STUDIO ORGANIC

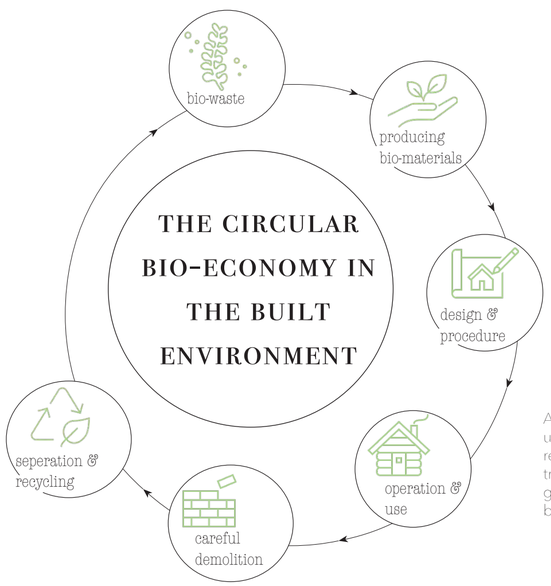
bio-based material hub

"CHALLENGES SUCH AS CLIMATE CHANGE, LAND SUBSIDENCE, CO_2 EMISSIONS AND THE SCARCITY OF FOSSIL FUELS REQUIRE NEW, SUSTAINABLE SOLUTIONS. THE CALL FOR A MORE BIO-BASED AND CIRCULAR SOCIETY AND ECONOMY IS BECOMING EVER GREATER AND INCREASINGLY NECESSARY."

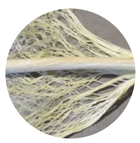
Bio-Based Creations

Studio Organic is a lab, research facility, design and innovation hub for biodegradable building materials. Transitioning into a bio-circular economy is at the forefront of our work, with the aim of regenerating the planet through design, not further destroying it.

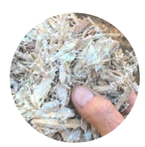
Our facilities offer spaces for contemporary designers and contractors to learn about, and trial sustainable methods of construction and design. Redirecting sustainable architecture, away from being unattainable and unrealistic, and towards standard practice. We work closely with unorthodox practitioners and bio-based design labs to exhibit alternative greener materials in-situ and in other practical settings.



A circular bio-economy explores using renewable natural resources to reconstruct and manage our industrial and societal systems, with the goal of achieving sustainable well being and harmony with nature.



Bio-based materials offer a responsible solution to managing and reducing the consumption of raw building materials. Utilising natural bi-products and upcycled waste materials can reduce the environmental impact of the construction industry, while exploring refreshing new technology and encouraging a new era of design.

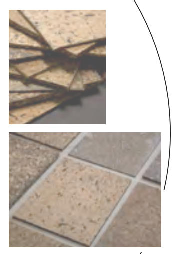


As more and more industries begin to redirect their attention towards sustainable practices, newfound materials and technology is emerging. Studio organic experiments with bio-based products like hempcrete (on left) and mycelium (on right) to test their potential as building materials.

exploring bio-based materials...

SEAWOOD

Seaweed is a fast growing plant that requires little maintenance. Sea-wood refers to a series of board-like materials composed of various seaweed species. This closed-loop material could be used as an alternative to MDF soft-board, or chipboard.

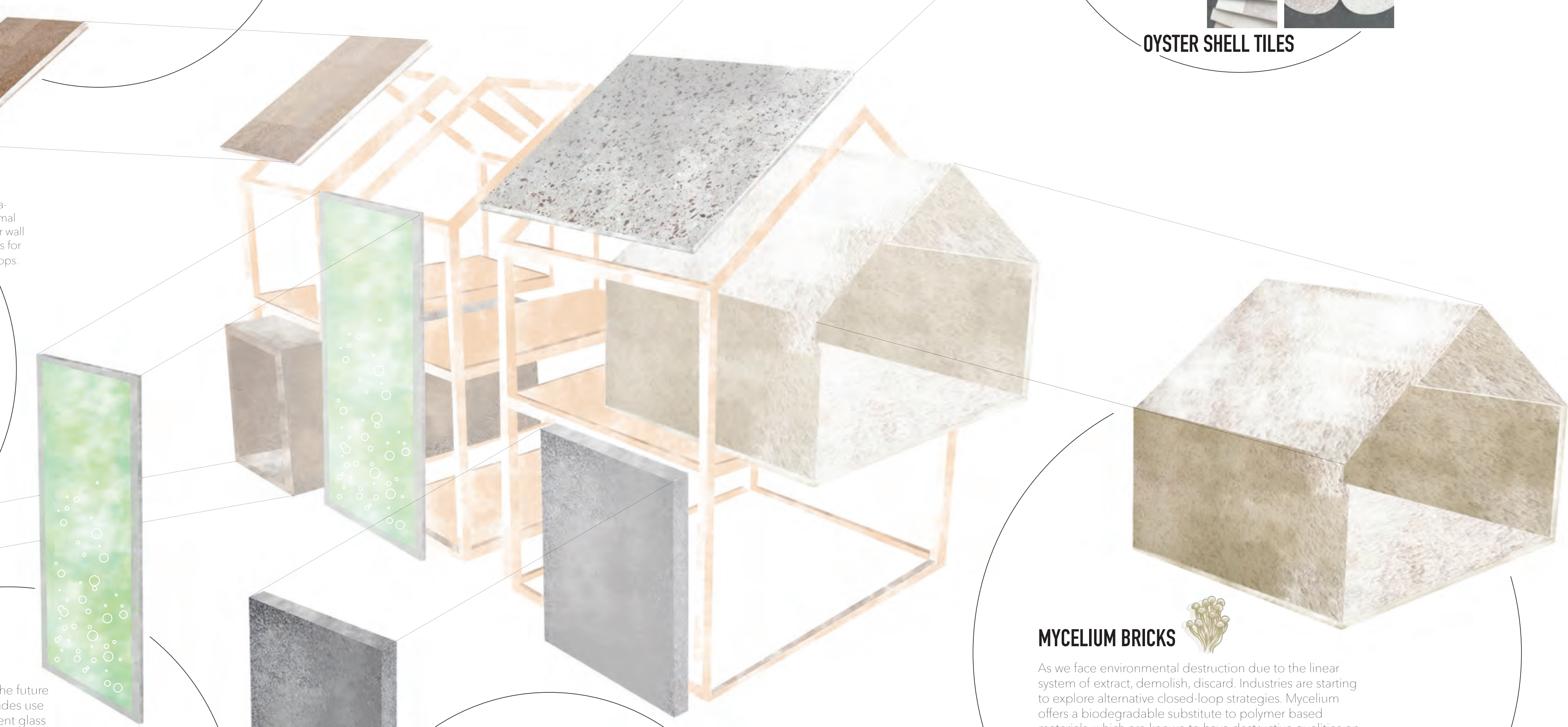


These panels can be used for non-load bearing interior walls, as decorative, acoustic, insulating and fire-resistant furnishings.

OYSTER SHELL TILES

Over 7 million tonnes of mollusc shells are discarded by the seafood industry every year. These shells are predominately made of calcium carbonate which is an important ingredient in the production of cement, a big contributor to rising CO_2 emissions.

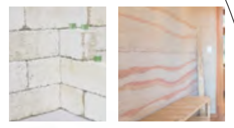
Developing research has revealed oyster shells can be crushed to form an aggregate that can replace ecologically harmful limestone in the production of cement-like tiles.



HEMPCRETE

Hempcrete is made from mixing the hemp herd with lime and water. This material weighs a fraction of normal concrete, reducing the emissions of material transportation, and therefore reducing the overall carbon footprint of a building. Hemp itself acts as an excellent carbon sink, research states hemp can absorb more CO_2 per hectare than any other commercial crop. Hempcrete can also be widely sourced, as hemp can be grown in a wide range of climates and takes little maintenance.

Hempcrete acts as a great insulation due to its outstanding thermal efficiency. It can also be used for wall paneling and interior furnishings for example cabinets and countertops.



ALGAE FACADES

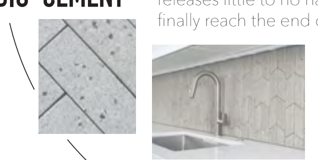
Bio-adaptive facades could be the future of renewable energy. These facades use live microalgae growing in resilient glass louvers to generate energy and provide passive temperature control.

Aglae is continuously supplied with carbon dioxide and nutrients via water pumps. Once it has grown into a thick pulp it's harvested and fermented into a biogas, which is then used to power the building. The facade should be sun facing in order to absorb maximum heat energy, while the sun encourages algae growth, it also provides shade for the building occupants.

BIO-CEMENT

Not only is cement one of the most widely used building materials, it is also the most environmentally harmful to produce. Through the use of research and technology, bio-based cement is in development.

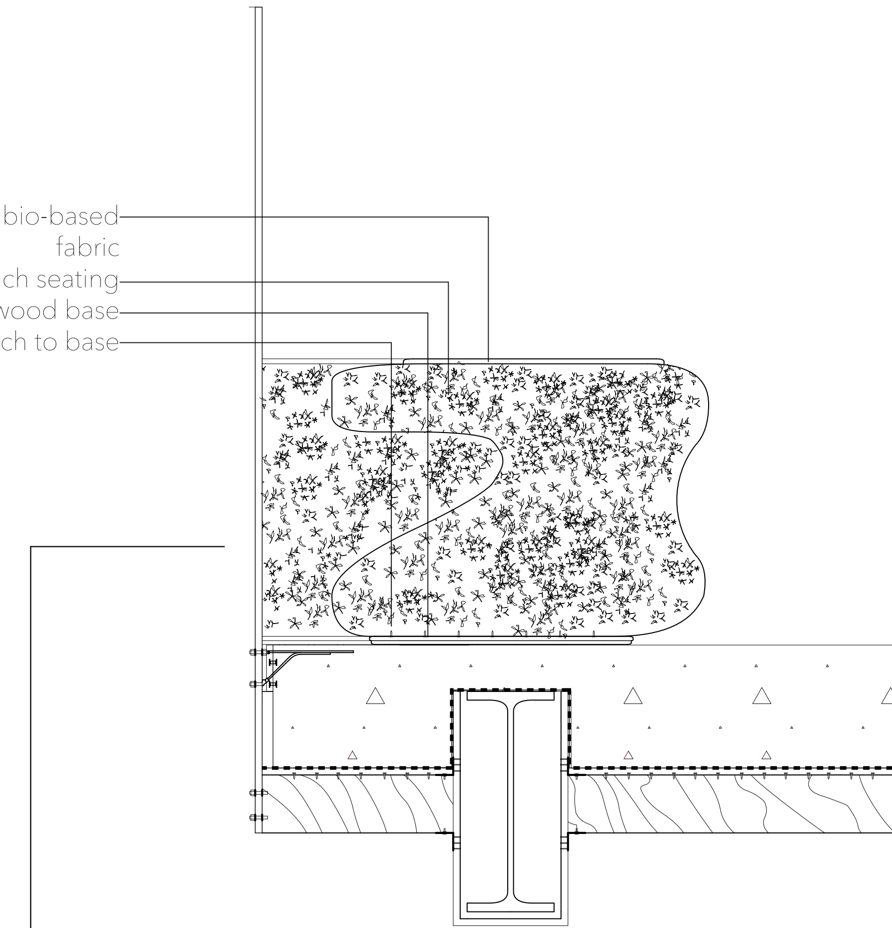
This bio-based cement is produced using inorganic crystals formed by bacteria at controlled temperatures. These living organisms are guided to create stone into specific patterns. Unlike other materials, bio-cement can be easily recycled and releases little to no harmful components when they finally reach the end of their life cycle.



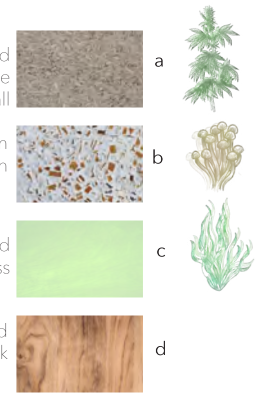
MYCELIUM BRICKS

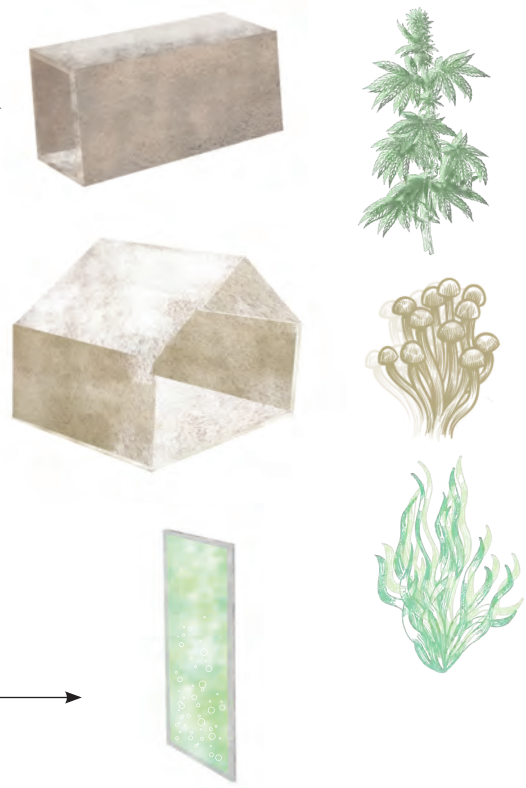
As we face environmental destruction due to the linear system of extract, demolish, discard. Industries are starting to explore alternative closed-loop strategies. Mycelium offers a biodegradable substitute to polymer based materials, which are known to have destructive qualities on the environment.

It can be implemented as insulation, acoustic paneling, decorative tiles or used for interior design applications.



1:20 section



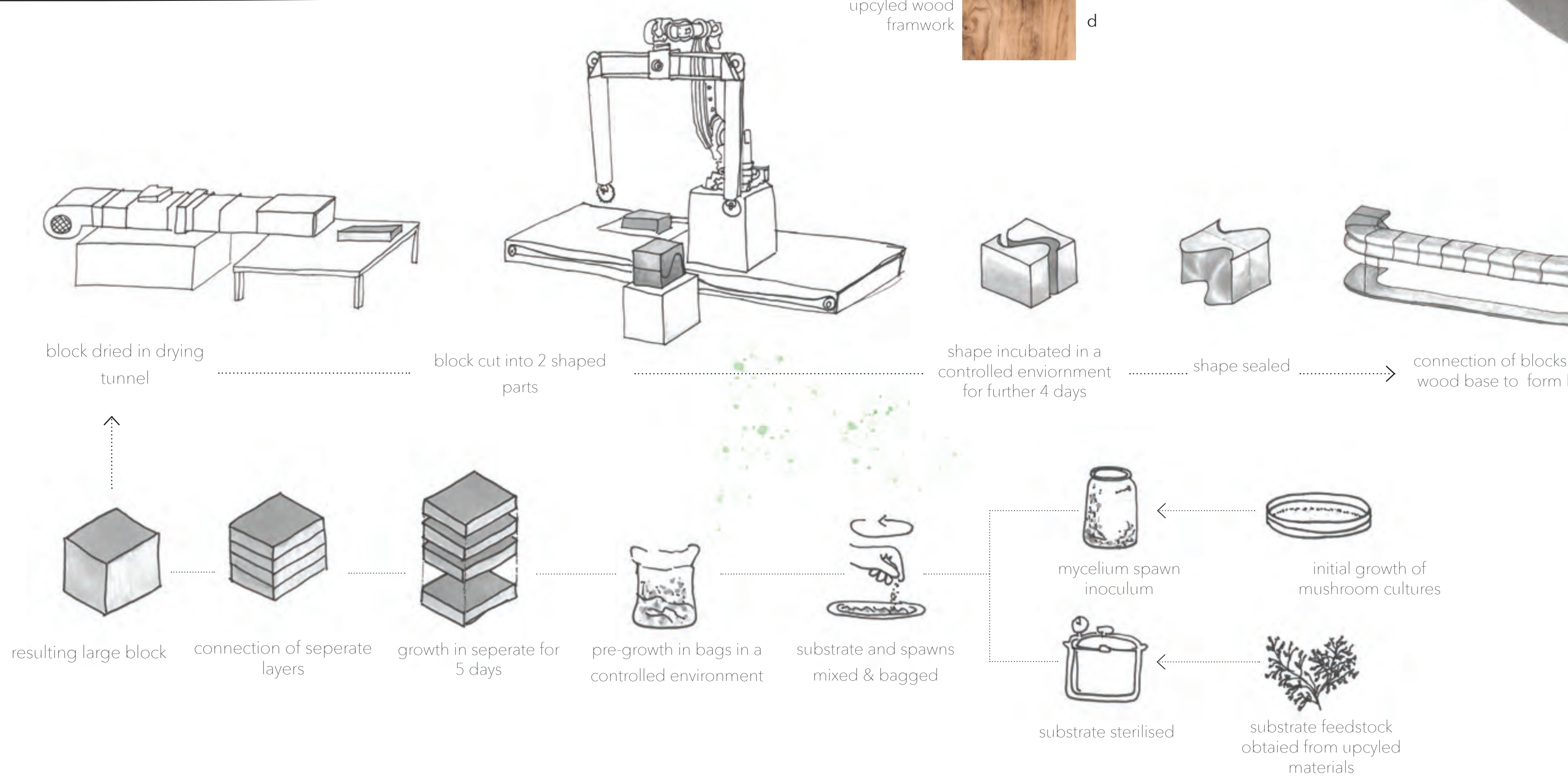


Hempcrete can be easily grown in the climate of Newhaven. It can be used for interior walls and insulation for proposed designs, as a closed loop alternative to consumptive materials.

The versatility of mycelium makes it an ideal material for making interior furnishings. It can also be applied as acoustic insulation for designing learning spaces.

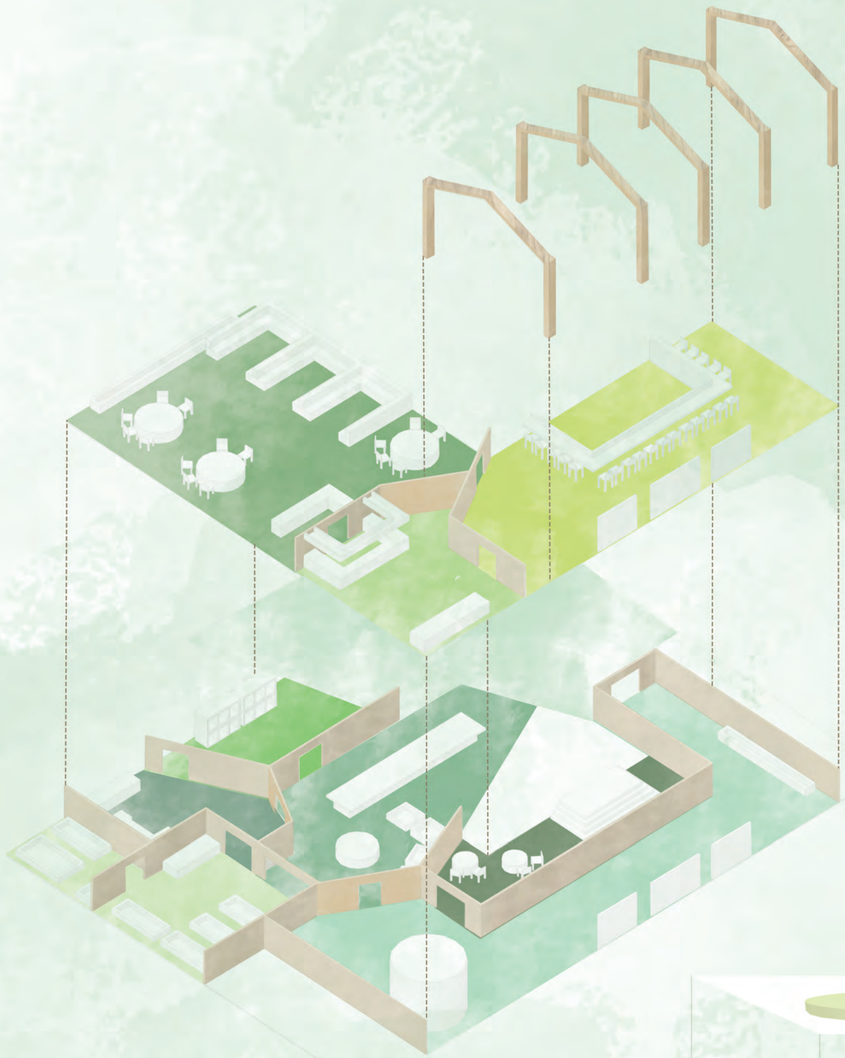
Algae facades provide a continuous renewable energy source and an opportunity to exhibit developing sustainable technology.

mycelium brick making process



Testing the efficiency of curved moulds for mycelium growth

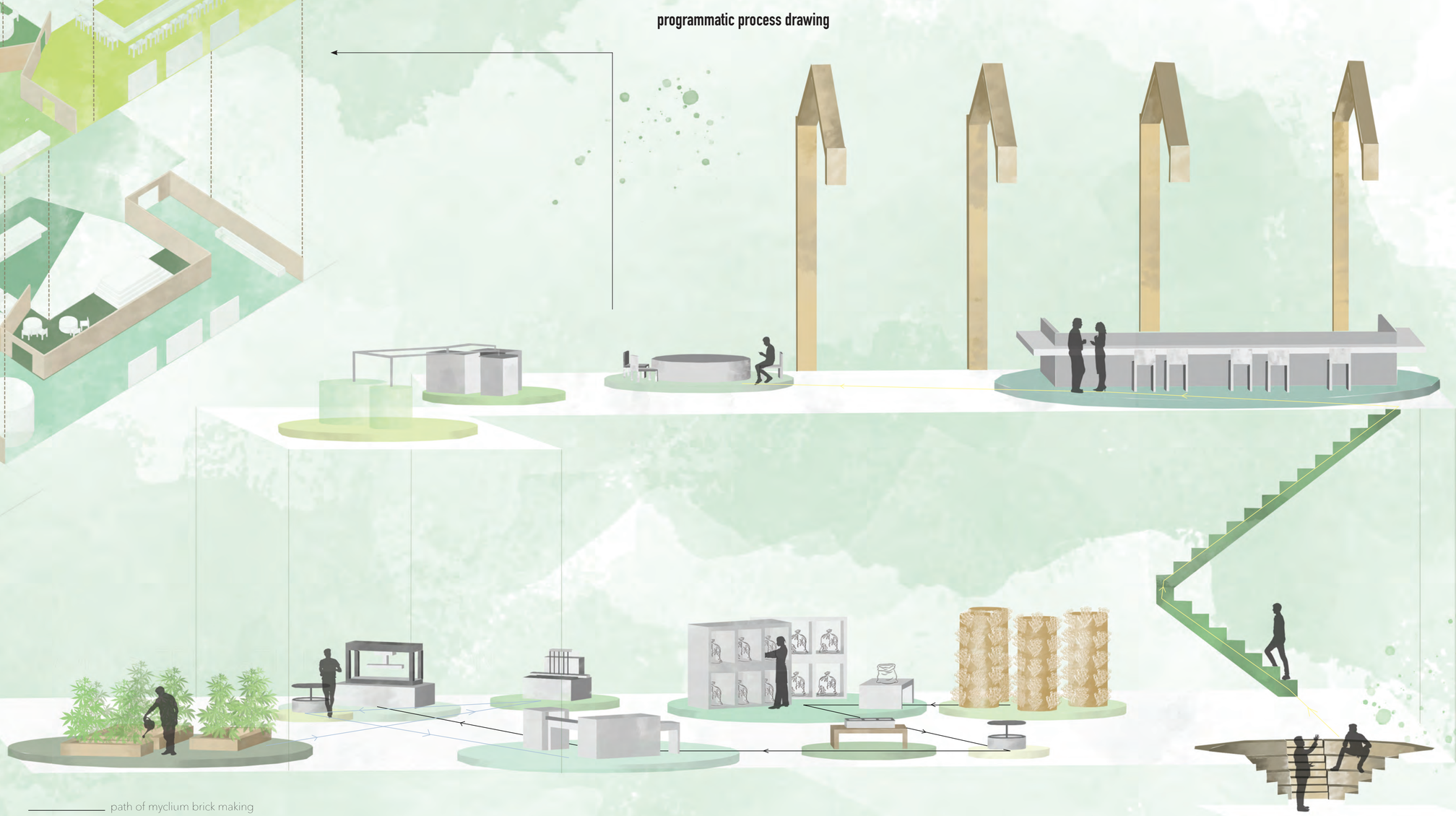
spatial strategy



- hemp growing room
- workshop for brick making with drying tunnel & press machine
- clean room & lab for mycelium growth
- upcycle space and sorting room
- public exhibition with algae infused louvres
- lecture and teaching space
- exhibition space and indoor seating
- cafe/bar
- roof cafe and garden within outdoor seating

This diagram (below) speculates the potential spatial layout of the site, exploring programmatic circulation and requirements. The processes involved in making each bio-based material have been carefully analysed and placed within the context of the site in the spatial strategy diagram (left).

programmatic process drawing



- path of myclium brick making
- path of hempcrete making
- path of public

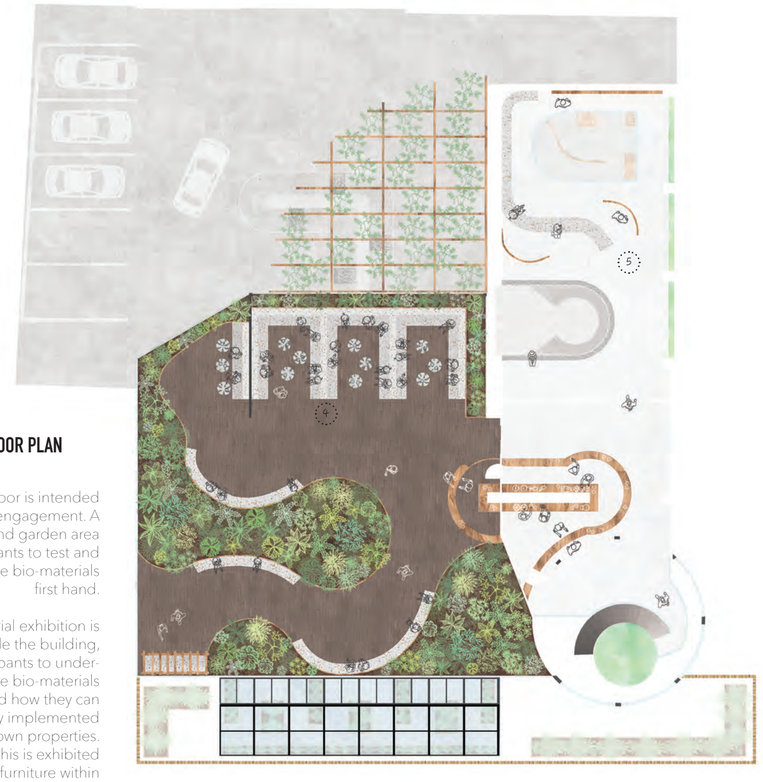
GROUND FLOOR PLAN

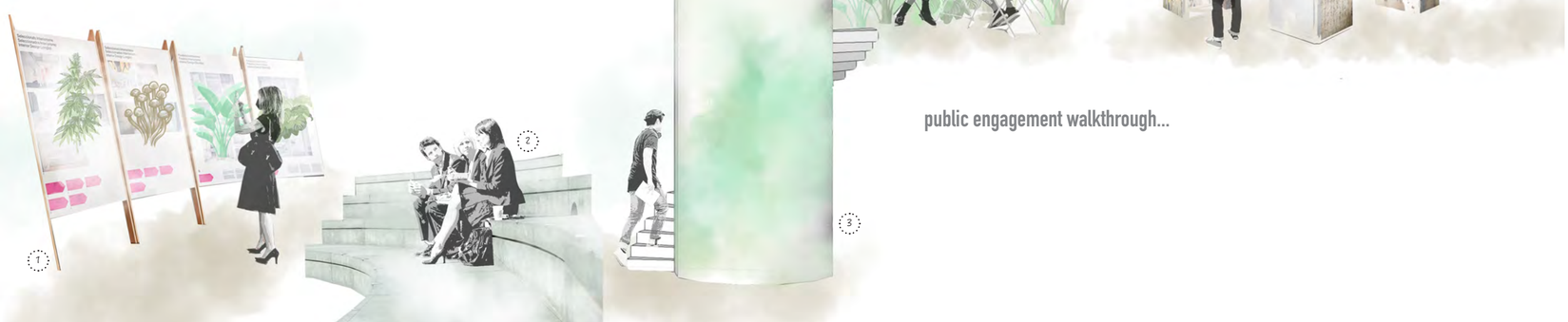
Highlihgting key activities within the space, relating to each programatic process.

FIRST FLOOR PLAN

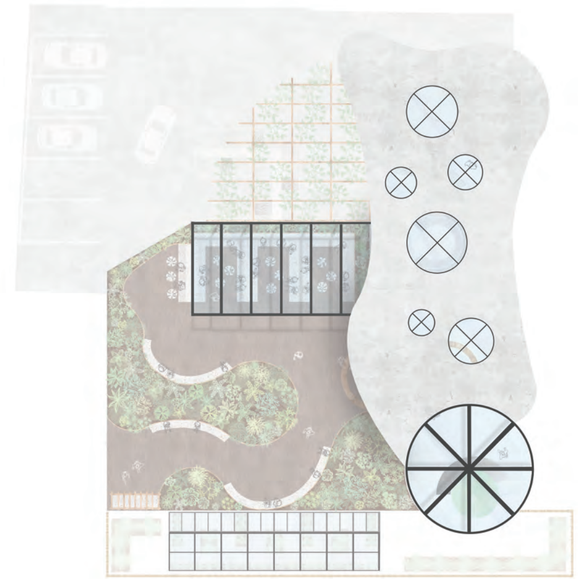
The first floor is intended for public engagement. A rooftop cafe and garden area allows occupants to test and experience the bio-materials first hand.

A bio-material exhibition is situated inside the building, allowing occupants to understand how the bio-materials are made and how they can be practically implemented into their own properties. Furthermore, this is exhibited by the realised furniture within this space that is made from the bio-based materials made on site.

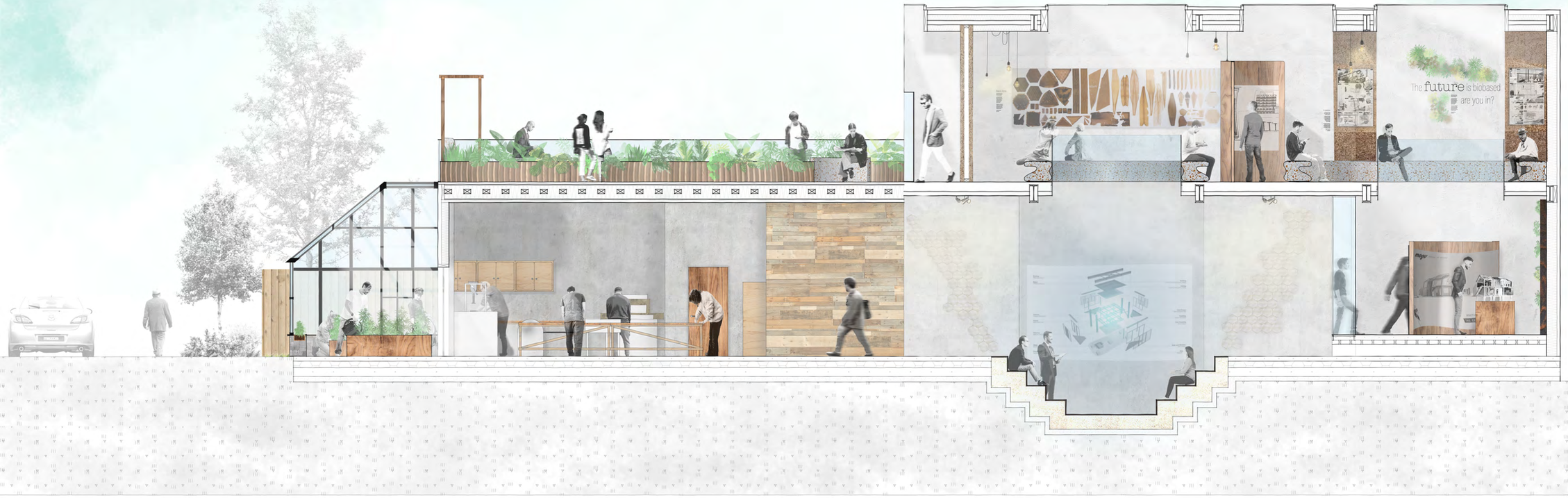




public engagement walkthrough...



ROOF PLAN



industry is glooming...

polluting industry

other buildings

site

Newhaven is a heavily industrial town, with a significant focus on the construction sector. Environmentally harmful materials like concrete and cement are the most commonly building materials. Newhaven's current reliance on these materials is unsustainable for the future development of the town. As material demand only increases, finding ecologically-friendly alternatives is a priority.

Studio organic aims to help Newhaven transition away from polluting and destructive construction practice, and towards more sustainable practices. This will be done by educating the town's residents and developers in alternative, less-harmful construction methods. If performed well, Circular (or closed-loop) methods could massively decrease Newhaven's carbon footprint, especially if they explore the potential behind biodegradable and bio-based materials.

HEMPCRETE

Used for insulation and wall finishings.

UPCYCLED WOOD

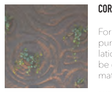
Taken from public upcycle and used through out the site for furntuire & finishings.

UPCYCLED BOARD

Taken from public upcycle and used through out the sute for storage & plant pots.

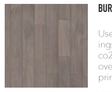
SEAWOOD

Used for wall finishings and exhibition boards.



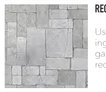
CORK WALL

For decorative purposes & insulation. Plants can be grown through material.



BURNT WOOD

Used for floor finishings. Also captures co2, reducing the over all carbon footprint of the building.

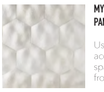


RECYCLED CONCRETE

Used for floor finishings and as aggregate. Recycled from recent demolitions.

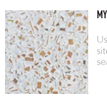
EXISITING CONCRETE

Leftover from existing structure. Left exposed in parts for decorative purposes.



MYCELIUM ACOUSTIC PANELS

Used to improve the acoustic range of a space. Made on site from leftover bricks.



MYCELIUM BRICKS

Used through out the site to make bench seating and tables.

bio-based materials found on site...