

Project Title :Energy Island Complex: Rafah as a Coastal Prototype for Resilient Development

INTRODUCTION

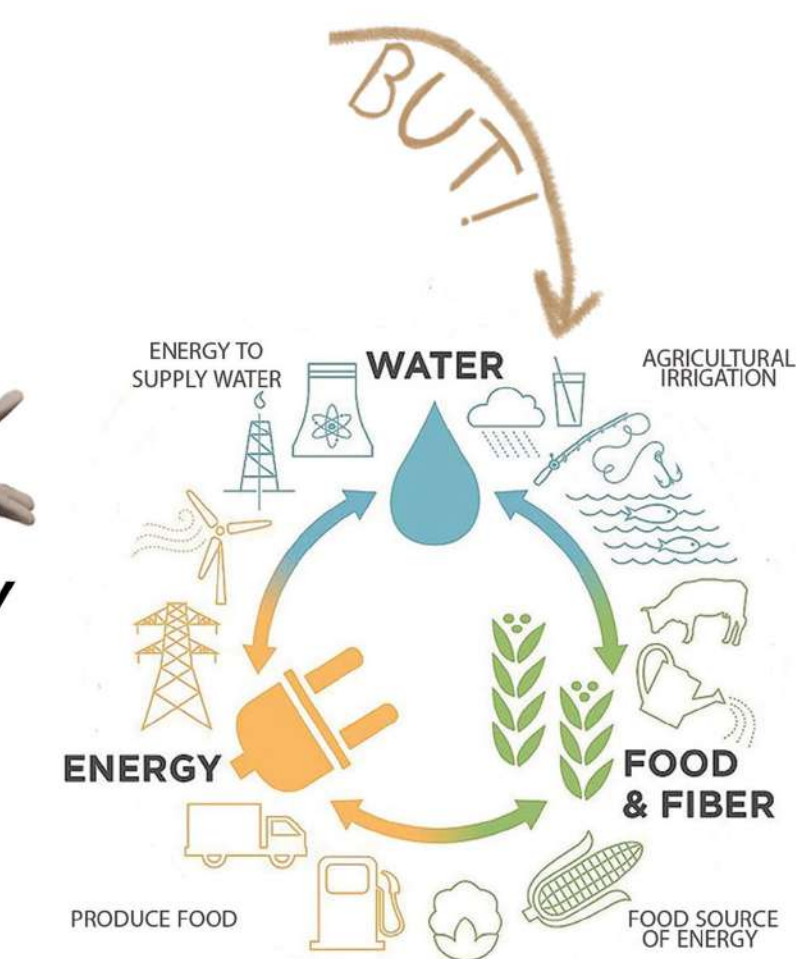
WHAT PROJECT WILL HELP GAZA IN ITS LONG-TERM POST-WAR RECOVERY PROCESS AND BE RESILIENT?



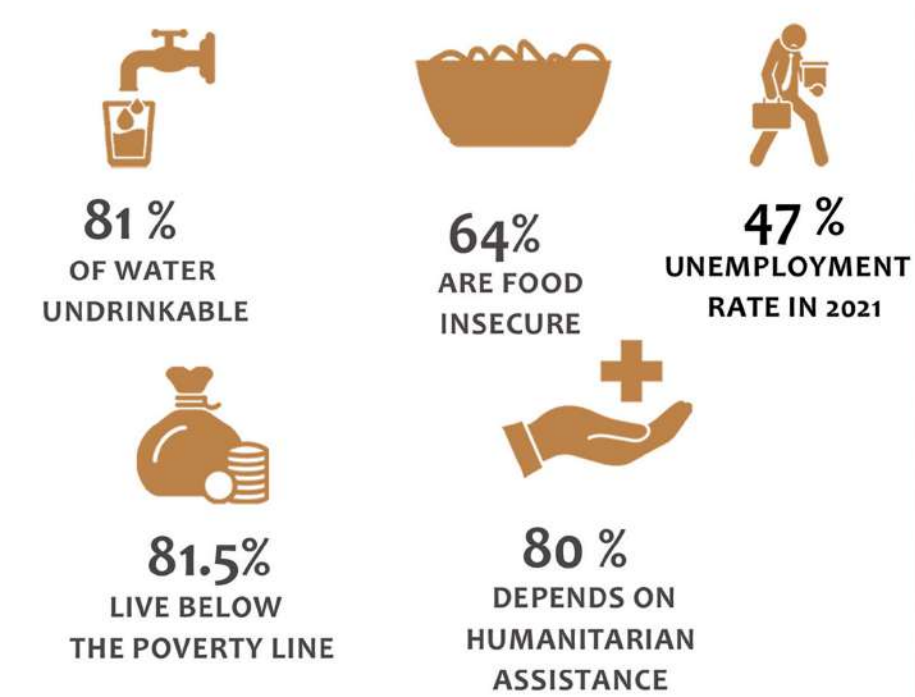
WHY?

IT IS A PROBLEM THAT HAS BEEN INGRAINED IN GAZA EVEN BEFORE THE WAR

12 TO 18 HOURS A DAY OF FREQUENT POWER OUTAGES BEFORE OCT 7TH BECAUSE MOST OF GAZA'S ENERGY SOURCES ARE CONTROLLED BY EXTERNAL PARTIES



IN ADDITION BEFORE THE LAST WAR



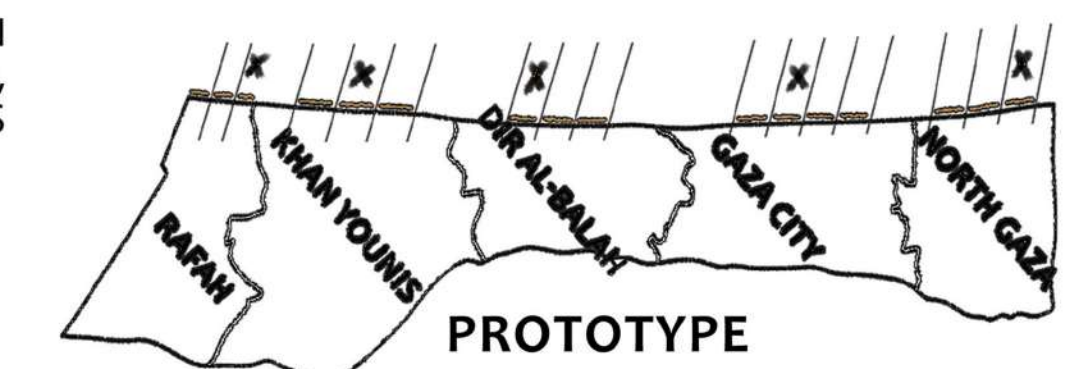
DURING THE WAR



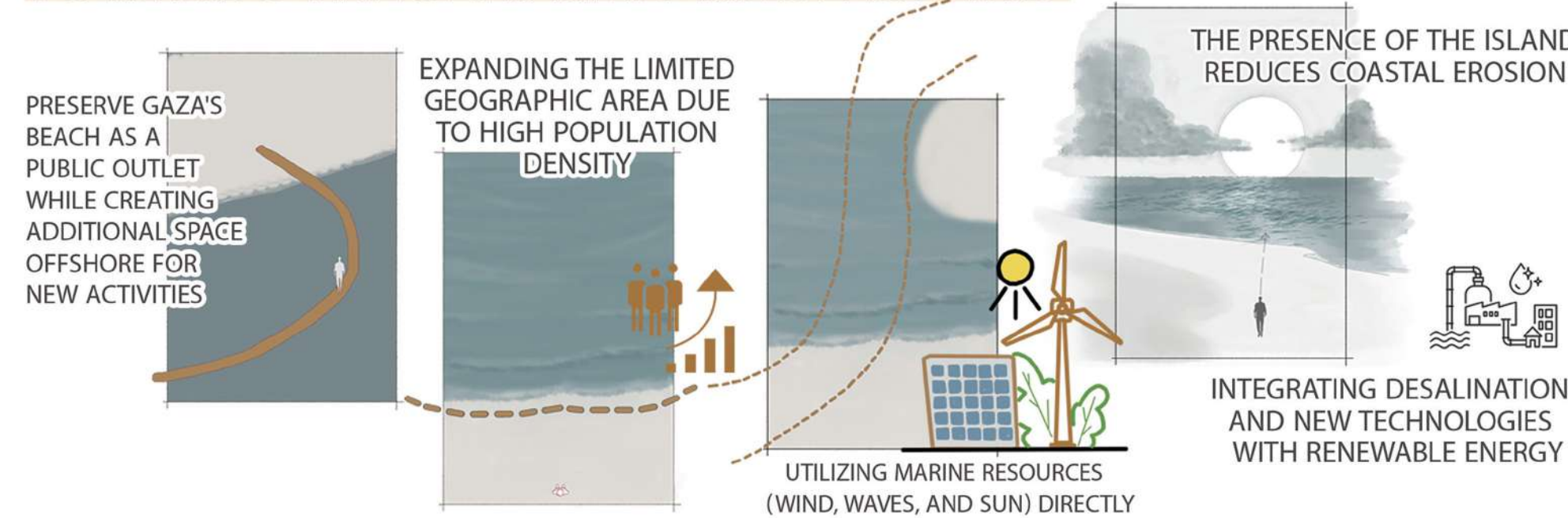
VISION

CREATE A REPLICABLE ENERGY PRODUCTION PROTOTYPE THAT INCLUDES FLEXIBLE, SUSTAINABLE, AND LONG-TERM SOLUTIONS

- ENERGY PRODUCTION
- WATER PRODUCTION
- FOOD PRODUCTION
- COMMUNITY & EDUCATIONAL



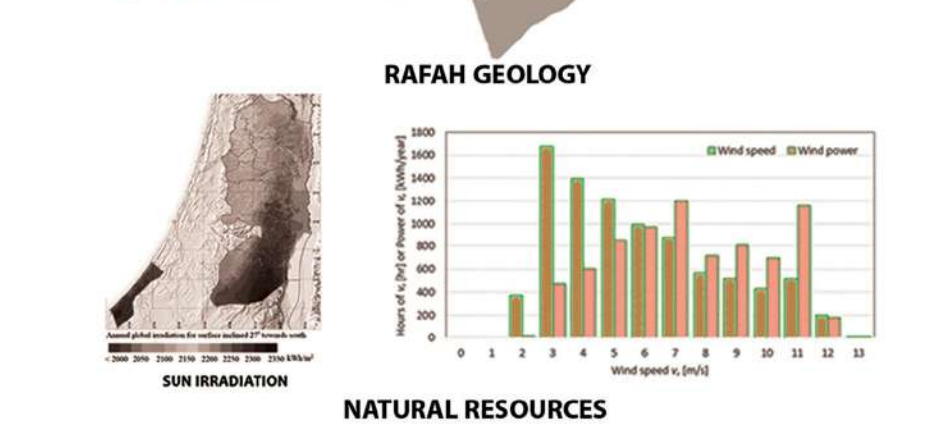
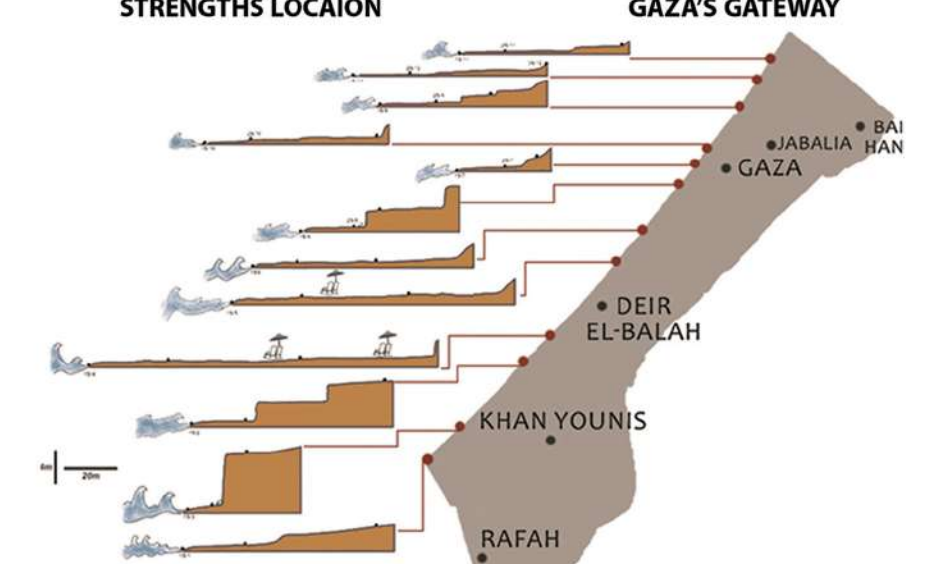
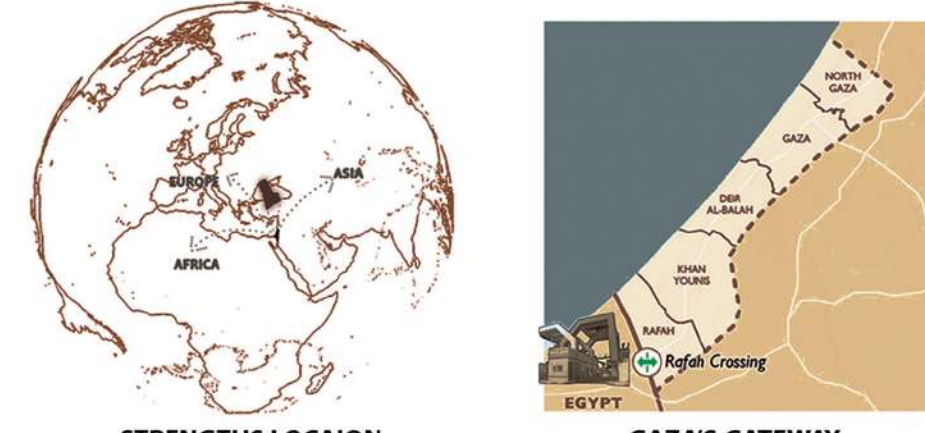
TOWARDS THE SEA: MAN-MADE ISLAND



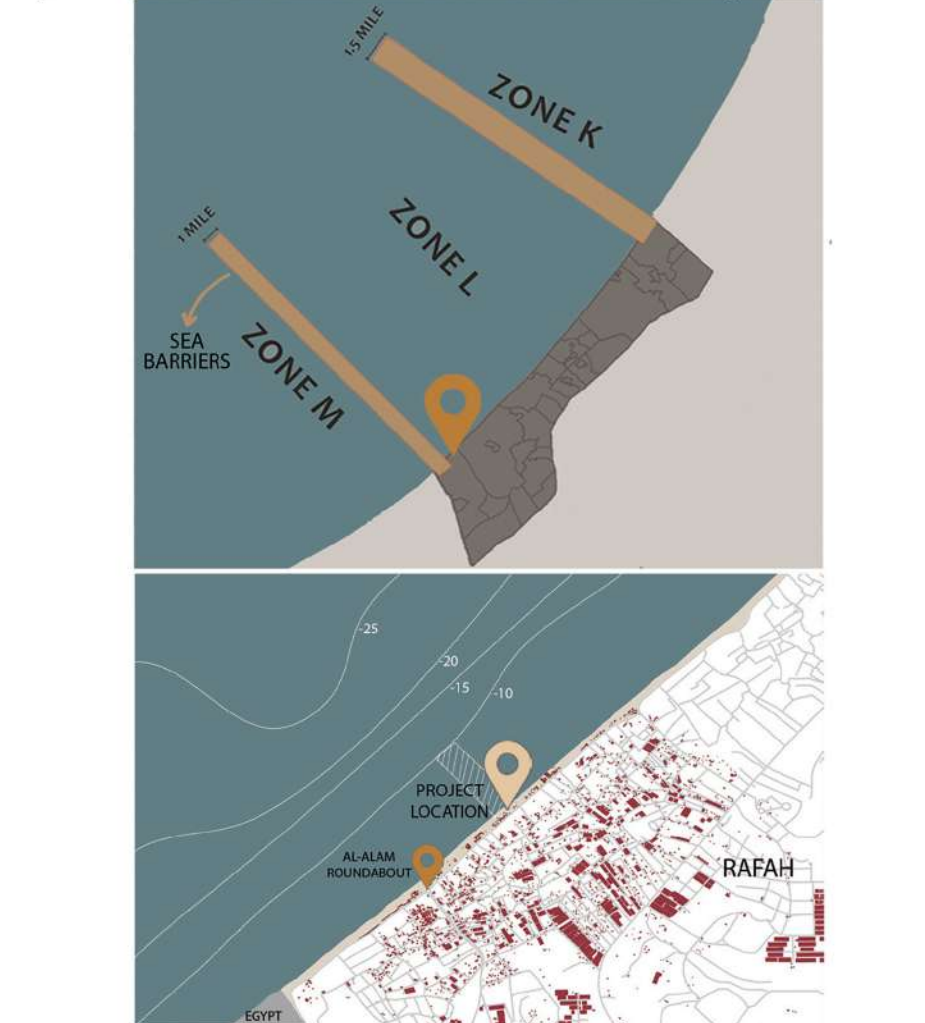
LOCATION: RAFAH AS PROTOTYPE



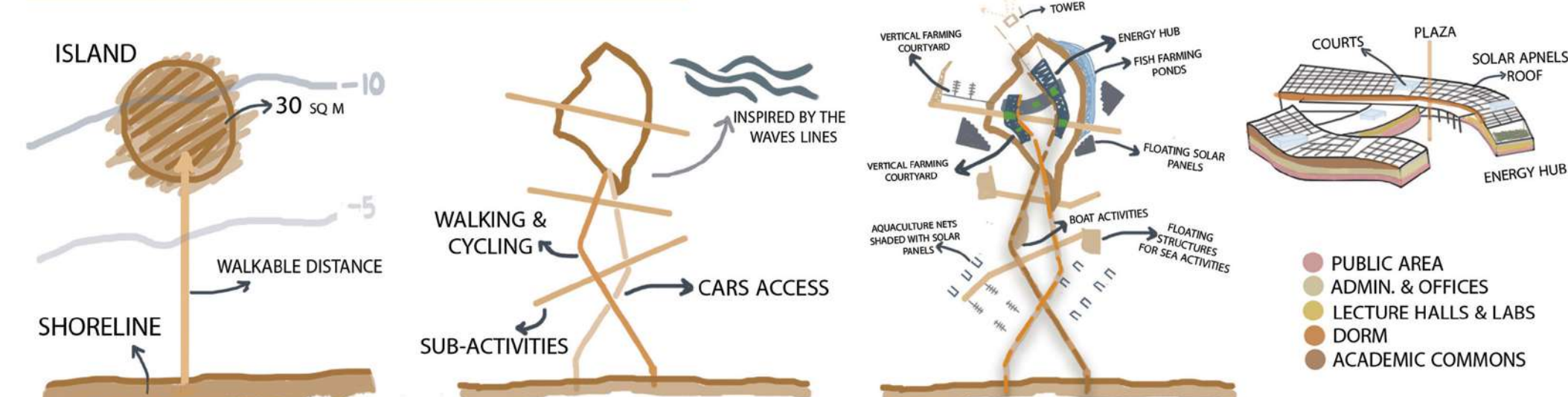
WHY RAFAH?



SITE SELECTION CRITERIA (POLITICAL RESTRICTIONS AND ACCESSIBILITY)



FORM

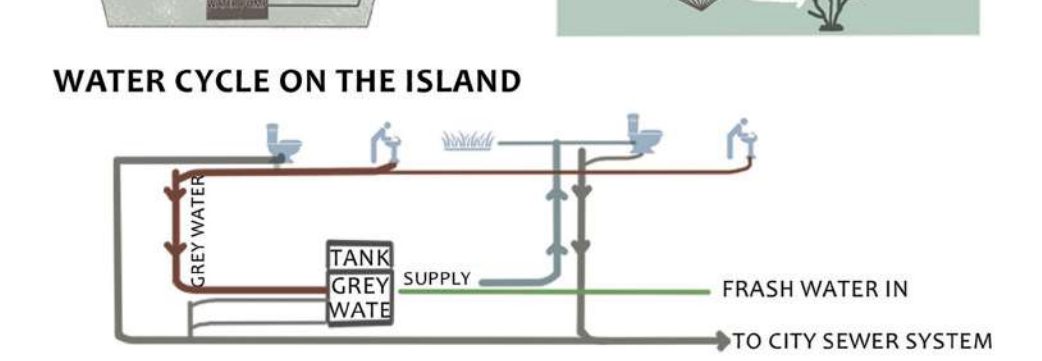
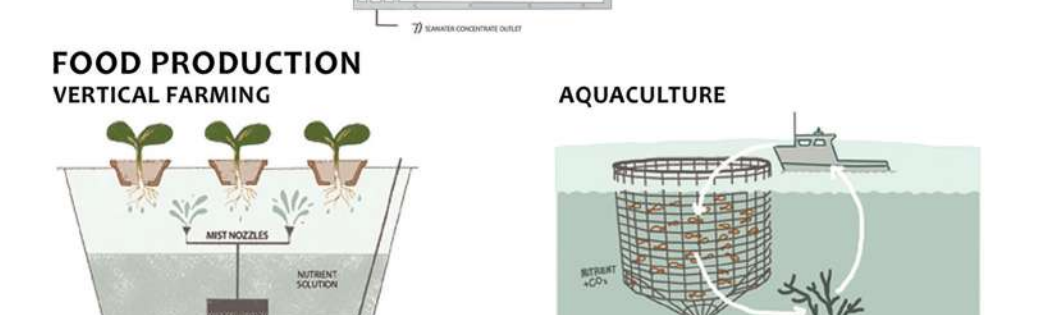
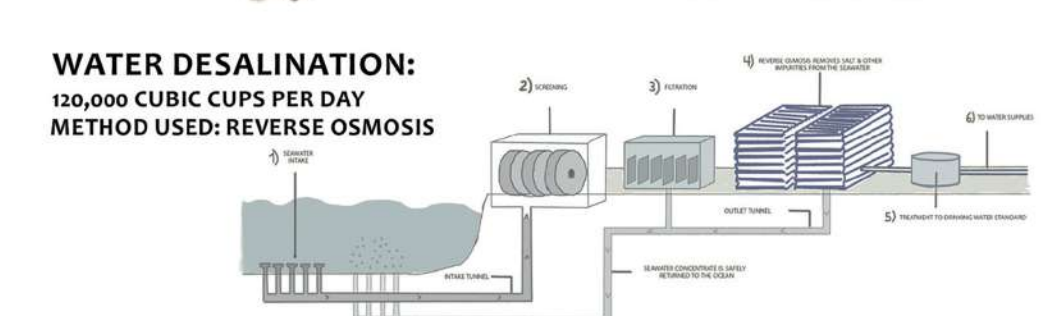
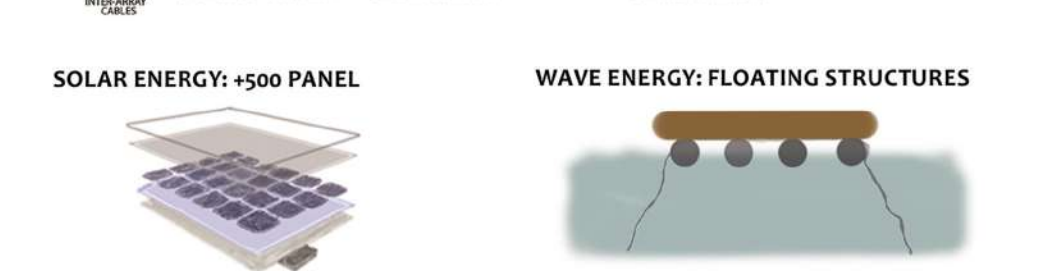
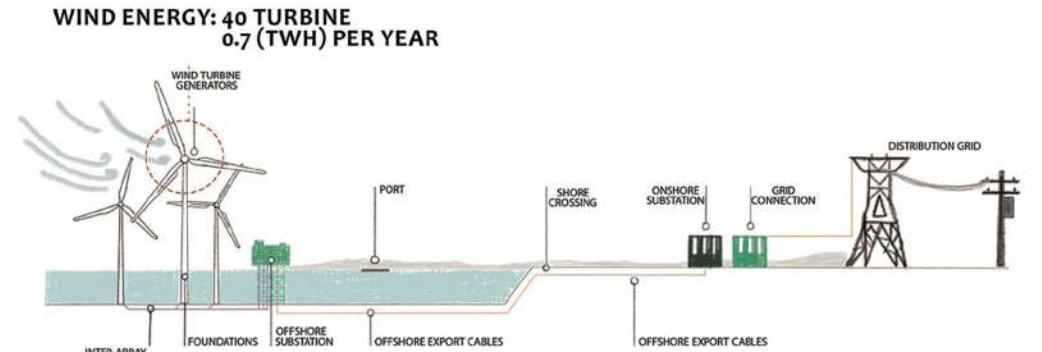


SOLUTIONS AND CALCULATIONS

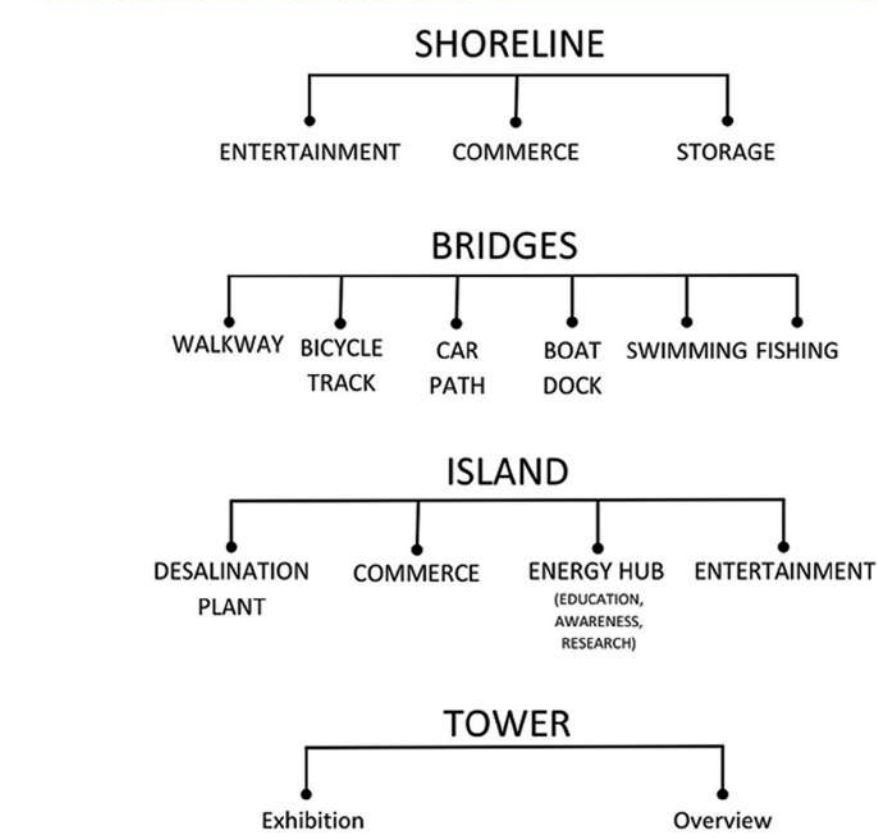
RAFAH IN FIGURES

POPULATION IN 2022	280,000 PERSON
POPULATION IN 2035	403,000 PERSON
ANNUAL ENERGY CONSUMPTION IN 2035	1.21 TERAWATT-HOURS/YEAR
ASSUMED AVERAGE PER CAPITA CONSUMPTION	3,000 KILOWATT-HOURS/YEAR
ESTIMATED WIND SPEED	200 HOURS/YEAR
AVERAGE WIND SPEED IN RAFAH	6.38 M/S
WIND SPEED > 7 M/S (ANNUAL DURATION)	3.18 HOURS/YEAR

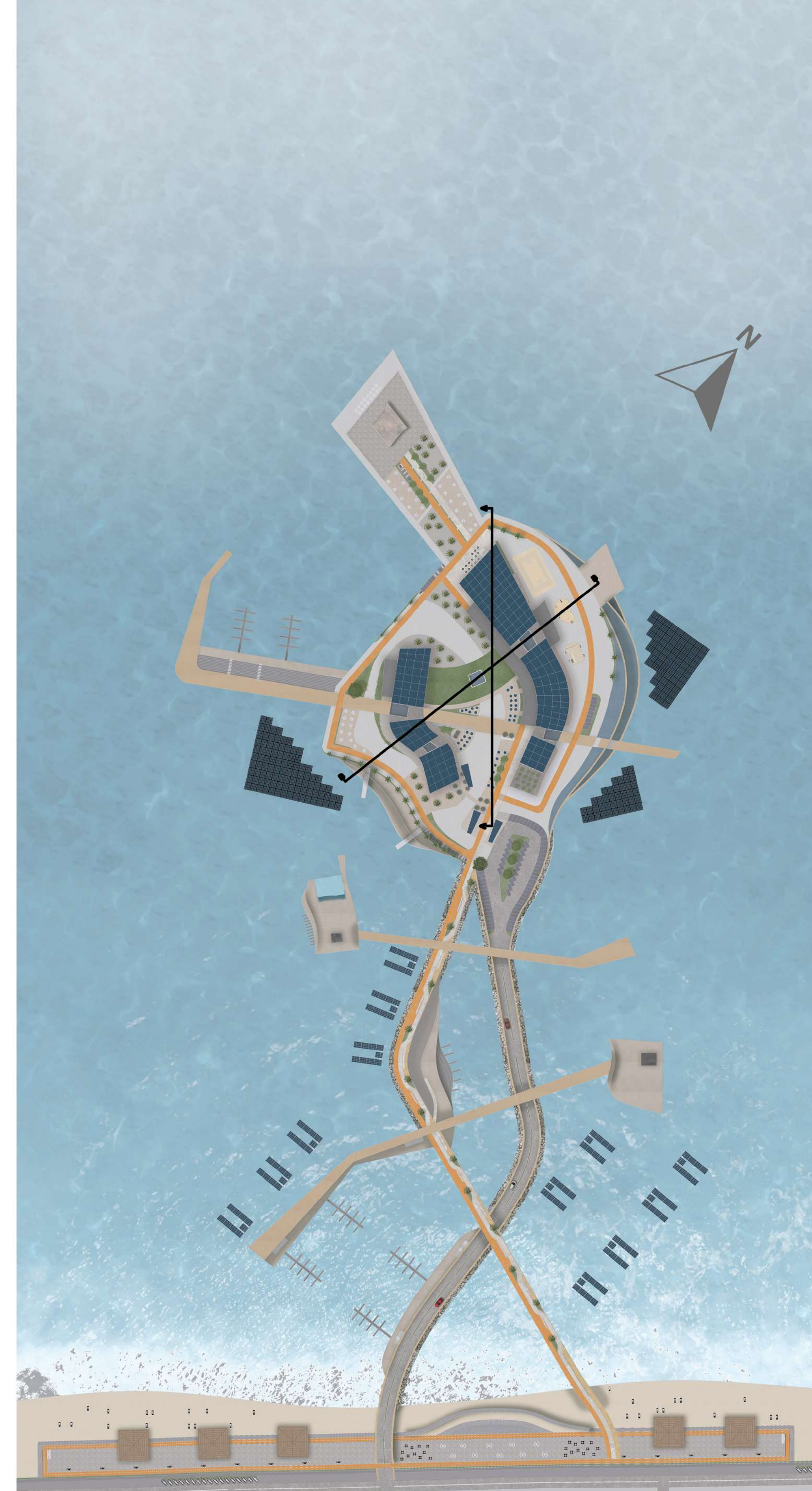
ENERGY TYPES



PROJECT COMPONENTS AND PROGRAM



SITE PLAN SCALE 1:1000



Energy Island Complex: Rafah as a Coastal Prototype for Resilient Development

This project emerges from a profound question raised after the recent war in Gaza: How can architecture actively drive long-term recovery and resilience? The answer lies in energy—the foundation for life, infrastructure, and sustainable growth. Gaza's chronic energy crisis, intensified by destruction and blockade, impacts every essential system: water desalination, food production, education, and healthcare. By positioning energy as the primary driver, this project proposes a visionary yet practical model for reconstruction—one that is regenerative, community-centered, and globally replicable.

Concept and Vision

The proposal envisions a floating energy island off the coast of Rafah, a strategic and symbolic location near the border with Egypt. Instead of consuming Gaza's scarce land, the island preserves the coastline as public space while transforming the sea into a productive landscape. Powered by wind, solar, and wave energy, it becomes a living laboratory for renewable technologies and self-sufficiency.

Location and Core Systems

Spanning 30 km² and anchored less than 10 meters deep, the island includes:

- A reverse osmosis desalination plant (120,000 m³/day).
- 40 offshore wind turbines.
- Over 500 solar panels.
- Floating wave-energy converters.

Energy and water production are calculated to meet Rafah's current and projected needs for the next decade, while raising awareness of renewable systems.

Water and Food Security

Vertical farms, irrigated with desalinated water, produce staple crops year-round. Fish farming technologies counter marine resource depletion caused by climate change. These initiatives

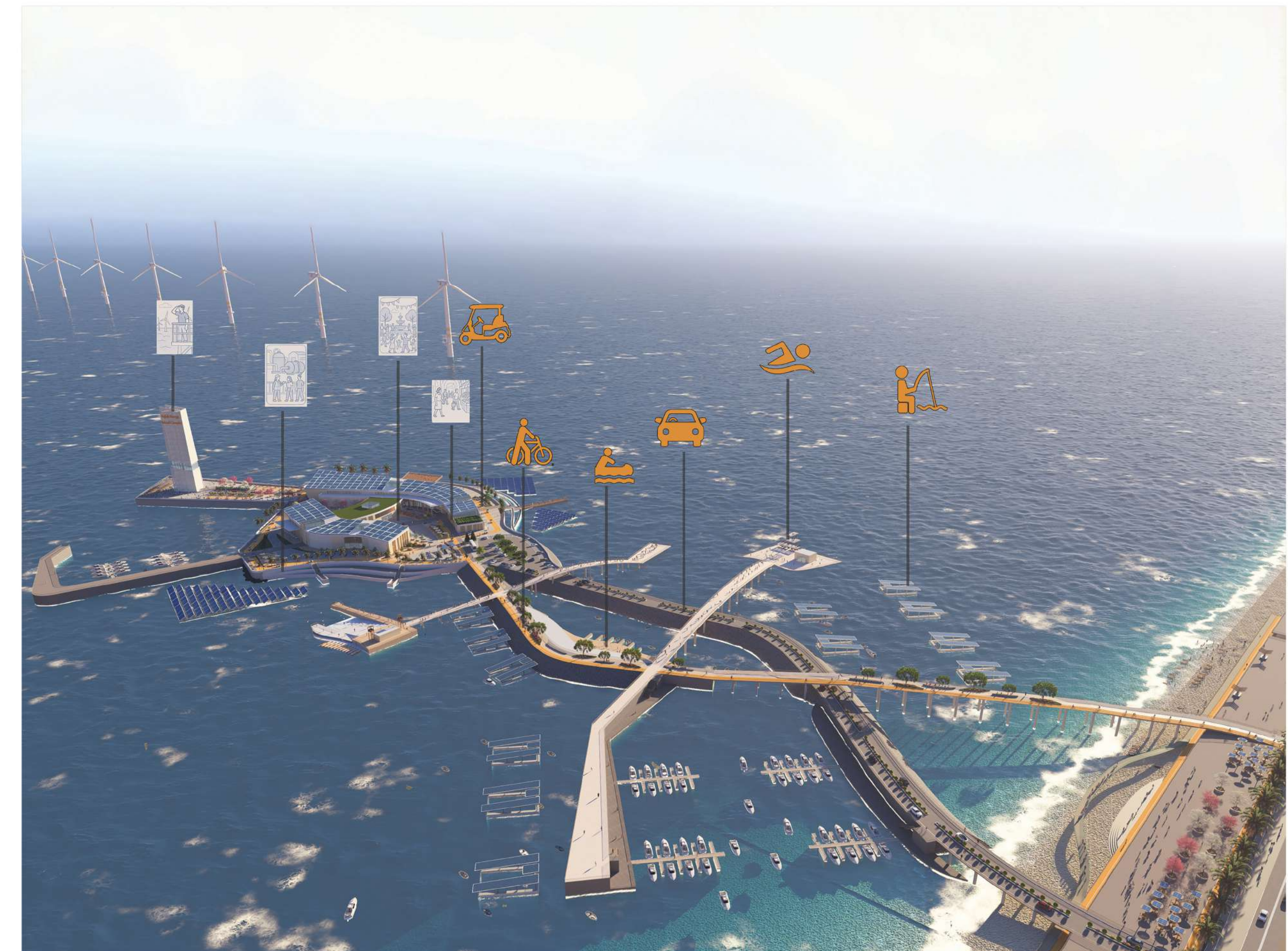
generate employment and feed into a public indoor market, connecting production directly with community needs.

Architectural Experience

The island's design echoes the rhythm of sea waves through fluid, layered lines. An interactive dual bridge—for pedestrians/bicycles and vehicles—guides visitors across floating energy platforms integrated with marine activities such as diving, kayaking, and boating. A rooftop plaza with open seating, playgrounds, and panoramic views invites both residents and visitors to experience Gaza's coast as a place of renewal rather than restriction.

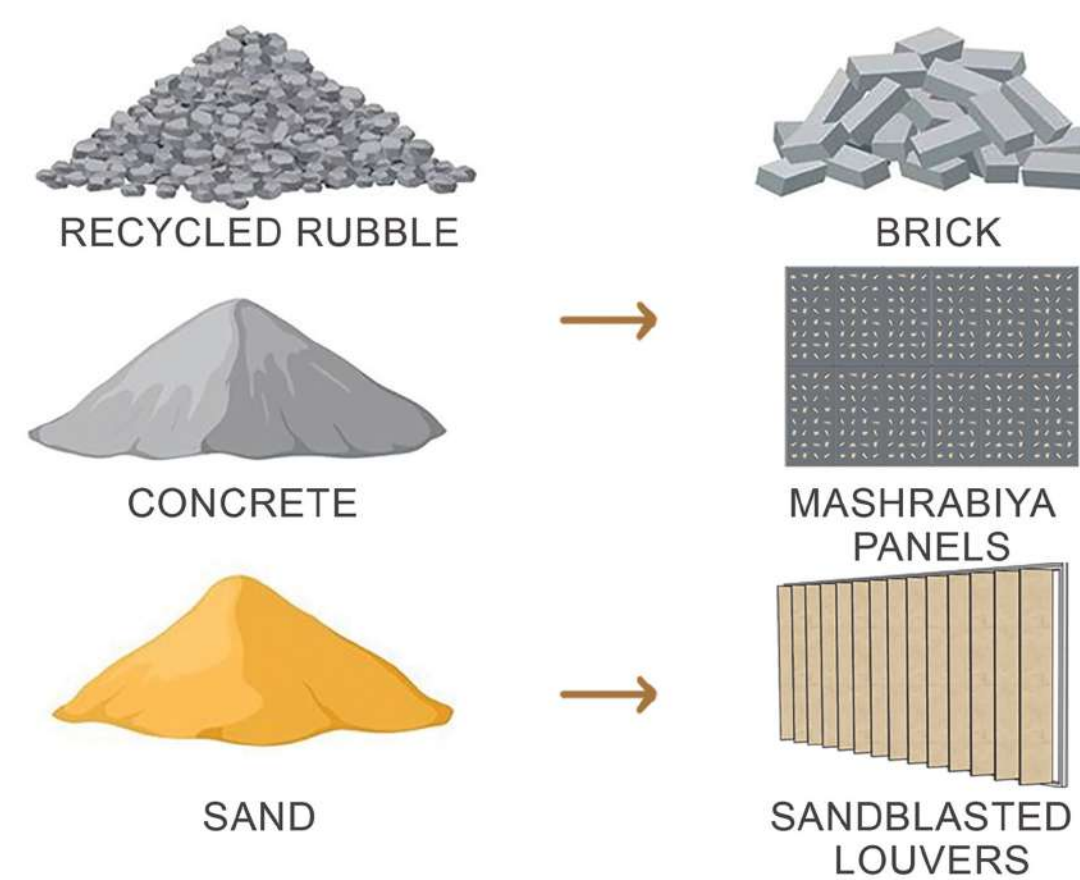


1. Main view

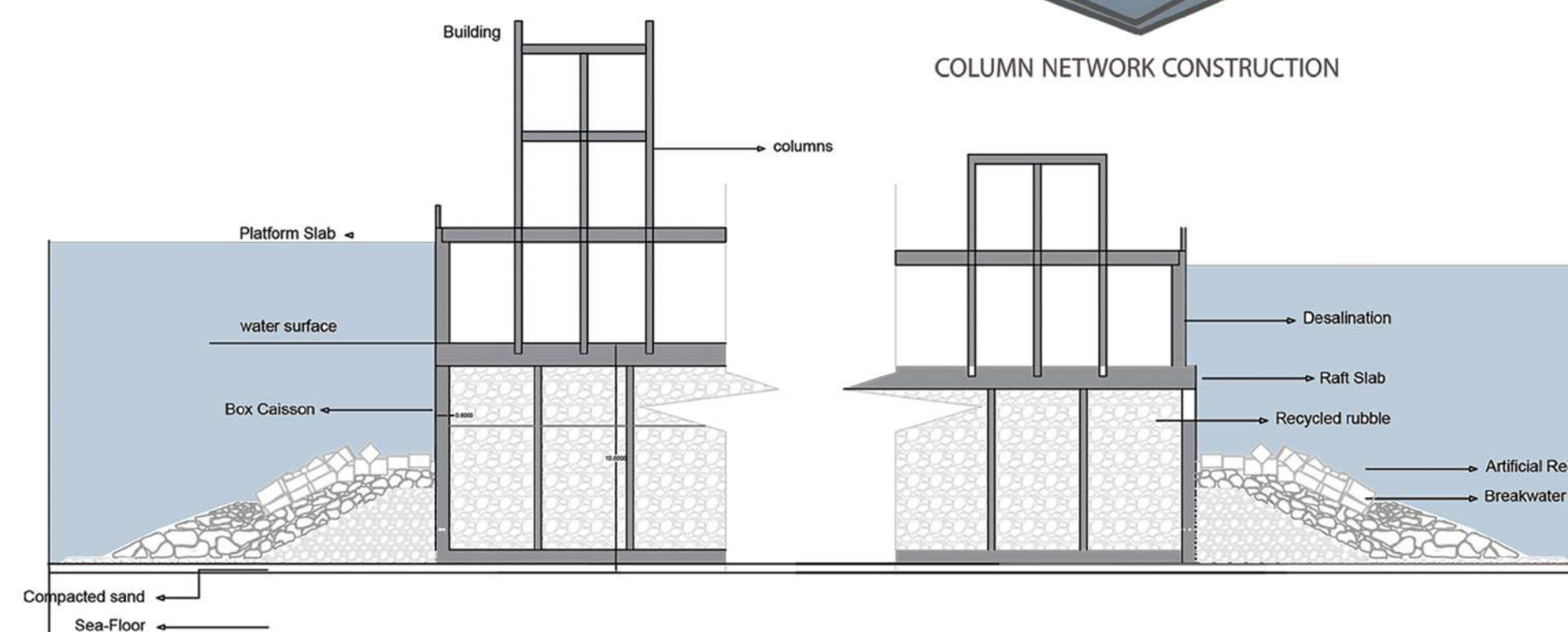
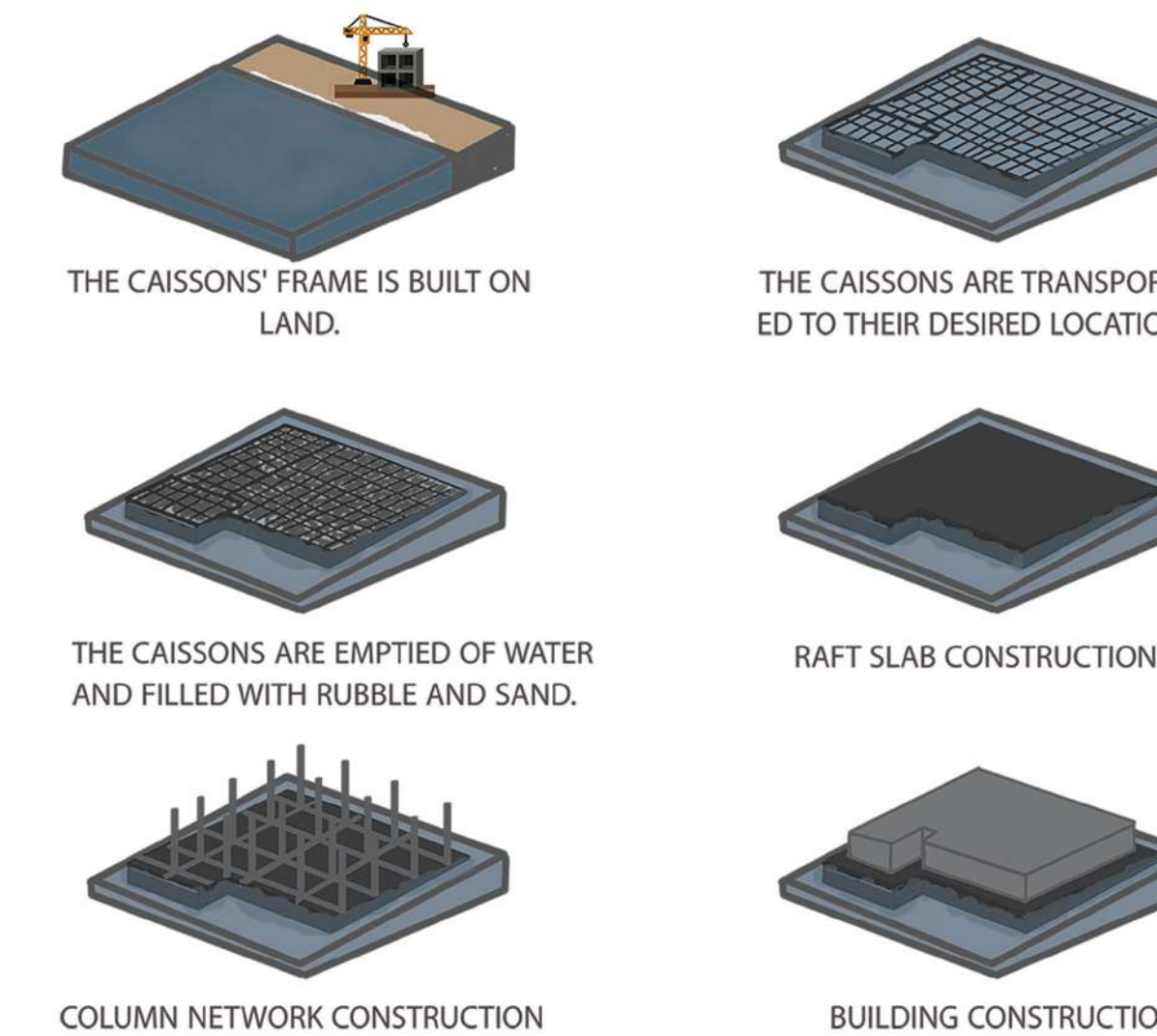


2. User experience

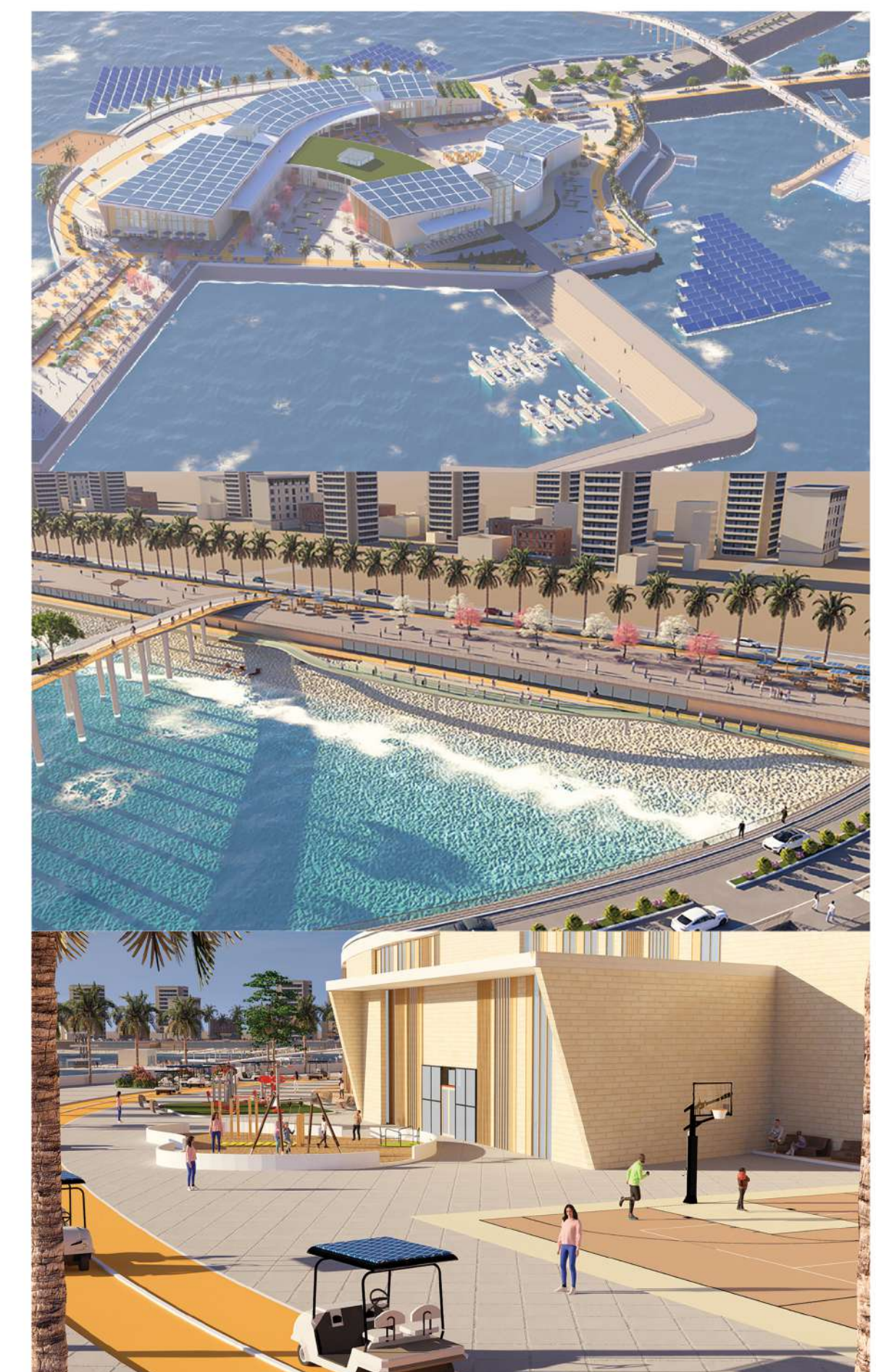
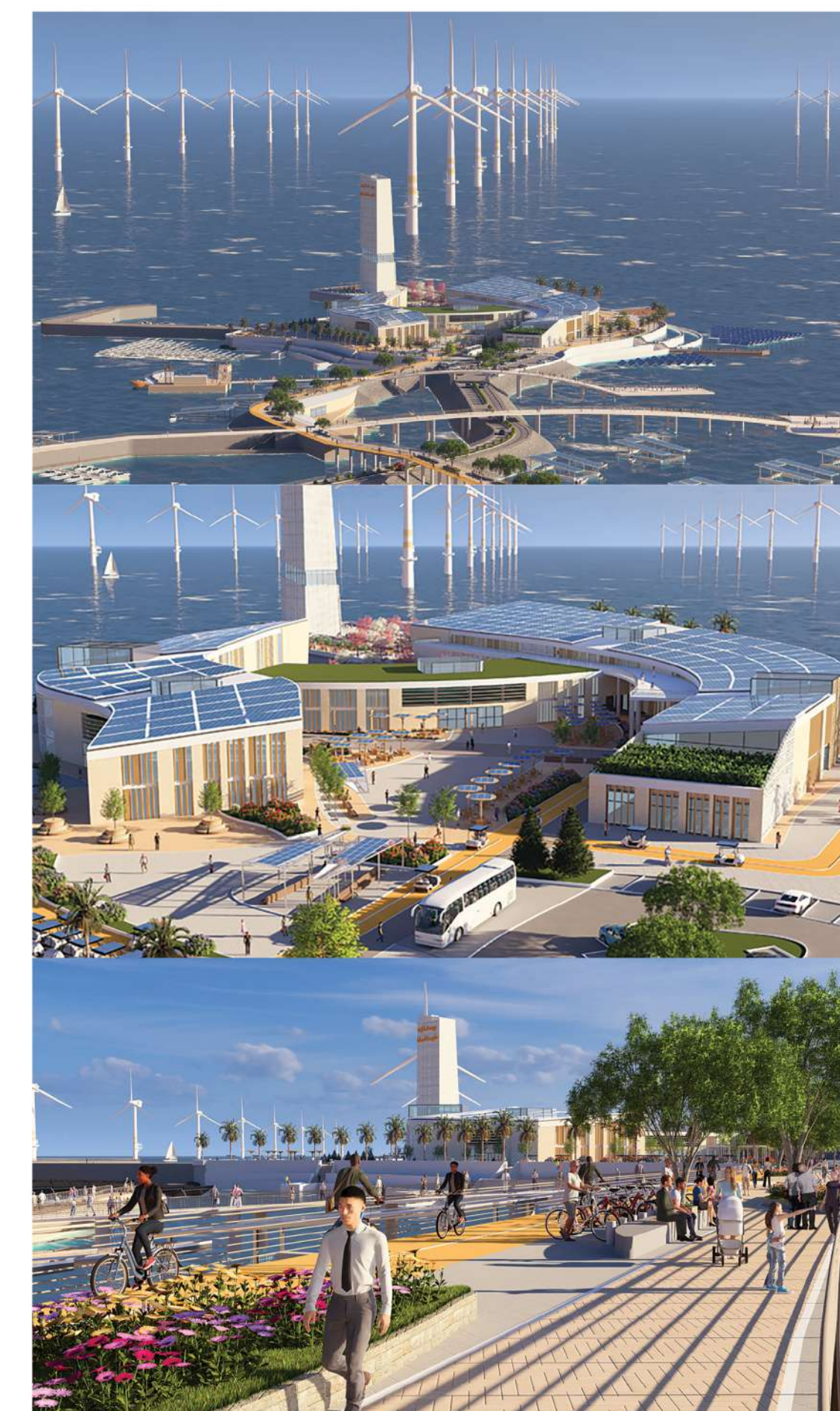
MATERIALS



CONSTRUCTION METHOD



3. Materials, Construction Method and 3D Shots



Energy Island Complex: Rafah as a Coastal Prototype for Resilient Development

The Energy Hub and Tower

At the heart of the island, the Energy Hub functions as a community anchor. The ground floor offers a library, market, workshops, restaurant, and multipurpose halls, while upper levels house research labs, academic spaces, and student housing. A lower-level desalination plant, open to educational tours, fosters public awareness of water technologies. The tower, a vertical beacon of resilience, combines observation decks, an art gallery, a restaurant, and vertical farms. It embodies the integration of energy, water, and food systems while offering inspiring views of the sea and wind turbines.

Materials and Construction

Sustainability is embedded in every detail. War rubble and local materials are repurposed into bricks, concrete, mashrabiyas, and foundations—transforming ruins into resources. Sandblasted louvers made from local sand reduce glare and heat while enhancing natural ventilation.

The island employs the caisson construction system: massive concrete slabs, prefabricated on land, are floated to sea, filled with sand and rubble, and topped with raft slabs to form the base structure.

Environmental Impact

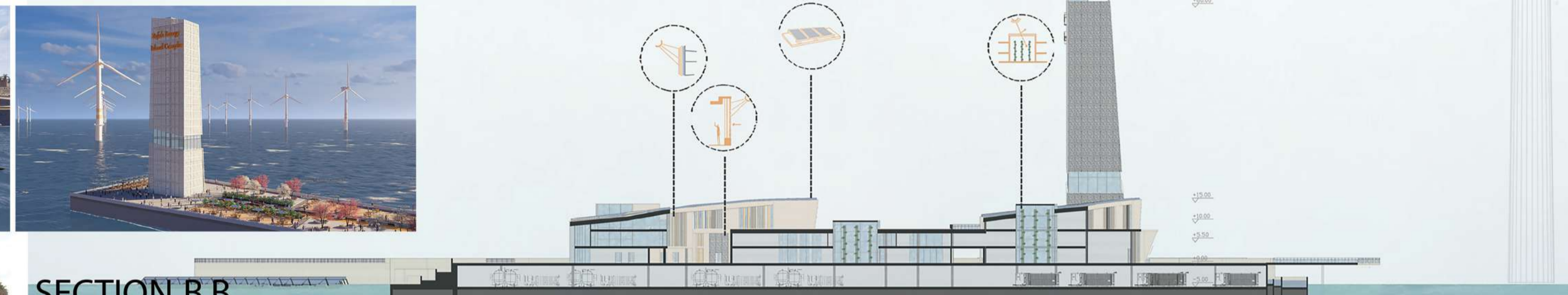
The project safeguards marine ecosystems through aquaculture tanks, artificial reefs, and recycling of grey and black water within closed loops. Vertical farming and renewable energy reduce ecological footprints while fostering a culture of sustainability and innovation.



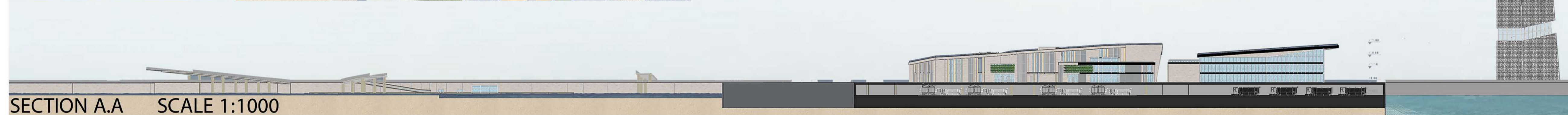
SOUTHWEST ELEVATION SCALE 1:1000



NORTHEAST ELEVATION SCALE 1:1000



SECTION B.B. SCALE 1:1000

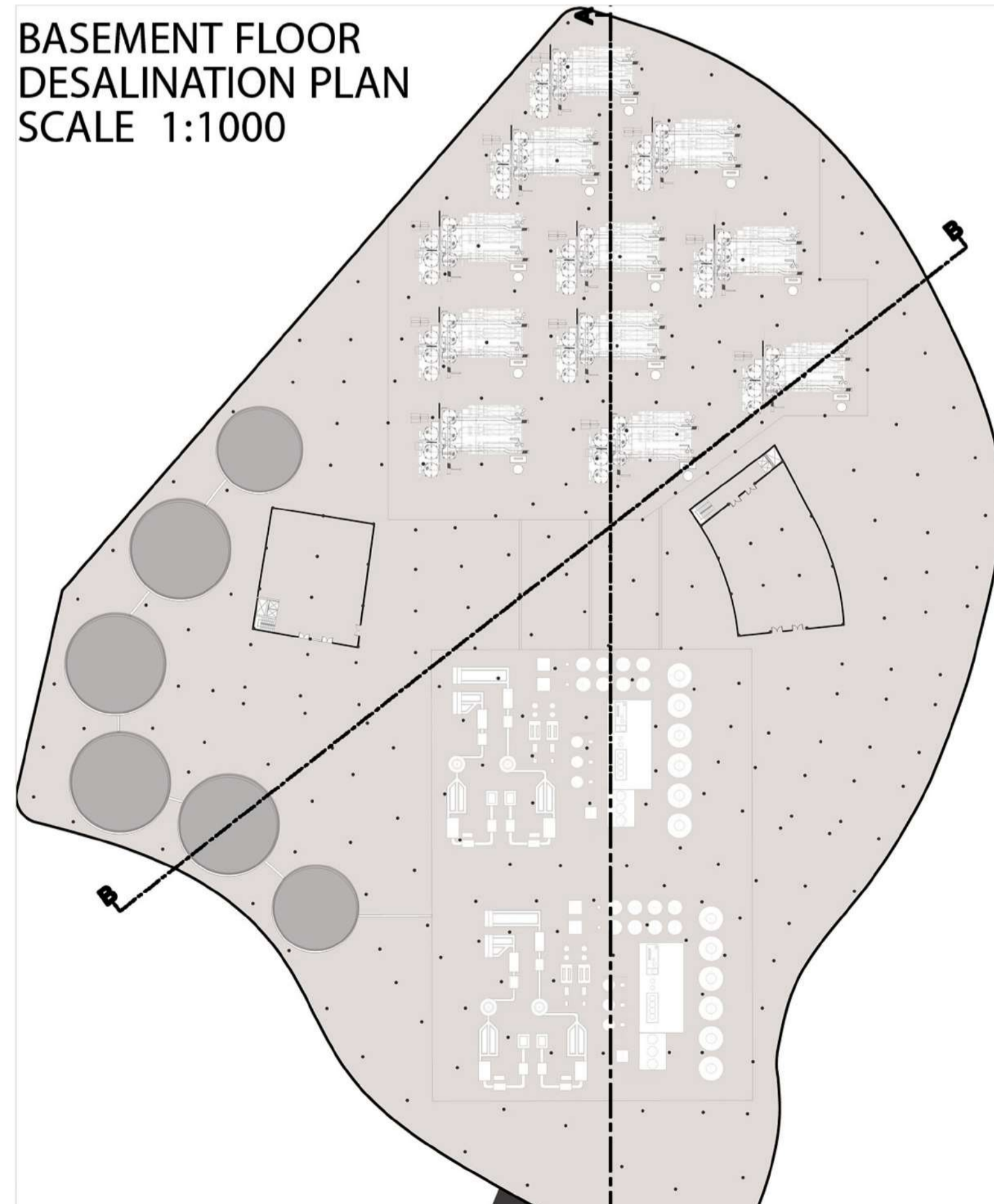


SECTION A.A. SCALE 1:1000

1. Sections, Elevations and 3D Shots

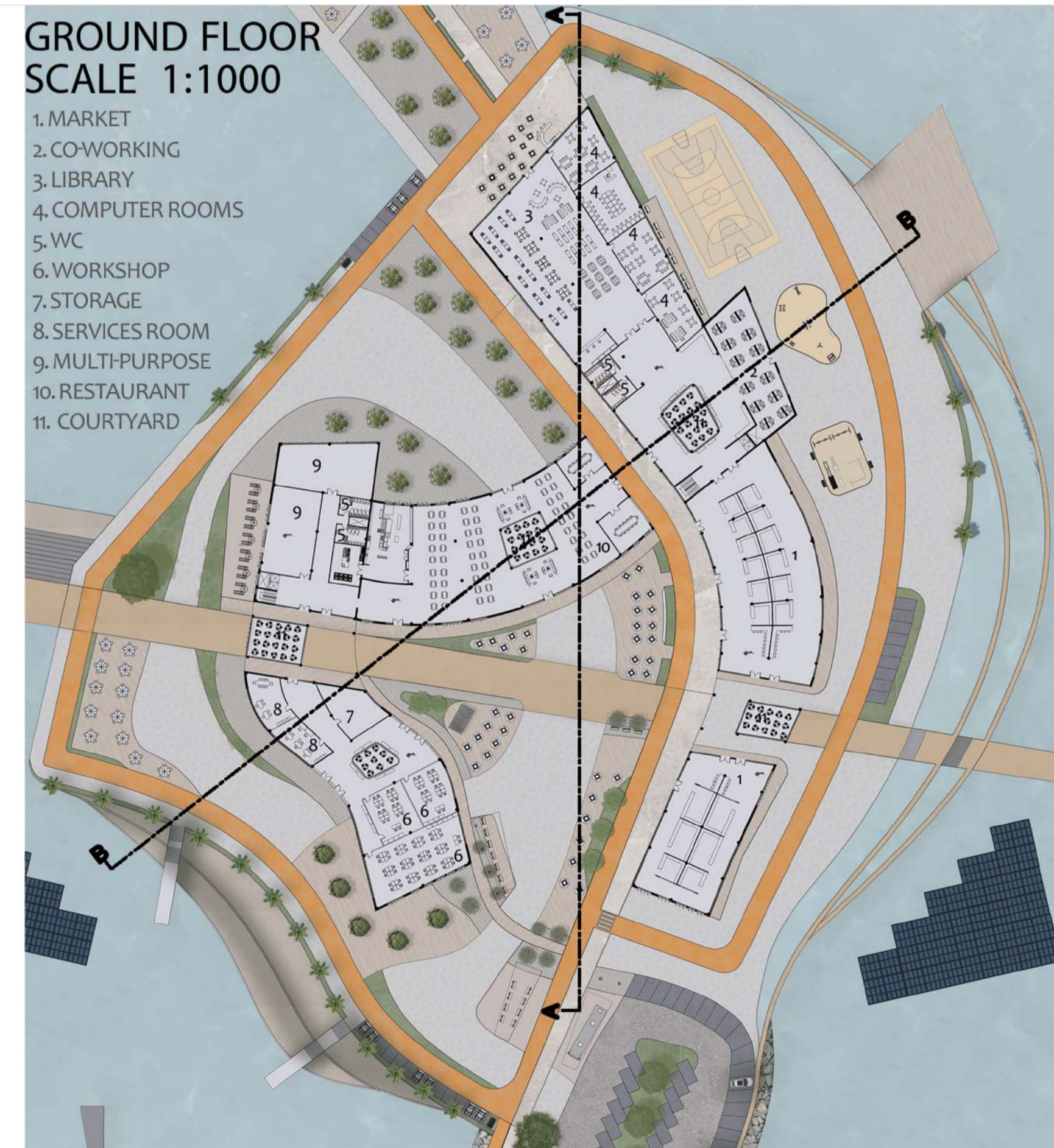
2. Sections, Elevations and 3D Shots

BASEMENT FLOOR DESALINATION PLAN SCALE 1:1000



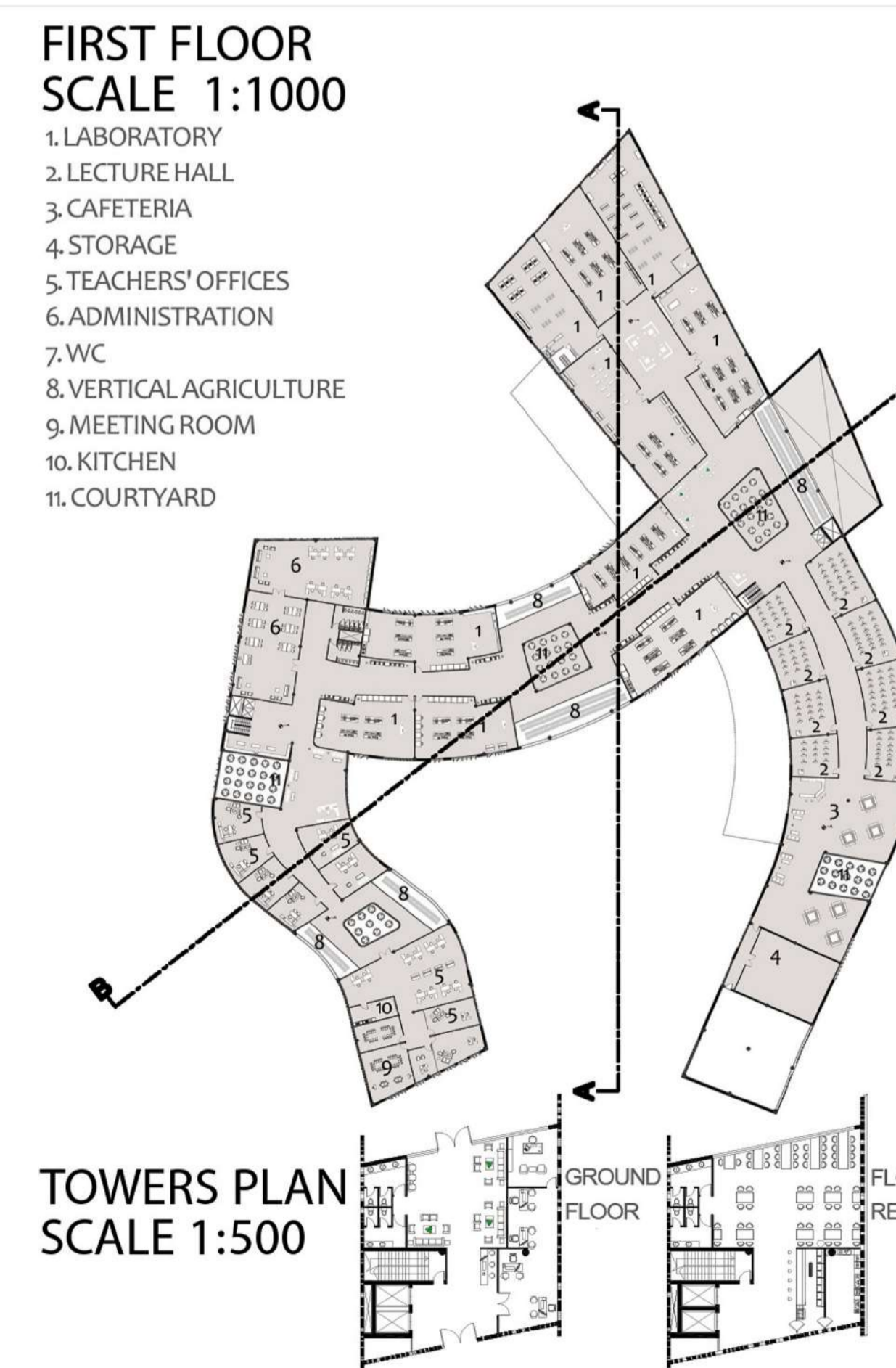
GROUND FLOOR SCALE 1:1000

1. MARKET
2. CO-WORKING
3. LIBRARY
4. COMPUTER ROOMS
5. WC
6. WORKSHOP
7. STORAGE
8. SERVICES ROOM
9. MULTI-PURPOSE
10. RESTAURANT
11. COURTYARD

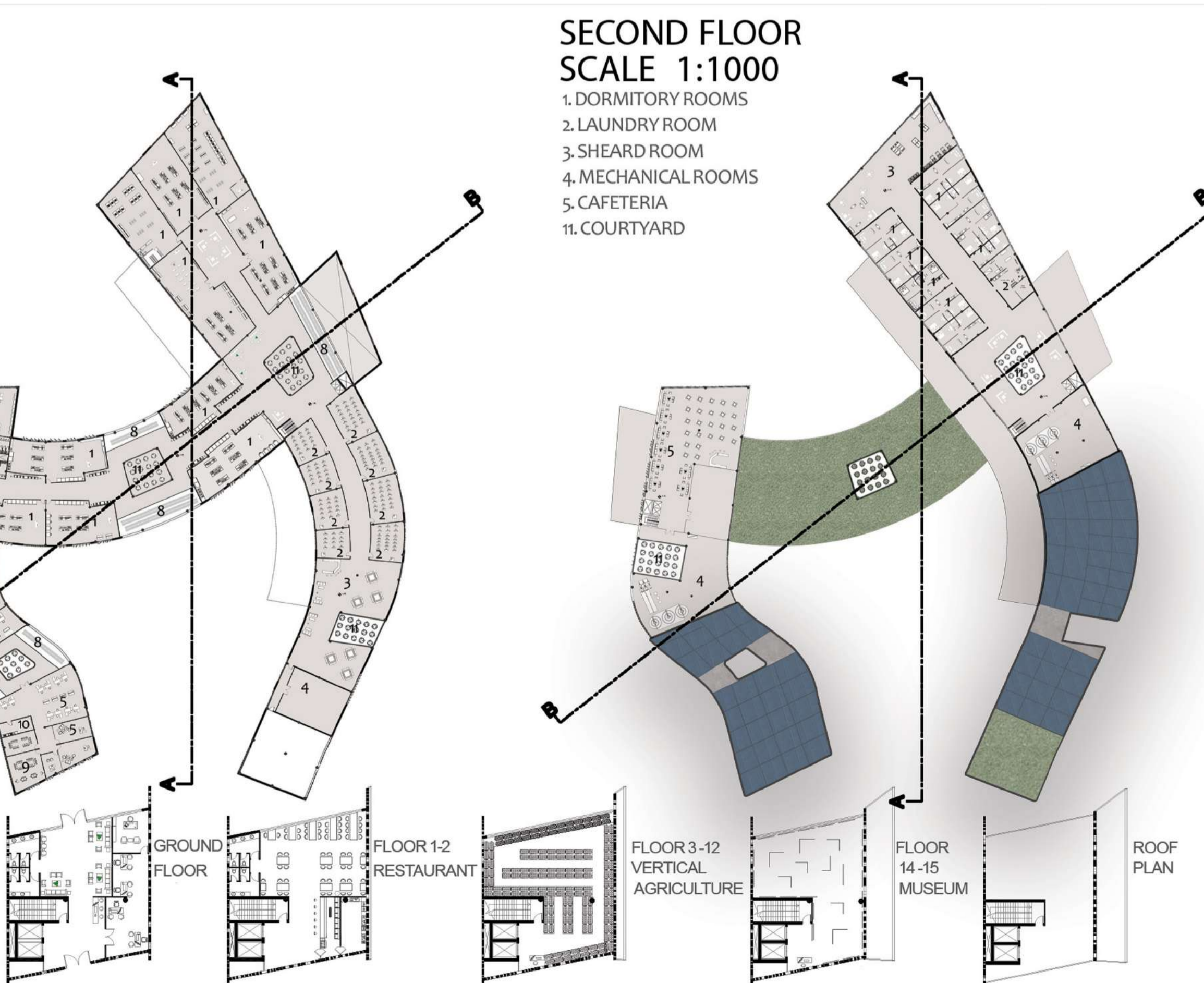


FIRST FLOOR SCALE 1:1000

1. LABORATORY
2. LECTURE HALL
3. CAFETERIA
4. STORAGE
5. TEACHERS' OFFICES
6. ADMINISTRATION
7. WC
8. VERTICAL AGRICULTURE
9. MEETING ROOM
10. KITCHEN
11. COURTYARD



TOWERS PLAN SCALE 1:500



SECOND FLOOR SCALE 1:1000

1. DORMITORY ROOMS
2. LAUNDRY ROOM
3. SHEAR ROOM
4. MECHANICAL ROOMS
5. CAFETERIA
11. COURTYARD

3. Plans

