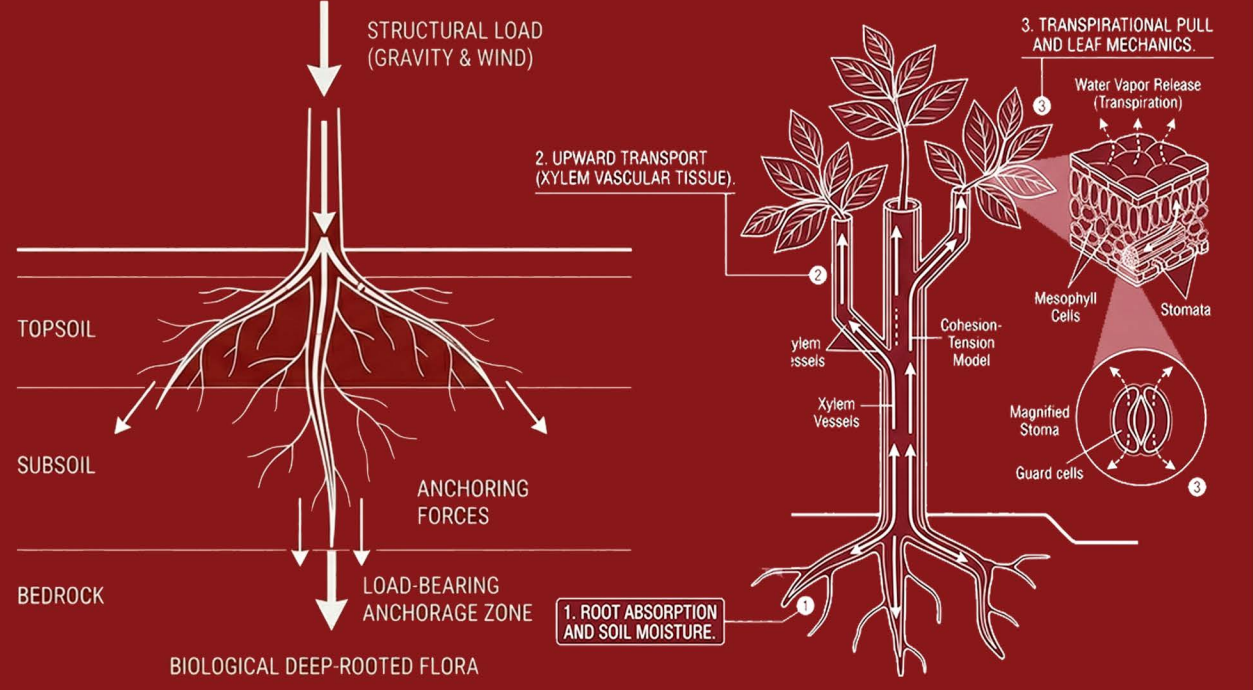


Concept

The project operates as a living system, taking its form directly from **plant biology** through distinct actions: Inspired by the resilience of **deep-rooted flora**, the project translates **natural anchoring** and **capillary mechanisms** into a responsive architectural framework. This biomimetic approach ensures **structural stability** in volatile terrains while actively **harvesting surface water** to sustain integrated ecological systems.

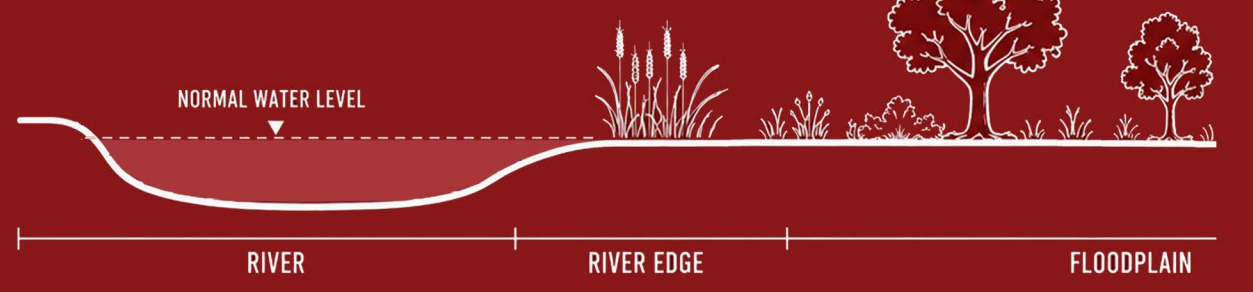


Roots absorb water from the surrounding soil and start the life-support process of the whole plant. **Roots' primary functions** include absorption of water and dissolved minerals.

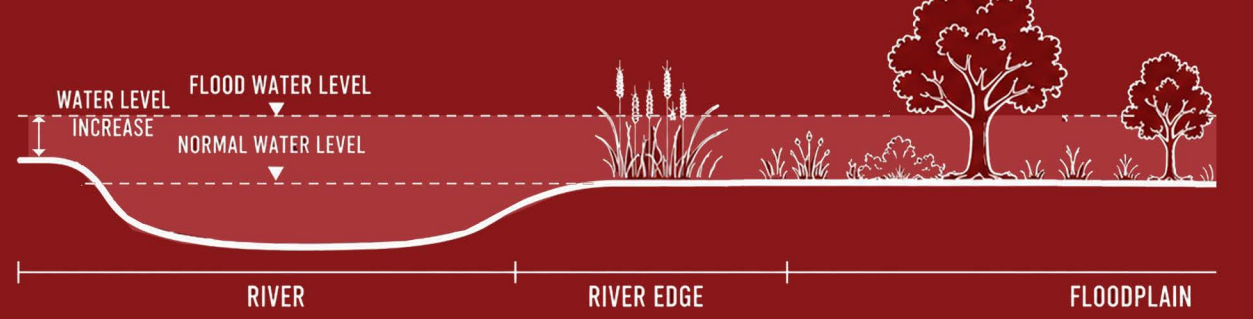
Problem Statement

The site is a **floodplain** where **water levels rise during flood season** and then recede quickly. Instead of treating floodwater as a threat, the project captures it, uses it to support vertical farming in the towers, and turns seasonal flooding into agricultural and economic value.

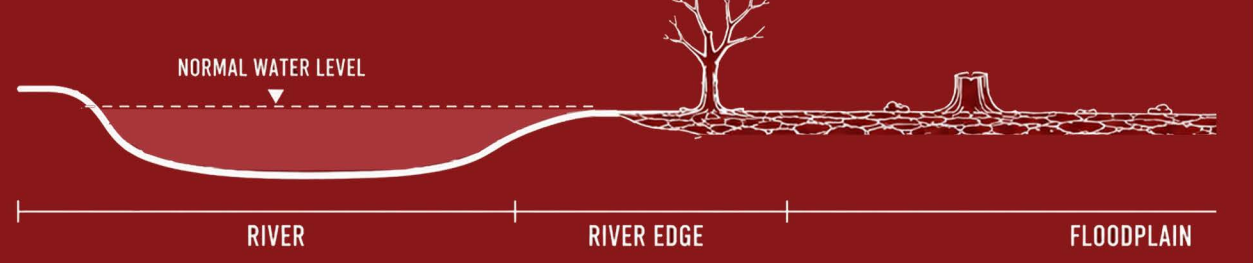
Phase 01: Before Flood



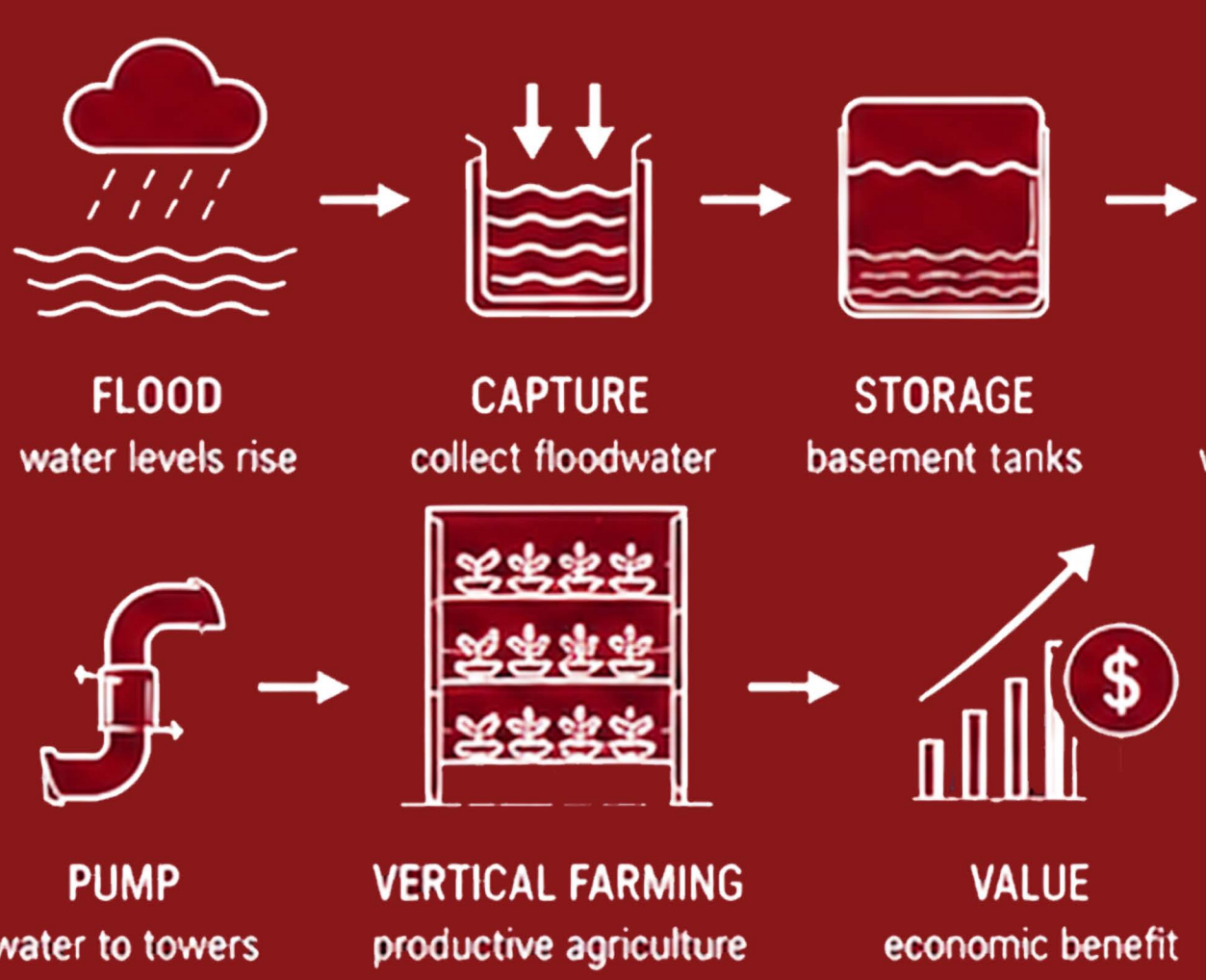
Phase 02: During Flood



Phase 03: After Flood



The Nile flood season in Egypt is usually from July to October, with the highest water rise around August and September.



Site Criteria

1

Advanced technology + skilled workers

A hub of innovation powered by expertise and future industries.

2

Daily maintenance, monitoring, and learning

Continuous care, data-driven insight, and leadership.

3

Attracts visitors, scientists, and global leaders

A magnet for collaboration, research, and leadership

4

Connects Upper Egypt with Lower Egypt

A Strategic link that unites the country from north to south.

5

Easy transport and ecosystem access

Seamless connectivity by land, water, and air with no limits.

6

Island setting buffers urban noise

A peaceful environment shielded from city disturbance

7

Protects Giza farming from urban concrete expansion

Preserving fertile land and securing a sustainable future.

The workflow agents translated the project needs into site selection criteria. Based on these criteria, Giza was selected as the strongest site, balancing accessibility, expertise, visibility, ecological potential, and the protection of threatened agricultural land.

Export - Oriented Crop

TOWER 1

PREMIUM BERRY CROPS

Strawberry

Berry trials

TOWER 2

FRUITING VEGETABLE CROPS

Cherry tomato

TOWER 3

HERBS, LEAFY GREENS & MICROGREENS

Basil

Mini Rocket

Lettuce

Microgreens

High export value

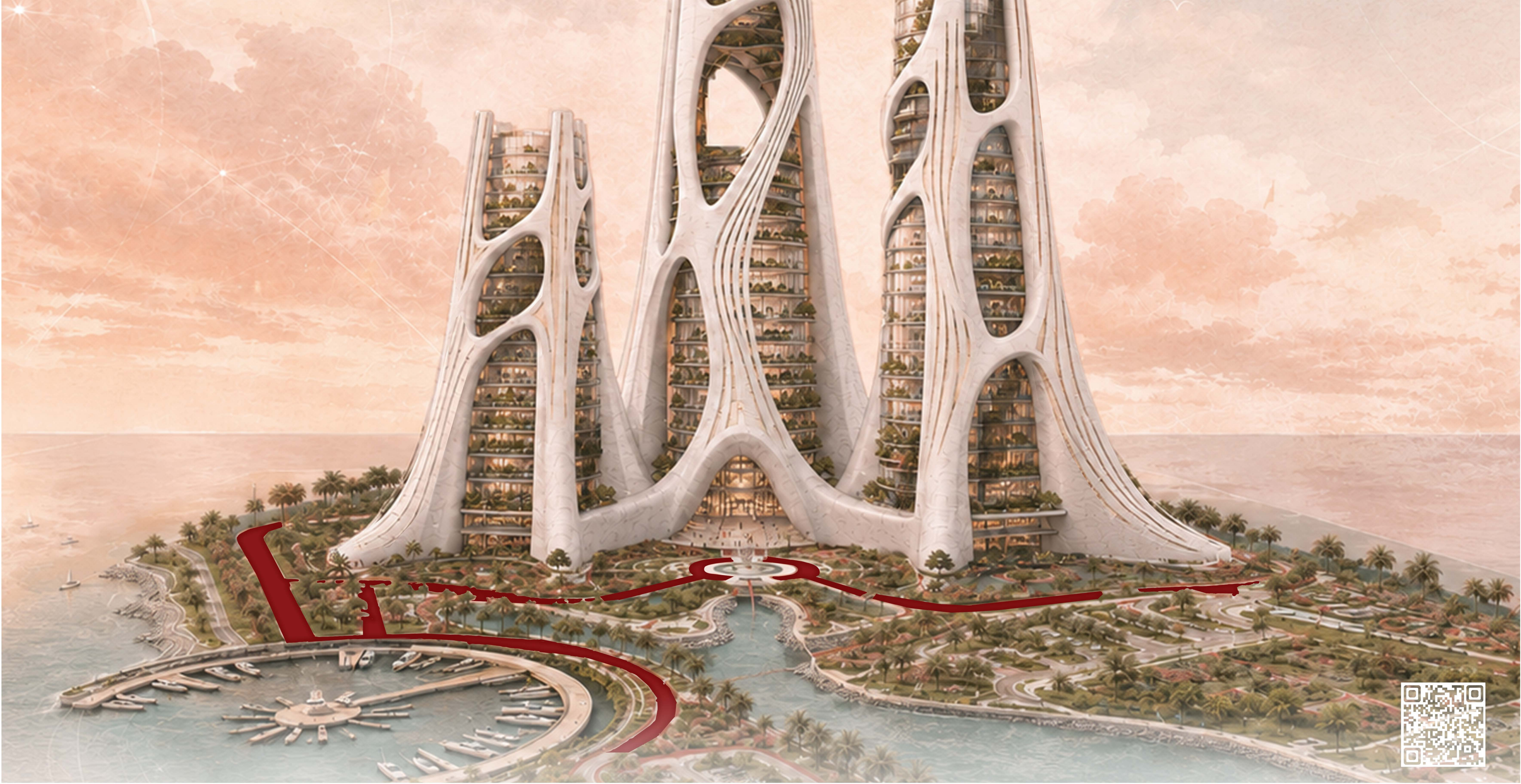
Suitable for vertical farming

Suitable for Giza

Juzur Nexus

Where roots rise into the future

Project that merges **vertical farming**, **scientific research**, and **public education** into a single, unified architectural form. The project features high-rise towers dedicated to vertical food production and data storage, which are physically merged with **experimental labs** and **irrigation research centers**.

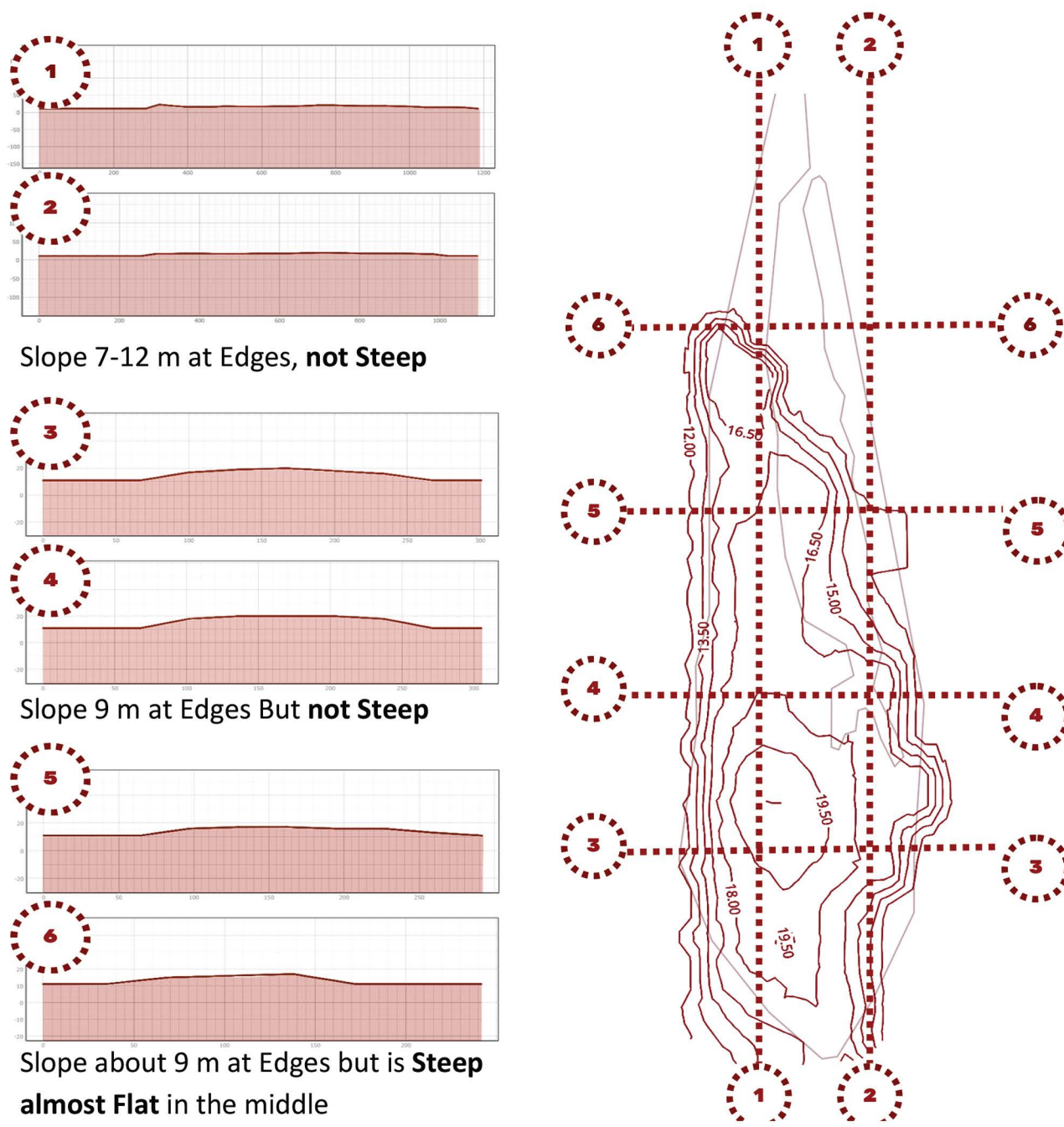


Site Analysis

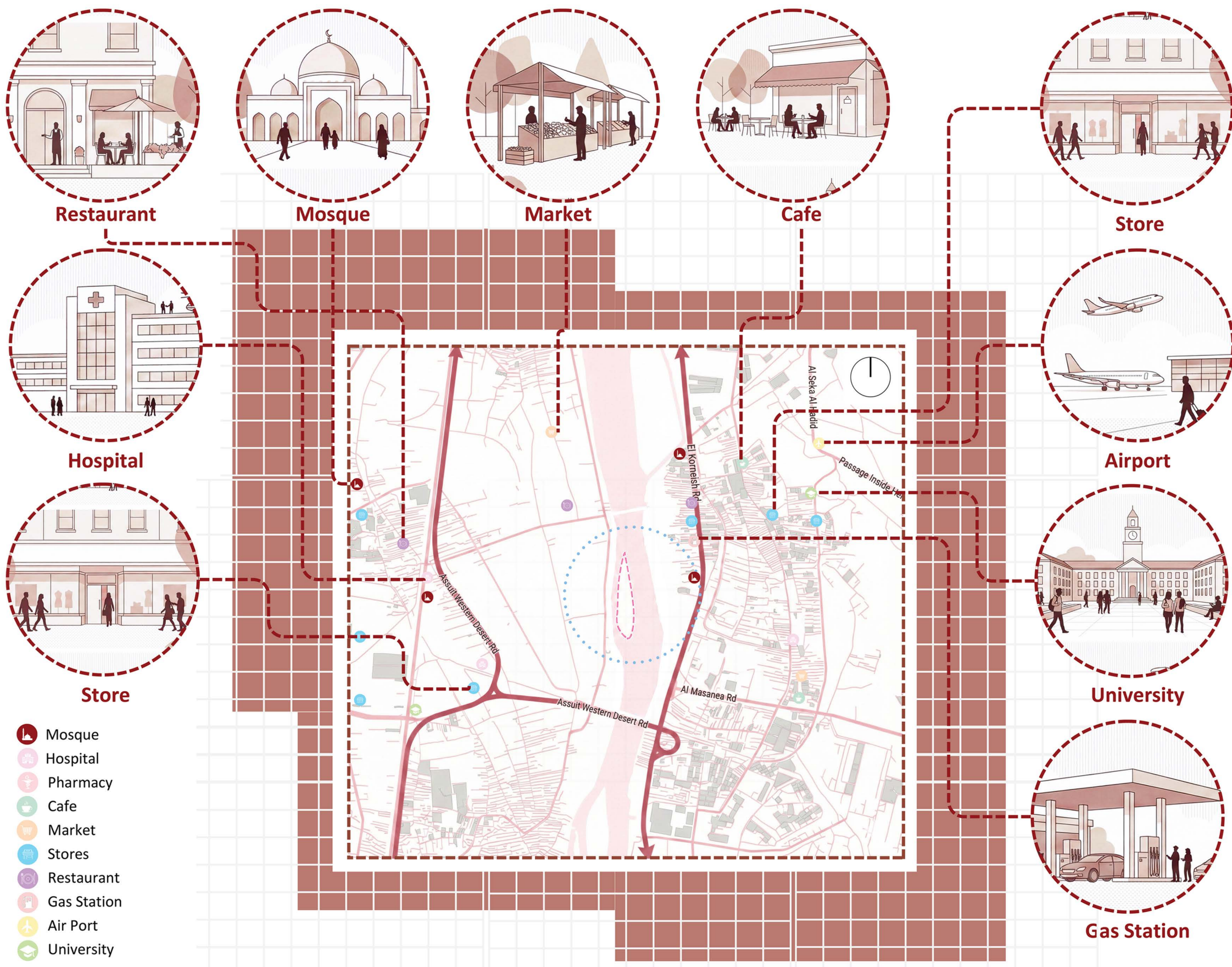
Location

Site : Island Near Abou-Regouan
Elbahary, Giza, Egypt
Latitude : 29°48'12.45"N
Longitude : 31°17'34.64"E
Area of Island: 67,500 m²
~16 Feddan
Floodplain: 70% of Area

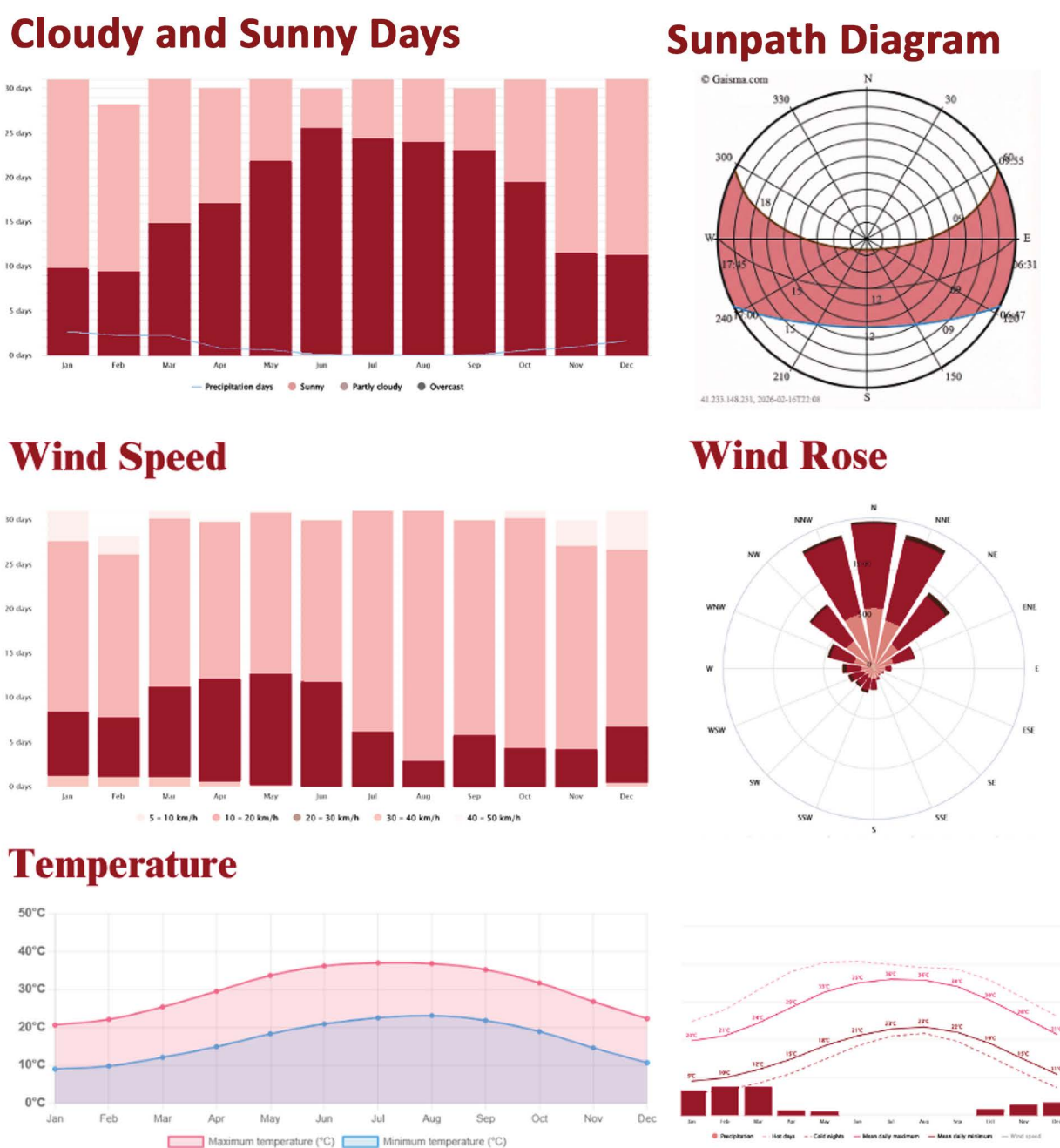
Contour



Utilities



Climate



Functions

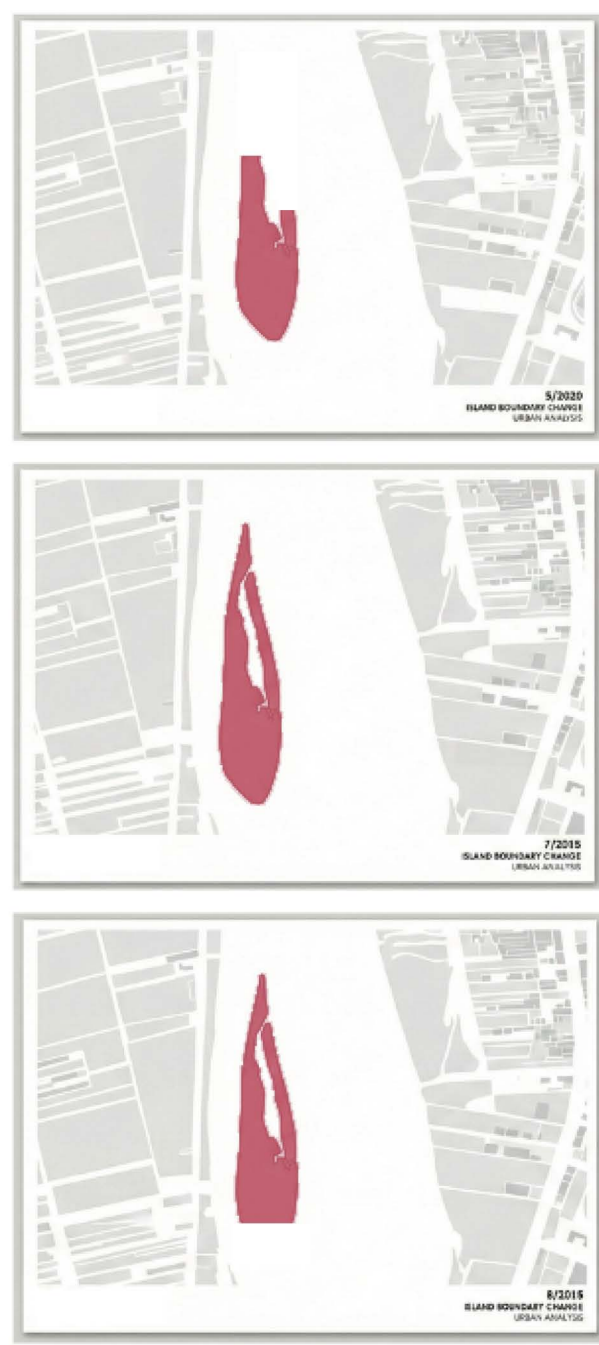


Space program

Scan to explore the complete space program, including area schedules, functions, and distribution across the three towers & podium. Also The Feasibility Study .



Site Phases



Accessibility

Conclusion

The island sits right in the middle of two different worlds: the green farmlands of Giza and the busy city streets of Cairo. There are no direct roads onto it, the island is quiet and private, yet it is still close to a main bridge (Al Marazeeek Bridge).

Parametric Approach

SITE DATA → SCORING LOGIC → TOWER MORPHOLOGY → ROOT SYSTEM

1 Point Discretization

Grid Centre Points

2 Wet / Dry Classification

Wet Points

Dry Points

3 Access Score

Remap dry points by ideal distance to site access.

4 View Score

Remap each point by its visibility to the view anchors.

5 Dry Cluster Score

Strengthen points with dry neighbours.

6 Tower Center Optimisation

Select three balanced tower centres.

7 Tower Generation

Scale elliptical profiles along wind height.

8 Wind Capture

Rotate voids to guide wind upward.

9 Boolean Void

Subtract the wind void and contour the tower into Green Terraces.

10 Booids Root

Guide agents from tower crowns points toward wet targets.

11 Entrance

Emphasising on the Entrance as if the user is grappled to the tower.

12 Final Form

Refine wind voids, farming floors, and root trails into one system.

User Scenario

01 RESEARCH & SCIENTIFIC COMMUNITY

Secure labs and research rooms

Data monitoring and analysis spaces

Trial / testing environments

Data storage and server infrastructure

02 AGRICULTURAL & PRODUCTION TEAM

Growing floors and production zones

Harvest, inspection, and monitoring

Storage and cold-chain management

Loading, logistics, and distribution support

03 PUBLIC & EDUCATIONAL VISITORS

Exhibition and orientation spaces

Viewing galleries and guided routes

Learning and engagement spaces

Public amenities and visitor services

04 ADMINISTRATION & OPERATIONS

Admin staff, facility management, security / transit

Meeting and offices rooms

Maintenance, control, and back-of-house support

Secure access and facility monitoring

Security, transit, and operational coordination

Pre-Dawn Logistics

Logistics Coordinators arrive at the loading docks (The loading of yesterday's cold-stored produce onto refrigerated vans for the week's deliveries)

Standardized Harvest & Briefing

Vertical Farm Managers walk the main floor, using tablets to inspect crop and hydroponic systems

Quality Control & System Calibration

QC Inspectors pull random crates of freshly harvested produce off the conveyor lines, then take the samples to the QC lab to test them

Analysis & Maintenance

Agricultural Laborsers put on standardized clean suits, hairnets, and boot covers, then operate sensor lifts to harvest mature leafy greens from the upper tiers of the vertical towers

Sanitation & Departure

Agricultural Laborsers discard disposables, PPE, change, and head over operations to the afternoon supervisor

Preparation & Handover

Quality Control Inspectors issue digital "Market Ready" certificates so shipping can begin. Logistics Coordinators finish their shift and head over operations to the afternoon supervisor

Sanitation & Departure

Vertical Farm Managers complete production log and leave viaerry. Quality Control Inspectors file compliance reports in the Facility Director and depart.

Standardized Harvest & Briefing

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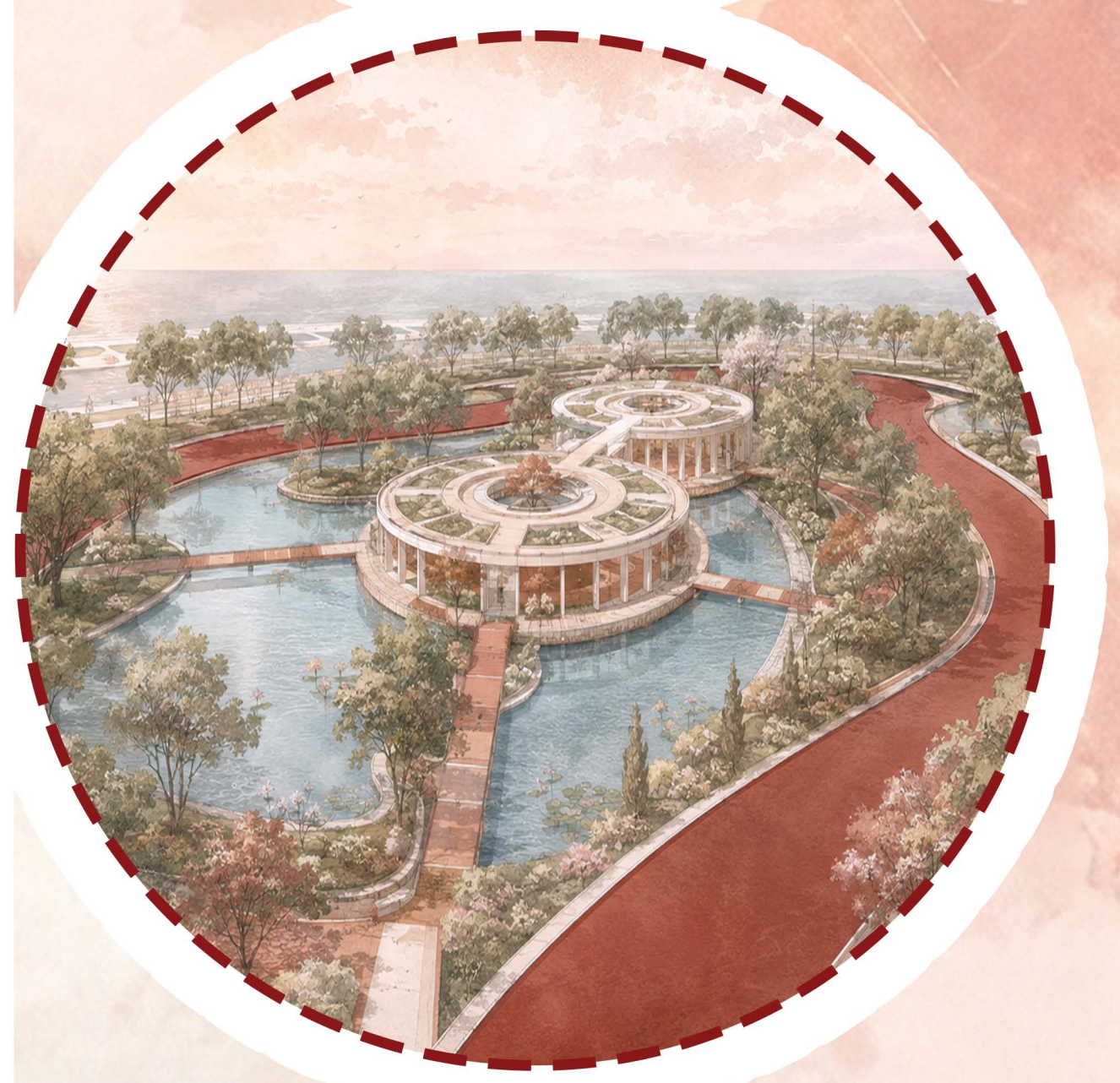
Agricultural Laborsers discard disposables, PPE, change, and head over operations to the afternoon supervisor

Preparation & Handover

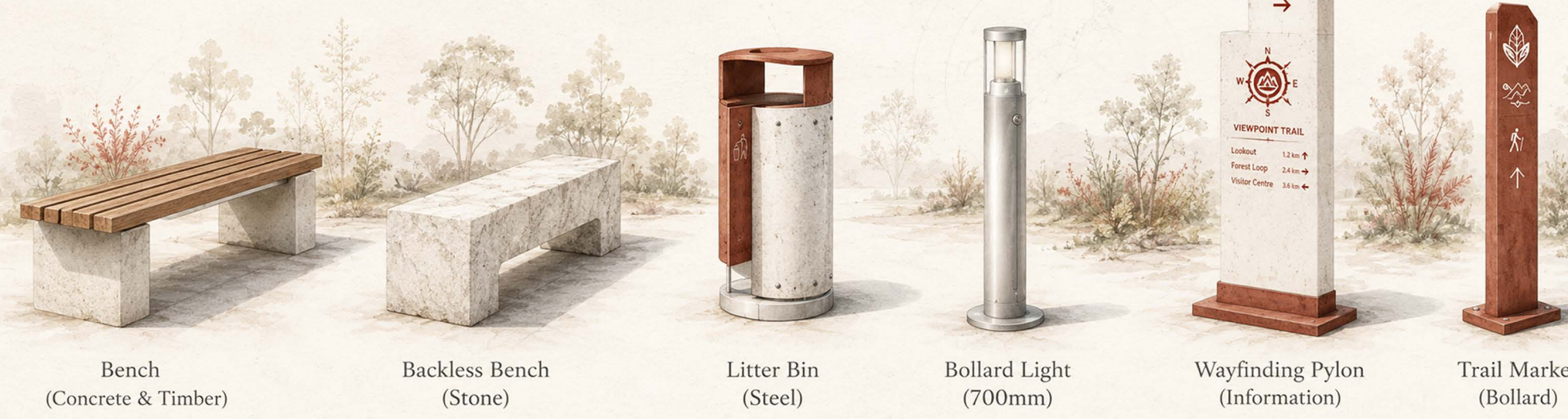
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Hardscape

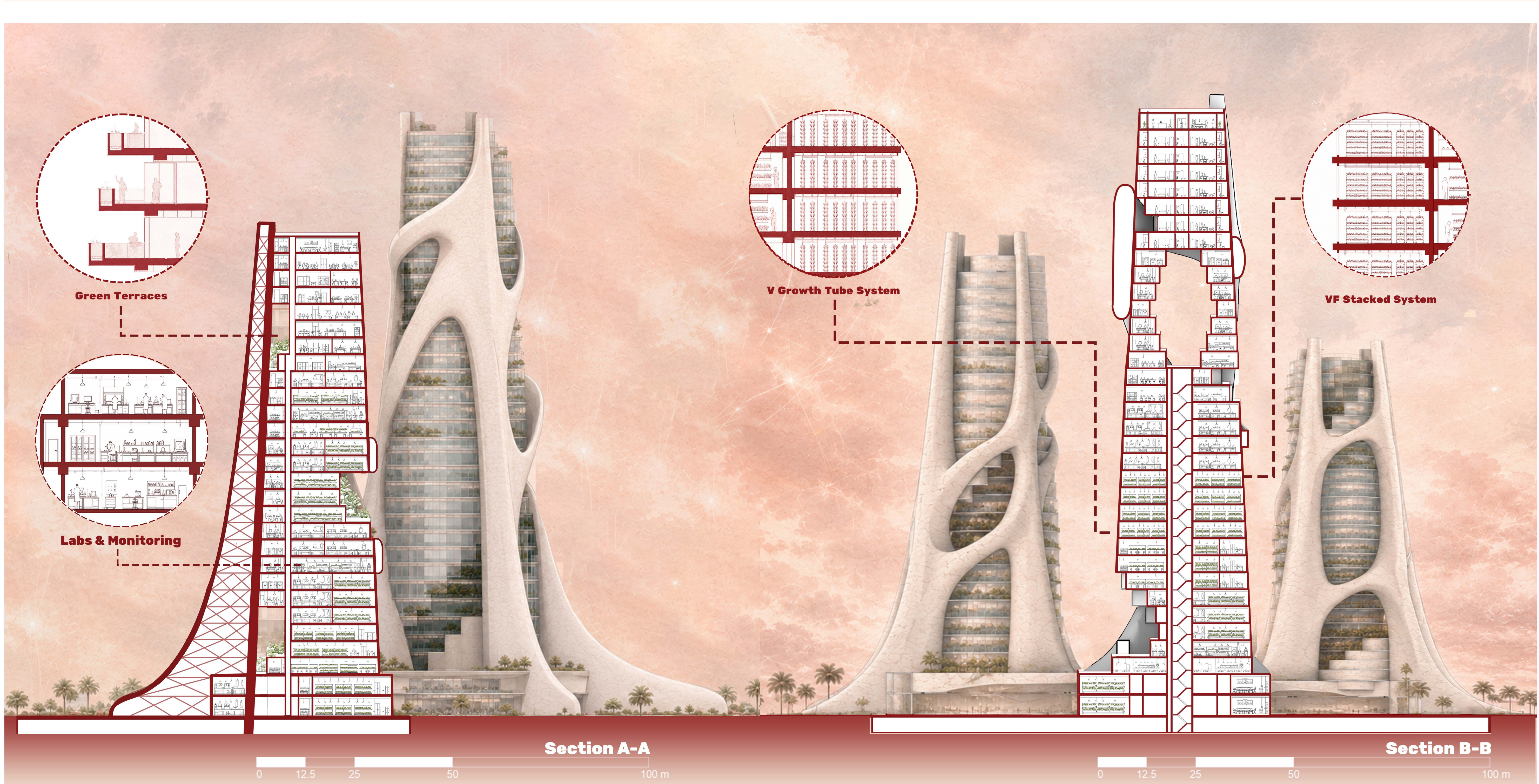
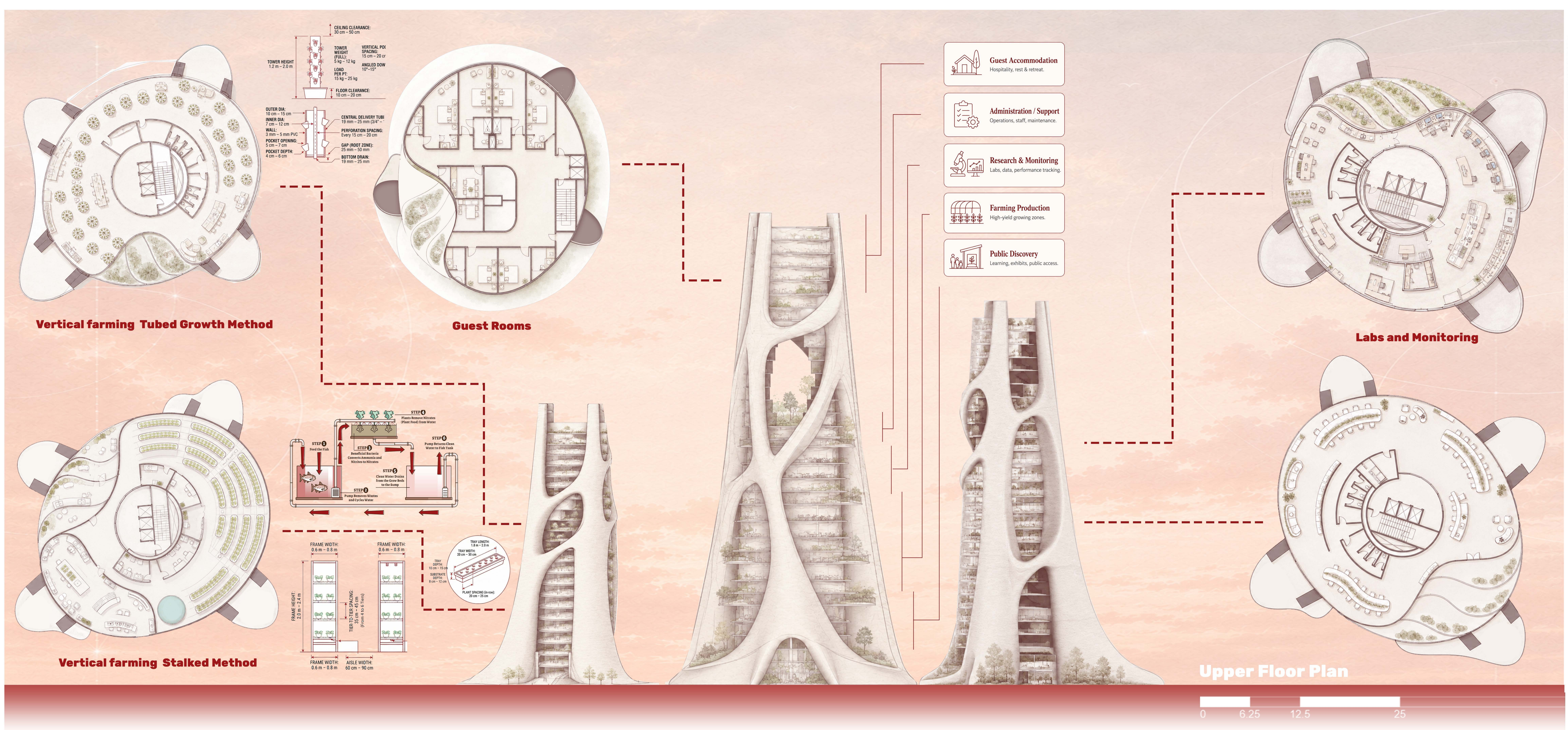
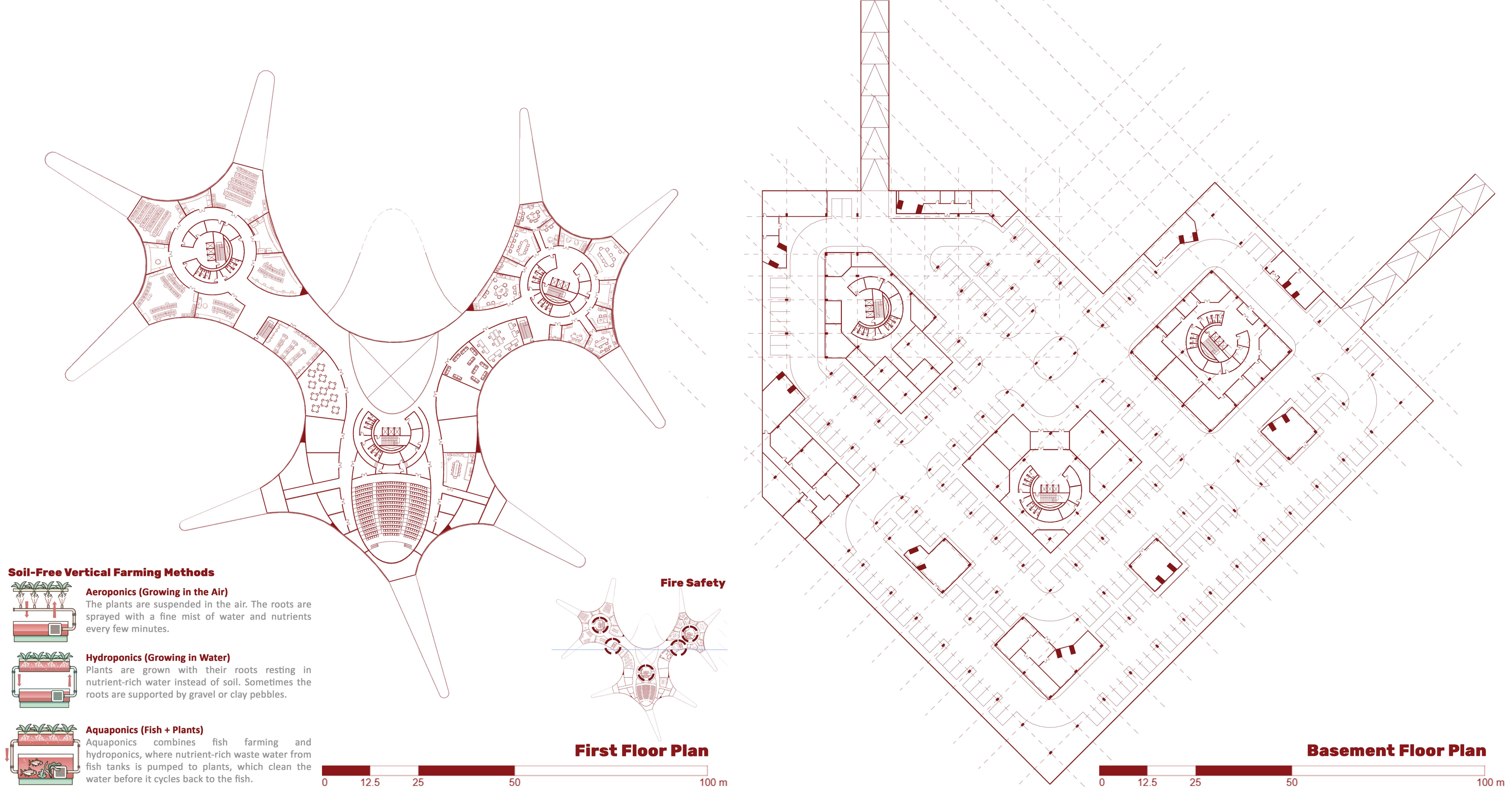


Materials



1. PUBLIC ARRIVAL & VISITOR JOURNEY	2. ADMINISTRATION & STAFF	3. BUSINESS, CONFERENCE & LEARNING	4. AUDITORIUM, TECHNICAL & BACK-OFF-HOUSE
01 Main Entrance & Reception 02 Egyptian Heritage Film Gallery 03 Plaza Food Plant Concessory 04 Public Cafe 05 Visitor Survey Interpretation Room 06 Interpretive Experience Room 07 Interpretive Immersion Room 08 Interpretive Experience Room 09 Interpretive Experience Room 10 Interpretive Experience Room 11 Class Science Farming Lab	12 Staff Lounge 13 Event Operations Open Office 14 General Manager Office 15 Meeting Room 01 16 Executive Restaurant Office 17 Staff Dining Room 18 Staff Kitchen 19 Finance & Procurement Office 20 Sales Manager Office 21 Marketing Open Office 22 HR & Digital Marketing 23 Sales, Event & Business Development Office	24 Conference Room 01 25 Conference Room 02 26 Meeting Room 02 27 Lecture Room 28 Event Dining Hall	29 Electrical Room 30 Mechanical Room 31 Service Room 32 Sound & Lighting Control Room 33 Landscape 34 Event Storage / Service Room 35 Changing Room 01 36 Restroom 37 Changing Room 02 38 Main Auditorium

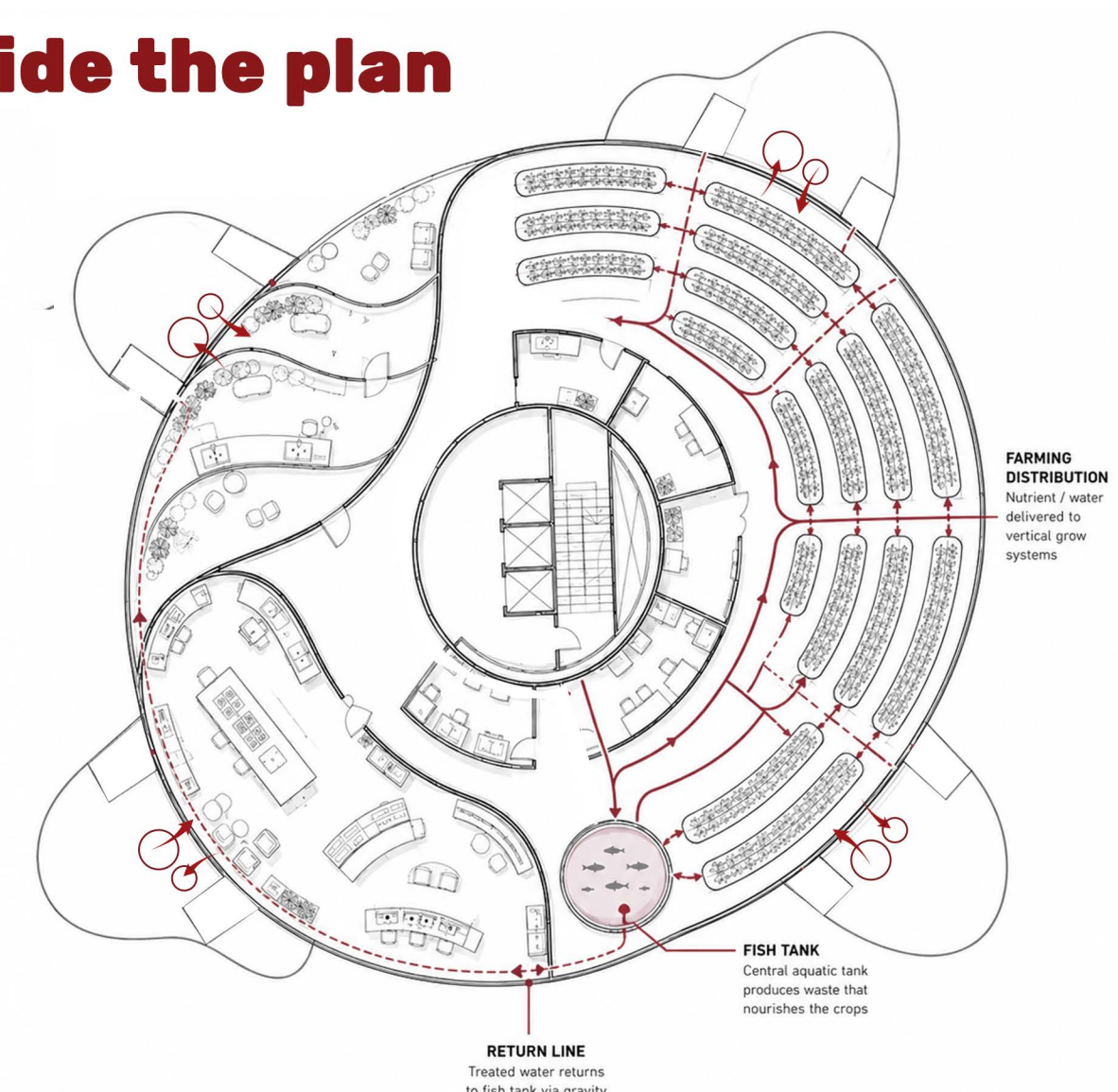
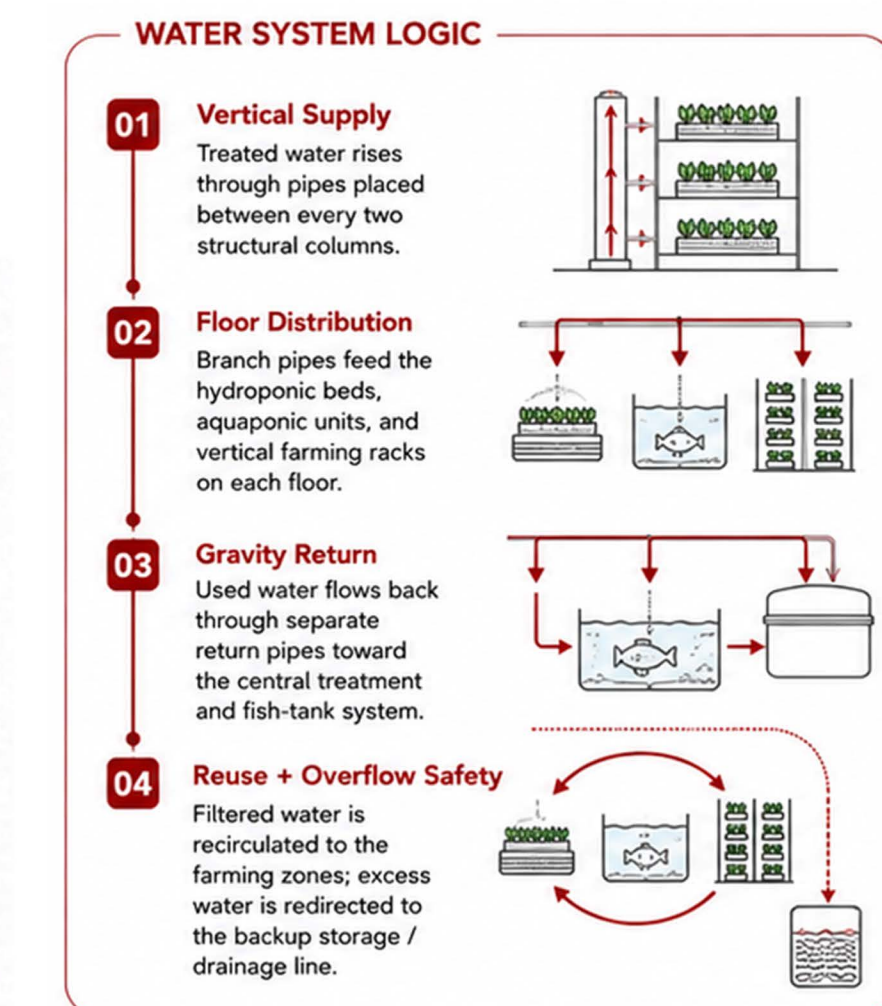




BASEMENT STRUCTURAL GRID & COLUMNS



Water circulation inside the plan



STEPPED VOID AS GREEN TERRACES

The stepped void creates a sequence of green terraces that bring nature deep into the tower and improve outdoor comfort.

WIND CAPTURE

Prevailing wind is captured at lower levels and guided into the stepped void. The geometry accelerates air movement as it rises.

WIND TURBINES

Captured wind is accelerated through the stepped void and directed to rooftop turbines for clean energy generation.

WIND ACCELERATION

The narrowing void increases wind speed (Venturi effect), optimizing conditions for energy generation at the top.

1. wet floodplain / water edge

2. roots extend from wet ground

3. roots become structural ribs

4. ribs merge into tower and feed farming floors

Diagram illustrating the wastewater treatment process:

- wetland basins**: Initial treatment stage with reeds.
- infiltration trench**: Water flows through gravel for further treatment.
- collection tank**: Water is collected and pumped to the next stage.
- treatment room**: Contains two large cylindrical tanks and a control unit for advanced treatment.
- nutrient tank**: Final stage where treated water is stored.

The diagram illustrates the structural components of a tall building, showing the exoskeleton, central core, floor plates, entrance space truss, and pile foundation.

- EXOSKELETON**
External ribs/columns resist gravity and lateral forces and carry floor loads.
- CENTRAL CORE**
Primary vertical circulation, services and lateral stability system.
- FLOOR PLATES**
Floor system spans between core and exoskeleton.
- ENTRANCE SPACE TRUSS (CANOPY ONLY)**
Space truss provides shade and structure at the main entrance only.
- PILE FOUNDATION**
Exoskeleton columns land on pile caps and transfer loads directly to piles below grade.

