

2.11 Basic Design of Water Supply and Drainage Facilities

2.11.1 Water Supply Facilities

(1) Size of Facility

A large volume of water is used at the fish market for cleaning, especially for washing the market floors at the end of the day. The consumption volume of water estimated at the new market is 83 tons/day, as shown in Table 2.11.1. The greatest volume of water is used for washing the floors of the auction hall and fish retail market. Therefore, in view of the fact that tap water fees are high in Tanzania, seawater supplied by a seawater pump will be used to wash the floors of these areas. It is planned in this Project that the volume of city water consumption will be minimized as much as possible.

1) City water

City water will be used for purposes other than washing the floors of the auction hall and the fish preparation site. The estimated consumption volume per day is 57 tons. However, due to the frequent suspension of the water supply and low water pressure, a water system that utilizes a water reservoir which is capable of supplying water throughout the project site is needed. Therefore, it was estimated that 90 tons of water would be needed to meet the entire daily water consumption volume. This estimation also includes the potential power failure or mechanical breakdown of the seawater pump.

2) Seawater

Seawater pumps will be used to supply the amount of water needed to wash the floors of the auction hall complex and the fish preparation site. The daily consumption volume is estimated at 25 tons which is equivalent to 31 % of the entire water consumption volume. It is expected to save the city water about 9,000 tons which is equivalent to US\$ 1,000 to 4,000 every year by using seawater.

Table 2.11.1 Breakdown of Water Supply Volume

	No. unit		Consumption/ unit		Amount (m ³)	Reference
1. Washing of auction hall	800	m ²	0.02	m ³ /m ²	16	Auction hall 800m ²
2. Washing of scaling floor	430	m ²	0.02	m ³ /m ²	9	Preparation building 430m ²
3. Washing of fish retail shop floor	770	m ²	0.02	m ³ /m ²	15	Fresh fish retail building 770m ²
4. Cleaning of fresh fish	194	shop	100	L/shop	19	Fish retailers 122, scalers 72
5. Water for fishing boat	20	boat	150	L/boat	3	
6. Consumption by other shop	187	shop	60	L/shop	11	
7. Consumption by other users	2,000	men	3	L/men	6	
8. Office and toilet	200	men	15	L/men	3	
Total					82	

(2) Equipment/Facility Plan

The city water supply pipe from the main water pipe (diameter of 150mm) running along Ocean Road will be installed within the market site to supply the water reservoir. A water reservoir with a 90 ton capacity will be installed above the ground level to supply tap water to each of the market facilities. The water will be supplied to each facility from the elevated water tank by gravity. The height of the tank will be 15m and two lifting pumps will be installed to pump up water into the elevated water tank. Suspended city water service will affect the sanitary conditions of the market floors, which must be washed on a daily basis. A small power generator will be provided to serve as an emergency power source for the water pump during power failures. The system of the city water supply is given below.

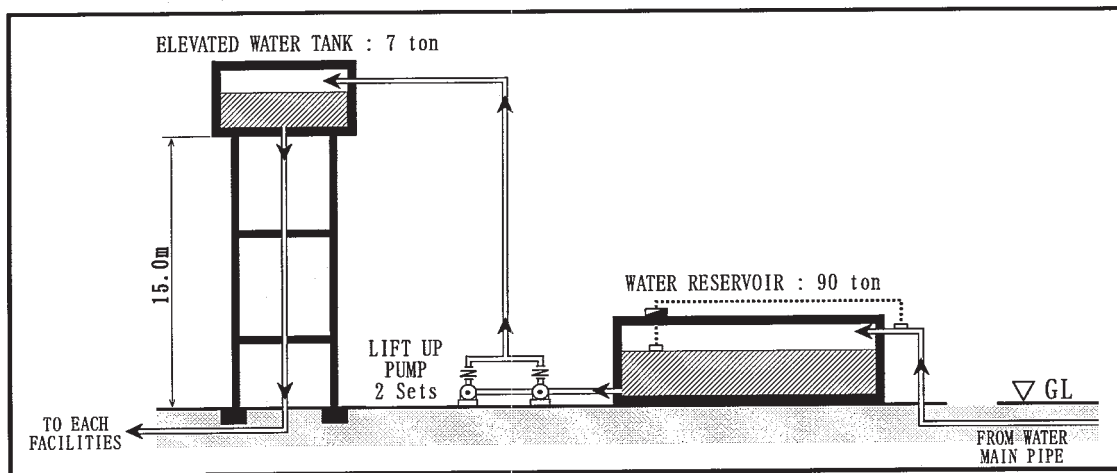


Figure 2.11.1 System of City Water Supply

The water reservoir with a size of 7.5m×6.0m, 3.0m height and a concrete wall structure will be provided. The water reservoir will be built above the ground level in order to enable easy cleaning without the use of a drainage pump. Also, the reservoir

will be divided into two sections.

The upper section of the water tower will be an assembled elevated water tank (7 tons). In order to secure the required water pressure for each facility, the height of the elevated tank will be 15m. The pump room containing the lifting pumps and their regulator boards, and an electrical room containing the power distribution boards that will supply electricity of the entire market and a small power generator, will be located on the ground floor of the elevated water tank.

(3) Structure Plan

In order to prevent the water tower and the heavy water reservoir from sinking, a pile foundation (support strength of 23 tons) will be used. A summary of the facilities structure is shown below.

Facilities	Story	Roof Structure	Super Structure	Foundation
Water Reservoir	1	Concrete Slab	Reinforced Concrete Wall Structure	Pre-cast Concrete Pile (400×400, l=8 m)
Water Tower	2	Concrete Slab	Reinforced Concrete Rigid Structure	Pre-cast Concrete Pile (400×400, l=8 m)

(4) Finishing Schedule

Based on the selection policy, the exterior and interior finish of each section of the major facilities are shown below.

Water Reservoir

<Exterior & Interior Finish>

• Roof	Water Proofing Mortar
• Wall	Fair faced Concrete, Mortar, Paint finish
• Interior Wall	Water Proofing Material

Elevated Water Tank

<Exterior Finish>

• Roof	Water Proofing Mortar
• Column & Beam	Fair faced Concrete, Mortar, Paint finish
• Wall	Concrete Block (C.B) Thk.150mm, Paint finish
• Doors & Windows	Window: Aluminum Sliding Window Door: Aluminum Frame Swinging Door
• Elevated Water Tank	Fiber Reinforced Plastic Prefabricated Tank

<Interior Finish>

Floor	Room	Floor	Column & Beam	Wall	Ceiling
Ground Floor	Pump Room, Electrical Room	Concrete Mortar finish	Fair faced Concrete, Mortar, Paint finish	C.B. Thk.150mm, Paint finish	Fair faced Concrete, Paint finish

2.11.2 Seawater Supply Facilities

Two seawater pumps will be installed on the south side of the fish landing wharf to provide seawater for cleaning the floors of the auction hall complex and the fish preparation site. They will be installed at a level (LWL-1m) that will enable seawater to be pumped during the low tide. A screen to protect the pump from rubbish and an inspection ladder will be provided.

2.11.3 Washing Place

One washing place will be located outside the building rather than installing individual washing places for each shop, in order to economize on water usage. Ten washing places will be provide at fish retail buildings and fish preparation buildings, two washing places in the shared kitchen for cafeteria buildings, and four areas for the other buildings. The washing places for the fish retail buildings and the fish preparation buildings will be a size of 2.4m×1.2m including one seawater well (diameter 90cm), other retail buildings also will be a 1.2m×1.2m sized washing place but without seawater well, and the shared kitchen will have a 1.2m×3.0m washing place, equivalent in size in other similar markets.

Based on the current practice of using seawater to wash fish, a seawater well will be installed at the washing places of the fish retail building and the fish preparation area. In order to provide equal access to the washing place from each building, five washing places will be located on both the east and west sides the buildings. The seawater well will be a shallow well 0.9m in diameter and 6.0m deep. A concrete sink, 1.2m×1.2m, will be installed. A total of four washing places, one area per two buildings, will be provided for the related retail market since it generates less sewage. The washing places will only have a sink of the same specifications as the fish retail market.

2.11.4 Drainage Facility

(1) Size of Facility

The type and volume of wastewater is shown in Table 1-3-24. Floor washing water is the most typical wastewater that will be discharged from the market. The waste water discharged from the auction hall complex is estimated at 16 tons/day and the BOD load is relatively low (under 50ppm). However, the 43 tons of wastewater by the floor washing activities of the fish retail building and the fish preparation area has a high BOD level (50-400ppm) and requires wastewater treatment.

(2) Facilities Plan

In order to meet local environmental standards (draft) for wastewater, the activated sludge treatment method is inappropriate for the Project site, since this method usually functions on automated operations and requires experts in wastewater treatment, and mechanical maintenance staff. In view of the fact that the back-up system for mechanical failure is not available in the site, it is concluded that this method is not suitable. Therefore, a more realistic wastewater treatment method to improve the sanitary environment of the existing market should be planned.

It is necessary to connect this waste/treated water to the city sewer when the city sewage water treatment system is established in the future. The waste water and treatment system planned for the facilities of this Project is shown as follows.

Table 2.11.2 Wastewater and Treatment System

Classification	Facilities	Type of water	Amount per day	Treatment 1	Treatment 2	Discharge point
Wastewater 1	Auction hall	Washing of floor	16t	Sedimentation of sand and waste by collecting pit & screen	-	Sea
Wastewater 2	Fish retail shop, scaling, fish washing	Washing of floor	43t	Same above	Septic tank & oxidation vessel	Same above
Wastewater 3	Vegetable, grocery and other shops	Washing of floor	7t	Same above	-	Seepage pit
Wastewater 4	Fish processing, cafeteria	Kitchen water	4t	Oil removal trap	-	Same above
Sewage	Public toilet, office	Sewage, shower water	3t	Inspection pit	Septic tank	Same above
Rain water	All area	Rain water	-	Collection by V shaped /L shaped channel and Sedimentation		Sea

1) Miscellaneous waste water 1

After selling fish, the floor of the auction hall complex is washed by city water or seawater. The wastewater from these washing activities will be collected in a collection pit. The interior of the pit will contain a metal screen which will filter the sand and scales of fishes and the collected sand will be allowed to accumulate as sediment. The wastewater will then be released into the sea (see figure below). The large amount of wastewater by the floor washing activities of the auction and selling areas contains little fish remains and will be released directly into the sea without any special treatment.

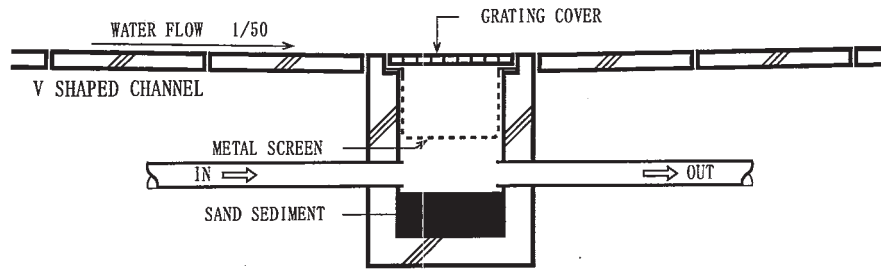


Figure 2.11.2 Structure of Cater Collecting Pit

2) Miscellaneous waste water 2

The extremely dirty wastewater discharged from the washing places, the fish retail building related to the auction hall complex, and the fish preparation sites will be collected in the collection pit via a V-shaped drain. The wastewater will be accumulated in a septic tank to lower the BOD value, then passed through an oxidation vessel, and combined with the relatively less polluted miscellaneous wastewater 1 to dilute the BOD value before it is released into the ocean. The septic tank and oxidation vessel will be made of concrete and due to the accumulation of slime, etc., inspection lids will be installed in several areas in order to enable the periodic vacuuming of the tank and vessel as required. A summary of the septic tank and oxidation vessels are given below.

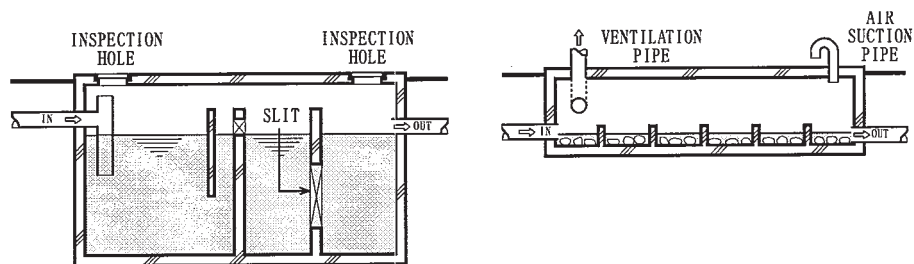


Table 2.11.3 Septic Tank and Oxidation Vessel

3) Miscellaneous wastewater 3

The wastewater discharged from the related retail market, the washing places, and the garbage disposal area is anticipated to be less in volume than the other facilities and therefore, the wastewater will be released into the seepage pit via the water collecting pit mentioned above.

4) Miscellaneous wastewater 4

The wastewater from the fried processing and food booths containing oil will be collected in an oil trap to remove the oil. The waste water will then be released into the seepage pit.

5) Sewage water

The sewage water from the two public toilets and the toilets of the administrative offices will be treated through the septic tank according to local specifications and the upper water will be released into the seepage pit. The septic tank will be made of concrete blocks in accordance with local specifications. In addition, the seepage pit will also be made of concrete blocks.

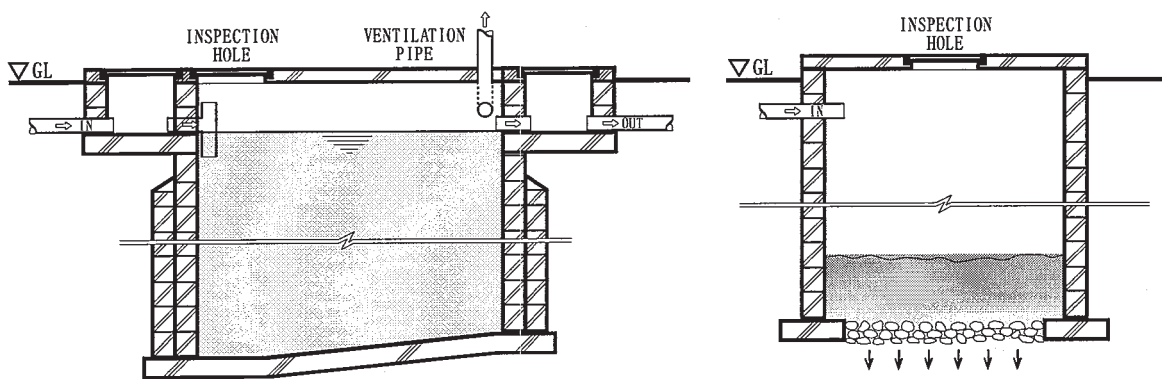


Figure 2.11.4 Septic Tank and Seepage Tank

6) Rain water

Rain water from the roofs of the facilities will be released into the sea via a rain water pit. Rain water from other areas such as the road and aisles will be collected in an L and V-shaped drain and released into the sea. the bottom of the rain water pit will have an area to collect sand and sludge.

2.12 Basic Design of Power Supply Facilities

2.12.1 Electricity Equipment

An underground low pressure electrical line (3 phase, 400V) runs along Ocean Road. An electricity post and a transformer will be installed at the site to draw electricity from this line and the line will be connected to the main electrical distribution board in the electrical room located on the ground floor of the elevated water tank and electricity will be supplied to each building from the main electrical distribution board. The single line diagram of the power receiving facilities is shown as follows.

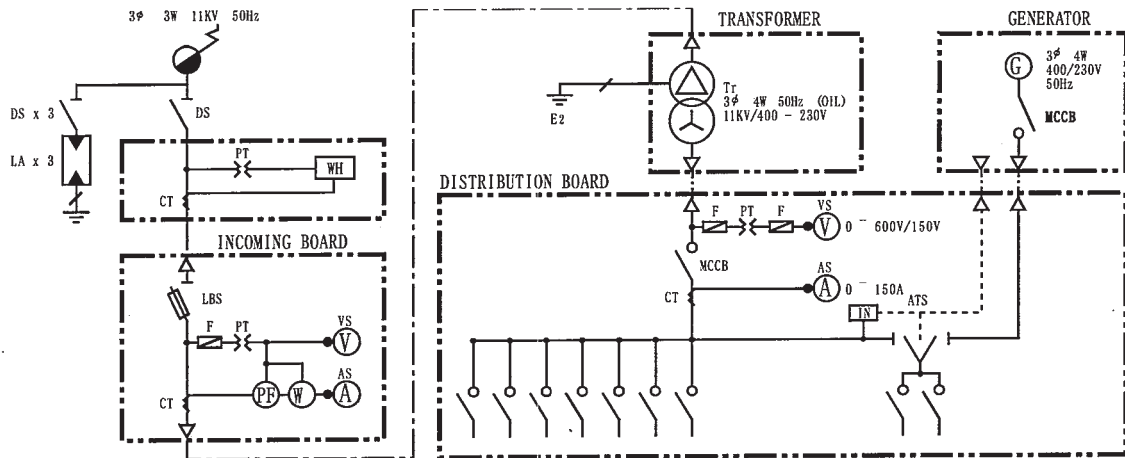


Figure 2.12.1 Single Line Diagram

2.12.2 Emergency Power Facilities

An emergency power generator will be installed in the electrical room to run a pump to supply water for washing the floors.

2.12.3 Lighting and Electrical Outlets

- Natural lighting will be used as much as possible in the rooms. The lighting equipment that will be provided under the Project will be supplementary.
- Administrative offices; one fluorescent light for each room; two fluorescent lights for the large room
- Auction hall/selling area: 4 anti-corrosive fluorescent lights will be installed in a 10m x 10m area
- Section of the stores facing the outside: 1 anti-corrosive fluorescent light will be installed in two or four sections
- Cafeterias: 1 anti-corrosive fluorescent light will be installed in each section
- External night light: 20 anti-corrosive fluorescent lights will be installed on the eaves of the buildings
- Street lights: 19 anti-corrosive mercury lights will be installed along the road

Two outlets will be installed in the administrative office. Other outlets needed for equipment, machinery, etc. will be installed where needed. Outlets will not be installed in the shop sections.

2.12.4 Telephone Facilities

An overhead telephone line runs along Ocean Road and three lines from this main line will be installed in the offices of the manager, the DCC, and the operations manager.

2.12.5 Broadcasting Facilities

Broadcasting equipment will be provided to announce the opening and closing of the market, the start of cleaning operations, emergency announcements, and other public announcements. Loud-speakers will be installed in four locations and a broadcasting amplifier will be installed in the administrative office.

2.13 Basic Design of Road and Parking

2.13.1 Road

(1) Concept of Road Planning

Ocean Road and fishery areas will be paved to provide for public use.

(2) Structural Type

Dimension : The road will be two lanes.

Structural type : The structural type will be same as the existing type of Ocean Road since the road will become a portion of Ocean Road in the future.

The width is determined to be 6.1 m same as the existing Ocean Road. The road will be planned as a one way road.

(3) Structural Design

As described above, the structural type will adopt the same asphalt paving as the existing Ocean Road.

(4) Site Paving

The site paving will be divided into three types as follows:

- Interlocking concrete block paving: The paving will be adopted for the site as the major paving type since it is able to correspond to differential settlement and easy to provide the materials and easy maintenance.
- Concrete paving: For sanitary reasons, the apron of landing wharf will be washed, the places of smelled water by fish washed and removed scales will be washed. Therefore, these areas will be paved by washable concrete.
- Asphalt paving: The paving type of road, parking area, and walkway will adopt

the asphalt pumps to match the adjacent area.

(5) Design of Walkway

The walkway will be planned for both sides of the road.

- Dimension: The walkway will have an enough width for two way traffic for carts (one or two wheeled cart without motor).
- Structural type: The walkway will be paved by the same asphalt as the road paving.
- Structural design: The walkway will be designed 15 cm above the crown of the road.

2.13.2 Parking

In order to improve the efficiency of the site, one bus stop and a parking area with a capacity to accommodate 13 mini-buses/ordinary cars and 7 large buses will be constructed along the road. Parking space for large trucks transporting ice and fish will be constructed behind the auction hall complex located on the reclaimed land. The parking area near the road will be asphalt-paved. The parking area on the reclaimed land will be concrete-paved to accommodate four medium trucks.

2.13.3 Bus Stop

Based on discussions about the current number of roads and parked cars and the distance from the new ferry terminal and market customer line-of-movement, the bus stop will be located on the west side of the land running along the road on the inland side of the project site, Three parking areas for medium buses and a parking space for two medium buses are planned in conjunction with the bus stop. The bus stop will be asphalt-paved in view of potential future infrastructure improvements.

2.14 Basic Design of Other Related Facilities

2.14.1 Public Toilets

(1) Size of Facility and Facilities Plan

In accordance with DCC standards, the size of one public toilet booth will be one toilet bowl for use by 100 to 150 people and 12 toilets will be installed to cope with the 2,000 daily market users. The toilets will be located in two areas – the north side of the auction hall complex on the ocean side and the west side of the vegetables/grocery building on the inland side. Incidental facilities also include one shower room for both the men and women's toilets since the toilet and shower are a combined facility according to local specifications. In addition, storage for cleaning

equipment and a locker room for staff members will be installed. A men's and women's toilet for staff members working outside will be installed on the ocean side. The eaves height will be 3.5m, the same as the fish retail building. A ceiling for noise barrier should be considered and should be 2.7m height for both the men's and women's toilets.

(2) Structural Plan

A wooden truss roof will be used as in the other buildings and the foundation will be a spread foundation (3 tons/m² bearing capacity). A summary of the structure of the facilities is shown below.

Facilities	Story	Roof Structure	Super Structure	Foundation
Public toilet	1	Wooden Truss	Reinforced Concrete Rigid Structure	Reinforced Concrete Spread Foundation

(3) Finishing Schedule

Based on the selection policy, the exterior/interior finishes of each section of the facilities are shown below.

<Exterior Finish>

• Roof	Metal Roofing Sheet Tile, Gable: Wooden Siding
• Column & Beam	Fair faced Concrete, Mortar, Paint finish
• Wall	Concrete Block (C.B) Thk.150mm, Paint finish
• Doors & Windows	Window: Aluminum Sliding Window & Top Hanging Window Door: Aluminum Frame Door

<Interior Finish>

Room	Floor	Column & Beam	Wall	Ceiling	Others
Toilet Room	Tile finish	Tile finish (H=2,000), Fair faced Concrete, Mortar, Paint finish	Tile finish (H=2,000) C.B.Thk. 150mm, Paint finish	Cement Sheet, Paint finish	Boos: C.B. Thk.100mm, Tile Door: Wooden door, Paint finish

2.14.2 Garbage Yard

There is one garbage cart at the existing market and a private company periodically collects and transports the garbage. Two garbage disposal yards will be planned on the ocean side of the site and the inland side of the site to improve the sanitation environment of the new market. Since there are no problems with the current

method, it will continue to be used at the new market.

The garbage yards will be located on the south end of the ocean side and west end of the inland side of the related retail market.

The garbage collection cart (4.5m × 2.5m) which is used at the existing market will be stored at the garbage yard and an area of 6.0m × 6.0m will be allocated. The garbage yard will be roofed to prevent an outflow of garbage during rainy weather. The beam height will be 4.5m based on the height of the collection vehicle. A low partition (1.5m high) is planned to divide it off from the surrounding area. In addition, a water faucet and sink will be installed to wash the floor.

2.14.3 Street Lights

Street lights (200W, 19 lights) will be installed every 20m for crime prevention along the boundary of the market site on the side of the president's official residence and the ocean road.

2.14.4 Watchman Box

A watchman box is planned near the main entrance to control the incoming visitors and cars. The room will accommodate one person and will be 1.5m × 2.4m. It will be a simple, roofed structure with low walls for ventilation and shade.

2.14.5 Navigation Aids

The navigation aids will be installed in accordance with the Harbor Regulations to navigate the commercial boats safely since the project area is adjacent to the navigation channel. Two navigation aids will be installed adjacent to revetment.

In addition, three under construction lights (yellow) will be installed adjacent to the landing wharf in accordance with the Harbor Regulation for safe navigation.

2.14.6 Slope Protection

To prevent scouring by waves, armour stones same as the ones at West Ferry Point will be placed on the slope of the channel.

2.14.7 Green Area

Areas that are not suited for constructing market facilities will be planned as green areas for their effective and environmental uses in the future. They will be excluded from the road pavement work. Curb stones will be constructed in order to divide the paving areas.

- The paved sections for parking will be differentiated.
- A maximum of 50cm of soil will be left for the cultivation of plants.

2.15 Basic Design of Project Equipment

2.15.1 Policy on Equipment

The type and grade of the equipment used in the market will be selected based on the following factors:

- Equipment and materials will be limited to only those items that are closely connected to fish handling and marketing activities.
- Equipment which requires highly technical maintenance will be avoided and only equipment which can be easily repaired will be procured.
- The type and grades of equipment will be selected based on durability, anti-corrosive factor, and existing usage. In addition, equipment which will curtail maintenance costs will be selected.
- In the selection of the equipment, keen attention will be paid to equipment and consumables that can be purchased, repaired, or replaced locally.
- One-half of the required quantities of equipment needed to improve the efficiency of fish transport and storage will be provided, in order that these improvements are necessary to be implemented in phases. The examination on the major equipment needed is given as follows.

(1) Fish Containers

The fish handling volume of the market is estimated at 30 tons/day. Of this volume, small and medium fish that utilize fish containers is estimated at about 85 % based on fish species landed from marine fisheries in Tanzania. In the case that fish containers with a 20kg capacity (the presently used capacity) are used, the required number of fish containers is as follows.

- Required number = $(30,000\text{kg} \times 0.85)/20\text{kg}/2 \text{ rotations} = 638 \text{ boxes}$
- Number of containers provided by the project: 350 containers (one half of 638 containers or 319 plus additional spare containers)

(2) Insulated Boxes

Insulated boxes are vital to the retail and storage of fresh fish. Due to the lack of refrigeration facilities at the existing market, fish is stored in insulated boxes that greatly affect their quality management. Presently, used Styrofoam boxes are utilized which affect fish quality. Therefore, 60 fish insulated boxes or half the 120 fresh fish retailers at the market will be provided by the project. The insulated boxes will have a capacity of 150 liters which is the most commonly used capacity by the

retailers.

(3) Fish Preparation Pallet

The cleaning and scaling activities are carried out directly on the beach. A pallet or working table will be provided for these activities at the new market in order to improve the sanitation environment. However, due to the difficulty in determining the standard size of the pallet needed by each scaler, the Project will only provide pallets for approximately 20 scalers who are presently using one. Therefore, 20 plastic manufactured pallets of 1m x 1m in size will be provided.

(4) Carts and Barrow

In order to improve the efficiency of transporting the fish from the fish landing site to the auction hall, a measure to increase the transport volume of one trip should be introduced. This can be done by combining the fish containers with the carts. Therefore, in order to improve the transport efficiency within the market and to cover the distance from the auction hall to the processing site (75m), two-wheeled barrows will be provided. Presently, only several carts are used for transporting fruits and vegetables due to the poor conditions of the passageways in the market. However, with the paved passageways in the new market, a rise in the use of carts is anticipated. The Project will provide 10 units each of carts and barrows which will be rented out to fishermen and market retailer associations. Since the carts will be used on the beach, they will be equipped with car tires. Both carts and barrows with specifications that can be reproduced locally will be provided.

(5) Weighing Scales

One set of weighing scales capable of handling large fish weighing 300kg and four units of hanging scales capable of weighing up to 10kg will be provided. The scales will be installed at the auction hall to take record of catches by DCC and also its usage will be open to general users.

(6) Fish Washing Tank

The fish washing tank will have a 500L capacity that will be able to easily accommodate the container which is presently used to wash fish (basket; diameter 50cm). A total of ten tanks will be provided, two at each of the three fish preparation buildings and four units at the wholesale market.

(7) Garbage Box, Garbage Collection Cart

Garbage boxes will be installed in the market and garbage will be collected by cart. A total of 20 garbage boxes (one for each building) will be provided.

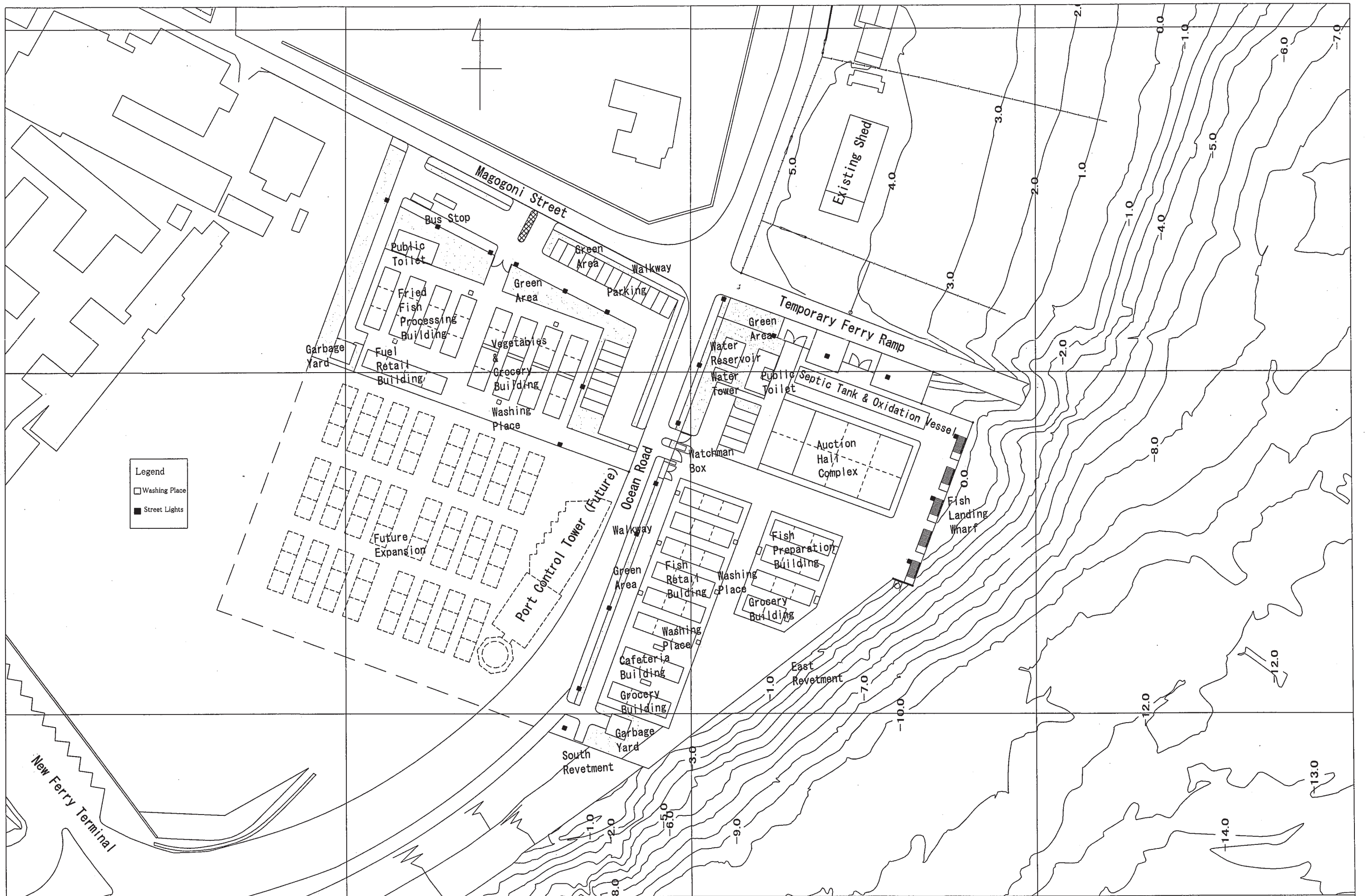
A summary of the equipment is shown in Table 2.15.1 below.

Table 2.15.1 Equipment List

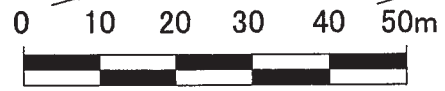
Name	Specification	No.	Purpose	Supply
Fish cart	Cargo bed 900(w)×1,200(L) mm, flame height 600mm, car tire, loading capacity 250kg	10	Transport the fish from landing beach to the market buildings.	Local (local made)
Barrows	Aluminum pipe, platform	10	Transportation in the market	Japan
Fish container	Capacity 30L, Polyethylene Size 670×390×160mm	350	Fish handling, auction	Japan
FRP tank	Capacity 500L, Size 1400×900×700mm	10	Fish washing	Japan
Fish Preparation Pallet	Size 1100×1100×150mm	20	Fish preparation, cutting	Japan
Insulated box (small)	Capacity 100L, with key Size 880×430×450mm	60	Fish preservation, for retailers	Japan
Insulated box (large)	Capacity 680L, with key Size 120×110×100mm	15	Fish preservation, for fishermen and retailers	Japan
Weighing Scale (small)	Scale capacity 20Lbs, Hanging type	4	Fish measurement, recording, statistics	Local
Weighing Scale (large)	Scale capacity 600Lbs, platform type	1	Same above	Local
Garbage box	Capacity 100L, fix type	20	Sanitary control in the market	Japan
Garbage collection cart	Capacity 60L	5	Garbage collection from dust box	Japan

2.16 Basic Design Drawings

The basic design drawings are presented as follows.



Legend
 □ Washing Place
 ■ Street Lights



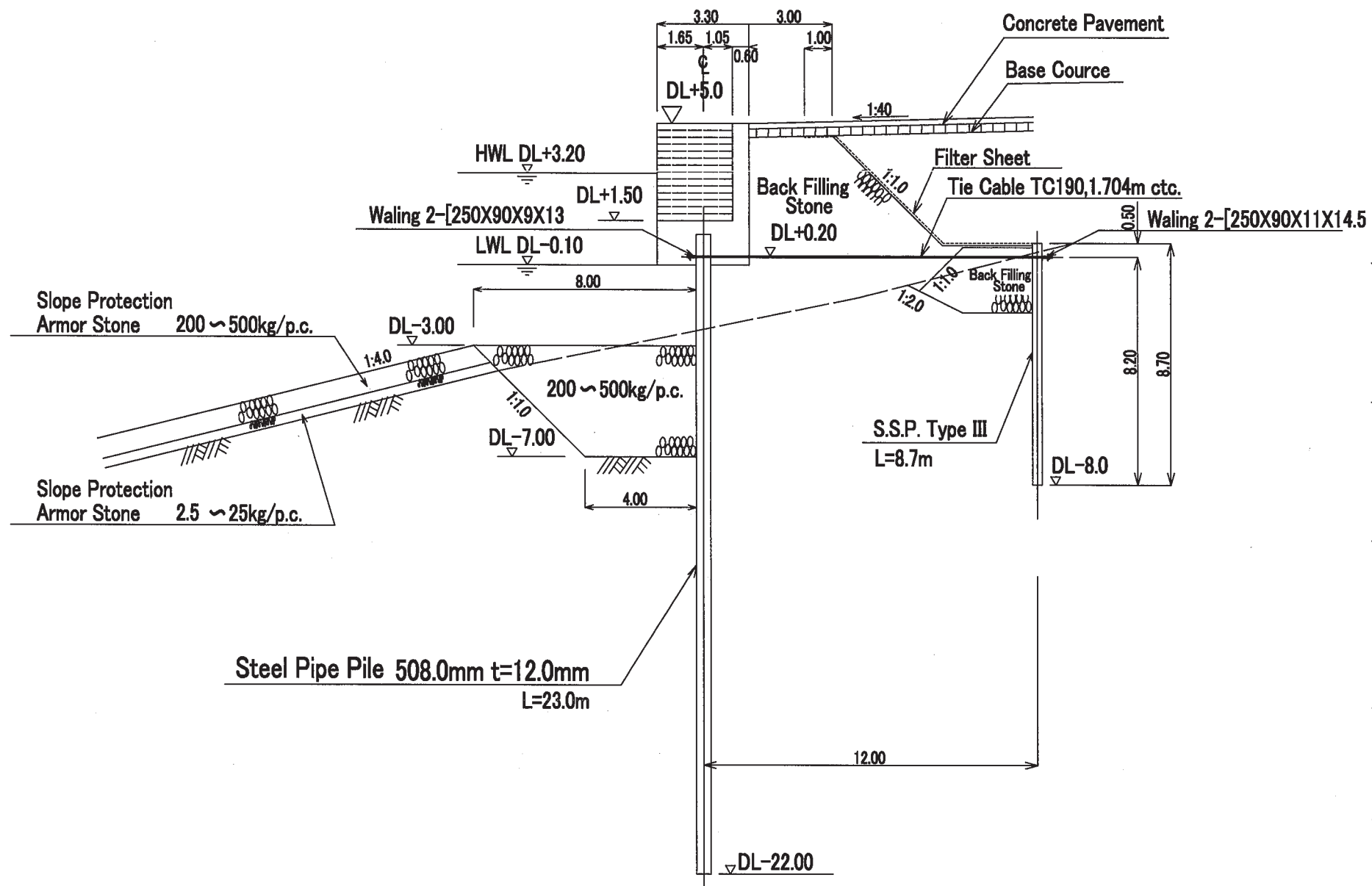
UNITED REPUBLIC OF TANZANIA
 BASIC DESIGN STUDY ON THE PROJECT FOR
 CONSTRUCTION OF DAR ES SALAAM FISH MARKET

JAPAN INTERNATIONAL COOPERATION AGENCY
 NIPPON KOEI CO.,LTD.
 SYSTEM SCIENCE CONSULTANTS INC.

DWG.TITLE
LAYOUT PLAN

SCALE
 1:1000

DWG.NO.
 2 - 77

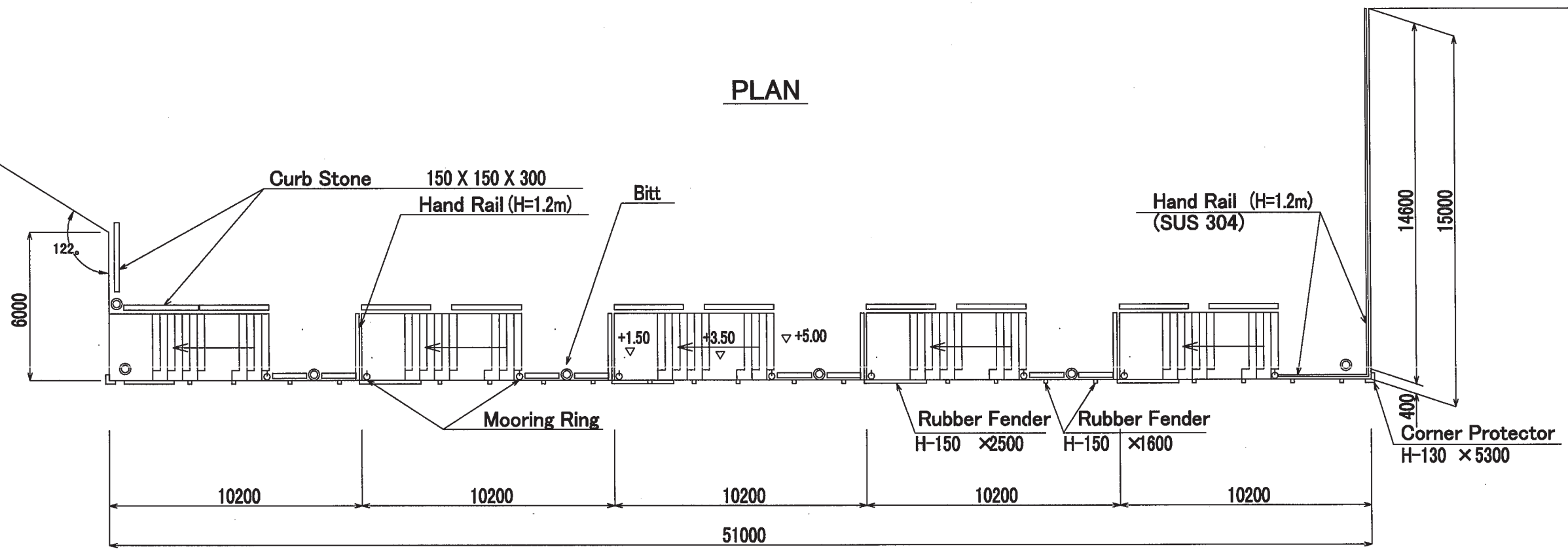


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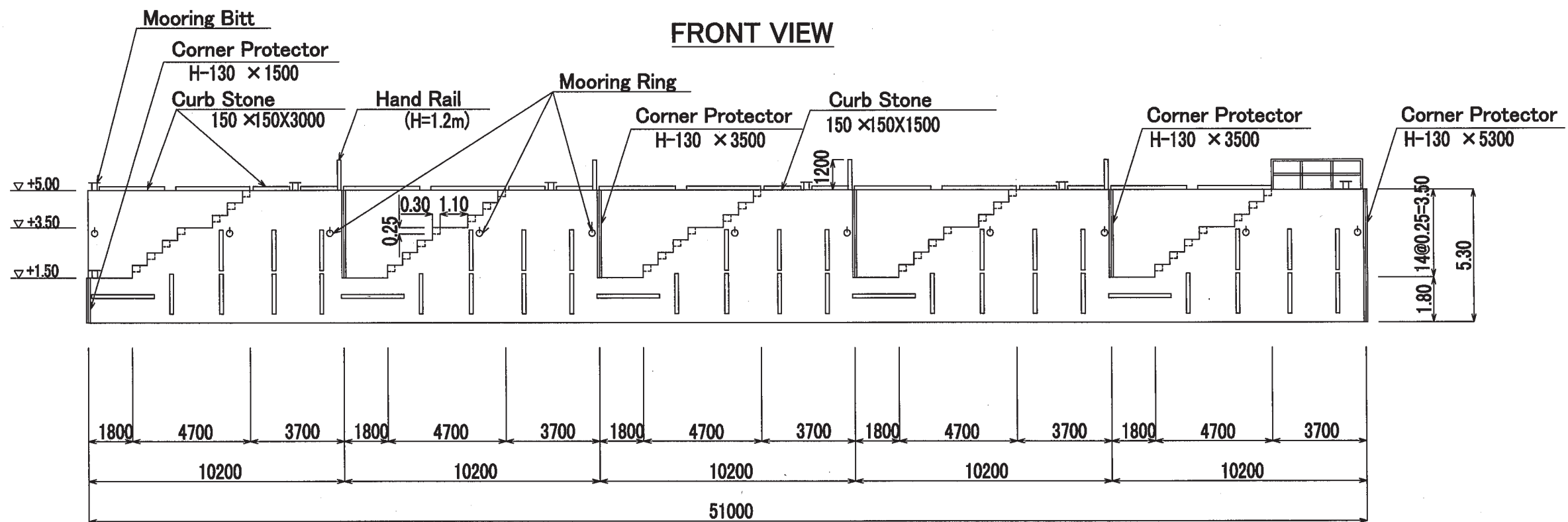
Soil Classification	N-Value	Mean N-Value	γ	C	ϕ	E
	10 20 30 40 50		(tf/m ³)	(tf/m ²)	(°)	(kgf/cm ²)
DL+0.0						
DL-5.0	7, 13	10	1.80 (1.00)	0.0	30.0	70
DL-10.0	21, 23	20	1.80 (1.00)	0.0	30.0	70
DL-16.0	13, 12, 11	10	1.80 (1.00)	0.0	30.0	70
DL-20.0	2	2	1.80 (1.00)	0.0	25.0	15
DL-25.0	15, 14, 19	15	1.80 (1.00)	0.0	30.0	100

():Submerged Unit Weight

PLAN



FRONT VIEW



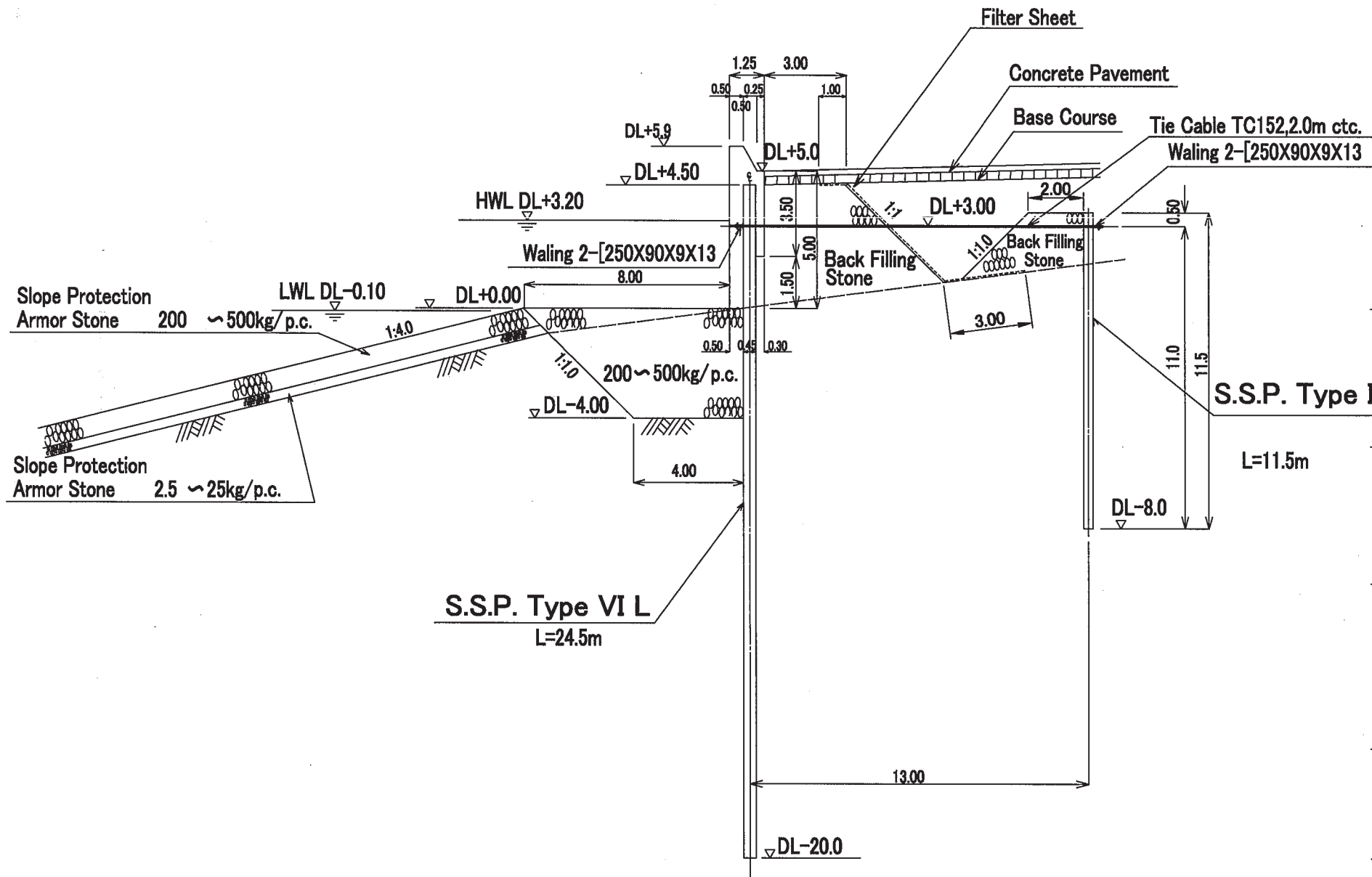
UNITED REPUBLIC OF TANZANIA
 BASIC STUDY ON THE PROJECT FOR
 CONSTRUCTION OF DAR ES SALAAM FISH MARKET

JAPAN INTERNATIONAL COOPERATION AGENCY
 NIPPON KOEI CO.,LTD.
 SYSTEM SCIENCE CONSULTANTS INC.

DWG. TITLE
ARRANGEMENT PLAN OF FISH LANDING WHARF

SCALE
1:200

DWG. Number
2 - 79



Elevation	Soil Classification	N-Value					Mean N-Value	γ (tf/m ³)	C (tf/m ²)	ϕ (°)	E (kgf/cm ²)
		10	20	30	40	50					
DL+0.0	SAND with coral fragment	7					10	1.80 (1.00)	0.0	30.0	70
DL-5.0	SAND with coral fragment	13					20	1.80 (1.00)	0.0	30.0	70
DL-10.0	SAND with coral fragment	13					10	1.80 (1.00)	0.0	30.0	70
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UNITED REPUBLIC OF TANZANIA
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CONSTRUCTION OF DAR ES SALAAM FISH MARKET

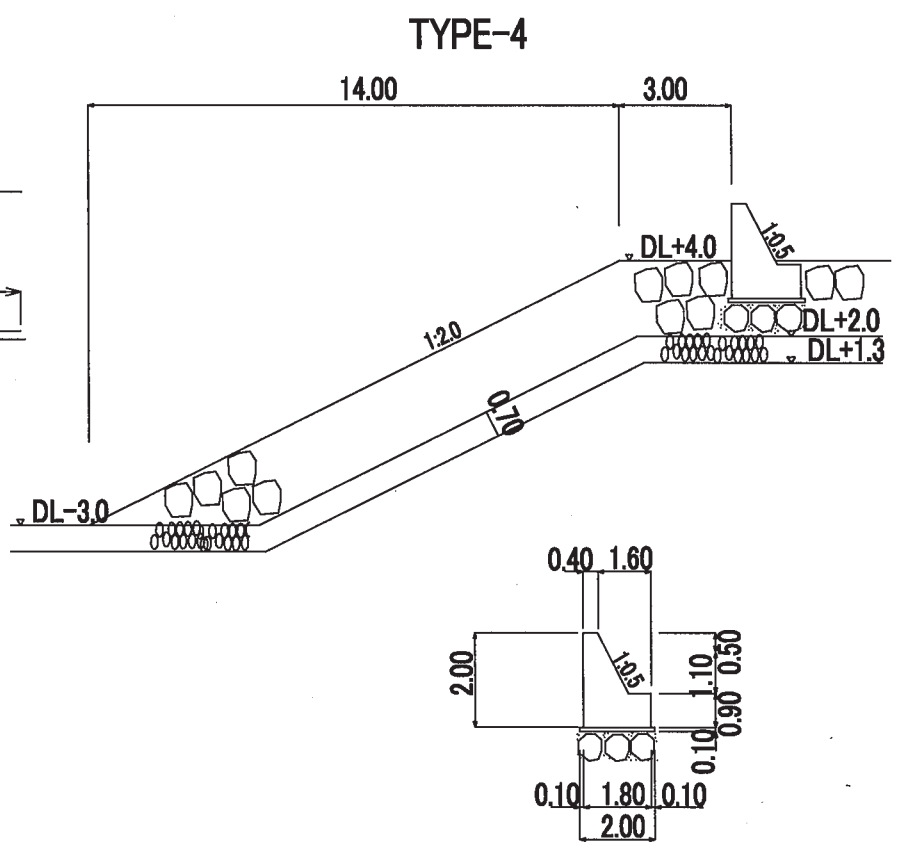
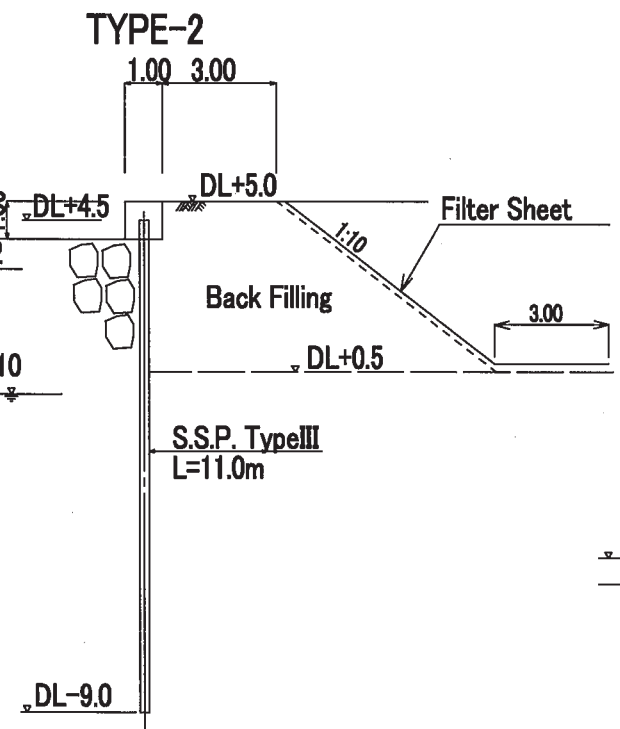
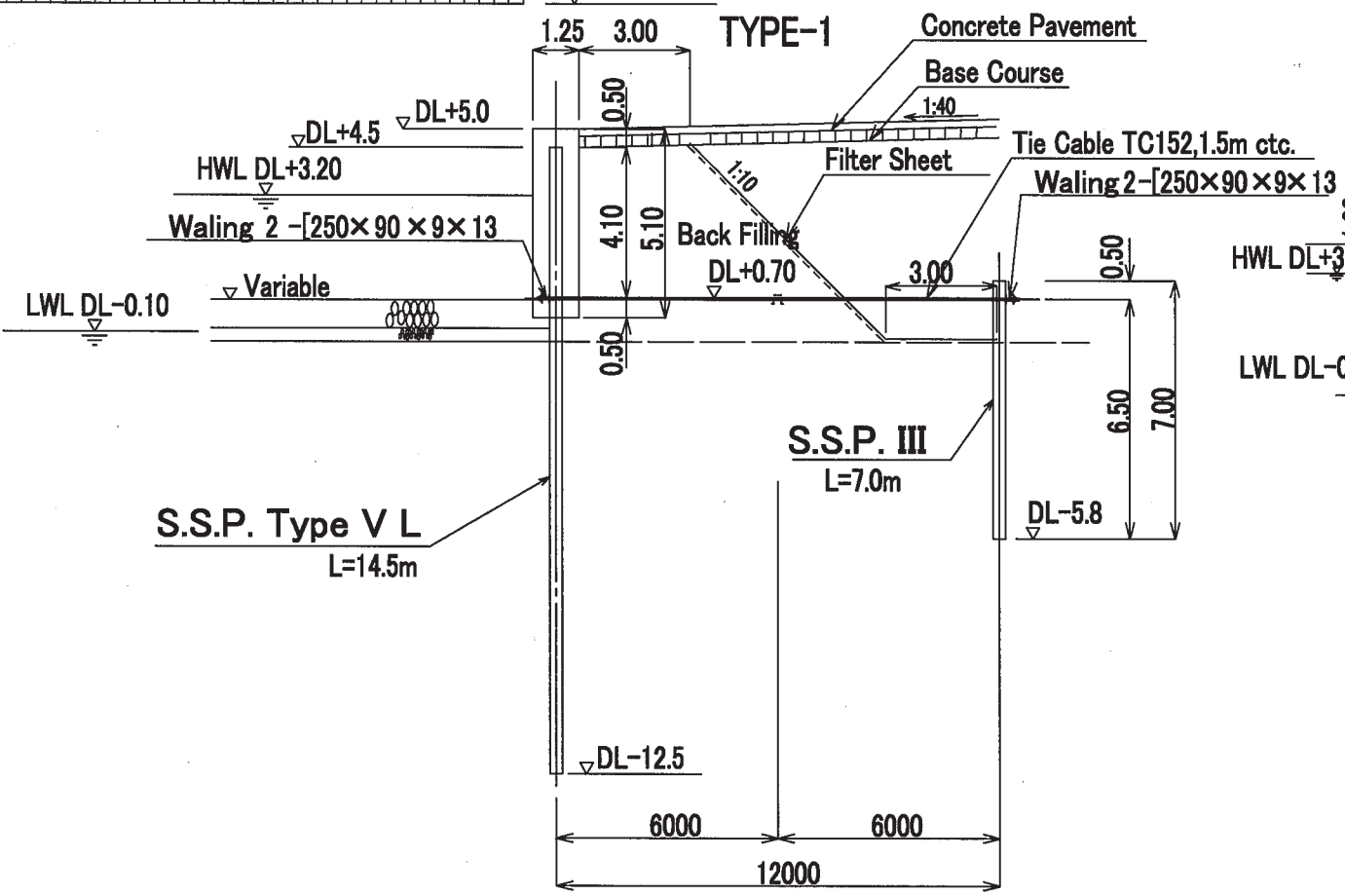
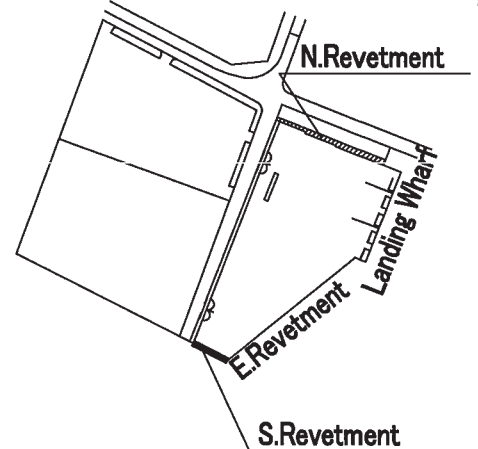
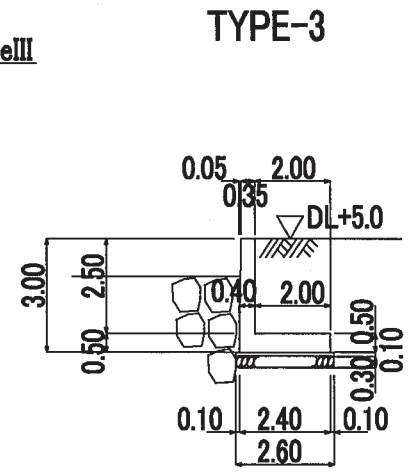
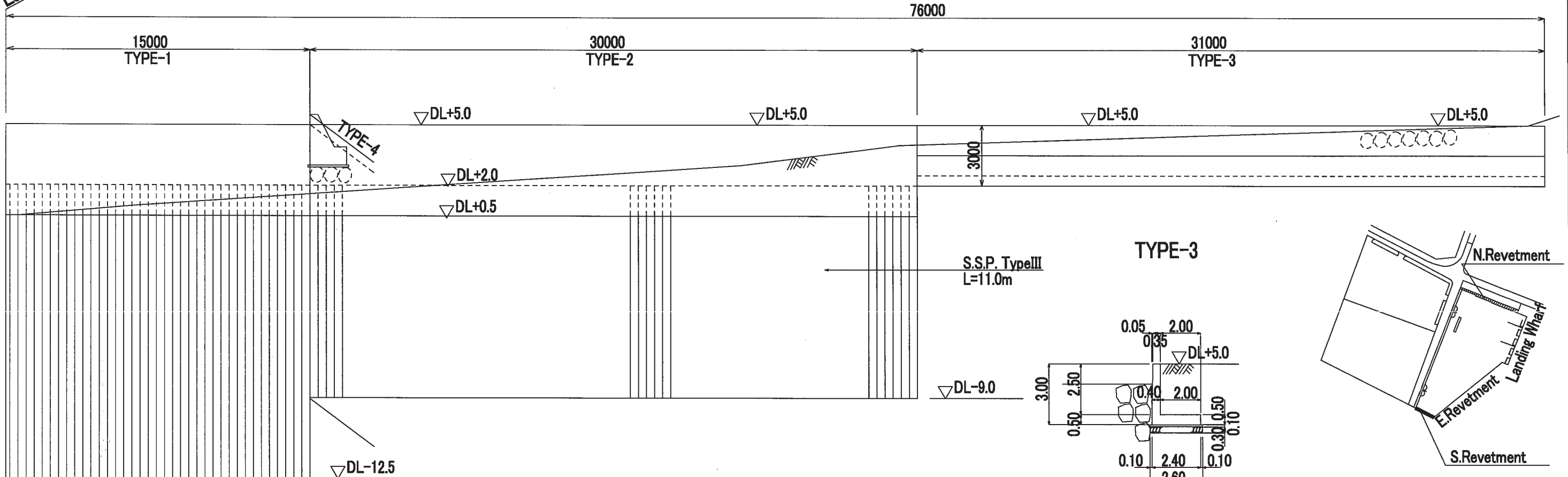
JAPAN INTERNATIONAL COOPERATION AGENCY
NIPPON KOEI CO.,LTD.
SYSTEM SCIENCE CONSULTANTS INC.

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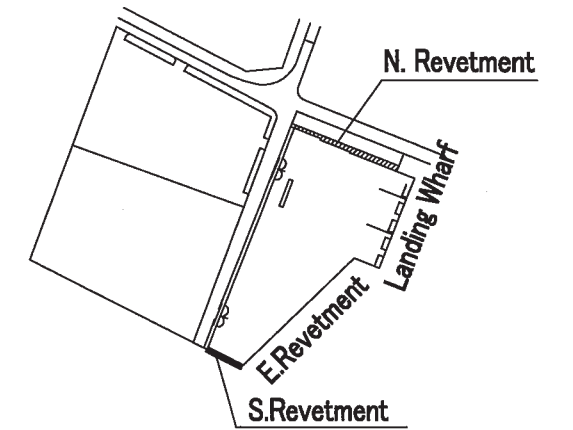
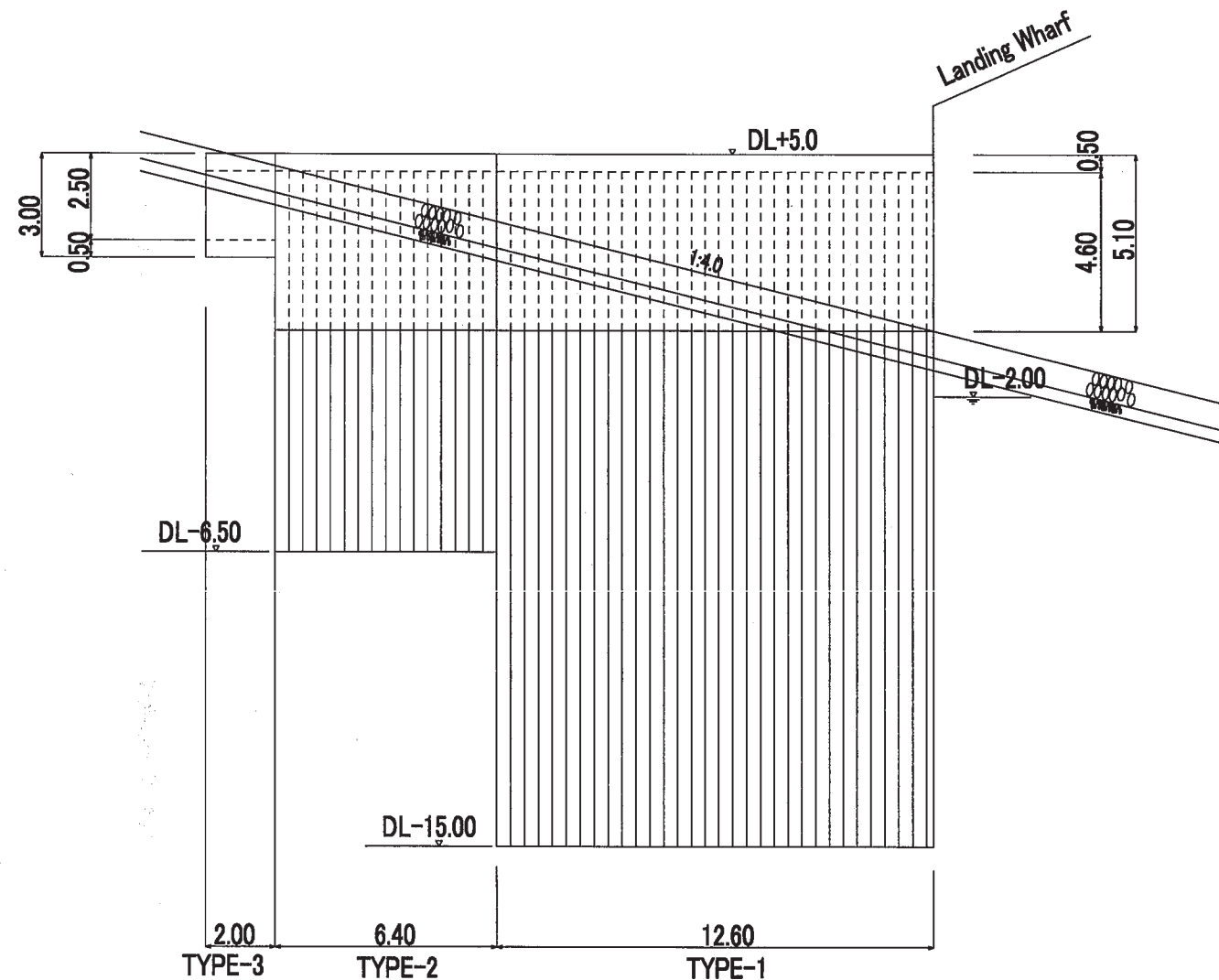
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Landing Wharf



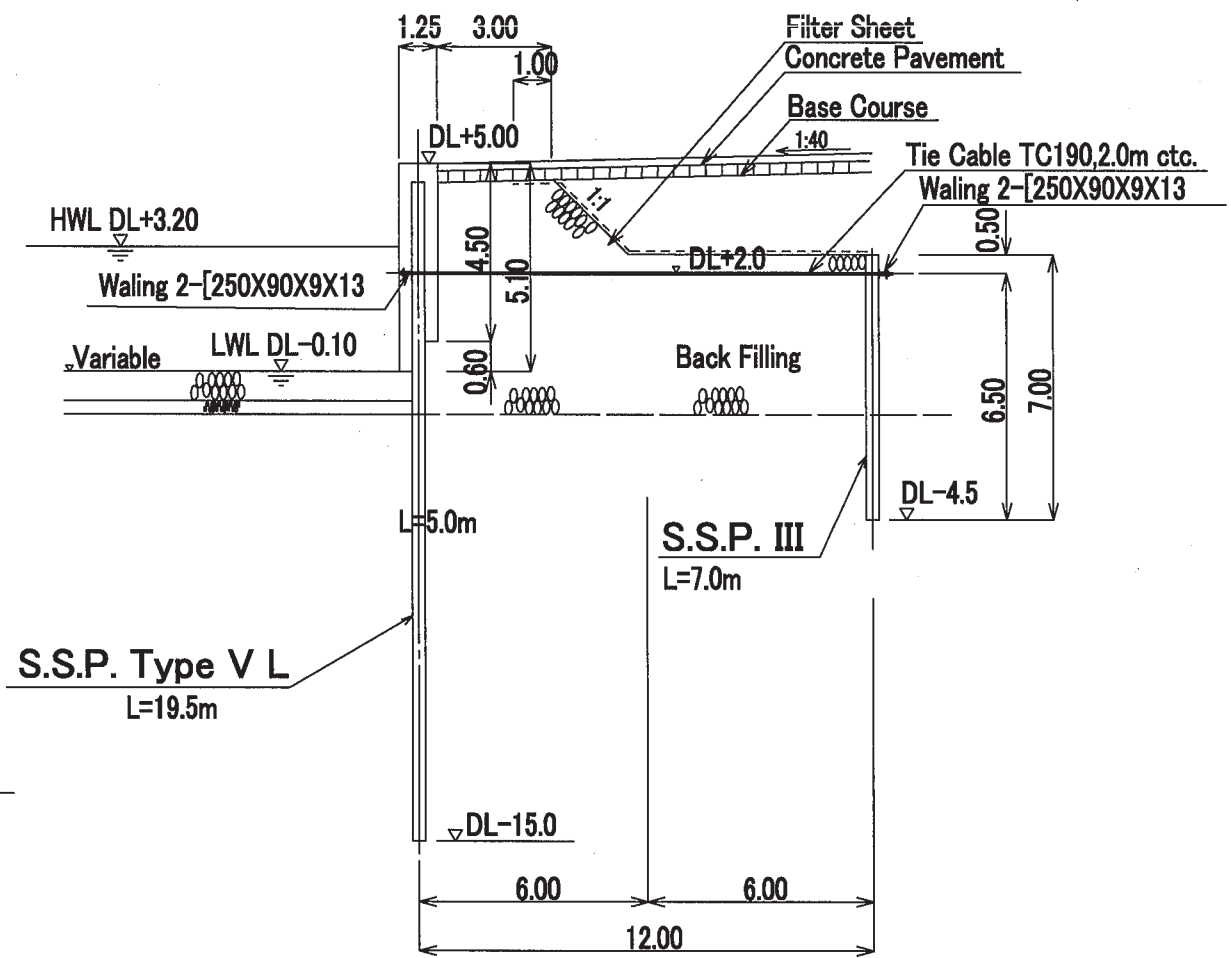
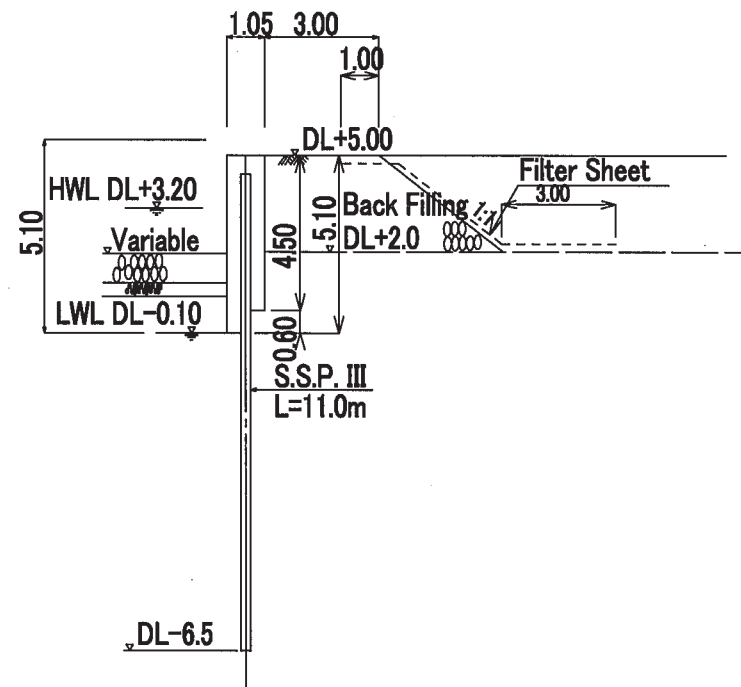
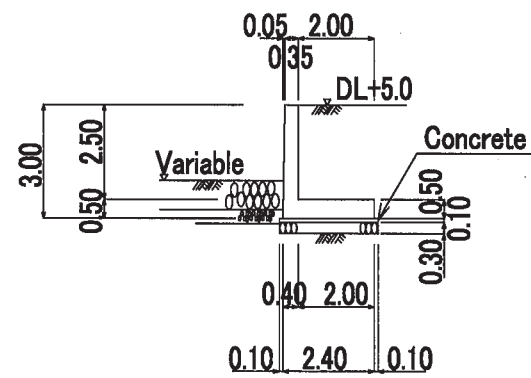
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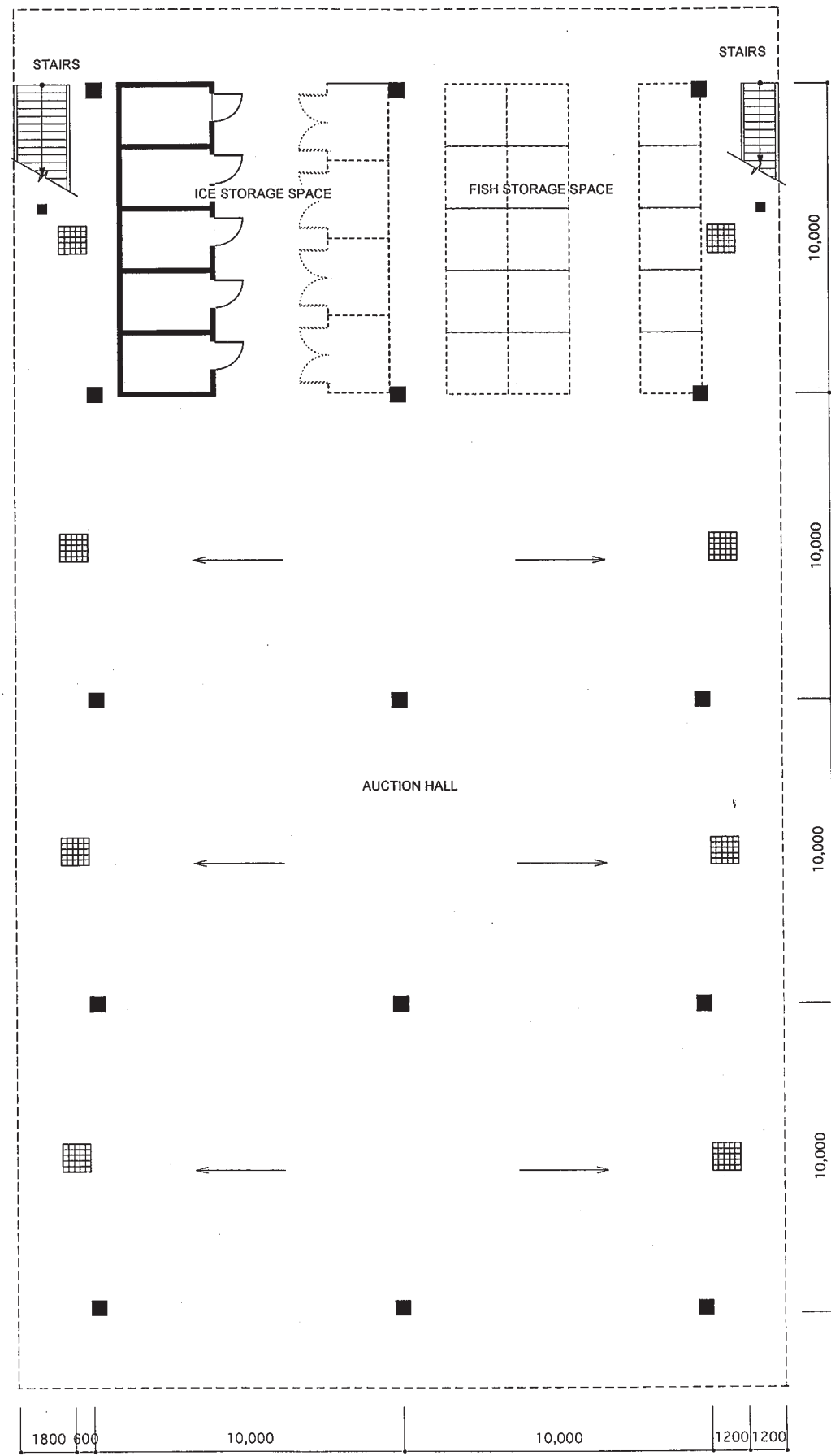
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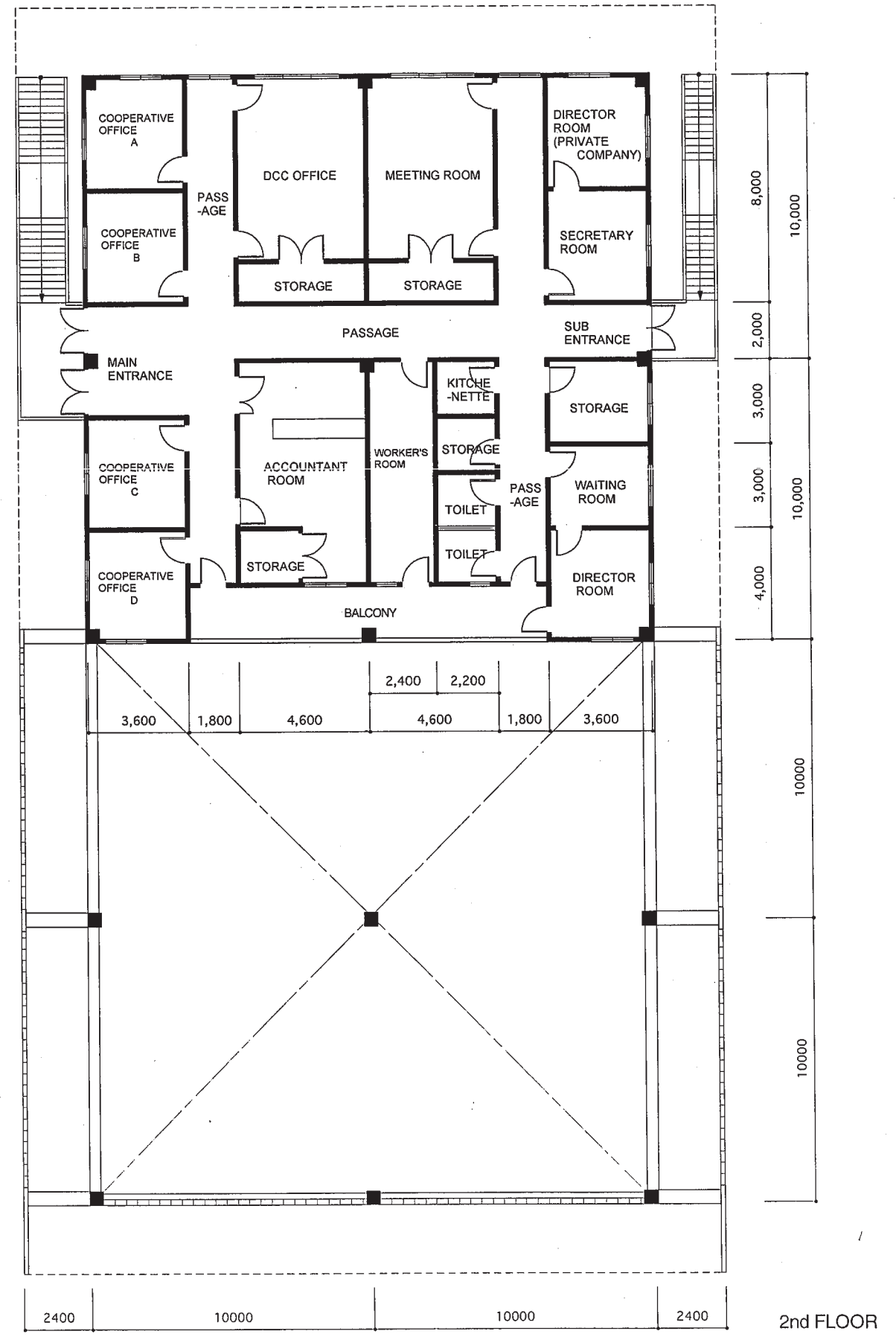
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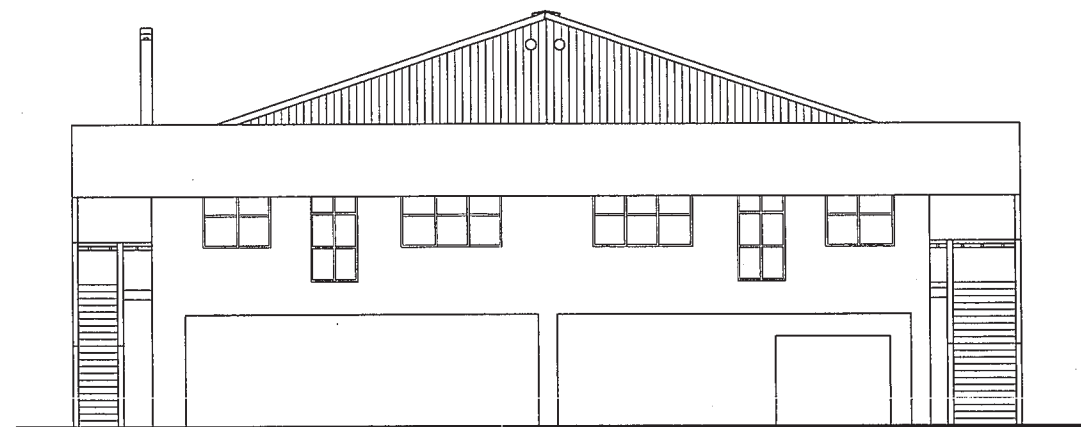
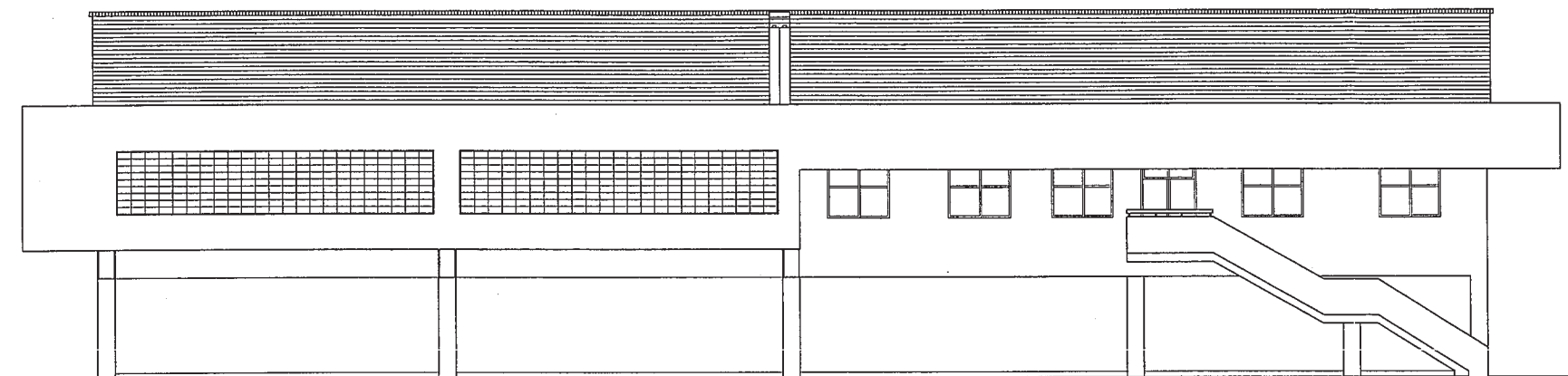
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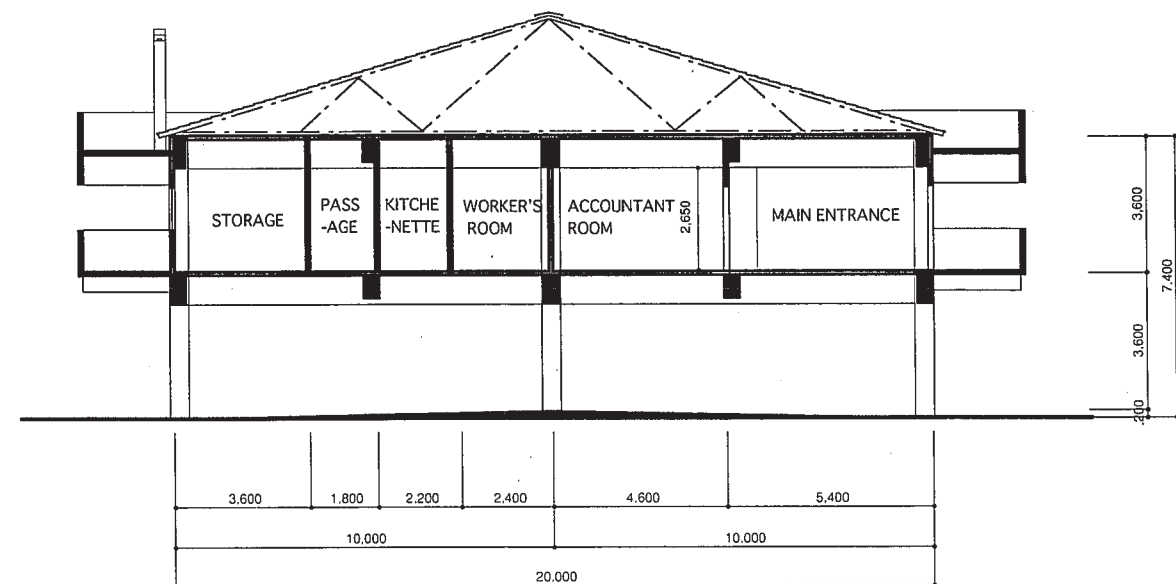
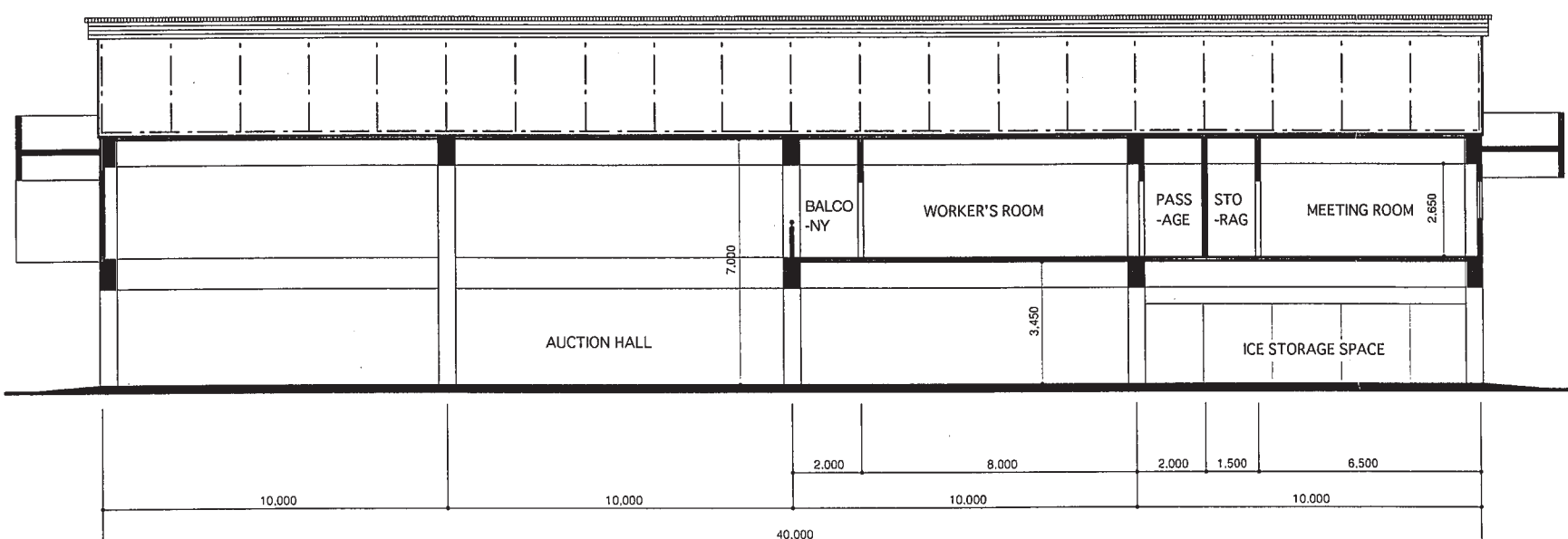
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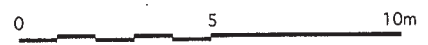
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ELEVATION



SECTION



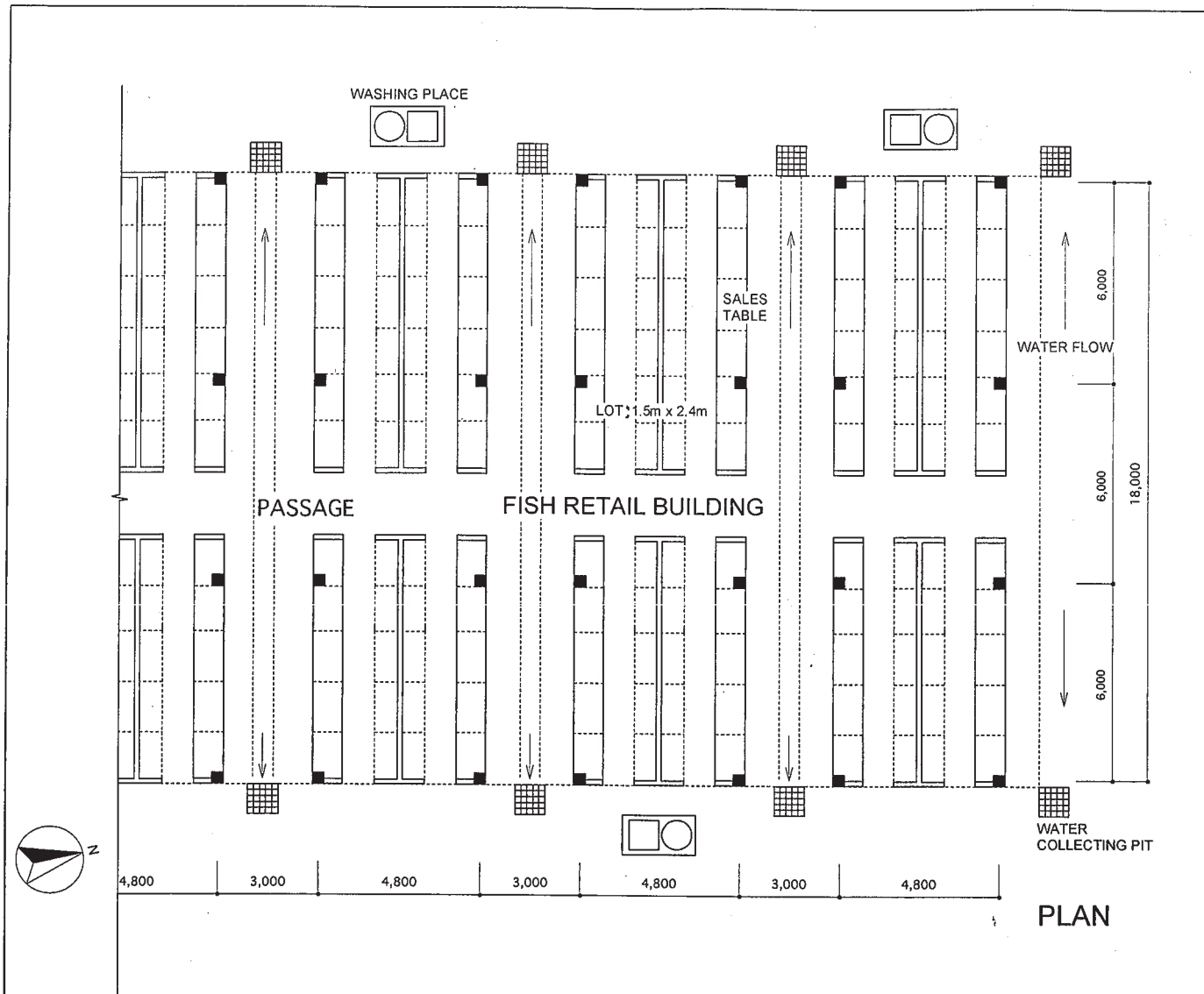
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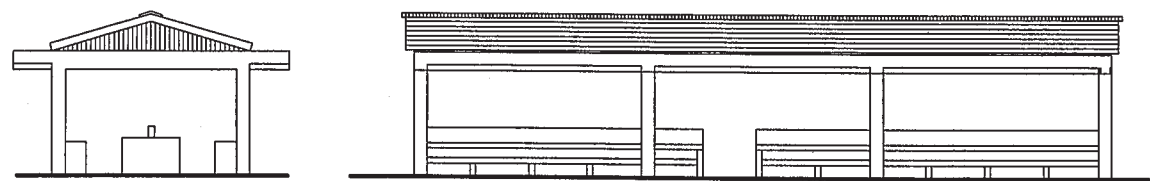
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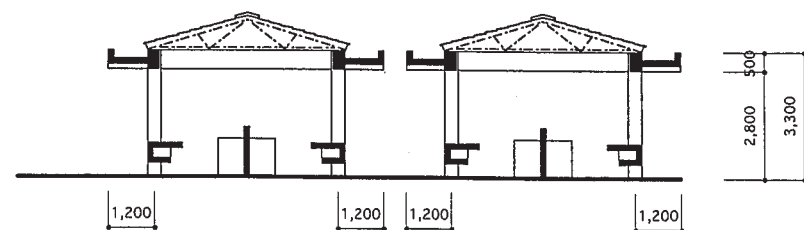
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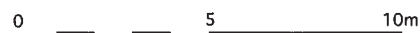
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ELEVATION



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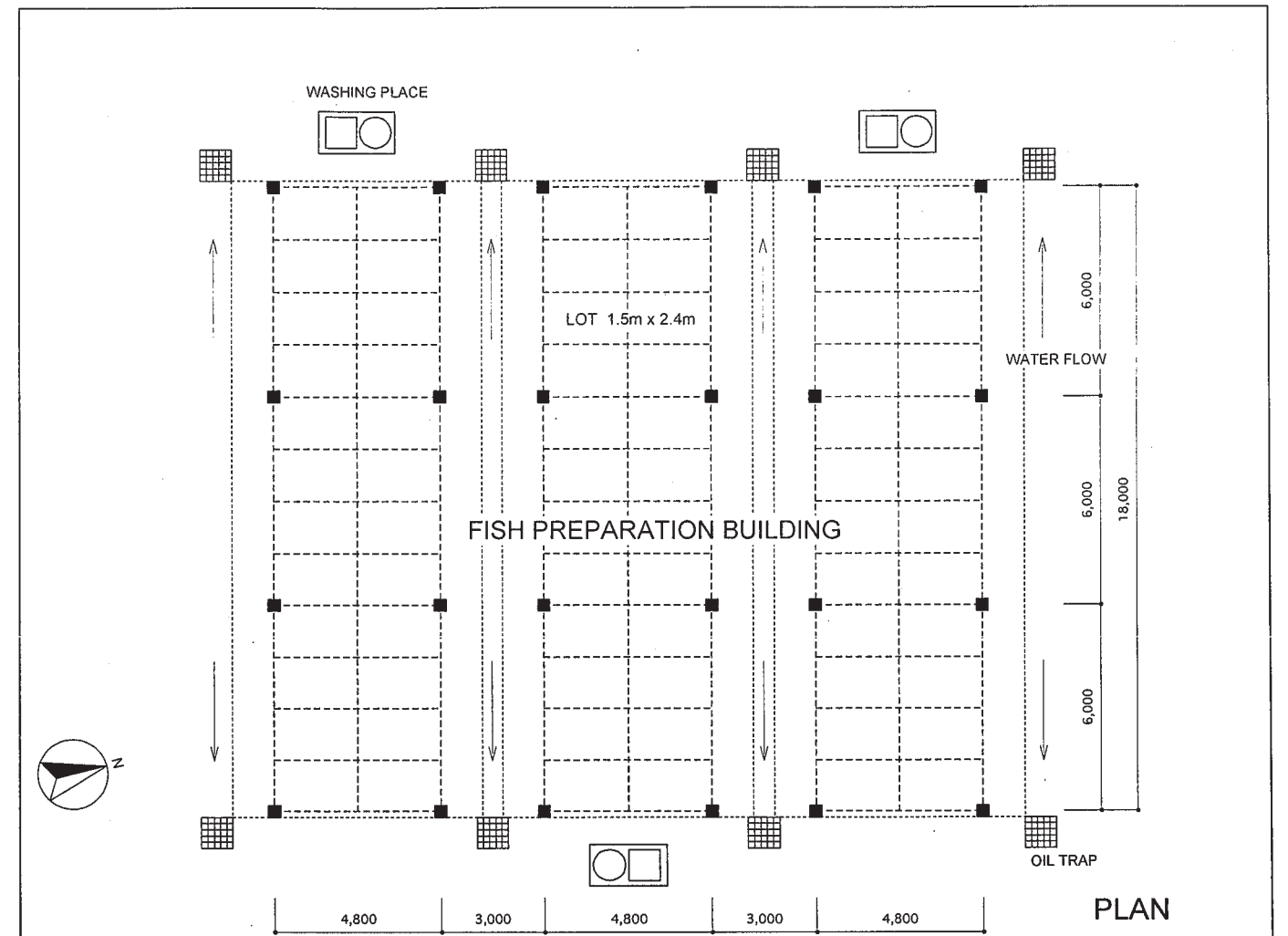
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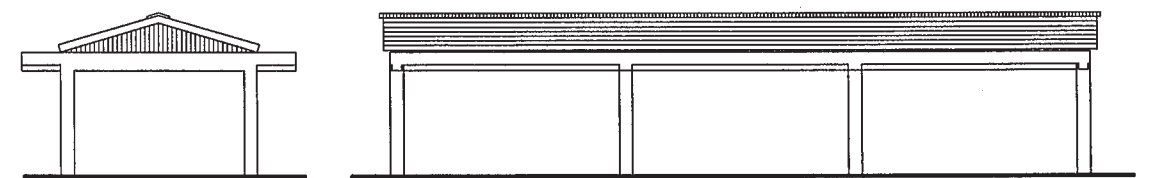
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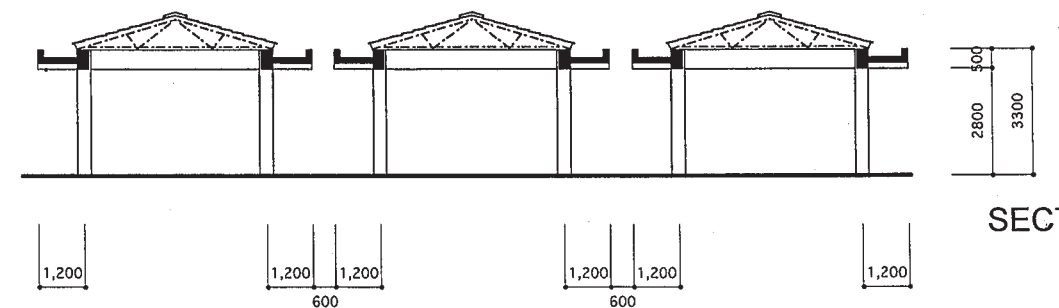
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ELEVATION



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UNITED REPUBLIC OF TANZANIA
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CONSTRUCTION OF DAR ES SALAAM FISH MARKET

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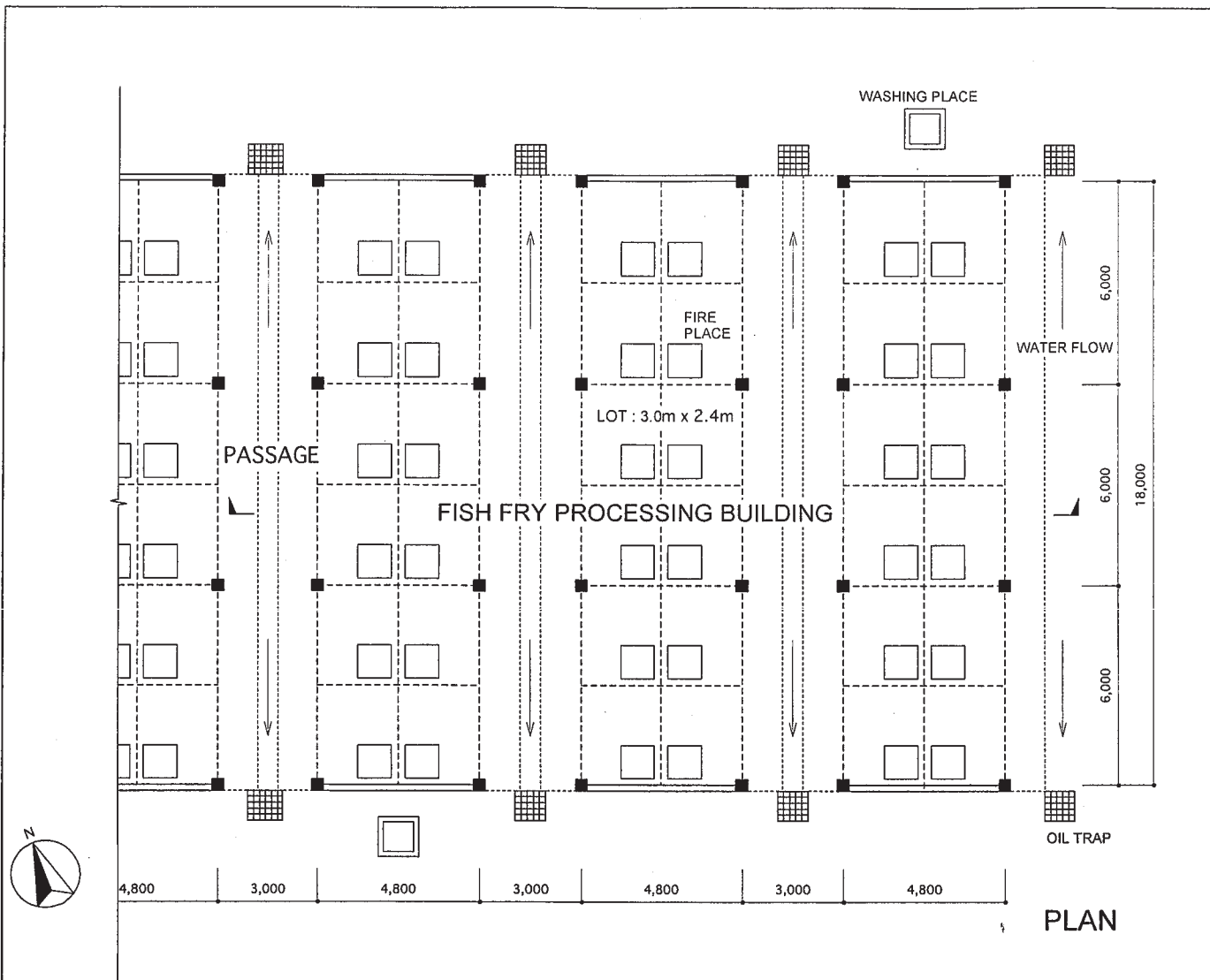
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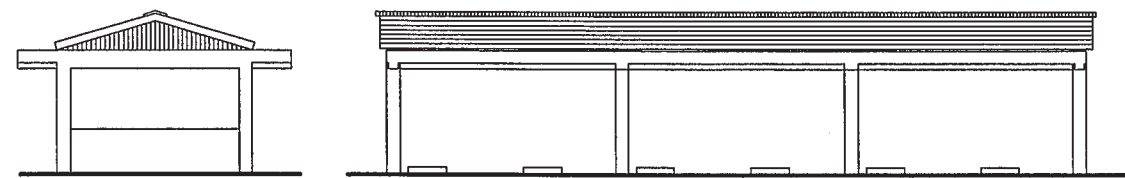
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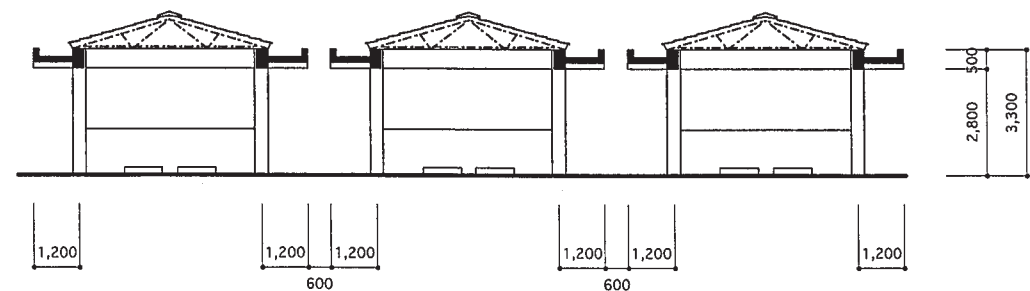
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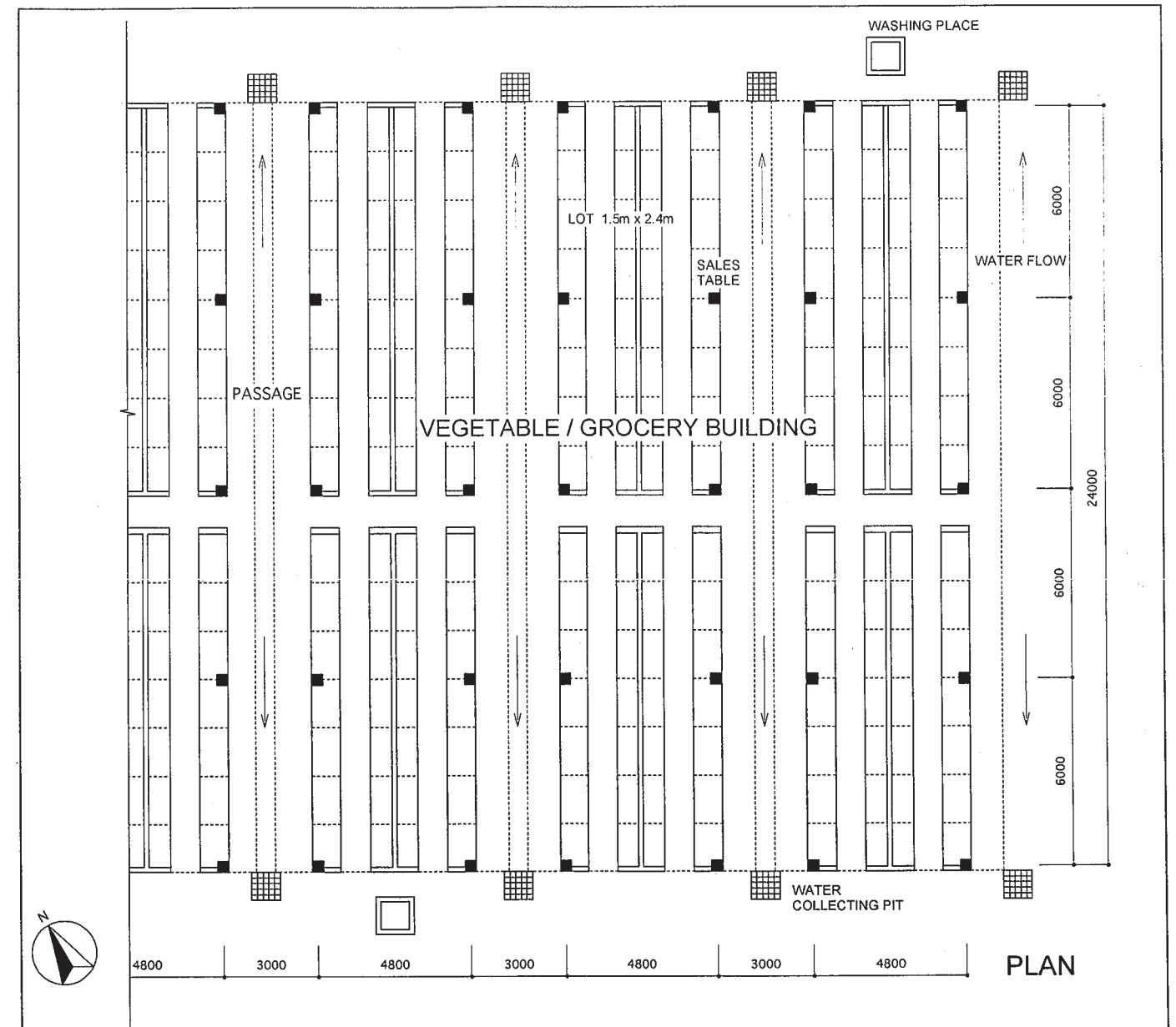
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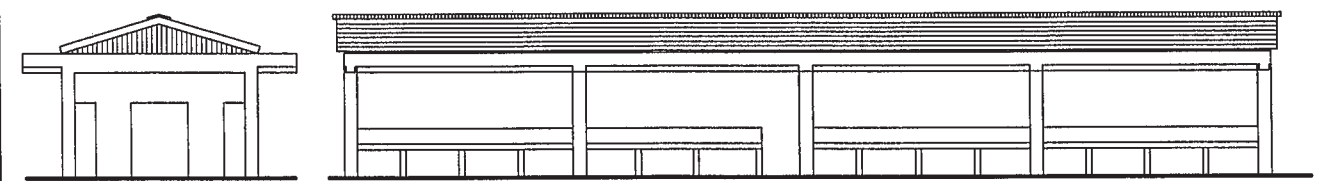
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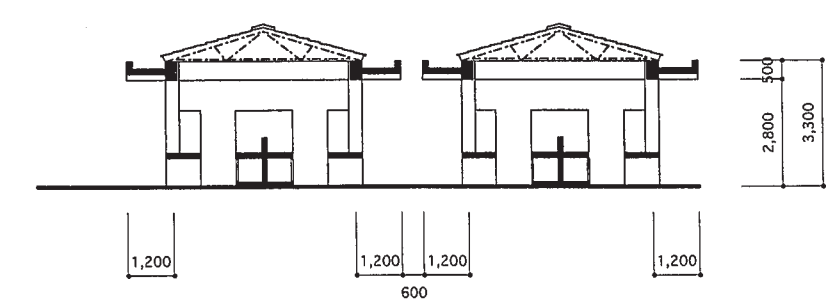
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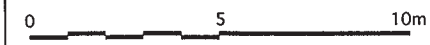
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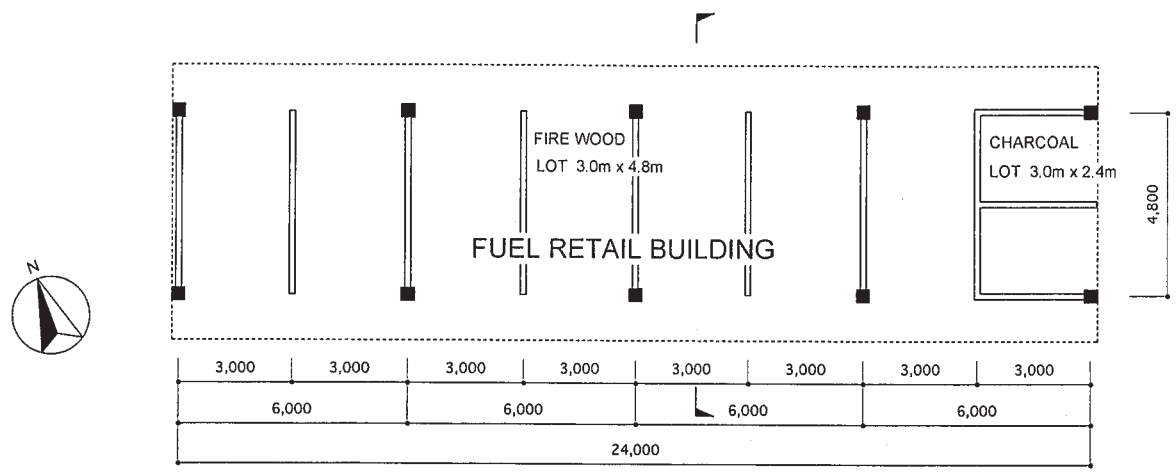
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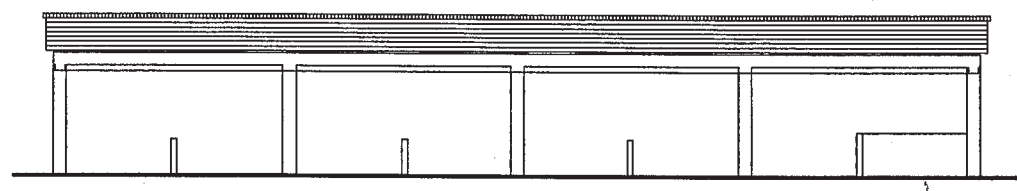
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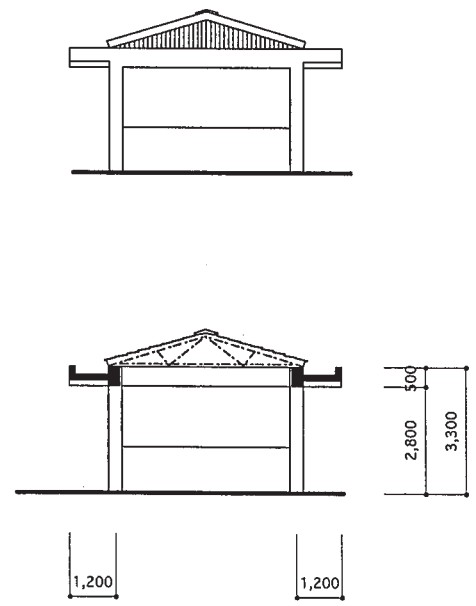
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PLAN



ELEVATION



SECTION

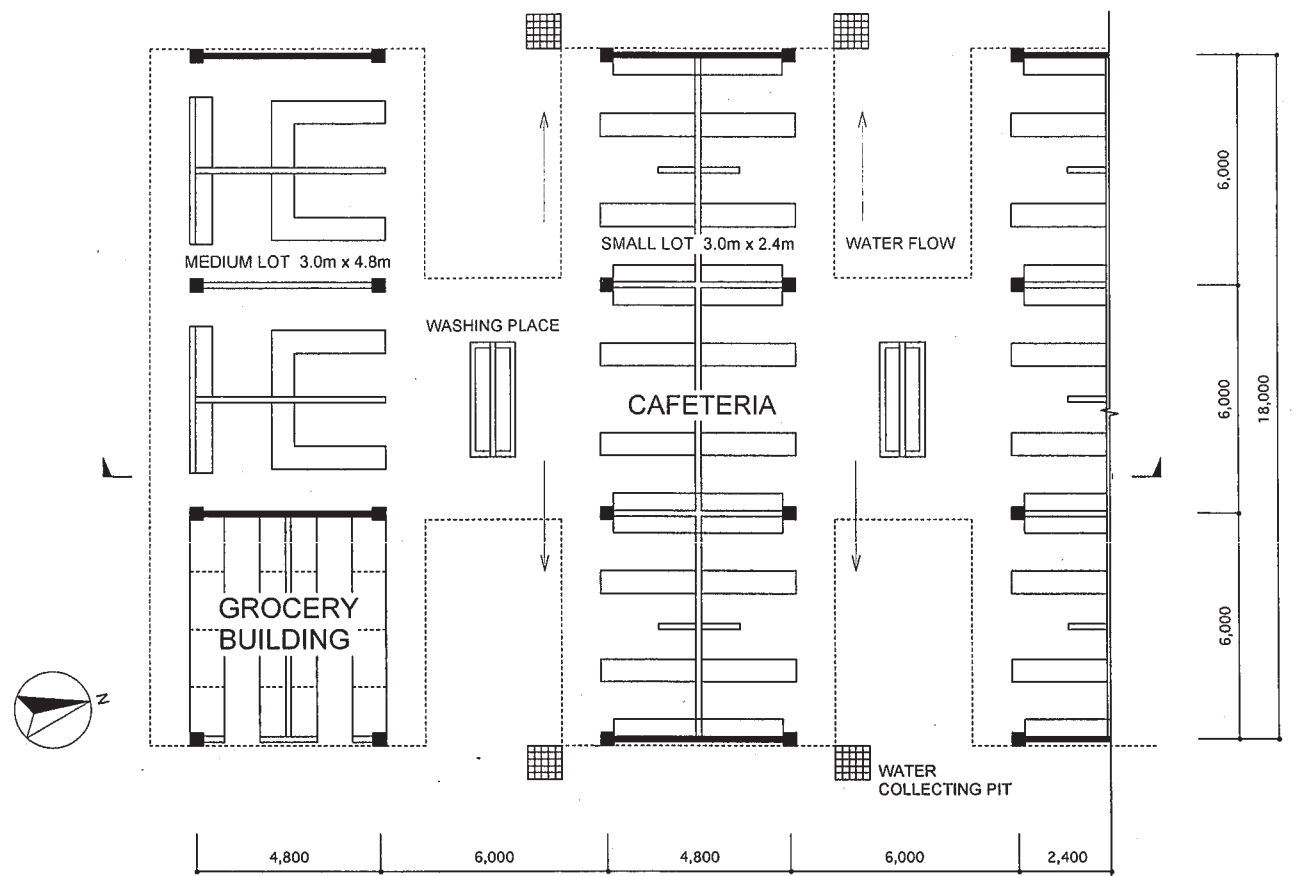
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UNITED REPUBLIC OF TANZANIA
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PLAN/ELEVATION/SECTION

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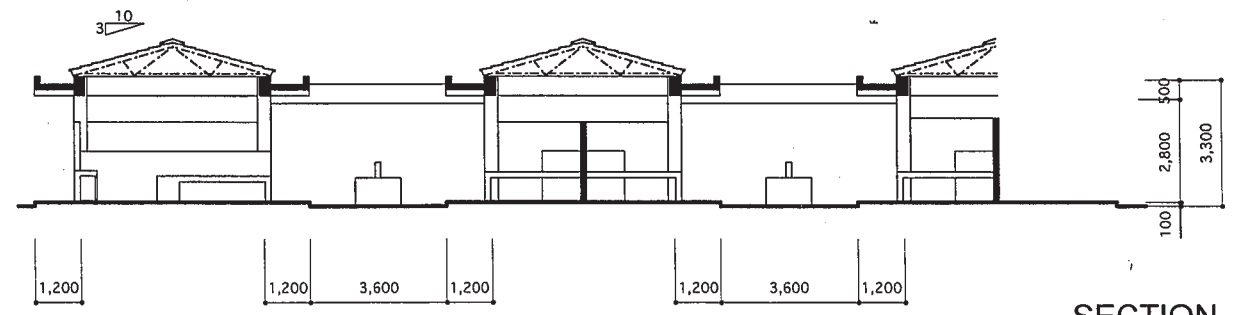
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PLAN



ELEVATION



SECTION

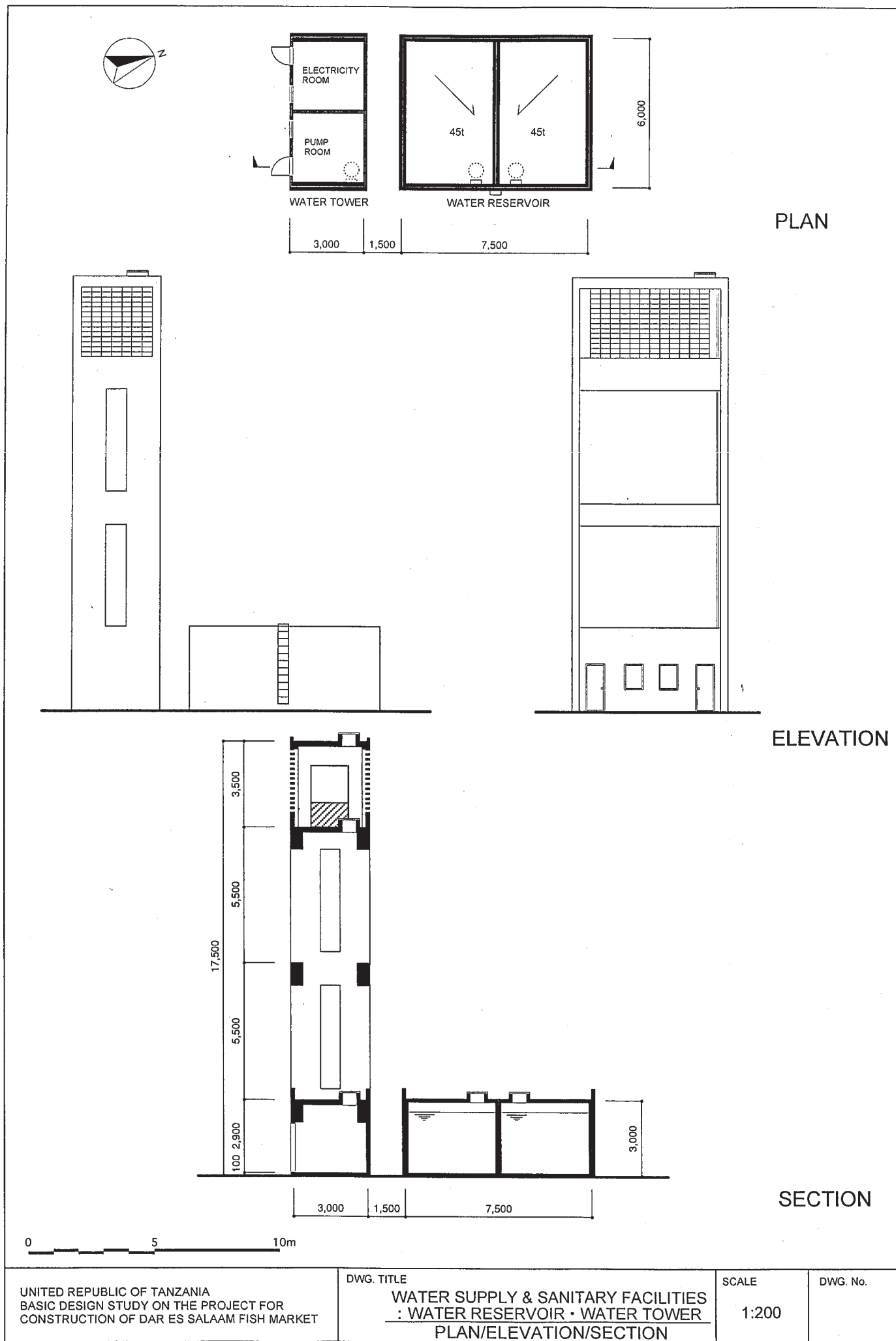
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CONSTRUCTION OF DAR ES SALAAM FISH MARKET

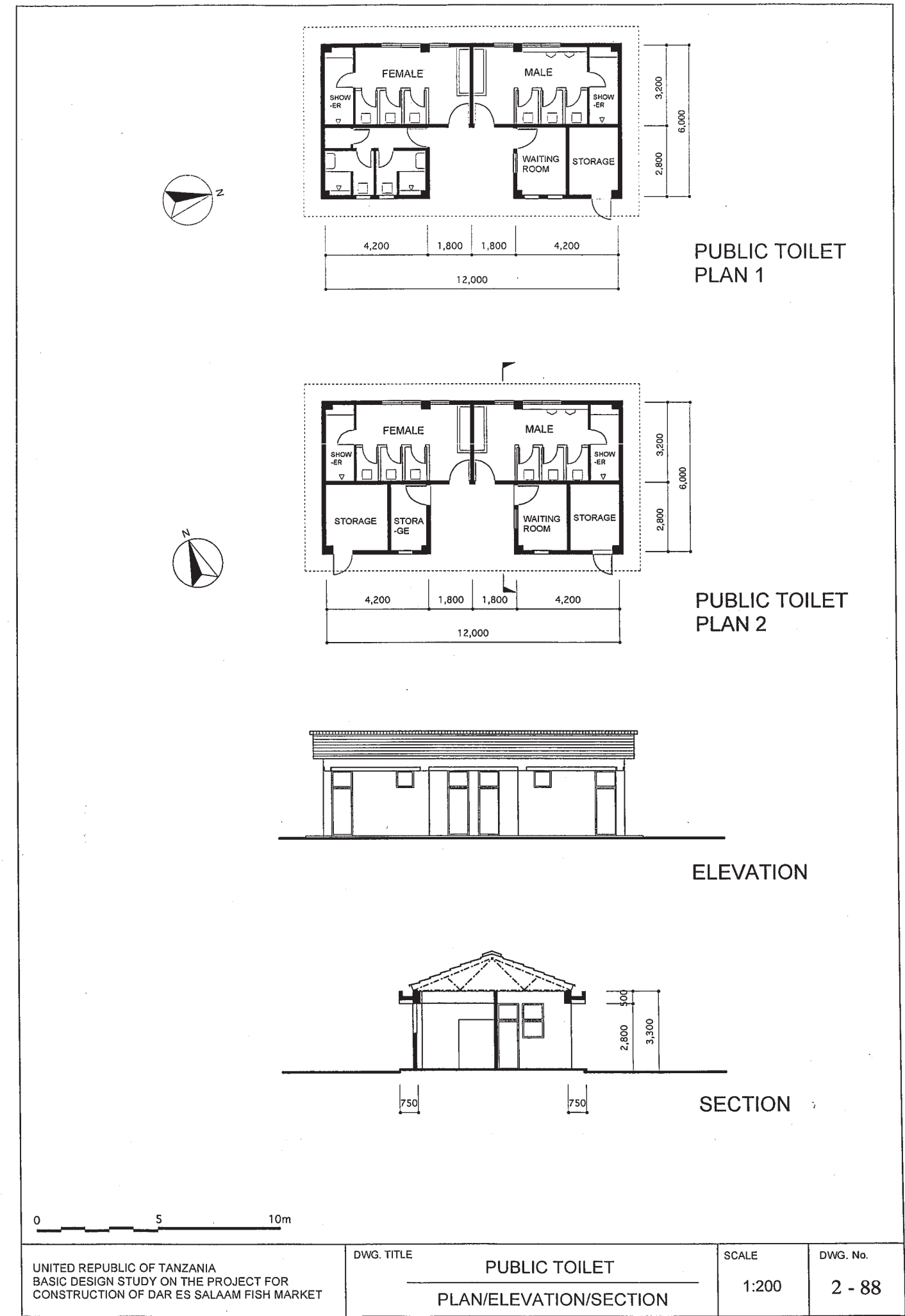
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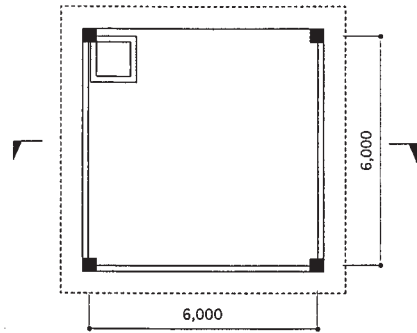
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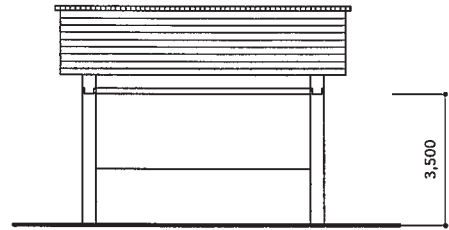
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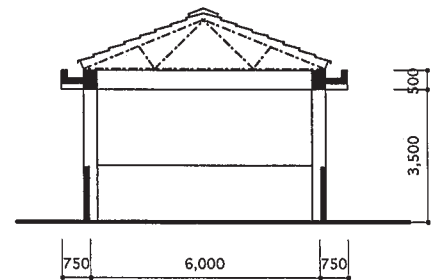
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PLAN



ELEVATION



SECTION

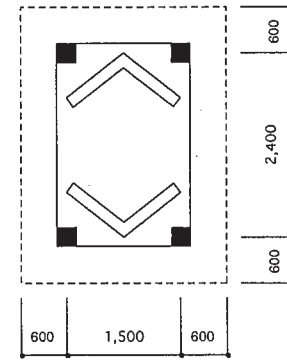


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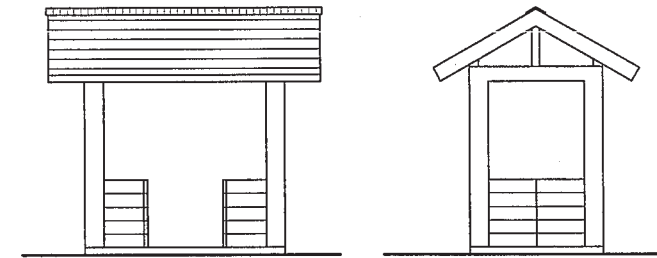
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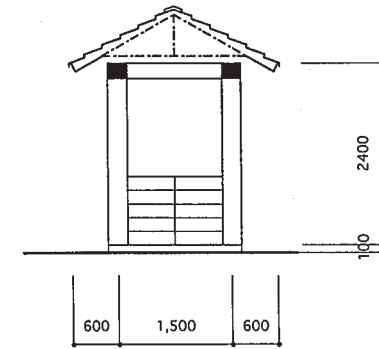
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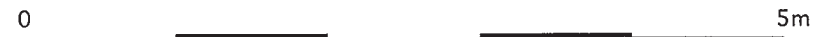
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ELEVATION



SECTION



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UNITED REPUBLIC OF TANZANIA
BASIC DESIGN STUDY ON THE PROJECT FOR
CONSTRUCTION OF DAR ES SALAAM FISH MARKET

DWG. TITLE
WATCHMAN BOX
PLAN/ELEVATION/SECTION

SCALE
1:100

DWG. No.
2 - 89

2.17 Basic Concept for Project Implementation

2.17.1 Organization

The ministry in charge of overseeing the Project is MNRT and the project implementing body is the DCC. In addition, following the completion of the Project, DCC will be responsible for supervising the management and operations of the market.

Figures 2.17.1 and 2.17.2 show the organization chart of MNRT and DCC.

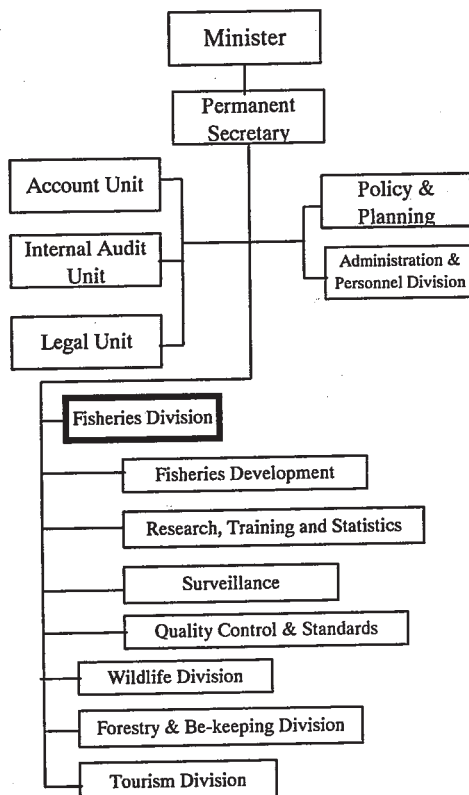


Figure 2.17.1 Organization of MNRT

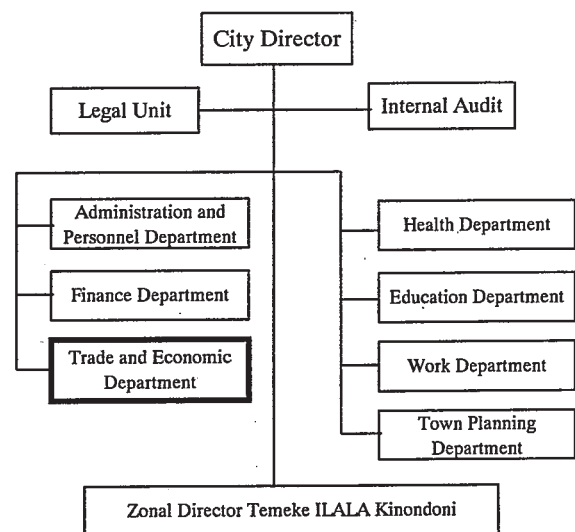


Figure 2.17.2 Organization of DCC

A new management organization as shown in Figure 2.17.3 will be established for the fish market in Dar es Salaam since the existing market does not have a management organization. The market will be managed by a Steering Committee comprised of DCC and representatives of the users and maintenance company. The actual day-to-day operations, maintenance, and management of the market will be consigned to the private maintenance company, which will be staffed by approximately 30 members. A total of 42 staff members, including 12 DCC members, will be responsible for managing the market. The Administrative Director will be from the DCC.

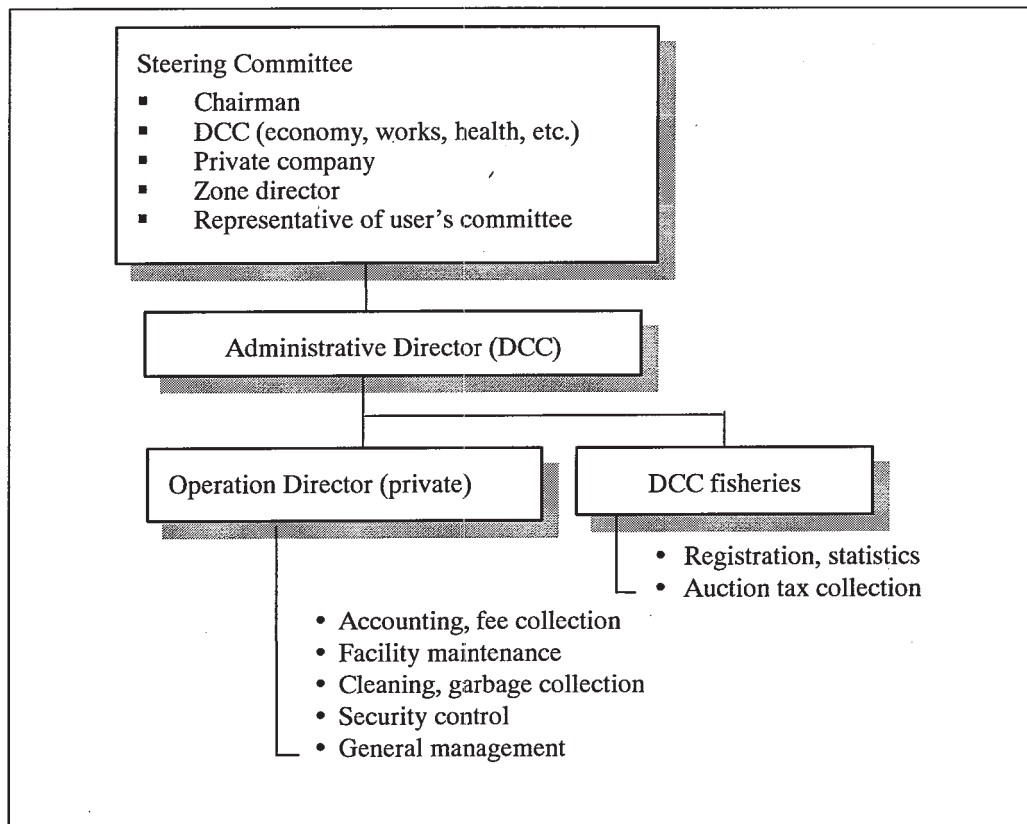


Figure 2.17.3 Administrative Structure of New Fish Market

Steering Committee

The steering committee is responsible for deciding the policies of the market and for supervising and monitoring the market. The committee will be chaired by the mayor of Dar es Salaam city and will be comprised of the representatives of the DCC dept. (Trade & economic, Health, Works and others) and related agencies, private maintenance company, user's committee, and representatives of district office.

Administrative Director

The administrative director will be appointed by the mayor of Dar es Salaam city and he will be responsible for managing the revenue and expenditures of the market.

Private maintenance company

The private company will be responsible for collecting the facility fees, paying expenditures (utility, cleaning, garbage collection fees etc), and other day-to-day administrative tasks of managing the market. The company will be recruited through newspapers ads and will be selected through tender by the city. The steering committee will be responsible for deciding and approving the details of

the administrative tasks and the TOR of the company.

DCC Fisheries Office

Presently, 11 DCC staff members are assigned to the existing market who are responsible for registration of fishing boats, collecting fishing information and Fish Auction Tax from the fishermen. They will continue to carry out these duties at the new market, and registering market users and collecting information will be added to their task in the new market.

Table 2.17.1 Plan of Market Staff

Staff	No.	Cost (Tsh/m)	Remarks
[Public: DCC]			
▪ Administrative Director	1	Paid by DCC	
▪ DCC fisheries staff	11	- do -	Registration & information 5, Tax collector 6
[Private company]			Similar to markets in DSM, such as Temeke, Makonbusho
▪ Operation director	1	100,000	
▪ Assistant director	1	80,000	
▪ Secretary	1	60,000	
▪ Accountant	1	80,000	
▪ Clerk	2	40,000	
▪ Janitor	10	30,000	
▪ Security personnel	6	40,000	Day and night rotation (3 each)
▪ Fee collector	8	40,000	
Annual Total	42	1,260,000	15,120,000 Tsh (US\$21,000)

2.17.2 Budget

Table 2.17.2 shows the budgets for MNRT and its Fishery Division for the last 5 years.

Table 2.17.2 Budgets for MNRT for Last 5 Years Unit:1,000Tsh

	Fiscal Year				
	1995	1996	1997	1998	1999
MNRT	1,466,255	1,626,207	6,455,175	7,898,581	8,305,864
Fishery Division	215,312	193,590	1,842,411	1,828,746	1,620,819

Source: MNRT

The following table indicates the budgets for DCC. They increased greatly in 1997.

Table 2.17.3 Budgets for MNRT for Last 5 Years Unit:1,000Tsh

	Fiscal Year				
	1995	1996	1997	1998	1999
Revenue	977,442	2,597,300	5,509,955	7,419,646	9,193,697
Subsidiary	4,921,715	4,505,264	5,756,823	5,953,021	8,455,254
Total Budget	5,899,157	7,102,564	11,266,778	13,372,667	17,648,951

Source: DCC

The collection of market user fees, etc. is expected to help the market achieve a self-supporting accounting system. The existing market does not collect market user fees from retailers and the 5 % tax collected from fishing boat registrations and fish sales is treated as a city's revenue. A revenue of 21 million Tsh is estimated from the three fish markets, including Banda Beach market, for FY1999/2000 (see table below). Following the implementation of this Project, the DCC will set up an independent account for the sales tax generated from wholesale fish sales, in order to secure the capital needed to operate the market.

Table 2.17.4 Revenue of Fish Auction Tax for 5 years (1995-99) unit:1,000Tsh

1995	1996	1997	1998	1999 (expected)
9,470	26,488	22,474	14,310	21,800

Source: DCC

2.17.3 Technical Level of Staff

The direct management and operations of the market will be carried out by the private company due to the shortage of DCC staff members to manage the market. The DCC has the experience of consigning the entire management and operations of a market to a private company and the Kariakoo market exemplifies the ability of a private company with a certain level of management capabilities to manage market operations. Therefore, no problems are anticipated with this arrangement. However, there are not many private sector or government personnel experienced in managing a market where fresh fish is the major product. Therefore, technical assistance is needed for the market supervisors in fresh fish transactions and fish market operations.