

INTERGENERATIONAL HUB

BRINGING TOGETHER A COMMUNITY OF ALL AGES



TEAM F STAGE 3 REPORT

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PROJECT SUMMARY 1

SUMMARY OF BRIEF

The proposed community centre is aimed to provide a service to people of all ages and address the socio-economic issues of the area as illustrated on the right. The programme will include a community hub, nursery, sporting change and wash facility and through these, will begin to tackle the challenges faced in the local area.

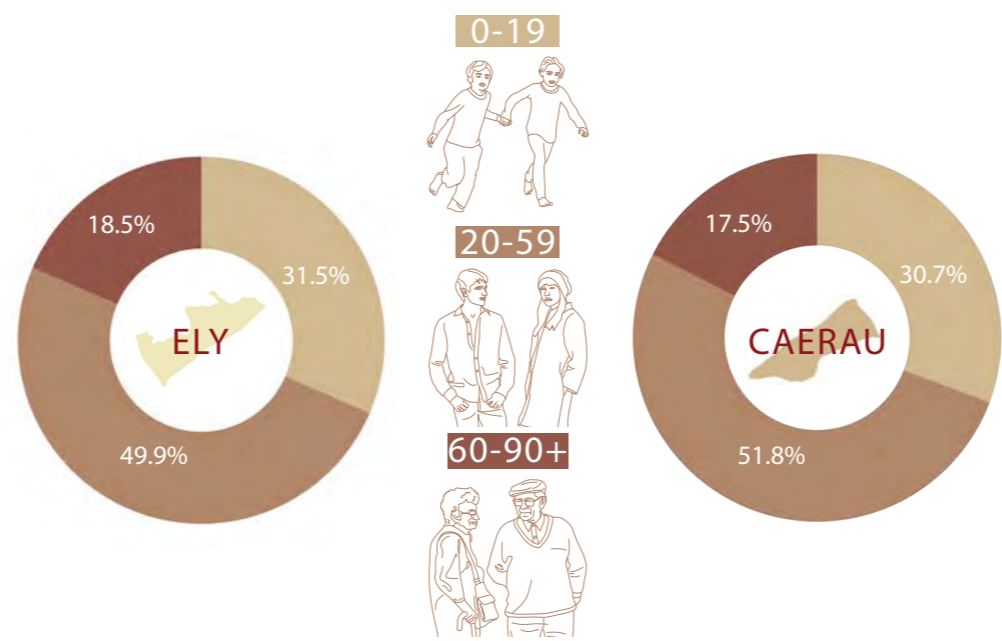
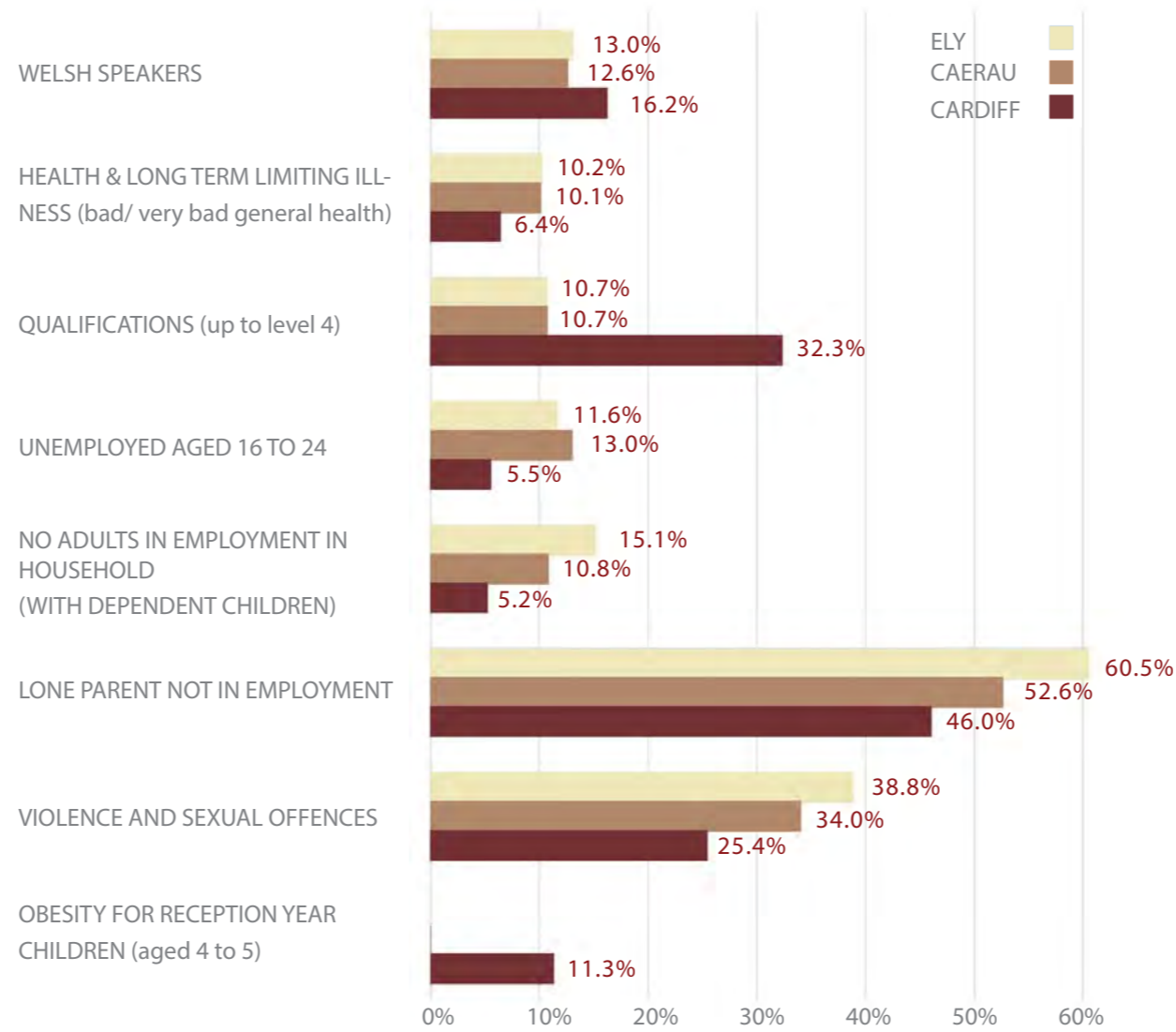
As a physical catalyst, the building aims to enact social uplift to Ely and Caerau by welcoming all under its roof and instil a sense of civic pride through the architecture of the new hub in Trelai Park. Through a dedicated facility it will create a mixing pot for the community to come together and enable the nuclear theory to take place under each of the programmes.

This engagement of young and old allows for the passing of knowledge and company between generations, allowing for the elder generation to become teachers, guardians and inspiration for young children who may not have role models in their lives.

The neighbourhood has a strong sense of community and is rich with historical context. This project looks to enhance this community, creating a focus hub that the residents can be proud of. The drive of the client is to enhance these playing fields, and to bring a sense of pride to the community. Local children need good role models, healthy activities, and a place to come together. In addition to sports, healthy food should also be provided, especially to children. Apart from the city council, NGOs and institutions are also involved in this development. Alongside this it's important to value the historical assets highlighted by Caerau and Ely Rediscovering Heritage (CAER).

The current occupants of the site are a nursery and a bowling green, and the programs will be kept and improved in this development. The client also addresses the necessity of surveillance within the site and building. The building is expected to run at night time, therefore services including lighting and entrances should be carefully designed.

DEMOGRAPHIC STUDY

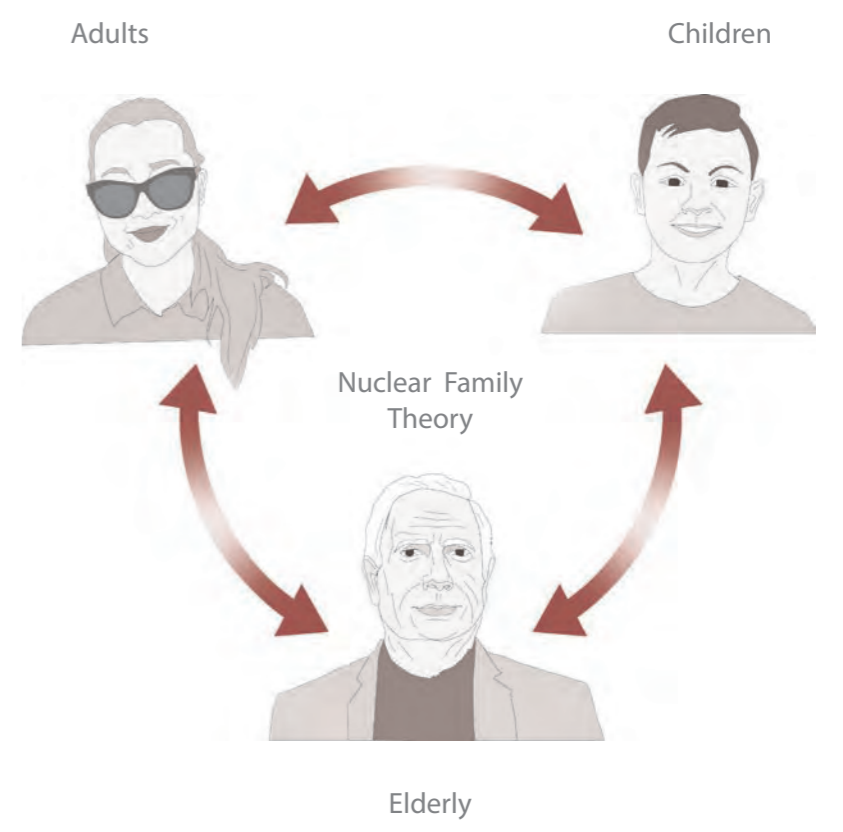


NUCLEAR FAMILY THEORY

The Nuclear family theory describes the symbiotic relationship between all members of a family, from young to old. Typically when parents are at the prime working age they also have less time to look after their children. In such situations the grandparents, who typically have more time, step in to look after the children. This allows parents to concentrate on their careers, grandparents can enjoy spending time with their grandchildren and benefit from the exuberance of youth, and the children can learn from strong role models with a vast amount of knowledge.

Our scheme aims to adapt this theory to a building and a whole community. This culminates in a large social space for all generations, the community hub. The centre aims to cater for people from all walks of life and all ages and the community hub is where these people meet and interact.

The nursery and bowling green bring both young and old to the community centre and the other activities hosted ensure that there are always a diverse range of people. The gardens provide an opportunity for children from the nursery to learn about growing food from the older residents who manage the allotments.





ACTIVITIES TIMETABLE

Open hours of the building: 7am-8pm, 7 days a week

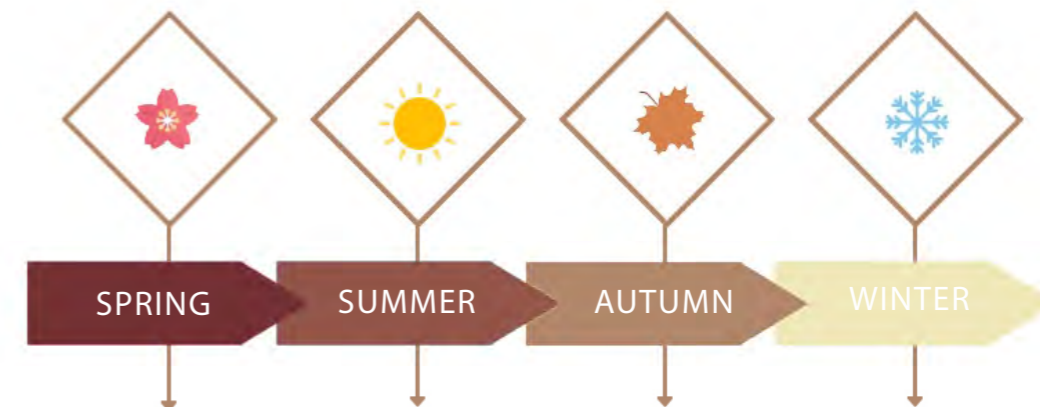
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
9-12	NURSERY	NURSERY	NURSERY	NURSERY	NURSERY	READING CLUB	-
13-16	NURSERY	NURSERY	NURSERY	NURSERY	NURSERY	-	READING CLUB
16-18	AFTER SCHOOL CLUB	AFTER SCHOOL CLUB	AFTER SCHOOL CLUB	AFTER SCHOOL CLUB	AFTER SCHOOL CLUB	-	-

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
9-12	COMMUNITY CONSULTATION WORKSHOP	(FOR RENTAL)	COMMUNITY CONSULTATION WORKSHOP	CV WORKSHOPS/ JOB SEEKING SUPPORT	(FOR RENTAL)	(FOR RENTAL)	LEARNING SUPPORT
13-16	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	LEARNING SUPPORT
16-18	(FOR RENTAL)	(FOR RENTAL)	COMMUNITY CONSULTATION WORKSHOP	CV WORKSHOPS/ JOB SEEKING SUPPORT	COMMUNITY CONSULTATION WORKSHOP	(FOR RENTAL)	(FOR RENTAL)
18-20	CV WORKSHOPS/ JOB SEEKING SUPPORT	(FOR RENTAL)	COMMUNITY CONSULTATION WORKSHOP	CV WORKSHOPS/ JOB SEEKING SUPPORT	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
730-9	BREAKFAST CLUB	BREAKFAST CLUB	BREAKFAST CLUB	BREAKFAST CLUB	BREAKFAST CLUB	(FOR RENTAL)	COMMUNITY MARKET
9-12	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	COMMUNITY MARKET
12-13	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	SPORTS TEAM EVENT	COMMUNITY MARKET
14-16	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	SPORTS TEAM EVENT	(FOR RENTAL)
16-1630	TEA	TEA	TEA	TEA	TEA	(FOR RENTAL)	(FOR RENTAL)
1630-18	(FOR RENTAL)	SPORTS TEAM EVENT	(FOR RENTAL)	SPORTS TEAM EVENT	(FOR RENTAL)	(FOR RENTAL)	TALKS
18-20	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	FILM NIGHT	(FOR RENTAL)	(FOR RENTAL)

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
9-12	BOWLING CLUB	GARDENING CLUB	BOWLING CLUB	NURSERY GARDENING	BOWLING CLUB	GARDENING CLUB	BOWLING CLUB
13-16	NURSERY GARDENING	GARDENING CLUB	BOWLING CLUB	COMMUNITY GARDENING	BOWLING CLUB	COMMUNITY GARDENING	COMMUNITY GARDENING
16-20	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
7-8	YOGA CLUB	PILATES	FITNESS CLUB	MEDITATION CLUB	RUNNING CLUB	CYCLE CLUB	WALKING CLUB
9-12	CRAFTS CLUB	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	WELSH FOR ALL	HERITAGE CLUB
13-16	(FOR RENTAL)	(FOR RENTAL)	COMMUNITY CONSULTATION WORKSHOP	CV WORKSHOPS/ JOB SEEKING SUPPORT	KNITTING CLUB	READING CLUB	LEARNING SUPPORT
16-18	AFTER SCHOOL CLUB	AFTER SCHOOL CLUB	AFTER SCHOOL CLUB	AFTER SCHOOL CLUB	AFTER SCHOOL CLUB	(FOR RENTAL)	(FOR RENTAL)
18-20	(FOR RENTAL)	(FOR RENTAL)	SELF DEFENCE	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)	(FOR RENTAL)



- Charity Runs/ Fun Runs
- Job Fair
- Networking Night
- Eating Well Workshops
- Community Bake Off

- Live Music
- Flea Market
- Community Picnic
- Job Fair
- Networking Night

- Harvesting Festival
- Job Fair
- Networking Night
- Art Exhibition

- Christmas Markets
- Christmas Carol
- Job Fair
- Networking Night

SITE ANALYSIS 2



01

We hope to enhance the connection with Caerau Hill Fort and local schools via a new route across the playing fields.



02

Creating a community hub at the meeting point of two key axes through Trelai Park



03

Current entrances to the park are not cycle friendly and through design will become more fluid.



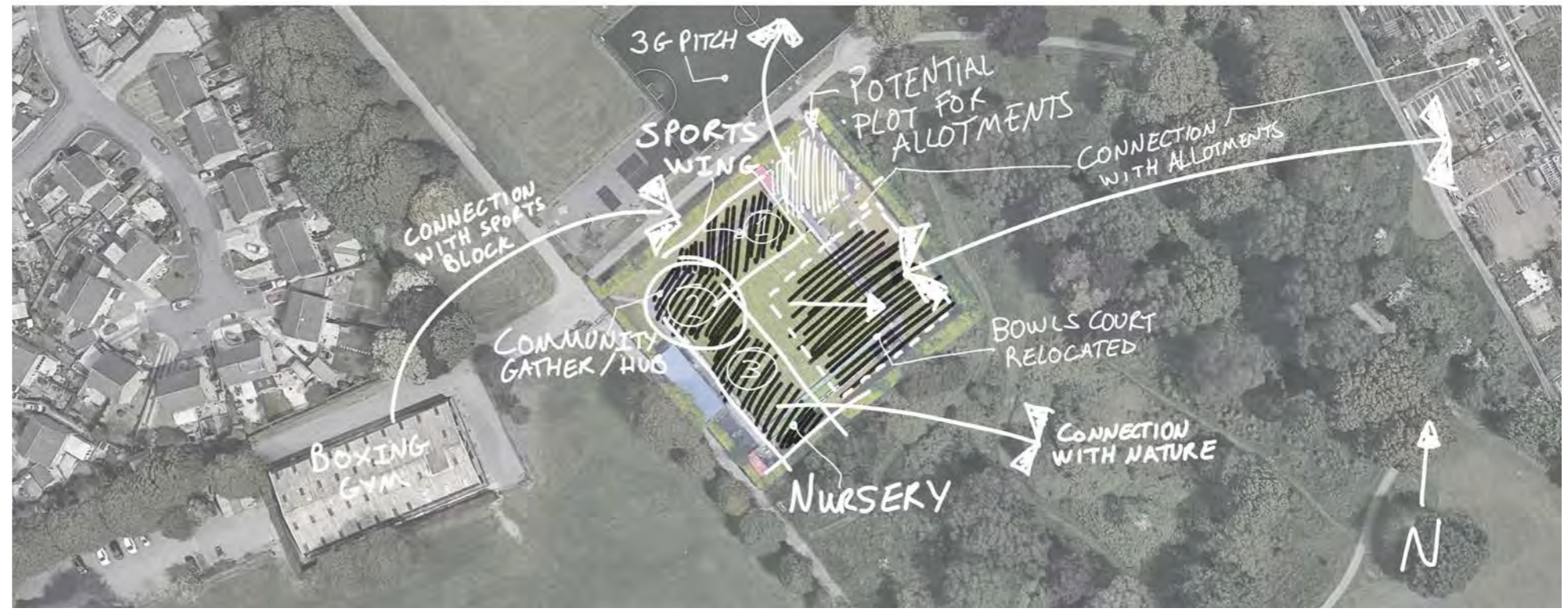
04

The bowling green will be moved North East to allow for a larger building to the West.



05

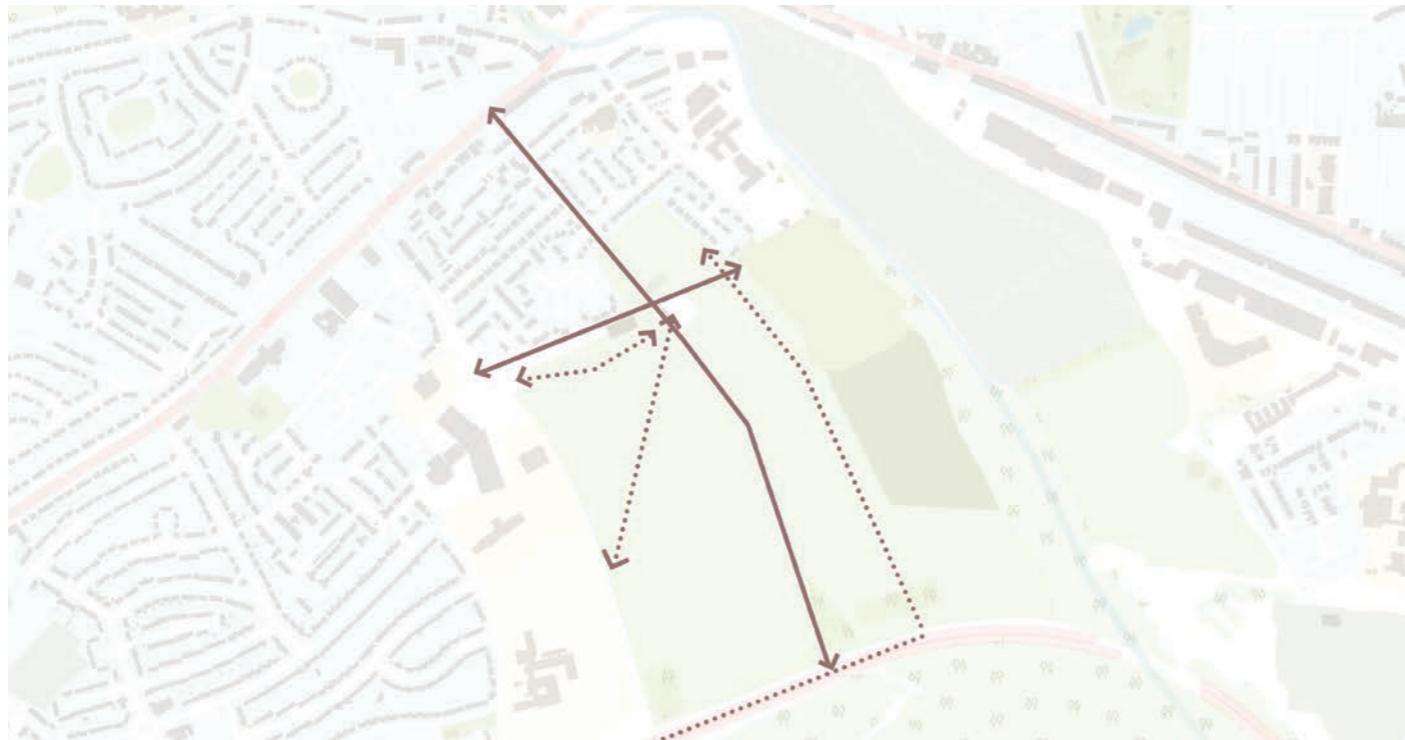
Adjacent play areas and sports pitches can have a connection with the new community centre





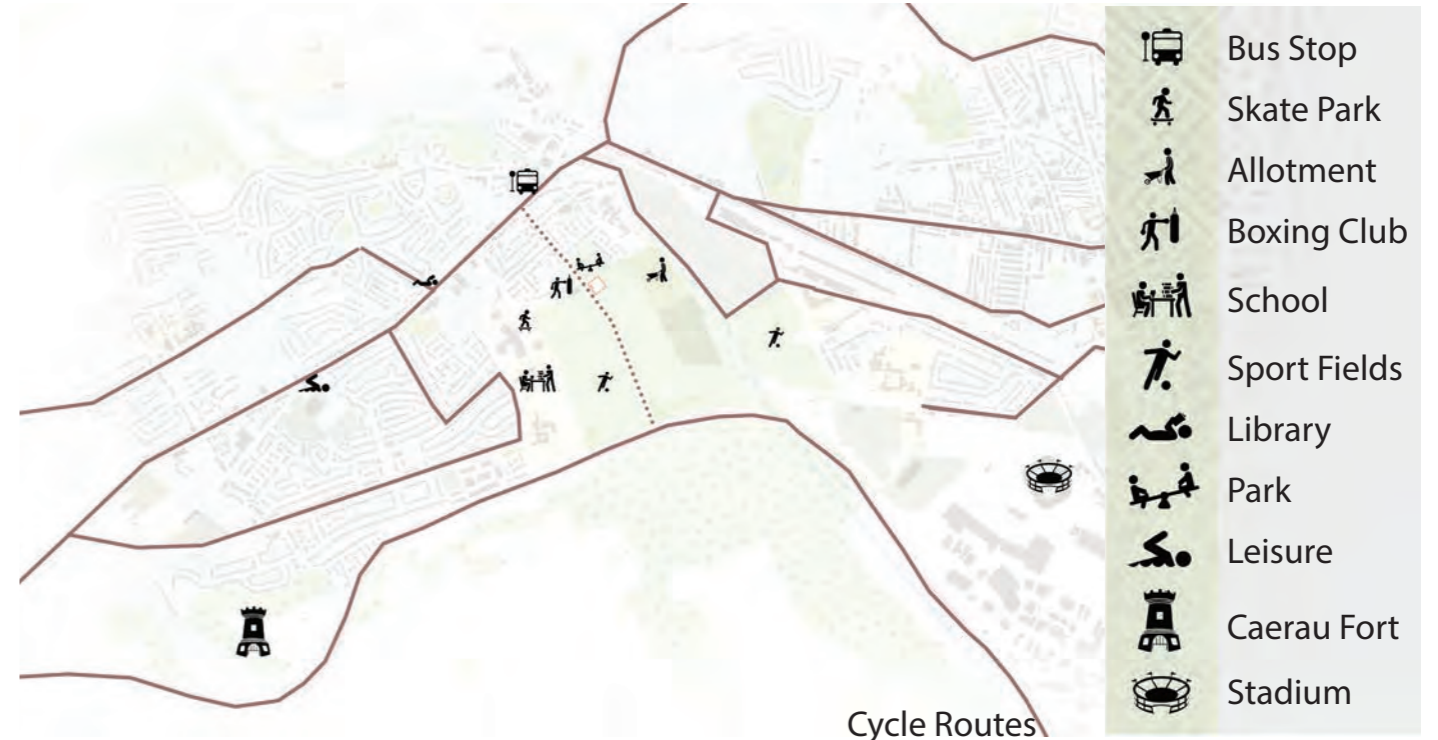
Traffic Calming

Current residents have complained to the council about cars driving too fast. The existing fabric of the streets in these areas are partly responsible and could benefit from green injection.



Formal & Informal Desire Lines

The site sits between two key routes (North to South & East to West), giving for a formal axis. Naturally, we walk along desire lines, taking short cuts. These sit across the fields and connect the site to the adjacent schools and neighbourhoods.



Immediate Context

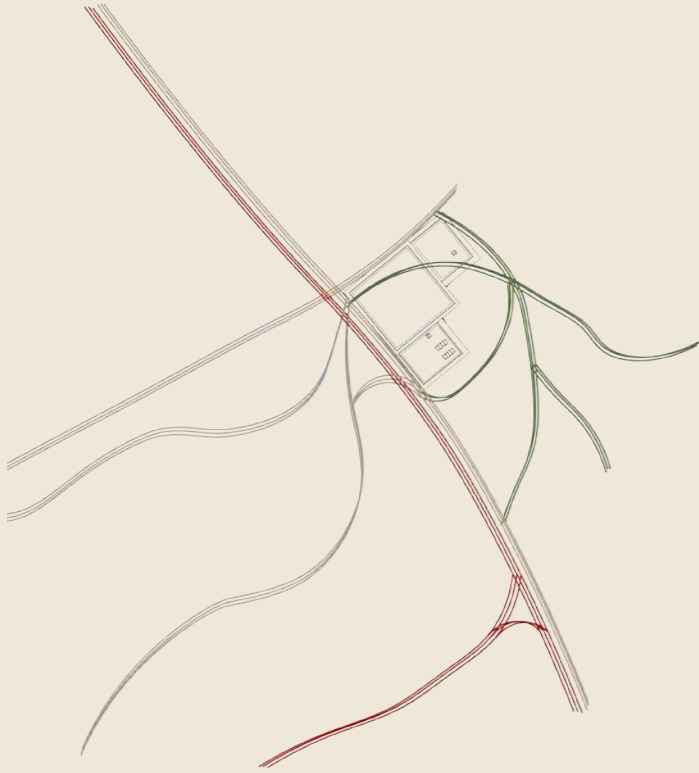
The site sits West of Cardiff city centre, a 15 minute bus ride or an 18 minute cycle. These existing cycle routes run around the site and with design will be brought in and through. Trelai Park and the surrounding area are rich with activities and sport fields but short on accessible facilities.



Connectivity & Heritage

With adjacent cycle routes to the site, there are connections to be made both North and South. This then allows a heritage route to adjoin the site with Caerau Fort.

URBAN & LANDSCAPE STRATEGY 3



Cycle Routes



Nature Trails



Heritage Trails

The urban layout is based upon the nuclear theory, bringing people to a new central hub along 3 sets of routes: cycle/urban infrastructure, nature trails for education and heritage trails to bring the site and surrounding area into connection. The nuclear theory adaptation looks to create a location where different generations can interact, and these paths create spaces for activity and social response. This is carried through into the building with its direct relationship to its site, and gardens.

Wider Masterplan Strategies



1:2000

01



Wet Attenuation Pond

Surface Water Flood Protection
Habitat Creation
Educational Function
Natural beauty
Play & Social Environment

02



Play / Sport Facilities

Dry Pavilion to Watch Sports
Urban Footpaths with Street Furniture
Well Lit & Safe Environment
Improved Social Facilities Indoor & Out
Bringing the Community Together

03



Urban Travel Paths

Connection to Skate Park
Safe Travel Paths with Urban Furniture
Moulded Landscaping
Social Interaction Across the Site
Promoting Healthy Activities

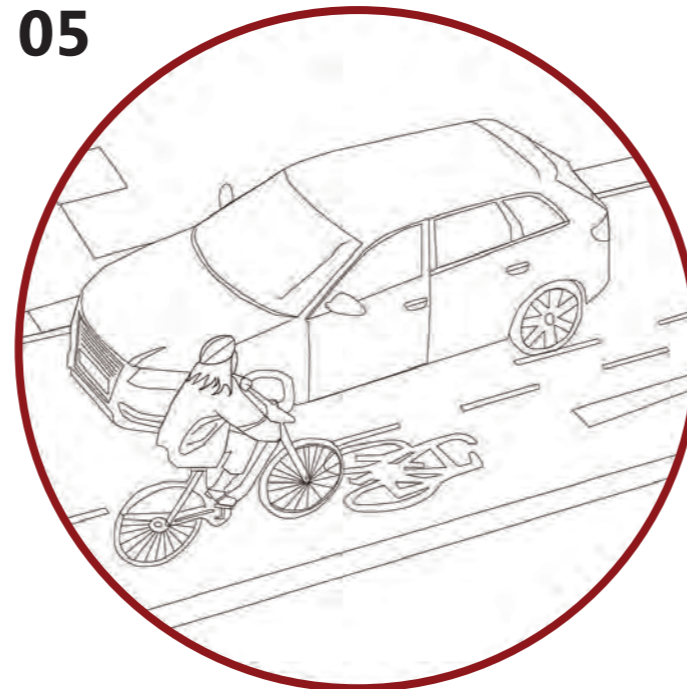
04



Nature Trails

Connections to the wider region
Educational Experience
Habitat & Wildlife Creation
Connection to Allotment for Food
Sustainability and Social Welfare

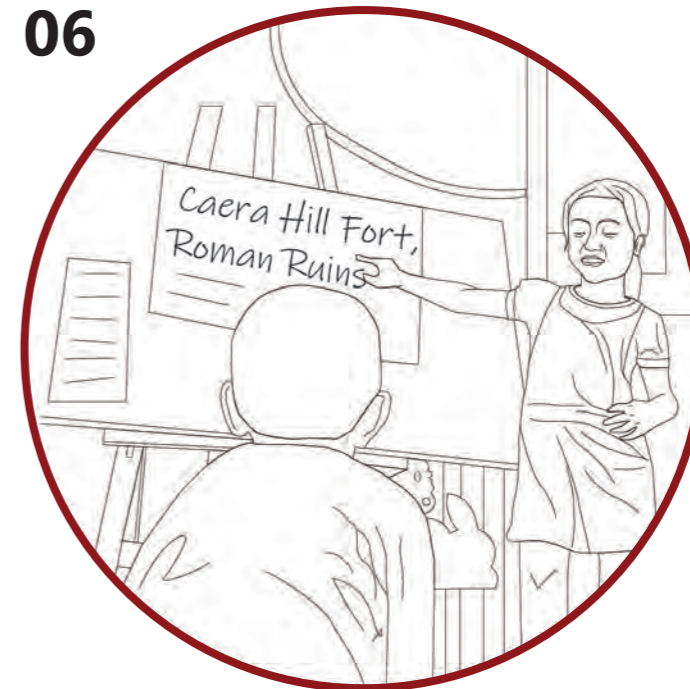
05



Natural Sprawl

Cycle Routes Interacting Through the Site
Reducing Traffic Speed & Increasing Safety
Visible & Open Site Entrance
Natural Shading & Wildlife Buffer
Shared Surface & Human Level Focus

06



Heritage Trails

Connections to: Caerau Hill Fort, Roman Ruins, St Fagans, Cardiff
Castle, St Mary's Ruins via Heritage Trails.
These Tie into the Taff Trail.
Enhancing the Sport Facilities



Natural shading woven through the landscape



Improved sports facilities and changing rooms



Outdoor table tennis



Create new wildlife habitats



Connection to existing allotments and new on-site ones



Cycle Routes and sheltered cycle storage



Nature and Heritage trails



The nursery can be locked off and secured when in use



Workshop and storage adjacent to bowls court



Link to existing facilities such as boxing club



Seating around bowls court



Grass crete allows for more parking along the current car park



Using the bowls court for interaction between ages



Urban infrastructure creates interactive spaces

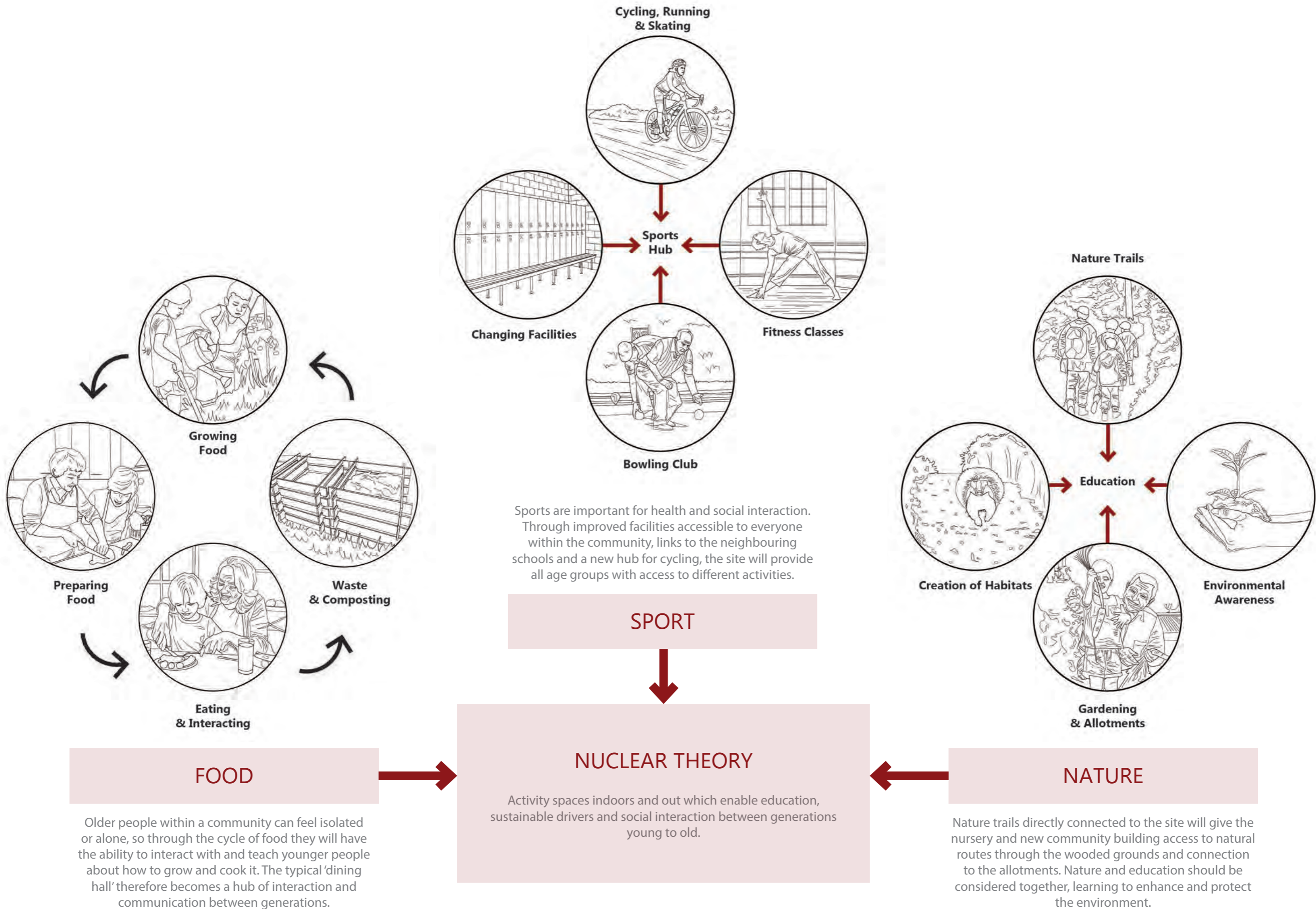


Covered indoor - outdoor spaces

'A NEW COMMUNITY CENTRE EMERGING FROM ITS LANDSCAPE SETTING'

1:500





ARCHITECTURAL VISION 4

WARM - WELCOMING - ICONIC

Social Hub - A Space for All

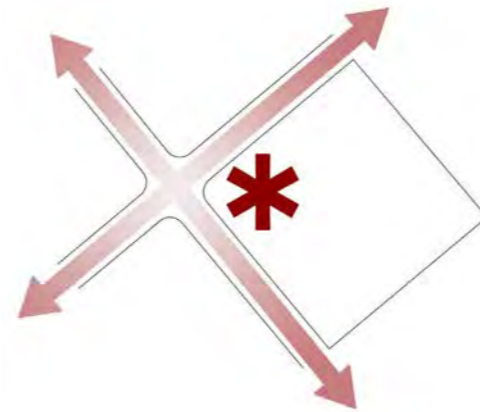
The social hub at the entrance to the community centre is a space which connects people from all age groups and walks of life. We believe this is fundamental to social wellbeing in a community and is the main focus of our project. The social hub is a multifunctional space, housing both the café and reception as well as a number of informal meeting areas of varying levels of intimacy. It is the heart of the building with all other spaces feeding directly into it and is where a variety of activities coexist during the day. This allows people of all walks of life to mix and come into contact with the daily activities within the centre. For instance a parent dropping off their child at the nursery might visit the café and witness the local cycling club having their weekly meeting or a yoga class in the background of the hall. For larger events the furniture in the hub can also be cleared to allow for assemblies of up to 200 people.

A Welcoming Entrance

We wanted to create a warm and welcoming entrance which would act as a beacon, drawing people into the community centre. The glass façades guide people into the building and allow for an openness and transparency through to the warmth of the rammed earth walls within.

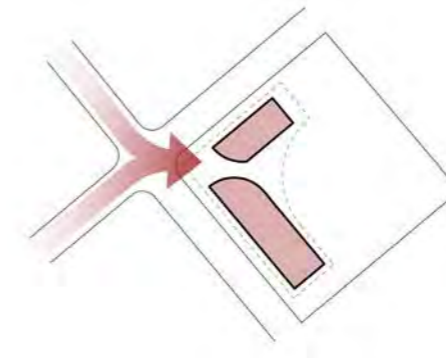
We hope this building will become an iconic image for the area and something the local community can be proud of for years to come.

DESIGN PRINCIPLES



A Key Point

Our site sits along the boundary of two main routes through the park. The intersection of these paths marks a key strategic location where people come together.



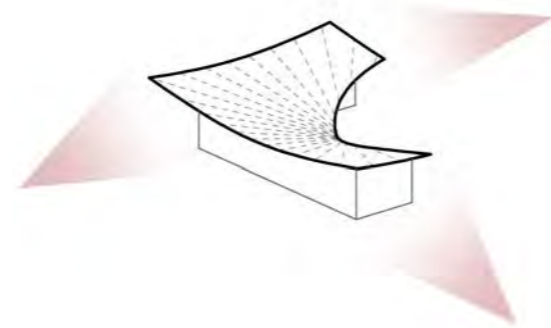
Welcoming People In

The general massing of the building engages with the flow of people along these two main paths, forming an L-shape in plan. This form is broken at the corner to create a welcoming entrance to the site.



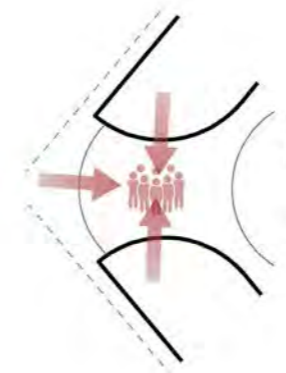
Gathering Under One Roof

The roof which spans between these two buildings creates a sheltered canopy for people to gather. As the bridge between the nursery and community centre, this is where people from all walks of life will meet and interact (nuclear theory).



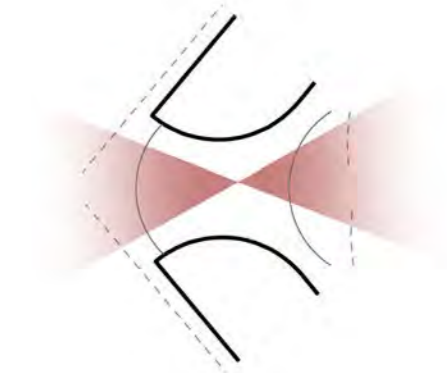
An Iconic Landmark

Raising the front corner of the building creates a reference point, visible from the rest of the park and an iconic corner entrance. The shape of the roof also responds to the internal layout as it rises to form a double height hub spaces, with lower more intimate spaces along the two wings.



Social Hub

All rooms flow into the social hub. This is the core of the building where different activities take place and people mix/interact ("nuclear theory"). A variety of social spaces of different levels of intimacy/privacy are provided for various types of meetings or events.



Connecting with Nature

The curved rammed earth walls of the social hub draw people into the building and guide visitors from more public to more private social spaces along the wings. The curving walls also allow the building to open up to views of nature to the west and east overlooking the bowling green and fields.



Nursery

- 1 Main Play Space
- 2 Kitchenette
- 3 Nursery & Centre Manager's Office
- 4 WCs
- 5 Cloakroom/Entrance Lobby
- 6 Storage/Seating Wall
- 7 Quiet Reading Area
- 8 Baby Room

Community Centre

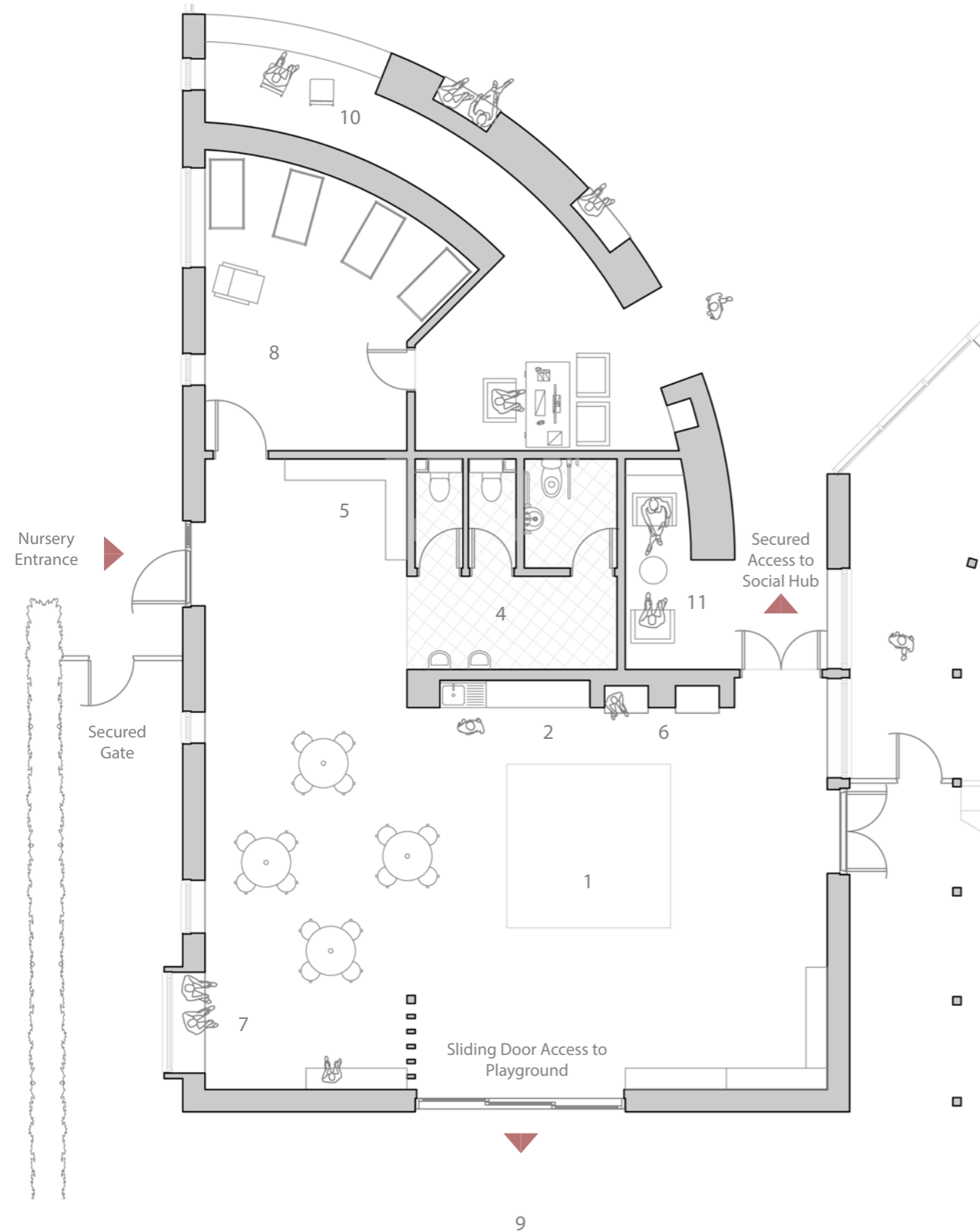
- 9 Community Café
- 10 Community Kitchen
- 11 Kitchen Storage
- 12 Reception
- 13 Social Space
- 14 Hall Storage
- 15 Plant Room
- 16 Family/Accessible WC
- 17 Unisex WCs
- 18 Accessible Shower Room
- 19 Showers/Changing Room
- 20 Cleaner's Cupboard
- 21 Multi-purpose Room
- 22 Confidential Consulting Booths
- 23 External Bowls Storage
- 24 Multi-function Social Hub (200pp)

External

- 25 Bowling Green
- 26 Community Allotments
- 27 Nursery Playground

Plan - 1:200

NURSERY WING



Nursery Plan 1:100



Nursery Wing

- 1 Main Play Space
- 2 Kitchenette
- 3 Nursery / Manager's Office
- 4 WCs & Wet Play Area
- 5 Cloakroom/Entrance Lobby
- 6 Storage/Seating Wall
- 7 Quiet Reading Area
- 8 Baby Room
- 9 Nursery Playground
- 10 Reception
- 11 Confidential Consulting Booth

The main nursery entrance is the only public threshold to the nursery other than through the central hall space which is secured with a safety lock to provide security and control. To ease the flow of traffic, the baby room is located immediately to the left hand side as you enter and toilet facilities are within five metres of entering for any emergency situations. Beyond this the main nursery space opens as one large adaptable play space. A thick feature wall housing the kitchenette and storage separates the facilities from the main area. This space is subtly divided with timber fins along one side to provide a soft boundary that creates the role-play area. An oriel window seat is the central focus of the area to provide a special moment for stories and adventure. The alternative point of entry allows the nursery to internally access the large hall space for inter-generational dining and an opportunity for indoor activities.

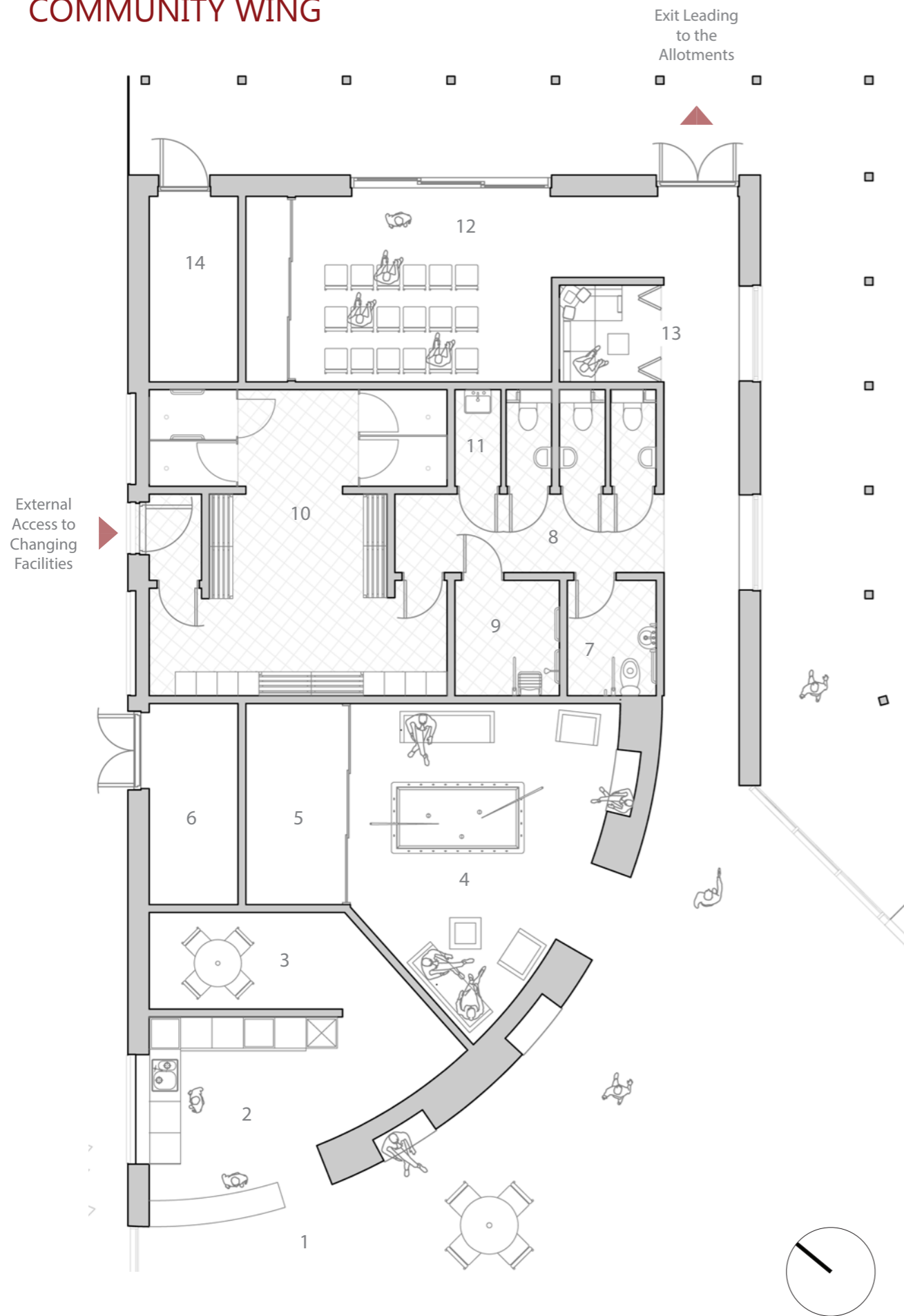
Right:
Section through consultation booth

Skylights are used in both the nursery and consultation booths to bring light down into the spaces and to create moments of intimacy and reflection.

The consultation booths are spaces that can be shut off for private conversation or opened up to look out over the bowling green



COMMUNITY WING

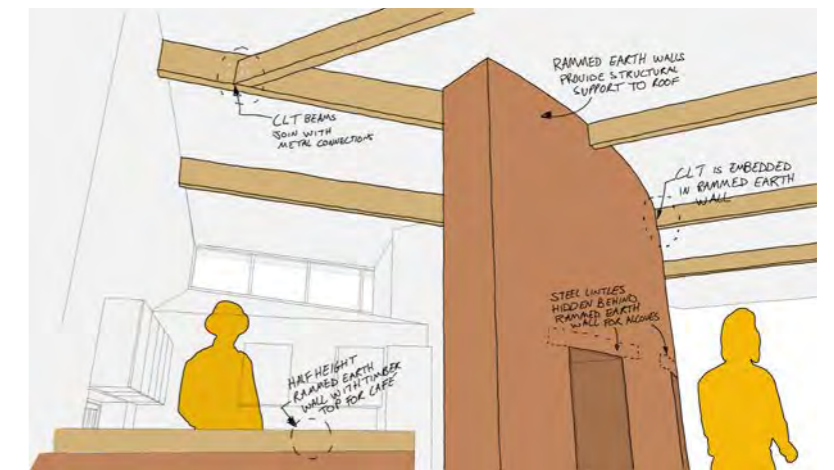


Community Wing Plan 1:100



Community Wing

- 1 Community Café
- 2 Community Kitchen
- 3 Kitchen Storage
- 4 Social Space
- 5 Hall Storage
- 6 Plant Room
- 7 Family/Accessible WC
- 8 Unisex WCs
- 9 Accessible Shower Room
- 10 Showers/Changing Room
- 11 Cleaner's Cupboard
- 12 Multi-purpose Room
- 13 Confidential Consulting Booth
- 14 External Bowls Storage

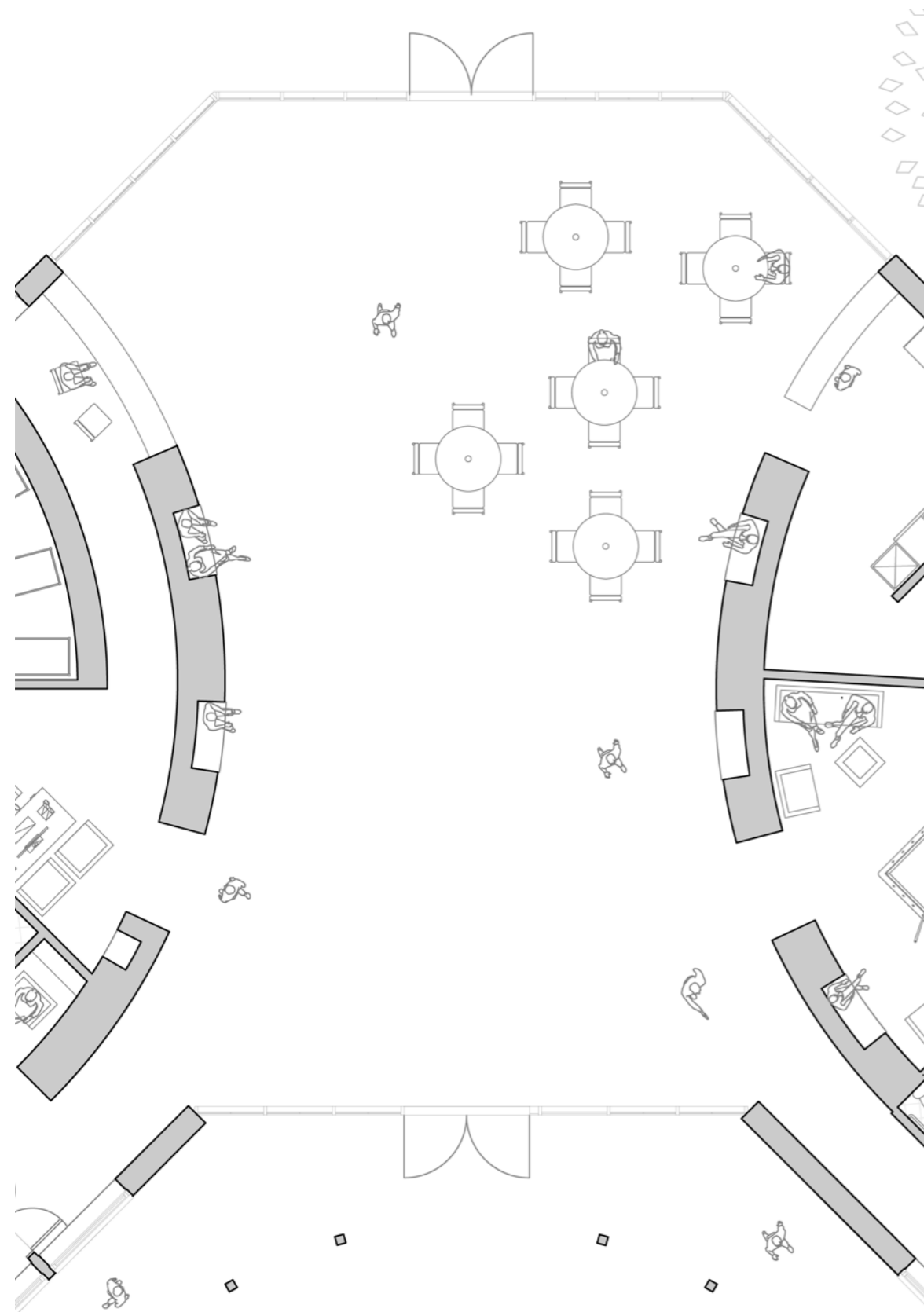


Above: view from social hub into the kitchen

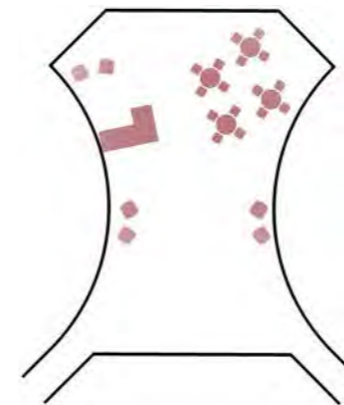
The community wing houses a number of functions for all members of the community. The kitchen and cafe hosts a breakfast club for local school children in the morning and during the day provides cheap meals to the community. It is also used for classes teaching children and parents how to cook healthy meals.

There are also changing facilities and showers for local sports teams accessed either from the hall or externally after matches.

SOCIAL HUB

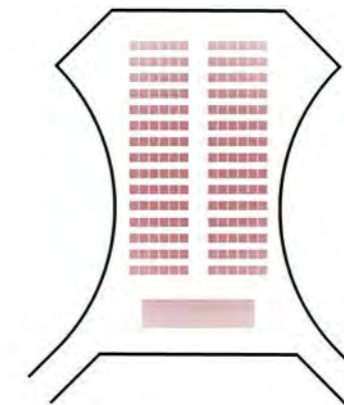


Social Hub Plan 1:100



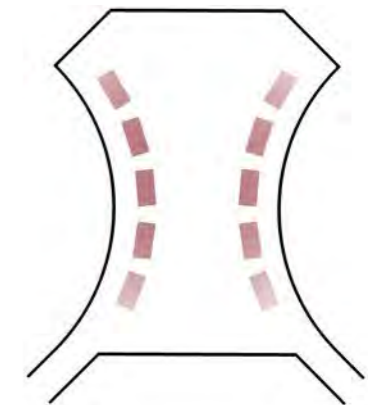
Every Day Use

On a day to day basis the social hub houses the cafe and reception whilst also providing a variety of communal spaces at varying levels of intimacy.



Talks/Presentations

When talks or presentations are held the social hub is able to accommodate up to 200 people.



Other Events

The social hub can be used for a variety of other community events such as job/craft fairs, indoor sports competitions (e.g. table tennis) or as a space for local youth clubs.

The building centres on one the social hub with curved rammed earth walls that flank your view as you enter, making you curious to see beyond. These curving walls guide you through the building and encourage you to explore. There is a slow transition between spaces from public to private with many auxiliary spaces for specific activities located at the fringes. There are a number of types of social spaces with varying levels of intimacy leading directly from the social hub. These include: seating alcoves in the rammed earth walls, consultation booths and the multifunction and social space. This arrangement focuses the social nucleus at the centre of the composition and allows everyone to experience this main space before venturing off to their specific locations.

JOURNEY STORYBOARDS



● Someone new to the centre requiring assistance and guidance. They partake in a private session and retreat to a space of contemplation.

● Elderly member of the community tending to the allotment followed by a game of bowls and some downtime in the cafe.

● A toddler attending the nursery, when elderly members of the community are invited to read to the children, followed by outdoor play.



A new member of the community arrives in the social hub and wishes to understand what support it can offer.



They are guided from reception to see some of the specific activities occurring in the bookable room and within the social spaces.



The community member can then sit and discuss what they need in private within the consultation booth with a member of staff.



Passing through the building overlooking the bowling green en-route to the changing facilities.



Once changed they tend to the allotments adjacent to the building with plenty of morning light.



Taking a break from gardening, members can enjoy everyone's company with a relaxed game of bowls.



The toddler's arrival at Nursery with a view straight out to the playground.



A quiet reading corner with a range of stories and seating options to give variety and excitement and an opportunity to share.



Outdoor playtime flanked by the hedgerow separating the space and perforated fence to look out at the bowls.



EXTERIOR VIEWS

Dual aspect windows from the social hub space take advantage of the morning and evening light. From the café you can both look out across the park and in towards the bowling green.

The roof structure creates a sheltered canopy looking out across the bowling green. This provides sheltered spectator space for the bowling club or other outdoor activities.

The canopy extends out over the nursery to provide a dry outdoor play space that connects seamlessly with the playground. Glass doors open directly out onto this sheltered terrace.





Section AA 1:100

Light Clerestory

Clerestory windows which run beneath the roof line allow light to come down into the spaces leading directly off the social hub (kitchen, manager's office and social space). The light will catch the curving form of the rammed earth walls creating a changing atmosphere throughout the day.

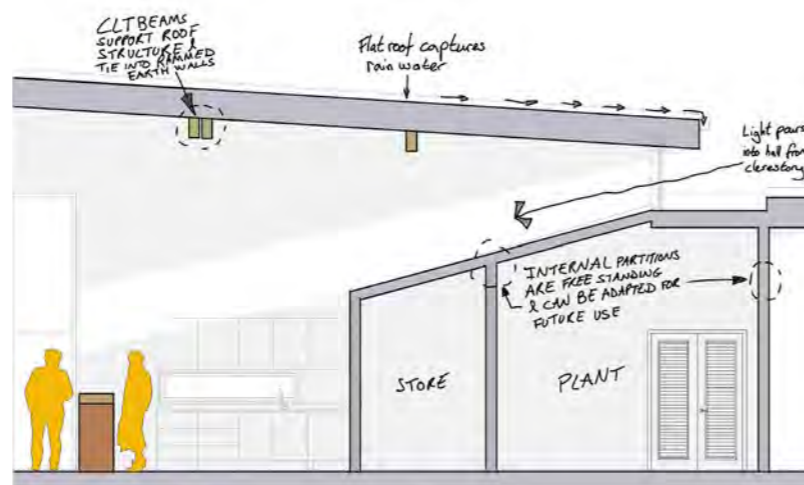
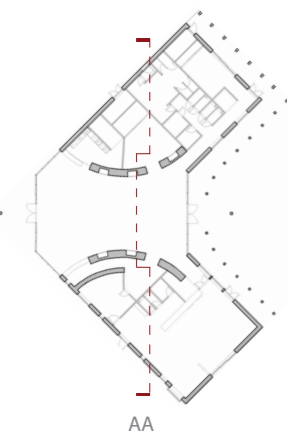
Slab Substructure

For simplicity on site and also for reducing thermal bridging throughout the building, the slab will be poured into a high density XPS insulation formwork. This ensures that the slab is fully insulated without gaps and reduces complexities.

Flat Roof Construction

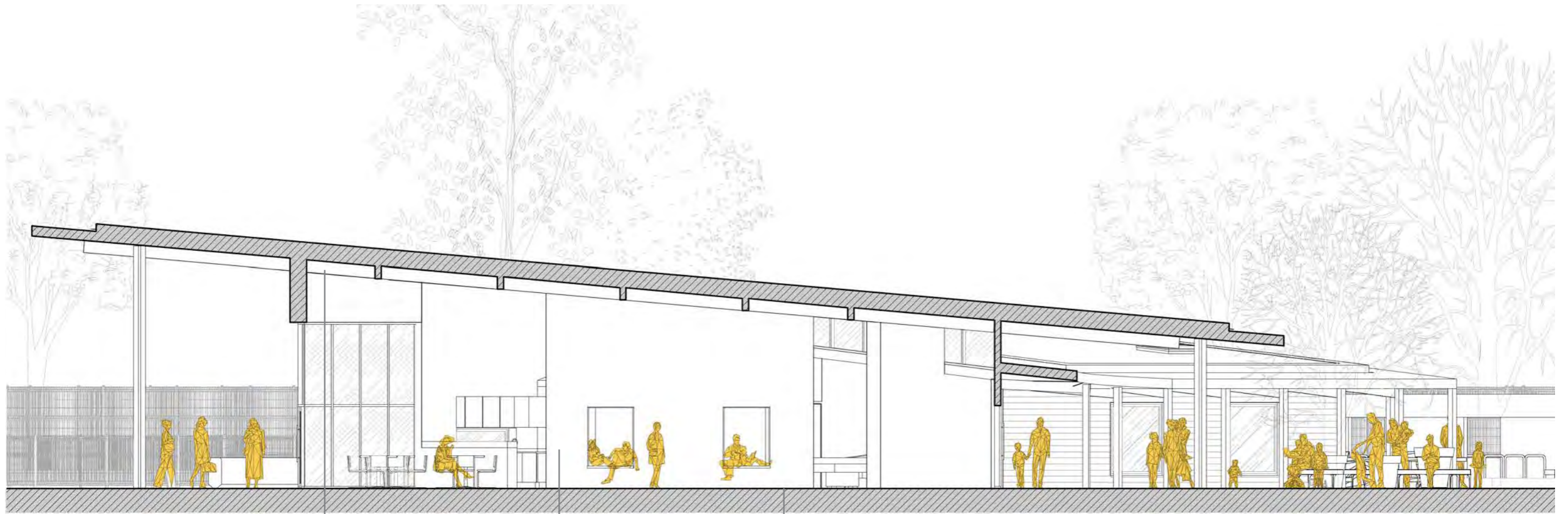
For ease of assembly on site a Flat roof CLT design has been chosen. A tapered insulation to enable the appropriate falls will be implemented to the flat roof areas of the building.

The roof is supported by CLT beams set a 3m x 6m grid with rafter infill to support laterally which are hidden, exposing only the CLT within the building.

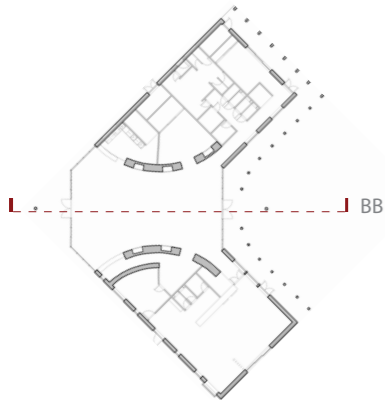


A Roof in Three Parts

Splitting the roof of the building into three allows the internal ceiling heights to vary according to the programme held within each block (social hub, community wing and nursery wing) and also reduces cost by reducing the massing of the building.



Section BB 1:100



Cross Laminated Timber Structure

CLT is incredibly strong and low carbon in its production. The timber beams can span large distances allowing for the desired open plan. With the use of the timber manufacturer the roof structure can be carefully planned into easily deliverable elements to site. When compared to steel beams CLT is far less harsh and industrial and far more suited to a community.



Rammed Earth Walls

Reuse of extracted soil from the excavation for foundations of the building incorporates a locally sourced material and is environmentally sustainable. It is an excellent showcase of uncommon material as an internal building finish and structural element. Which is low carbon and brings the textures of the ground into the building.



Polished Concrete Floor

Use of polished concrete for internal floor provides a surface rich in texture and a quality finish. Although expensive per square meter, the material is incredibly long-lasting and hardwearing. It allows for easy maintenance and cleaning when compared to carpets which capture dust and require replacing after a few years.

MATERIAL PRECEDENTS

Above: The Wales Institute for Sustainable Education, Patrick Borer and David Lea Architects, Wales

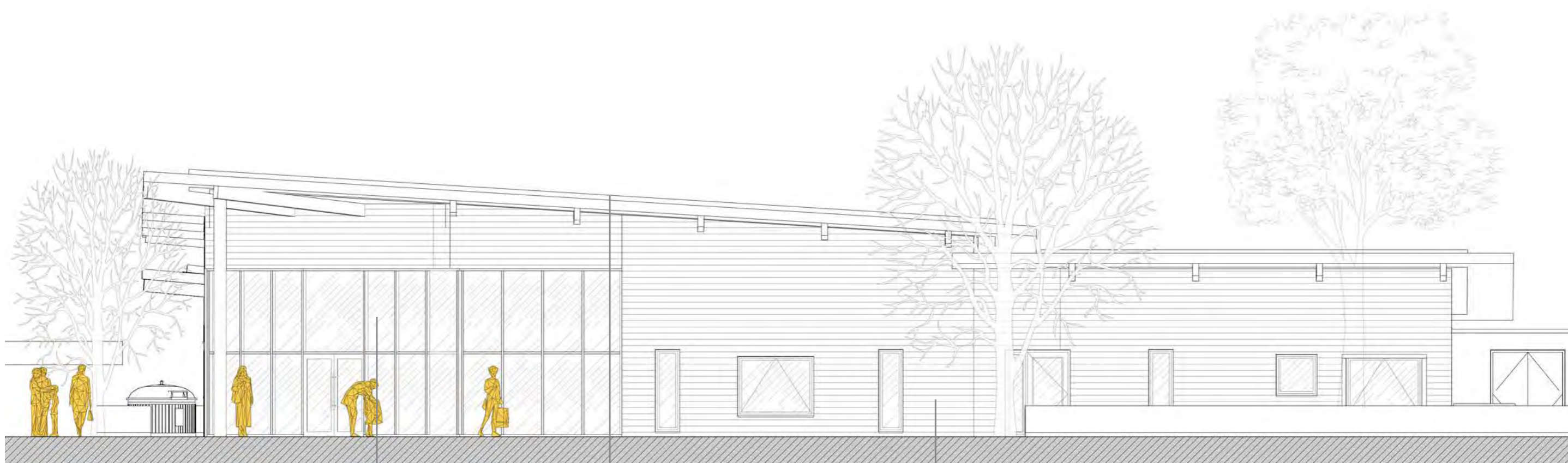


Taking inspiration from the beautiful freeform curves of the WISE building, the building aims to welcome and draw its visitors to the two wings of the building. Rammed earth whilst beautiful in its composition is incredibly strong and can act a structural element in a building whilst creating non linear walls.

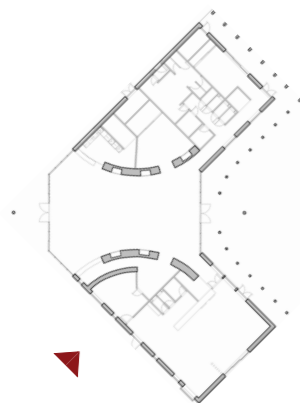
Below: Hood River Residence, Scott | Edwards Architecture, US



Drawing inspiration from the extended roof joists which extend from inside to outside. Our building intends to blur boundary of the roof structure, tying it to Trelai Park in a seamless manor. The over projection of the roof has duality in its function, providing solar shading from over heating in summer and providing shelter to people visiting the building.



Nursery West Elevation 1:100



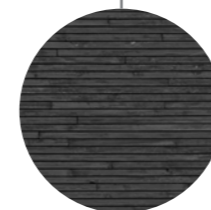
Double Glazing

Airtight double glazing ensures that the building will maintain views throughout the building whilst reducing heat loss through adequate U-values across the buildings surface areas. The large curtain walling can be supported by a metal or timber frame system dependent manufacturing and further cost analysis.



Sedum Roof

The sedum roof is a living green roof which provides camouflage, tying the building into Trelai Park from the air. Green roofs are incredibly long-lasting and can capture CO₂ and pollutants emissions from the air whilst providing an environment for insects to thrive by planting wildflowers.



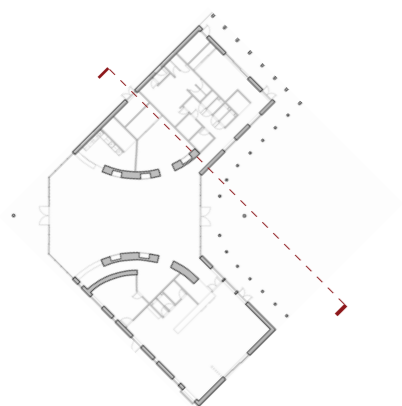
Charred Welsh Larch Cladding

Charred wood helps to defend the building from arson and insect attack by creating a protective layer. The textures created by the wood cracking from the heat also add texture to the façade. The charring will enable the building to maintain its finish as it ages with little aesthetic changes due to weathering.

The Boards are lapped in a traditional horizontal fashion which is best suited for timber cladding as it allows the water to fall away from the building. A significant cost saving is gained as vertical cladding requires an additional batten layer to provide adequate ventilation to the rainscreen.



Section BB 1:100



Structural GRID

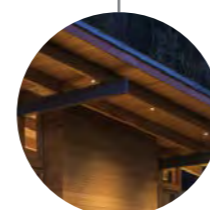
The building is set to a 2 x 2 metre grid for the timber frame structure, this ensures that the panels are easily deliverable on a standard delivery truck, whilst allowing for them to be manoeuvrable by workers without excessive use of a crane after delivery. The prefabricated panels



Astro Turf Bowling Green

Astro turf costs about three times more than real grass per square meters. However, real grass requires lots of care and attention throughout the year and the costs of frequent mowing, watering, aeration, brushing and weeding can really start to add up. These high maintenance costs result in higher rental costs, which would also create a barrier for community use.

Astro turf also extends the bowling season and increases the community use as it could be a venue for many activities other than bowling. This in turn would generate more income for the building.



External Canopy

Uninsulated canopy outside of the external envelope to reduce additional engineering and expensive thermal breaks.



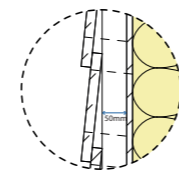
Non-Structural Stud Walls

The decision to use CLT as the key structural element holding up the roof enables flexibility in the internal arrangement of the building. This allows for future removal of Internal stud partitions without issue of amending the structural elements.

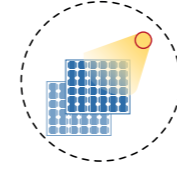
The non-structural walls can be the metal framing system or alternatively timber stud depending on the builder's choice.

HOW THE BUILDING WORKS

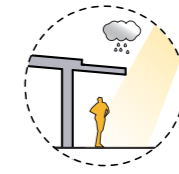
Perspective Section through Nursery (NTS)



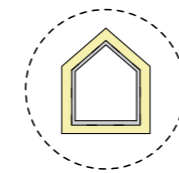
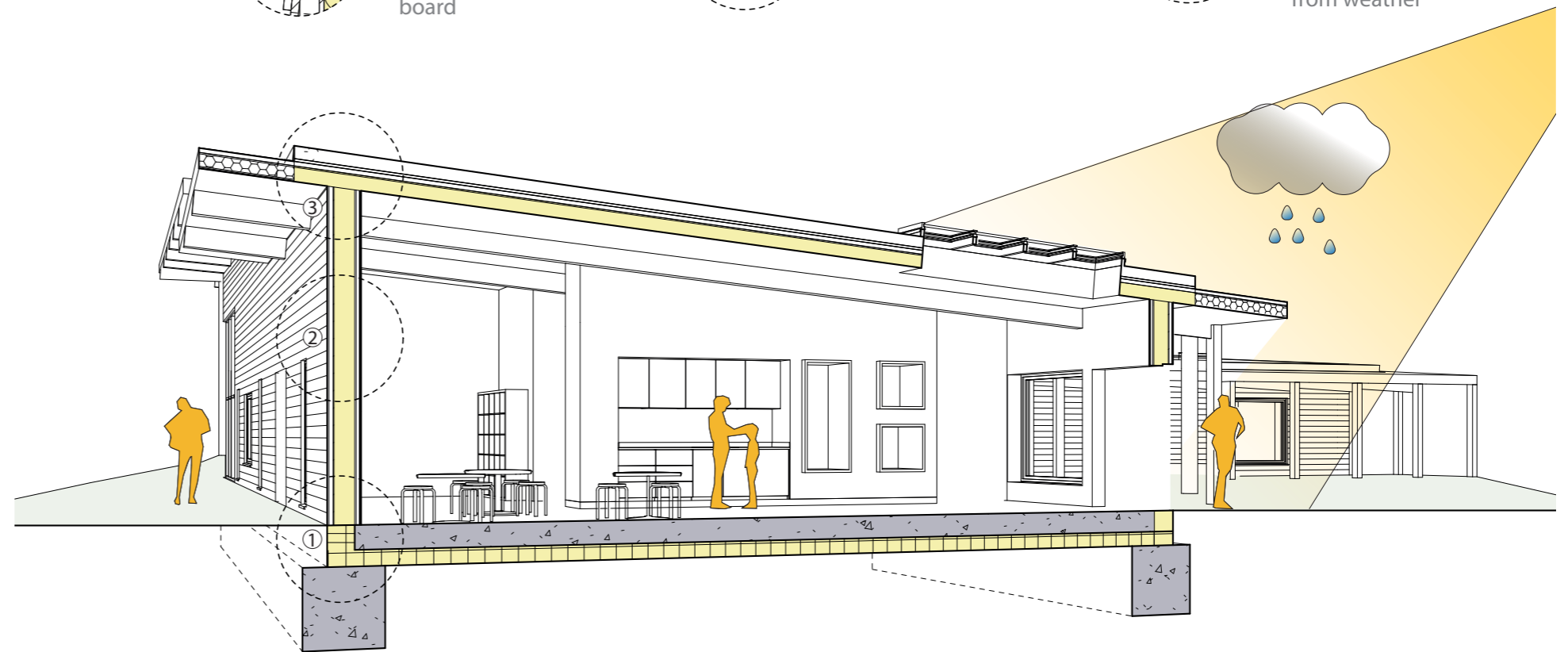
Overlapping cladding board with 50mm minimum ventilation behind board



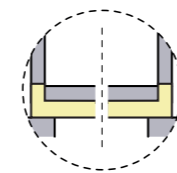
Flat roof provides opportunity for solar panels



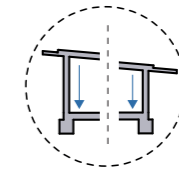
Canopy over-sails to provide thermal shading to prevent over heating and a space for bowls players to be protected from weather



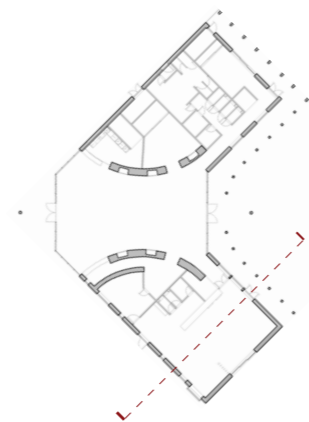
Continuous insulation airtight detailing



XPS insulation acts as concrete formwork

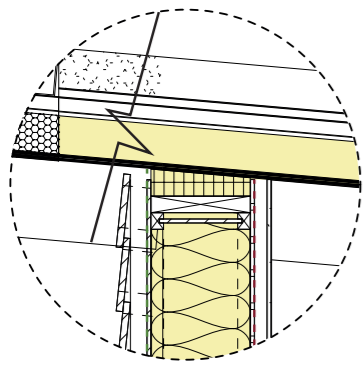


Structural elements are external walls



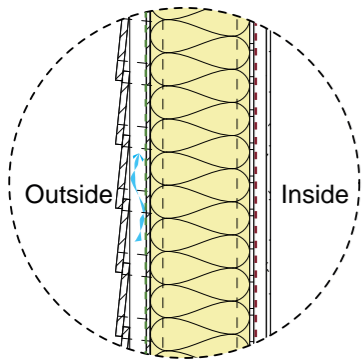
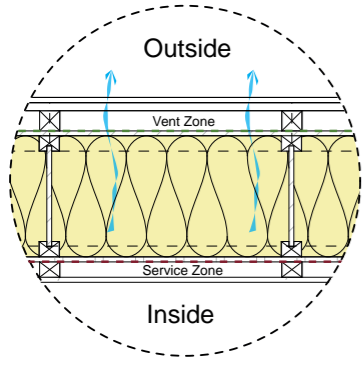
Roof - Build up

- Seavdum build up
- 150mm Insulation
- DPM
- 12mm Sheathing Board
- 200mm Timber Rafters with Fullfill insulation
- 12.5mm Plasterboard
- 300mm CLT



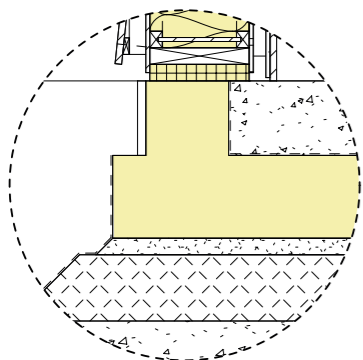
External Wall - Build up

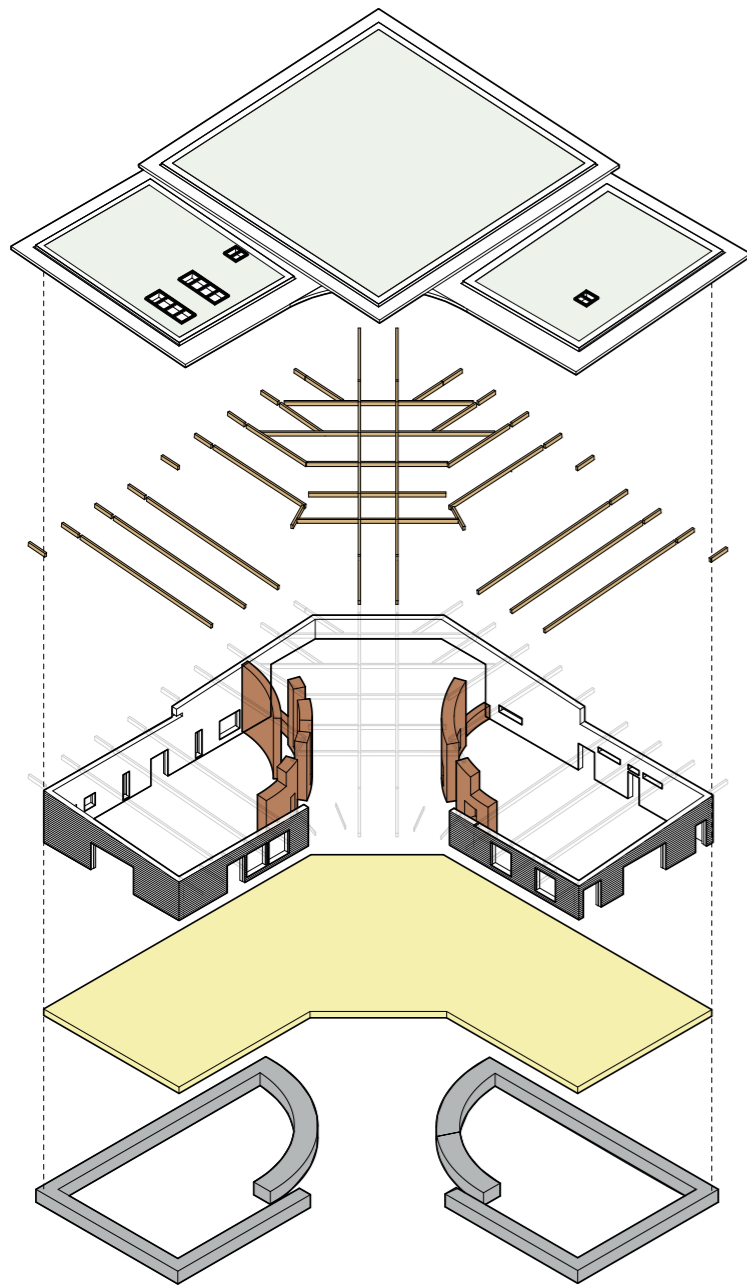
- 20mm skirting board
- 12.5mm plasterboard with finish?
- 45mm service zone
- Internal sheathing: 12.5mm Smartply with taped joints for improved airtightness
- Timber I-Beams 300x50 with full fill Warmcell insulation
- 12mm Timbervent board
- 50mm vertical treated timber battens at 600 centres
- 20mm overlapping horizontal welsh larch cladding



Floor - Build up

- Perforated pipe to perimeter in Terram 1000 geotextile (Drainage)
- 200mm Concrete slab polished finished – easy maintenance
- DPM
- 250mm Polyisocyanurate rigid Insulation [PIR] insulation / Formwork, installed to specification
- 50mm Sand blinding
- 200mm hardcore (recycled demolition material from local area if possible)





Sedum Roof

- Thermal performance
- Ties roof into landscape

Cross Laminated Timber Joists

- Maintains structural elements to outer edge of building

Rammed Earth Walls

- Reuse of extracted soil from the excavation for foundations of the building. Immediately and locally sourced and environmentally sustainable. Excellent showcase of material as an internal building finish and a structural element. Texture brings the outside in

Concrete Slab on XPS insulation

- Easy efficient way of building by pouring concrete into XPS form work

Foundations

- Concrete foundations underneath structural walls to minimise ground works

PHASING



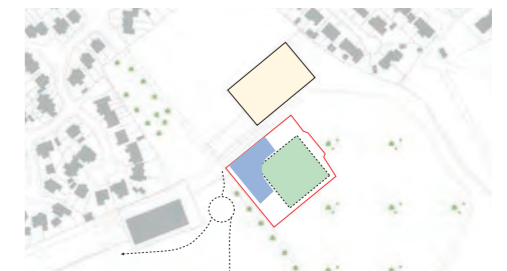
01 Setting up site boundary



02 Site compound instated and nursery moved during build



03 Construction of building



04 Grounds and landscaping made good



05 Nursery reinstates to new building and is opened

- Site
- Site boundary fencing
- 3G Pitch
- Play area
- Contractor's compound
- Bowling green
- Nursery
- Temporary path for construction traffic
- Construction traffic path
- Temporary public footpath

WHERE IS MOST OF THE MONEY GOING?

Rammed earth walls are typically comparable to other forms of masonry construction, however in our design they are curved and may therefore require a specialist skilled contractor. The addition of seating alcoves creates further complications (such as the need for steel lintels) and it means that the walls need to be deeper using more material which will likely increase costs further. However, these elements are fundamental to our concept of the inter-generational hub which justifies the additional cost.

The expansive cross-laminated timber roof structure is also likely to be one of the more costly elements. However the dramatic peak of the roof structure is key to drawing people towards our building and the exposed timber structure within provides a strong character to the spaces which also justifies the cost. Efficient structural systems (e.g. prefabricated structural panels around the perimeter) are also used elsewhere to help balance the costs of the more expensive elements.

01 Setting up site boundary - A site boundary is extended around the entrance to Trelai park, surrounding the 3G pitch and play area to prevent the public entering. A temporary public footpath is created to ensure enough provision for construction traffic.

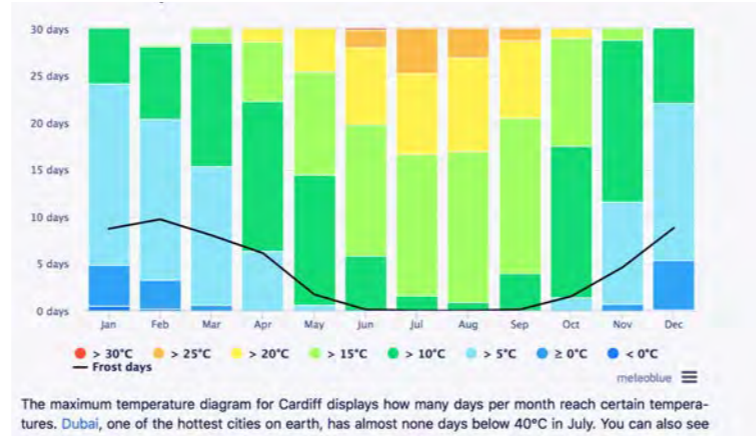
02 Site compound instated and nursery moved during build - Removal of play area, which is extended and adopted into a contractor's compound. 3G pitch is retained but not disturbed during construction. Temporary pavement is instated for construction traffic and to prevent damage to footpath.

03 Construction of building - Building is constructed safely behind site boundary fence with adequate turn circles for construction vehicles and deliveries.

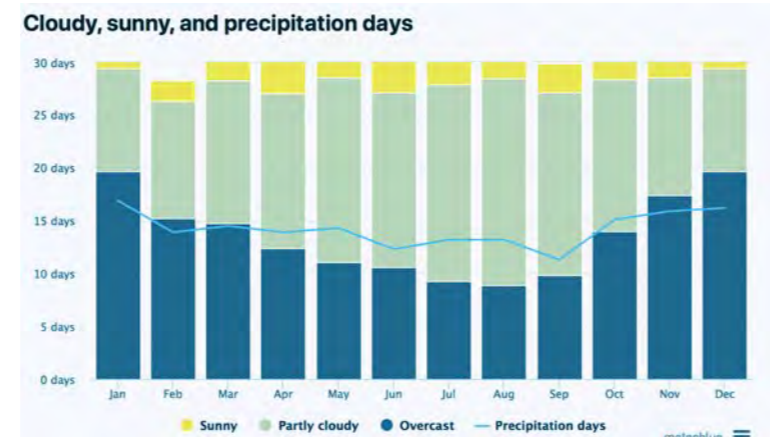
04 Grounds and landscaping made good - Reinstated bowls green which is moved slightly to allow for the footprint of the building. Removal of site boundary fence, contractor's compound and temporary footpaths.

05 Nursery reinstates to new building and is opened - Upon completion of building, nursery is reinstated. Grounds and footpaths are returned to original state with new landscaping entwined.

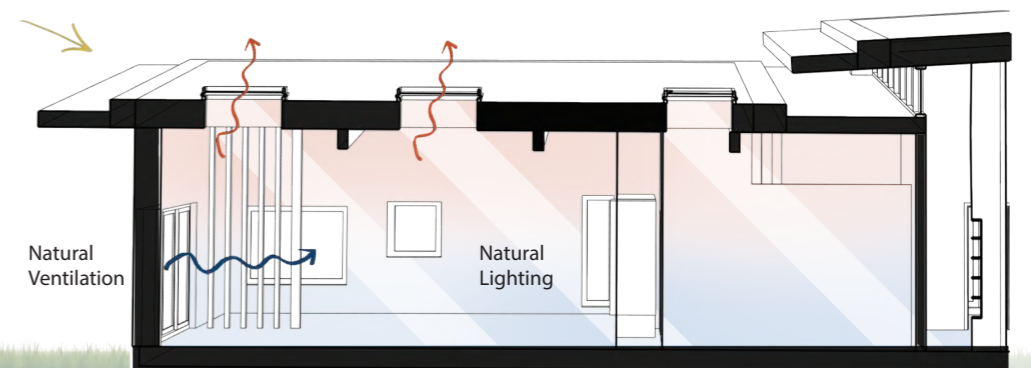
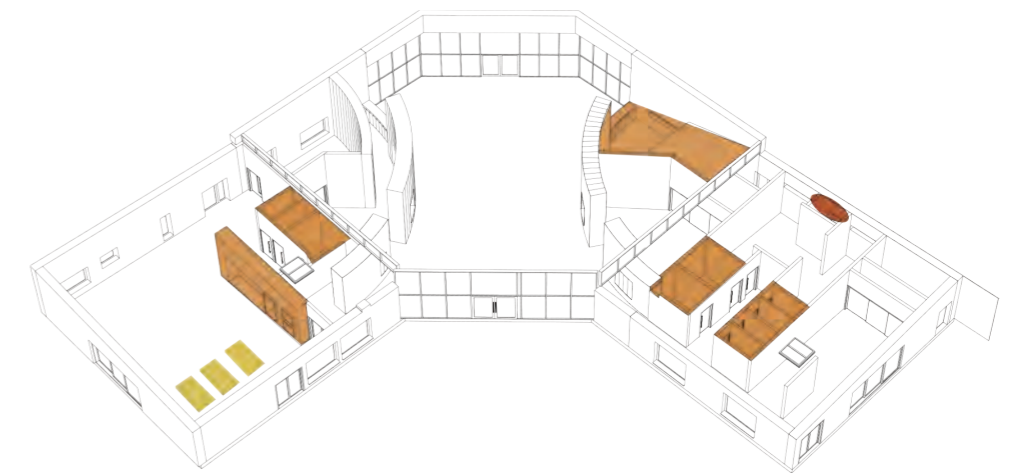
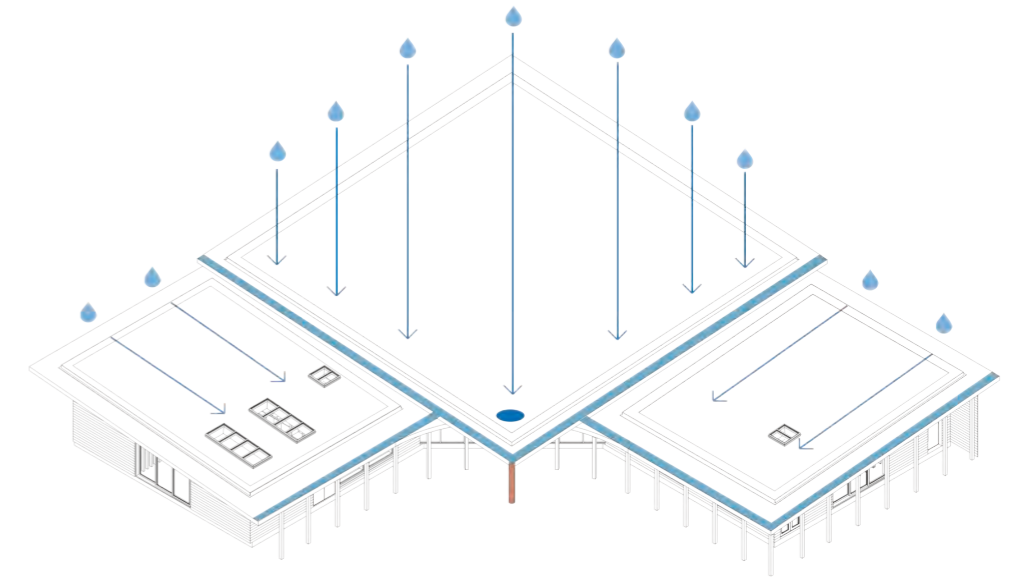
SUSTAINABILITY STRATEGY 5



Based on research, Cardiff as a city has about **50 days of sun** per year. Due to this statement, **solar panels and passivehaus strategies will not be as effective in the long run.**



However, an alternative way for solar panels could be **geothermal energy or groundwater heating** that could be applied in the heat pump system. This was something recently investigated as a way to heat homes in Wales and specifically in Cardiff and can be much more effective in the long run than solar panels. "Natural water in the ground could be used as a low-carbon heat source in many towns and cities, according to research from the British Geological Survey (BGS)."



Section through the Nursery
Scale: 1:200



Rainwater Harvesting System

Rainwater harvesting could be the most sustainable solution to be included in the urban water management system. It can mitigate the water crisis problem, reduce the burden on traditional water sources, control water logging problems, prevent flooding, help in controlling climate change impacts, contribute to the storm water management, and so forth.

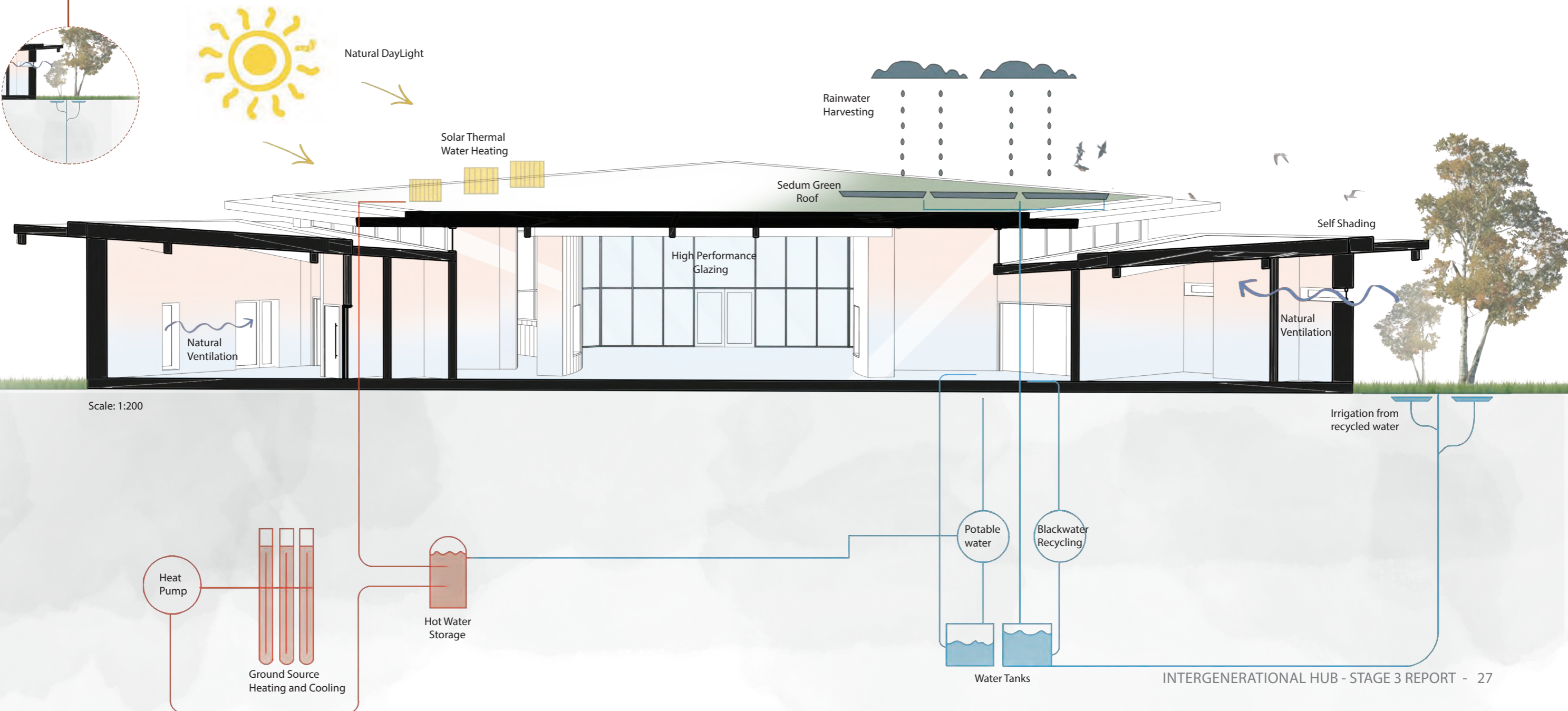
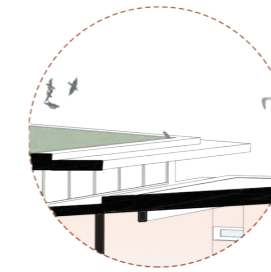
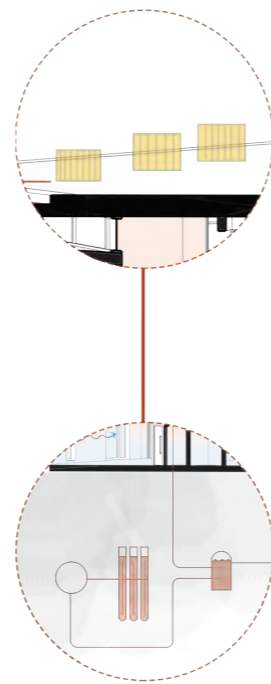
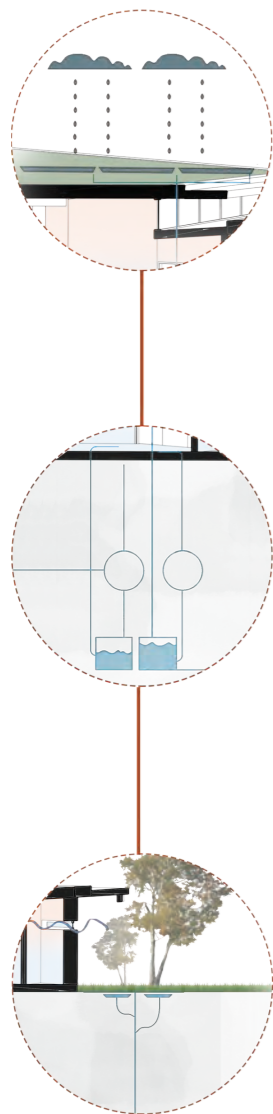
Harvested rainwater could be idealized and used like supply water if the water-quality parameters satisfy the desired level. The monitoring of collected rainwater is of great concern as it is the potential for health risk because of the presence of chemical and microbiological contaminants. Therefore quality assessment of collected water is essential before use. It will be used as a way to provide water for the services of the building as well as watering the plants nearby.

Solar Panels and Underground Heat Pumps

Solar panels will be used as a heating source for the building. Due to the low number of sunny days in Cardiff (aprox. 50) solar panels will not be used for energy purposes. They will provide hot water which will be used through services (sinks) but at the same time the water will be an act of source for ground heat pumps. Ground Heat pumps provide a clean way to heat buildings, free of all carbon emissions on site. They make use of solar energy stored in the ground to provide one of the most energy-efficient ways of heating buildings.

Sedum Green Roof

A Sedum Green roof will be used for the sustainability of the building which will bring biodiversity in the area. This is because sedum roof can attract bee population as it provides a wealth of flowers and other plants which can benefit the area. In addition to bees, it can also assist a number of other beneficial creatures including butterflies and birds. The combination of plant and soil, reduces the amount of solar energy absorbed by the roof membrane, thus resulting to a cooler temperature beneath the surface. "Green roofs can improve the water quality of the stormwater that leaves a roof with vegetation and substrates on it" and it can act as an insulation barrier as well.



COSTS & FUNDING 6

STAKEHOLDERS AND FUNDING

Additional funding - We aim to seek additional funding from different groups in order to have a higher grant for the building.

1) New Funding for Urban Parks and Green Spaces (UK) - £10 million 'Future Parks Accelerator' initiative is a new national initiative to enable places across the UK to develop ambitious solutions to secure and enhance the future of public parks and green spaces for long term public benefit.

2) The Trusthouse Charitable Foundation - up to £50,000 000 for running costs or one-off capital costs to charities and not-for-profit organisations that are working to address local issues. Three key interests of the foundation are community support, disability and healthcare as well as arts, education and heritage which are all areas that the building addresses.

3) National Allotment Gardens Trust - The National Allotment Gardens Trust awards funding of between £250 to £2,000 to allotment gardens.

4) 'Taking Part' Funding - supports projects for children, young people and their families / projects for the voluntary cultural sector / projects in arts for health and wellbeing settings

5) Virgin Money Foundation - support community regeneration by backing the people who can make big changes happen locally

6) Heritage Fund - fund projects that connect people and communities to the national, regional and local heritage of the UK

7) Paul Haymlyn Foundation - independent funder working to help people overcome disadvantage and lack of opportunity, so that they can realise their potential and enjoy fulfilling and creative lives

8) People's Postcode Trust - provides project based funding in Great Britain under the themes 'Promoting human rights, Combating discrimination and Preventing poverty'

COSTING PRECEDENTS

1) 3No Outreach Centres, Ringmer Community College, Lewes Road by Michael Cook Architects

- BREEAM: Excellent
- single storey single classroom
- strip and pad foundations concrete ground floor
- **laminated timber** external columns and minor beams, timber stud frame
- laminated sloping green timber roof with overhang to veranda, windcatcher, sunpipes and rain chain
- **rammed earth** with insulated cavity and local sourced timber cladding on frame
- triple glazed PPC aluminium windows and doors
- air source heat pump with underfloor heating, ventilation, electrics, data and intruder alarm

Location	Ringmer, East Sussex
Client	East Sussex County Council
Completed	Jun 2010
GIA (m2)	117
Building Cost (£)	273,482
Cost/m2 (£)	2,337
Total inflated building cost (£) for 2018	434,279
Total inflated building cost/m2 (£) for 2018	3,711

	Cost per m2 (£/m2)	Total cost (£)	% of overall cost
Substructure	179	20,896	6
Superstructure	1,132	132,416	41
Finishes	109	12,711	4
Fixtures & Fittings	132	15,485	5
Services	488	57,096	17
External Works	290	33,933	10
Other			17



3) Eco Teaching Block, St Christopher's School, Hykeham Road

- single storey teaching block to primary school built to energy saving standards
- bored piles, PCC suspended slab, timber frame and sedum and plastic clad pitched roof
- SIPs walls, weatherboarding, render, rainscreen, double glazed composite windows, timber stud and cubicle partitions
- plasterboard and paint to walls, vinyl and carpet flooring, plasterboard and suspended ceilings
- gas HW central heating, ventilation, electrics

Location	Lincoln, Lincolnshire
Client	Lincolnshire County Council
Completed	Jan 2012
GIA (m2)	531
Building Cost (£)	809,813
Cost/m2 (£)	1,525
Total inflated building cost (£) for 2018	1,344,369
Total inflated building cost/m2 (£) for 2018	2,532

	Cost per m2 (£/m2)	Total cost (£)	% of overall cost
Substructure	151	80,257	8
Superstructure	706	374,902	37
Finishes	127	67,701	7
Fixtures & Fittings	27	14,561	1
Services	426	226,400	22
External Works	294	155,871	15
Other	171	90,850	9

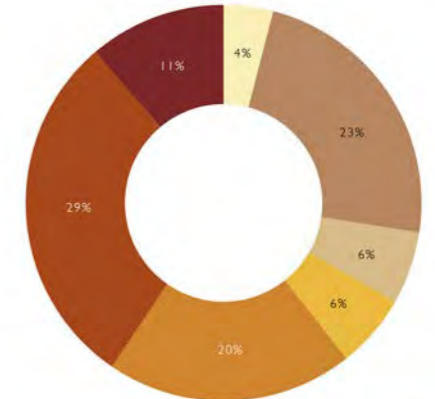


2) Sport Pavilion and Bowling Green, Belfast Harlequins

- 2 storey sports pavilion with 60m2 balcony and a bowling green
- concrete foundations and ground slab, PCC upper floor and stairs
- steel frame and pitched roof with aluminium cladding, block walls with render or timber cladding, double glazed hardwood or aluminium windows
- plaster, tiles and paint only to walls, vinyl, carpet and hardwood flooring, suspended ceilings
- PC sums for heating and electric light and power
- external works with paving, walls, fences, landscaping and drainage

Location	Belfast, Northern Ireland
Client	Belfast Harlequins Sports Club
Completed	May 2001
GIA (m2)	1,472
Building Cost (£)	1,217,597
Cost/m2 (£)	827
Total inflated building cost (£) for 2018	2,532,902
Total inflated building cost/m2 (£) for 2018	1,721

	Cost per m2 (£/m2)	Total cost (£)	% of overall cost
Substructure	203	68,702	10
Superstructure	854	289,620	40
Finishes	157	53,375	7
Fixtures & Fittings	31	10,660	1
Services	473	160,256	22
External Works	217	73,510	10
Other	188	63,888	9

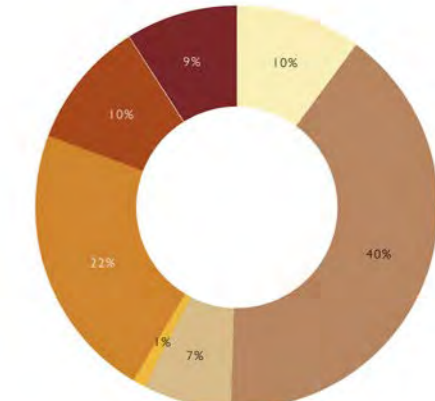


4) Elm Park Library, St Nicholas Avenue

- single storey library, laminate timber frame, birch and timber clad walls
- timber pitched roof with aluminium cladding and **sedum roof with rooflights**
- timber stud partitions
- lump sums for mechanical and electrical services, photovoltaic panels
- external works with paving, brick walls, landscaping, services, drainage and demolition of existing library

Location	Elm Park, Hornchurch, Greater London
Client	London Borough of Havering
Completed	Mar 2008
GIA (m2)	339
Building Cost (£)	639,362
Cost/m2 (£)	1,886
Total inflated building cost (£) for 2018	901,527
Total inflated building cost/m2 (£) for 2018	2,659

	Cost per m2 (£/m2)	Total cost (£)	% of overall cost
Substructure	203	68,702	10
Superstructure	854	289,620	40
Finishes	157	53,375	7
Fixtures & Fittings	31	10,660	1
Services	473	160,256	22
External Works	217	73,510	10
Other	188	63,888	9



ECONOMIC POTENTIAL

Revenue from private rental supports the running costs of the building itself and potentially some of the nursery's running cost.

The prices can be raised for party hires as it allows people to use other facilities as well. (eg. use of kitchen to cater conferences/meetings)

Nursery - Yearly rent from the nursery for their use of the site and the building. The price could be raised if they are expecting to expand or takeover a larger proportion of the building or the site.

Cafe/ Social Hub - The cafe will bring further income and potentially attract a steady group of public to the building. This aim to increase the outreach into the community and to give an incentive for the wider community to visit

Artwork - Work could be placed in the cafe and people could purchase them if interested. Both the artist and the building will benefit

Function Spaces - Consultation rooms could double as music rehearsal rooms or as study rooms for 1:1 tuition (for adults or children), the Multi-Purpose room could be rented out on a hourly or daily rate, Canopy can provide a space for stalls on special occasions or music shows

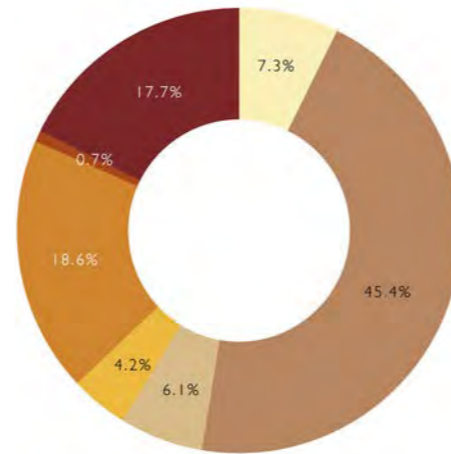
COSTS

From SPON's First Stage Estimating Handbook, the average cost/m² is :

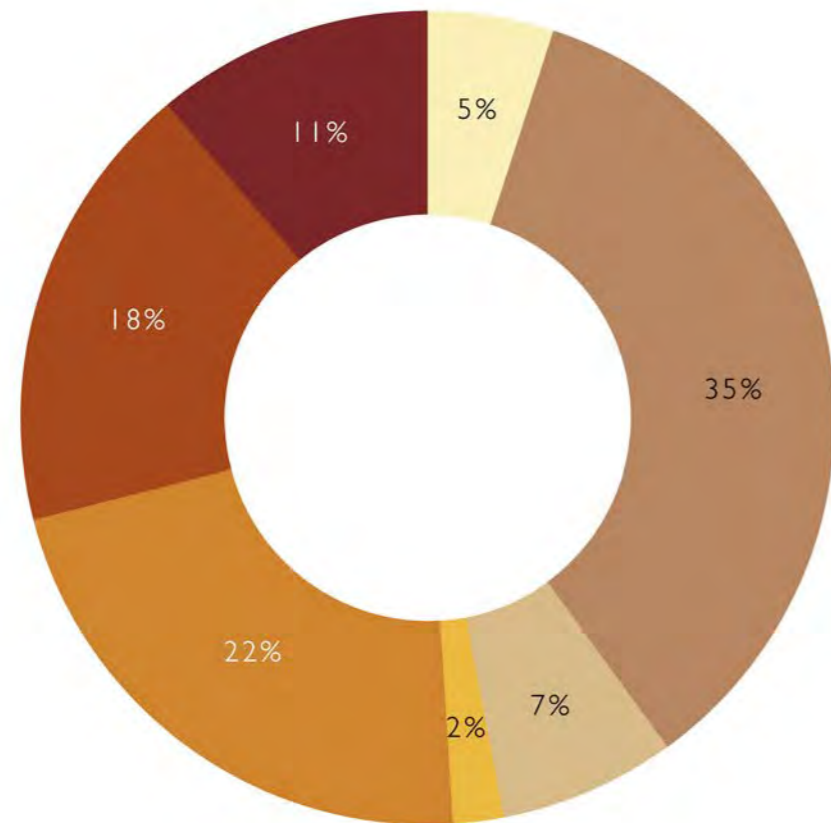
Leisure facilities - Community centres (1100-1300 £/m²)
 Youth clubs (1000-1300 £/m²)
 Social clubs (1200-1600 £/m²)

Educational buildings -
 Nursery (1200-1500 £/m²)

Our proposed building:
 GIA(m²): 547.5
 Total building cost (£): 1,533,000
 Cost/m² (£) : 2,800



This diagram shows the cost of the community centre on the SPON's architects and builders' price book



	Cost per m2 (£/m2)	Total cost (£)	% of overall cost
Substructure	140	76,650	5
Superstructure	980	536,550	35
Finishes	196	107,310	7
Fixtures & Fittings	56	30,660	2
Services	616	337,260	22
External Works	504	275,940	18
Other	308	168,630	11

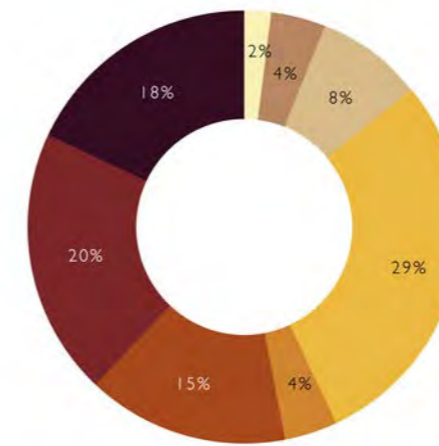
OCCUPANCY COST

Occupancy datas on BCIS:-

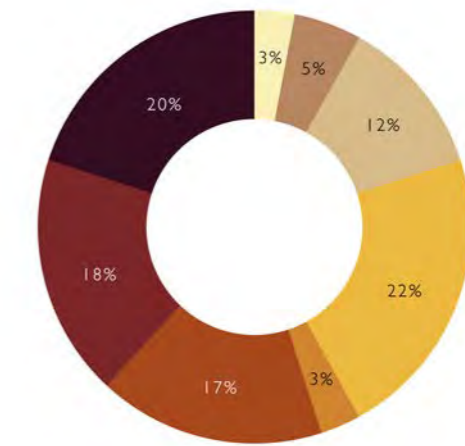
Plan 1 -
 GIA: 1000m²

Plan 2 -
 GIA: 356m²
 Cost /100m² per annum: 8500

Decorations
Fabric
Services
Cleaning
Utilities
Administrative Costs
Overheads
External Works



Plan 1



Plan 2

Although the two occupancy models have a different GIA value but their costs have similar percentages. These two models are both community centres. Therefore for our proposed building the percentages spent on the different elements will be similar. However, there should be a higher percentage on external works as our project focuses on the urban furniture and the paths leading to the building.

Sports club pavilion with a GIA of 689m² have a higher percentage on utilities and cleaning (26%). The occupancy cost is about £ 7,500/100m².

Swimming pool with a GIA of 3,643m² have a higher percentage on utilities (39%) and cleaning. The occupancy cost is about £ 7,800/100m².

Visitor centre have a higher percentage on external works and cleaning (32.5%), closely followed by utilities and minor repairs. The occupancy cost is about £ 10,000/100m².

Youth centre however have a large percentage on external works and cleaning. The occupancy cost is about £ 7,500/100m².

Therefore for our proposed building the annual running cost, there will be a higher cost on cleaning and external works. Because having spend more on services, the proposed building should not have high annual occupancy cost. It would be around £ 45,000/ year.

