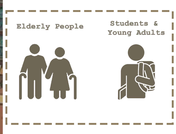
• Project Brief

The United Kingdoms population of over 65 year olds is expected to double by 2050 and there is a demand for age-appropriate services to accommodate them. This project aim is to create a design for an intergenerational community centre that addresses issues of ageing, social connection and the health and well being of the users.

Alongside the primary users, it is aimed to facilitate the needs of a second client and consist of a mutual support between generations.

This project aims to focus on social wellbeing with features aimed to provide an optimised environment that promotes socialising through shared space and schemes like
workshops to further connection between the chosen clients.

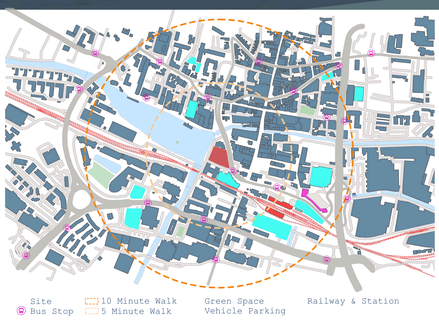
• The Clients



These clients were chosen as they have signicant overlap in social and emotional challenges. Elderly people often face isolation and for new students travelling to the city and being away from home for the first time, both may feel like there is a lack of strong community support.

• Design Problems

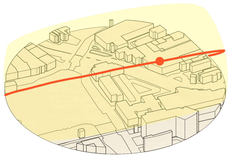
These design problems are ones that directly affect the chosen clients. It is important during designing that solutions to these problems are considered. For example, resolving isolation and accessibility could be achieved through shared spaces, usable by people of all abilities. To aid in the circadian rhythm and mental health aspects, it is essential to maximise natural light and green spaces in the design as they improve and promote overal health.



Site

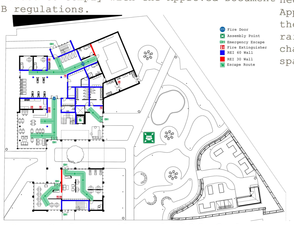
The key benefits of this site are its access and proximity to the Brayford Pool. This allows for connection to the University and surrouding city areas like the High Street, as well as providing pleasant site lines of the Wharf itself.

Sun Orientation



Part B Compliance

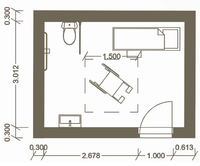
In order to achieve Part B Compliance an indepth fire strategy was created. This plan shows the proposed exit strategy for building users and the wall integrity needed to comply with the Approved Document B regulations.



Fire Safety Plan 1.400 @A1

Part M Compliance

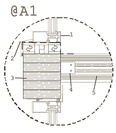
As the hydro therapy pool will be used by disabled users, the neighbouring changing rooms have been equipped to facilitate their needs, following all guidance from Approved Document M. This ensures there is adequate turning space and railings as well as a bed to aid changing for users and make the space more accessible.



Technical Section 1.50 @A1

01 - Exterior GLT Beam to CLT slab connection

1. Curtain Wall system
2. Sill Flashing
3. External GLT Beam
4. Steel Connector Plate
5. CLT floor slab (see 04)

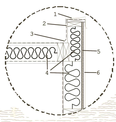


02 - Grass Roof Trim

1. Retention Trim
2. Filter Fleece
3. Growing Medium
4. Gravel Boundary
5. Drainage Element
6. Insulation
7. CLT Floor slab

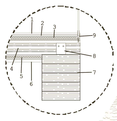
03 - Roof to Parapet connection

1. Parapet Flashing
2. Water Control Membrane
3. Cant strip
4. Insulation
5. Mounting Battens
6. Larch Cladding



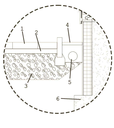
04 - CLT Floor slab to GLT Beam connection with railing

1. 16mm Exposed Cork Tiling
2. 5mm Rubber Absorption Layer
3. 60mm PIR Insulation
4. 130mm 5 Layer CLT Panel
5. Vapour Control Layer
6. 12.5mm Plasterboard
7. GLT Beam
8. Steel Connector Plate
9. Railing channel partially embedded into floor



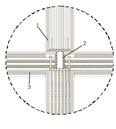
05 - Gravel Boundary

1. 50mm Stonework Pavers
2. 30mm Sand
3. Compacted Hardcore
4. 20mm Decorative gravel
5. Drainage Pipe
6. Foundation



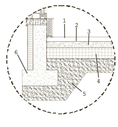
06 - GLT Column to CLT Floor connection

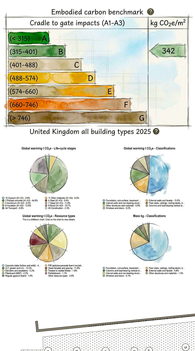
1. GLT Column
2. Steel Connection
3. CLT Floor slab (see 04)



07 - Foundation

1. 16mm Exposed Cork Tiling
2. 5mm Rubber Absorption Layer
3. 50mm Concrete Slab
4. 150mm PIR Insulation
5. 400mm Compacted Hardcore
6. Concrete Footing





Part L Compliance

The calculated embodied carbon benchmark of A1-A5 is rated B. This demonstrates a good performance in material use and construction methods compared to the performance against the current UK industry benchmarks. The tables provided demonstrate that the chosen buildups in this project are far below the maximum U-Values allowed in the Approved Document Part L.

Wall - Max U-Values = 0.26

Material	Thickness (mm)	K-Value (W/mK)	R-Value (m²K/W)
Larch Cladding	25	0.13	0.192
Wood Fibre Composite	15	0.048	0.313
PIR Insulation	210	0.022	9.545
Particle Board	15	0.13	0.115

Calculated U-Values = 0.097 W/m²K

Foundation - Max U-Values = 0.18

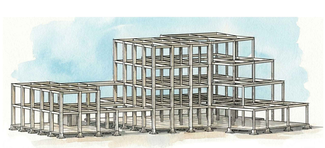
Material	Thickness (mm)	K-Value (W/mK)	R-Value (m²K/W)
Cork Tile	8	0.04	0.2
Concrete Slab	250	1.75	0.143
PIR Insulation	150	0.022	6.818
Compacted Rubble	400	1.5	0.267

Calculated U-Values = 0.132 W/m²K

Roof - Max U-Values = 0.18

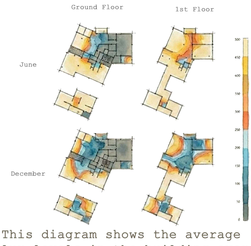
Material	Thickness (mm)	K-Value (W/mK)	R-Value (m²K/W)
Roof Sealant	1.5	0.2	0.008
OSB	18	0.13	0.138
PIR Insulation	260	0.022	11.818
Particle Board]	15	0.13	0.115

Calculated U-Values 0.082 W/m²K

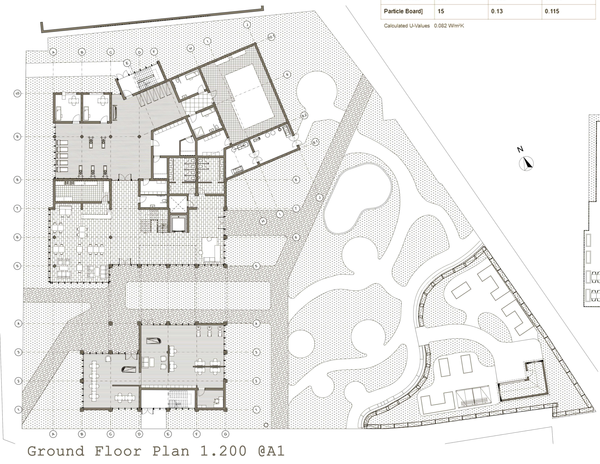


The building features a Glulaminated Timber grid structure with Cross Laminated Timber acting as slab floors. Glulam was chosen due to its high strength to weight ratio which allows for long spans and a subsequent open plan space. The grid structure was chosen as it utilises pre-fabricated sections and allows for even distribution of weight. Also the modular design will allow for reduced material waste and faser construction both reducing embodied carbon emissions.

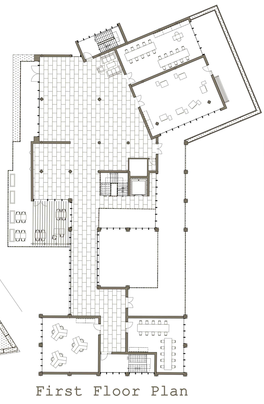
Illuminance



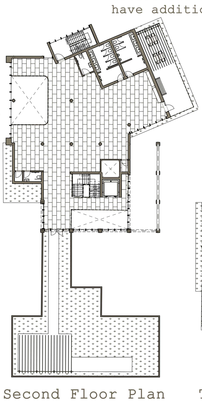
This diagram shows the average lux levels in the building over the year. Ensuring the recommended day light levels are met is important for Net Zero compliance to avoid the need for artificial lighting which will have additional carbon costs.



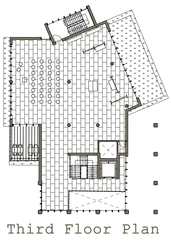
Ground Floor Plan 1.200 @A1



First Floor Plan



Second Floor Plan



Third Floor Plan

Lincoln Community Centre

Oliver Evans-Howe - 27494075

In order to improve the buildings Net zero contribution, materials chosen for this project were chosen as they can be sustainably sourced and are renewable. This building features many timber based materials for this reason to reduce the embodied carbon emissions and as they provide good thermal performance

Materials

Larch Cladding
- Low Embodied Carbon
- Thermal Insulation
- Low Carbon construction
- Recyclable at end-of-life
- Renewable natural material

Cork Tiles
- Low Embodied Carbon
- Acoustic insulation indoors
- Low life cycle emissions
- Fully renewable
- Locally sourced

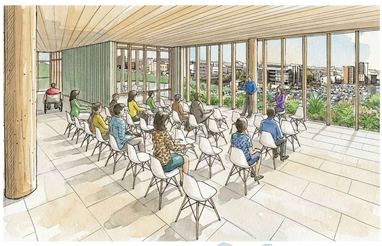
Powdar Coated Aluminium
- Recyclable
- Coating improves durability, reduces maintenance
- Lightweight construction lowers transportation cost

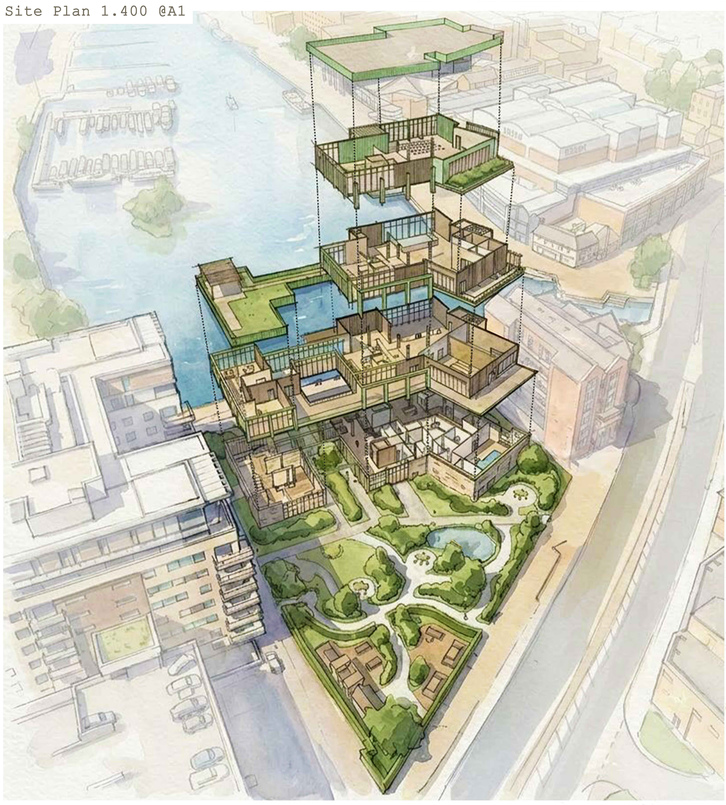
Cross Laminated Timber
- Renewable material
- Low embodied carbon
- Thermal insulation
- Faster construction, fewer site emissions

Limestone
- Long life cycle
- High thermal mass
- Locally sourced
- Low maintenance
- Reusable in future applications

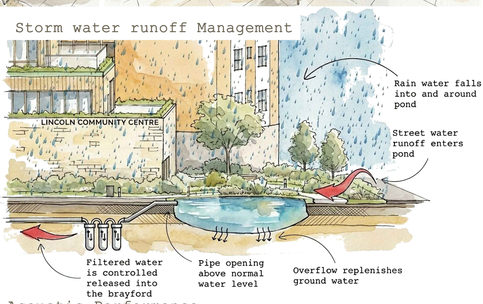
Moss Roof
- Increase biodiversity
- Reduce Urban heat island effect
- Renewable
- Thermal insulation
- Reduce rainwater runoff

Site Plan 1.400 @A1

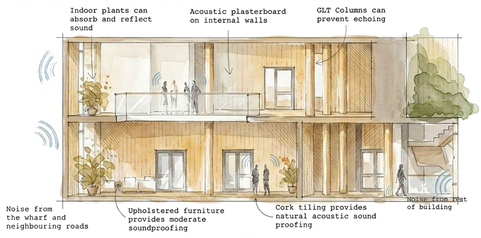


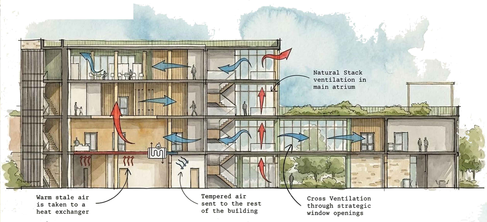


Storm water runoff Management



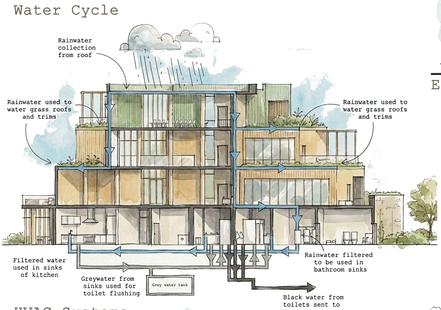
Acoustic Performance



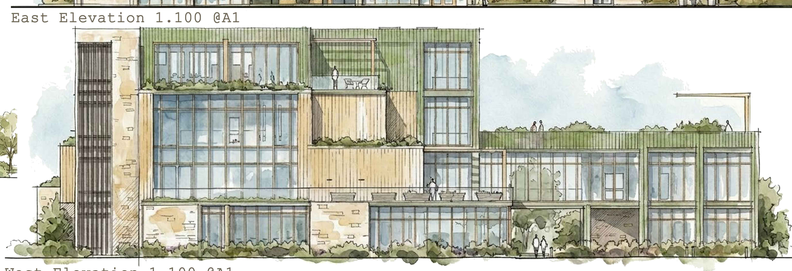


These diagrams show both the active systems and benefits of the passive design features that were included in the creation of this building. These passive design features were aimed at improving the sustainability of the project by reducing the reliance on operational systems and its associated carbon cost.

Water Cycle



East Elevation 1.100 @A1



West Elevation 1.100 @A1

HVAC Systems