FISHING REGENERATION HUB

For Burullus's Neglected Fishermen

A Struggle that runs deeper than the water

One Faces Poverty,
One faces Neglect, &
The Lake faces destruction

The ones who feed,
are the ones forgotten

GASE 564
Graduation Project II - Spring 25
Architectural Engineering Department
Student Name: Hadeel Zakaria ID: 220009
Project Name: Fishing Regeneration Hub
MSA UNIVERSITY
UNIVERSITY of GREENWICH

PROJECT GOAL

Following one of the most important values in design according to the **RIBA**, My goal is to design a hub is a Technical Solution wrapped in an Ethical Framework that uses Advanced Communication to save a historical industry while remaining Economically Viable

DESIGN KEYWORDS

Fair Payment, Fisheries, Reed Artwork, Regeneration, Wall Art, Auction, Sustainability, Aquaculture, Fair Wages, Local Food

SITE LOCATION

The Bogaz in Lake Burullus, Kafr el Sheikh (often referred to as Bughaz El-Burullus) is the vital, narrow natural channel that connects the Mediterranean Sea to Lake Burullus, the second-largest natural lake in Egypt's Nile Delta. It serves as the primary, direct connection between the two water bodies, acting as the main artery for the exchange of water, fish, and nutrients. The site has a relatively narrow sandbar structure (which separates the lake from the sea) and acts as the gateway for seawater into the predominantly brackish, shallow lake. The sea is deeper than the surrounding lake, with a maximum depth reaching 4 meters.

VIEWS INTO SITE

ACCESSIBILITY

PROBLEM OF THE LAKE

ZERO SUSTAINABILITY
ILLEGAL FISHING HARBOR COMMUNITIES
NO EDUCATION
LOW INCOME
LACK OF ALTERNATIVE JOB OPTIONS
TRADITIONAL FISHING METHODS

"We grow up, not recieving proper education, making it difficult for us to choose a different career path or help our families in fishing with a more advanced techniques"

"We reached an age where doing our daily fishing routine in the old traditional ways is getting really hard. We are in dire need of advanced ways to doing our job.

SURROUNDING CONTEXT

CONCEPT: Making the Invisible Visible.

Burullus does not stand empty; it breathes quietly through salt-stained wood, through the rhythm of casting nets at dawn, through reeds bending with the wind along the bogaz. Its identity has never been absent , only unspoken, dissolved into the ordinary. Our Fishing Regeneration Hub emerges from this silence as an act of revelation. It gathers the unnoticed textures of fishermen's lives ,the grain of boat timber, the geometry of woven nets, the crystallized trace of salt, and transforms them into space, structure, and light. Here, architecture does not invent meaning; it uncovers it. It makes the invisible visible, framing labor as heritage, routine as ritual, and community as culture. In doing so, Burullus is no longer a place passed by , it becomes a place recognized by its people and by the world.

THEME DESIGN ANALYSIS

Theme: Sail-inspired Modular Pattern

The design is unified by a modular pattern inspired by the triangular geometry of traditional Burullus show sails. This pattern is interpreted & repeated to organize the outdoor shading structure, geodesic dome geometry,shaded seating canopies, and semi-circular pavilion. This leads to creating rhythm, unity & a strong connection to Burullus Maritime heritage

Primary Modular Unit: Sail Module

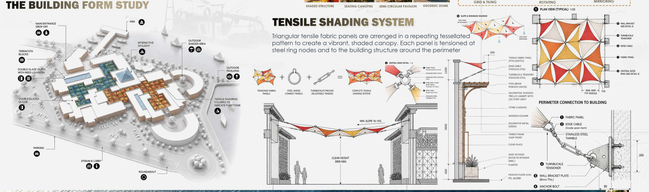
The fundamental triangular sail shape that is repeated, rotated, mirrored, & combined to form the overall pattern

Pattern Repeat Analysis

The sail module is repeated in multiple orientations & combinations, creating a dynamic yet cohesive geometric language across the project

Applications Across the Design

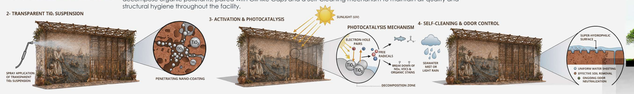
THE BUILDING FORM STUDY



LAYOUT Scale 1:400

ODOR TREATMENTS

The building skin employs a transparent TiO_2 Suspension that undergoes Photocatalysis under sunlight to decompose organic pollutants, paired with Gill-like Gaps and a Self-Cleaning mechanism to maintain air quality and structural hygiene throughout the facility.



MASTERPLAN Scale 1:200

LEGEND

Fishermen's Zone
01. Lockers Rooms
02. Restrooms
03. Kitchenette
04. Change Room
05. Fishermen's Entrance
06. Fishing Equipment Storage
07. Fish Processing Zone
08. Boat Tying Equipments

Auction Zone
09. Trader's Entrance
10. Auction Hall
11. Loading Zone
12. Fish Crate Preparation
13. Cold Refrigerators
14. Ice Machine Storage
15. Cashier Booth
16. Quality Inspection Office
17. Managerial Offices
18. Traders waiting Hall

Community Training Zone
19. Managerial Training Offi
20. First Aid Training Clinic
21. Seminar Halls
22. Reed Making Training Ha
23. Artwork Training Rooms

Fish Market Zone
24. Harbour Security
25. Clinic
26. Food Take-away Prep
27. Kitchen
28. Dehydrator Zone
29. Kitchen Storage
30. Fish Market
31. Fish Mongers Waiting Hall
32. Meeting Room
33. Restaurant

Burullus Cultural Zone
34. Reed Cafe
35. Reed Market
36. Artwork Gift Shops
37. Art Workshops
38. Art Galleries

Visitors Zone
39. Reception
40. Lobby
41. Quiet Waiting Room
42. Temporary Gallery
43. Permenent Gallery
44. Theatre Hall
45. Storage
46. Presenter Entrance

Administrative Departme
47. Ticket Office
48. Admins Office
49. Meeting Rooms
50. Offices
51. Electrical Room
52. Hub Maintenance Office

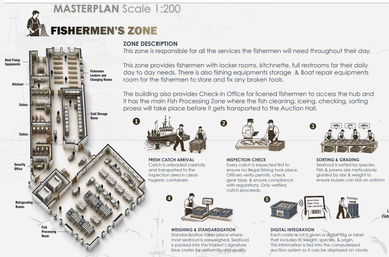
Outdoor Zone
53. Open Pavilion
54. Event Tensile area
55. Promenade
56. Community Parking
57. Loading Trucks Parking
58. Jetty (Pier)

FISHERMEN'S ZONE

ZONE DESCRIPTION
This zone is responsible for all the services the fishermen will need throughout their day.

This zone provides fishermen with locker rooms, kitchenette, full restrooms for their daily day to day needs. There is also fishing equipments storage & Boat repair equipments room for the fishermen to store and fix any broken tools.

The building also provides Check-In Office for licensed fishermen to access the hub and if has the main Fish Processing Zone where the fish cleaning, iceing, checking, sorting process will take place before it gets transported to the Auction Hall.



1. **FRESH CATCH ARRIVAL** — Catch is unloaded carefully and transported to the processing area in hygienic containers.
2. **INSPECTION CHECK** — Every catch is inspected first to ensure no illegal fishing took place. Any illegal catch is seized, gear taken, & ensure compliance with regulations. Only verified catch proceeds.
3. **SORTING & GRADING** — Seafood is sorted by species. Fish & prawns are meticulously cleaned, gutted, & iced to ensure buyers can bid on uniform quality.
4. **WEIGHING & STANDARDIZATION** — Standardization takes place where most seafood is pineweighed. Seafood is then packaged in standard blue crates for uniformity and quality.
5. **DIGITAL INTEGRATION** — Each crate is tag & given a digital ID or label that includes ID, Weight, species, & origin. This information is fed into the auction system so it can be displayed on clocks

FISHERMEN'S WORKING HOURS BEFORE AUCTION
4:00AM-5:30 AM

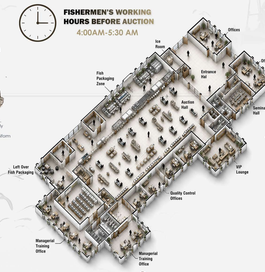
AUCTION ZONE

AUCTION TIME
5:30 AM - 9:00 AM

ZONE DESCRIPTION
This zone is responsible for Auction Hall and all the managerial services around it.

This zone welcomes the traders at 5:30 AM to let them check the fresh fish in person, as they will then register at the Auctioneer office to enter the bidding process.

The rest of the building include waiting lounge for the traders to wait for the bidding to start, managerial offices and on-site management training for young boys, quality control offices, electrical offices, cashier, and fish packaging and icing zone.



1. **BUYER INSPECTION** — Around 5:30 AM, registered buyers examine the product in person to check freshness, color, and quality, or review product data remotely.
2. **AUCTIONEER STARTS THE SALE** — The auctioneer initiates the sale with a high price per kilogram, which ticks down on digital screens
3. **BUYERS STOP THE CLOCK** — Buyers watch the clock and press a button/keyboard to "stop the clock" and buy the lot of that price.
4. **FIRST BIDDER WINS** — The first bidder to stop the clock wins the lot
5. **IMMEDIATE PURCHASE ALLOCATION** — The system records successful bidder immediately, the purchase is then board for the lot
6. **COLLECTION & DISPATCH** — "Wheelers" (staff) take the purchased lots from the hall and load them the auction floor to refrigerated transport for delivery to retailers and restaurants

FISH MARKET ZONE

ZONE DESCRIPTION
This zone is responsible for Fish Market & Restauarant.

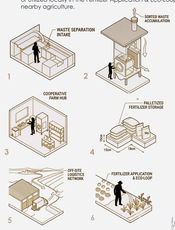
This zone acts as the main meeting point between all users as everyone can access it anytime.

The building has a main fish market that has an interactive skylight that helps in reducing heat and odor to the fish market The back kitchen and food-takeway preparation zone are behind the market.

INTERACTIVE SKYLIGHT

DEHYDRATOR MACHINE

The dehydrator machine is located in the food prep zone and it operates as a sustainable waste-to-resource loop, beginning at the Waste Separation Intake where organic by product is collected. It then moves through Sorted Waste Accumulation and processing in the Cooperative Farm Hub, eventually being converted into Palletized Fertilizer Storage. Finally, the product is distributed via the Off-Site Logistics Network or utilized locally in the Fertilizer Application & Eco-Loop to support nearby agriculture.

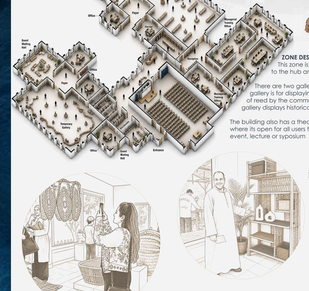


VISITORS ZONE

ZONE DESCRIPTION
This zone is responsible for welcoming the visitors to the hub and taking them inside the galleries.

There are two galleries in the building. The temporary gallery is for displaying new artwork made out of reed by the community and the permenent gallery displays historical information about Burullus.

The building also has a theatre hall, where its open for all users to attend an event, lecture or symposium



BURULLUS CULTURAL ZONE

ZONE DESCRIPTION
This zone is responsible for all Reed-making artwork and normal household products.

This zone trains the community on how to utilize the reed plants to their advantage wolthout harming the environment. This training not also opens doors for job opportunities apart from fishing but also increase the family's income, thus improve life in a sustainable way.

The building also has a Reed-cafe where locals and visitors can have coffee and bakries whilst making reeds with each lother.

1. **CLEANING** — Strip leaves and debris. Rinse stalks in fresh water.
2. **DRYING (CURING)** — Lay reeds on flat racks in a dark, dry place for 5-10 days. They turn a golden hue.
3. **SORTING** — Grade reeds by thickness and length for uniform weaving.
4. **RE-HYDRATION** — Dip dry reeds in water briefly to make them pliable.
5. **BEATING/TWISTING** — Take 3 or more strands and braid or tightly twist into long ropes.
6. **SPLICING** — Lock a new strand into the braid to create a continuous rope.
7. **THE BASE** — Coil the braided reed rope into a circle, stitching the layers together with thin fibers.
8. **BINDING** — Move in a sewing motion to lash each new row to the one below, building the walls. Decorative patterns are created by varying the lash stitch.
9. **TRIMMING** — Use shears to trim the top of the strip, finishing the "containers".
10. **SEALING** — Apply a thin coat of eco-friendly, water-based matte sealant. Protects from humidity & gives a slight sheen.
11. **BRANDING** — Attach a small wooden tag or leather label stamped with the hub logo. This tells the story & justifies a premium price.

MAIN ENTRANCE

FISH MARKET

REED PAVILION

TENSILE SHADED SEATING

BIRD EYE Shot

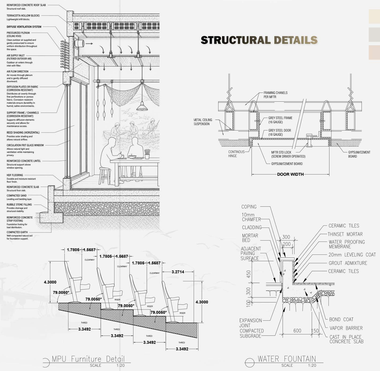
CULTURAL WALKWAY ZONE

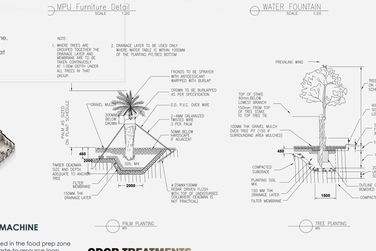
AUCTION HALL

REED- CAFE

STRUCTURAL DETAILS

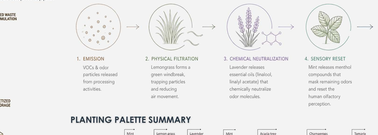
HOLLOW BLOCKS
PANELLED BEAMS
FRAMES



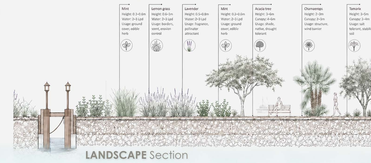


ODOR TREATMENTS

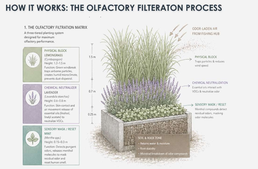
The odor treatment strategy utilizes a multi-layered filtration system to ensure a "fresh environment for all users, starting with Physical Filtration via lemongrass windbreaks that trap airborne particles. This is followed by Chemical Neutralizationusing lavender to break down odor molecules and a sensory Reset through mint, which masks lingering scents to provide a "fresher experience" for the public plaza.



PLANTING PALETTE SUMMARY



HOW IT WORKS: THE OLFACTORY FILTERATON PROCESS

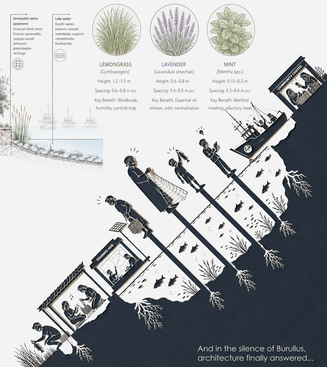


MAIN ELEVATION Scale 1:200

SIDE ELEVATION Scale 1:200

SECTION B-B Scale 1:200

SECTION A-A Scale 1:200



And in the silence of Burullus, architecture finally answered...