

PROJECT POTATO

PRISON REHABILITATION THROUGH FARMING

LUCIA YELL

REHABILITATION OF PRISONERS IN HMP LINCOLN


PRISONER HEALTH
Prisoner health in England is declining and re-offending rates are rising due to confinement, inadequate access to healthcare, loss of liberty, and a lack of support beyond the prison sentence.

THE FARMING COUNTY
HMP Lincoln is situated in Lincolnshire, a county known for its contribution to the UK's vegetable supply. This provides an opportunity to link the prisoners to the local community and help them to find job prospects in agriculture.

GROWING POTATOES
The design proposal promotes potato cultivation, as it is an accessible introduction to farming, equipping prisoners with essential agricultural skills. Other vegetables will also be grown on a smaller scale on-site, to introduce prisoners to other vegetables.


A 'SKELETON' DESIGN
The design proposal features exposed timber, glass, and brick. Practically, the structures on-site will act as the 'skeleton' of the design proposal. This is avoid overhauling the site's agricultural focus and allow the vegetables to take precedence.

COMMUNITY BOND
The design includes a cafe that will serve the potatoes grown on-site to the public. Other vegetables cultivated on the premises will also be used in the food production. This will connect the local community with the prisoners, breaking social misconceptions about prisoners.




GROWTH REQUIREMENTS

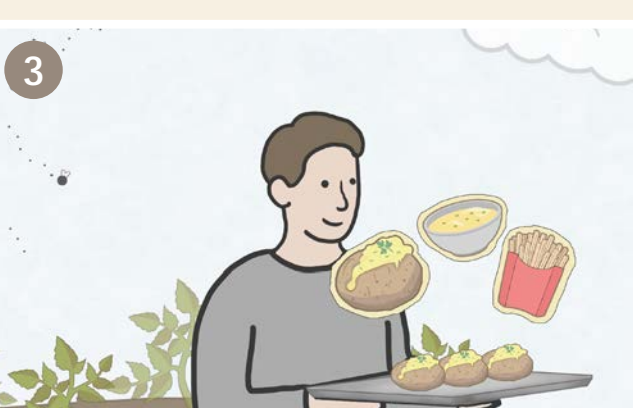
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GERMINATION
Before growing vegetables, the process of germination is required to develop the seeds into new plants.

ENVIRONMENT
Vegetables, such as potatoes, tomatoes, carrots etc. require air, precipitation, sunlight and warmth to grow efficiently.

GROWTH
In optimal conditions, potatoes, and most other vegetables grown in the UK, have a 3 to 5 month growing period.

CONTEXTUAL ANALYSIS

SOIL TYPE AND CLIMATE
Lincolnshire has fertile loam and clay soils. This, alongside consistent rainfall, makes the site suited to growing produce, such as potatoes.

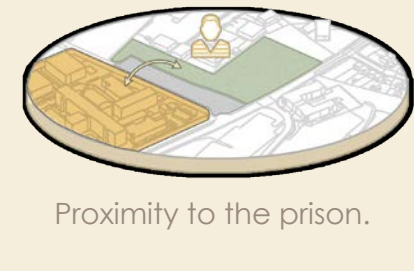
NOISE ANALYSIS
The site is surrounded by noisy localities, which may be audible on-site. However, external noise is unlikely to be of concern as the design proposal on-site will also produce noise.

VEHICLE ROUTES AND PARKING
The site has good bus links from Lincoln city centre and is surrounded by ample car parking. It can also be walked to from the city centre.

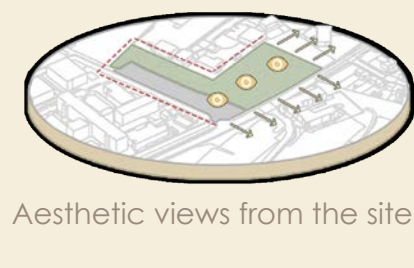
BUILDING TYPOLOGY
The site is surrounded by noisy localities, which may be audible on-site. However, external noise is unlikely to be of concern as the design proposal on-site will also produce noise.

SITE OPPORTUNITIES


Proximity to the prison.




Neighbouring main road.




Aesthetic views from the site.




Proximity to popular locations.



Little surrounding business competition.




Mostly greenfield on-site.




SITE THREATS

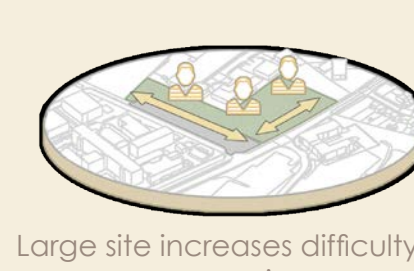
Security and escape risks of the site.




Lack of surrounding greenery.



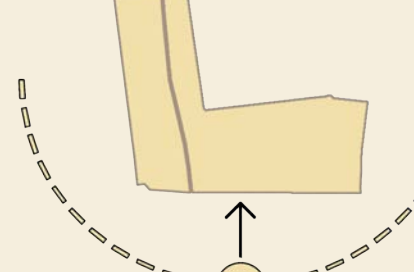
Located on the outskirts of the city centre.




Demolition of the existing car park on-site.



Large site increases difficulty to manage prisoners.

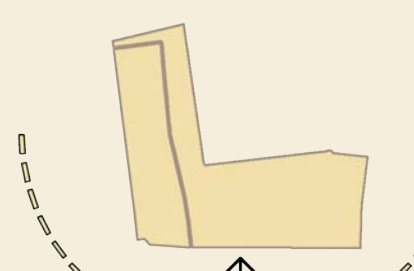


Public perspective of the prison and the site.

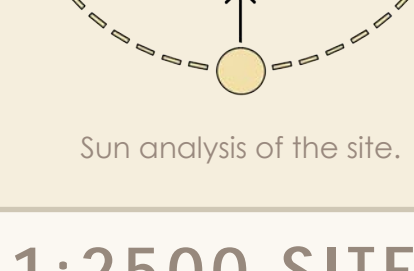


WEATHER ANALYSIS

Sun analysis of the site.



Rain and wind analysis of the site.



1:2500 SITE ANALYSIS

SITE COMPOSITION
The existing site will be converted back into a full greenfield site as the design proposal requires soil. Therefore, the concrete will need to be demolished. The size of the site is 1000m², but the built-up area will take up 4000m² in the proposed design.

USE OF SITE
The existing site will be renovated from a car park, into a farming space for prisoner use. There will also be a cafe for public use.

SITE ACCESS
Due to the demolition of the existing car park, which was the only access point onto the site, there will be two new access points, where one will be for prisoners and the other will be for the public.

CONNECTION TO PRISON
Originally, the site's existing car park had no direct connection to the prison. The proposed site will have a path for prisoners to access the site directly from the prison.

THE DESIGN PROPOSAL

CAFE
Makes the potatoes and other produce grown on-site into dishes served to the public.

VERTICAL FARMING
The potatoes are grown here in a controlled environment. Vertical farming maximises the space on-site.

MULTI-PURPOSE
This building can be used as a break room or as an educational space to teach the prisoners about farming.


STORAGE
The second half of this building is for the storage of vegetables and large farming equipment.

PERMACULTURE
Using permaculture to teach prisoners how to grow produce in an external and unpredictable environment.

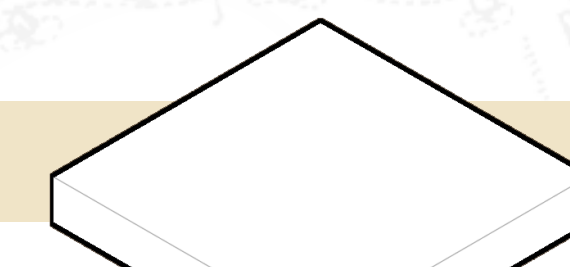
SITE SECURITY
The site has been secured using a moat design, with pond plants growing at the edge of the moat. Natural barrier system.

MASSING OF BUILDINGS

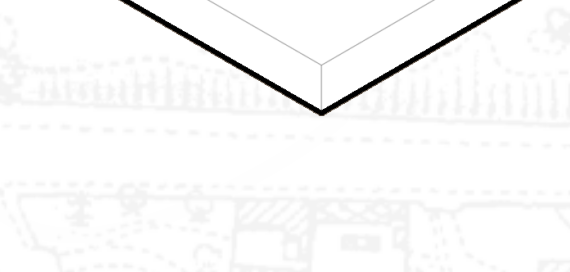
The original shape of the vertical farms before massing.



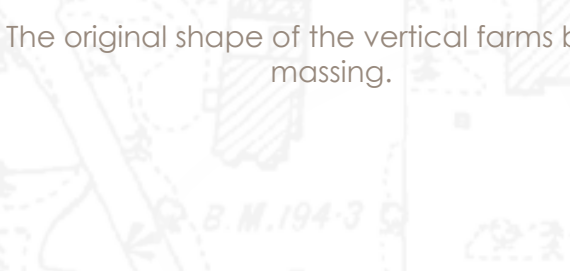
A post-and-beam framing has been added with a bracing system at the core of the building. The framing has been angled to allow for more window space.




Sun shades have been added to the perimeter to avoid direct sunlight that could cause glare and overheating.



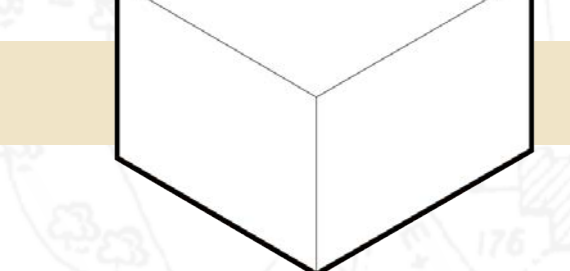
Multiple floors were added to increase the quantity of produce being grown without taking up any further ground space.




The ground floor was converted into a germination space to germinate the potatoes before planting them.




A wind tower was added to the centre of the vertical farms to allow air circulation between the floors. Stairs were added to the side as a form of fire escape.




The vertical farms are attached by lobbies, which also serve as the main entrances to inside.




The original shape of the multi-purpose building before massing.




The floor was elevated to match with the geographical landscaping.




Windows and lobbies were added to allow for daylight intake and to preserve heat.




The building was elevated to allow for prisoners to enter the site from underneath.




The original shape of the cafe and storage building before massing.




The building curved to match with the geographical landscaping and provide easy access to the different rooms.



Parapet walls were added to improve the aesthetic value of the building. Sedum roofs were added to increase biodiversity.



A window tower was added to the cafe space to allow for plentiful natural ventilation.

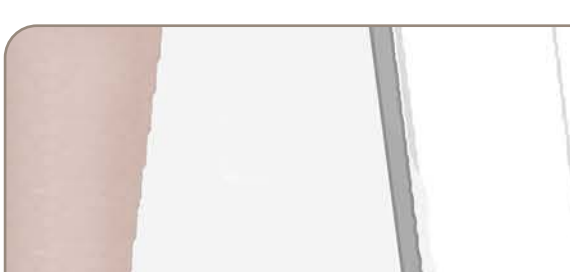


1:500 SITE PLAN


PLAN PERSPECTIVES

1:50 DETAILING (VERTICAL FARMS)


1 VERTICAL FARMS



2 CAFE & STORAGE



3 MULTI-PURPOSE



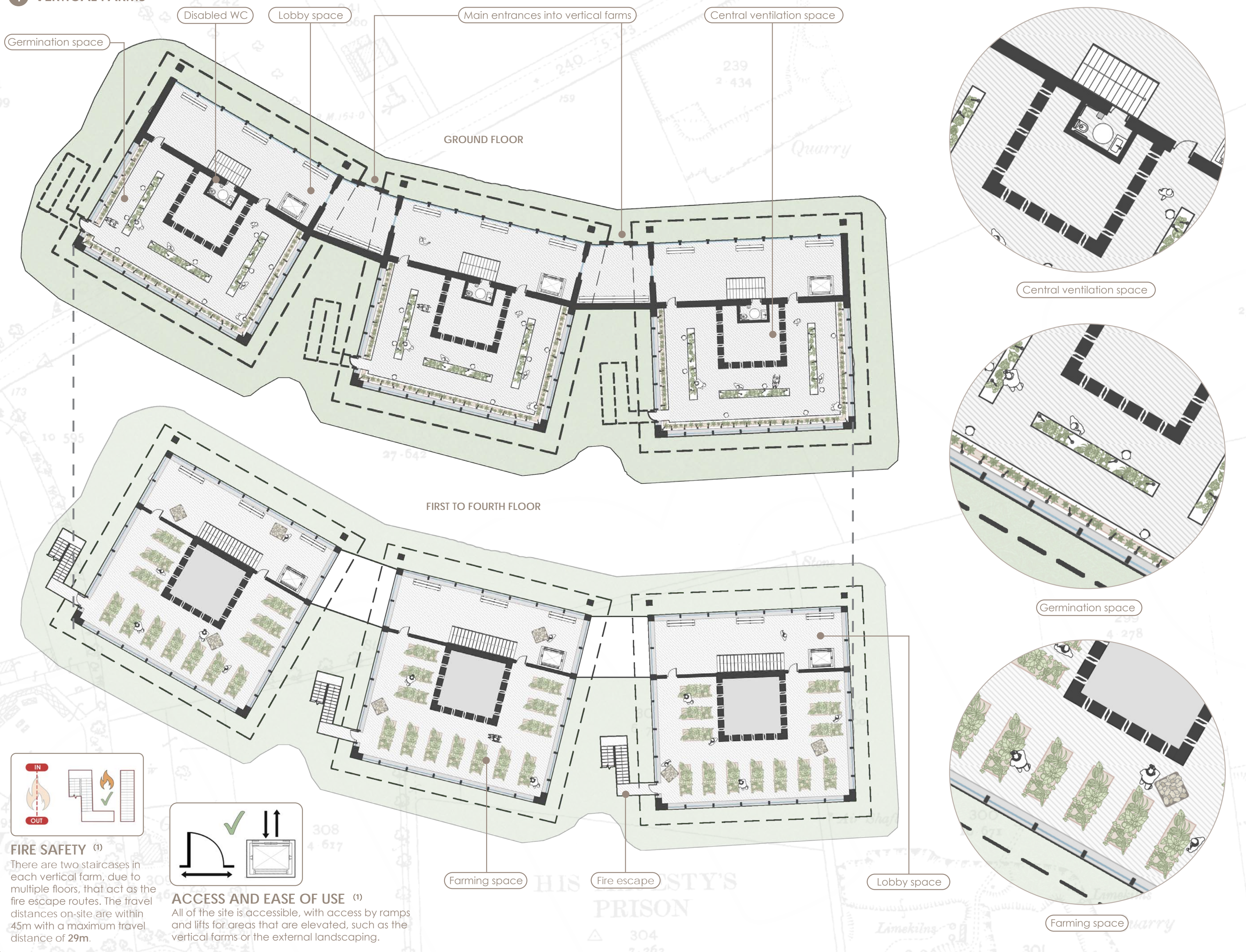
U-VALUES OF VERTICAL FARMS
Ground Floor = 0.17 W/m²K
First to Fourth floor = 0.10 W/m²K
Walls = 0.11 W/m²K

Vertical farms:
Plywood suspended ceiling with service access
25mm
Aluminium flashing
25mm
Cedar flooring and underflooring
100mm
Cedar cladding
100mm
Cedar solar shading
Weep hole with cavity tray
25mm
Horizontal wood battens
200 x 100mm
Woodfire insulation
200mm
Cavity with wall ties
50mm
Double-glazed windows
25mm
WPC and sheathing boards
25mm
Yellow Brick Cladding
100mm
DPM
CLT flooring
330mm
Internal steel fixings with bolts
Reinforced concrete pile foundation

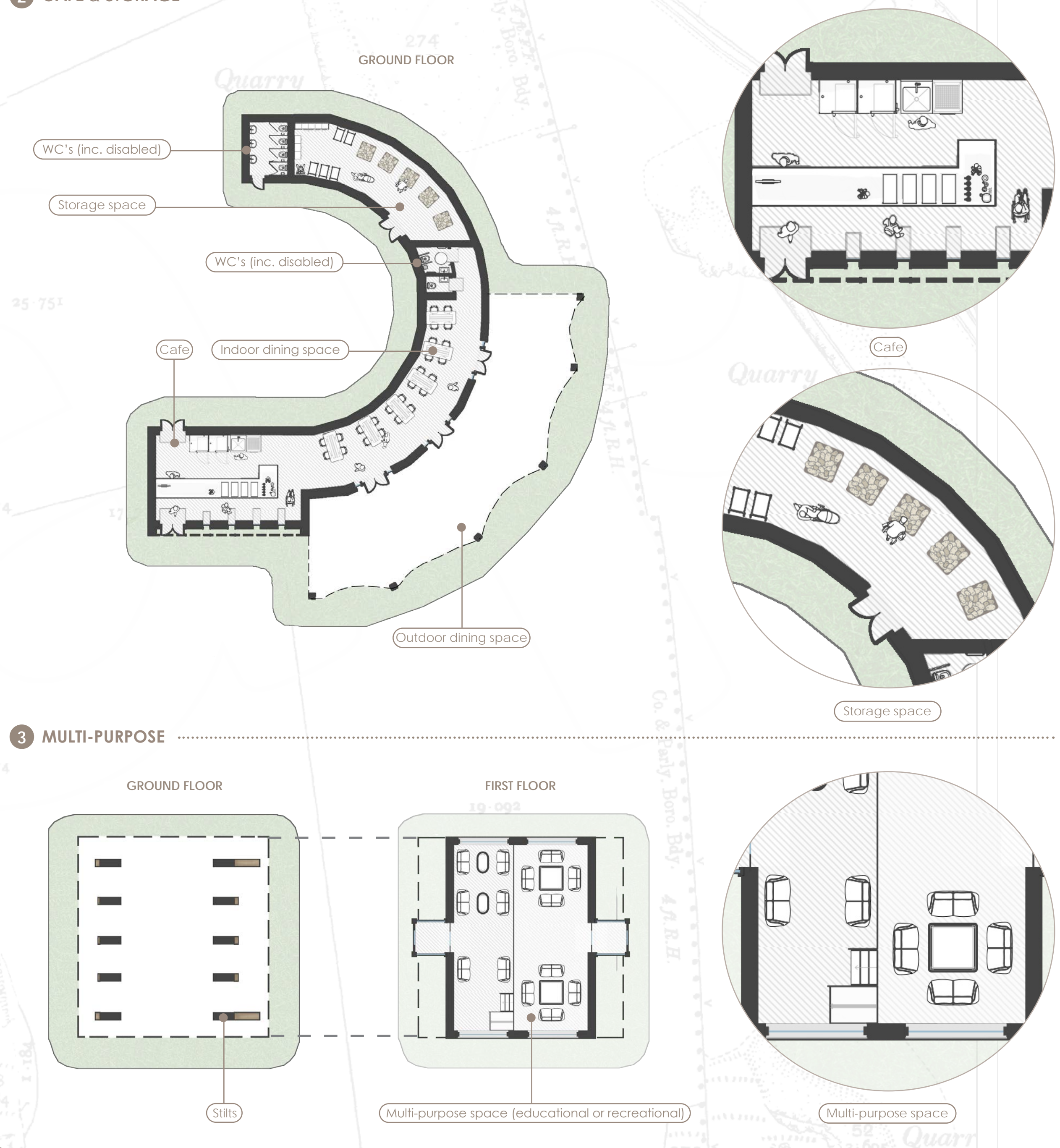
Cafe and storage:
Plywood suspended ceiling with service access
25mm
Aluminium flashing
25mm
Cedar flooring and underflooring
100mm
Cedar cladding
100mm
Cedar solar shading
Weep hole with cavity tray
25mm
Horizontal wood battens
200 x 100mm
Woodfire insulation
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Cavity with wall ties
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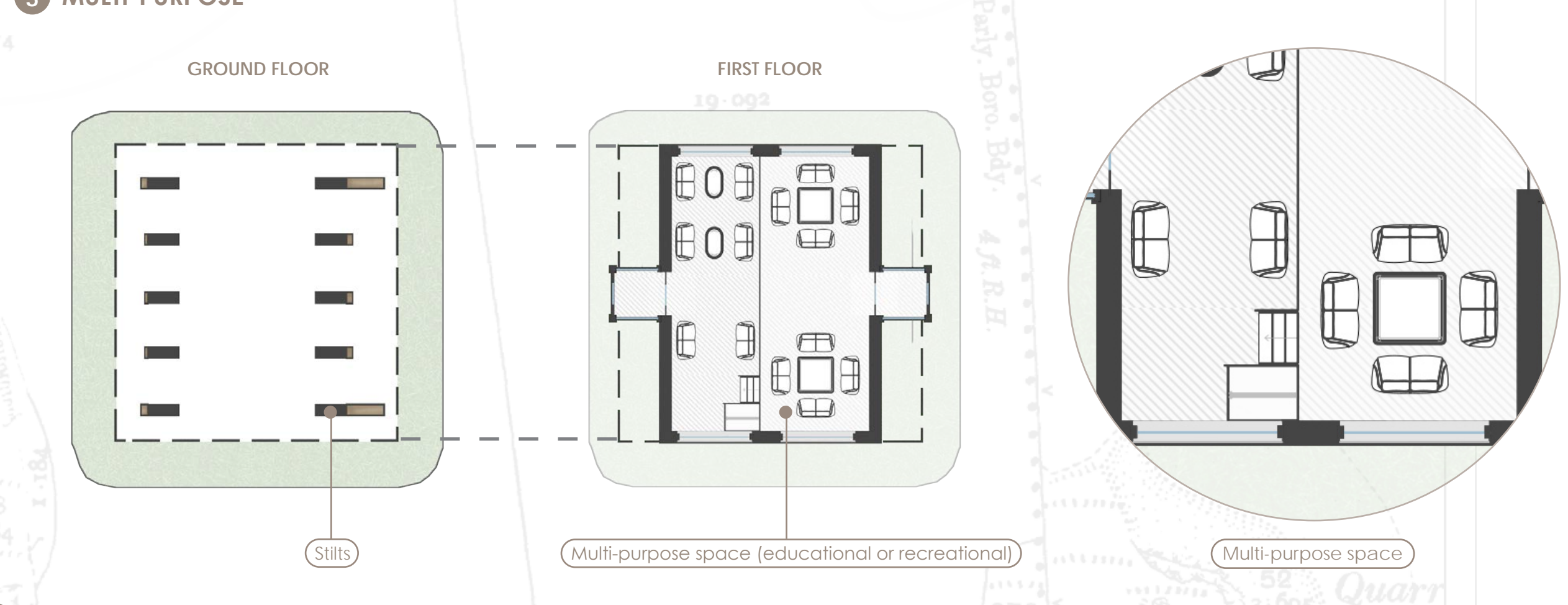
1 VERTICAL FARMS



2 CAFE & STORAGE



3 MULTI-PURPOSE

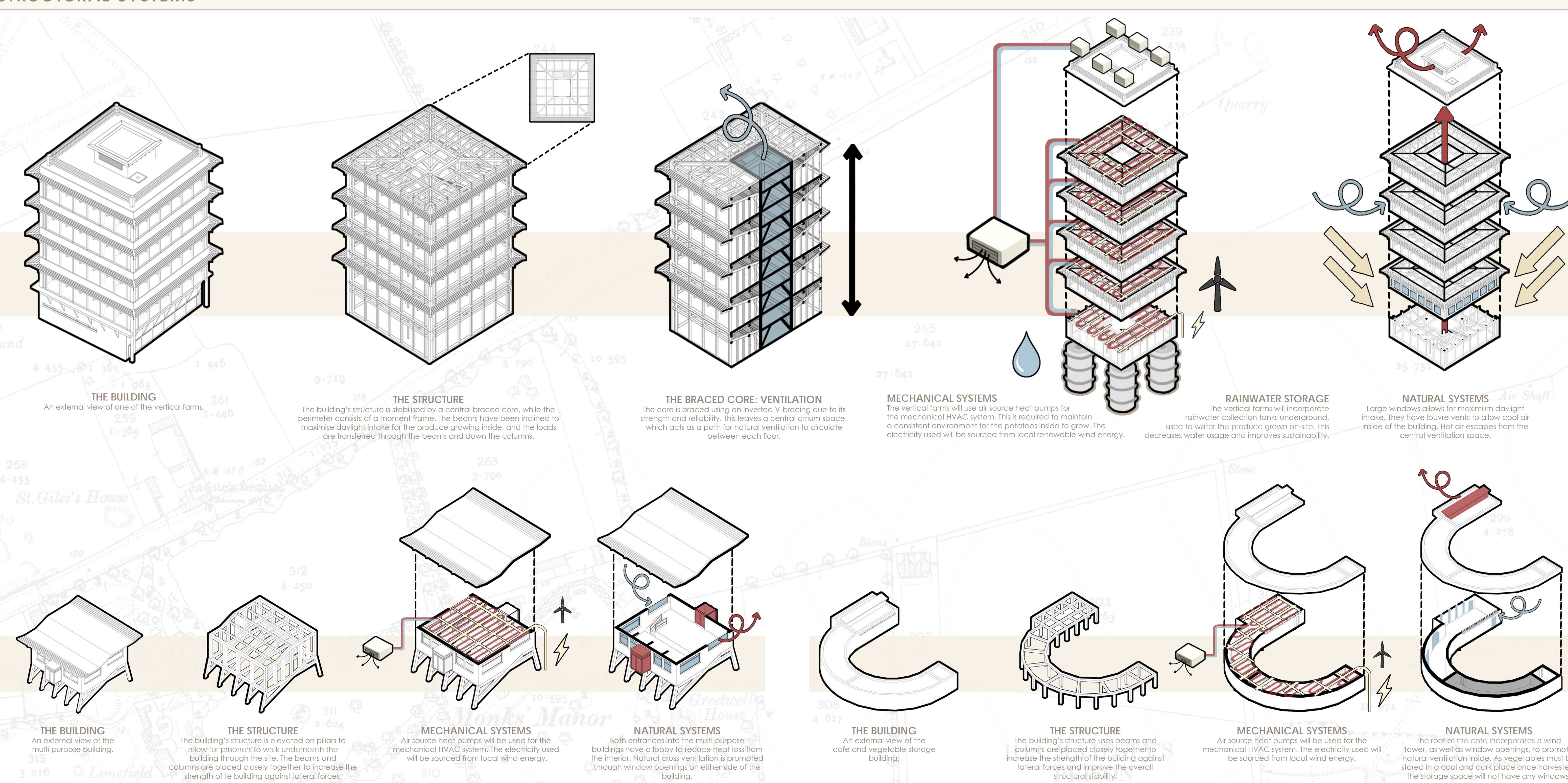


1:200 ELEVATIONS

SOUTH ELEVATION

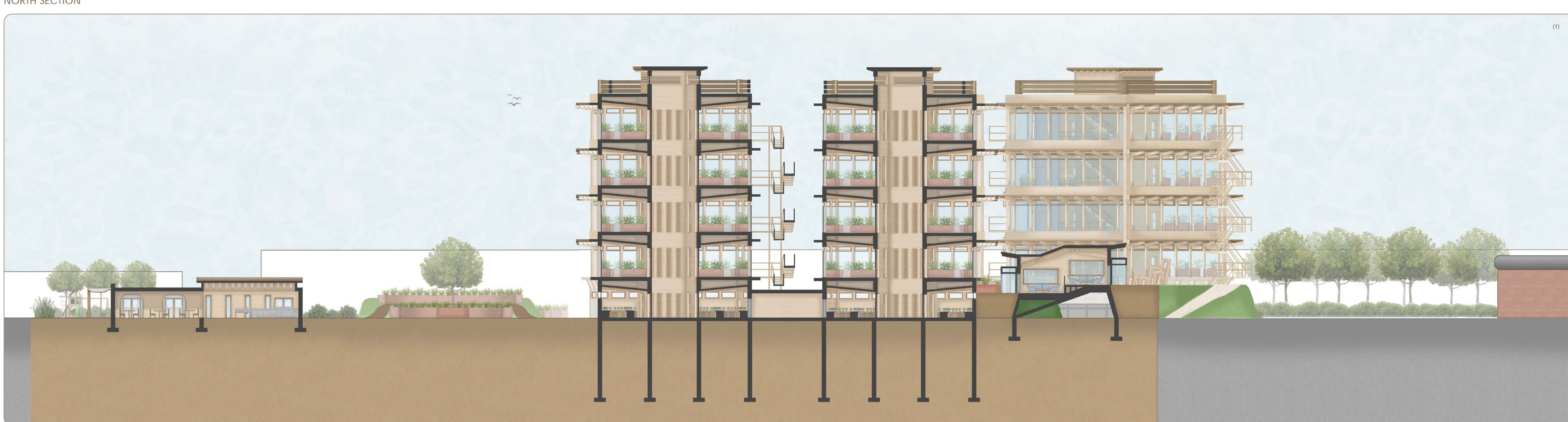


NORTH ELEVATION

STRUCTURAL SYSTEMS ⁽¹⁾

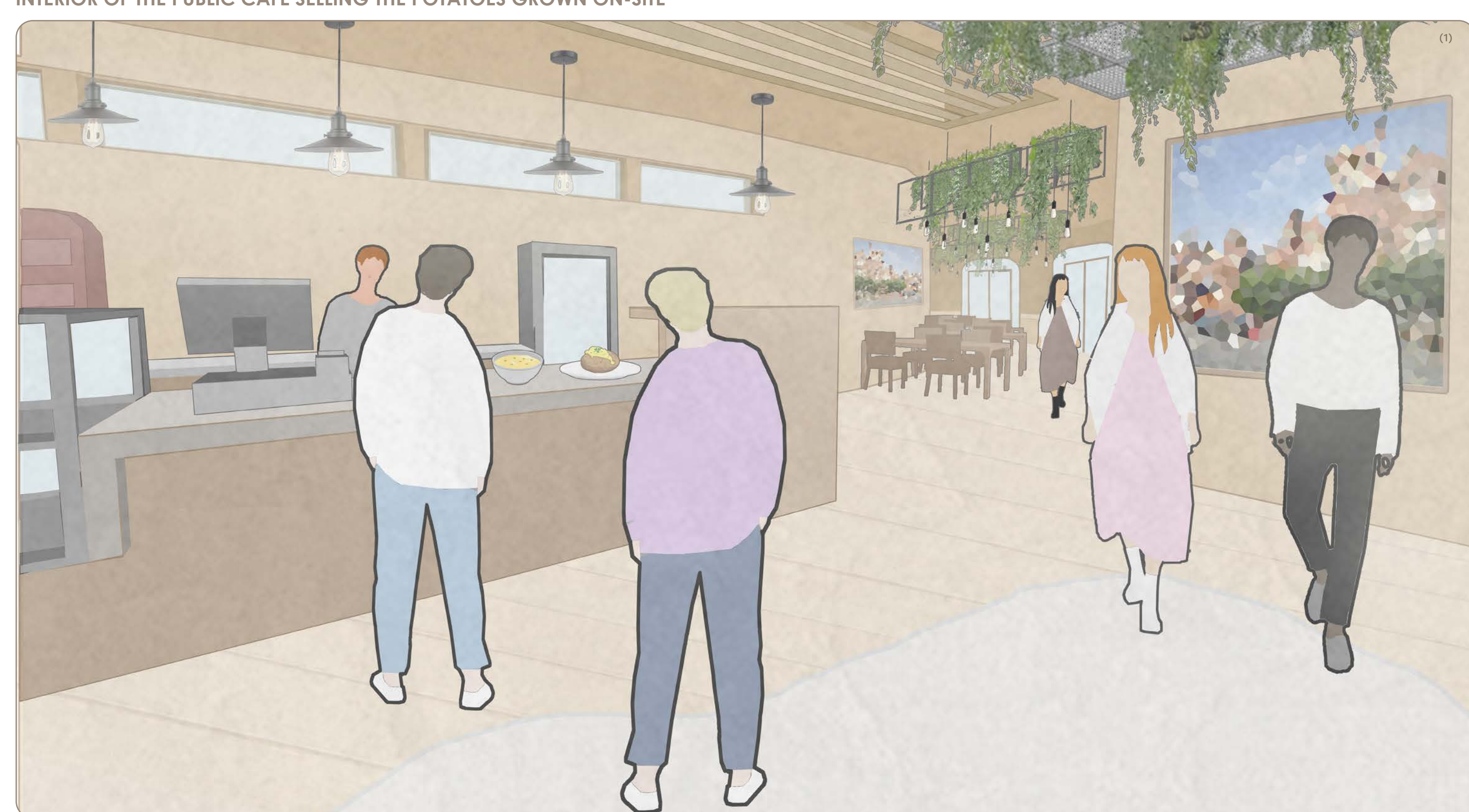
1:200 SECTION A-A

NORTH SECTION



INTERNAL RENDERS

INTERIOR OF THE PUBLIC CAFE SELLING THE POTATOES GROWN ON-SITE



INTERIOR OF THE FARMING SPACE IN THE VERTICAL FARMS

