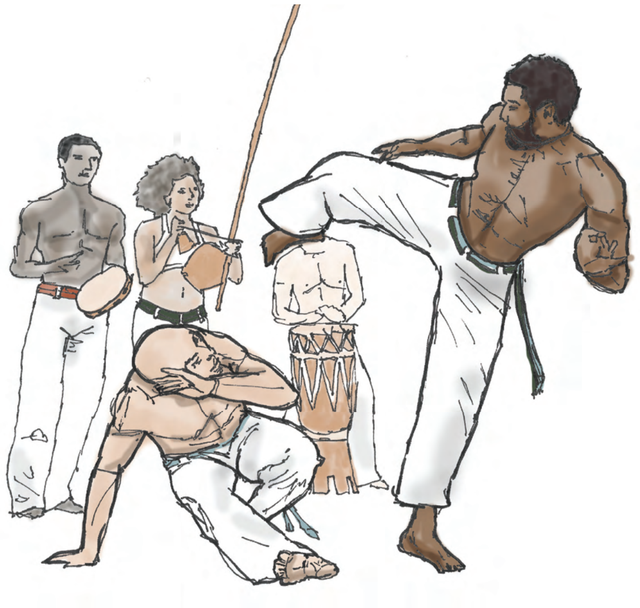
Ginga

Callie Hock

A centre for capoeira, community & education.



Gin.ga:
/JING-guh noun

He has ‘ginga’–that peculiarly Brazilian rhythmic, jaunty way of moving, almost like dancing.’

The base move is called, ginga, which acts as a thread from one movement to the next. [1]

a term used for people that dance and fight at the same time. [2]

Contents

Brief

What is Capoeira?

Capoeira is an Afro-Brazilian unique blend of martial arts, acrobatics, music and dance. An ‘art in motion’, Capoeira is a fluid exchange between spectators and participants, call-and-response and improvisation. [1] It is a distinct means of self-defence, with a rich history, which has evolved into a unique and dynamic method of expression. Community lies at the heart of Capoeira, fostering a sense of belonging and a shared experience.

Capoeiristas do not “fight” or “dance,” but “play” (jogar), and a match between two capoeiristas is “a game”. [1] This term reflects the non-competitive nature, there are explicitly no declared winners or losers, and the practice is non-contact.

Central to the sport is the Roda. Roda (wheel or circle) refers to both the physical space, or ring, in which Capoeira is played as well as to the event of bringing capoeiristas together. [1] It serves as a vibrant stage, as games seamlessly enfold one another: two new capoeiristas begin afresh at the foot of the lead berimbau or by a player entering the roda and replacing someone already playing. The fluid transition ensures a consistent and evolving exchange of movements.

“Capoeira is a fight for dancers. It is a dance for gladiators. It is a duel between pals. It is a game, a dance, a struggle, a perfect mixture of strength and rhythm, poetry and agility. The only one where music and singing command the movements.” [2]

History

origins
It is primarily traced to central Africa, with specific links to Angolan warriors. It also has links to Brazilian aboriginal dances. [3]

1500
Evolved from enslaved Africans who used it as a means of self defence and to preserve cultural heritage.[4]

Developed a great popularity and formed an art that embodies the spirit of resistance, freedom and community. [5]

1888
Slavery was abolished in Brazil. [3]

1890
Criminalized, as fear of using it to revolt represented a threat to the authorities. Practice continued in secret, if found you were arrested and punished. 10% of crime was from practicing Capoeira. [6]

Capoeristas played a game of trickery, which allowed the art form to flourish whilst outlawed. [6]

1935
Mestre Bimba creates the first capoeira school. He overcome its history of “thuggery” by: creating a faster style, focusing more on athleticism, mandating uniforms and implementing a course curriculum. [6]

1937
Bimba’s school is recognized by the government, and the ban on Capoeira is lifted. [6]

1972
It is recognized as a Brazilian national sport. [6]

1985
Capoeira is promoted and grows abroad. Through its incorporation in films, it becomes a part of popular culture.[6]

2014
UNESCO added Capoeira to its list of the intangible cultural heritage of humanity. [5]

today
Capoeira is in 150 countries, with 25% of it being practiced outside Brazil. [5] Its success forms strong communities, and is employed as a social tool in initiatives such as ‘Capoeira for peace’.[7]

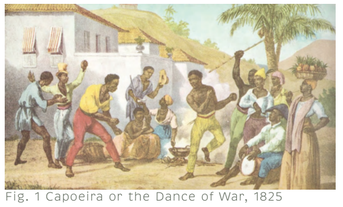


Fig. 1 Capoeira or the Dance of War, 1825

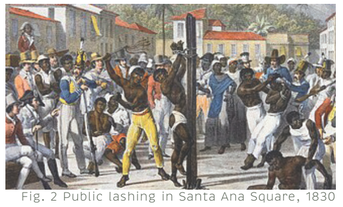


Fig. 2 Public lashing in Santa Ana Square, 1830

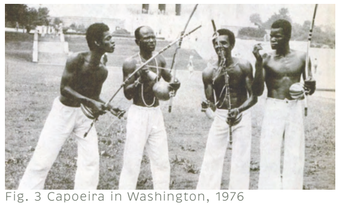


Fig. 3 Capoeira in Washington, 1976

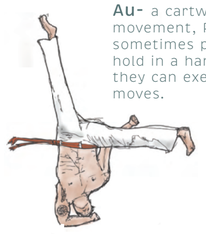
Movement

Unlike other martial arts, Capoeira is constantly in motion because of the basic movement, ginga. The emphasis is placed on the interaction between kicks and evasions, and the flow between the two players. The main form of attack was primarily head-butts, but after Mestre Bimba intervened, Capoeira adopted techniques from Asian martial arts. [6]

Players shaking hands before entering the 'Roda'.

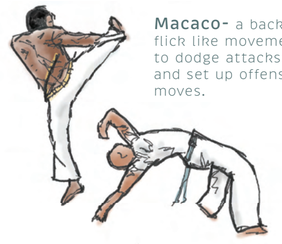
Esquiva- a dodge to avoid attacks, many variations exist, but they distinguish capoeira from other marshal arts as it keeps a flow in the game.

Bencao- A front kick to attack opponents from a distance.



Au- a cartwheel like movement, Players sometimes pause midway to hold in a handstand, where they can execute a variety of moves.

Meia Lua- a spinning kick, often used in a combination of other acrobatic moves.



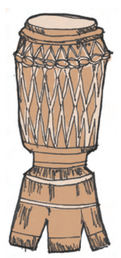
Macaco- a back-flick like movement to dodge attacks and set up offensive moves.

Music

Music is an indispensable and vibrant component of the Capoeira experience. It is what sets Capoeria apart from other martial arts. The music of Capoeira adds rhythm and soul to the movements, used to communicate and tell stories. The rhythm and tempo of the music sets the intensity of the game. Each instrument has a specific role, which add to the singing and clapping of the other participants. The communal act of singing and playing music in the roda enhances the sense of unity, turning capoeira into a lively and enriching experience.

Berimbau

The most important instrument, used to set tempo and rhythm. A hollowed out gourd to which a wooden bow and a metal string is attached. The player holds a stone, and plucks the string with a wooden stick, holding a shaker in the other hand.

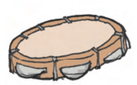


Atebaque

A drum used to add depth and resonance to the music. It is made of Jacaranda wood from Brazil and calfskin. A system of ropes hold it together.

Ladainhas

Songs that tell stories, sung in a call and response format. They are often about the enslaved Africans who created Capoeira, or tell the stories of love, nature and everyday life.



Pandeiro

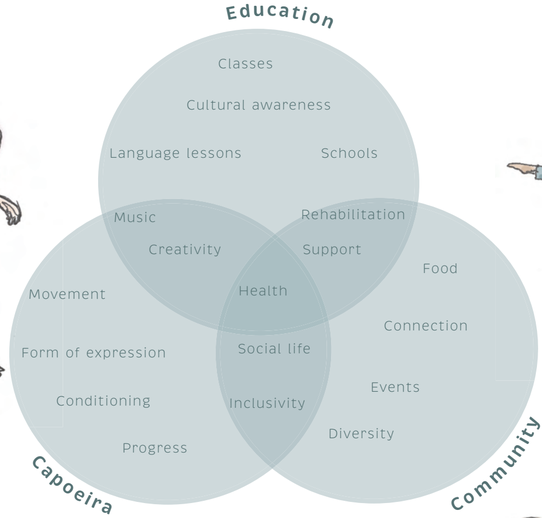
A type of tambourine that adds bright, vibrant sound

Agogo

A bell that adds a metallic, high pitched sound to the music

What will the Center Offer?

What will Capoeira Provide to the community



Why in Swindon?

The literature to date demonstrates the transformative ability of Capoeira. [8] For example, Burt and Butler looked at using Capoeira to conduct positive change in aggressive and marginalized adolescents, and observed a beneficial impact. [8] A similar study by Grinden and Botha looked at the increased pro-social engagement, development and integrative nature of Capoeira practiced by children. [8]

Swindon's health and well-being strategy is particularly targeting mental health after the COVID pandemic, including having a social network, access to green space and a support system. [9] Looking at Swindon's Local Plan 2026, there are key targets that Capoeira can look to address.

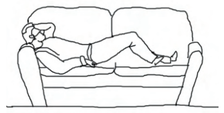
Although Swindon Borough is relatively prosperous, there are **challenges around health, education and economic inequality** between communities. [11] It is also important to meet the needs of Swindon Borough's **young population, the more deprived communities, the ethnic minority population** and those with other specific needs. [11]

The Borough Council aims to **increase physical activity**, promote it as part of everyday life and increase the capacity of facilities to support it. [11] **Diversification of activities** for residents and visitors will be crucial in driving regeneration, attracting inward investment and supporting recruitment and retention. [11]

Capoeira used to be present in Swindon but was shut down in 2017 due to lack of facilities. [10] Facebook comments have been made about 'missing' and 'wanting' Capoeira in Swindon.

One in three children are overweight or obese.[9] It has been proven that the most effective way to maintain a healthy weight is through regular participation in exercise.

Swindon has a **higher rate of mental health and self harm hospital admissions** than the rest of the UK. 15% of people are estimated to be living with depression or anxiety. [9]



1/3 adults are physically inactive. [9] Depression and Obesity are some of the most prevalent long term health conditions in Swindon. [9]

Client, Operators & Funding

Funders

Sport England
Each year, they invest over 250 million pounds to help people take part in physical activity. [12] A large part of this goes towards the 'places and spaces fund', which helps build and improve sporting facilities. [12]

The National Lottery
The National Lottery's community fund provides large donations to many schools and community centres to help fund sports facilities. [13]

Swindon Borough Council
Swindon Borough Council are facilitating the project; it will give them a chance to revitalize Broadgreen Community Centre and have a positive impact on the surrounding deprived area.

Fig. 4 SPORT ENGLAND

Fig. 5 THE NATIONAL LOTTERY

Fig. 6 Swindon Borough Council

Fig. 7 wasp wiltshire and swindon sport

Operators

Wiltshire and Swindon Sport
Working under Sport England, they work in partnership with local organisations to provide opportunities to get involved in physical activity. [15] They also provide funding opportunities that support their cause.

Client

Fig. 8 THE HARBOUR PROJECT

The Harbour Project
Currently located in Broadgreen community centre, this redevelopment will provide them with the additional space and facilities required. Merging Capoeira with this project will provide another facility for social events and activities. It will help foster a sense of inclusivity and community integration.

Fig. 9 CAPOEIRA 4 REFUGEES Music, Sport & Play

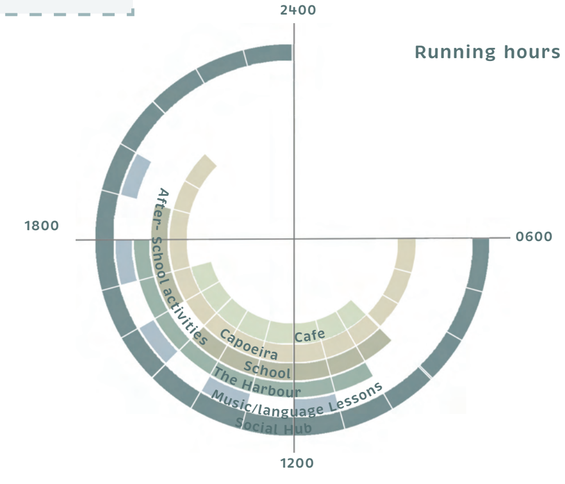
Capoeira 4 Refugees
This organization can work in partnership with the Harbour project, using Capoeira as a tool to help refugees. It currently works with refugees all around the world, using Capoeira to make a difference. [16]

Client

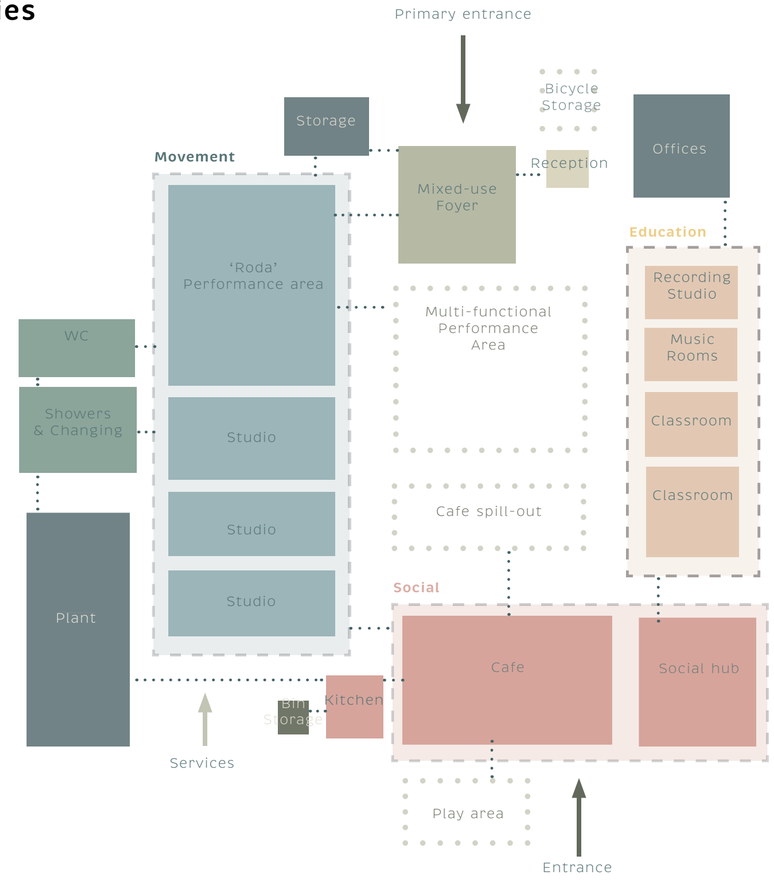
World Capoeira Federation
A non-profit organization, their objective is to promote Capoeira as a world sport. [37] It brings together various Capoeira organizations under one banner, standardizing practices. [14]

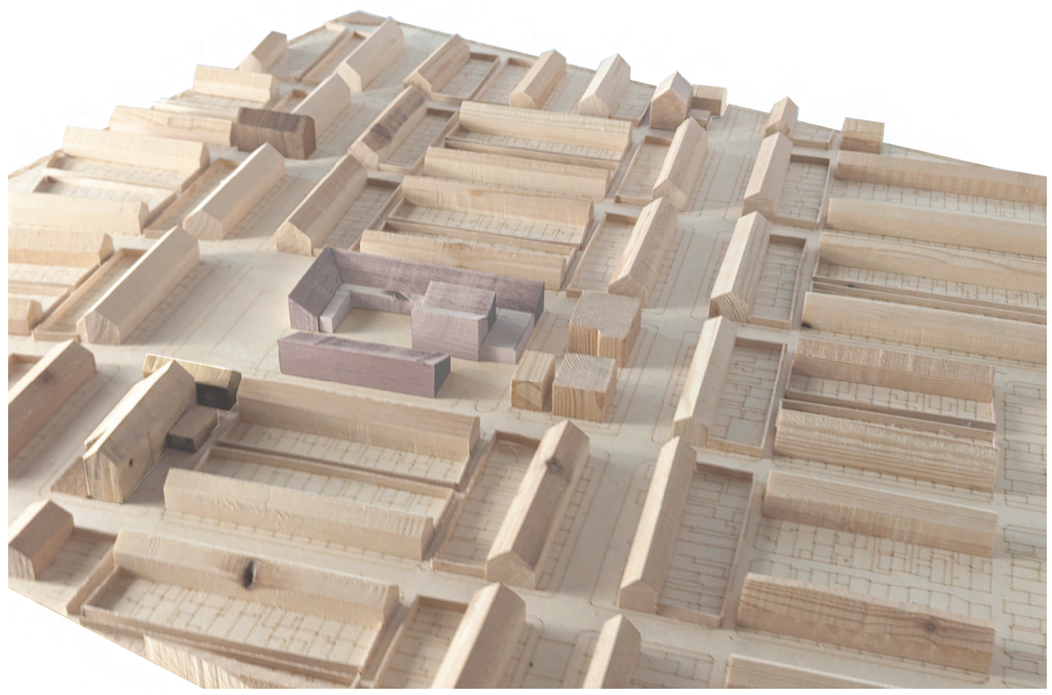
Fig. 10 World Capoeira Federation WCF Federação Mundial de Capoeira

Running hours



Adjacencies





Users

Capoeira is entirely inclusive to everyone. All ages train together, creating bonds across the entire community. The belt system is based on commitment and effort, as opposed to skill. If movement is impaired, participation can be focused on the musical and social aspects.

Targeted groups:

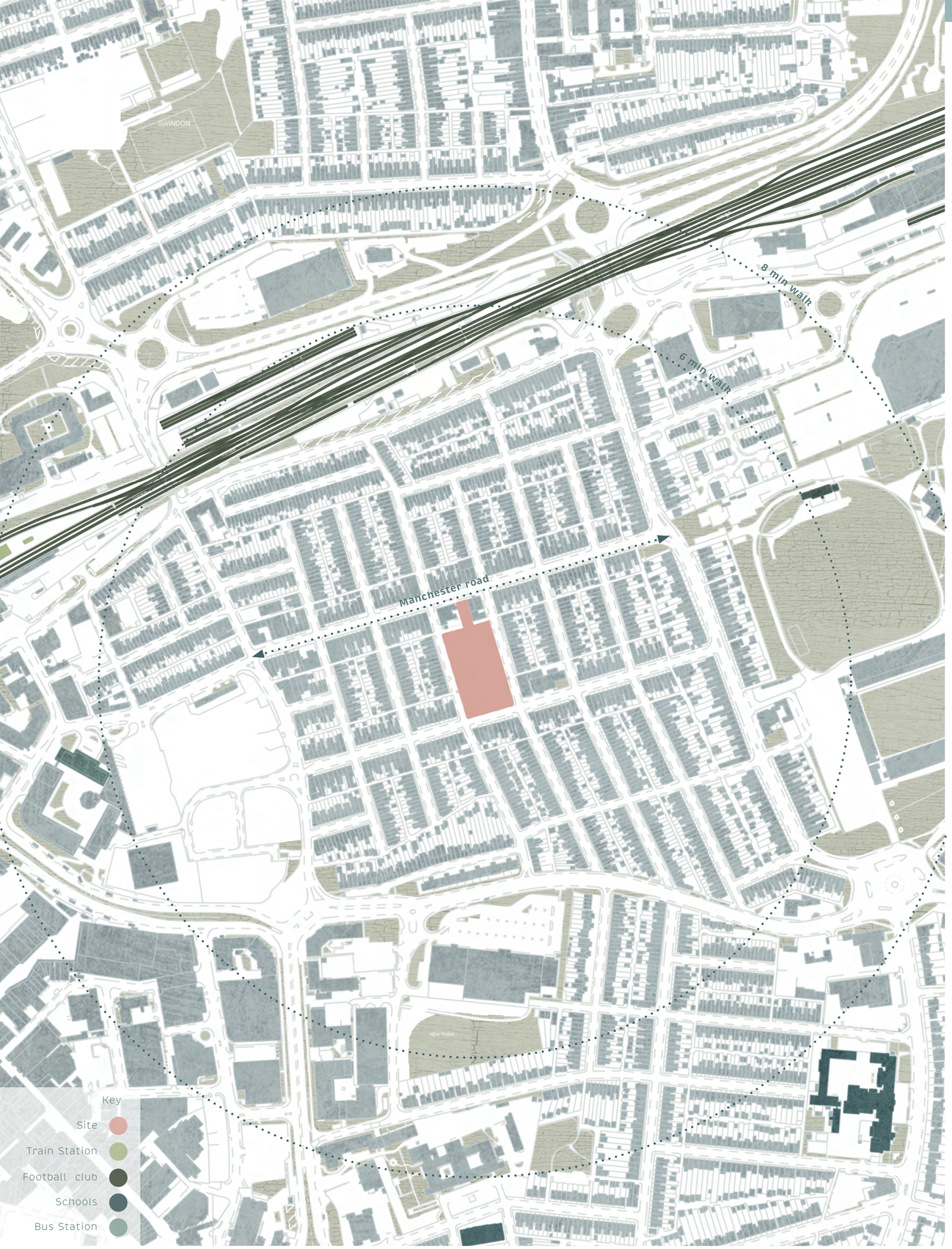
Refugees- Harbour Project [33]
Swindon is in the top five cities in the southwest taking in refugees. [33] The Harbour project, currently located in Broadgreen, supports and hosts a variety of events, which the new center will provide, along with improved facilities.

Capoeiristas
Being in a prime central location in the UK and having great bus and train links, it can form a hub of Capoeira that serves all groups across the UK.

Youth
One of Swindon's primary issues is the lack of facilities and space dedicated to youth. [12] The center can facilitate after-school activities and provide a space to support this need.

General public
The spaces will welcome all users. This may feature joining a Capoeira class, a language lesson or hosting their own event. The center will continue providing space for events previously occurring.

The Site



Location plan 1:7500 @ A3 0 200

Context

Wider context

Although Swindon is relatively prosperous, seven areas in the borough are amongst the 10% most deprived in the country. [17] The site I have chosen is located in one of these communities. The area is a hot spot for crime, anti-social behaviour and is known as one of 'the worst places in Swindon' [18 & 19]. Providing some form of revitalization can hopefully benefit the people in need.

Swindon is one of the most ethnically diverse towns in the southwest of England, with 17% of people being born overseas. [17] Broadgreen is a hub of diversity, providing Capoeira as a resource can empower social justice and cultural richness.

The site is in the centre of a primarily residential area, although small establishments are scattered around, especially on Manchester Road and surrounding the site.

The sites central location provides excellent access. It is no more than an 8-minute walk to the centre of Swindon, the train station, bus station and football club. [20] Being in close proximity to several schools can extend the facilities to them, along with supporting the youth in Swindon in the forms of after-school activities.

Deprivation in Swindon

Most deprived — Least deprived

Diversity in Swindon

Least white — Most white

Local Development

Over the next three years, 100 million will be invested in town centre projects to upgrade transport links, the public realm and heritage assets.[20] There is a substantial influx of resources directed towards the revitalization of Swindon's town centre. While this initiative is imperative, it is paramount to underscore that the adjacent locale, encompassing Manchester Road, exhibits a pronounced degree of deprivation, arguably requiring regeneration more urgently.

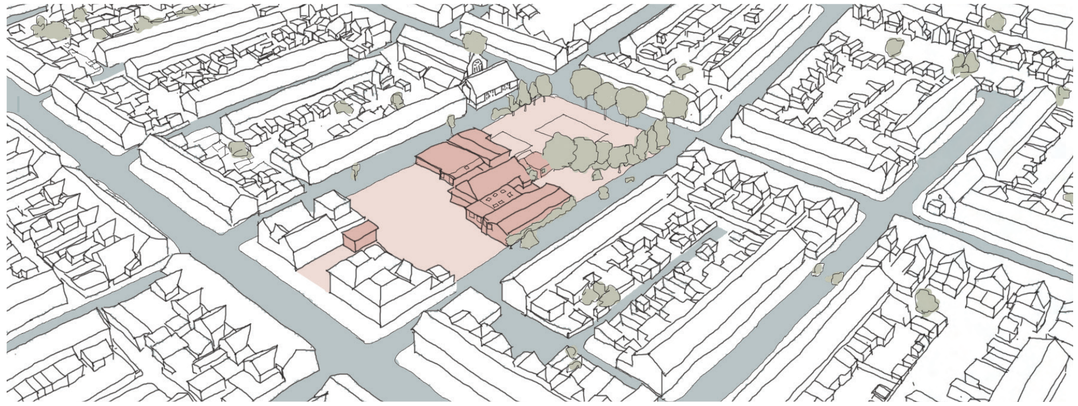
- Conservation zone
- Future cultural quarter
- Fleming way bus development
- Kimmerfields
- Site
- Rail

Broadgreen community centre

The site currently houses Broadgreen community centre, featuring a main hall, classroom, activity room and kitchenette. [21] The existing building is of poor quality, badly built and has unacceptable environmental performance.
The area desperately needs some revitalization, and currently all funds are being directed towards flashy developments in Swindon's town centre. [22] Demolishing Broadgreen and erecting a new cultural institution will benefit and enhance the area whilst providing a more prominent link to the local centre that is Manchester Road. More active street frontage can help improve the area and eliminate its dangerous reputation.

Prior to 2020, Broadgreen held a range of activities, including the Sahara health fair, ballet lessons, a street food festival, Chinese school and religious events.[23] However, during the COVID-19 pandemic, it was converted to being a testing centre and the community function never properly recovered. It is now used to host private events and the home of the Harbour project. The Harbour project is delivering a positive impact though supporting refugees, yet it lacks facilities. [24] A better building with the new purpose of Capoeira can revitalize the area and provide better resources for the Harbour Project.

Collage of Broadgreen



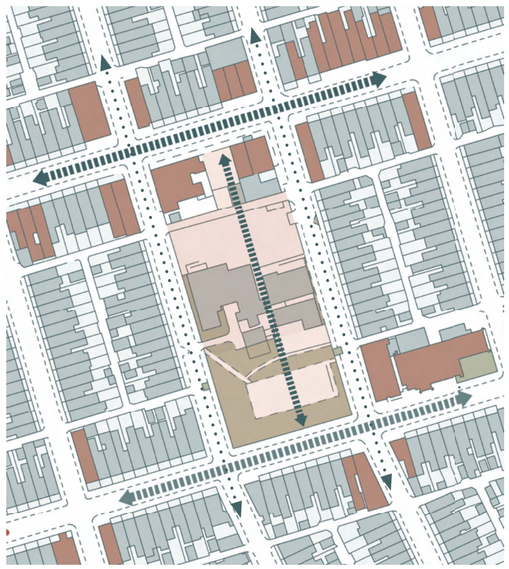
Site

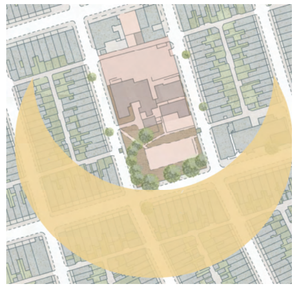
Site Analysis

The Design driver: Examining Active Frontage

Despite being mostly residential, the district is home to a number of salons, restaurants, and retail establishments integrated within terrace homes. This is particularly true for Manchester Road in the north and, to a lesser extent, for Broad Street in the south. The peaceful roads that go east and west are only frequented by locals. The Manchester Road infill area, which is now a parking lot, offers a multitude of possibilities for an entryway to the site. This draws a primary axis through the site, linking the park and Broad Street together.

A concentration on designing around the axis allows the building to turn away from the quieter residential roads and focus on the route that connects the busier areas.



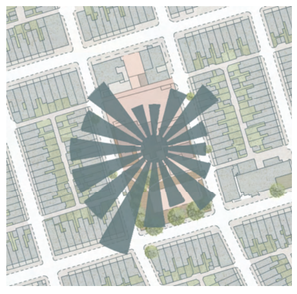


Sun path

The site offers the potential for lots of solar gains and great lighting, with the benefit of having a park lying towards the south causing minimal sun obstruction.

Access

Currently the top of the site serves as a carpark with vehicle access from the east and a number of pedestrian access points are scattered around the perimeter.



Wind

Swindon is not a very windy place, meaning little wind consideration is required in the design. The primary wind direction from the south-east has been taken into account for ventilation purposes.

Views

The most utilized view is though the infill section into the site, along with the four corners offering a peek of the building. Views out are focused on the park and the church.

Proposal

Entrance

The Arrival Square

Design Approach

Creating a form

Sectional response

A mass on site

Creating a place on the site, whilst giving the surrounding buildings space.

Introducing a break

Allowing passage through the main axis of the site, breaking into two buildings.

Creating a heart

Cutting away a courtyard, having a form that declines towards it.

The Roda

Celebrating the Roda through form by elevating it from the surroundings. Having a mass that ‘holds’ the courtyard.

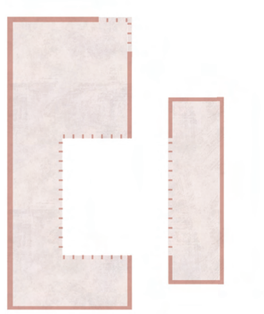
Plan response

Design Approach

Key design aspects

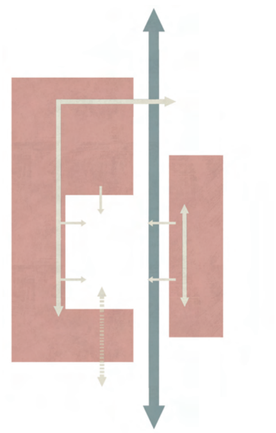
Density of fabric

A tough brick outer shell echoes the context, leading into an open, permeable courtyard.



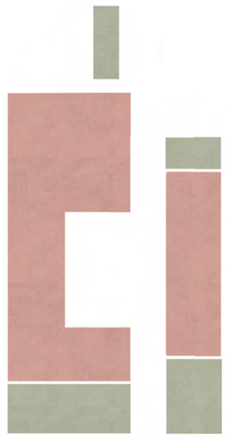
Routes through

The axis, defined by the infill section at the top of the site, creates a direct route through. Off shoot routes from the axis lead into the building.



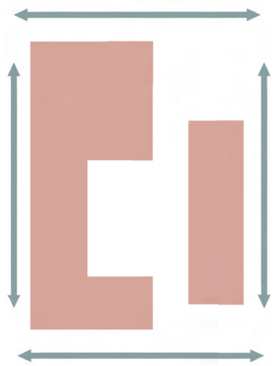
Green space

More green space is introduced to the site, whilst retaining and enhancing the green space currently existing in the community park.



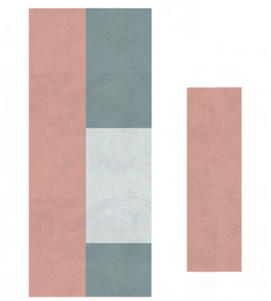
Rectilinear

To fit into context and the site appropriately, the building echoes the rectilinear forms of the surroundings.



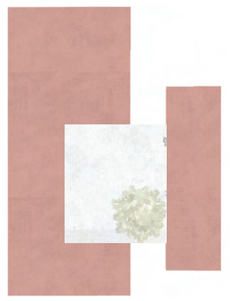
The central spine

The primary spaces lie centrally, to provide privacy to the surrounding terrace houses.



Courtyard

A protected, enclosed community hub sits centrally in the site.



Cladding

The Roda
'Timber clad gem'

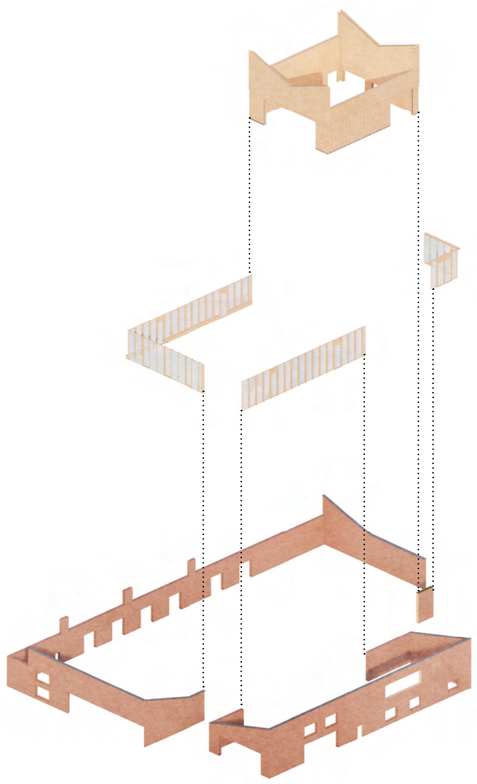
Using vertical and horizontal timber elements, the central Roda pops out as a more organic feature and differentiates its self via its materiality.

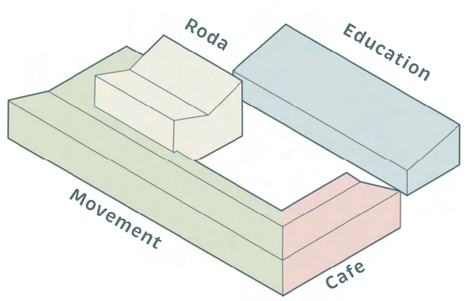
Internal courtyard
Permeable glazed/ timber elements

The language of this space is very pervious, with glazed panels sitting between timber fins lining the courtyard, allowing visual connection and light to flood the spaces.

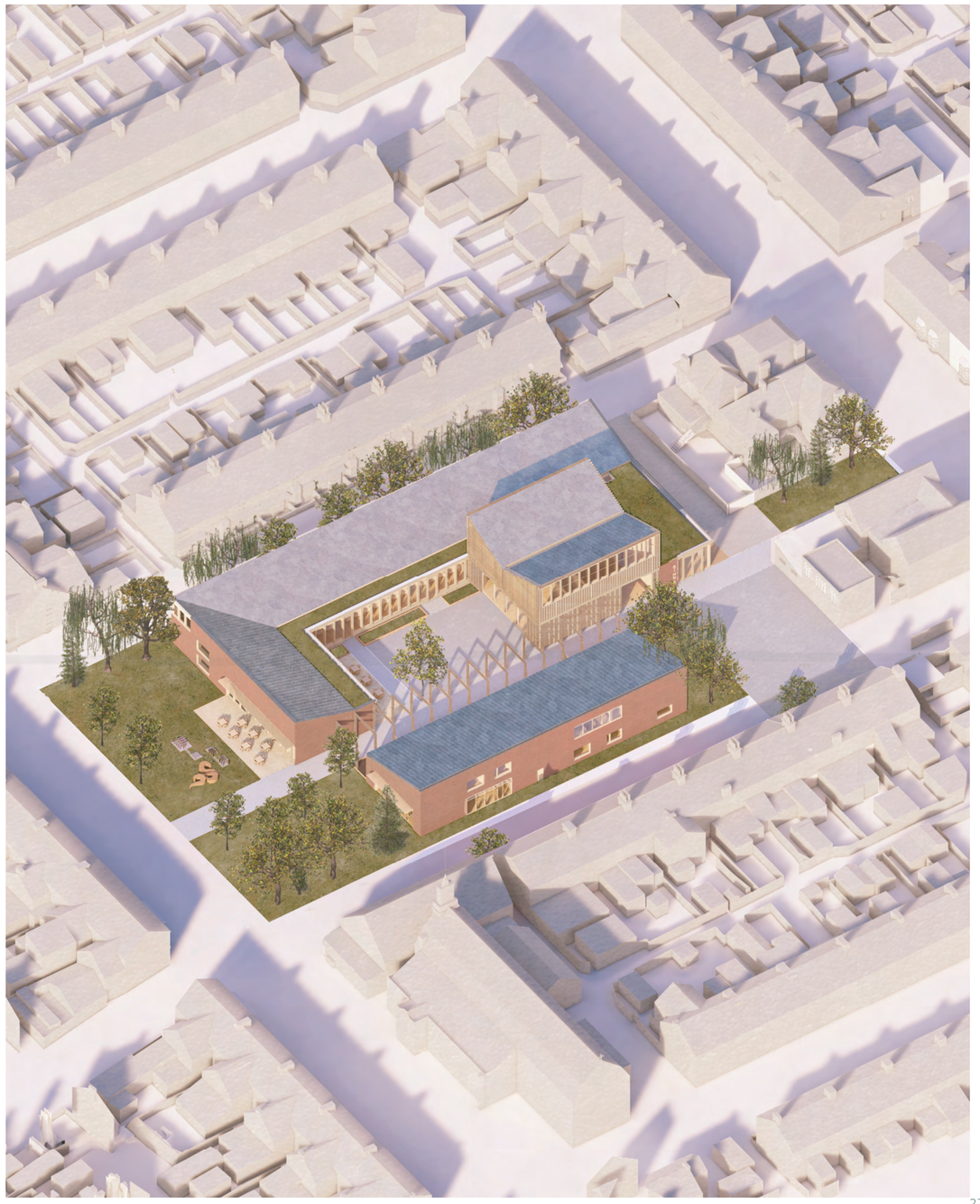
Protective skin
Reclaimed brick wrap

Reclaimed Swindon red brick creates a tough external skin, echoing and respecting the surrounding terrace housing.





Isometric



Contextual response

The East Elevation

The elevation responds to the surroundings by echoing the rhythm of the existing terrace houses. Bay windows are mirrored by full length glazed windows, and first floor glazing on the terrace houses is reflected by a clerestory strip.

The pedestrianised street bridging the two buildings will become an area where kids are free to play or a lovely place for a stroll, with a green buffer separating Ginga from the street.

The only exceptions for the pedestrianisation will be allowances for fire trucks and servicing. Three service doors allow access to the kitchen, plant rooms and bin store on this elevation. The fins, which mirror the clerestory's rhythm, serve as a concealed vent system for MVHR.

Rhythm

The existing

The proposed

Facing existing elevation

Site

1:200 @ A3

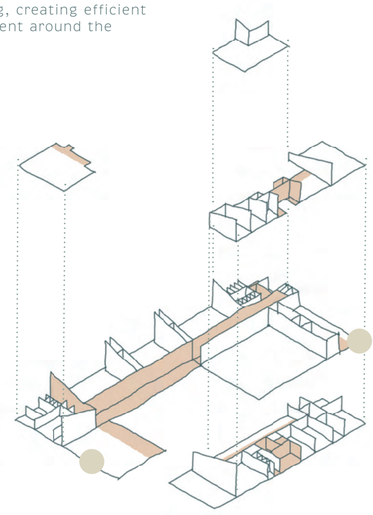
0 2 4 6 8 10

Design Approach

Circulation

Primary entrance zones

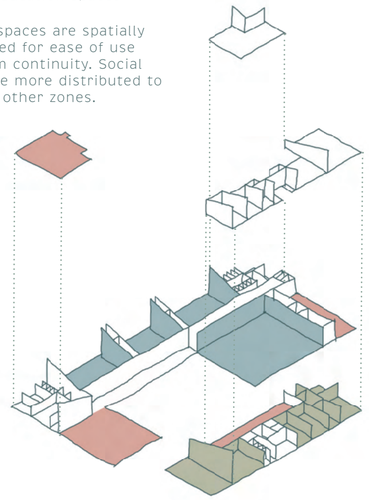
A primary corridor wraps around the interior of the building, creating efficient movement around the spaces.



Usage

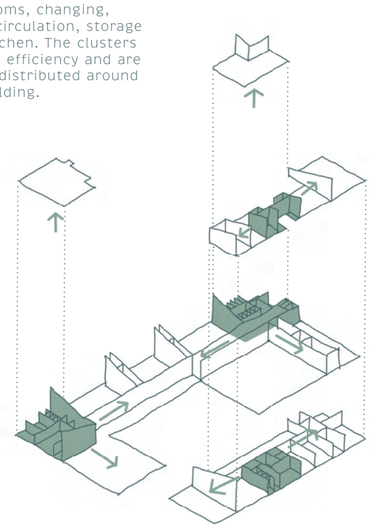
- Movement spaces
- Social spaces
- Education spaces

Similar spaces are spatially connected for ease of use and form continuity. Social areas are more distributed to support other zones.



Service 'knuckles'

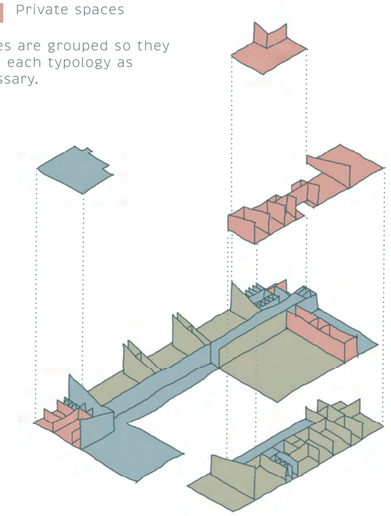
The knuckles provide the relevant supporting spaces, including bathrooms, changing, plant, circulation, storage and kitchen. The clusters provide efficiency and are evenly distributed around the building.



Space definition

- Public spaces
- Semi- public spaces
- Private spaces

Spaces are grouped so they serve each typology as necessary.



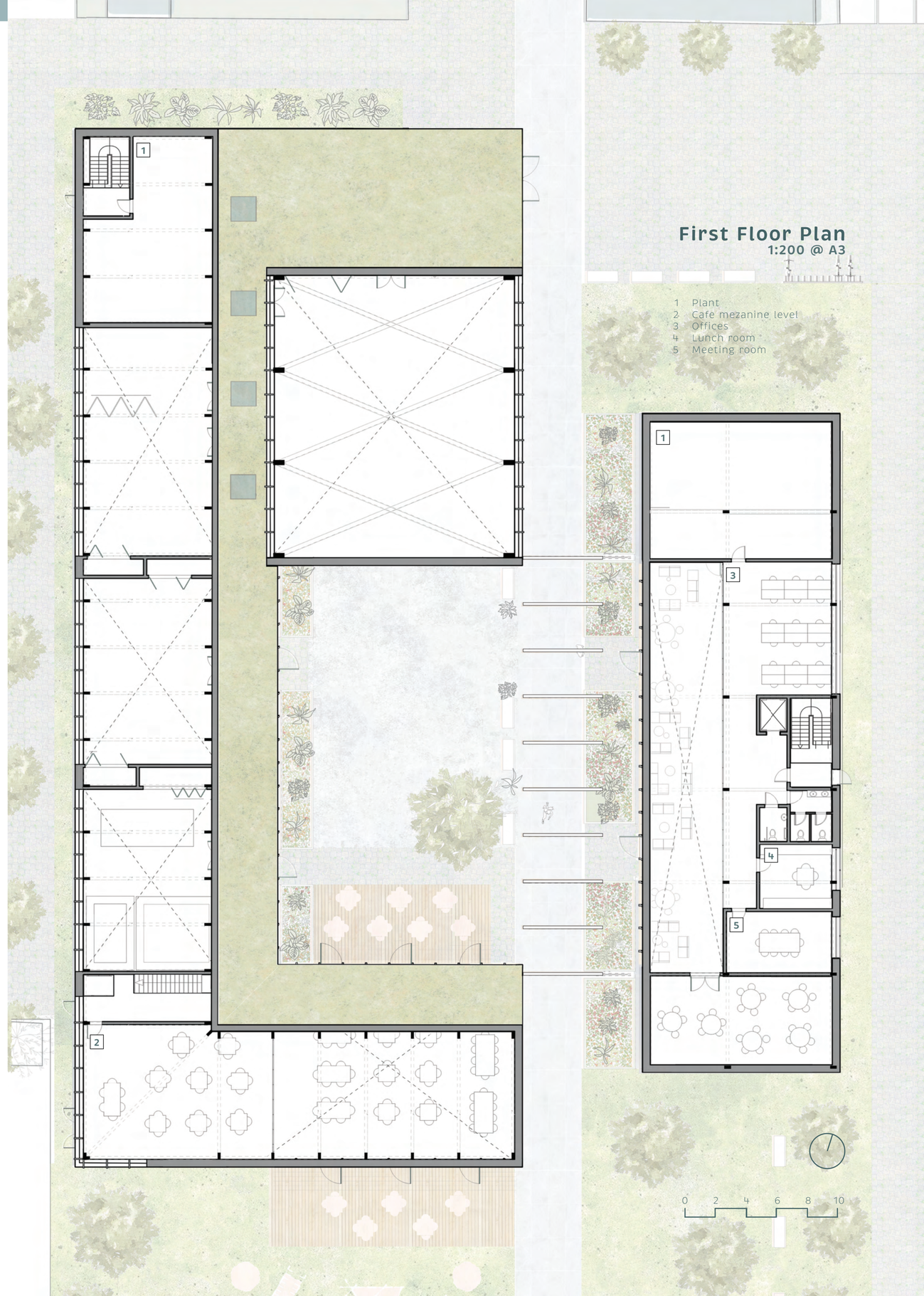
Ground floor plan

1:200 @ A3

1 Changing places changing room
2 Foyer
3 Changing/ shower room
4 Boot/cloak room
5 Store
6 Reception
7 Roda
8 Studios
9 Cafe
10 Servery
11 Kitchen
12 Plant
13 Bin store
14 Recording studio
15 Social Hub
16 Music room
17 Classroom

0 2 4 6 8 10

Arrival
The infill

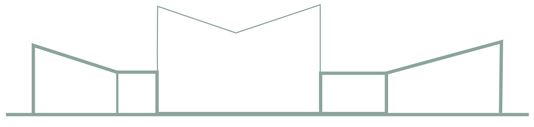


Section
1:100 @ A3

0 2 4

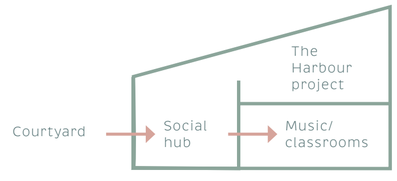
Protection

The roofs lean inwards, towards the courtyard, creating an intimate area at a more human scale, while the exterior walls echo the height of the surrounding terrace houses, providing a protective case.

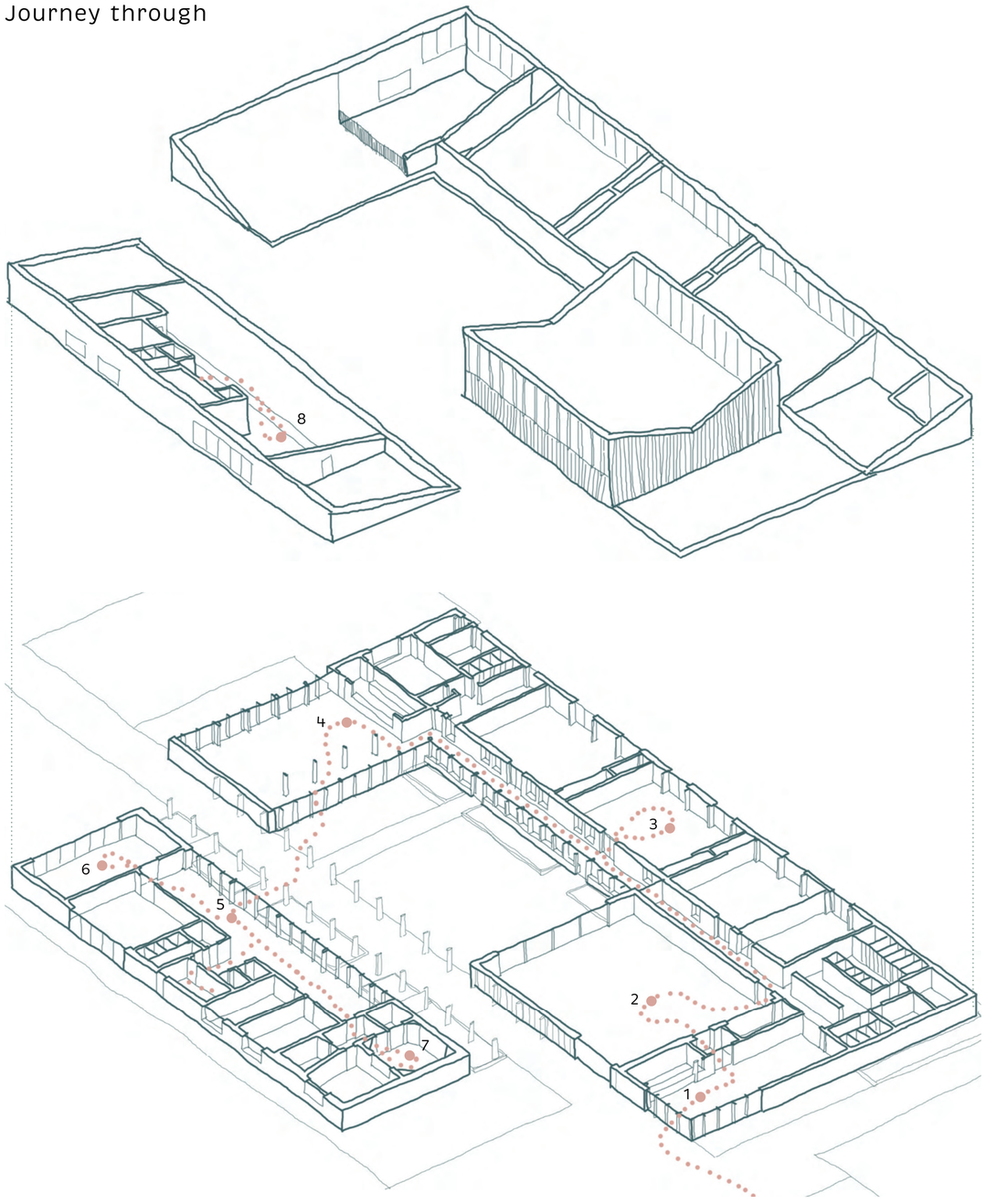


Privacy

The Education block is designed to feature a hierarchical flow of spaces, starting from the most accessible public areas like the outdoor courtyard, leading into the predominantly public social hub. From there, the block branches out into semi-public spaces like the music rooms and classrooms. Being a private area, the Harbour project is on a different level, offering more seclusion.



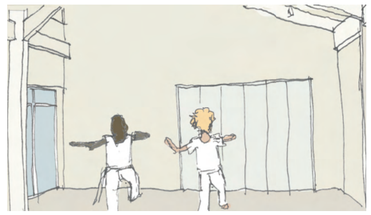
Building program
Journey through



Building program
Journey through

1 **Foyer**

2 **Roda**



3 **Studios**

4 **Cafe**

5 **Social hub**

6 **Classrooms**

7 **Music spaces**

8 **The Harbour Project**

Contextual response

The West Elevation

The west elevation has the most elements in its composition. The foyer, timber-clad Roda and edge of the cafe all peek out from behind the education block. The education block echoes the distance that the houses sit from the road, giving the street breathing room and a break in the form of a green barrier. The buildings sit at mirrored heights, embodying separate forms. These elements, along with materiality, help the Ginga find a place in the surroundings without pastiche.

Response

Sectional response

The glazed rhythm

Facing existing elevation

0 2 4 6 8 10

Section

1:100 @ A3

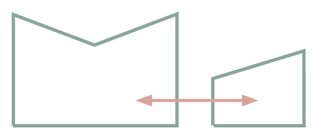
0 2 4

Materiality

The contrast between the sturdy brick exterior and the softer timber interior adds visual interest and depth. This juxtaposition of materials highlights different aspects of the building's function, with the Roda as the key space for performance.

Movement spaces

The movement spaces are interconnected across the corridor, providing complementary support. The Roda is larger and more extensive, while the studios are more intimate and private.

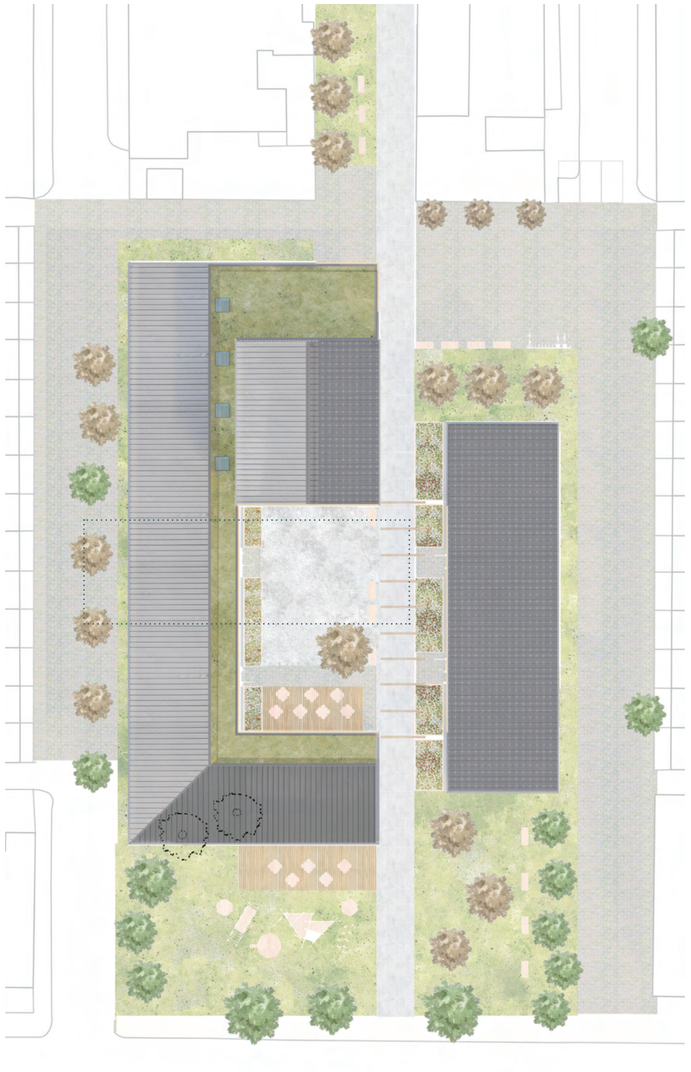


Landscaping

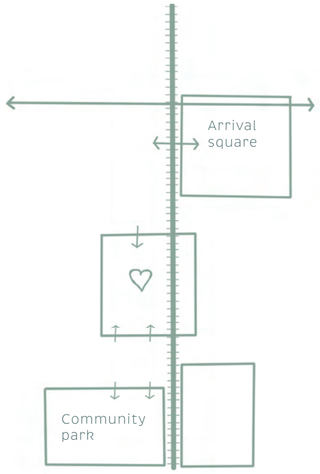
Overview

Landscaping plan

1:500 @ A3



Landscaping parti



Key

Existing retained trees
The majority of the trees will remain, with adequate space to flourish and grow.

Proposed trees
A variety of new species will be introduced to enhance the area and maximize the benefits from trees.

Removed transplanted trees
2 trees will need to be transplanted to another location on site to allow for building works.

Pedestrianized roads
Gladstone St and Salisbury St will be mostly pedestrianized. Already quiet roads, this will only disrupt traffic minimally and primarily have beneficial effects on the neighbourhood, allowing children to play and encourage activity.

Landscaping

Palette

English oak, sycamore and silver birch will be planted alongside existing trees to create a buffer between the residential, improve street quality and provide clerestory shading for the studios. These deciduous native trees will eventually reach between 20- 30 m, helping account for the increasing cooling demand from climate change.

The **Semi-intensive green roof** will contain herbaceous plants, perennials, ground covers, grasses and small shrubs, being rich with biodiversity. Moderate maintenance will be required and the roof is easily accessible by ladder.

Planting Beds will provide better soil quality, protection, enhanced drainage, effective pest and disease management and an extended growing season. They also introduce a boundary between the internal and external where necessary, marking the circulation axis.

Planting bed palette:
All chosen species are easy to care for, tough and long lasting to ensure upkeep.

Wildflowers- provide valuable support for insects and nurture ecosystems. When in bloom they will brighten up their surroundings.

Fig. 11

Ornamental grasses-bare flowers that last for months and look great year round. They are great companions to wild flowers, and add volume and a more vertical element.

Fig. 12

Natural grasses and wild flowers will be cultivated in a green strip below the trees, creating a green 'buffer zone' between the building and the street.

Exposed aggregate concrete will provide a smooth, durable, non-slip surface for outdoor performances. It is easily cleaned, suitable for the barefoot nature of capoeira.

Limestone paving slabs will mark the axis leading across the site. Its consistency in colour will create a soft palette, whilst its smooth nature allows easy passage for cyclists and accessibility requirements.

External places

The community park

Broadgreen Community Park will be maintained as a space and enhanced by re-landscaping with a new play area to optimise its usability and appeal. A stretch of grass and wild flowers will be cultivated, creating a place for recreation. Trees will be planted around the east side of the park, creating a lush and shaded green area.

External Places

The colonnade

The colonnade marks the axis through the site, guiding visitors. Wires tie the glulam elements together and act as a perfect growing medium for vines. The colonnade functions as a shading device for the education building, with deciduous vines allowing sun through in the winter, and shading in the summer. Evergreen plants ensure that the colonnade doesn't look barren. Planting beds on one side gives the vines a growing medium and allows them to stretch over the structure. The combined organic elements capture the excitement and dynamism of seasonal change.

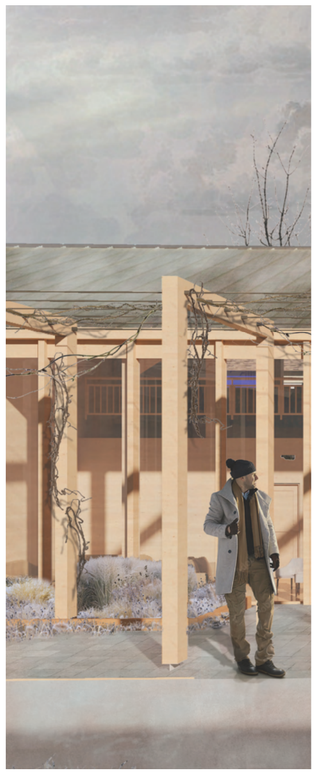
Clemantis Montana
A perennial, it is a strong plant that thrives in many environments. Its vibrant flowers light up the landscape in spring and summer.

Fig. 13

English Ivy
Another low maintenance plant, it is evergreen, giving life to the building all year round. Although very invasive in other environments, in the UK the vines pairs perfectly with other plants.

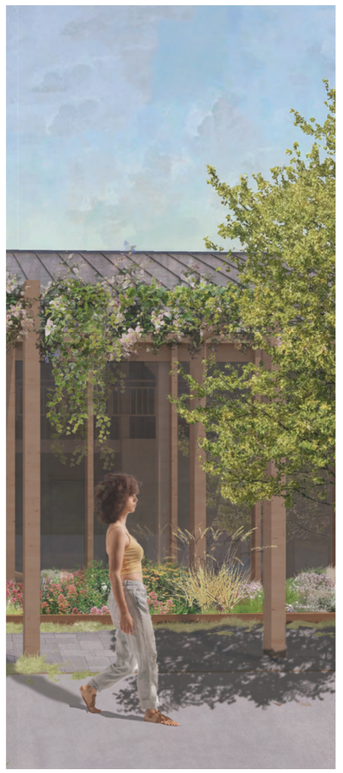
Fig. 14

Winter



Spring

Summer



Autumn

The Courtyard

A central heart

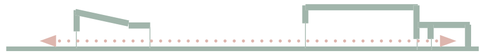
The courtyard stands out as a key feature within the design, serving as a vibrant hub for informal practice and performances that are easily accessible to the public. It removes any formal barriers or schedules, fostering a welcoming environment where spontaneous games of capoeira can unfold whenever individuals are inspired to participate. The open and inclusive nature promotes the courtyard as a lively and inviting venue.

The space that 'pops'

The datum set by the surrounding terrace houses is adhered to by all spaces but the 'Roda' juts out vertically, creating a statement piece and countering the ground level central courtyard.

A direct route through

From the community garden to the courtyard to the foyer, glazed elements create a direct line of site though these primary spaces.



Section 1:75 @ A3

0 2 4

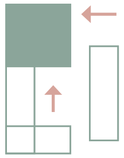
Ginga at Night

A hub of activity

On a casual night, individuals will be free to use the Roda and courtyard as they please, enjoying games of capoeira, practicing, or just strolling through.

If privacy or security is required, gates located at both ends of the colonnade can be used to lock off the courtyard from public access, thereby closing up the building.

During an event, such as the Roda on a Friday night, a sliding door partitions a portion of the building's interior, creating an enclosed event space. This ensures the adjacent supporting areas, such as the cafe and other studios, maintain security and privacy.



Detailed Elevation

1:50 @ A3

Short Elevations

1:200 @ A3

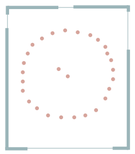
The south elevation

The north elevation

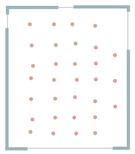
The Roda

The Roda is where the training is put into practice. A large gathering of people sing and clap, with a band of musicians playing their instruments, providing rhythm, and two players dancing in the centre. The Roda is full of energy, excitement and an awesome event to take part in.

Flexibility of space
The open nature of the space makes it ideal not only for the Roda, or a large capoeira lesson, but also serving as a community hall or event space.



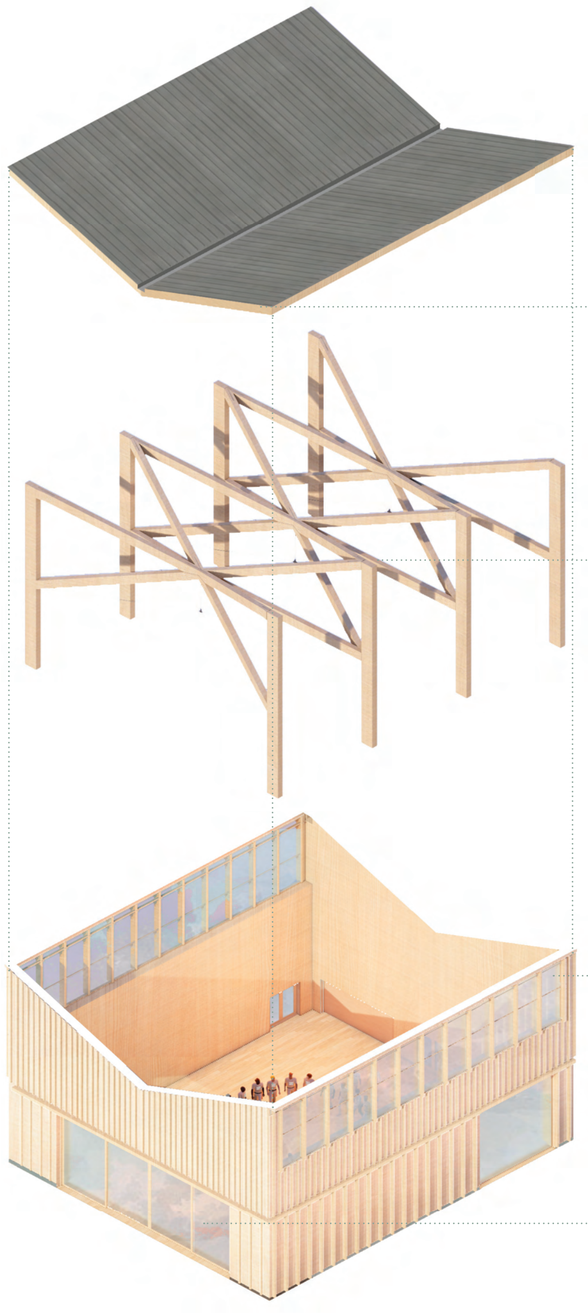
The Roda formation



Capoeira lesson formation

The Roda

The Roda caters for a variety of different musical applications, from unamplified solo vocal performances and a small gathering of instruments to larger band performances, that may wish to use amplified sound. Being a space for performance and live music, acoustical considerations are key to the design.



Cork panels are suspended from the CLT deck for acoustical absorption.

The diagonal glulam beams break up the roof surface and space into less regular shapes, helping to scatter lower and higher acoustic frequencies and stopping unwanted echoes.

Clerestory windows from either side illuminate the space creating balanced light distribution and reducing glare.

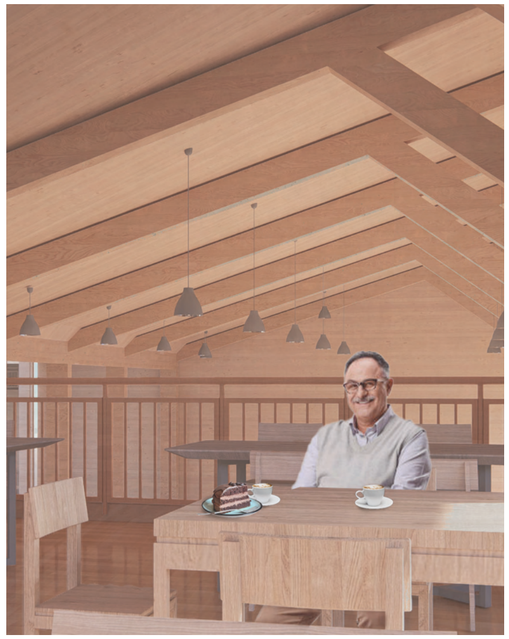
Retraction of the door into the wall creates a large opening connecting the Roda and courtyard. This design method helps accommodate larger events.

The Cafe

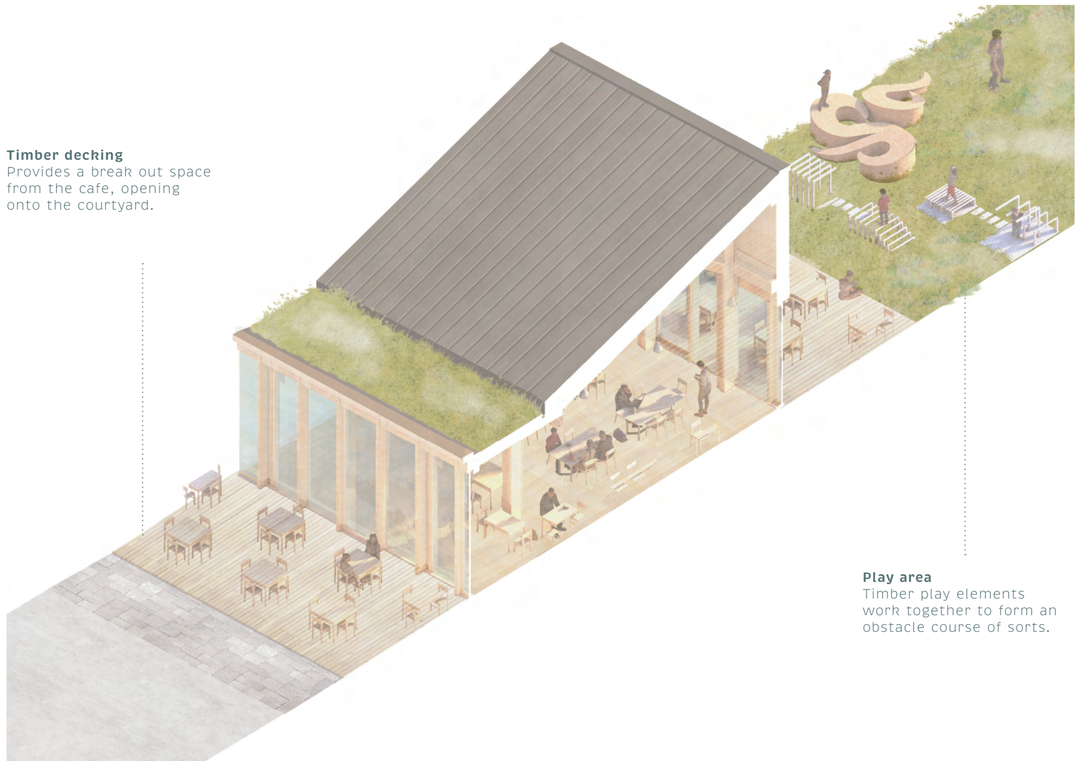
The cafe will be a hub for social activity. The surrounding area currently lacks any sort of cafe, so this amenity will fill a need. The ample space provided can allow working, social events and meet-ups.

The availability of different places, the spacious layout of the ground floor, two outdoor areas, and the more secluded mezzanine level offer a range of options, providing comfort to a variety of users.

The play area, lying next to the cafe, promote the engagement of children and families, allowing parents to supervise their children.



The mezzanine level



The Studios

A space for movement

The design facilitates the needs of capoeira gatherings and training. High ceilings offer ample space for unrestricted mobility and the usage of various equipment. Each studio has its own store for apparatus, a sprung floor which helps prevent injury and mirrors, that allow individuals to watch themselves and perfect movements. Plenty of daylighting creates an inviting and usable space.

Flexibility of use
As much as these spaces are designed for capoeira, an abundance of activities can occur. The studios provide an ideal area for yoga lessons, exercise classes, drama groups, any kind of dance or martial art and many other activities.
With the provision of a few tables or chairs, they could create amazing art studios or classrooms.

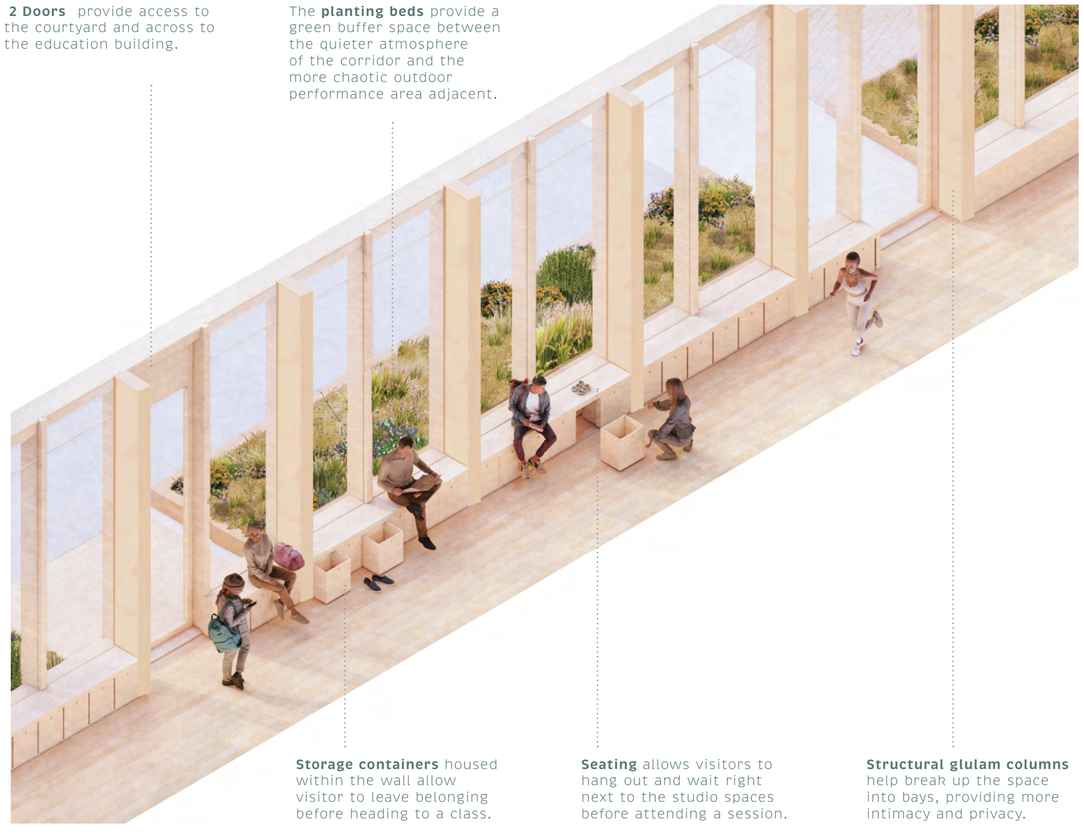
Circulation

More than a corridor

The corridor in itself is a destination; a visitor may choose to wait in the provided seating alcoves or get themselves ready for a class here. Being one of the best daylight spaces in the building, it has a strong connection to the outside and acts as a permeable intermediate space between indoors and out.

2 Doors provide access to the courtyard and across to the education building.

The **planting beds** provide a green buffer space between the quieter atmosphere of the corridor and the more chaotic outdoor performance area adjacent.



Storage containers housed within the wall allow visitor to leave belonging before heading to a class.

Seating allows visitors to hang out and wait right next to the studio spaces before attending a session.

Structural glulam columns help break up the space into bays, providing more intimacy and privacy.

The Social Hub

A community space

The social hub is a more casual space for meet ups. Furnished with cosy sofas, it is a great place to hang out before heading to a class or a music session.

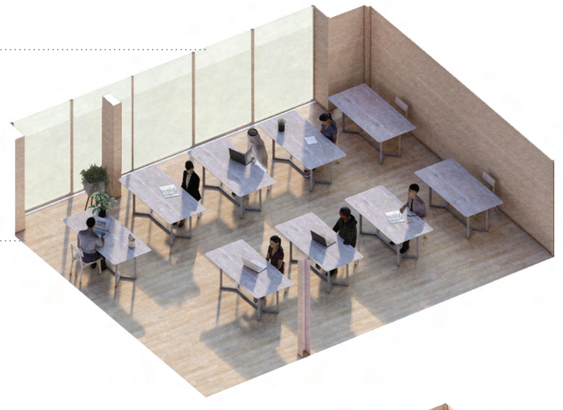
The Classrooms

A zone for learning

Doors from the social hub lead to the classrooms. These will mostly host activities led by the Harbour project, along with capoeira related lessons such as language and history and any other kind of lesson the community may wish to put on.
Large, full height windows allow plenty of light into the space, reaching a daylight factor of above 5% in both classrooms, meaning no artificial lighting is necessary during the day.

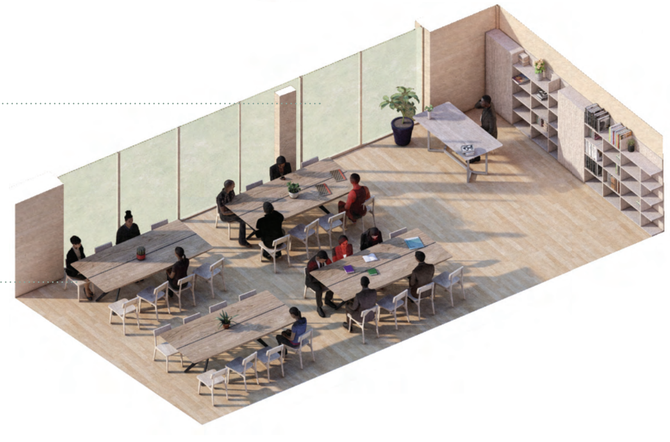
Being south facing, exterior shading fins and blinds are provided to prevent overheating and glare. An array of trees outside assist with this, while providing privacy.

The classrooms provide the opportunity for flexibility, furnishings can be rearranged or stored as required, to suit the activity.



North-east light Illuminates the space, providing less issues with glare and morning sunlight. An external green barrier creates a privacy buffer.

Timber finishes provide a warm, organic space creating a nurturing environment for learning.



The Recording studio

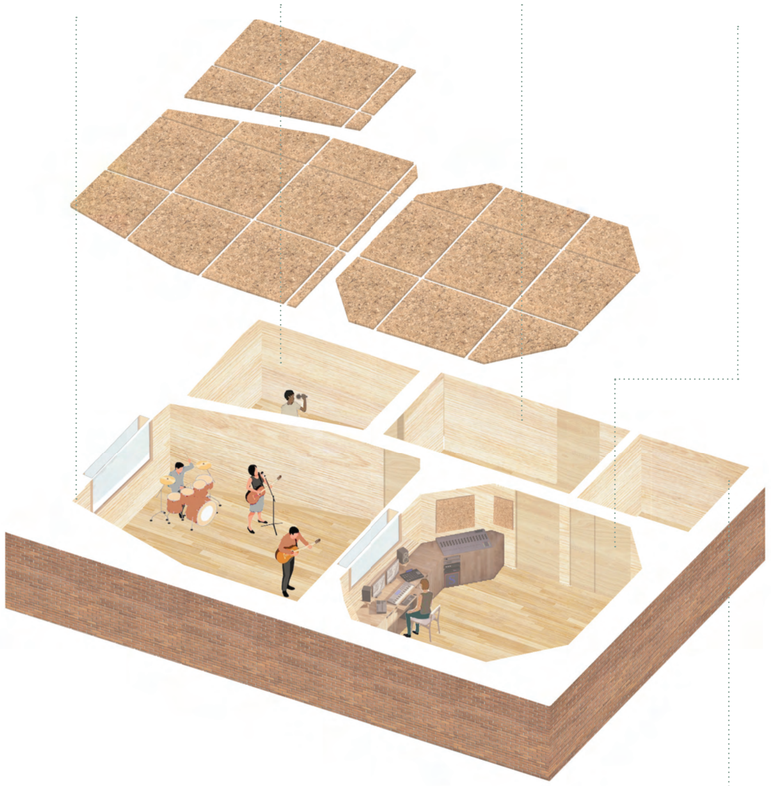
The recording studio is perhaps the most specialised area of the building. Designed and detailed for optimal acoustics, this area is where capoeira music can be created, recorded, and published to be shared with the world. Of course, it is not only capoeira specific, and anyone from the community is welcome to record music of their choice.

The live room is where instrumentalists and vocalists perform, essentially where the sound is 'created'.

The isolation booth is where a specific musician or vocalist is acoustically isolated for optimal audio recording quality.

The sound lock provides an entrance zone to the recording studio, leading to the other spaces, while also helping to acoustically isolate the spaces.

The control room is where audio engineers operate professional audio consoles, where the sound is recorded and manipulated.



A large store allows for plenty of instrument and equipment storage.

The Recording studio

Acoustics

The capoeira instuments

box in box construction

The recording studio requires the most acoustical reinforcement to prevent disturbance from sounds from the surrounding environment and enhance sound quality within.
Using box-in-box construction allows a space to be insulated against unwanted extraneous noise and vibration. This acoustic isolation technique is widespread and has been proven to be effective in recording studios.
Glazing is limited in music rooms and the recording studio in order to keep the reverberation time low, as glass is very reflective. The window separating the two rooms uses two independent fixed windows in order to have a high sound transmission class where little or no sound is heard.

Floors
Floors are arguably one of the most important elements for box in a box. The floor is floating above the standard floor build up.

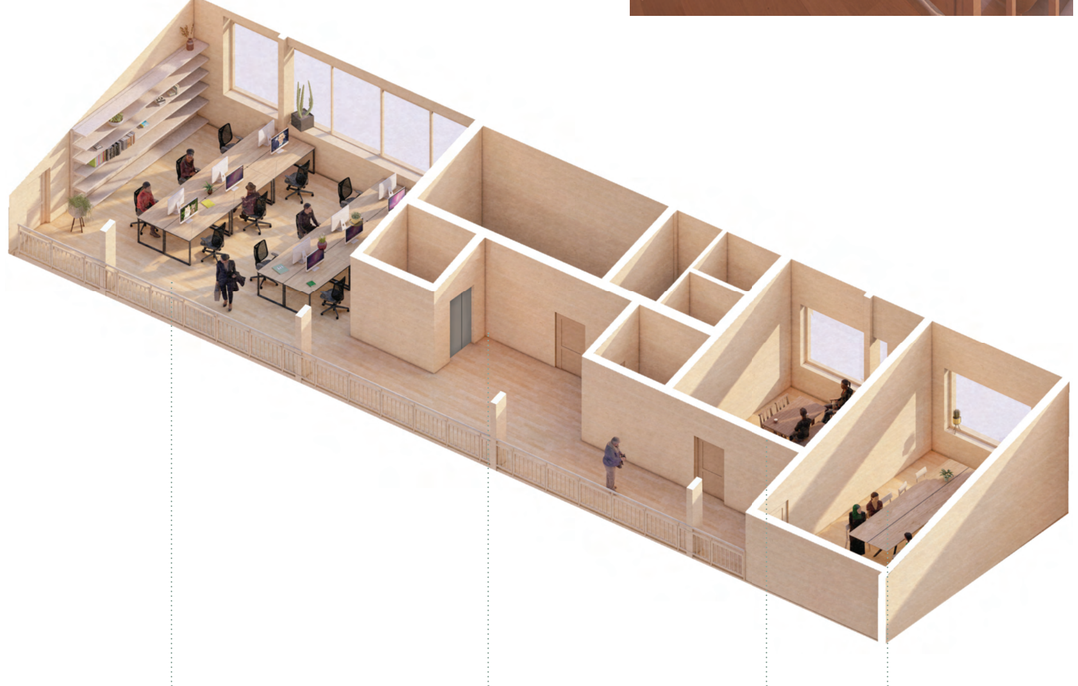
Walls
The new internal walls are supported by the new floor and are fixed to the external structure with acoustic wall ties. The control room requires extra acoustic panelling on walls to reach the optimal reverberation time.

Ceiling
The ceiling comprises of acoustic hangars supporting cork acoustic tiling which is fixed to the CLT decking.

The recording studio and iso booth have tapered, non-parallel walls that prevent flutter echo and help reduce sound reflection.

The Harbour Project

The Harbour project, currently inhabiting Broadgreen Community Centre, will continue to have their facilities on site. They lack adequate space and amenities at the moment, but Ginga will provide new, improved spaces to help them operate. They have a mezzanine level complete with specialized spaces for them, along with access to the rest of the centre to run the activities required.
The project presently employs a total of 12 individuals, and the office has been designed to comfortably accommodate this number, with sufficient space for future expansion.



Offices allow a lovely open plan space for The Harbour Project to house its headquarters. North-East light illuminates them, whilst the inhabiting an upper level retracts it from the rest of the building and allows privacy.

Service core provides a platform lift, stairs, a disabled toilet and two other toilet cubicles. It also functions as a CLT core for structural stability.

Lunch room a kitchenette and lunch table create a small relaxing space to have a break in.

Meeting room provides privacy when necessary, allowing group gatherings or consultations.

The Harbour Project

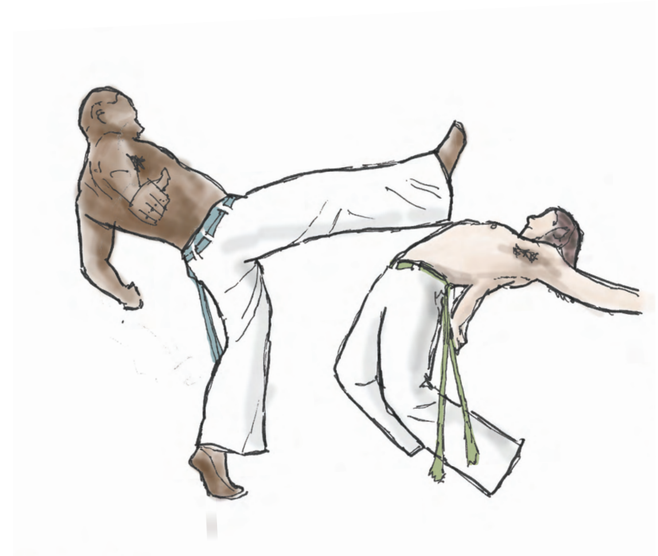
Activities

The Harbour Project will involve a blend of new and preexisting activities, as seen on the poster. All of these initiatives are centred around the integration of refugees into the society, with the aim of offering 'friendship, advice and hope'[24]. The new partnership with Ginga and other foundations such as Capoeira 4 Refugees aims to utilise capoeira as a means to accomplish these objectives.

English work culture lesson

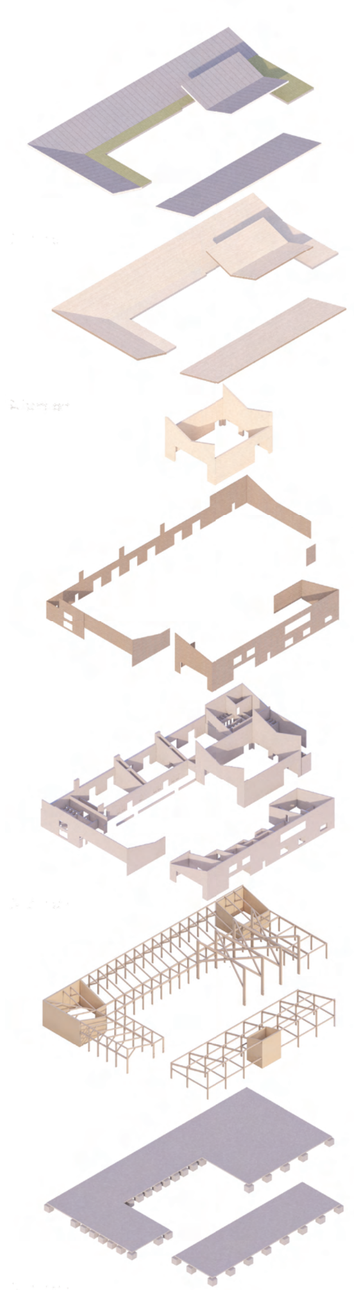
Breathing, meditation and yoga class

Structure and Tectonics



Building Fabric

A material overview



Roof finishes

These include a standing-seam zinc roof, which will have solar panels clipped on the south west facing sides, and a semi- intensive green roof.

CLT deck

This spans the primary structure, supporting the roof build ups, solar panels and maintenance access, whilst providing stability.

Timber clad Roda

A soft, organic exterior finish to differentiate the structure.

External brick wrap

Offering a strong and durable exterior layer.

CLT secondary structure

The CLT varies in thickness around the building to account for differing needs, forming interior walls and exterior ones by wrapping around the frame.

Glulam frame with CLT cores

The primary structural system, the strong timber columns and beams are able to span the necessary distances.

Concrete slab and pad foundations

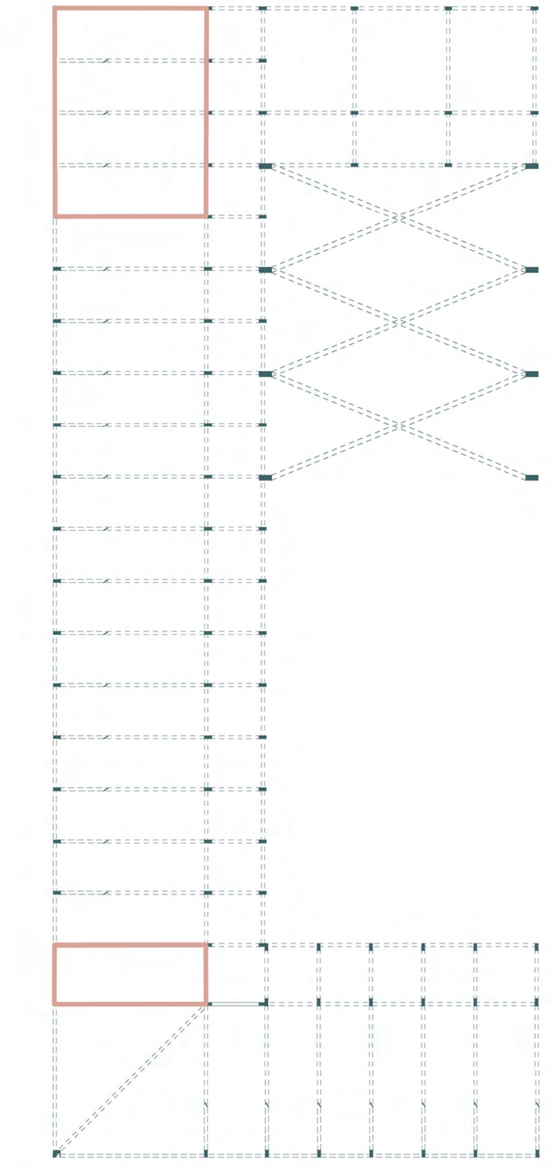
The base layer supporting everything lying above.

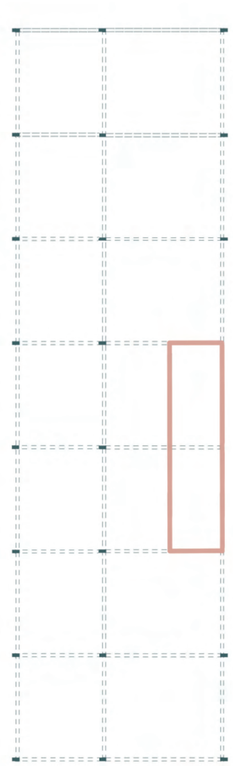
Structural Grid

1: 200 @ A3

CLT cores for stability

Glulam beams





Overview

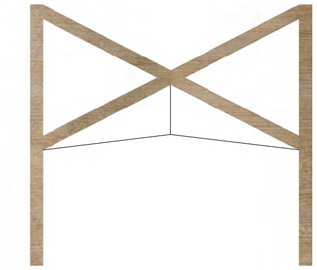
Structural Principles

Three Timber Frames

Glulam frames make up the principal structural element. The building consistently utilizes the three main frames. Occasionally, variance is necessary to explain the distinct characteristics of a place. For example, the education block's plant room necessitates a complete floor-spanning beam.

Education & Music

The education building consists of a 5m and 7m span, with a beam running across the 7m span to support the mezzanine level.



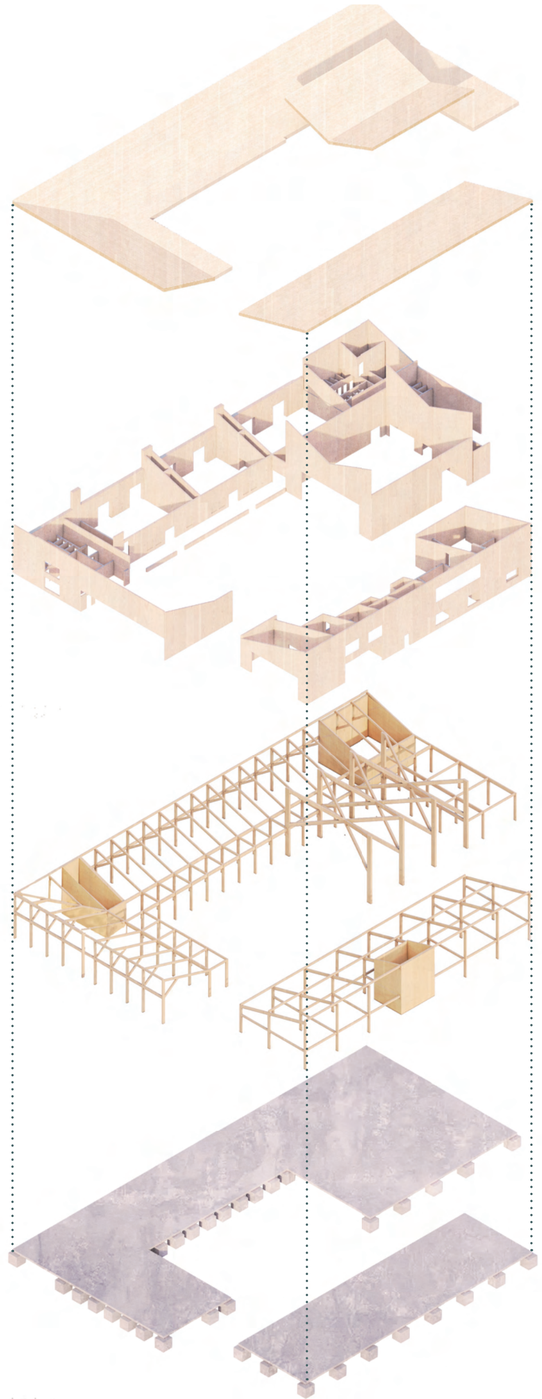
The Roda

The Roda consists of a 15m span, with the timber elements supporting a butterfly roof. A wire tie holds the structure together.

Movement spaces & Cafe

The movement spaces and cafe consist of a 9m and 3m span. The 9 m span has a prop to help support it, and facilitates the open spaces below.

Structural Isometric



200 mm CLT deck roof

60mm CLT secondary structure

(This increases to 150mm around the Roda for stability with the bigger truss)

Glulam frame with CLT cores for stability

1200 x 1200 mm Pad Foundations with a concrete slab above

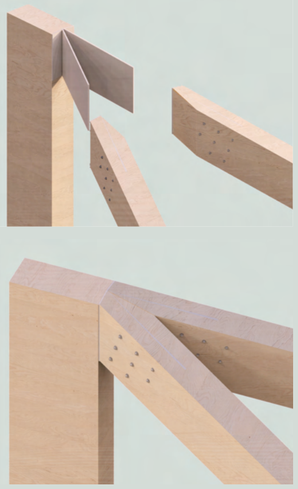
(This increases to 1600 x 1600 to support the Roda columns)

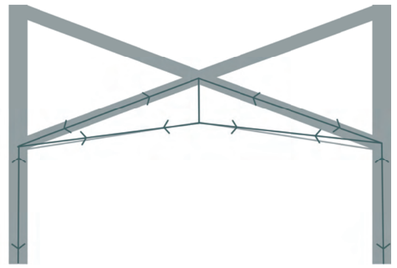
The Roda Truss

The Roda glulam truss has a clear span of 15 metres, allowing for an open space below to practise capoeira. The structure offers ample vertical space, enabling clerestory windows on both sides to flood the room with natural light. Having a diagonal position on plan provides bracing of the roof.

Corner connection

The beams and column intersect at a steel plate and are fastened together with bolts.



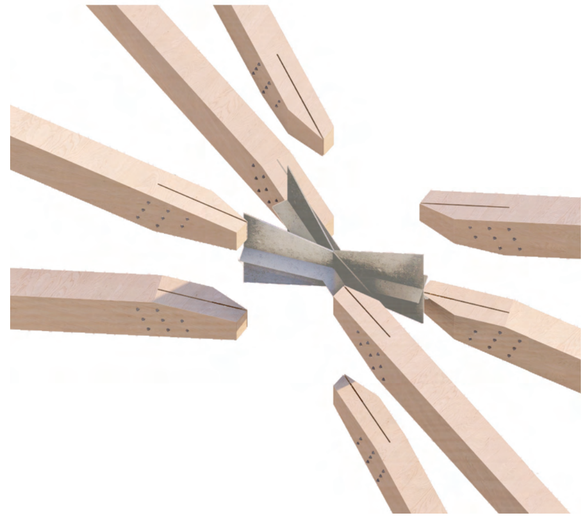


The steel wire acts in tension, and the glulam works in compression. The butterfly section of the truss has little structural significance, as it primarily serves to support the roof and clerestory windows. The CLT wraps around externally, acting as a secondary structure and helping to resist torsion.

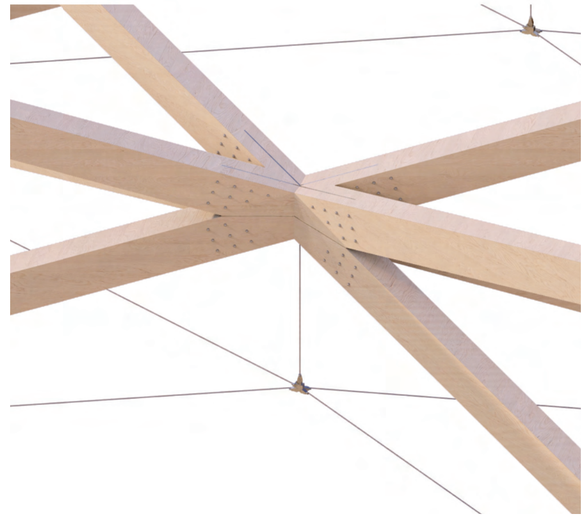
Center Detail

At the core of the intersection, a steel plate supports eight symmetrical glulam beams, each of which is a mirrored replica of the others. The Glulam is securely fastened to the steel structure, facilitating convenient disassembly and subsequent reuse.

Exploded center connection



Center connection with wiring below



Materials & Sourcing

Material Sources [25]

Using 0.02556 gCO2/kg/km for transport by train and 0.1065 gCO2/kg/km for transport by truck. [26]


Fig. 15

1 Douglas Fir Glulam

Glulam offers the opportunity to have large wooden spans. It is extremely efficient to produce, light for transport (being 1/6 of the weight of reinforced concrete), durable, and easy to handle. Manufactured outside Bristol, and grown in the UK, transport carbon remains relatively low.
Minimum lifespan: 100 years

Manufacturer: Glulam timber engineering ltd
Distance: 98 km
Carbon from truck transport: **23 $KgCO_2e$**
Carbon from train transport: **176 $KgCO_2e$**

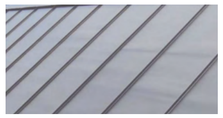


Fig. 16

2 Recycled Zinc

The roofs fall inwards, towards the courtyard; the seams responding to the rhythmic pattern of the timber. Although zinc has high embodied energy, the roofing will be 100% recycled, which will contribute to minimising its overall impact.
Minimum lifespan: 60 years

Manufacturer: Rheinzinc
Distance: 97 km
Carbon from truck transport: **21 $KgCO_2e$**
Carbon from train transport: **161 $KgCO_2e$**


Fig. 17

3 CLT

Not only is CLT used as the secondary structure to glulam and for lateral stability in cores, CLT also acts as a beautiful internal finish and provides airtightness. Up-and-coming initiatives like UK CLT, are looking into repurposing discarded timber into CLT[31] , which may be a viable future construction option.
Minimum lifespan: 100 years

Manufacturer: Constructional timber manufacturers limited
Distance: 82 km
Carbon from truck transport: **315 $KgCO_2e$**
Carbon from train transport: **841 $KgCO_2e$**


Fig. 18

4 Reclaimed red brick

Winston's Reclaimed Brick Swindon, along with various other reclamation yards in Swindon, can provide the brick exterior rain screen. Paying homage to Swindon's red brick heritage and using the locally available materials is a driver for using this cladding. The extreme durability, resilience, and low maintenance are advantageous, while it responds to the neighbouring residential properties.
Minimum lifespan: 150 years

Manufacturer: Winston's reclaimed Brick
Distance: 5.5 km
Carbon from truck transport: **135 $KgCO_2e$**

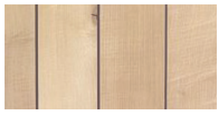


Fig. 19

5 Brimstone sycamore timber cladding

Made and sustainably grown close to Chippenham, this thermally modified hardwood, creates a more durable, stable, and consistent timber material. Using the UK's fast-growing hardwood species,it increases the demand for UK wood and is helping to regenerate woodlands. The wood is silky and provides a gorgeous finish.
Minimum lifespan: 50 years

Manufacturer: Vastern Timber
Distance: 14 km
Carbon from truck transport: **4.5 $KgCO_2e$**


Fig. 20

6 Hempspan Insulation

Hemp can be locally grown, with a 100 day full life span, making hemp insulation highly sustainable. It also has excellent insulating properties and durability. Although other insulations have better thermal properties, the extra amount required is more than compensated in embodied carbon.
Minimum lifespan: 50 years

Manufacturer: Hempspan
Distance: 223 km
Carbon from truck transport: **14 $KgCO_2e$**
Carbon from train transport: **247 $KgCO_2e$**

Embodied carbon

Material Sources continued...


Fig. 21

7 Triple Glazing
(With argon infill and low e-coating)

Manufacturer: Fieger
Distance: 9 km
Carbon from truck transport: **246 $KgCO_2e$**


Fig. 22

8 Concrete

Manufacturer: Spanwright UK
Distance: 8 km
Carbon from truck transport: **1406 $KgCO_2e$**

Embodied carbon from production

	Embodied Carbon KgCO2e/kg	Requirement Kg	Embodied Carbon kgCO2e	Sequestered Carbon kgCO2e
Glulam	0.42	72,750	30,750	-119,300
Recycled Zinc	0.52	67,136	35,090	
CLT	0.32	197,123	64,240	-323,280
Reclaimed Red Brick	0.24	231,930	55,800	
Brimstone sycamore timber cladding	1121* *using KgCO2e/m^3	5.29 (m^3)	5,940	-4,960
Hempspan insulation	0.19	43,879	8,600	-13,670
Glazing (triple glazed unit)	96* *using KgCO2e/m^2	663 (m^2)	63,630	
Concrete	0.107	1,650,820	178,040	

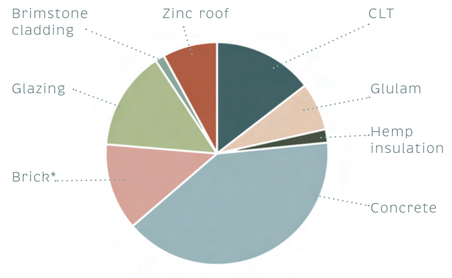
Total Embodied Carbon:
(Transport + production + 30% for other materials)
574,715 kgCO2e

Per m^2: 290 kgCO2e

Including sequestration:
113,500 kgCO2e
Per m^2: 57 kgCO2e

Using guidance from The instutution of structural engineers: a brief guide to calculating embodied carbon, [26] individual estimates of primary materials embodied carbon have been calculated by hand.
The RIBA 2030 Targets of < 540 kgCO2e/m^2 [27]have been far exceeded, suggesting that even under more rigorous analysis, the building would still fall far under this target.

Summary of relative total carbon:



* standard brick embodied carbon measurments have been used, not reclaimed, in order to take a more conservative approach.

Detailed Section

1: 75 @ A3

0 1 2

Detailed Elevation

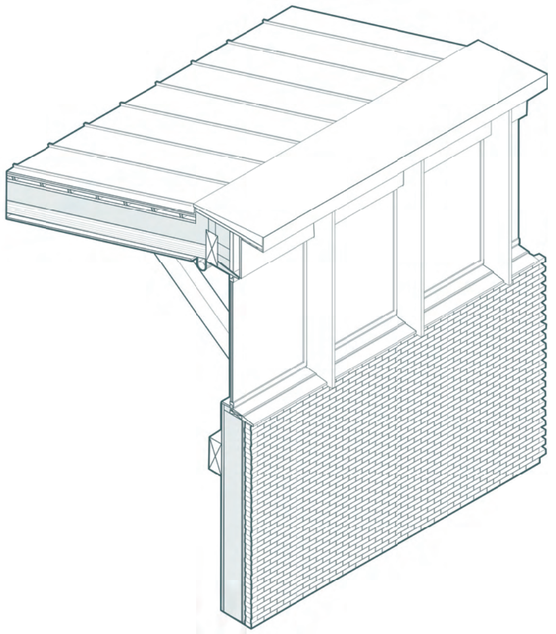
1: 75 @ A3

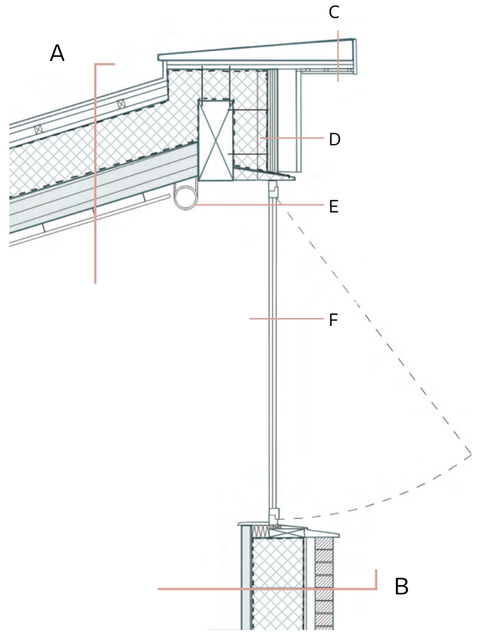
0 1 2

Junctions

Clerestory window and brick clad wall

1: 25 @ A3





A **Zinc Pitched Roof**
0.8 mm Zinc sheeting with standing seam (25mm)
18 mm OSB sheathing
Timber battens at 400 mm centres
Waterproofing membrane
250 mm Rigid hemp insulation
VCL
150 mm 5 ply CLT
Cork acoustic panels with a resilient clip
400 x 180 mm primary Glulam Beam

B **Brick clad wall**
112.5 mm Swindon reclaimed brick
wall ties at 400 mm centres
vertically, 600 mm horizontally
50 mm Air gap
Waterproofing membrane
10 mm OSB
300 mm Rigid hemp insulation
Vapour control membrane
60 mm 3 ply CLT
400 x 180 mm primary Glulam column

C Precast coping with timber flashing attached underneath

D 60 mm CLT with brimstone sycamore clipped

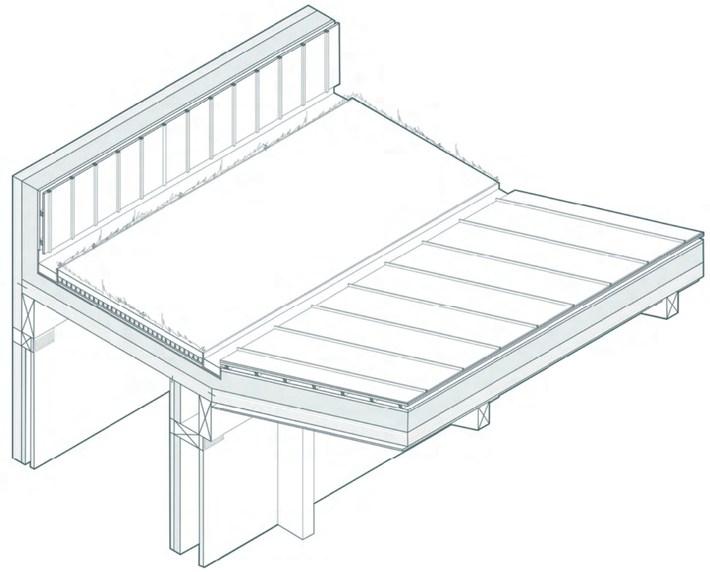
E Roller blind

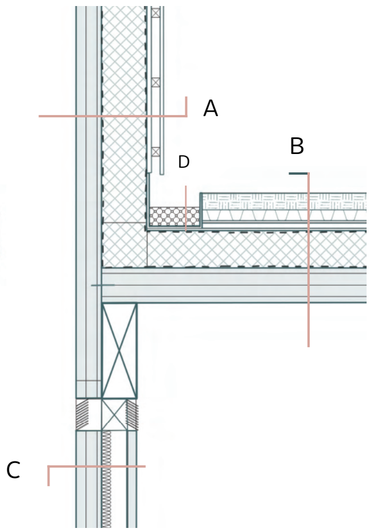
F Triple glazing with argon infill and low e coating with timber finish frame

Junctions

Timber clad wall and green roof

1: 25 @ A3



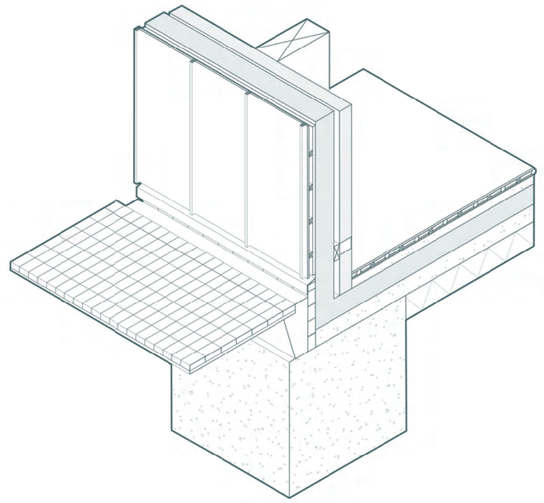


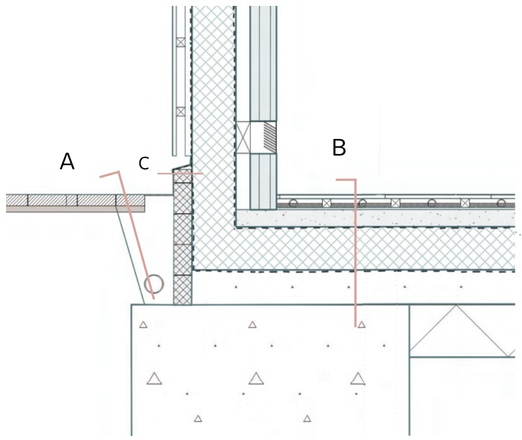
A **Timber-clad Wall**
Brimstone sycamore Timber cladding
Horizontal timber battens on vertical timber battens
Waterproofing membrane
10 mm OSB
260 mm Rigid hemp insulation
Vapour control membrane
150 mm CLT
700mm x 300 mm Primary Glulam columns

B **Green Roof**
Semi- intensive planting
110 mm Substrate
Filter fabric
100 mm Attenuation cells
Eco mat Protection layer
Root barrier
Waterproofing membrane
250 mm Rigid hemp insulation
VCL
150 mm CLT
300 x 180 mm Primary Glulam beam

C **Internal wall**
150 mm CIT
50 mm Hemp acoustic insulation
100mm Service gap with 100 m x 100mm Mechanical ventilation ducts
40 mm CLT

D Gutter with gravel channel





A **External surface**
External paving at a 1: 60 fall
Mortar bed
Gravel with drain

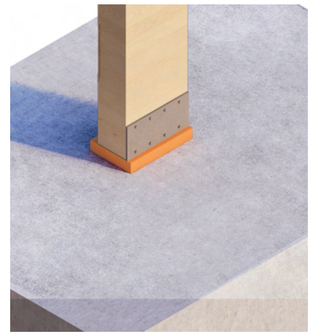
B **Sprung floor**
Oak flooring
Softwood battens at 400 mm centers with Insulation and underfloor heating in between
Resilient foam strip
VCL
60 mm Screed
250 mm Rigid hemp insulation
150 mm Concrete slab
150 mm Hardcore
1600 x 1600 mm pad foundation

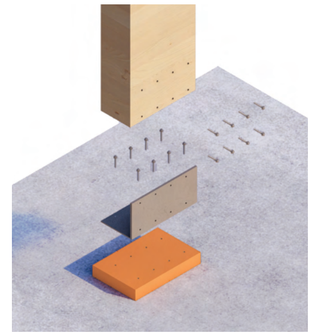
C Alumium flashing over blockwork

Junctions

Floor build up

1: 25 @ A3





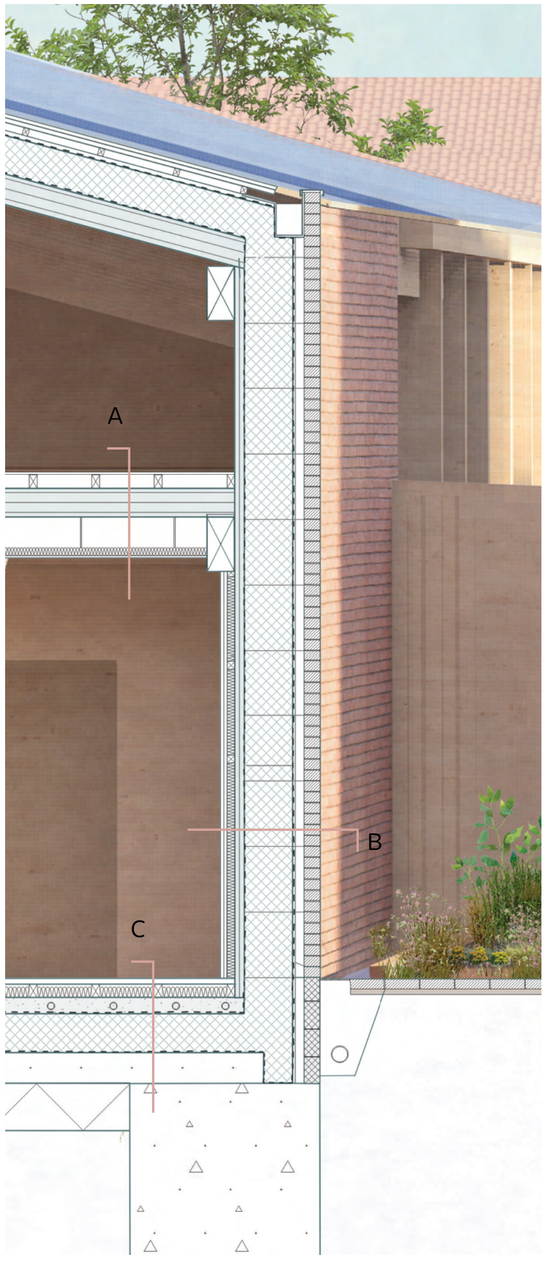
Glulam floor join

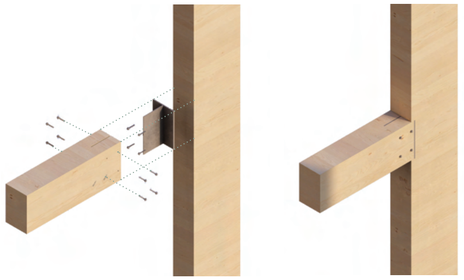
Using Amatherm 500 thermal break, the glulam column sits upon the concrete whilst not breaking the thermal line. A steel L shaped plate bolts the two elements together , while bolting to the concrete foundation.

Junctions

The education building

1: 25 @ A3





Glulam beam to column

A steel plate is also bolted to the column. Then is inserted into the glulam beam and bolted from either side.

A **Intermediate floor**
Oak flooring
Timber battens at 400 mm centres with servicing in-between
150 mm 5 ply CLT deck
Resilient clip with servicing in-between
50 mm Hemp acoustic insulation
10 mm Cork panels

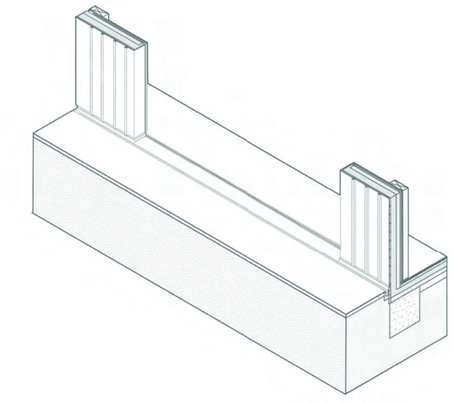
B **Acoustically treated wall**
112.5 mm Swindon reclaimed brick
50 mm Air gap
Waterproofing membrane
10 mm OSB
300 mm Rigid hemp insulation
Vapour control membrane
60 mm 3 ply CLT
50 mm Hemp acoustic insulation in between timber battens at 400 mm centers
20 mm Nano clt

C **Acoustically treated floor**
Oak flooring
Softwood battens at 400 mm centers with acoustic insulation in between
60 mm Screed with underfloor heating
VCL
250 mm Rigid hemp insulation
150 mm Concrete slab
150 mm Hardcore
1200 x 1200 mm pad foundation

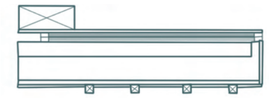
The Roda

Retracting doors

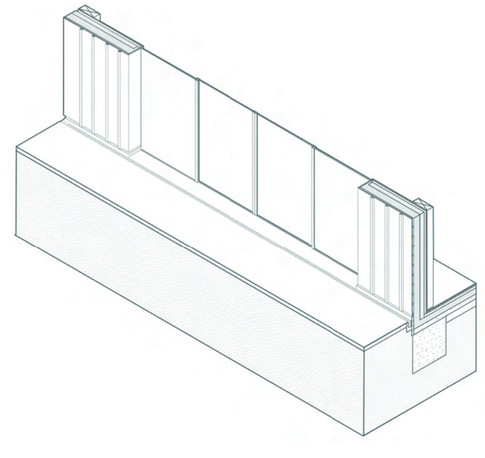
The Roda door exists in several states, closed (maintaining a thermal line), open to various degrees (depending on user preferences) or completely retracted into the wall (creating a seamless transition between outside and inside).



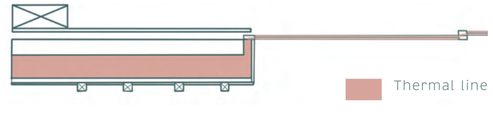
Completely retracted Roda door



An enclosed CLT pocket houses the door when it is completely open, creating a seamless transition from inside to out. Vitrocsa Minimal glazed sliding doors will be utilised, being triple glazed, with a minimal frame. The floor frame sits flush with the ground, creating a level access as specified in Part M. The doors are available up to 6m in height, allowing the 4400mm tall element to be built.



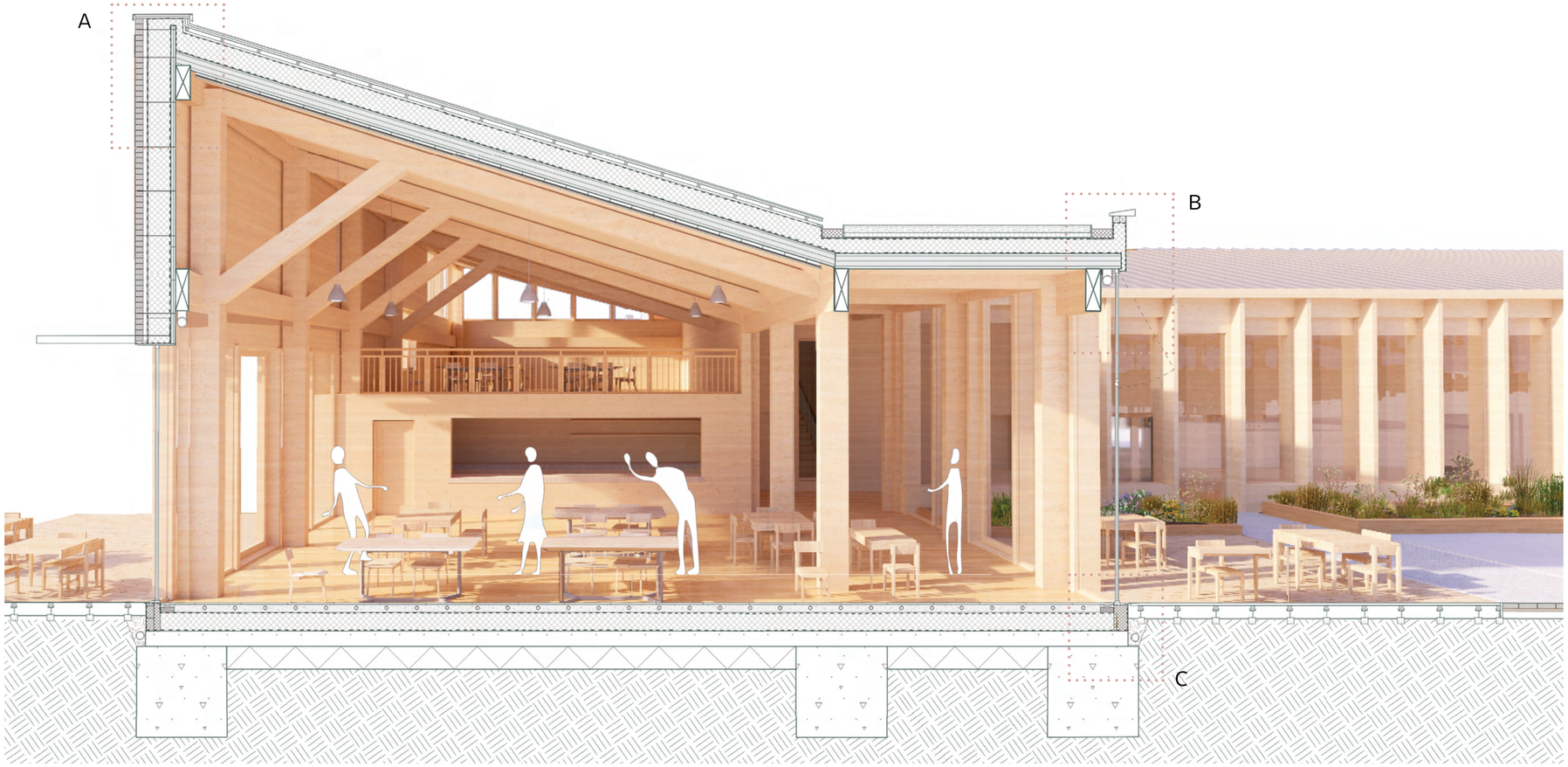
Closed Roda door



When closed, the tracks and frames are thermally broken to ensure no thermal bridging. Insulation wraps around the CLT to ensure that the thermal line is maintained.

Cafe Detailed section

1:50 @ A3



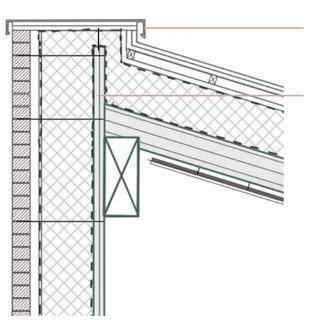
Detailed elevation

1:50 @ A3

Junctions @ 1:25

0 1 2

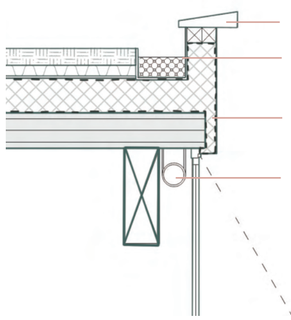
A Brick parapet



Zinc coping on 60 mm CLT deck

Extended 60 mm CLT to form parapet

B Green roof parapet



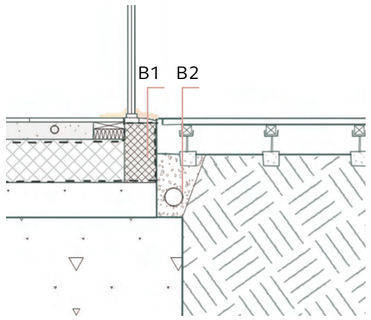
Precast coping

Aluminum gutter with gravel

Rigid hemp insulation wraps over clt deck to avoid thermal bridging

Roller blind hidden behind beam

C Interior to exterior floor



B1 Timber decking
Timber joists at 400 mm centers
Saddle
Concrete footing
Gravel with drain

B2 Stone sill with 15 mm fall
Insulating thermoblock

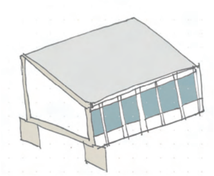
Environmental Strategy

Overview

Overall strategies

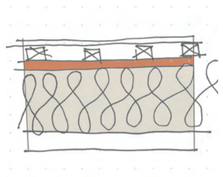
Passivehaus principles

Using continuous insulation to prevent thermal bridging, airtight details to prevent infiltration and low u values to prevent fabric heat loss.



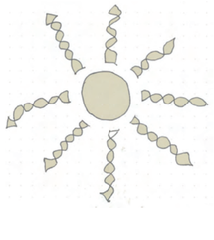
Fabric First

Choosing local, sustainable and durable materiality. Using materials with low embodied carbon whenever possible.



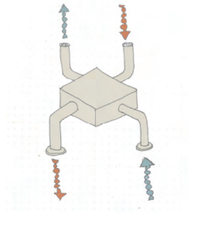
Considered Orientation

Each space's orientation is considered for lighting/ shading requirements and to exploit the suns energy for solar gains.
The form is shaped to produce minimal overshadowing in external spaces.



Appropriate technologies

Each space has been evaluated for its needs. PVs for electric, a ground source heat pump and MVHR system for heat recovery have been implemented for the environmental demands, reducing operational carbon.

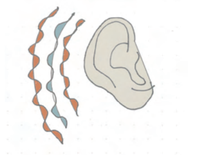


Maximising Biodiversity

Landscaping strategies and areas of green space have been preserved and enhanced, increasing diversity and mass.

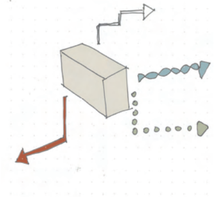
Integrated acoustics

Areas with high acoustic requirement have been identified and designed accordingly, using appropriate materials for reverberation and acoustic isolation.



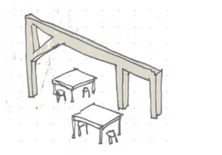
Efficient servicing

Plant space lies right beside the most highly conditioned spaces, minimising networks.



Flexibility

The spaces are designed for re-use, adaptation and a long life span. Ease of disassembly, and an open grid ensures these principles.



Design approach

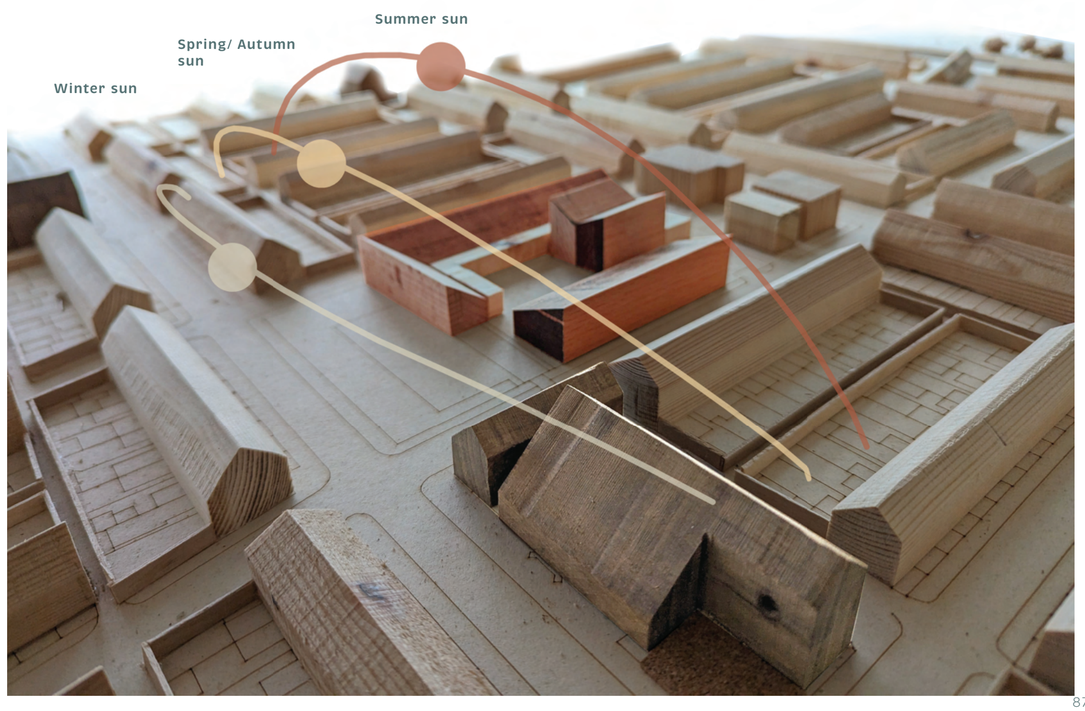
Form and Orientation

The design of the form prioritises the placement of the highest building to the north, while the surrounding smaller buildings are carefully placed to prevent excessive shading in the courtyard. The community green space is situated to the south, ensuring ample sunlight throughout the area. The roof also slopes inward, towards the courtyard, facilitating increased sunlight penetration into the courtyard area.

Form Factor

Primary building	Music & education building
Total heat loss area/ Total floor area 4,961/1,654 =**2.94**	Total heat loss area/ Total floor area 1852/836 =**2.22**

The form factors are not very low, due to a significant amount of double height space required, especially in the primary building. However, both buildings **sit below the passivhaus standard** of 3 [28].



Sectional overview

Environmental interactions: adapting according to the seasons

The systems in place allow for the users to adapt the Roda and studios to fit the required comfort level and the daily conditions. For example, over the duration of a high exertion capoeira session, windows can be opened, blinds adjusted and underfloor cooling turned on/ heating turned off to offset the heat produced.

1 Remote controlled clerestory windows can be opened for fresh air intake, creating effective cross ventilation across the Roda.

2 Internal blinds are remote user controlled to help prevent solar gain and overheating and reducing glare

3 Fins help shade the east and west facing clerestory windows, avoiding the harsh noon sun and allowing morning and evening sun into the Roda.

4 Artificial lighting sits at regular intervals across the ceiling, protruding from the acoustic panelling.

5 The Roda doors leading to the courtyard can be retracted into the wall to create buoyancy ventilation.

6 Inhabited walls contain mechanical ventilation ducts for MVHR. In winter, Stale air from the building is extracted and heat is transferred to the incoming air. In summer, the MVHR can operate on heat bypass mode.

7 User operated window can be opened for required fresh air. Remote user controlled clerestory can also be opened for single sided buoyancy driven ventilation.

8 Underfloor pipes can be used to have either underfloor heating or cooling as required, using a ground source heat pump.

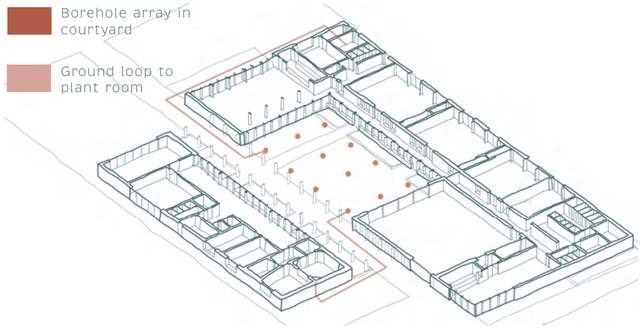
9 The fabric (apart from windows) all have u-values lower than 0.12, creating minimal heat loss or gain.

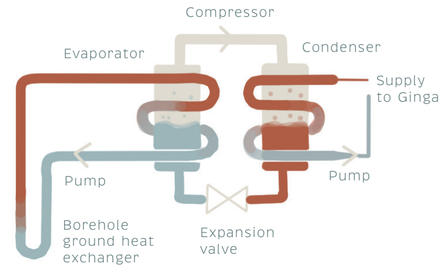
10 Deciduous trees mean that more shading will be provided in summer, whilst sun will be let into spaces in winter. Evapotranspiration will help cool and purify the air.

11 External brick will be used for thermal mass, storing and releasing heat.

12 Gutters will collect rainwater to be stored and used for toilets/ gardening.

13 Roof lights help illuminate the corridor.



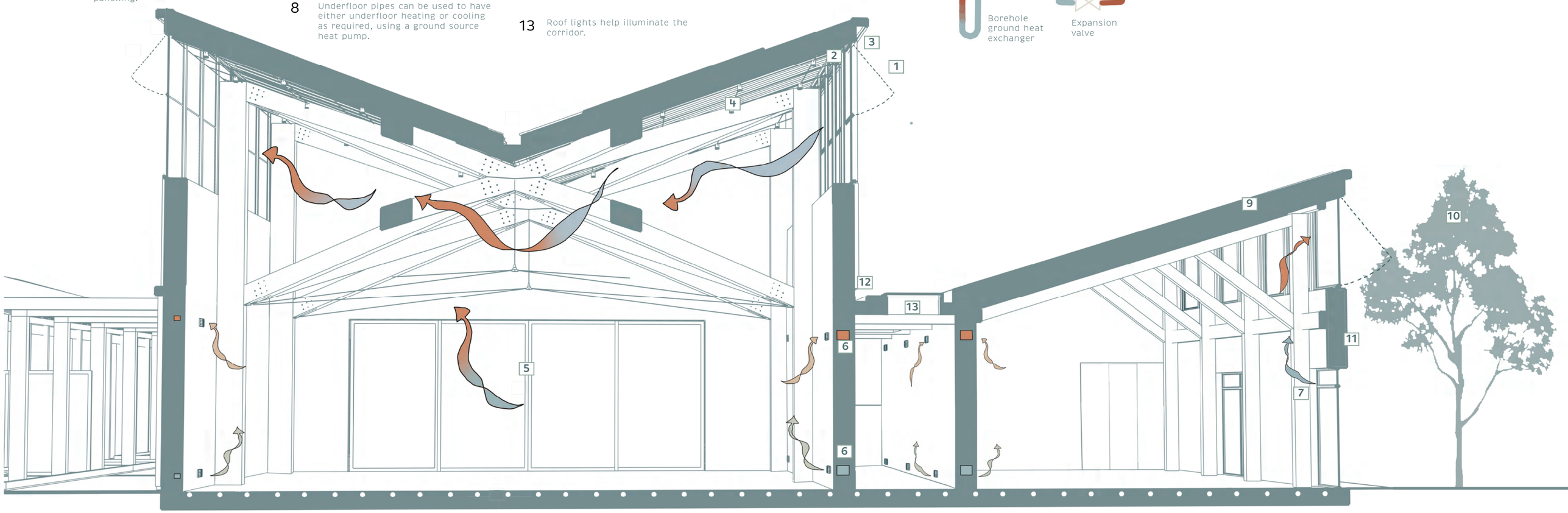


Heating/ cooling strategy

Excessive heating demands have been avoided via well insulated spaces with limited thermal bridging and MVHR provision. However, when required a ground source heat pump has been used due to its superior efficiency. A downside is that it requires a substantial amount of outdoor space, but the courtyard area supplies this perfectly.

A ground source heat pump with boreholes across the courtyard supplies heat in the winter and provides cooling in the summer. Vertical boreholes will be provided, as they are more efficient and take up less space than a horizontal system. They will be 60m deep in a regular arrangement across the courtyard.

The heat pump, powered by electricity generated by the PV's, compresses fluid to reach the desired temperature. This is then pumped through Underfloor pipework to supply the required heating or cooling demand. Underfloor heating and cooling ensures consistent, efficient and even distribution of temperature.



Lighting - Studio study

Day time - naturally lit

Clerestory glazing lines the top of the studio, allowing light to penetrate further into the depth of the studio (as shown), creating better light dispersal around the room.

A couple of floor to ceiling windows create visual interest, allowing inhabitants to view the surroundings and vice versa, whilst providing more immediate lighting.

The use of a large mirror at the end of the room, not only helps the users practice movement, but also reflects light around the room

These factors lead the Studio to have a daylight factor of **4.59 %,** meaning little to no artificial lighting will be needed in the daytime.

Using individually controlled lights mean the lighting can be set as desired by users- another method to encourage less electrical usage.

Night time- artificially lit

Servicing runs through the inhabited wall and up along CLT to provide wiring for the lights. This is hidden by the cork acoustic tiling suspended from the CLT deck. The lights sit in between, in the seams of panels, spaced across each structural bay.
The studio room requires 300 lux to be a well lit space for its function.

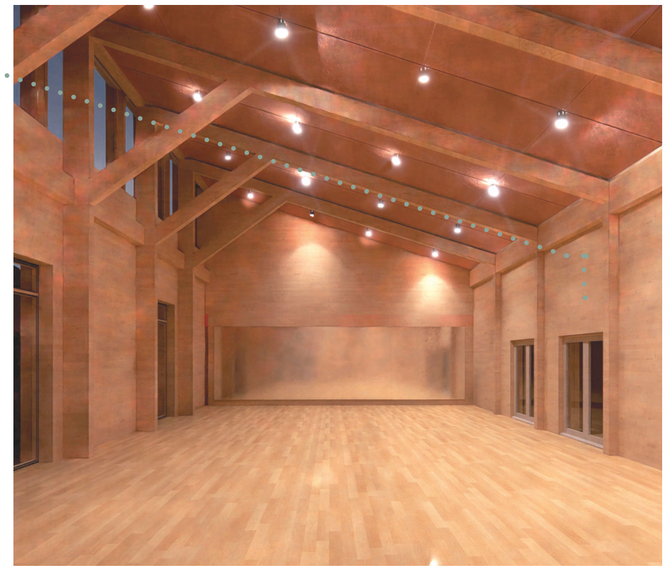
Lumens = lux X area

= 300 x 130

= 39,072 lumens required

Meaning 20 x 2000 lumen lights (20 W LED lights) will light the space well. This is provided with 4 lights per bay, across 5 bays.

Using LED lights will mean the lighting is more energy efficient and long lasting than regular light bulbs.



Similar methods of artificial lighting are used though other spaces such as the Roda, cafe and social hub.

Daylighting

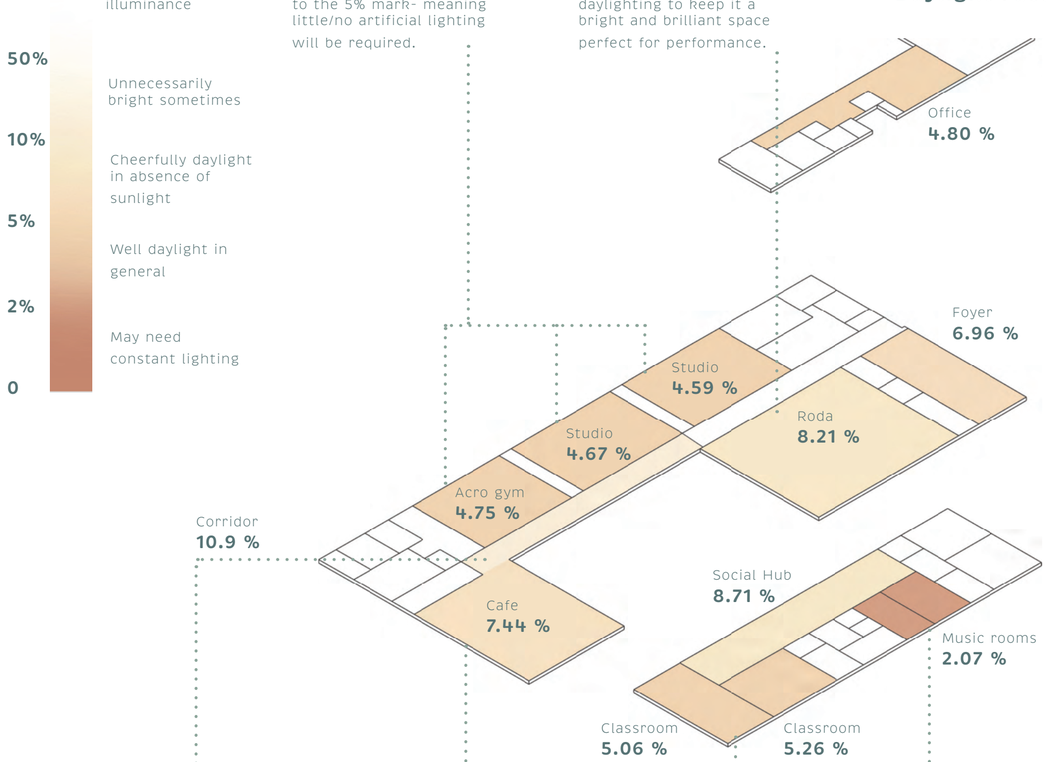
Daylighting has been prioritized throughout all spaces. Very minimal north glazing has been used in the building, with 6% of glazing facing that direction to prevent heat loss. The majority of the glazing lies of the South and west (close to 70%), capitalizing on the potential for solar gains and sunlight.

33% of the walls of the building are glazed, which is on the higher side of what is recommended, but still acceptable. This provides excellent daylighting factors in each room.

The average daylight factor over the working plane of each space has been calculated using the formula below:

$$DF_{wp} = \frac{T_{win} \times A_{win} \times \theta_{sky}}{A_{in} \times (1 - R_{in}^{\ 2})}$$

Daylight Factor



The studio spaces sit close to the 5% mark- meaning little/no artificial lighting will be required.

The Roda has great daylighting to keep it a bright and brilliant space perfect for performance.

The corridor is extremely well lit, almost an intermediate between the indoors and outdoors.

The cafe will be a brightly lit space with a high visual connection leading from the park to the courtyard.

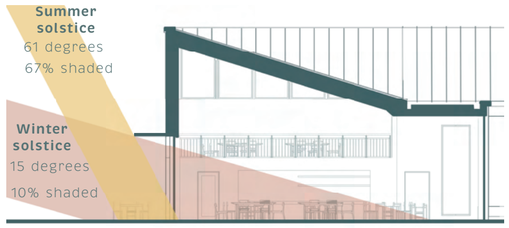
The classrooms both hit the 5% mark- meaning little/no artificial lighting will be required.

The music rooms just surpass the minimum recommended 2% daylight factor. This is purposeful, to allow enough daylighting for a comfortable space but also maximize the priority- great acoustics.

Cafe Study

South facing shading

Timber fins protruding from the brick provide solar shading on south facing windows. They shade most of the window area in the peak of summer, whilst allowing in significantly more winter light. This strategy should help reduce overheating and create a pleasant internal environment. The same strategy is used for the south facing glazing on the classroom.



Winter mode

The deciduous trees will be barren of leaves and the sun will be low, allowing plenty of sunlight into the space. Blinds will be rolled away and doors kept closed, with the MVHR providing ventilation. Underfloor heating will warm the space. Because of the limited hours with natural light, hanging lights attached to the CLT deck will illuminate the space when it is dark outside. Occupants will remain cosy inside.

Summer mode

The space will be mostly overshadowed by the fins and blinds, avoiding overheating and glare. the doors to the timber decking will be left open, allowing the prevailing south-west wind to run across the space, ventilating and cooling. Underfloor cooling can be turned on if necessary. Occupants can bask outside in the sunshine. With long sunlight hours, and a daylight factor of 7.44 artificial lighting will not need to be used.

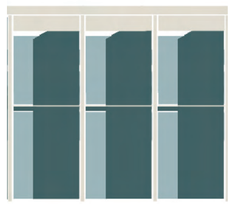
Shading strategy

Clerestory shading

A significant amount of clerestory glazing has been utilized through the design. Along with providing a method of ventilation, more clear-sky sight lines create less overshadowed lighting, light can be brought deeper into the plan and the amount of onlooking is contained.
A series of timber fins lie alongside the clerestory windows, which either face West-South-West or East-South-East. The fins, along with an overhang, are used as a shading device, shading the harsh noon sun and preventing excessive solar gains, whilst allowing morning and evening sun into the space. The Westerly fins have a greater depth as more shading is needed at 325 mm, whilst the predominantly east facing fins have a depth of 225.

West Facing clerestory

December 12 am



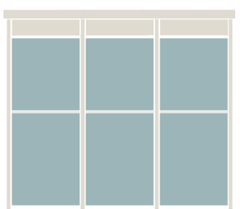
December 4 pm

June 12 am

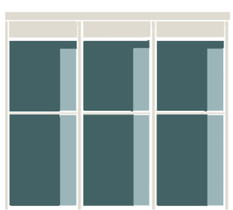
June 4 pm

East Facing clerestory

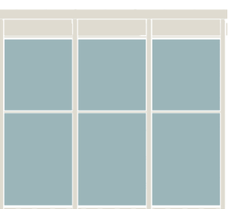
December 7 am



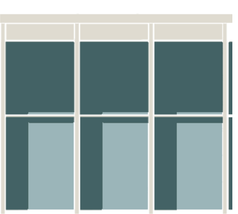
December 11 am



June 7 am



June 11am



Ventilation: Natural

Natural ventilation will be window based, and mostly only suitable in the shoulder seasons and summer, due to the warmer external temperatures. Using natural ventilation is suitable throughout the building due to minimal noise disturbance and good surrounding air quality from a lack of vehicles.

Cross ventilation

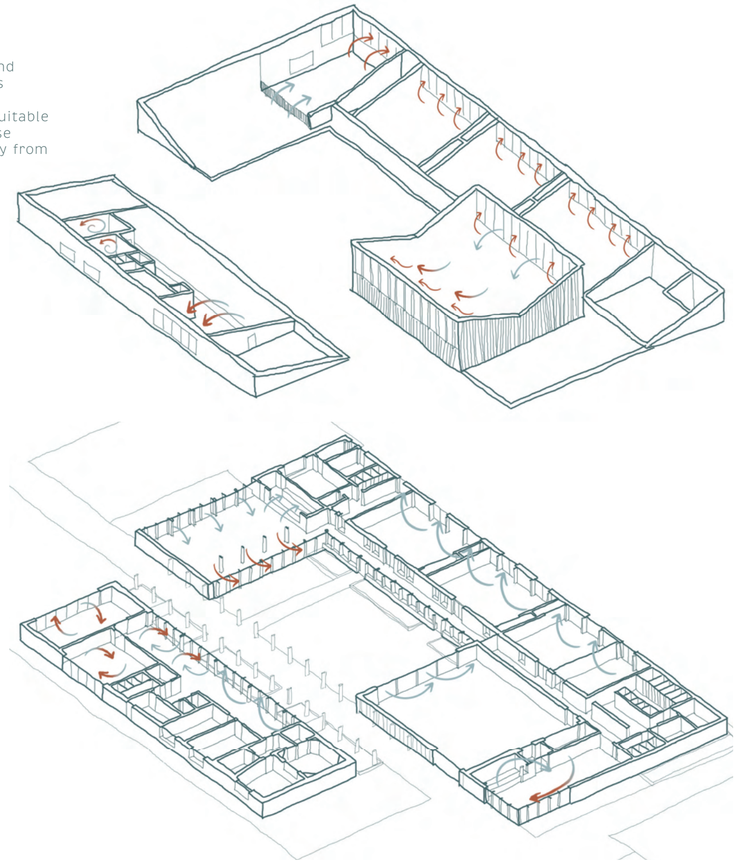
Used in larger spaces stretching across two exterior walls such as the cafe, Roda and social hub to office transition.

Buoyancy driven ventilation

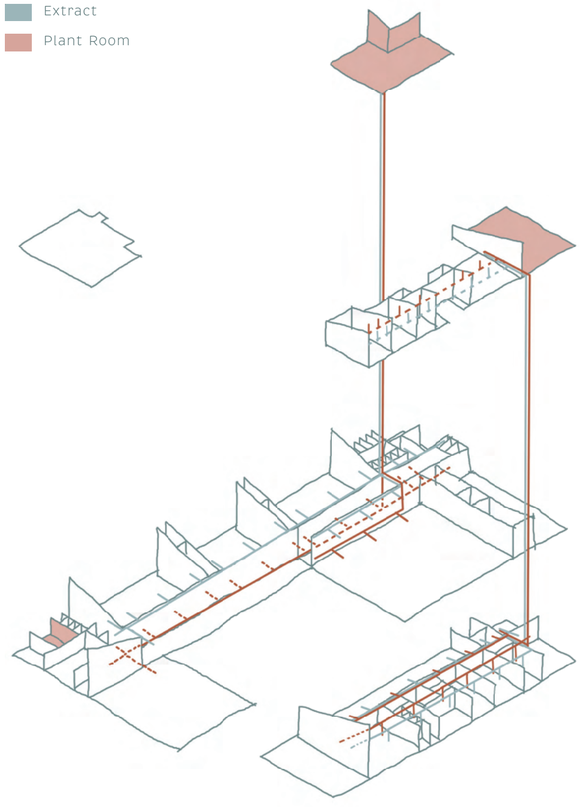
Used in spaces with high ceilings that require a significant amount of ventilation, such as the studios and Roda.

Single sided ventilation

Primarily used in the smaller spaces such as classrooms, meeting rooms and the foyer. Many spaces may also choose to utilize this option by only opening some windows when limited ventilation is required.



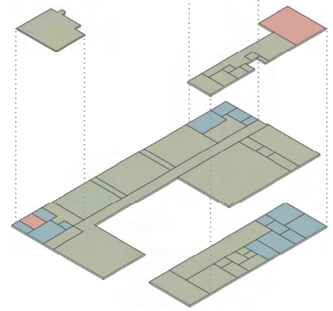
Supply
Extract
Plant Room



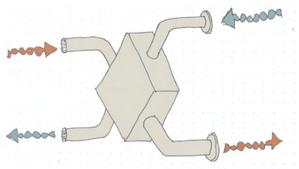
Ventilation: Mechanical

Three plant rooms service the building, each sits next to spaces that require the most mechanical intervention.
Although almost all spaces use mixed mode ventilation systems, allowing seasonal adjustment and providing adequate provisions for the needs of exercise spaces. Some specialised areas only use MVHR, such as the music spaces to ensure optimal acoustics, or toilets, shower and kitchens, to meet high standards of cleanliness and hygiene.
In winter, MVHR systems will be used for heat recovery and thermo-regulation. In summer, fan coils will cool the fresh air and the heat exchange process will be bypassed.
In the primary building, this will occur via vents in the inhabited walls running as a spine through the building and servicing all rooms and corridors.
In the education building, suspended ceilings will house vents for the rooms below, whilst the mezzanine level is serviced by a raised floor.

Mixed mode ventilation
Mechanical ventilation
Plant Room



MVHR
The MVHR unit enables fresh air to be distributed throughout the building without excessive heat loss. This occurs via a heat exchanger, which takes the heat from the stale air being extracted and transfers it to the fresh air being taken in. This greatly reduces ventilation heat loss, and helps maintain a comfortable temperature without excessive energy use.



Ventilation: Roda study

1 Cross ventilation

This is the primary ventilation option, with either side of the clerestory open to allow the south-westerly wind to drive air across the space.

Area of ventilation opening=

$$A = \frac{q}{CU}$$

= 2.7 / 0.03 x 10
= **9 m²**

The cross ventilation openings (clerestory) in the Roda exceed this at 12 m², creating effective cross ventilation through the space.

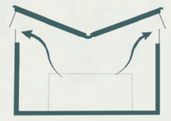
2 Buoyancy driven ventilation

This will be the most effective form when the most ventilation is required, with all openings fully open. The height of the space makes it especially efficient.

Area of ventilation opening=

$$A = \frac{q}{C_d}\sqrt{\frac{T+273}{\Delta T g h}}$$

=2.7/0.61 sqrt(23+273)/(5x9.81x3)
=**6.27 m²**
Wind from the south west, will drive air through the door opening and leave via the clerestory openings. The opening area required is far exceeded, creating effective ventilation.



3 Mechanical: the inhabited wall

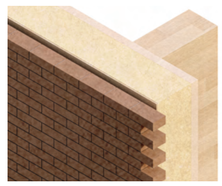
The Roda walls will house input and extract ducts that the MVHR unit will provide fresh air for. Mechanical ventilation will be favoured in winter to reduce heat loss and heating demand.

Fabric Performance

Walls

U- Values

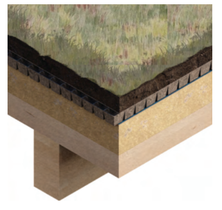
Brick rain screen	d	^	r	U=1/∑r
Reclaimed brick	0.1125	0.73	0.153	
Air gap	0.5			
Waterproofing membrane	0.004			
OSB	0.01	0.13	0.0769	
Rigid hemp insulation	0.3	0.038	7.89	
Vapour control membrane	0.006			
CLT	0.04	0.12	0.3	
Glulam frame				**0.118**



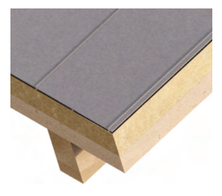
Timber-clad	d	^	r	
Timber cladding	0.01	0.14	0.0714	
Vertical timber battens	0.024	0.1154	0.21	
Waterproofing membrane	0.004			
OSB	0.01	0.13	0.0769	
Rigid hemp insulation	0.26	0.038	6.67	
Vapour control membrane	0.006			
CLT	0.04	0.12	1.25	
Glulam frame				**0.118**

Roof

Green Roof	d	^	r	
Planting	n/a			
Avg. substrate	0.25	0.2	1.25	
Filter fabric	0.004			
Attenuation cells	0.1			
Protection layer	0.004			
Root barrier	0.004			
Waterproofing membrane	0.006			
Rigid hemp insulation	0.25	0.038	6.58	
VCL	0.004			
CLT	0.15	0.12	1.25	
Glulam frame				**0.110**

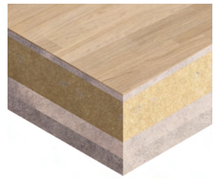


Zinc Roof	d	^	r	
Zinc standing seam	0.008	110	0	
OSB sheathing	0.018	0.13	0.138	
Timber battens	0.024	0.1154	0.208	
Waterproofing membrane	0.006			
Rigid hemp insulation	0.25	0.038	6.57	
VCL	0.004			
CLT	0.15	0.12	1.25	
Cork acoustic panels	0.05	0.034	1.47	
Glulam frame				**0.103**



Floor

Sprung floor	d	^	r	
Timber flooring	0.01			
Softwood battens	0.024			
Insulation	0.025	0.12	0.0833	
Resilient foam strip	0.08	0.1154	0.208	
VCL	0.004	0.034	0.735	
Screed	0.6	0.0446	1.79	
Rigid hemp insulation	0.25			
Concrete slab	0.15	1.1	0.545	
Hardcore	0.15	0.038	6.41	
		1.33	0.113	**0.100**



Regular floor	d	^	r	
Timber flooring	0.01			
VCL	0.004			
Screed	0.6	0.12	0.0833	
Rigid hemp insulation	0.3			
Concrete slab	0.15	1.1	0.545	
Hardcore	0.15	0.038	7.69	
		1.33	0.113	**0.116**

Heat loss & gain

Fabric heat loss

Ventilation heat loss

Total heat loss

	Element	U-value	Area	Heat loss	whole building:	Average air change (Using self calculated values)	Volume	Heat loss	with MVHR (Assumed 80% recovery)	
Primary building	Brick wall	0.118	738.5	87.3						
	Timber wall	0.118	428	52.2						
	Window	0.800	663.5	520						
	Sprung floor	0.100	657	65.8						
	Regular floor	0.116	779	90.2						
	Green roof	0.110	401	44.3						
	Zinc roof	0.103	1177	121.0						
					981 WK $^{-1}$	2.83	10,232	9654 WK $^{-1}$	1931 WK $^{-1}$	2,912 WK $^{-1}$
Music & education building	Brick wall	0.118	550	65						
	Window	0.800	204	163.2						
	Regular floor	0.116	544	63						
	Zinc roof	0.103	563	57.9						
					349 WK $^{-1}$	5.18	3,611	6235 WK $^{-1}$	1247 WK $^{-1}$	1,606 WK $^{-1}$

Casual Gains

	Primary building	Educational building
People (Assuming a thermal output of 400 while exercising and 100 while resting)	Occupancy x opening hours x person output	
	324 x 12 x 300	131 x 10 x 100
	1166 kW	131 kW
Lighting	No. of lights x period of lighting x thermal output	
	45 x 9 x 50	27 x 7 x 50
	20 kW	9 kW
Total	(People + Lighting) / 24	
	(1166 + 20) / 24	(131 + 9) / 24
	49 kW	**6 kW**

Solar Gains

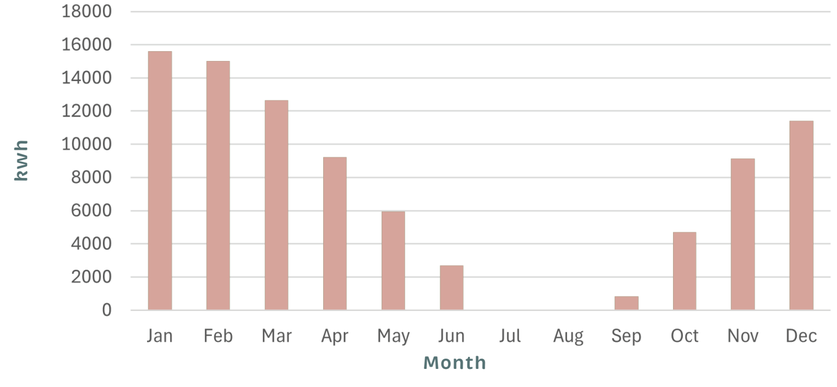
	Sunlit area of glazing x mean solar intensity x solar gain factor	
	443 x 0.67 x 162	204 x 0.67 x 162
	48 kW	**22 kW**
Total	**97 kW**	**28 kW**

Heat loss has been reduced through achieving passivehaus u-values (all under 0.12) and details have been created to minimize heat loss through thermal bridging. However, the majority of heat loss occurs via the glazing. Triple-glazing with argon infill is used to minimize the extent of this and performs far better that other options.

LETI standards for schools specify: Maximum 10 W/m² peak heat loss (including ventilation).[29] Ginga exceeds this at **8.69 W/m²** or 2.27 W/m² including MVHR, Falling far under LETI standards.

Heating Demand

To heat the building to 18 degrees, using the monthly average temperature in Swindon



Renewable

Solar

All the west-south-west facing roofs will be equipped with solar panels, covering 78% of the roofs in this orientation, and 27% of total roof area. Although not as efficient as south-direct facing roofs, the westerly orientation and roof pitch, produce 91% of optimal output. The east facing roofs could also be equipped with solar panels if desired, but their efficiency would be lower at about 78% of optimal output.

Using Rheinzinc PV,[30] the solar panels will be flat mounted onto the zinc cladding, parallel to the roof, becoming virtually visually seamless to onlookers. They will use a seam and module clamp attached to the zinc double standing seam, ensuring quick and easy assembly.

PV's have very high upfront embodied carbon, which is an important consideration. If electricity utilized was guaranteed to come from hydro, nuclear or offshore wind turbines, a smaller carbon footprint would be guaranteed. However, this is impossible to determine, and after about 6 years the PV's will offset their own embodied carbon, before proceeding to offset other materials (full breakdown on page 72-73) along with covering operational energy.

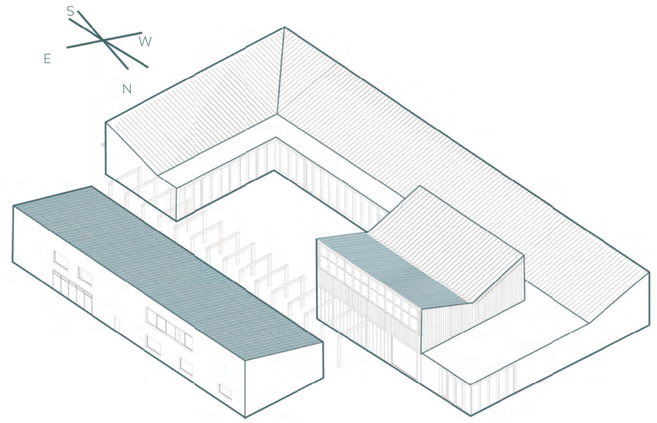
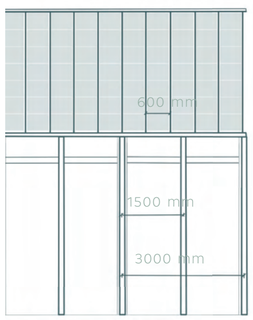


Diagram indicating portion of roof with solar panels

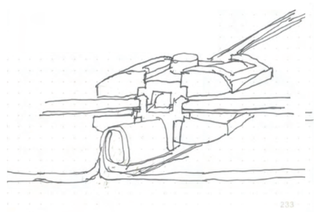
Total panels required (using Rheinzinc 530 x 1640 panels)	657
Efficiency (using 20 degree pitched roofs and 74 degrees south-west facing)	0.91
Pv rating (Wp)	150
UK daylight levels (kWh of electricity per kWp system size, per year)	858
Generated electricity (kWh/ year)	**76,950**

Elevation diagram of education building



Rheinzinc 530 x 1640 panels clip in between 600 mm standing seam zinc roof, seamlessly slotting into the rhythm of columns 3000 mm apart and the fins at half that. The roofs allow 7 layers of vertical panels on the education building roof and 5 on the Roda roof.

Rheinzinc pv clip [30]



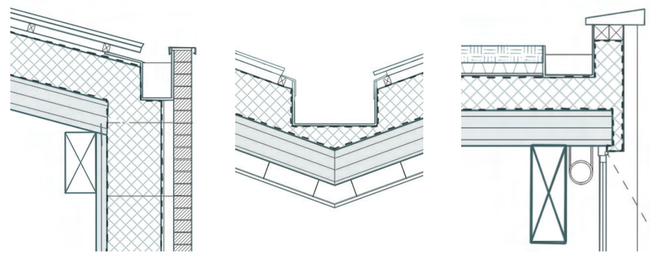
PV's seam and module clamp attaching to the zinc standing seam

Water management

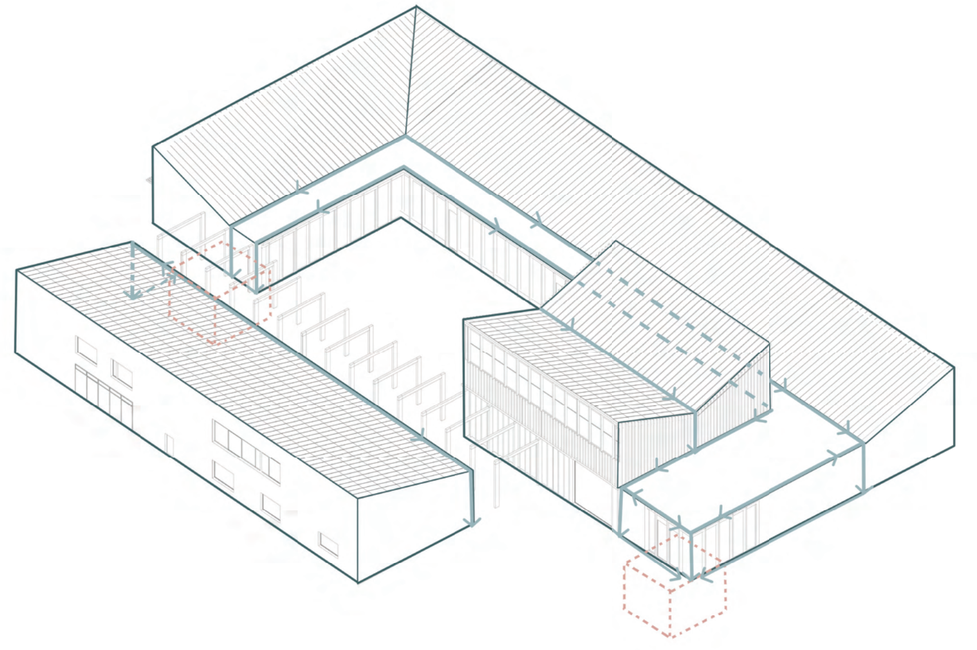
Rainwater is collected into 2 attenuation tanks, 1 to the arrival zone by the foyer, and another one in the courtyard by the cafe. Beneath the courtyard. The collected water can then be used to flush toilets and water plants.

Roof area (m^2)	657
Average rainfall in Swindon (mm)	766
Runoff coefficient	0.9
Filter efficiency	0.9
Water collected per year (L)	**1,328,400**
Water collected per day (L)	**3,640**

If a toilet requires 4L of water per flush, the water can be used for 910 flushes per day. If the maximum occupancy is taken as 455, everyone can use the bathroom twice using rainwater!



Gutter detailing across the building



Acoustics

Acoustical treatments

Fig. 23

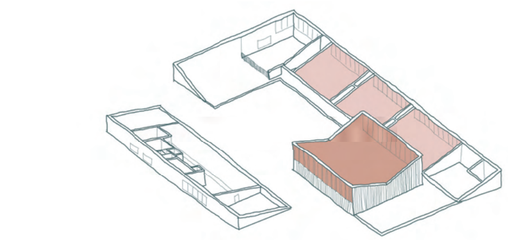
Why cork?

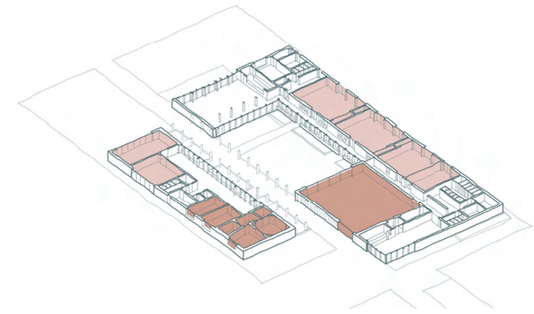
Cork panelling acts as the main acoustic treatment in each space. Cork has excellent sound absorbing properties, and is particularly good at absorbing the common frequencies of a human voice. It is very durable and a great insulator. Most importantly, it doesn't require high-energy processing. Harvesting cork is one of the most sustainable forestry practices in the world, as stripping cork actually benefits the health of the tree. The material itself is both recyclable and biodegradable.

Fig. 24

Glulam

The exposed glulam frame also assists in breaking up the spaces, helping scatter acoustic frequencies and preventing unwanted echoes.





High acoustic requirements

Moderate acoustic requirements

To an extent, the spaces are grouped according to their acoustical requirement. For example, the music spaces (practice rooms and recording studio) lie together with heavy acoustical treatments helping to acoustically isolate the spaces.

Reverberation times in the most acoustically key spaces

	Isolation booth	The live room	Control room	Music room	Roda
Ideal time	< 0.5 s	< 0.5 s	0.3 - 0.4 s	<0.5 s	1.5 - 2
Reverberation time (Using absorption coefficients at 1 kHz)	0.31 s	0.42 s	0.36 s	0.42 s	1.52 s

All rooms sit in the ideal reverberation times, due to considering the materiality and adapting it accordingly. For example, extra acoustical wall panels were added in the control room to meet the requirements. This ensures good acoustical properties in the space.

Looking towards the future

Year 0
2027

The building has finished construction. Many lessons and activities are underway, and it is a bustling community hub. The building is operating at zero operational carbon to reach the 2030 target.

Year 10
2037

The new trees will grow and establish their presence and community park will develop ecologically, providing a better green space for the community.

Year 50
2077

Replacement of timber cladding will likely be necessary, which can be recycled and used to produce CLT or other timber products. Temperatures will have risen, requiring more cooling demand, cooling methods will be fitted (hopefully new effective sustainable solutions!) to deal with this. Trees and planting will be mature providing greater shade and air quality.

Year 100
2127

The building might be tired and ready for deconstruction, or it might still have a few years left in it. The Brick rain-screen can be deconstructed and once again be used as a reclaimed building material. Glulam and CLT will be easily dissembled, and re-purposed or modified as needed. Concrete foundations can be reused for another building, or crushed to produce more concrete.

Reuse

The future is unknown, therefore Ginga has been designed for flexibility and reuse. There is plenty of opportunity to expand the building- into the park or infill section. The open timber frame allows for the spaces to be reused in many different forms. This may be reducing the double height space to increase floor area or partitioning more rooms. Lots of the spaces are already very flexible. The studio spaces themselves could become classrooms, offices or fulfil the needs of most functions without any alteration.

?

Ginga in the future?

Regulatory Compliance

Part B- Fire

Overview

This building has been designed in accordance with **Approved Document Part B,** and most closely classifies under **Purpose Group 5- Assembly and Recreation**.

B1 Means of Warning and Escape

The whole building is primarily single story, enabling lots of double height spaces and interesting roofscapes, but also allowing for easy escape in the case of fire.

An electrically operated fire alarm system will be provided, which can be triggered by users upon the detection of fire by sight or smell.

All escape routes are over 1500 mm with clear signage, lighting and doors always opening in the direction of exit.

On the ground floor, all rooms are under 18m of an escape route. The Roda and cafe, the only rooms with an maximum occupancy over 60, have 2 escape routes under 18 m distance of travel and over 45 degrees from each other in any position.

The first floor in the education block has one escape stair in the centre, with a horizontal escape width of under 18 m in each direction. Both other stairs in the primary building fall far under the escape distance of 18m, only serving one room. Having a single escape stair is permitted as no storey has a floor level above 11m and it is allowed only a single escape route.
Refuges are provided with in the stair enclosure, and exceed the minimum 900 x 1400 mm in size, equipped with an emergency voice communication system.
The escape stairs are in a protected stairway, with stairs 1200mm, far exceeding the occupancy requirement.

Once evacuated, users will gather at assembly points 15m away, either by the church or the infill section of the site by Manchester road.

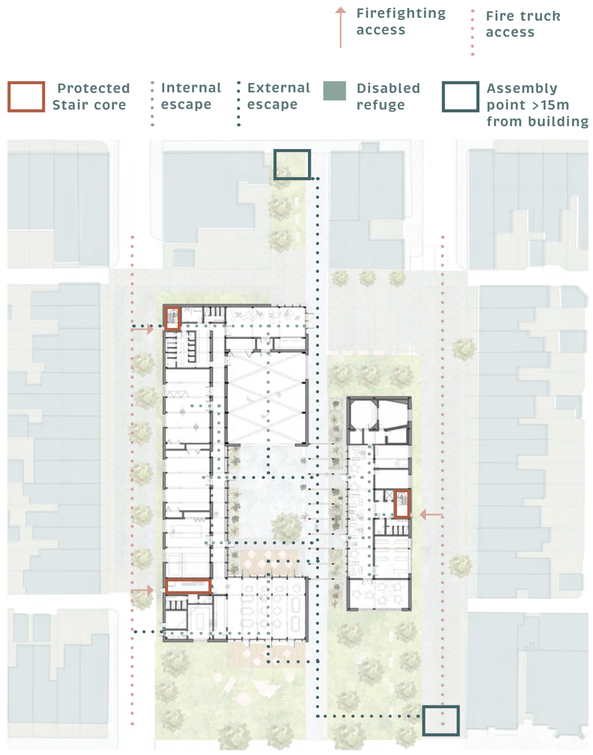
B12-4 Fire Spread

Being a predominantly timber structure, sprinklers are not needed as the building is below 18m tall and the floor area does not exceed 7000 m^2.
All internal CLT has been treated with Class 0 clear Flame retardant oil.
Cavity barriers close external brick walls at edges and openings.
Sufficient space between buildings means that fire should not spread from one building to another.

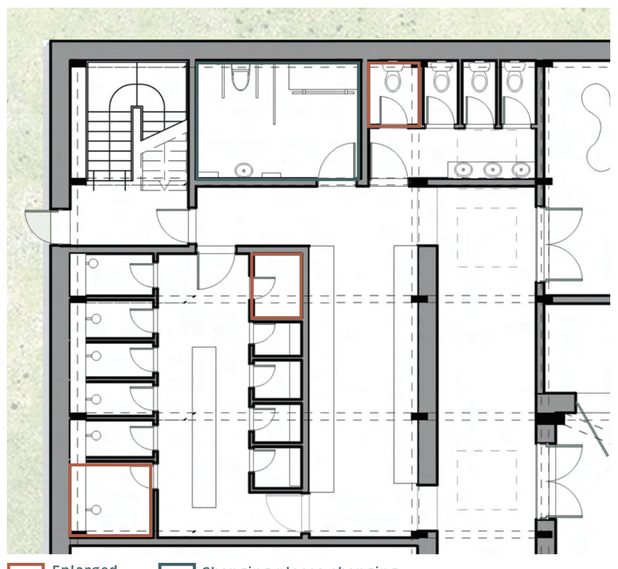
B5 Access & Facilities for the fire service

Vehicle access for a pump appliance is provided to over 15% of the perimeter, down both gladstone st and salisbury st.
The only elevation over 60m with vehicle access, has two doors at either end, whilst the shorter elevations have 1.

No dedicated fire fighting stair or lift is required.



Part M- Disabled access



Access to site

Visitors can reach the site entrance from the site boundary easily, it lies next to provided accessible parking spaces. The routes are clearly defined and well lit.

The entrances are signposted and easily recognizable, with doors wider than 1000 mm.

The site is entirely level, therefore the need for external ramps or stairs is avoided. All access routes are sufficiently wide, with a surface width above 1.5 metres and a clear height of 2.1 meters. The surfaces are smooth, durable and slip resistant to reduce the risk of slipping and falling. The joins between materials are no greater than 5mm.

The danger of walking into a vehicular access zone is heavily reduced due to the pedestrianization of surrounding streets.

Stairs

Stairs inside the building are not less than 1.2m in width, made of a non-slip material and have continuous handrail support. The handrails contrasts with the wall and meets the dimensions necessary. The nosing are made apparent by a permanent contrasting material 55mm wide on both the tread and the riser. rise and going is consistent.

Horizontal and Vertical Circulation

The reception is easily accessible and visible from external access doors, with clear manoeuvring space around the area.
Corridors often have columns projecting into them, but they are made obvious by contrasting the materials around them. No doors project into corridor space .
Good lighting and acoustic design, including high daylight factors and recommended reverberation times, make it easy for those visually or auditory impaired.
A passenger lift is provided where necessary, alongside stairs, that measures over 2000 by 1400 to accommodate any wheelchair at 2000 by 2300. 1.5 m turning circles have been respected throughout.

Facilities

The facilities provided will all be usable by wheelchair users. For example, the Roda, used for spectator-ship is level and individuals will be able to manoeuvre to a desired position.

Sanitary

Adequate provision of disabled unisex toilets are made, with one at each location of sanitary facilities. Enlarged cubicles for each provision are included and will also be useful to families and those who need a larger space.

A changing space toilet is provided by the changing areas, meeting the necessary requirements.

Designing for Exercise

Approved Document F- Ventilation

Volume 2: Building other than dwellings

There will be adequate methods of ventilation provided of the building. Mechanical ventilation will be designed to minimize noise, with in walls of suspended floors/ ceiling that have acoustic insulation.
The bathrooms, the changing areas/showers and kitchens contain extract ventilation to remove moisture-laden air.

The studios and Roda, rooms that will have aerobic exercise, will have indoor air quality monitoring using co2 monitors. These are mains powered, at a breathing height, away from openings and at least 500 mm from people.

Gymnasiums Sport England Design Guidance Fitness and Exercise Spaces (2008)

Adhering to guidance from this document, the mirrors in the studio spaces shall be securely fixed above skirting level, secured to the CLT to ensure no warping.

The buildings will be naturally lit, as suggested, with artificial lighting of 200-300 lux with good uniformity provided when necessary.

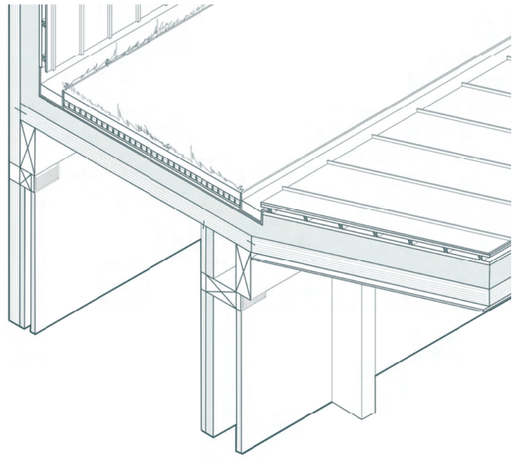
The floor detailed in the studios and roda area are sprung, meaning they shall reduce the risk of injury by have a resilient shock absorbent surface. The underfloor heating will leave them warm to the touch when necessary and the specified timber shall be smooth, slip resistant anf splinter free.

Underfloor heating and cooling can maintain the recommended 16-18 degrees.

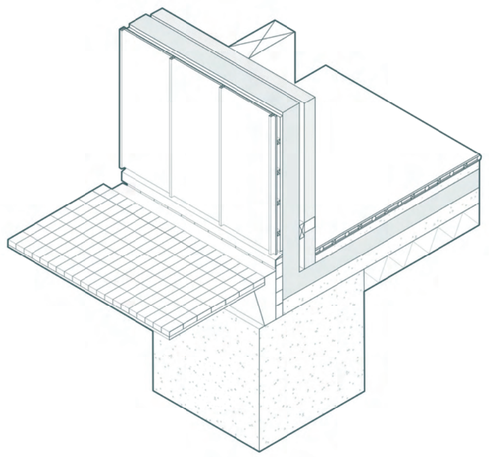
The ventilation calculations shown previously depict the necessary 20/ liters/ per sec/ per person of fresh air.

Approved Document K- Protection from falling, collision and impact

Stairs rise are 150-170 rise and 250-400 going. Handrails for mezzanines are 1100 mm and 900 mm for flights of stairs. Handrails on stairs extend 300 mm from the end of the stair.



Inhabited wall with a mechanical ventilation system



Sprung and heated timber floor

CDM

Build-ability and safety management

Pre-construction

Around the established site boundary hoarding will be erected to prevent the public entering the site. This will be at least 1400 mm away from the construction of the building to allow for scaffolding. Pedestrian access will be maintained on the roads surrounding the site during construction. The residential roads on the east and west of the site will be used as vehicular access points to the site.
A CDM manager will be appointed early on to manage and address issues and hazards. They will also delegate responsibilities and work closely with the construction team to ensure health and safety . Materials will be stored in the central courtyard area to be used in construction.

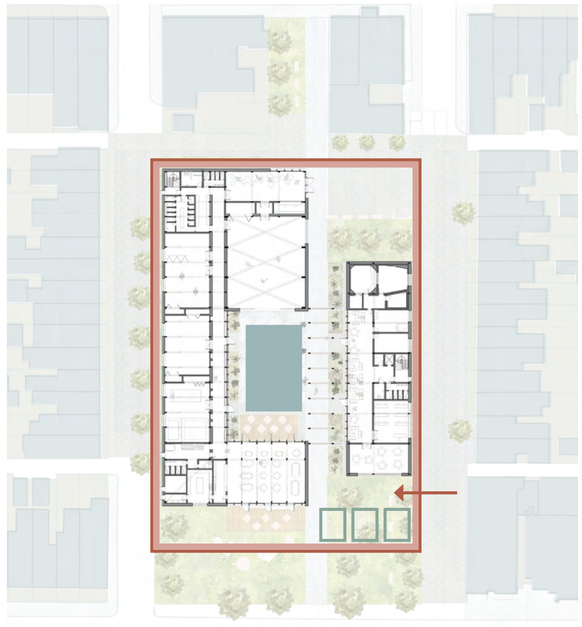
During construction

All workers will wear full PPE at all times, which will be provided in site offices. Site offices will be temporarily erected including WC and changing facilities, a kitchenette and offices. The office will control access to the site with a check-in procedure. Visitors should then be accompanied by the site manager.
There is limited risk of falling as the building is only two stories, but harness points will be provided when necessary.
Construction will only occur during daytime hours to not impact the residential community surrounding the site, and measures will be taken to ensure dust and vibrations are minimised.

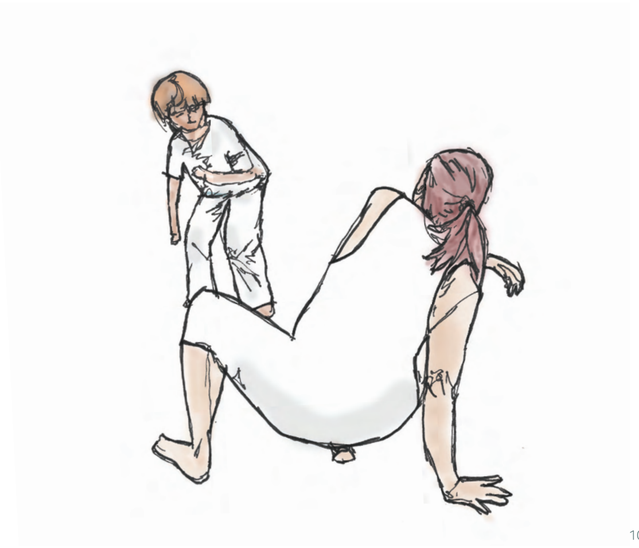
Post construction

(Maintenance)

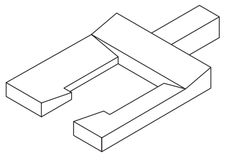
The majority of windows can be accessed from the ground for cleaning purposes. For the higher clerestory windows a telescopic rod with a mop attachment on the end should work adequately. Accessing the green roofs can be done using a ladder and falling whilst maintaining them will be minimized using a clip way system. All plant rooms are easily accessible for maintenance of the machinery.



Design Development

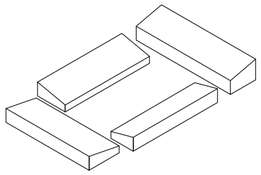


Overview



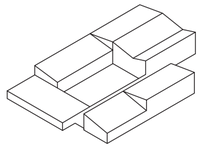
Week 1-2

The initial stab



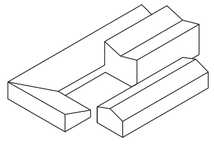
Week 3

Separating blocks and containing the courtyard



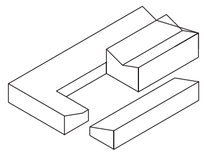
Week 4

Pulling pieces together



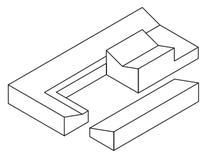
Week 5

Bringing cohesion to forms



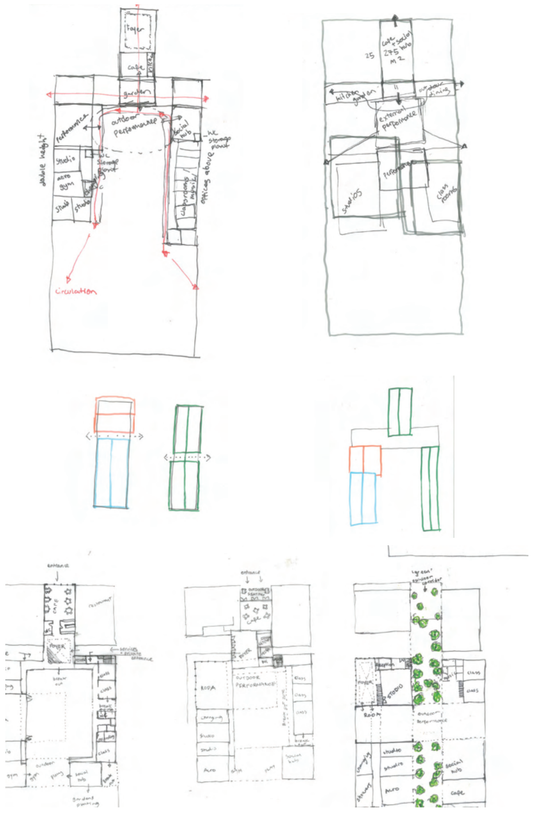
Week 6-7

Unifying the roofs

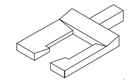


Week 8-10

Introducing a flat roof



Making a site model with Hannah!



The Beginning...
Initials thoughts & Week 1

Starting out

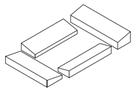
The freedom of design, the size of the project, the weighting of it on our degree, and working independently after Ted felt extremely exciting, yet also completely nerve racking. I was going to miss my teammates, their support, and their 'specialized' skills.
The start of the project left me doubting the site that I had chosen. Accessibility from all sides left few constraints to begin designing with. However, the more I researched about the community and area, the more invested I became.

Although I always felt more comfortable using software over sketching, I held off from my computer, opting for my sketchbook and trace, which allowed many more iterations with more fluidity. I am extremely glad I did this, as I feel that more exploration allowed me to develop a better thought through scheme towards the end.

Week 1

A lot of time was dedicated to making a site model, which would become undeniably useful for testing out massing.

This week was filled with many, many iterations, really getting the feel of how my schedule of accommodation sat on the site, interrogating precedents and testing out all sorts of design ideas. I was very keen to use the infill section of the site as part of the building, to add to the active street frontage on Manchester road. The shape of the site, along with context, also gave rise to many courtyard-driven ideas.



Resolving leakiness
Weeks 2-3

Desktop Review

All about plans.

The first desktop review was great to get another pair of eyes critiquing the design, with the focus remaining on planning and adjacencies. Although the idea of using the infill part of the site was appreciated as a gesture, the verdict was that it would be too difficult to develop a coherent form. The form was regarded as ' **too leaky**' and needed containment. The adjacencies were working fairly well, but needed some refinement, such as the relation of the cafe to the social hub.

Landscape & Architecture tutorials

The courtyard scheme was further embraced, however it was still considered **'too leaky'**
The leakiness had to stop!
More issues stemmed from awkwardness with the changing areas and too many long circulation corridors.
My primary focus remained on the ground floor, and more iterations and development were required from the first floor plan.

Resolving entrances

Another primary issue, very intertwined with the leakiness, was the entrances/ entrance sequence. Having too many entry points and lacking an obvious hierarchy meant the design lacked clarity.

Hitting pause on the design for a few days, I turned back to precedents to really analyse how they worked and dealt with entrances to their buildings. Vajrasana Buddist Retreat Center and Brockholes Nature Reserve were great in directing my entrance strategy.

Staying true to the site, examining active frontages, and utilising the infill section, lead to me creating a prominent axis, which started shaping the design.

Massing, massing, massing ...

A series of quick Sketchup models in context helped me test out a variety of forms, roof shapes and run shading analysis. Flipping the Roda to the back side of the site meant that the highest mass sat towards the north, with a low-lying cafe providing plenty of sun to the courtyard.

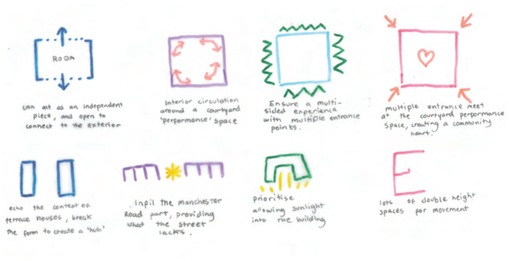
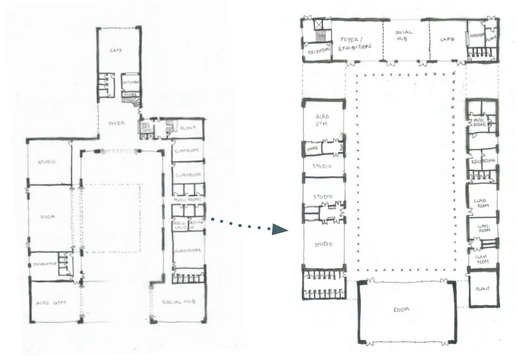
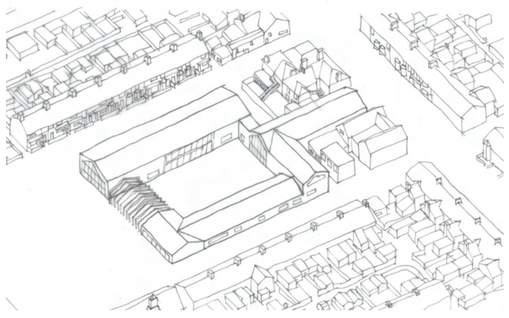


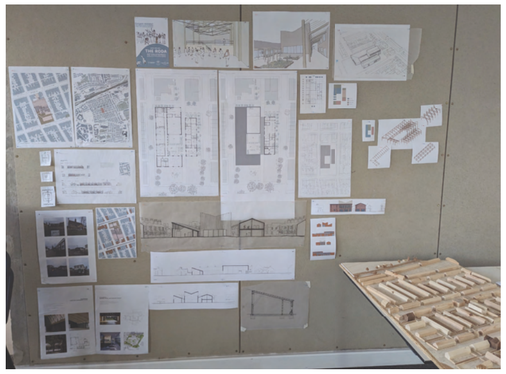
Diagram of my 'Keystone ideas'



Plan @ desktop review Plan developed after desktop

Undeniably leaky

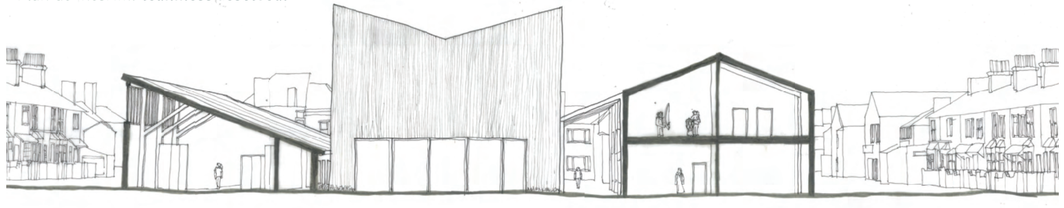




Roda perspective featuring the new **truss**

The structural isometric developed after my structural tutorial

Plan at Interim: **leakiness resolved!**



Re-thinking the education block
Weeks 4-5

Clarity through structure

The structural tutorial gave a lot of coherence to my design.
Although I had already worked the design to a clear structural grid (which Tim seemed pleased with), he defined three clear structural systems that I could develop.

He proposed an intriguing truss structure for my largest span- 15m across the Roda, along with two simpler solutions for the movement and education spaces. This got me very excited about the structural nature of my scheme and how it could drive the design.

The interim review!

A focus on the education block

The interim seemed to be a very positive review! The majority of my plan was well received, and Hugo said that it was 'well-thought out'.
Despite this, the education building needed more work, needing 'as much thought as the rest of the building has received.'
Massing wise, the form was coming together, but the education block needed a more cohesive roof. The position of the education block on the site needed to be re-examined.

Vanessa was uncertain about the minimal auditory and physical distance between the foyer and the Roda. This was an aspect of the design I really liked, providing an informal transition between spaces and struggled with how to resolve the design while convincing both of us.

Trusses and flat roofs
Weeks 6-8

The build up to the Tectonic review!

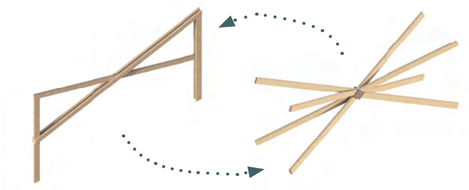
Materials and making put a bit of a spanner in the works. My Roda roof truss was interrogated, and ultimately deemed too complicated.
A flat green roof wrapping around the corridors and foyer was suggested, and seemed like it might be able to resolve some previous issues.

Resolving the foyer & truss

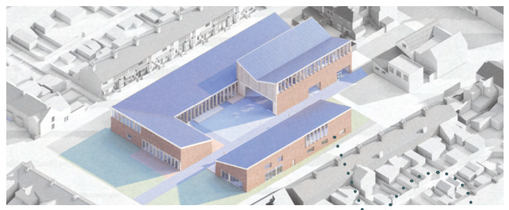
The tectonic review was overall another positive one!
With the tectonic review being so soon after materials and making, I didn't quite have time to implement all the changes. I quickly drafted the new options so I could get feedback on what my tutors think may be best. They agreed that adding a flat roof was a good idea; however they weren't sold on the new, simpler truss and thought that the more complicated version may be more effective and create better internal space.

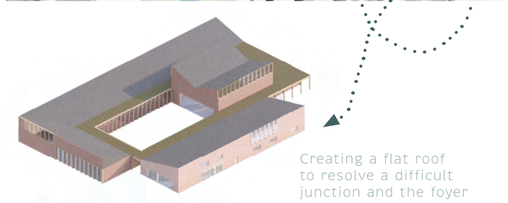
The flat roof would help resolve the issue of the foyer not being its own space and a complicated connection between a pitched roof and wall. However, it introduces the question of how the flat roof will connect to the education block, something left for me to interrogate.

Materiality wise, this introduced the shift on the Roda as my 'timber-clad gem' with a strong brick outer facade.

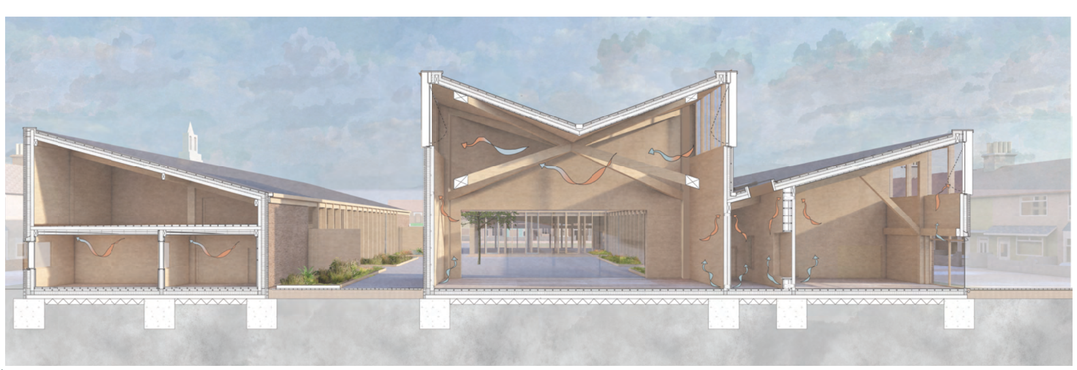


Which truss?





Creating a flat roof to resolve a difficult junction and the foyer area



All about spread sheets
Easter & Weeks 9-10

Spread sheets

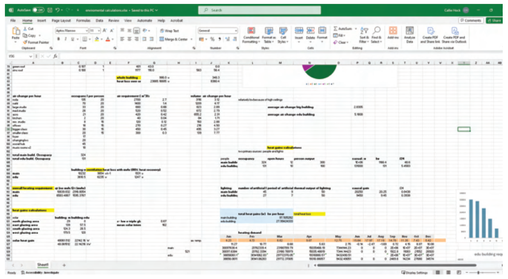
As much as Easter was a time for a break, it was also time to start setting up my report and spreadsheets. Knowing that I had always struggled with environmental design, but it being something I thoroughly cared about, I really wanted to start calculations early and adjust the design accordingly.
After looking at the glazing percentage, although aesthetically pleasing and creating a lovely indoor space, it couldn't be justified in terms of heat loss, gain, and embodied carbon. After calculating the daylight factors of spaces, the glazing was then adjusted accordingly, cutting it down in corridors and the cafe. After realising its acoustic properties were not that terrible, doubling its area in the music rooms to provide adequate light.

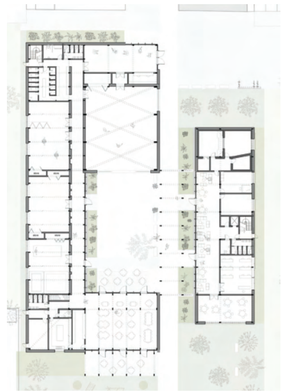
Building regs

Attempting to start filling up parts of my report, it was time to read the building regulation documents and make sure that my building complied! Although I had been designing with them in mind, after double-checking, it led to the realisation that the stairs to my cafe mezzanine did not comply, causing a design shift in that service 'knuckle'.

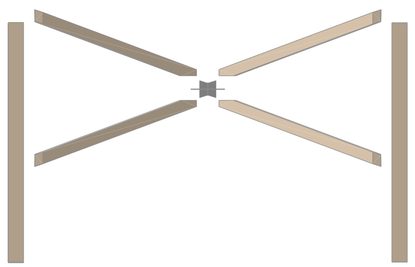
Structure

During my structural tutorial, I was told that my Roda truss was extremely inefficient. By adding ties between the columns, this was resolved elegantly. Tim also provided an excellent precedent that has a very similar connection to the one I needed, which helped resolve the complicated center juntion of the Roda.

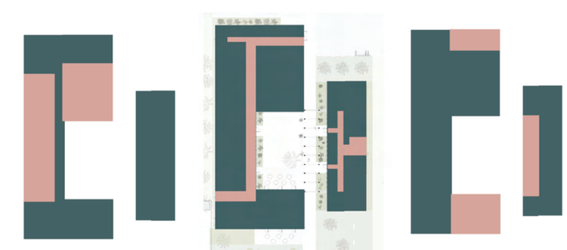




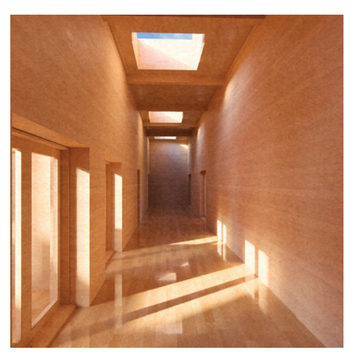
Plan prior to knuckle shift



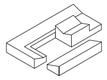
Exploded roda structure prior to addition of wire



Initial stab at partis for report



Introducing roof lights to the corridor



The last push! (Almost)

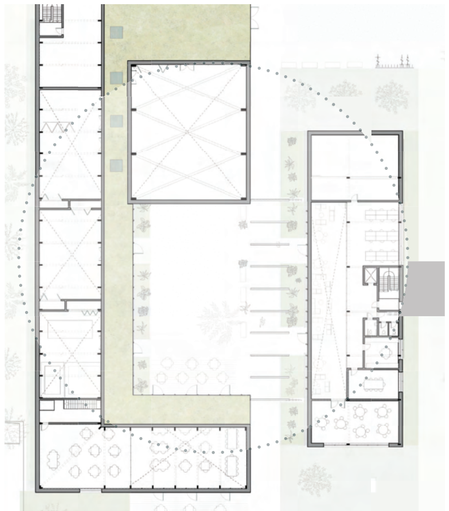
Week 11- The Final Review

Although the week before the review was especially tough, the final review was such a lovely experience. It felt like the closing of a chapter in the most wonderful way. All the work put in throughout the past few months had paid off in a design I was proud to pin up. The feedback was mostly positive with just a few tweaks to be made. It was so lovely to see all the work my group mates and cohort had completed and I felt very inspired by them to push on for the last few days.

Reviewers walking past my wall commented that 'it had a lot of believability' and that 'Swindon's never looked so good' and that really made my day, although they did joke about the fact that my courtyard was not completely square.

The tweaks from Vanessa and Jonny mostly included altering drawings, improving the design of my pergola, reconsidering the design of my doors and making elevations more playful. Most of these where achievable changes, however I was unable to find the time to develop the elevation further or alter the doors very much- I would of loved to look into this if time allowed.
They also said not to put too much writing in my report, which was a relief because that is my least favourite part of making a report.

= areas of drawings that required fixing



Key design techniques

Vectorworks

After learning Vectorworks over my last placement, I was unsure whether to use it for this project, or Autocad and Sketchup, which I was more comfortable with or Revit, which we used for Ted. I asked around studio and only found peers using it for 2D drawings, not 3D. Despite this, I have found that using it for 3D has been a game changer to my work flow, appreciating its BIM qualities, while finding it more visually pleasing and less rigid than Revit. Despite this, when working with larger file sizes it did crash constantly. At about week 10 my laptop could not cope anymore, so I resolved to switch to sketchup and start a model mostly from scratch.

Many Iterations and decisivness

I quickly realised that although creating as many iterations as possible is a great elimination and design method, it could also lead down rabbit holes and make the process go in circles. The time crunch of the project meant that being decisive when necessary was equally as important as creating iterations.

Spreadsheets

I was really glad to set up a big excel spreadsheet for all my environmental formulas over the Easter break, which I could then use to alter my design. In hindsight, I wish I had done this even earlier so that the design could be further modelled to fit exemplary environmental criteria.

Running

There is almost no problems that a good long run would not help me solve. Providing that time to think and breathe meant I would often come home with a design idea or solution, or a new found clarity. Making sure I got in enough exercise a week made it so much easier to focus and improved my efficiency, along with greatly helping out my mental health (especially because Bath is so beautiful!).

Reflection

From the beginning, the 4th years seemed incredibly daunting, especially the final project, and it was hard to imagine myself ever being in those shoes. I tried to give this project my all, but also wanted to make the most of my last term before graduating.

This project has definitely been the most fulfilling so far, the most resolved and interesting. Being able to work on a project I had prior knowledge on and am so enthusiastic about has been amazing. Having witnessed first-hand how brilliant capoeira can be for all aspects of life for so many people really brought forward extra motivation.
I felt the most well equipped to tackle the challenge of a design project yet, being armed with knowledge from placements and 3 years at Bath. These factors definitely made the process more enjoyable. Despite this, I am finishing the project wishing I had even more time to elaborate on and perfect details.

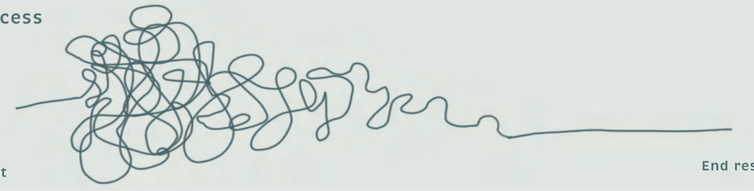
Balancing being part of this year's ACE2Zambia team, running and attempting to have a social life whilst working on this project has been impossible at times, but incredibly fulfilling. Time management has always been one of my biggest challenges, but (attempting) to front-load, learning from Ted and Vanessa's organisational skills to keep us on track has made this project seem fairly manageable.

Living with and constantly being surrounded by architects has been both a blessing and a curse. They understand the process better than anyone else and are literally the best support system, but there is no escape from architecture, and they are always equally stressed.

This year, more than anytime else, I felt like I was really able to get so much information from tutorials. Having consultant tutorials were also a new and great way to help drive the design forward (and ensure it wasn't falling over). I definitely enjoyed crits and tutorials more than other years, with both feeling more like a discussion than a stipulation.

In hindsight, I wish I had considered environmental factors and calculations sooner to allow them to drive the design further. I wish that I had more time to consider and implement suggestions from the final review, such as each elevation being 'a tiny city' and introducing more playful elements into the elevations.
Mostly, I feel proud of what I have accomplished and learned and looking forward to bringing it into practice.

The design process



Special thanks to:

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Always having brilliant advice and being so organized- I really appreciated how the project was always pushed forward to the next stages and how you made sure we stayed on track, making the workload so much more managable.

Matthew Wickens head of year-
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Managing to sketch enough ideas to fill a roll of paper about as tall as me! and answering all my questions so thoroughly.

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Always having enthusiastic structural solutions and great precedents!

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Being incredibly knowledagble and managing to spot the mistakes in my spreadsheets.

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Wyn-
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Emma, Eabha, Brian, Anna, Tara & Sanaa-
The best (& craziest) table-mates, my architecture family!

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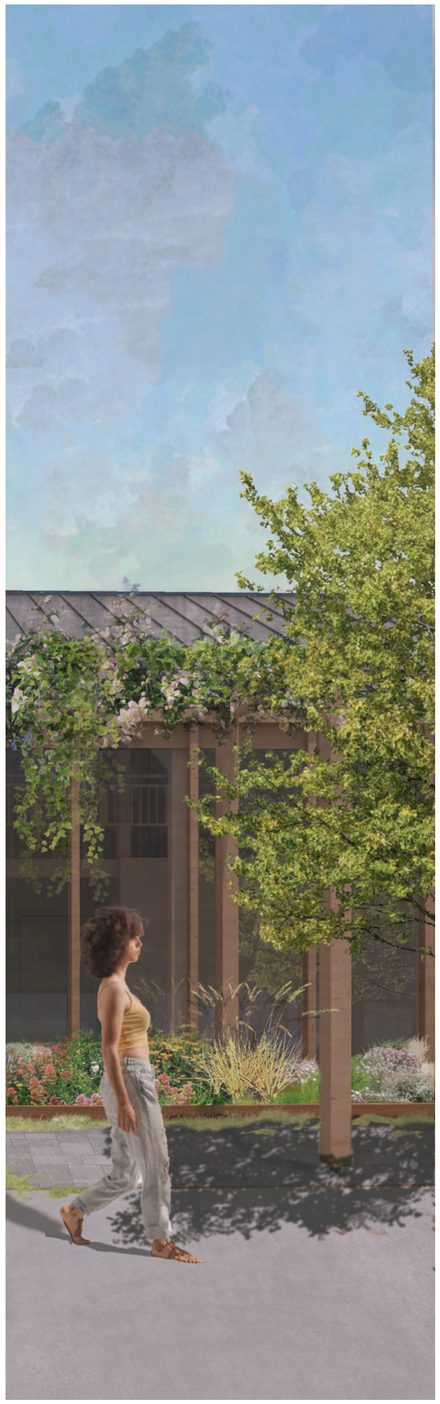

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