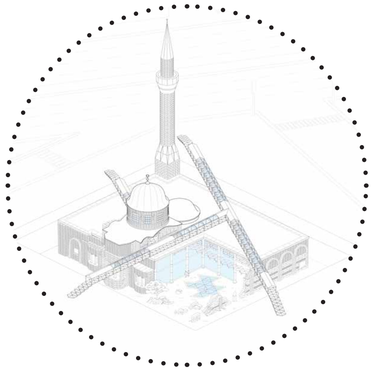
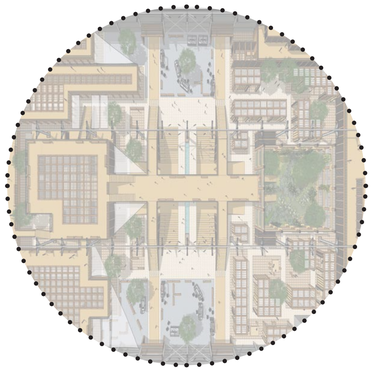
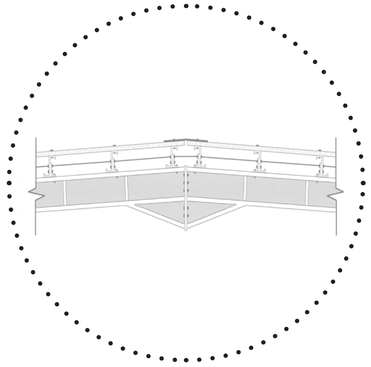
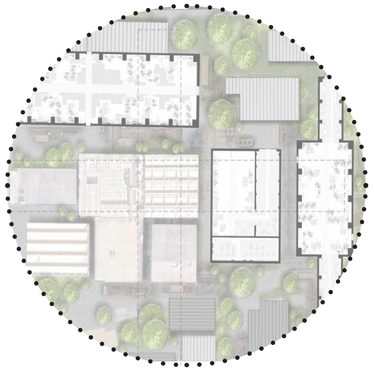
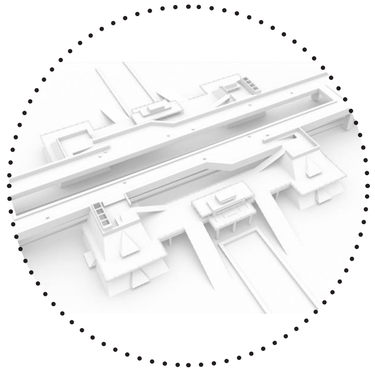






ARCHITECTURAL DESIGN PORTFOLIO

Muhittin Can Binan

INTRODUCTION

This is a concise summary of my work that has been produced within the span of the last 4 years during my time at the AA School of Architecture (Intermediate and Diploma) and also the "year-out" for professional practice. The final part focuses on recent ETS (Environmental Technical Design) projects focusing on sustainable design and retrofit/re-use strategies, including details and 1:2 build-ups, both from the 5th Year Design Thesis and 4th Year TS submissions.

CONTENTS

For further detailed portfolio and more work, please visit my website: https://www.binan.co.uk

04

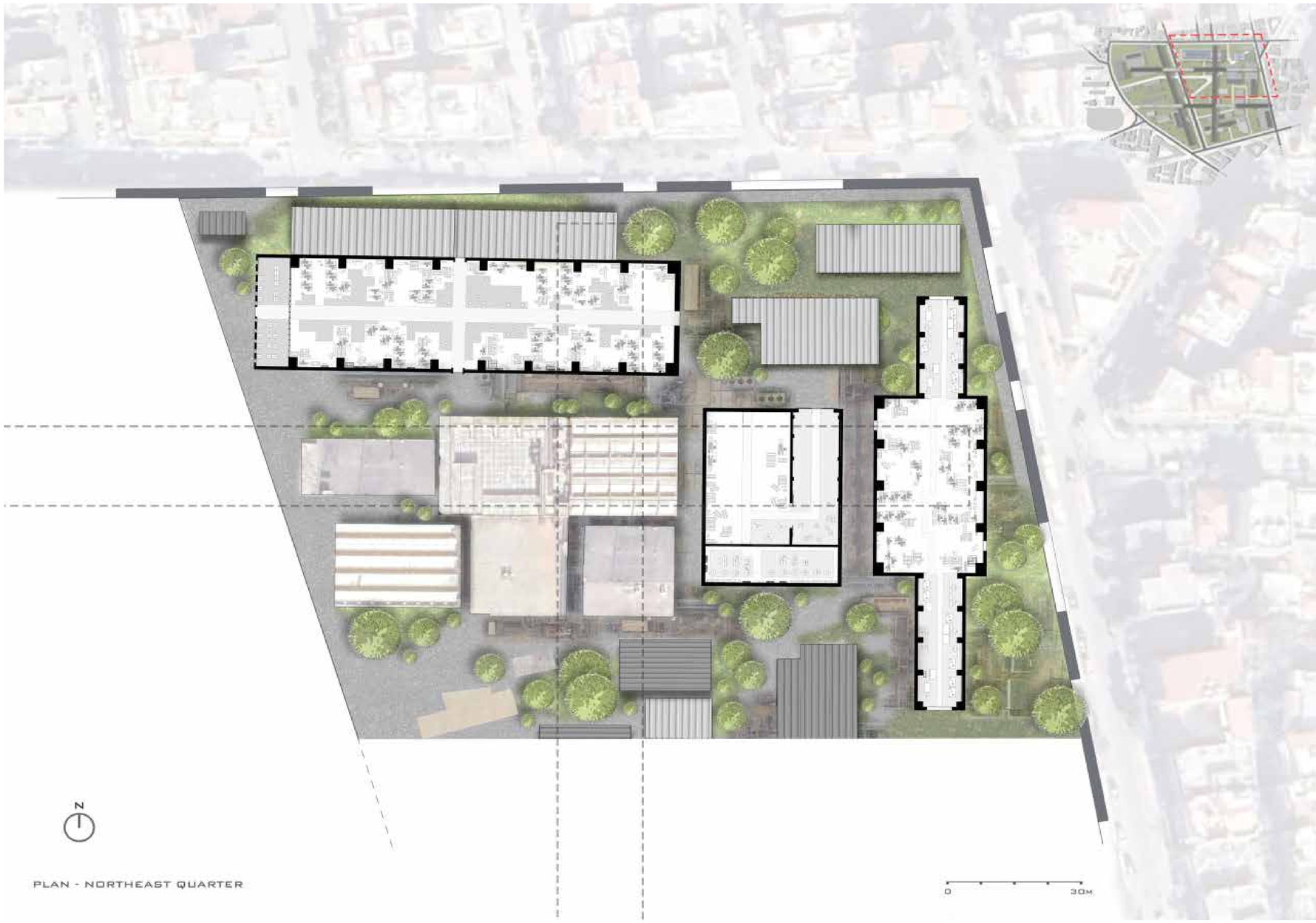
Studio: Government & Park

4th year design studio project - Focusing on the existing ground plane and its qualities, aiming to preserve the ground level buildings

04

Studio: Government & Park

4th year design studio project



PLAN - NORTHEAST QUARTER

STUDIO BRIEF: ***GOVERNMENT & PARK***

4th year design studio project- Focusing on the existing ground plane and its qualities, aiming to preserve the ground level buildings and gradually re-integrate them into the community, negotiating space inside the abandoned interiors and ground level of this manufactory complex, while proposing a superposed office structure/infrastructure lifted off the ground to respond to the brief that requires new governmental office programme.

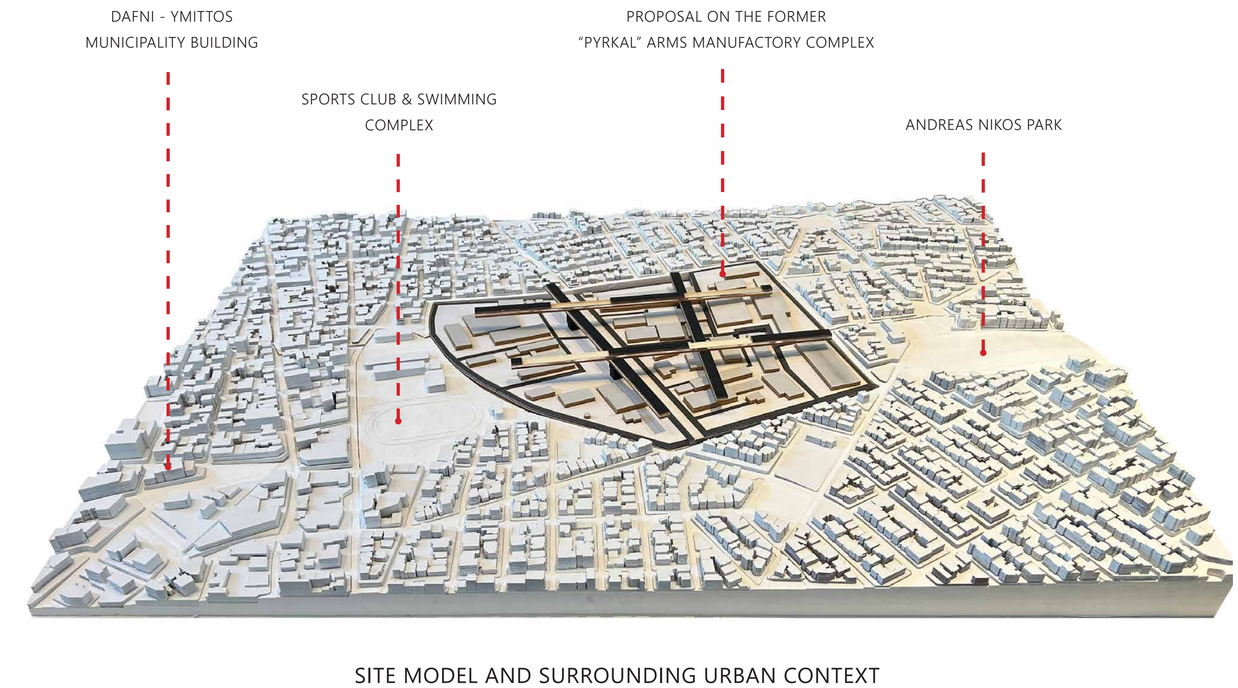
Taking on the seemingly questionable challenge of preserving a former arms & explosives manufactory complex, the project builds on the concept of experimental preservation, and using the act of "preserving" a mid 20th century complex to send a message. The idea of erasing and "redeveloping" former sites that embody the cruel and potentially evil nature of our pasts is purposefully rejected, and the former military complex shaded from public entry is incorporated back to the public realm to enable ruptured the urban tissue to heal, while also raising awareness towards the existance of entire industries targeted towards harming human life.

[Tutors: Ryan Neiheiser & Xristina Argyros]

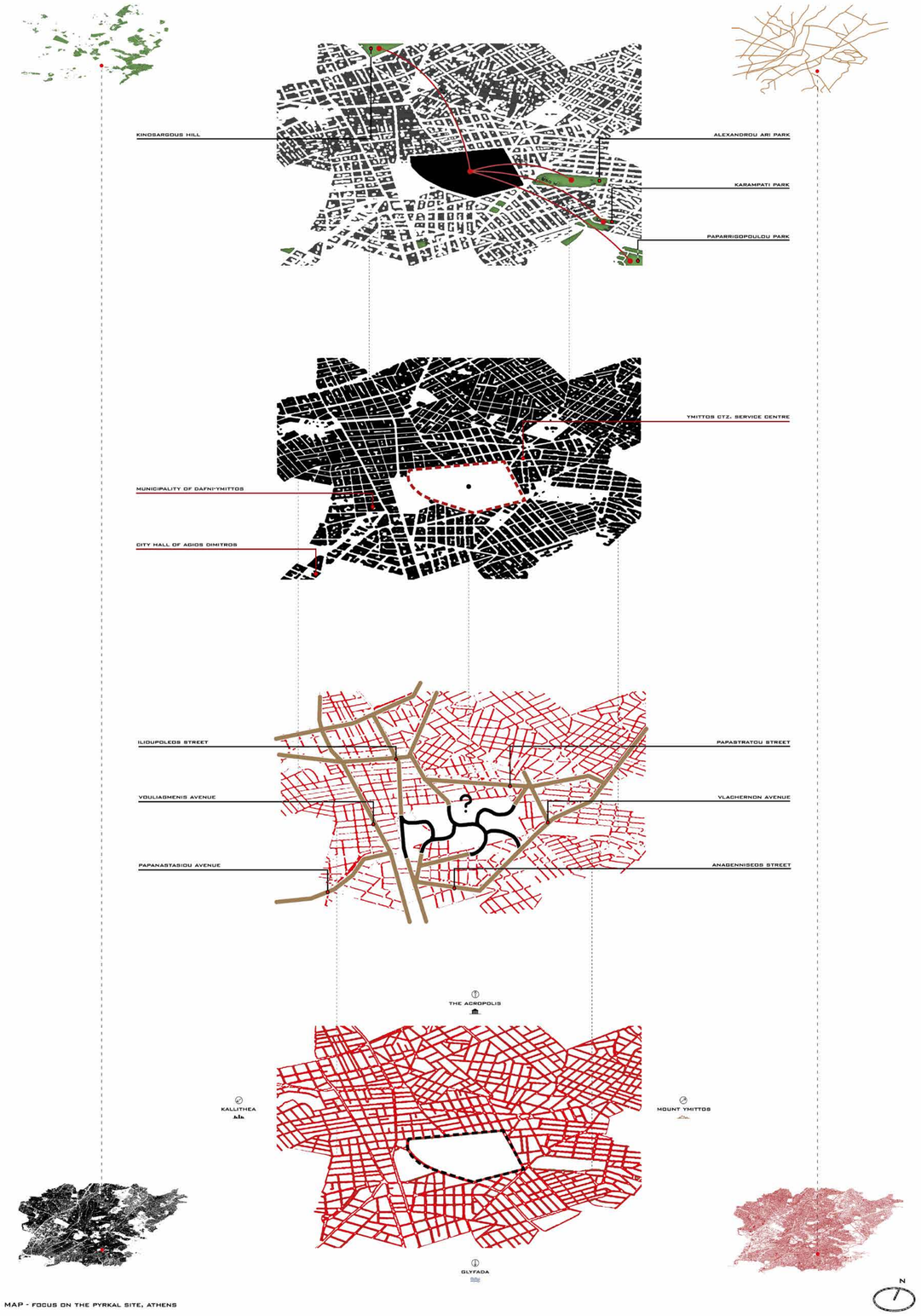
o4

Studio: Government & Park

4th year design studio project



SITE MODEL AND SURROUNDING URBAN CONTEXT
(CNC-MILLED LANDSCAPE POPULATED WITH LASER CUT BUILDING MODELS)
(1:1000)

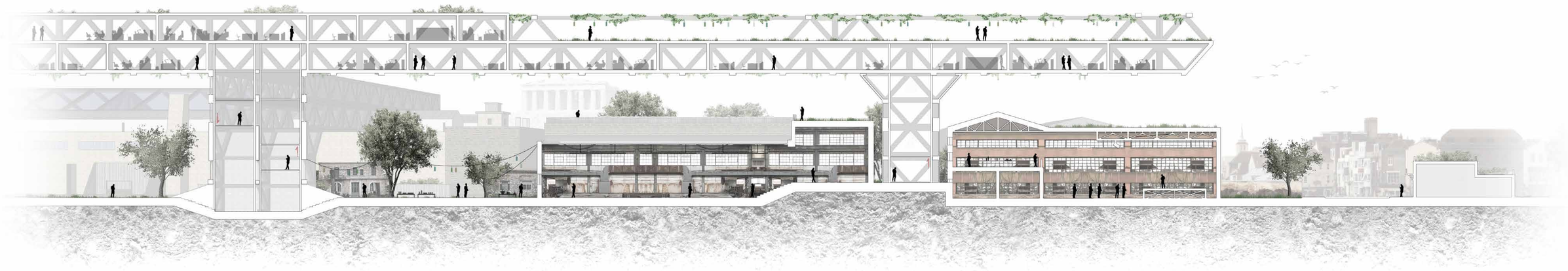


MAP - FOCUS ON THE PYRKAL SITE, ATHENS

o4

Studio: Government & Park

4th year design studio project



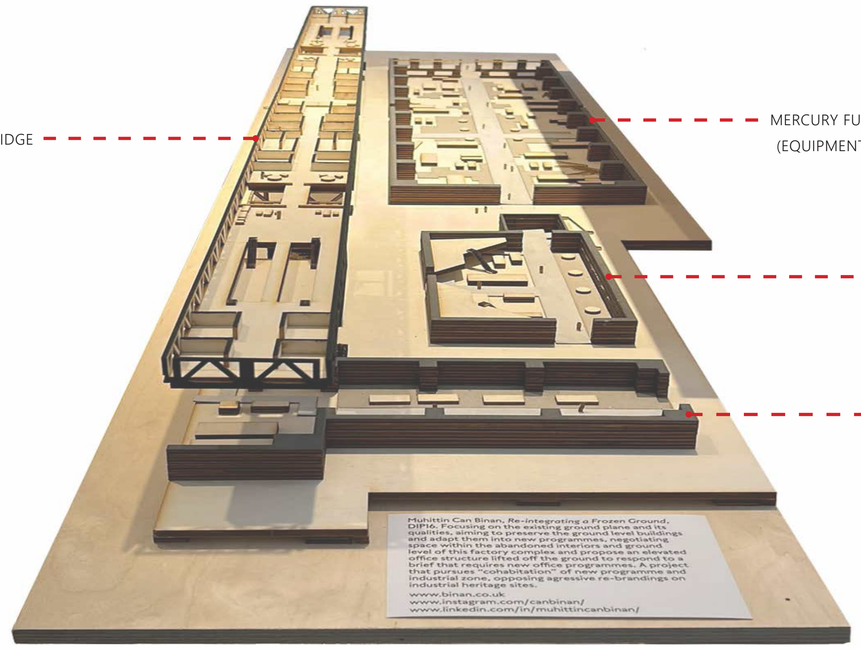
SECTION A-A'

0 20M

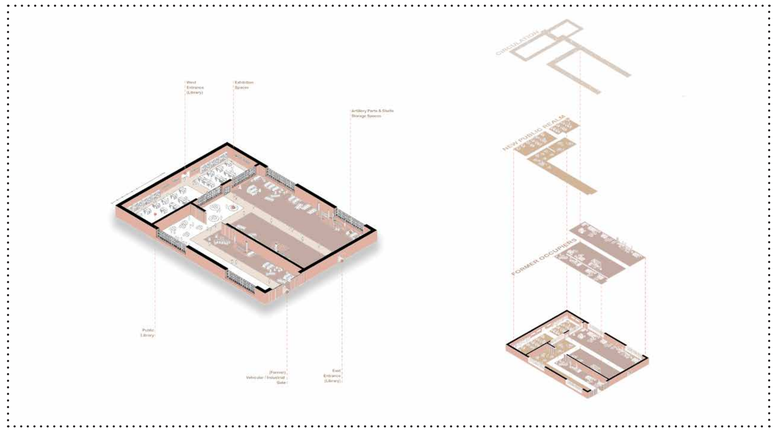
o4

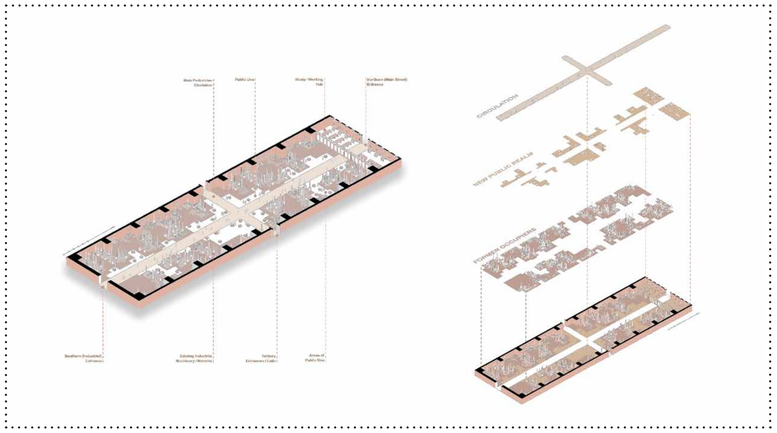
Studio: Government & Park

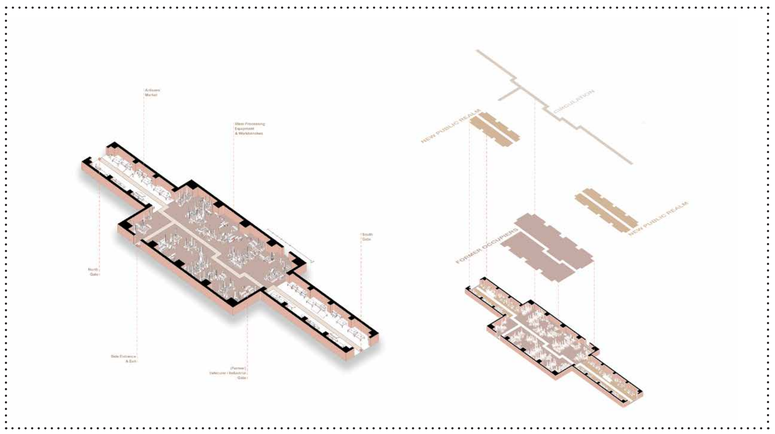
4th year design studio project



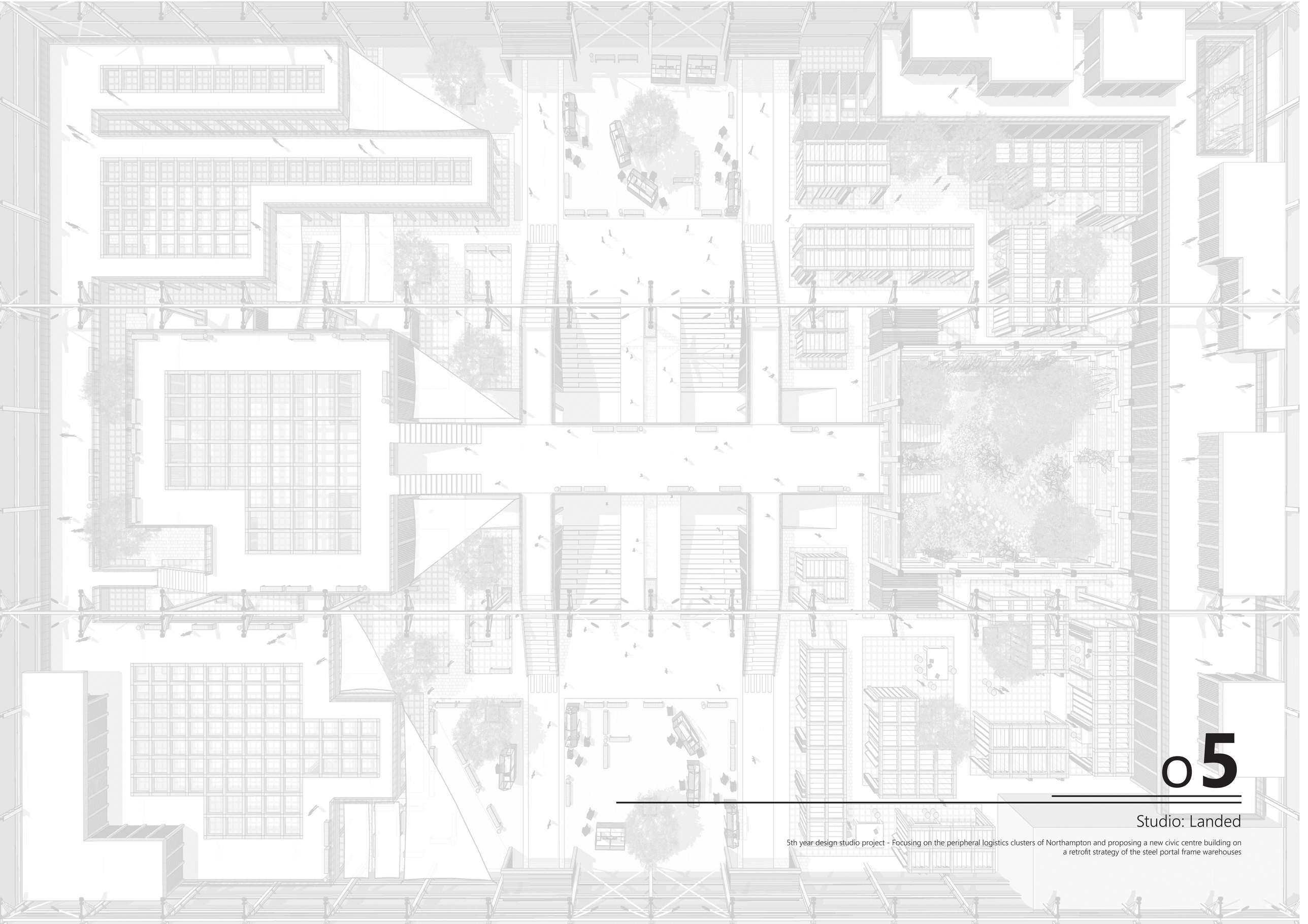
MODEL ZOOMING INTO A STRIP OF THE INHABITED BRIDGE AND GROUND BUILDINGS (1:200)







Diagrammatic proposals on three different kinds of abandoned factory buildings on site and how the spaces could be arranged enabling different, effective ways of preserving their former atmospheres, to bring attention to more experimental and radical ways of preserving industrial heritage.



05

Studio: Landed

5th year design studio project - Focusing on the peripheral logistics clusters of Northampton and proposing a new civic centre building on a retrofit strategy of the steel portal frame warehouses

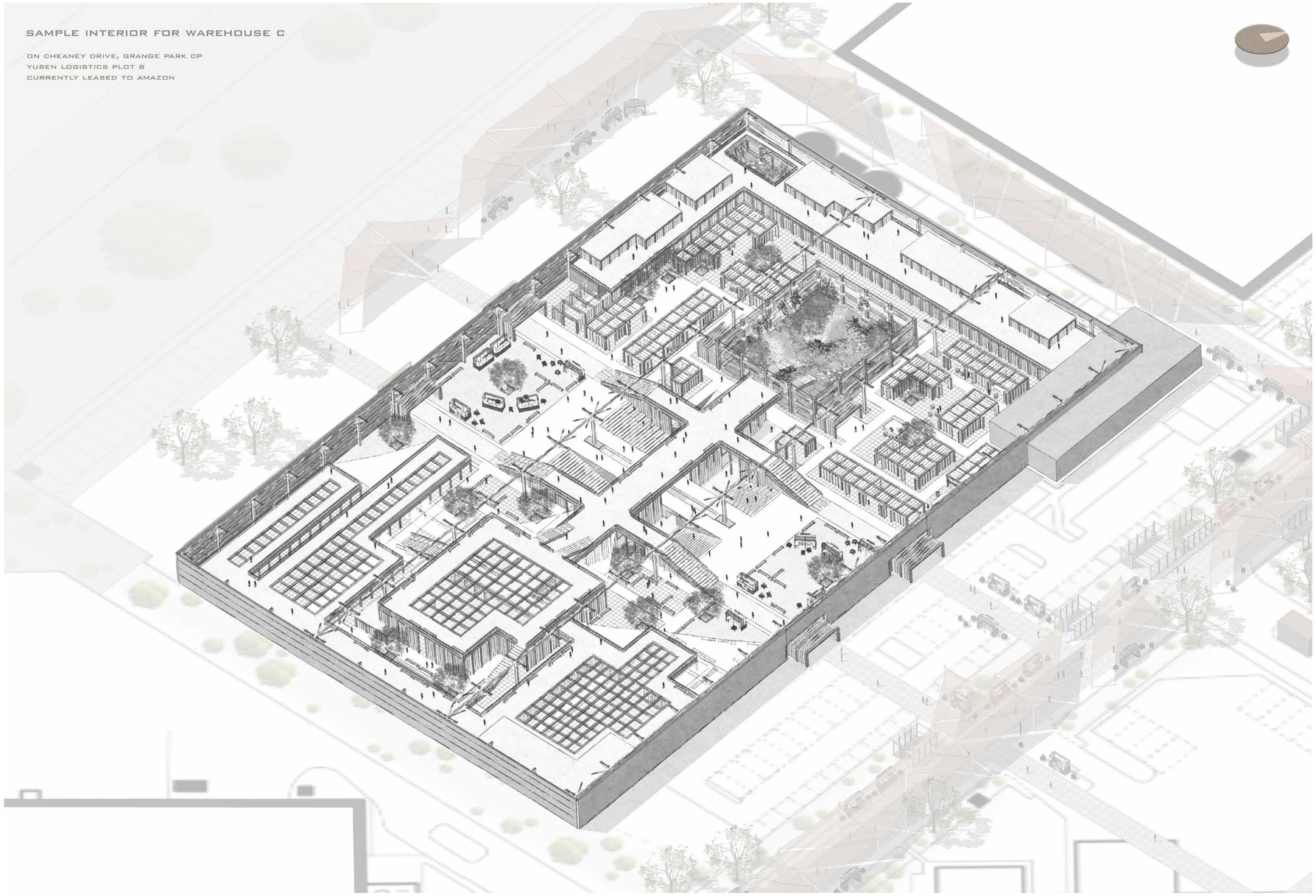
05

Studio: Landed

5th year design studio project - Looking at the peripheral conditions of a city in british midlands and exploring strategies of re-use and retrofit of the steel portal frame.

Associated ETS Design Thesis Document:
Hybrid Typologies: Civic and Residential Re-Use of the Steel Portal Frame

Link to Document:
https://www.binan.co.uk



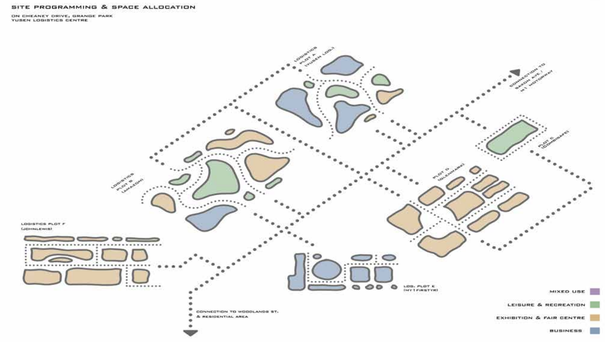
STUDIO BRIEF: ***LANDED***

5th year design studio - project focusing on the logistics clusters that are sporadically appearing more and more along the M1 and the infrastructurally serviced parts of Northampton.

The projects builds an argument towards the future potential abandonment of the site and proposes a provocative and smart retrofit strategy which can work as a general example towards the redevelopment of such sites. The project works with the steel structure at hand and proposes ways to effectively bring "a piece of a city" into these warehouses, promoting a new kind of civic space.

The Technical Studies Design Report(also known as ETS Design Thesis); focuses on technical and quantifiable aspects related to the studio project. It proposes alternative natural fibre insulated CLT wall buildups on the interior, and incorporates a strategy which the massive warehouse interiors would be split into designated climatic zones with customised target temperatures, optimising energy usage and associated costs.

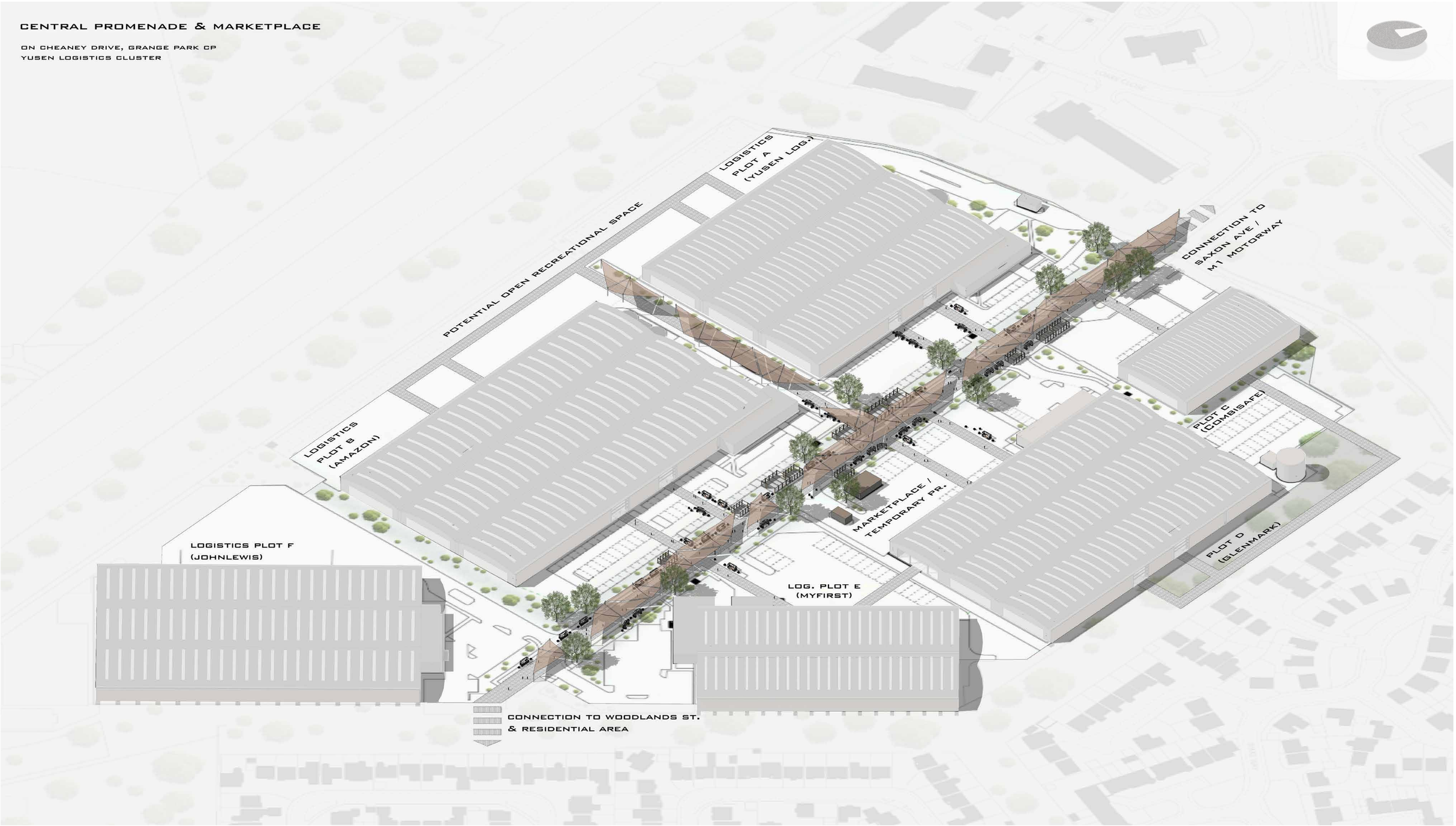
[Tutors: Pierre d'Avoine, Pereen d'Avoine]



o5

Studio: Landed

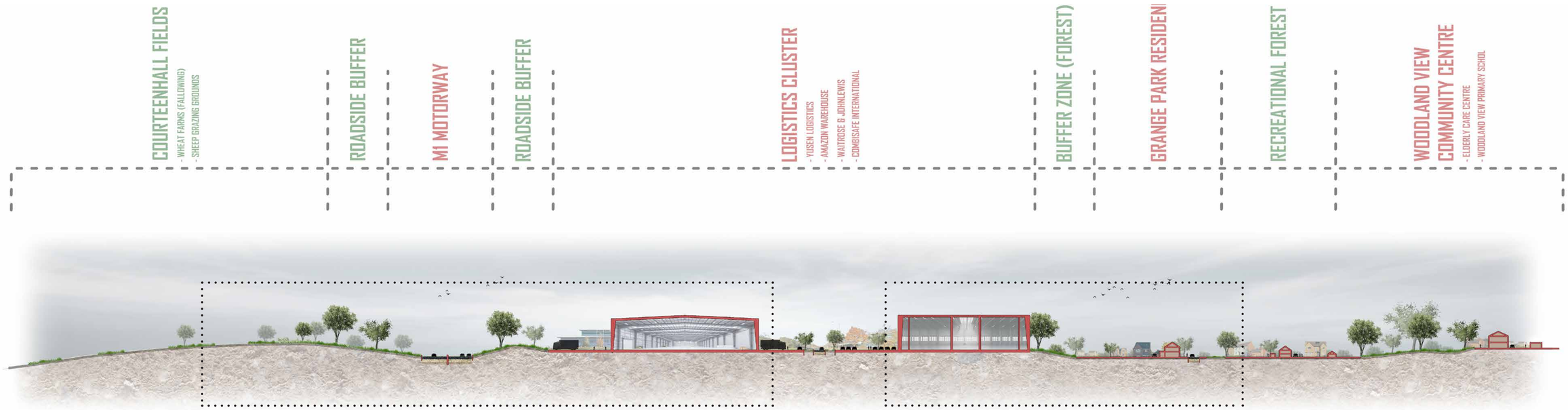
5th year design studio project - Looking at the peripheral conditions of a city in british midlands and exploring strategies of re-use and retrofit of the steel portal frame.



o5

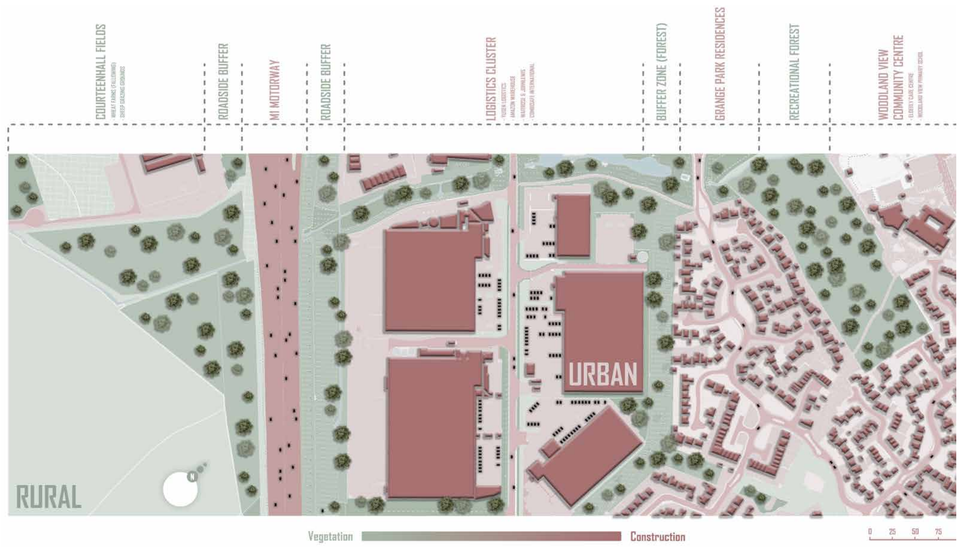
Studio: Landed

5th year design studio project - Looking at the peripheral conditions of a city in british midlands and exploring strategies of re-use and retrofit of the steel portal frame.

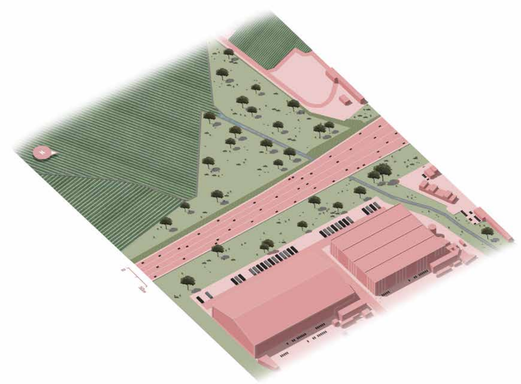


LONGTUDINAL SECTION

0 25 50 75 100m



SITE PLAN : THE UNIQUE CONDITIONS OF THE PERIPHERAL BUILT ENVIRONMENT OF NORTHAMPTON AT THE EDGE OF GRANGE PARK: A COLLAGE OF URBAN & RURAL PATTERNS



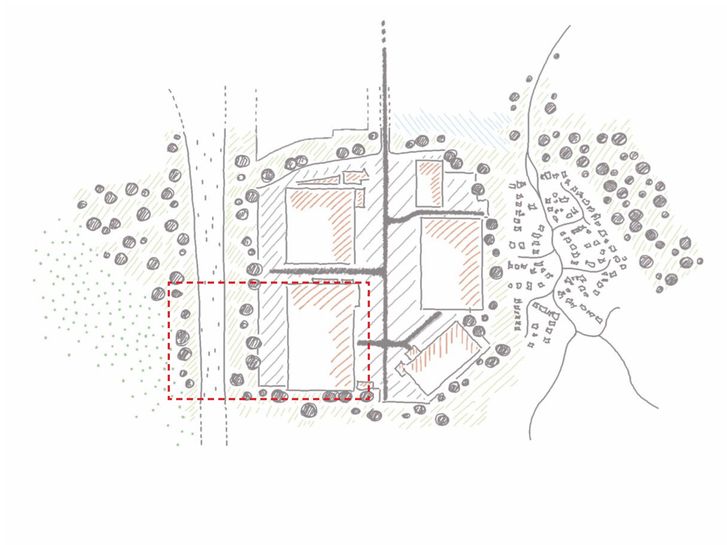
ISOMETRIC IMAGE: ZOOM-IN TO THE M1 MOTORWAY AND NEIGBOURING LOGISTICS CLUSTER & AGRICULTURAL FIELDS

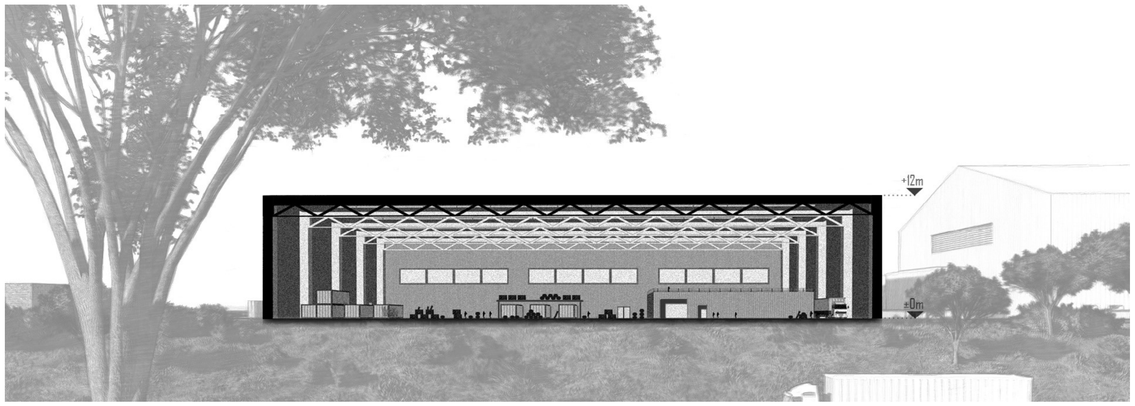
ISOMETRIC IMAGE: ZOOM-IN TO THE BUFFER ZONE THAT SEPERATES THE AMAZON WAREHOUSE AND ADJACENT LOW DENSITY RESIDENTIAL ZONE OF GRANGE PARK

o5

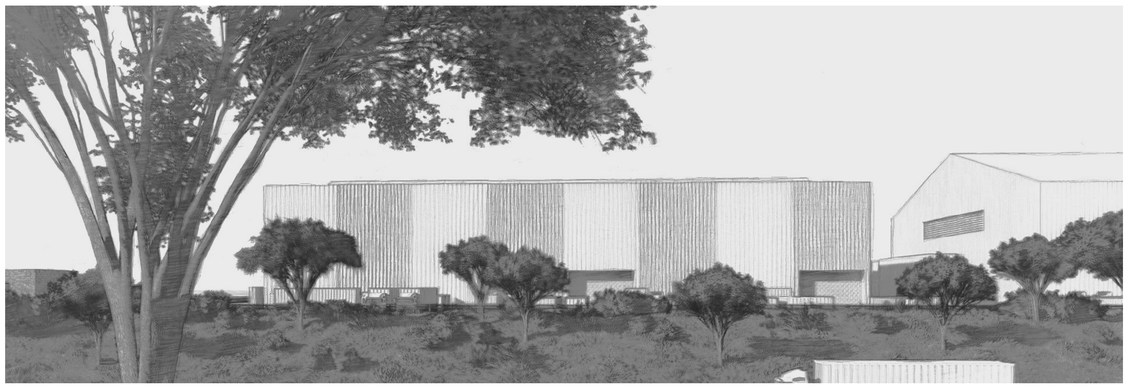
Studio: Landed

5th year design studio project - Looking at the peripheral conditions of a city in british midlands and exploring strategies of re-use and retrofit of the steel portal frame.





Section along the Amazon warehouse next to the M1 Motorway at Grange Park, Northampton.

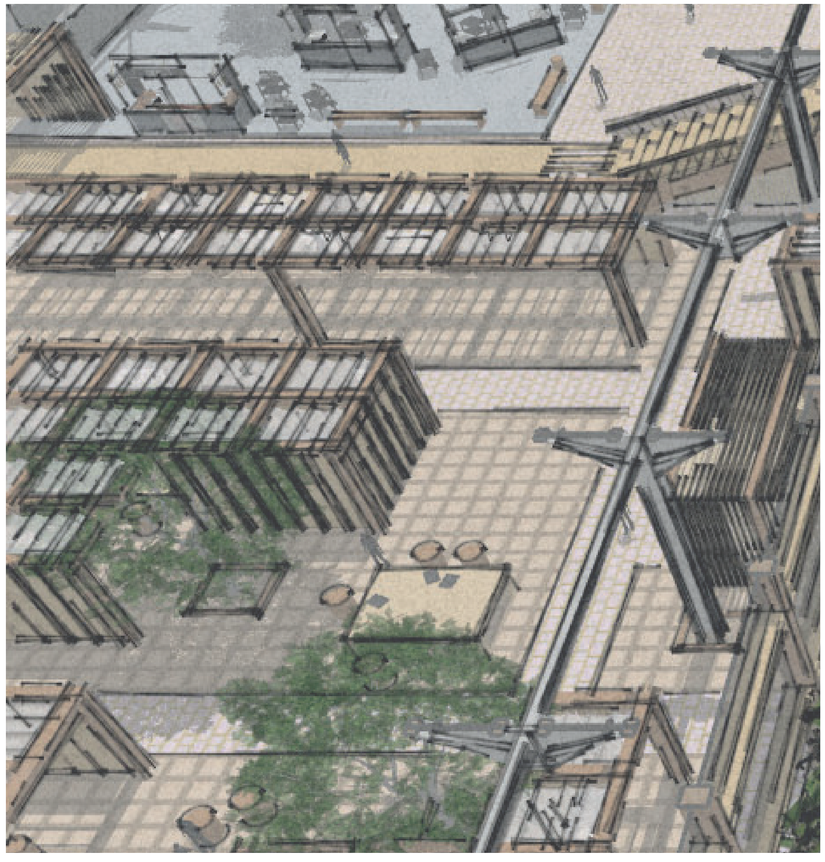


View towards the Amazon warehouse next to the M1 Motorway at Grange Park, Northampton.

o5

Studio: Landed

5th year design studio project - Looking at the peripheral conditions of a city in british midlands and exploring strategies of re-use and retrofit of the steel portal frame.



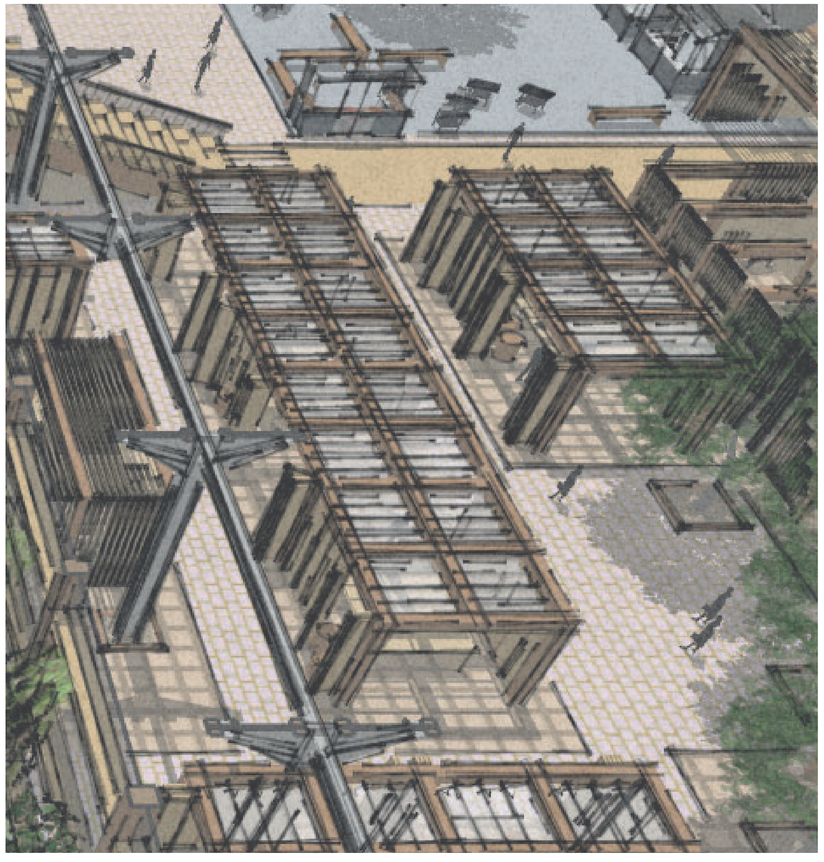
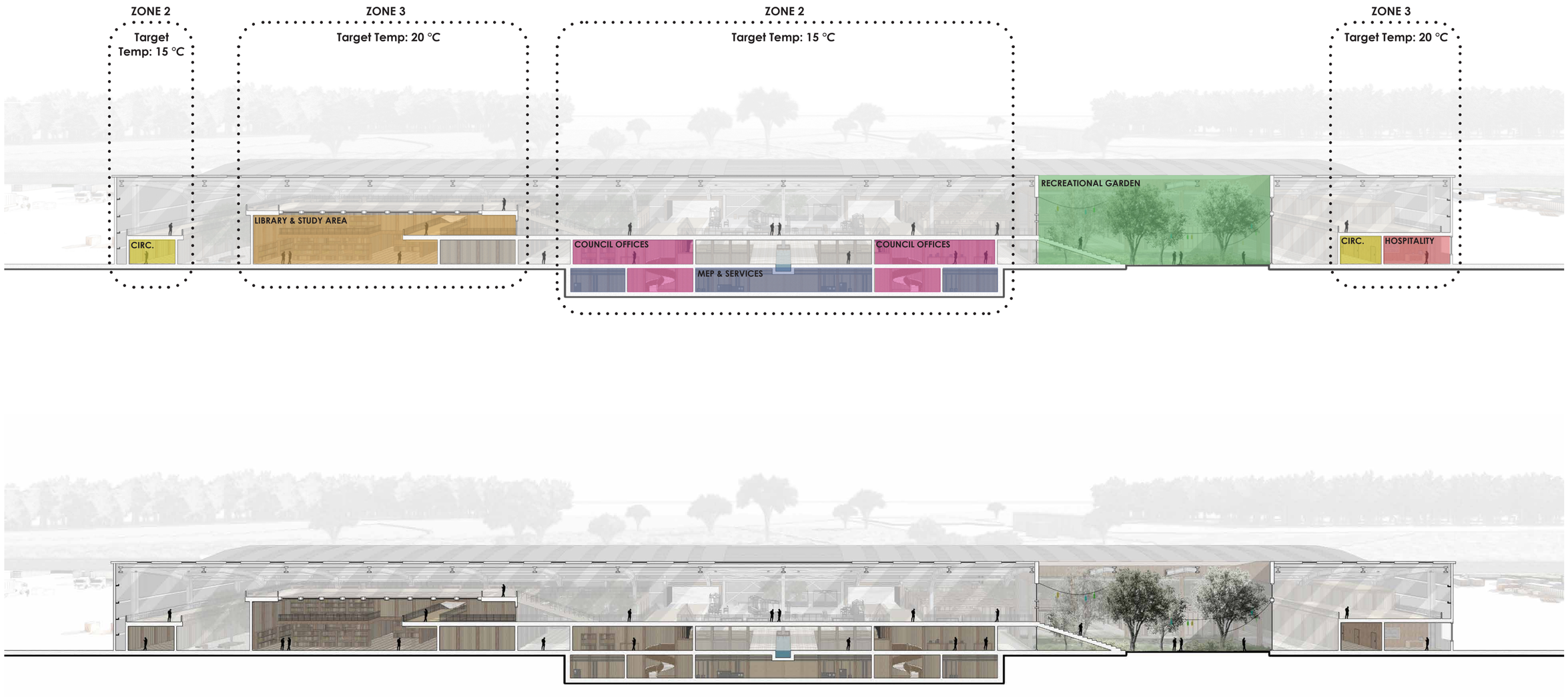


Image of the interiors of the warehouse (flexible programmed bookable work/meeting spaces) around the opened up courtyard for recreational use.

o5

Studio: Landed

5th year design studio project - Looking at the peripheral conditions of a city in british midlands and exploring strategies of re-use and retrofit of the steel portal frame.



SECTION A-A'

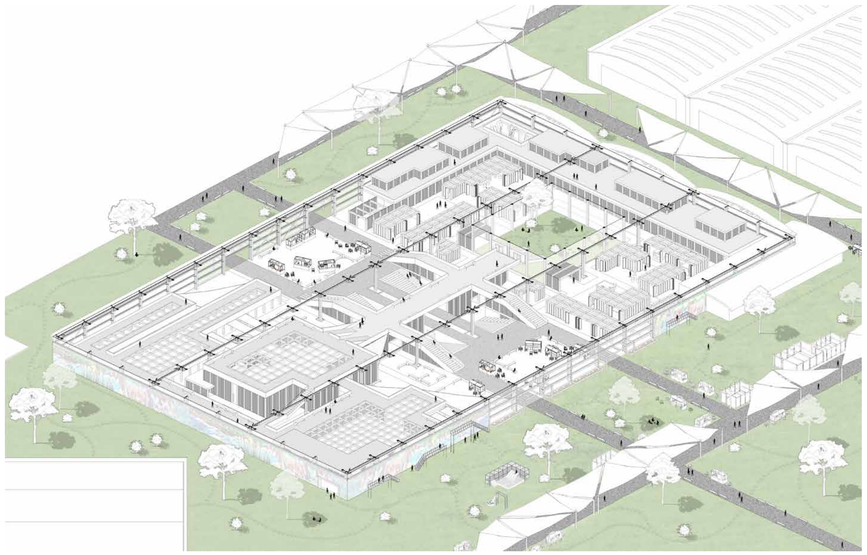
0 20M

o5

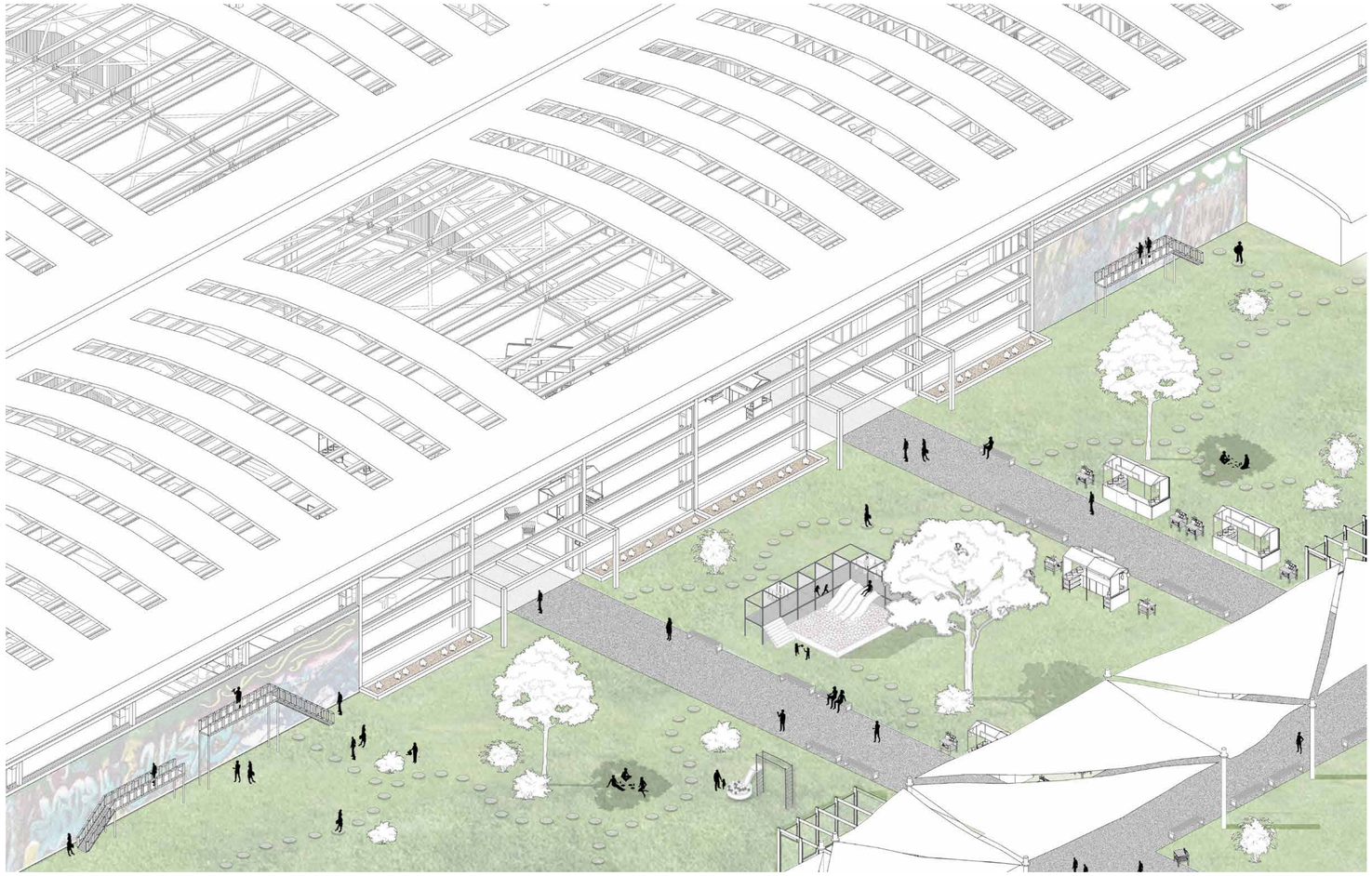
Studio: Landed

5th year design studio project - Looking at the peripheral conditions of a city in british midlands and exploring strategies of re-use and retrofit of the steel portal frame.

Proposal of the building and surrounding areas, as a better, re-activated area for civic use.



View into the “small village” inside the a formerly mundane amazon warehouse.



Zoom-in to the entrance and the intermediary area between the central promenade/marketplace and the warehouse in focus.

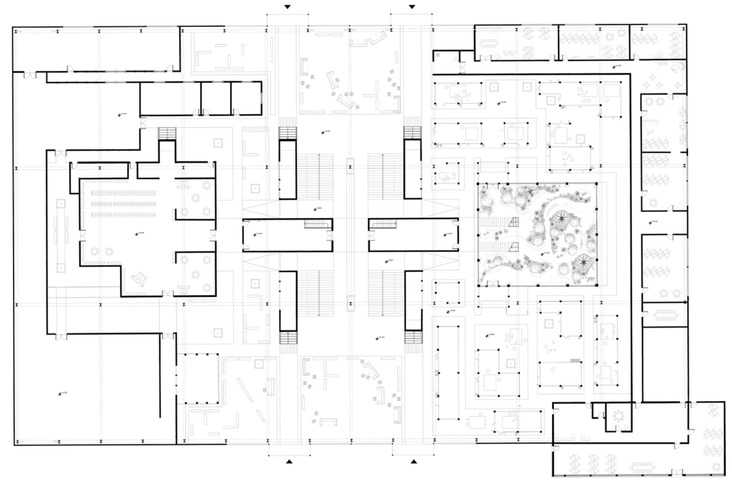
o5

Studio: Landed

5th year design studio project - Looking at the peripheral conditions of a city in british midlands and exploring strategies of re-use and retrofit of the steel portal frame.

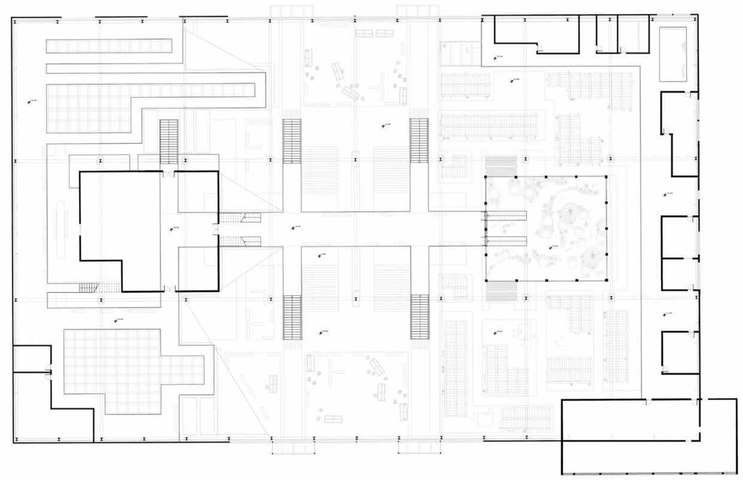
SITE PLAN

0 100 150 200



GROUND FLOOR PLAN & ELEVATIONS

0 10M 20M



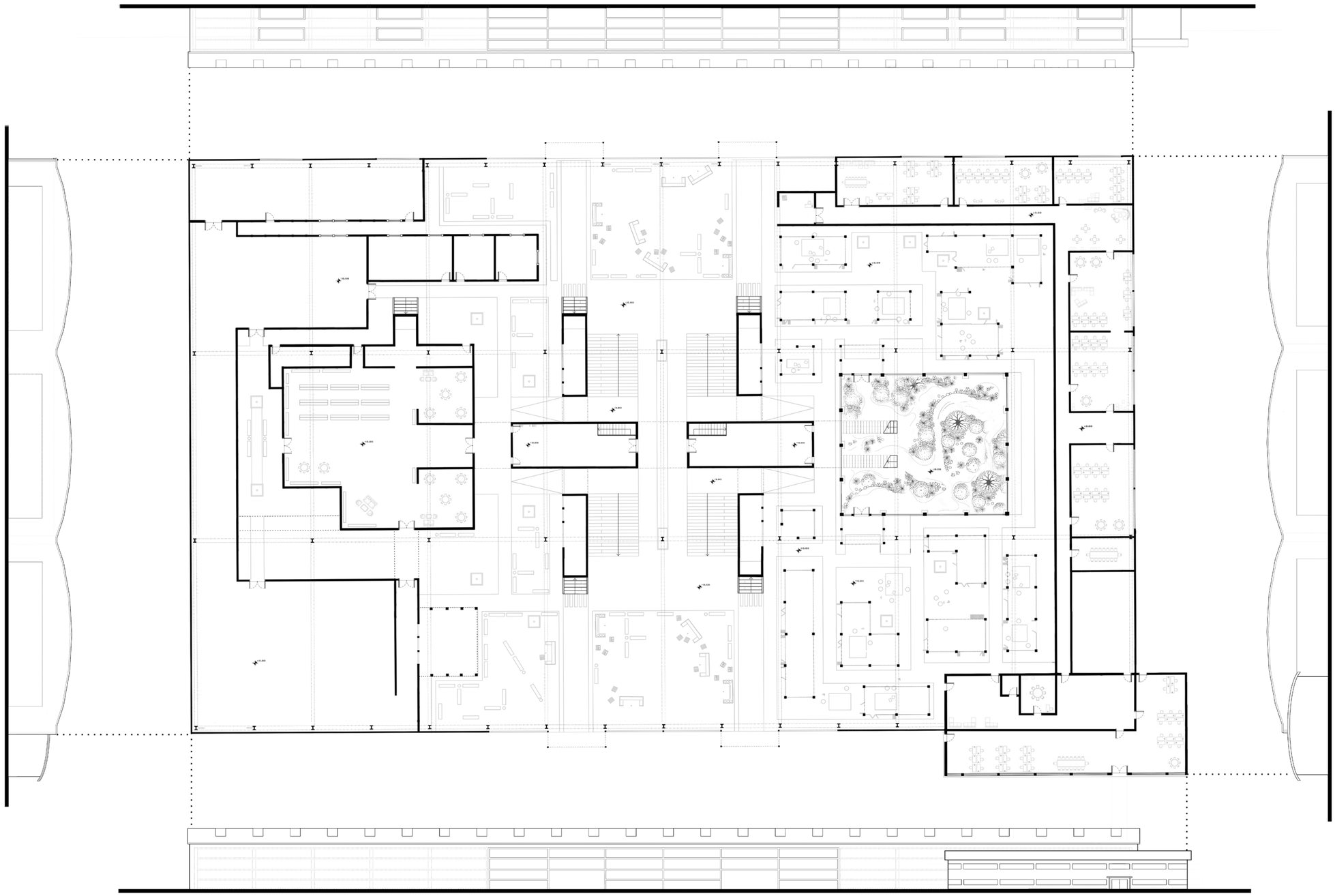
FIRST FLOOR PLAN

0 10M 20M

o5

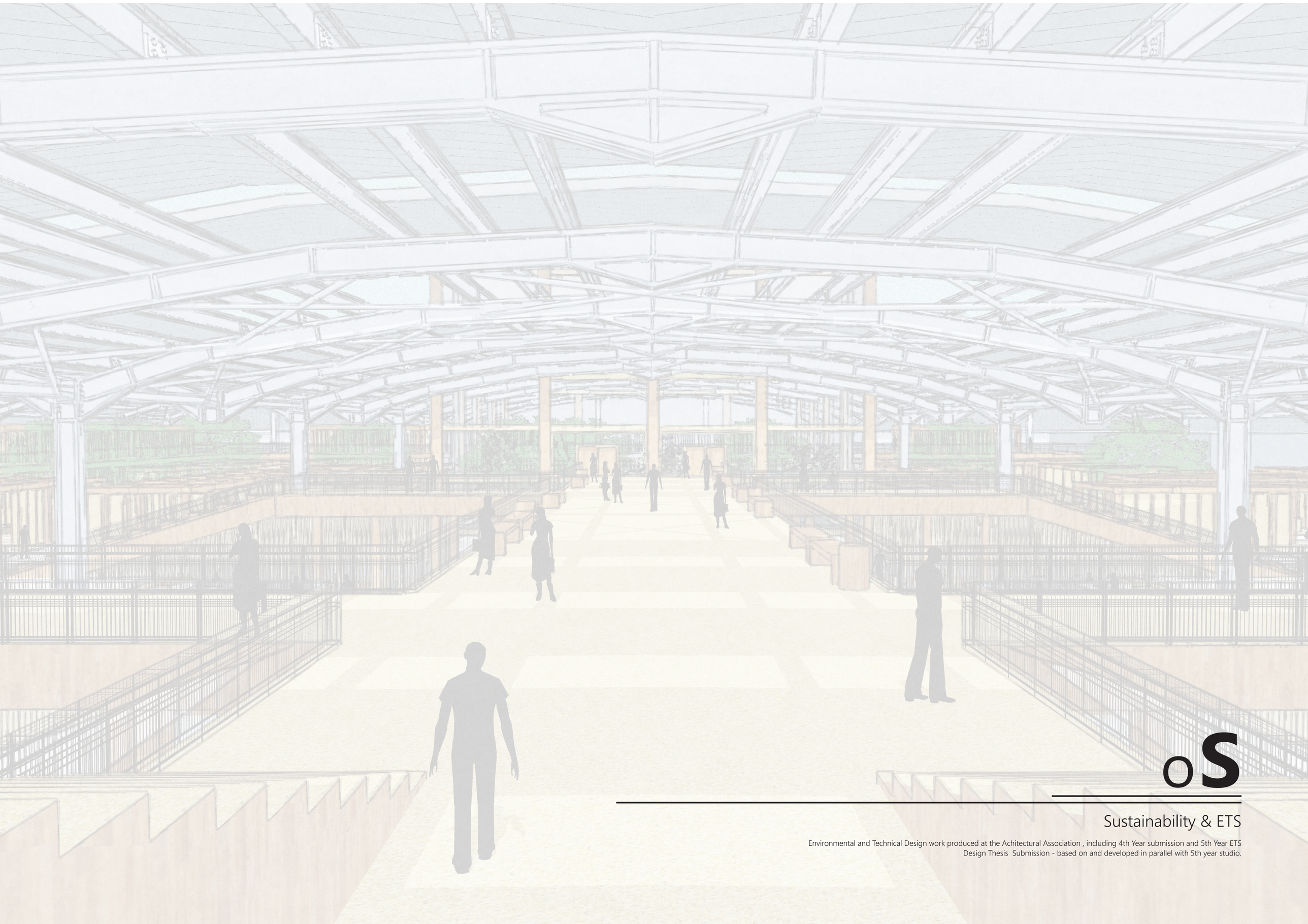
Studio: Landed

5th year design studio project - Looking at the peripheral conditions of a city in british midlands and exploring strategies of re-use and retrofit of the steel portal frame.



GROUND FLOOR PLAN & ELEVATIONS

0 10M 20M



0S

Sustainability & ETS

Environmental and Technical Design work produced at the Achitectural Association , including 4th Year submission and 5th Year ETS Design Thesis Submission - based on and developed in parallel with 5th year studio.

oS

Sustainability & ETS

5th year Environmental Technical Design Thesis Submission - Recommended for High Pass

Focuses on technical and quantifiable aspects related to the studio project. It proposes alternative natural fibre insulated CLT wall buildups on the interior, and incorporates a strategy which the massive warehouse interiors would be split into designated climatic zones with customised target temperatures, optimising energy usage and associated costs. Following digital submission the 110 page document was printed for the High Pass jury to be displayed in school - document exists both online (website) and in print.

ETS Statement

The ETS project will focus and deal with the practicalities and technical aspects of adapting part of an existing warehouse/logistics cluster into being used under a new residential and civic programme, and explore strategies of overcoming expected issues around insulation, heating and structural manipulations that aim to transform and reprogram the site. The project will do so while maintaining fragments -or large chunks- of its industrial character and set an example within the context and testing the feasability and best ways of converting underused shed/warehouse structures into becoming a provocative new civic space.

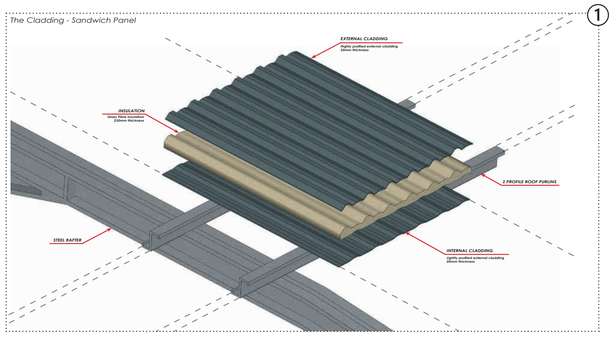
RESULT & FEEDBACK

"A solid and focused document, it breaks down the areas of study and development that a retrofit and re-use process should have, on the base of a steel frame building. It tackles every aspect in general and in particular, first by making reference to case studies to substantiate the positions taken, and later by applying it to the design. It includes quantifications and calculations, and a final stage of speculation of the building with the new program. Overall the balance between research, analysis and proposition is excellent and the panel agreed that this should be put forward to the High Pass Table."

KEY SNAPSHOTS FROM DOCUMENT:

Full Document (110 pages) available online (PDF viewer, no downlaod needed) at: https://www.binan.co.uk/concise-portfolio-pdf

The Cladding - Sandwich Panel ①



Enabling different modes of circulation, access and recrational space ②

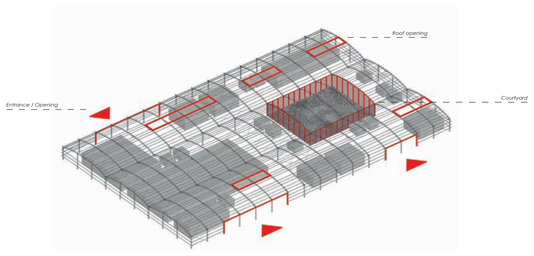
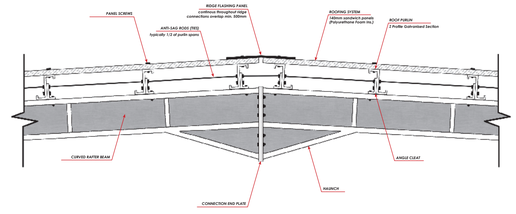
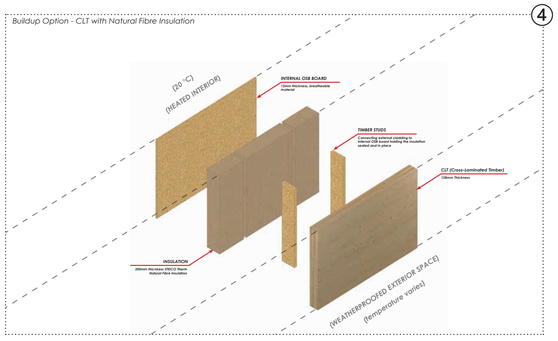


Image - iagram showing the base concept of the retrofit goals; red highlights tentative new openings for entry, lightwells, and a courtyard.

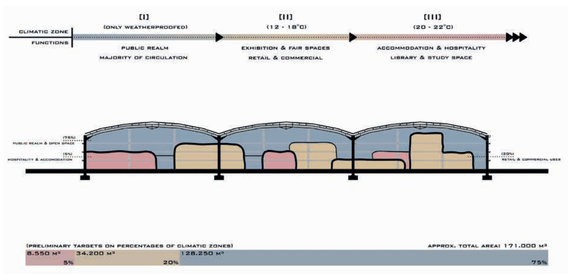
Opening up a courtyard - Roof Ridge Detail Drawing ③



Buildup Option - CLT with Natural Fibre Insulation ④



The Third Option ⑤



Calculating the energy and costs - Alternative Condition (Polyurethane Foam) ⑥

Surface Area: 45,496 m²

Heat Loss Per Hour Formula: $\text{Heat Loss} = U \times \text{Area} \times \Delta T$

Calculation:

$$\text{Heat Loss per Hour} = 0.18 \times 45,496 \times 13 = 106,349.04 \text{ Watts}$$

Conversion to kWh

$$\text{Heat Loss per Hour in kWh} = \frac{106,349.04}{1000} = 106.349 \text{ kWh}$$

Daily and Annual Energy Requirement:

$$\text{Daily Energy Requirement in kWh} = 106.349 \times 24 = 2,552.376 \text{ kWh}$$

$$\text{Annual Energy Requirement} = \frac{2,552.376 \times 180}{0.95} = 484,115.752 \text{ kWh}$$

Annual Heating Cost:

$$\text{Annual Cost} = 484,115.752 \times 0.25 = £121,028.938$$

KEY VALUES

ΔT = 13°C *(let's assume the average outside temperature is 7°C)*

U-Value *for exterior cladding = 0.18 W/(m²K)*

Surface Area *= 2(lw+lh+wh) = 45,496 m²*
(we are neglecting any windows for this demonstration, and assuming the building fully covered with panels)

Heating Season Lenght: *180 days*

Heating system *with an energy efficent rating (ErP) of A - (95%)*

Cost *per kWh = 26p for Large Businesses in the UK as of 2024*

Calculating the Volumes, Zones and their Energy consumption ⑦

(CLIMATIC ZONES 3)

Library & Study Space

Heat Loss Calculation:

Heat Loss = U×A×ΔT

= 0.17W/(m^,K) × 2921.9m² ×13°C

= 6457.399W

Conversion to kWh:

$$\frac{6457.399\,\text{W}}{1000} = 6.4574\,\text{kWh}$$

Daily Energy Requirement:

$$6.4574\,\text{kWh/hour} \times 24\,\text{hours/day} = 154.98\,\text{kWh/day}$$

Annual Energy Requirement:

$$\frac{154.98\,\text{kWh/day} \times 180\,\text{days}}{0.95\,\text{efficiency}} = 29,364.17\,\text{kWh/year}$$

Annual Heating Cost:

$$\text{Annual Heating Cost} = 29,364.17\,\text{kWh} \times £0.25/\text{kWh} = £7,341.04$$

Council Offices & Rooms

Heat Loss Calculation:

Heat Loss = U×A×ΔT

= 0.17W/(m^,K) × 1785.56m² ×13°C

= 3946.088W

Conversion to kWh:

$$\frac{3946.088\,\text{W}}{1000} = 3.9461\,\text{kWh}$$

Daily Energy Requirement:

$$3.9461\,\text{kWh/hour} \times 24\,\text{hours/day} = 94.706\,\text{kWh/day}$$

Annual Energy Requirement:

$$\frac{94.706\,\text{kWh/day} \times 180\,\text{days}}{0.95\,\text{efficiency}} = 17,944.31\,\text{kWh/year}$$

Annual Heating Cost:

$$\text{Annual Heating Cost} = 17,944.31\,\text{kWh} \times £0.25/\text{kW} = £4486.08$$

Hospitality & Accomodation

Heat Loss Calculation:

Heat Loss = U×A×ΔT

= 0.17W/(m^,K) × 8699.87m² ×13°C

= 19226.713W

Conversion to kWh:

$$\frac{19226.713\,\text{W}}{1000} = 19.227\,\text{kWh}$$

Daily Energy Requirement:

$$19.227\,\text{kWh/hour} \times 24\,\text{hours/day} = 461.44\,\text{kWh/day}$$

Annual Energy Requirement:

$$\frac{461.44\,\text{kWh/day} \times 180\,\text{days}}{0.95\,\text{efficiency}} = 87,431.95\,\text{kWh/year}$$

Annual Heating Cost:

$$\text{Annual Heating Cost} = 87,431.95\,\text{kWh} \times £0.25/\text{kWh} = £21,857.74$$

Calculating the Volumes, Zones and their Energy consumption ⑧

(CLIMATIC ZONES 2)

Marketplace & Bookable Units

Heat Loss Calculation:

Heat Loss = U×A×ΔT

= 0.17W/(m^,K) × 3398 m² × 8°C

= 4621.28W

Conversion to kWh:

$$\frac{4621.28\,\text{W}}{1000} = 4.621\,\text{kWh}$$

Daily Energy Requirement:

$$4.621\,\text{kWh/hour} \times 24\,\text{hours/day} = 110.91\,\text{kWh/day}$$

Annual Energy Requirement:

$$\frac{110.91\,\text{kWh/day} \times 180\,\text{days}}{0.95\,\text{efficiency}} = 21,014.66\,\text{kWh/year}$$

Annual Heating Cost:

$$\text{Annual Heating Cost} = 21,014.66\,\text{kWh} \times £0.25/\text{kWh} = £5,253.67$$

Gallery & Exhibition Spaces

Heat Loss Calculation:

Heat Loss = U×A×ΔT

= 0.17W/(m^,K) × 6465.46² × 8°C

= 8793.03W

Conversion to kWh:

$$\frac{8793.03\,\text{W}}{1000} = 8.793\,\text{kWh}$$

Daily Energy Requirement:

$$8.793\,\text{kWh/hour} \times 24\,\text{hours/day} = 211.03\,\text{kWh/day}$$

Annual Energy Requirement:

$$\frac{211.03\,\text{kWh/day} \times 180\,\text{days}}{0.95\,\text{efficiency}} = 39,985.13\,\text{kWh/year}$$

Annual Heating Cost:

$$\text{Annual Heating Cost} = 39,985.13\,\text{kWh} \times £0.25/\text{kWh} = £9,996.28$$

oS

Sustainability & ETS

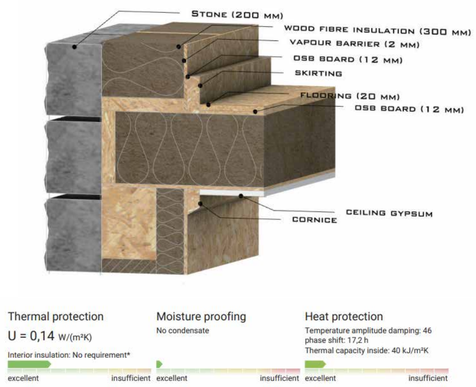
4th Year Environmental Technical Studies Submission - Proposal of a Stone & OSB wall buildup with analysis on associated values and emissions, later built as a 1:2 model shown in photos below.

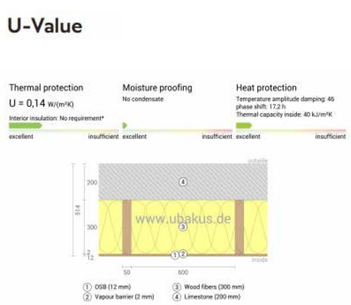
These are from a environmental technical design project that based itself roughly on the guidence of LETI one-pager design guide on small scale housing.

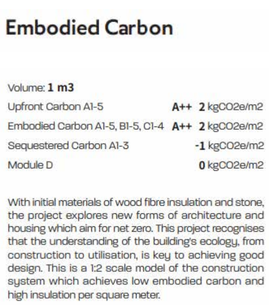
Using u-value and carbon footprint calculators, like stage one embodied carbon calculator v6 from M.E.S.H energy and with the help of uBakus u-value calculator for insulation details, the project aimed to attain an lowest practical u-values possible with the materials assigned.

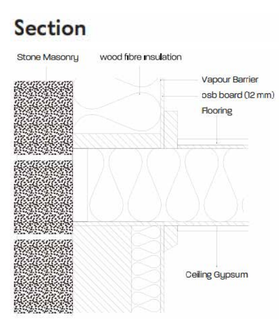
(In this case assigned materials were stone, wood, and fibre) - (Was exhibited in TheEngineeringClub - Engineers Create exhibition between 16-25 November 2023 at St Pancras Church and at the AA Projects Review 2023)

PROPOSAL NO.1







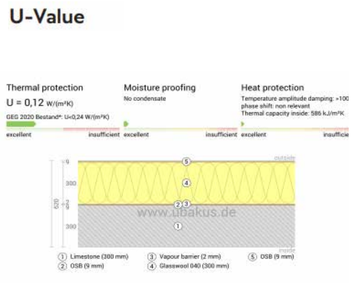


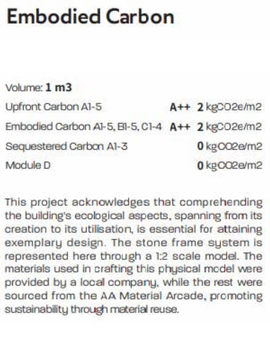
1:2 SCALE MODELS OF THE ATTEMPTED "NET-ZERO" NATURAL FIBRE (ABOVE) AND GLASS FIBRE (BELOW) INSULATED STONE-OSB WALL BUILD-UP

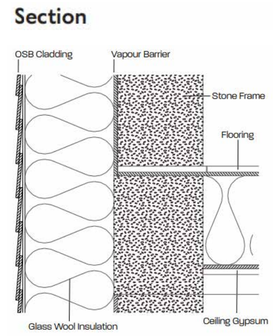
(STONE WERE NOT STUCK DOWN WITH MORTAR AND JOINED WITH THE INSULATION LAYER, BUT RATHER STACKED ON SITE TO BE DISPLAYED, AS THEIR WEIGHT WAS UNMANAGABLE IF JOINED PERMANENTLY)

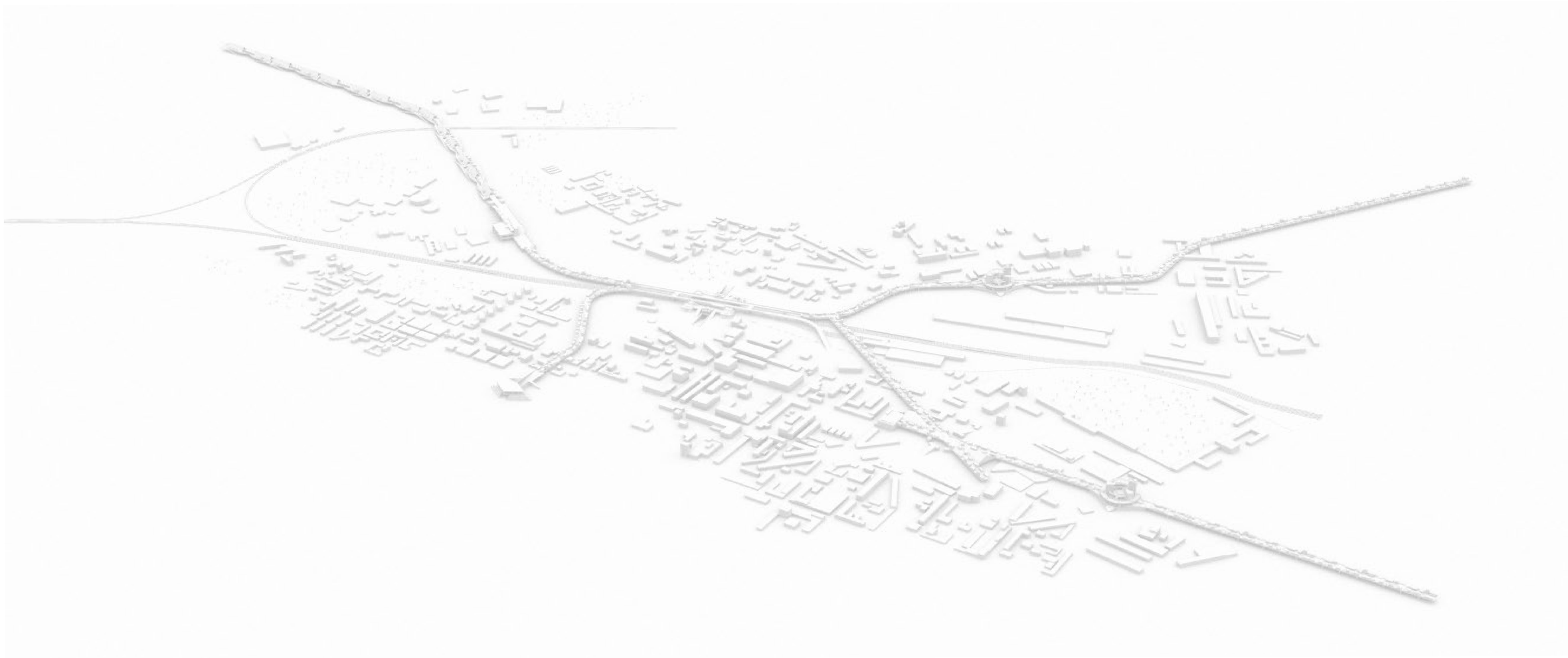
*REAL LIMESTONE PIECES WERE SUPPLIED BY THE STONEMASONRY COMPANY
*NATURAL FIBRE INSULATIONS WERE FROM STEICO UK

PROPOSAL NO.2









02

Studio: City in Transition - Old and New

Summative images from 2nd year at the AA

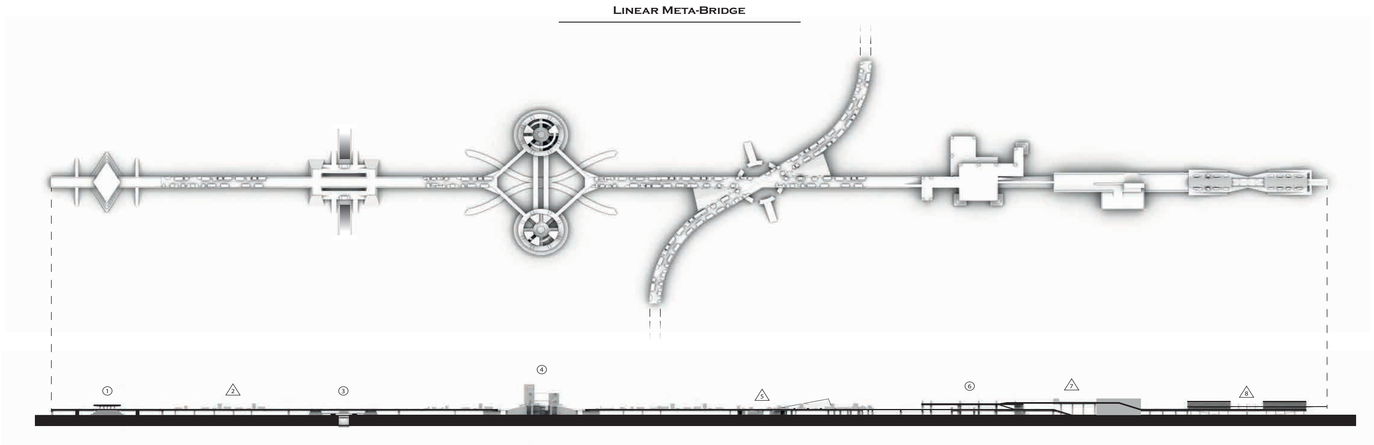
02

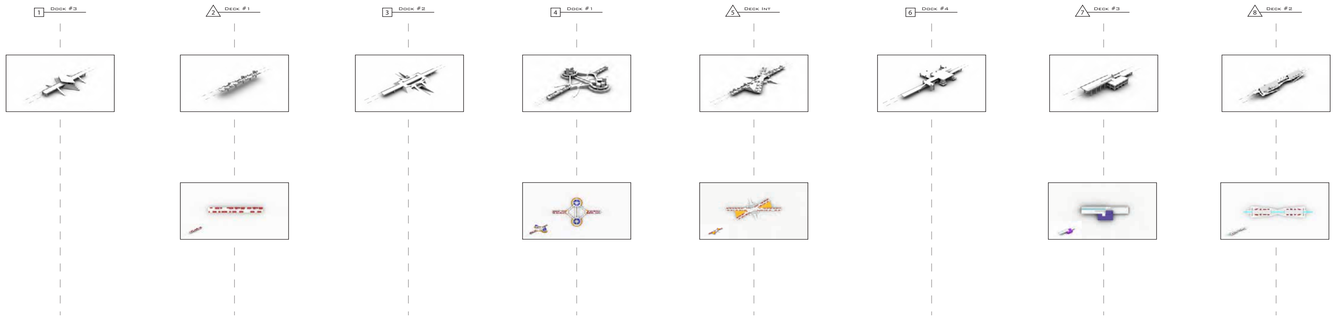
Studio: City in Transition - Old and New

Few summative images and final plates from studio project focused on the city of Milan and its underused peripheral railway infrastructure, which creates potentially unsustainable and problematic ruptures within the urban fabric. The provocation revolved around the idea of a inhabited, programmed viaduct network that forms bridges between urban edges of derelict & underused industrial and infrastructural sites.

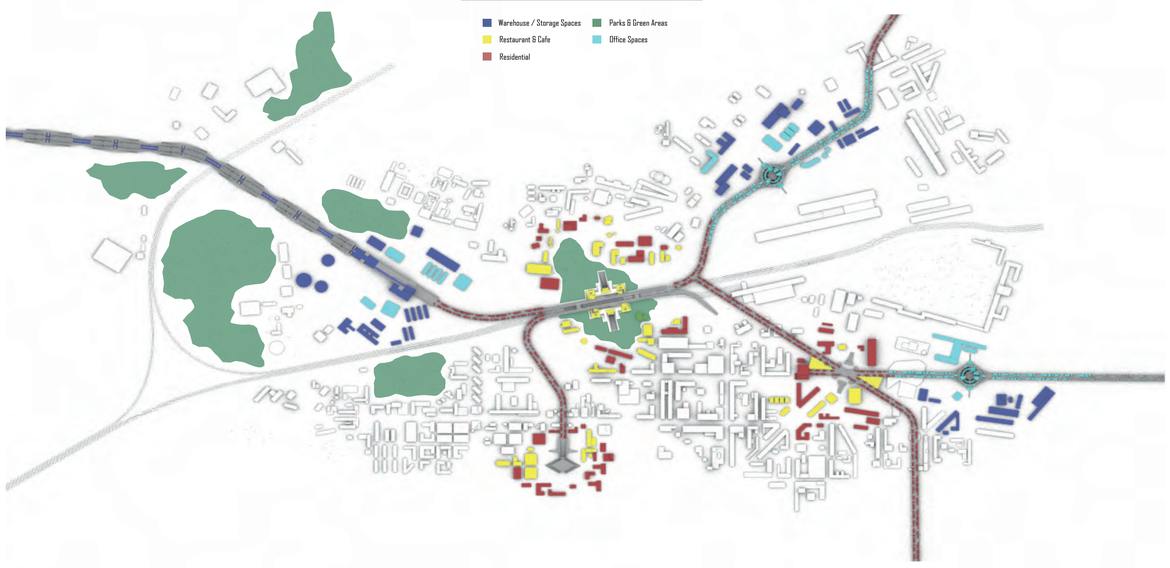
[Tutor: Maria Fedorchenko]

Linear Meta-Bridge



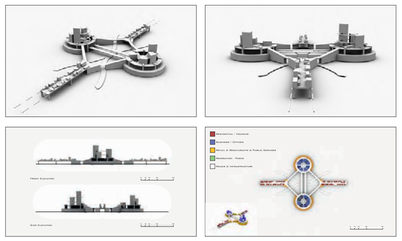


Programamtic Masterplan



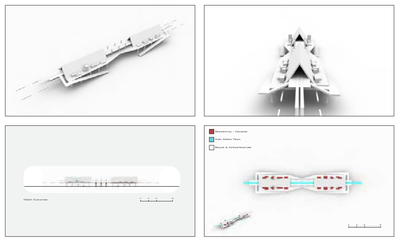
Deck #1 - Alternative

A softened and simplified form of the older version of overly saturated Deck #1. Practically a replacement for it.



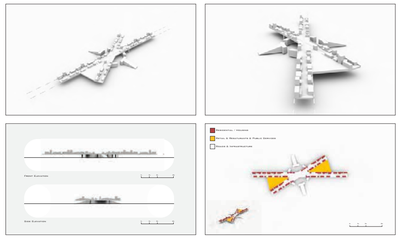
Deck #2

The "high speed deck", which has the aim of considerably increasing the speed of travel throughout different parts of the bridge. The bridge has a limited amount of housing on it compared to decks #1 and #3 in order to have space for a more extensive highway underneath and train/tram on the upper level.



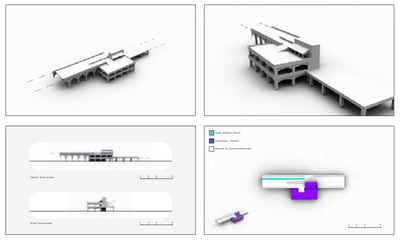
Deck Intersection #1

Initially inspired from DMU's 5th street bridge park in Washington. This is one of the many possible scenarios of how decks might intersect. In this instance we have an example of two deck #1's colliding and the space created inbetween the decks being used for programs like public services as well as leisure. Its additional connection to the ground renders this a point of interchange between the city and the bridge.



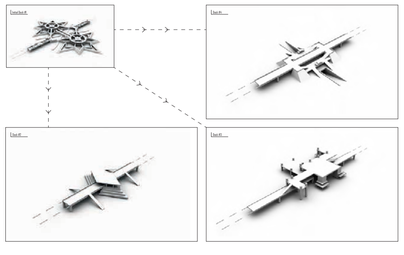
Deck #3

Another version of the deck which is designed as a possible step for the elevated train decks seen in deck #2. Converts high speed and possibly elevated decks to medium/low speed suitable for residential decks like deck #1. It mainly functions as a depot and storage to supply the offices and retail businesses on the bridge city.



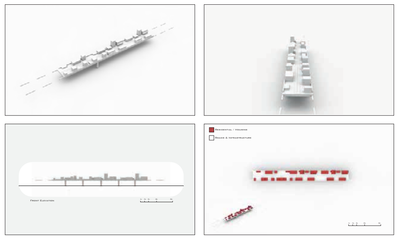
Recent Elements

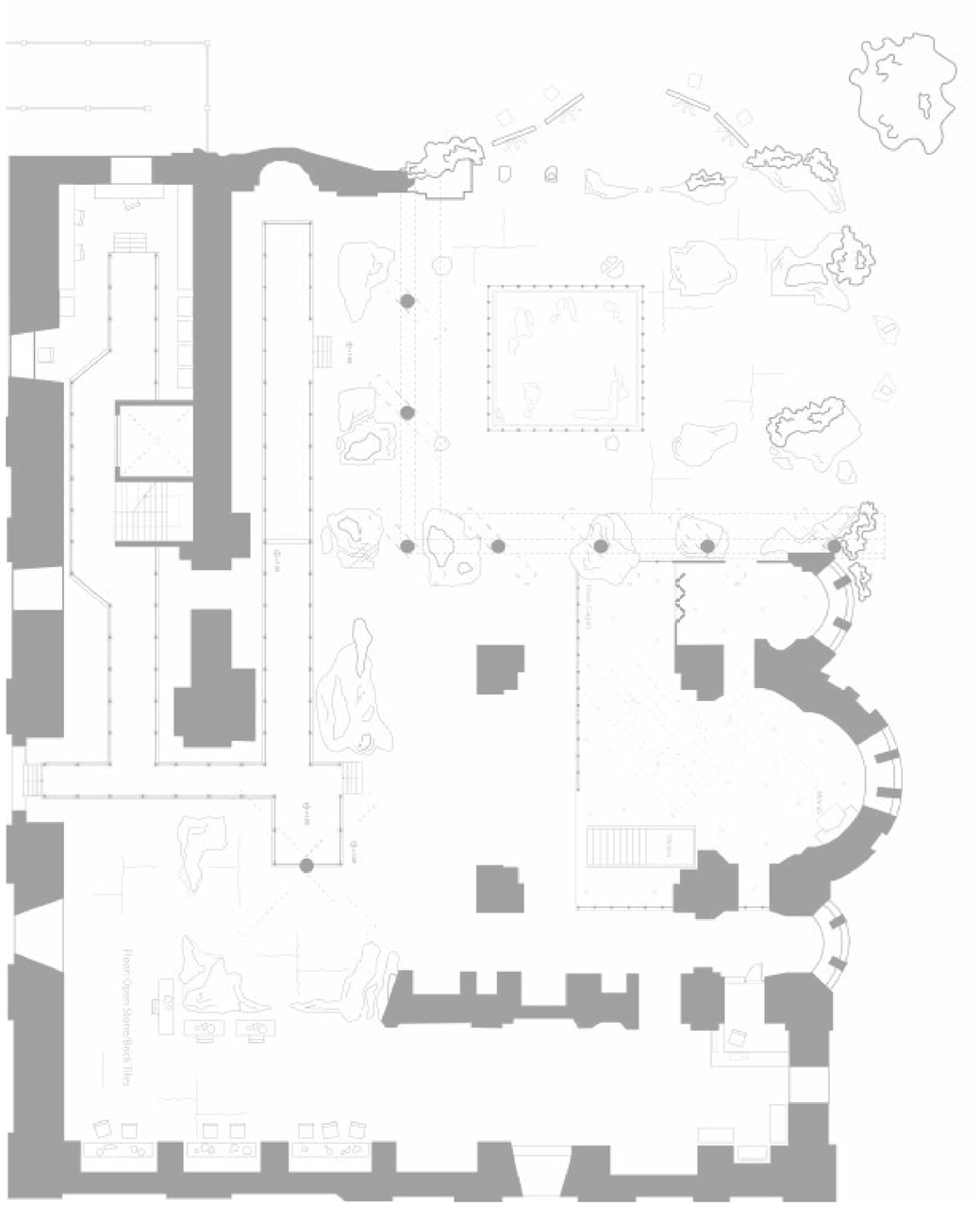
Explorations on form - deconstruction the earlier "star form". Former Deck #1 into three different elements.



Deck #1

One of the standard pieces of decks: essentially a bridge with certain amount of housing on the sides around the central road. It references the much earlier historical precedents of inhabited bridges like the old London bridge.





03

Studio: Dodici Personaggi In Cerca D'autore

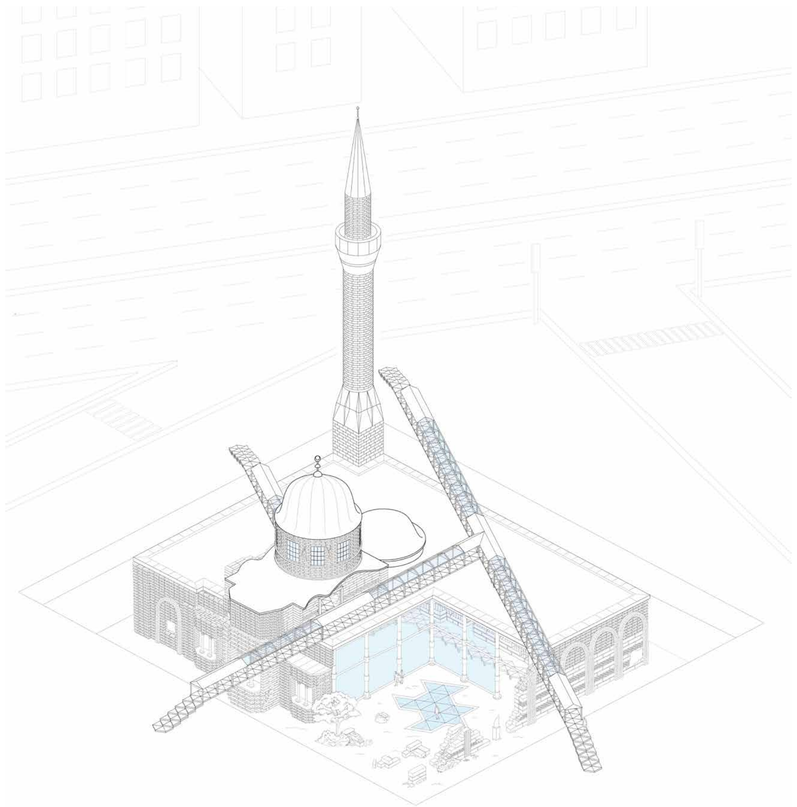
Summative images from 3rd year at the AA

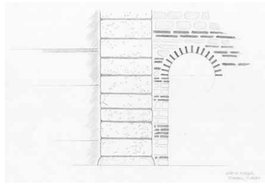
o3

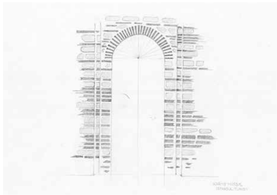
Studio: Dodici Personaggi In Cerca D'Autore

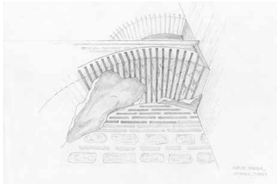
Studio focusing on nationalist connotations of UNESCO's hertage classifications and builds on a criticism of the way architectural identities were projected upon subjective, biased and often misled understandings of ownership in today's world driven by nation states.

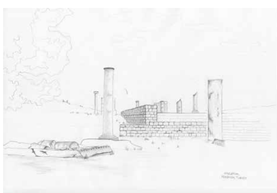
[Tutors: Christopher Pierce, Amandine Kastler, Aram Mooradian]

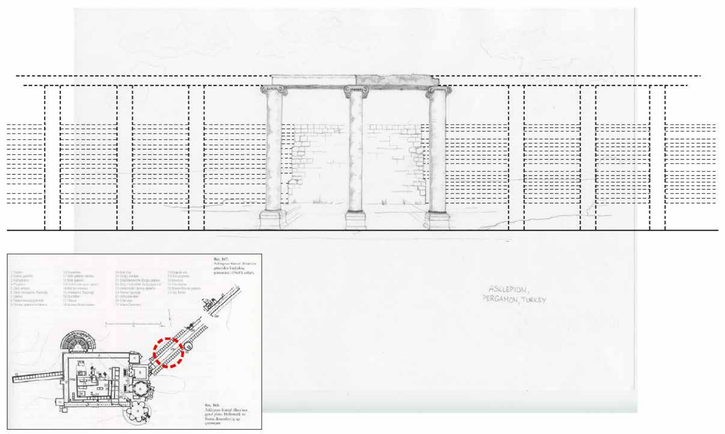


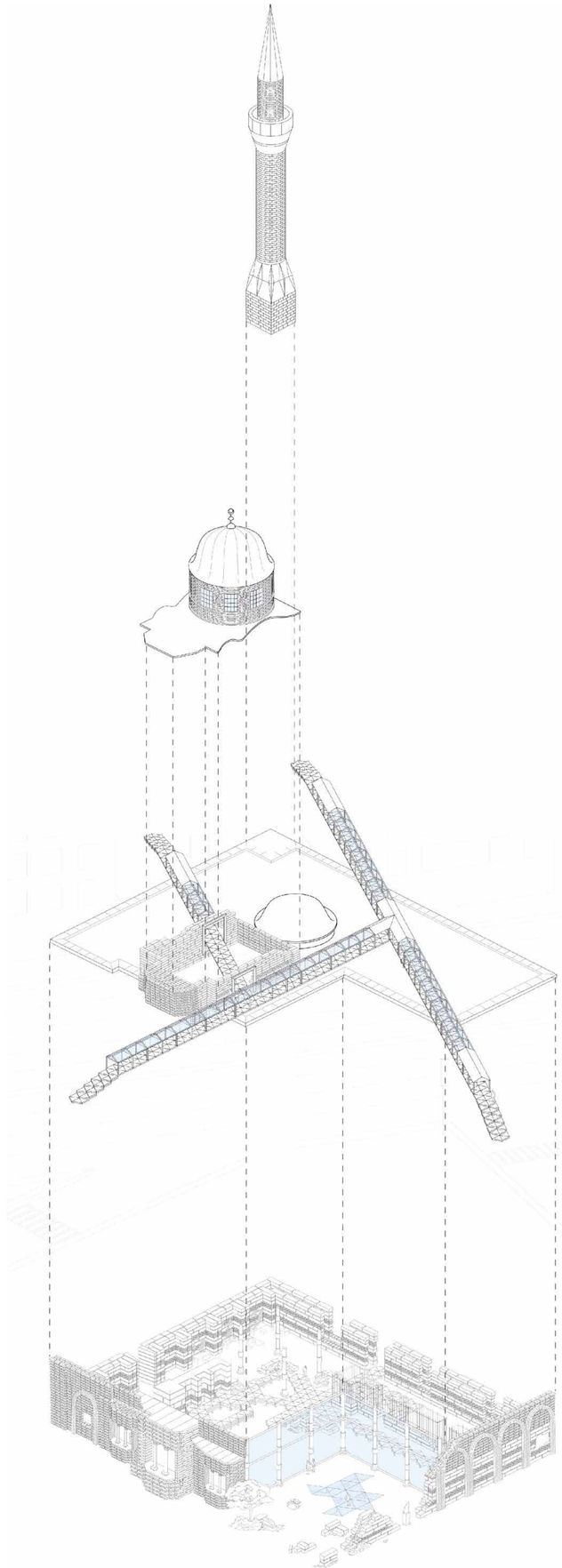










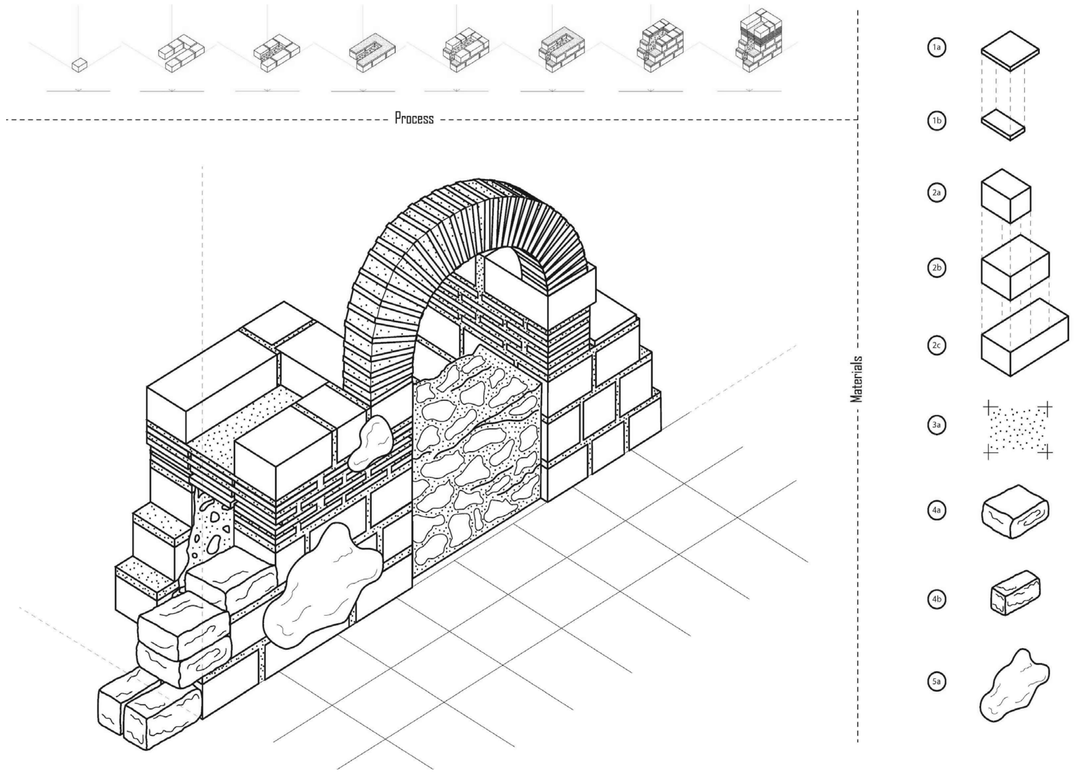


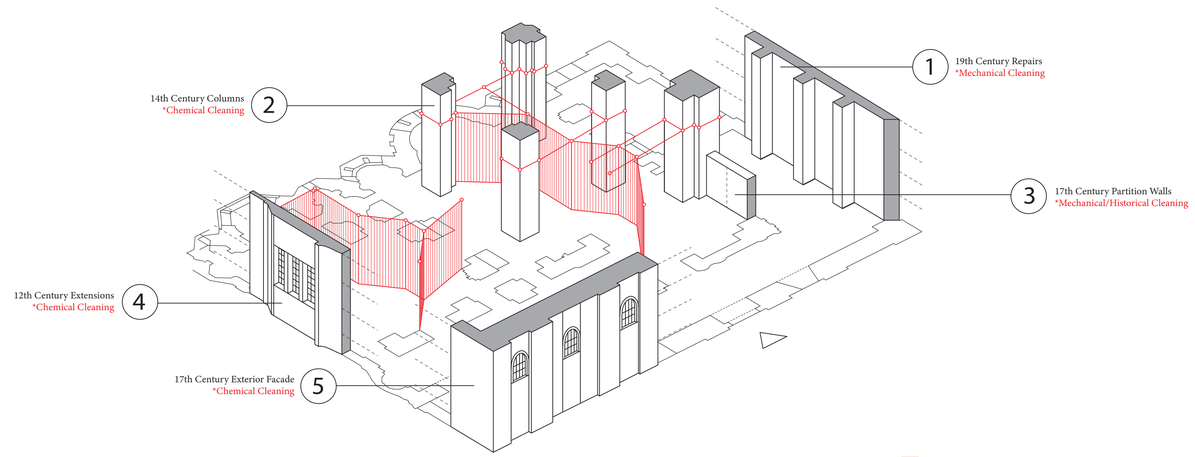
o3

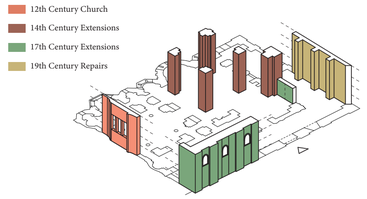
Studio: Dodici Personaggi In Cerca D'Autore

Studio focusing on nationalist connotations of UNESCO's hertage classifications and builds on a criticism of the way architectural identities were projected upon subjective, biased and often misled understandings of ownership in today's world driven by nation states.

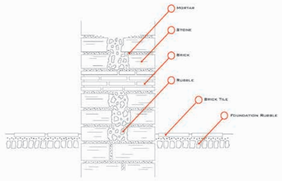
[Tutors: Christopher Pierce, Amandine Kastler, Aram Mooradian]

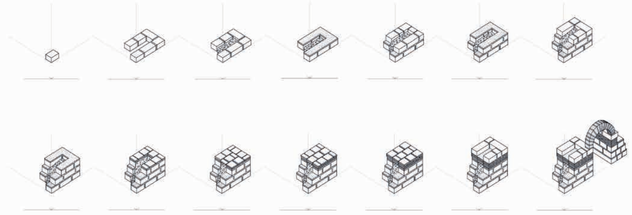


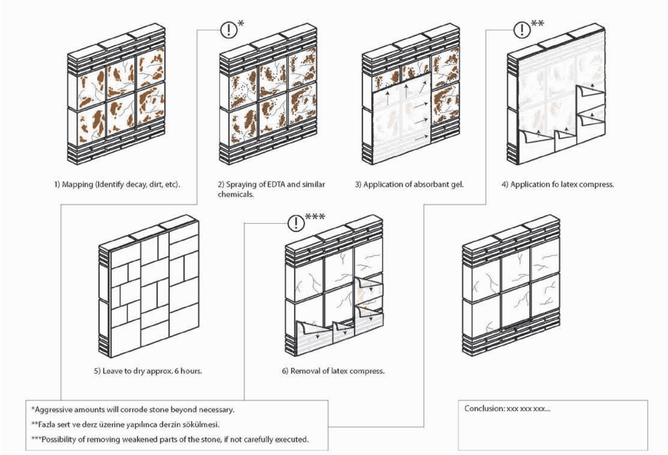


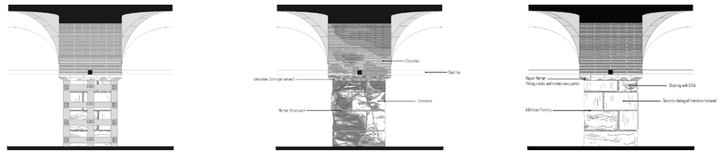


Item No	Item Name	Properties	Quantity
1a	Clay Brick	40x40cm Clay Brick	38
1b	Clay Brick	40x20cm Clay Brick	18
2a	Limestone	45x38cm Stone	9
2b	Limestone	45x80cm Stone	12
2c	Limestone	45x120cm Stone	9
3a	Mortar	Mortar - Rubble mix	n/a
4a	Marble	Marble (Spolia)	3
4b	Marble	Marble (Spolia)	2
5a	Plasterwork	Plaster	n/a









oY

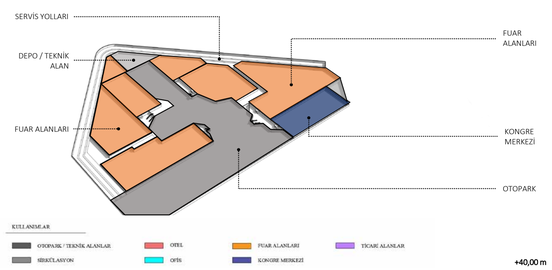
Year-out / Professional Practice

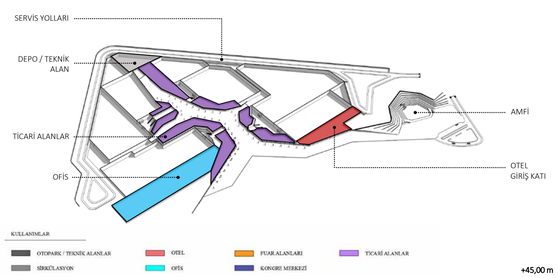
Collection of a few undertakings during the year-out inbetween 3rd and 4th years in AA

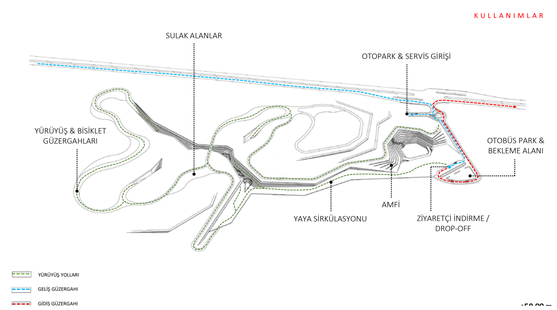
oY

Year-out / Professional Practice

- Few images from a feasability study presented to a municipality in Turkey on a potential exhibition centre, during year-out professional practice experience. (apart from all other work during year-out experience based within larger teams, this pre-concept project was developed by me under supervision and directions of principal architect)

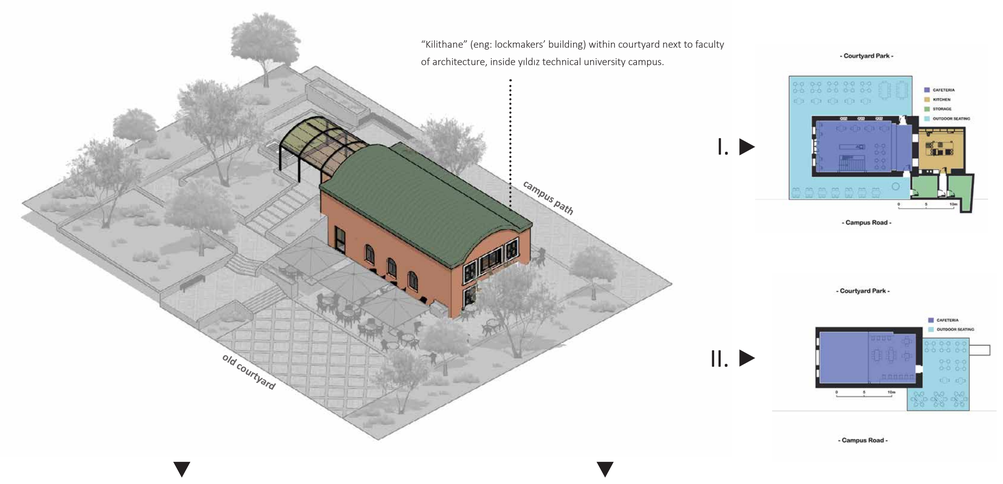


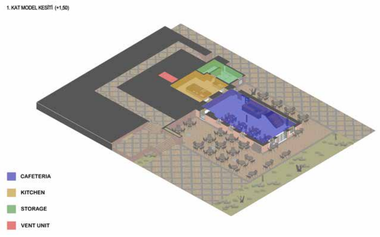


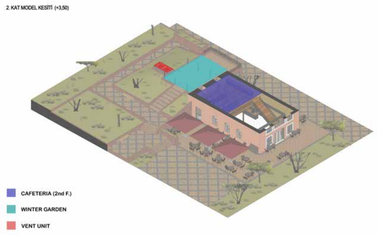


Pre-concept renders from inside the "split"

- Upon request of a small-scale developer client, on a listed (the original built structure could not be altered, including for additional windows and openings) abandoned existing structure and courtyard space in yildiz technical university campus; surveys and consequent 3d modeling work were conducted and proposals for the buildings' interior and exterior re-use were developed in accordance with client's request of its re-purposing into a cafeteria to serve the adjacent faculty of architecture.





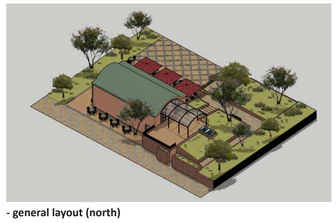


- Interior proposal

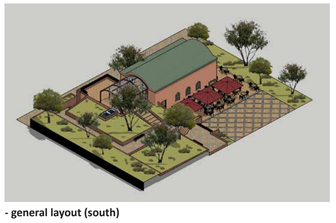
- Interior proposal

- approach & outdoor seating

- approach (courtyard) & outdoor seating



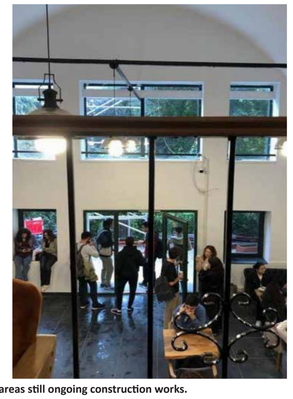
- general layout (north)



- general layout (south)

- previous state of interior

- previous state of interior



- Current state of building interior in use as intended, exterior areas still ongoing construction works.