

MANCHESTER SCHOOL OF ARCHITECTURE

BLOOMWELL

Join us in collaborating with Blossom! Blossom is a charity located in South Manchester's Wythenshawe Park that focuses on community wellbeing through its many activities. We want to support Blossom in achieving its long-term vision of becoming a low-carbon, zero-waste horticultural hub. We aim to create a phased, sustainable, refurbishment strategy that Blossom can implement to improve insulation within realistic financial constraints, while keeping nature and community at the heart of the project.

Visit msa.ac.uk for more information



MSA LIVE 26

Team

Hala Zeenelabedeem (MArch1)

Lucy Pepper (MArch1)

Albert Mitchell (MArch1)

Xiaoxiang Hong (MArch1)

Keti Katchkatchuri (MA AR)

Zhou Junze (MA AR)

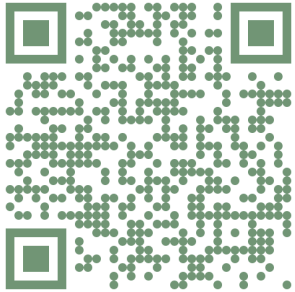
Hannah Boylan (BA1)

Maya Malcolm (BA1)

Al-Megdad Al-Halaly (BA1)

Cheuk Yi Tam (BA1)

Bryn Mills (BA1)



Check out our [blog!](#)



Collaborators

Blossom is a community-based charity situated in Wythenshawe Park, South Manchester. It offers engaging volunteering opportunities and workshops, such as teaching people to cook from scratch and explore climate change in a positive way. The charity focuses on helping people of all ages build confidence and positivity, especially those with special needs and retired adults. It also inspires participants to live healthier and greener lifestyles.

Blossom works in close partnership with Manchester City Council, Wythenshawe Community Housing Group, the National Health Service (NHS), the Age Friendly Network, and CLA. Together, these organisations support co-founder Kay Bamford's vision of creating a greener, healthier, and more connected community for local people.

As students at the Manchester School of Architecture, we are collaborating with Blossom to develop a practical sustainability plan that directly supports their long-term vision of becoming a zero-waste, low-carbon community hub.

Introduction

Bloomwell

Our project is in collaboration with Blossom Charity, a community based charity in Wythenshawe Park, for which we were asked to create a sustainability plan for the charity's horticultural centre and classrooms. The existing amenities have poor insulation, inefficient and outdated oil-based heating supply, and inconsistent thermal protection. We were tasked with providing solutions to these issues that are realistic, low-cost and environmentally conscious, such as recycling of materials, passive solar design, and improved thermal efficiency.

To enhance thermal efficiency, we recommend the charity continues to replace glass in the greenhouses with polycarbonate. Following first principles we believe that the metal framing should also be replaced by a less thermally conductive material. However, we recognise this may be unfeasible due to budget constraints, and potential conservation challenges that it would fundamentally alter the historic nature of the building.

Alternatively we suggest prioritizing the space's airtightness. This can be achieved by sealing glazing to the frame with dedicated seals and tapes. Airtightness should be supported by mechanical ventilation to prevent overheating. The feasibility of mechanical ventilation should be carried out by a registered Architect, but we believe this solution will save money due to the existing building's inefficiency. It is also possible that a natural nighttime ventilation strategy could prove adequate which would not incur high capital costs.

To replace the current oil-based heating supply, we recommend an air source heat pump connected to a water based distribution system. The pipes of this can be run through the existing Victorian floor cavity. Due to the high temperatures required, we also recommend the installation of on-site energy generation (solar panels) to support the ASHP. These improvements will provide Blossom Charity with the ability to focus on their mission, providing them with better facilities to engage with their volunteers in growing, cooking and wellbeing sessions. We are looking forward to watching our collaborator's wonderful organisation bloom!

Site history

Originally Wythenshawe Park was an estate owned by Robert Tatton where he built a timber framed Tudor manor house, greenhouses walled and kitchen garden that were later seized by parliament during the English civil war in 1643-44.

Wythenshawe Park was then donated by Lord and Lady Simon to the Manchester corporation in the 1930s intended 'to be kept forever as an open space for the people of Manchester,' as part of the garden city concept.

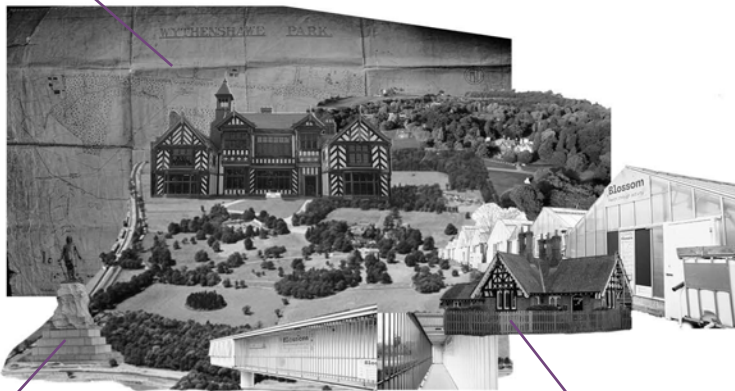
The greenhouses that stand in Wythenshawe Park today date back to around 1965. They were built to replace the earlier 1908 greenhouses that were demolished in 1960. Later the greenhouses were taken over by Blossom in October of 2021, who converted the greenhouses into a Horticultural Centre, where they help promote the wellbeing of people and promote enjoyment of nature. The greenhouses are now home to one of the largest cacti collections in Manchester.



The parks Bowls and Tennis Pavillion was built in the 1960s by Leonard C Howitt. It is a rare example of a parks pavilion in a modernist style unique to Wythenshawe Park.

Historic buildings

Wythenshawe Hall – Grade II listed, with 16th-century fabric and later alterations.



Oliver Cromwell statue – Grade II listed and moved to the park in 1968, reflecting the site's Civil War association.

North Lodge – Grade II gatehouse on the northern entrance, dating from the mid-late 19th century.

Site visit & survey

The survey identified environmental control, water management, and structural deterioration as the primary challenges across the greenhouse complex.



Jungle room



Lack of insulation, significant drafts, metal corrosion affecting structural components, poor temperature regulation, and structural concerns surrounding raised planting beds.

Veg classroom



Currently benefits from existing insulation and improved thermal performance compared to other greenhouse

Cactus house



Inconsistent temperature control, poor pond filtration, and damaged glazing panels.

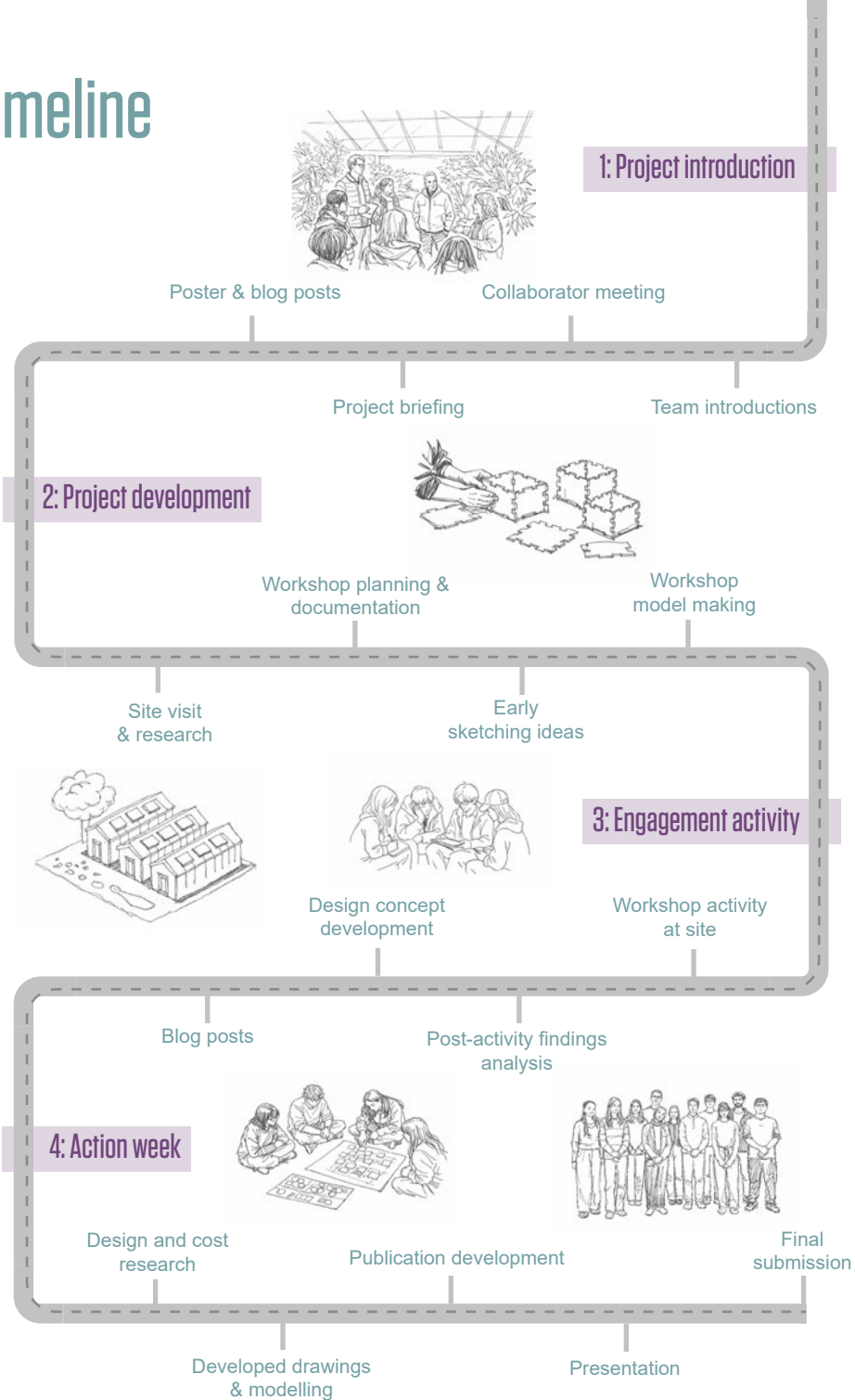
Fernery room



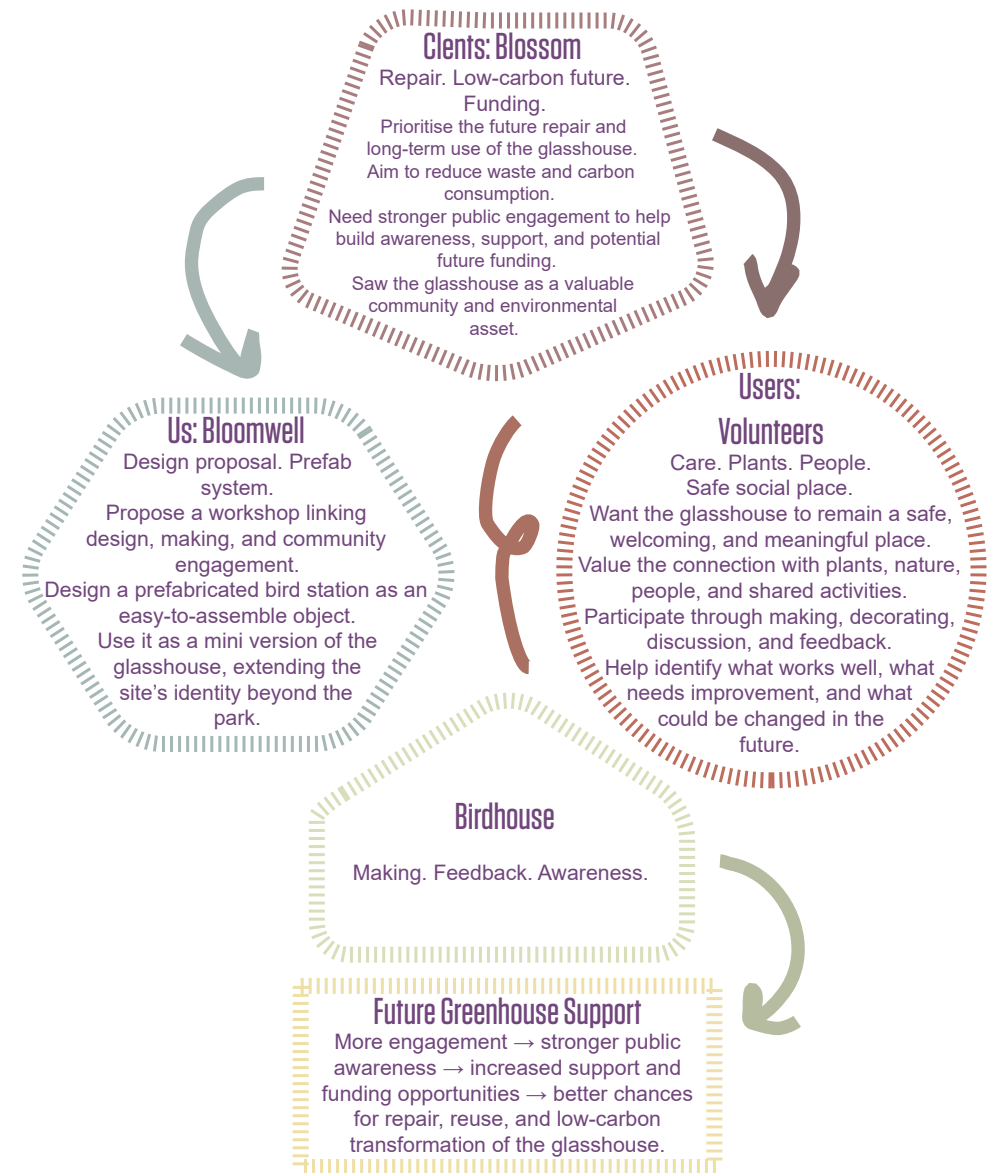
Water leakage from roof glazing systems, groundwater and drainage-related issues, and ongoing metal corrosion throughout the structure.



Timeline

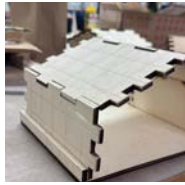


Workshop planning



The proposed workshop uses a prefabricated bird station as a small-scale version of Wythenshawe Park Greenhouse. It creates a simple making activity where students, staff, and volunteers can connect through assembly, decoration, and discussion. The aim is to build awareness, strengthen community care, and support the greenhouse's future repair, funding, and low-carbon reuse.

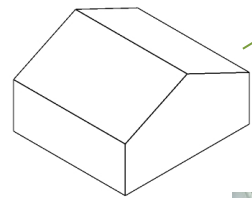
Construction process



The birdhouses, modelled as the greenhouses, can be assembled into a complete structure; the two end pieces differ slightly in design from the others, making it easy for users to distinguish them.

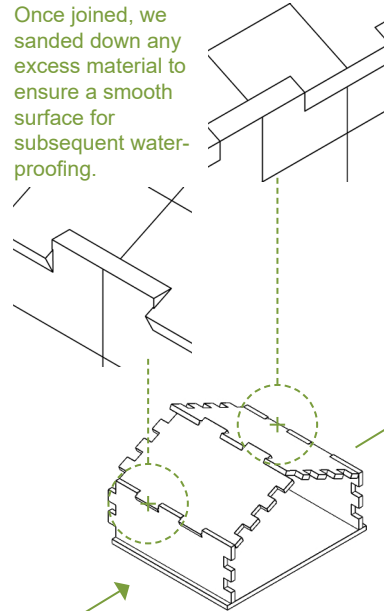
Before proceeding with the construction of the birdhouse using plywood, we created a sample model using MDF.

Design details: Allowing for an extra 3mm to account for laser cutting tolerances and ensuring a more secure join.



The dimensions of the birdhouse are based on the Blossom greenhouse measurements.

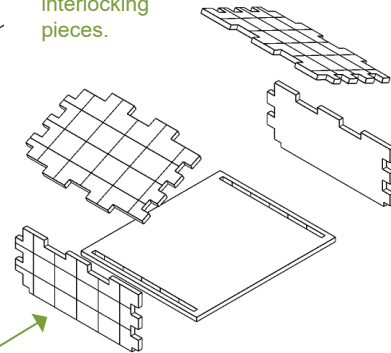
Once joined, we sanded down any excess material to ensure a smooth surface for subsequent waterproofing.



Design details: Applying a waterproof coating to the surface.



Taking the users into account, the model is assembled without the use of any glue, relying solely on interlocking pieces.



Staff and volunteers assembled the birdhouses made of plywood on site.



Staff and volunteers were free to doodle within the grid created by the laser-cut design to be creative and create a birdhouse unique to them.



Workshop activity results

Through the birdhouse workshop, we were able to gain valuable feedback from volunteers regarding the existing greenhouse conditions and our draft proposals. The workshop created an opportunity for participants to share their experiences of using the space, allowing us to identify inaccuracies within the initial greenhouse plans and refine them based on user feedback.

It also provided a deeper understanding of what currently functions well on the site, alongside the areas requiring the most urgent improvement. The feedback collected through annotated plans and post-it notes directly informed the ongoing development of the proposal.



What currently works well:

- The classroom space is well insulated and generally provides a comfortable environment for activities.
- Existing greenhouses support a strong connection between nature, wellbeing, and community engagement.
- The site already functions as an important social and educational space for volunteers and visitors.

What needs improvement:

- Raised beds and planting areas require maintenance and upgrading.
- Better balance needed between plant care and user comfort.
- Temperature control issues within the cactus house.
- Pond filtration and water management improvements required.
- General maintenance concerns, including cleaning and upkeep.

Urgent Issues Identified:

- The Jungle Room lacks sufficient heating and insulation, making it cold and draughty.
- Water leakage from sections of the roof.
- Metal corrosion and wider structural deterioration.
- Broken and damaged glazing affecting thermal performance and safety.

Sustainability strategy

According to the Lower Energy Transformation Initiative (LETI), the best practice for retrofit projects is to employ a fabric first approach, however, replacement of the entire fabric is not feasible due to budget constraints. Consequently, there are three steps to improve the building's sustainability:

1. Improve the thermal conductivity of the building fabric.
2. Improve the building's airtightness.
3. Electrify all building services.

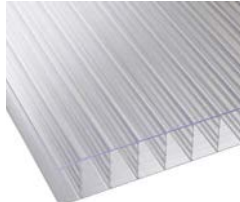
1. Fabric

Glass



k value \approx 1 W/mK

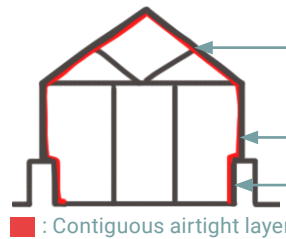
Polycarbonate



k value \approx 0.2 W/mK

Switching existing materials to those with better thermal conductivity will decrease the building's required energy use intensity (EUI). This will reduce operational monetary and carbon costs. Adding wall insulation, specifically to the foot of the wall will further reduce EUI.

2. Airtightness

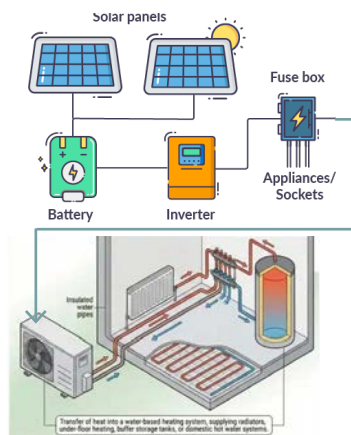


Airtight connections between frame and support structure
Airtight window seals
Airtight plaster wall

■ : Continuous airtight layer

Airtightness is critical as existing thermal bridging cannot be fully rectified within budget, and the building relies on convective heating. A contiguous airtight layer is achieved using overlapping airtight seals and wall finishes.

3. Electrification






Solar is an intermittent energy source and PV arrays are made more effective by battery storage. The ASHP can be an air to water heating system and utilise the existing Victorian waterpipes if they are repaired.

An air source heat pump (ASHP) will likely be the most cost effective solution. Though a case could be made for ground or water sourced heat pumps too. Mechanical ventilation of the greenhouse will be required to ensure it does not overheat in the summer.

Ventilation and heating can be made net zero by attaching them to onsite energy generation such as solar panels.

Funding information

System	Existing condition	Proposed upgrade	Approx cost (£)	Dimensions	Benefits	Source
Glazing	Single glazed panel	Polycarbonate sheets 	16.78	1000mm x 16mm x 500mm	Reduced heat loss & improved thermal performance	https://roofin.co.uk/shop/supaclear-16mm-triplewallpolycarbonate-roofing-sheet?attribute_pa_colour=clear&attribute_pa_choose-width-button=500mm&attribute_pa_choose-length-button=1000mm
Insulation/airtightness	Poor airtightness, drafts	Airtightness seals  Insulated wall finishes 	4.99 27.18	10m x 9mm x 5.5mm 2400mm x 1200mm x 30mm	Reduced drafts & improved internal comfort for plants & users	https://www.screwfix.com/presentised-pm-rubber-p-profile-draught-seal-white-10m/753YU7product_additional_details_container https://www.buyinsulationonline.co.uk/product/warmline-eps-insulated-plasterboard-30mm
Heating	Oil-powered heaters	Air source heat pump Ground source heat pump 	1619 2499	973mm x 330mm x 940mm	Lower operational carbon & reduced long-term energy costs	https://www.theheatpumpwarehouse.co.uk/shop/heat-pumps/air-source-heat-pumps/samsung-heat-pumps/samsung-5kw-r32-monobloc-air-source-heat-pump?attribute_heat-pump=STANDARD https://www.ebay.co.uk/itm/354712595037?chn=ps&ul=GB&mkevt=1&mkcid=28&google_free_listing_action=view_item
Energy	Non-renewable energy supply	Roof mounted solar panels 	60.32	1762mm x 30mm x 1134mm	Renewable energy generation & reduced electricity costs	https://www.tradesuperstoreonline.co.uk/products/trina-430wtype-n-transparent-back-pvpanel?vari

In order for Blossom to follow the sustainability strategy, they will need a grant to cover the capital cost of the new building services. We have identified the following organisations as most likely to support the proposed scheme:

- Greater Manchester Environment Trust - Green Spaces Fund
- National Lottery Awards for All England – Environment
- Bupa Foundation Green Community Grants
- Grants for Good (Matthew Good Foundation)
- Northern Powergrid Foundation
- Stobart Sustainability Fund
- The Leathersellers Small Grants Programme (applications open September)
- Naturesave Trust (current focus is Devon but future rounds may not be location specific)

Developed design



Steel Frame

Advantages:

- * High structural strength and load-bearing capacity
- * Durable material with long service life
- * Minimal sectional depth allows greater daylight penetration

Disadvantages:

- * High thermal conductivity results in poor insulation performance
- * Susceptible to corrosion without protective treatment
- * Greater embodied energy compared to timber construction



Timber Frame

Advantages:

- * Good thermal insulation properties
- * Renewable material with lower embodied carbon potential

Disadvantages:

- * Requires regular maintenance and weather protection
- * Vulnerable to moisture decay
- * Larger structural sections may reduce light transmission



Plastic / PVC Frame

Advantages:

- * Lightweight and cost-efficient construction system
- * Resistant to corrosion and moisture damage

Disadvantages:

- * Lower structural durability
- * UV degradation can reduce lifespan over time
- * Derived from non-renewable petrochemical resources with negative

Proposed components

System/Component	Existing Condition	Proposed Upgrade	Material / Structural Change	Benefit
Glazing	The existing greenhouse uses single glazing with poor thermal performance and heat loss.	Replace the single glazing with 16 mm multiwall polycarbonate panels.	Roof and wall envelope upgraded from single glass to polycarbonate multiwall panels.	Improves insulation and reduces heat loss while maintaining good daylight.
Airtightness	Gaps at panel-to-frame junctions allow draughts and heat loss.	Add airtight seals and local sealing treatment at panel-to-frame junctions.	New airtight seals at glazing-to-frame junctions.	Reduces cold air infiltration, improves thermal stability, and lowers heating demand.
Internal Thermal System	The high roof volume allows heat to escape upward at night and during winter.	Install a retractable thermal curtain below the roof structure.	New internal retractable thermal curtain.	Provides seasonal and day-night thermal control and reduces heat loss through the roof.
Perimeter Upstand	The zone near ground level has weak thermal performance and is prone to thermal bridging.	Introduce an insulated low perimeter upstand.	New insulated low perimeter upstand.	Improves base insulation and protects planting and occupied space.
Floor Edge	The junction between the floor and foundation may create significant thermal bridging.	Add insulation at the floor edge.	New insulated floor edge.	Reduces thermal bridging and improves thermal comfort near the walkway and planting beds.
Primary Structure	The lightweight metal frame is largely retained, but some joints lack stability and durability.	Retain the structural logic while strengthening the main load-bearing members and key connections.	Reinforced or renewed galvanised steel columns, rafters, ridge connections, diagonal bracing, and panel fixing system.	Supports the new envelope system and improves stability, durability, and resistance to deformation.
Foundation	The existing foundation has limited thermal and moisture performance.	Use a concrete strip footing with compacted hardcore and insulated base construction.	Concrete strip footing with compacted hardcore.	Provides stable support, improves base thermal performance, and helps drainage and damp protection.

Proposed design

Keeping the **existing frame**: Prioritising fabric first upgrades and low cost solutions.

Introducing **internal divisions** of spaces: keeping areas more temperature regulated for longer periods of time

Sealing around windows: improving airtightness to reduce drafts

Upgrading the glass to **polycarbonate**: improving thermal conductivity

Introducing the **electrification of building services**: retrofitting existing pipework and cavity with air source heat pump pipes for concentrated underfloor heating

Adding **insulation** to wall fittings: improving consistency of indoor temperatures



In terms of phasing, we believe this intervention should begin in the **jungle room** where there are issues of drafts and poor temperature regulation. Following this should be the **cactus house** where there are also inconsistent temperature control, and damaged glazing panels.

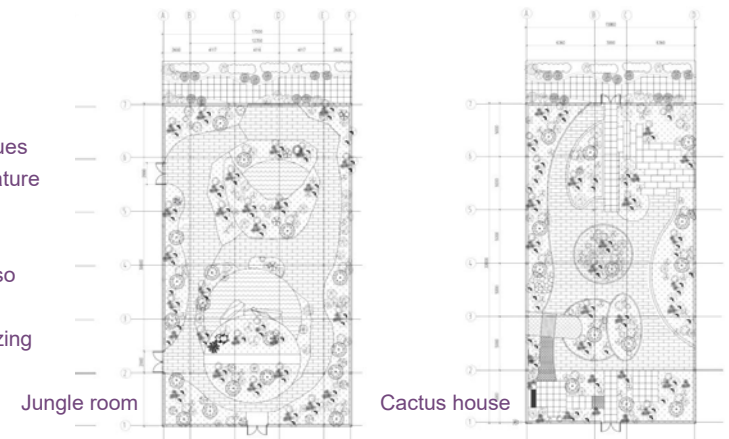


Photo diary

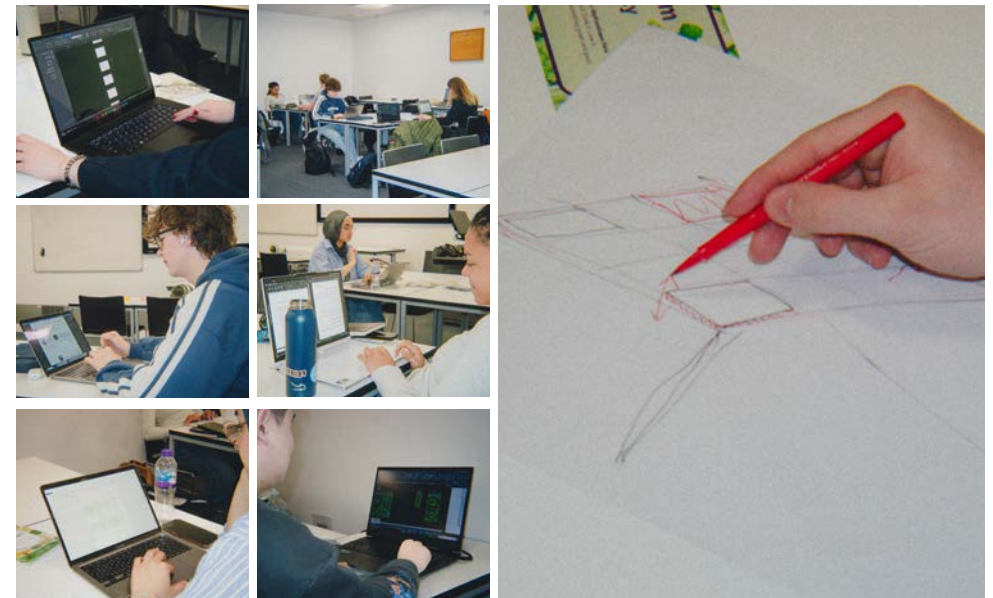
Engagement activity (preparation & workshop)

The project was centered around our on-site workshop, shifting from research to making. We prototyped 'Bloomwell' kits in B15 using laser-cut timber, then worked with the Blossom Charity community to build and decorate them in the greenhouse. This hands-on session gave valuable feedback and showed how users engaged with the designs, helping refine our ideas.



Action week

In the final stage, we turned workshop insights into a clear design proposal. Using software and group brainstorming, we refined plans for sustainable, cost-effective greenhouse upgrades. The result blends community input with technical research to support both plant growth and well-being.



ABOUT

Each year the MSA LIVE programme unites Masters Architecture year 1, Masters of Architecture & Adaptive Reuse students, BA foundation and year 1 and Masters Landscape Architecture 1 in mixed-year teams to undertake live projects with external partners to create social impact.

LIVE PROJECTS

All MSA LIVE projects are live. A live project is where an educational organisation and an external partner develop a brief, timescale, and outcome for their mutual benefit.

SOCIAL IMPACT

All MSA LIVE projects are for community benefit or have social impact. Social impact is the effect an organization's actions have on the well-being of a community. Our agendas are set by our external collaborators.

EXTERNAL PARTNERS

MSA LIVE projects work with many organisations: charities, community groups, social enterprises, community interest companies, researchers, practitioners and educators.

STUDENT-LED

Our MSA students take the lead in the project conception, brief development, delivery and co-ordination of a small project. The projects are celebrated in presentations at the end of the academic year.

KNOWLEDGE TRANSFER

Working in teams within and across year groups and courses; MSA students participate in peer to peer learning. In addition, collaborators, participants and students engage in the transfer of tangible and intellectual property, expertise, learning and skills.

LARGE SCALE

This year approximately 400 students from 5 cohorts in MSA have worked on 34 projects with partners.

QUESTIONS

For questions about MSA LIVE please contact the MSA LIVE team, Emily & Julie:

**e.crompton@mmu.ac.uk and
j.fitzpatrick@mmu.ac.uk**

BLOG

live.msa.ac.uk/2026

SOCIAL

**#MSALive26
[@msa.live.26](https://twitter.com/msa.live.26)
[@TheMSArch](https://twitter.com/TheMSArch)**

WEBSITE

www.msa.ac.uk