

PORT- FOLIO

ADITYA BILLAVA

SELECTED WORKS

2022

ARCHITECTURE

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ARCHITECTURE

BIO

Hi, my name is Aditya, a Part 1 BA(HONS) Architecture student who graduated this year from Northumbria University Newcastle in the United Kingdom. I have always been fascinated by buildings, their design, and the various construction processes. I'm fascinated by people, their cultures, and their diversity. Drawing, diagramming, and rendering 3D models, are some of my favourite things to do.

DOWNLOAD CV

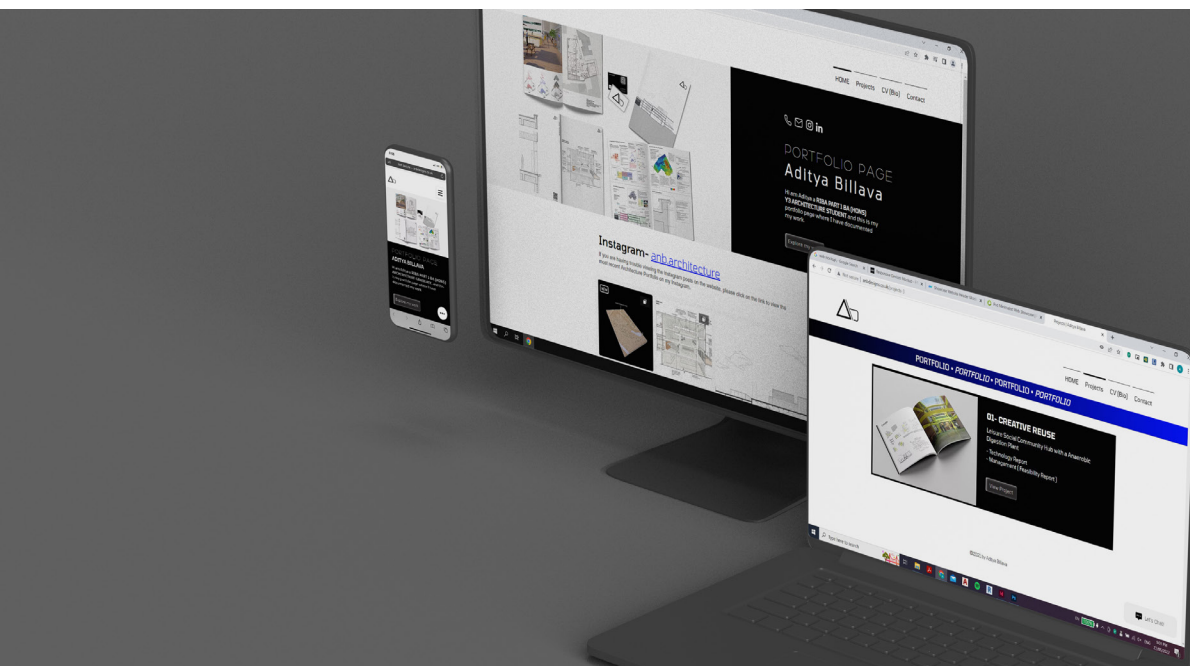
<https://www.anbdesigns.co.uk/cv>

TABLE OF CONTENTS

• RECYCLING FACILITY (ANAEROBIC DIGESTION PLANT) WITH A COMMUNITY HUB	1-5
• TALIESIN WEST CONSTRUCTION MODEL	6
• COMMUNITY MUSIC AND ART CENTRE	7-13
• EXTRACTS FROM TECHNOLOGY REPORT	14
• EXTRACTS FROM MY MANAGEMENT REPORT	15
• SOME OTHER DESIGN WORKS	16

GET IN TOUCH

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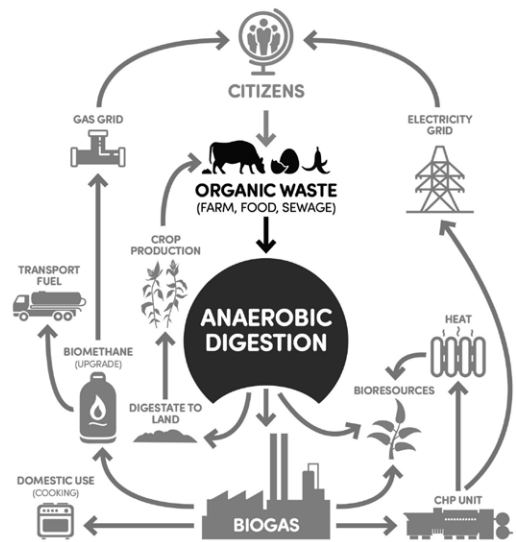
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More Information on my projects can be found in my website.

01: ANAEROBIC DIGESTION PLANT WITH COMMUNITY HUB (CREATIVE RE-USE)

- **Notional Client:** Newcastle City Council
- **Location:** Newcastle Upon Tyne, UK
- **Estimated Budget:** £3,112,998.17

The task was to design a **Recycling facility with a public space**. The recycling centre (**Anaerobic Digestion facility**) will be located in the heart of Newcastle Upon Tyne, UK and will specialise in recycling food waste (**organic waste**). The **recycled product (Renewable Energy)** will be reintroduced into the public venue and will interact with the local community through redistributing, educational, and cultural amenities, and change the way people think about food waste.

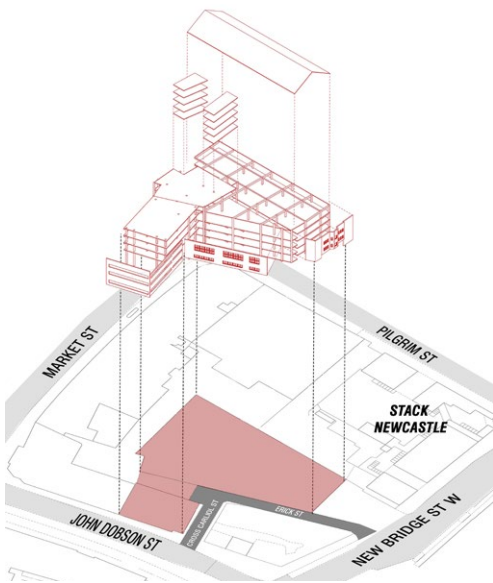
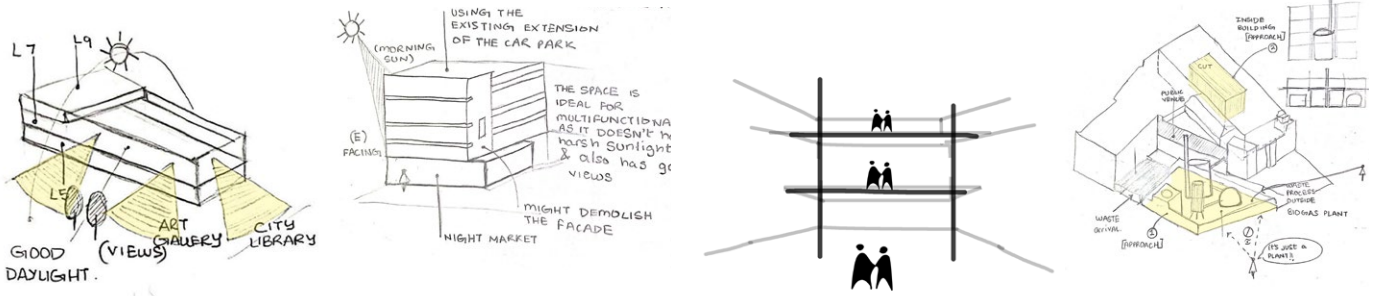


FOOD RECYCLING PROCESS

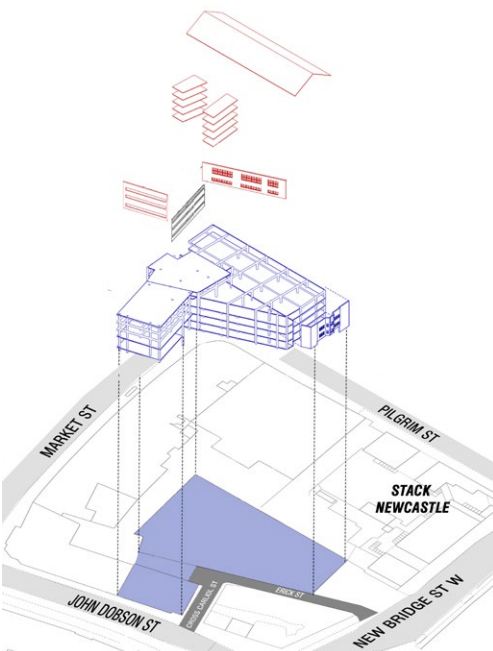


ENTRANCE- The public will be able to see the vibrant yellow painted pre-existing columns and the energy plant activities upon entering the building. The purpose of painting the existing columns yellow is to give a sense of enthusiasm while also making the location memorable because of it's colour.

EARLIER CONCEPT DIAGRAMS

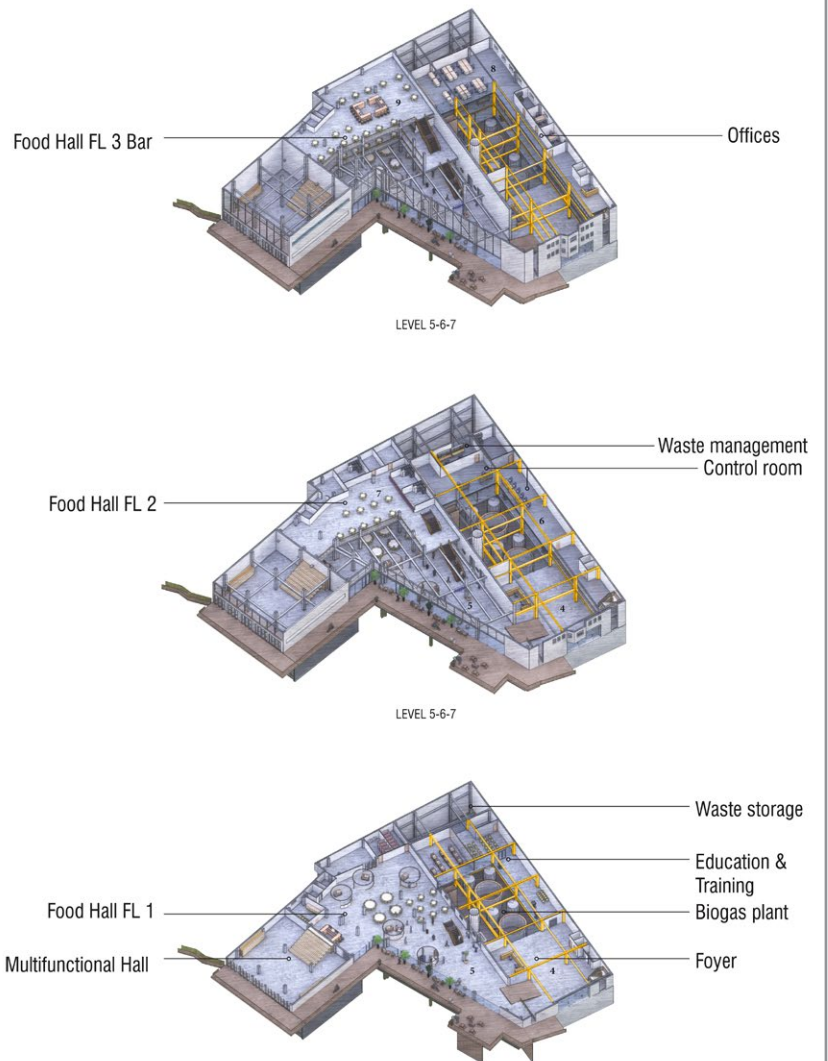


EXISTING CONDITION

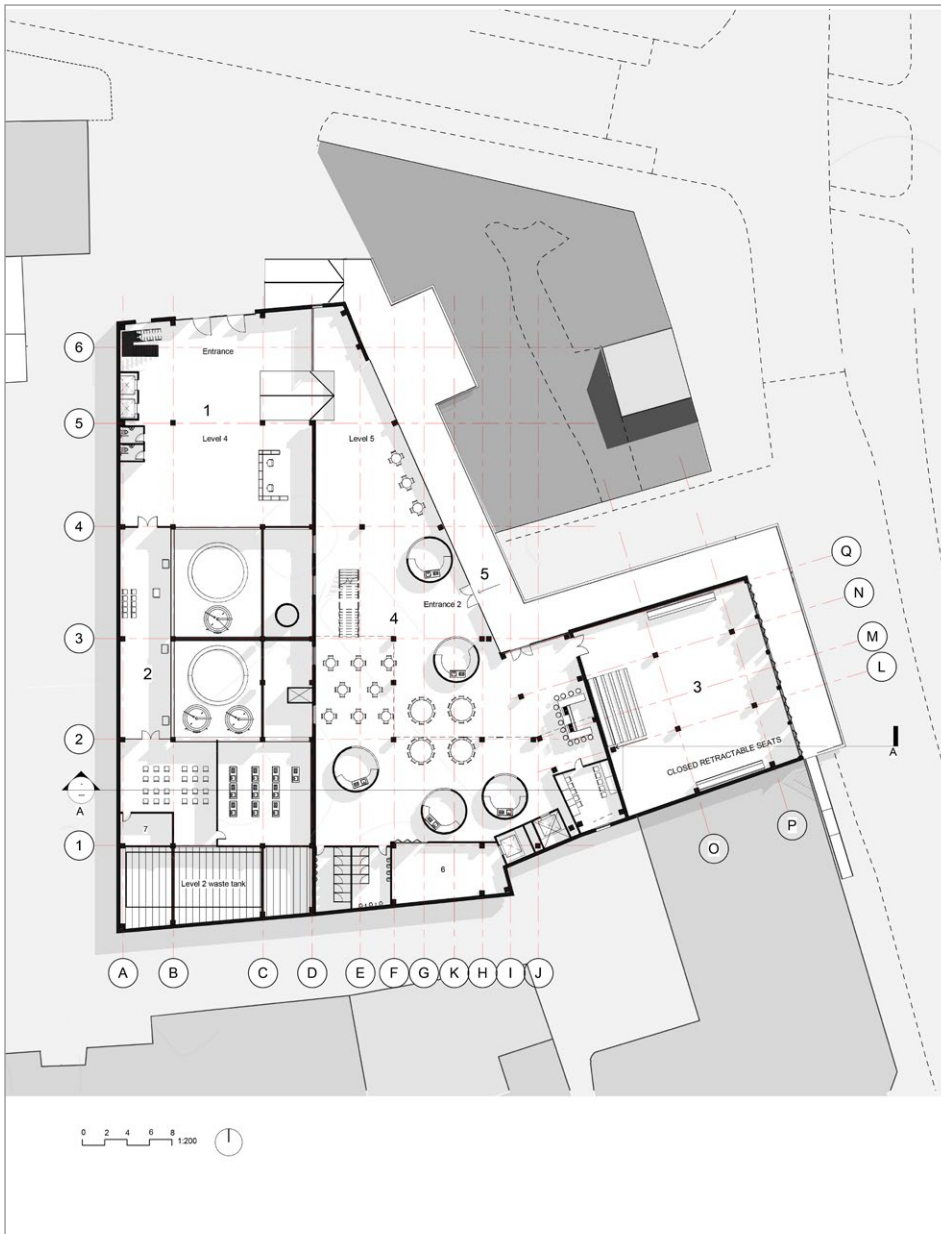


DEMOLISHED

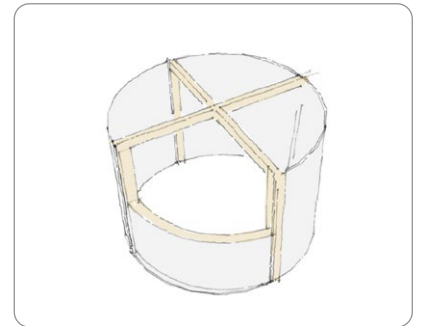
RETAINED



PROPOSED



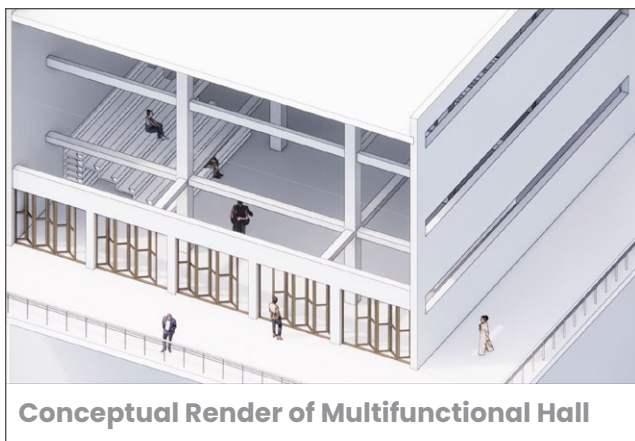
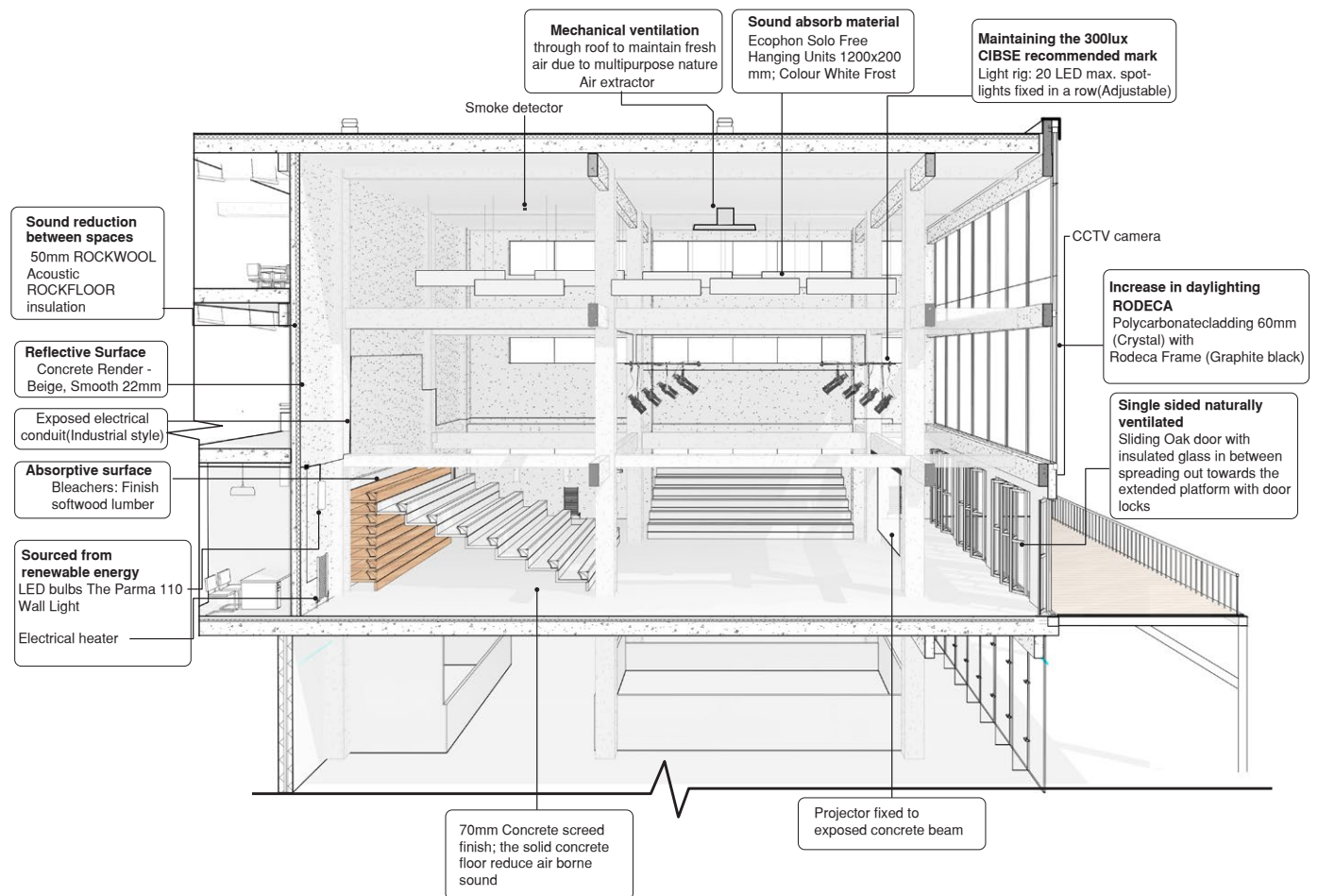
1. FOYER
2. EDUCATION AND TRAINING SPACE
3. Multifunctional Auditorium
4. Food Hall with flexible food stalls
5. External wooden Platform linked to Food Hall and Auditorium space
6. Storage for temporary stalls and auditorium equipments
7. Storage for education and training space
8. Green room



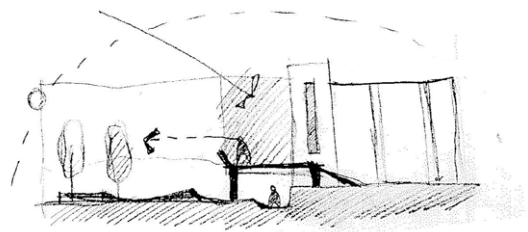
The temporary stalls will be composed of wood frames and encased in thin semi-transparent polycarbonate. The stalls will also be able to be moved and clamped in different places within the area, making them more customizable and offering a new appearance of the venue each time the public enters.



INTERNAL FINISHES AND SERVICES INTEGRATION

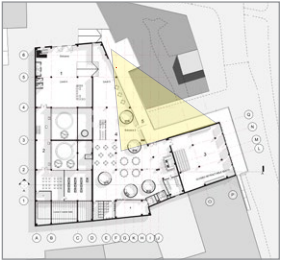


Extending the platform will allow venues and concerts to have a larger stage, as well as attract a large number of people from the streets.

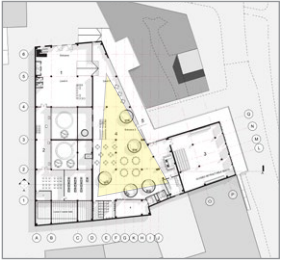




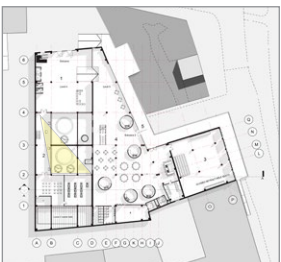
URBAN TERRACE



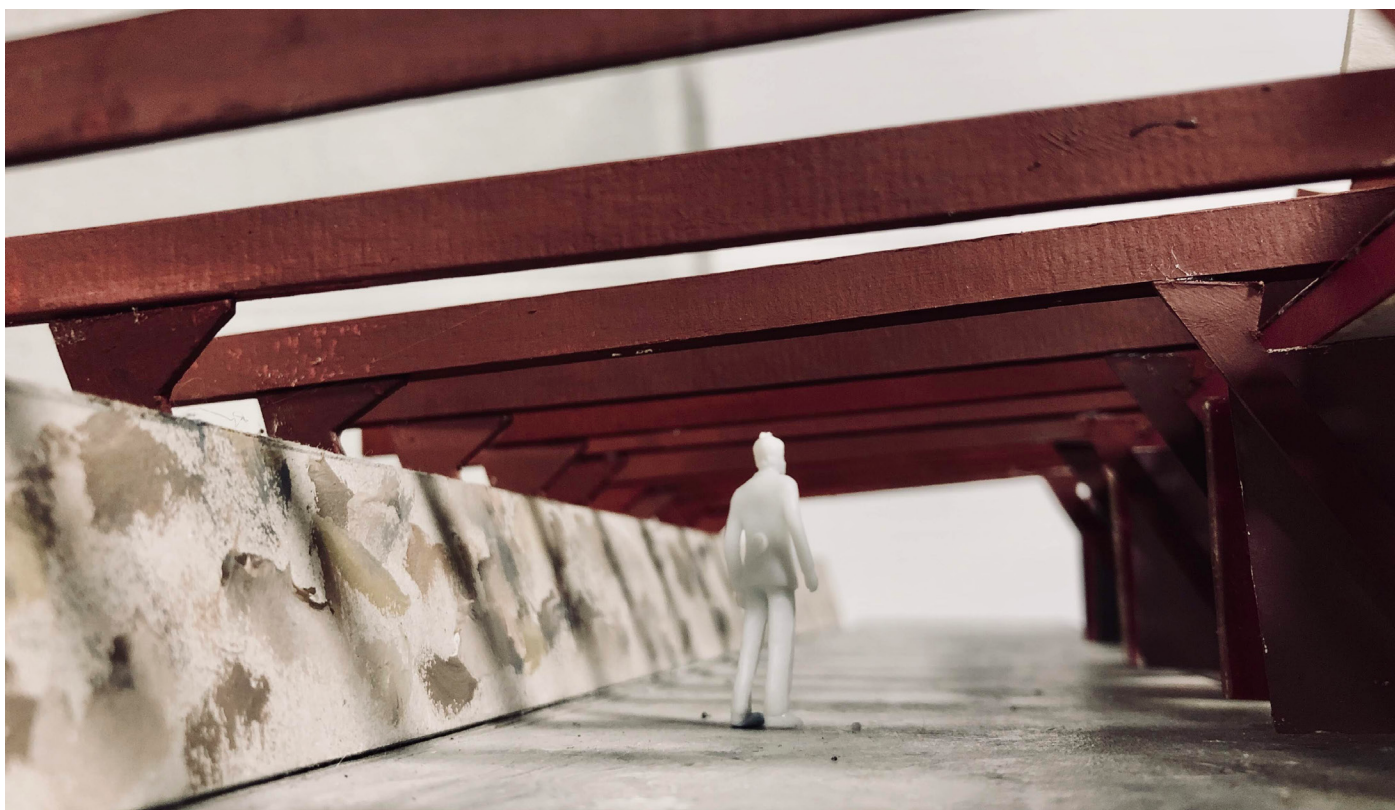
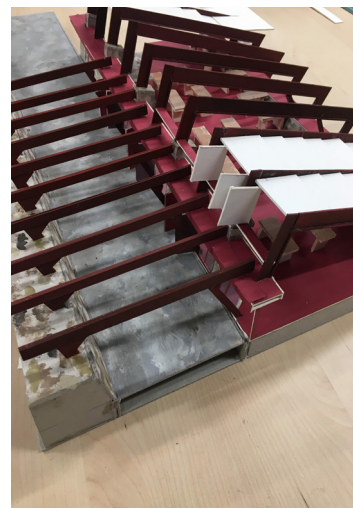
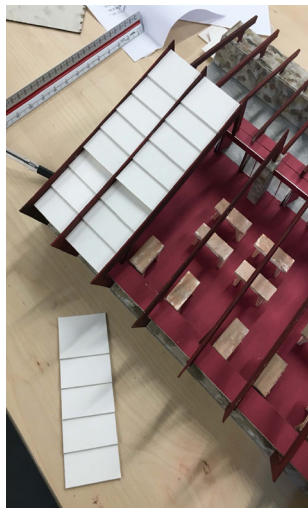
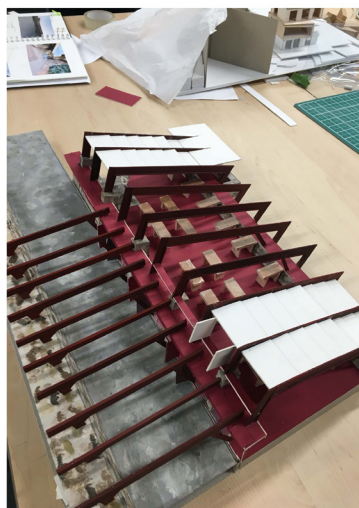
FOOD HALL



EDUCATION CENTRE



0.2 TALIESIN WEST MODEL

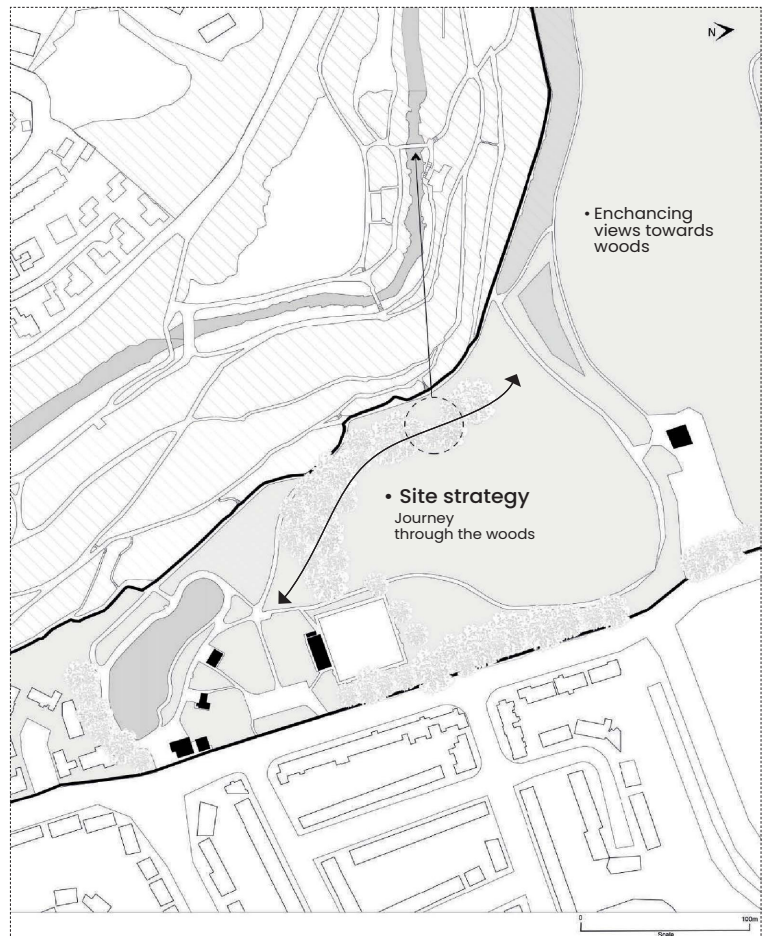


03: COMMUNITY MUSIC AND ART THERAPY CENTRE (LANDSCAPE DESIGN)

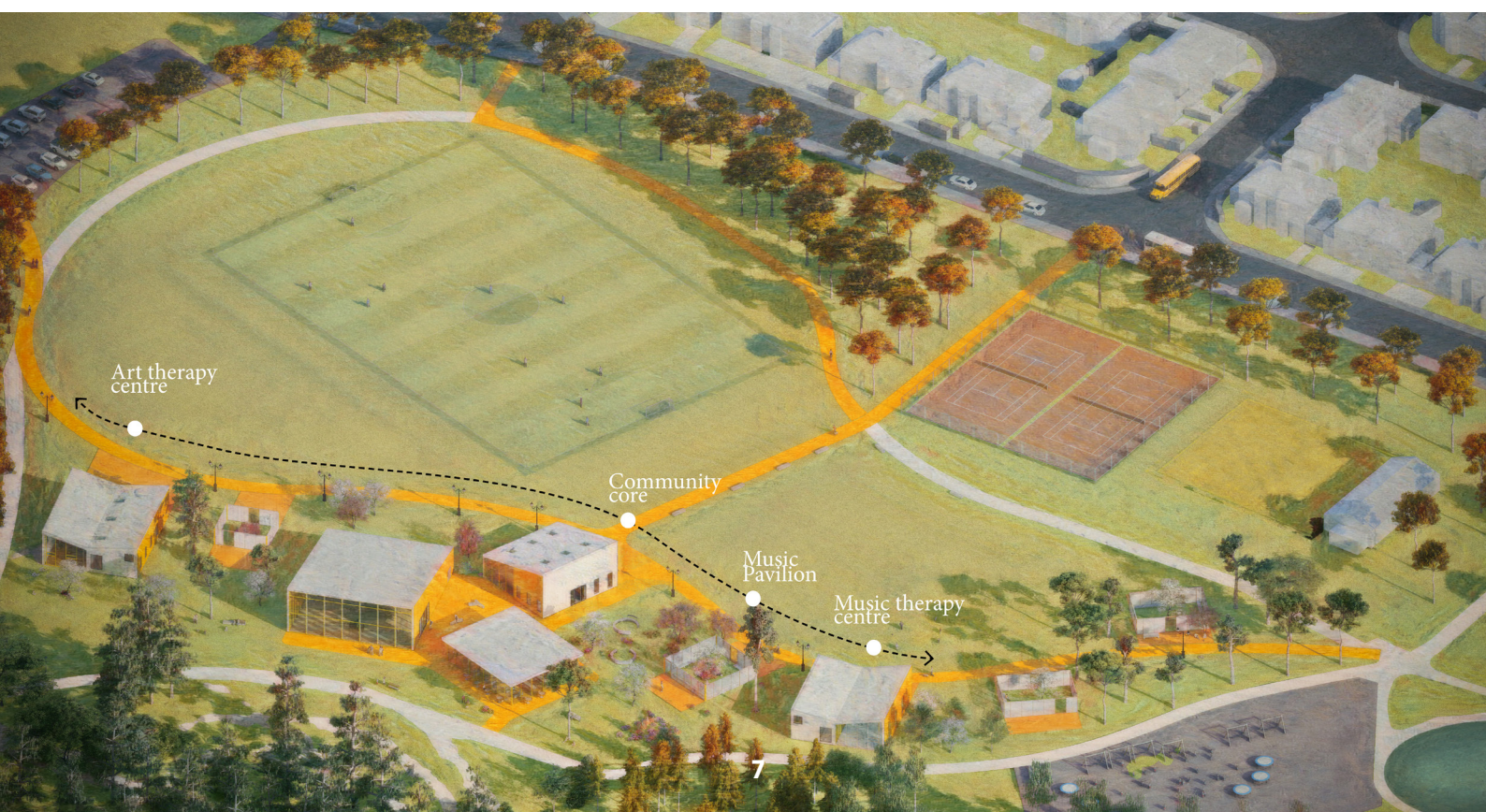
- **Notional Client:** Jesmond community
Location: Jesmond Dene Park in Newcastle upon Tyne

Mental health has become a serious medical concern after Covid-19, and this project will help in the rehabilitation of people via architecture. These spaces will serve as people's places to have open dialogues with one another, as well as incorporate art and music therapies to help people with issues like depression, anxiety, and stress.

Site Concept: The spaces are separated and positioned around the trees in such a manner that the views are enhanced, providing an atmosphere for visitors to feel calm via a natural healing and create a journey from art centre to music centre and enhancing the inside outside connection through transparency in façades. I have intended to keep the present amenities to complement my concept of mental well-being via physical activity.



Site: Recreational Park





ADMIN

1. Lobby with reception
2. Community meeting room
3. Kitchen and seating space
4. Therapist office

TOWN HALL

5. Town hall
- 5a. Storage
6. Changing room
7. Intermission space

CAFE

8. Servant space (kitchen for cafe)
9. Cafe counter
10. Served space

11. MUSIC PAVILION

MUSIC THERAPY

12. Music therapy Entrance with reception
13. Waiting space
14. Music Individual therapy space
15. Closed Group Therapy space
16. Open Group therapy space

ART THERAPY

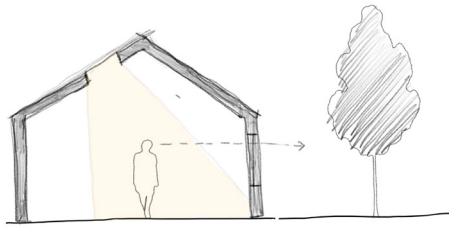
17. Art therapy entrance with reception
18. Waiting space
19. Open group therapy space
20. Individual art therapy space
21. Closed group therapy space

22. DECK

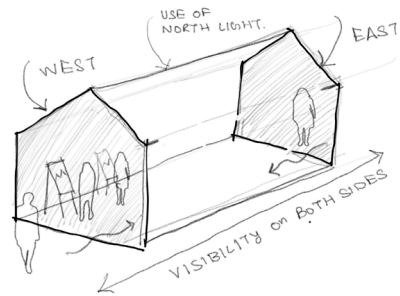


EAST ELEVATION

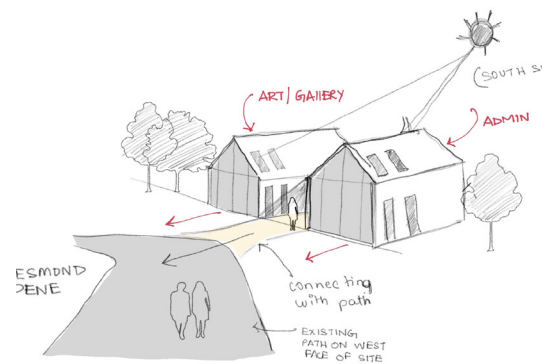
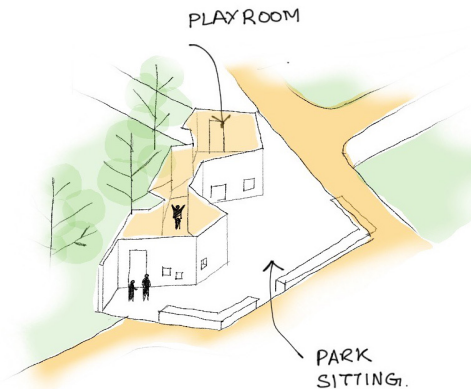
Feeling of being in nature



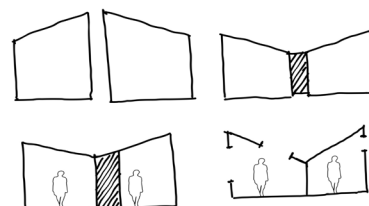
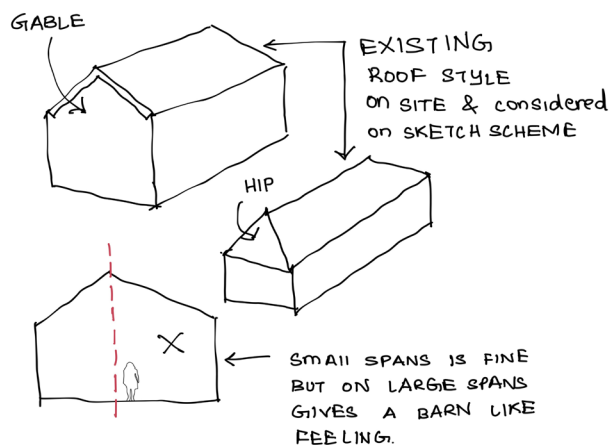
THERAPY SPACE



Vibrant routes connecting the spaces



Form derived from surrounding context

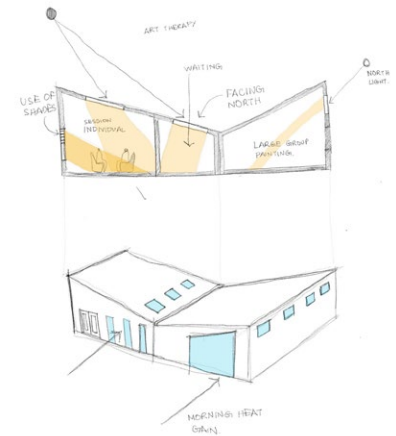


series of mono-pitch roof
& BUTTERFLY ROOF



Art Therapy

Art Therapy is effective because creating art influences brain wave patterns and the substances released by the brain. It aids in the expression of suppressed emotions as well as relieves stress, anxiety, and fear.

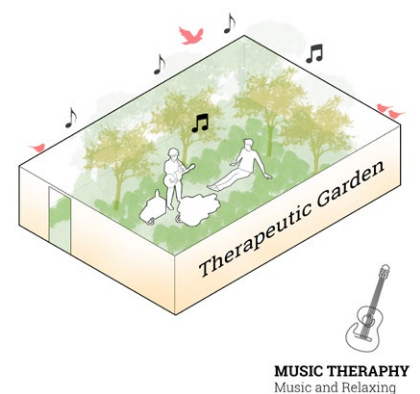


Environmental considerations



Music Therapy

On the other hand, can support communication and expression, help in the exploration of thoughts and feelings, as well as improve mood and concentration.



MUSIC THERAPY
Music and Relaxing

Music Pavilion Diagram



People enjoying open session music therapy

1:20 CONSTRUCTION PART SECTION (ADMIN BUILDING)

1: Modular roof light system thermal glazing module size 1800/1000mm

2: ROOF

20mm White stained **Russelwood** Siberian larch cladding with 5mm gaps fixed to exterior 50x50 battens with stainless steel fixing
60mm continuous air gap
50x50 counter battens on breather membrane
2x90mm **Kingspan** mineral wool insulation
200mm Spruce CLT structure
Exposed CLT birch wood finish on the inside

3: Pre formed aluminium concealed gutter

4: FACADE CONSTRUCTION

20mm Pickled white stained Siberian larch cladding with 5mm gaps fixed to exterior 50x50 treated battens with stainless steel fixing
60mm continuous air gap
50x50 counter battens on breather membrane
90mm Kingspan Rigid foam insulation
200mm Spruce CLT structure
Exposed CLT birch wood finish on the inside

5. Fixed yellow stained wood frame window unit size 2800x1000

6: Hollow mould EPS filled with reinforced concrete

7: Floor

30mm granolithic concrete separating layer
80mm reinforced concrete; underfloor heating pipes
2x150mm XPS thermal insulation
300mm sand bed

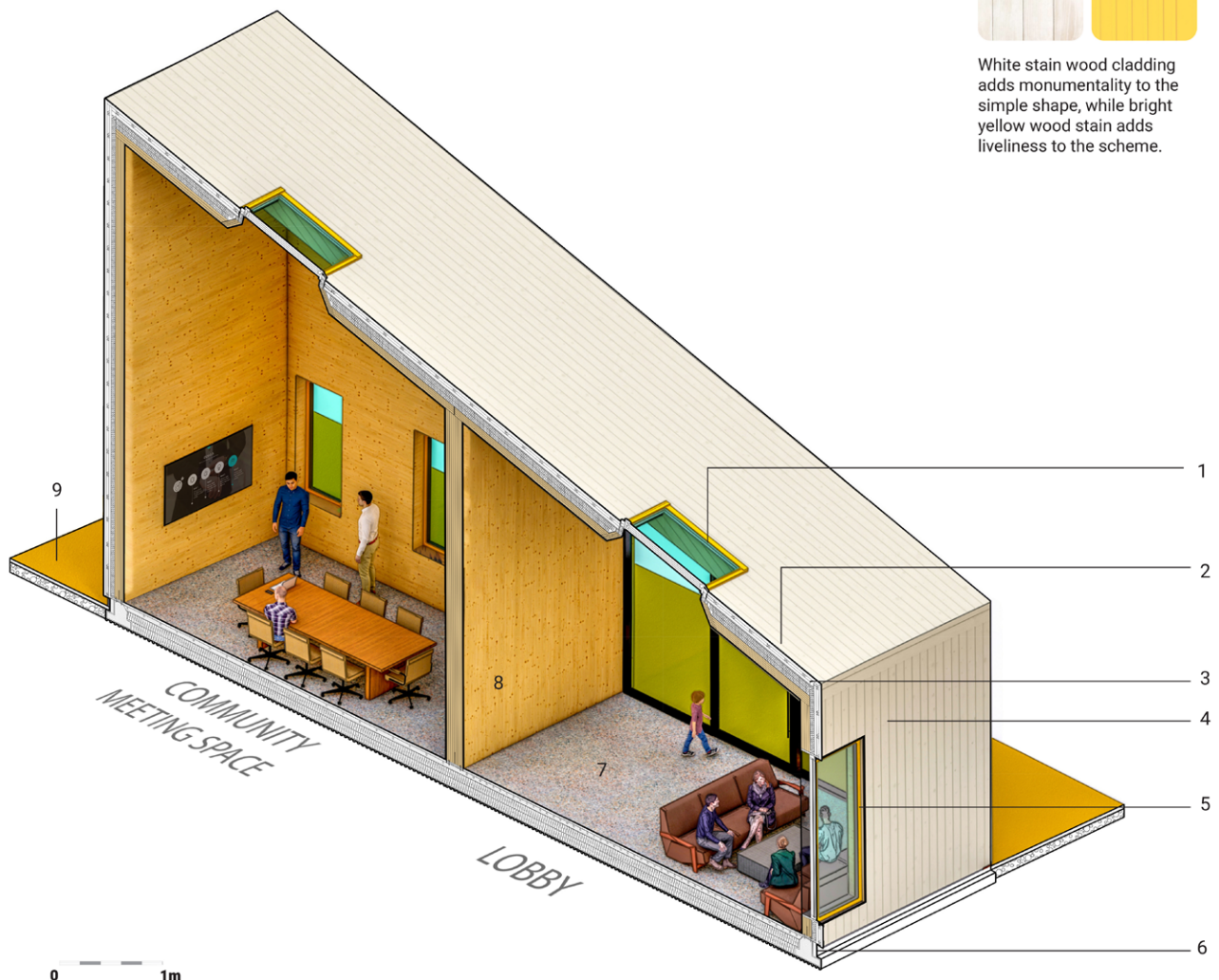
8. CLT Structural wall on the interior supporting the solid CLT roof

9. Pavement

Yellow painted Asphalt Layer
Aggregate Base layer
Sand bed



White stain wood cladding adds monumentality to the simple shape, while bright yellow wood stain adds liveliness to the scheme.



CONSTRUCTION TOWN HALL AND CAFE

1. Town Hall

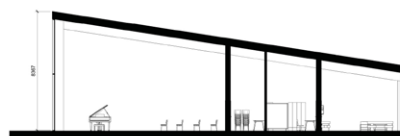
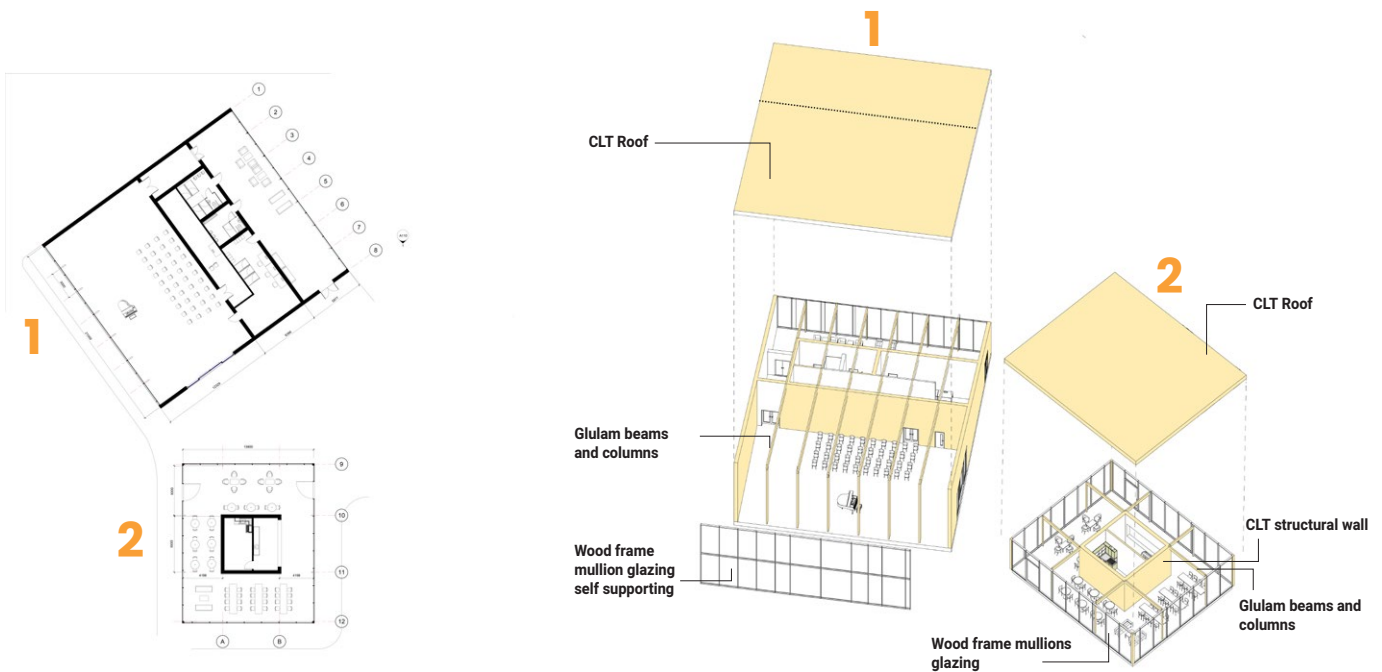
Depth of a beam: 20th of it's span

- 12m span in town hall will have a beam depth of 600mm
- Diameter of a Column: Height divided by 20,
- 8m height in town hall will have a column diameter 400mm but I have chosen to keep it 600mm as the roof is slanting and might need extra support from the columns

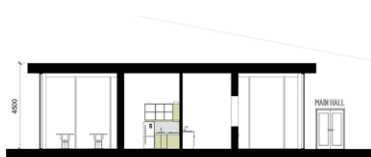
2. Cafe

In case of cafe the servant space in the centre is a structural CLT wall 400mm thick and acts as a supporting beam.

The Grid is decided in a way that all beams connect to the central CLT wall and have a depth of 200mm according to span that is 4m from all sides. The columns are also 200mm in dia. as the height is 4m, according to the rule of thumb

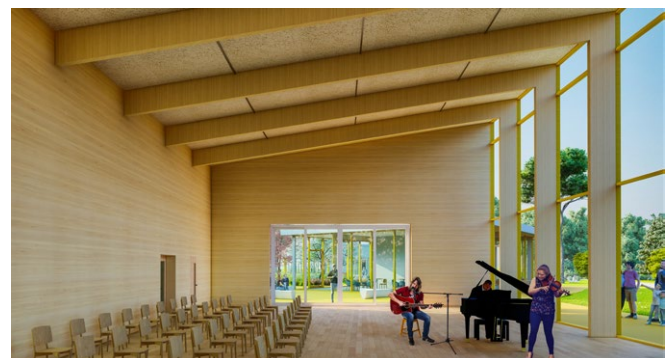


1. Town Hall



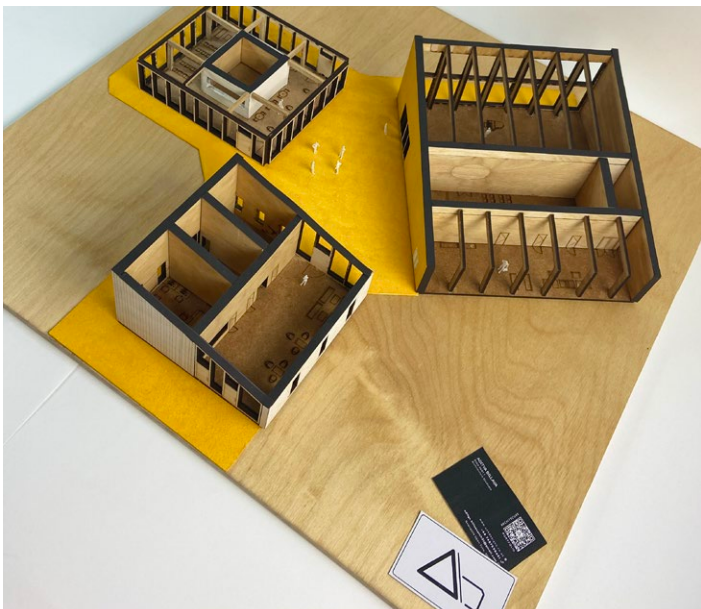
2. Cafe

0 5m





1:100 STRUCTURAL MODEL OF THE CORE OF THE SCHEME (VIBRANT COURTYARD) : TOWN HALL, CAFE, AND ADMIN SPACE. The model is made of wood so as to show the sustainable approach of the scheme which is to make use of wood extensively.



EXTRACTS FROM MY TECHNOLOGY REPORT- LINKED TO PROJECT 1



PDF LINK & QR: https://www.anbdesigns.co.uk/_files/ugd/2f3ad7_dec67902cef-0408c919ba69c6382571e.pdf

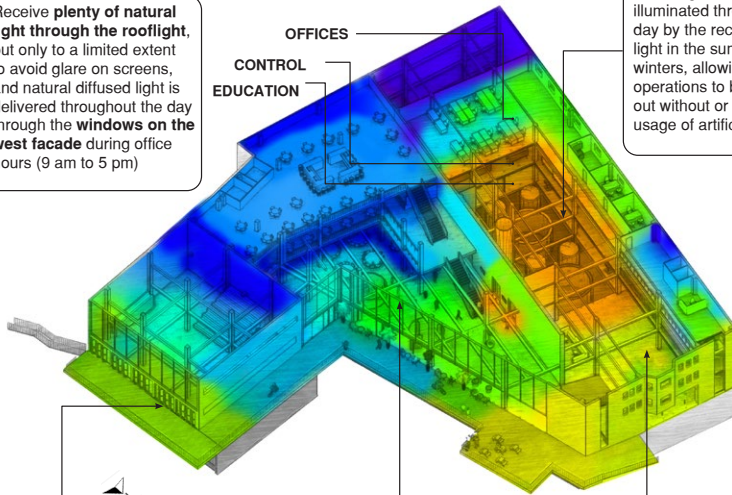
Visual Comfort and Lighting Design

DAYLIGHT INTENSITY DIAGRAM

The office, control, and education areas

Receive plenty of natural light through the rooflight, but only to a limited extent to avoid glare on screens, and natural diffused light is delivered throughout the day through the windows on the west facade during office hours (9 am to 5 pm)

OFFICES
CONTROL
EDUCATION



BIOGAS PLANT

The Biogas Plant is naturally illuminated throughout the day by the rectangular roof light in the summers and winters, allowing the plant's operations to be carried out without or with minimal usage of artificial lighting.

BREEAM: Daylighting

- The site being surrounded by high rise buildings receives very less sunlight
- The daylighting in the building is increased with the help of polycarbonate facade and rooflight.

Artificial Light:

Borde CCT Pendant

Foyer, Food Hall



These lights will be hung from the exposed concrete beams and will maintain the original aesthetic of the Dex car park.

Ecophon Dot

Offices, control room and education space



MULTIPURPOSE HALL

The Multifunctional Hall receives natural diffuse light facing east throughout the day due to its occasionally occupied character and also darker room requirements, and the materials selected to maximise the light include polycarbonate facade and Oak frame sliding doors with insulated glass in between.

Artificial lighting in night sourced by the reserve from biogas plant making it a renewable source of energy

3 FLOORS OF FOOD HALL

The food hall's natural light is increased with the use of insulating polycarbonate and glass facade, and because there is no direct solar gain during the afternoon hours that is Lunch Hours, the light that is transmitted inside the area is a softer diffused light, creating a comfortable atmosphere. The upper floors are of the food hall receive minimum lighting and use artificial lights to maintain the relaxed lighting conditions

FOYER

Combination of plenty of natural light from the rooflight and diffused light from windows on the north facade create a very comfortable environment in the foyer

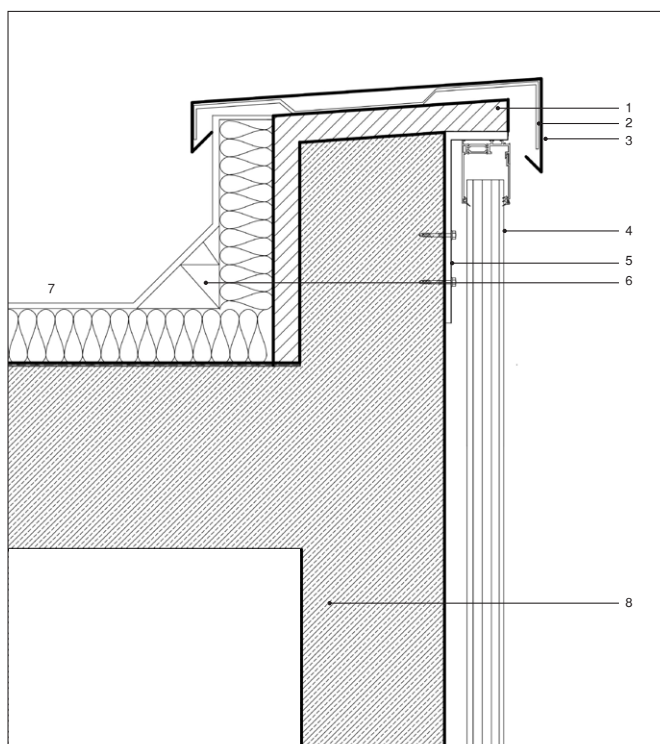


RECOMMENDATIONS

Recommended maintained illuminance levels (Lux) in accordance with CIBSE Environmental Design Guide (Butcher and Craig, 2016)

- Food Hall- Night Club, public house, cafeteria - 200 lux
- Food preparation and cooking - 500 lux
- Multi-purpose Hall- 300 lux
- Changing room/Dressing room - 300 lux
- Foyers- 200 Lux
- Offices
- Staff offices with computers - 300 lux

C4: Wall to Roof Junction 1:5



The project's approach was to reuse as much of the existing fabric as possible in order to extend the lifespan of the structure. The existing concrete roof structure is insulated on top with a fully adhered roofing membrane. The roof previously supported a live load with car parking on the roof; in my case, the roof will have no load. The ventilation gap between the concrete frame and the polycarbonate facade helps element the moisture and keeps the space dry

- 1 20mm marine ply, breather membrane
- 2 Clip
- 3 Aluminium coping
- 4 **RODECA** polycarbonate cladding 60mm (Crystal) with Rodeca powder coated aluminium frame (Graphite black)
- 5 Screws fixed to Rodeca frame through L angle bracket
- 6 Rigid Insulation
- 7 Fully Adhered single ply non-bituminous roofing membrane
- 8 90mm **Rockwool** rigid insulation

EXTRACTS FROM MY MANAGEMENT REPORT- LINKED TO PROJECT 1

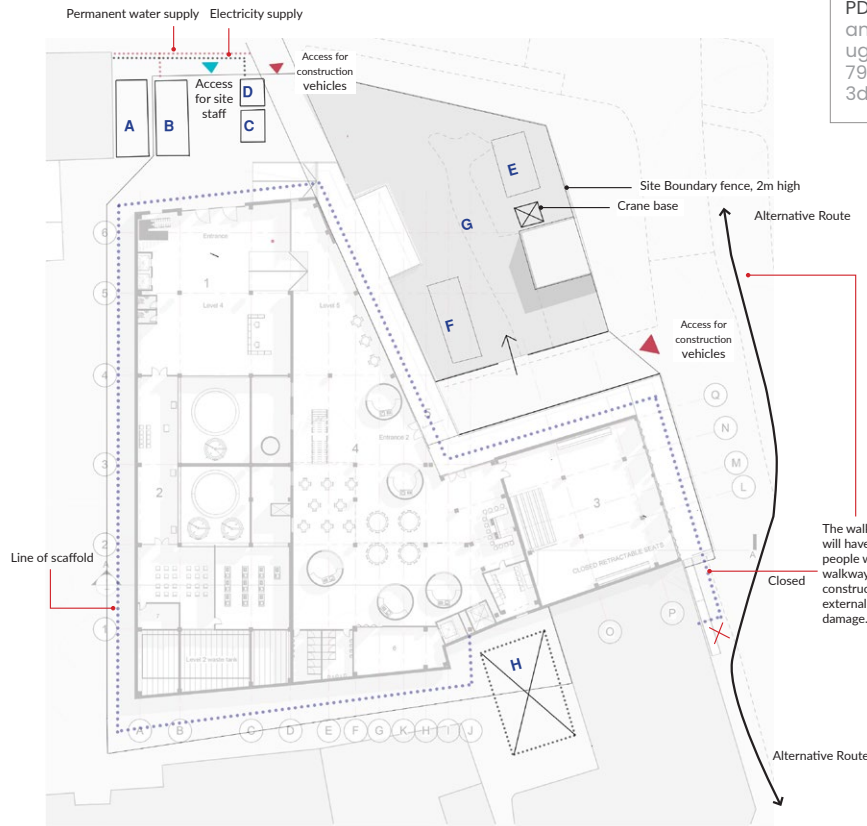


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Pre-construction Health and Safety plan

Health and Safety Executive (2006). Health and safety in construction.

- A** Car park for site staff, site visitors
- B** Resting facilities, mess and drying facilities
- C** Portable Toilets with temporary drain connection
- D** Timekeeper, site office
- E** Cement store and area for mixing
- F&H** Scaffold storage
- G** Area where trucks can load the demolition waste to keep the site clear



The walkway on the John Dobson street will have to be temporary closed and people will have to use the adjacent walkway. This is during the urban terrace construction and demolition of the external facade on the east to prevent any damage.

4.2: Building regulations: Part B (Fire Safety)

Information taken from Approved document B: Buildings other than Dwellings



Layout is done in such a way that there no rushing while escaping the building

B1 Warning and escape

1:5 : Automatic fire detection and alarm systems should be provided in non residential occupancies where a fire could break out in an unoccupied part of premises (e.g storage area)

Table 2:1- Offices, shops, and commercial buildings have a maximum travel distance of 18m if travel is only allowed in one direction and 45m where travel is available in more than one way.

Table 2:2 Minimum number of escape routes and exits from a room

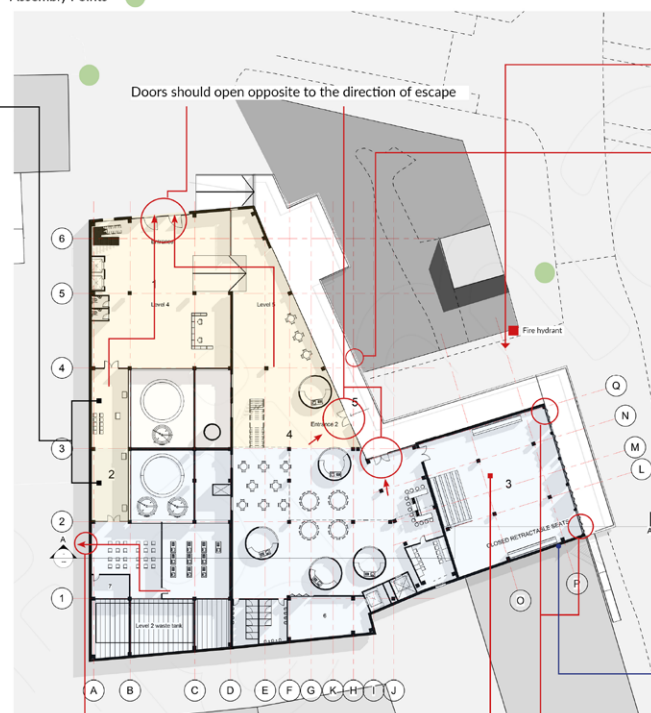
The building will have several exits because of the different venues with different levels of occupancy ranging from anywhere 60-400 people, so the minimum escapes routes of 3 will be followed but can be more. In this project there are 6 exits in total

The escape stairs in the food hall have a width of 1500mm more than the minimum requirement and the possible people served here would be anywhere around 200-220

Situation of stair	Maximum number of people served	Minimum stair width (mm)
1a In a residential (institutional) building (unless the stair is only for use by staff)	100	1000
1b In an assembly or recreation building and serving an area used for assembly purposes (unless the area is less than 100m²)	200	1100
1c In any other building and serving an area with an occupancy of more than 50	Over 200	See note 3
2 Any stair not described above	50	800

Minimum number of people	Minimum width (mm)
40	750
50	800
100	1000
More than 100	1100

Assembly Points -



B5: Access and facilities for fire service

- There is a lot of space for the fire fighters, also enough space to turn around
- The use of fire hydrant

- A staircase of 1500 or more should also be considered for quick escape as the food hall is very vulnerable to fire and also most of the people will be accommodated in that space

B2&B3: Internal Fire spread (Linings & Structure)

- As the interior walls are made of pre-cast concrete panels they resist fire for safe evacuation, it reduces the spread of fire from one room to another.
- Precast walls were used on to inside because of it's impact resistance and also because of noise of plant
- Also the internal Pilkington fire-resistant glass partitions are also non combustible reducing the spread.
- The floors and intermediate walls are made of concrete will also help stop the spread of fire from one to another.

B4: External Fire spread

- The external walls are clad with Pilkington Pyroclear (E glazing), and RODECA Polycarbonate cladding 60mm (Crystal) with Rodeca Frame (Graphite black) B-s1,d0 which can resist fire.
- The existing structure is reinforced concrete frame which is non combustible and withstand the fire for a long time before collapsing.

This is a reinforced concrete wall to stop the spread of fire from harming the adjacent property

A alternative escape should also be considered here because as the chances of fire in the Kitchen workshop is more and the travel distance from kitchen to possible escape is very far this will also reduce rushing in event of fire

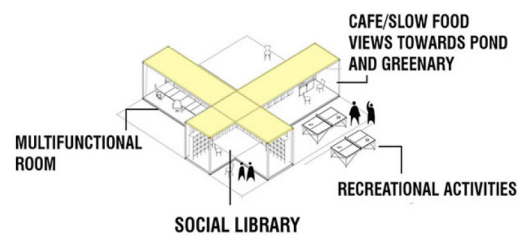
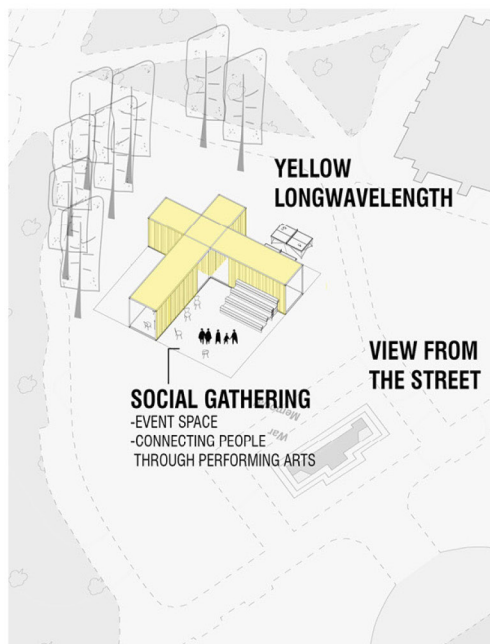
The bi-folding doors can also be used for escape

Alternative fire escape door to be considered for quick escape

SOME OTHER DESIGN WORKS



NAS X NUAS COMPETITION



LIVE PROJECT AT NATIONAL TRUST

