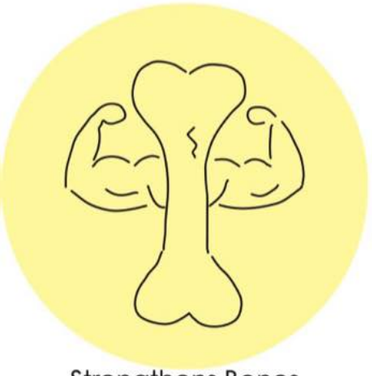
Helping women with trauma

Participants with PTSD and panic disorder who received morning light therapy and CBT had (Cenkner et al., 2022):
- a significantly greater reduction of depression and anxiety symptoms
- improved sleep quality
- improved mood

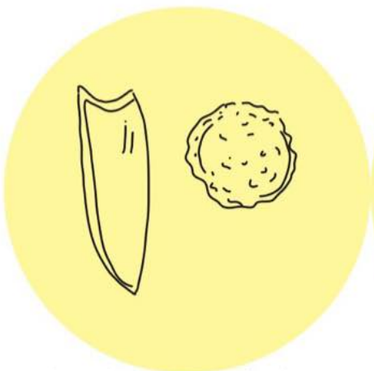
(Shaw, 2024)

Enhances Sleep Patterns

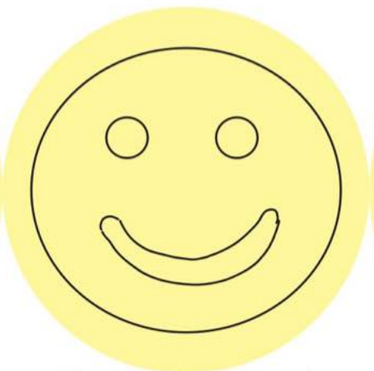
Reduces Stress



Strengthens Bones



Boosts Immune System



Elevates Your Mood

May Reduce the Risk of Melanoma

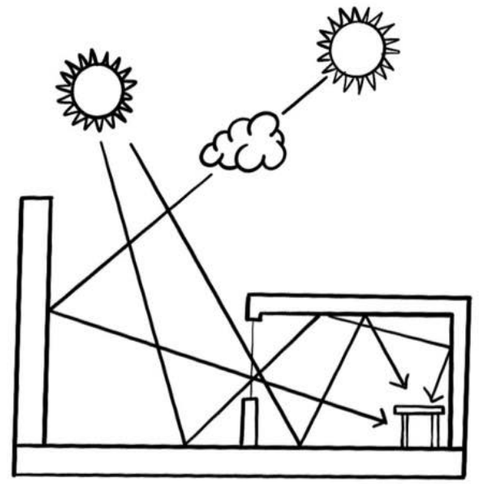
Daylight Factor

There are two components to natural light - direct sunlight and diffuse sunlight.

The overall daylight factor is made up of 3 components:
- The sky component
- The externally reflected component
- The internally reflected component

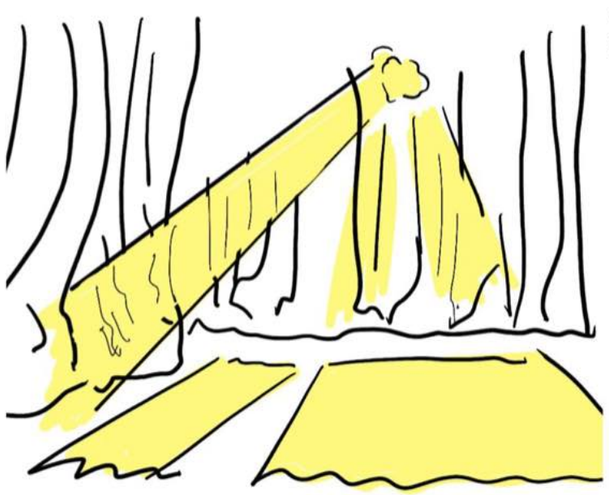
To maximise the internal sunlight reflection surfaces should be as light as possible:
- 70% reflectance's for ceilings
- 50% reflectance's for walls
- 30% reflectance's for floors

Increasing height of window ensures the back of the room is well lit

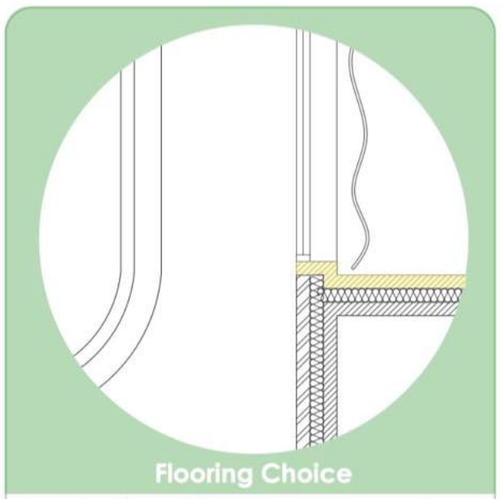


Glare and diffusion

Glare can occur from any direct source of light. The space could be softened to allow for light to fill the space whilst re-ducing glare to reduce risk of accidents occurring



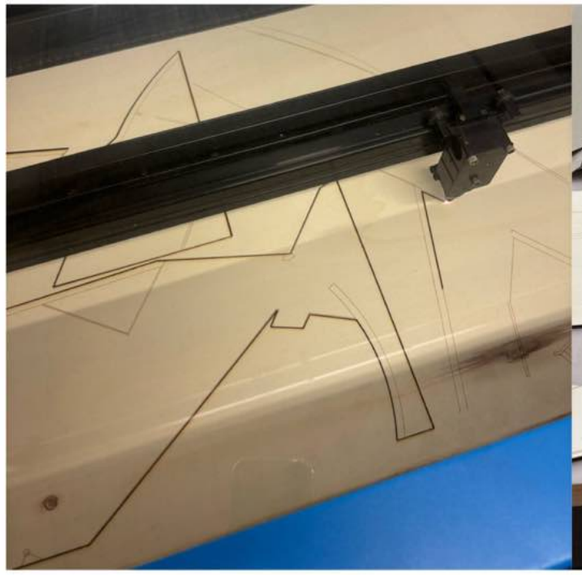
I want to use textiles in my design to help diffuse the light through the space. This can flow from the partition curtains to cover the windows. This type of translucent curtain will add a layer of privacy to the space, whilst making it calming and soft with the light.

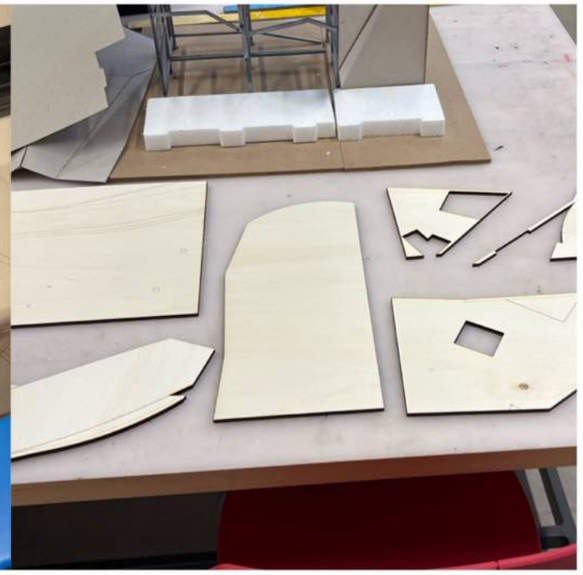


Flooring Choice

The Flooring will be the same as the walls and ceiling- Douglas Fir Marine Plywood. This is for the softness of the floor for pilates and yoga, as well as the low maintenance and moisture resistance. As a light choice of natural material, it would not need staining.

Interior Plywood- Model Making





For the plywood interior, I wanted to represent this as panels, which at this scale would make sense to laser cut the full piece. I started by laser cutting the floors and then the walls.

I applied a clear satin varnish to these floors and wall panels, and part from adding a layer of protection to the wood, it did not change the way it looked or felt.

It was suggested that if the finish wanted to be smooth and less rough from the natural grain, then a clear wax could be used. I decided against this as I wanted the natural look of the timber

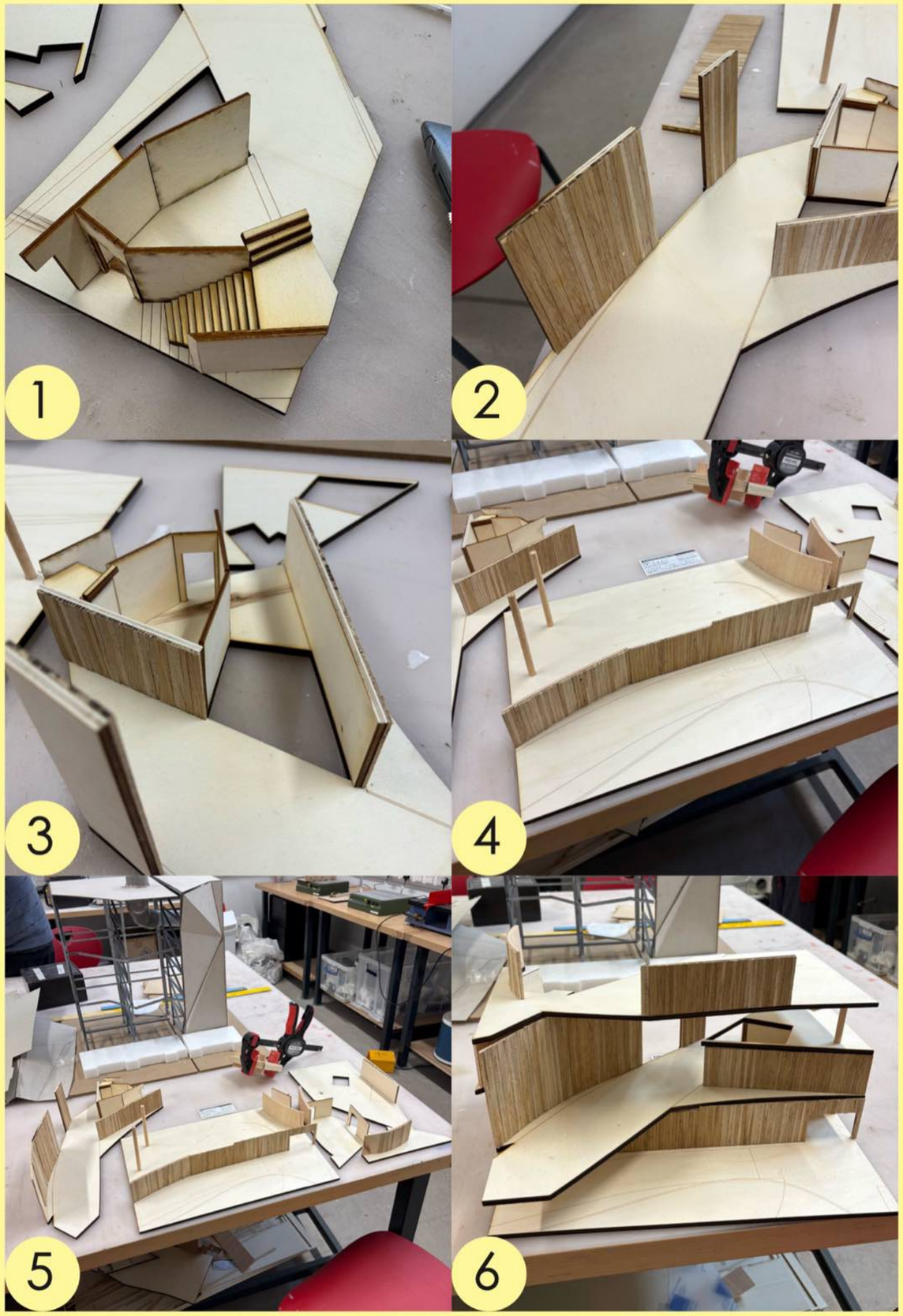
The Process

1 → 2 → 3

1. I started to assemble the smaller interior walls, those that don't have any exterior finish and the staircase
2. Once all the vertical oak cladding was adding to the panels, I added these to the model. I kept all floors separate at this stage
3. The views and walls started to take shape, especially on the first floor where some of my key views are.

4 → 5 → 6

4. The plywood at 3mm thickness is able to bend, so I used thick super glue to attach the curved walls and hold their shapes
5. All wall pieces were added and dowels for the plywood pillars on each floor
6. All the levels together, the model is starting to take shape



Interior Plywood- Construction

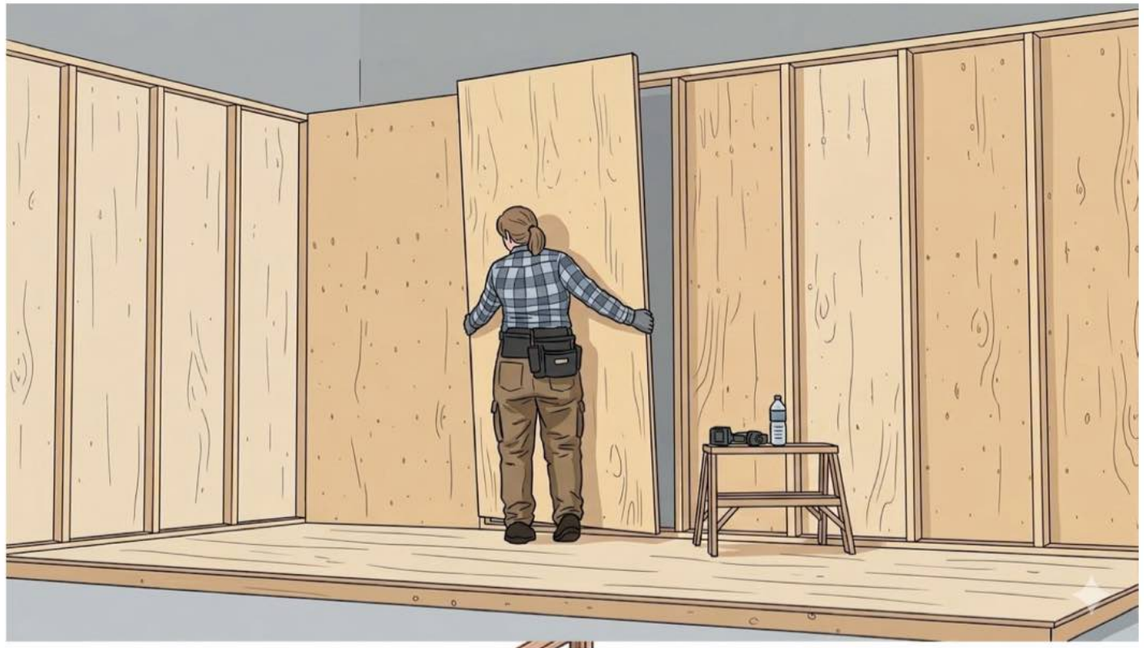
What is the size of plywood panels for the walls and floor?
How is it attached to the walls?

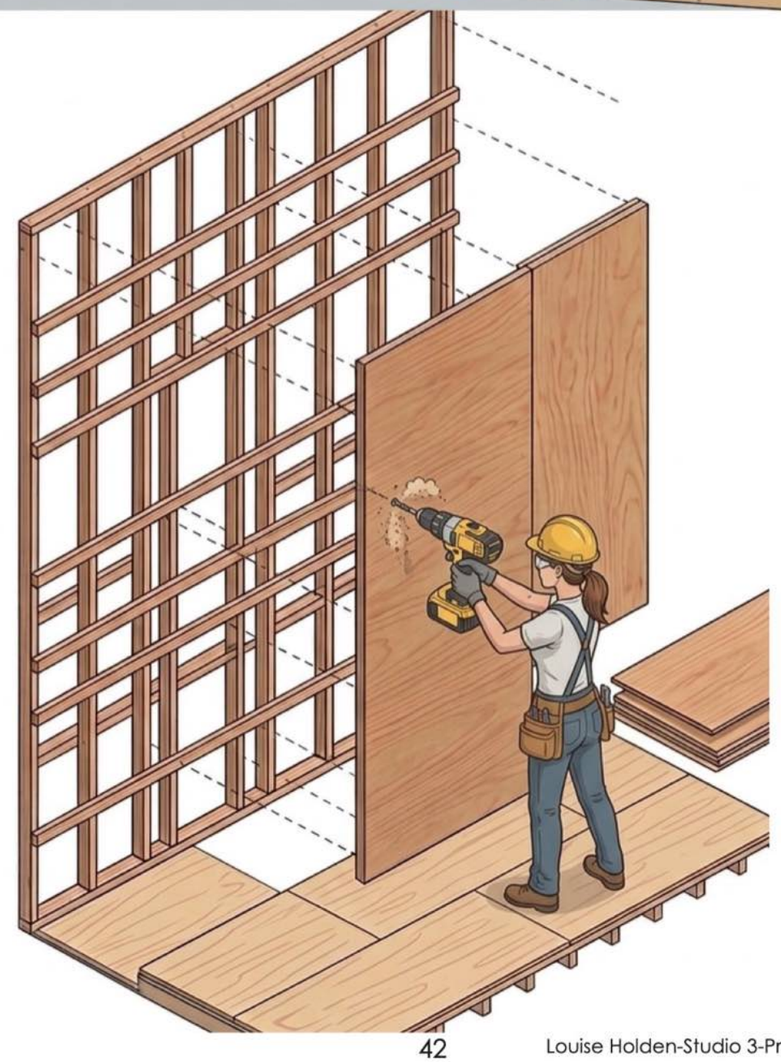
The most common standard sheet size of douglas fir marine plywood is 2440mmx1220mm.

Average cost of 12mm Douglas Fir Marine Plywood sheet is between £42- £80. For wholesale or batch it is £40-£50 so I will use £50 as the higher end of the average price for a bulk buy

How many panels would I need?

Level	What surface?	Total area m²	Sheets of plywood 2440mmx 1220mm	Cost Total £50 per sheet of ply
Ground Floor	Floor	1330.7	418	£68,436.63
	Walls	293.71	109	£17,845.92
	Ceiling	1330.7	418	£68,436.63
First Floor	Floor	463.4	172	£28,160.53
	Walls	274.32	102	£16,699.85
	Ceiling	463.4	172	£28,160.53
Second Floor	Floor	487.1	180	£29,470.32
	Walls	542.97	201	£32,908.52
	Ceiling	526.9	195	£31,926.18
Third Floor	Floor	558.4	207	£33,890.87
	Walls	265.14	98	£16,044.95
	Ceilings	558.4	207	£33,890.87
			2479	£136.345





AI generated images to show how the panels will fit onto the battens based on a rough sketch I did to show the principles

Windows- Glazing

As previously discussed, windows should:

- be tall to allow light to the back of the room
- be covered in a translucent curtain to protect privacy
- allow for views into the public parts of the building to show the play elements

As per Building Regulation Part L

Table 4.3 Reference glazing systems for solar gain calculation

Type of space (as defined in the National Calculation Methodology)	Average zone height	Glazing location for reference space	Glazing area for reference space	Framing factor for reference space	Glazing g-value for reference space
Side-lit	Any	East-facing façade	Full-width to a height of 1000mm	10%	0.48
Top-lit	≤6m	Roof	10% of roof area[1]	25%	0.48
	>6m	Roof	10% of roof area[1]	15%	0.42

NOTE:

1. 'Roof area' determined from the inside of the space looking out.

Not modelled, but all windows on the east side of my building will be no taller then 1000m

4.2 The U-value of a window should be assessed using one of the following methods.

a. Calculated using the actual size and configuration of the window.

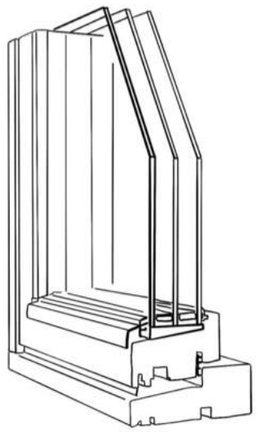
Location	area m²	frame type	double glaze U-Value	Triple Glaze U-Value
A	11.34	Timber	5.88 W/m²K	5.78 W/m²K
A	11.34	Timber+ insulation	4.26 W/m²K	4.2 W/m²K
A	11.34	uPVC	4.76 W/m²K	4.69 W/m²K

From this table, triple glazed windows with an insulated timber frame works best and will fit in with the timber exterior

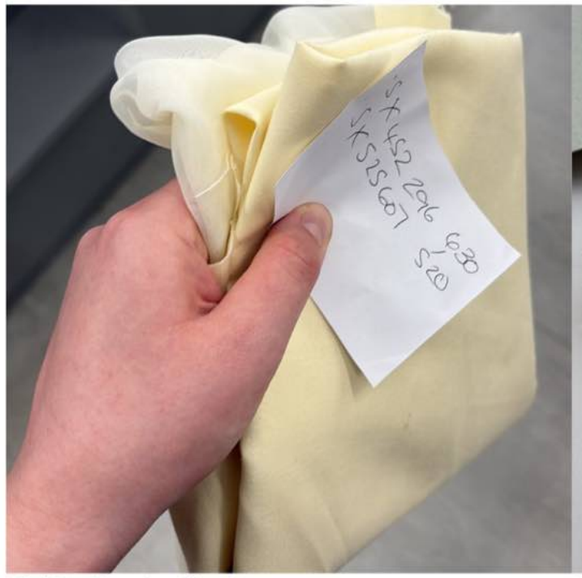
What's Modelled:

To make the windows for this model I used 6mm acrylic found in the scrap box to reuse materials. This is larger then 1:50 scale. Laser cut to create clean edges.

3 glazed panels
Argon filled
Timber Frame
44mm wide



Textile Curtains



Visit to the textile shop:

Common materials for see-through, sheer curtains include voile, chiffon, organza, and linen blends. I explored the collections to find voile represented the curtains I wanted to show and was recommend by the assistants.

Alternatives:

Chiffon

Linen

Organza

First attempt:

Cutting the voile was quite tricky as it frays and doesn't cut clean with scissors, the curtains cut this way I decided needed to be re-cut with a sharp scalpel

The private spaces:

For the private spaces, a thicker opaque curtain to divide the space. Eyelets were used to support 2mm dowels to act as curtain rails. Slits at the top of the material slotted along these rails.

Second attempt:

After the voile was cut with a sharp scalpel (surprisingly the blunt scalpel didn't work either!), the edges were soft and clean. I used the same idea to cut slits and slide the material onto the curtain rail.

Roof textiles

As spoken about for thermal insulation and sound control, fabric draping over the ceiling absorbs the sound the create a softer and quieter space

The Path

The Material- Wet pour surfacing

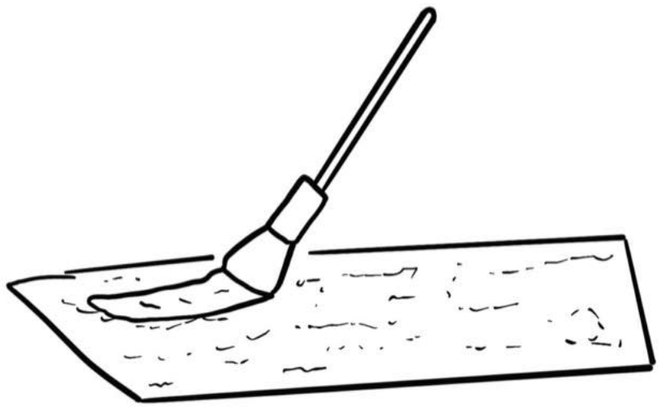
(Bounce Bound, 2026)

The Model

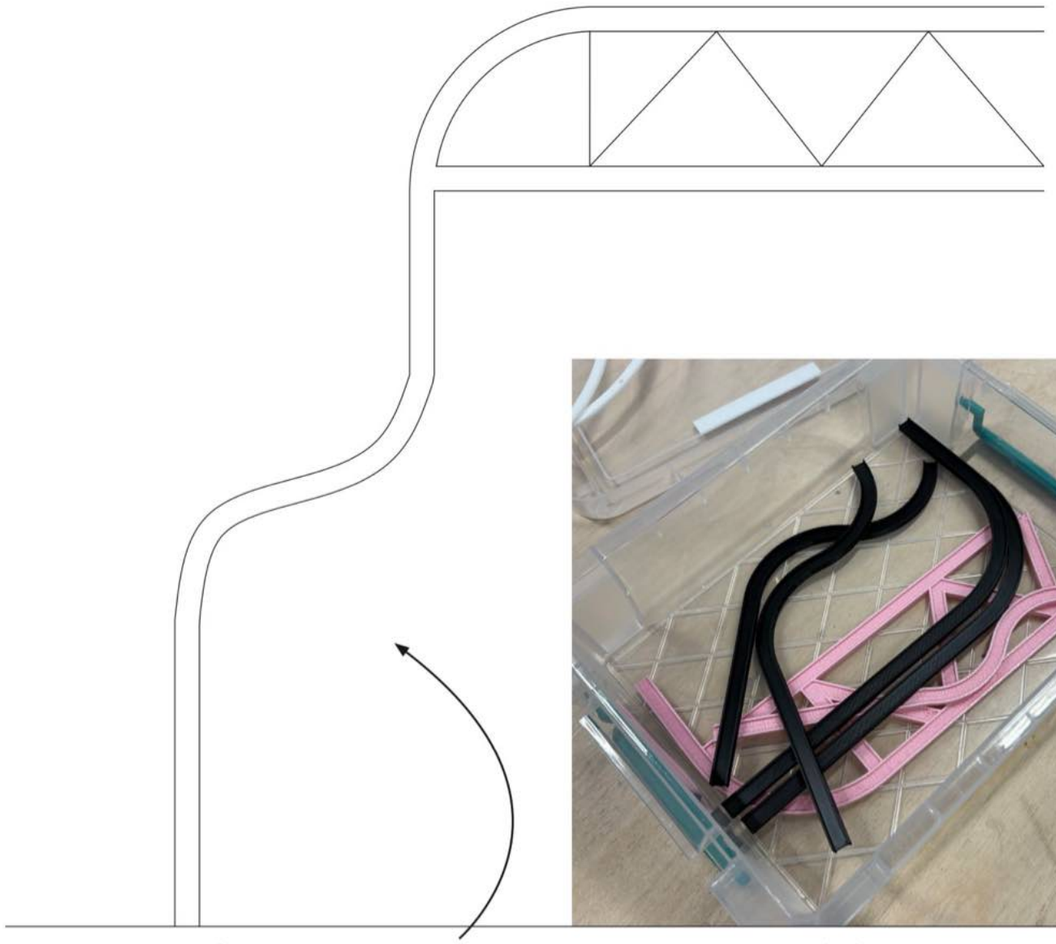
Made from sandpaper- size 80 grain

PVA smoothed over the top to reduce sharp effect and to have a glossy finish

Colourful to add to the playful nature of the building



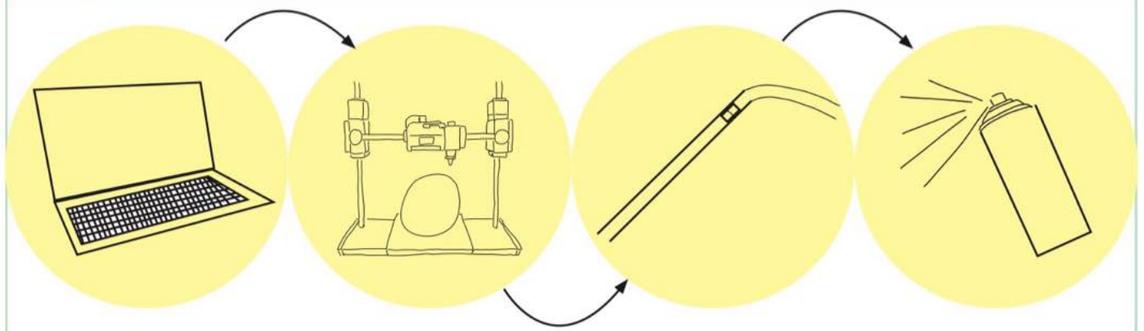
The Shell- the Trusses



The trusses were first modelled on CAD, to be places in the most secure points on the plan and to allow the trusses to hide on top of the roof. Each Truss is unique to the position it stands on the plan due to the changing shape of the shell

For the trusses, 3d printing the structure allowed for the most detail to be shown. The I-Beam the scale is thin so to maximise strength, the beams were cut in 2 parts each and secured back together using a thin plank of timber to act as the bolt plate.

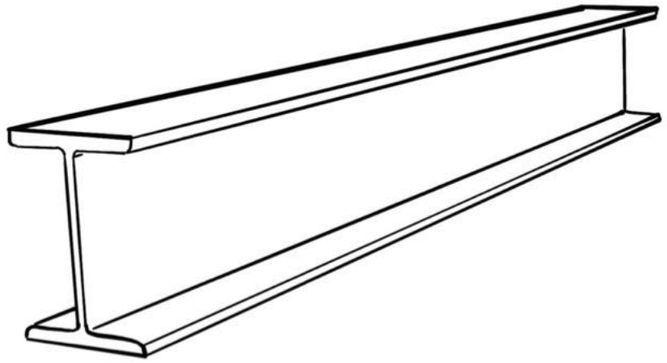
The Process



The Shell- the Trusses construction

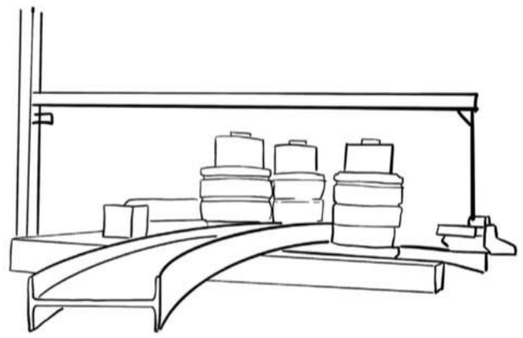
Larger sized I-Beams would be used for this project.

For this project 406x178x54mm is used.

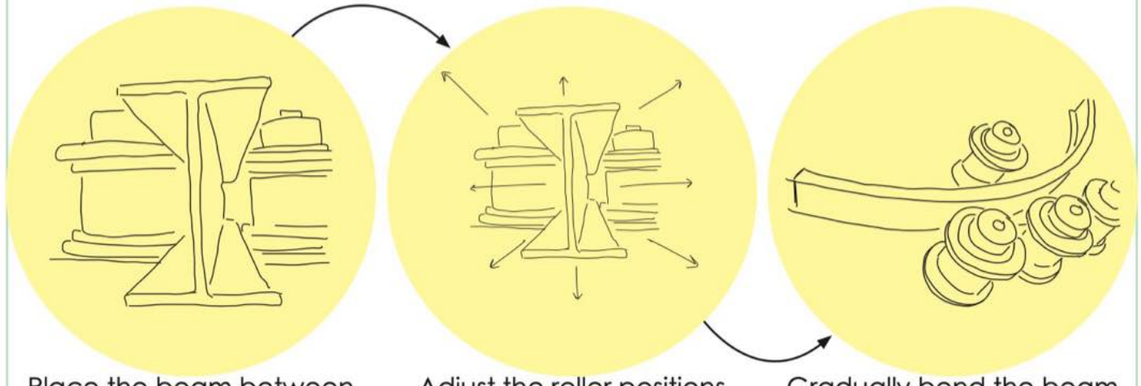


Beam Roll Bending

Beam rolling is a specialized metal forming process. It uses a profile bending machine, a three-roll bending system, where two side rollers and a central roller apply gradual pressure to achieve the desired curvature. Beams achieve the required curvature while maintaining strength and load-bearing capacity (BIT, 2026)



The Process



Place the beam between the rollers.

Adjust the roller positions based on the desired curvature.

Gradually bend the beam as the rollers apply force, repeating passes for complex or tight bends.

Downland Gridshell, Weald and Downland Museum, Sussex

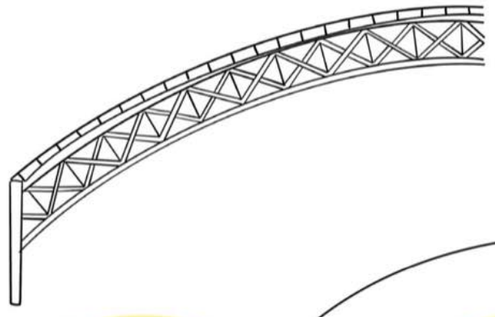
A Barrel Vault Structure with lightweight timber lattices that need to be tensioned around their edge using a continuous ring beam.

A system like this would aesthetically be ideal for my shell, however it requires contact to the floor both sides of the vault, my project not only bends and weave, but has cut outs. This would make this structure too weak for my project

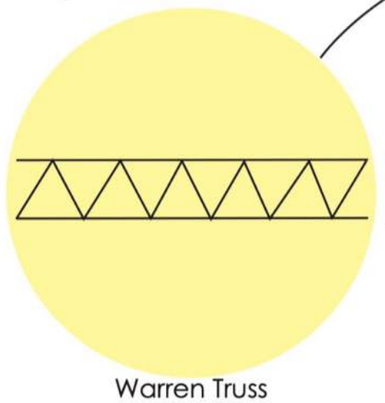
Berlin Hauptbahnhof, Berlin, Gerkan Marg and Partners

Another barrel vault structure, this time with high strengthened structural steels that curve and maintain the main structure.

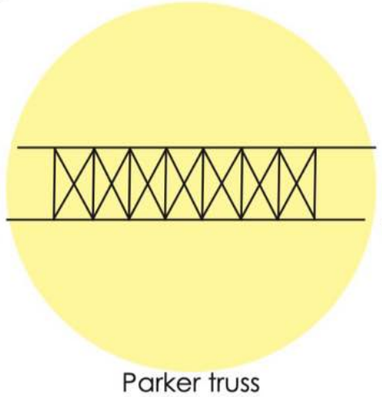
This is more similar to what could be used in my building, however extra support will be needed as the shell bends and flows.



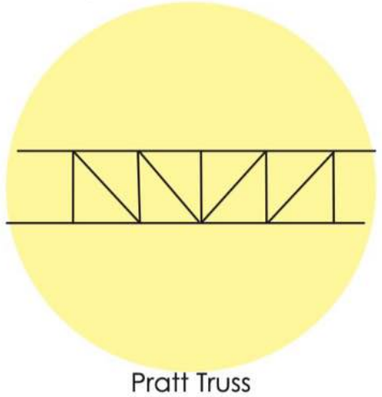
I choose this truss because it allows for the shell to lay flat over the roof and to be more efficient for space and material use compared to the dome of a parker truss



Warren Truss
common design because it spreads the load evenly across the various members.

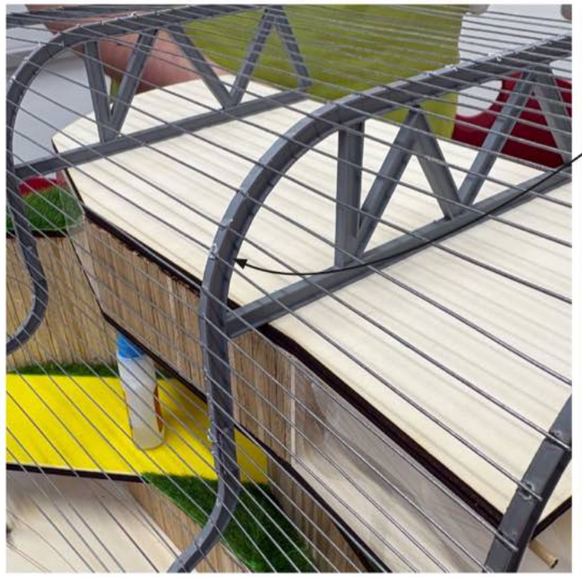


Parker truss
more material where the bending stress is highest, lighter at the ends



Pratt Truss
Often used in bridges, loads are evenly distributed across the truss.

The Shell- The tension cables



The Model:

For the model, I used a Dremel drill to create rivets in the 3D printed beams which would allow wire to sit in them. The wires sit 10mm apart from the next, to allow the tiles later to rest of them.

This process was very time consuming, using masking tape to hold the wire on the frame whilst the glue dried. The wires were placed individual between the beams so I could bend them to the right shape.

This process took 2 Days in total!

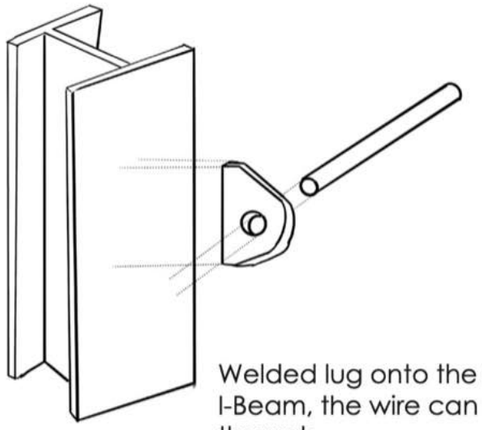
The Tension Cables

Adding tension cables between the I-Beams on my shell:

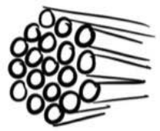
- provides structural stability
- increase load capacity
- higher resistance to lateral forces such as wind

Additionally the tension cables can support the tiles

Made from high strengthened steel, the elongation of the cable length can be between 0.10 and 0.75%, depending on the magnitude and frequency of loading. This allows for movement in the shell to stop it from buckling or bending. Alternatively, Galvanised steel cables can be used as the cost efficient option, however high strength steel is more durable



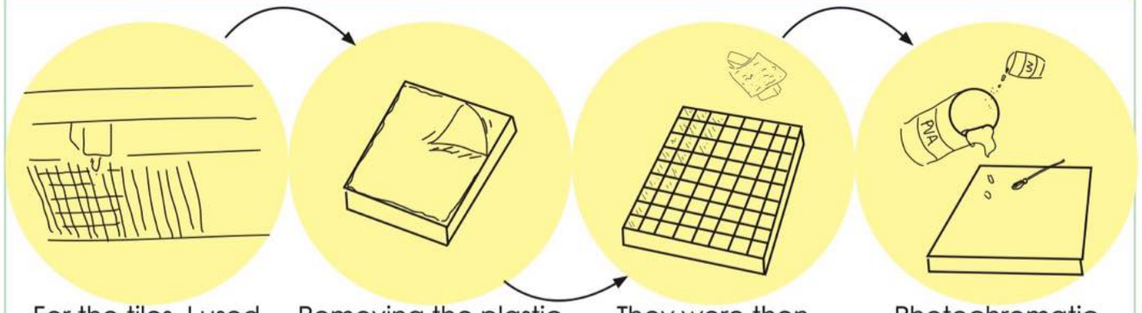
Welded lug onto the steam I-Beam, the wire can thread through



1x19 strands is used for construction use

The Shell- The Tiles

The Process



For the tiles, I used misted acrylic, laser cut into 10x10mm tiles.

Removing the plastic protective film on each individual tile

They were then sanded down to make the surface rough for application of the photochromatic pigment

Photochromatic pigment mixed in 1:10 ratio with PVA as the binder, painted on top of the surface

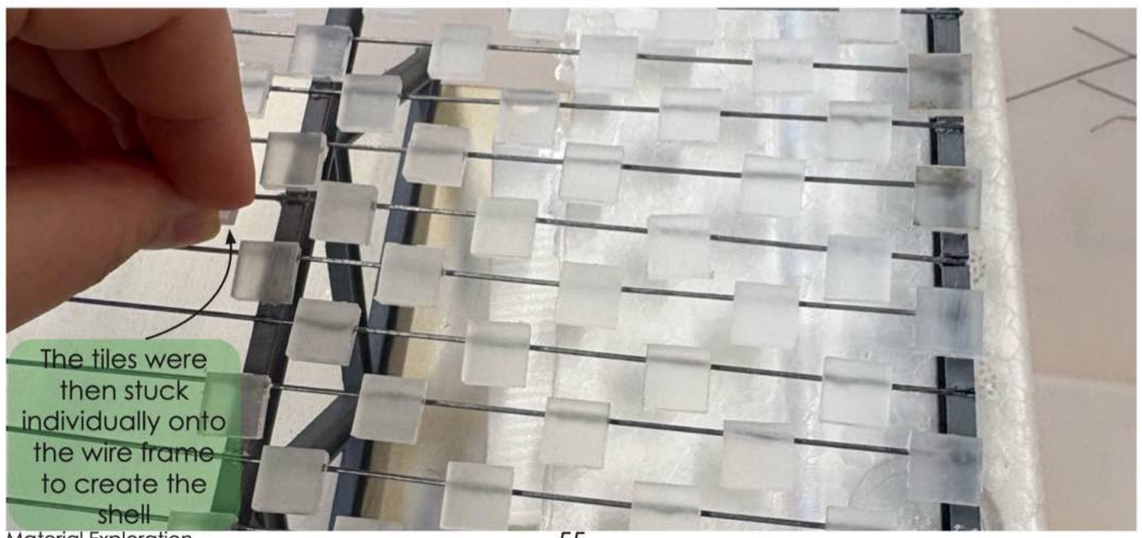
The Photochromatic Pigment

The pigments I used where:

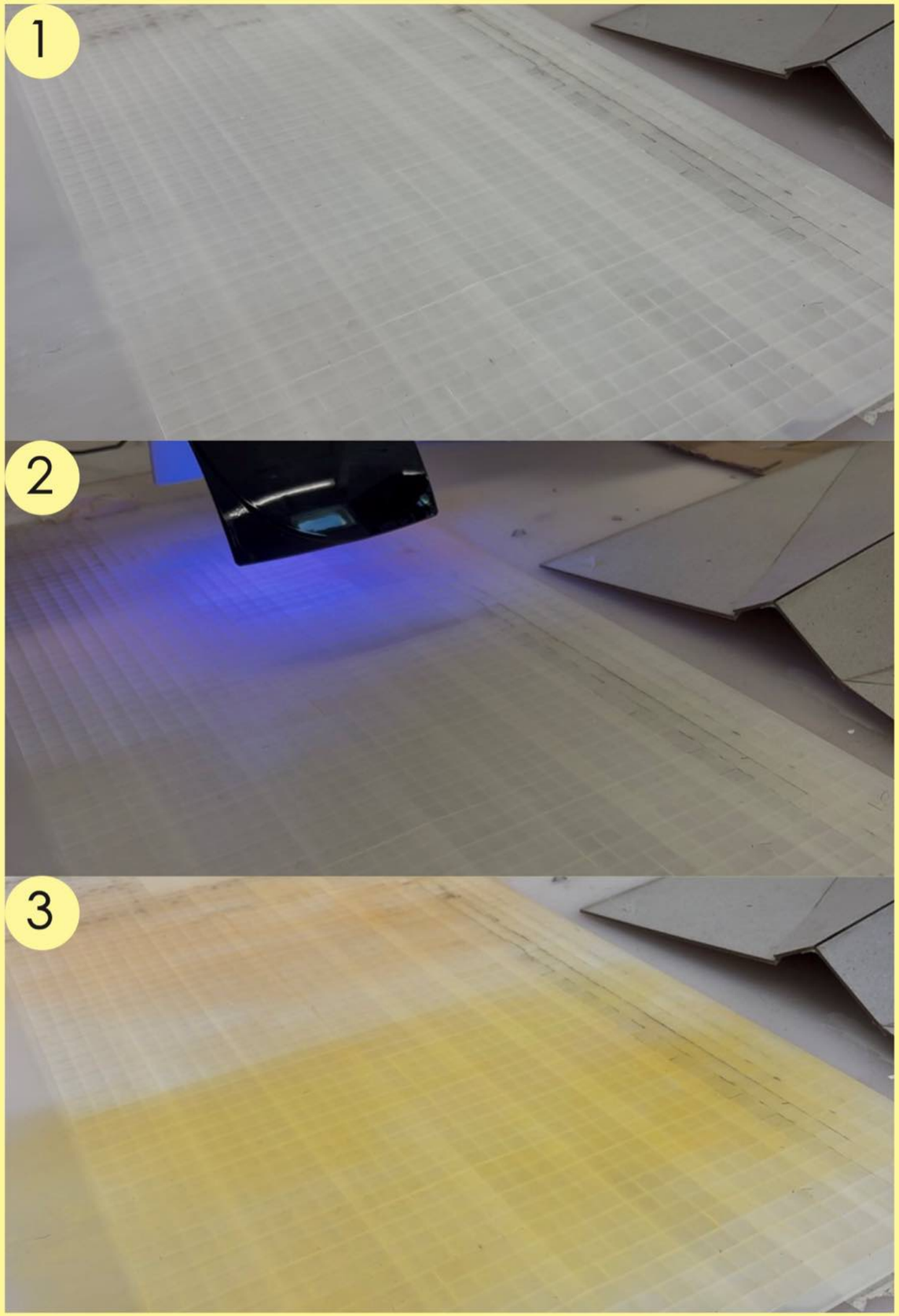
- clear to orange
- clear to yellow

These colours suited my project best and can be randomly spread across the frame. Dependent on the level of UV light, the colours will have different strengths in saturation. This colour reverses itself after about 60 secs of no exposure. Long lasting, however reapplication is advised after about 5 years of intense use.

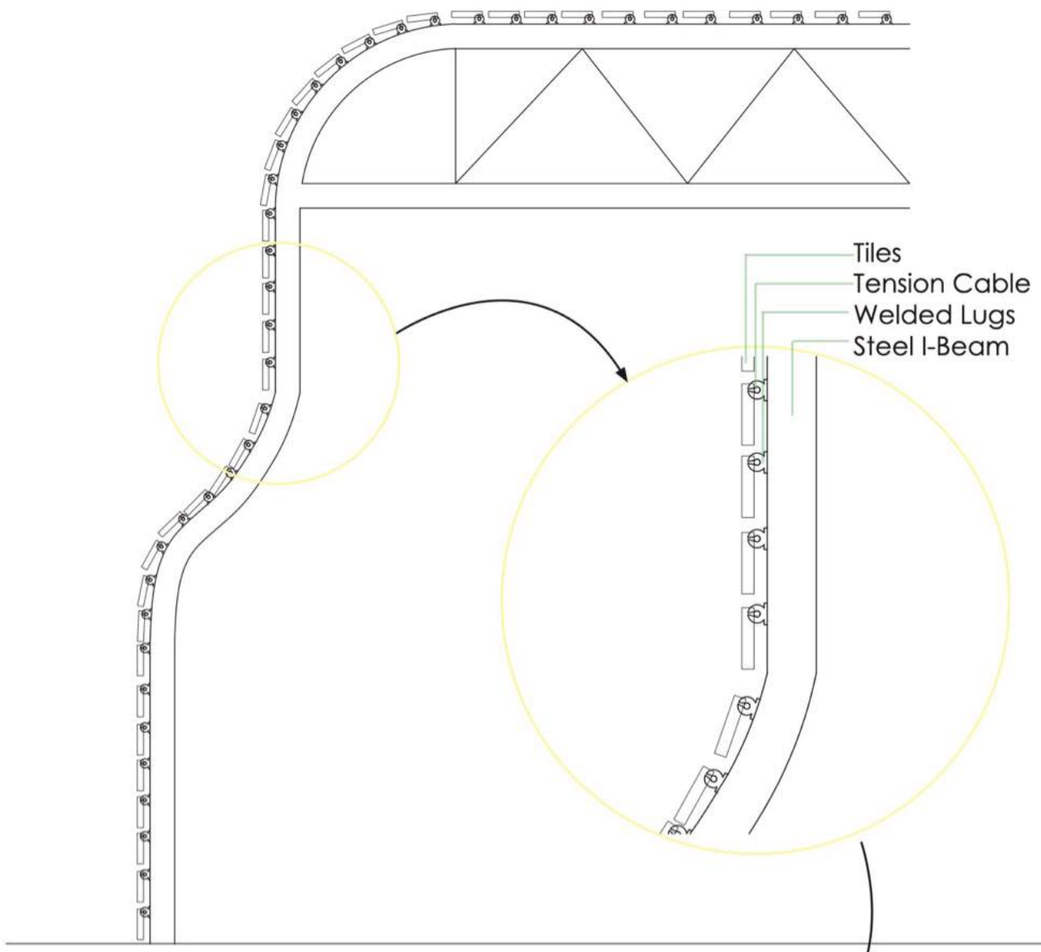
1. The tiles under artificial light and no sunlight
2. UV lamp to represent the sun moved over the tiles
3. The tiles have changed colour under the UV light

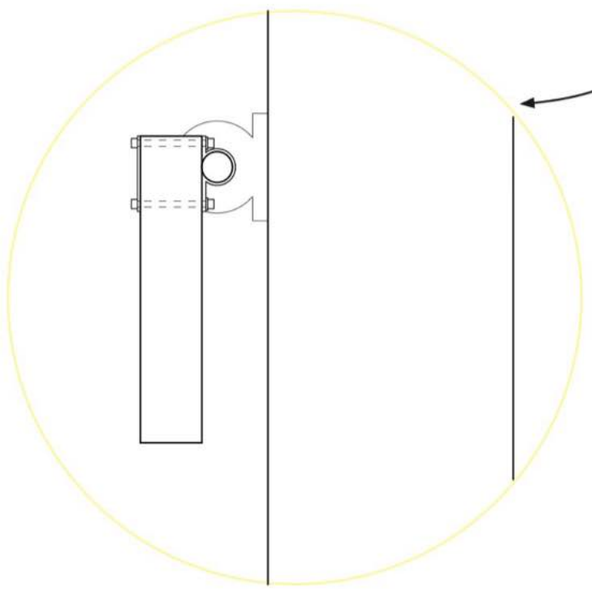


The tiles were then stuck individually onto the wire frame to create the shell



The Shell- The Tiles Construction





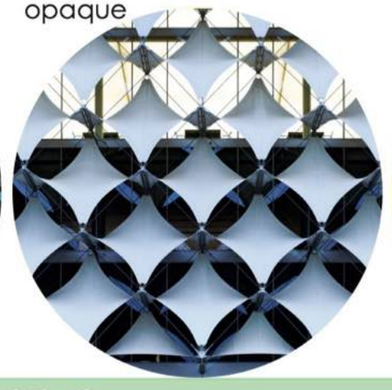
Steel Saddle clips will attach the GRP sheet tiles to the tension cables, allowing them to moved slightly with the wind

Maintenance and Repair:
Glass fibre reinforced plastic has a life span of 25-50 years. To replace and repair panels they can be simply unbolted from the clips, so a single panel can be changed without the whole shell needing replacing

The Material

Aluminium- Brisbane Airport durable but not as translucent as desired

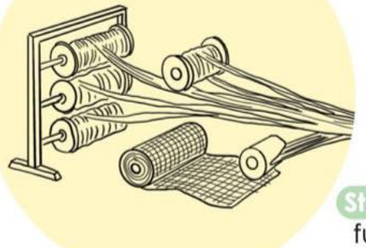
Textiles- Fahad National Library Flexible, uses glass fibres, but opaque



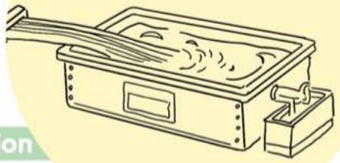
Glass reinforced plastic uses glass fibre and is durable

The Process- Glass Reinforced Plastic

Step 1- Reinforcements
woven mats for multi-directional reinforcement

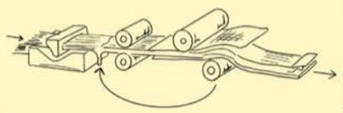


Fed through creel

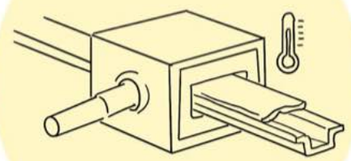


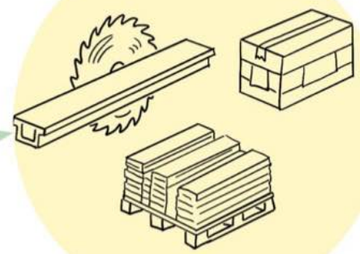
Step 2- Resin Impregnation
fully saturated in a bath of thermosetting polyester resin. Pigment is added

Step 3- Pre-Forming and Surface Enhancement
composite is shaped using pre-former tools. surface veil is applied



Step 4- Curing
pulled through a heated die, where the resin polymerizes, solidified

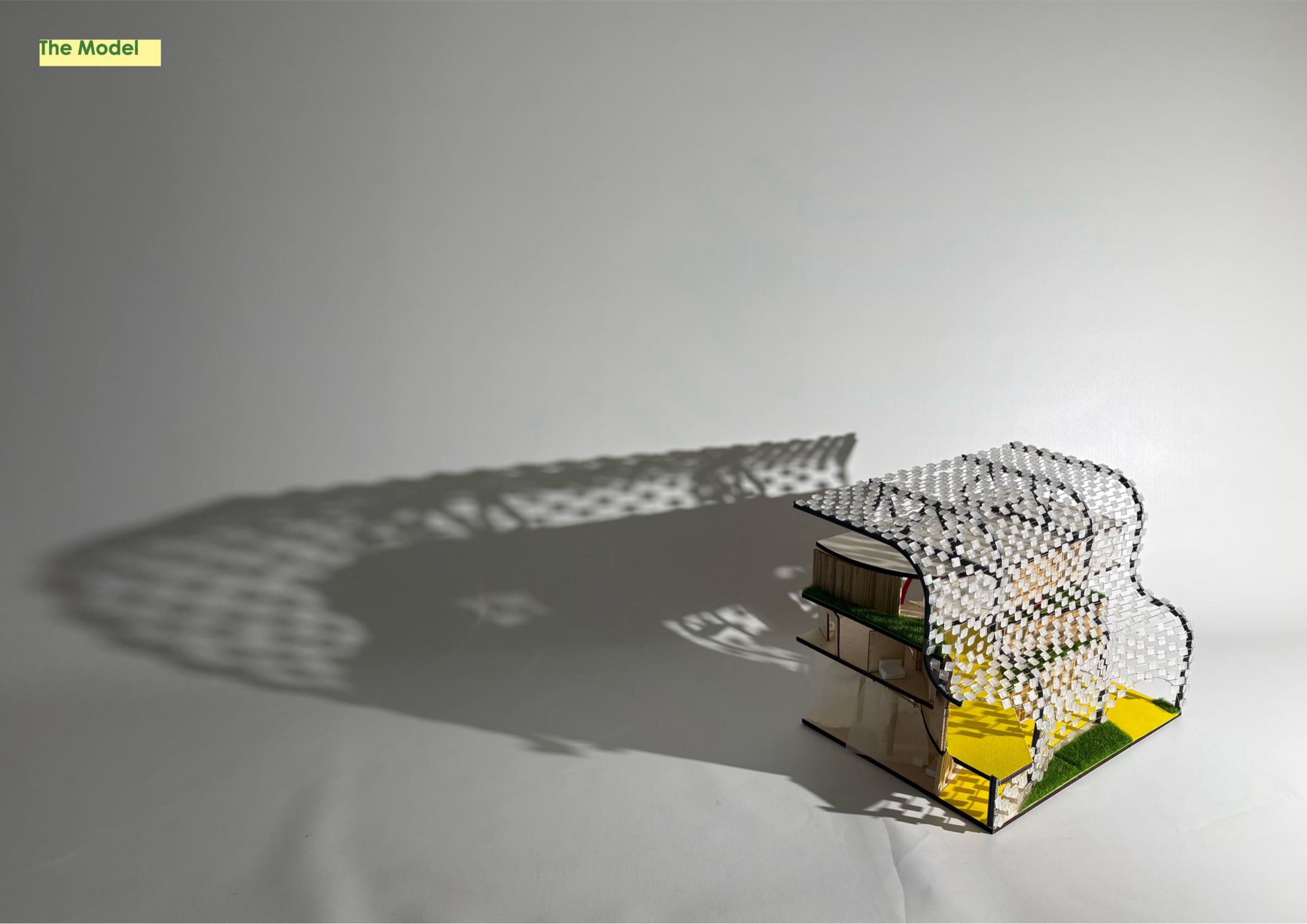




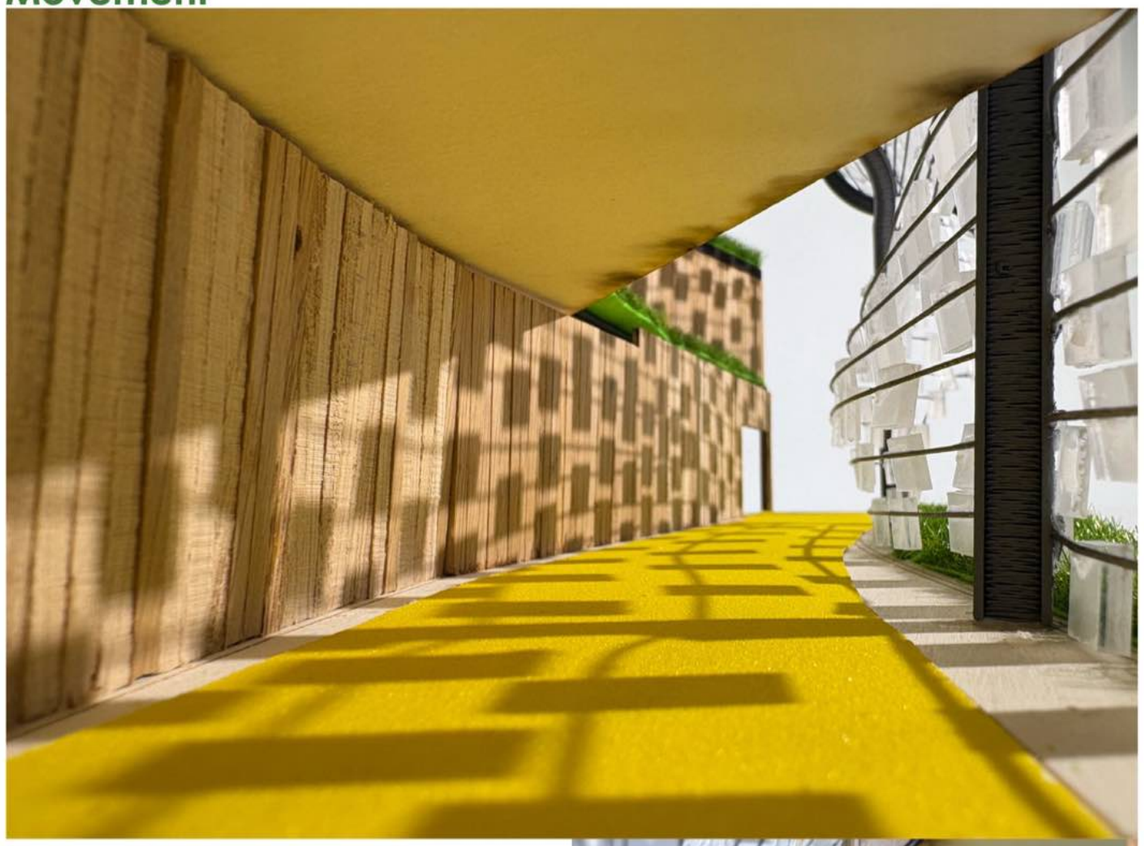
Step 5- Cutting and Finishing
The cured profiles are cut to specified lengths and prepared for packaging and distribution.

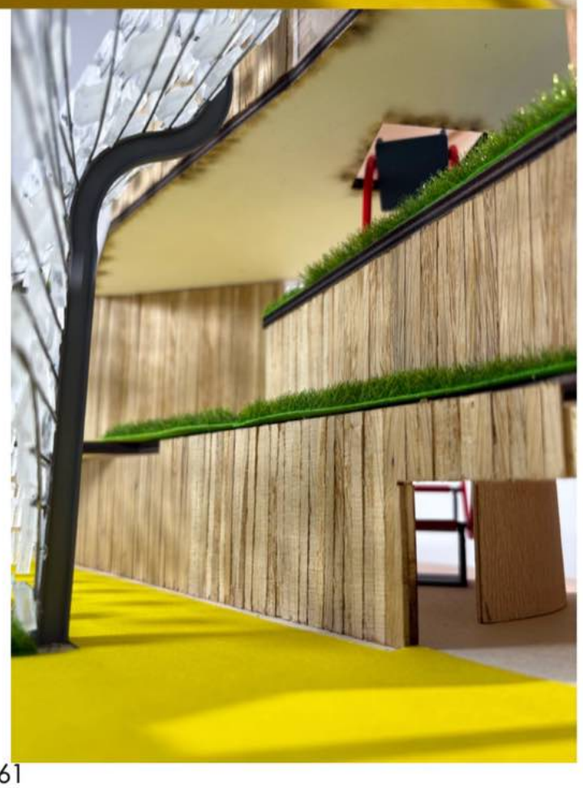
(Tencom Ltd, 2026)

The Model

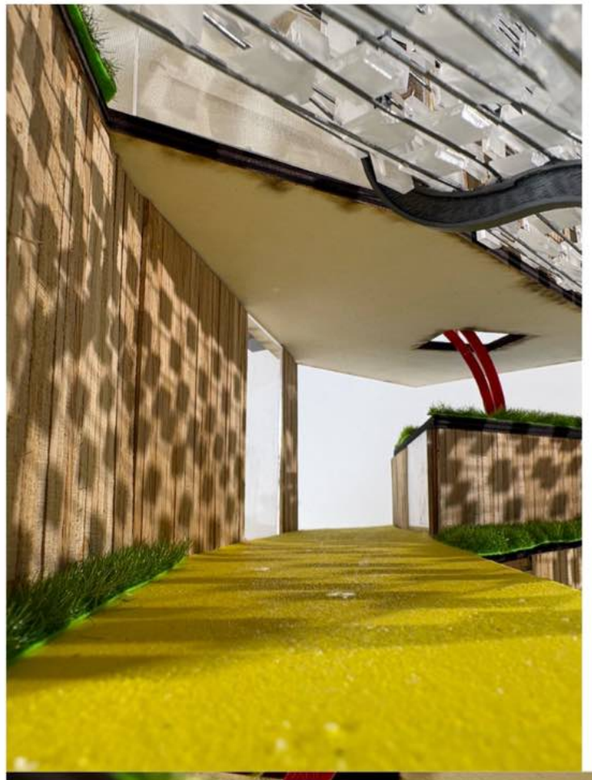


The Model- Walking Through Movement



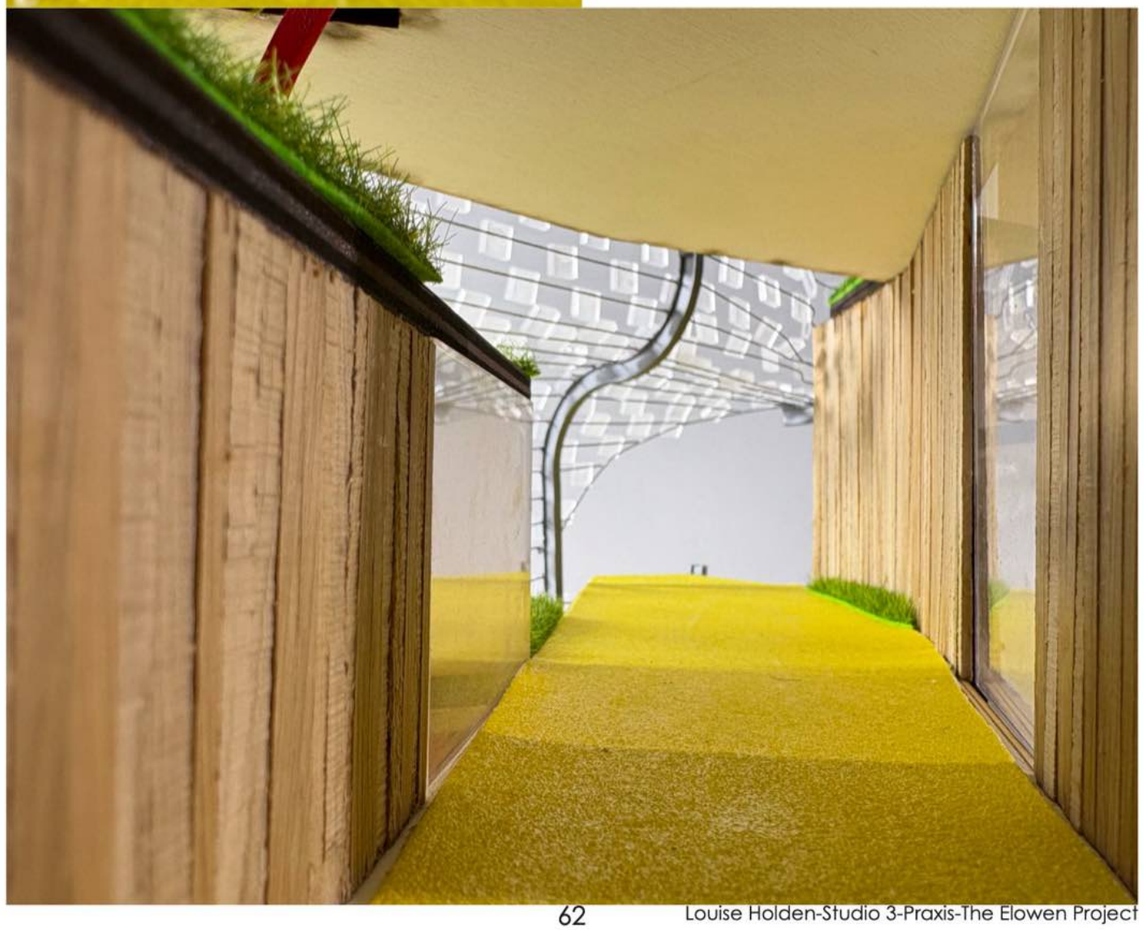


For me, some of my key views through this model were to do with how someone would walk around the site. I wanted the paths to be wide and bright to be clear where they go.



I particularly liked how the light causes the shell to create a patterned shadow across to walkway to make it more interesting a playful.

In the photo to the left, you can see how the wheel pops out of the roof and is visible from the path, as well as the windows shown in the image below.



The Model- Key moments
Privacy

The Moments

Moment 1
The Private Spaces
A space that can be closed off for private moments in comfort

Moment 2
The Textile Studio
Using the textile to make walls, cover windows and help with acoustics

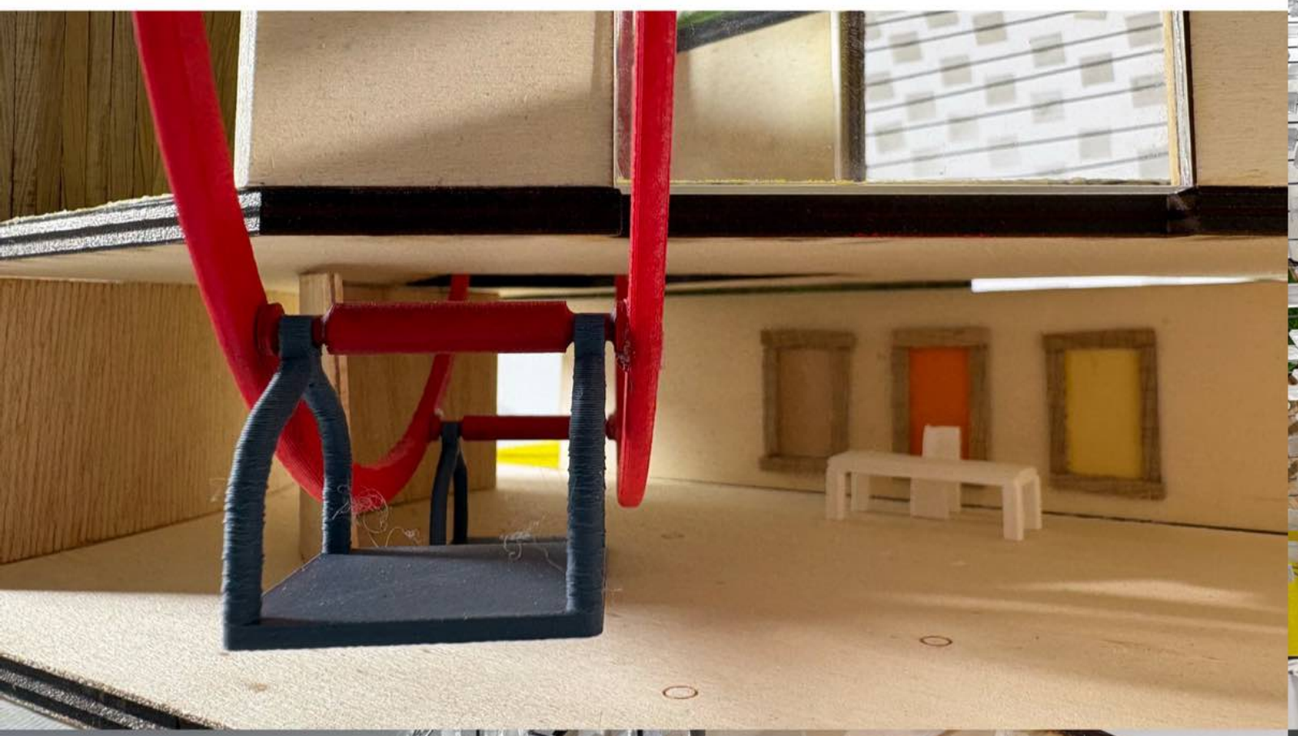
Moment 3
The Entrance
What will the reception area look like and what to expect when to enter the building

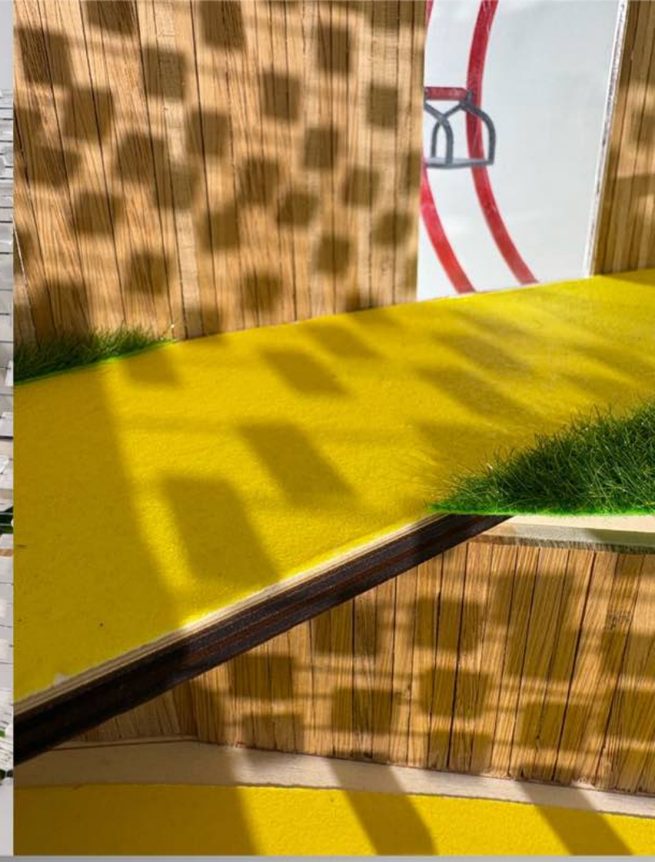

Moment 2


Moment 1

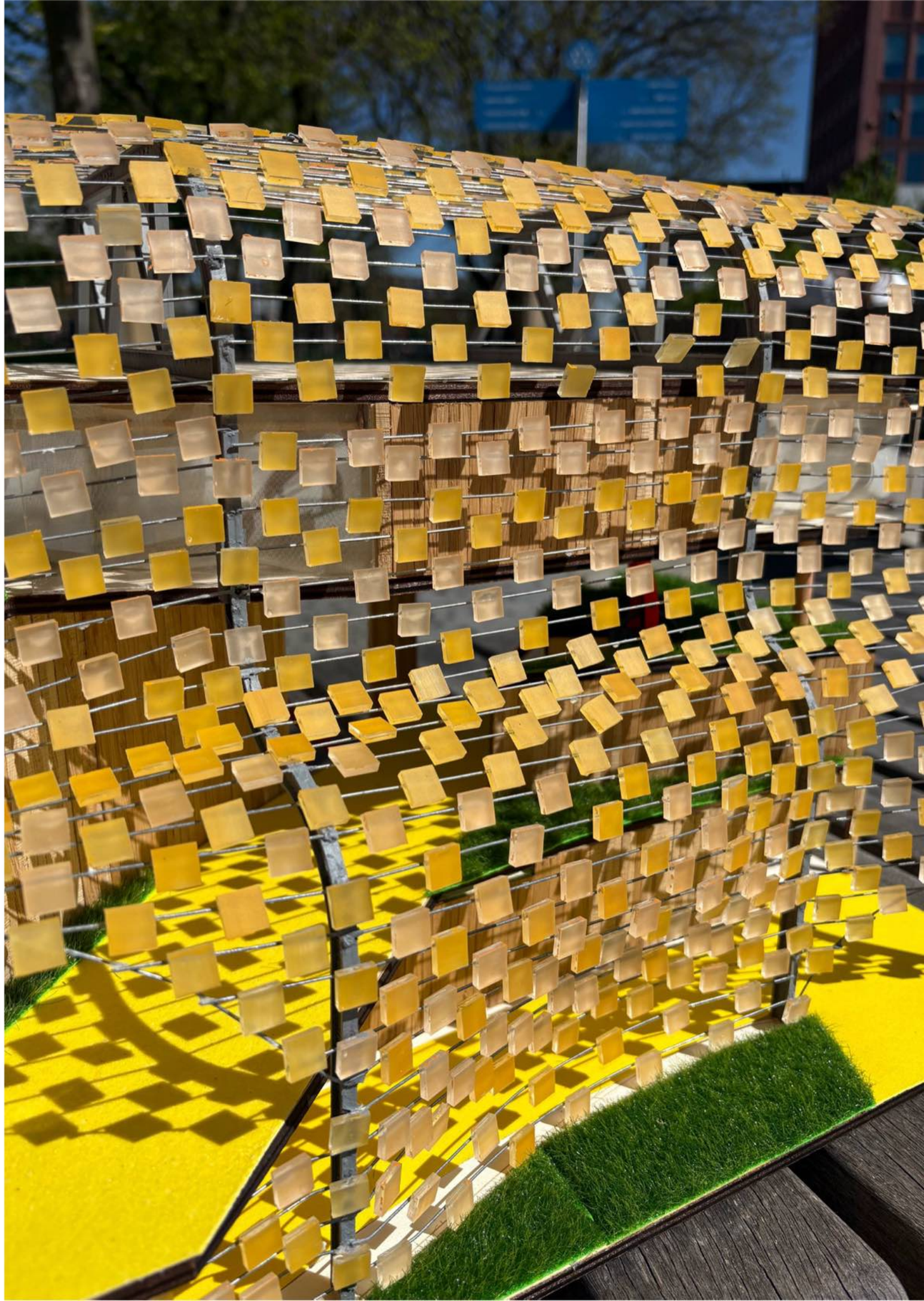

Moment 3

The Model- Other Photos

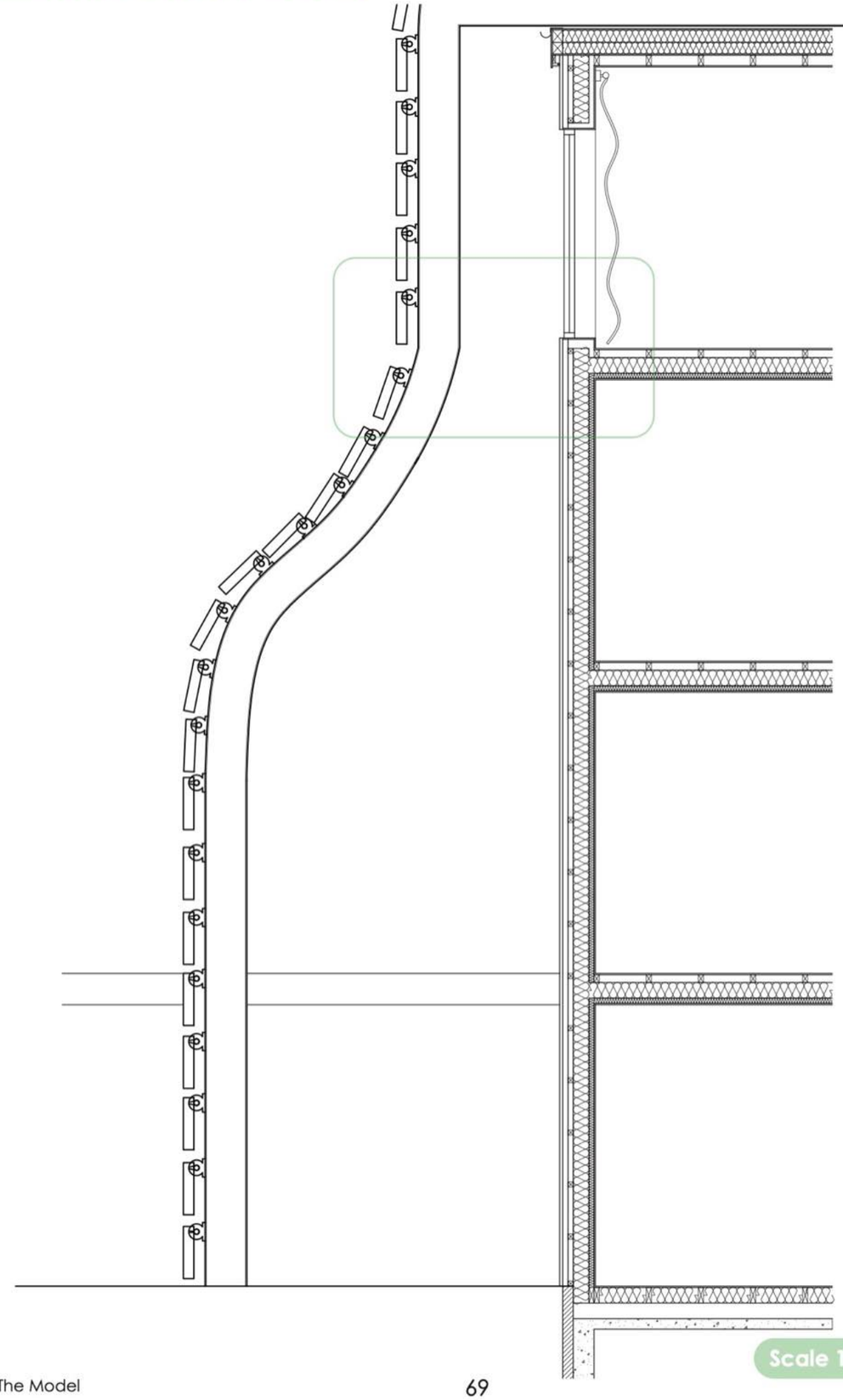




The Model- The Shell

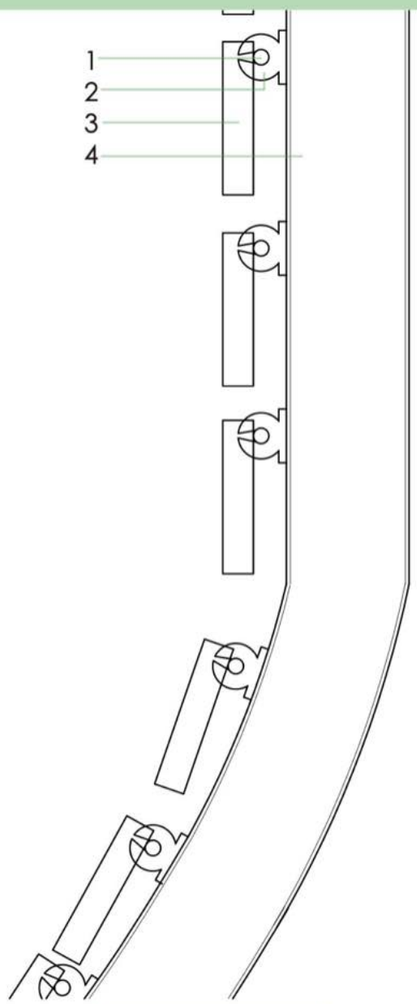


Material Choice Details

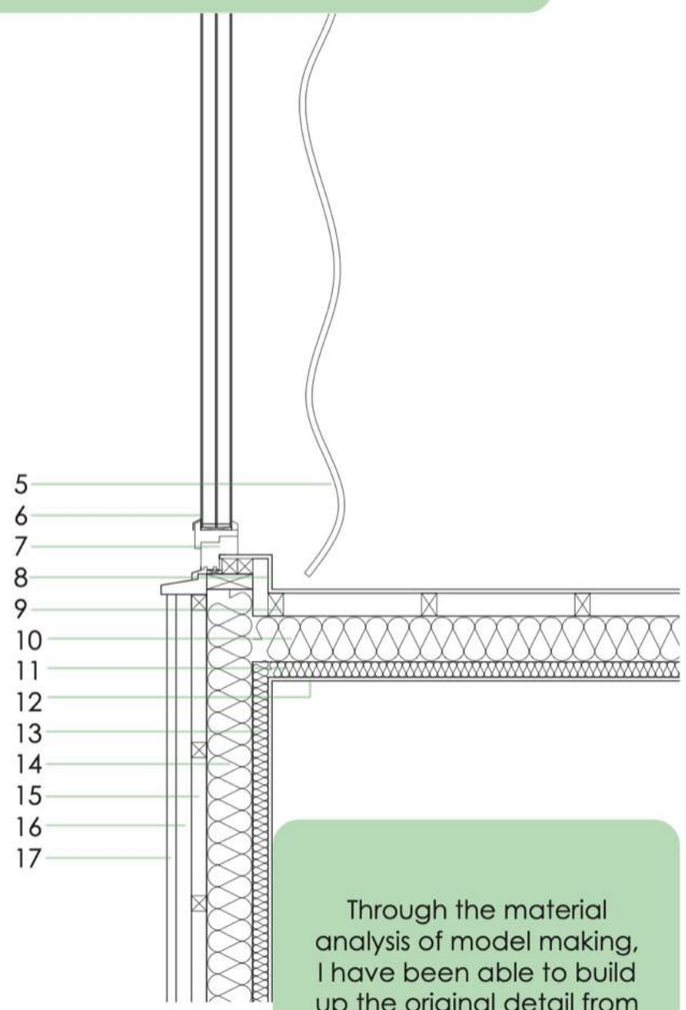


Scale 1:50 @A3

1- 1x19 high strengthened steel tension cable
2- welded lug
3- Glass Reinforced Plastic with UV pigment
4- I-Beam
5- Viscous curtain
6- Triple glazing
7- Timber Window Frame
8- UK Douglas Fir plywood
9- 50x75 timber studs
10- 150mm sheepswool insulation
11- 50x50 timber stud packed with sheep wool insulation
12- UK Douglas Fir plywood
13- vapour control layer and 50x50 timber slats packed with sheep's wool insulation
14- 150mm sheepswool insulation
15- Breathable membrane layer and 50x50 timber slats horizontal
16- 50x50 timber slats vertical
17- Vertical Green English oak timber



Scale 1:20 @A3

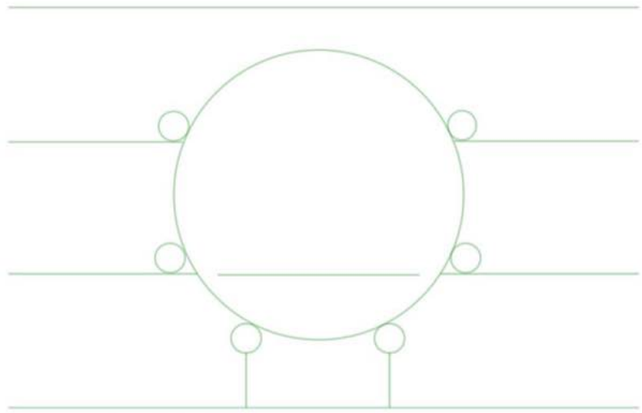


Through the material analysis of model making, I have been able to build up the original detail from Studio 2. The Specific materials that will be used can be shown in this 1:20 detail

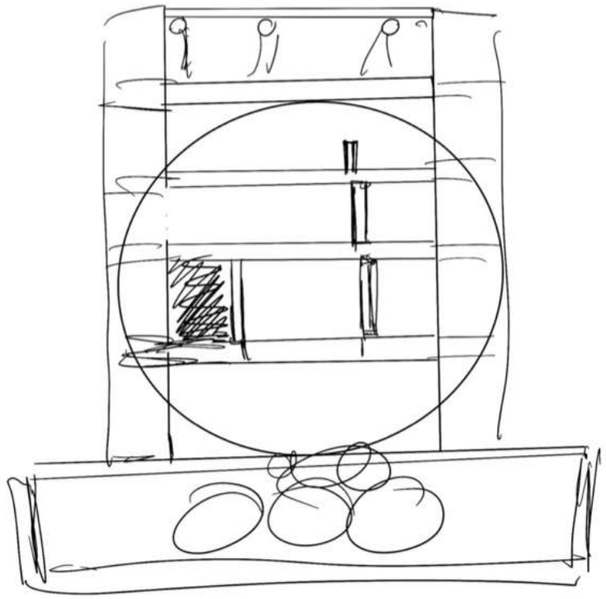
The Ferris wheel- The Sketches

In Conversation With...

Engineering Student

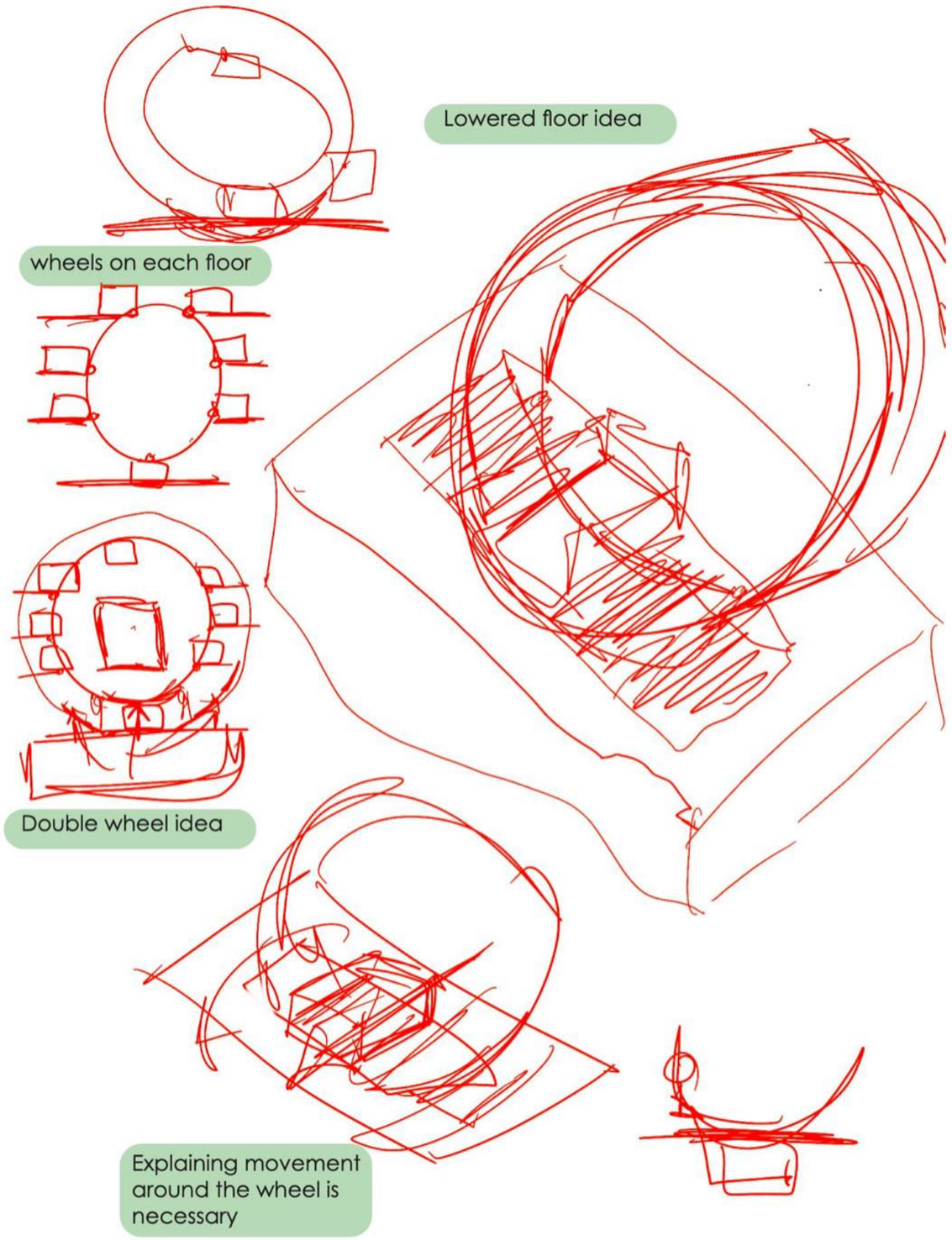


Initial Conversation	Decision
An option for a 2 wheel design was discussed, however we realised this would take up too much space in the building. Another Idea was to remove a part of the floor so the carriage could stay at floor level, however this caused a safety hazard for people falling in	Without the spokes the wheel would likely collapse under its own weight, so to counteract this, as it passes through each floor it is supported and stabilised by the structure of the building using runner wheels to take some of the weight.



The aim is to have this ferris wheel rotate on it own through a mechanical system which will need to go under the floor and attach through a small hole and an elastic band attached to a motor

The Initial Sketches



The Ferris wheel- Model process

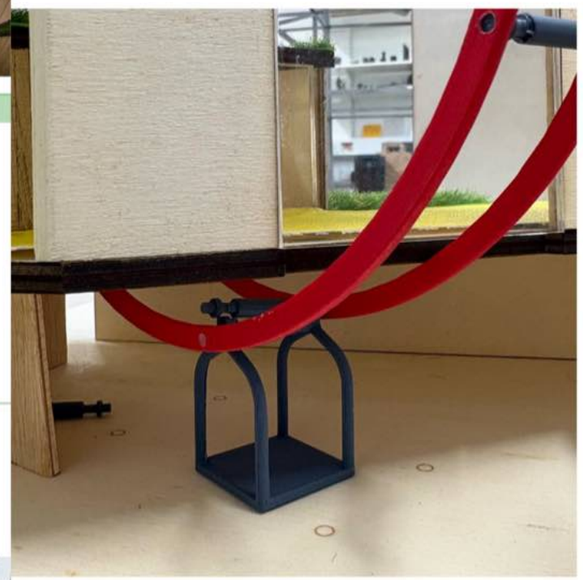
Step 1- 3D printing

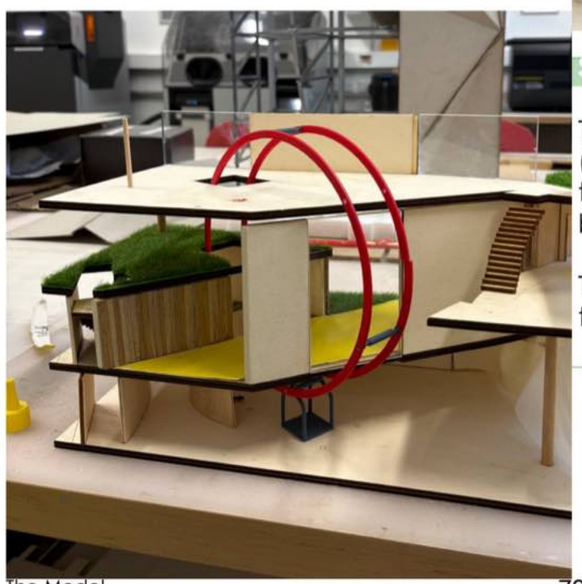
To start the process, the carriages and main wheel components were modelled on CAD, which exported into 3D printing files.

The parts were then printed and stored, this took 6 printers.

Step 2- Checking Parts

Testing the wheel parts to check it would fit and rotate around the building. At this stage, it was discovered that the carriages were too tall for the clearance and therefore these had to be edited and reprinted.





Step 3- More checking

The main wheel rounds fitted perfectly (*sigh of relief*) and the rods between the wheels allowed for the correct width between the two main wheels.

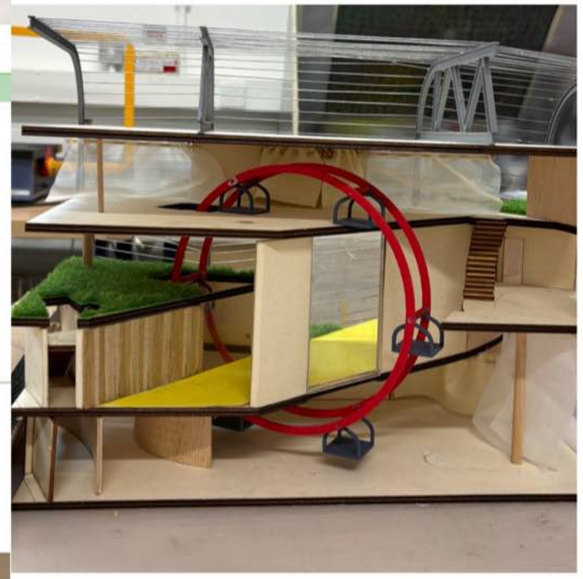
These roads are to be sanded down so they can be spray painted and fit together.

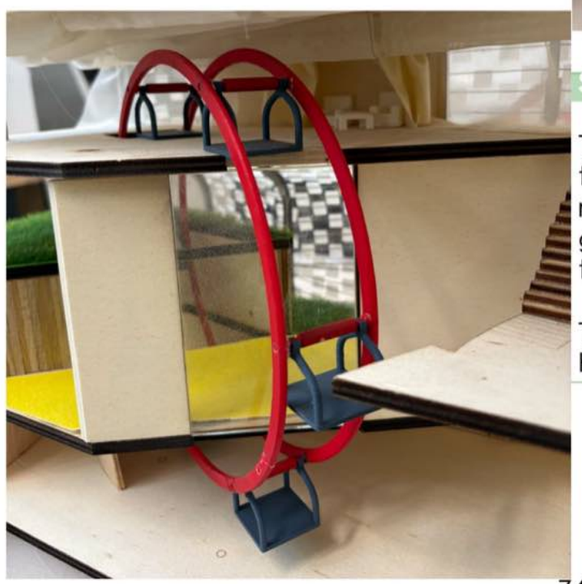
Step 4- The roof check

At this stage we added the rood to the building and checked the wheel could still rotate whilst fully enclosed.

Step 5- The new carriages

The new smaller carriages are added to the wheel. This time they rotate and make clearance!





Step 6- making the Wheel move

This part ended up being trickier then thought. Because I had already put the roof onto the model, it was very fiddly to get the stands with the wheels to fit onto the model.

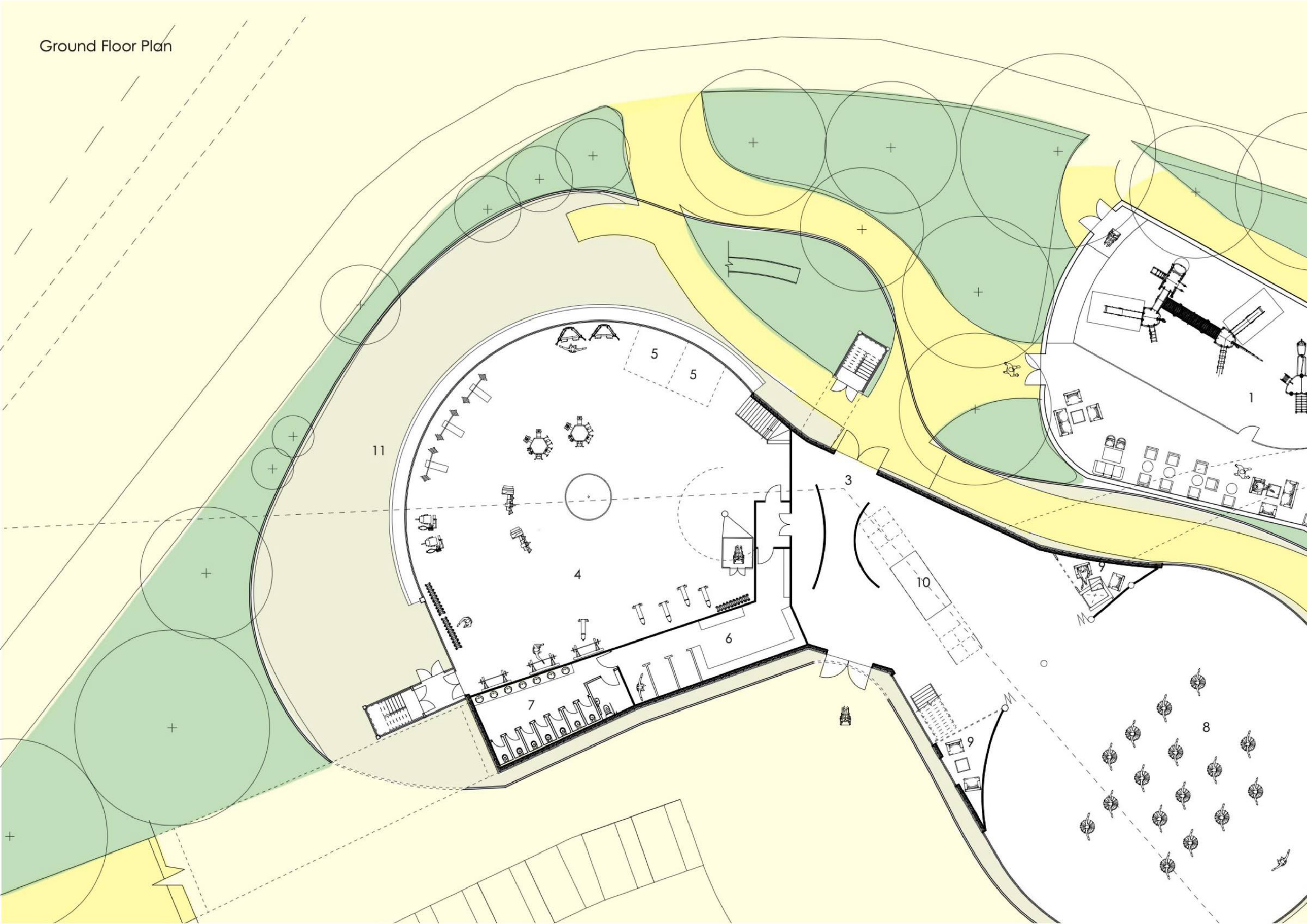
The plan is at a later date to add a motor, hopefully in time for the exhibition.

The Ferris wheel- Final model Image
Play

Final Drawings

Scale @ A2

Ground Floor Plan




1
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9
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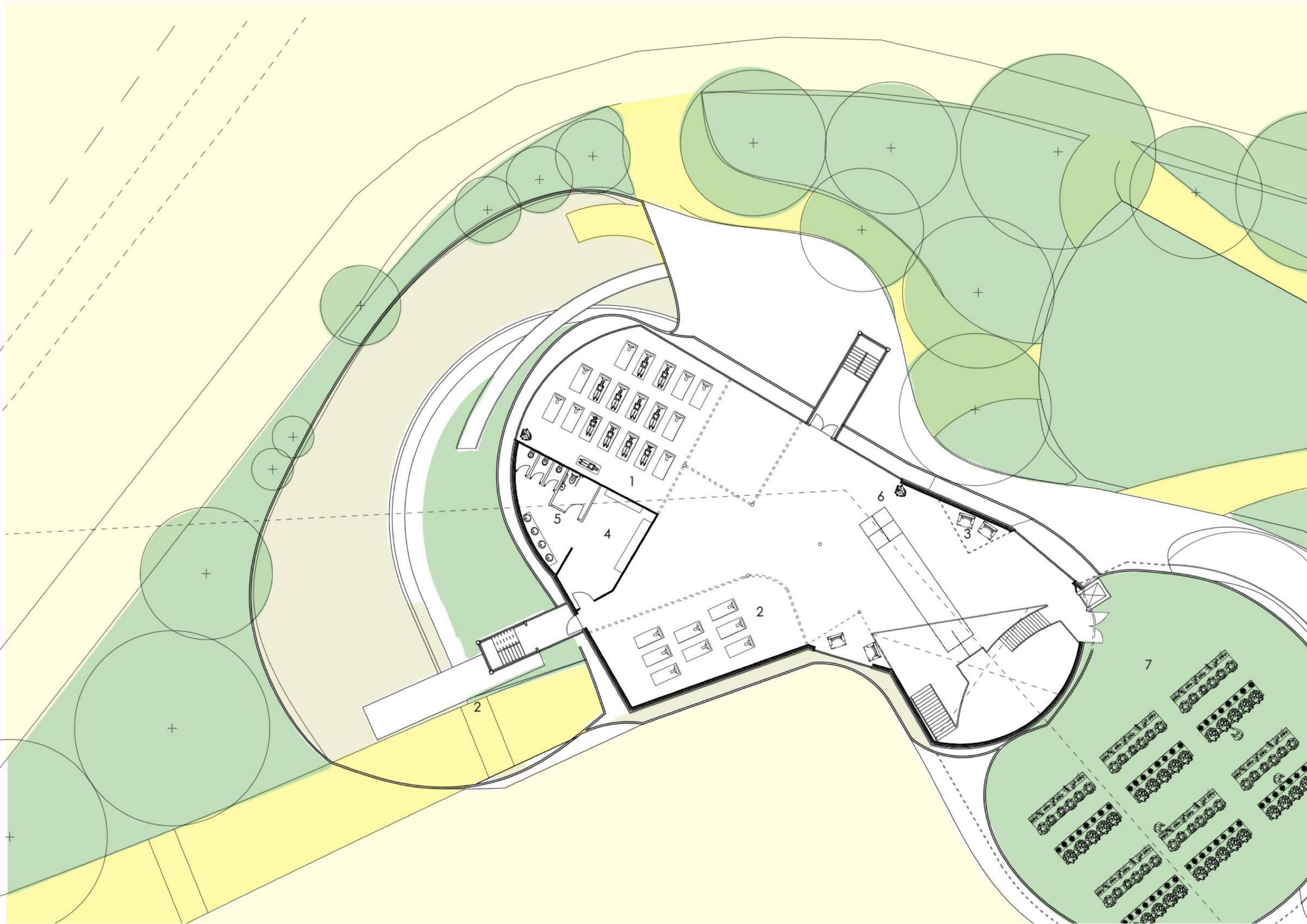
1
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3
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6
7
2

Route from town centre

EDGE LANE

CHESTER ROAD

C

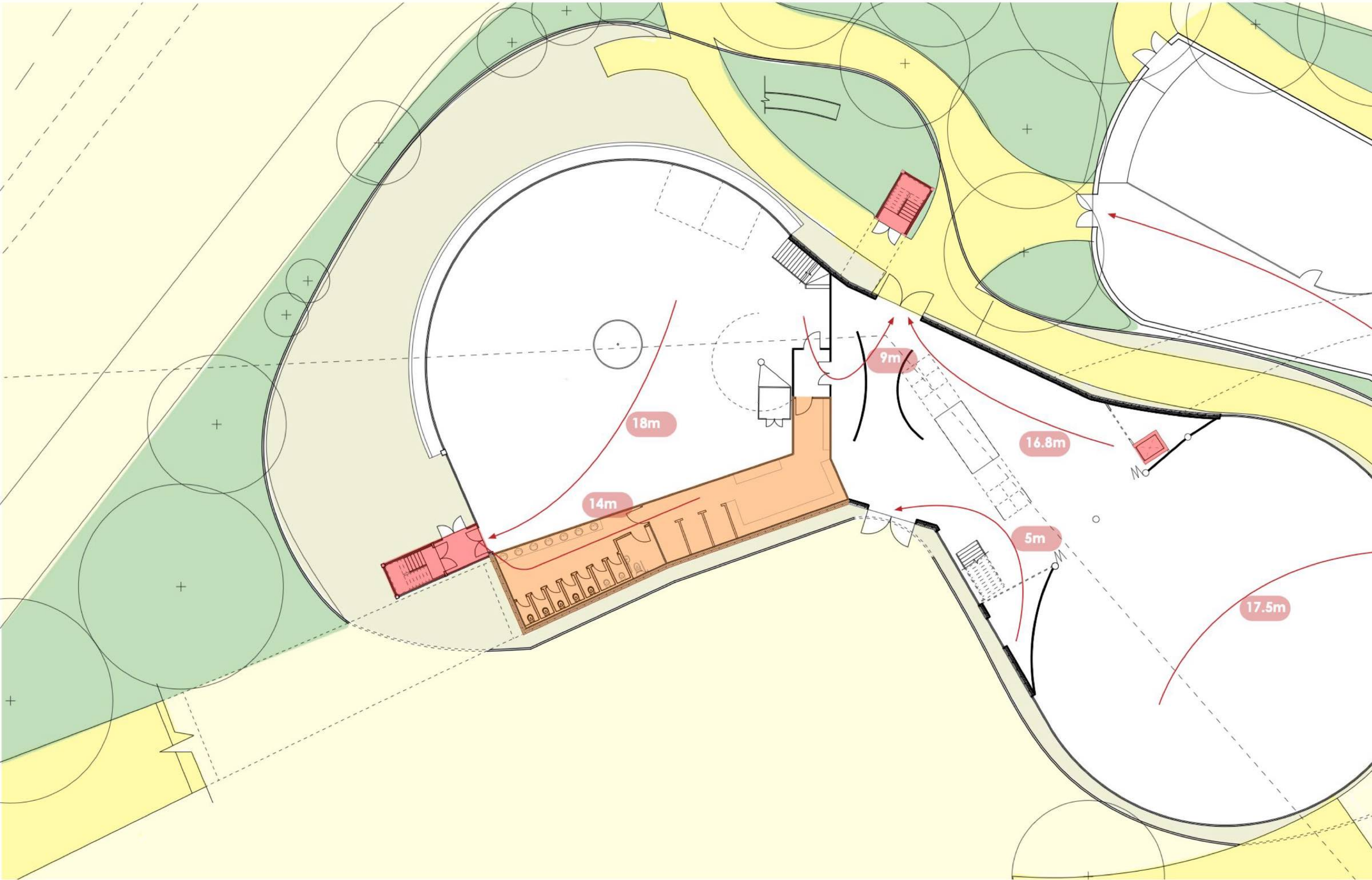
B

Route from Bus stop

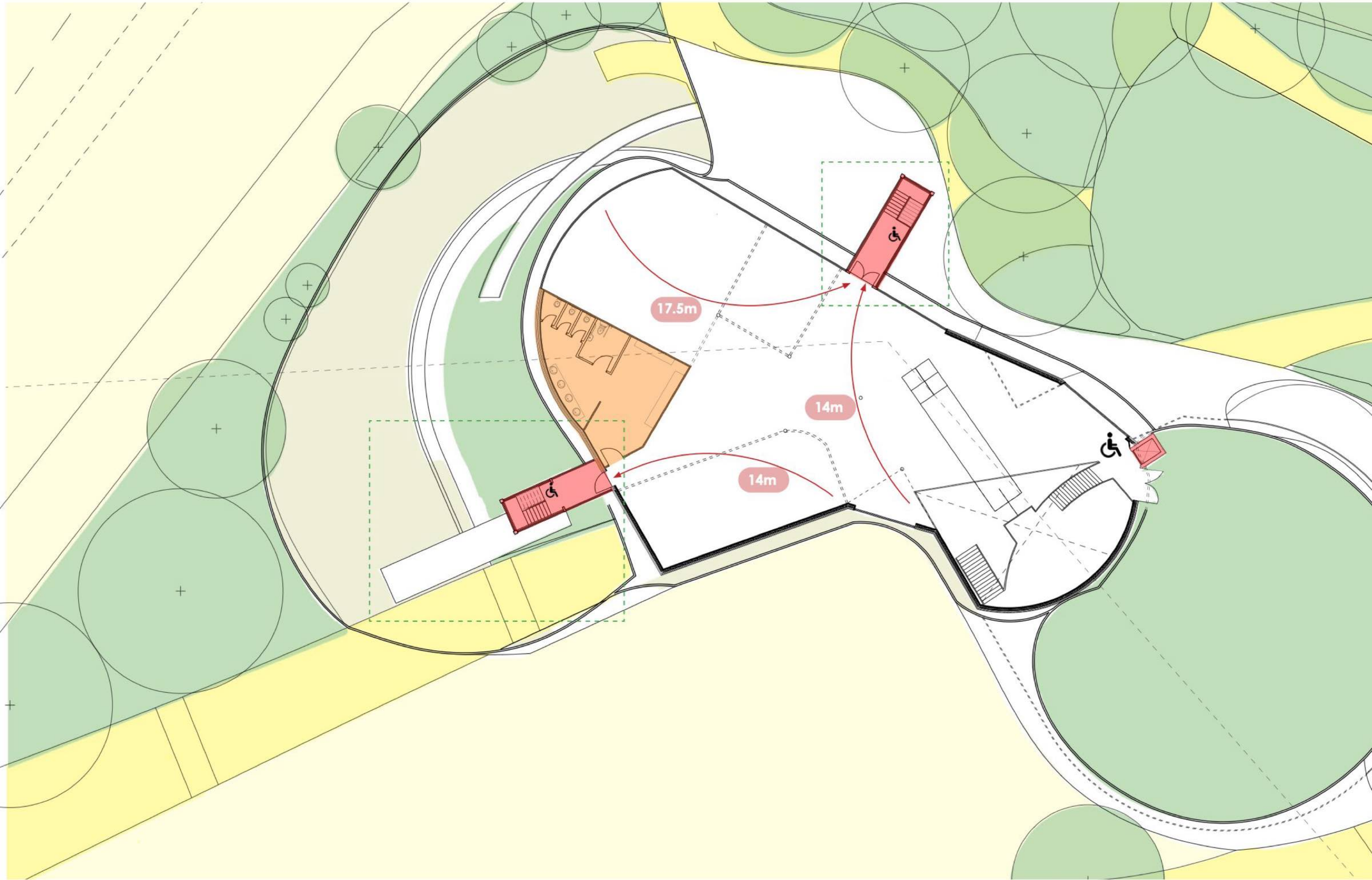
A

Route from main road

Fire escape- Ground Floor

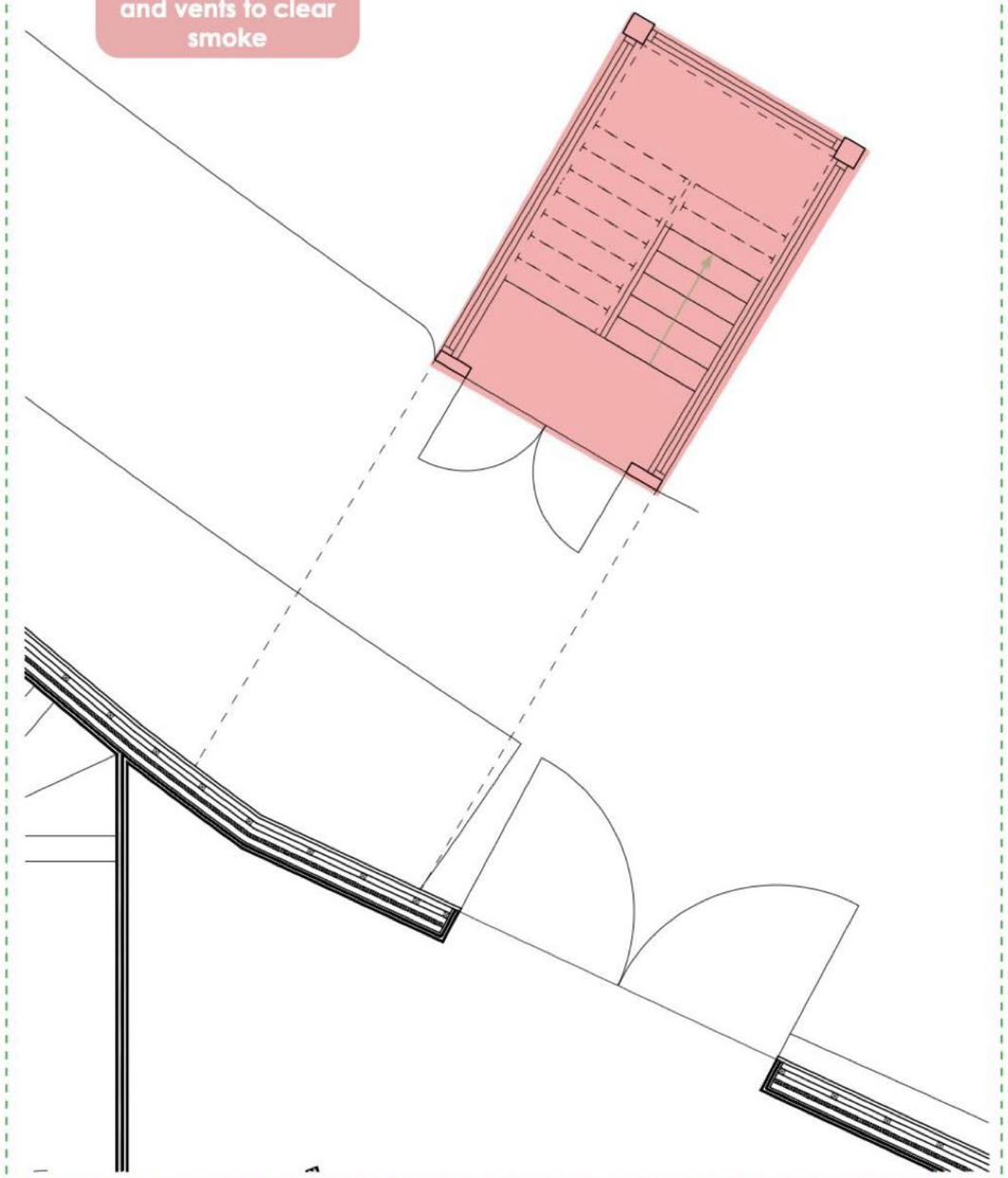


Fire escape- Top Floor

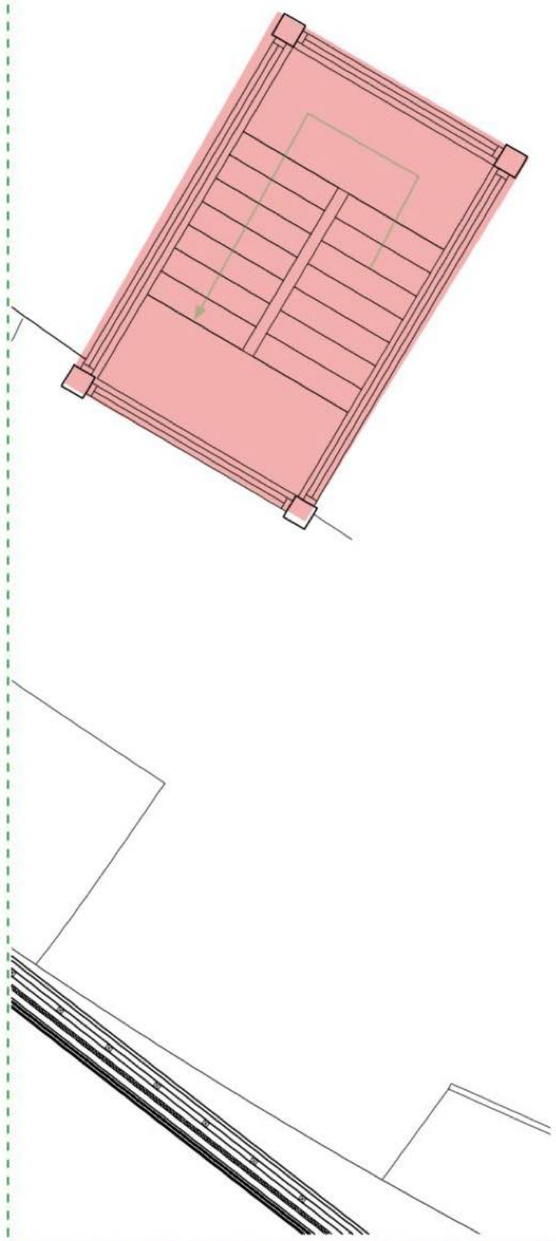


Fire escape stairs

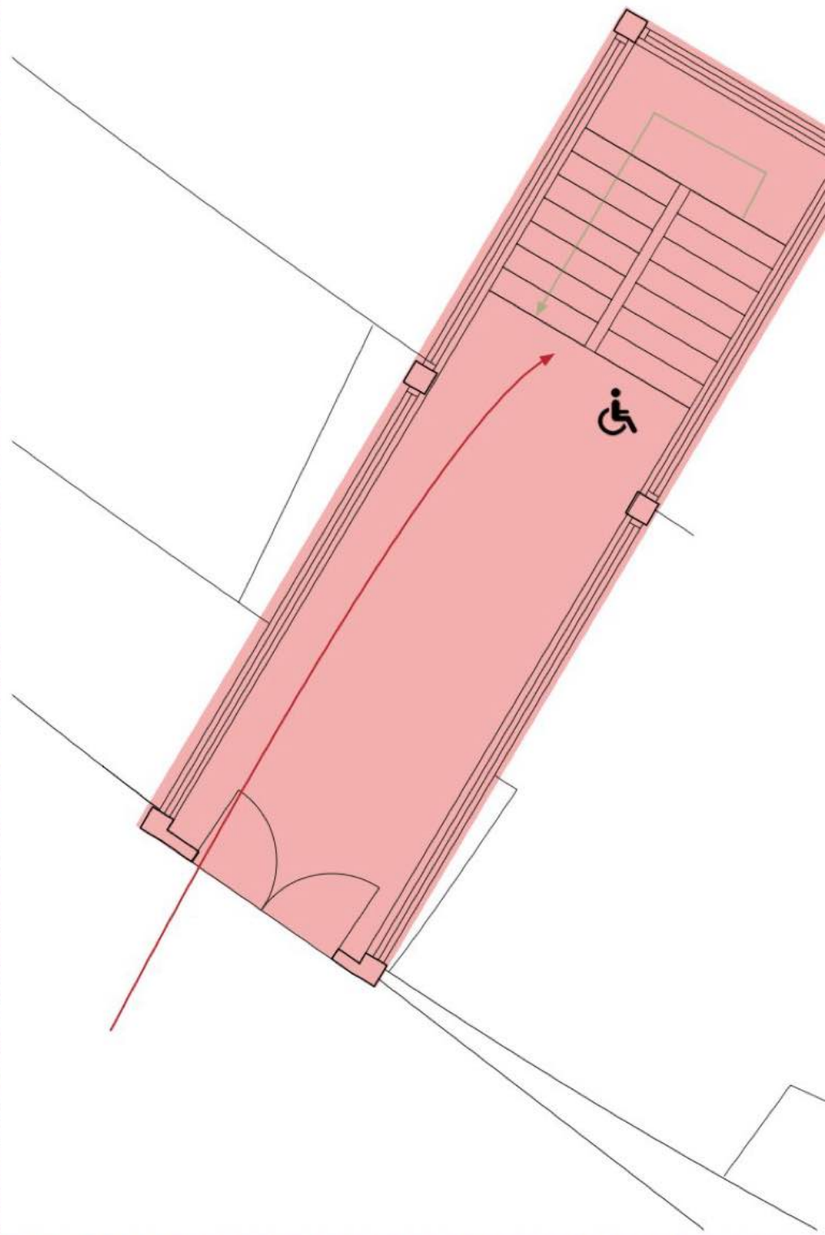
60 minute fire barrier and vents to clear smoke



Ground Floor

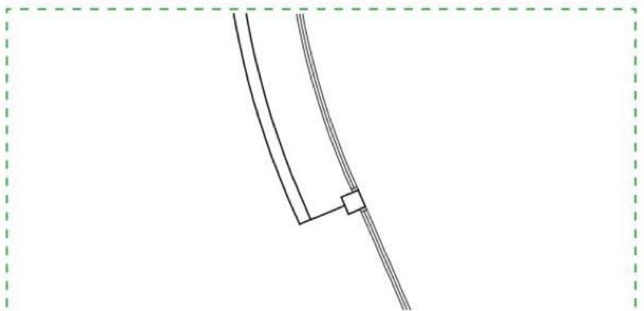


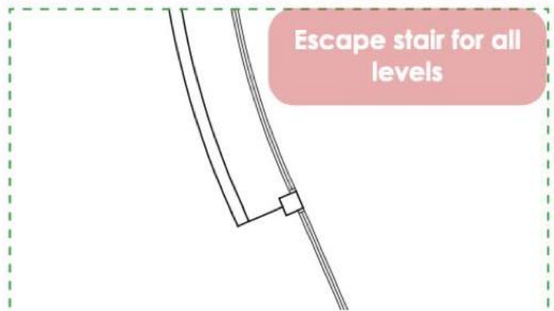
First Floor

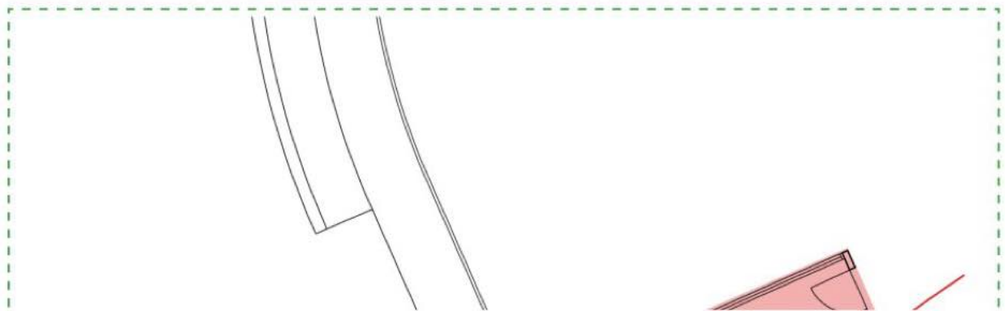


Second Floor

Escape stair for all levels

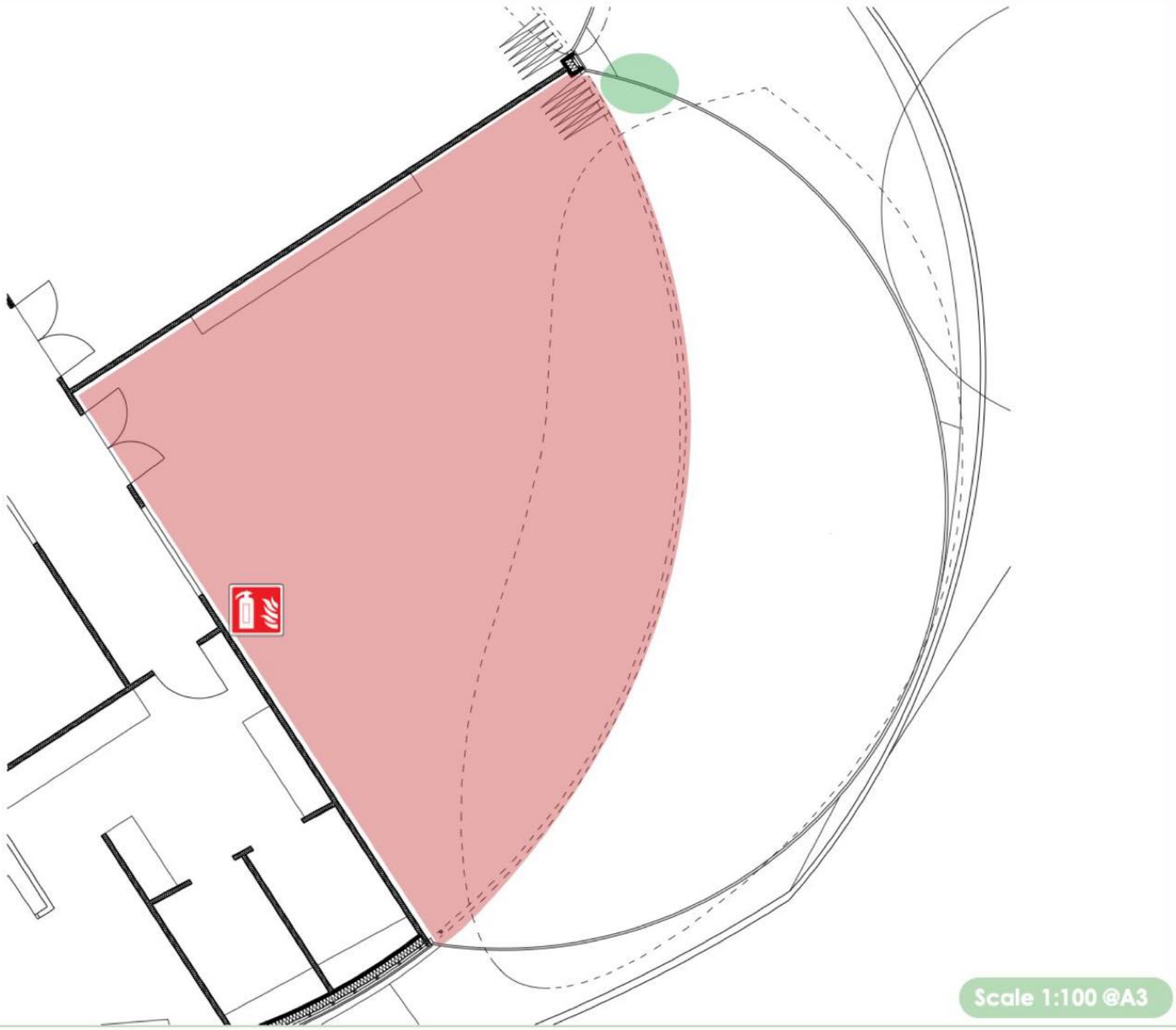






Fire escape plan- 3 key spaces

Hot Yoga/Pilates Studio- High Risk Area



Scale 1:100 @A3

60 minute fire barrier

Fire extinguisher and blanket to be located here

Emergency Fire Escape ladder

Interventions in the Studio:

Ventilation of the space

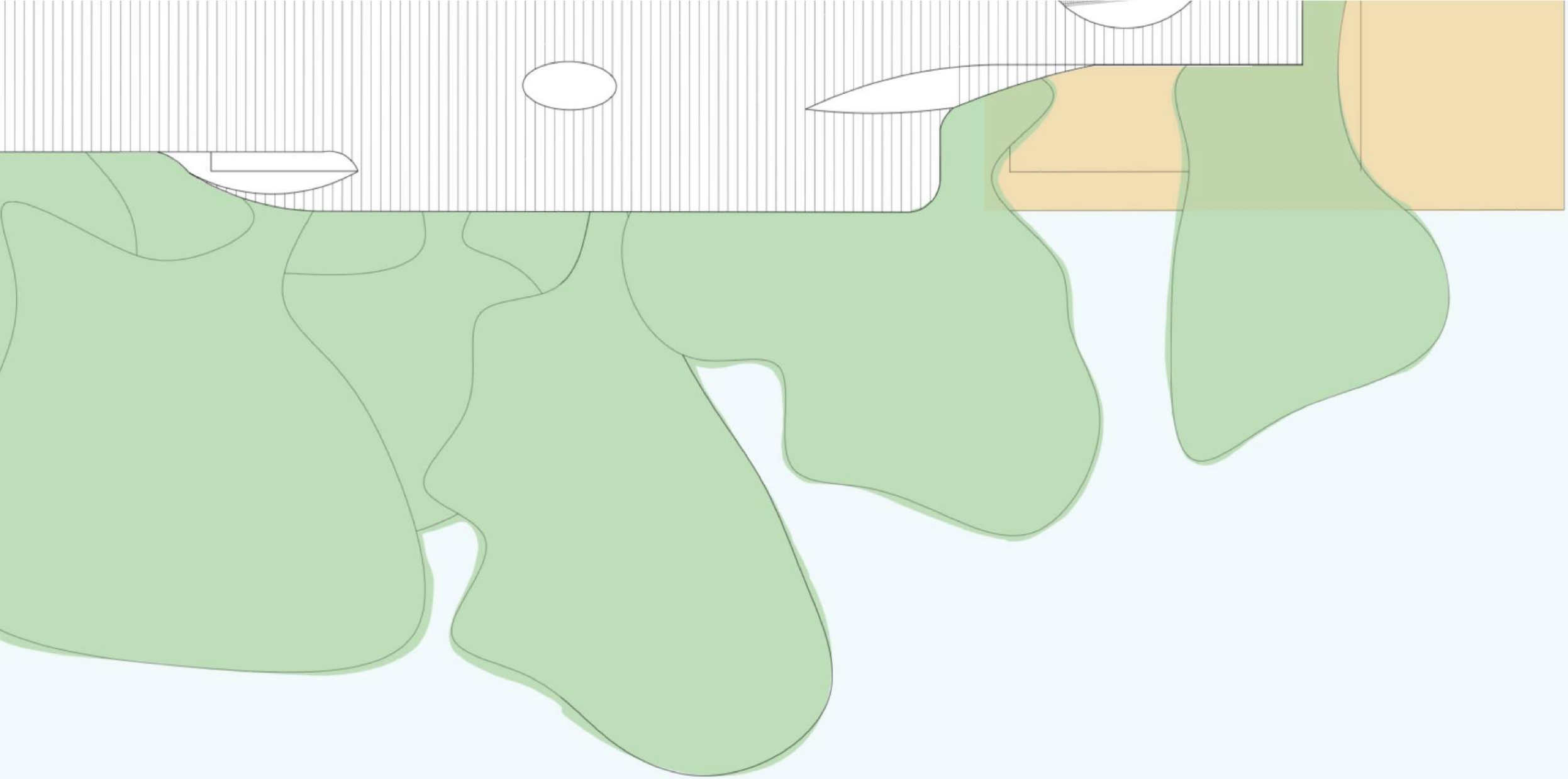
Top Floor Changing Rooms

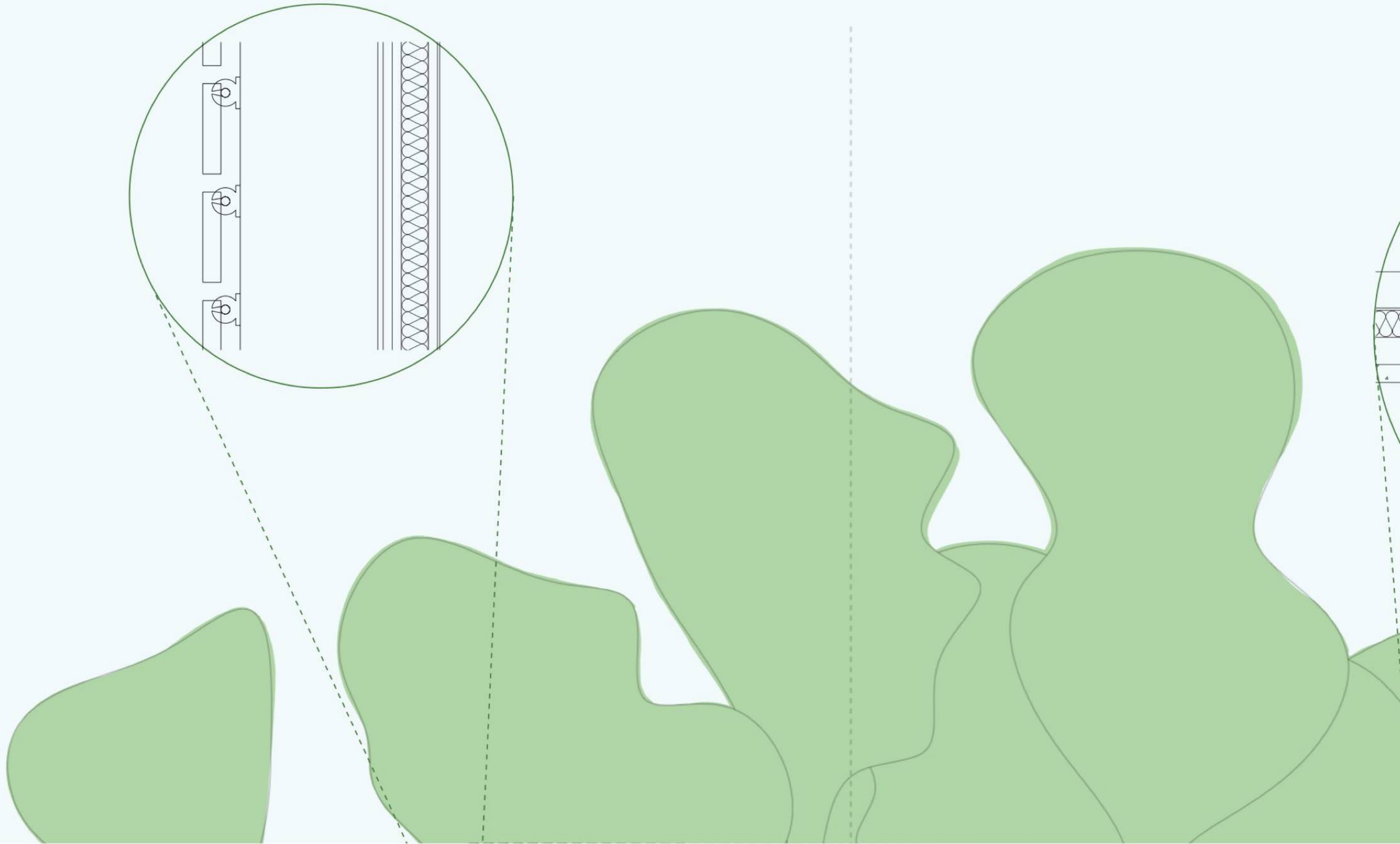
Scale 1:100 @A3

Ground Floor Changing Rooms

30 minute fire barrier

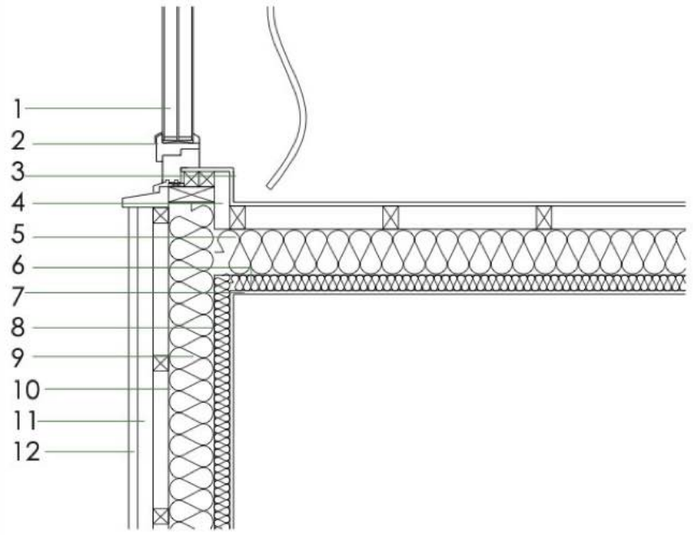
Fire Escape door





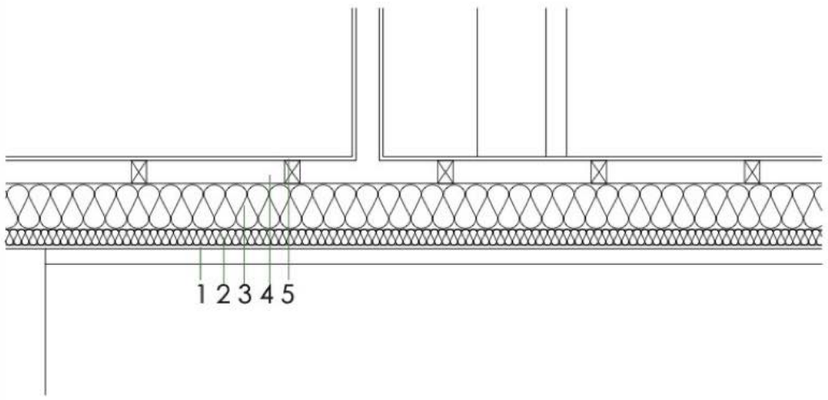
Section Key Elements

Window Joint



1. Triple glazing
2. Timber Window Frame
3. UK Douglas Fir plywood
4. 50x75 timber studs
5. 150mm sheepswool insulation
6. 50x50 timber stud packed with sheep wool insulation
7. UK Douglas Fir plywood
8. vapour control layer and 50x50 timber slats packed with sheep's wool insulation
9. 150mm sheepswool insulation
10. Breathable membrane layer and 50x50 timber slats horizontal
11. 50x50 timber slats vertical
12. Vertical Green English oak timber

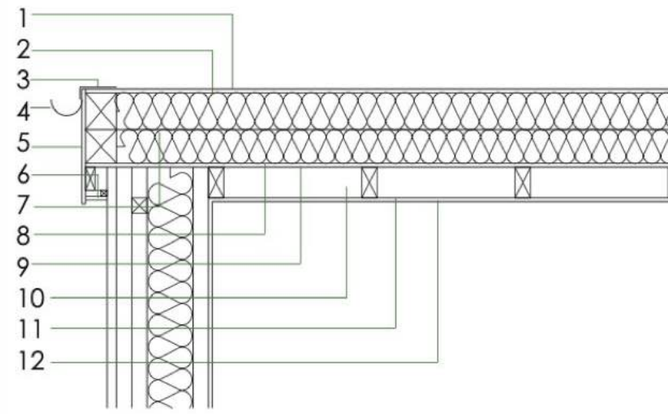
First Floor Detail



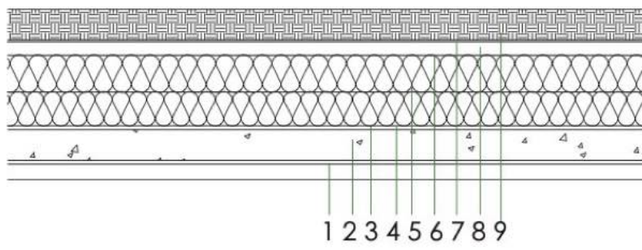
1. UK Douglas Fir plywood
2. 50x50 timber stud packed with sheep wool insulation
3. 150mm sheepswool insulation
4. 50x75 timber studs
5. UK Douglas Fir plywood

Ground Floor Detail

Roof Detail

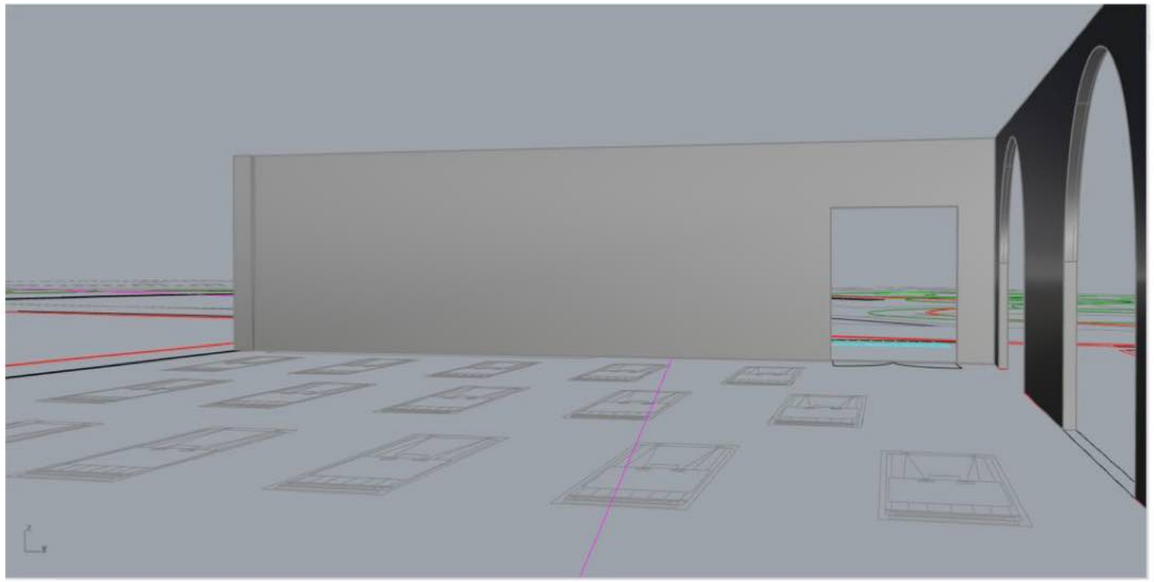


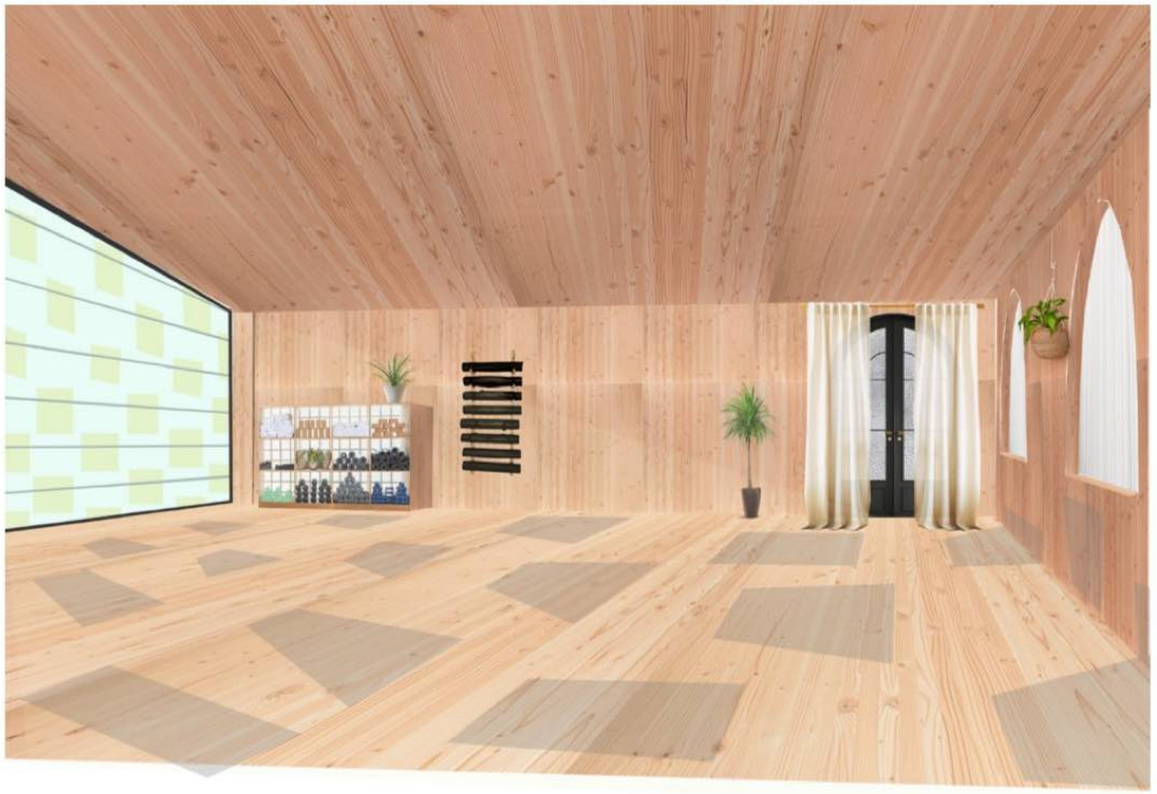
Green Roof Detail



Wall Detail

Making the Drawing





1

Making the rhino model

For this step I created the room I wanted to render in rhino so I could get proportions and angles correct

2

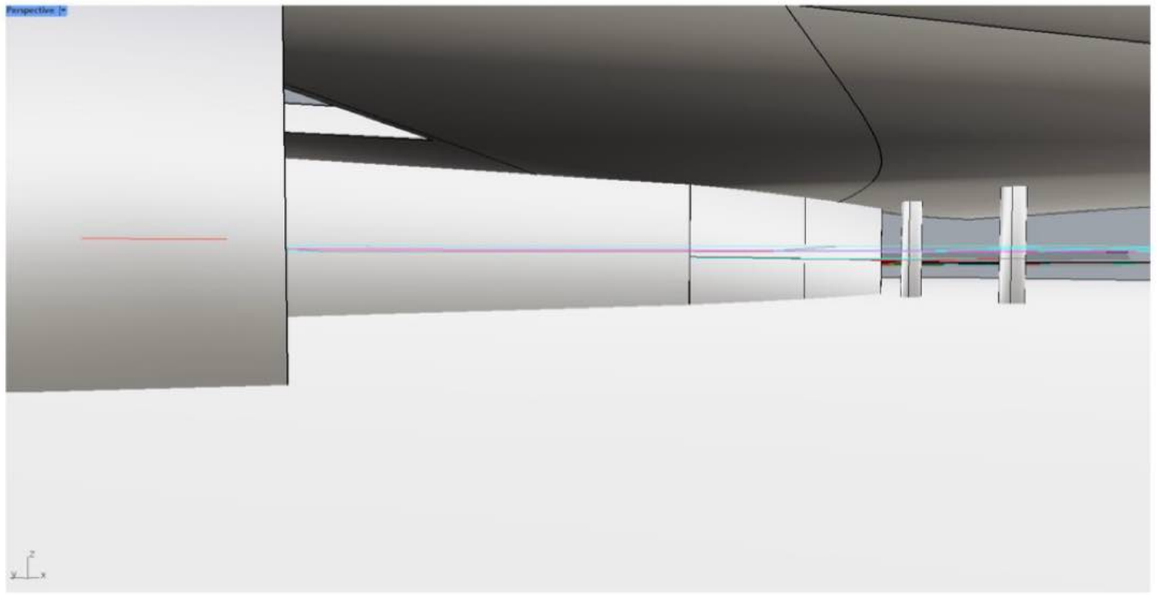
Photoshop rendering

Adding materials such as the Douglas fir plywood and the viscous curtains and shading, along with showing strorage and furnishings

3


GYM
WELCOME
adidas

Making the Drawing



1

Making the rhino model

For this step I created the room I wanted to render in rhino so I could get proportions and angles correct

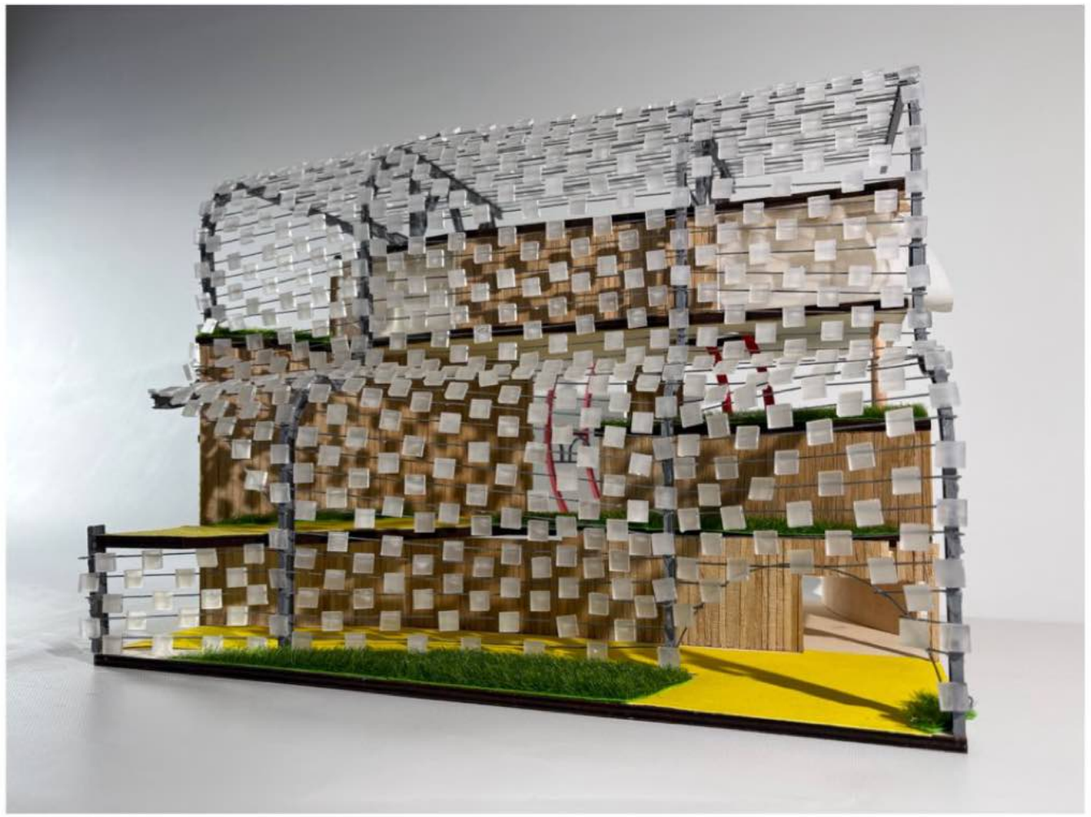
2

Photoshop rendering

Adding materials such as the Douglas fir plywood and the viscous curtains and shading, along with showingthe front desk and furnishings

3

Making the Drawing



1

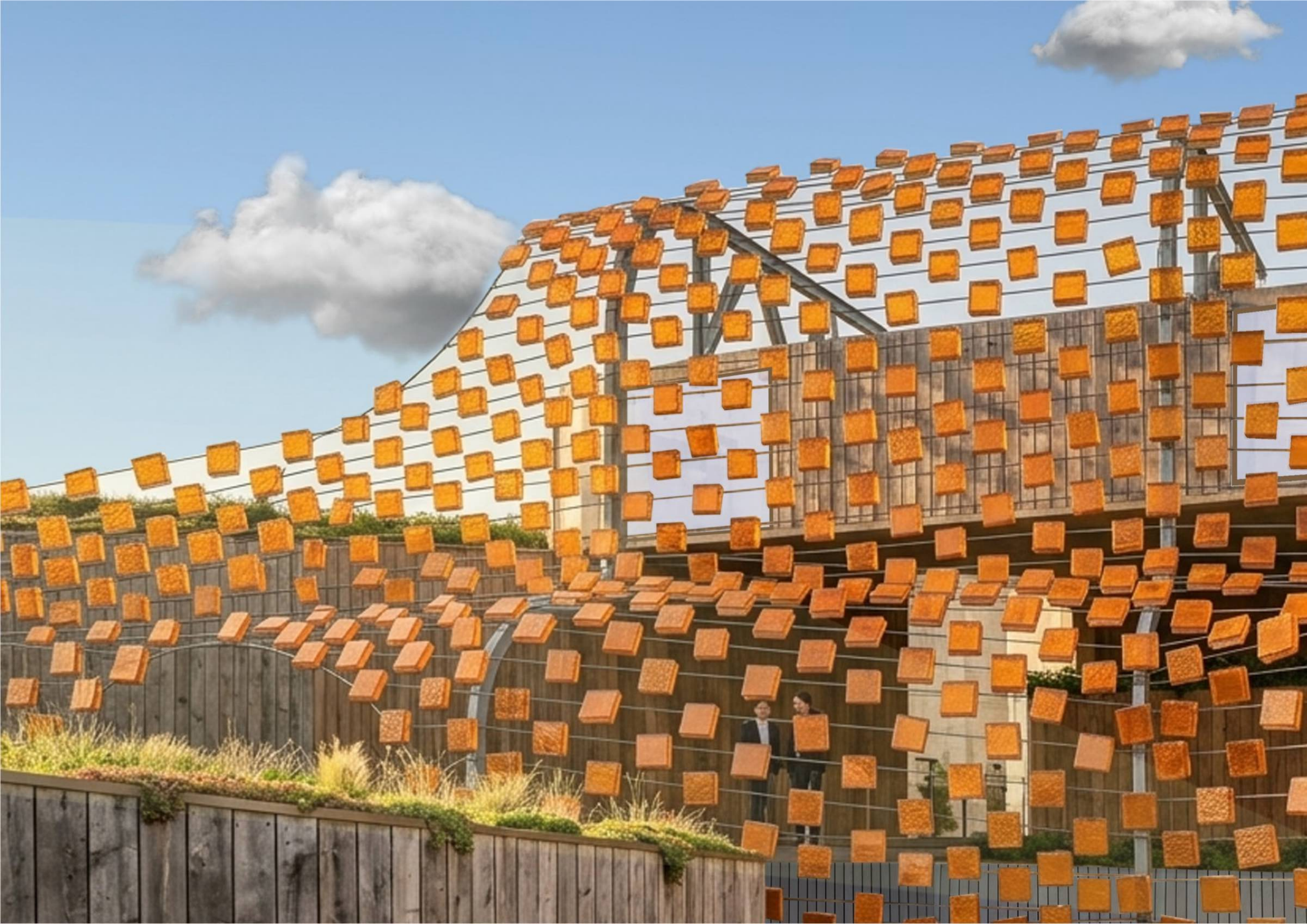
The physical model

To start with I used my physical model to line up a shot of the correct angle from the POV of someone visting the site

2

Procreate Drawin

At this stage, I use
what I saw my en
not in the model.



The Manifesto

Process

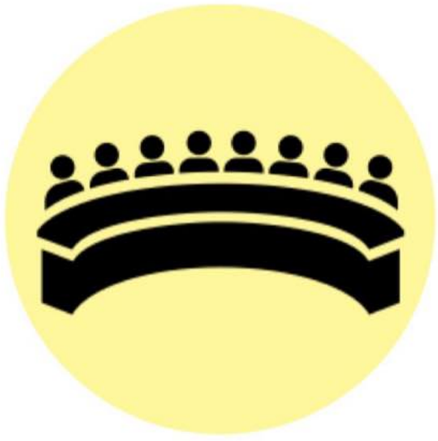
What will my Manifesto be?

What is my aim?

I would like this manifesto to make a change and have my project implemented in everyday life. This manifesto could give a brief to the local councils to tell them why it is needed and then an instruction booklet on how this could be done.

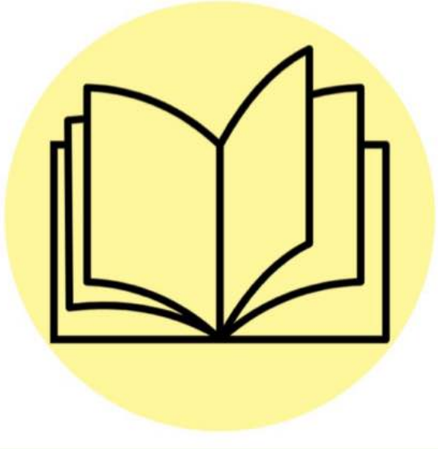
Who is it for?

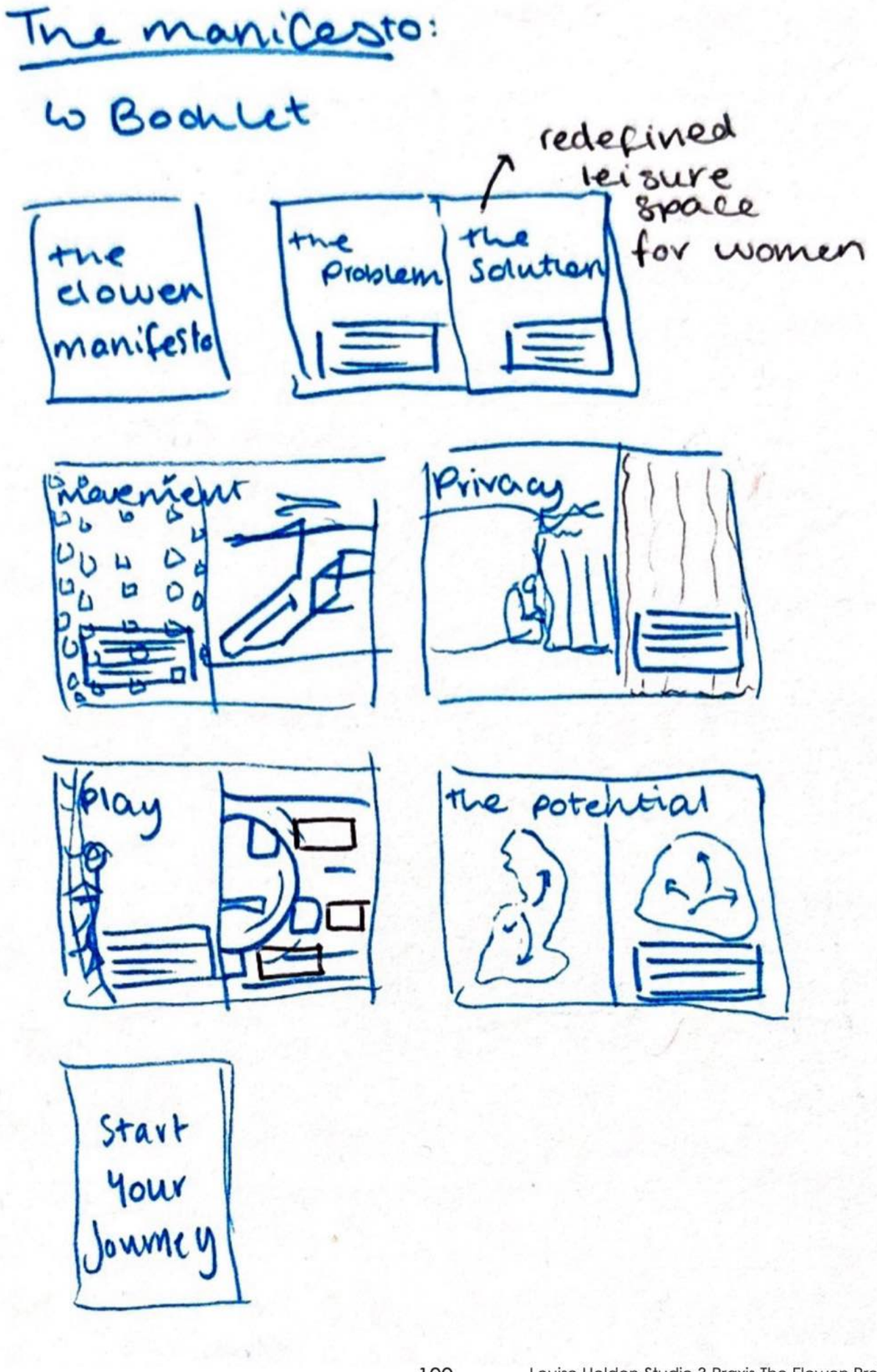
It will be for council people who can make changes in sports and leisure. In Trafford this would be in line with the Trafford Moving Stratedgy and therfore the department dealing with this would be ideal to implement that change.



What will the format be?

I would like to look into different formats of manifestos, including political manifestos that local concils use as well as manifestos given to the council. I would ideally like to make a booklet to be able to produce all the information and have something phsyical to hand out.





Inspiration for Layout

What is a political manifesto?

"A manifesto is a publication issued by a political party before a General Election. It contains the set of policies that the party stands for and would wish to implement if elected to govern." (UK Parliament, 2026) The aim of the manifesto is to win votes from the population by lying out the parties policies or background (Paxton and Haddon, 2024).

What is included in a manifesto is up to each individual party. They are also used by the civil servants to understand what policies might be in place after a party is elected and therefore what they need to do. The Salisbury convention sets out that the Upper House does not vote down government legislation that was outlined in the winning party's election manifesto. They have become longer, from between 3000 and 6000 words in 1945, to over 20,000 words in 2019.

The layout of a manifesto normally includes concise points, catchy slogans and a call to action, all of which I'd like to include in my manifesto.

A Poltical Manifesto
Centre for Mental Health
Manifesto for the councils

This Manifesto calls for local councils to include their ideas in their own manifestos. The layout is bold, clear title and logo, with a summary on the front page so engage people to read more. To improve this layout, I would include less writing on the front page, as a booklet this could be included on a contents page.

A Feminist Manifesto
The personal is political
Carol Hanisch

For this manifesto, I wanted to look at the bold design, clear symbolism and the message. As a call to action, it is simple and a poster. This would work well as a front page or a back page to end the document

A Past Student Manifesto
Vidal Jackson

I was inspired by this manifesto by the use of a booklet/ magazine design. I loved the graphical design, simple background and bold imagery that helped show what was being said. Throughout the manifesto, bold catchy slogans were used and repeated to itterate the main point.

The First Iteration and Final Presentation

The Final Pitch

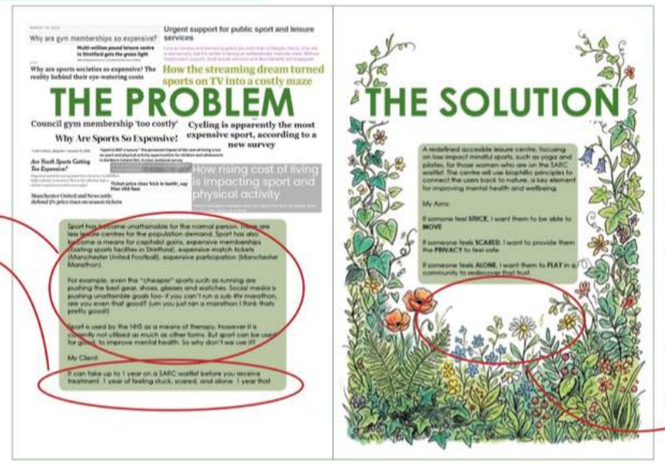
For my final pitch, I presented my manifesto to get an understanding if what I was presenting was clear and concise, as well as if there was any information missing.

I felt like the pitch went well and was informative for me to understand where there was disconnections and reassurance that my drivers and the potential was clear. I want to increase the selling factor and further push that this is a document that can cause change.

Front Page Back Page

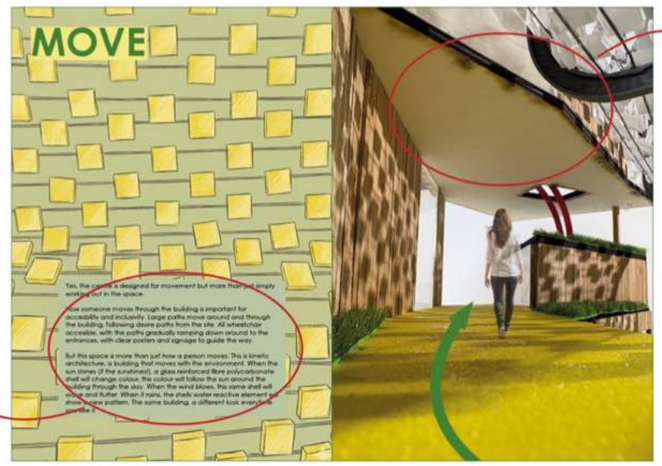
2 problems should be clearer apart and how that come together to stop a disconnection

I also want to add in my thesis question to show what I am questioning with this project



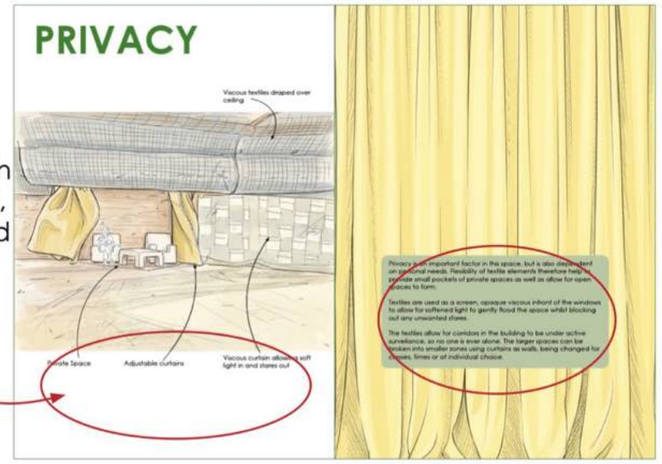
Additionally to this information, I want to add what the effect of this space will have and why its worth investing in. Remembering this is a pitch to sell the idea to a council

For these pages, the main drivers were clear however I should treat the 'what' sections more as a instruction manual for architects, so they know what to include when handed this document as a guideline.

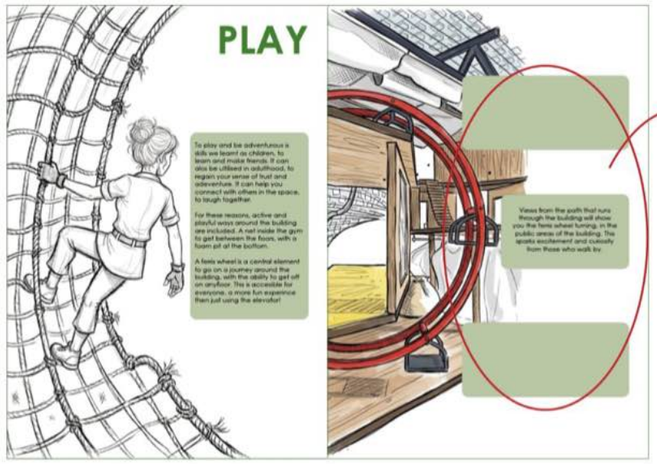


Splitting the information over the two pages to have a clear what and why.

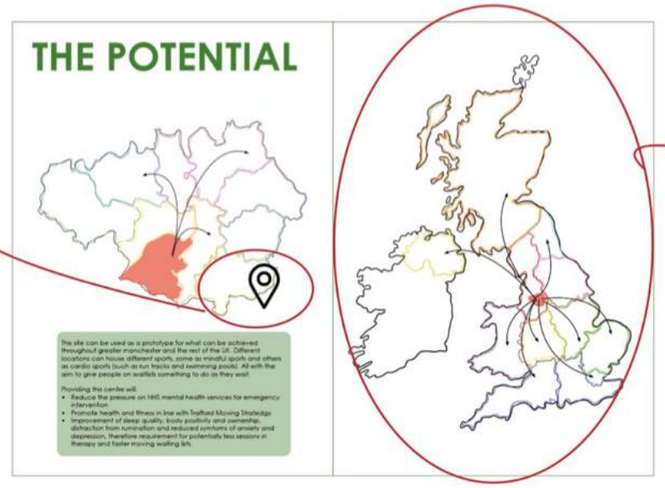
Keeping the main what factors to 3, simplifies the read and graphical style



The 'why' sections are directed more at the local councils and the government to show them the facts, data and why they should do something about this cause.



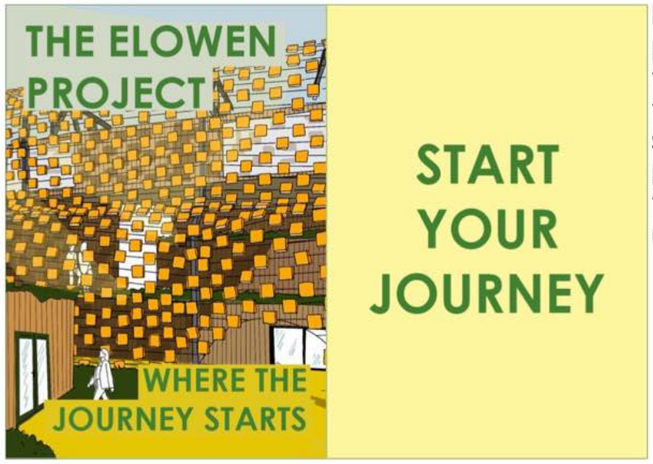
Where is my prototype site?



For this page I want to add more graphics to understand that other sports can also be used

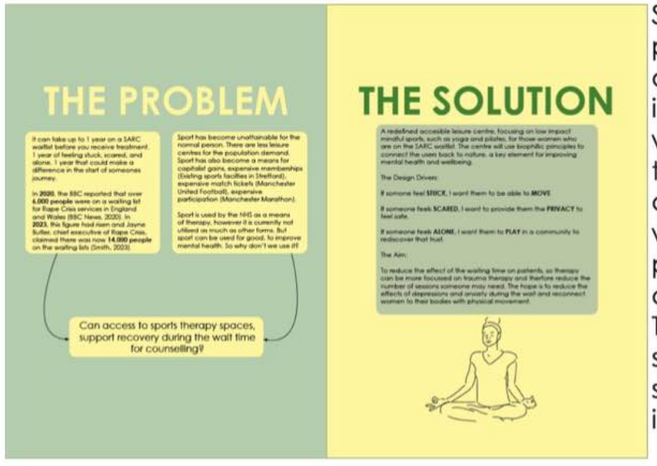
The Manifesto Explanation

The front page shows the title and a draw of what the Elowen project could look like and in particular I wanted to include the shell structure. I added the slogan 'where the journey starts' to hint at what the elowen project is and make poeple want to read more



I wanted the end page to be a call for action but also tie together the slogan of the front page to complete the journey of the manifesto

Improving from the final presentation, I wanted to simply the loom of these pages and sepearte the two main problems to show how they come together to ask the thesis question.

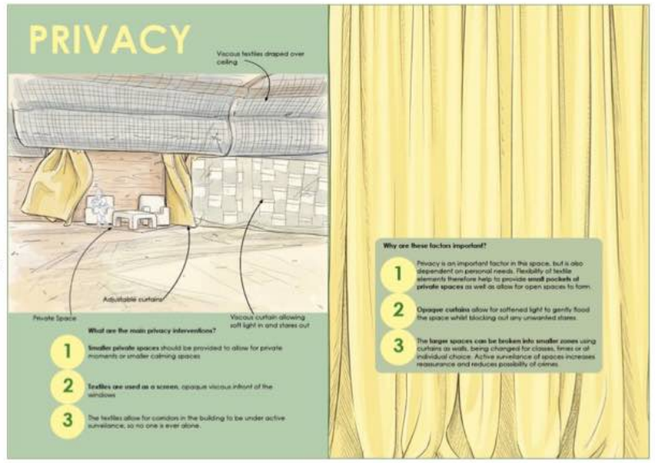


Simplifying this page also, I added the information of what the aim for the project was and therefore what I was pitching to the council people. This page summarises the sections I will cover in the booklet

I aimed this page at the question ' what are the movement factors in this space' and laying it out as a three point instruction of what to include for this element. This meant my 3 main points could be put across

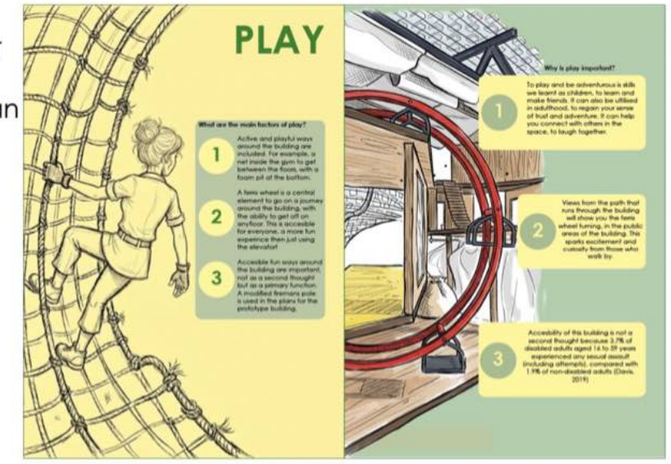
The why page is aimed more at the council people reading this document for data and reason of why they should implement this into design.

The same as the movemnt and play pages, the first page is dedicated to what should be introduced. Visually I decide to have the pages green and yellow throughout to keep the layout consitent as this is easier to follow



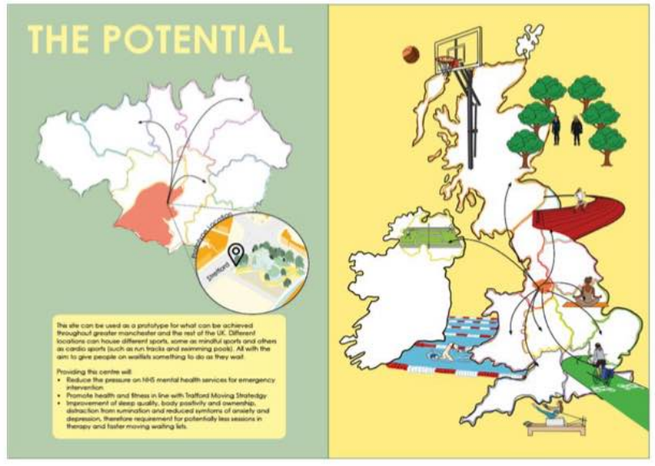
I used textile curtains for the background to sub-conciously push the use of textiles in my design, especially for the privacy factors.

Visually, the play section is the best to show through images rather than words. The idea of climbing and moving pushes this.



The ferris wheel drawing is based of an image in from my model and using AI to 'change the style into a sketch format' to fit the sketch style of the document. I used the carriages as the three points for the why element to make it more playful

Since the last iteration, I have added the prototype site to mention the location that this project became possible for.



For the UK map, I wanted to show different sports diciplines across the UK, to show how not only can the site grow but can also branch into other sports and have different motives for each site. Visually it promotes the UK moving.

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