

MANCHESTER SCHOOL
OF ARCHITECTURE

NIAMOS CENTRE

BEAT THE CHILL!



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Partner Logo 1

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MSA
LIVE 22

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Chen Youtao (BA 02)

Hadiza Tafida (BA 02)

Miguel Melero Martinez (BA 02)

PARTNERS

Our partner, Niamos manages the Nia Centre (The Playhouse as previously known for 120 years) located in the heart of Hulme - providing access to spaces to create, learn, dance and share. They want to re-develop the cultural and historical significant building into a community well-being centre. Their goal would be to connect the local community and artists from around the world.

With the venue deeply rooted in the community, Niamos hopes to be the hub of cultural life, where people come to experience and participate in a quality programme of work, with performances, productions and classes by local people. This will be serving the need for Hulme to diversify, regenerate and become a dynamic local economy and have a thriving cultural scene.

Impacted by Covid, the centre had to be shut which impacted their plans for re-development. However, now that the doors have reopened, their goal is to recreate interest once again by hosting various activities and fundraisers to generate income for the theatre redevelopment and back into the local community.

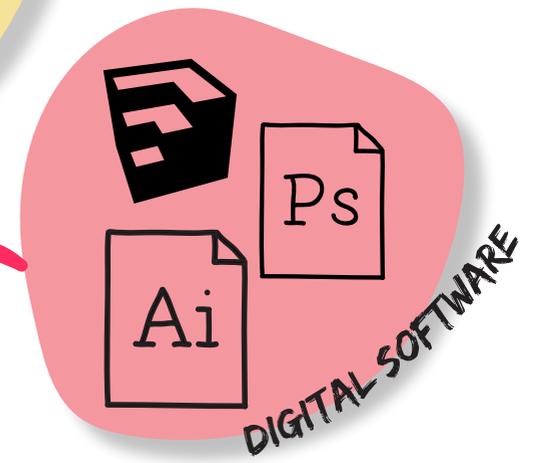
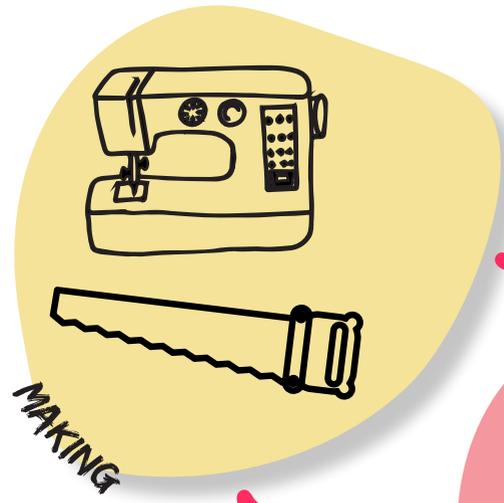
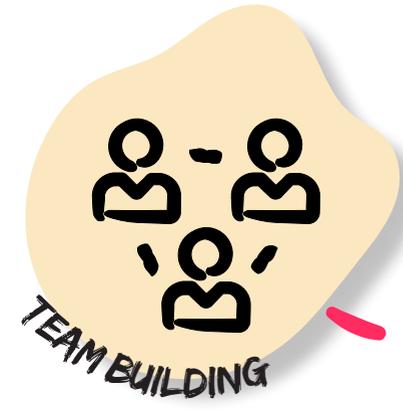
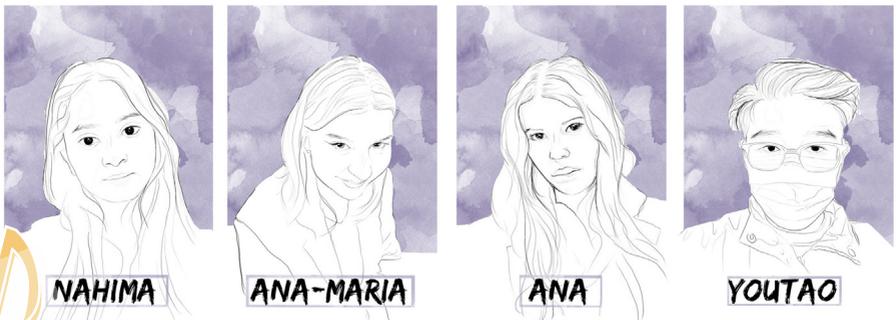
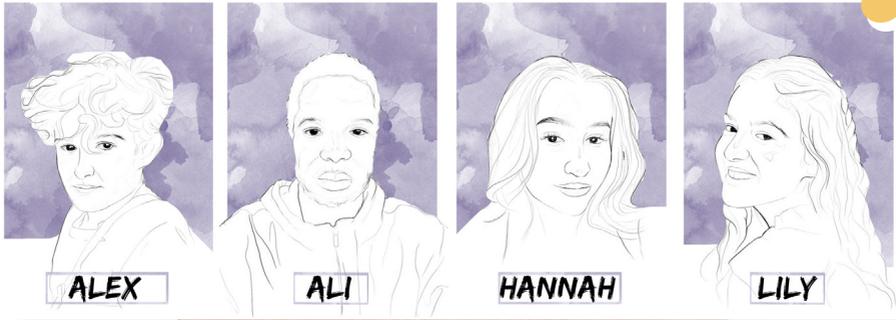
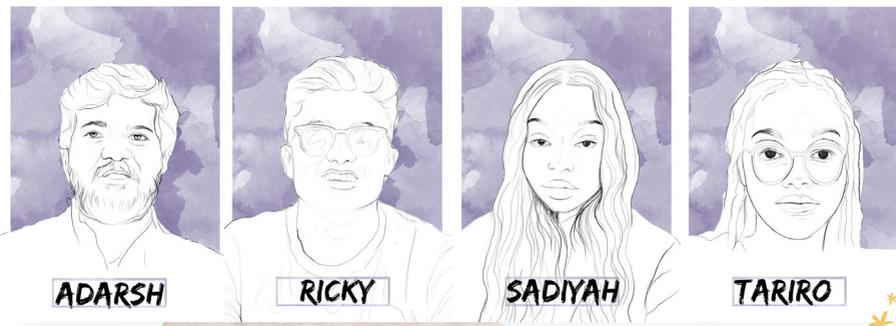
AGENDA

BEAT THE CHILL

This project aims to assist Niamos with documentation of heating solutions that can be implemented. One of the main issues facing the partner and the building itself is the lack of heating. We are to provide a study and survey of the best plans for an energy-efficient retrofit for the historic and community centre in the heart of Hulme.

This is by looking at the best sustainable low carbon footprint, a heating system which would be aligned with their ethical and sustainable ethos. We thought it best if it was divided into two sections: short term and long term. The short term would entail solutions which Niamos could implement and replicate throughout the building due to ease and low cost. Other than in documentation, we thought it best to showcase these short-term solutions in physical form in a showroom in the theatre itself. We would be getting the BA students to investigate and construct these solutions onsite. The long term would entail solutions that can happen in the far future when the centre is more funded and established. This would be accompanied by fundraising ideas and grants that the centre could utilise to fund these expensive and laborious solutions.

The document will display the students' research and conceptualisations. We endeavoured to make the students explore several mediums and makings during this project. While utilising digital software such as Sketchup, Adobe Creative Suite and AutoCAD; we encouraged the BA students to explore methods of making such as textiles and woodworking and incorporate gardening and greenery into our scheme.



SKILLS GAINED

TIMELINE



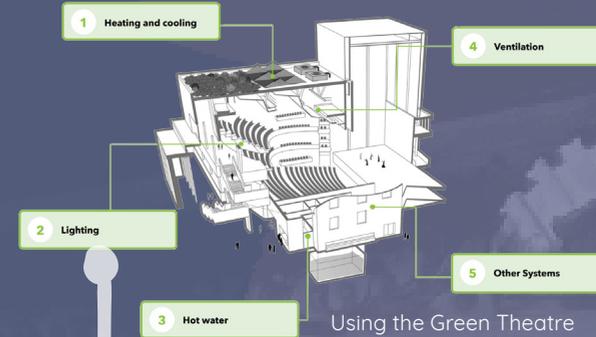
An introduction to the team and the students.



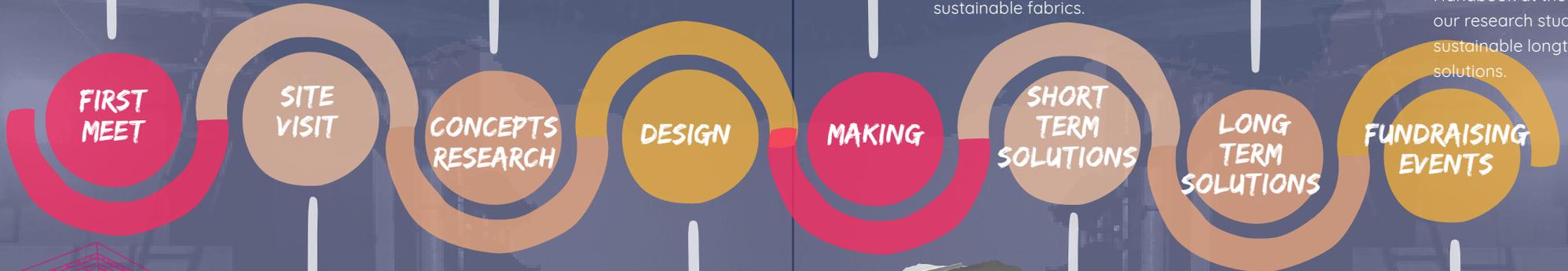
Presentations of conceptual designs and research from the students.



Production and making of insulated curtains designed using second hand sustainable fabrics.



Using the Green Theatre Handbook at the forefront of our research students outline sustainable longterm heating solutions.



The team are introduced to the site and the client behind NIAMOS



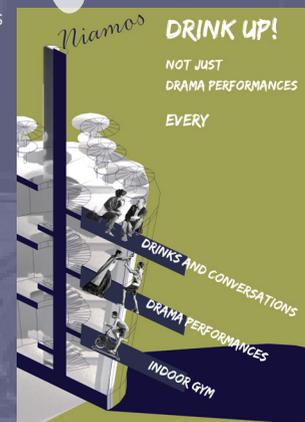
Design team workshop with the students, led by Adarsh.



Installation of 1:1 Prototype short term solution. Designed and made by students.



Fundraising events to raise money for sustainable longterm heating solutions.

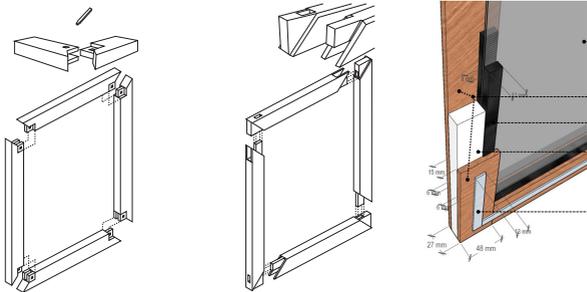


HEATING SOLUTIONS

SHORT TERM

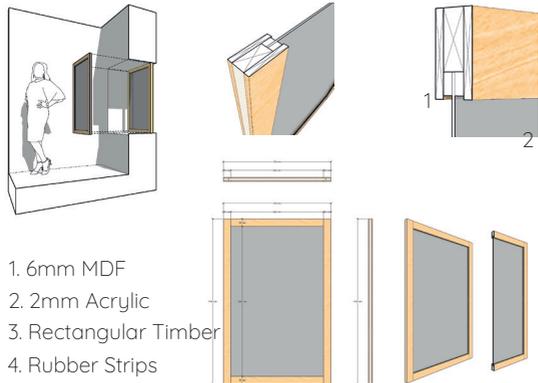
1. SECONDARY GLAZING

Window Joint Exploration



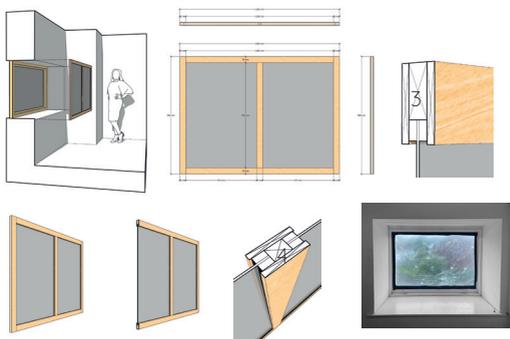
We explored a range of joining structures when deciding on the best way to create a frame to attach to the existing window that currently can not close. The left diagram shows a mortise and tenon construction while the right is a right angle hidden tenon joint.

Window 1



From these precedent explorations we designed our own frame that would be able to limit the amount of draft into the room. The window two design provides a sliding door option for when ventilation is needed. With the cost and time restrictions we decided to use an acetate sheet from the theatre to cover up the major holes in the window.

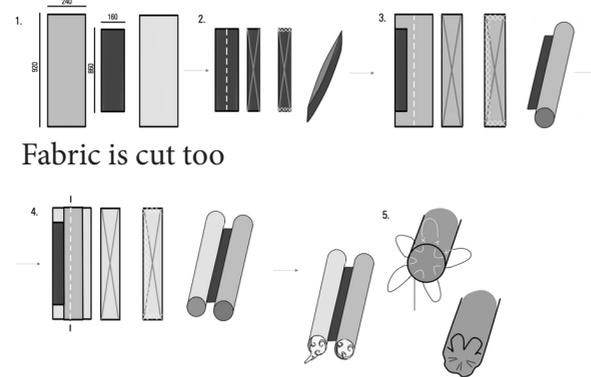
Window 2



The draft stoppers shown to the top right reduce the high levels of exterior draft from entering closed internal spaces. We created two for demonstration purposes on each door of the room. The production process is shown above.

Cotton was used for the outer fabric, a soft and heat resistant material. Wool for the stuffing due to it being a good insulator even when wet and white thread for the stitching.

2. DRAFT STOPPERS



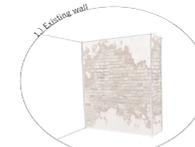
Fabric is cut too



3. INTERIOR WALL SOLUTION

DIOTHONITE

Images showing the areas of heavy damp and leakage on the first and second floor.



When analysing the building we identified particular areas of heavy damp. A short-term solution we found was the application of diathonite. An easy cheap process where paint can be applied to solid stone, masonry, plasterboard, interior and exterior walls.

Cost: £39.00 for 18 kg, 2.17£/kg

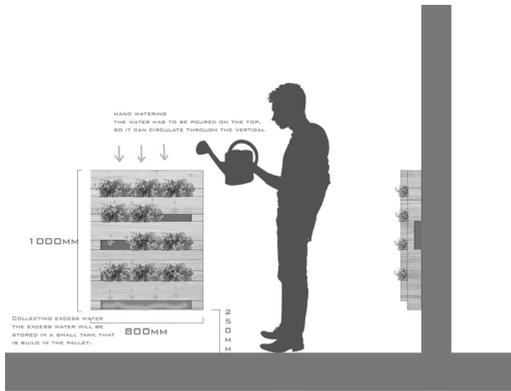
- Excellent thermal conductivity of 0.045 W/mK
- Breathable and Capillary active
- Easy Application
- High Elasticity

A 40-60mm thickness improves the thermal performance of the wall by 3.5 - 4.5 times. Diathonite Evolution should be built up in 15-25mm layers to the required total thickness, typically one layer per day.

HEATING SOLUTIONS

SHORT TERM

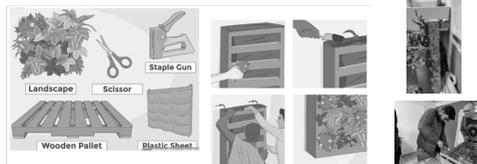
4. GREEN WALL



Green walls improve building insulation by breaking vertical airflow and generating stationary air.

Plant types include Monstera, Calathea, Anthurium, Dracena, Pothos etc.

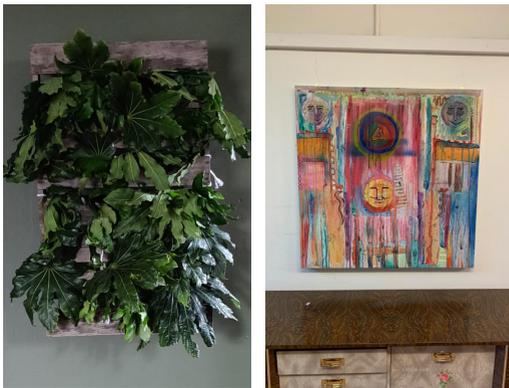
The system makes use of climbing plants and attaches a frame to a wall with an irrigation and fertilization system to nourish plants in a hydroponic manner.



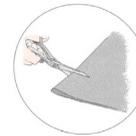
Not only can plants add a layer of insulation; they can improve air quality, reduce noise pollution, reduce energy demand as well as room temperature variation and even keep a room cooler during heatwaves.

Research was undertaken to establish whether a small scale green wall was viable.

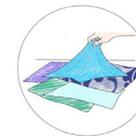
With the plants being a costly expense we sourced free materials to give the desired effect and provide inspiration as to the possibilities of green wall design as a heating strategy for the various rooms at the Niamos centre.



5. CURTAIN



Curtain base is cut to size with allowance for hems.



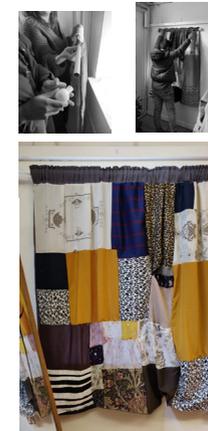
Additional pieces are cut to squares.



All components are sewn together.



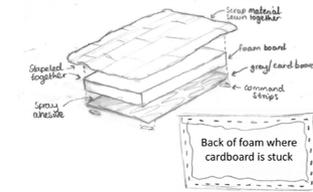
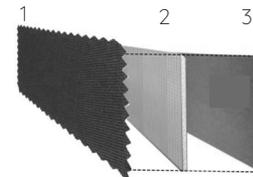
Curtains then slide onto the rod which attach to the wall.



While providing new glazing to the cracked windows was not an option we agreed a curtain would be an alternative short-term solution to keep drafts out the building. We sew recycled fabrics and installed them to the smaller window on site.

In warmer months they block out heat keeping rooms cool while in winter months they help to retain warm air. A quick and affordable solution that can be replicated around the site.

6. FABRIC PANEL

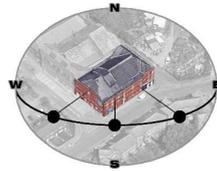


For the fabric panel we used an existing artwork provided by Niamos which was then adapted to provide thermal comfort for the room. They can be replicated on a larger scale across walls to help lock in heat. An art piece as well as a practical solution!

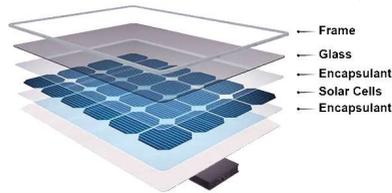
- 1 Recycled material for front layer.
- 2 Insulated fabric for middle layer.
- 3 Back layer of insulation board.

HEATING SOLUTIONS LONG TERM

1. SOLAR ENERGY



The optimum direction to face solar panels is between south and East direction, where there is maximum solar heat gain throughout the day. The Niamos building have a significant percentage of its rooftop facing a south-east orientation, ideal for solar panel installation and the smaller and less efficient south-west rooftop.

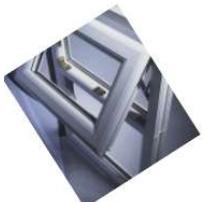


Solar panels are a long term sustainable solution to generate electricity from the sunlight that hits the rooftop. The Panel absorbs the sun's rays and convert them into green electricity or heat and are capable of generating around 1000 watts per square meter.

2. TRIPLE GLAZING



Enhanced security: A third pane of glass provides an extra layer of defense



Noise reduction: second unit cavity make the sound wave transfer difficult.

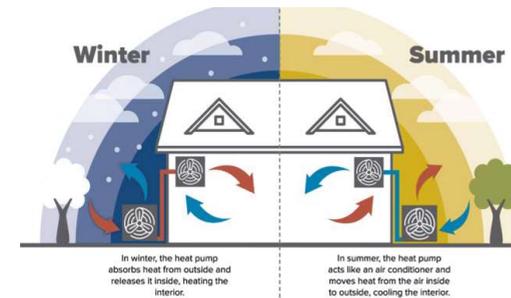


Energy Retention: With the 36mm glazing, the triple glazing unit can achieve U-values as



Triple Glazing has the potential to reduce the energy bill whilst making the space warmer, safer and quieter. The average cost for 4 rooms is around £2,500. Frames come in UPVC and Aluminum options. The installation for 15 windows can be around £ 6,500- £ 8,000 depending on the frames and profiles. It is an ideal solution for colder and noisier areas.

3. AIR SOURCED HEAT PUMP



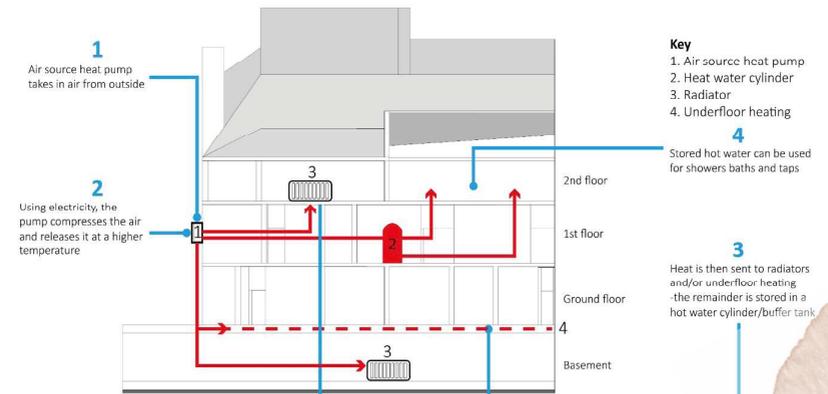
The life expectancy of a heat pump depends on several factors, such as the type of heat pump, your location, and how well the heat pump is maintained. Heat pumps normally last an average of 15 years, though some can wear out after a decade.

A typical air source heat pump installation will cost you around £6000 - £8000, and a ground source heat pump installation can cost



Pros	Cons
Can be used for heating and cooling	Your home must already be well insulated
Low carbon footprint	Lower heat supply than boilers
Easy installation process	Extra spending to install underfloor heating
Low maintenance	Lower efficiency below 0°C

The ideal location for exterior unit of the heat pump is on the North East elevation. Placing it on the rear facade helps it hide from the visible heritage facade. Place it minimum 7ft from above the road level to prevent dust & foreign matter from entering the unit.



FUNDRAISING

Exploration of funding opportunities is the most practical way to facilitate the repair of longer-term building issues such as the roof and heating system. Research into the grants available can be used to understand which opportunities you qualify for.



The Tudor Trust is an independent grant-making trust which supports voluntary and community groups working in any part of the UK. Application is open from 1st April 2023.



The Paul Hamlyn Foundation addresses inequalities of opportunity to access and participate in the arts. They help with pre application access support and bursary of £500 to help apply.

Grant range: £30,000 and £400,000
Time period for funding : 12 months- 4 years.

Precedent: Royal Exchange theatre company, Central Manchester- £57,275 over 24 months.



The foundation work with registered charities to provide funding for new build, refurbishment and major equipment to improve performance and training facilities.

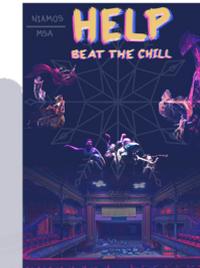
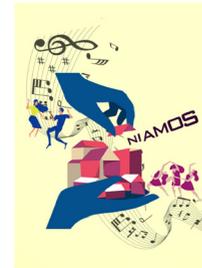
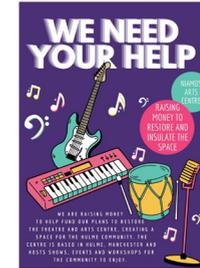
Grant range: £15,000 – £150,000
Decision dates: June and December annually

The project must have a total cost of at least £250,000 and also aim to produce one or more of the following outcomes:
Improved quality of performance venues
Better teaching, education and rehearsal facilities
Increased audience numbers



Similarly, to the Wolfson fund, Theatre's trust provide funding for new build, refurbishment and major equipment to improve performance and training facilities.

Grant range: Upto £20,000
Decision dates: deadline noon on 6 September 2022.



The figures show posters produced by the BA students. They're a range of smaller scale fundraising ideas that can be used as the base for flyers and event nights.

ABOUT

Each year the MSA Live (formerly Events) programme unites M Arch. year 01 with B Arch. year 01 and 02 and M Land. Arch 01 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 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 masters students take the lead in the project conception, brief development, delivery and co-ordination of a small project. Other cohorts join for an eventful 2 weeks of activities 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 600 students from 4 cohorts in MSA will work on 42 projects with partners.

QUESTIONS

For questions about MSA Live 21 contact MSA Live Lead: Becky Sobell:
b.sobell@mmu.ac.uk

BLOG

live.msa.ac.uk/2021

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