MODERNIZATION OF FISHING HARBOUR

THESIS REPORT

Submitted by

MATHIMETHA S
(17136008)

Under the guidance of
AR.KASI RAJAN

in partial fulfillment for the award of the degree of

B. ARCH (Bachelor of Architecture)

HINDUSTAN
INSTITUTE OF TECHNOLOGY & SCIENCE
(DEEMED TO BE UNIVERSITY)
CHENNAI

SCHOOL OF PLANNING ARCHITECTURE AND DESIGN EXCELLENCE

spade
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BONAFIDE CERTIFICATE

Certified that the Thesis titled " Modernization of fishing harbour" is the bonafide work of Ms: **MATHIMETHA S (17136008)** who carried out the Thesis work under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other thesis on the basis of which a degree or award was conferred on an earlier occasion on this or any other UG student.

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INTERNAL EXAMINER **EXTERNAL EXAMINER**

Name:_____ Name:_____

Designation: _____ Designation: _____

Date of Viva voce:

ACKNOWLEDGEMENT

I take this opportunity to express my deepest gratitude to DR. SHEEBA CHANDER, (Dean of School of Planning, Architecture and Design Excellence) and Mr. J. Sudhakar, (Professor and Head of the Department of School of Planning, Architecture, and Design Excellence), for their guidance and support throughout thesis and in all aspects in the period of time.

I am extremely grateful to my supervisor **AR. KASI RAJAN** for sharing his expertise and valuable guidance, encouragement, and support without which it wouldn't have been possible to finish in this short period of time. I would also like to thank Professor **AR. RAMA KARTHIKEYAN** for her continuous optimism and encouragement which had motivated me to give my best concerning this work.

I am deeply grateful to my parents, friends and Architects (Shafiyur Rahman – Evolve studio, Ram Krishnan, Nivetha Venkat) for their support and help in providing facilities to complete it with ease.

I also thank the Youtuber KASIMEDU MEENAVAN – DANISH for his help and support during the site visits.

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ABSTRACT

The community of Kasimedu, typically, living near the sea, having their main occupation as fishery have been a part of oldest occupation in the history of mankind. India is striving to increase the exports of fish and fishery products by 50% before 2023. But in recent times, it is losing its importance because of low maintenance lifestyle and no fixed income. Fishermen are typically one of the wealthiest communities but at the same time their income is not fixed depends on the fishes caught during season.

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CHAPTER 1

INTRODUCTION OF THESIS

1.1 Introduction

Kasimedu, one of the fishing harbour of the city and a tourist spot. Over years it has been confronted with problems like lack of infrastructure, unhygienic surrounding. Over-crowding has become one of the greatest problems of that area. The sense of self belonging and pride is missing which has led to deterioration of market and the culture of the community.

Project paying attention to marine life can help bring new life into waterfront areas and can also provide a point of interest for the entire region itself. There exists in our society an absence of awareness regarding marine ecosystems, which has resulted in a lack of opportunities, care, and resources available for marine life. Thus, a thesis project on this topic would not be addressing the administrative concerns related to marine life, but could also cater to providing a recreational public space, where visitors can appreciate and interact with marine life.

This thesis is therefore intended to examine the issues faced by the people of Kasimedu and therefore purpose an architecture design solution to the problems associated with it. The topic also tries to provide spaces for visitors which would act as money generating for the localities.
It is also an ongoing proposal to make kasimedu harbour a very modernized fishing harbour - proposed by the state government.

Fig 1- Kasimedu fishing harbour

1.2 AIM

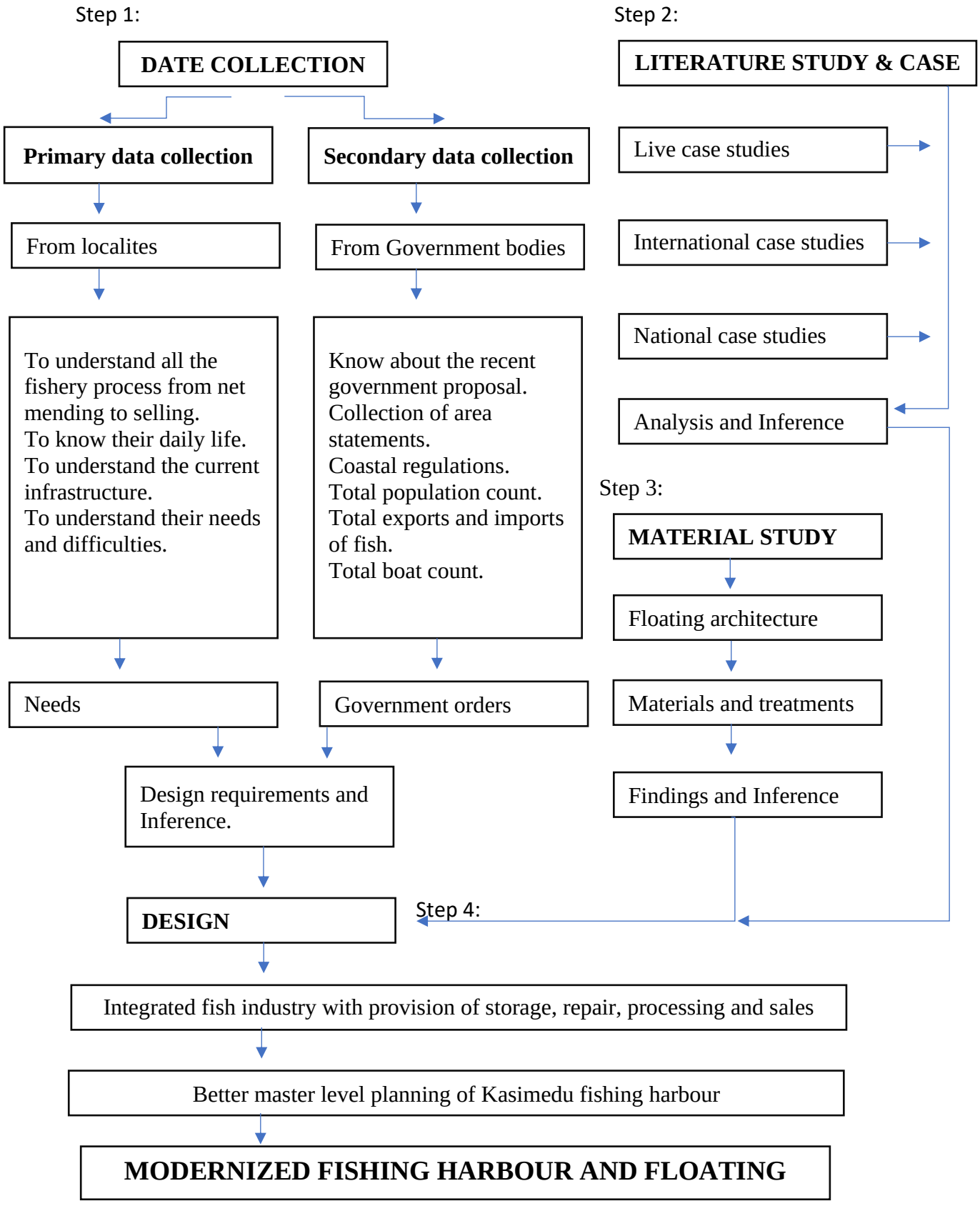
- The aim of the project is to design and create a modernized fishing harbour keeping in mind the comfort and needs of the employees and common people.
- To create the first floating market in Chennai which will be a major tourist attraction in North Chennai.

1.3 OBJECTIVES

- To study the existing organic pattern and the infrastructure in Kasimedu.
- To understand the people phycology and needs before designing.
- To design and create a modernized hub which support all existing activities with good amenities and hygiene.
- To study and organize the areas property which are actually scattered and establish a proper fish port, transportation facilities, markets, ice plants, cold storage and public utility complex.
- To create urban catalyst that would initiate surrounding development.
- To highlight and to improve the income of small fisherman, through the provision of services and facilities which add to the value of their product.
- To retain the intermingling and diverse activities. The centre shall serve as a forum for interaction and will remain as the nucleus for the region.
- To provide proper water supply arrangements.
- To maximise the use of renewable energy.

Fig:2 Kasimedu fishing harbour

1.4 METHODOLOGY



1.5 SCOPE

- Going further into the study of a fisherman understanding his living and design a space that can be suited according to his livelihood.
- To follow the costal regulation rules.
- More scope to design in the master level planning of Kasimedu harbour.
- To understand the architectural needs of fishery people and bring in more possibilities to make their life economically better.
- To provide different types of fish storages and equipment.
- Since the fishermen live near the costal areas, new construction techniques which are suitable for such weather conditions will be studied.
- Learning about floating markets and its construction styles.
- To design the wharf and its rules

1.6 OUTCOMES

- Kasimedu will serve as an integrated fish industry with provision of storage, repair, processing and sales activity.
- The business of the fisherman will increase after dedicating a proper infrastructure with all the amenities and provisions of modern technology.
- There will be increased environmental awareness and consciousness in the fish quality which will also bring a change in consumer behaviour.
- The port will also give new employment opportunity.

- There will be good tourist flow in the area which in-turn will increase the need of fishery products.

Fig 3- Kasimedu fishing harbour

CHAPTER 2

LITERATURE STUDY

2.1 DATA COLLECTION

2.1.2 FISHING HARBOUR AND IT'S FUNCTION:

The role of the fishing port may be considered as the interface between the netting of fish and its consumption. In today's world of increased environmental awareness, a fishing port must be planned, designed and managed in harmony with both the physical and biological coastal environments.

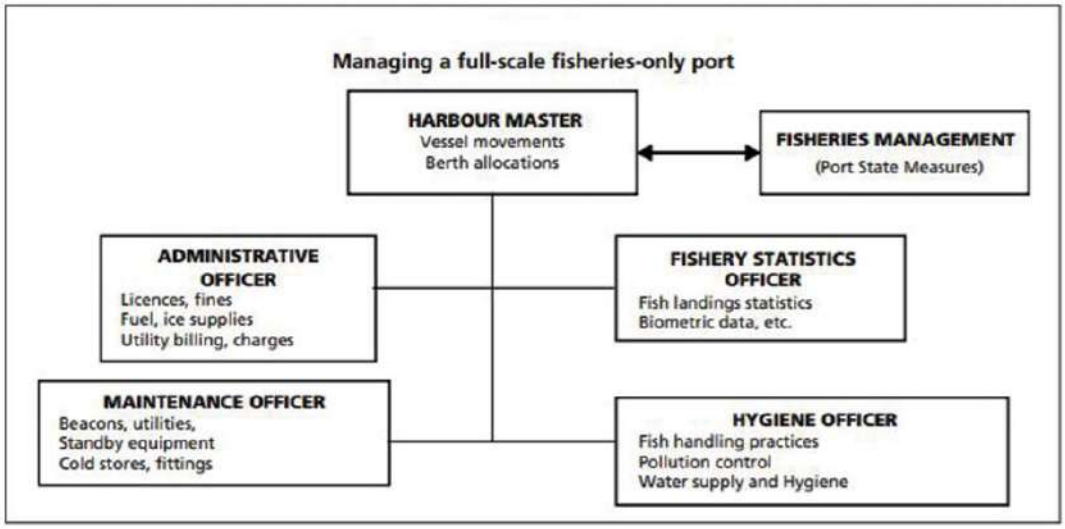


Fig 4- Managing fishing harbour

More than government private bodies play a maroj role in Kasimedu

2.1.3 TYPES OF FISHING HARBOUR:

There are obviously different types of fishery operations, each requiring different arrangements. Ports are categorized according to the type of fishery they serve,

1.artisanal 2.coastal

3.offshore 4.distantwaters.

Kasimedu is an OFFSHORE fishing harbour

Fig 4- offshore fishing harbour

Offshore fisheries usually involve both fishermen and non-fisheries-related business interests who invest in vessel fleets. The vessel sizes are usually in the 20 to 40 metre range and the vessels generally need proper port facilities.

Offshore fisheries harbour characteristics

Location of fishing grounds	Offshore and far coastal, steaming distance up to 1 week.
Typical fishing trip	Anywhere from 2 to 4 weeks.
Type of vessels handled	Large motorized canoes, purse seiners and trawlers. Vessels up to 100 tonnes in weight. Fishing gear purse seine and trawl nets.
Type of landed products	Mainly iced but also frozen pelagics, shrimps and other high-value species.
Typical shore processing	Canneries, fishmeal, salting, drying and smoking.
Minimum water depth required	At least 5.0 metres below Lowest Astronomical Tide level.
Breakwater protection	Generally required unless port is inside a river estuary but breakwaters on beaches are reactive and unsustainable.
Auction – sorting hall	A sorting hall and auction area is required in all cases.
Utilities	Mains power only and town supplied water. Boreholes and seawater systems acceptable in areas of low rainfall.
Ice production	Of primary importance. Should only be mains powered otherwise delivered from nearest supplier.
Cold storage	Cold storage required for buffer stocks. Chilled storage on ice (3 °C) is acceptable in some cases.
Refuelling	Large sized installation (up to 1 000 tonnes in weight) is the most suitable. Bowser service also acceptable in some cases.
Dry docking – slipways	Slipway to handle vessels up to 500 tonnes in weight normally required.
Transport links	The port is only feasible if road already exists.
Workshops	Proper engine and hull workshops required in loco. Steel or GRP hulls may need extra workshop area.
Net repair areas	Required in all cases. A minimum of 1 000 m² required. Area should drain surface water away and be part covered.
Fishermen's/seamen's facilities	A cooperative with full facilities (banking and wholesale supplies) is required. Full toilet and shower facilities as well as canteen services must be included.
Open storage and parking	Enough area should be set aside for parking and storage of seasonal fishing gear, as well as for dry boat storage in areas where monsoons are active.
Ancillary services	Port may also act as base for coastguard, SAR centre, oil spill combat and fishery protection vessels.
Hinterland	A town community nearby is desirable with full facilities, including hotels, hospitals, banking, shipping agents.

Fig 5 - offshore fishing harbour characteristics

2.1.4 TYPES OF FISHING BOATS:

1. Small 24ft boats

Catch capacity: 120-200 kg

No. of fishermen: 1-5

Time at sea: couple hours

Fig 6 – small boat

2. 30ft fishing trawler

Catch capacity: 200-2000 kg

No. of fishermen: 2-7

Time at sea: 2-3 days

Fig 7 – 30ft fishing trawler

3. 50ft fishing trawler

Catch capacity: 200-2000 kg

No. of fishermen: 2-7

Time at sea: 2-3 days

Fig 8 – 50ft fishing trawler

2.1.5 PARKING OF FISHING BOATS:

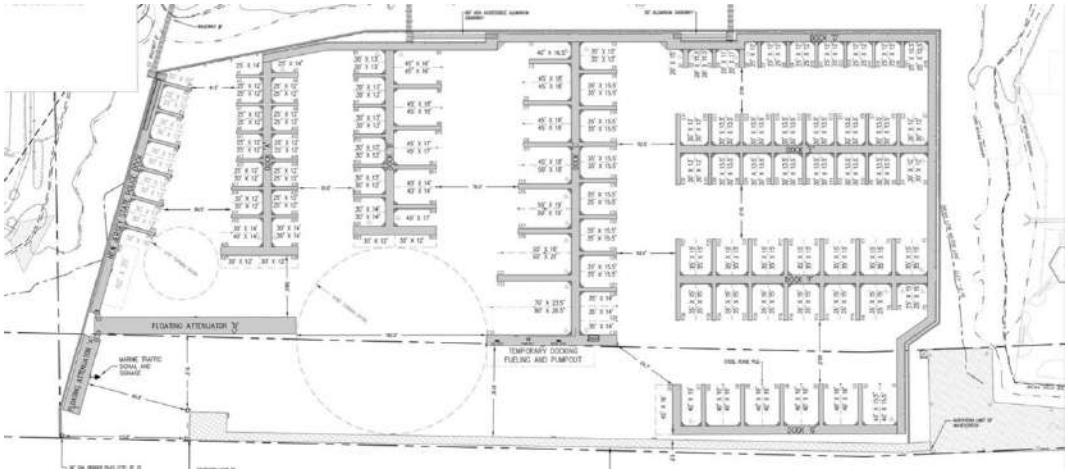


Fig 9 – Boat parking

Each dock has a sub dock which holds two boats. With this boat counts and illegal ships can be spotted easily.

30’x13’, 40’x14’ , 50’x19’ are some of the standard parking docks.

Kasimedu does not have any parking docks.

Fig 10 – Boat parking Zadar

2.1.6 BREAK WATERS

The core should ideally be 4 - 5 m wide at the top and approximately 0.5 m above mean sea level or, when there is a large tidal range, above high water spring level. The top of the core should be kept level and uniform.

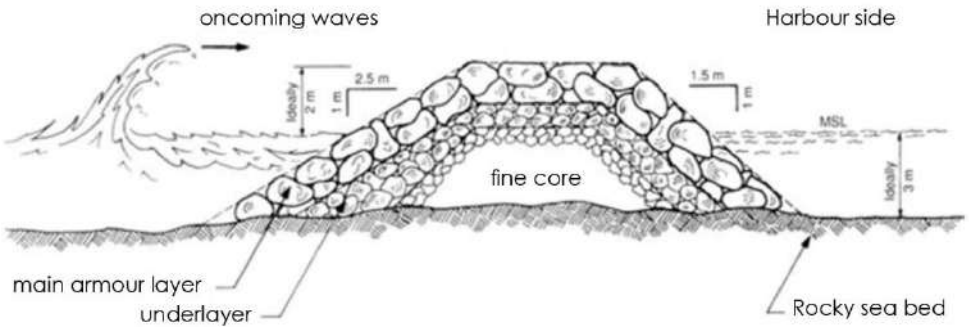


Fig 11 – Break water

2.1.7 JETTIES

A narrow structure projecting from the shore into water with berths on one or both sides and sometimes at the end also.

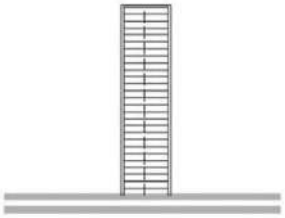


Fig 12 – Finger finger

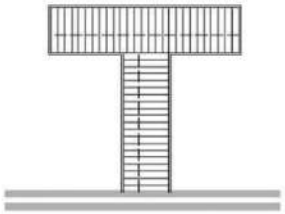


Fig 13 – T finger

FISHERY WORKING PREMISES

2.1.8 TYPICAL LAYOUTS OF MULTI COLD STORE FACILITIES

Typical 5000 MT Multi Commodity Cold Store with provision of rapid room cooling and palletized storage, suitable for long/medium term storage of commodities.

In case of cold stores which are sized to store pallets stacked four levels high, the floor to ceiling height can vary between 7400 mm to 8200 mm depending on pallet frame height to allow sufficient air circulation.

There is no cold storage facilities available in kasimedu. Around 20 ice factories are present.

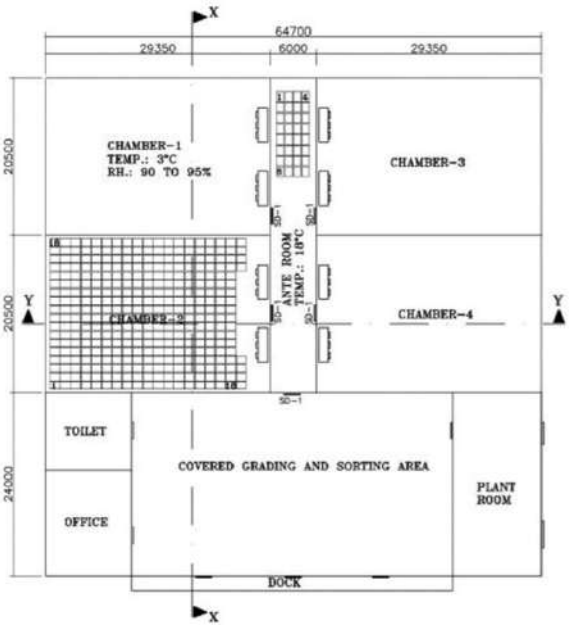


Fig 14 – Cold storage

2.1.9 WHOLESALE FISH MARKETS

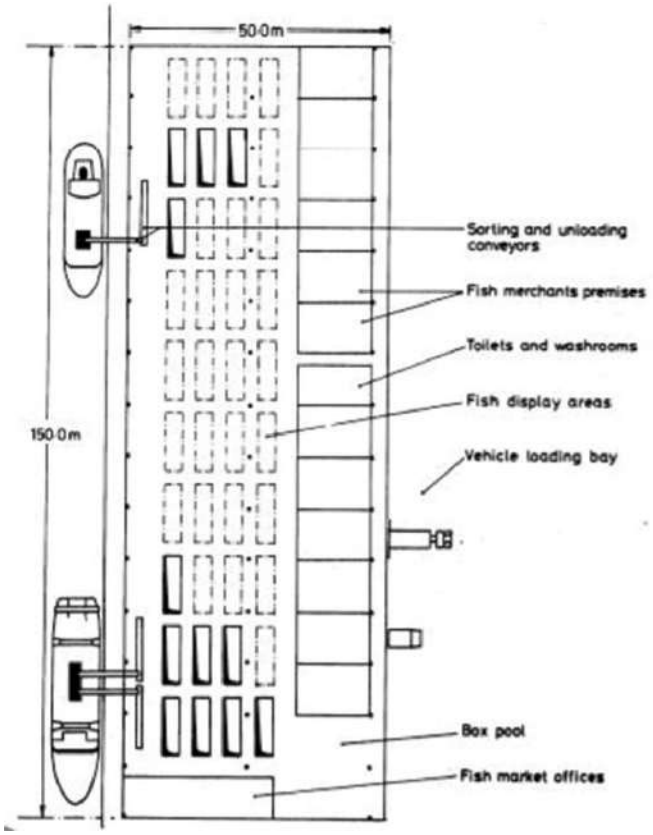


Fig 15 – Whole sale fish market

2.1.10 FISH MARKET DRAIN

Three drainage systems should be provided.

1.domestic foul sewage,

2.storm water and surface drains

3. main drainage system for handling liquid wastes.

Main drains should not connect directly to a sewer without an intermediate trap, and should be sufficiently barge to carry away all waste water without backing up or flooding.

Floor drainage channels should have easily removable gratings which can be simply cleaned.

2.1.11 CLEANING AND PROCESSING AREA

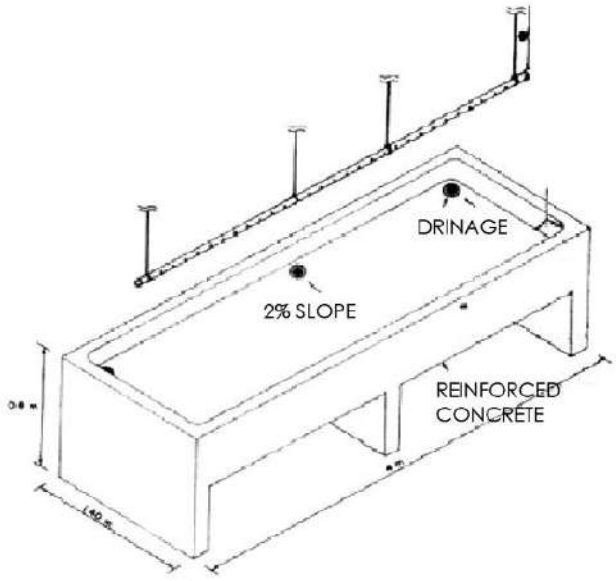


Fig 16 – cleaning process

2.1.12 FOOD PROCESSING UNIT AND TEMPORARY STORAGE

Fig 17 – simple processing unit

2.1.13 AUCTION HALL

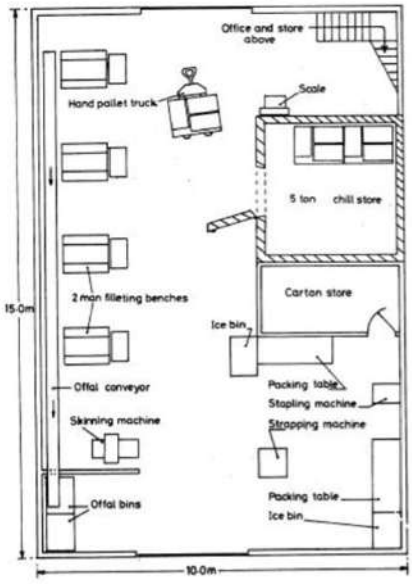


Fig 18 – auction hall

For now the auction is happening on the RCC platform and the fishermen find it very difficult in case of rain for auction.

Fig 19 – auction hall

2.1.14 FISH EXPORT OFFICE WORKING PROCESS

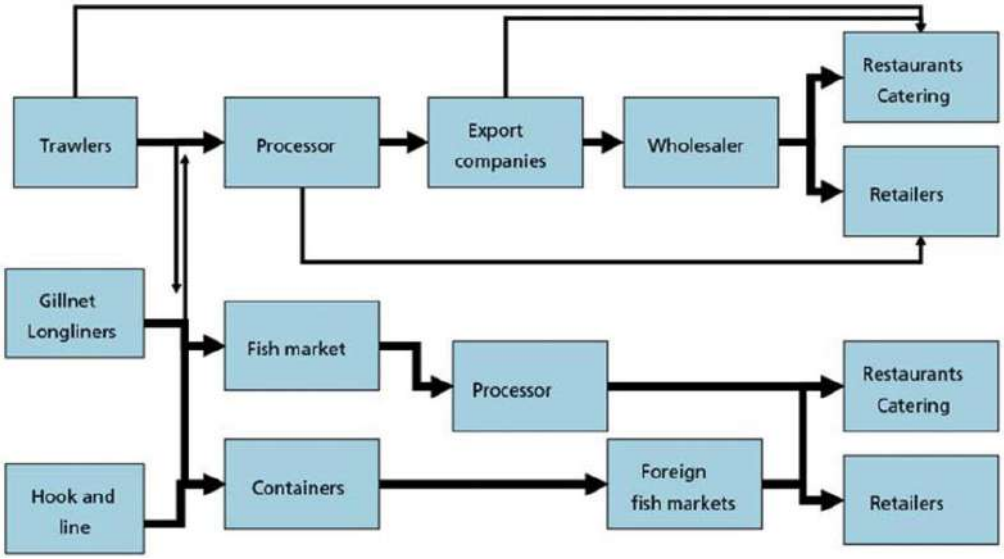


Fig 20 – fish export

Number of people	Area
From 4 to 5 people	11.15 m^2
From 5 to 7 people	13.9 m^2
Meeting of 12 people	22.3 m^2

Table 1: No. of people

2.1.15 CLASSROOMS FOR WORKSHOPS

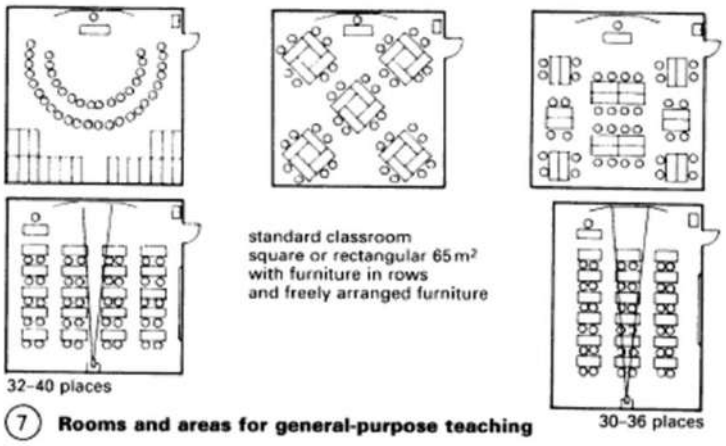


Fig 21 – room

Workshop area statement

classroom - 55 60 sq m
room for collection and materials - 30-35 sq m
room for preparation - 30-35 sq m
room for demonstrations and practicals - 70-75 sq m

2.1.16 RESTROOMS

In the case of office building the usage of the bathroom is limited not like residential usage, but culturally two units of W.C (men and women) must be designed in such buildings. 100 people 2 restrooms.

2.1.17 CANTEEN

The standard dimensions for the person to be eat comfortably is 60 cm wide and 40 cm deep. With the additional spaces for dishes and neighborhood the spaces that will be sufficient.

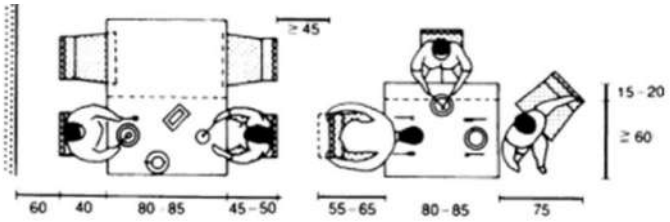


Fig 22 – canteen

2.2. NORMS & STANDARDS

MIN. PLOT EXTENT	1000 SQ.M
MIN. PLOT FRONTAGE	30M
MIN. ROAD WIDTH	MIN - 7.2M MAX- 18M
MAX. HEIGHT	15.25M
MAX. FSI	1.5 + (0.25) FOR GOVERNMENT BUILDINGS
MAX. PLOT COVERAGE	40%
FRONT SETBACK	6M
SIDE SETBACK	6M
REAR SETBACK	6M
PARKING	1 CAR SPACE FOR EVERY 100 SQ.M 1 TWO WHEELER SPACE FOR EVERY 25 SQ.M
VISITORS PARKING	10% OF ABOVE PARKING STANDARDS
MIN. CORRIDOR WIDTH	2M

Table 2 - DCR standards

SITE PLANNING	PARKING	BUILDING REQUIREMENTS
EVERY BUILDING SHOULD HAVE AT LEAST ONE ACCESS TO MAIN ENTRANCE/EXIT TO THE DISABLED WHICH SHALL BE INDICATED BY PROPER SIGNAGE.	• MAX. TRAVEL DISTANCE BETWEEN ANY BUILDING TO PARKING SHOULD NOT EXCEED 30M • WIDTH – 3.6M	RAMP DETAILS: • RATIO – 1:12 • MAX. LENGTH OF RAMP – 9M • MIN. WIDTH OF RAMP – 1.5M • NON SLIPPERY • MIN. SIZE OF LANDING – 1M X 2M
-	-	LIFT SIZE – 0.8M X 1.5M
-	-	MIN. DOOR WIDTH- 0.9M

Table 3 - Provisions for disabilities

CHAPTER 3

CASE STUDY

3.1. NET CASE STUDY

3.1.1 DIKKOWITA FISHERY HARBOUR : SRILANKA

Location: Gampaha District, Wattala PS, Srilanka

Architects: Delta marine constructions

Total breakwater length : 1170m

Land Area : 19.7 acre

Basin Area : 28.91 acre

The harbour of Dikkowita, situated just 10 kilometers north of Colombo, is one of the biggest fishery harbours of Asia.

The harbour is divided into two areas. The fisheries sector is the third most important contributor to economic growth in Sri Lanka.

The northern basin is used by local fishermen to berth their boats. The

facilities on this side of the harbour are therefore purely for the local fishermen, such as fuel dispensing units, toilets and a fish auction hall. The northern basin is designed for a capacity of 400 to 450 fishing boats. The fishing boats in the northern basin stay on average two or three days in the harbour, depending on the weather conditions and if some repairs have to be carried out.

The southern basin of the harbour is used for the export. International boats come to this section to get supplies for their mother ship and to unload their fish. When the fish is unloaded, it will be processed in the processing hall.

Fig 23 – Dikkowita fishery harbour

3.1.1.1 MAIN FACILITIES AVAILABLE

Southern basin

- Administrative building with all the facilities.
- Office places for registered companies.
- Ice- plant (20 tons per day / storage capacity 40 tons).
- Waste management system.
- Oil spill protection equipments & fire fitting systems.
- Vehicle packing areas.
- Space for containers storage facilities.
- 24 hrs security.

Northern basin

- Auction, Net mending facilities.
- Fuel dispensing units / storage capacity
- Administrative building / Fuel office/ canteen.
- Ice- plant (20 tons per day / storage capacity 40 tons).
- Waste management system.
- Vehicle packing areas.
- 24 hrs security.
- Providing safe and easy anchorage facility for 340 multi-day fishing vessels and 150 one day IBM boats.

The fish will be loaded into trucks and transported to the Bandaranaike International Airport. The amount of boat on this side of the harbour is 3 to 6 boats on average. The total capacity of the southern basin is 40 to 50 boats.

All office buildings are situated in the southern part of the harbour. The two parts are separated by fences.

Fig 24 – Dikkowita fishery harbour

3.1.1.2 ANALYSIS OF THE SURROUNDINGS

The harbour is located in an urbanized area of the suburbs of Colombo. Along the coastline south of the harbour are beaches, hotels and restaurants located.

PUMP HOUSE

The pump houses are placed in a way that they can be filled to boast directly. It is constructed at sufficient gaps.

Fig 25 – Pump house

MAIN OBJECTIVES

Maximization of fisheries sector contribution to the national economy.
Increasing employment opportunities related to fisheries.
Attract & encourage local and foreign investments in sector.

Offer efficient service for the stakeholders.
Minimize of post-harvest losses.
Provide unloading and packing facilities to cater fish importing countries requirements (EU, Japan, U.S.A).
Strategically located fish exporting harbour(close proximity to Airport and Colombo Port).
Facilitate Negombo lagoon & Hamilton cannel located boats.
As an alternative site for Mutwal fishery harbour.

FISH PROCESSING FACILITY

1020msq Building with 3 Cold Rooms (Offloading)
Internal dimensions excluding service area – 18L * 15W * 5H (m) * 3 units
Material Input - 10,000Kg to be stored at -5ºC
Personnel employed with cold room - 20 persons

The harbour has an administration building, auction building, fish processing units, six cool rooms, a ship chandlery, crew quarters/ amenities, a net and glass fiber repair building, a general store with firefighting equipment, a canteen, fuel and water facilities and a slipway. The new harbour is also consisting of two terminals for local and international operations. It is designed to handle a daily catch of 125 metric tons of fish.

3.1.2 PIKE PLACE MARKET

Location: Seattle, Washington, United States
Architects: The Miller Hull Partnership

Pike Place Market has become a pillar of Seattle's urban fabric. More than just a public market, this neighborhood turned historic district is home to farmers, craftspeople, small businesses and residents, each an integral part of the area's history and character.

Pike Place MarketFront caters to the present, but looks to the future, acting as the gateway from the heart of downtown to the waterfront.

Today, the project serves as a critical connection point where the most essential goods and services are available within a 10-minute walk and well-served by transit.

In the near future, Pike Place MarketFront will also lead down to Overlook Walk, a part of Seattle's multi-phase waterfront revitalization plan that is currently in design.

Fig 26 – Pika place market

Fostering a unique community

Between 20,000 and 40,000 people visit the Market each day from all over the world.

The highly compact, complete urban neighborhood of the Market exhibits the informal, diverse and vital compactness of true urbanism—buildings of varying age are humanly scaled, its streets are dominated by pedestrians, not cars, regional and local fish, fruits and produce are abundant and small owner-operated businesses are the rule, not the exception.

3.1.2.1 VISION

The design team's vision was to open the city's treasured landmark with grand public gathering space framed by a contemporary lightness and transparency.

The team found contextual inspiration in the character of Pike Place Market's simple utilitarian character, as well as in the concrete post and beam structures and heavy timber elements commonly found throughout the existing Market.

An extension of the neighborhood, Pike Place MarketFront is inspired by the existing district, adding 50 vendor stalls, 40 low-income, and senior apartments, commercial, retail and office space, public restrooms and 300 underground parking spaces.

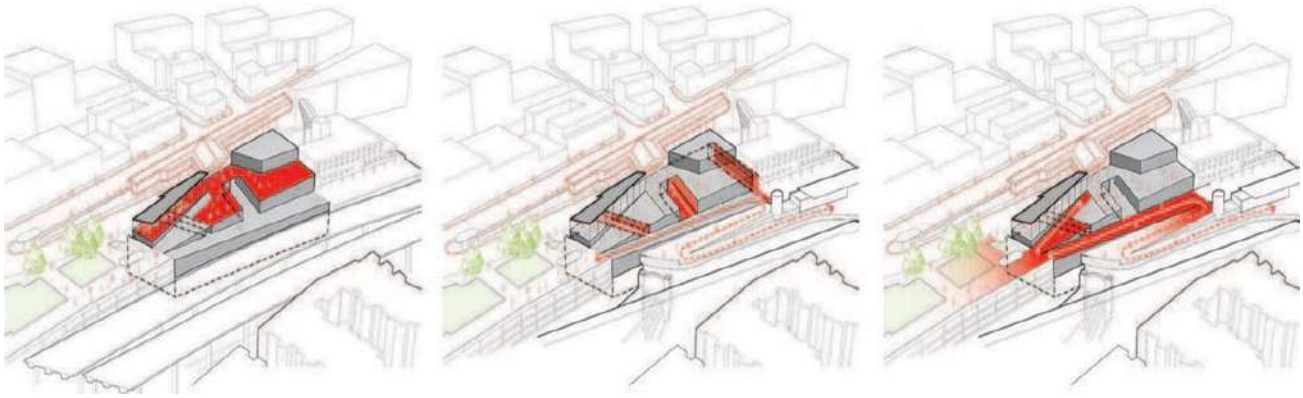


Fig 27 – Pika place market concept

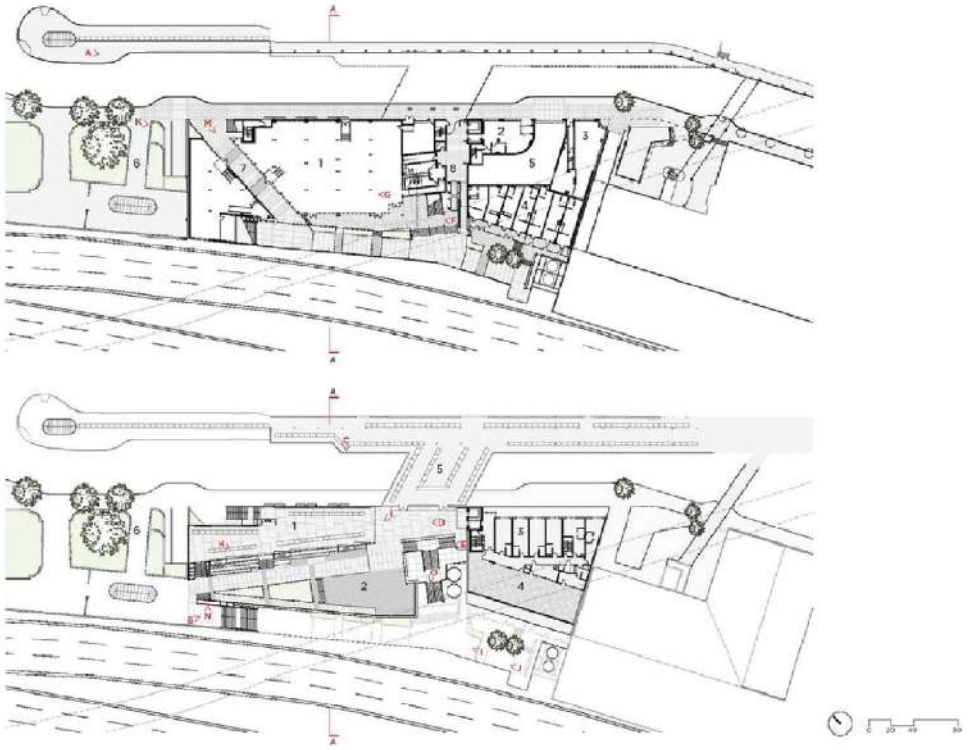


Fig 29 – Pika place market plan

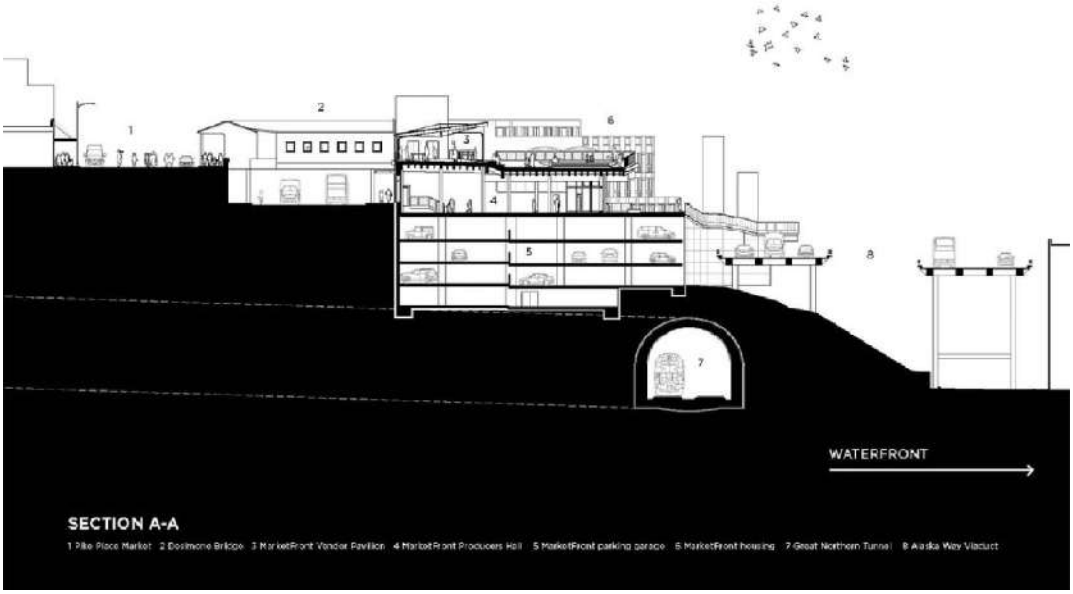


Fig 30 – Pika place market section

Fig 31 – Pika place market elevation

3.1.2.2 ARCHITECTURAL CHARACTERISTICS

Pike Place MarketFront has a strong Pacific Northwest toughness, employing cast-in-place concrete in combination with engineered timber for the project's base, capped by an open-air structural steel framed pavilion.

Fig 32 – Pika place market exterior

3.1.3 SYDNEY FISH MARKET

Location: Sydney

Architects: GXN, BVN, Aspect Studios, WallnerWeiss

Area : 80,000 msq

The Sydney Fish Market, currently housed in a series of old warehouses and post-industrial buildings, is one of the most significant community and tourist destinations in the city. 3XN has approached this project with the specific goal of creating a fish market that is much more than just a fish market. The building will serve many purposes when it is finished - a working fish market, an amenity for the city, a cultural destination, an urban connector, and an inspiring icon along the would-renowned Sydney Harbour.

Fig 33 – Sydney fish market

3.1.3.1 CONCEPT

In designing this new building, 3XN was inspired by the traditional market archetype, which appears throughout history and across cultures.

The market is the social hub of cities around the world; it is generally comprised of a series of stalls that

are open to the air but covered in a canopy and located in a large plaza.

3.1.3.2 HOW MARKET PLACE TURNS TO A TOURISTS DESTINATION

As a significant community and visitor destination, the new Sydney Fish Market will facilitate interaction by combining a vast amount of public space with an authentic market.

As a working seafood market and wholesale operation, the new facility must support these functions in an uninterrupted way. The new facility goes beyond its immediate role of the sale and distribution of seafood and provides an array of varied experiences that enable change and responsiveness to the future, creating a destination for locals and tourists alike that is an integral part of the city fabric.

3.1.3.3 SYDNEY PLANS

Fig 33 – Sydney fish market ground floor plan

In the new building, the ground floor hosts all the functions traditionally associated with fish markets – the landing and loading of fish, the wholesale market, and the auction hall.

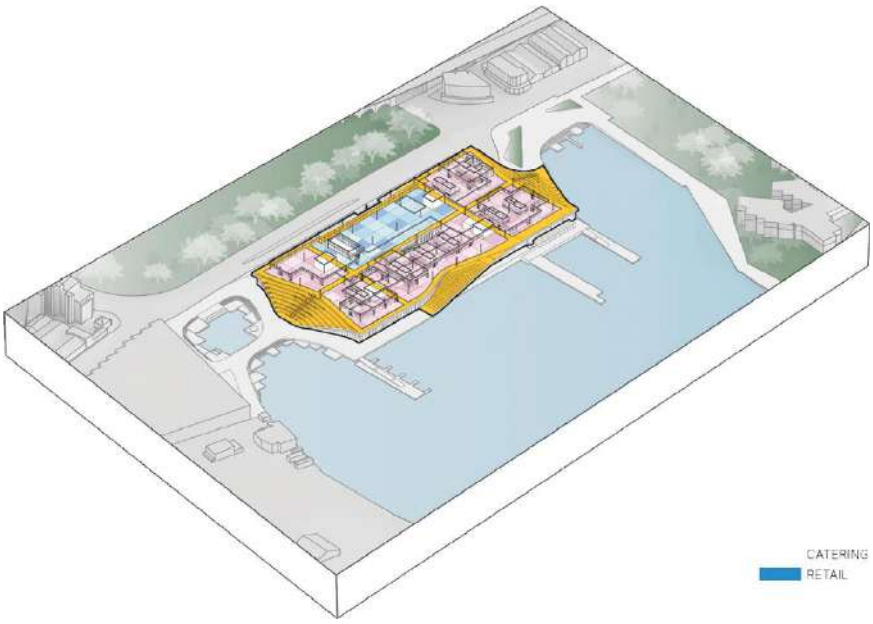


Fig 34 – Sydney fish market entry

The staircases that lead from the plazas to the upper ground are a continuation of the surrounding landscape and act as an invitation for people to enter the market. The stairs also double as seating, creating a public space where people can enjoy their food and the view over the bay.

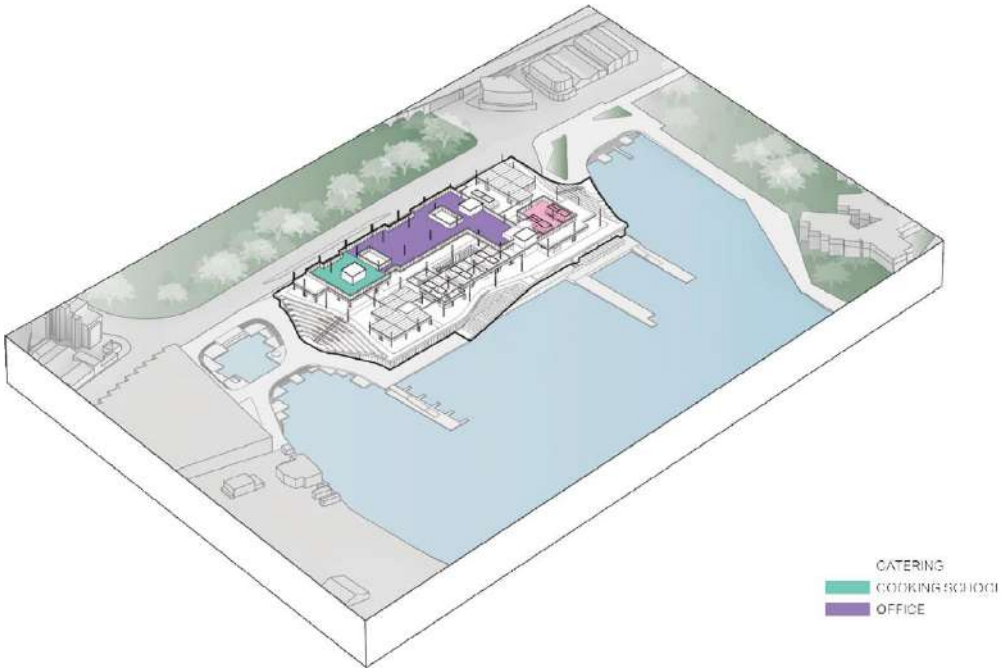


Fig 35 – Sydney fish market upper ground

The upper ground houses fresh seafood retailers, restaurants and cafés. The design focuses on maintaining a human scale and creating a true market atmosphere – just like historic marketplaces or bazaars with a series of small stalls that are connected. The aim is to create an intimate market atmosphere.

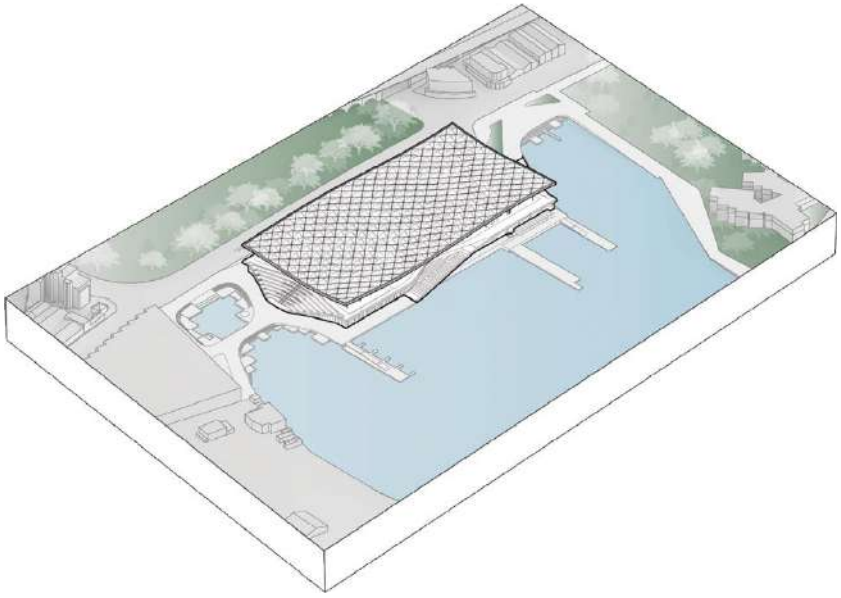


Fig 36 – Sydney fish market roof

A sweeping timber-and-aluminium roof floats over the building like a canopy; it ties all the various program elements together in one elegant move, while giving the building an iconic presence along the harbour.

3.1.3.4 STEPS TOWARDS ENERGY SAVING

A comprehensive energy optimisation strategy has been employed to reduce consumption and demand while producing energy from renewable sources. The strategy includes the possibility for absorption chillers to turn excess heat from refrigeration into cold water for cooling, use of excess heat sources to power the hot water system and space heating. Potential use of leftover ice to pre-cool air for refrigerated areas. Passive conditioning utilises canopy shading, wind capture, thermal mass and excess cool air from other zones to create a comfortable environment with minimal reliance on active conditioning systems.

Plantings and bio-filtration zones across the site will form a ‘green bridge’, offering native fauna habitat and access to the water with local flora providing a natural water purification and filtration of the site run-off.

The waste systems employed in the new fish market aim to recycle all industrial food-waste. A comprehensive strategy for all recyclables will be instituted and managed to optimise consumables and the fish market will reprocess materials used in packaging and operation.

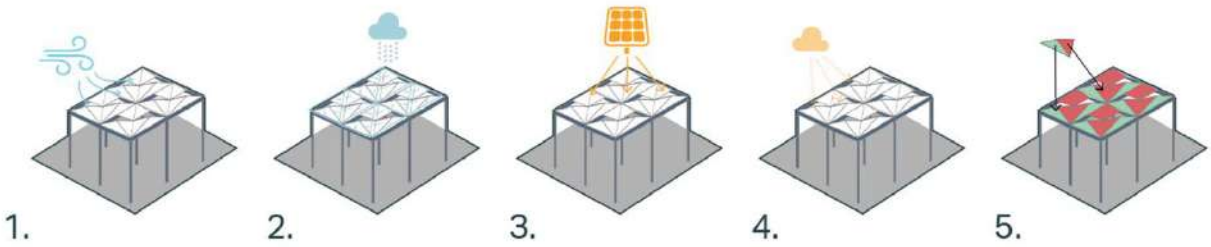


Fig 37 – – Sydney fish market roof

The wavy structure is a response to the underlying functions; it rises and falls to correspond with the program below.

Beyond design, the roof has four primary efficiency and sustainability attributes: shading, daylighting, ventilation, collection of rainwater and the possibility for solar cells harvest the strong Sydney sun.

The roof's triangular openings allow abundant natural light into the building, while their orientation shades the building from the harshest sun. The market has been designed to be as permeable as possible to maximise natural ventilation and minimise the need for air conditioning.

The design utilises the roof's geometry for rainwater collection and recycling.

3.1.4. ODORLESS FISH MARKET

Location: Madeira

Architect: Lik San Chan

Area: 60,000 msq

It is a fishing village located 10km west of the capital, Funchal.

The fishing community is quickly dwindling into poverty as Funchal provides its own facilities for fish vending businesses.

Camara de Lobos remains the only place in the world where the Black Scabbard fish industry can be self sustained, yet the fishermen still receive second hand pay for their catch as most of it is sold in Funchal.

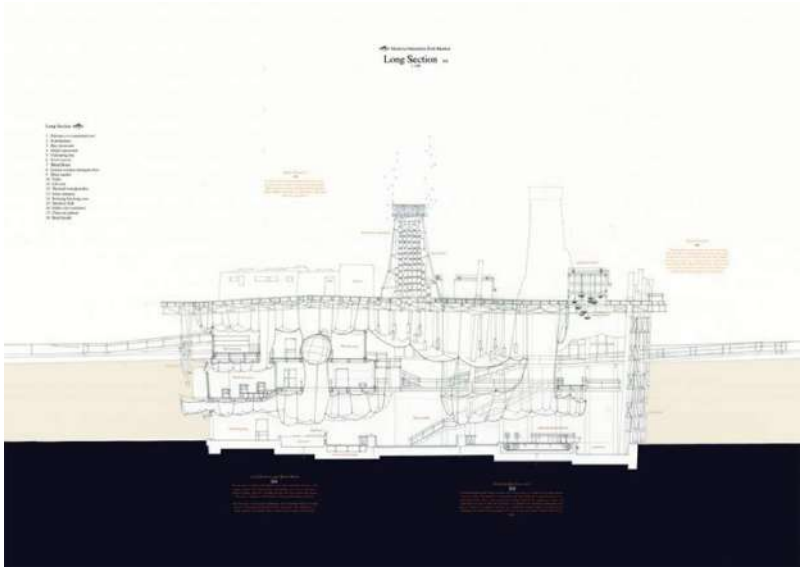


Fig 38 – odorless fishing marker

Accordingly, the Odorless Fish Market "provides a place where their catch can be sold directly. The programme consists of a fish market, smokery,

fish cookery school

cum restaurant run by the fishermen community.

Its architecture is technically driven to control Smell, Ventilation and Cooling, to provide a building with a greatly reduced smell of fish. The heart of the architecture is a solar chimney system which uses the consistent madeiran sun to, ironically, ventilate/cool the building."

It is a spatially self-deodorizing architecture of thermal air control.

3.1.5. TANGALLE FISHERY HARBOUR AND TRAINING CENTER

Location: Tangalle, Srilanka

Built: Rebuilt after 2004 tsunami

Total breakwater length : 221m

Quay wall length: 258.5 m

Tangalle Fishery Harbour is the first man made fishery harbour in Sri Lanka. Department of fisheries initiated the construction of this first fishery harbour in 1955. Subsequently Ceylon Fishery Harbours Corporation financed to construct several fishery habrours, until Ceylon Fishery Habrours Corporation was established in 1972.

Harbour is situated facing the bay and is well protected from South-West Monsoon.

The harbour has received a substantial amount of assistance from the government of Japan under JICA project, and has a new Slipway, 20 T Mobile crane, Workshop, Ice plant and other facilities. It is expected that a large number of boats will use the harbour facilities in future.

Fig 39 – tangalle fishery harbour

3.1.5.1 SHORE FACILITIES

· Fish Auction Hall.
· Net Mending Building.
· Public Toilets and Showers.
· Slipway, Winch and its accessories 20 Tons. (Capacity)
· Boat repair workshop with equipments.
· Fuel Storage Tank. (36000 Ltr.)
· Two dispensing units.
· Flake Ice Plant.
· 20 Ton Tadano Mobile Crane.
· Fuel Storage Tank. (36000 Ltr.)
· Two dispensing units.

3.1.5.2 GENERAL FACILITIES

(a) Berthing and Toilet Facilities.
(b) Office Building - 450 m2.
(c) Stores - 100 m2.
(d) Water Storage 14000 L.

3.1.5.3 REFRIGERATION FACILITY

(a) Fish on Ice Storage
- 04 Nos. Capacity 25 Tons.
(b) Block Ice Plant
(c) Flake Ice
(d) Holding Room Fish on Ice - 50 T. CFHC

The Project facilities are planned at two sites, “TFH site”, where is the northeast of Tangalle City, and “TFTC site”, where is 500 m from the southwest of TFH.
Either site is located around the center of Tangalle City.

TFH site, the site plan of facilities are planned with being divided to Fish Landing Site, where is extended next to the center part of the wharf, and Boat Repair Site where is located in the southeast edge.

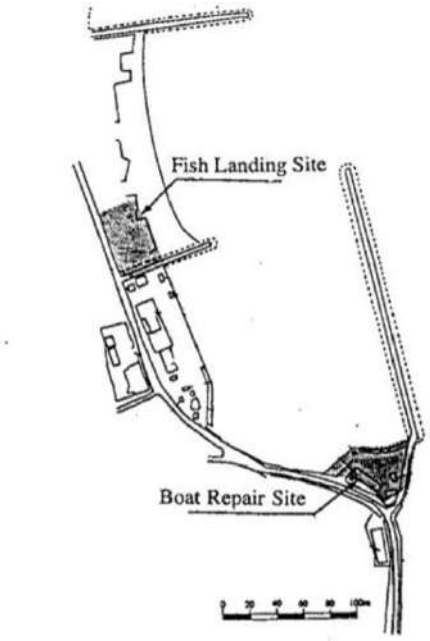


Fig 40 – tangalle fishery harbour

3.1.5.4 THE INSTALLATION OF TRAINING EQUIPMENT IN PRACTIVE ROOM

The practice rooms are required for fishing gear and fishing training, boat steering, navigation and fishing equipment training, diving training, engines and engineering training and electrical training.

For the training aforementioned, since it is appropriate to allocate practice rooms by the mutuality of the technical contents of training, 3 practice rooms are allocated at present.

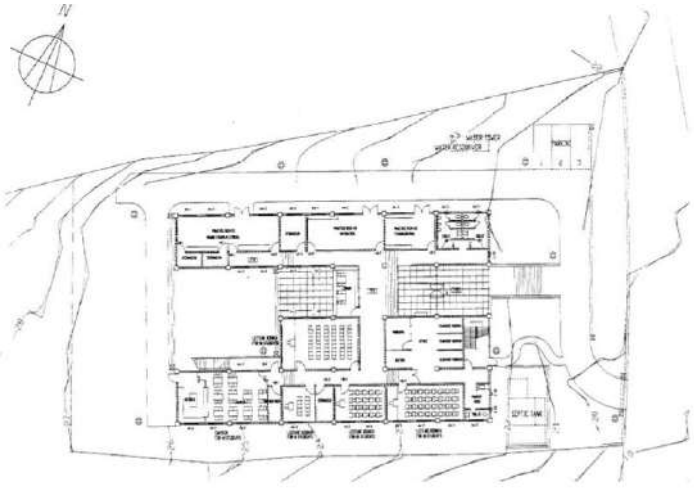


Fig 41 – tangalle fishery harbour site plan

By considering blows of rain and sunshine, the eaves are deepened upon the elevation plan. The roof pitch is adjusted to the specifications of Spanish roof tile, which is habitually utilized in the local areas. The selection of finish materials is planned, according to the General Specifications for Building Construction Works of Japan, by considering the durability and the endurance of the construction, simple maintenance and easy procurement of local materials.

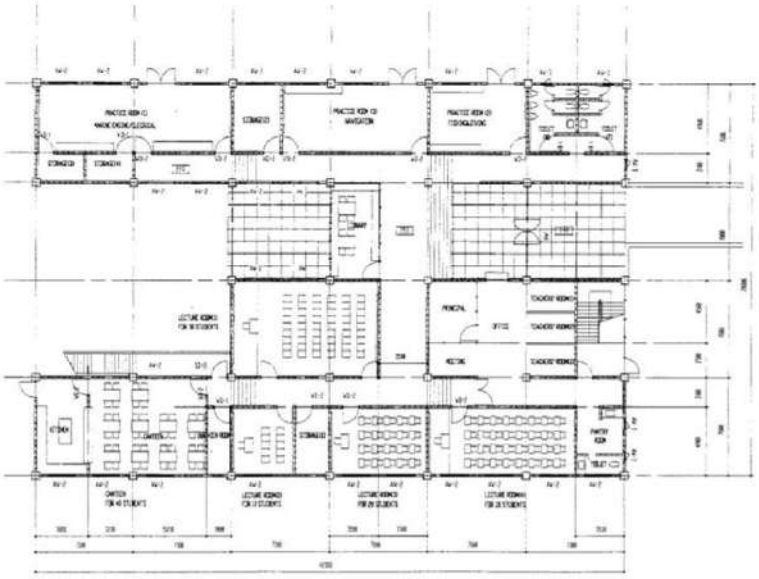


Fig 42 – tangalle fishery harbour Ground floor plan

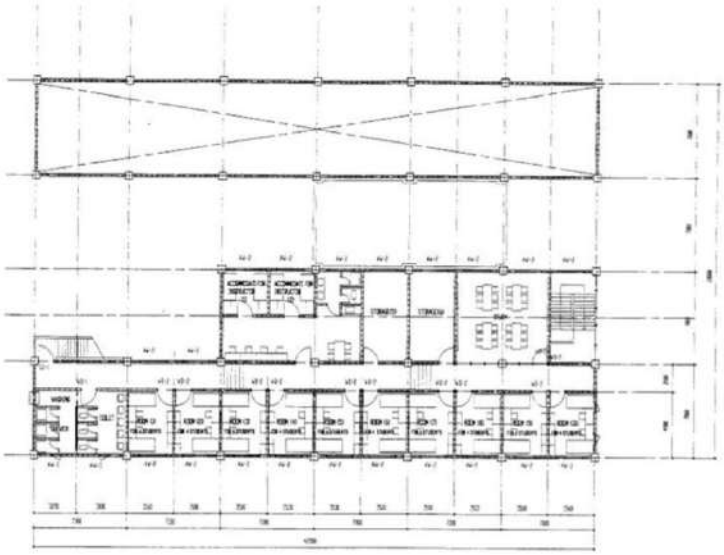


Fig 43 – tangalle fishery harbour First floor plan

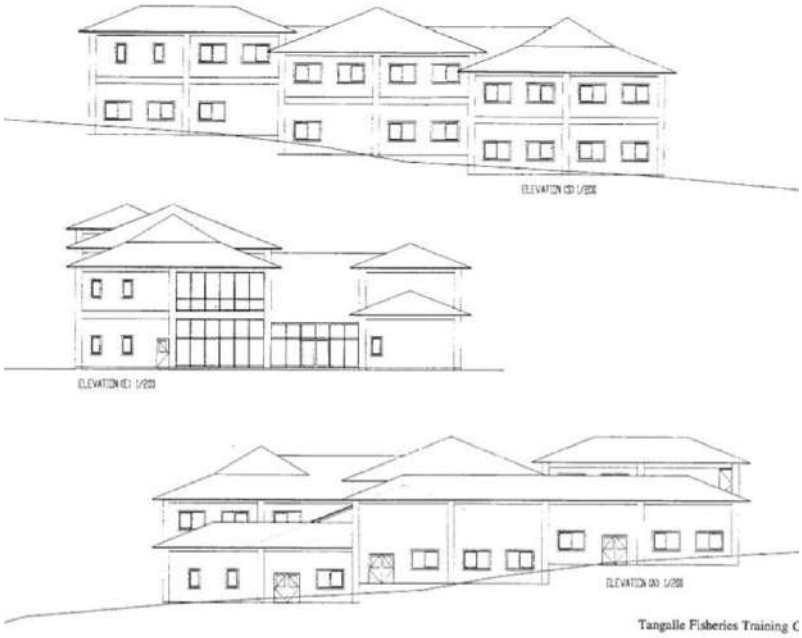


Fig 44 – tangalle fishery harbour elevation

3.1.5.5 TRAINING CENTER

Table 2-13 The months of utilization by the course and the room allocation for the training plans in 2002

Course	Period of each course	Number of courses per year	Number of students (per course)	Annually trained students	Total months of utilization	Classroom to be unitized
Fishing Technician course	9 months	1	50	50	9 months	Classroom (1)
Assistant fishery technician course (female)	2 months	3	20	60	6 months	Classroom (3)
Diving training course	1 month	3	10/10/5	25	3 months	Classroom (4)
Fishing boat electric course	1 month	3	20/20/10	50	3 months	Classroom (3)
Ornamental fish culture course	2 months	1	25	25	2 months	Classroom (2)
Marine electronic equipment course	1 week	1	30	30	0.25 months	Classroom (2)
Marine bio resource technology course for students	1 day	10	50	500	0.33 months	Classroom (1)
Marine bio resource technology course for instructors	2 days	4	25	100	0.26 months	Classroom (2)
Marine engine training course	3 months	1	30	30	3 months	Classroom (2)
FRP Fishing boat repair course	1 week	5	10	50	1.25 months	Classroom (4)
Fish handling course	1 week	5	10	50	1.25 months	Classroom (4)

Note: A capacity of Classroom (1) is 50 students, (2) is 30, (3) is 20 and (4) is 10. (source: MFARD)

Table 4 – Time table

TFTC was also founded in 1972 and has provided professional training for fishery related people not only in Tangalle but also all over the southern area for a long time. TFTC is geographically located in the center of the southern area where fishery activities are prosperous and the number of candidates for training is large. There were two courses, a fishing technician course and a fishing boat electric course, available when it was opened, various courses have been established so far and 11 courses are available at present.

3.2. LIVE CASE STUDY

3.2.1 SHARADHA KRUPA COLD STORAGE

Location: No 152/34, Gnt Road, Madhavaram, Madhavaram, Chennai, Tamil Nadu 600110
Year constructed: 1999
Capacity of the storage: 20,000 metric ton
Total workers: 35 loading\unloading 12 staffs
Size: It is the second largest cold story building in Chennai

The coldstorage is very nearer to shipyard 9 kms facilitating the export/import traders .
The cold storage can accommodate more than ten containers and trucks of various sizes for simultaneous loading and unloading exercise.

Fig 45 – Cold storage

Building height: 60ft roof Under permanent R.C.C. structure R.C.C. roof, which facilitates easy loading and unloading of goods even under extreme climatic conditions.

Flooring is made of rafters for air circulation.
Walls are 300mm thick RCC for better insulation

Huge ducts run throughout the building to have a proper air circulation.
Digital temperature display adds to the transparency of the service.
Electricity : 9-11L

FORM AND SPACE:

No much architectural characteristics as it is an industrial building. The form is completely based on the function of the cold storage.

FENESTRATION

There are proper doors with state of the art locking systems and sufficient light points along with uninterrupted electricity supply. No windows can be seen.

PARKING

The cold storage can accommodate more than ten containers and trucks of various sizes for simultaneous loading and unloading exercise. Everyday about 5-7 trucks from kasimedu reaches here. aprox 5tons.

3.3. INFERENCE

COMPARITIVE ANALYSIS.

Project	Site context	Planning/ circulation	Existing facilities	Architectural characteristics
Dikkowita fishing harbour 	**Study:** Master planning **Location:** Gampaha District, Srilanka **Basin Area :** 28.91 acre	The **northern basin** is used by local fishermen to berth their boats. The **southern basin** of the harbour is used for the export. Separate access and entries are provided for both basins.	Facilities on the North side of the harbour are purely for the local fishermen. **Eg: Auction, Net mending, Fuel dispensing units etc.** For the south its only for export. **Eg. admin block, Processing units etc.**	**It is designed to handle a daily catch of 125 metric tons of fish.** Their unique X shape blocks provides a very stable interlocking structure, while their production requires less concrete than that of traditional elements.
Pike place market 	**Study:** Public intervention and architectural characteristics **Location:** Seattle	Pike Place Market has become a pillar of Seattle's **urban fabric.** More than just a public market, this neighborhood turned historic **district is home to farmers, craftspeople, small businesses and residents,** each an integral part of the area's history and character.	**100 vendor stalls, 40 low-income,** and senior apartments, **commercial, retail and office space,** public restrooms and 300 underground parking spaces.	engineered timber for the project's base, capped by an **open-air structural steel framed pavilion.** Large expansion materials are used to withstand heavy wind load and **underscore the industrial feel.**
Sydney fish market 	**Study:** Planning, Materials **Location:** Sydney **Area :** 80,000 msq	The **ground floor** hosts all the functions traditionally associated with fish markets.**The stairs** also double as seating, creating a public space where people can enjoy .**The upper ground** houses fresh seafood retailers, restaurants and cafés.**The roof** ties all the various program elements together in one elegant move	The Sydney Fish Market will facilitate **interaction by combining a vast amount of public space** with an authentic market. As a working seafood market and wholesale operation, the facility support these functions in an uninterrupted way. It creats **destination for locals and tourists** alike that is an integral part of the city fabric.	The market has been designed to be as permeable as possible to maximise natural ventilation and minimise the need for air conditioning. The design utilises the roof's geometry for **rainwater collection and recycling, solar power cells and shading.**
Odouriess fishing market 	**Study:** Ventilation **Location:** Madeira **Area :** 60,000 msq	The Odorless Fish Market provides a place where their catch can be **sold directly.**	The programme consists of a fish market, smokery, fish cookery school cum restaurant run by the **fishermen community.**	Its architecture is technically driven to control Smell, Ventilation and Cooling, to provide a building with a **greatly reduced smell of fish.** The heart of the architecture is a solar chimney system which uses the consistent madeiran sun to, **ironically, ventilate/cool the building.**
Tangalle fishing center 	**Study:** Training center **Location:**Tangalle,Srilanka **Basin Area :** 5.4 acre	The planned site is located at hillside of the City that takes **5 minutes walk from Tangalle City Hall** and the bus terminal.For the training , since it is appropriate to allocate practice rooms by the mutuality of the technical contents of training, **3 practice rooms** are allocated at present.	The Project facilities are planned at two sites, "TFH site", and "TFTC site. The TFH site has the **fish landing area,**markets, boat repair centers etc. While the TFTC has **accomodation facilities and training facilities.**	By considering blows of rain and sunshine, the eaves are deepened upon the elevation plan. The roof pitch is adjusted to the specifications of Spanish roof tile, which is **habitually utilized in the local areas.**

Table 5 – Comparative analysis

CHAPTER 4

ANALYSIS

4.1 SITE DETAILS

4.1.1 SITE HISTORY

The first settlers in Royapuram were the migrants from Durgarajapattinam (called Armagoam by the British), that was ruled by the Vijayanagara empire.
To improve the quality of lives of the fishermen at Kasimedu, former Chief Minister
M G Ramachandran constructed a harbour in 1975.

The boatmen now got into fishing for a living. A part of Royapuram gradually came to be referred to as Kasimedu.
The gopuram of Kasi vishwanathan temple was seen in the waters, from the shore till 15 years ago through which It got the name kasimedu. Medu was the area of the harbour since it was like a small heap long ago.

Fig 46 – History

Site location: fort-tondiarpet taluk
coastal regulation zone: crz-2

4.1.2 TOTAL BOAT COUNT

TYPES OF BOATS IN KASIMEDU FISHING HARBOUR	NUMBER OF BOATS
MOTORIZED MECHANICAL	1003
MOTORIZED NON-MECHANICAL	1348
NON MOTORIZED	82
TOTAL	2433

Table 6 – Boat count

4.1.3 SITE ACTIVITIES

AGE	ACTIVITIES- MEN	ACTIVITIES- WOMEN
18-25	Fishing in boats fibre and lounge,	cooking
26-35	Fishing in boats fibre and lounge, fish sales boat making, Transporting fish to markets	Selling fish, Cooking, Cleaning, Fish cutting
36-45	Fishing in boat .Fibre,boat making, Net mending, fish sale	Selling fish, Cooking, Cleaning, Fish cutting
46-55	Net mending, Fish cutting	Selling fish, Cooking, Cleaning, Fish cutting
55+	Net mending, Fish Cutting, Supervising	Cooking, Basket weaving.

Table 7 – Site activities

4.1.4 SITE WORKERS

Fig 47 – Site workers

The people who work at the fishing harbour are pridominantly from Chennai and Andhra.

The boat owners are from different parts of Tamil Nadu like Chennai, Tuticorin, Rameshwaram.

4.1.5 SITE ACTIVITY DETAILS

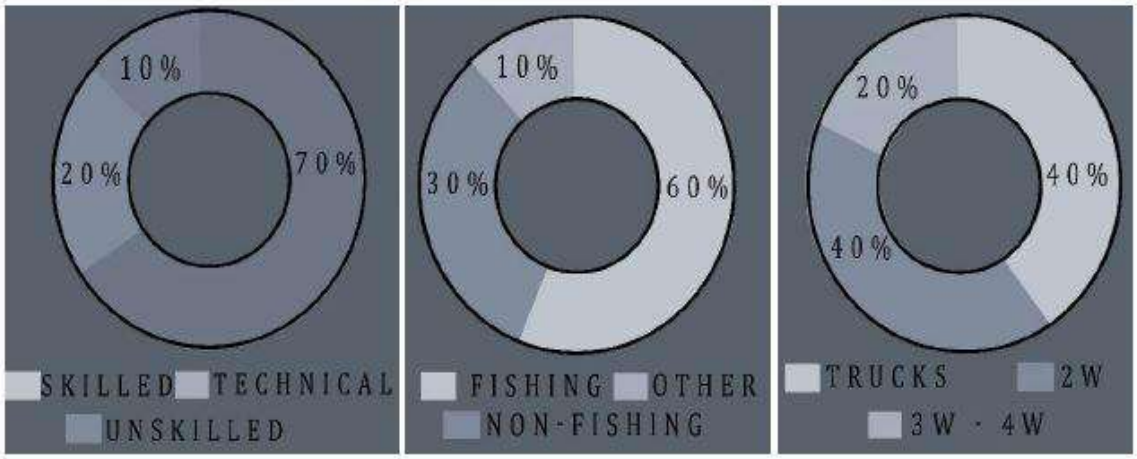


Fig 48 -Types of workers **Fig 49 - Purpose of visits** **Fig 50 - Types of vehicles**

4.1.6 SITE WORKING MONTHS

Fig 51 – activity details

During the non-fishing period the import of fish is more. Small fibre boats are permitted to do fishing in that period. The government gives each ration card holder a sum of 6000k per month during ban period.

4.1.7 PROXIMITY

LOCATION	DISTANCE FROM SITE
KALMANDAPAM BUS STOP	2.4KM
NH4 POLICE STATION	0.03KM
ROYAPURAM RAILWAY STATION	3.7KM
ROYAPURAM BRIDGE	4KM
HDFC BANK ATM	84.94M
IDREAM CINEMAS	1.5KM
SRI PRASANA SRINIVASA PERMAL TEMPLE	2KM
ZEHRA MASJID	1.9KM
DR JAHER CLINIC	2KM
HP PETROL BUNK	1.7KM
BHARATHI WOMEN'S COLLEGE	3.6KM
AVVAI ACADEMY	2.1KM
ANNAI SIVAKAMI PARK	2.4KM
CHENNAI CORPORATION PARK	8.4KM
PASSPORT CONSULTANCY	1.7KM
GEORGE TOWN	7.3KM
PORT OF CHENNAI	6.2KM
MARINA BEACH	8.8KM
STANLEY GOVERNMENT HOSPITAL	4.2KM
RAJIV GANDHI GOVERNMENT GENERAL HOSPITAL	6.9KM
TONDIARPET METRO	1.2KM
WASHERMANPET METRO	2.6KM
MADRAS HIGH COURT	5.7KM
AIRPORT	27KM
CHETPET ECOPARK	11KM
CONNEMARA PUBLIC LIBRARY	11KM
GOVERNMENT MUSEUM CHENNAI	11KM
NATIONAL ART GALLERY	11KM
SANTHOME CATHEDRAL BASILICA	11KM
GUINDY NATIONAL PARK	18KM
VALLUVAR KOTTAM	13KM
ASHTALAKSHMI TEMPLE	19KM

Table 7 – Proximity

The site is well connected and is self-sustaining. Except for immediate user needs all other facilities like schools, colleges, metro, police station, bus stops are available within 5km radius.

4.2 SITE ANALYSIS

4.2.1 LAND USE MAP

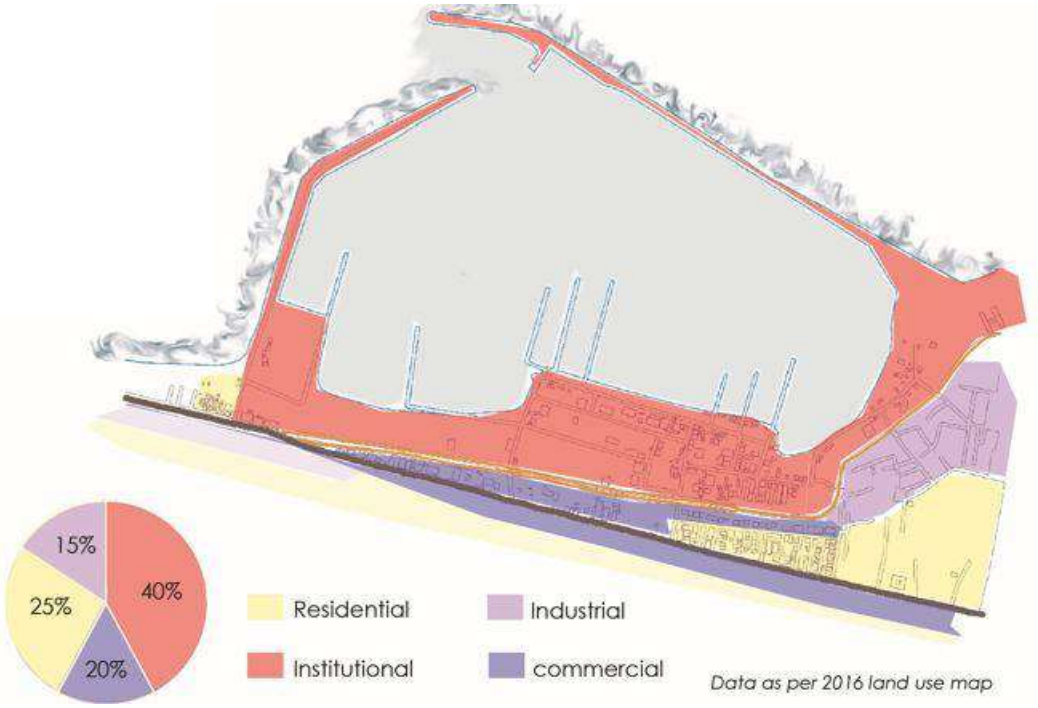


Fig 52 – Land use

4.2.2 FLOOD PRONE MAP

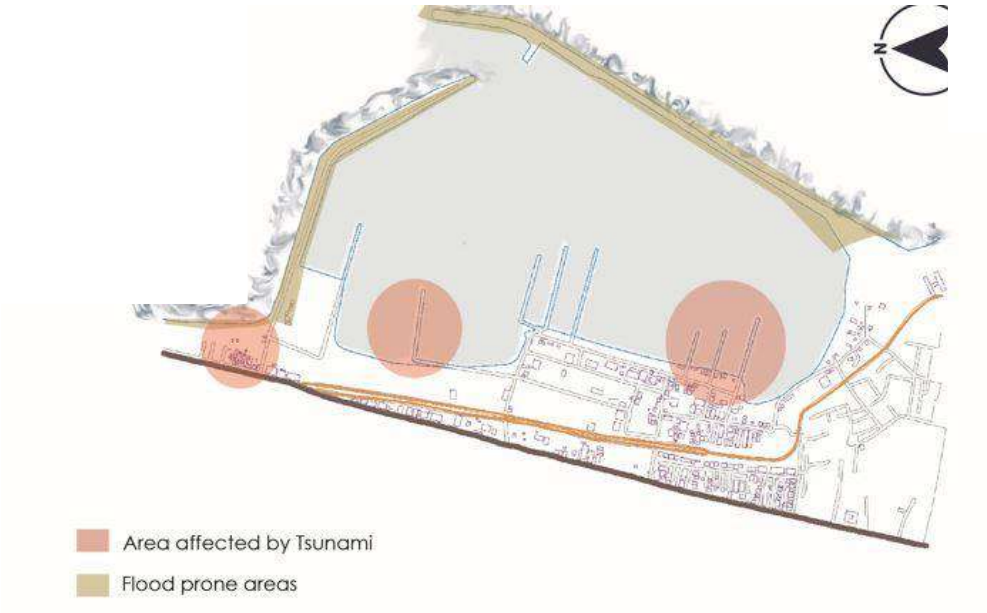


Fig 53 – Flood prone map

4.2.3 GREEN COVER

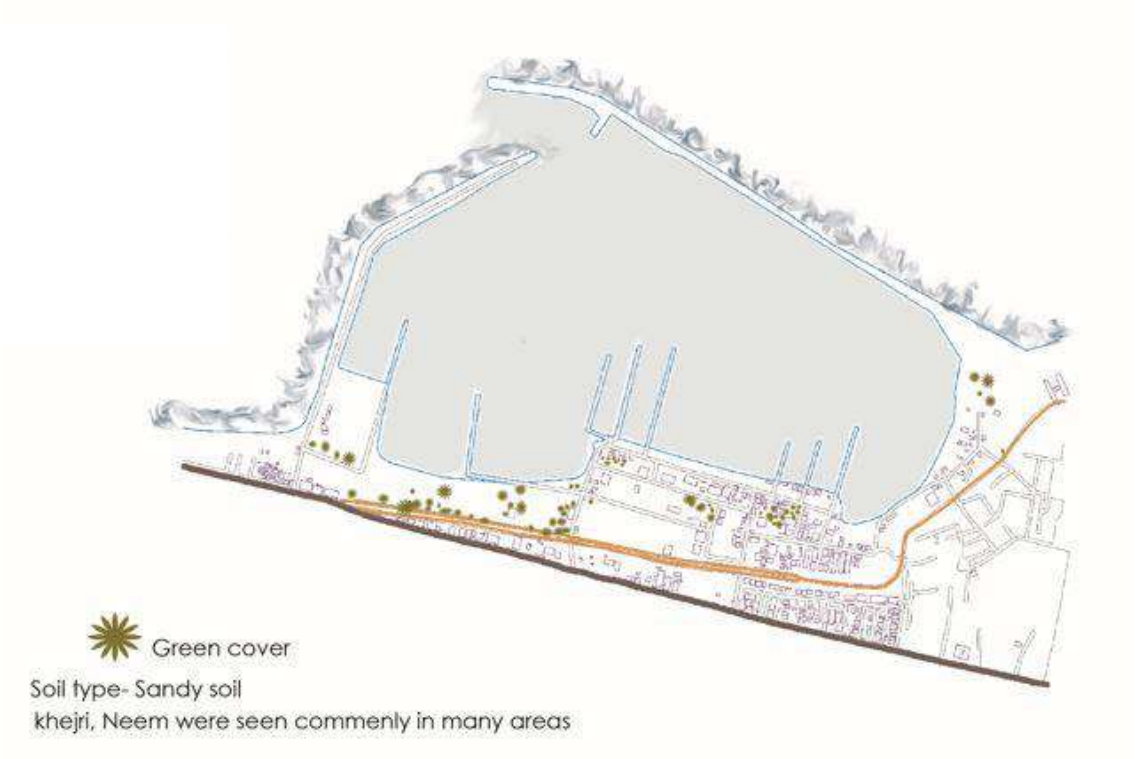


Fig 54 – Green cover map

4.2.4 SOLID AND VOID

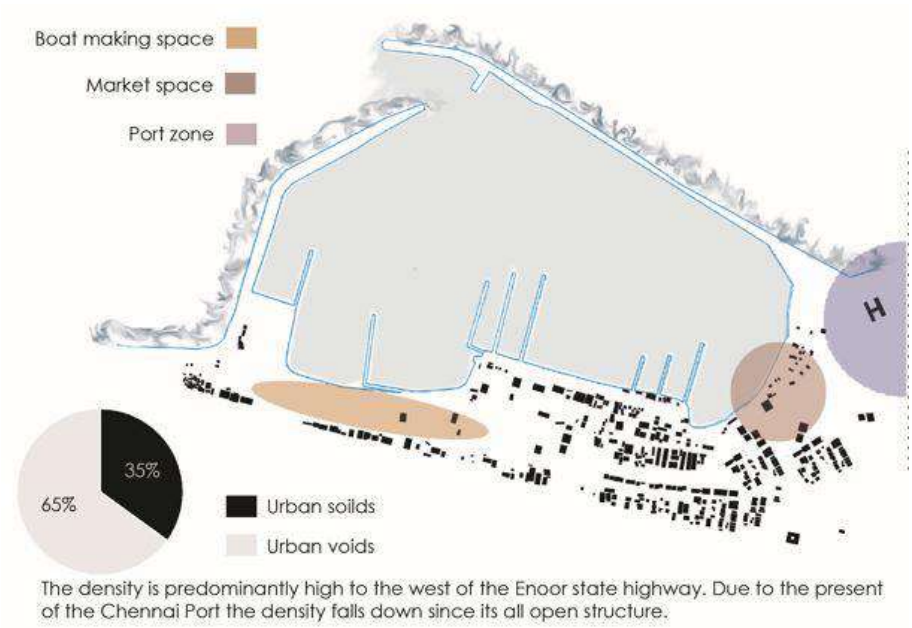


Fig 55 – Solid and void map

4.2.5 TRAFFIC ANALYSIS

On week ends

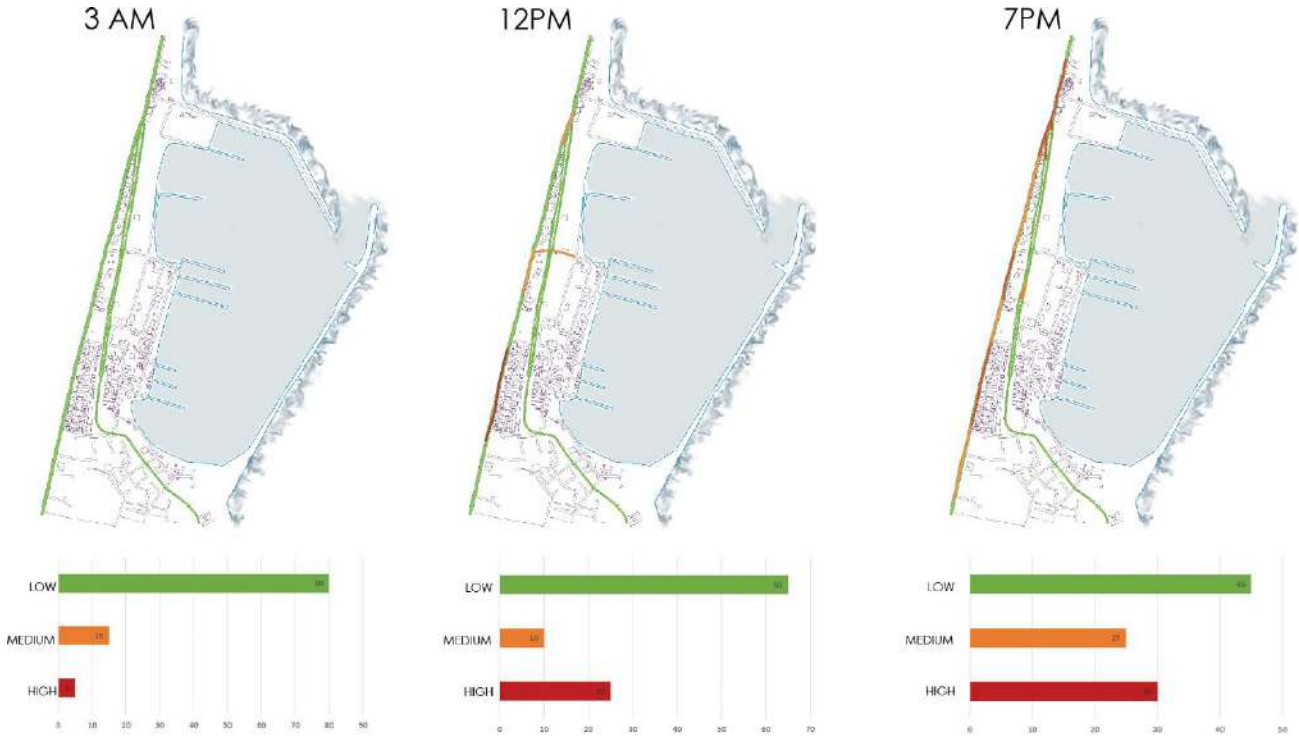


Fig 56 – Traffic

On week ends

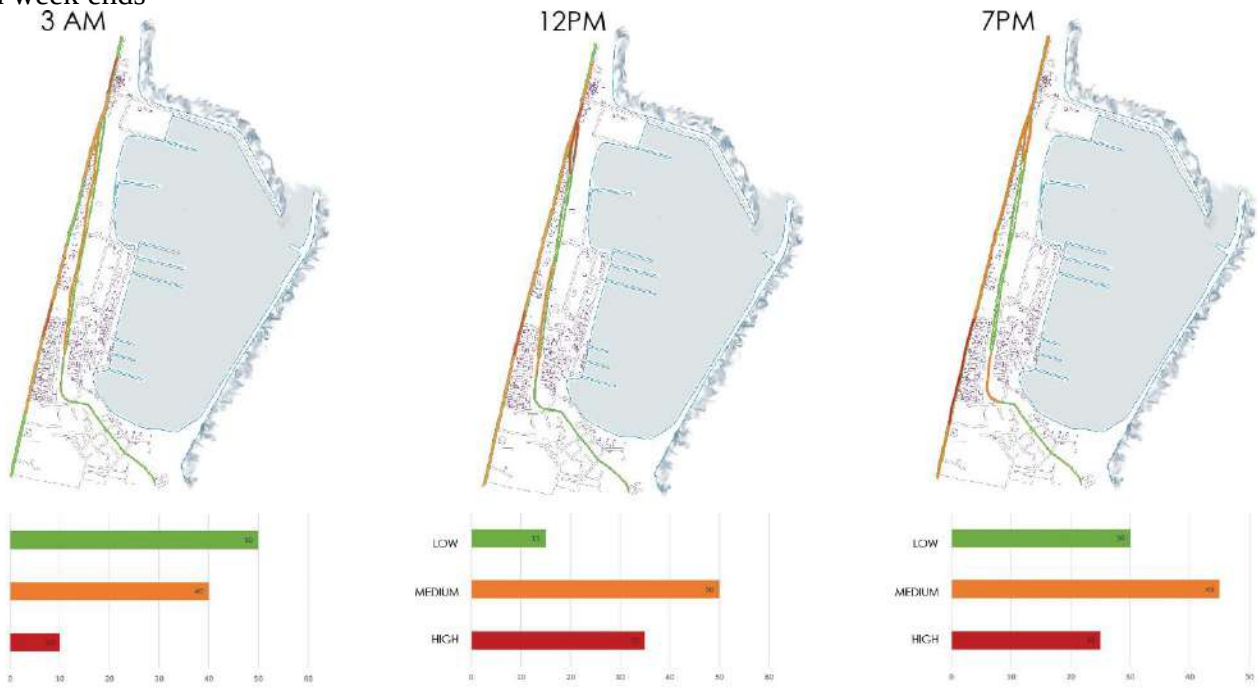


Fig 57 – Traffic

4.2.6 SITE

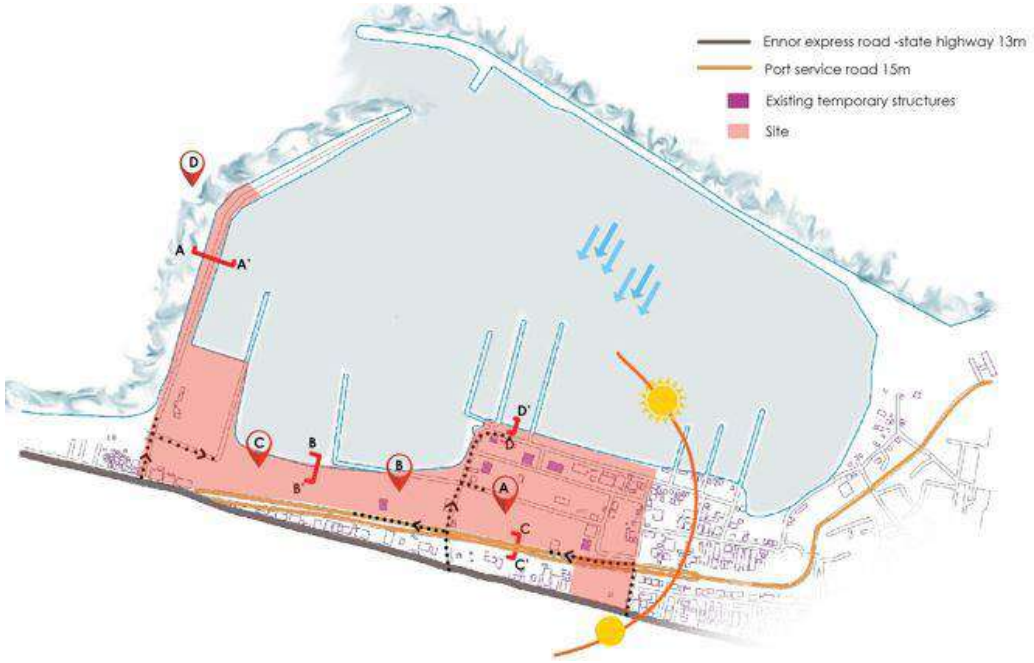


Fig 58 – Site

Total site area - 54632.56 (13.5acres)

Total built up area – 16386 sq m.

4.2.6 SITE SECTIONS

SITE SECTION AA'

Fig 59 – Section AA'

Many people can be seen by evening 6pm - 8pm in this promenade as it is has less activities of the harbour.

It has good views of the sea and the fishing harbour on a whole.

SITE SECTION BB'

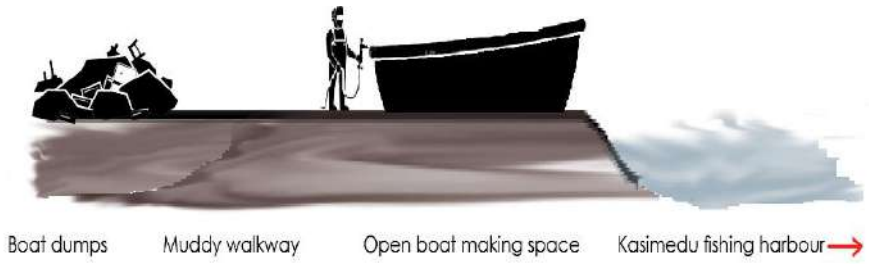


Fig 60 – Section BB'

Though it is considered as the boat baking space it acts as a dead space due to the narrow pud walkways and dump. There is no proper boat making area or a storage space.

SITE SECTION CC'

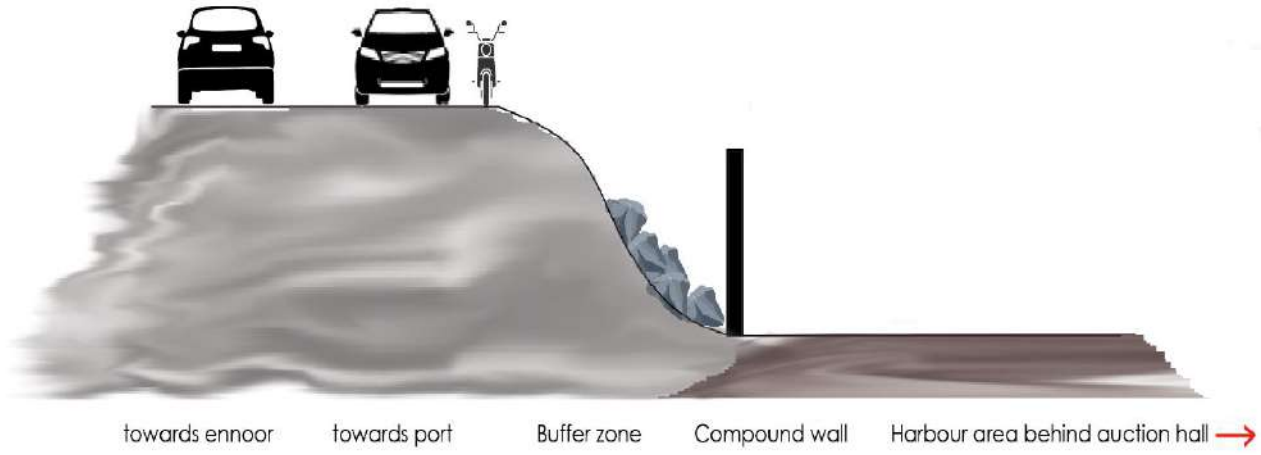


Fig 61 – Section CC'

This zone is being used by the younger generation to play, sing etc by evening. The port road is elevated from the harbour zone as hourbour is just 7m high from the sea level.

SITE SECTION DD'

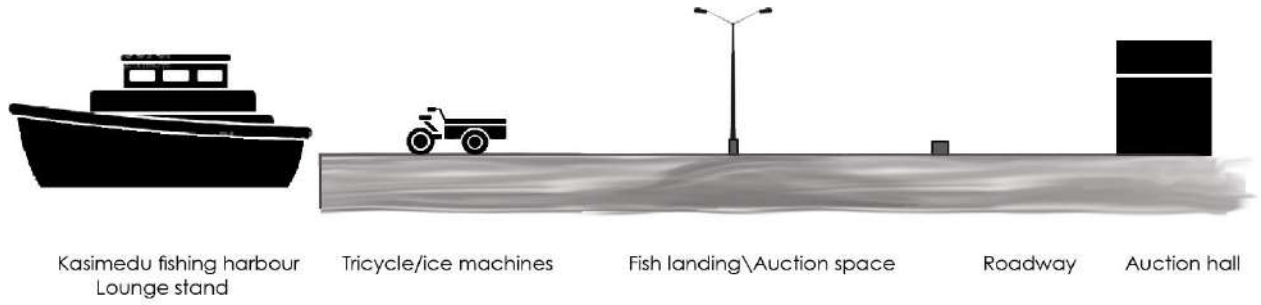


Fig 62 – Section DD'

This zone is being used by the younger generation to play, sing etc by evening. The port road is elevated from the harbour zone as hourbour is just 7m high from the sea level

4.2.7 SWOT ANALYSIS

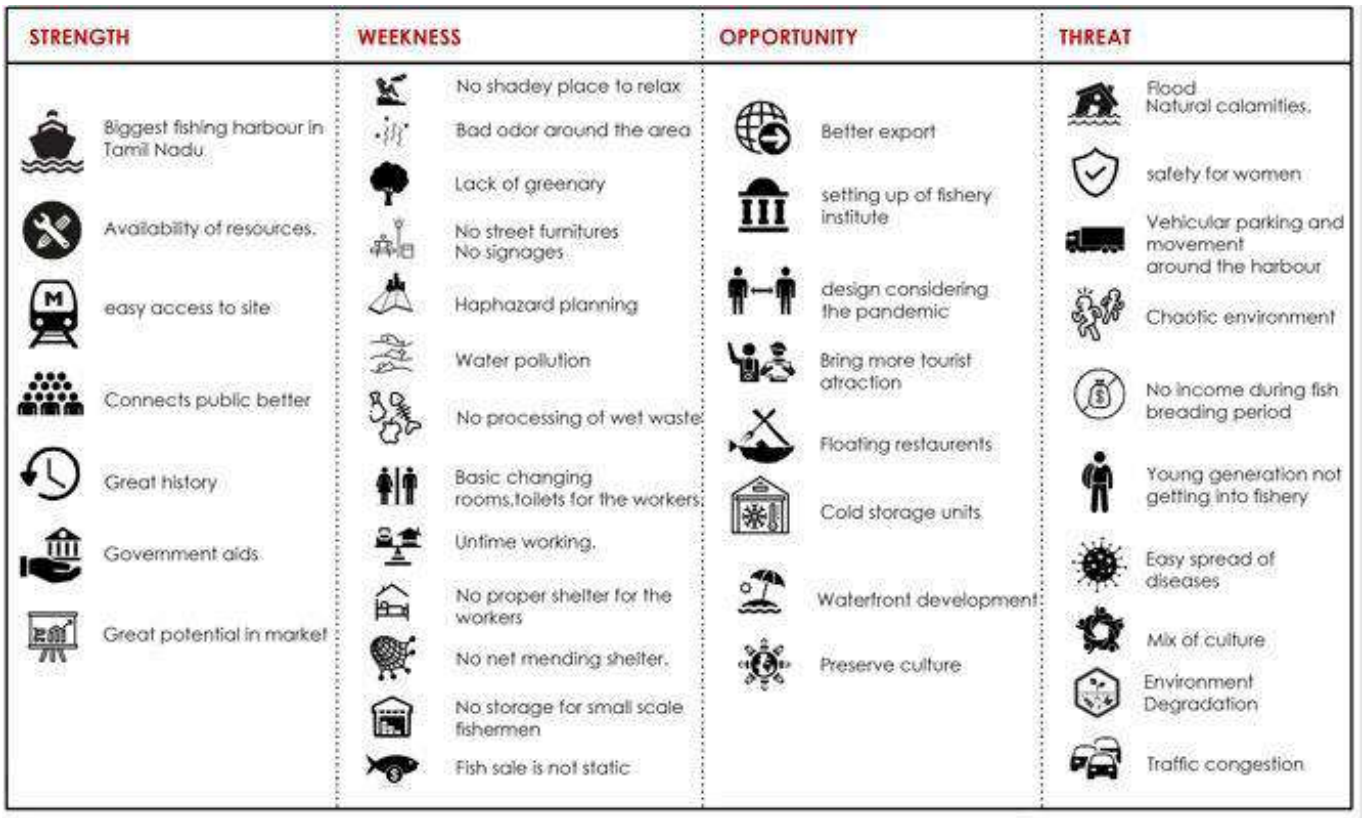


Fig 63 – swot

4.2.8 PROPOSALS

Fig 64 – proposal

CHAPTER 5

DESIGN DEVELOPMENT & PROPOSALS

5.1 REQUIREMENTS

To reconstruct the Kasimedu fishing harbour mainly to mitigate environmental pollution as an important means of improving hygiene and to provide a proper infrastructure with all the amenities and provision of modern technologies.

5.1.1 AREA STATEMENT

S.no	Description	Area per Person (sqm)	No. of Users	Area per Units (sqm)	No.of Units	Total Area (sqm)
A	Fishery people Zone					
	Admin Block and training block					
1	Security Room	4	3	12	2	24
2	Control Room	..	..	120	1	120
3	Administrative office	..	..	220	1	220
4	VIP wating lounge	12.5	6	75	1	75
5	VIP wating lounge rest room	..	..	4	2	8
6	Waiting lounge	2	20	40	1	40
7	Meeting room	..	12	40	2	80
8	Con. Call room	3.2	15	48	2	96
9	Data center	6	12	72	1	72
10	Digital help library	5	50	250	1	250
11	Reception	..	..	30	1	30
12	Service Room	..	..	30	1	30
13	Utility room	4	6	24	1	24
14	Gents toilet	5	8	40	1	40
15	Ladies toilet	5	8	40	1	40
16	Breakout space	2.5	10	25	2	50
17	First aid room	8	6	48	1	48
18	Power station	..	..	20	1	20
19	Cafeteria	1	..	40	1	40
20	Class room -01	..	..	70	1	70
21	Class room -02	..	..	70	1	70
22	staff room	..	..	50	1	50
23	Technical lab	..	..	90	1	90
24	Class room	..	..	50	1	50
25	Material storage space	..	..	60	1	60
					Total	1697

B	*Fish Market - open spaces and Industrial zone*					
26	Fish drying zone	..	..	500	1	500
27	Fish cleaning area	..	..	10	30	300
28	Fish Stalls	..	..	15	148	2220
29	ice plant	..	..	500	2	1000
30	fish storage units	..	..	800	1	800
31	fish processing units	..	..	1000	1	1000
32	Buffer zone	..	..	50	1	50
33	control room	..	..	20	1	20
34	electric room	..	..	25	1	25
35	security room	..	..	25	1	25
36	Men locker and rest room	..	..	50	1	50
37	women locker and rest room	..	..	50	1	50
38	retail	..	..	60	1	60
39	Frezer room	..	..	60	1	60
40	Indregient store	..	..	60	1	60
41	AHU	..	..	60	2	120
					Total	6340

C	*Auction Hall- semi open space*					
42	Fish unloading and seperation	..	..	1500	1	1500
43	Fish showcase area	..	..	4495	1	4495
44	Fish cleaning & Packing	..	..	480	1	480
45	Export office room	..	..	125	1	125
46	store room	..	..	75	1	75
47	women Rest room	..	..	50	1	50
48	Men Rest room	..	..	50	1	50
49	Viewing deck	..	..	120	1	120
					total	6895

D	*CCOMMODATION - PRIVATE SPACE*					
50	Living	..	..	330	1	330
51	kitchen	..	..	50	1	50
52	dining	..	..	120	1	120
53	stay space	..	..	320	2	640
54	Bed room	..	..	20	8	160

Table 8 – Area statement

55	Bath	..	..	40	2	80
56	rest room	..	..	25	2	50
57	Store	..	..	12	2	24
					total	1454

Total area	16386

5.2 CONCEPT

Critical regionalism
Critical regionalism is an approach to architecture that strives to counter the placelessness and lack of identity of the International Style, but also rejects the whimsical individualism and ornamentation of Postmodern architecture.

Critical Regionalism had emerged as an onslaught to the modernist image of universal architecture. It acted as a bridge between the built environment and it's geographical context. It can be considered as the self consciousness of a region. It kind of blends modern architecture with regional tradition.

Critical regionalism buildings co-related with the local environment and showcased cultural and regional features. They also had provisions designed to adapt to the local climate.

Hence, Critical Regionalism in architecture was more of a promotion of the local and cultural value, rather than blindly accepting the preaching of modernism.

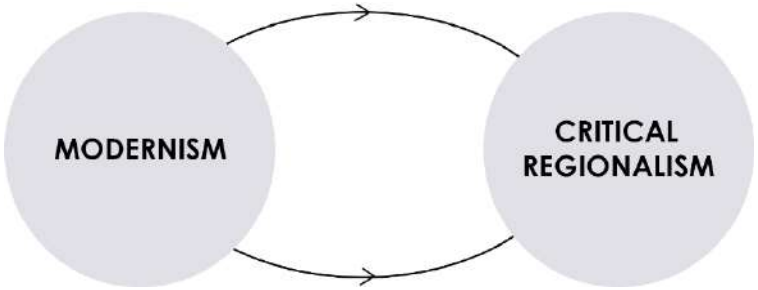


Fig 65 – Critical regionalism

UNDERTSTANDING CRITICAL REGIONALISM TO KASIMEDU

Fig 66 – Critical regionalism

By giving focus to place and identifying qualities of a geographical context, the design philosophy of Critical Regionalism builds its own unique diverse identity, and avoids the danger of resulting in yet another ironic attempt at Regionalism.

Furthermore, it identified the concept of place as an approach to architecture that transcends the visual narrative of culture to a phenomenological representation of memory. In essence, critical regionalism promotes a sense of identity and purpose within architecture, arguably resulting in a design philosophy that ensures more than a pure aesthetic approach to design.

5.3 ZONING

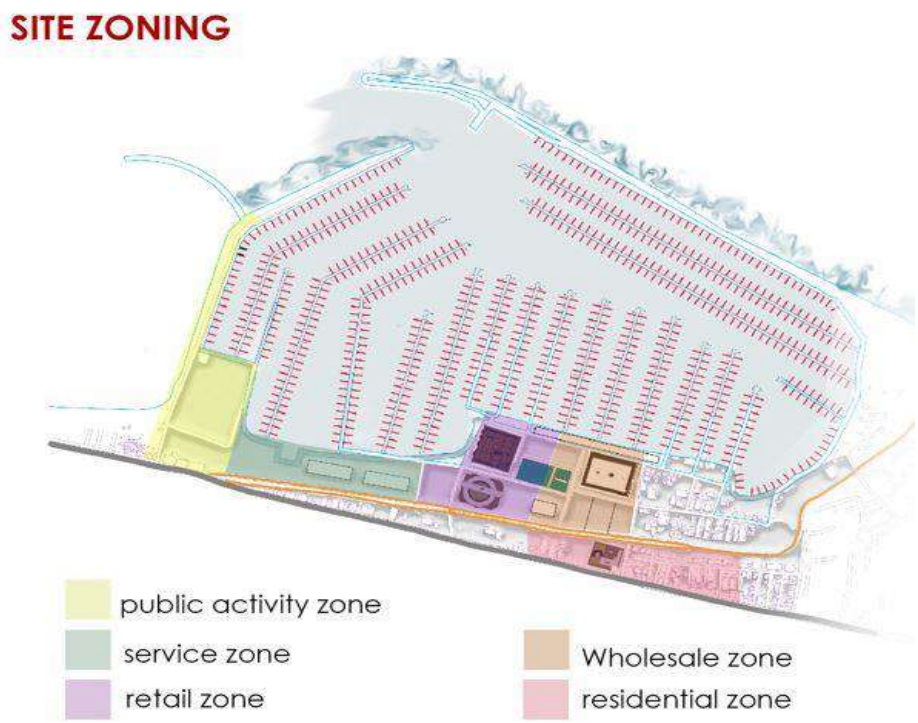


Fig 67 – Zoning

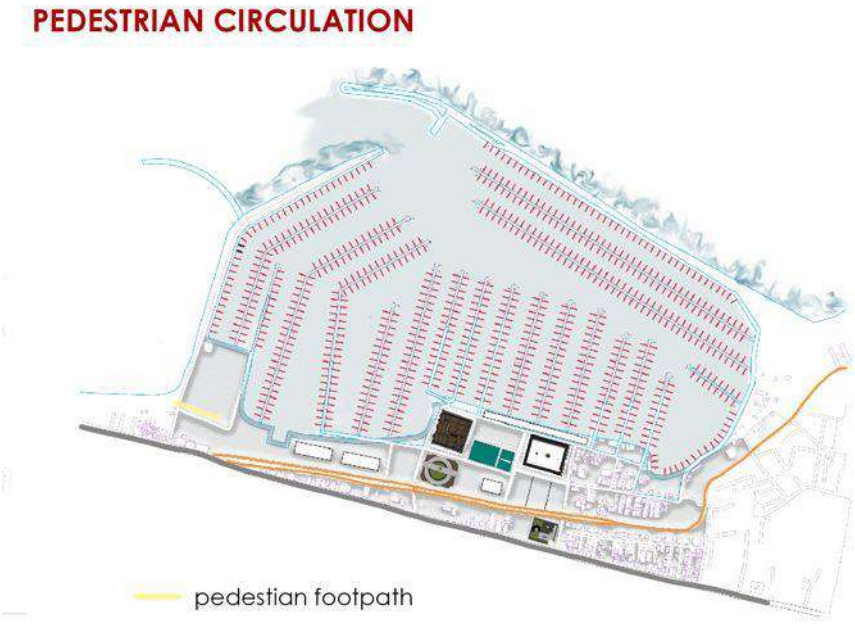


Fig 68 – Zoning

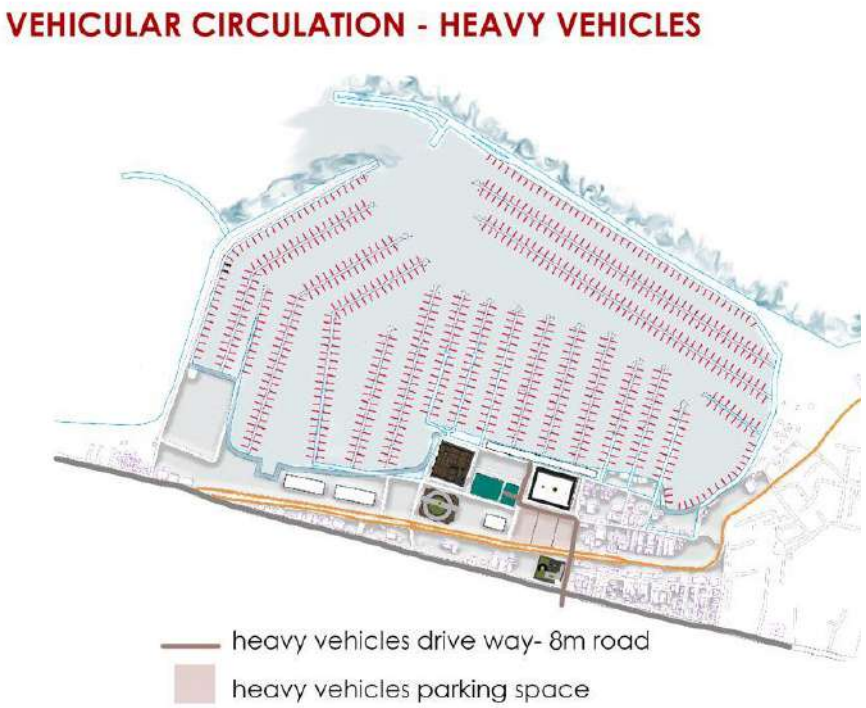


Fig 69 – Zoning

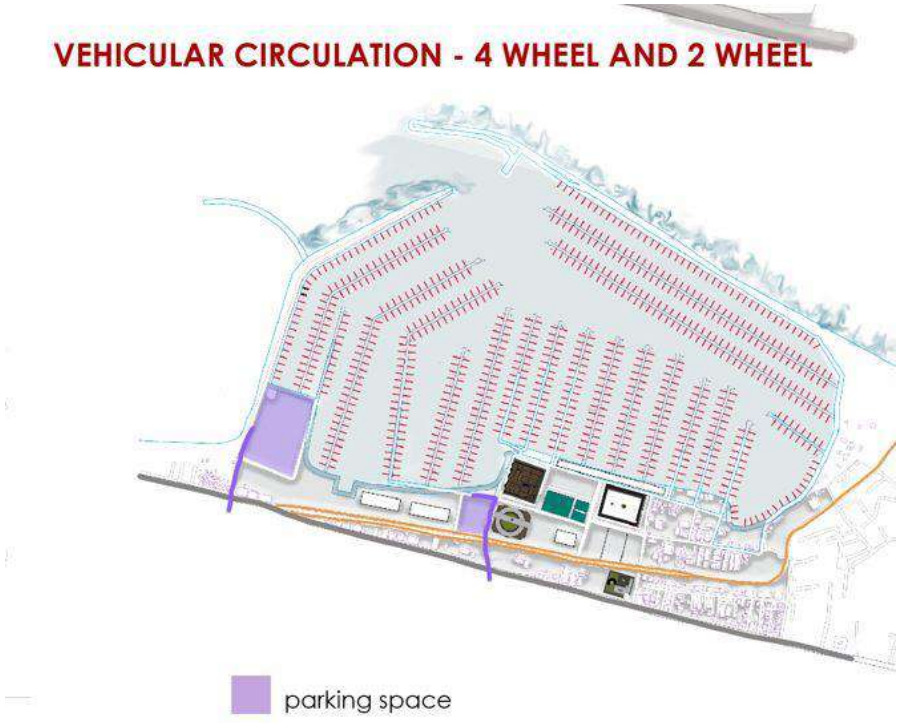


Fig 70 – Zoning

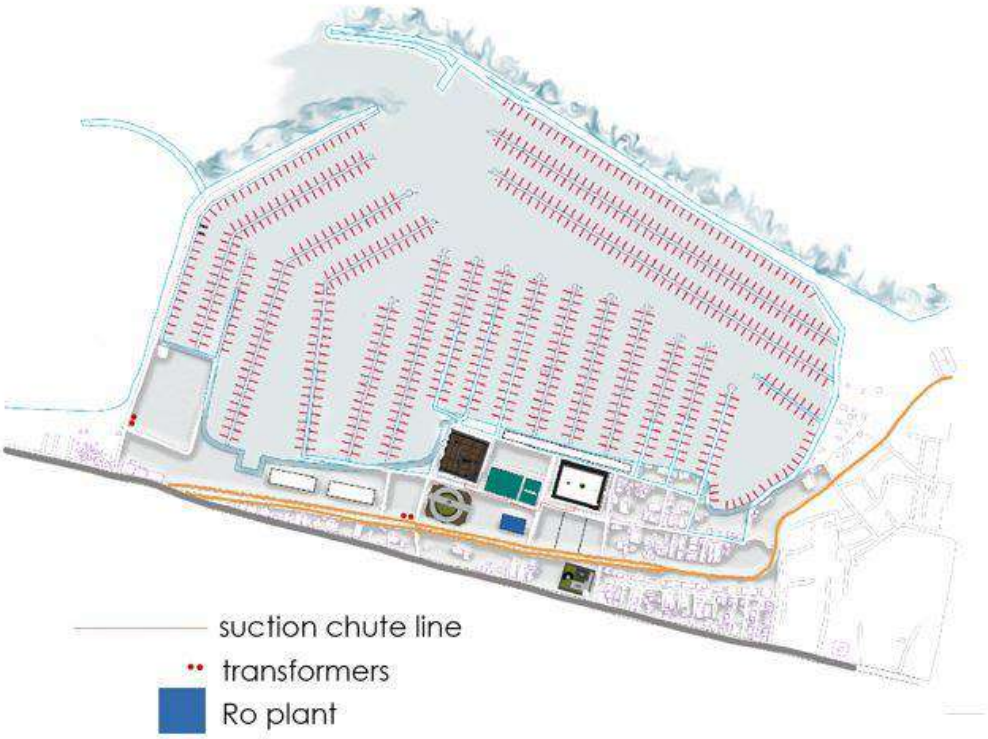


Fig 71 – Zoning

5.4 SITE PLAN

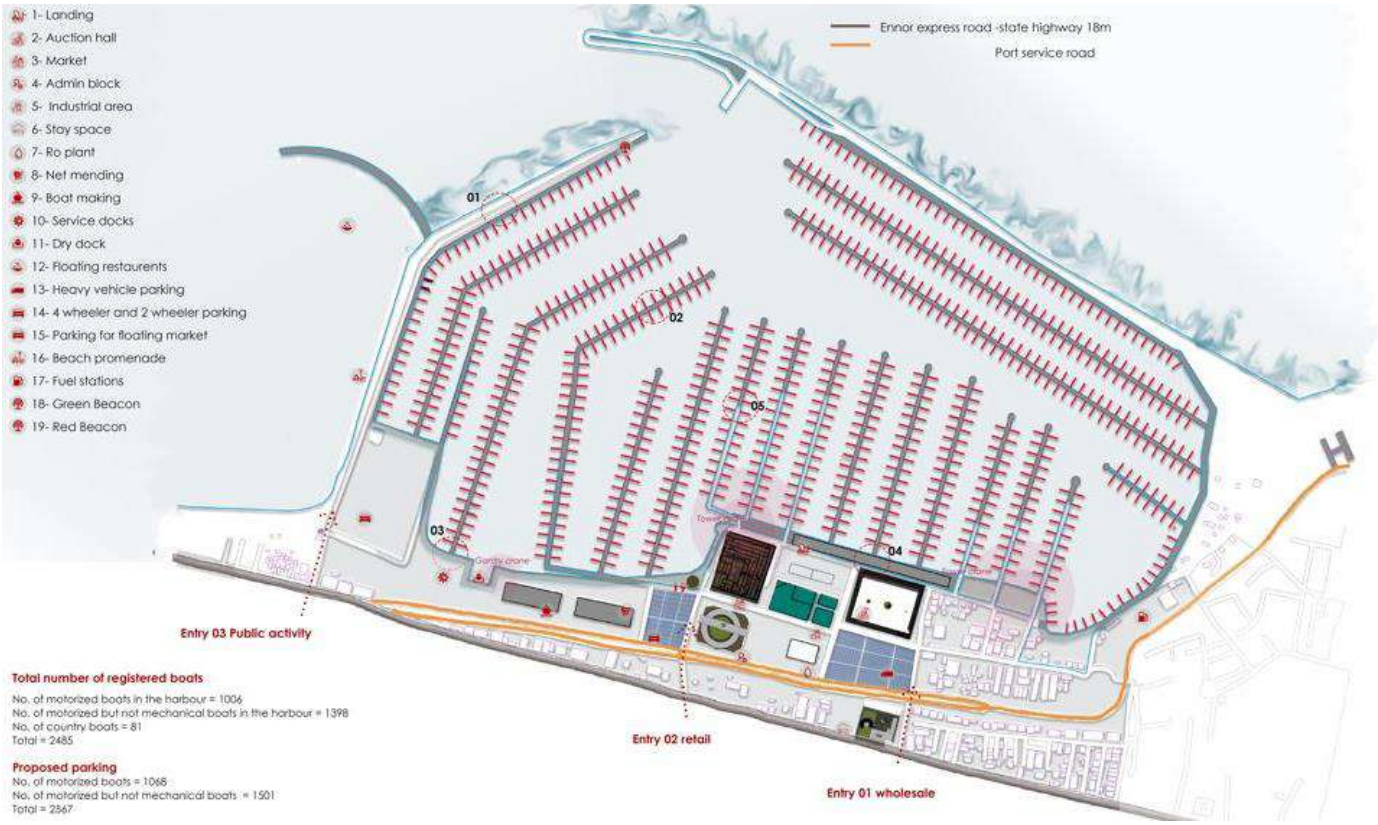
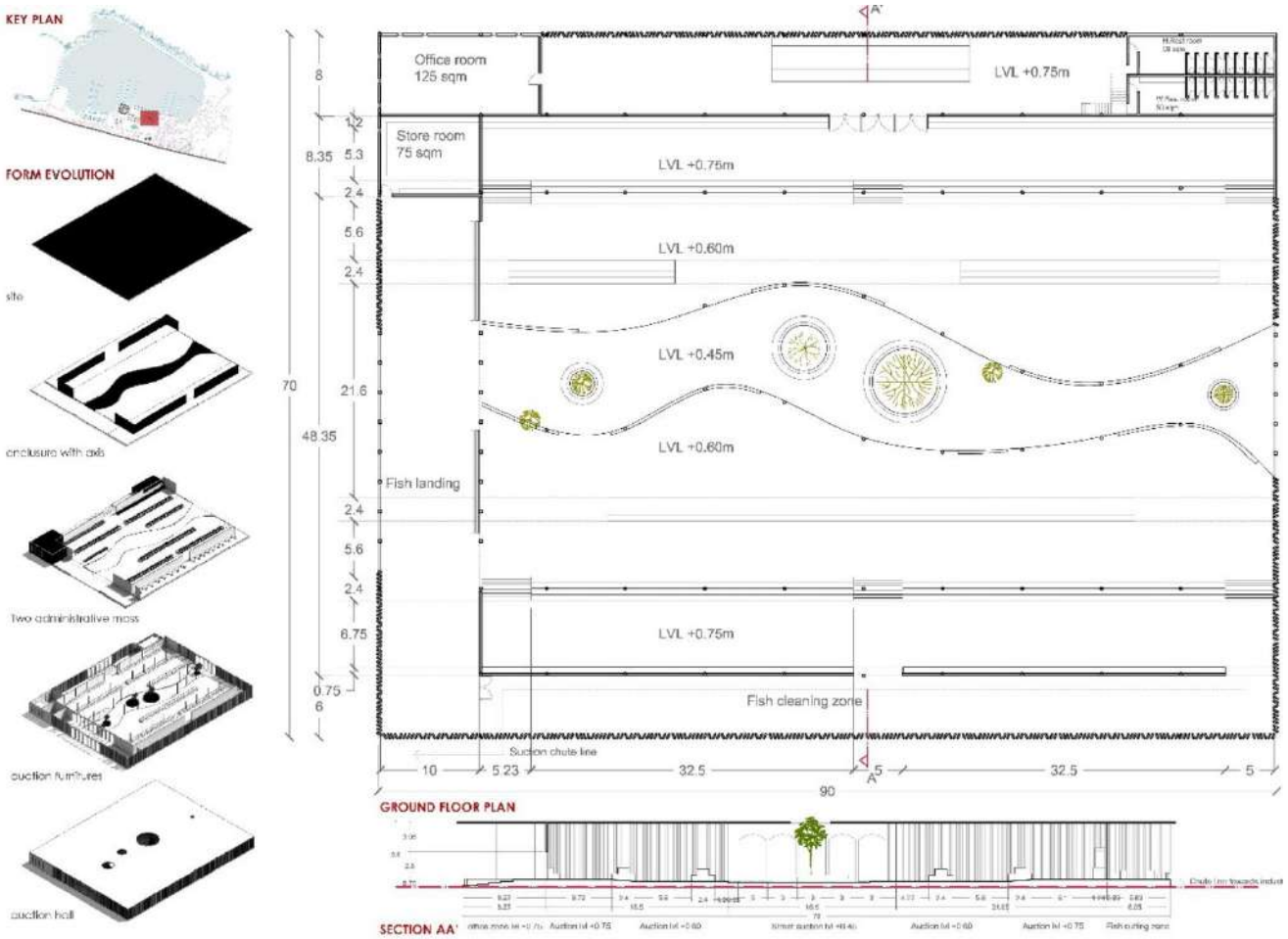


Fig 72 – Master plan

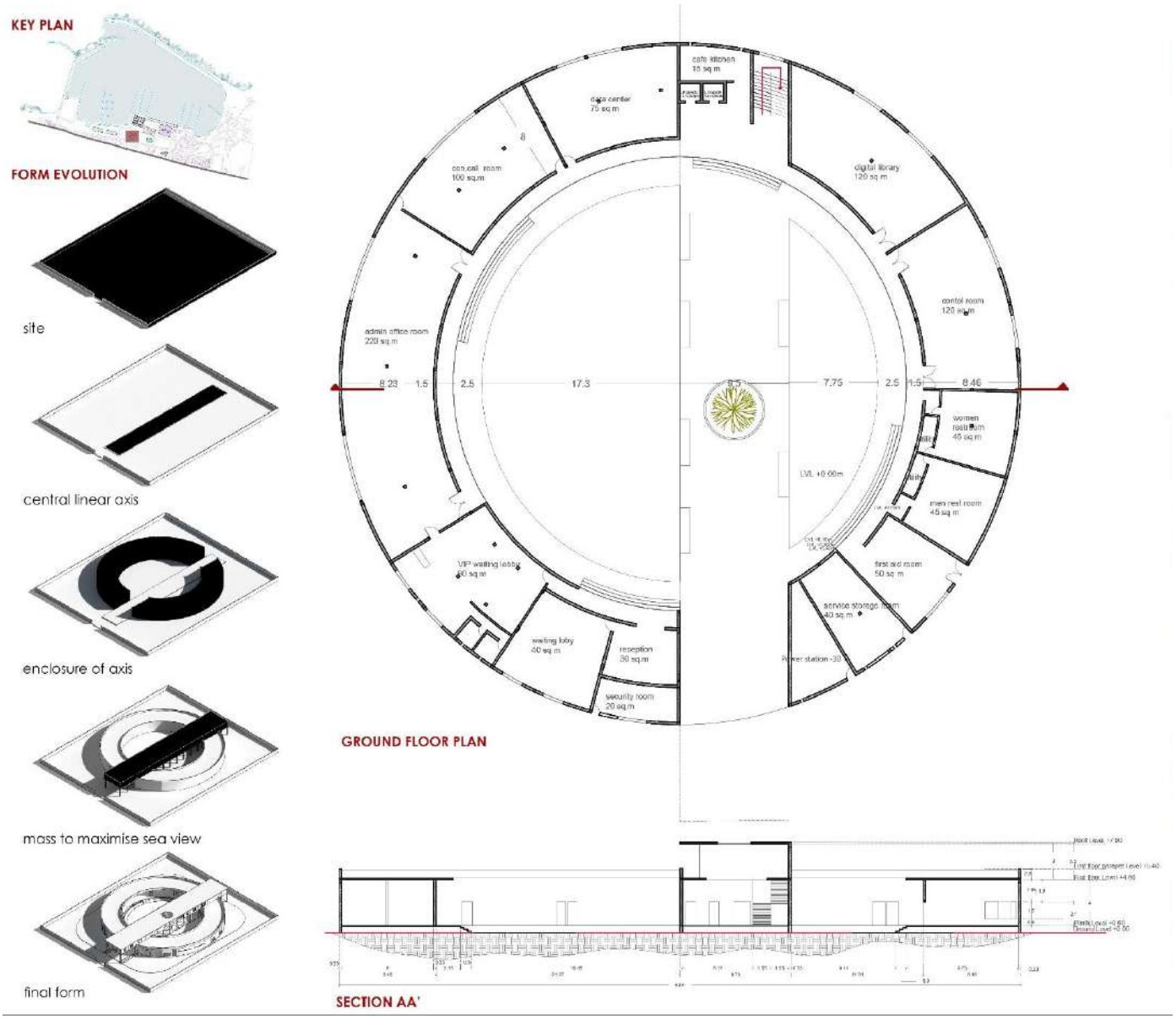
5.5 DESIGN

5.5.1 AUCTION HALL GROUND FLOOR



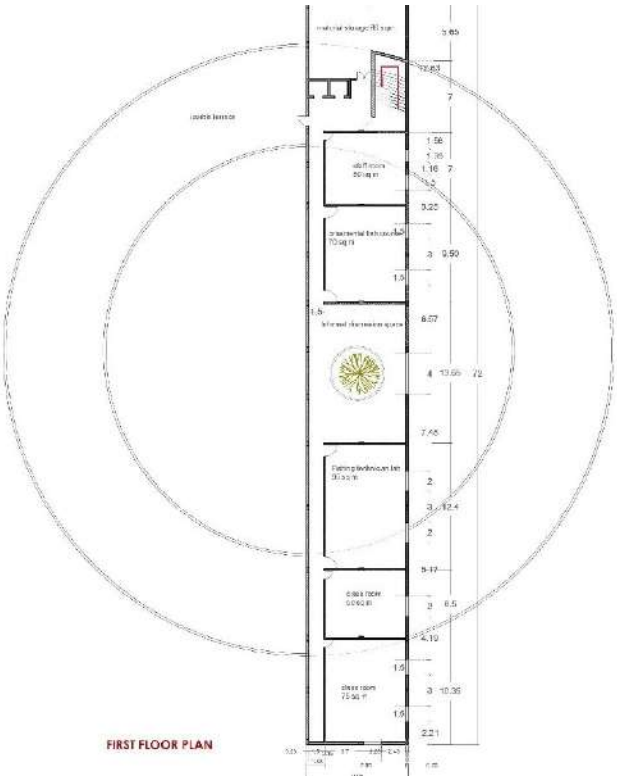
Drawing 1 auction hall ground floor

5.5.2 ADMIN BLOCK GROUND FLOOR



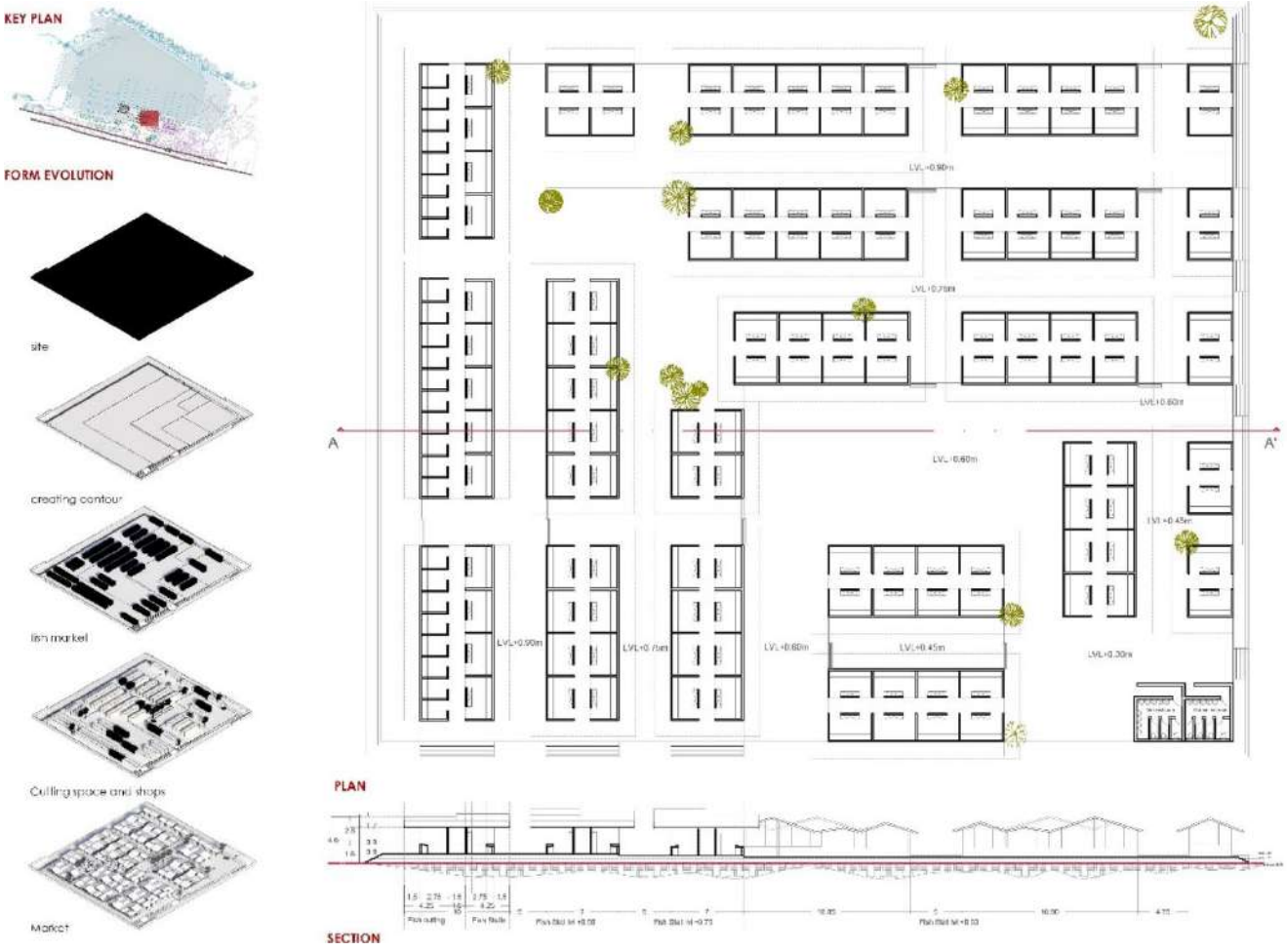
Drawing 2: Admin block Ground floor

5.5.3 ADMIN BLOCK FIRST FLOOR



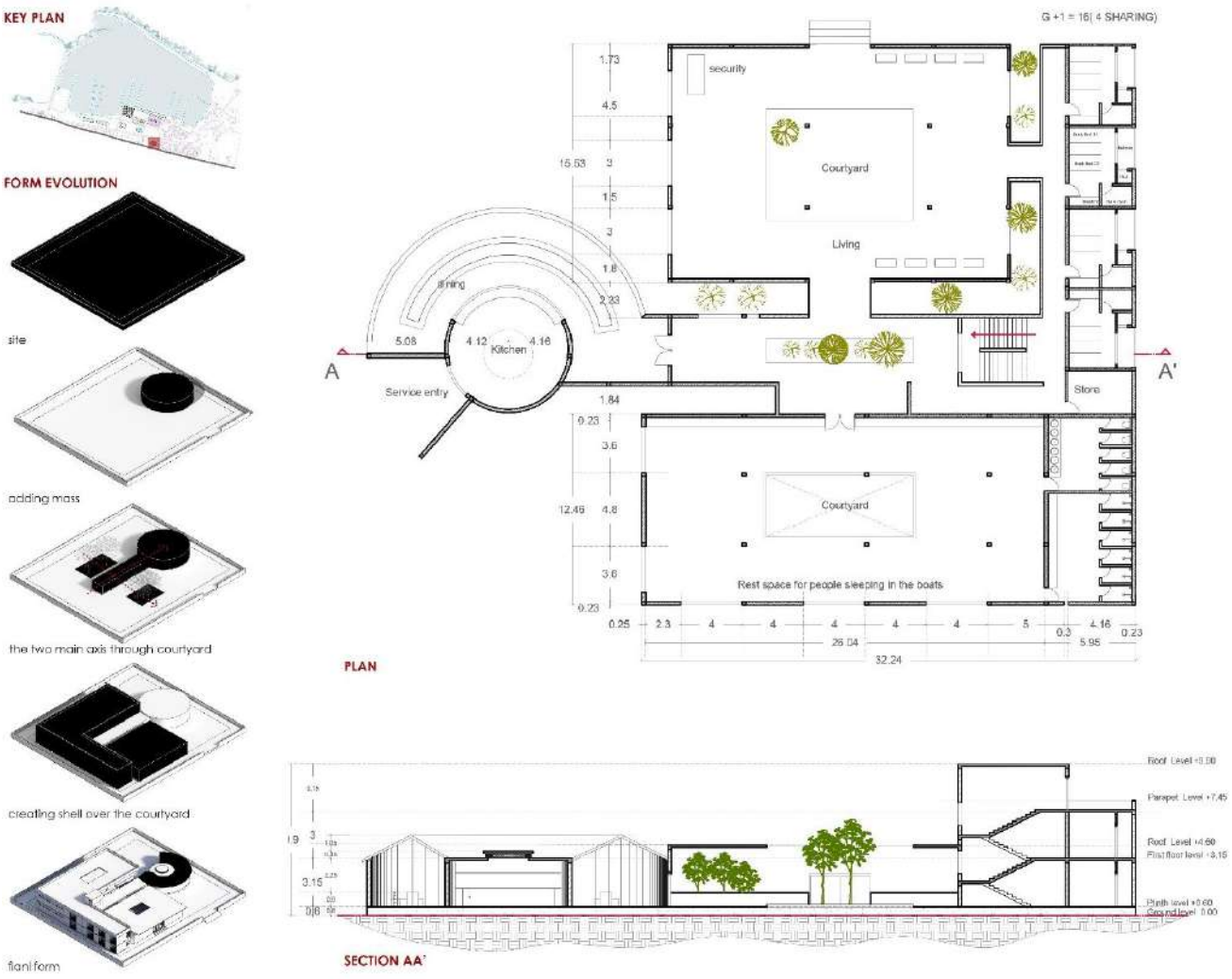
Drawing 3: Admin block first floor

5.5.4 MARKET PLAN



Drawing 4: Market plan

5.5.5 ACCOMMODATION GROUND FLOOR

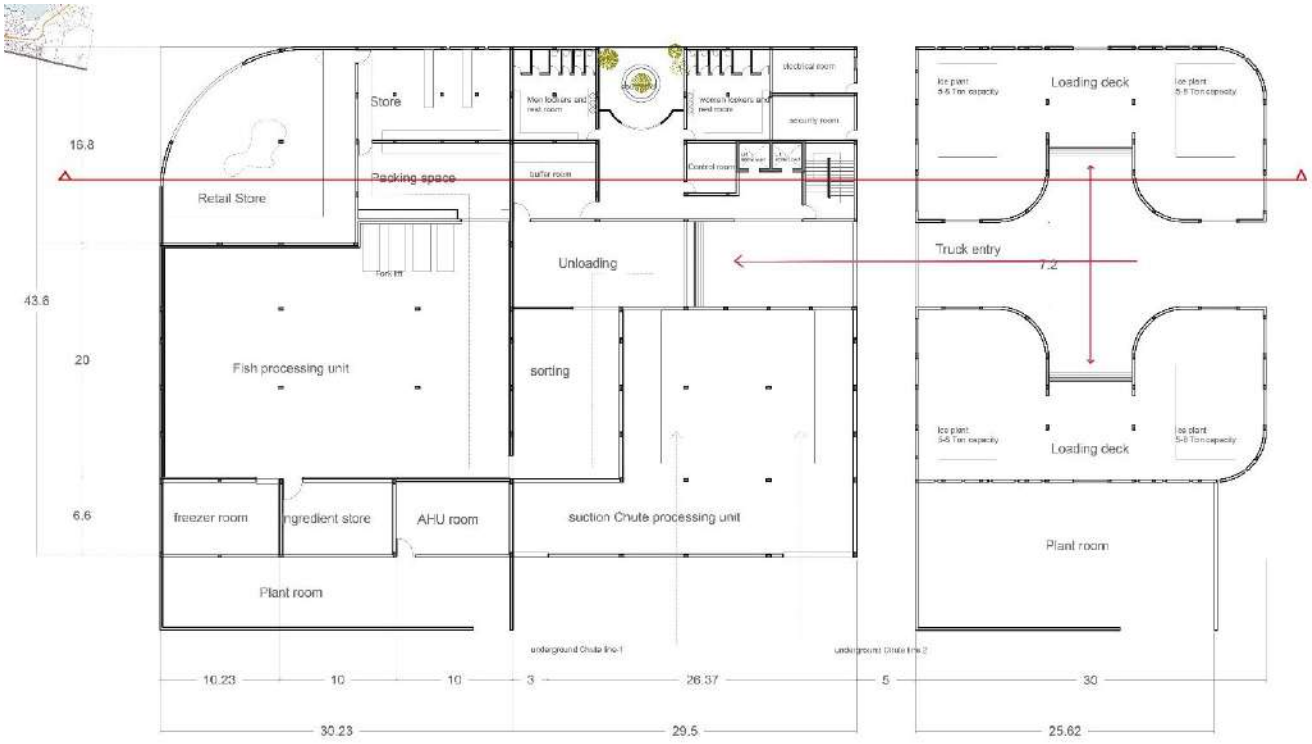


Drawing 6: Accommodation ground floor

5.5.6 ACCOMMODATION FIRST FLOOR

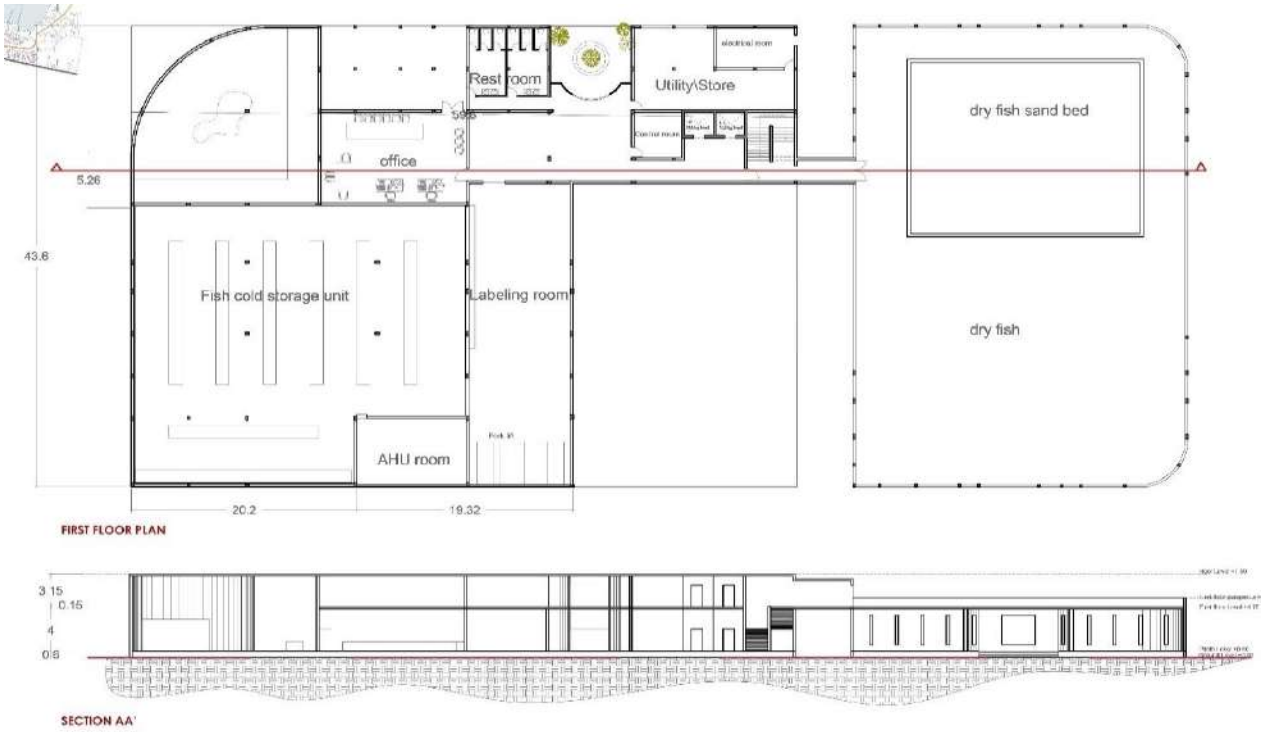
Drawing 6: Accommodation first floor

5.5.7 INDUSTRY GROUND FLOOR



Drawing 7: Industry Ground floor

5.5.8 INDUSTRY FIRST FLOOR



Drawing 7: Industry First floor

CHAPTER 6

VIEWS

Fig 72 – ariel view

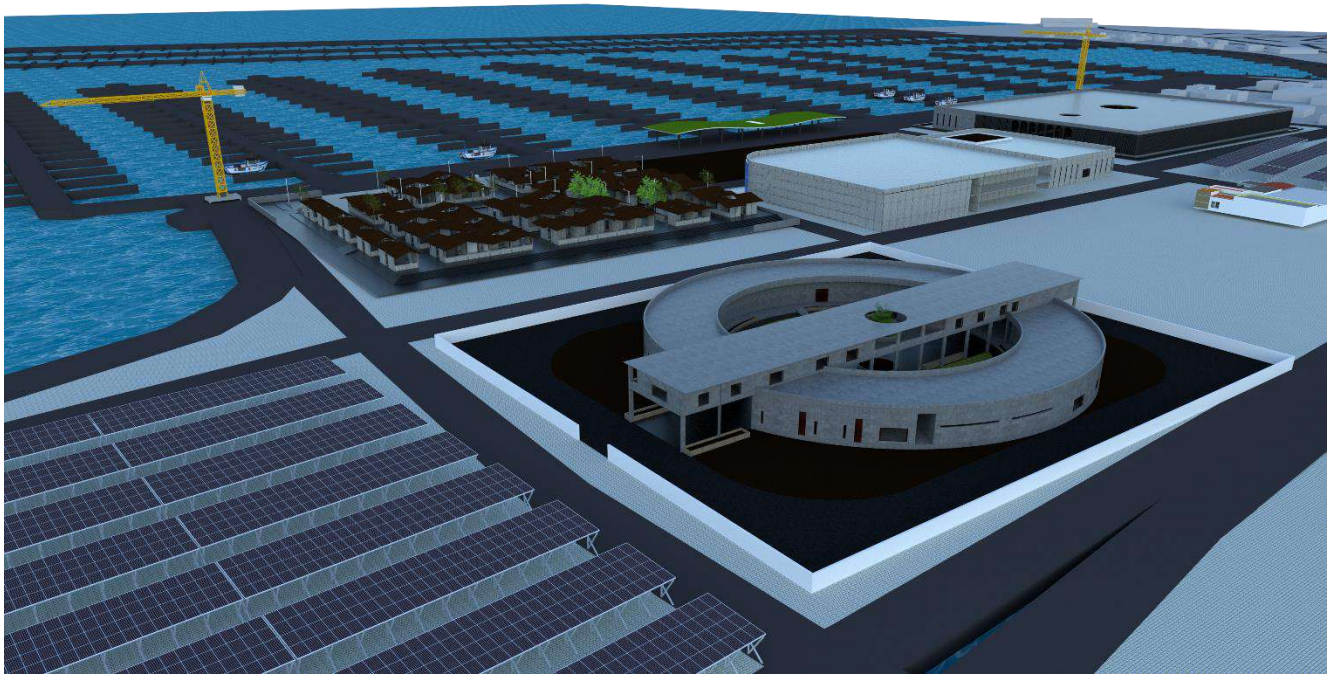


Fig 73 – ariel view

Fig 74 – Accommodation living view

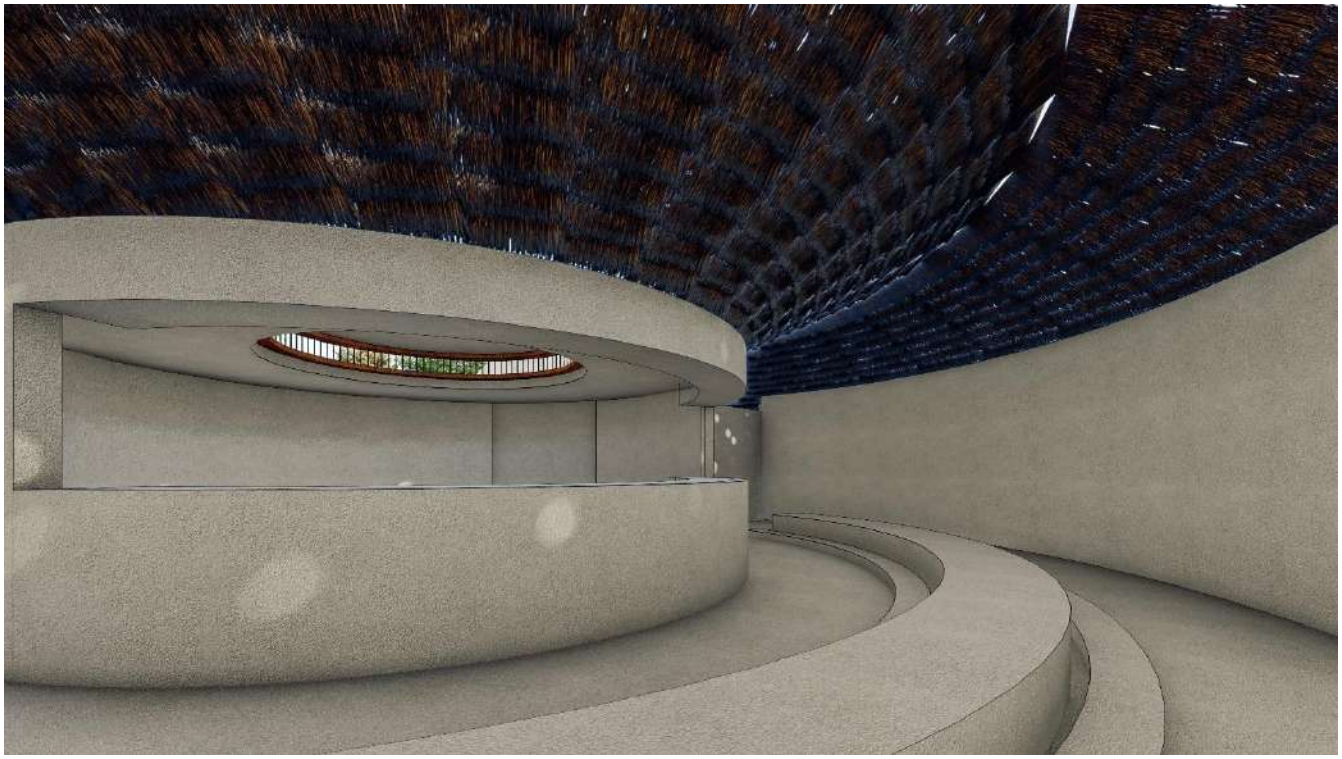


Fig 75 – Accommodation kitchen view

Fig 76 – Admin block view

Fig 77 – Admin block view

Fig 78 – Auction hall view

Fig 79 – Auction hall view

Fig 80 – Auction hall view

Fig 81 – Auction hall view

CHAPTER 7

CONCLUSION

I redeveloped the harbour design mainly to mitigate environmental pollution as an important means of improving hygiene and to provide a proper infrastructure with all the amenities and provision of modern technologies.

The infrastructure of Kasimedu fishing harbour is updated in the design. And also, fishermen community's work cycle won't get disturb because of people's interaction, The zoning is in a way that the retail and wholesale is separate.

This will help is reduction of crowd in the market.
By this proposal Kasimedu will be modern with modern amenities but with the same culture of Kasimedu.

As this is also a Government proposal the need of modernization is met.

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