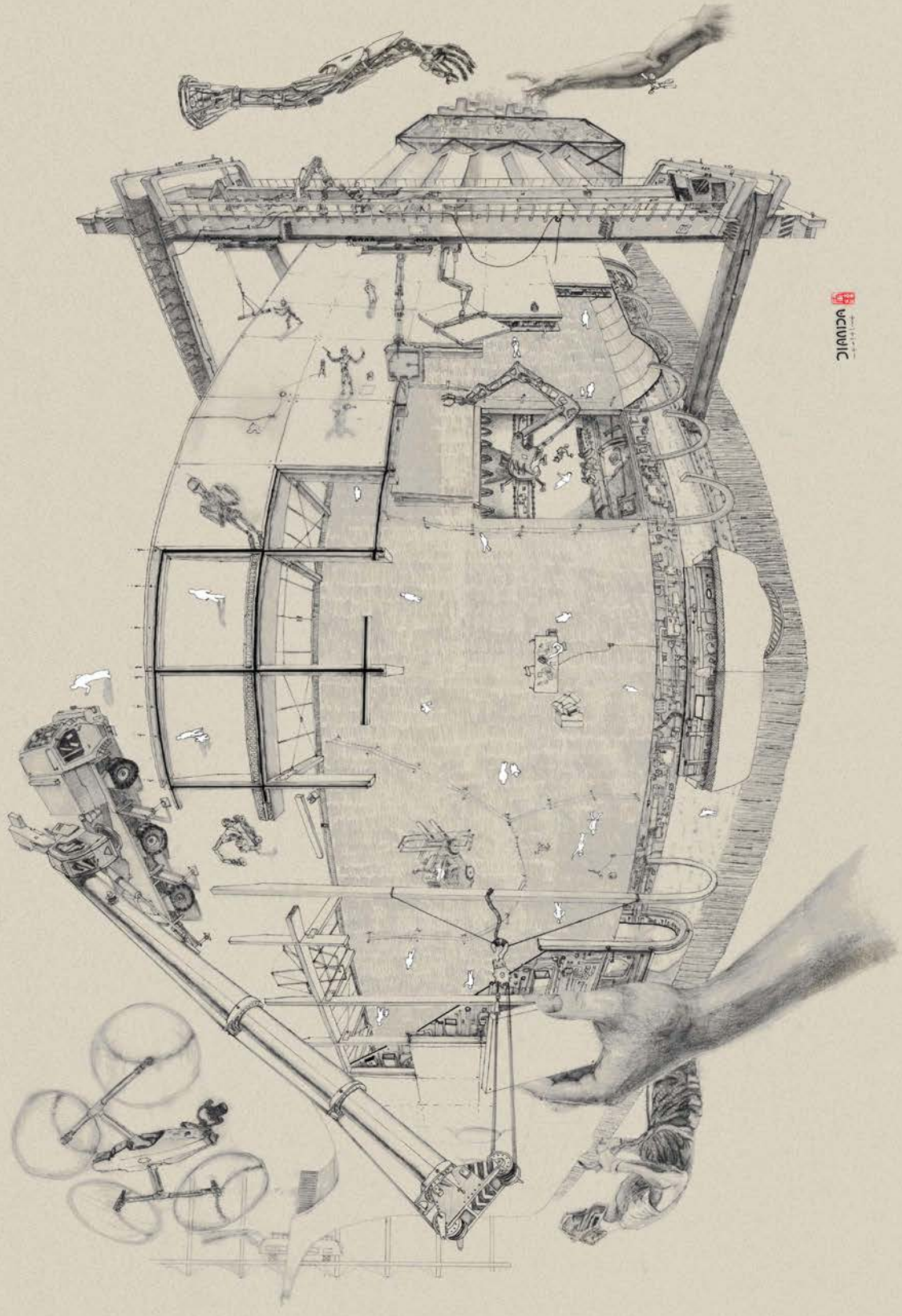


DA LAN

MANCHESTER SCHOOL OF ARCHITECTURE
UNDERGRADUATE PORTFOLIO
FEATURING PROJECTS SINCE 2022

CONTENT

SYMBIOTIC FUTURE

ART INSTALLATION

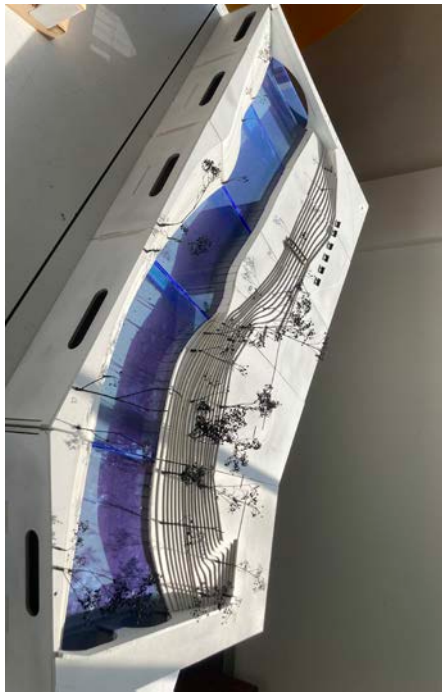
BARKITECTURE

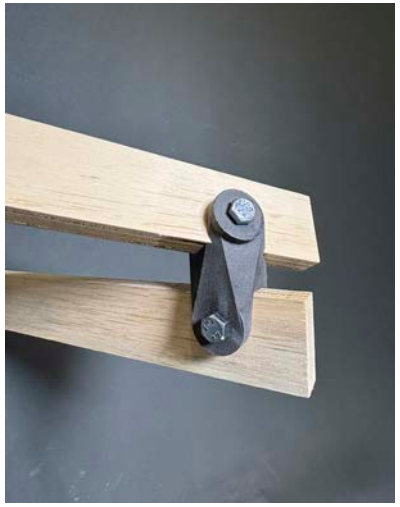
FURNITURE DESIGN

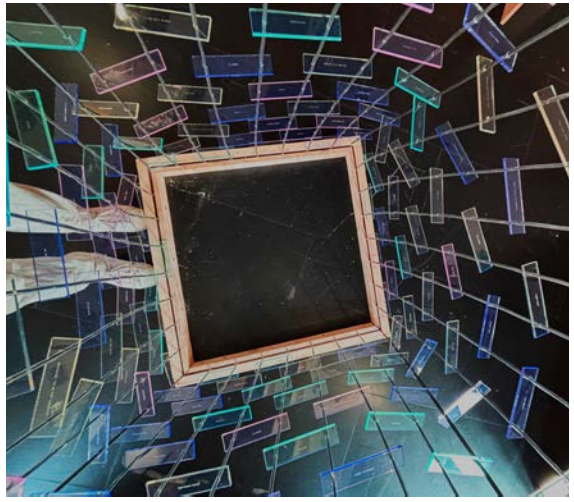
PRODUCT DESIGN

GROUP WORK

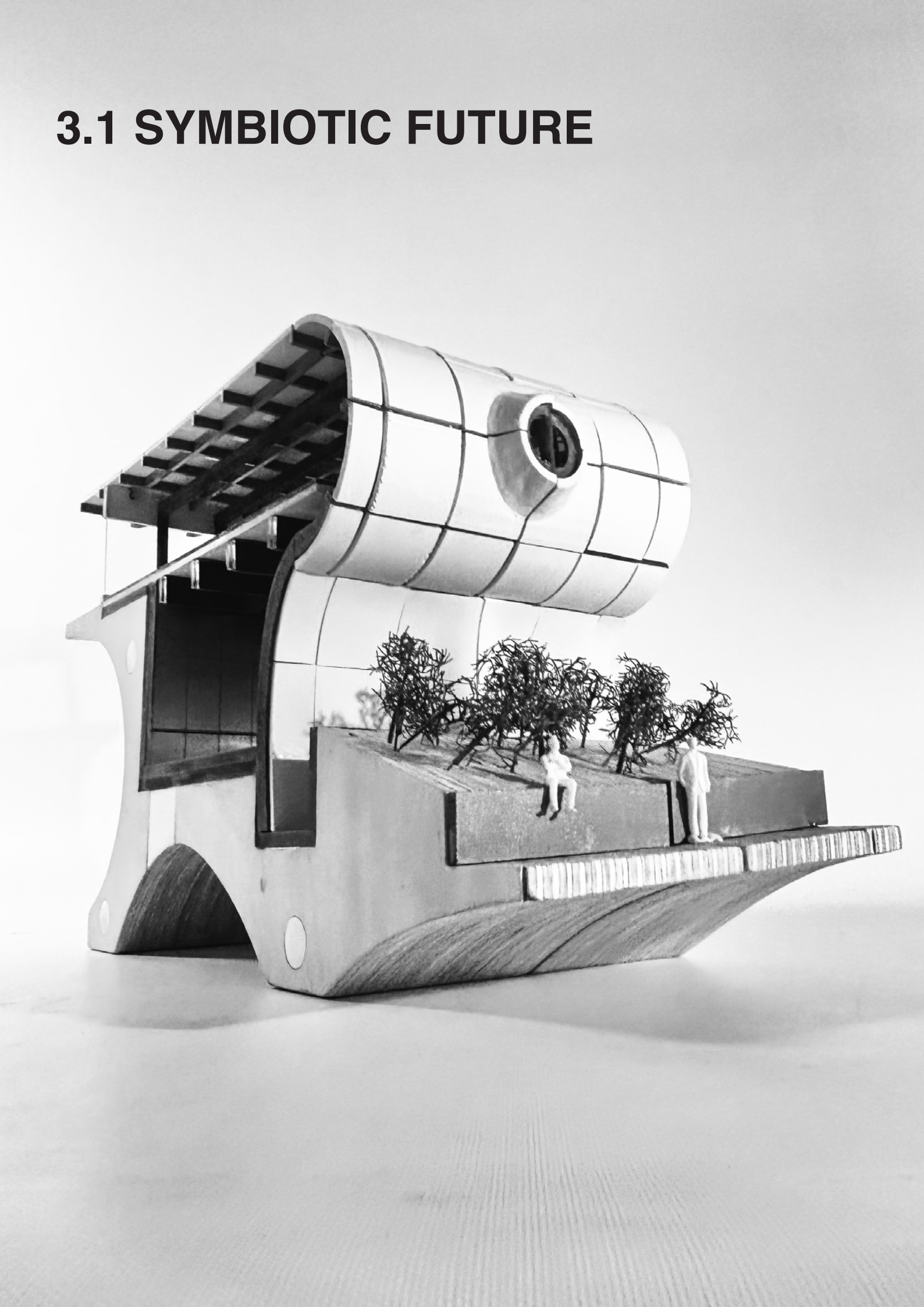
REAL LIFE PROJECT



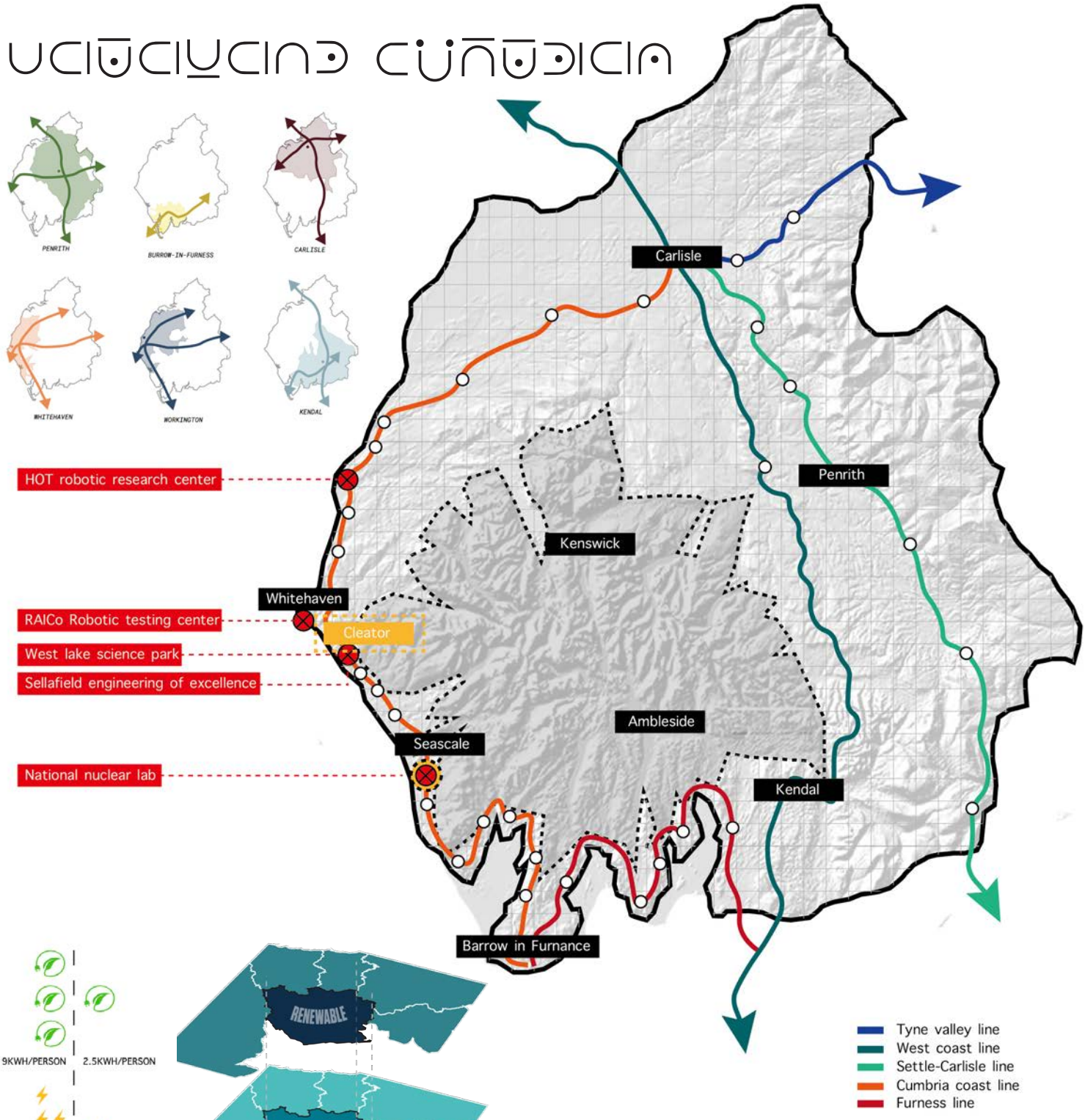


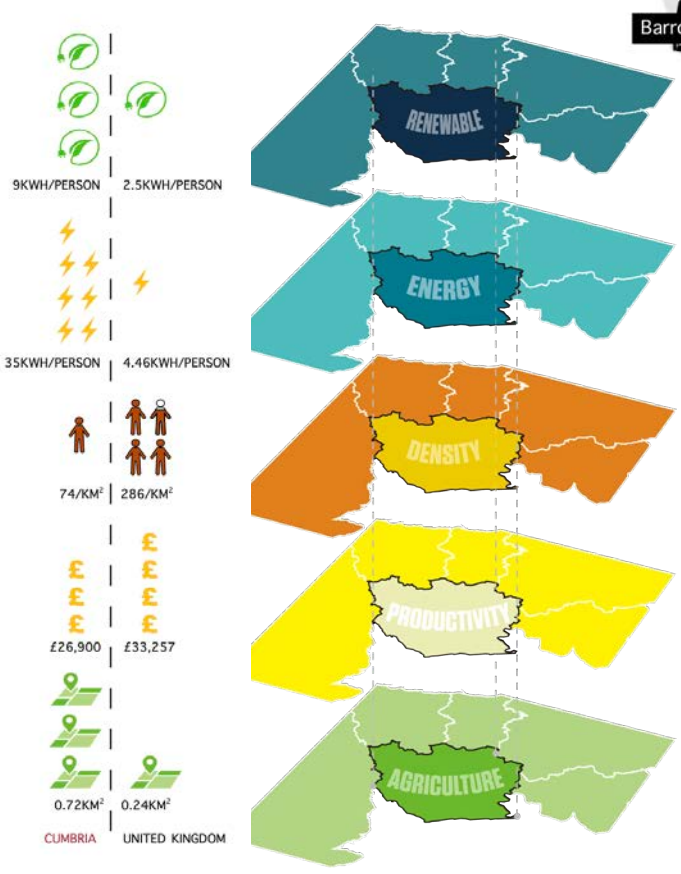


3.1 SYMBIOTIC FUTURE



Revitalising Cumbria

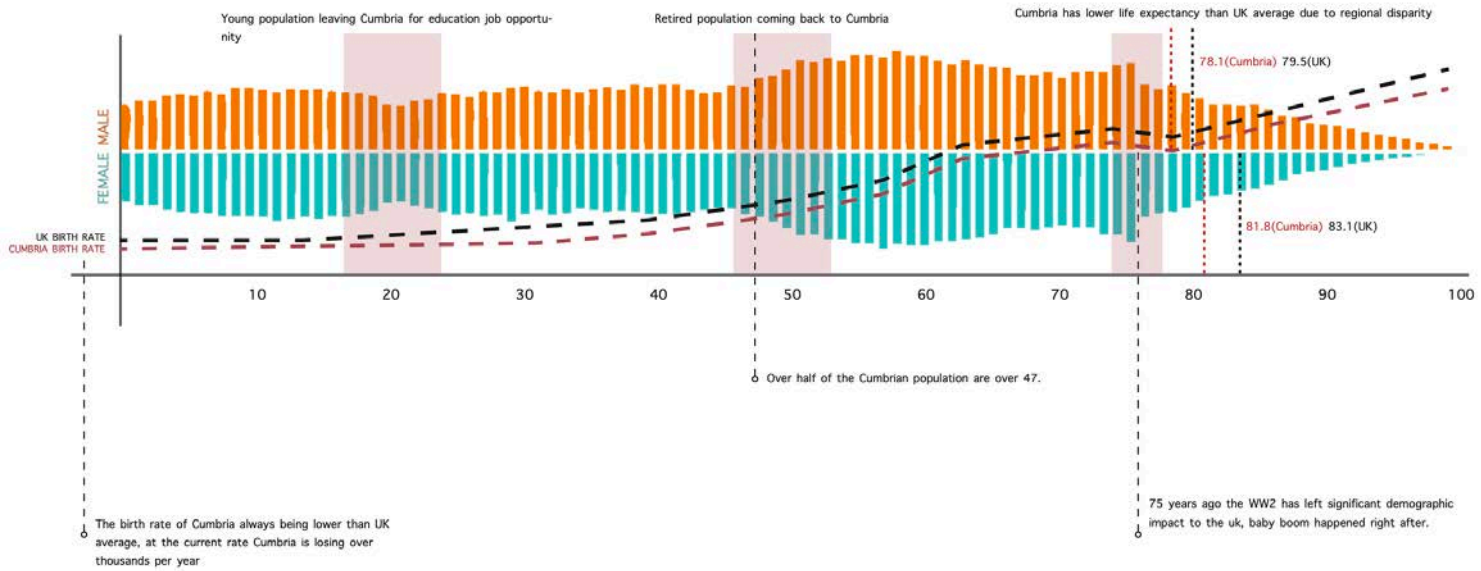


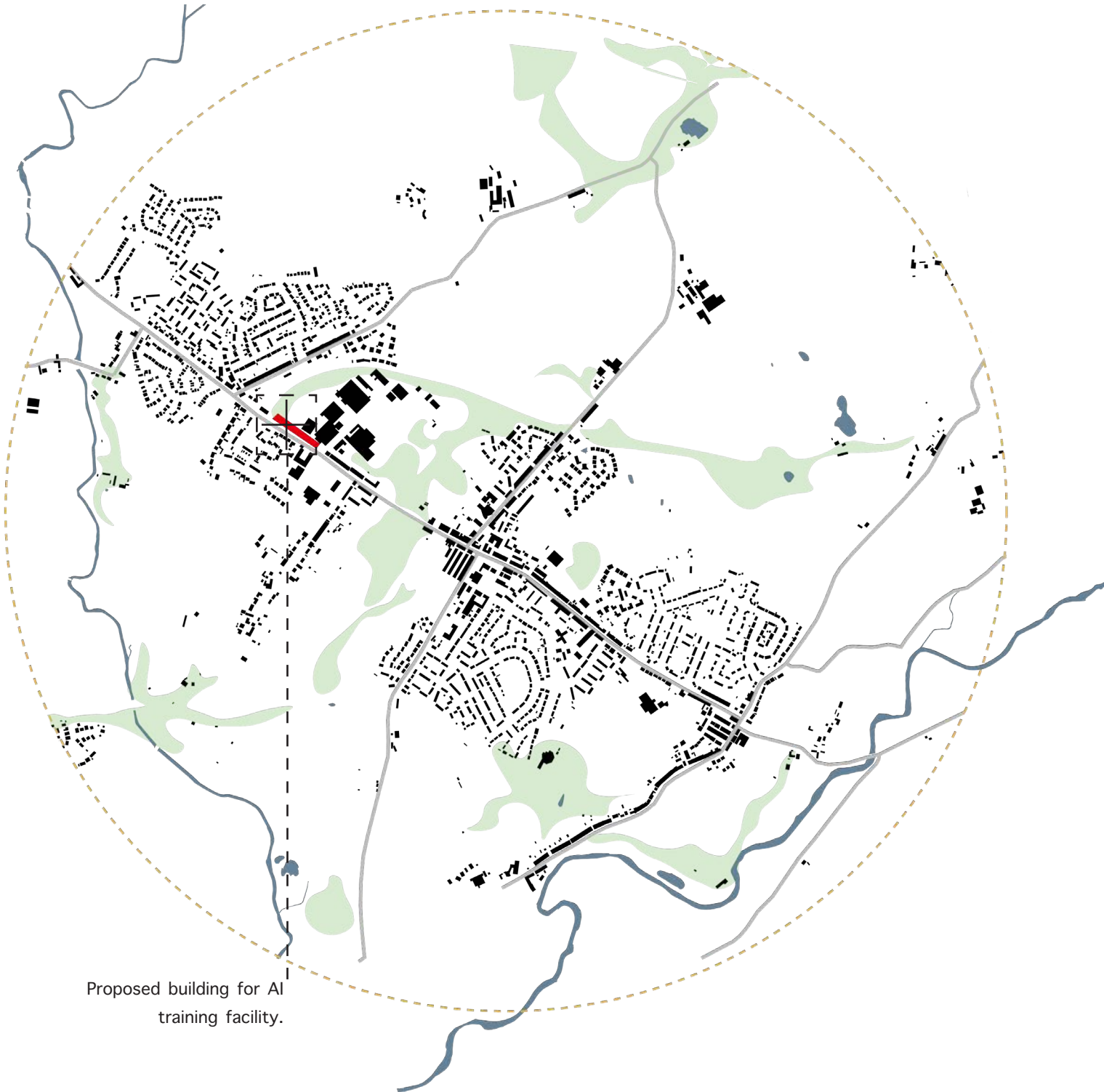


In my third year my school project I have created a high tech AI training center that is going to transport the resource rich Cumbria into a prosperous region.

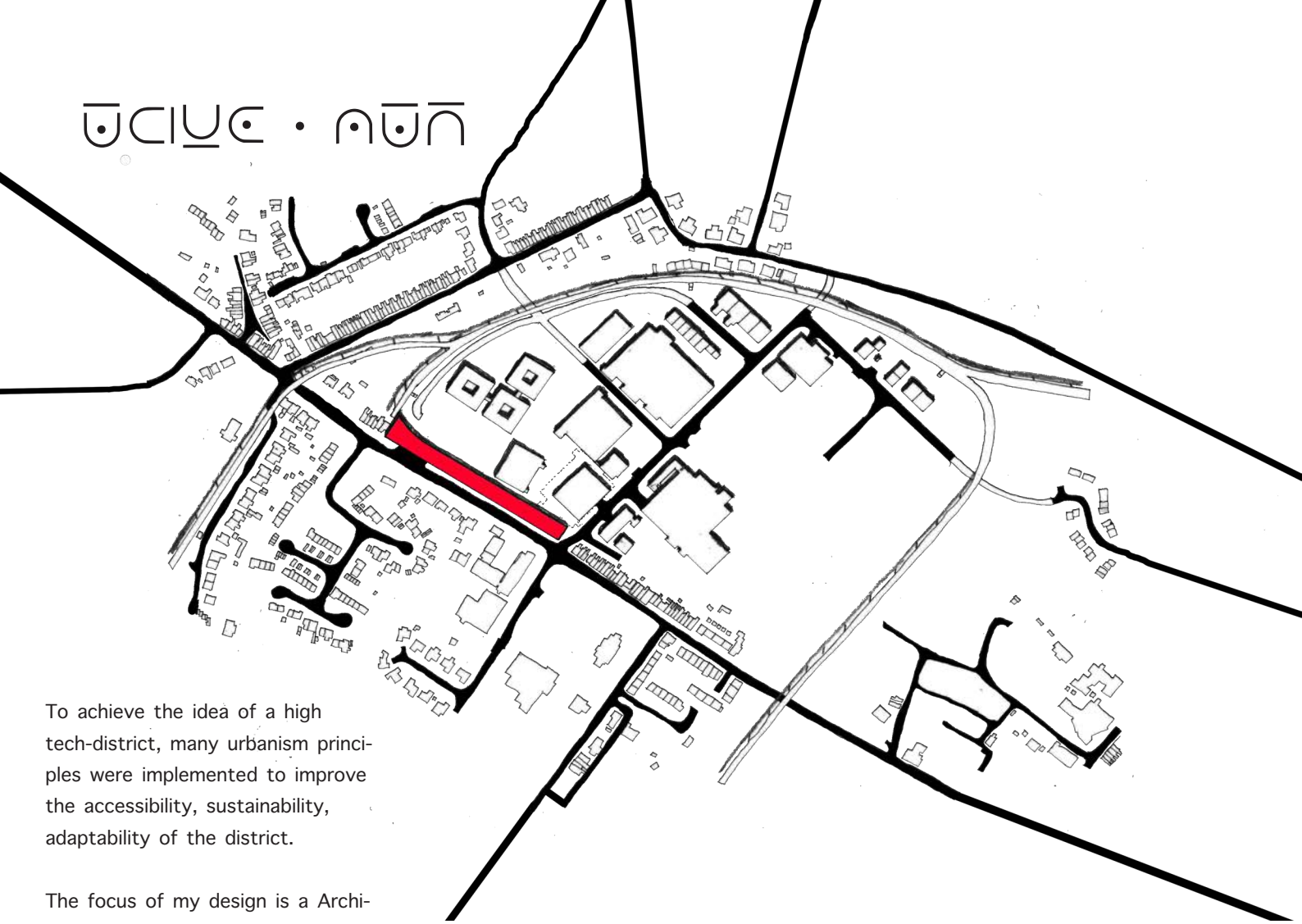
Cumbria is a resource rich, vast but it lacks labour forces, it has existing Sellafield high tech industry which can be turned into more diversified high tech industry.

The idea behind my project was to create a zone that fosters the growth of AI and robotics, increasing the productivity of the region by implementing future robotics labour.





Proposed building for AI training facility.



To achieve the idea of a high tech-district, many urbanism principles were implemented to improve the accessibility, sustainability, adaptability of the district.

The focus of my design is a Architecture AI training center, where AI learns design, Construction and building Operation.

MINIMUM IMPACT

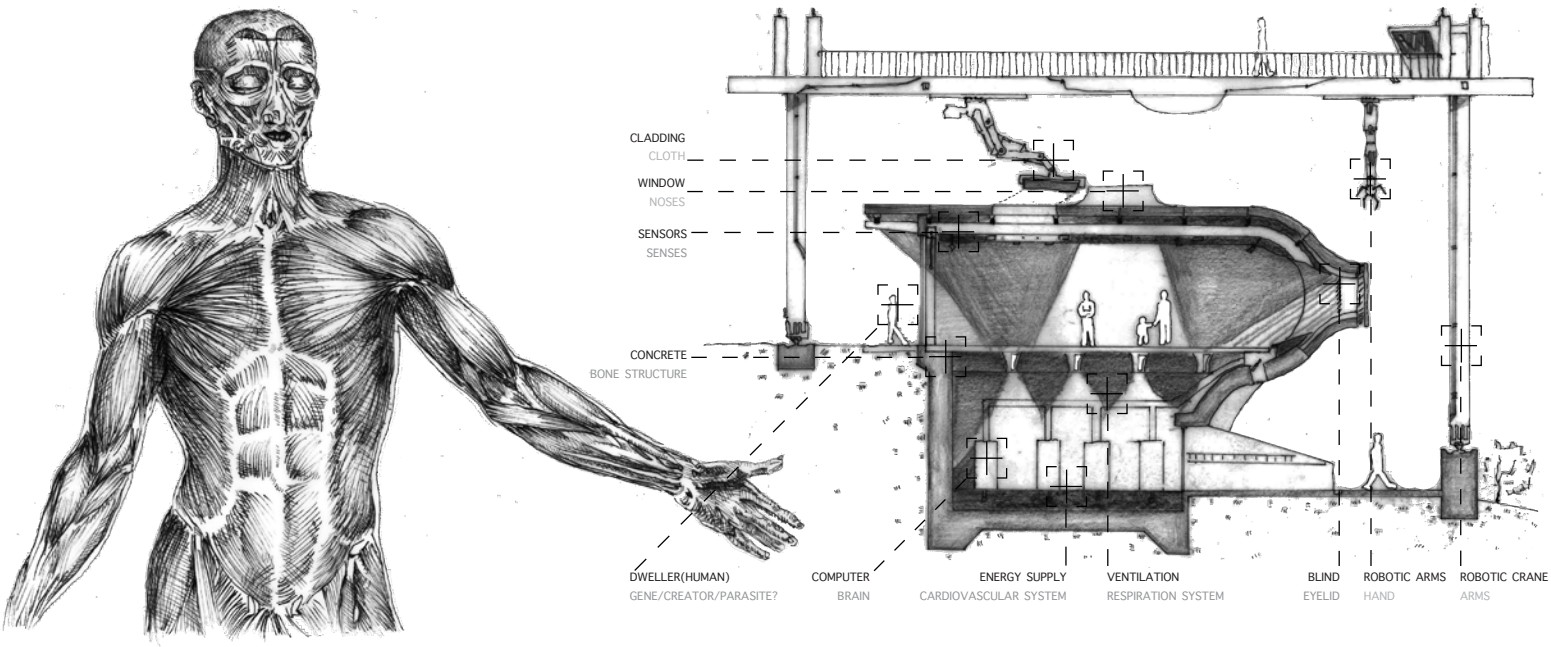
ACCESSIBILITY

INCLUSIVITY

ADAPTIVE REUSE

PRESERVATION

CAR USE

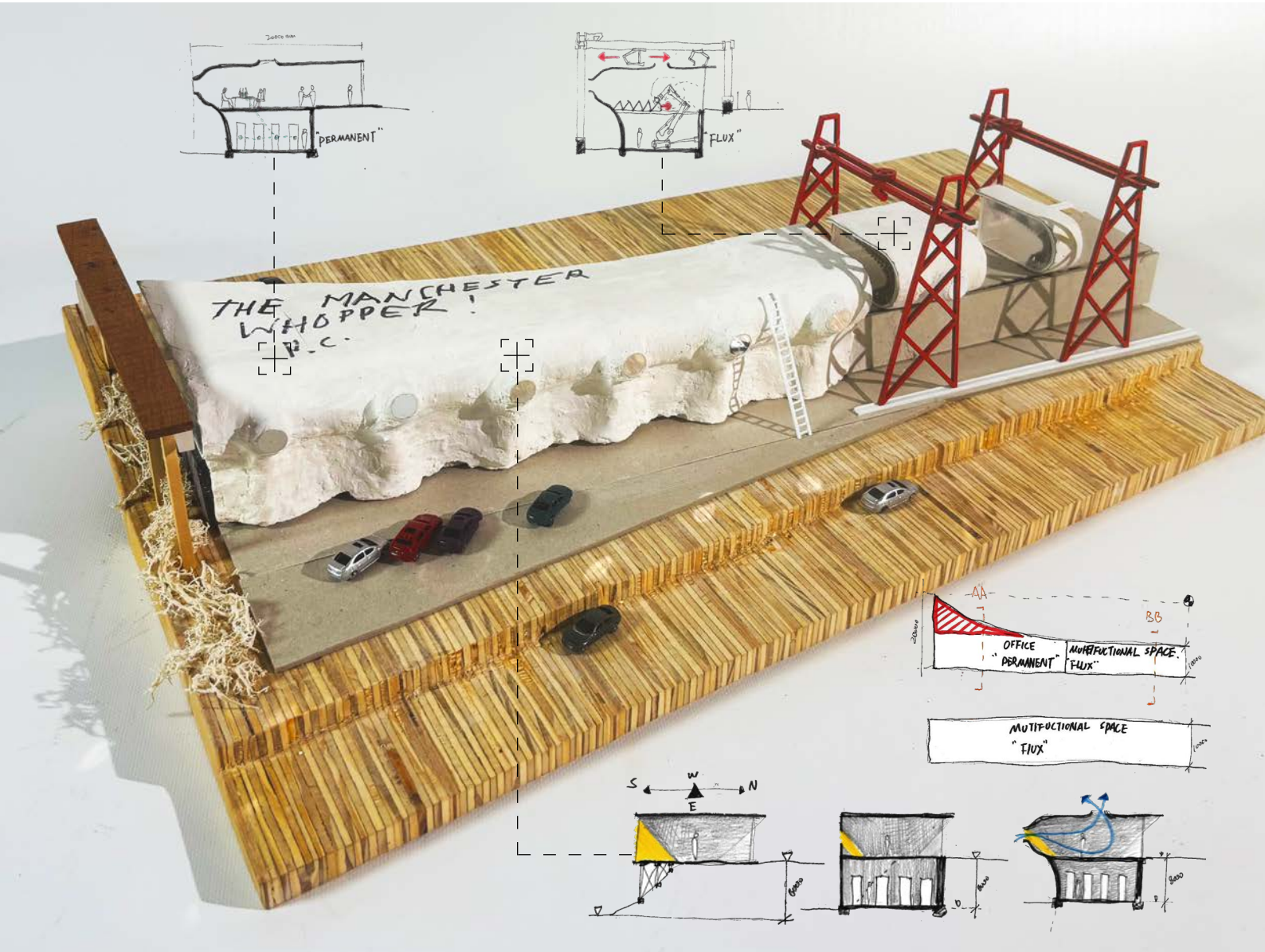


This types of Architecture are referred as Sentient architecture, which should be able to sense the environment, making responses to the change of environment, self adapt to the environment, upgrade it self to fit into the environment, similar to a human.

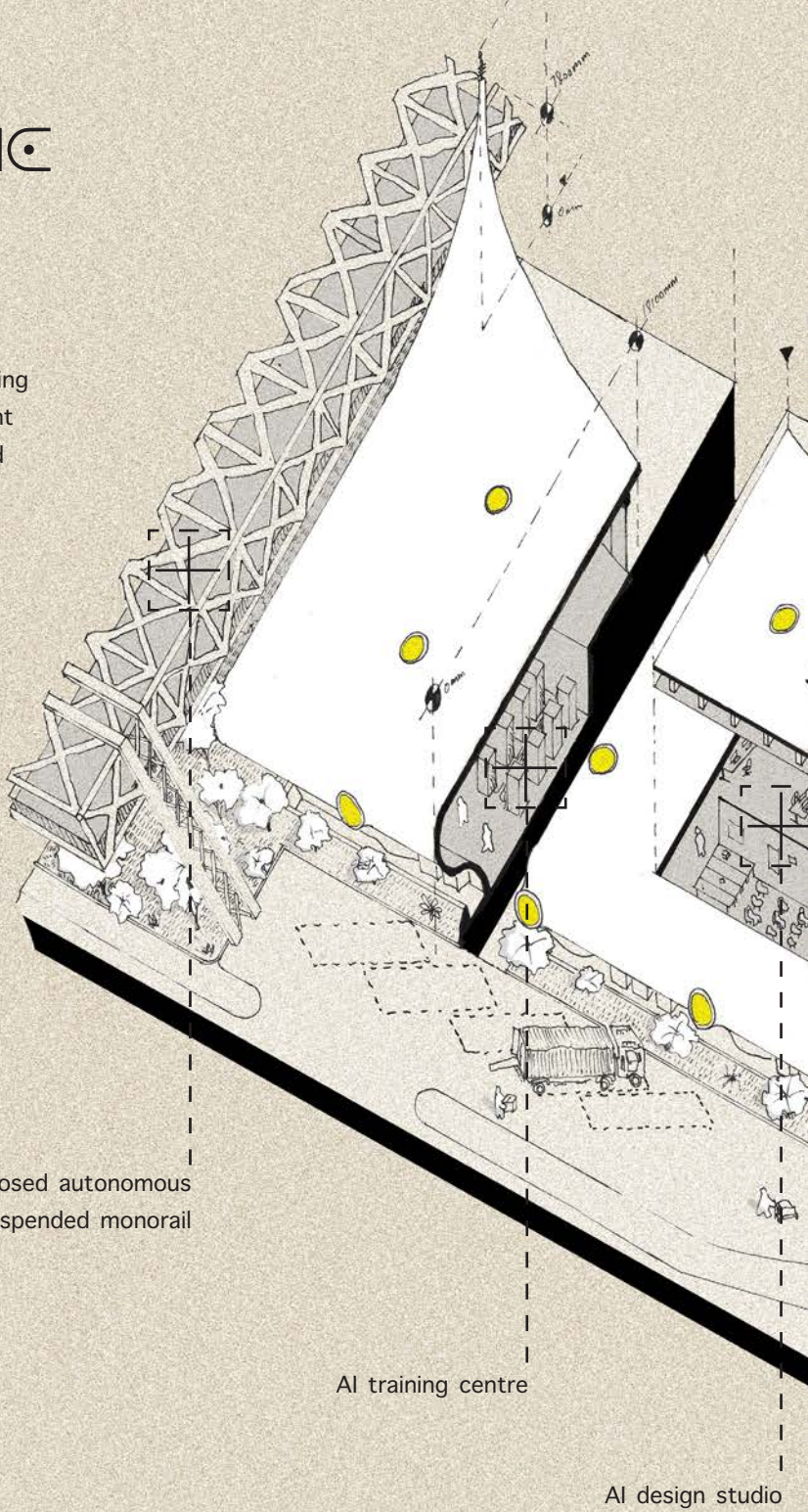
HUMAN = MIND + BIOMECHANICAL BODY

SENTIENT ARCHITECTURE = AI SYSTEM + MECHANICAL SYSTEM

HUMAN ::: SENTIENT ARCHITECTURE

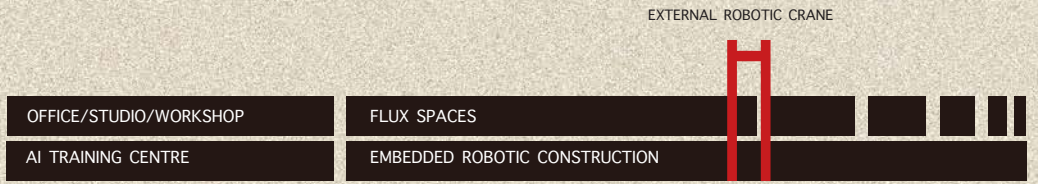


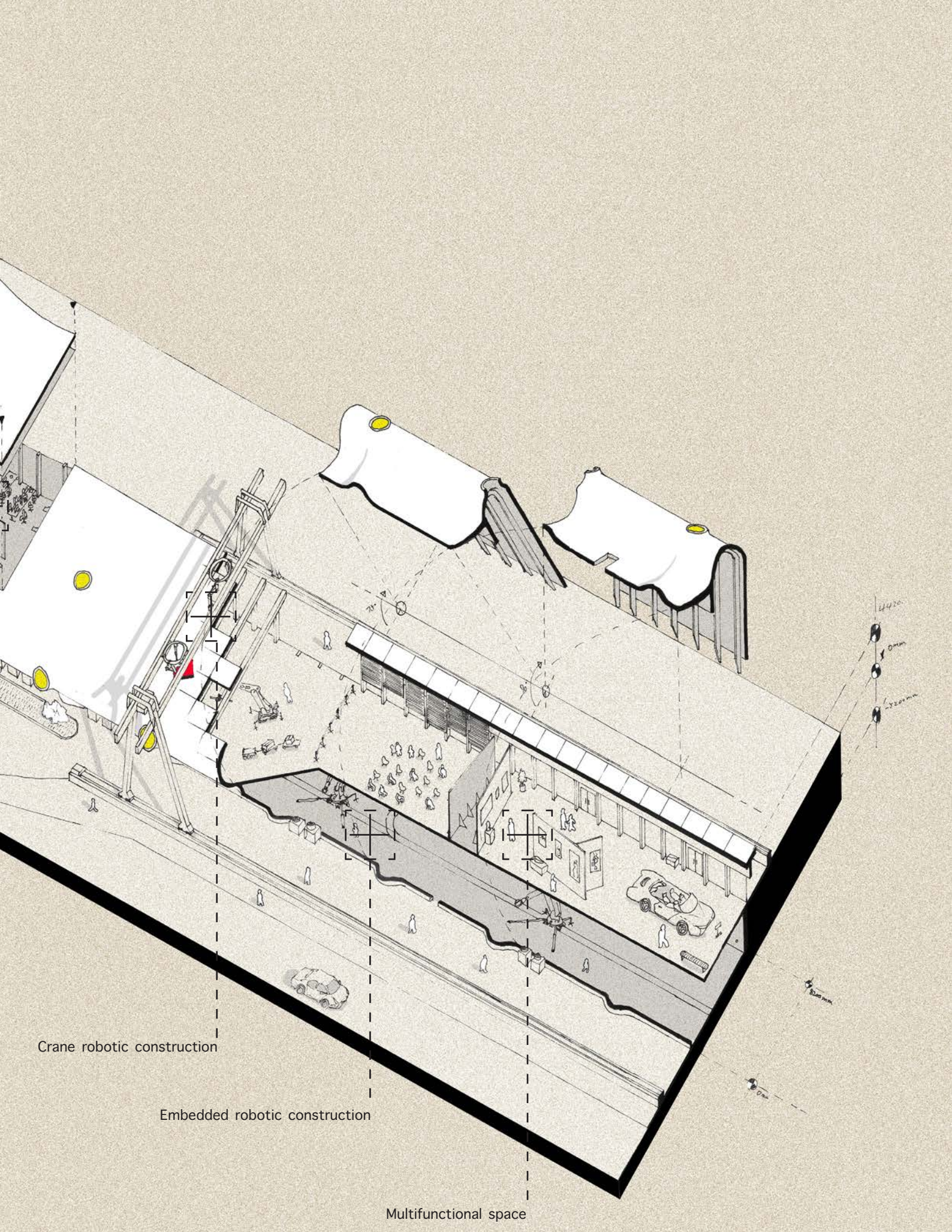
As sentient architecture are very flexible in term of on-going programs inside the building, the building adapt to different human needs, the robotics and AI facilitate the design and construction of the spaces.



FLUX SPACE

- ART GALLERY
- EXHIBITION
- CONFERENCE
- HIGH-TECH EXPO
- EDUCATION CENTRE
- COMMUNITY CENTRE

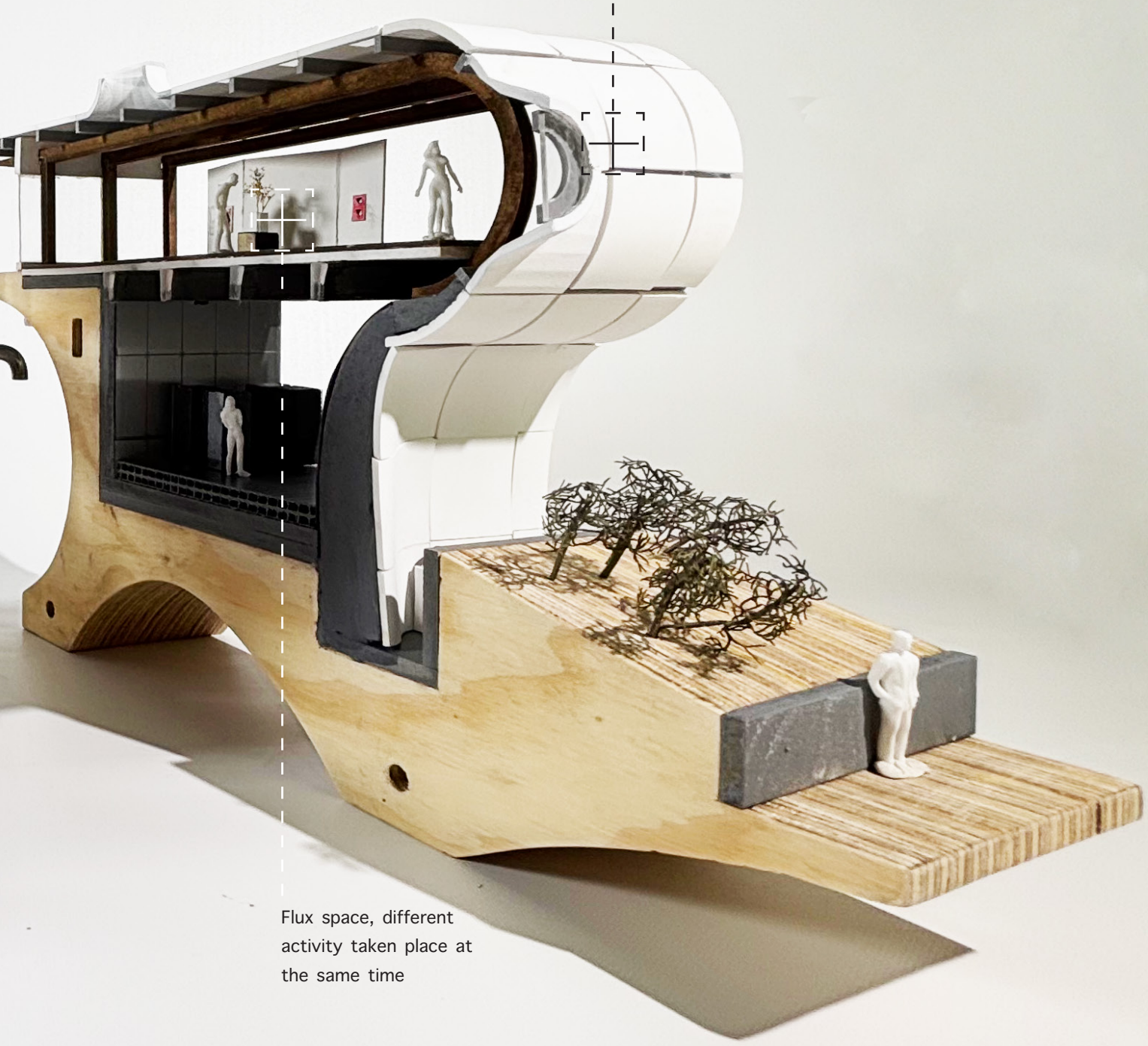



Crane robotic construction
Embedded robotic construction
Multifunctional space

Parasitic Space

The learning space of AI is parallel to the human inhabitant,
as AI facilitate more changes of the function of the space,
AI becomes better in architecture design and construction,
as a result the work made by AI gets better,

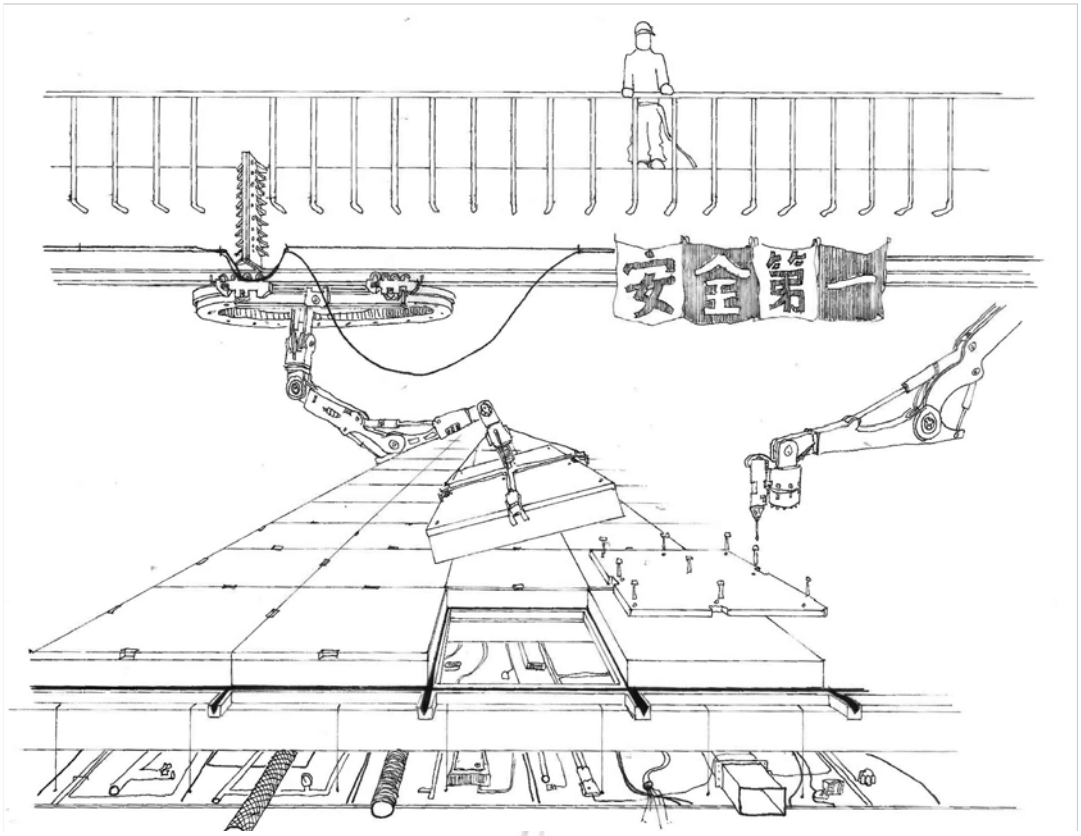
Ceramic cladding proposal, creating this clean and futuristic finish

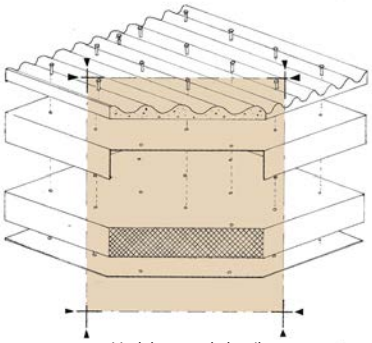


Flux space, different activity taken place at the same time

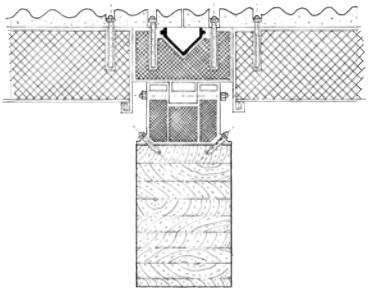
Construction

Working in high places needs to comply with heavy regulations, so instead of human doing dangerous things, let the robotic do it instead.

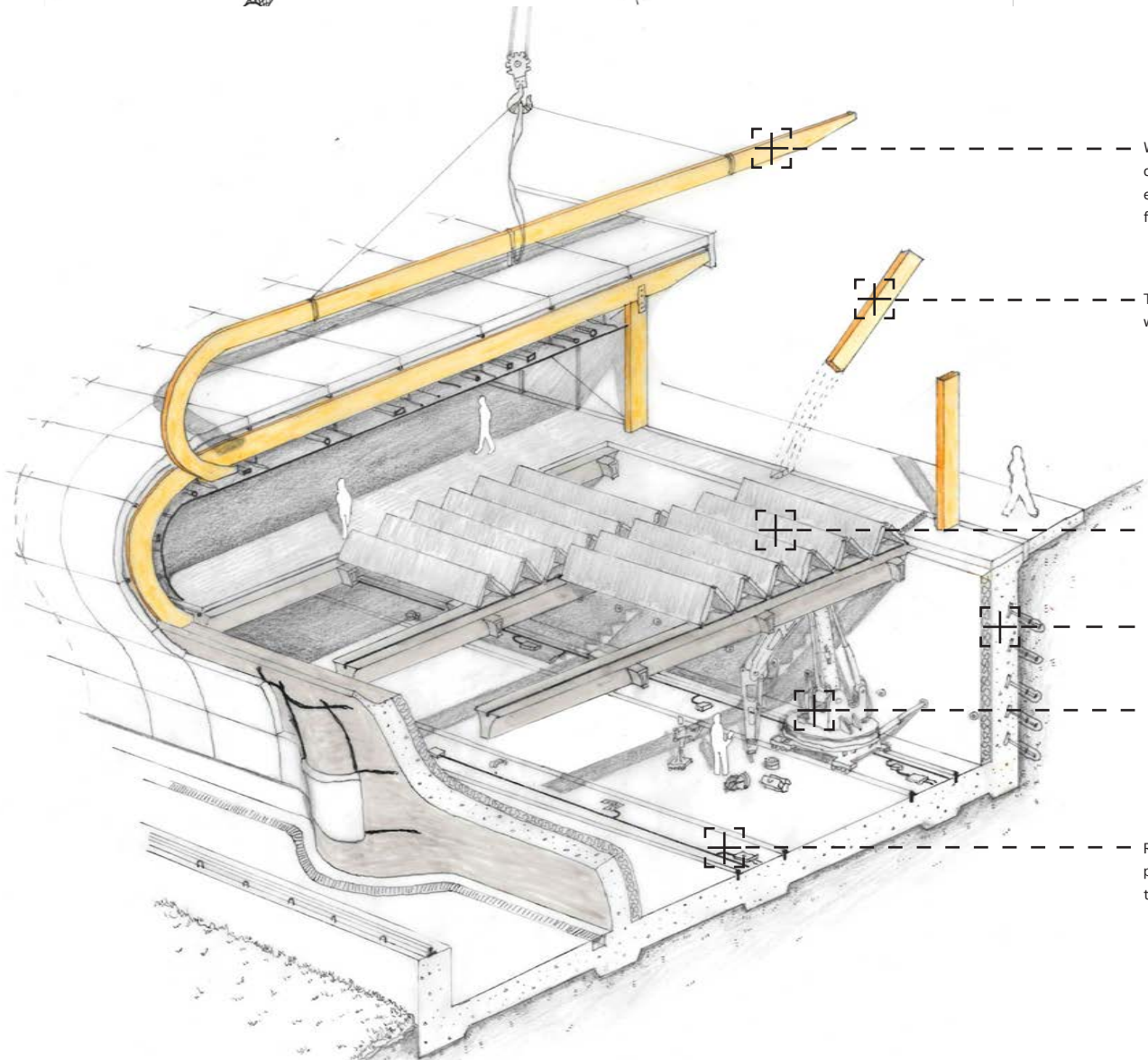




Modular panel detail



Structure-cladding detail



With the help of robotic crane construction Glulam beam can be easily installed onto the concrete foundation.

Timber columns can be installed with the embedded robotic arm.

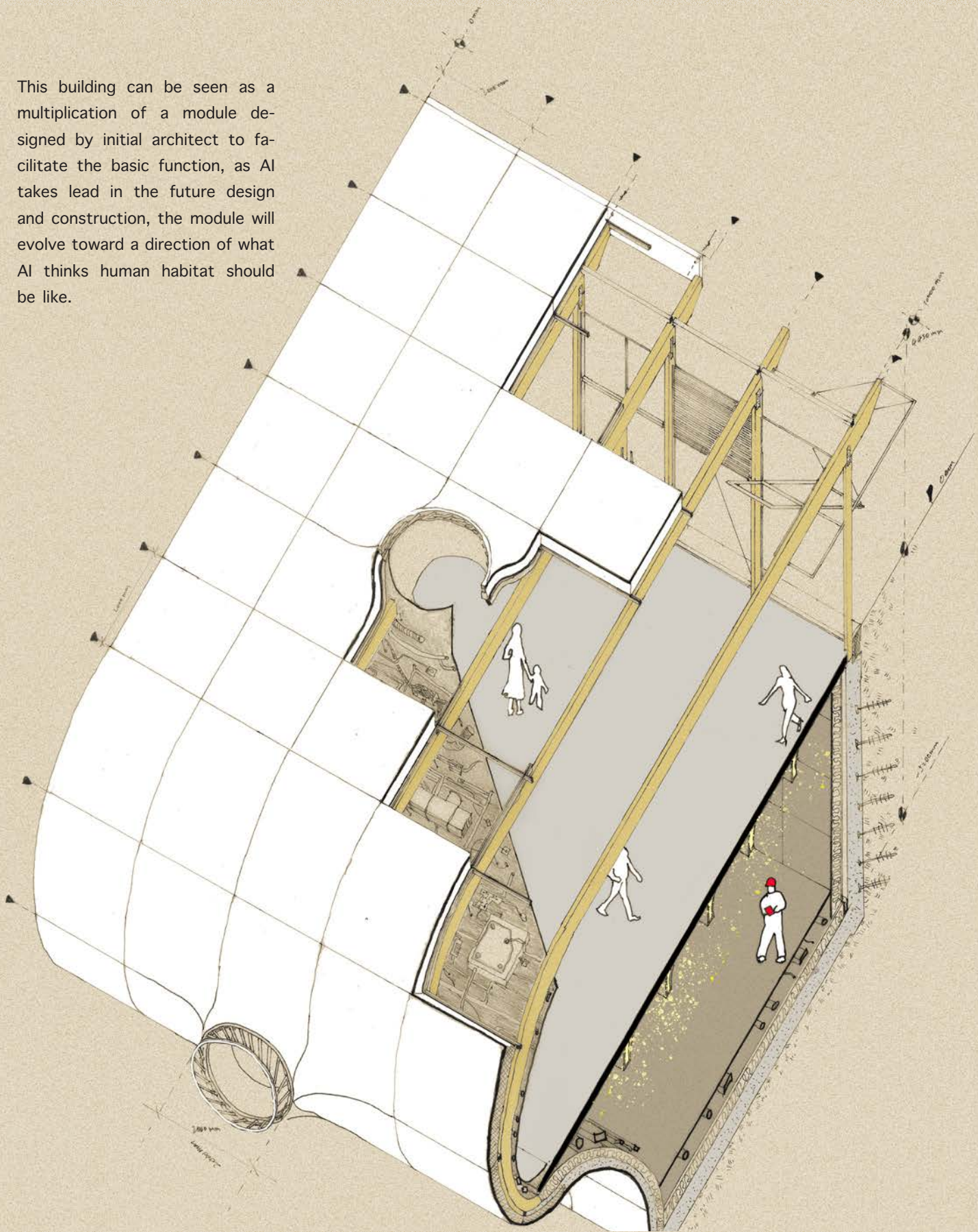
The floor slab are designed to be fordable to leave spaces for operation of Embedded robotic arms.

Soil nail anchored into the soil to strengthen the earth.

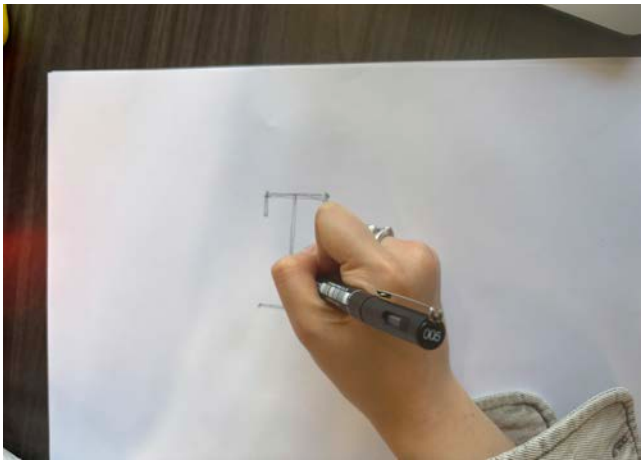
Embodied robotic arm is the key mechanism that allows the change of internal spaces, it enables heavy changes in short amount of time.

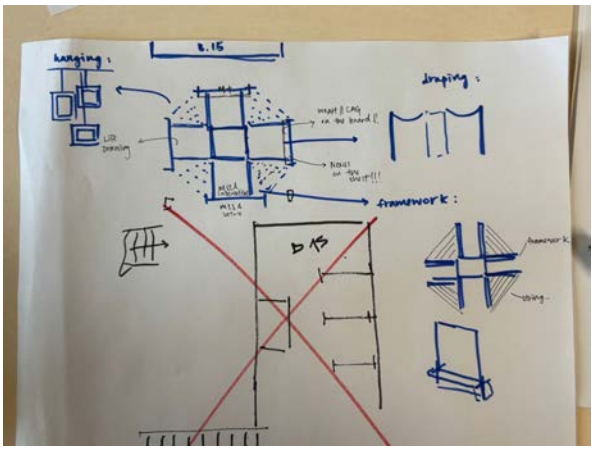
Robotic railing system that permit robotic arm moving along the basement.

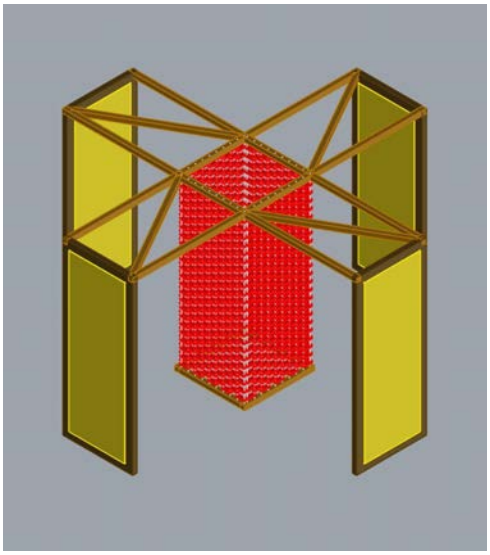
This building can be seen as a multiplication of a module designed by initial architect to facilitate the basic function, as AI takes lead in the future design and construction, the module will evolve toward a direction of what AI thinks human habitat should be like.

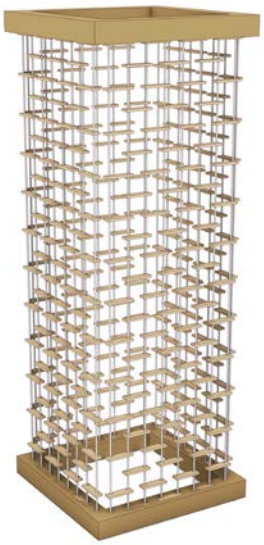


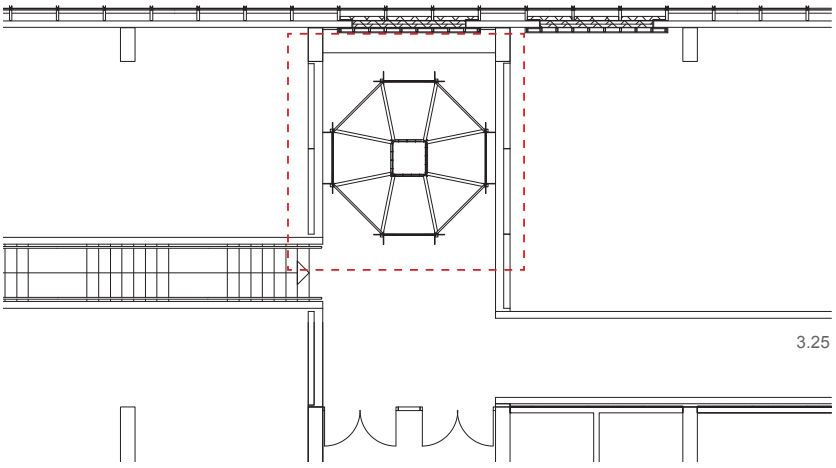
DEGREE SHOW INSTALLATION



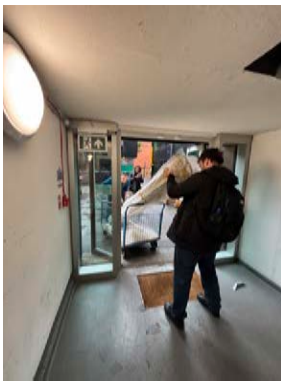


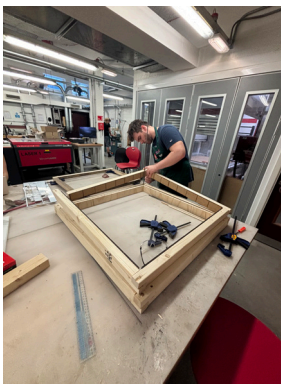
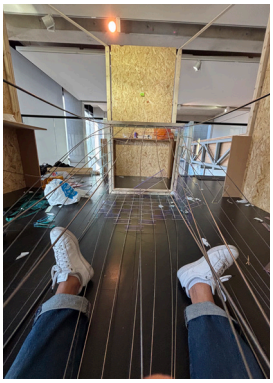






As a graduate, I wanted to create something ceremonial to all graduates this year, As a student I have proposed an pavilion in our MSA degree show, I gathered a team of 8 people, gained the support from school, designed and constructed this pavilion, timber and steel structure with 324 graduate's name engraved on the acrylic plates, will be given out to all the graduates during the graduation ceremony.




This project spanned 4 weeks of time, more than 10 design iterations has been made to comply building safety, accessibility, budget, fire regulation, constructibility etc.

Everyone of us has learn so much in this project, making us realizing how many processes there are for an idea to materialize in real world situation.

The pavilion situate at Benzie building 3rd floor Manchester, please come and have a look.

BARKITECTURE

CANOPAW

‘A COCOON OF COMFORT, SHAPED BY NATURE ,TO NURTURE’

DA LAN
JAMES R.B COOP

CONCEPT

Ever noticed how a dog’s **paw interacts with the ground—soft yet strong, cushioned yet connected?** Our kennel design brings this idea to life!

Built with wooden ribs for a sturdy shell and stitched **padded sections** for comfort, it **cocoons** your dog in a space that feels both **protective and natural**. The padded leather base mimics the **sensation of a paw pressing against a leaf,** resting on the earth—creating a **seamless bond between dog, nature, and home.**

Taking inspiration from **leaf skeletonization,** the structure allows **light and air to weave through,** blending the lines **between shelter and the outdoors**. It’s a perfect **balance of nature vs. nurture**—where your dog can **feel secure while staying connected** to the world around them.

STUDENT SUBMISSION FOR THE GOODWOOF BARKITECTURE COMPETITION 2025 ‘FROM NATURE ; FOR NATURE’

MANCHESTER SCHOOL OF ARCHITECTURE

1 INTERACTION

When dogs walk **paws are a key way that they experience nature** - the ground and surface below their paws. We were especially interested in how the **cushioned dog paw on leaves resting above the ground** is just like a **dog bed on a floor**. We wanted to become the unusually interesting way with **materiality and textures** to create a **really fun and dynamic space.**

2 LEAF SKELETONS

The falling leaves of trees **embody nature’s enduring cycle** —each year they **descend, nourishing the earth to foster new growth** Inspired by this profound yet simple rhythm of renewal, our design seeks to **recreate this serene scene,** enhancing **both dogs and their owners** that no matter what life brings, **nature’s timeless cycle continues.**

Image source:https://kentuckypestnewswordpress.com/

3 NATURE VS NUTURE

The landscape pattern and the **tructure’s orientation define fluid boundaries between public and private spaces** , creating both **shared moments** and **secluded retreats for dogs to rest undisturbed.** This design fosters **mutual respect in human-canine interaction,** restoring the **delicate balance inherent in nature itself.**

CONSTRUCTIBILITY

DIGITAL

STRUCTURE :

- A Plywood ribs [Primary structure]
- B Leather base padding
- C Panel padding + stitching
- D Twine netting

A PLYWOOD RIBS

Structural + hand sanded to give soft rounded ensuring aesthetics & canine safety

C WOVEN FABRIC

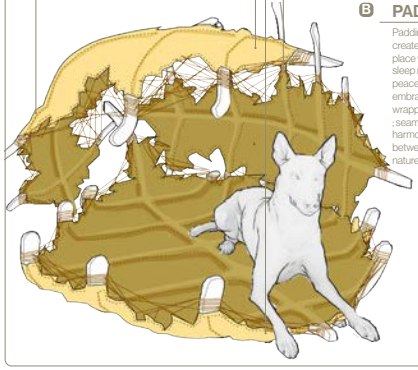
Padded + soft quilt to ensure a soft relaxing area. Muted colours to ensure a seamless transition between nature and the home with a possible small touch of natural elegance.

D THREADED TWINE

Helps to keep the structure in tension increasing strength to balance aesthetics & stability

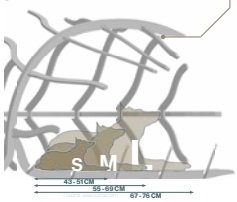
B PADDING

Padding is used to create a soft warm place where dogs can sleep nestled into their peaceful spot , embraced and wrapped within nature ;seamlessly harmonising dogs between nurture & nature

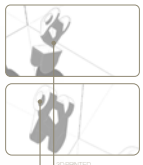


TECHNICAL

From the tiniest pooch to the greatest hound, ‘CANOPAW’ design is made for every dog to enjoy! Just like nature welcomes all paws, our barkitecture entry is a space where every tail can wag, every nose can sniff, and every tiny pup can feel right at home embraced by nature but under the gaze of their human friend...



JOINT CONFIGURATIONS



3D PRINTED FABRICATED CONNECTION WITH ADDITIONAL SPACING

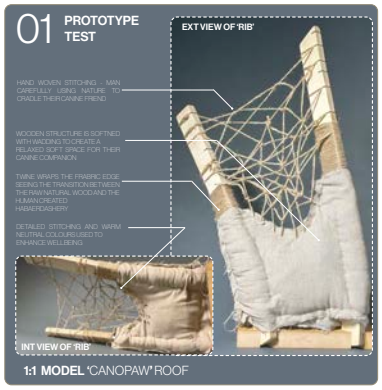
MIRFULL THREAD BOLT TO ENSURE STRUCTURAL STABILITY

1 : 5 FRAMEWORK TEST

ONCE WE SETTLED ON SIZE WE **TESTED THE SCALE** USING LAZERCUT PIECES TO IDENTIFY IF THE STRUCTURE COULD BE **SELF SUPPORTING** AND **IDENTIFIED KEY STRUCTURAL WEAK POINTS** THAT REQUIRED **REINFORCEMENT** FROM THE SPECIALISED JOINT CONFIGURATIONS ABOVE.

*PLEASE NOTE FOR THE PURPOSE OF EXPERIMENTATION THE FABRIC LAYER HAS BEEN REMOVED

01 PROTOTYPE TEST



1:1 MODEL ‘CANOPAW’ ROOF

02 PROTOTYPE TEST

1:1 MODEL ‘CANOPAW’ JOINT

COST ESTIMATION

	PRICE PER UNIT	CANOPAW COST
TIMBER FRAMEWORK	£90 / Sheet	£90
LEAF PADDING + FABRIC	£4.80 / Mtr : Linen union [138mm wide]	£76.42
	£2.50 / Mtr : 4 Oz Polyester Wadding [100cm Wide]	£52.32
TIMBER FRAMEWORK	£0.90 / 25 Mtr : Embroidery thread Series N.o 842 [Natural - 115 ‘5]	£15.30
	£3.60 / 150 Mtr : Medium Coarse Fine Twine [Natural colour]	£14.40
FRAMEWORK SUPPORTS	£6.10 / unit : SLS Powder 3D print	£24.40
	TOTAL EST COST	£272.84

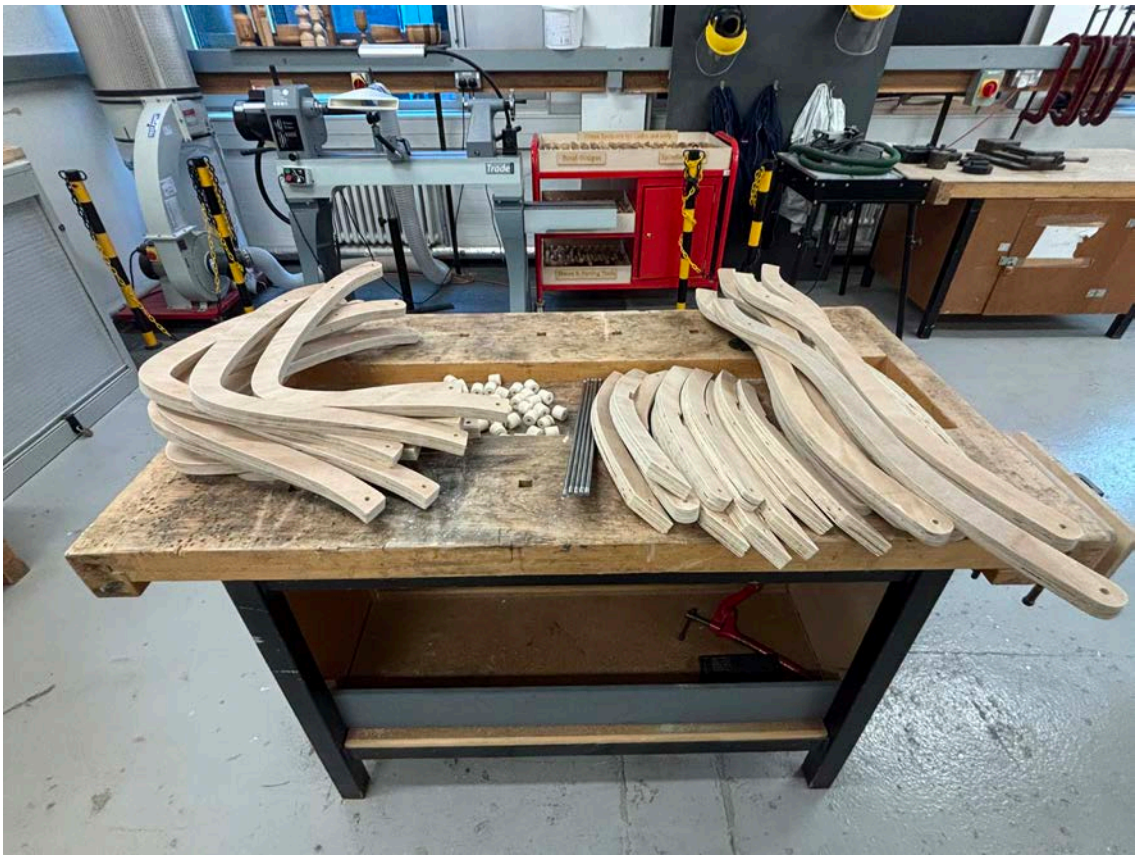
* All prices gathered from discussions with workshop technician staff

As a team of 2 people we are horned to be the finalist for a dog kennel design competition organized by Goodwood, our design has won the recognition of Kevin McCloud and Duke of Richmond and displayed at the event with more than 20000 people and dogs visiting.

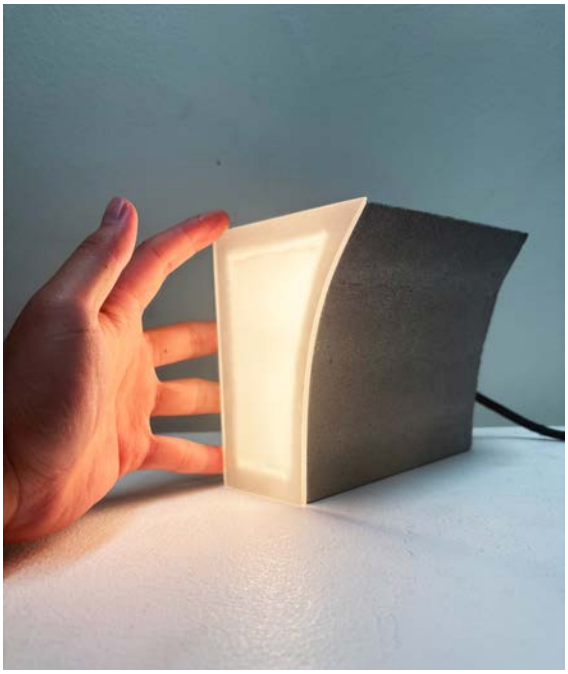
The design propose a god kennel that brings natural environments to urban context through the media of smell from wood, texture from fabric and privacy offered by the form of the fabric.

FURNITURE DESIGN

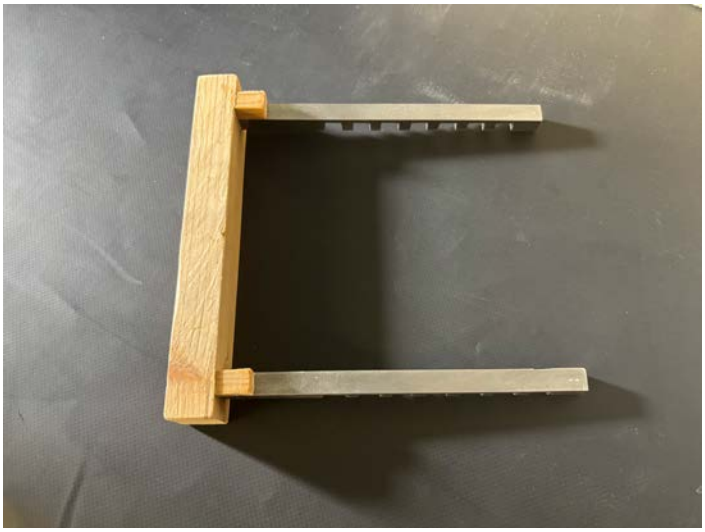
Driven by a passion for full-scale furniture design and a belief in technology's potential to make customization cheaper and more accessible, I embarked on designing and fabricating a chair. The initial concept drew inspiration from ergonomics of human then adjusted to my body, then I took the organic forms from nature. A lots of prototypes has been made from digital model to 1:5 model then 1:1 detail model, this allowed me to validate the design. To optimize material efficiency, I designed the chair to fit all components onto a single 1220x2440mm plywood sheet, leveraging CNC machining for precision cutting.

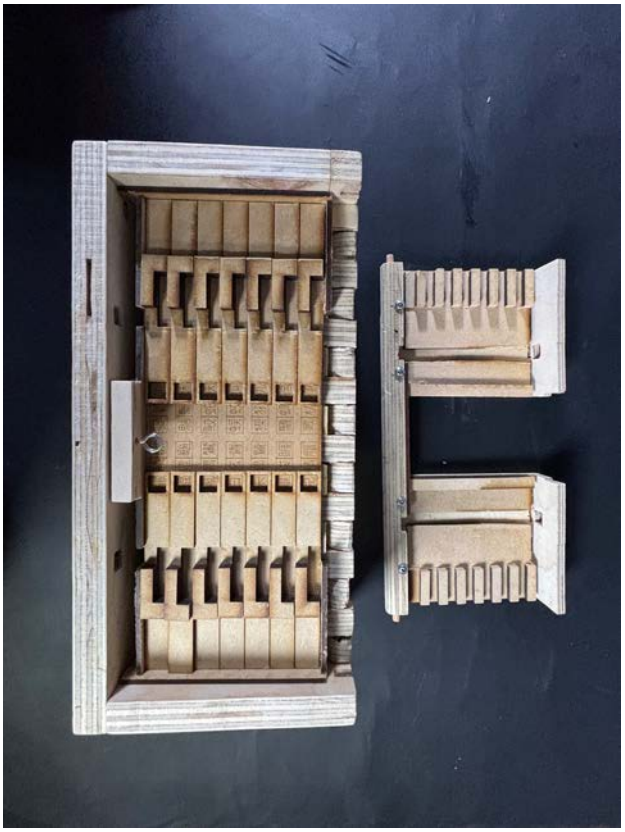


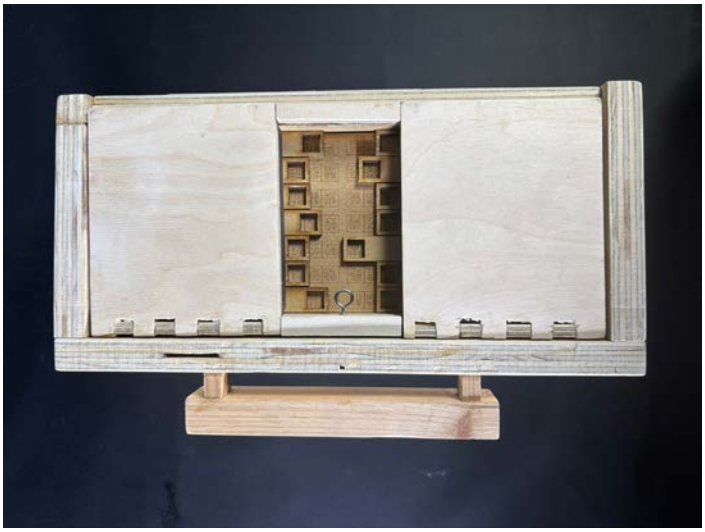
PRODUCT DESIGN



I believe the importance of use of interior design to amplify the architecture design of the building, this light design is a 1:3 model of the lighting strategy used in my “Symbiotic future” project, by mimic the form and texture of concrete beam, this light design can be attached to concrete flawlessly.





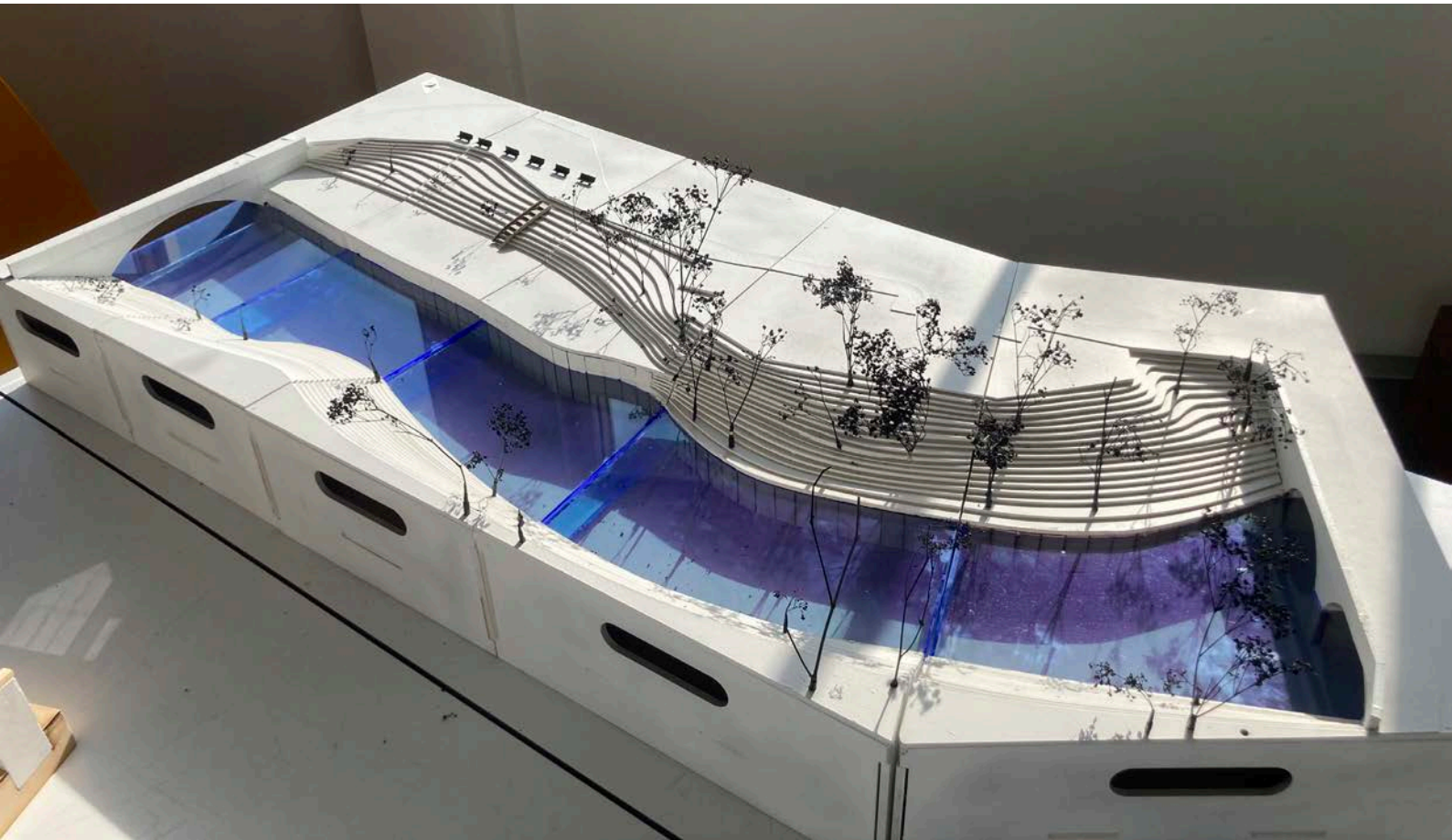


Driven by personal interest I designed and made a pass-coded box with more than 4.3 million combination, the best part is that the pass-coded can be changed according to the needs of the user.

The structural integrity of the box is very strong as it uses 18mm plywood with finger joint, further securing the safety of the box.

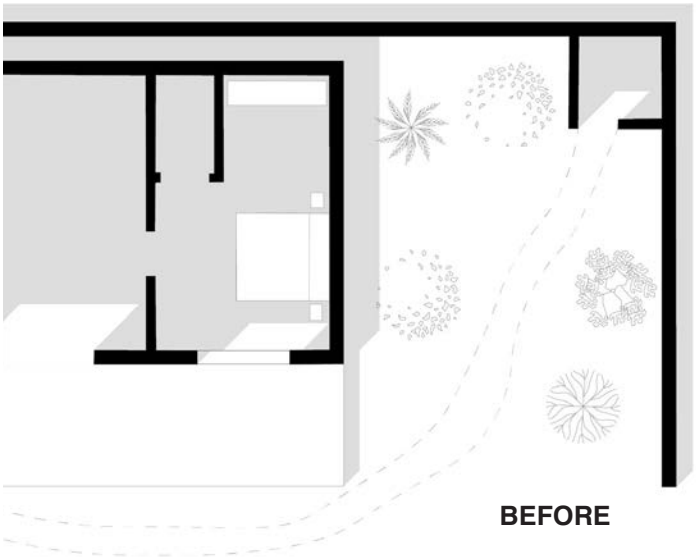
OTHER WORKS-GROUP WORKING

I have initiated and organized many group project, for example this massive site model involved 18 people to construct, different model making technique was used and the result has won recognition from all students and teachers.

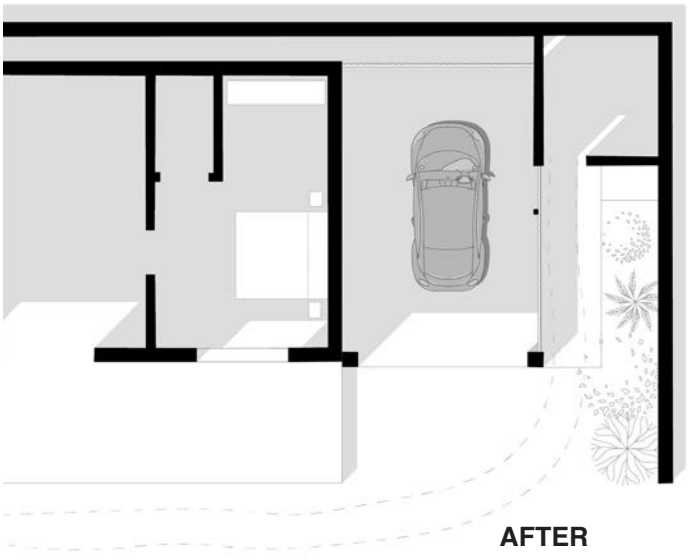


This project was about structural analysis of a case study of Saintsbury museum in Norwich UK, 7 people were involved to make this complicated model, 3D printed structure, machine cut aluminium plates, concrete made foundation and reusing waste material with plater we made the base for the model.

REAL LIFE PROJECT



BEFORE



AFTER

In 2023 I have been commissioned a project of building a car garage space and expanding existing toilet.

The site is located at a rural village in Ningxia China, where my grandfather lives, during the project I had an opportunity to lead, design and participate in the building phase, we had a plan of upgrading the living space for my grandparents, it was planned to have 3 phases of development, including retrofitting kitchen, building a garage and expanding the toilet.

And in this project I was cooperating with local construction team and was responsible for the design of the project and also material purchasing, logistics and communications between each parties, I had also helped out the construction of the garage.

The design of the garage is structure oriented, it occupies 24 meter square, with square steel as the main structure material, the iron sheets as the main walling material decorated with brick pillar makes it consistent with the main house design.

The toilet was expanded from 2.5 meter square to 5 meter square, the old brick wall was taken down and recycled and used in the new toilet, ventilation hole was purposely placed, allowing additional air and light flow into the space.

The total budget of the project cost roughly around £1000, including manual labour, building material and transportation.

THE END

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