

MANCHESTER SCHOOL
OF ARCHITECTURE

MYCO-POD
SOW THE CITY



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MANCHESTER
1824
The University of Manchester



BOILER HOUSE

**MSA
LIVE 23**

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Partners

The Collaborators for this project were Sow the City, a Manchester based social enterprise working out of a former district power station which has been re-purposed to run community workshops for making and mending. The Boiler house formerly operated as a power station for thousands of homes in Moss Side, however the boiler house now serves the local community by providing free and low-cost use of tools whilst also providing accessible workshops for the people in Manchester.

The Boiler house has become an integral part of the moss side community, offering monthly 'repairs café' which allows people to be assisted by local experts to fix their damaged or broken items free of charge, as well as initiatives such as 'community re-paint' whereby the boiler house and sow the city have teamed up with trades and other businesses to take away their surplus paint to sell back to the community at a heavily discounted of the cost to both the person and the environment.

Sow the city's aims to empower communities to grow and live sustainably heavily influences the running and practice within the Boiler house as they also offer a Mushroom growing and Biomaterials course, in which they encourage locals to learn to grow their own mushrooms and consider eco alternatives.

Agenda

The Boiler House- MYCO Pod

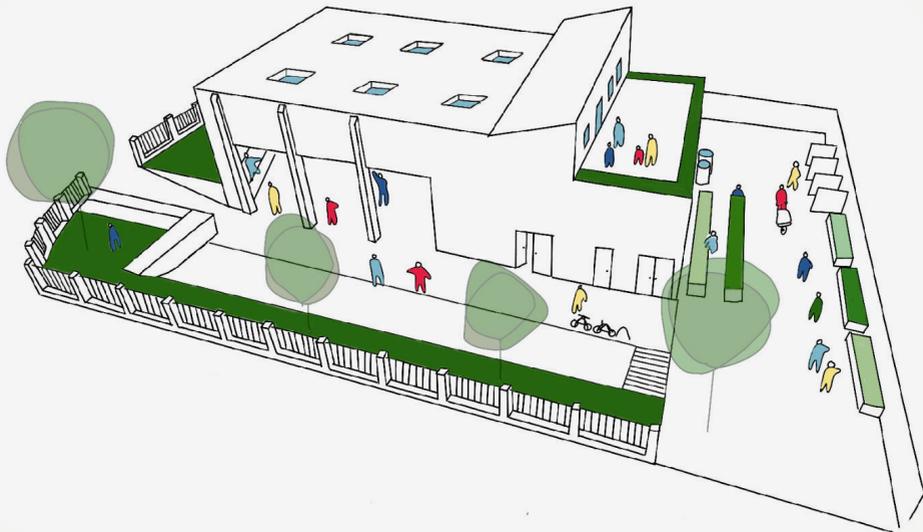
The Boiler House, located in Moss Side, is a local enterprise which runs workshops to help build life skills and a community ties.

The workshops range from woodworking and mending, to pottery and mushroom growing; offering valuable employment skills and wellbeing spaces to the residents of Manchester. The Boiler house is run by Sow the City, a Manchester based organisation which aims to empower local communities to live sustainably. Jon and Ladislav approached our team regarding one of their allotment sites. Their outdoor storage unit was very small and no longer fit for purpose and so the team was challenged to create the eco shed: an outdoor storage/ workspace unit which combines stool storage and inhabitable shelter with space for a green roof and solar panels. The eco-shed was produced in the Boiler House and the design was developed alongside the collaborators, with tools and materials being kindly provided by Sow the City. The design needed to be ergonomic and efficient, whilst also being an attractive space to inhabit and work in. The structure would consist of timber and other organic materials, with opportunity for planting and insulation to be installed in phases.

As the Boiler House is a repurposed power station, the fabric of the building doesn't perform to the activity going on inside. The wall buildup is breezeblocks and brick with little to no insulation, meaning the winter months are too cold to host workshops and the heating bills are astronomical. Another casualty during these months is the mushroom/mycelium growing workshops held by Ladislav. The Mushroom Growing course offers insight into the production and uses of fungi and focuses on the root network of mushrooms; known as mycelium. Mycelium is a versatile and sustainable materials which can be easily produced and integrated into a range of industries such as textiles, culinary, retail and construction as a viable replacement for plastic products - a poignant issue when tackling the climate crisis. We were invited to take part in their mushroom growing course. The course was a great opportunity to learn more about the growth, accessibility, and wide use of mycelium, but also helped us understand what courses like these mean to the community from the other local students who were in attendance. We were asked to produce a booklet which displays the strengths of mycelium with the aim of securing funding to insulate more of the building and/or expand their mycelium production.



THE BOILER HOUSE MCR



COLLABORATOR

The Boiler House, Manchester, is a repurposed power station which holds making and mending workshops at a low-cost for the local community. The Boiler house is run by Sow the City, a Manchester based organisation which aims to empower local communities to live sustainably



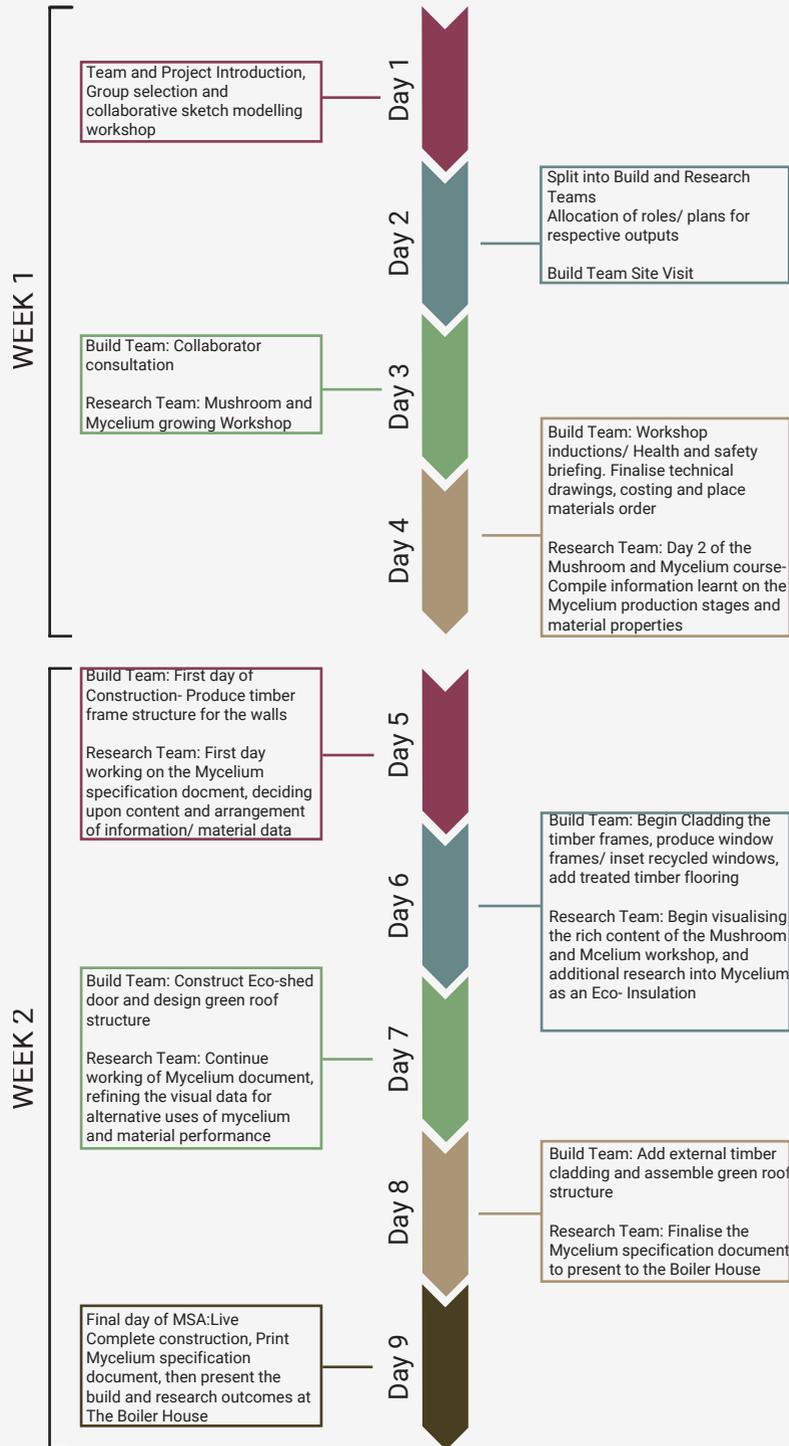
The Boiler House and Sow the City was founded by Jon Ross. From humble beginnings, the organisation has grown to an award winning initiative which helps Manchester residents live sustainably.

SOCIAL VALUE

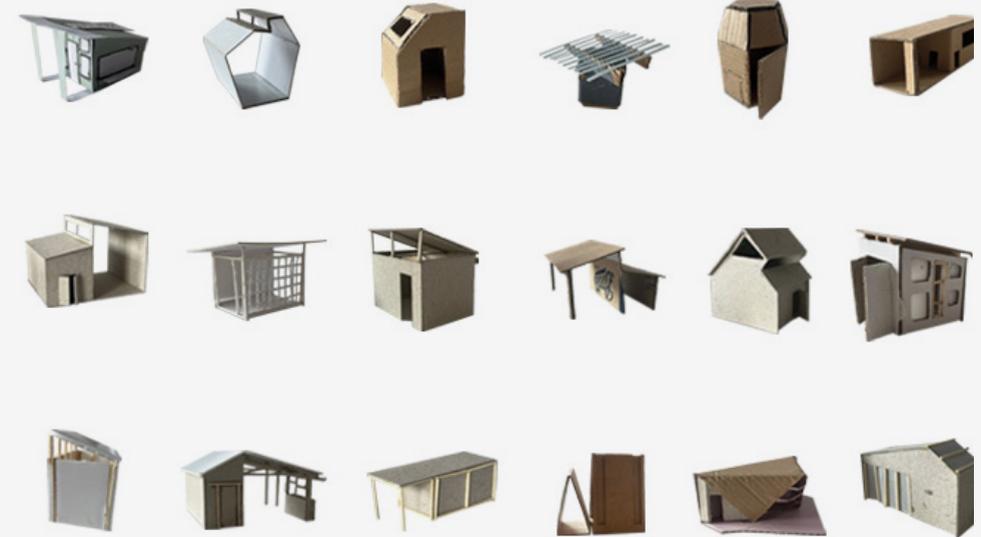
The workshops held at the Boiler House range from woodworking and mending, to pottery and mushroom growing; offering valuable employment skills and wellbeing spaces to the residents of Manchester.



Timeline



Initial Meeting and Sketch model workshop



The first session of MSA:Live involved collaborative sketch modelling workshop in which the BA and MA students explored different design iterations for The Boiler House's Eco-shed. We took into consideration the need for enclosed storage space and potential for a later addition of a sheltered seating area. This was a great opportunity to get to know each member of the team in an informal yet productive way, this workshop generated some great design ideas.



Mycelium and Mushroom Workshop

During the first week of MSA: Live we were fortunate enough to be able to take part in the Boiler House's Mushroom and Mycelium growing course. During this time, we learnt about the controlled and sterile conditions required to grow Mycelium, and were able to take in preparing various growing mediums, such as Agar, which involved heating water, agar powder, and glucose together - and straw - which involved shredding hay with an electric hedge trimmer and sterilising it with boiling water. After pasteurising the straw, Mycelium strains are added and the natural material- in this case straw acts as the substrate for the fungal growth of the Mycelium to inhabit, this grow-bag must then remain in a controlled warm and damp environment in order to optimise growth.

Ladislav, (the in-house Mushroom and Mycelium expert at The boiler House) showed us the various forms that mycelium can take on dependent upon the method of production, and the choice of natural substrate, it was interesting to see the examples that Lad had produced himself, and his demonstration of the ways in which Mycelium can address the over reliance on plastic use in industry.

Along with taking part in propagating Mycelium growth, we also helped to produce some Shitake Mushroom logs, in which we drilled holes large enough to embed wooden dowels impregnated with Mycelium spores which will enable the log to become the growing substrate, out of which Shitake mushrooms will grow and be harvested by The boiler house for either consumption or Mycelium growth- a cyclical and sustainable practice.



The Site and the Brief

The site for the eco-shed build was Ossory Street allotments. The space, formerly an overgrown unused piece of land, is now a beautiful food garden used to deliver regular food growing activities and events for the community. The existing shed was small and needed an upgrade to reflect the tools and activity needed for their local groups.



The team was requested these things:

1. Tool storage, which is visual and easy to access for volunteers (some of whom speak limited English).
2. Sheltered area which can be used for a brew and seed sowing. Plus, can also provide a bit of storage for items like plant pots.



The space available for the eco-shed was a 4200x4100mm paved block with a greenhouse, shelter, gardening spaces and a picnic bench surrounding it. Space is limited so an efficient and functional design was needed.



Initial Consulation

The initial meeting was round a table in the Hangar space with collaborators Jon and Steve to discuss design elements. We showed them them our initial design ideas that we engaged in the day prior. With the client we finalized the design.



The decision was made to build a 1.5m wide, 3m long, and 2.5m high eco-shed, and a 2.4m long, 3.5m long, and 2.8m high lean-to shelter. These two elements be flat packed and moved to the allotment site. The shelter includes a green roof, solar panel, and rainwater collection.

After this meeting the team drew up in CAD blueprints of the design, and the dimensions of each material. Using these dimensions the team did a quantity survey to determine what materials needed to be ordered for the second action week. It also was done to ensure our materials fit the budget of the project.

PURCHASED MATERIALS

Material	Quantity (MINIMUMS)	Individual Length	Total Length
50x50 Timber members	20	3m	60m
50 x 75 Timber	9	4.8m	43.2m
50 x 100m	10	4.8m	48m
8x4 18mm ply	1		
8x4 12mm ply	1		
OSB 8x4 18mm	2		
OSB 8x4 11mm	4		

FLOOR

Description	Material	Quantity	Individual Length	Total Length
CAT050075	Treated Carcassing 50 x 75mm	3	4.8	#REF!
25STB019	OSB Flooring 18mm	3		

SHED ROOF

Description	Material	Quantity	Individual Length	Total Length
25STB019	OSB 18mm (1.22 x 2.44)	3		
CAT050075	50 x 75 Treated Timber	4	3.2	18m

LEAN TO ROOF

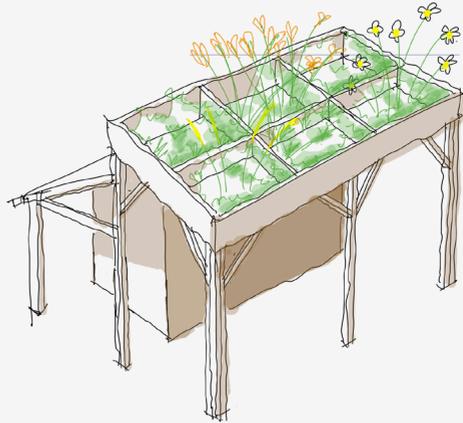
25STB019	OSB 18mm	3		
	Visqueen Damp Proof Membra	Damp Proof Membrane (25m x 4m)		
CAT050100	50 x 100 Treated Timber	7	4.8	
CAT050100	50 x 100 Treated Timber	2		
FEN100100	100 x 100 posts - 2.4m length	6	2.4	
	Met Post	6	2.4	
CAT050150	150 x 50 Treated Timber (Framing)	4	4.2	

WALLS

25STB013	OSB 11 mm	9	-	
54S050050	2v2 members	28	2.8	
FEA125	Feather Edge	128	1.8	
		206		
	Hex Screws/Coach Screws	100	50 pack - 8 head	
	Hex Screws/Coach Screws	100	50 pack - 10	

Design and Construction

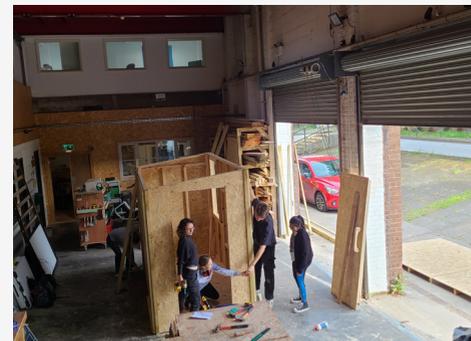
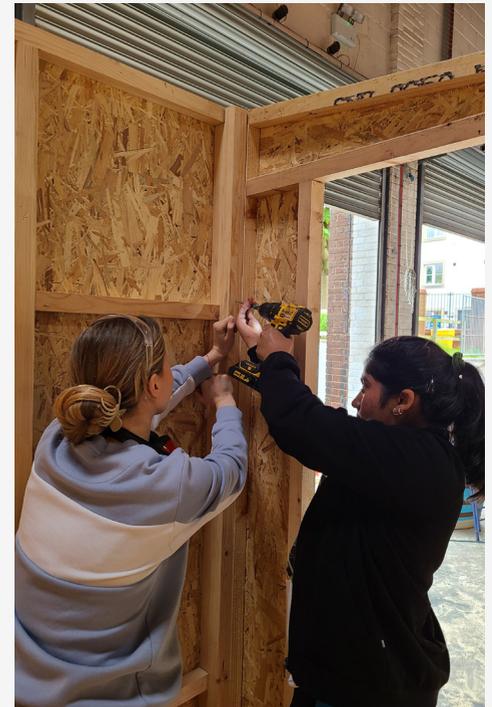
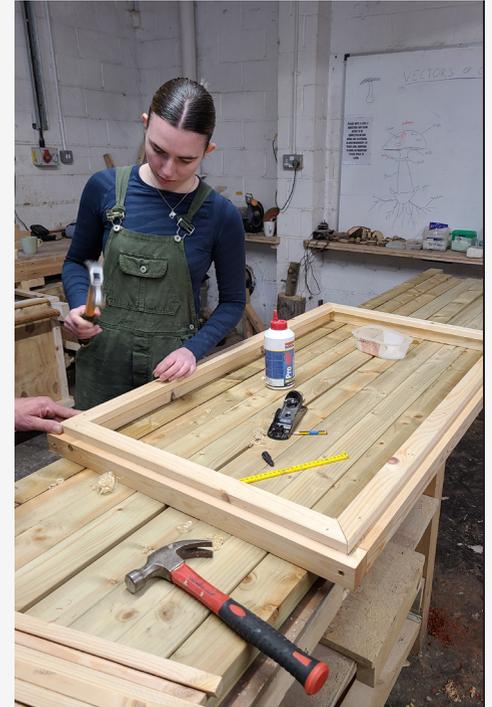
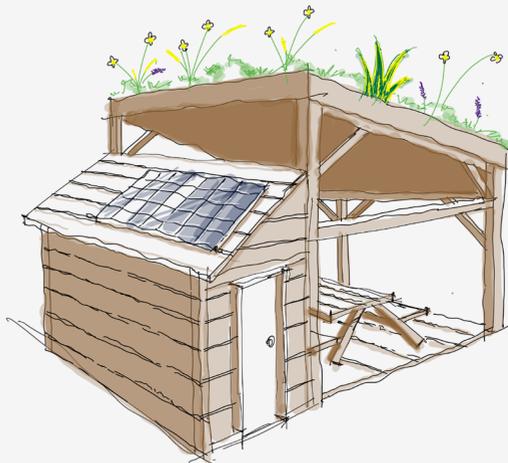
The overall construction was done over 4 days. Steve and Nick oversaw the build, having years of carpentry and construction experience. They helped ensure that the structural integrity of the build was maintained. They also guided the team with using chop saws, hand saws, track saws, hammers, and drills.

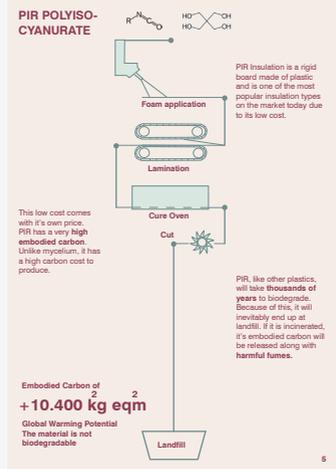
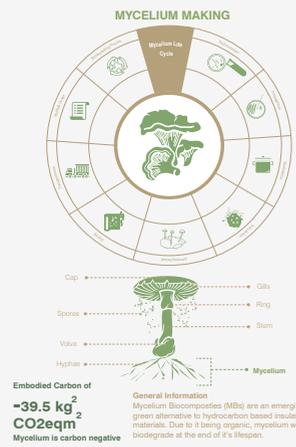


On the first day of construction, we created timber frame walls for the eco-shed. And started cladding these walls with OSB. On the second day of our build we had more consultations with the Jon and Steve because we were unable to get council approval for the lean-to shelter we decided to focus our efforts on the eco-shed. This meant we altered the design to have the green roof and solar panel design that was originally for the shelter for the shed. The timber frames were reinforced. Next we constructed a timber floor made of treated timber and OSB to prevent water damage.



The next few days the team would construct a timber window frame for a recycled window, build a custom door, add an air gap for water drainage. Simultaneously the team would start constructing the green roof and fit the solar panel on top. This roof was not fitted in the Boiler House but would be finished on site. A waterproof membrane will be installed, as to not cause any tears when moving the flat-packed walls. Finally we cladded the walls and dismantled for flat packing.





Final outputs

Comparison of Mycelium's cyclical/ sustainable production with current industry insulation equivalents



Highlighting alternative uses for Mycelium, and the gap in the market for Mycelium production in the North West

ALTERNATIVE USES OF MYCELIUM

Packaging
Mycelium-based composites can be used as a single use packaging alternative to plastic and polystyrene. Mycelium is 100% biodegradable and compostable, so helps to reduce waste and landfill. Swedish furniture brand IKEA and computer brand DELL have committed to using mycelium packaging.

Textiles
Mycelium can be used to create sustainable versions of leather and other synthetic textiles. Reducing carbon emissions and reliance on plastic. Large brands such as Adidas and Stella McCartney use mycelium based textiles in clothing, footwear and accessories.

Protein
Production of protein by conventional animal based systems is very resource intensive and has a high environmental impact. Producing and consuming mycelium based meat alternatives, emits significantly less carbon, and uses less water when compared to animal derived protein.

Mycelium provides a durable, sustainable alternative to plastic. Rather than break down into micro-beads which are harmful to plants and animals, mycelium breaks down into useful nutrients for the soil, giving back to the environment after use.

MYCELIUM IN THE UK

Map of mycelium suppliers

Warabrough Paper
Milton, Somerset

Merit Mushrooms,
Hertfordshire

BIOHM, London

Currently, there are no mycelium suppliers in Manchester, with the nearest supplier located in Leeds. Increasing the number of mycelium growing facilities in and around Manchester would help it become a more sustainable and environmentally friendly city.

KEEP THE BOILER HOUSE GROWING

Cellulose Insulation
£670.56
An environmentally choice that is cheap and has a comparative value to rock wool.

Hemp Insulation
£1065.54
Contains moisture regulating qualities that make it a great choice for insulating walls. It is also completely compostable.

Sheeps Wools
£1292.09
The most suitable substitute to mycelium as it has a high heat storage capacity and has an excellent insulating and air purifying properties.

Ensuring these spaces remain open and with a consistent temperature during the cold months would vastly improve the Boiler House's production capabilities. This investment also means that the residents of Manchester can continue to engage with the activities held here - a brilliant boost to well being and community building.

Though the Boiler House is a brilliant example of how a disused building can be transformed into something valuable for the community, the building was not constructed with community workshops in mind.

The building was originally an electric power station. The lightweight brickwork and metal shutter doors mean that the building is expensive to heat and so these workshops are at risk in winter.



The need to support the future growth of the Boiler House, and Insulation costing for a workshop or Mycelium growing space

ABOUT

Each year the MSA LIVE programme unites Masters Architecture year 1 students with those in BA year 1 and year 2 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 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 joined 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 650 students from 4 cohorts in MSA have worked on 42 projects with partners.

QUESTIONS

For questions about MSA LIVE please contact the MSA LIVE team:

msalive@mmu.ac.uk