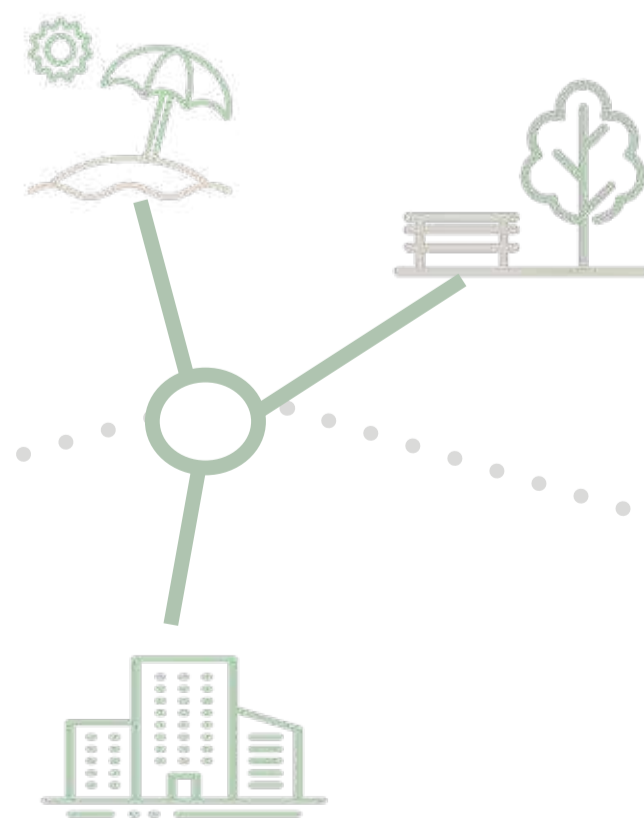


# THE GATEWAY NEXUS

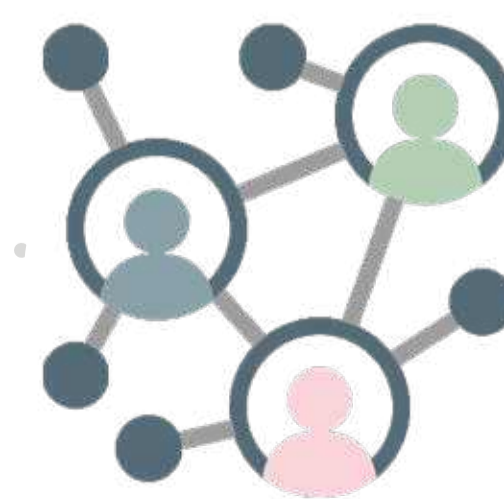
A GATEWAY TO UNITING **TRADE**, **EDUCATION** AND **LEISURE** IN PURSUIT OF FOOD SUSTAINABILITY



SUSTAINABILITY : ENERGY, WATER, HEATH AND WELLBEING



CONNECTIVITY



COMMUNITY ENGAGEMENT

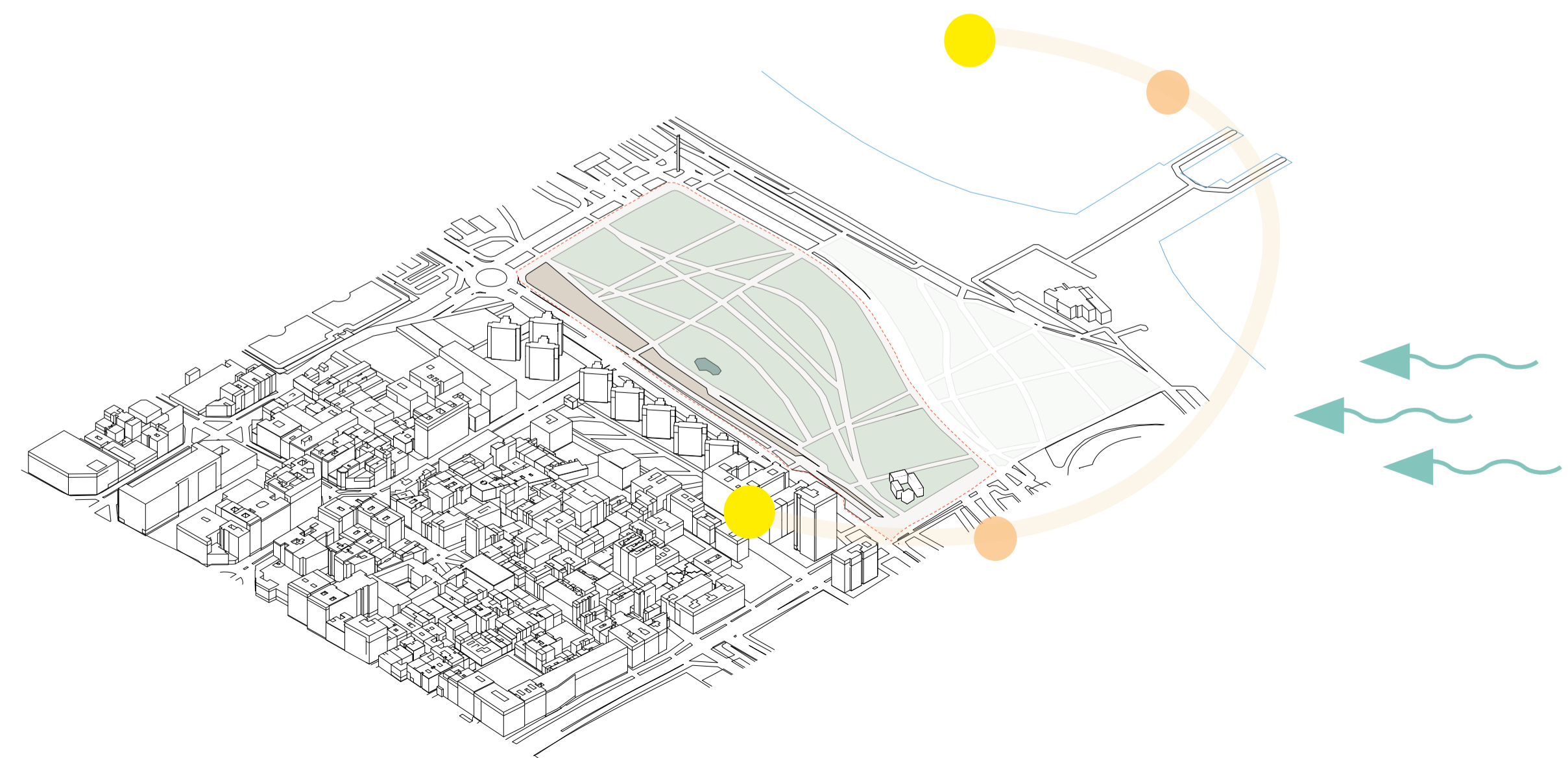
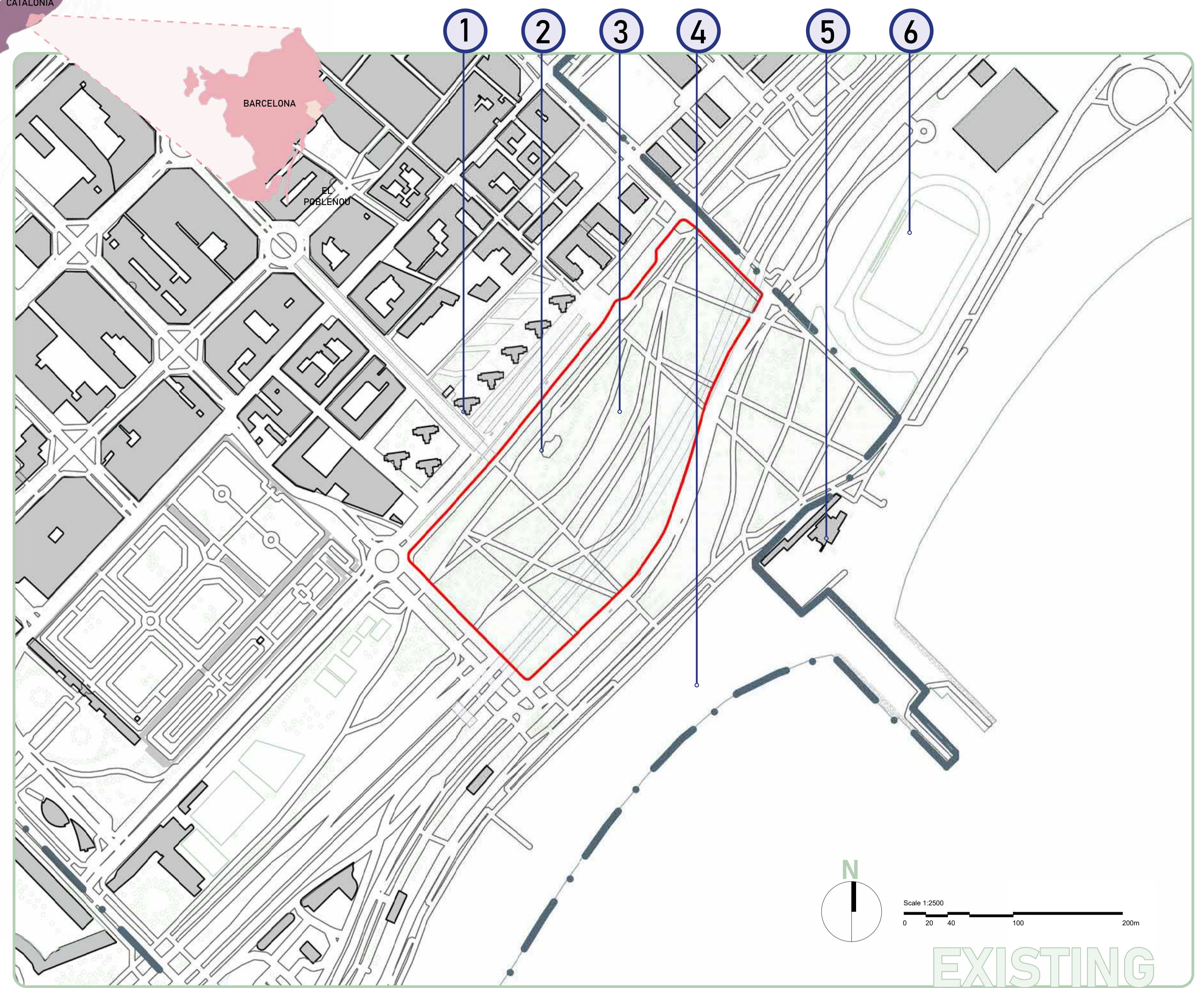
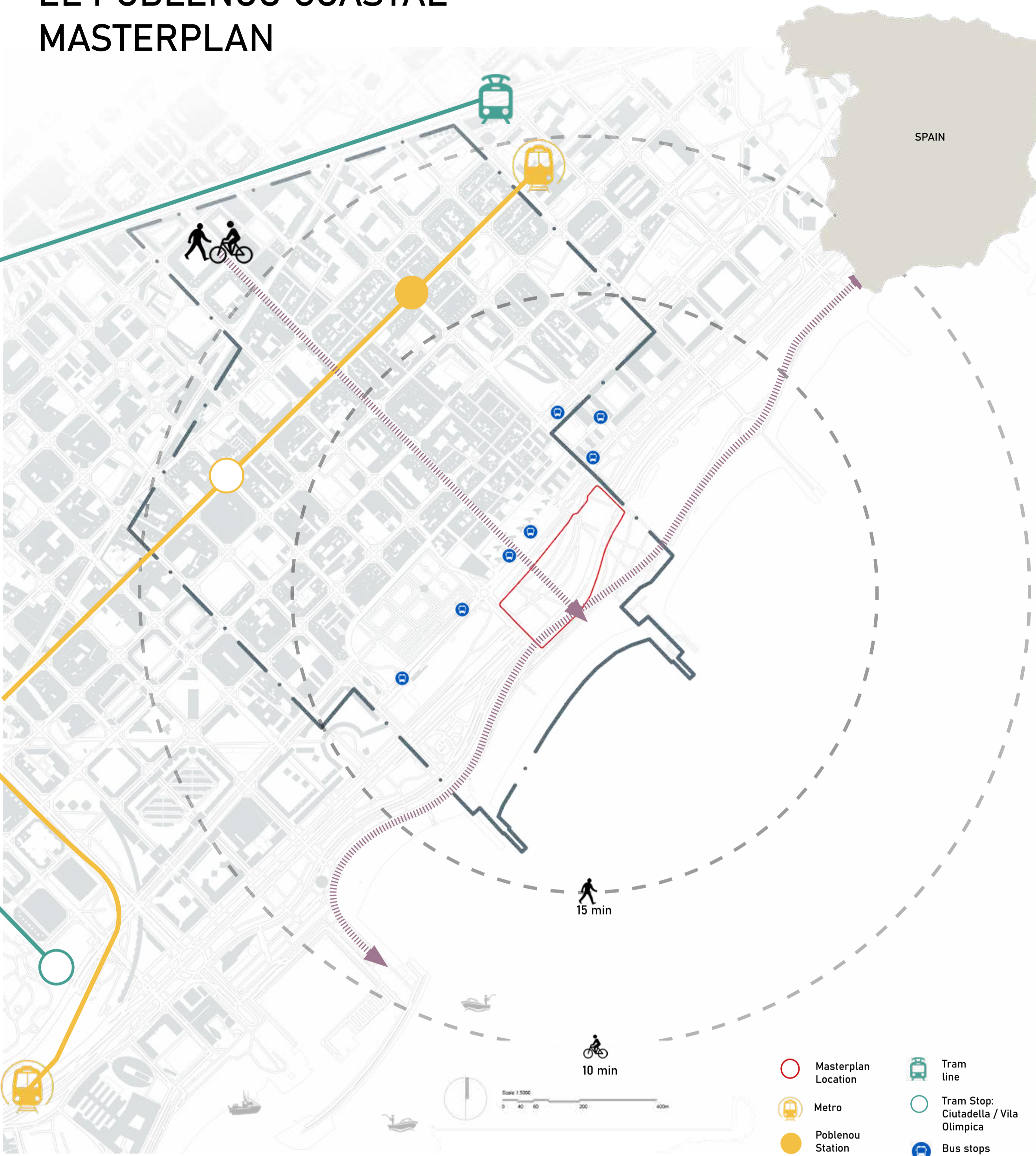


CONNECTING WITH THE EXISTING VEGETATION



THE NEXUS

# EL POBLENOU COASTAL MASTERPLAN



- Masterplan Location
- Metro
- Poblenou Station
- Llacuna Station
- Tram line
- Tram Stop: Ciutadella / Vila Olímpica
- Bus stops
- Pedestrianised walkways and cycle routes



1  
EXISTING APARTMENTS



2  
EXISTING PLAY PARK



3  
PARC DEL POBLENOU



4  
EL POBLENOU BEACH



5  
POBLENOU NAUTICAL CLUB - WINDSURFING

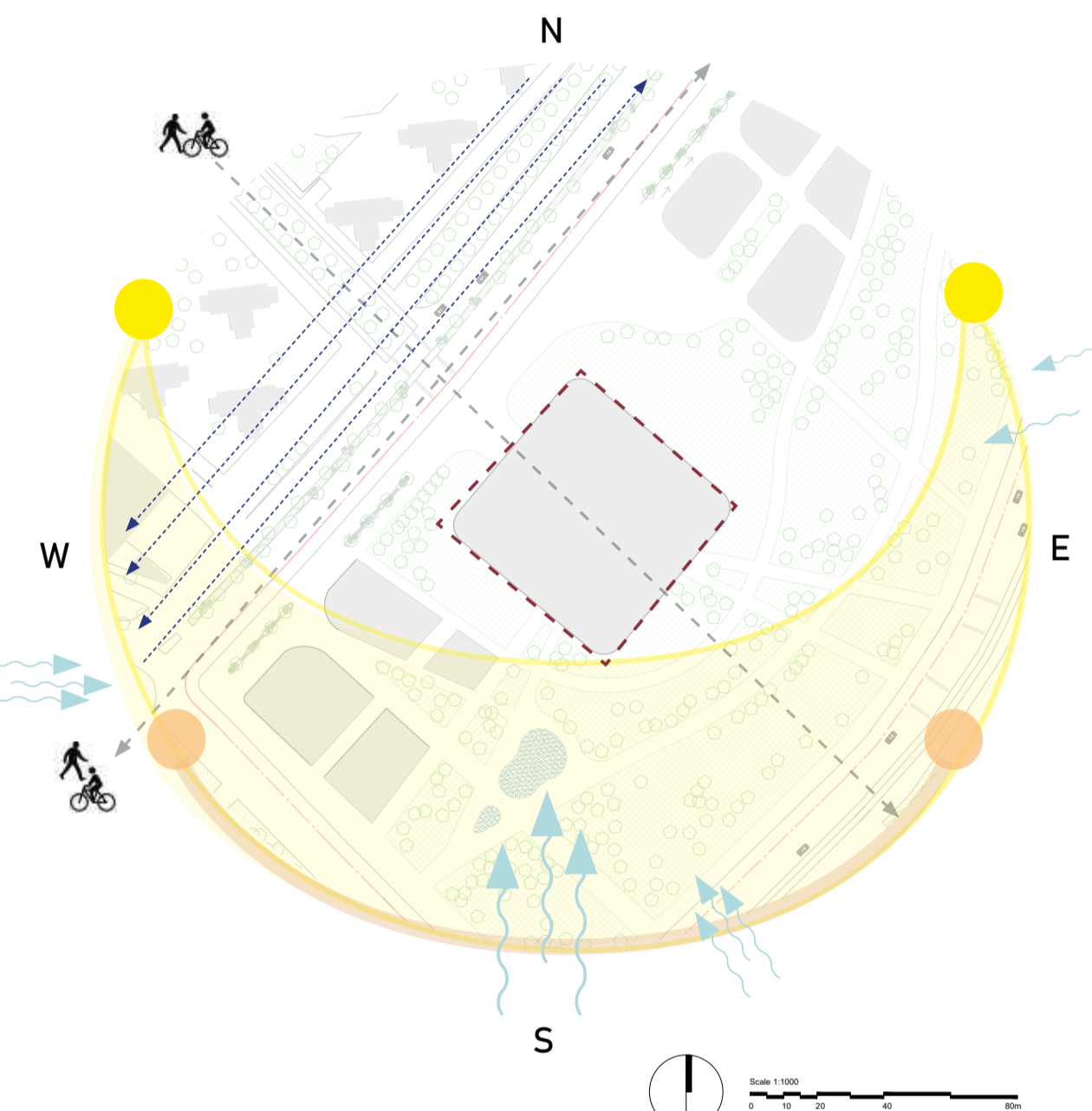
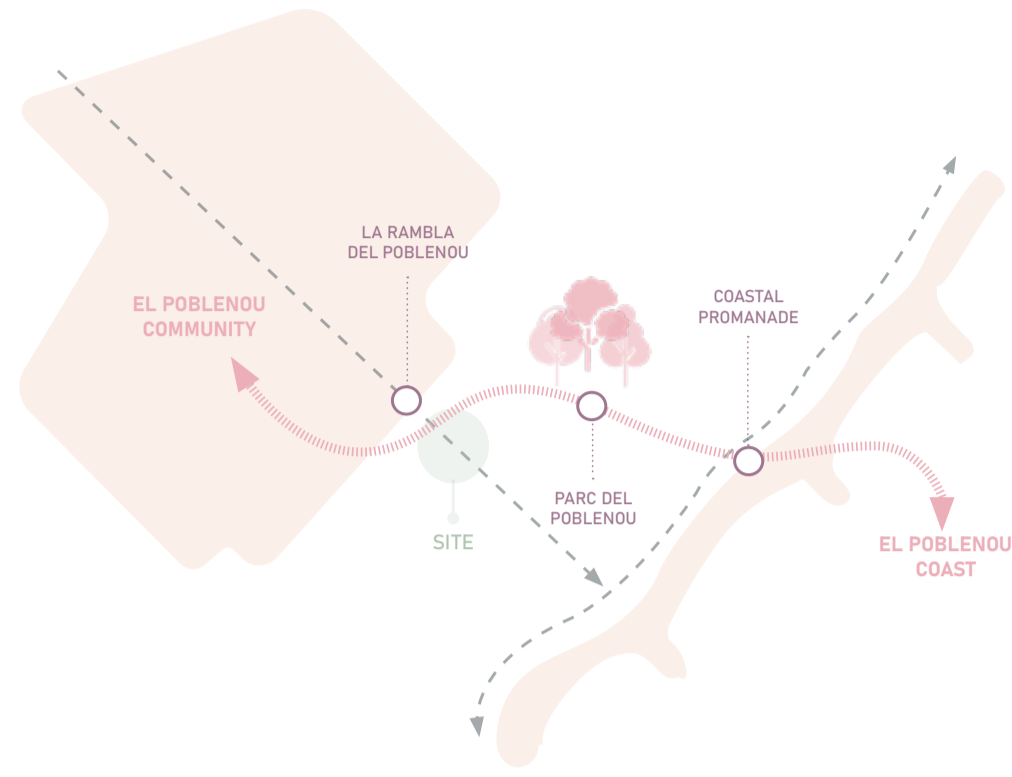


6  
PISTA ATLETISMO LA MAR BELLA - SPORTS FACILITIES

All the existing activities along the coastal front are either seasonal or sport related, it would benefit from more community centric amenities to increase community engagement all year round.

EXISTING

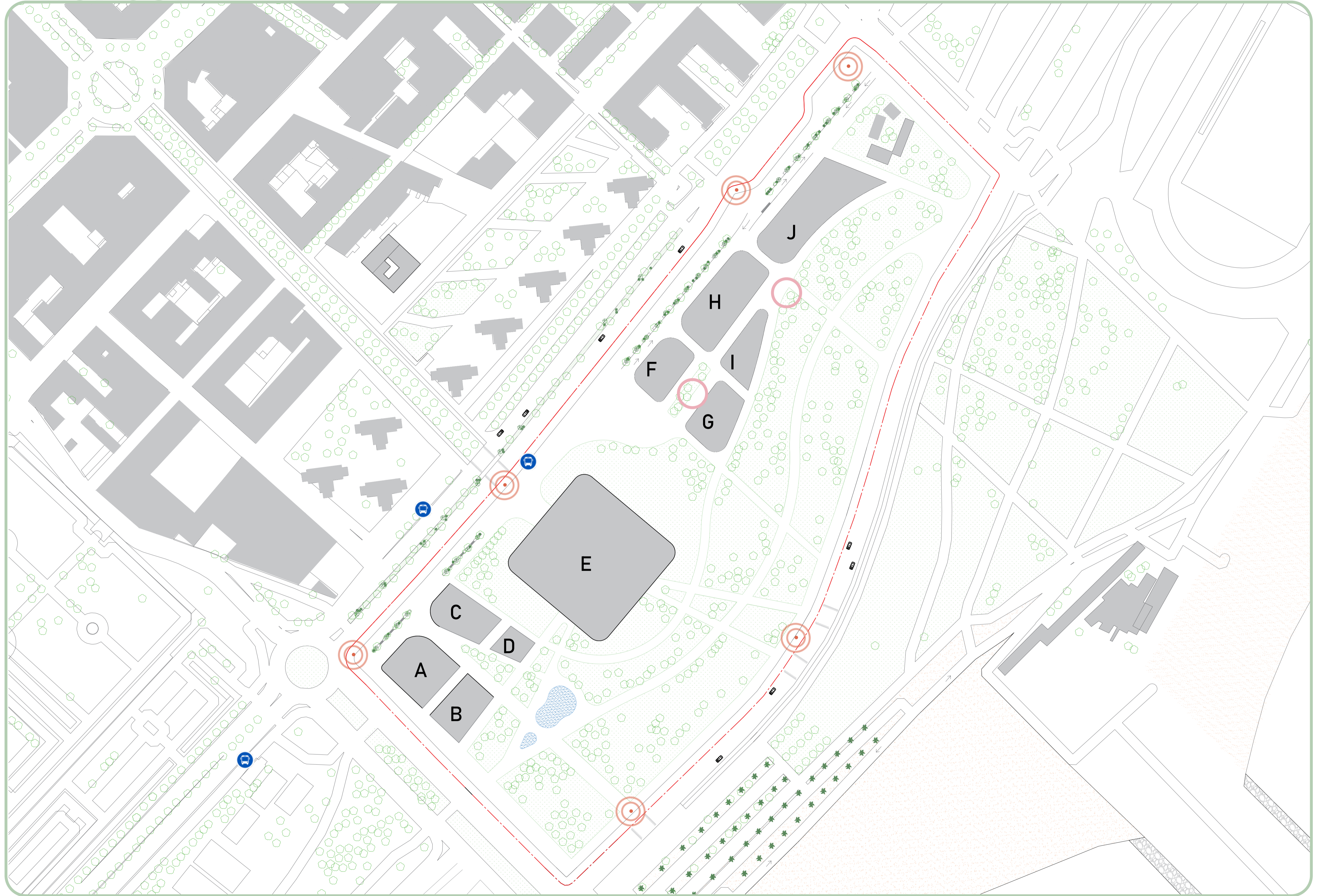
# THE GATEWAY CONNECTOR



- SITE ANALYSIS KEY**
- Vehicle Routes
  - Site Boundary
  - Pedestrian & Cycle Routes
  - Prevailing Wind
  - Winter Solstice
  - Summer Solstice

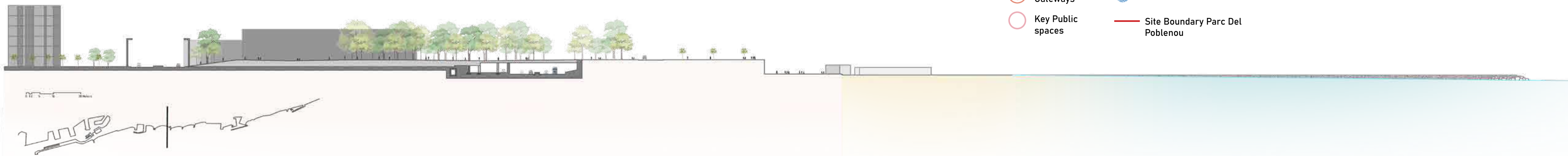
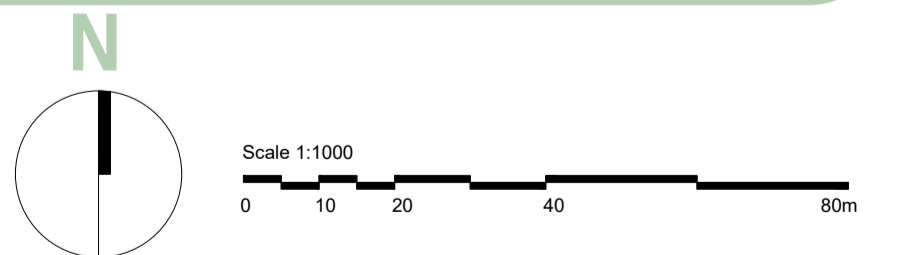
Plots	m2	ft2
A	758	8159.04
B	523	5629.53
C	574	6178.48
D	208	2238.89
<b>E</b>	<b>3826</b>	<b>41182.72</b>
F	546	5877.1
G	595	6404.53
H	1056	11366.69
I	439	4725.36
J	1301	14003.85

# PROPOSED



**MASTER PLAN KEY**

- BUS STOP
- Site Gateways
- Key Public Spaces
- Family Play Park
- Site Boundary Parc Del Poblenou



# THE ISSUE

Dr Ana Moragues Faus an expert in sustainable food systems and urban food policies at the University of Barcelona highlighted the following issues, that both the Mercat Del Peix Research Centre, @22 Food Lab Research Centre and the Barceloneta Fishing port are both advocating solutions for:

## PROBLEMS:

- INADEQUATE DIETS
- ULTRA PROCESSED FOOD
- OVERFISHING



**90,000 DEATHS IN SPAIN and 1 IN 5 DEATHS IN CATALONIA** caused by **INADEQUATE DIETS**

**43.7% INCREASE** in **GLOBAL SALES OF ULTRA PROCESSED FOOD** in the last 13 years, and is linked to a **GREATER THAN 10% INCREASE OF CANCER AND OTHER HEALTH RELATED CONSEQUENCES.**

**GLOBALLY MARINE POPULATIONS AS A WHOLE HALVED BETWEEN 1970 AND 2012**

## SOLUTIONS:

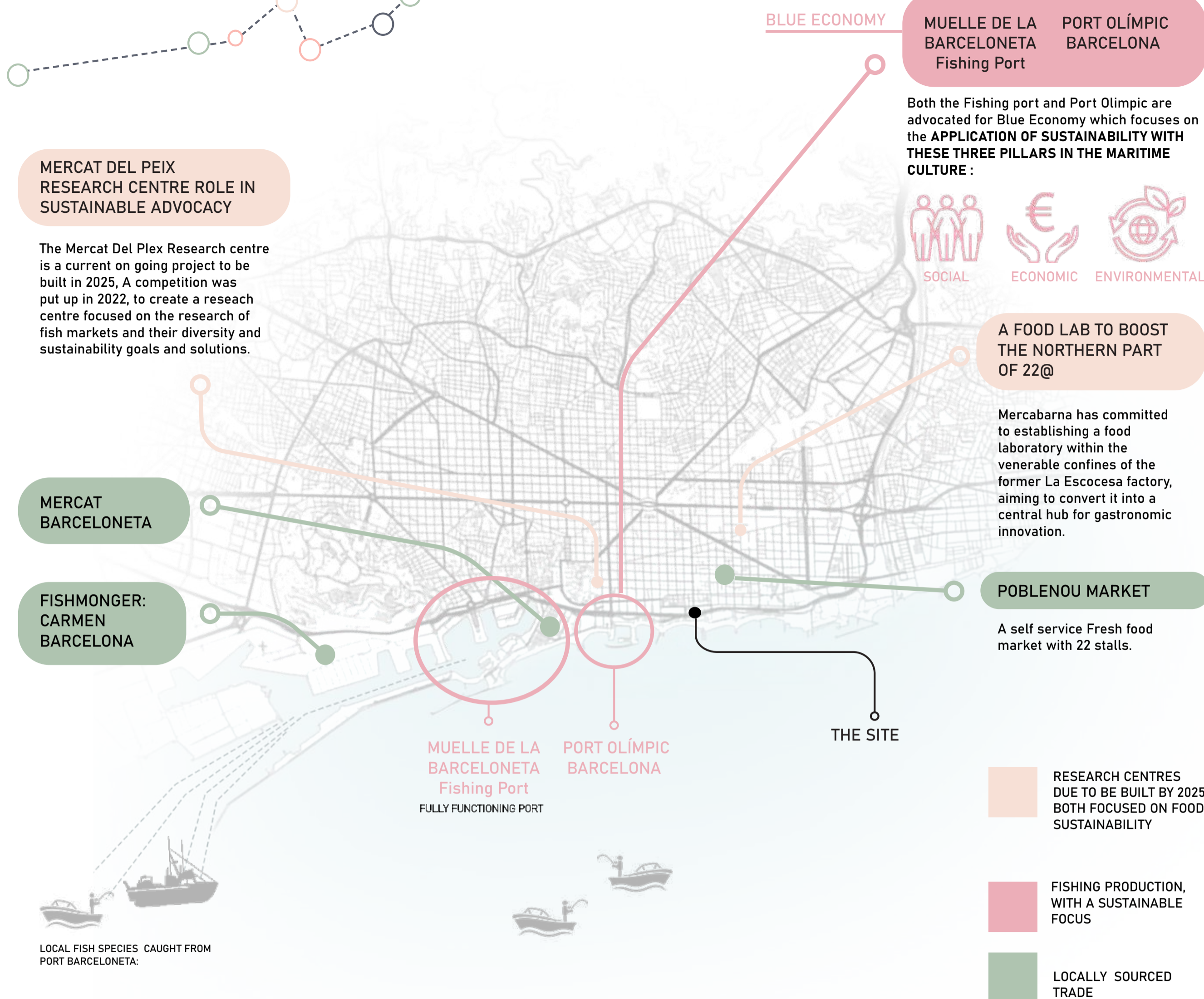
- Increasing the appeal of healthy eating
- Improving the availability of healthy foods
- Consume, promote or sell sustainable fish products
- Value fishing communities and our heritage

MUELLE DE LA BARCELONETA Fishing Port

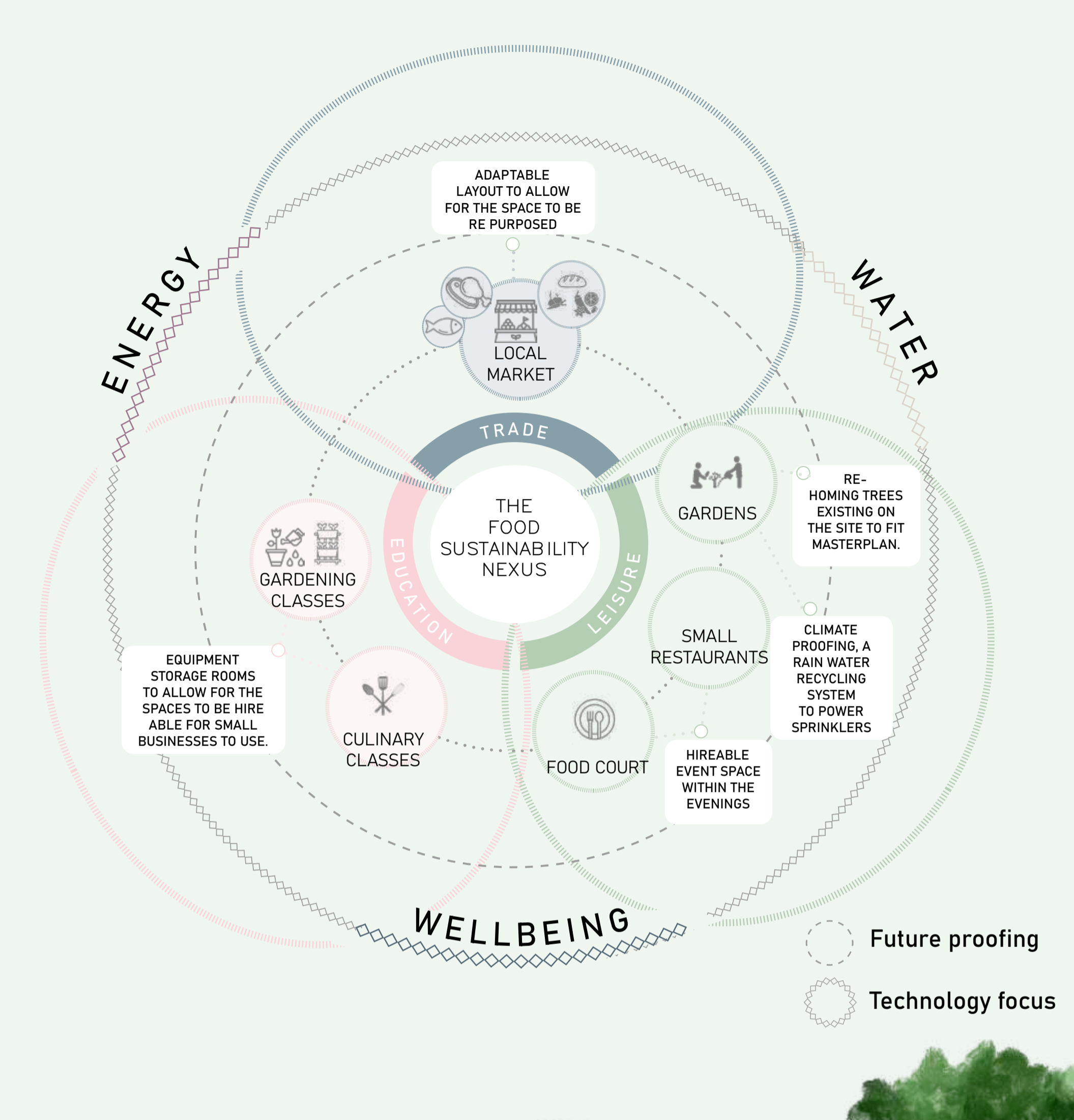


**IN RESPONSE TO OVERFISHING:** The Barceloneta fisherfolk and network of collaborators take part in activities to **"ADVOCATE AND INFORM THE PUBLIC ABOUT SPECIES THAT, IN SPITE OF NOT BEING IN HIGH DEMAND, HAVE HIGH CULINARY AND GASTRONOMIC VALUE, as well as showcasing the role of the different elements that sustain this activity, from the fisherfolk, fish and local markets to traditional recipes and consumers"** (Moragues-Faus, A, 2020)

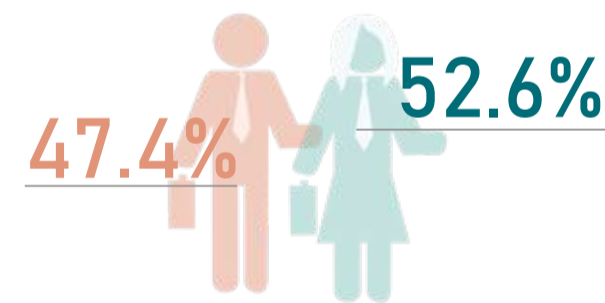
# THE CURRENT GROWING NETWORK



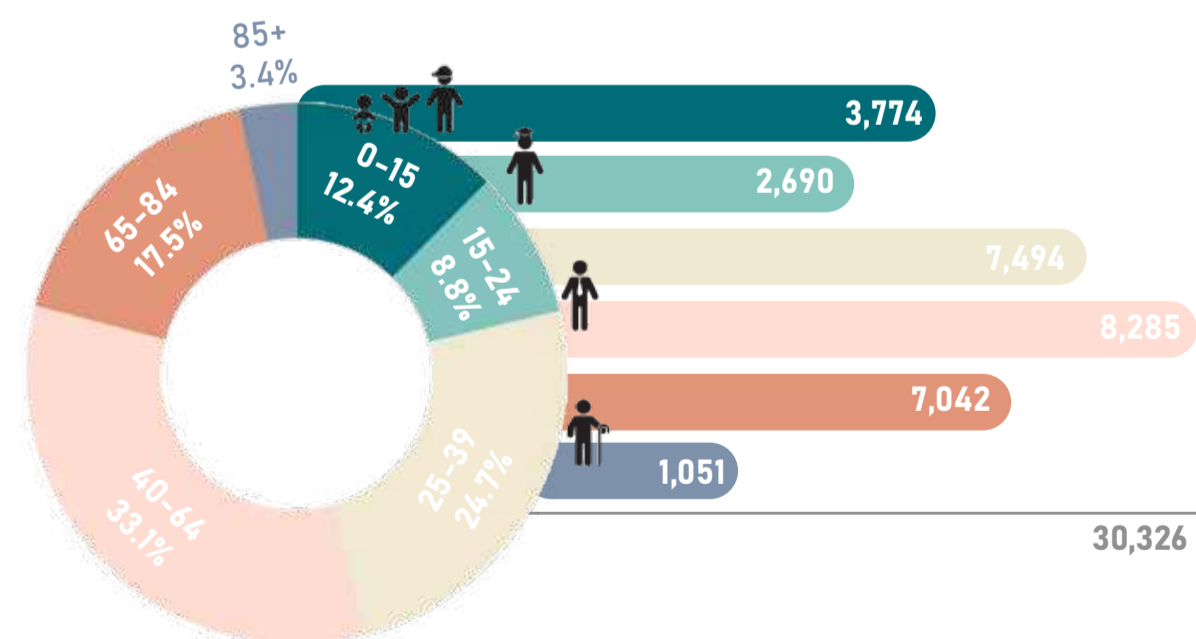
# THE OPPORTUNITY : A GATEWAY TO UNITING TRADE, EDUCATION AND LEISURE IN PURSUIT OF FOOD SUSTAINABILITY



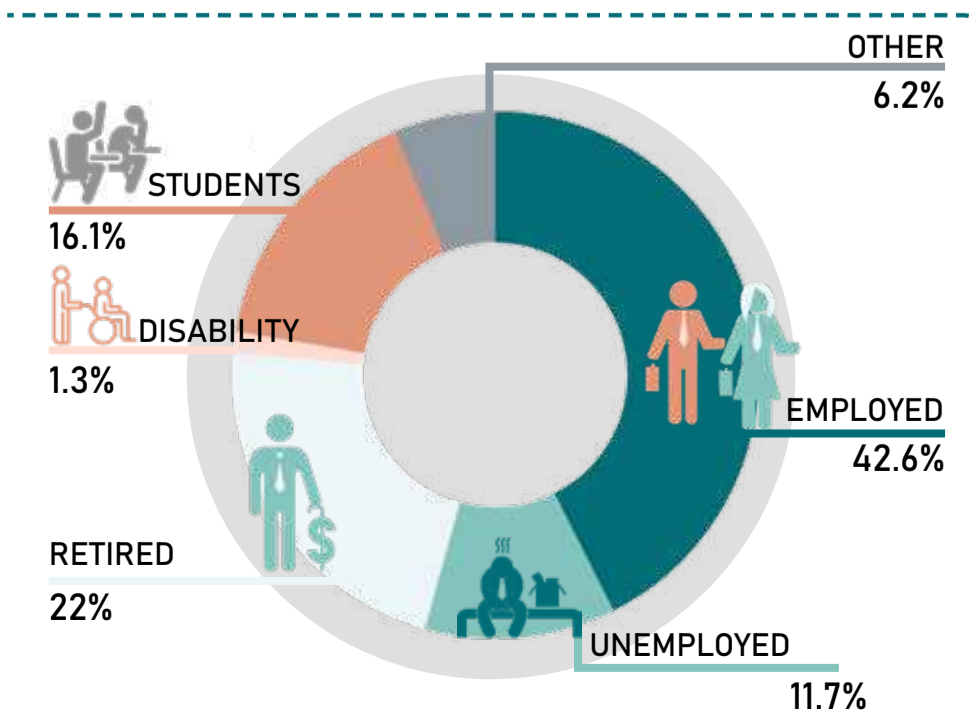
# EL POBLENOU COMMUNITY



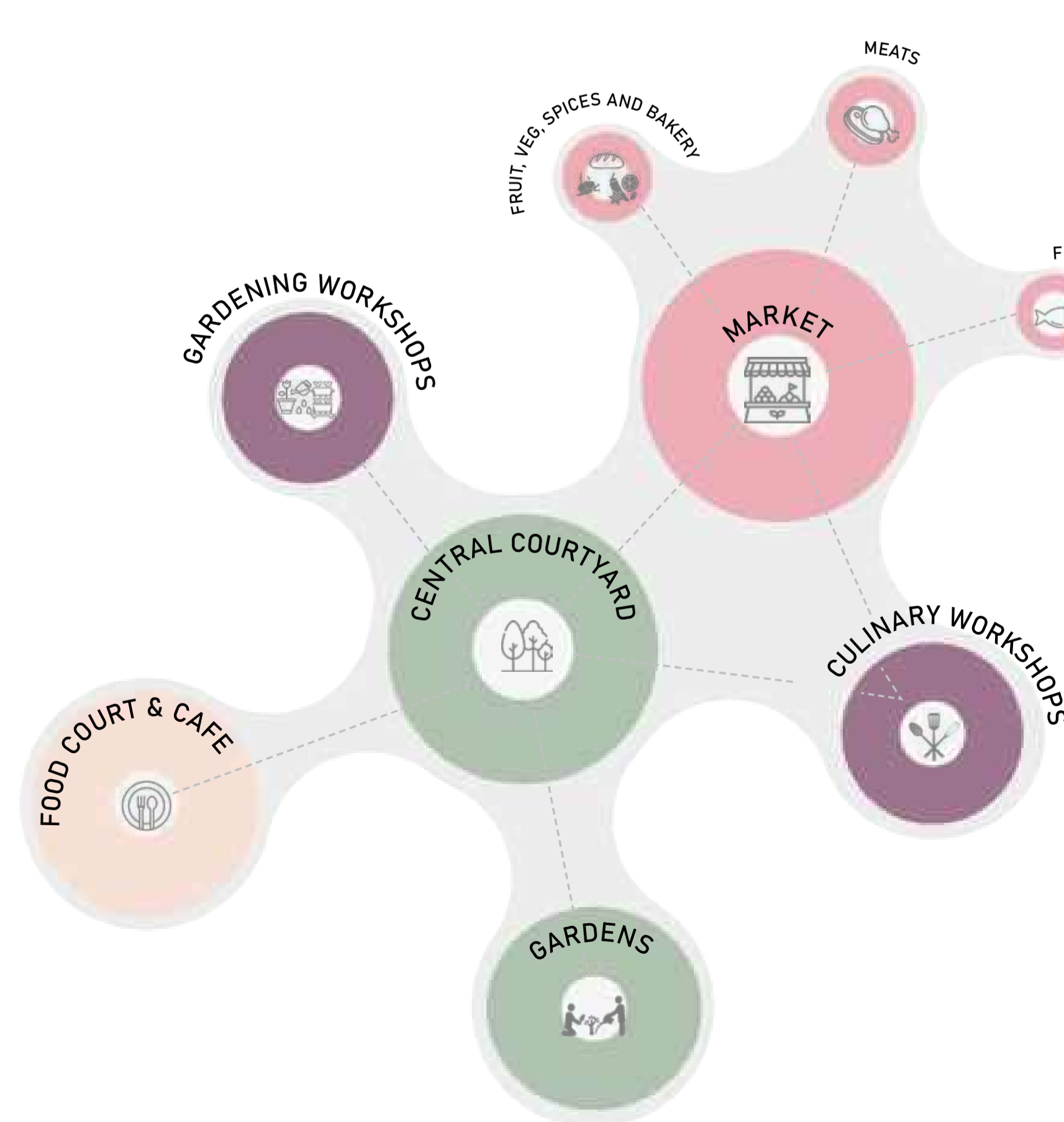
## EL POBLENOU POPULATION BY AGE



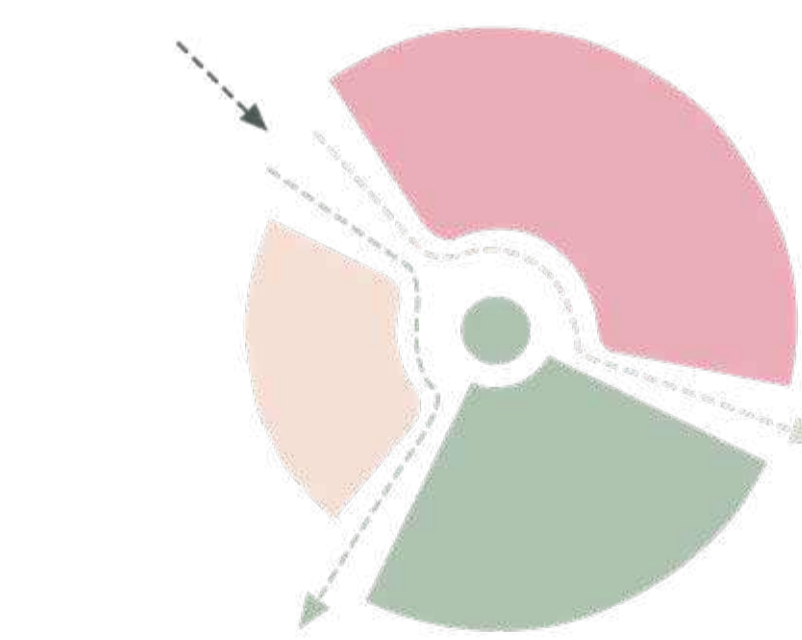
## BARCELONA EMPLOYMENT



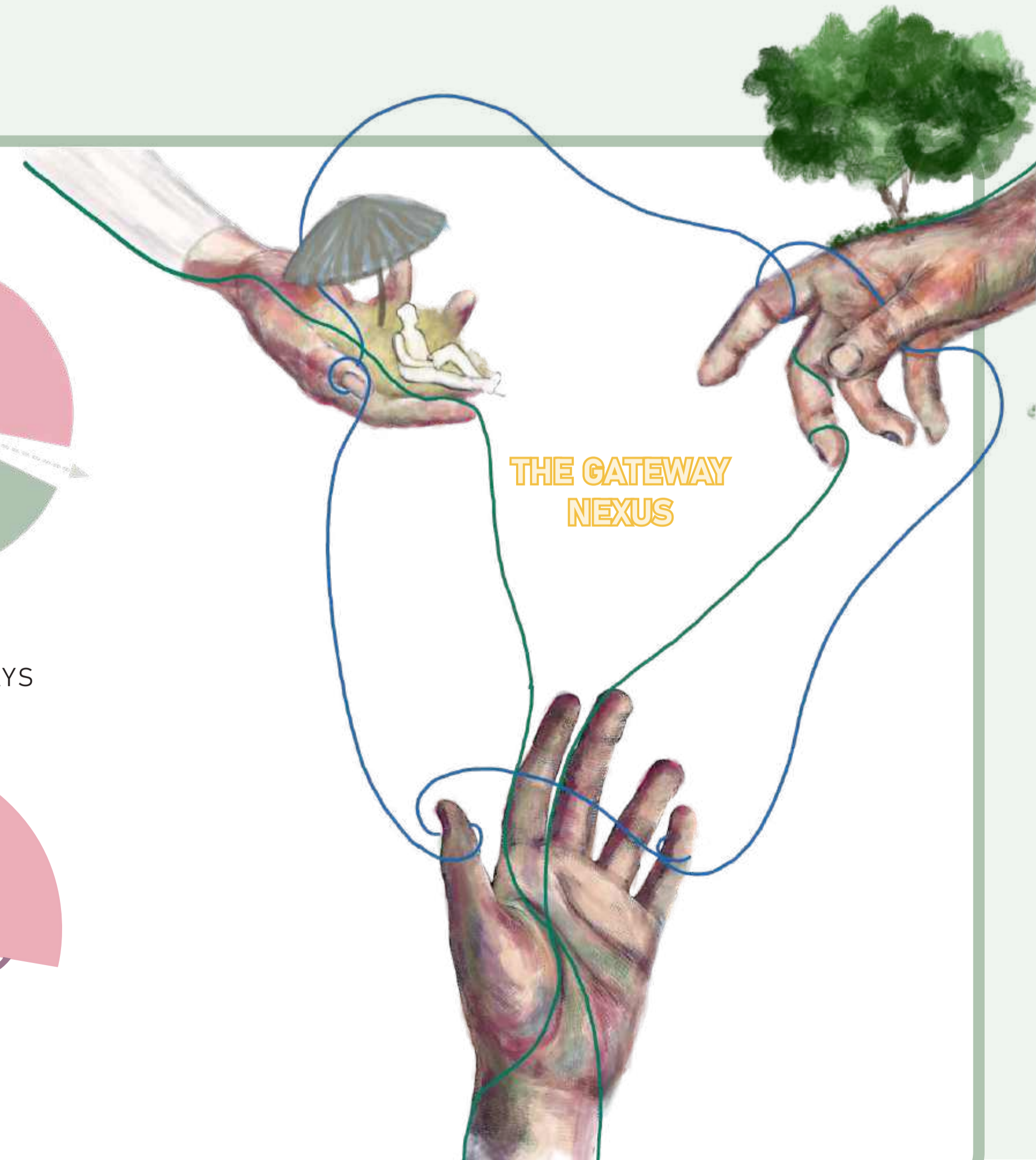
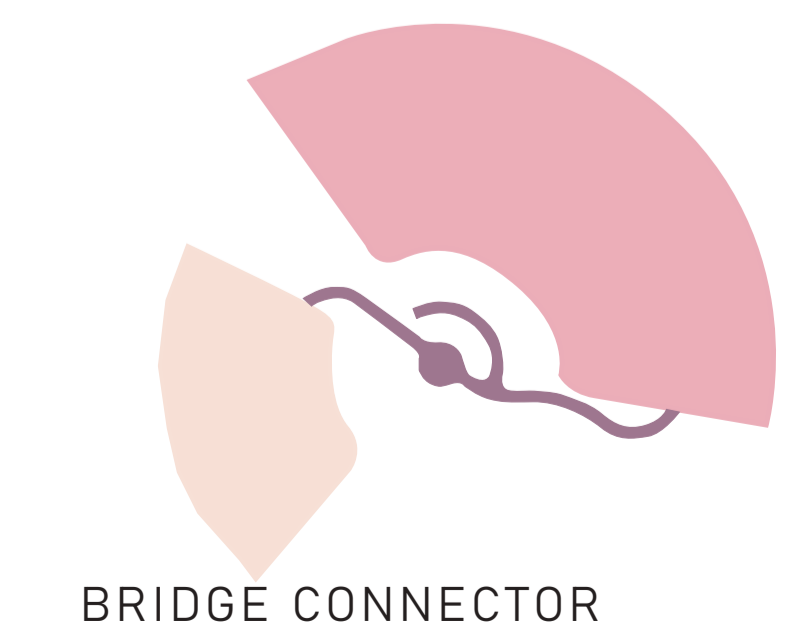
Infecting more areas with economic growth will help reduce the % of unemployed.



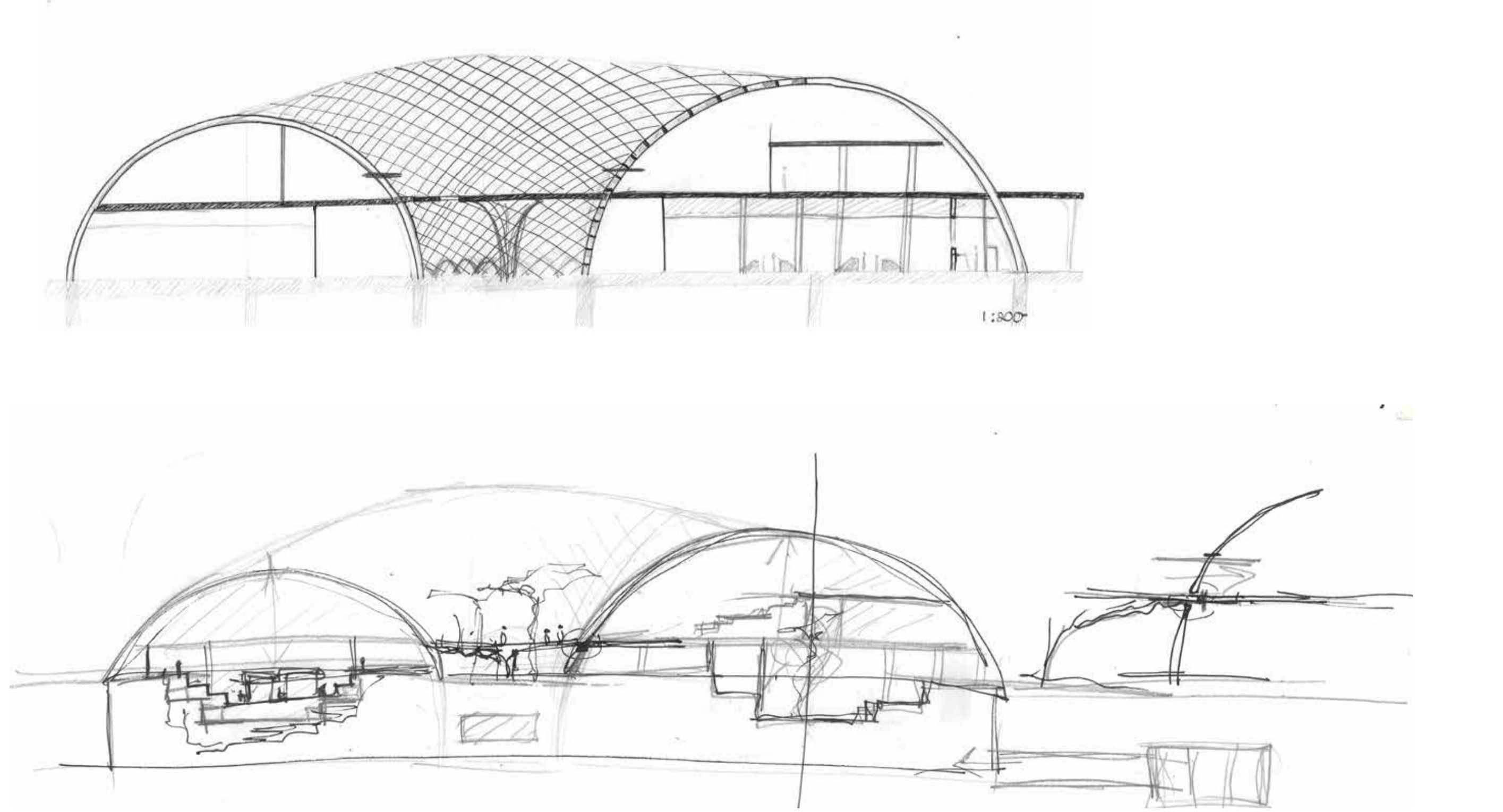
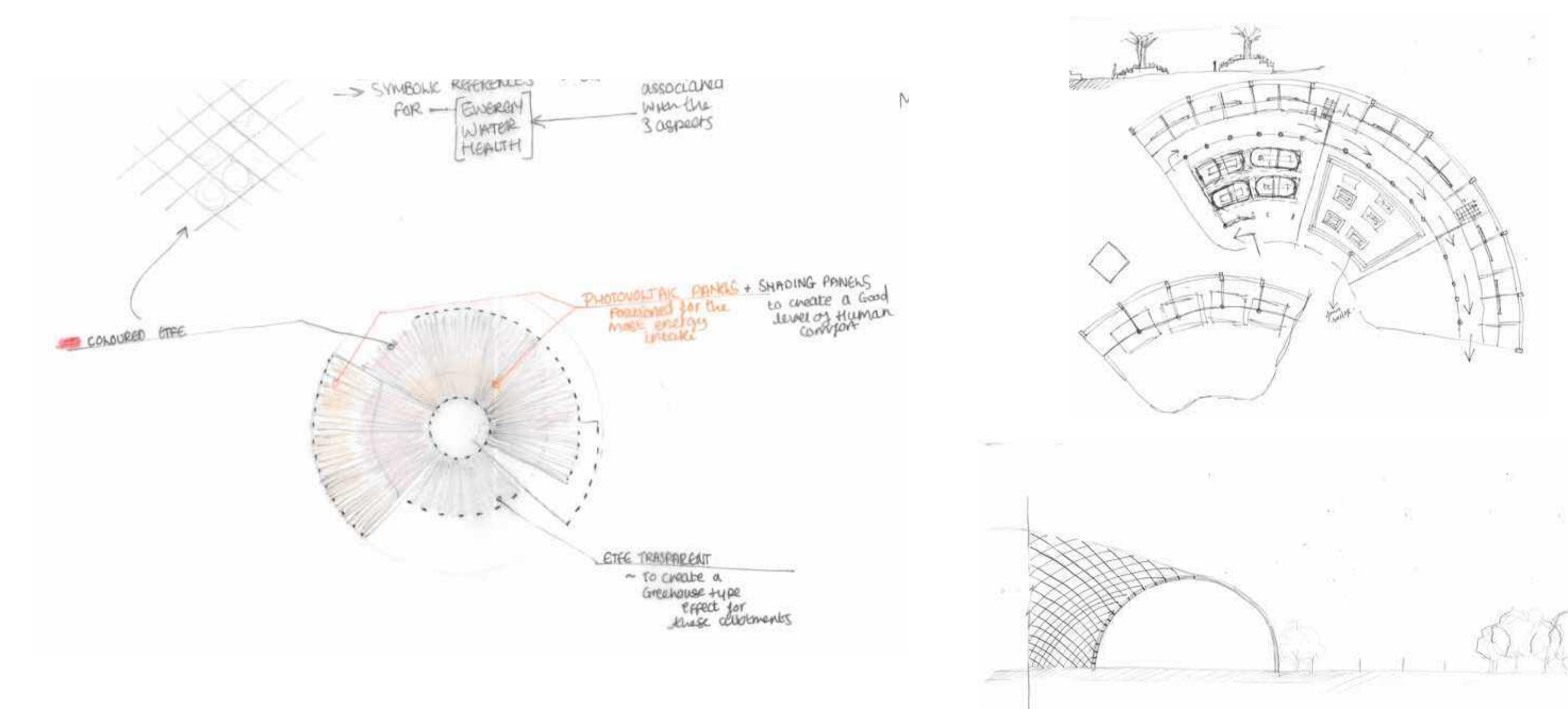
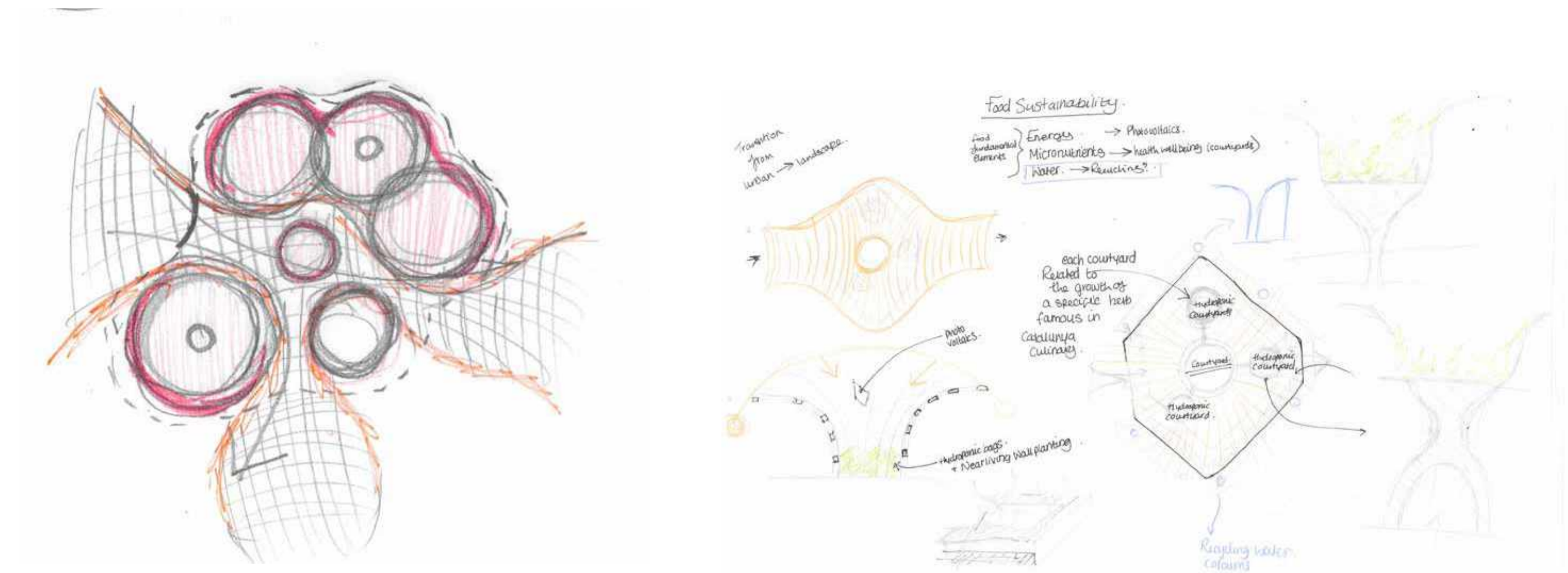
# THE CONCEPT



## THE GATEWAY PATHWAYS

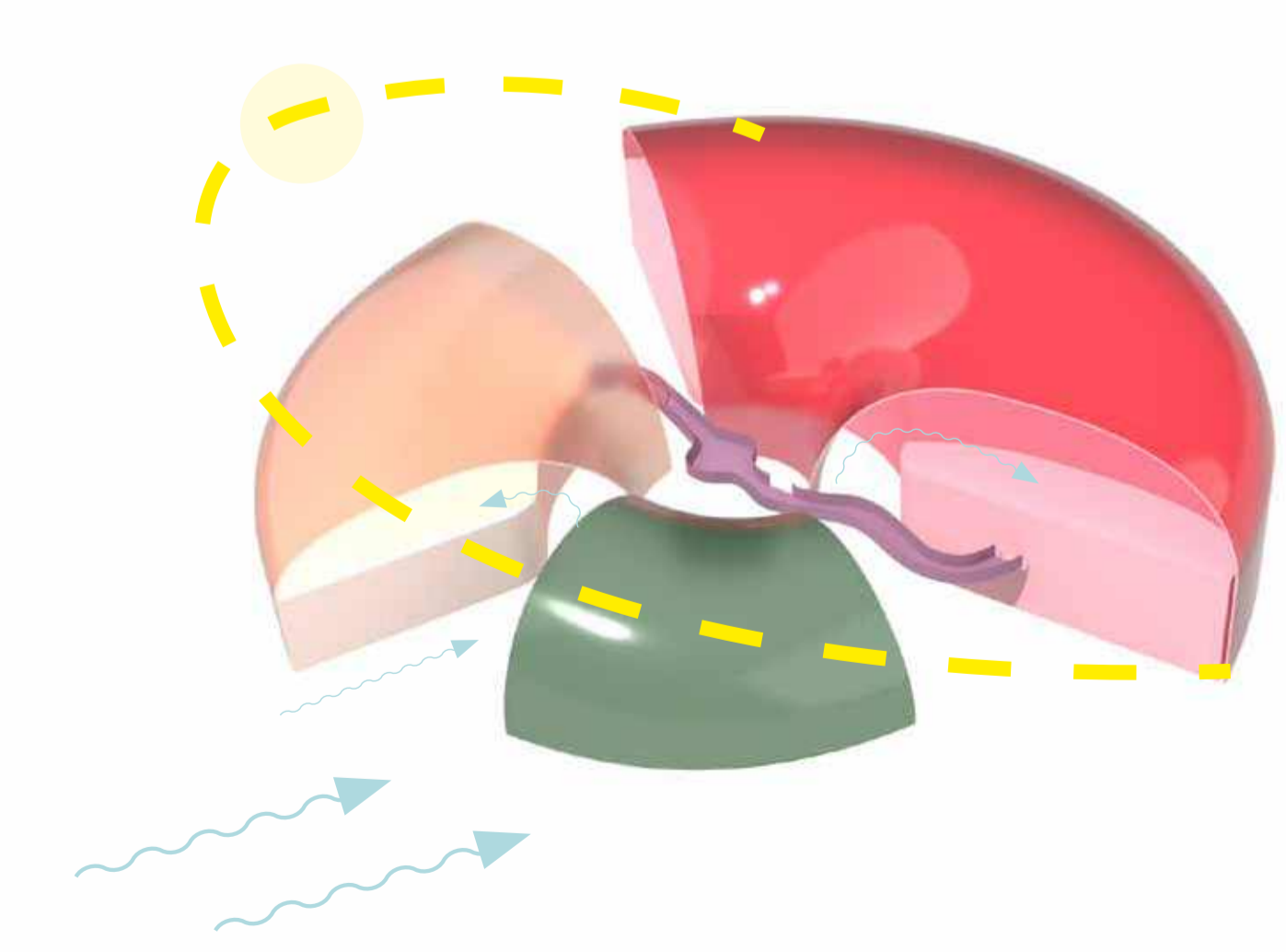
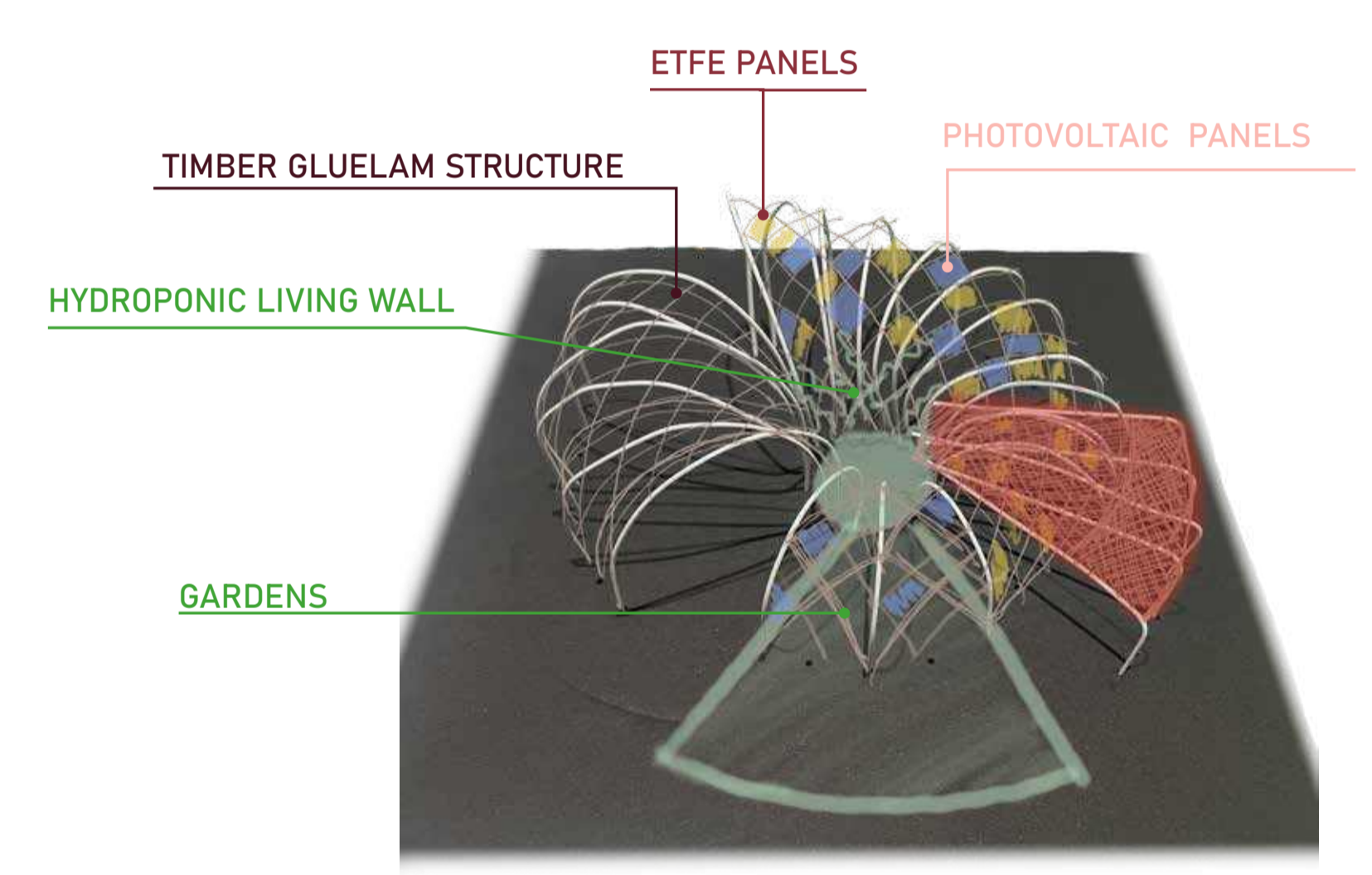
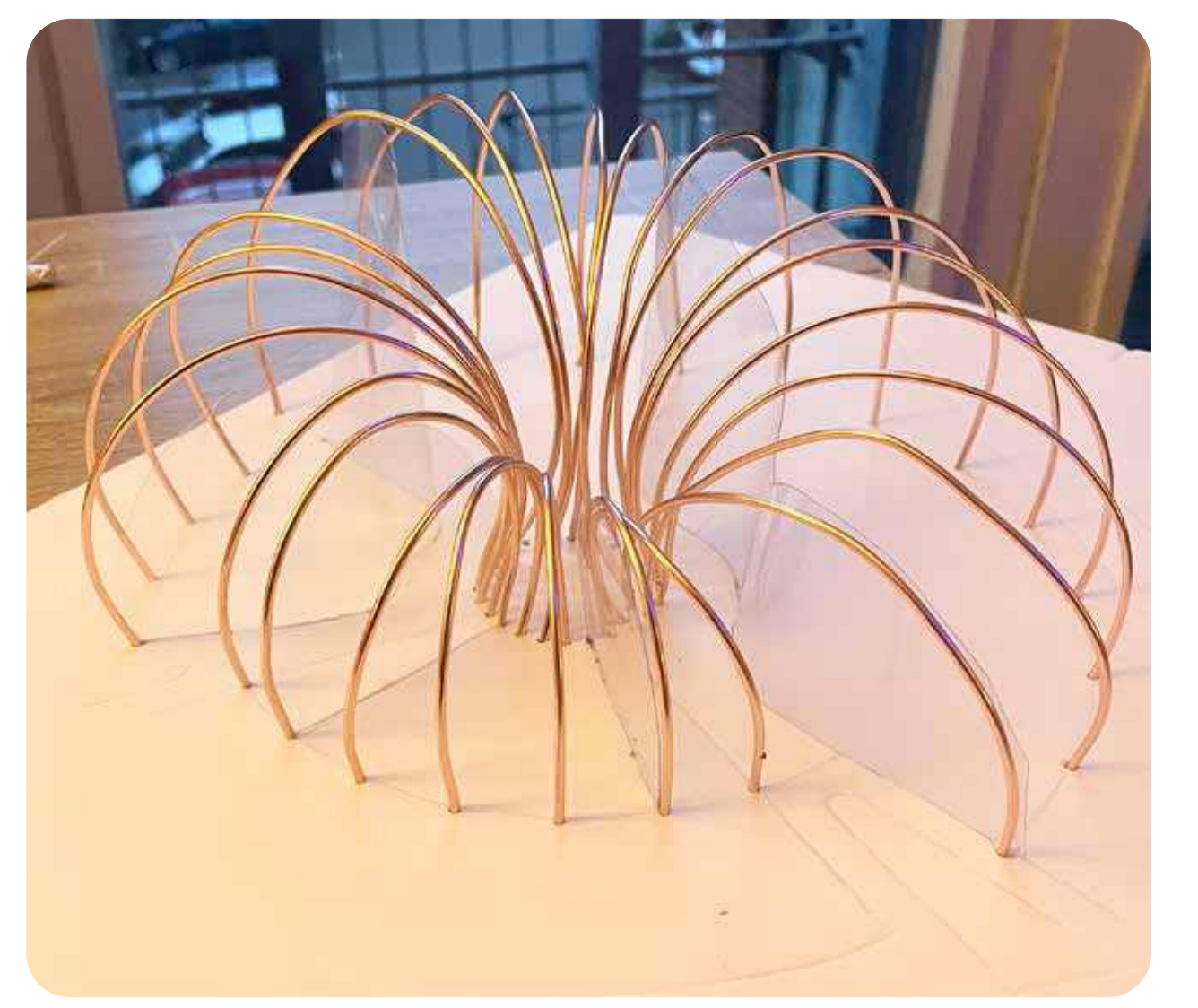
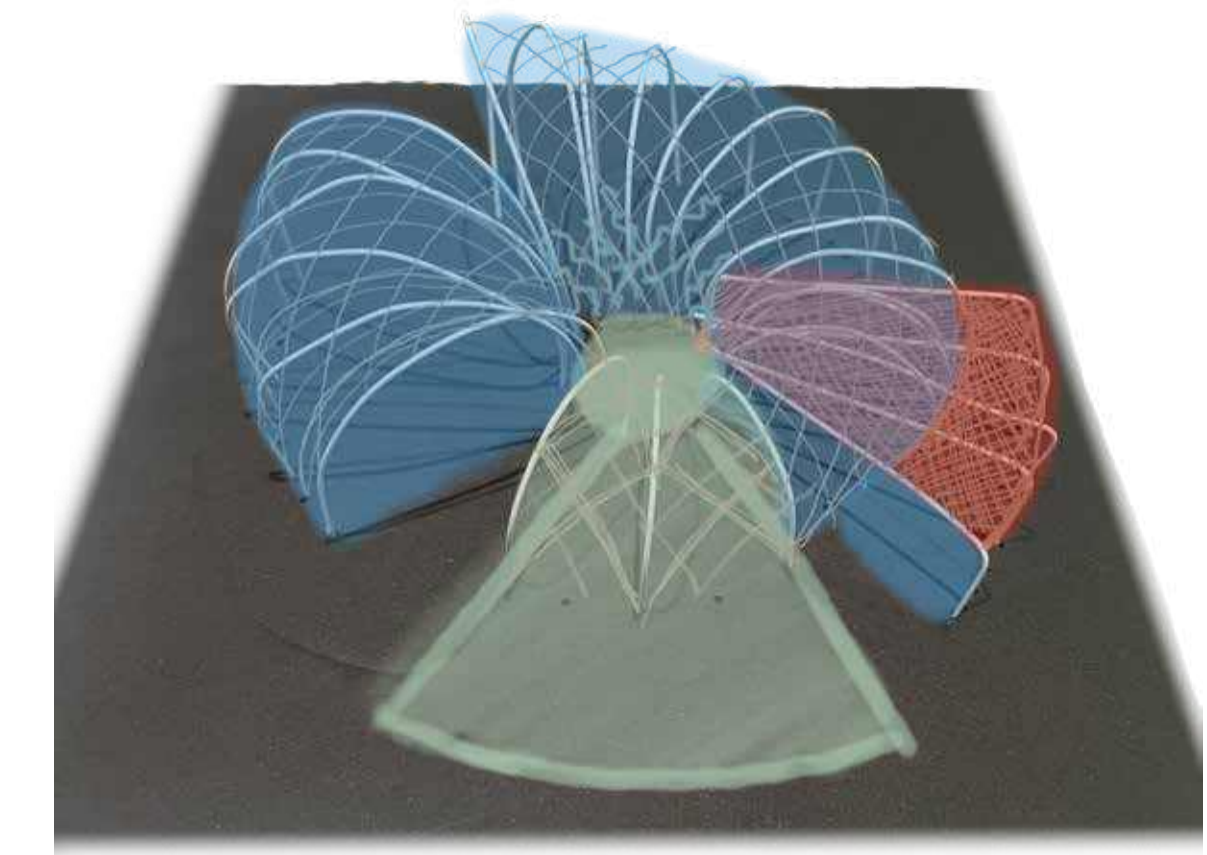


# DEVELOPMENT SKETCHES



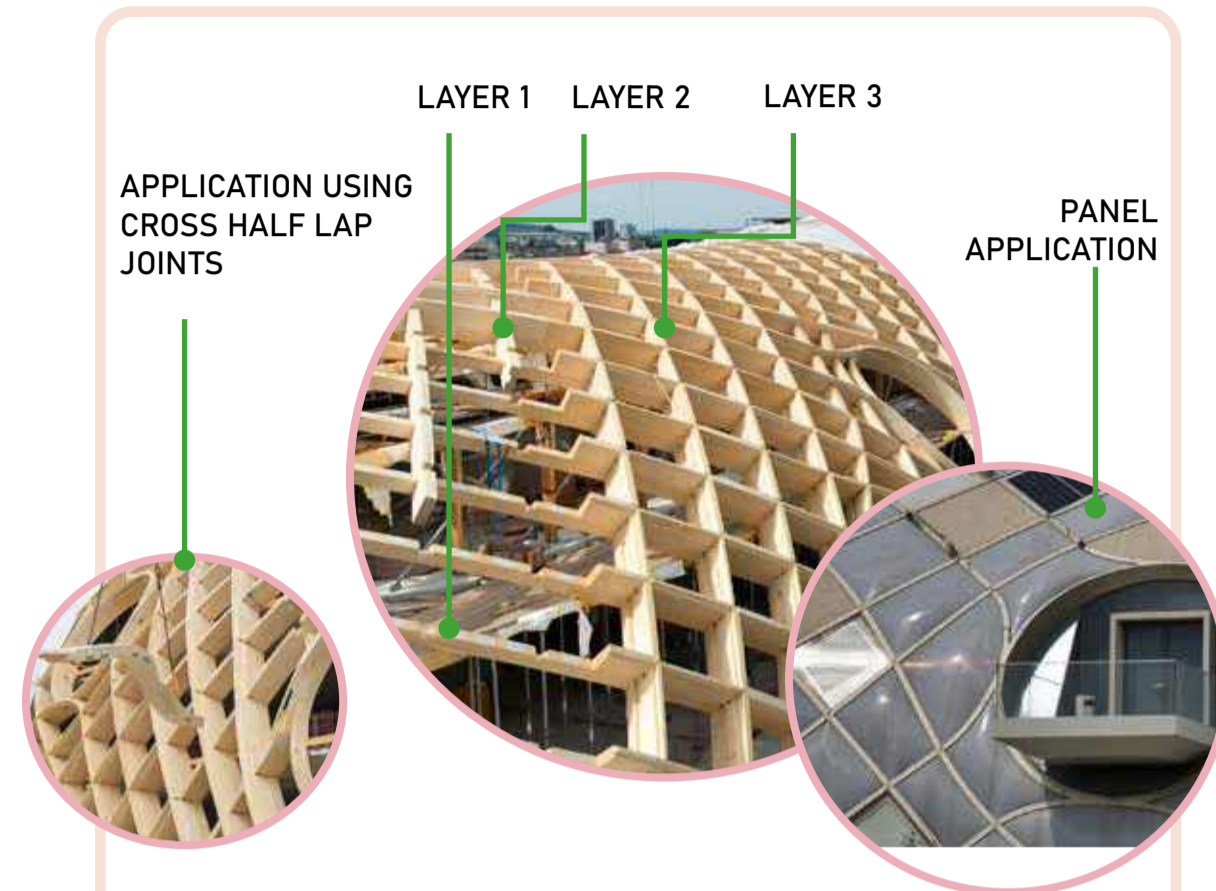
# 3D DEVELOPMENT

Market Garden Education



# CASE STUDIES AND TECHNOLOGY RESEARCH

## 01 SWATCH OMEGA HEADQUARTER, BIENNE, SWITZERLAND



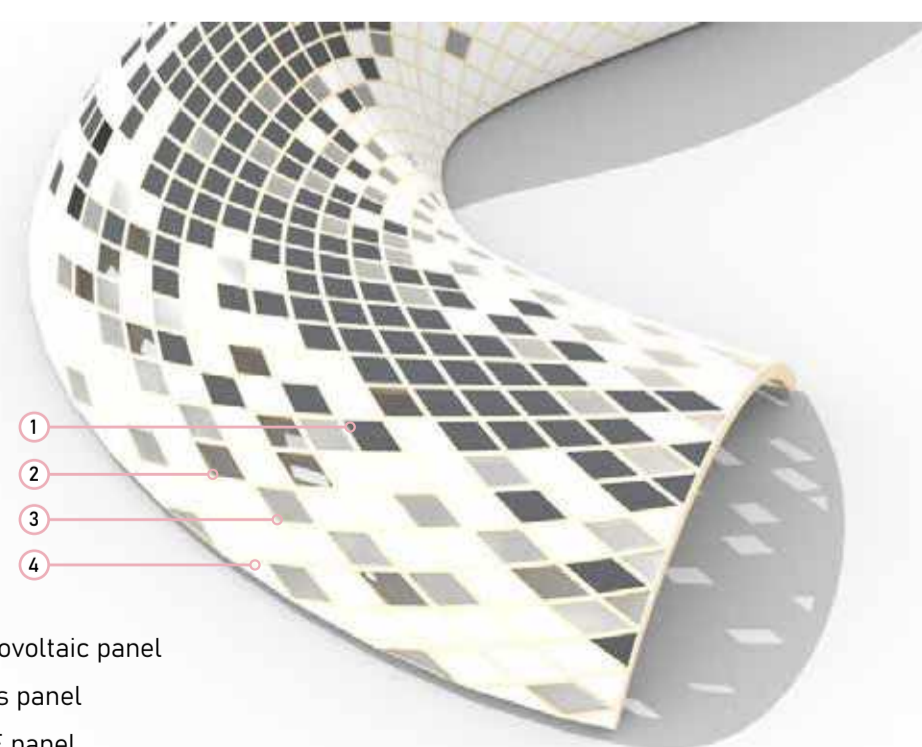
Client: Swatch AG  
 Completion: 2019  
 GFA: 465,539 ft<sup>2</sup> / 43,250 m<sup>2</sup>  
 Architects: Shigeru Ban, Itten+Brechbühl AG

### IDENTIFYING THE ELEMENTS



- 1 FACADE MASS TIMBER CONSTRUCTION
- 2 SWATCH HEADQUARTERS
- 3 OMEGA MUSEUM
- 4 OMEGA MUSEUM

### FACADE PANELS

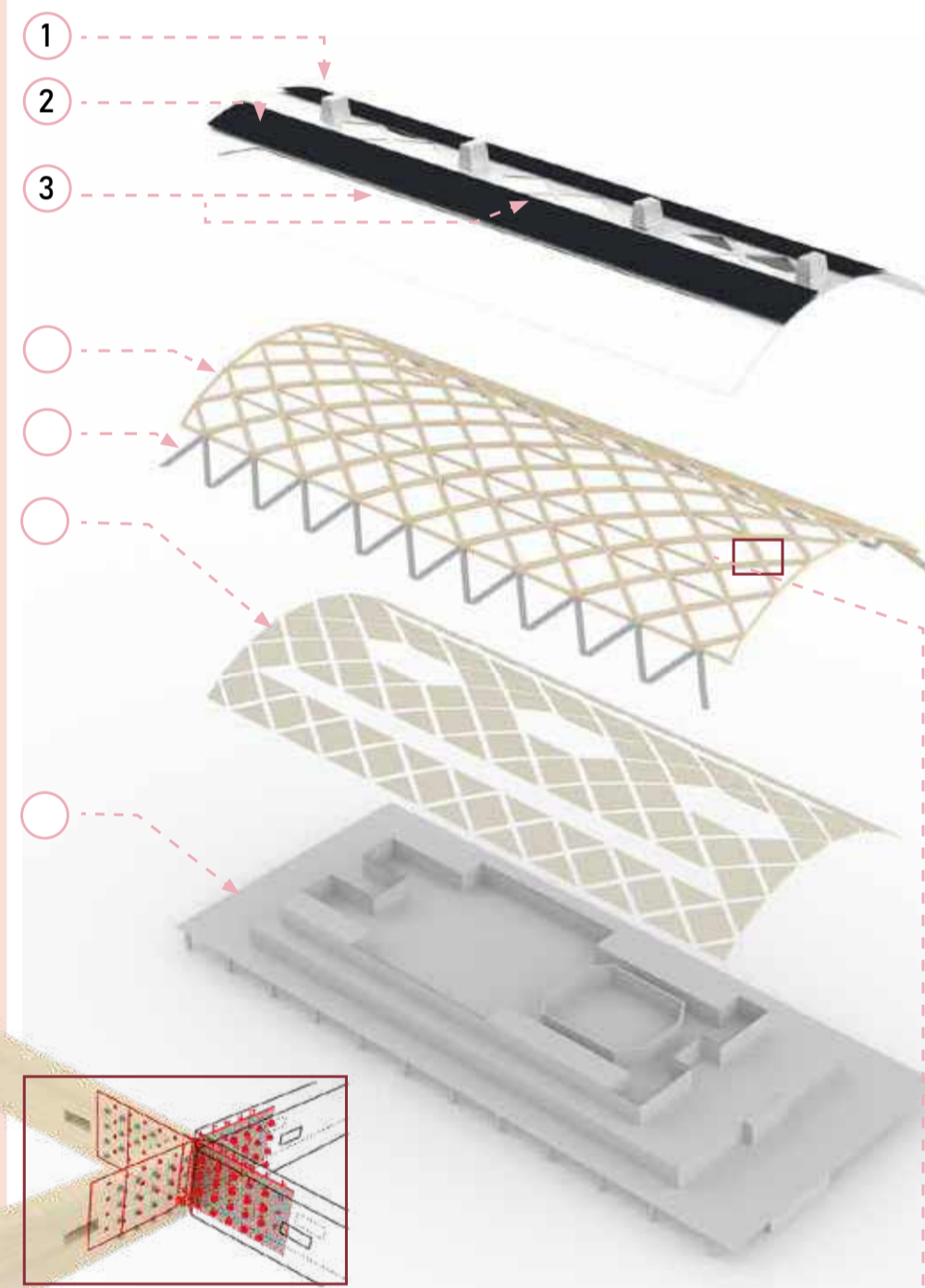


- 1 Photovoltaic panel
- 2 Glass panel
- 3 ETFE panel
- 4 Solid panel

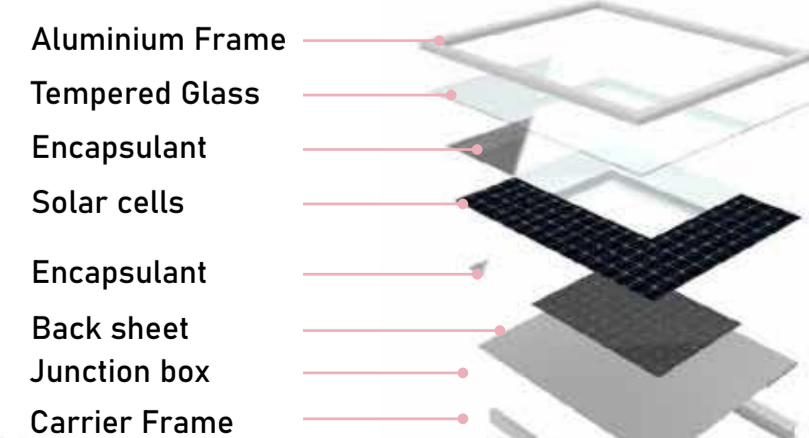
## 02 WWF-UK'S LIVING PLANET CENTRE



Client: WWF UK, Woking  
 Completion: 2013  
 Architects: Hopkins Architects, London



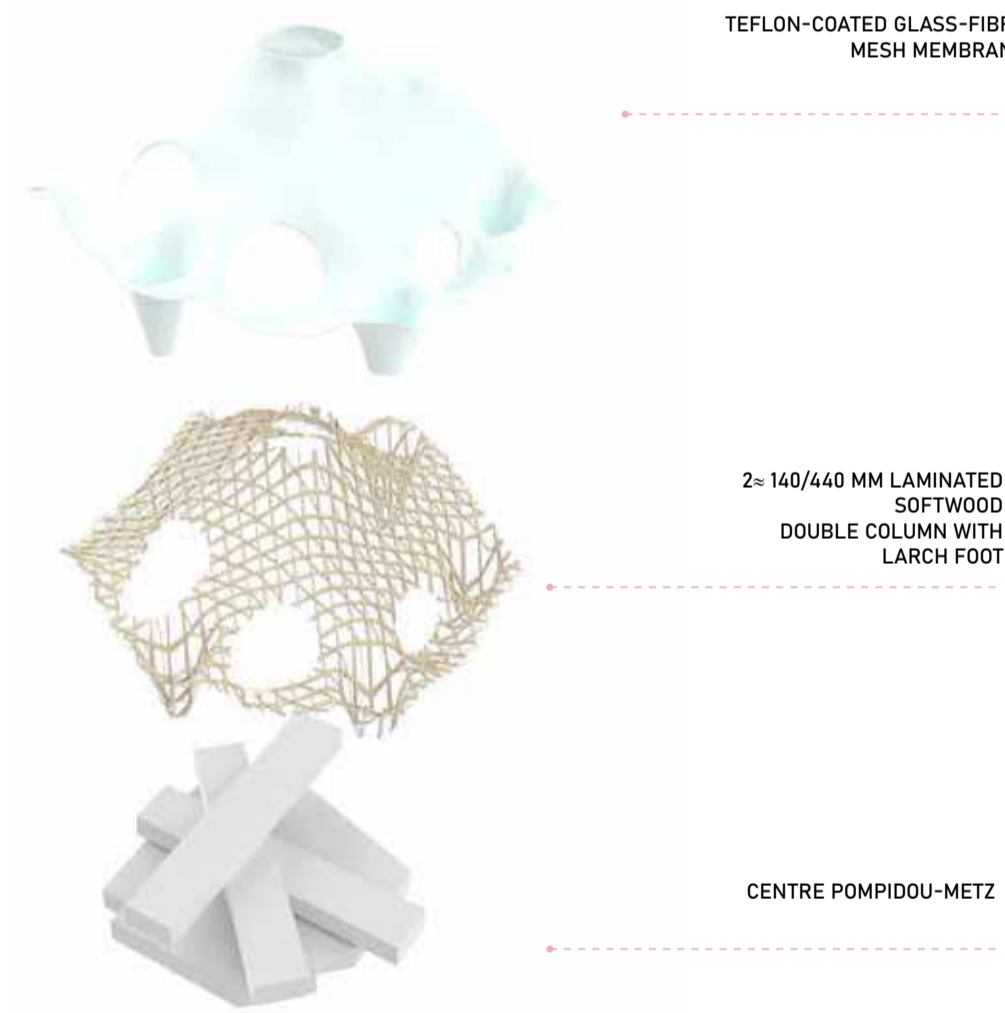
- 1 Wind cowl
- 2 PV modules on carrier frame
- 3 Roof lights: Double glazing in aluminium frame
- 4 Diagrid timber roof: Structural glulam beam, 175 x 585 mm
- 5 V-struts, painted steel, Diameter : 323 mm
- 6 Inner ceiling - birch plywood cladding
- 7 Concrete with recycled aggregate and GGBS



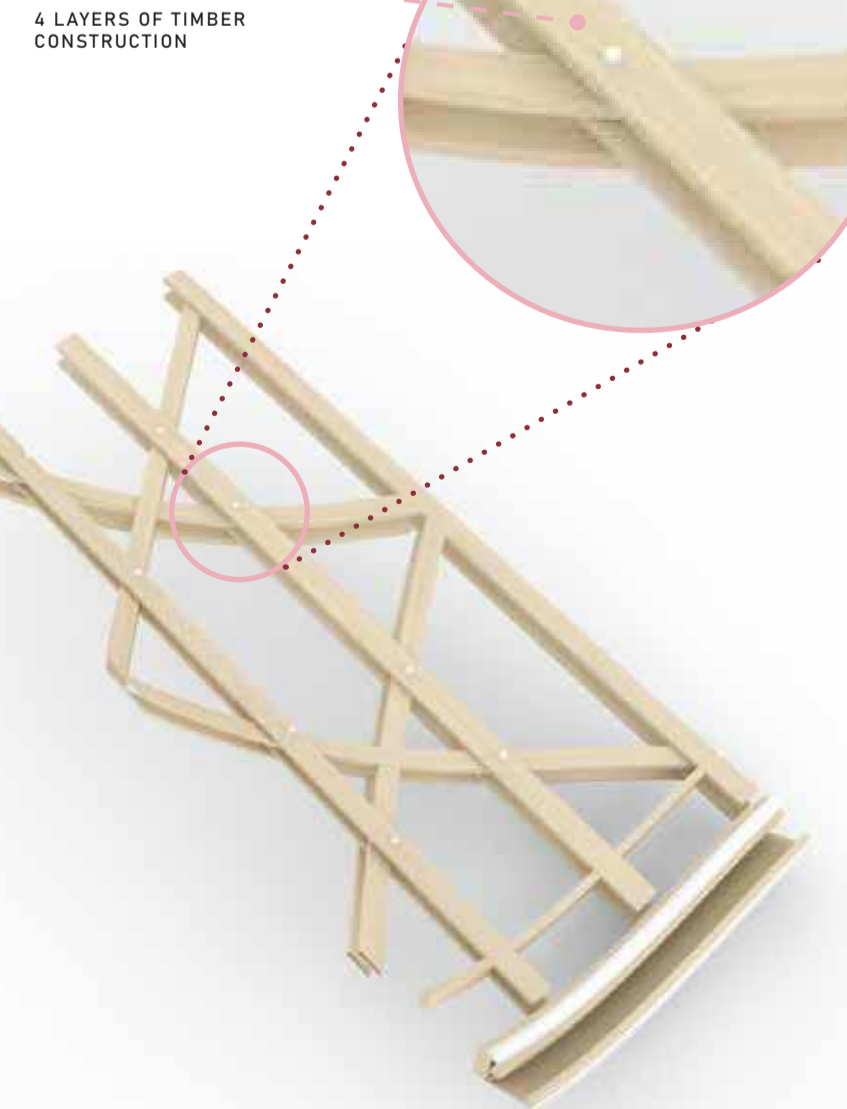
## 03 CENTRE POMPIDOU-METZ



Completion: 2010  
 GFA: 11330 m<sup>2</sup>  
 Architects: Shigeru Ban  
 Architects Europe, Paris

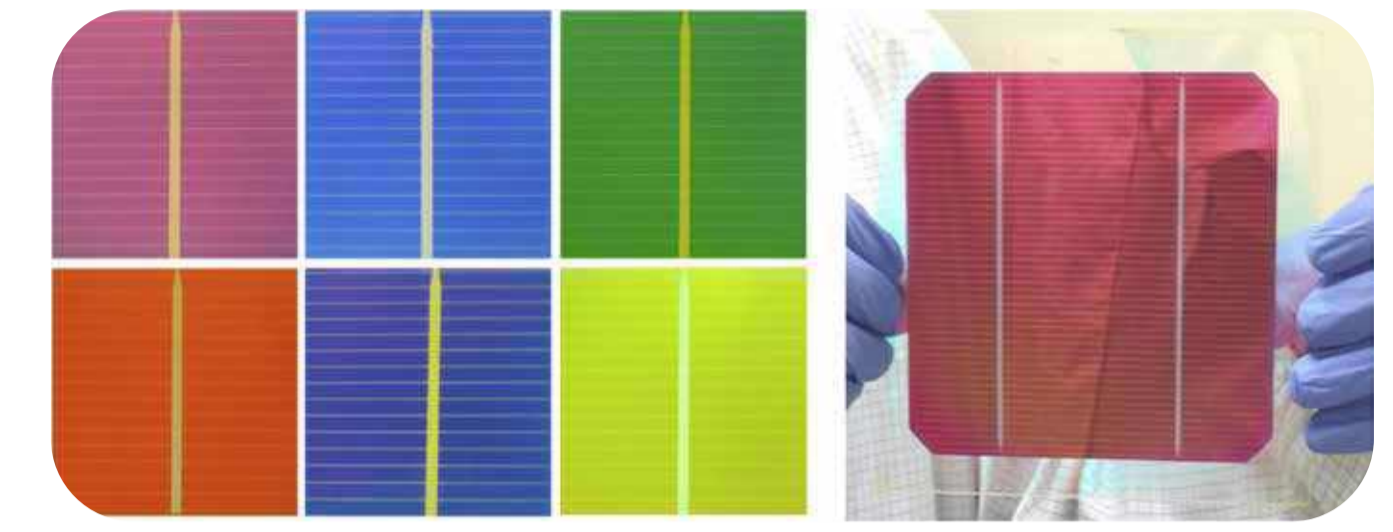


### PINNED CONNECTION

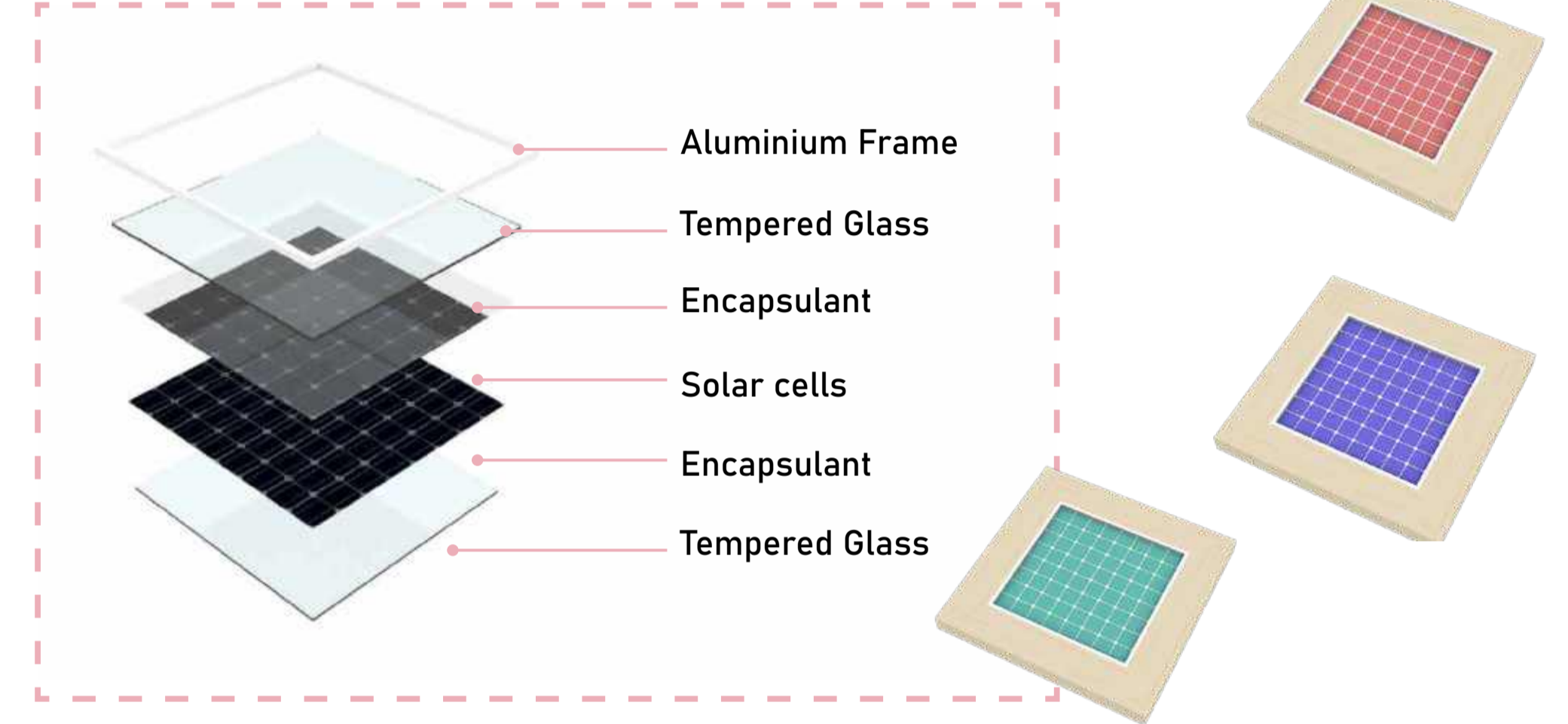


## 04 BIVP: with SMART nanophotonic coating

Anishkumar Soman and Aldrin Antony reported that a "nanophotonic coating called Selectively Modulated Aesthetic Reflector Technology (SMART), which can be integrated to any matured solar cell technology to produce colored solar cells or modules" - improving "aesthetics along with being commercially feasible."



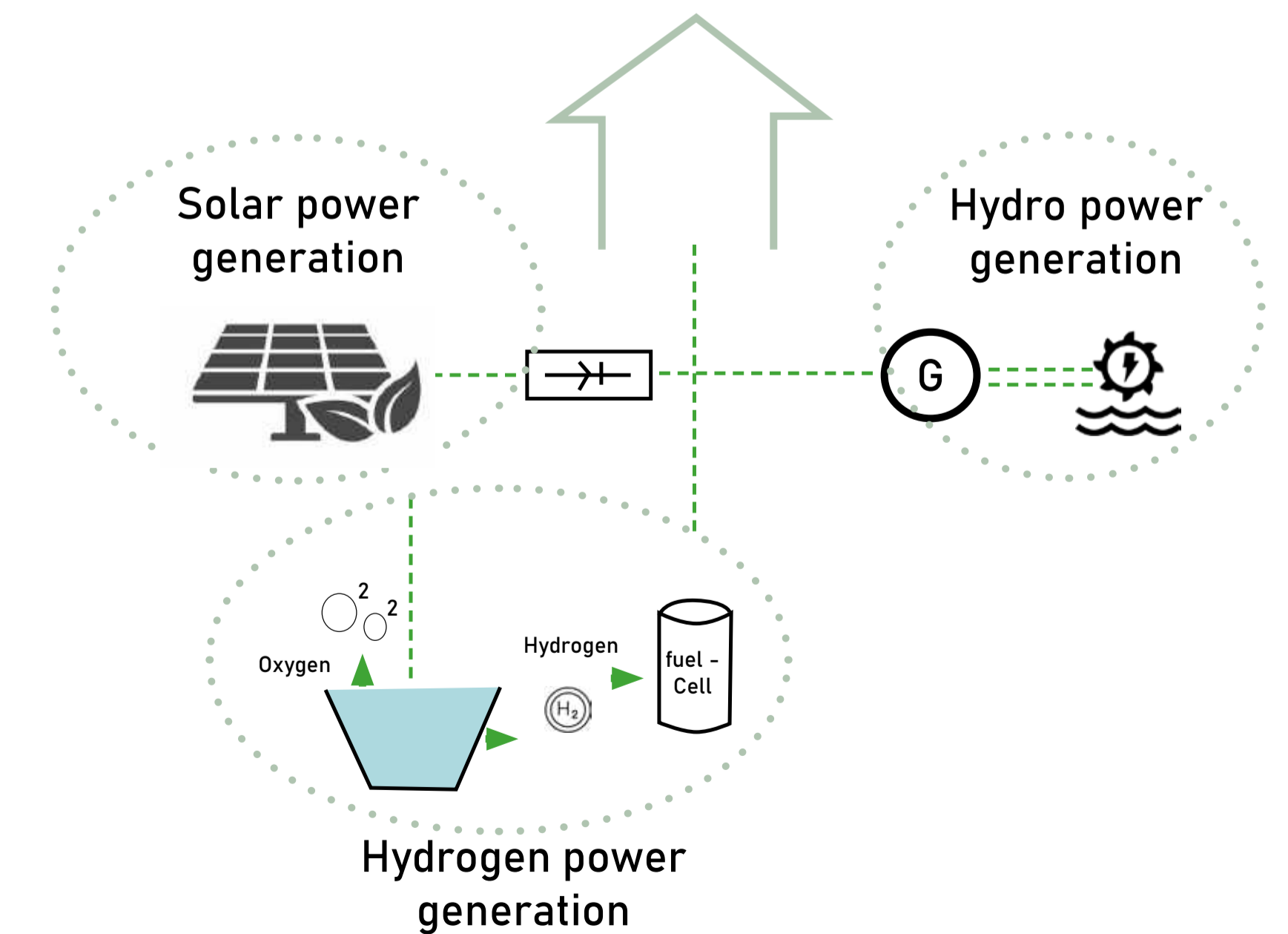
### BUILT - IN VOLTAIC PANEL



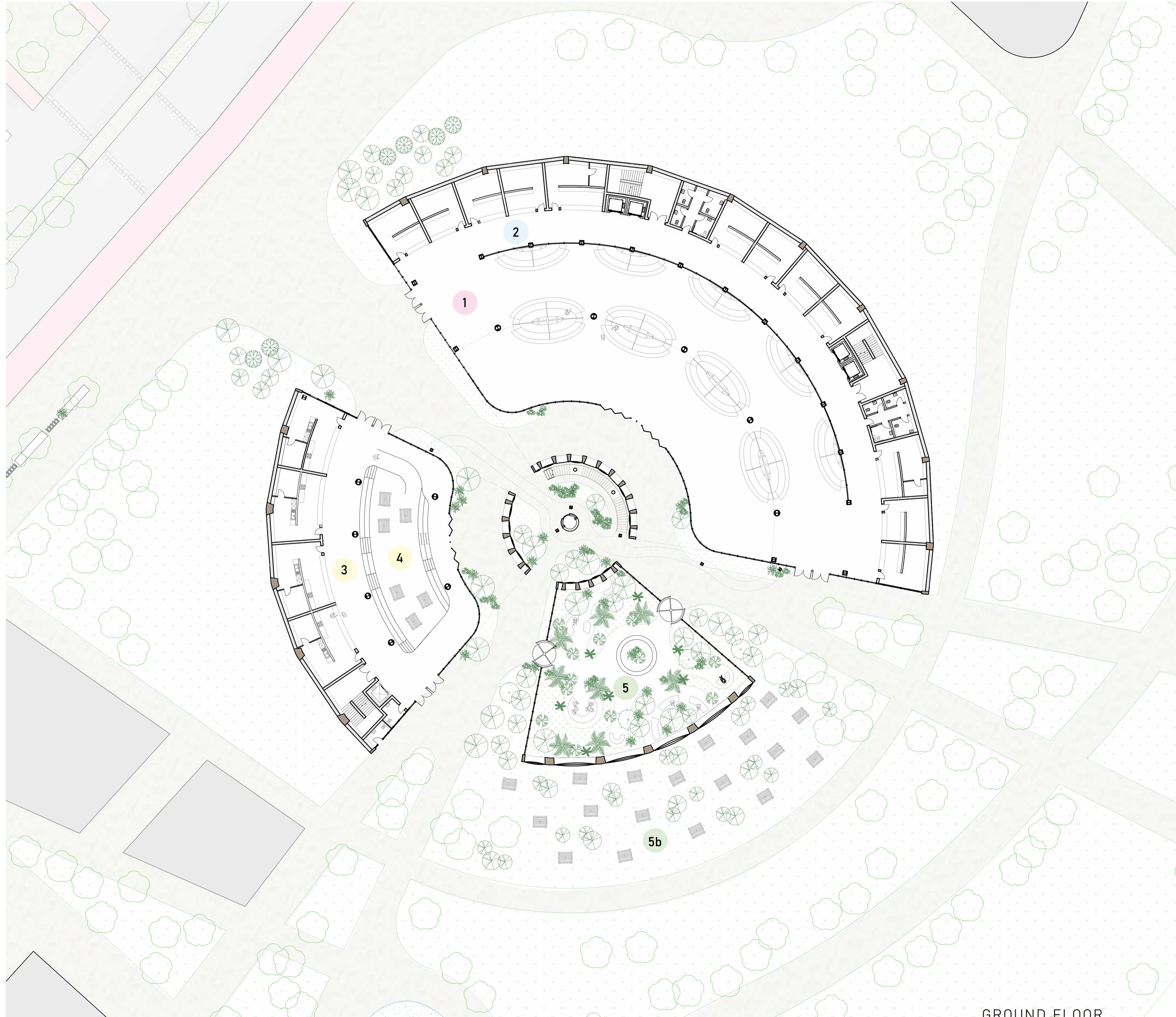
## SWATCH OMEGA HEADQUARTER, BIENNE, SWITZERLAND

### PV PANELS - SOLAR, WATER RESOURCING AND THERMAL BALANCE

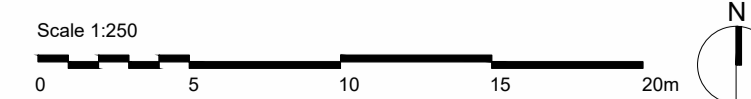
The radiative heating and cooling, ventilation, and primary lighting of all three buildings function autonomously.



# THE GATEWAY NEXUS



GROUND FLOOR



TRADE

1



2



MEAT & FISH

3



SOCIALISING

5



RELAXATION

KEY

1 VEG MARKET STALLS, FLEXIBLE SPACE

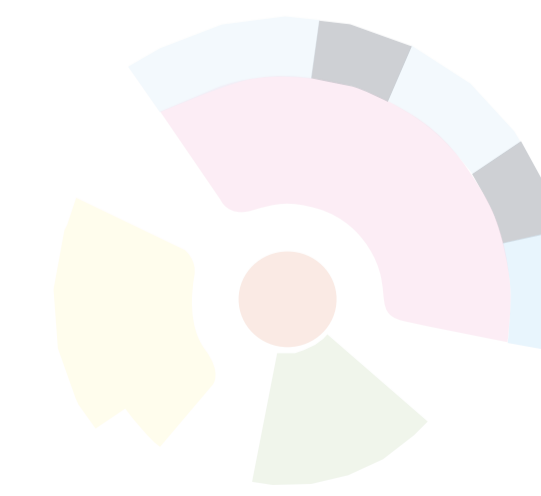
2 MEAT AND FISH STALLS

3 FOOD COURT STALLS

4 FOODCOURT SEATING

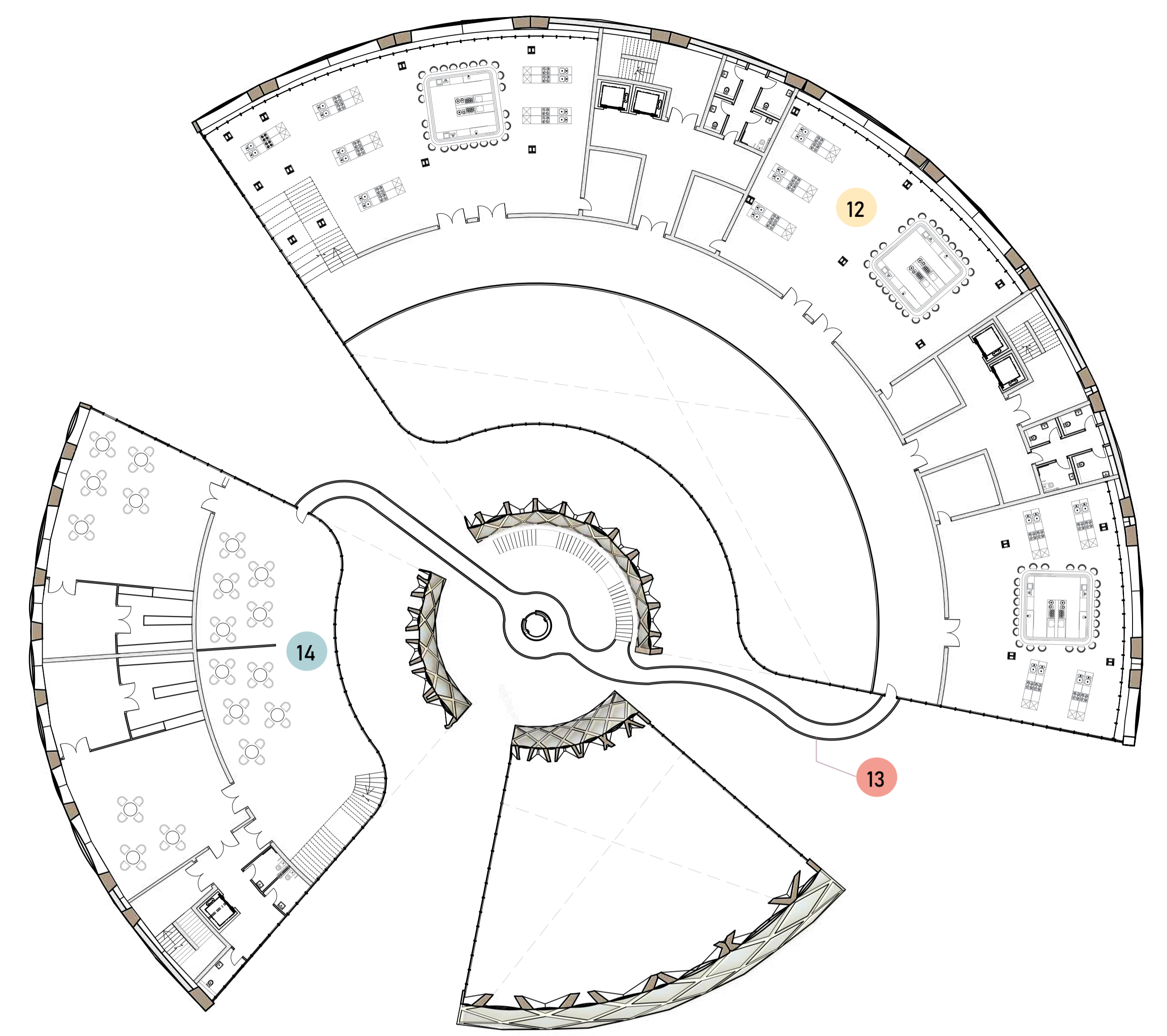
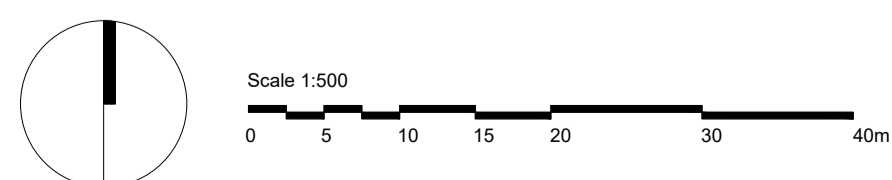
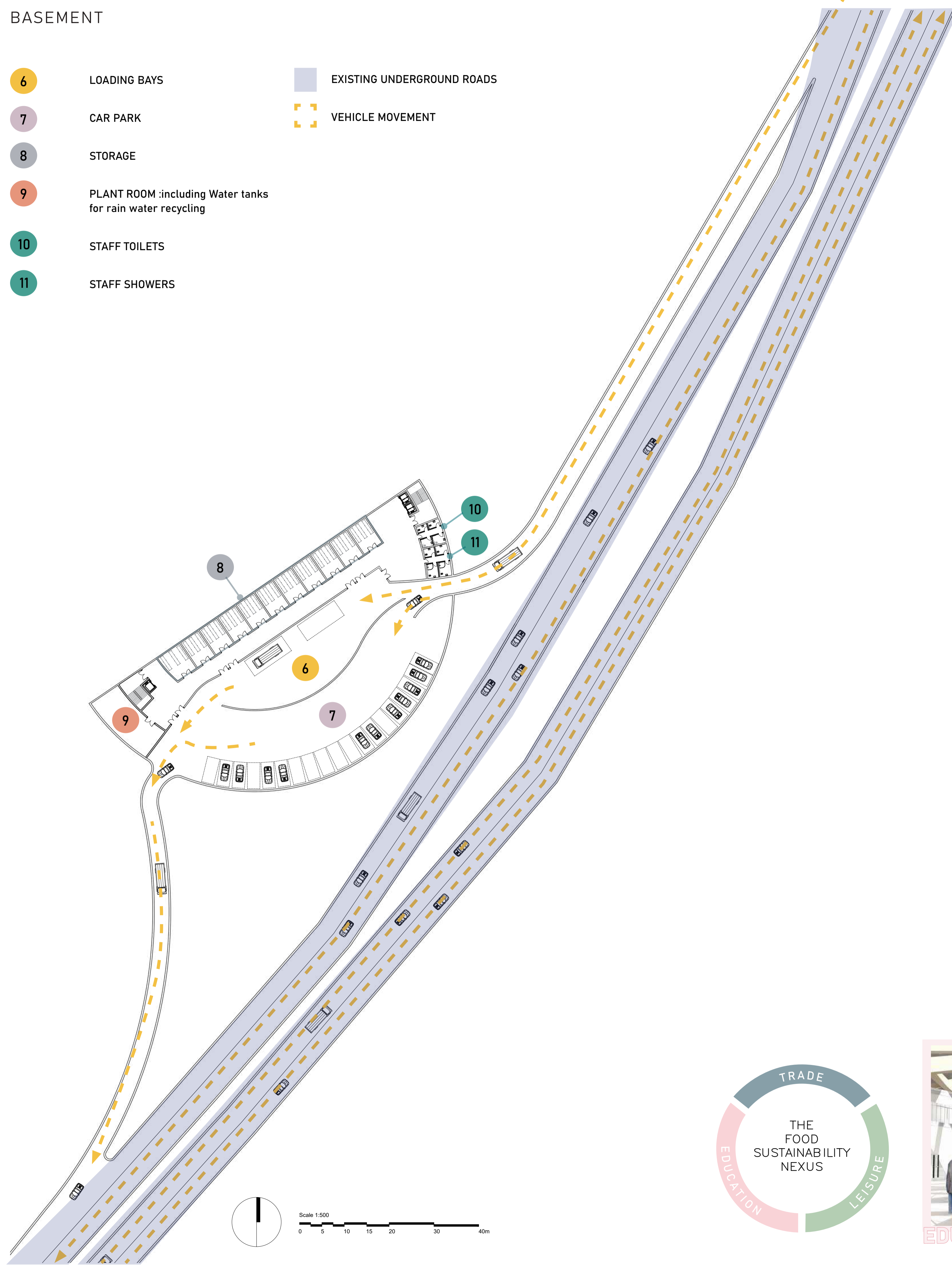
5 INDOOR GARDEN SPACE

5b OUTDOOR SEATING AREA

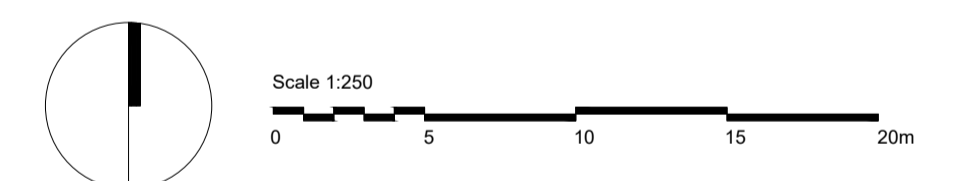


BASEMENT

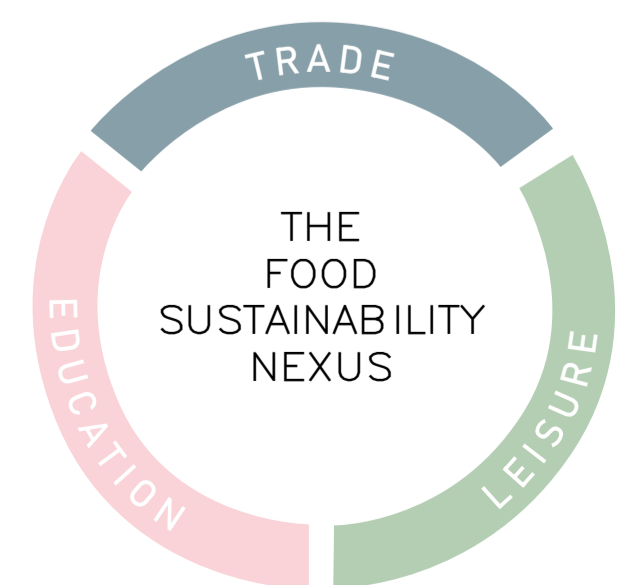
- 6 LOADING BAYS
  - 7 CAR PARK
  - 8 STORAGE
  - 9 PLANT ROOM :including Water tanks for rain water recycling
  - 10 STAFF TOILETS
  - 11 STAFF SHOWERS
- EXISTING UNDERGROUND ROADS  
 VEHICLE MOVEMENT



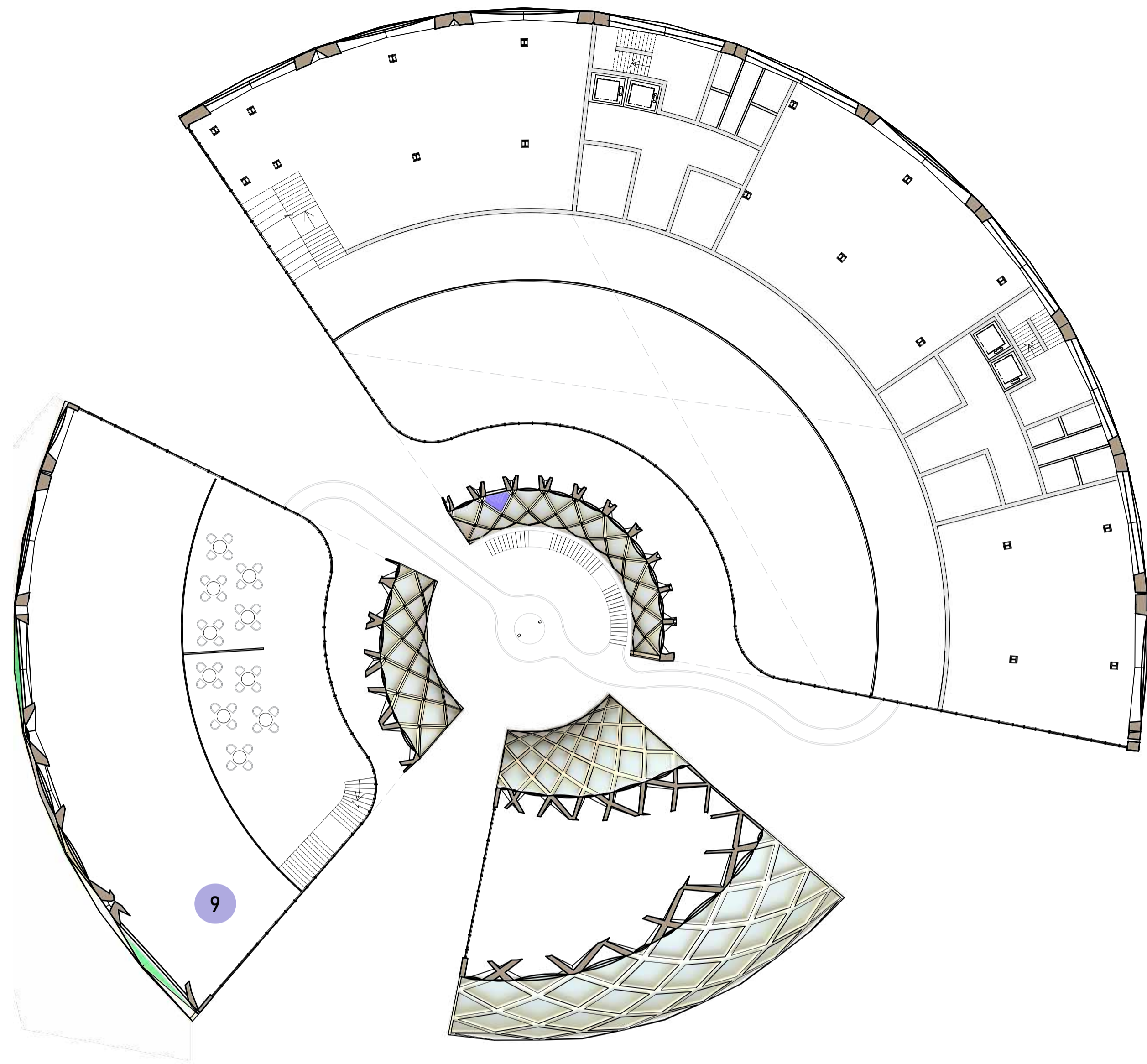
1ST FLOOR PLAN



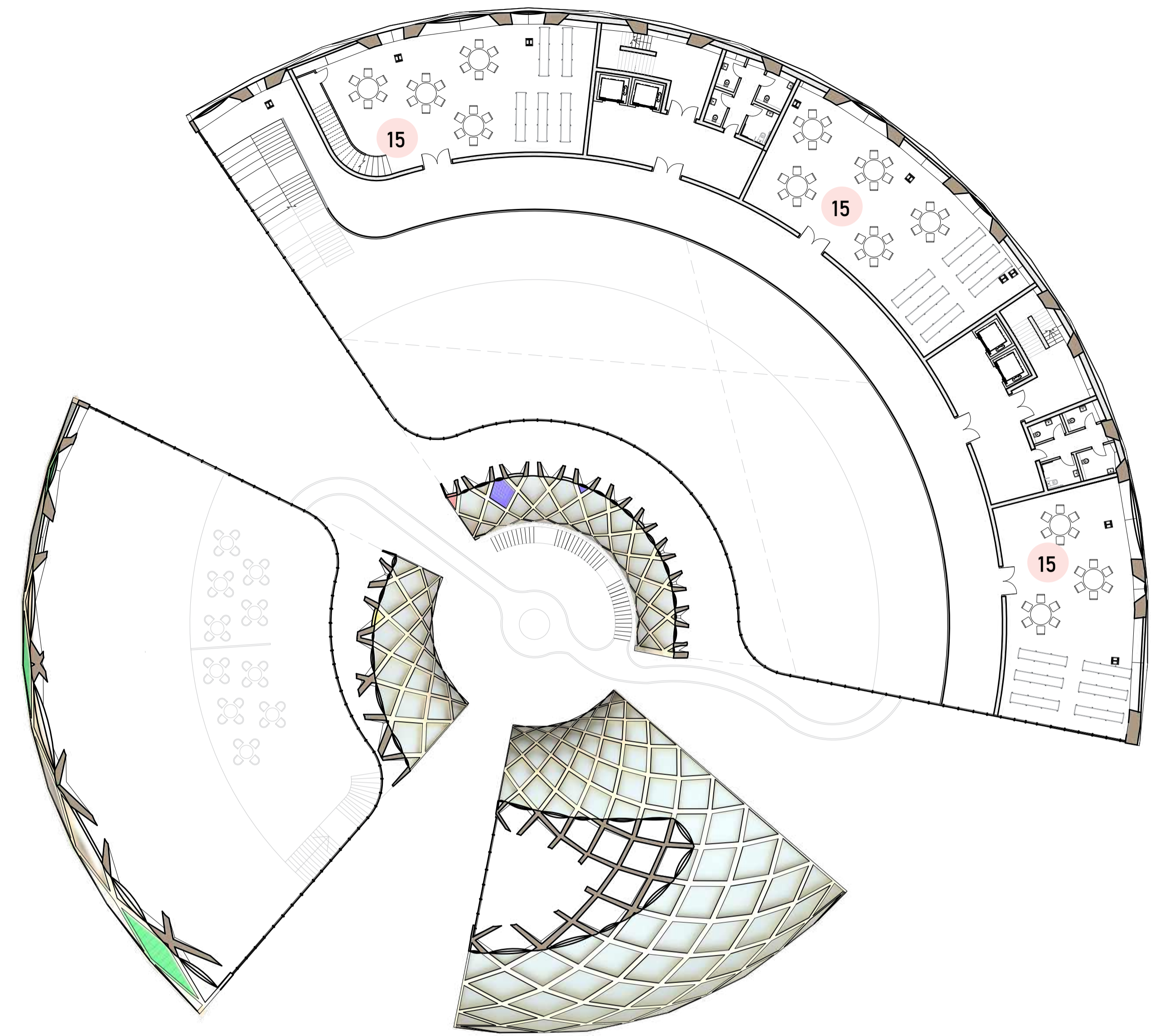
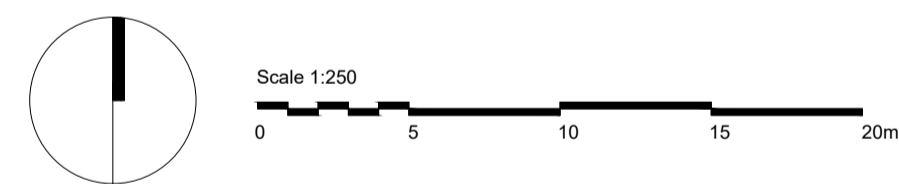
- KEY
- 12 CULINARY WORKSHOPS
  - 13 CONNECTING BRIDGE
  - 14 SMALL RESTAURANTS



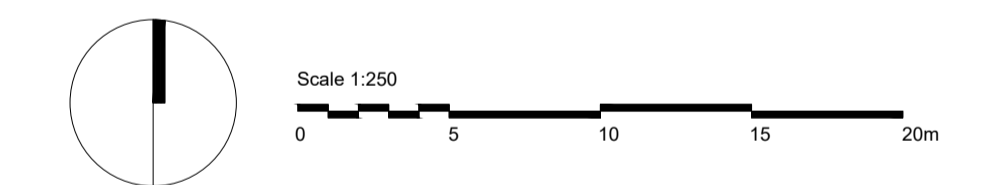




2ND FLOOR PLAN



3RD FLOOR PLAN

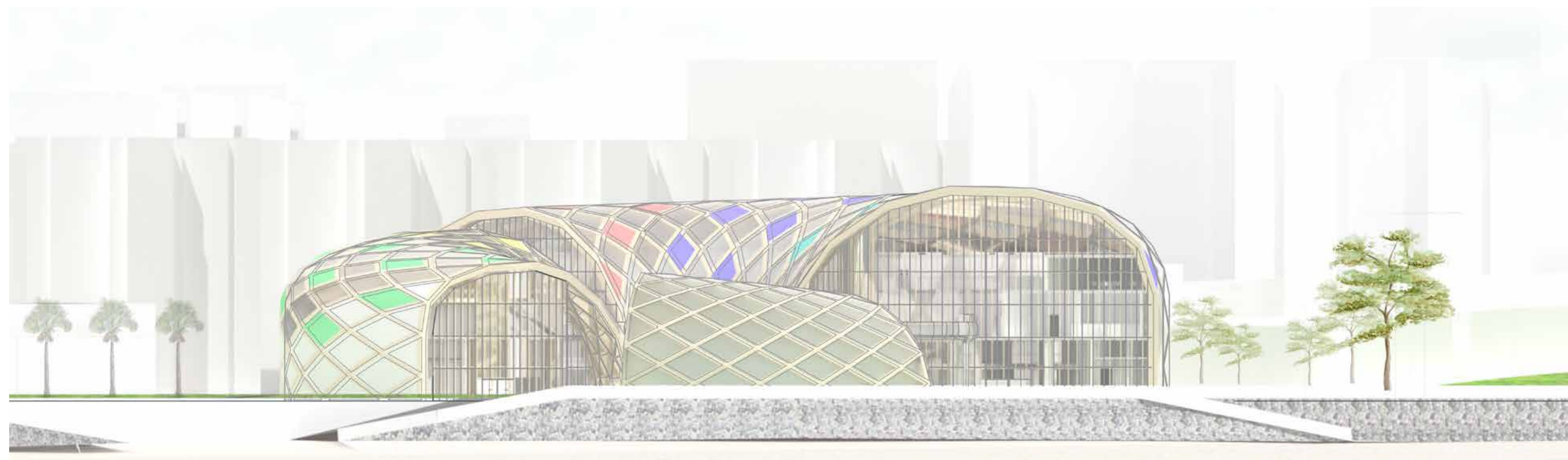


KEY

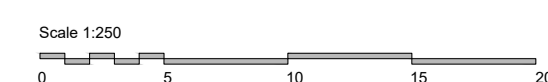
- 9 EXTRA SEATING FOR THE RESTAURANTS - hire-able flexible space

KEY

- 15 GARDENING WORKSHOPS: Hire-able for other purposes



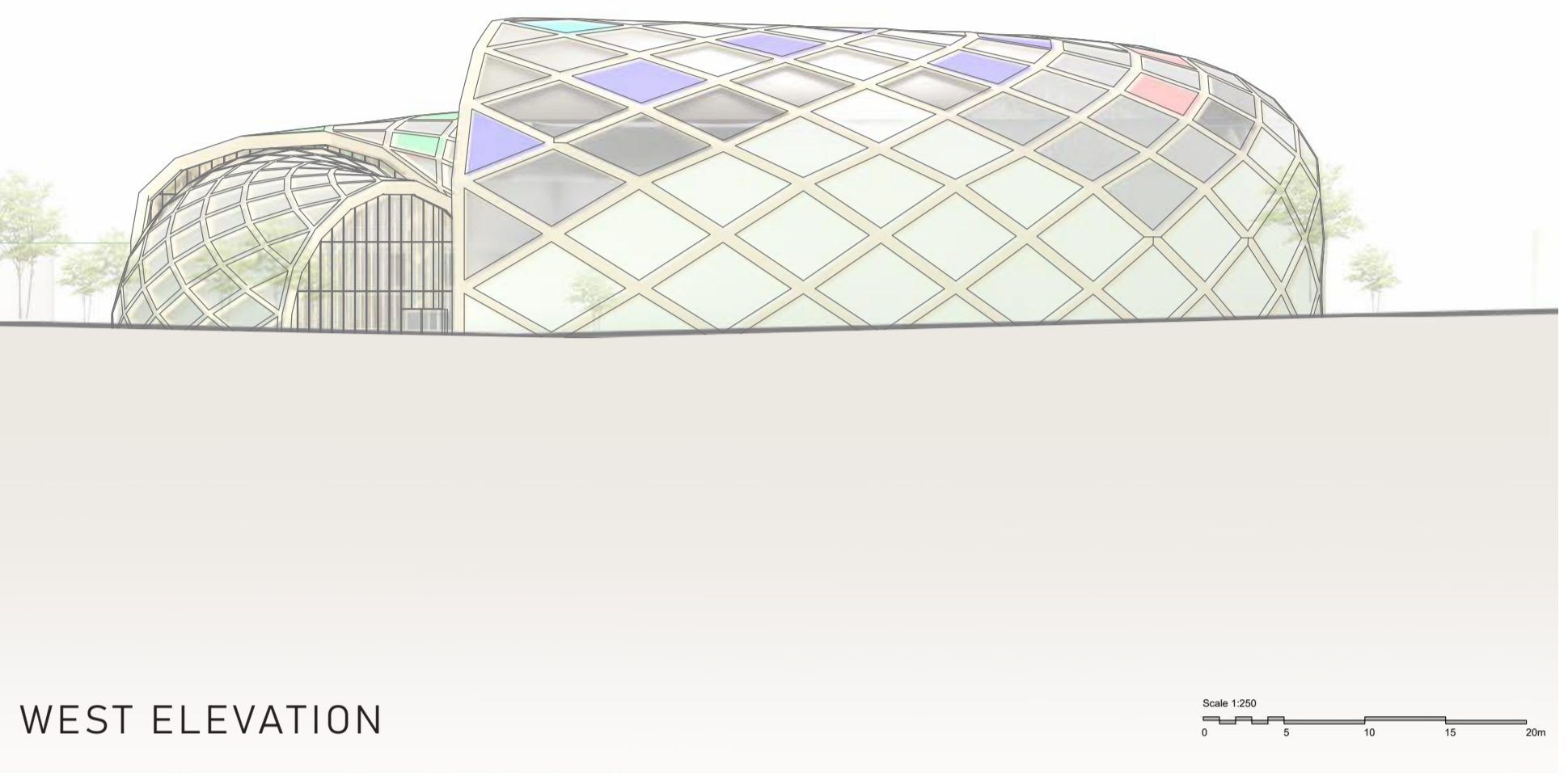
NORTH ELEVATION



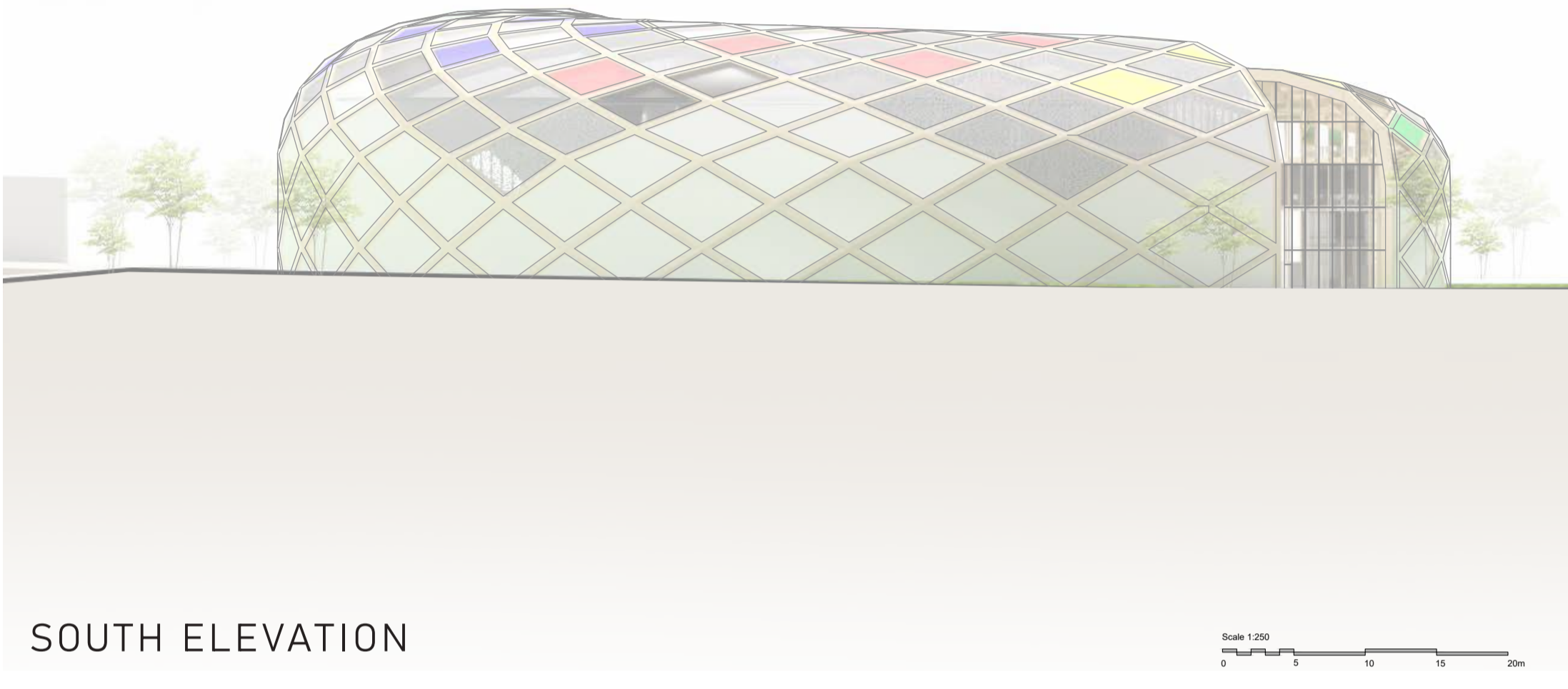
15



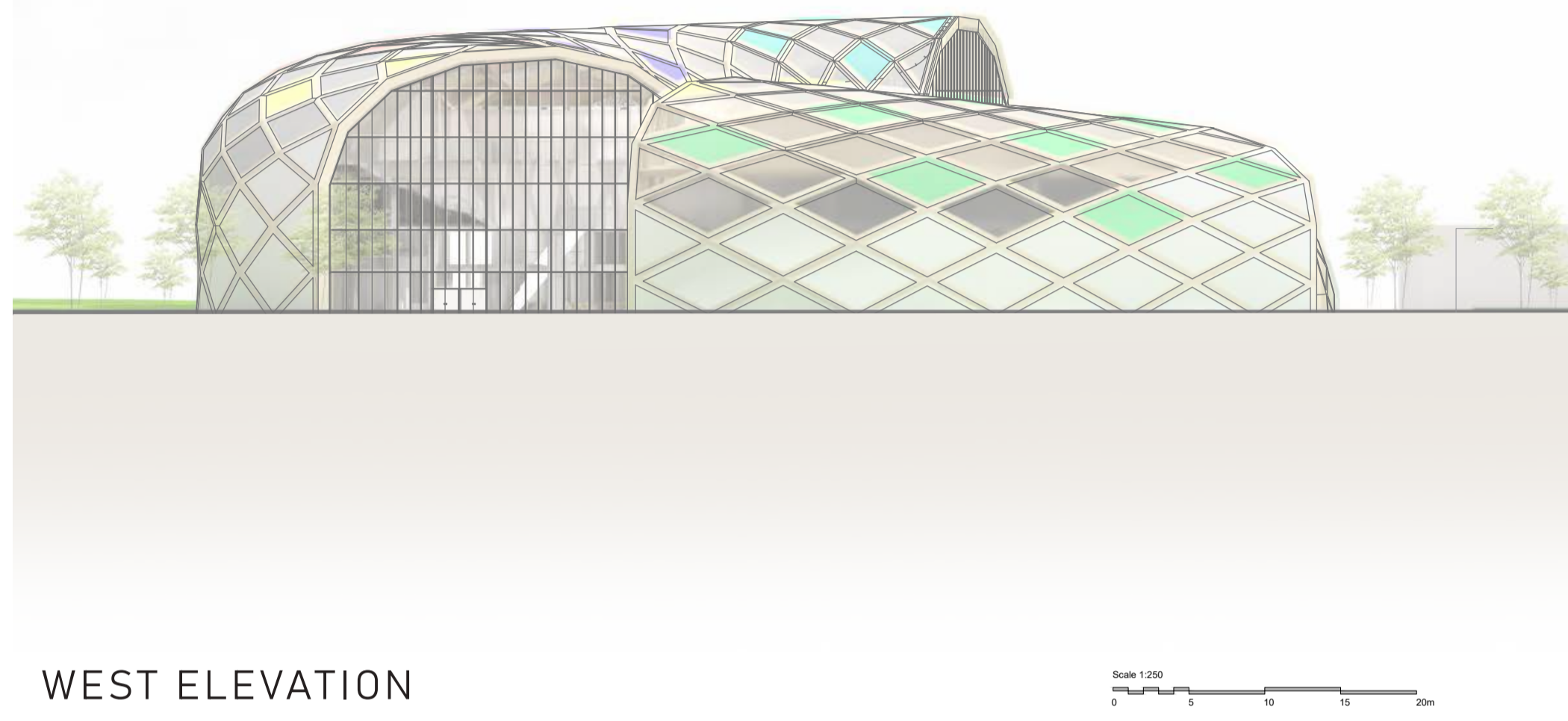
# ELEVATIONS



WEST ELEVATION

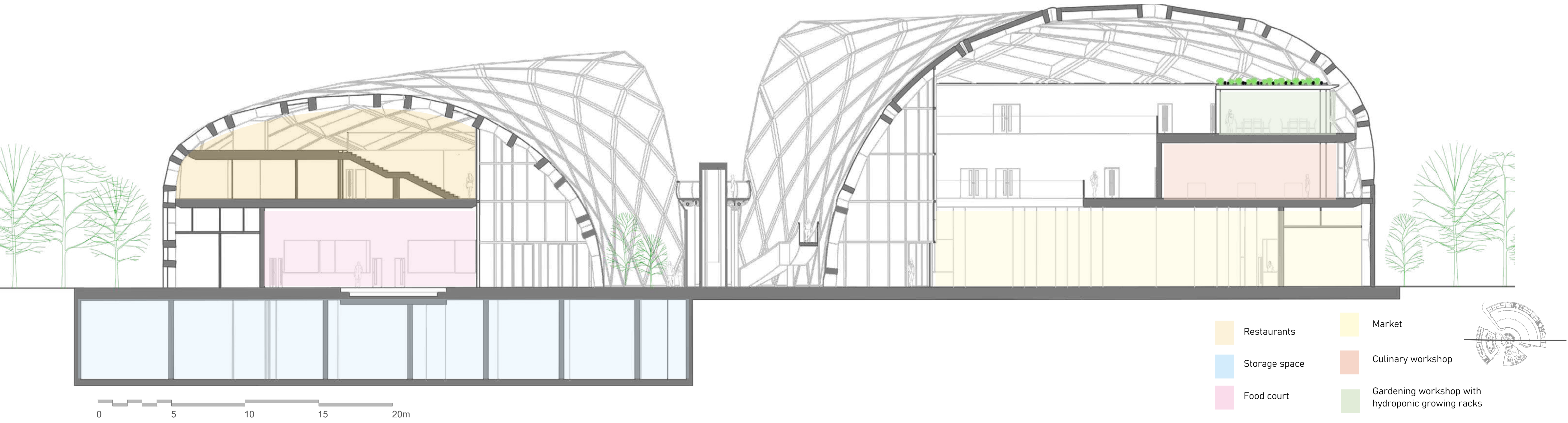


SOUTH ELEVATION

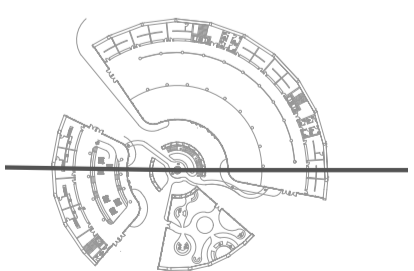


WEST ELEVATION

# ADDITIONAL SECTION



- Restaurants
- Market
- Storage space
- Culinary workshop
- Food court
- Gardening workshop with hydroponic growing racks





TRADE



MEAT & FISH



FOODCOURT



EDUCATION

CULINARY



EATING



FLEXIBLE

WORKSHOPS

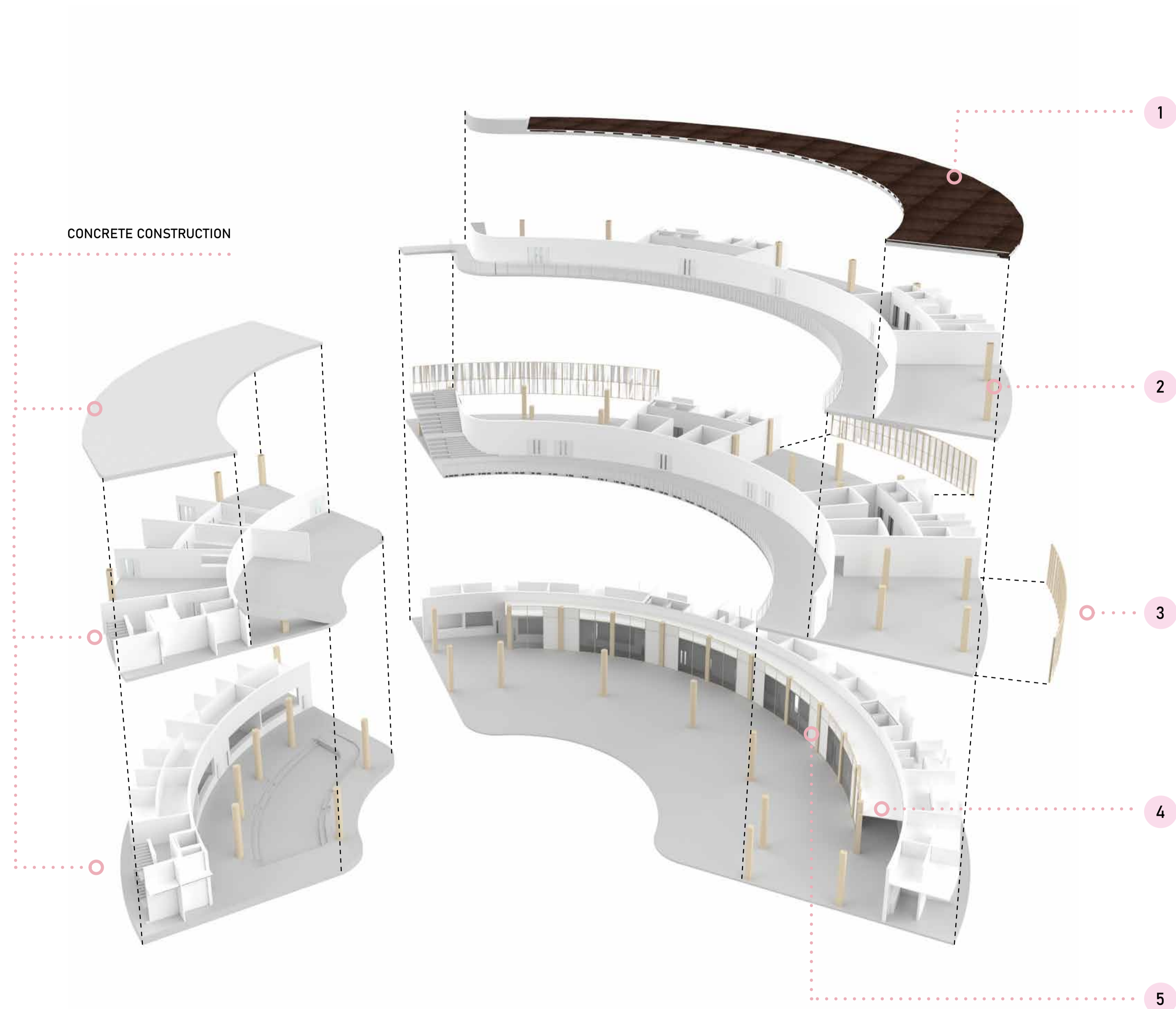


RELAXATION



SOCIALISING

# PRIMARY STRUCTURE



1 EXTENSIVE LIVING ROOF

2 COLUMNS : ENCASED STEEL I BEAMS WITH A TIMBER AESTHETIC FINISH

3 CURTAIN WALL :

The curtain wall on the floor is to allow the space to be sealed off having its own ventilation system , so that the cooking smells can be contained.

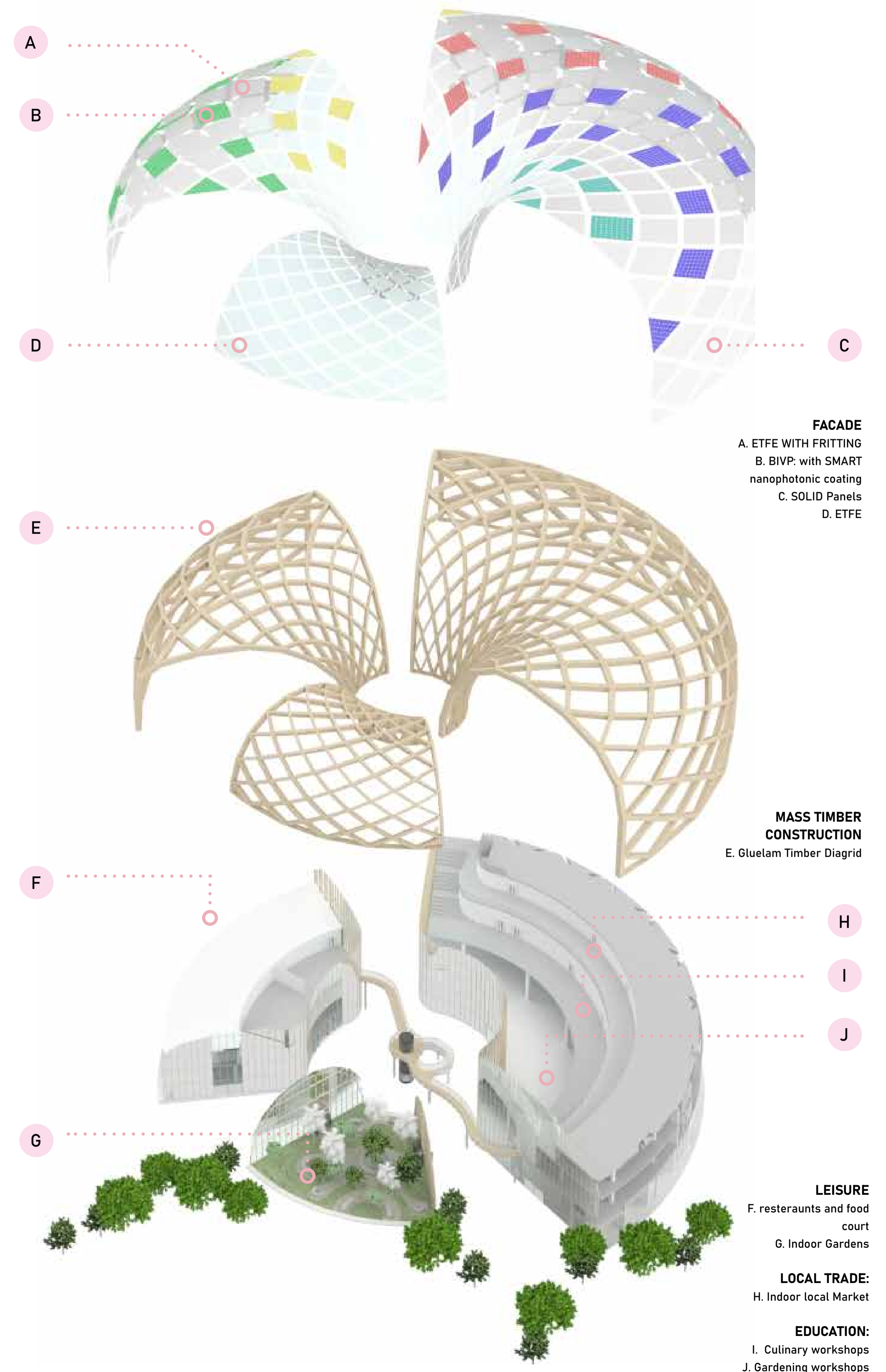
4 SUSPENDED CEILING:

Holding mechanical systems, lights, air-con, and ventilation systems.

5 CURTAIN WALL:

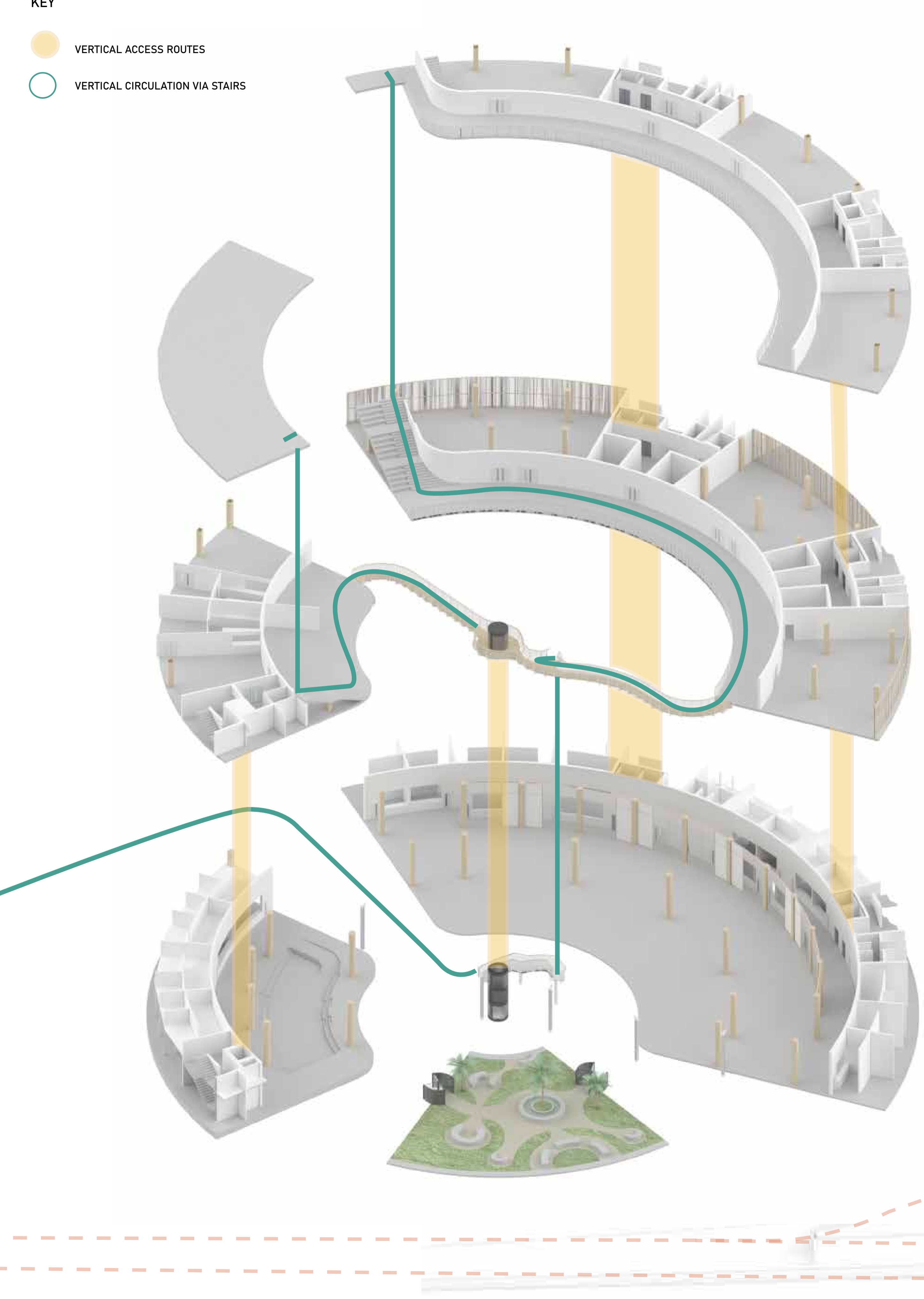
This curtain wall separates the Meat and Fish stalls from the Veg and other stalls.

# SECONDARY STRUCTURE



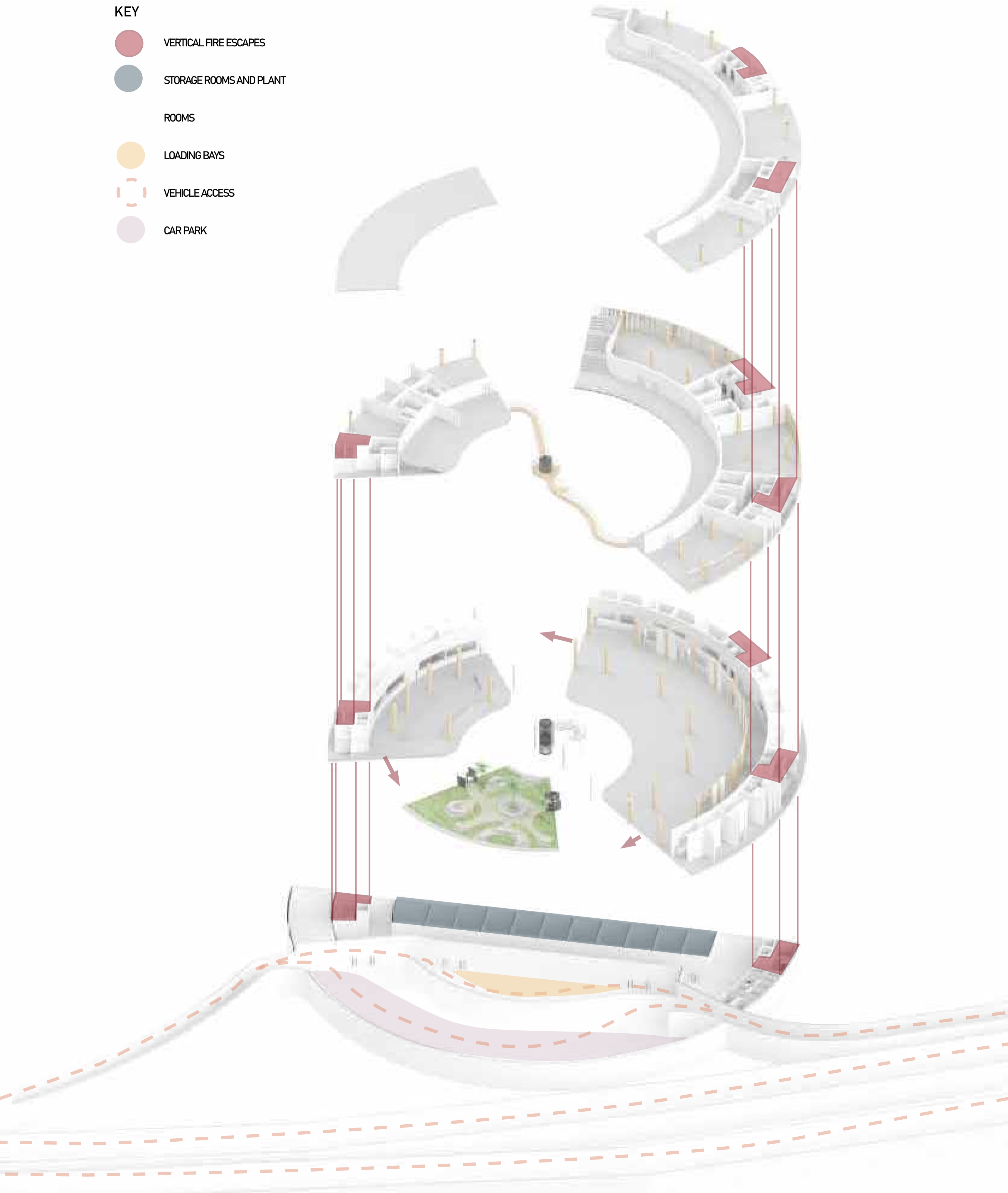
# ACCESS AND CIRCULATION

- KEY
- VERTICAL ACCESS ROUTES
  - VERTICAL CIRCULATION VIA STAIRS

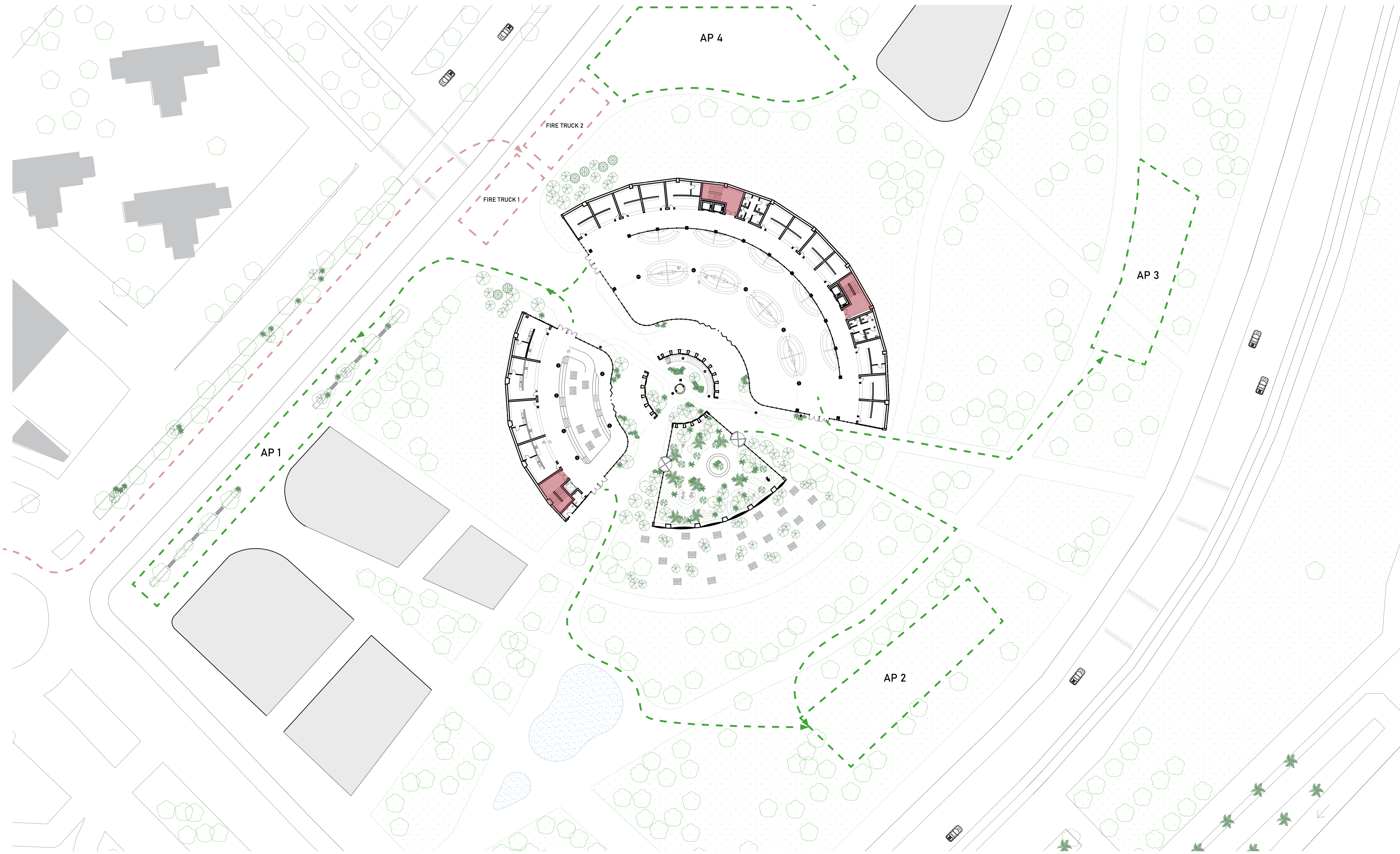


# FIRE AND LIFE SAFETY

- KEY
- VERTICAL FIRE ESCAPES
  - STORAGE ROOMS AND PLANT
  - ROOMS
  - LOADING BAYS
  - VEHICLE ACCESS
  - CAR PARK

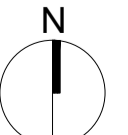


# FIRE AND LIFE SAFETY



AP: ASSEMBLY POINT    FIRE STAIRS    FIRE TRUCKS

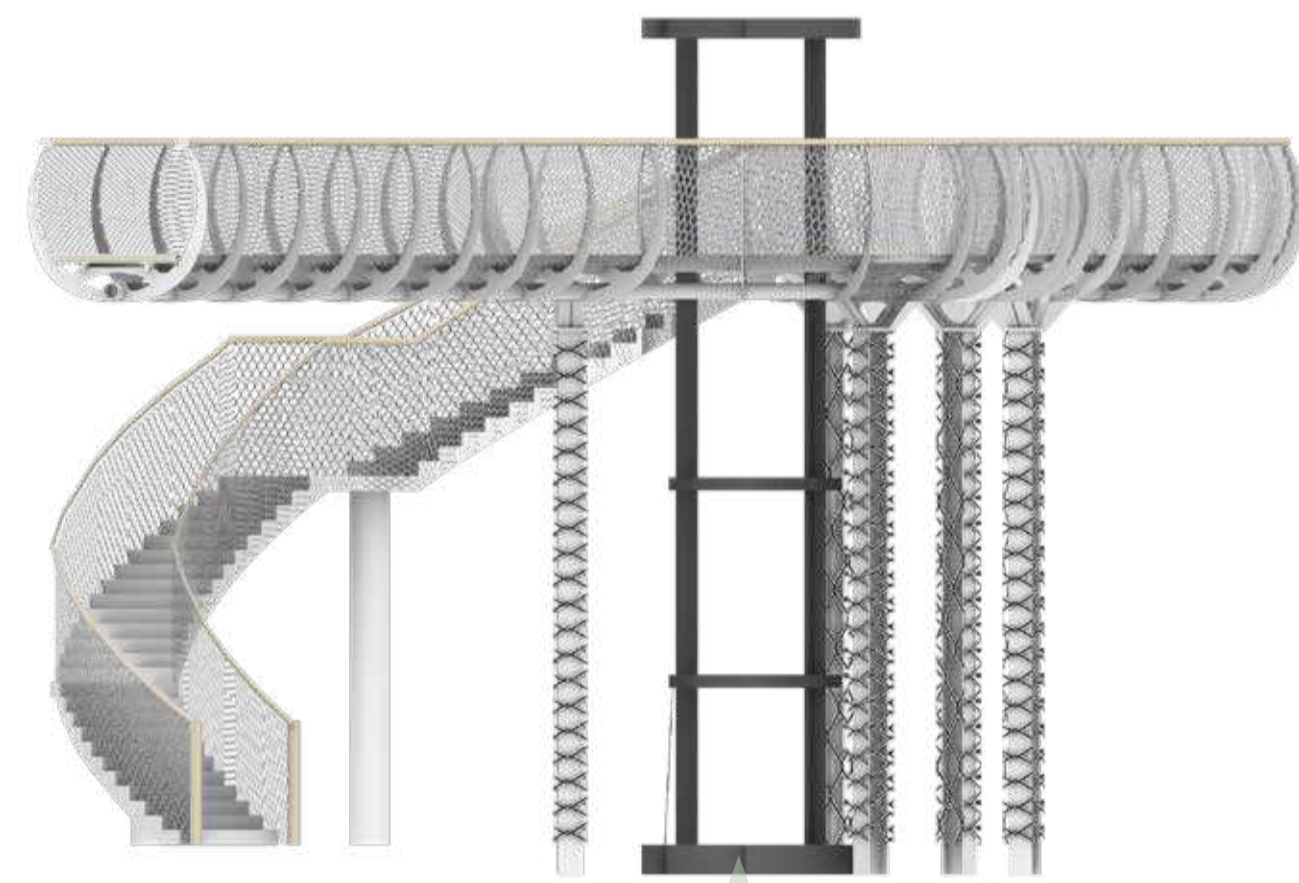
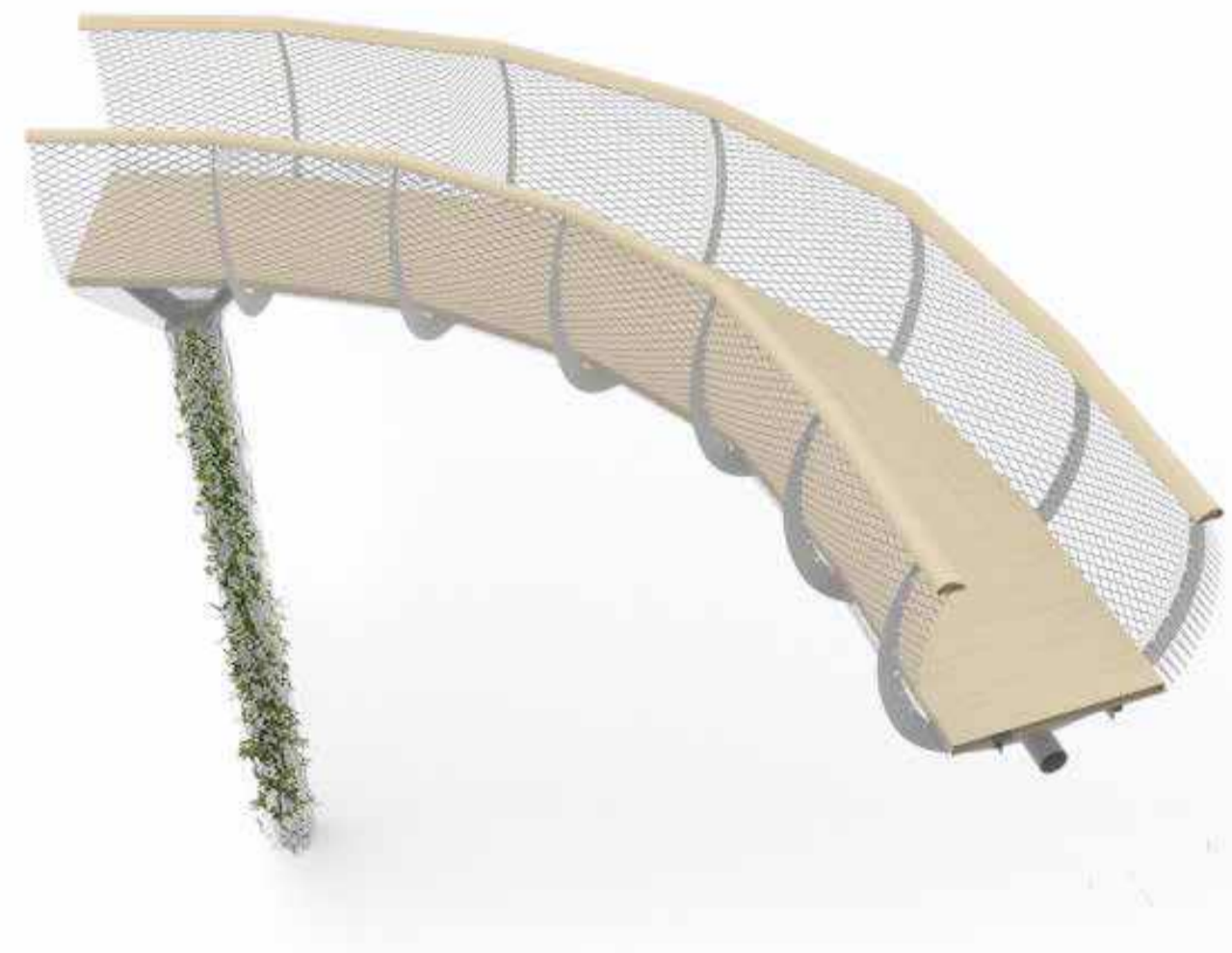
Scale 1:500  
0 5 10 15 20 30 40m



# BRIDGE - THE CONNECTOR

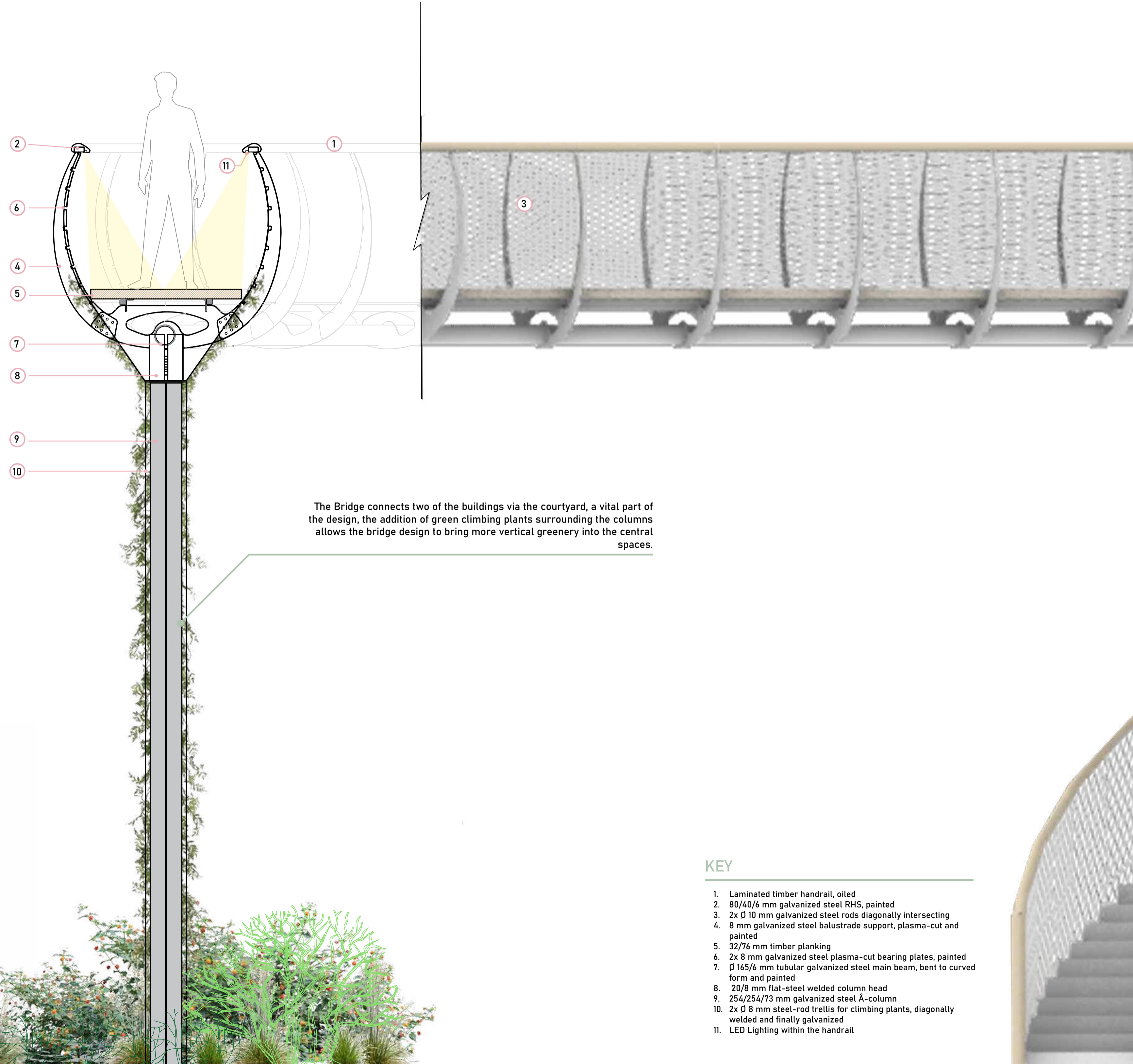
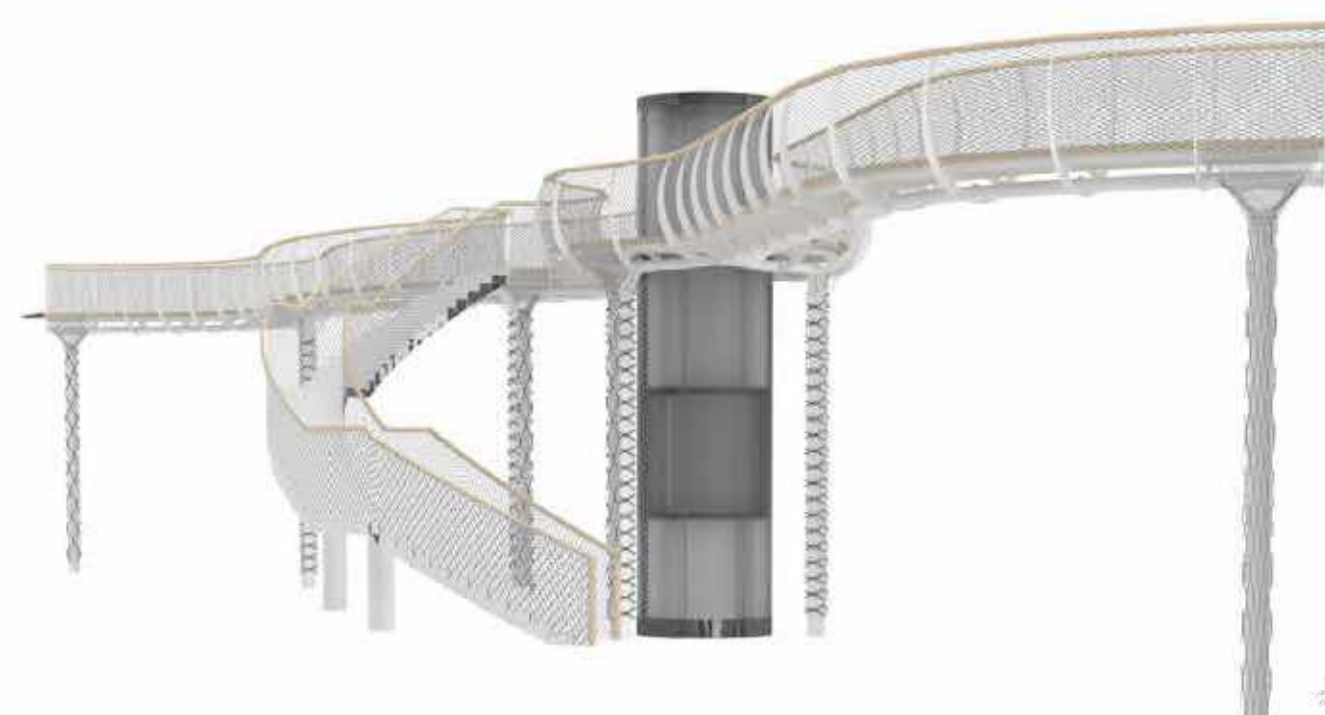
## 'THE DRAMA OF THE INBETWEEN'

The Bridge connects two of the buildings via the courtyard, a vital part of the design, the addition of green climbing plants surrounding the columns allows the bridge design to bring more vertical greenery into the central spaces.



### ACCESSIBILITY

A central glass circular lift, allows for accessibility, so everyone can enjoy the walkway above the courtyard.

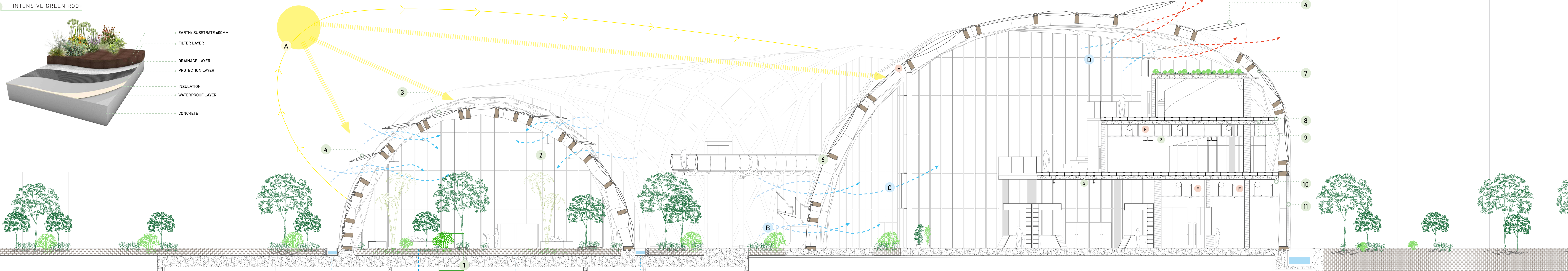
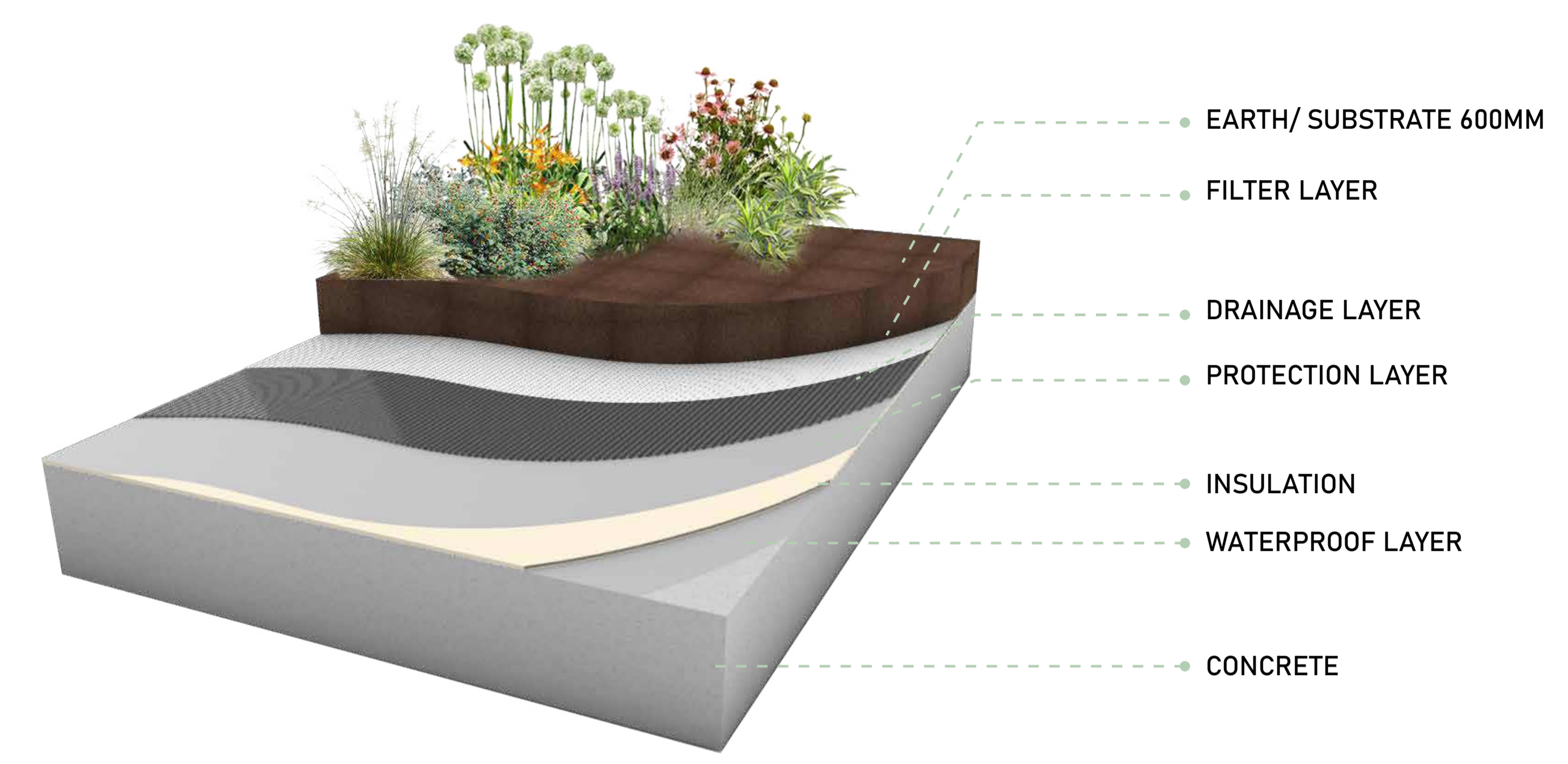


The Bridge connects two of the buildings via the courtyard, a vital part of the design, the addition of green climbing plants surrounding the columns allows the bridge design to bring more vertical greenery into the central spaces.

### KEY

1. Laminated timber handrail, oiled
2. 80/40/6 mm galvanized steel RHS, painted
3. 2x Ø 10 mm galvanized steel rods diagonally intersecting
4. 8 mm galvanized steel balustrade support, plasma-cut and painted
5. 32/76 mm timber planking
6. 2x 8 mm galvanized steel plasma-cut bearing plates, painted
7. Ø 165/6 mm tubular galvanized steel main beam, bent to curved form and painted
8. 20/8 mm flat-steel welded column head
9. 254/254/73 mm galvanized steel A-column
10. 2x Ø 8 mm steel-rod trellis for climbing plants, diagonally welded and finally galvanized
11. LED Lighting within the handrail

1 INTENSIVE GREEN ROOF

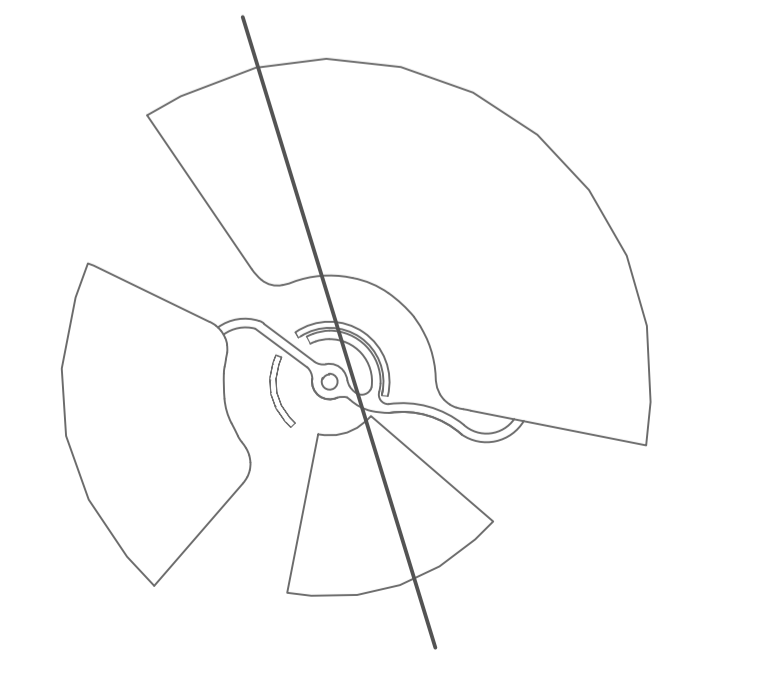
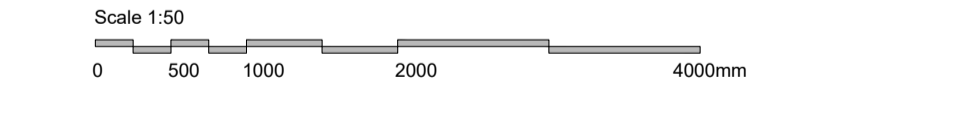


ENVIRONMENTAL FACTORS

- A** Sun piecing the Indoor Garden , and being captured by the solar panels
- B** Perforated panels to allow for ventilation to pass through the facade envelope
- C** Mechanical windows within the Curtain wall , openable to allow for ventilation to pass through.
- D** Natural ventilation, coming through from the south prevailing wind.
- E** Solar Panels - BIPV
- F** Suspended ceiling allows for mechanical systems.
- Natural ventilation

TECHNOLOGY KEY

- 2** ELECTRIC FAN
- 3** ETFE PANEL:  
External ETFE foil, Plywood Frame  
Internal ETFE foil, Transparent
- 4** OPENABLE ETFE PANEL:  
External ETFE foil, Plywood Frame  
Internal ETFE foil fritted
- 5** RAIN WATER RECYCLING SYSTEM:  
To power sprinklers
- 6** PERFORATED ALUMINIUM PANEL
- 7** MASS TIMBER CONSTRUCTION:  
SPRUCE GLUELAM - 220x845mm
- 8** RAISED FLOORING
- 9** CONCRETE CONSTRUCTION
- 10** SUSPENDED CEILING: With HVAC systems, sprinklers, lighting and other services
- 11** SOLID PANEL:  
FFO Membrane  
Wood-Fibre Insulating Board  
3-Layer Board

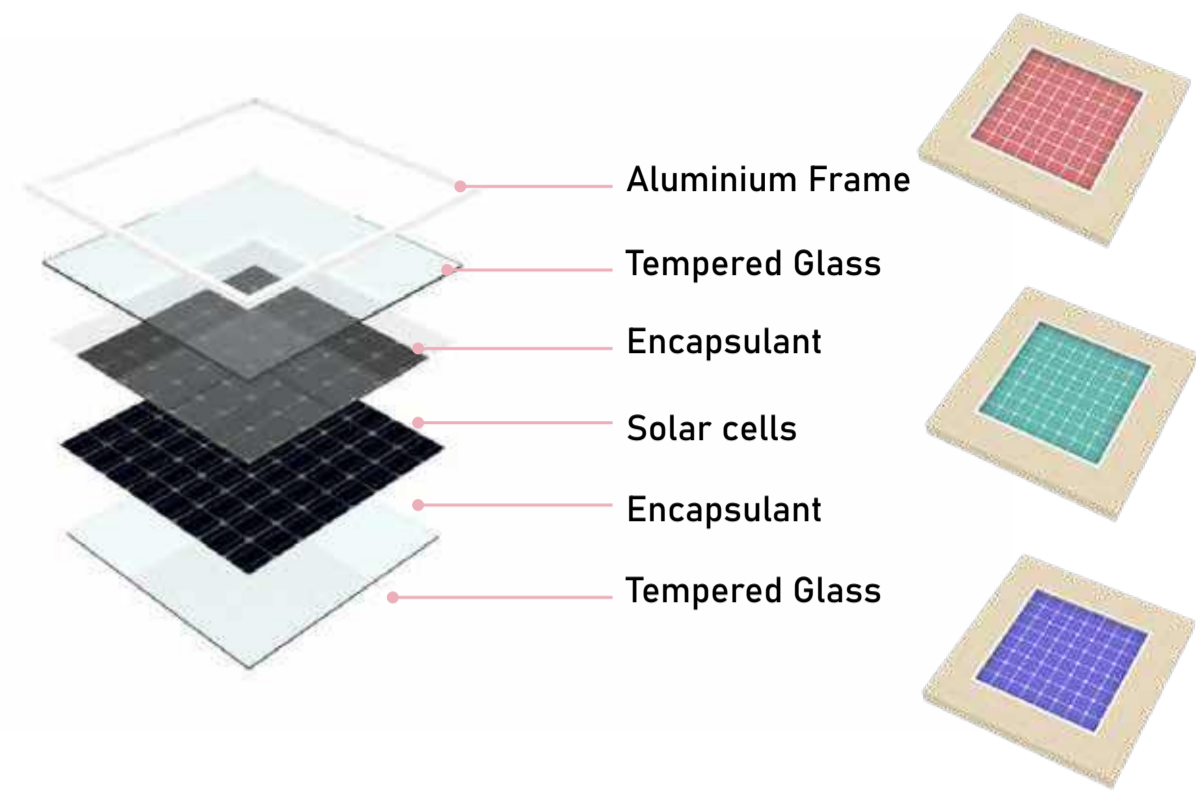




# TECHNOLOGY DETAILS

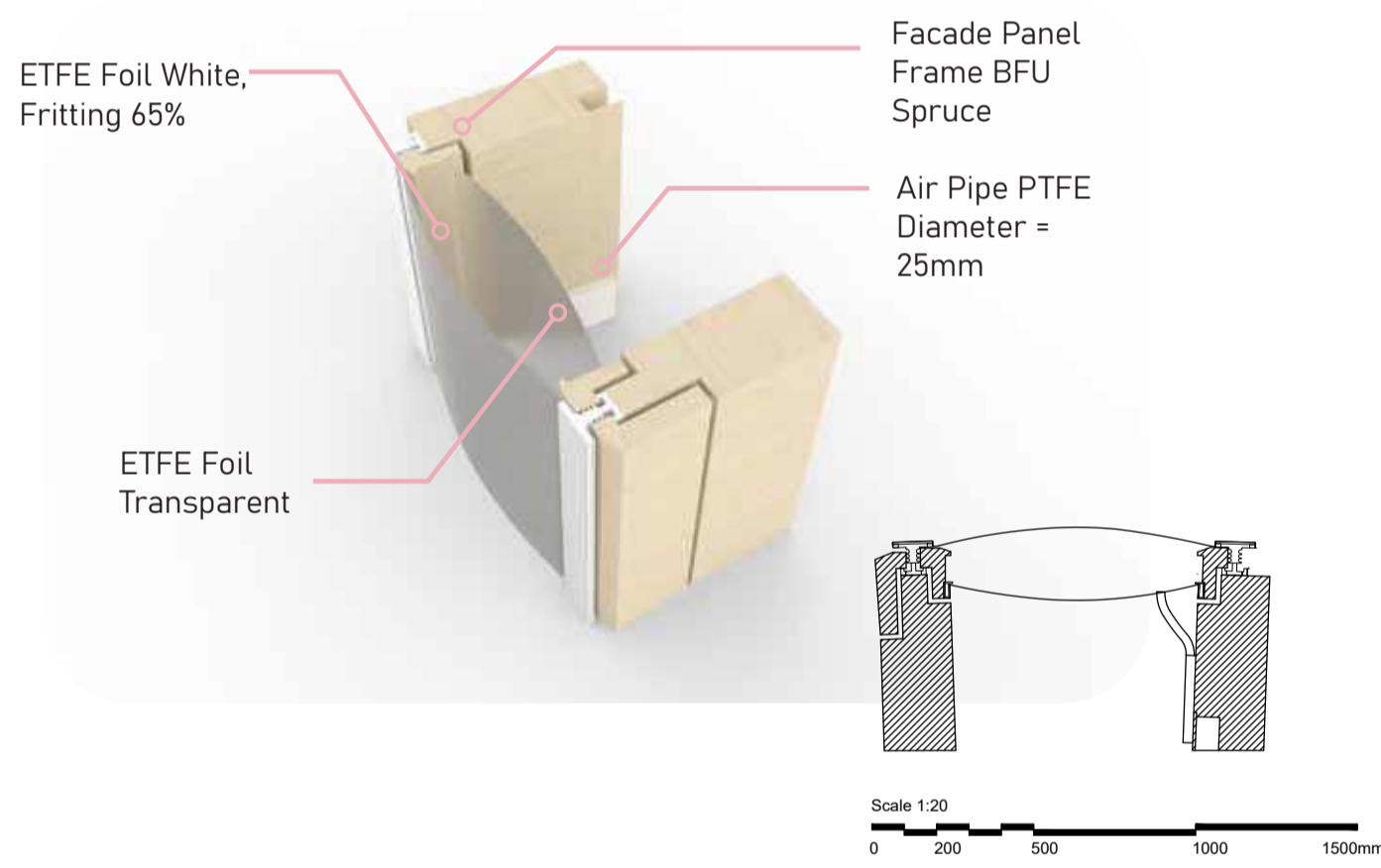
## FACADE DETAILS

### E BIVP: with SMART nanophotonic coating

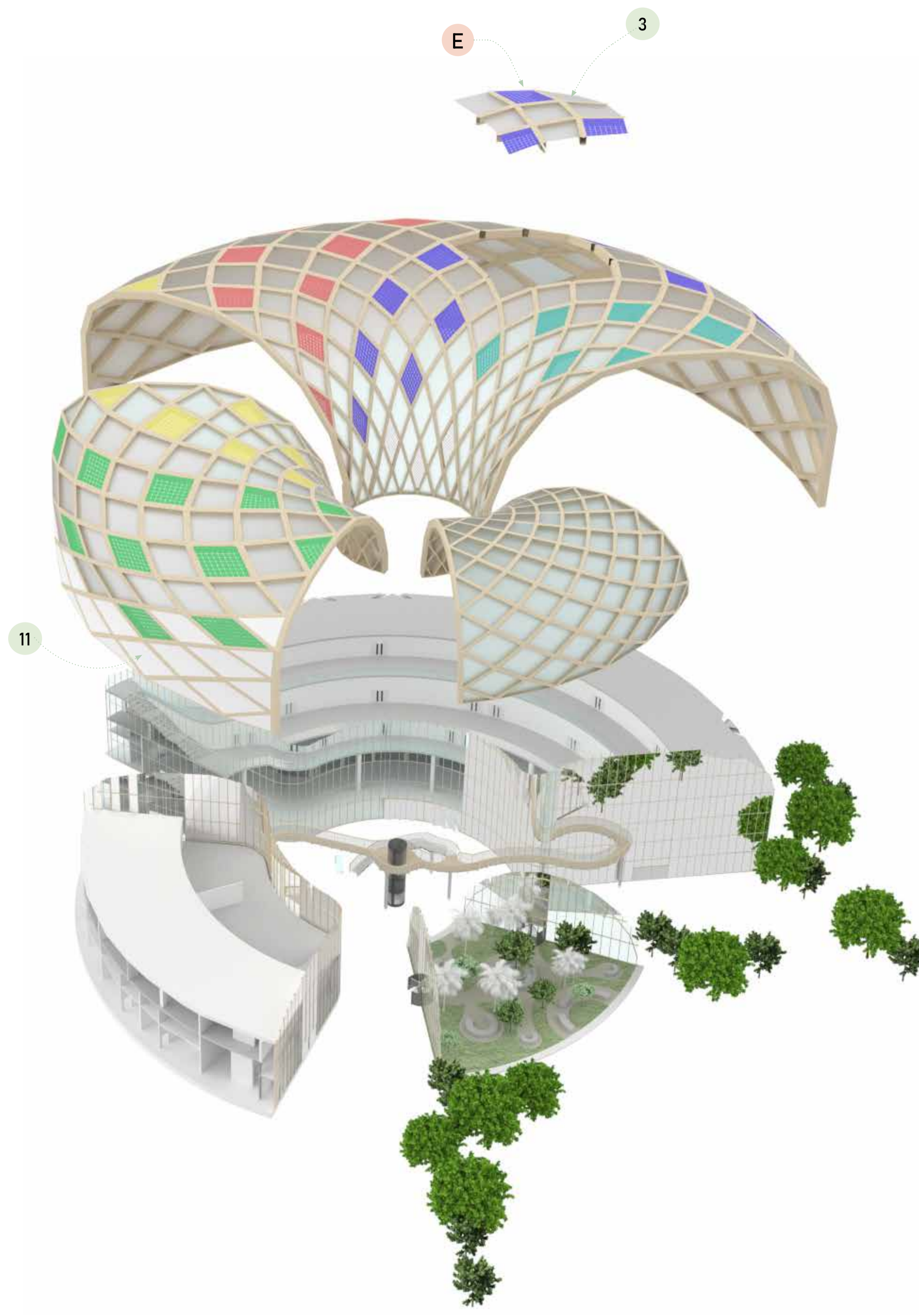
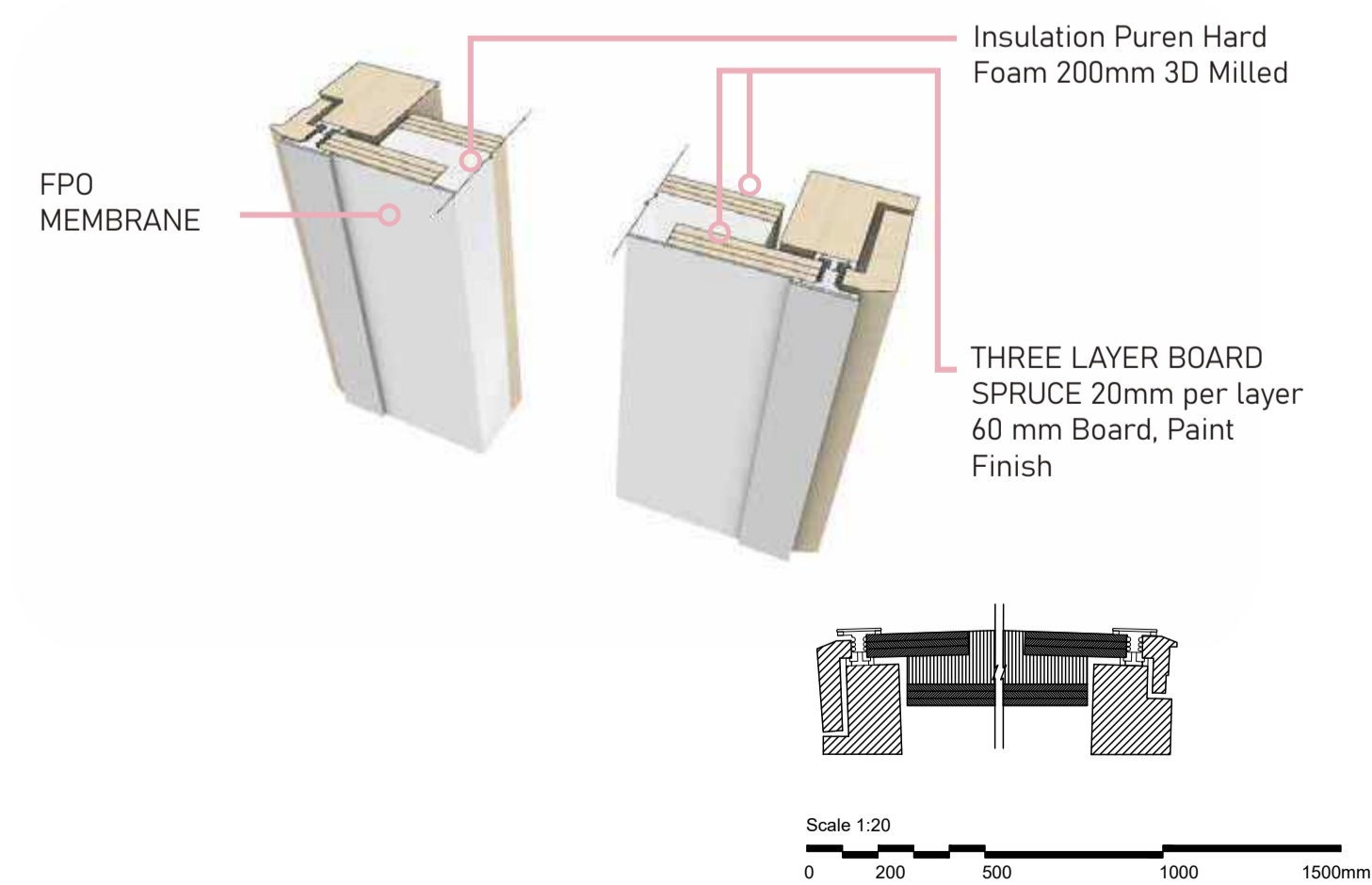


ETFE AND SOLID PANEL DETAILS FROM SWATCH OMEGA HEADQUATER, BIENNE, SWITZERLAND

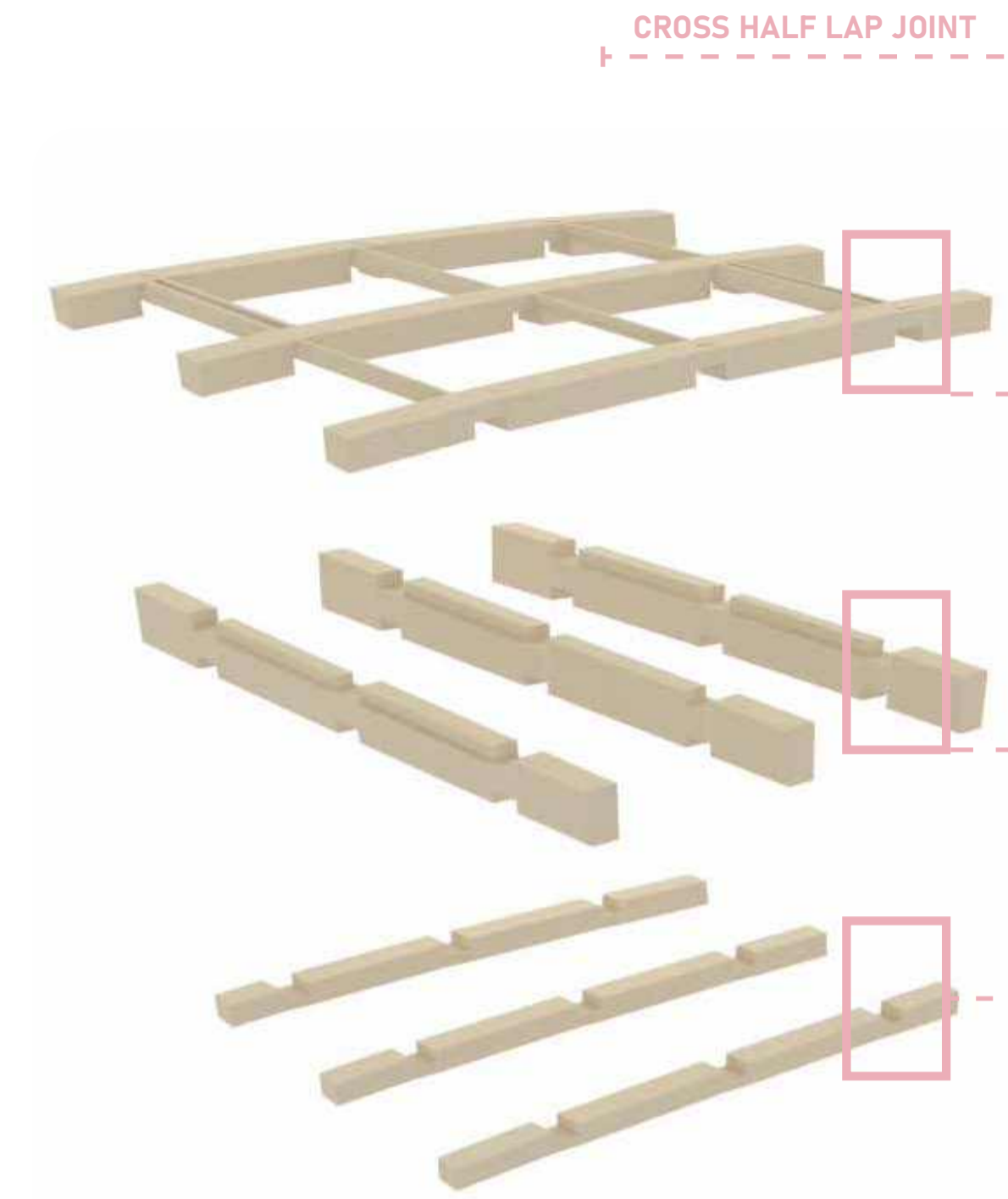
### 3 ETFE PANEL



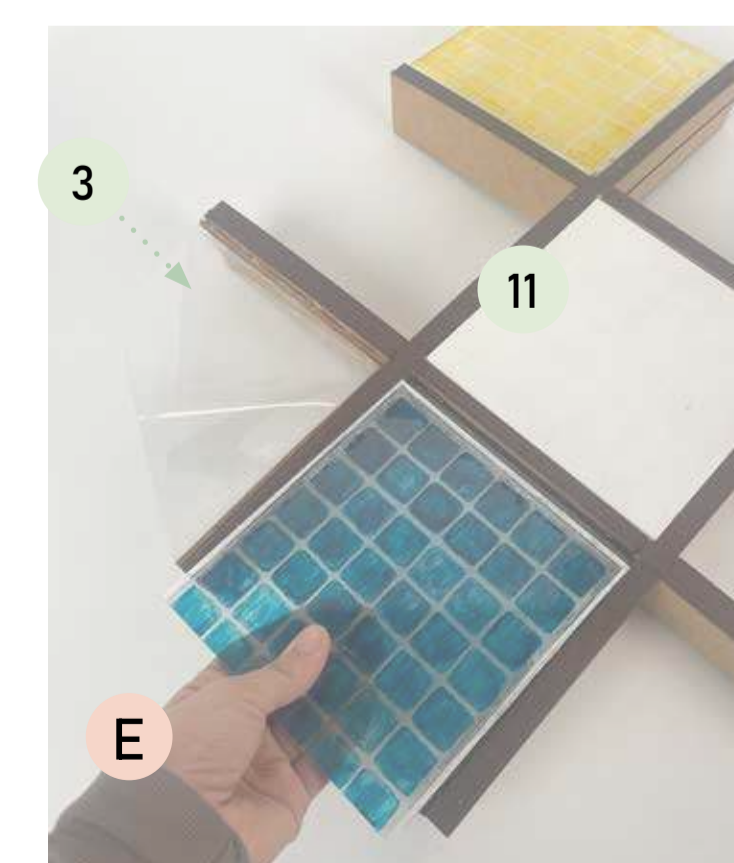
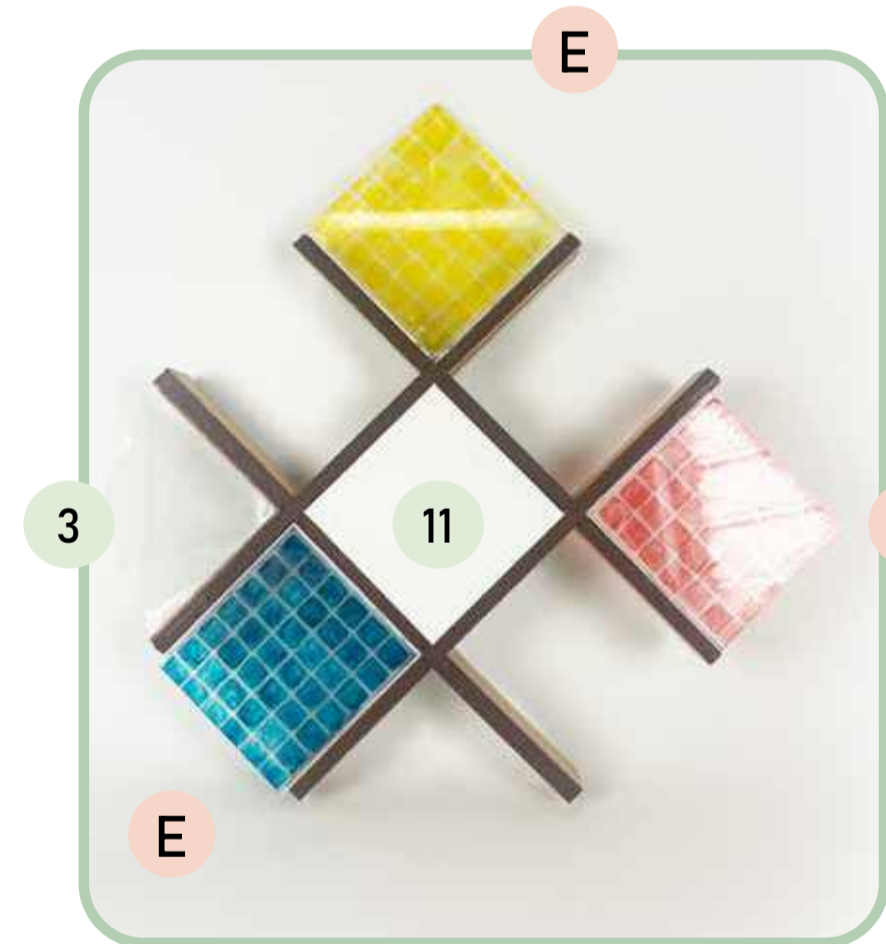
### 11 SOLID PANEL



## TIMBER DIAGRID CONNECTION

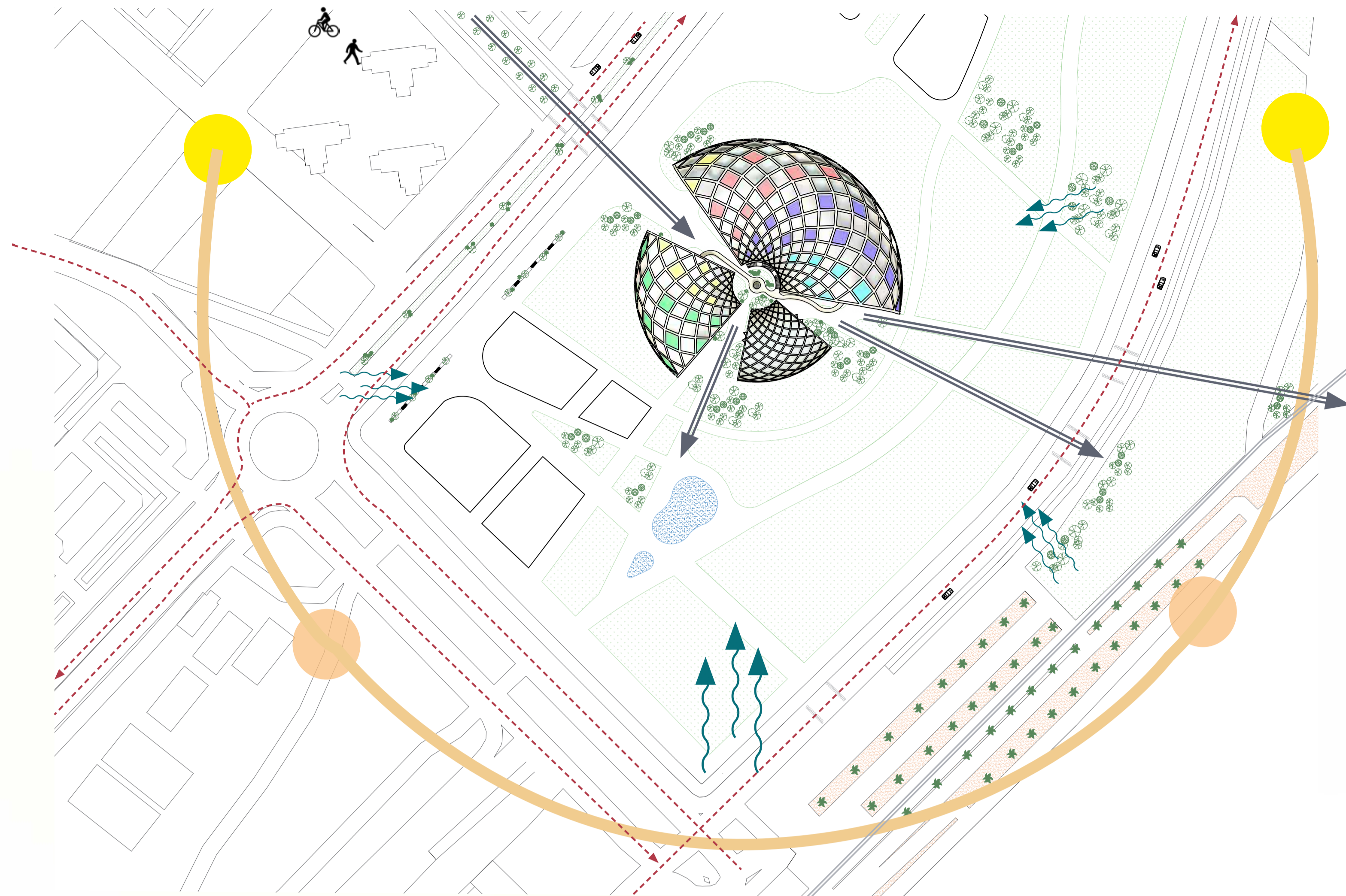


1:20 PHYSICAL MODEL OF A PIECE OF THE MASS TIMBER DIAGRID

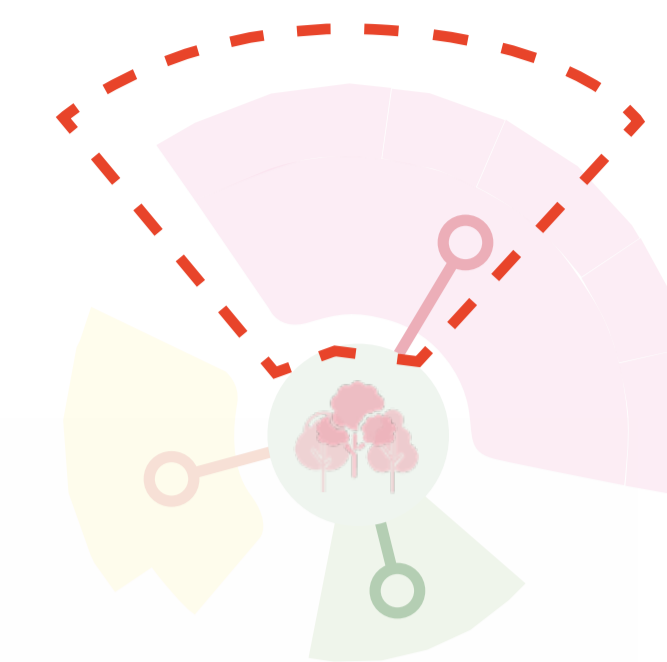


# ENVIRONMENTAL CONSIDERATIONS

3D CUT SECTION



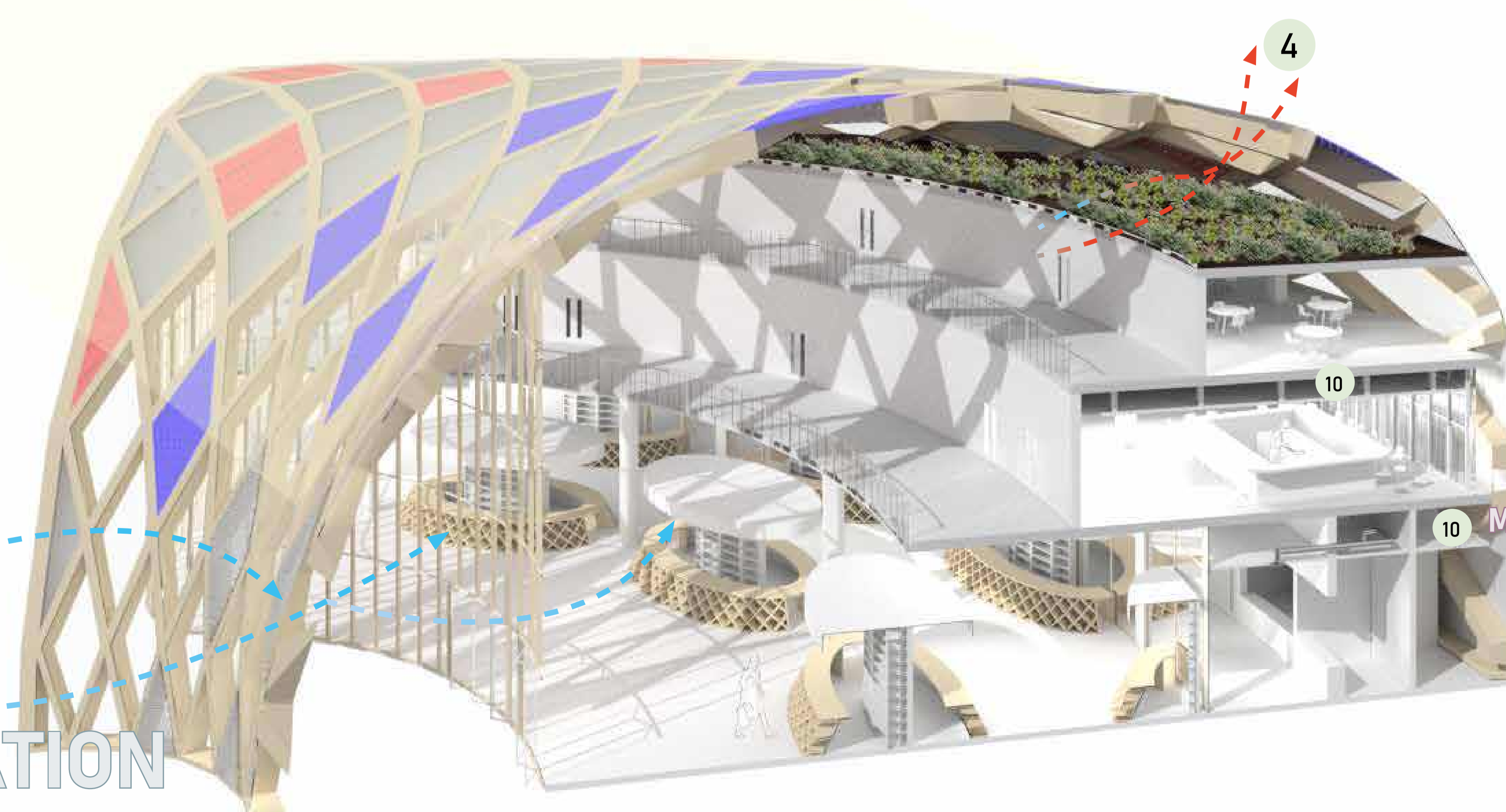
- KEY
- SUN PATH
- MAIN PEDESTRIAN WALKWAYS
- WIND
- VEHICLE MOVEMENT



DEMOUNTABLE

DEMOUNTABLE FOR MAINTENANCE, IF ONE NEEDS REPLACING.

SOLAR



PERFORATED PANELS TO ALLOW CROSS VENTILATION

VENTILATION

MECHANICAL

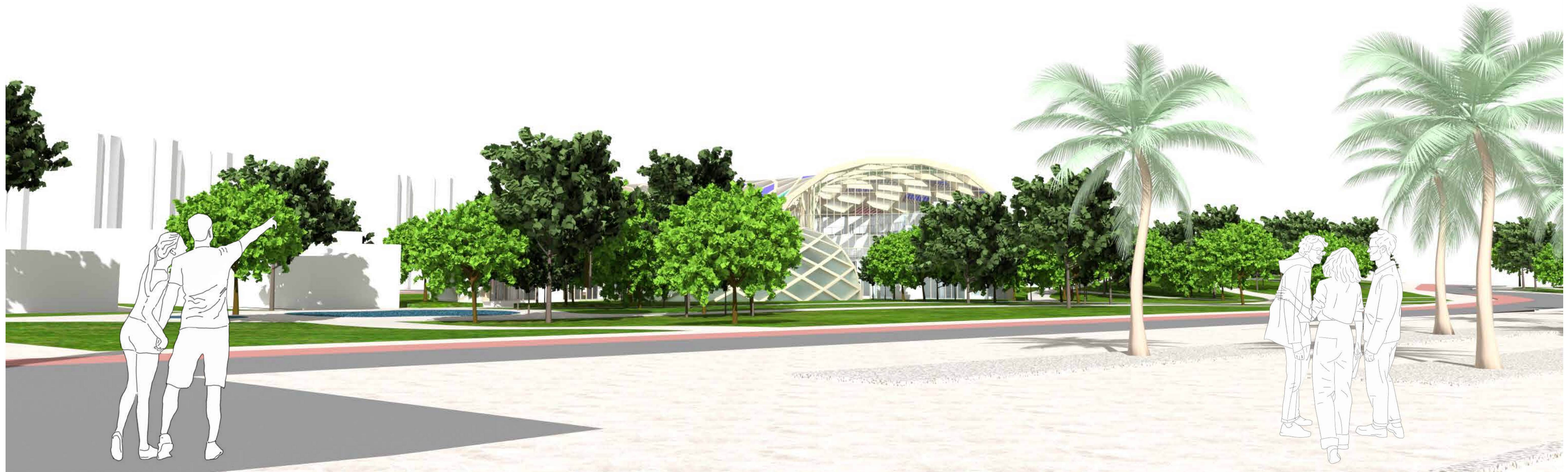
OPENABLE ETFE PANEL:  
External ETFE foil, Plywood Frame  
Internal ETFE foil fritted

4

SUSPENDED CEILING: With HVAC systems, sprinklers, lighting and other services

10

COASTAL PROMANADE VIEW

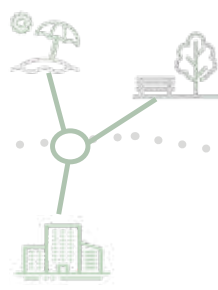


# THE GATEWAY NEXUS

A GATEWAY TO UNITING **TRADE, EDUCATION** AND **LEISURE** IN PURSUIT OF FOOD SUSTAINABILITY



SUSTAINABILITY : ENERGY, WATER, HEALTH AND WELLBEING



CONNECTIVITY



COMMUNITY ENGAGEMENT



CONNECTING WITH THE EXISTING VEGETATION



THE NEXUS

FIG 1

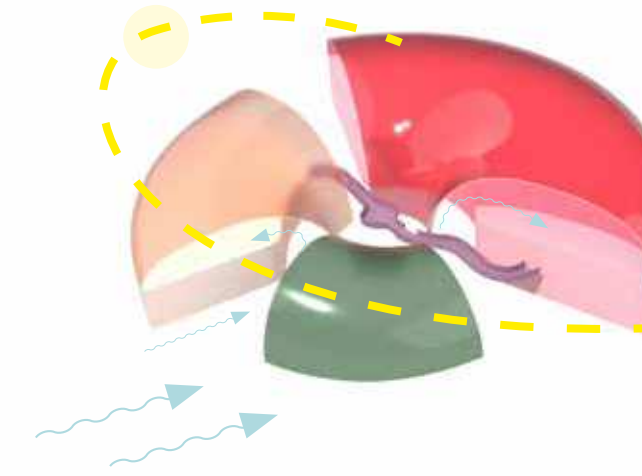
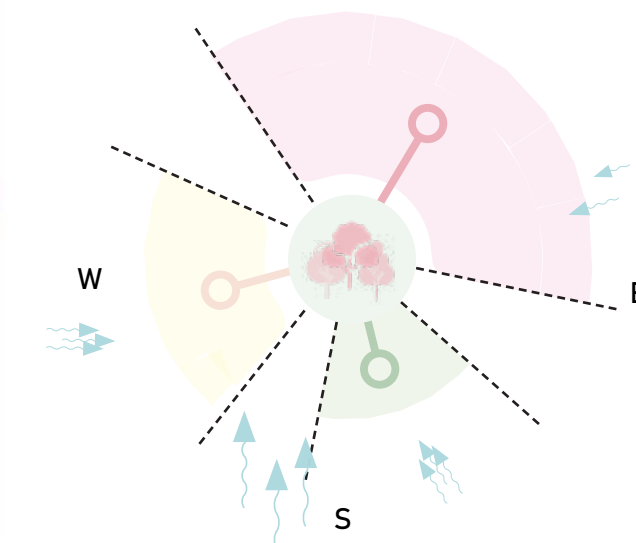


FIG 2



## DESIGN STATEMENT

### El Poblenou Coastal Masterplan: Enhancing Community and Connectivity

The El Poblenou Coastal Masterplan aims to enhance community-centric amenities along the coastal promenade, fostering greater engagement and connectivity within the area. Currently, the coastal front predominantly features sports facilities and two seafood restaurants, with a strong focus on seasonal activities. The masterplan seeks to better integrate El Poblenou's urban landscape with its coastline, creating a seamless connection for the community all year round.

### Strategic Location and Environmental Focus

The decision to situate the masterplan at the edge of Parc del Poblenou was driven by two key factors. Firstly, the park's vegetation faces challenges from climate change and escalating droughts. This location offers an opportunity to enhance the park's entrance while implementing innovative rainwater recycling systems to support irrigation during hot seasons, addressing critical environmental concerns. Secondly, the site's strategic position along El Poblenou's vital pedestrian routes, particularly where La Rambla del Poblenou intersects with the coastal promenade, makes it a crucial community connector. The masterplan prioritizes the development and improvement of gateway connectors within the site, enhancing connectivity and emphasizing the harmonious relationship between proposed buildings and surrounding vegetation.

### Plot E: The Gateway Nexus

Uniting Trade, Education, and Leisure in Pursuit of Food Sustainability

Plot E, designated as the Gateway Nexus, is strategically positioned to enhance the journey to El Poblenou beach and improve entry into Parc del Poblenou. This multifunctional facility aims to unite accessible trade of locally sourced fresh produce with community education and leisure activities, focusing on food sustainability.

The Nexus: The three categories- Trade, Education, and Leisure in Pursuit of Food Sustainability

The Nexus is designed to boost community engagement (through leisure activities: food court, restaurants, gardens). As well as provide educational opportunities in pursuit of food sustainability (through workshops and culinary demonstrations). With the addition of a local food market (improving the accessibility to trade fresh produce). The goal is to create a dynamic facility that enriches the journey to the coastal promenade and expands the community's culinary landscape, fostering a deeper understanding and appreciation for sustainable food systems.

### Driving Concept: The Gateway Nexus

The primary concept driving the project's design is the 'Gateway Nexus.' This concept focuses on three fundamental elements: better connecting El Poblenou, the beach, and Parc del Poblenou; increasing community engagement through leisure and community-based activities; and responding to the design with a sustainable focus. By integrating these elements, the facility aims to create a cohesive, vibrant, and sustainable community space.

## ENVIRONMENTAL STRATEGY STATEMENT

### Environmental Strategies

The design prioritises environmental considerations across several key areas: selecting sustainable materials, utilising eco-friendly construction techniques, strategically positioning façade panels, and shaping the overall form of the structure to harmonise with its context. The technology focus has transformed essential elements of food and critical connections between people and nutrition—encompassing **energy, water, and micronutrients**—into architectural solutions. These solutions emphasise **energy efficiency, innovative water recycling methods**, and the integration of functional spaces with nature, ultimately enhancing overall **health and well-being**.

### Contextual Integration

When developing this design, the form was shaped not only by the 'Gateway Nexus' concept but also by considerations of cross-ventilation and the sun's path. The sloping form is crafted to maximize natural light in each space: the market and education areas receive ample morning and daytime sun, the gardens are sunlit throughout the day, and the food court and restaurants benefit from the evening sun. Each area is strategically placed to align with its busiest time of day (see Fig. 1).

Where the design is segmented (see Fig. 2), it creates pathways that connect the beach, Parc del Poblenou, and the community, enhancing connectivity through the Gateway concept while facilitating cross-ventilation throughout the building. Additionally, the design respects existing vegetation by rehoming existing trees within newly created green spaces and planting additional species in the indoor garden area, creating a bridge between the urban landscape of El Poblenou and the **natural vegetation** of Parc del Poblenou.

Overall, the design thoughtfully considers its context by integrating the sun's path, enhancing ventilation, and preserving and augmenting vegetation.

### Construction and Material Choices

The design incorporates two structural systems: primary and secondary. The secondary structure utilizes mass timber construction with Glulam, chosen for its environmental and aesthetic qualities. Glulam's versatility allows for beams of any shape and size, enabling the design to achieve a complex form. The primary structure comprises of encased steel columns and concrete floor slabs, facilitating the large spans required by the design.

The half-lap connection used for the diagrid allows for easy maintenance or replacement of individual Glulam pieces. This design ensures that extensive measures are unnecessary; instead, the specific piece needing attention can be carefully removed and replaced, simplifying the maintenance process.

### Façade Panels and Strategic Positioning

The choice and placement of façade panels were carefully considered to respond to the site's location, enhance **energy efficiency**, and create a comfortable interior environment. The design incorporates various types of panels, including built-in photovoltaic (BIPV) panels with a SMART nanophotonic coating, ETFE panels, openable ETFE panels, ETFE with fritting, and solid panels.

The SMART nanophotonic coating adds color and aesthetic qualities to the solar cells, integrating them seamlessly into the façade. The design includes 42 BIPV units, comprising a total of 9600 solar cells, which power systems such as lighting, fans, and other electrical systems.

The openable ETFE panels facilitate natural ventilation, controlled by mechanical systems, and are strategically placed in the indoor garden to allow wildlife access, promoting pollination of various plant species. ETFE panels

with fritting control UV transmission, providing shading and enhancing interior comfort. All these panels work together to respond to the site's location, enhance energy efficiency, and create a comfortable interior environment.

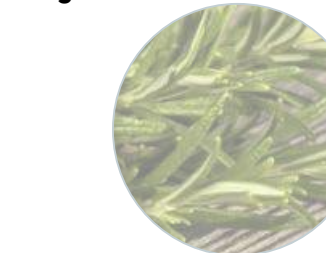
### Mechanical Systems and Services

The design also considers the placement of mechanical systems and services, using suspended ceilings to house HVAC systems, lighting, sprinkler systems, plumbing, and more. Mechanical controls power both the HVAC system and natural ventilation through openable panels and windows. Natural ventilation can pass through various perforated panels within the secondary façade, situated in the courtyard, then through the curtain walls with openable windows, and finally out of the secondary façade using a mechanical system.

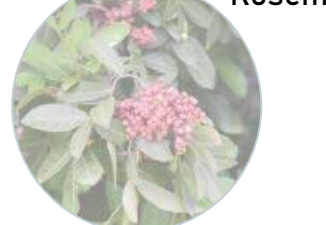
The facility can also use **grey water recycling, and rainwater recycling techniques to power sprinklers** within the indoor gardens and the rest of the site, improving the vegetation environment during hotter dry climates. The recycling systems tanks will be placed within the basement, with other service amenities such as a plant room, storage space, loading facilities and car park access for those who need it.

**Overall**, the design meticulously considers various aspects, including the site's location and context, material choices, construction methods, façade panels aimed at enhancing energy efficiency and creating a comfortable environment, mechanical systems focusing on water recycling, HVAC, lighting, and more. Additionally, it prioritises increasing **vegetation to promote health, well-being**, and connection to existing greenery.

### Some of the plants to go in the indoor garden



Rosemary



Mastic tree



Laurustinus



Citrus Trees



Palm Trees

# 'THE DRAMA OF THE INBETWEEN'



**THE  
GATEWAY NEXUS**  
A GATEWAY TO UNITING **TRADE**, **EDUCATION**  
AND **LEISURE** IN PURSUIT OF **FOOD**  
SUSTAINABILITY

## FIGURES

Aldrin, A., & Anishkumar, S. (2019). Colored solar cells with spectrally selective photonic crystal reflectors for application in building integrated photovoltaics. *Solar Energy*, 181, 1-8. <https://doi.org/https://doi.org/10.1016/j.solener.2019.01.058>

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