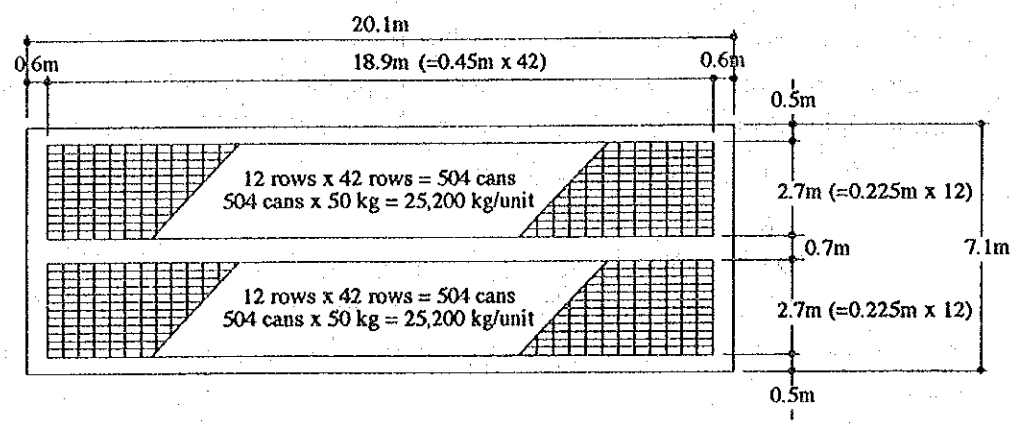


Figure 3.3.5 Ice-making Tank Plan (50 tons per day)

The required floor area for the ice-making tank, ice thawing tank, and raw water filling tank, plus adequate handling space, will be 960 sq.m.

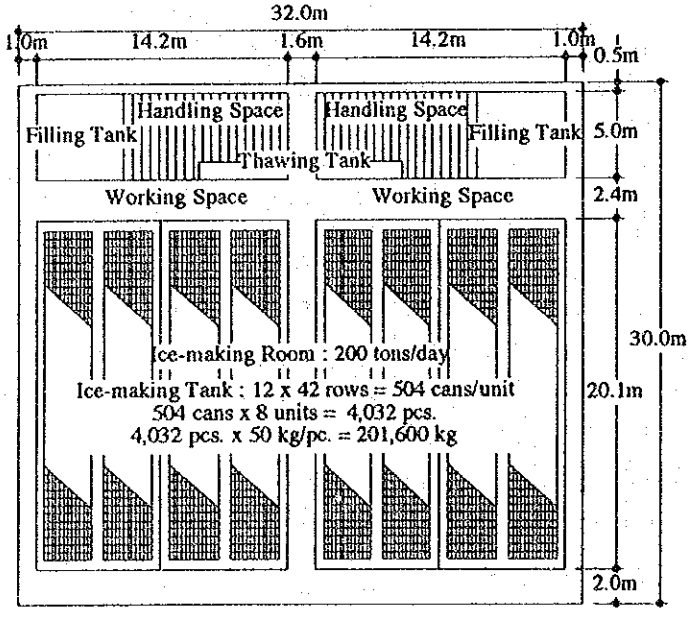


Figure 3.3.6 Ice-making Room Plan (Floor Area : 960 sq.m)

b) Size of Ice Storage Unit:

We shall next calculate the capacity needed to store 1,000 tons of ice. In this Project, the 1,000 tons will not be stored in one room but equally distributed over 4 rooms (250 tons/room x 4 rooms). This multiple room plan will enable the facility to cope effectively with breakdowns

and maintenance of the refrigeration equipment and to reduce storage volume when catches are poor.

Ice storage operations may be either manual or mechanized via conveyors. In this Project, however, given the small ice size (50 kg/block), manual operations will be ample to cope with loading requirements, in which case a suitable ice stacking height inside the ice storage units would be in the order of 2.4m.

The dimensions for the 50 kg ice blocks will be:

H x B x D = 400 x 200 x 800 mm

Since the ice will be stacked vertically,

400 mm x 6 layers = 2,400 mm.

Accordingly, a 6-layer ice-stacking method will be employed, with a total height of 2.4m. As shown in the following figure, ceiling height has been set at 4m.

The following figure shows the ice-stacking arrangement within the ice storage unit along with a typical sectional plan.

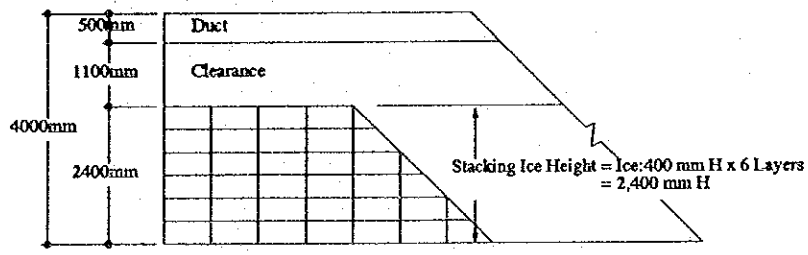


Figure 3.3.7 Ice Stacking Arrangement

The required area of each ice storage room will be:

250 tons/room ÷ 2.4m x 110% (margin) = 114.5 sq.m

However, required floor area in ice-stacking operation will be :

17.6m (=0.8m/pc. x 22 pcs.) x 6.0m (=0.2m/pc. x 30 pcs.) = 105.6 sq.m,

and the net volume of stacked ice in the ice storage room will be :

105.6 sq.m x 2.4m H = 253.44 cu.m.

Based on the above conditions, the approximate surface plan for the ice storage rooms will be as shown below.

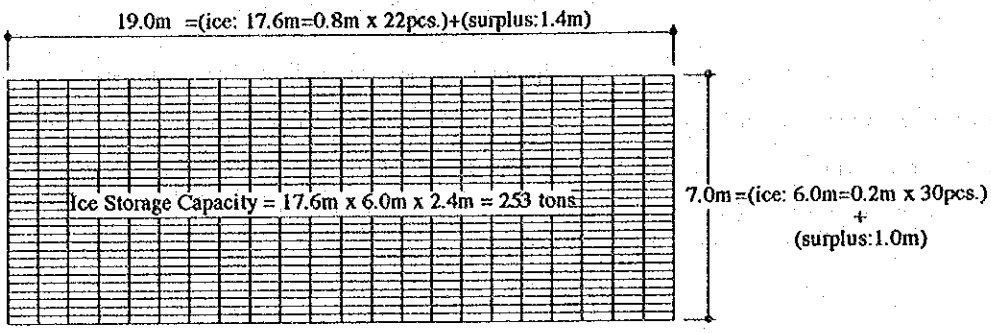


Figure 3.3.8 Ice Storage Unit Plan

A prefabricated structure will be built with overall dimensions of 7,000mm x 19,000mm x 4,000mm.

c) Size of the Machine Room :

The machine room will house the machineries for ice production and storage facilities, and chilling/cold storage machineries and quick-freezing machineries installed in the chilling/cold storage, such as condensers, compressors, pumps, and other machinery; as well as the emergency generator, power board, and other machinery for the Project facilities.

Table 3.3.10 Number & Dimensions of Machineries in the Machine Room

Machinery	Dimensions (unit: mm)	Number
(1) Condensing Unit for Ice Making	2400 x 1400	8
(2) Condensing Unit for Ice Storage	2100 x 1200	4
(3) Condenciing Unit for Quick Cold storage	2100 x 1200	1
(4) Condensing Unit for Cold/Chilling Storage	1600 x 900	2
(5) Pump for Defrosting	1200 x 800	2
(6) Receiver, Oil drum, Fuel tank	--------	1
(7) Freshwater Lifting Pump	1200 x 800	2
(8) Emergency Generator	4500 x 1700	1

Allowing for suitable placement of the above facilities as well as adequate space for maintenance and piping, the required floor space for the machinery room will be 256 sq.m.

d) Size of the Storage:

Periodic checks of salt density must be made at the ice facilities to measure brine evaporation in the brine tank and losses during ice thawing operations, with calcium chloride replenished as required to regulate this density. This area will include a regulating tank as well as supplies of calcium chloride and related materials for this purpose, maintenance equipment and materials for the ice-making room, and space for material storage. The floor area required to efficiently accommodate these items will be 75 sq.m.

e) Size of the Locker Room:

This space will include mainly a locker room, toilet, and shower room for ice-making plant workers. Allowing for placement of fixtures and suitable work space, the required floor area has been set at 75 sq.m.

f) Handling Space:

This space will be used to ship the ice produced at the ice facility. Since this area should have a width of about 3m running in front of the ice facilities, the required area will be ;

3.0m x 62.0m = 186.0 sq.m

The space requirements for the ice-making plant, as calculated above, are summarized in Table 3.3.11.

Table 3.3.11 Room Composition and Areas for the Ice-making Plant

Room Designation	Required Area	Remarks
Chilling/Cold Storage	960 sq.m	
Ice Storage	150 sq.m x 4 rooms =600 sq.m	
Machine Room	256 sq.m	
Storage	75 sq.m	
Locker Room	75 sq.m	
Handling Space	(186 sq.m)	(Staging is not included in floor area.)
Total	1,966 sq.m	

B) Fish Handling cum Market Building :

The fish handling cum market building will be a key facility at the Project fishing port. Its functions will include: sorting of catches landed at the jetty; washing, weighing and other operations: and serving as a market for brokers and fishermen. The only facility requirement here will be a roof to shield catches from direct sunlight. A rest area is also planned on the second floor for fishermen, brokers, and other persons using this area.

a) Size of handling area:

The size of the handling area has been determined on the basis of the following equation

$S = N / R \times \alpha \times P$

where S; Required area (sq.m)

N: Plan daily volume to be handled (kg/day)

R: Rotation (time/day)

P: Handling volume per unit of area (kg/sq.m)

α : Ratio of space devoted to fish handling

b) Estimating conditions

N: Landing volume by species on a standard day
(Miscellaneous species, such as sardine's and horse mackerel)

-- from offshore vessels 65 tons

-- from coastal vessels 174 tons

Total: 239 tons

Storage method: bulk

P: Handling volume per unit area = 62.5 kg/sq.m (standard value for catches in Japan, based on data from the Fisheries Agency of the Government of Japan)

R: Rotation: Once a day for catches from offshore vessels
Twice a day for coastal vessels

α :Ratio of space devoted to fish handling; 0.677 (standard value in Japan, based on data from the Fisheries Agency)

c) Calculations:

Required area :

$S = N / R \times \alpha \times P$

$= 65{,}000 / (1 \times 0.677 \times 62.5) + 174{,}000 / (2 \times 0.677 \times 62.5)$

$= 1{,}536$ sq.m + 2,056 sq.m = 3,592 sq.m

Shed configuration will be 78m long x 46m wide = 3,588 sq.m

(area inside columns 78m long x 40m wide= 3,120 sq.m)

Rest area :

The target users for this area will the fishermen and brokers who assemble here during fish landings. Setting the total number of persons to be accommodated at 70% of vessel crews and 30% 0f brokers, the total requirement, as calculated below, becomes 358 persons.

Vessel crews: 368 persons x 70% = 257.6 (say 258 persons)

Brokers: 334 persons x 30% = 100.2 (say 100 persons)

Total: 358 persons

The Plan calls for a unit area sufficiently large to accommodate the above users and allow for future partitioning. On this basis, the total required floor area has been set at 600 sq.m. The layout provides for a second floor area to be created by spans at either end of the handling area (2 rooms of 300 sq.m each).

Accordingly, the total floor space of the handling cum market, as calculated on the basis of the above considerations, will be as follows:

Total floor space: 3,120 sq.m (handling area) + 600 sq.m (rest facilities on the 2nd floor)
= 3,720 sq.m (Other open space under the roof = 468 sq.m)

C) Cold and Chilling Storage:

The target rooms for these facilities will be: processing space for primary processing of a portion of the catches landed at the Plan jetty (filleting operations involving only the removal of heads and guts); and the Chilling storage, Cold storage and quick-freezer; plus field offices and W.C. for employees.

(1) Plan handling volume per day

The fish to be processed daily at the cold storage facility will be the catches landed by offshore and large coastal vessels. The proportion this fish will represent of total landings at the Project facility, round fish weight, and the anticipated storage volume after primary processing (i.e., filleting) are shown in the following table:

Table 3.3.12 Daily Handling Volume at the Chilling/Cold Storage

Target Vessels	Daily Landing Volume	Ratio of Fish to be Processed	Raw Fish Weight	Filleting Yield	Daily Processing Volume
Offshore	65 tons	10%	6.5 tons	40%	2.6 tons
Large Coastal	150 tons	5%	7.5 tons	40%	3.0 tons
Small Coastal	24 tons	0%	0 tons		0 ton
Total	239 tons		14.0 tons		5.6 tons

(2) Room Areas:

a) Processing space:

The only processing operation to be performed on raw fish landed at the Project facility will be filleting, following by quick-freezing and storage in the cold storage.

The required space for this processing operation has been calculated by the following equation:

A = M / N x L

where: A: required processing area (sq.m)

M: Annual raw fish processing volume = 13,520 tons x 10% + 54, 600 tons x 5%
= 4,082 tons

N: Number of operating days per year at the processing facility (days/year).
= 357 days =(365 - 8 national holidays)

L: Required area per raw fish (ton)= 20 (sq.m/ton)

A = M / N x L = 4,082 / 357 x 20 = 228.6 sq.m

The processing area, as calculated above, comes to 228.6 sq.m but, owing to the column and span configuration, the overall space requirement for this facility has been set at 245 sq.m.

b) Quick-freezer:

The daily processing volume computed above is based on peak-season operating rates. Figuring normal operations at about 80% of peak,

5.6 tons x 80% = 4.48 (rounded to 4.5 tons/day)

The quick-freezer is intended to freeze the above 4.5 tons of processed fish per day. In terms of both economics and quality control, it will be desirable to divide the quick-freezing operation into 2 batches per day. It is planned, therefore, to use two quick-freezing units.

Number of quick freezers = 1.2 tons / 6 hrs = 2 units

c) Chilling Storage:

It will be necessary to temporarily store the raw fish for processing in a Chilling Storage to keeping fish fresh between landing and start of processing operations.

Figuring that, during periods of concentrated landings, a 5-day supply of raw fish will have to be chilled, the storage capacity of the Chilling Storage becomes 100 tons.

(65 x 20% + 150 x 15%) - 14 tons = 21.5 tons

21.5 tons x 5 days = 107.5 tons (say 100 tons)

The Chilling Storage must accommodate a 5-day supply of raw fish (100 tons). The required floor area for the this facility may be determined on the basis of the following formula:

Floor area of Chilling Storage

= {storage capacity (tons) x 2.5 (cu.m/ton) x 1.2 x 1.5 }÷ effective height (m).

where: 1.2: allowance for aisles inside the refrigerator

1.5: allowance for the machinery, freezer, and electrical rooms

(however, since the machinery room has been separately measured in this Design, it has been excluded from this computation)

Effective height = 2.4m (for manual loading)

On this basis, the floor area requirement for the refrigerator unit becomes :

Refrigerator area = {100 tons x 2.5 (cu.m/ton) x 1.2 x 1.5 } ÷ 2.4 (m) = 125 sq.m

For plan purposes, estimating on the basis of the prefabricated panel method, the required floor space for the Chilling Storage unit has been set at 138.5 sq.m.

d) Cold storage:

Assuming that daily production of processed fish production, as estimated above, will be shipped out in carrier vessels every 30 days, the capacity of the cold storage facility may be computed on the basis of the following equation

4.5 tons x 30 days = 135 tons.

The area of the cold storage has been calculated on the basis of the same formula as was used for the chilling storage. However, in this Project, while the Cold Storage will receive daily frozen products, shipments from the cold storage will be on a monthly cycle (i.e., once a month). And since the products can be stored in proper order from the deep end of the Cold Storage, there is no need, in our judgment, to provide aisle space. The floor area of the Cold Storage, then, can be computed as follows:

Floor area of Cold Storage = {135 tons x 2.5 (cu.m/ton)} ÷ 2.4m = 140 sq.m

Taking into account of the columns and walls in a prefabricated frame structure as well as the plan to partition the Plan cold storage into two compartments with a view to shortening operating time, the total floor area requirement for this facility has been set at 150 sq.m.

If the Cold storage is divided into 2 rooms, the required floor area for each room, based the above prefabricated panel system, becomes 75 sq.m.

e) Field Office:

The field staff requirements at these facilities will include an ice-plant supervisor (1 person), a cold storage operator (1), and shipping personnel (2). Office space for these employees will be provided in a portion of the cold storage facilities. The required floor space for these offices will be 45 sq.m.

f) Toilet and Washing Room:

A washroom will be provided for employees and operators at the Project facilities. The total staffing requirement is for about 20 persons, with an anticipated male-female ratio of 2:8. Thus, minimum unit of a rest room facility will suffice. We plan to provide one toilet and one urinal for the male staff and 2 toilets for the female.

The required floor area for this facility will be 24.5 sq.m. The sizes of the rooms in cold storage facility, as above calculated, are summarized below:

Table 3.3.13 Required Room Sizes at the Chilling/Cold Storage

Room	Required Area
Processing Space	245.0 sq.m
Quick-freezers	24.0 sq.m
Chilling Storage	138.5 sq.m
Cold Storage	75 sq.m x 2 units = 150.0 sq.m
Field Office	45.5 sq.m
Washing Room	24.5 sq.m
Total	627.5 sq.m

D) Workshop

The functions of this facility comprise primarily repairs and maintenance checks on the freezing machinery, pumps, and other equipment in the ice-making and cold storage facilities, carpentry to repair the wooden plank cover of the ice-making tank, ice can fabrication, as well as welding operations on steel components.

The following table outlines the room requirements for the workshop building along with their respective functions, equipment, and materials.

Table 3.3.14 Functions & Main Equipment for Workshop

Room	Main Equipment Items	Functions
Workshop	Work table, woodworking tools, gus cutting equipment, pipe benders, compressor	Refrigeration machinery check, carpentry
Working Space	Open space with roof	Welding & pipe cutting operations
Parts Storage	Spare parts, piping & steel materials, lumber	Storage

The functions to be performed in this area will include repair work on freezing equipment and pumps, metal cutting, and woodworking. All of these operations are minor in nature, with hand tools comprising the bulk of the required equipment. The large installed equipment will comprise such items as welders, compressors, work table, and carpentry equipment. Space must be provided for the woodworking equipment plus working space for about 2 persons.

In the case of the welding work, steel welding will be performed in the outdoor working area, but precision welding, such as that on coils for the ice-making tanks, will be done indoors. As to metal cutting operations, space must provided for the welding and gas cutting equipment, with an allowance for work space for 2 persons. It is planned that the cutting and welding work for ice can fabrication and pipes will be performed in the roofed open space.

The workshop layout will incorporate an operations room, including space for equipment checks and carpentry, a parts storage, and a roofed open area for welding operations.

After proper allowance for room size and functions along with parts storage, the required floor space for the enclosed workshop rooms will be 84 sq.m, the open working space under the roof 84 sq.m, and the parts storage 42 sq.m -- for a total of 210 sq.m.

E) Administration Building

This is to be the nerve center of the Project facilities, providing operating and management control to ensure smooth functioning of the port complex. The functions to be performed at the Administration Building may be broadly classified as follows ;

1) Administration Department
2) Operation Department
3) Maintenance Department
4) Management for ditto 1) - 3)
5) Secretariat for the Advisory Committee for the Vung Tau Fishing Port Authority
6) Meeting cum dining facilities
7) Common facilities

(1) Administration Department

Manpower requirements for this division have been set at a total of 18 persons, comprising a Director plus a staff of 17: accounting (6), personnel (2), store (2), security (1) , administration (2), public affairs (1), and statistical (3) . The sizes of the various rooms have been calculated on this basis.

a) General office (within the Administration Department)

The office will accommodate the above 17 - man staff. Based on a consideration of activity patterns and layout arrangements for fixtures and flow space in existing offices in the Project area, the space requirement for the general office has been set at 108 sq.m.

b) Reception counter and waiting area

In view of the variety of reception services to be performed in this division, it will be necessary to install a reception counter and provide a suitable waiting area. Accordingly, allowing an average of 2.0m for each reception function, the floor space requirement for the reception counter and waiting area has been set at 42.0 sq.m.

c) Director's office

Drawing on the size and usage patterns of comparable offices in the Project vicinity, the total floor area required for the office of the Director will be 22.0 sq.m.

d) Office instruments space ; document storage

For Office instruments and document storage, allowing for the necessary fixtures and a suitable layout, each of these rooms will be given a floor area of 10.0 sq.m.

The room sizes for the Administration Department, as above calculated, are summarized below:

Table 3.3.15 Room Composition and Areas for the Administration Department

Room Function	Required Area
General Office	108.0 sq.m
Reception Counter and Waiting Area	42.0 sq.m
Director's Office	22.0 sq.m
Office Instruments Space	10.0 sq.m
Document Storage	10.0 sq.m
Total	192.0 sq.m

(2) Operation Department, and

(3) Maintenance Department

A total of 7 persons will be required to staff the Operation Department: a Director plus 6 employees: an ice production supervisor (1), cold storage operator (1), delivery control personnel for outside shipments (2), and vessel and jetty supervisors (2).

However, since the bulk of the duties performed by the 4 staff members assigned to ice production, cold storage; and delivery operations will be of a supervisory nature done outside the office (i.e., in the field), these functions can be accommodated within the offices attached to the cold storage facility. The remaining 3 persons (vessel jetty supervisors and Director) will be performing duties that in cooperation with those of the Maintenance Department, and so their facility requirements will be calculated in combination with those of the Maintenance Department.

The personnel for this portion will include 10 persons in all: the respective Directors of the Operation and Maintenance Departments plus a staff of 8 -- marine operation (1), construction (1), machinists (2), electricians (2), as well as the transport supervisors (2) from the Operation Department.

a) General office (Operation and Maintenance Departments):

This office is to accommodate 8 persons (2 from the Operation and 6 from the Maintenance Department). Based on the usage and layout patterns in comparable local offices, we have set the required floor space for this office at 64.0 sq.m.

b) Offices for Directors of the Operation and Maintenance Department

These managers will be given the same size offices as those allocated to their counterparts in the Administration Department (22.0 sq.m). Thus, the two offices combined will require a total area of 44.0 sq.m.

c) Equipment room; Document room

We have provided the same amount of space for these areas as for the Administration Department viz., 10.0 sq.m each. An additional 10.0 sq.m have been allocated for a room to house equipment.

Following table shows areas for Operation and Maintenance Department.

Table 3.3.16 Room Composition and Areas for the Operation and Maintenance Department

Room Function	Required Area
General Office	68.0 sq.m
Offices for Directors	44.0 sq.m
Office Instruments Space & Document Storage	20.0 sq.m
Equipment room	10.0 sq.m
Total	138.0 sq.m

(4) Management

This division, will provide office space for the Managing Director and Deputy Managing Director of the Authority, who will have overall administrative responsibility for the fishing port facilities, plus 2 secretaries. It will also contain a small conference room for about 12 persons and a large conference room holding about 25 persons.

a) Offices for the Managing and Deputy Directors of the Port Authority

These offices have been modeled on typical facilities observed in the Project area for senior executives of comparable status. Most executive offices included locker space, a reception alcove for 5 - 6 visitors, and a private washroom. After allowing for furniture layout and proper working space, the required area for these offices has been set at 64.0 sq.m.

b) Secretarial office

While this office is to be used by only two secretaries, it will also require a tea service area for visitors and conferences as well as a document storage area. The total size of this office has been set at 32.0 sq.m

c) Small conference room

The usual pattern for this size conference room is to seat attendees around a single table. Allowing for furniture arrangement, the required area for this Project will be 32.0 sq.m.

d) Large conference room

For 20 or more conferees, it will be difficult to use the single table configuration suggested for the small conference room (for up to 12 persons). In this case, therefore, a 3-sided layout can be considered. The required floor area to accommodate 25 persons has been set at 64.0 sq.m. If, in addition, the two conference rooms are made adjoining, through the use of movable partitions instead of a fixed wall between them, a maximum of 30-40 persons could be accommodated at a single conference.

The sizes of the rooms in the management, as calculated above, are summarized below.

Table 3.3.17 Room Composition and Areas for the Management

Room Function	Required Area	
Offices for the Managing & Deputy Directors	64.0 sq.m	
Secretarial Office	32.0 sq.m	
Small Conference Room	32.0 sq.m	(for up to about 12 persons)
Large Conference Room	64.0 sq.m	(to hold about 25 persons)
Total	192.0 sq.m	

(5) Advisory Committee Secretariat

Regular staff at this facility will comprise a General Secretary and 2 secretary-clerks. In additions, provision will be made for a small conference room accommodating about 12 persons. Since this area will be essentially similar to the small conference room in the management, it has been allocated the same area.

Following are the component areas for the Advisory Committee secretariat.

Table 3.3.18 Room Composition and Areas for the Advisory Committee Secretariat

Room Function	Required Area	
Managing Secretary's Office	32.0 sq.m	
Secretarial Office	32.0 sq.m	
Small Conference Room	32.0 sq.m	(to hold about 12 persons)
Total	96.0 sq.m	

(6) Meeting cum Dining Facility:

This facility will serve for conference of vessel crews, fish brokers, and other users of the Project facilities. When the facility is not in use as a meeting room, it will serve as a lunch and snack room for employees, and visitors.

The meeting/dining area will have 3 components:

a) Meeting / dining room

b) Utility and storage room

c) Entrance area

The dining area will use tables seating four persons, as commonly seen in the vicinity. Based

on this layout and unit areas, the area requirement for the dining room has been set at 75 sq.m, with an additional 25 sq.m for the utility room, storage room, and entrance area, yielding a total area of 100 sq.m for the meeting/dining facility.

(7) Common Facilities:

The common facilities will have three categories

a) Common Washing room

b) Common space (e.g., stairs, corridors)

c) Medical Room

a) Washing room:

These washrooms will be used by both staff members and visitors. Assuming simultaneous usage, and based on the building plan,

1) 2 urinals, toilets, and wash basins should be provided in each toilet area.

2) considering the building plan, toilet facilities should be installed in 2 locations.

Based on this layout, the common toilet facilities have been given a total area of 40.0 sq.m.

b) Common space (e.g., stairs, corridors):

The space for stairs, corridors, and movement within the Project facilities, as determined from the Plan, has been set at 118.0 sq.m. Adding this to the space for a), space requirement for the external stairs and external corridors has been set at 228.0 sq.m.

c) Medical Room

This room will be used by staff members and visitors, fishermen and brokers for first-aid treatment. The required area for the Medical Room has been set at 32.0 sq.m.

The area composition of the Administration Building may, then, be summarized as follows:

Table 3.3.19 Areas for the Administration Building

Function/Department	Area	Remarks
1) Administration Department	192.0 sq.m	
2) Operation Department, & 3) Maintenance Department	138.0 sq.m	
4) Management	192.0 sq.m	
5) Secretariat for Advisory Committee	96.0 sq.m	
6) Meeting cum Dining Facility	100.0 sq.m	
7) Common facilities	150.0 sq.m	
External Stairs and Corridors	(228.0 sq.m)	(excluded from floor area)
Total	868.0 sq.m	

F) Warehouse:

This facility will be used to store the following two categories of materials and equipment

a) Oil fence and adsorbent for oil leaks

b) Equipment for supplying electrical, water, ice and fuel for fishing vessels.

The space requirement for this facility has been set at 196.0 sq.m.

G) Common Facilities:

The common facilities at the Project facility will include:

a) Substation

b) Shed for fire fighting pumps and waste water treatment equipment

c) Public lavatories

d) Elevated water tank

a) Substation:

Power will be received at the Project facility via high-tension power cable of 15,000 V, which will have to be stepped down to 380/220 V. The frames, transformers, and other equipment required for this purpose will be stored in this room. The space requirement has been set at 42.0 sq.m.

b) Shed for fire fighting pumps and waste water treatment equipment:

This room will house a water storage tank and pumps for fighting oil tank fires as well as a intake tank for waste water from the fish processing space, sewage pumps. The total area requirement has been set at 48.0 sq.m

c) Public Lavatories:

These lavatories will be used by vessel crews and fish brokers in the handling area. It will be given an area of 40.0 sq.m.

d) Elevated water tank:

These tanks comprise a freshwater tank with a capacity of 40 tons and a river water tank of 10 tons, from which water will be distributed to Project facilities.

H) Exterior Facilities:

The exterior facilities will cover the following 6 categories:

a) guard and security facilities
b) gates
c) site roads
d) loading area and parking lot
e) apron pavement
f) service channels and pits.

a) Security Facilities:

A guardhouse already exists in the southeastern corner of the Project site, though doors, windows, and other fittings are missing. This existing facility will be renovated for Project use.

b) Gates:

At present, a block fence stands along the access road from Highway 51 to the Project site. Two locations have been secured for gates and entrance doors -- one in front of the guardhouse mentioned in a) and another in the northwestern part of the site. In this Project, then, we will provide two steel gates at the above locations.

c) Site roads:

The site roads linking the various facilities within the Project site, as shown in the Site Plan, will be paved with concrete.

d) Loading area and parking lot:

Space must be provided on the southern side of the handling area for fish transport and loading operations after sorting. The Project is to use concrete paving both for this staging area and for a parking area for transport vehicles.

e) Apron pavement:

Concrete pavement is planned for a band 15m wide along the riverbank within the Project site to facilitate fish/ice movements between the jetty and other Project facilities.

f) Service channels and pits:

Piping will be required to distribute, water, fuel, and power to the Plan jetties.

From the standpoint of safety and security control, these pipes will have to be laid in underground concrete service channels and pits, which will also serve as conduits for

rainwater drainage. These channels and pits will be covered, as required, by either gratings or concrete lids.

2) Section Plan

The Section Plan is intimately related to ventilation, light, and insulation in the various rooms. In the Administration Building, these elements are of prime importance, and so an open corridor plan will be used to secure openings directly exposed to the outside air. In the other facilities, the same approach will be used for a portion of the offices, the processing area, and the locker room. However, in the working and storage areas of the ice-making plant, it is, to the contrary, desirable to that light be minimized, and so a ventilation plan has been prepared. With regard to ceiling height, the popular building method employed to solve the heat problem in the Project area is through the use of high ceiling's in tandem with ventilating windows. Ceiling heights in comparable facilities, based on these survey values, are as shown below.

Table 3.3.20 Plan Ceiling Heights

Facility	Room Designation	Ceiling Height
Fish Handling cum Market Building	Fish Handling	Hole
	Rest area for crews & brokers	Hole
Ice-making Plant	Ice-making room, Storage, machine Room	Hole
	Ice Storage	4.0 m
	Locker Room	3.0 m
	Washroom	2.5 m
Chilling / Cold Storage	Field Office / processing area	3.0 m
	Washroom	2.5 m
	Chilling / Cold storage	2.4 m
Administration Building	Offices / conference rm / others	3.5 m
	Washroom	2.5 m
Workshop / Warehouse / others	Workshop / warehouse	Hole

3) Structural Plan

A) Superstructure

Based on facility use and scale, the superstructure can be either brick, concrete, or steel-frame. Since earthquakes stronger than M.4 have not occurred in south Vietnam, even in wide-span construction, concrete is used for columns and beams, with exterior walls and partitions

made of hollow brick and roofs of steel-frame truss construction. Even in small homes, the substructures are built in the same manner, with wood used for the roof trusses.

In multi-story office buildings, concrete is generally used for columns, beams, and floors along with flat roofs. The superstructure methods will be used in the Project buildings, depending on facility size, as shown below.

Table 3.3.21 Superstructure for the Building Facilities

Facility	Columns	Beams	Roof
Fish Handling cum Market Bldg.	R.C.	R.C.	Steel structure
Ice-making Plant	R.C.	R.C.	Steel
Chilling / Cold Storage	R.C.	R.C.	Steel
Administration Building	R.C.	R.C.	Concrete slab flat roof
Workshop, Warehouse	R.C.	R.C.	Steel structure

B) Foundations:

Soil in the Project area is composed of a layer of soft silt, with an N value of not over 5, from the surface to - 7m; a clay stratum with an N of about 12 between -7 ~ -15 m; a silty sand layer with an N of 10 ~ 20 between -15m ~ -20 m; and a hard sand layer with an N of at least 40 below -20 ~ -25m.

Judging by the results of our geotechnical investigation, including boring tests, the surface layer is silt, but we can expect a long-term bearing capacity of only 3 - 5 tons/sq.m. Although the Project facilities are generally low-rise, the Administration Building and a portion of the Fish Handling cum Market will be 2-story structures, while the Ice Plant and Chilling/Cold storage will have high ceilings and wide spans, requiring a bearing capacity of 7 - 10 tons/sq.m. We plan, therefore, to use pile or direct foundations, depending on the load at each facility.

4) Equipment Plan:

The Plan will specify piping and power line systems that are efficient and can flexibly respond to future development needs. Equipment selection will be based not only on technical suitability but will also, from a management standpoint, be oriented to simple and efficient facilities that will minimize operating downtime.

In choosing the equipment, we have paid careful attention to maintenance and the use of standard products for which spare parts are readily obtainable. The equipment must be able to cope with future repair requirements, expansion plans, and functional changes. At the same time, we have strictly avoided the use of equipment whose operation would demand a too much high level of technical expertise.

A) Electrical installations:

With regard to the power supply for the Project facilities, there are presently two lines of 15,000 V power cables running along Highway 51, at a point 450m southeast of the Project site. The Vietnam authorities will be responsible for power intake into the Project area.

The construction plan will step down the 15,000V power, as received at the substation, to 380V/220V, 50 Hz for transmission to the main switchboard in the machine room at the ice-making plant, from which power will be branched to the consuming facilities. The main distribution lines will, in principle, be laid underground, except indoors which will be laid in PVC pipes.

In the electrical plan, we have avoided products that would be complex to handle or would require maintenance; the selected facilities are all both simple and efficient.

The electrical system is divided into (1) lighting and outlet facilities and (2) power facilities. Maximum power loads at the Project facilities are estimated as follows.

Table 3.3.22 Maximum Power Load at Project Facilities

Facility Designation	Maximum Load
Ice-making Plant and Chilling/Cold Storage	950 KW
Machine tools (including Ice Crushers)	80 KW
Power Source for Vessels	90 KW
Lighting and Outlets (including exterior lights)	90 KW
Air Conditioning and Ventilation Equipment	45 KW
Others (water lifting pumps, fire fighting pumps)	95 KW
Total	1,350 KW

a) Lighting and Outlets:

< Lighting fixtures >

Lighting fixtures in the Project vicinity include both fluorescent and incandescent type. The lighting design will specify locally available fixtures wherever possible.

The fixtures for the Fish Handling cum Market Building and Ice-making Plant will be given salt-proof specifications. Mercury lamps will be used at all exterior locations, including the landing facility. Luminosity at the main indoor and outdoor facilities, as shown below, has been specified with due regard to local conditions.

Table 3.3.23 Luminosity at the Project Facilities

Facility Designation	Luminosity
Interior lighting:	
Offices	200 lux
Corridors and storage areas	100 lux
Fish handling cum market and ice-making area	100 lux
Cold storage	30 lux
Toilets	100 lux
Exterior lighting :	
Landing facilities (jetties)	20 lux
Other on-premise locations	10 lux

The following chart shows the electric power system for the Project facility.

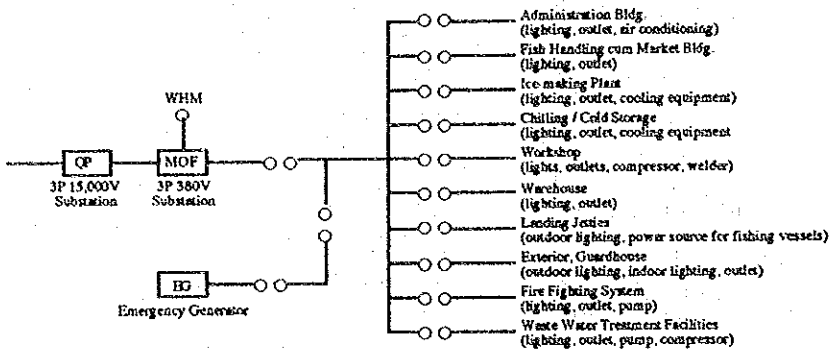


Figure 3.3.9 Diagram of Electrical Distribution System

< Outlet installations >

The outlet installations will be of two types: general-purpose sockets in office and comparable locations and specialized sockets for use with equipment and tools installed in the workshop building. Load voltage will be 220V, 50 Hz.

b) Power lines:

The power lines will include ice-making plant, cold storage and freezing facilities, pumps, and power supply equipment for vessels. Load voltage will be 380V, 50Hz.

c) Lightning rods:

Since thunderclouds form frequently in the Project area during the rainy season, the various facilities will be protected with lightning rods to prevent accidents from this source.

d) Telephone and Public Addressing Facilities:

The only telephone construction required under this project will be laying lines to offices and other administrative facilities. The Vietnam government will be responsible for installing telephone and switching equipment.

A public addressing system will be installed on the premises for emergency announcements and instructions. An intercom system will connect the Managing Director, Deputy Managing Director, Director's offices, field office, workshop, and offices.

e) Emergency generator:

At present, frequent power stoppages are experienced in the Project area, and so an emergency generator will be required to serve the ice-making plant, cold storage facilities, and pumps when commercial power is interrupted.

The generating capacity has been calculated on the basis of simultaneous operation of all target facilities. The specifications for this emergency generator will be as follows

Engine:	Diesel
Supply voltage:	3 phase, 4-line, 380/220 V, 50 Hz
Generating capacity:	700 KVA

B) Water Supply and Drainage System:

a) Water supply system:

A city water main with a 760mm pipe diameter reaches a point on Highway 51, 450m southeast of the Project facility. The Vietnamese authorities will be responsible for building a branch pipe to bring water from the main pipe into the Project site.

The scope of the construction services to be provided under the Project will include laying connecting pipes within the premises, storing water in an underground tank, raising it to an elevated water tank via lifting pumps, and delivering it via gravity feed to the various facilities.

In the case of the washing operations on the floor of the jetty and fish handling cum market building, there is no need to use city water; the plan is to draw in river water at the front of the Project site.

The daily demand for freshwater from fishing vessels has been calculated on the assumption that vessels will completely fill their freshwater tanks each time before sailing. The daily water requirement for the Project facilities will be as shown in the following table.

Table 3.3.24 Daily Water Requirements for the Project Facilities

(1) Freshwater (FW) for Fishing Boats				
Target Boats	FW tank capacity (cu.m)	Supply per boat (cu.m)	No.of user boats per day	Daily requirement (cu.m)
Offshore	21.0	21.0	1	21.0
Large coastal	3.0	3.0	12	36.0
Small coastal	0.5	0.5	24	12.0
Sub-total (1) Freshwater for boat use				69.0

(2) Freshwater for Shore facilities		
Target use		Daily Requirement (cu.m)
Processing	14 tons x 5 cu.m/ton = 70 cu.m	70.0
Ice-making & cooling use	Ice making & ice = 200 cu.m Cooling water = 130 cu.m Thawing water = 40 cu.m	370.0
Waste water treatment	Treatment of Waste water from processing = 70 x 2 = 140 cu.m Treatment of Waste water from fishing boats = 48 x 2 = 96 cu.m	236.0
Fish Handling cum Market Bldg.	Fish washing = 0.5 cu.m / ton x 239 tons= 119.5 cu.m	119.5
Other (drinking, general service)	Office / plant = 100 persons x 0.1 cu.m = 10 cu.m Handling area = 600 persons x 0.02 cu.m = 12 cu.m	22.0
Sub-total (2) Freshwater for Shore facility		817.5
Total Freshwater Requirement (1) + (2)		886.5

(3) River Water for shore Facility		
Target Use		Daily Requirement (cu.m)
Washing apron of landing jetties	Washing volume = 0.02 cu.m / sq.m x 1,800 sq.m	36.0
Washing floor in fish handling area	Washing volume = 0.02 cu.m / sq.m x 3,600 sq.m	72.0
Total River Water Requirement (3) for Shore facility		108.0

Accordingly, the daily demand for water at the Project facilities will be

Freshwater	886.5 cu.m/day
River water	108.0 cu.m/day

As shown above, the daily requirement for freshwater at the Project facilities is projected at 886.5 m3. At present, the total supply of water in Vung Tau City is 33,000 tons/day, which is said to fall short of demand, but it is planned to increase the daily supply to 100,000 tons. During the discussions between the Basic Design Survey Team and the municipal water authority, we received assurances of a supply of 1,000 tons/day for the Project facilities.

Following is a diagram of the water supply system for the Project facilities.

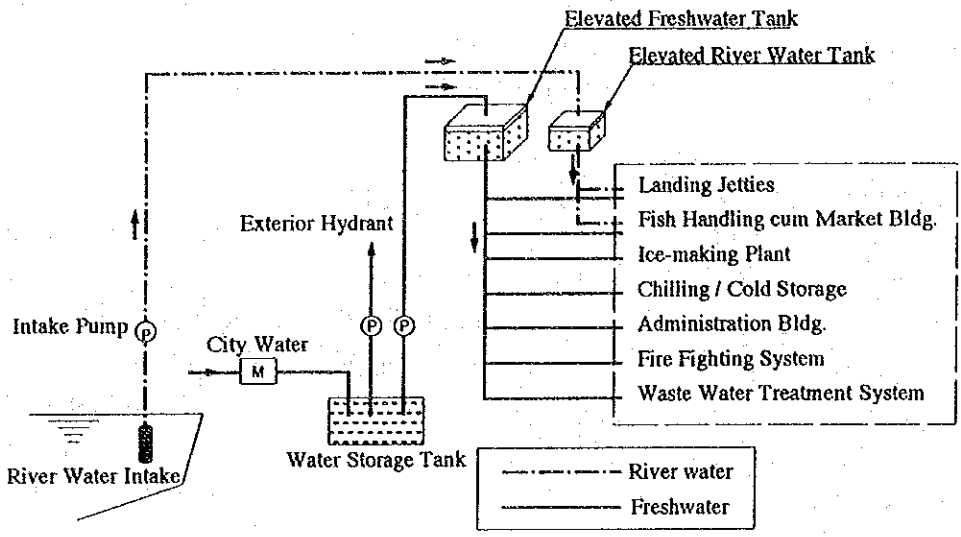


Figure 3.3.10 Diagram of Water Supply System

b) Waste Water Treatment System:

At the present time, Vietnam has no special laws or regulations relative to the discharge of water. However, in April, 1994, in a report compiled by the UNDP, it was urgently recommended that environmental standards be prepared and that an administrative agency be established for this purpose. It may, therefore, be considered a certainty that, in the near future, laws and regulations for environmental protection, along with administrative support in this area, will be enacted in Vietnam along the lines of such legislation in advanced countries.

The Project facilities that require environmental consideration are the fish processing operations and the waste of contaminated water with fish blood from the fish holds of boats. A major effort must be made to treat this waste water, in the manner described below, so as to protect environment.

< Treatment method for general sewage >

General sewage from the Project facilities will be treated in a joint septic tank and then seeped down into the ground.

< Treatment method for waster water from floor washing >

Waste water from the washing of catches and floors at the jetty and fish handling cum market building will not be particularly contaminated. Thus, the general treatment method for such water, as used in Japan, will be sedimentation in a sediment tank, following by release of the top water into the river in front of the Project site.

< Treatment method for waste water from processing operations and bloody waste water from fish holds >

Bloody water remaining in vessel fish holds is presently being discharged untreated in Vietnam. However, in the Project facilities, this contaminated water will be pumped out of the fish holds, together with water discharged from fish processing operations, and purified via the activated sludge process before being discharged into the river. The B.O.D. concentration of discharging water treated by the activated sludge process will be less than 20 p.p.m. based on the Environmental Quality Standard for Water Pollution in Japan, and the daily volume of water treated by this process will be about 120 cu.m/day, as shown below.

Table 3.3.25 Daily Waste Water Treatment Volume at the Project Facilities

Method of Treatment	Waste water volume per unit	Concentration	No. of unit	Daily waste water generated (cu.m / day)
Natural seepage				
General service water	0.1 cu.m	--	100 persons	10.0
Sedimentation				
Fish washing at jetties	0.02 cu.m	--	1,800 sq.m	36.0
Fish washing at Handling area	Washing 0.02 cu.m Sorting 0.50 cu.m	--	3,600 sq.m 239 tons	191.5
Waste water volume(Sub-total)				277.5
Activated sludge process				
Offshore vessel (at 10% of fish hold)	13.0 cu.m	1,000 p.p.m.	1 boat	13.0
Large coastal boat (Do)	2.5 cu.m	1,000 p.p.m.	12 boats	30.0
Small coastal boat (Do)	0.2 cu.m	1,000 p.p.m.	24 boats	4.8
Vessel Discharge water (Sub-total)				47.8
Processing water		1,000 ppm		70.0
Activated sludge process (Total)				117.8

C) Air Conditioning:

a) Air conditioner:

Room air conditioners have been specified from the standpoint of operating and maintenance economies. In the Administration building, separate units will be installed in the offices of the Managing Director, Deputy Managing Director, each Director and Managing Secretary of the Advisory Committee, as well as in conference rooms. Elsewhere, ceiling fans will be used as required.

b) Ventilation:

Exhaust fans will be installed, as necessary, together with ceiling units. The rooms requiring such fans will include the Machine room, Utility rooms, Washrooms, Substation and Shed for fire fighting pumps and waste water treatment equipment.

5) Construction Materials Plan:

The following natural and social conditions have been taken in to account in planning the Construction Materials:

1) This will be a coastal facility, subject to damage from sea winds.
2) With the exception of the Administration Building, the Plan structures will be characterized by high ceilings.
3) It will be possible to draw liberally on locally available building materials.
4) The construction period is limited.

The Construction Plan has been developed on the basis of the above conditions. Unless otherwise noted, the materials shown in this section will be common to all Project facilities.

A) Exterior Finishes:

a) Roofing:

Cement boards and galvanized steel sheets are widely used in local wide-span construction, such as Warehouse and Workshop. Only a very few buildings use colored sheets. In office buildings, flat and tile roofs predominate. In this Project as well, a flat roof will be used in the Administration Building while, in the other wide-span structures, such as the Fish handling cum market building and Ice-making plant, where durability and corrosion are prime considerations, polyvinyl chloride coated sheet iron will be specified.

b) Wall Finishes:

The principal wall material used locally in medium- and high-rise construction is hollow brick with a mortar paint finish. Hollow brick is the traditional building material in Vietnam

and can be obtained at low cost. In the subject Project too, we plan to use hollow brick with a mortar paint finish, owing to its local availability and ease of construction.

c) Openings:

The usual openings used in the Project area are aluminum and wood doors, with steel doors used for large openings in factories and other industrial buildings.

In this Project as well, we will, in principle, use aluminum and wood doors for normal openings in offices and private rooms and steel doors for large openings.

In the Project area, windows in ordinary rooms are mostly wood with steel sashes, though aluminum sash was observed in a number of buildings under construction. With wooden and steel sashes, problems are encountered with regard to air tightness and rust, as well as in terms of function and usage. Also, considering the fact that this will be a coastal facility, subject to salt damage from sea winds, aluminum sashes, which is relatively better than other materials in durability against salt damage and water, in principle, will be specified.

B) Interior Finishes:

a) Floor finish

As standard finishes for the concrete slab flooring, we plan to specify tile, which is commonly used locally, in the Administration building and the other main offices, while a mortar finish will be used in the fish handling cum market building, machine room, and storage.

From a sanitary standpoint, a tile finish will also be used in the Meeting/dining room and Utility, processing space, and similar locations.

b) Ceiling and Wall finishes

Ceilings are to be installed in offices, meeting/dining area, processing space, and washrooms, with open ceilings to be used, in principle, in the Fish handling cum market building, ice-making plant, storage areas, and other operating locations.

The following finishing materials will be used, as appropriate, on ceilings and walls:

Ceilings:	Veneer boards, gypsum boards, and plywood
Walls:	Cement mortar with steel trowel finish, plywood,and waterproof boards

3.3.4 Machinery Plan:

1) Ice-making plant and Cold Storage Plan:

At present, there are no laws or ordinances regulating freezing facilitiesin Vietnam, and

so there are no restrictions in designing equipment or refrigerant. However, for safety considerations, designs and construction should be developed pursuant to the laws and regulations of advanced countries. Accordingly, in this Project, the design plan for the ice and freezing facilities will follow regulations in Japan's "Act for Controlling High Pressure Gases".
In selecting equipment for this purpose, considering the variety of items that will be used, we have given careful consideration to equipment compatibility so that the facilities will be in a position to cope with future maintenance requirements and improvements.

The safest and most stable substances that have been widely used to date as refrigerants have been Fluorons (Chloro Fluoro Carbon : CFC, Hydro Chloro Fluoro Carbon : HCFC). In recent years, however, as the very result of this stability, these Fluorons have come to be branded the chief culprit in the destruction of the stratospheric ozone layer and so have become the target for international regulations on their production and use. Among these Fluorons, the production of CFCs (such as R-11, R-12, and R-114), which have been major contributors to ozone destruction, will be totally abolished by 1996.

Even the HCFCs (such as R-22, and R-225), which, despite their chlorine content, cause only limited ozone destruction, thanks to the presence of hydrogen, will come under restrictions, starting in 1996, and their output is expected to be cut to less than 35% of present levels by 2010 and completely eliminated by 2030. While research is being conducted on substitute HFCs (Hydro Fluoro Carbons) that do not contain chlorides and so cannot harm the ozone layer, confirmation tests on their safety have not yet been completed.

Thus, no definitive substitute substance is yet available. As a result, there is a growing trend back to ammonia as a refrigerant for large facilities. Although ammonia had traditionally been used for this purpose, since its safety properties are inferior to those of fluoro and it presents difficulties in reducing equipment size, it has been generally shunned by industry as a refrigerant.

In Vietnam, however, since ammonia is currently used in many kinds of machinery as a refrigerant, people are quite familiar with handling this substance, while there is no problem in securing the necessary materials. Accordingly, we plan to use ammonia as the refrigerant in the Project facilities.

However, in the case of the packaged air conditioners used in the office, since no substitutes for Fluoro for such equipment are yet available, R-22 will be used as the refrigerant.

The design conditions have been established as follows :

a) Outside temperature : 33 degree C (Dry Bulb)
: 29 degree C (Wet Bulb)
b) Humidity : 75%
c) Refrigerant : Ammonia
d) Brine : Calcium chloride
e) Water source : City water

< Principal Equipment >

A: Ice making equipment

Ice making capacity ; 50 kg block ice x 200 tons/day

-1. NH3 Compressor with Oil Separator — 8 sets
Capacity 150,000 Kcal / hr
Motor 75 KW, 50 Hz, 380V

-2. Evaporation Condenser with Pump — 2 sets
Capacity 800,000 Kcal / hr

-3. NH3 Receiver, holyzontal type — 1 unit
Dimensions 1,000 OD x 4,000L mm

-4. Oil Drum — 1 unit
Dimensions 300 OD x 600L mm

-5. Refrigerating machine oil supply tank with feed pump — 1 set
Tank capacity 250 lit
Feed pump 0.4 KW, 50Hz, 380V

-6. Refrigerant connection piping — 1 LS
incl. automatic valves, pipes, joints, fittings

-7. Water connection piping — 1 LS
incl. galvanized pipes, valves, joints, fittings, etc.

-8. Ice Making Tank — 4 sets
Outside finish : Moisture proof, steel trowel
Steel plate : t = 6mm
Insulation material : Styrofoam t = 125 mm
Dimensions 7,100 x 21,900 x 1,200 mm
incl. Plank cover

-9. Herring Bone Coil — 8 sets
Area of refrigeration More than 170 sq.m

-10. Suction Trap — 8 sets
Dimensions 318 x 2,400 mm

-11. Brine Agitator — 8 units

	Dia. of propeller 400 mm	
	Motor 5.5 KW, 50Hz, 380V	
-12.	Air Blower with tank	2 sets
	Motor 5.5 KW, 50Hz, 380V	
-13.	Core Pump	2 sets
	Motor 2.2 KW, 50Hz, 380V	
-14.	Jacket Cooling Water Pump	1 set
	Motor 5.5 KW, 50Hz, 380V	
-15.	Filling Water Tank	2 sets
	Steel Plate t = 6 mm	
	Dimensions 5,000 x 4,500 x 1,200 mm	
-16.	Thawing Tank	2 sets
	Steel Plate t = 6 mm	
	Dimensions 9,000 x 4,500 x 1,200 mm	
	with Plank cover	
-17.	Can Dumper	2 sets
	Type 50 kg x 12 cans	
-18.	Ice Cans	4,234 cans
	50 kg type	
	Dimensions 190 x 450 x 870 mm	
-19.	Can Grid	336 sets
	Type 50 kg x 12 cans	
-20.	Ice Hoist Crane	4 sets
	Capacity 1.5 tons, winding speed 8 m/min,	
	running speed 15 m/min	
	Motor 4.5 KW, 50Hz, 380V	
-21.	Brine Mixing Tank	1 set
	Steel plate t = 6 mm	
	with Brine Agitator (dia. 200 mm)	
	Dimensions 3,000 x 1,500 x 1,200 mm	
-22.	Brine Supply Pump w/piping	1 set
	Motor 2.2 KW, 50Hz, 380V	
-23.	Lateral Pipe and Drop Tube	84sets
	Type 12 cans	
-24.	Control Panel for Ice making	1 set
-25.	Electric wiring(secondary side)	1 LS
-26.	Air piping (PVC)	1 LS
-27.	NH3	300 kg

-28.	Refrigerating Machine Oil	400 lit.
-29.	Filling Water Hose L = 15,000, w/Handle	1 set
-30.	NH3 Gas Mask	2 sets
-31.	Refractioner	2 sets
-32.	Hydrometer	2 pcs
-33.	NH3 Leak Detector	1 set

B. Ice Storage — 4 sets

Prefabrication Construction

Holding Temperature - 5 degree C

Dimensions 7,000 x 19, 000 x 4,000 mm

-1. NH3 Compressor w/Oil Separator — 3 sets

Capacity 45,000 Kcal / hr

Motor 22KW, 50Hz, 380V

-2. Evaporative Condenser w/pump — 2 sets

Capacity More than 800,000 Kcal

-3. NH3 Receiver — 1 set

Type Horizontal

Dimensions 1,000 OD x 4,000 L mm

-4. Unit Cooler (w/Multi Suction Trap) 4 sets

Type Floor mounted

Capacity 25,000 Kcal / hr

-5. Duct — 4 sets

Polyvinyl Chrolide Coated Sheet Iron t = 30 mm

-6. Defrost Pump (w/piping) — 2 sets

Motor 2.2 KW, 50Hz, 380V

-7. Refrigerant Connection Piping — 1 LS

incl. pipes, valves, joints, fittings, etc.

-8. Jacket Cooling Water Pump — 1 set

Motor 2.2KW, 50Hz, 380V

-9. Prefabricated panel for Ice Storage wall — 1 LS

Rigid polyurethane foam t = 100 mm

-10. Prefabricated panel for Ice Storage ceiling — 1 LS

Rigid polyurethane foam t = 100 mm

-11. Insulation Door — 4 sets

Manual single sliding type

Dimensions 800 W x 1,800 H mm

-12.	Reach-in Door	4 sets
	Manual hinged type	
	Dimensions 600 W x 600 H mm	
-13.	Wooden guard material for floor	4 sets
	Water-proof plywood t = 12 mm	
-14.	Wooden guard material for wall	4 sets
	Wood H = 2,000 mm	
-15.	Air curtain	4 sets
-16.	Vinyl curtain	4 sets
-17.	Lighting	4 sets
	100 W x 6 pcs	
-18.	Relief valve	4 sets
-19.	Thermometer	4 sets

C. Quick Freezing system — 2 sets

Contact freezing type
incl. Suction Accumulator
Capacity 1,200 kg / 6 hrs
Holding temperature - 35 degree C
Prefabricated Freezing Tank
Outside finish Stainless steel
Inside finish Stainless steel

-1.	NH3 Compressor Unit (w/Oil Separator)	2 sets
	Two stage reciprocating open type	
	Capacity 150,000 Kcal / hr	
	Motor 37 KW, 50Hz, 380W	
-2.	Hydraulic system (w/operating valves)	2 sets
-3.	Refrigerant connection piping	1 LS
	incl. pipes, valves, joints, fittings. etc	
-4.	Freezing Pan	120 sets
	Galvanized iron sheet	

D. Cold storage — 2 sets

Holding temperature - 25 degree C
Prefabricated panel type

-1.	NH3 Compressor w/ Accumulator	1 set
	Capacity 20,000 Kcal/ hr	
	Motor 22KW, 50Hz, 380V	

-2. Unit Cooler w/Multi Suction Trap		2 sets
Capacity	8,000 Kcal / hr	
-3. Refrigerant connection piping		1 LS
-4. Defrost water piping		1 LS
incl. pipes, valves, joints, etc.		
-5. Prefabricated Panel		2 sets
Wall Panel	Insulated panel with rib, t = 100 mm	
Ceiling panel	Insulated panel, t = 100mm	
Dimensions	5,800 x 12,000 x 2,400 mm	
-6. Insulation Door		2 sets
Manual single hinged type	800 x 1,800 mm	
-7. Air curtain		2 sets
-8. Vinyl curtain		2 sets
-9. Thermometer		2 sets
E. Chilling Storage		1 set
Holding temperature	- 5 degree C	
Prefabricated panel type		
-1. NH3 Compressor w/Oil Separator		1 set
Capacity	20,000 Kcal/ hr	
Motor	22KW, 50Hz, 380V	
-2. Unit Cooler w/Multi Suction Trap		1 set
Capacity	9,000 Kcal / hr	
-3. Refrigerant connection piping		1 LS
-4. Defrost water piping		1 LS
incl. pipes, valves, joints, etc.		
-5. Prefabricated Panel		1 set
Wall panel	Insulated panel with rib, t = 100 mm	
Ceiling panel	Insulated panel, t = 100mm	
Dimensions	11,500(9,000) x 12,000 x 2,400 mm	
-6. Insulation Door		2 sets
Manual single hinged type	800 x 1,800 mm	
-7. Air curtain		2 sets
-8. Vinyl curtain		2 sets
-9. Thermometer		2 sets

2) Fuel Supply Facilities:

a) Required scale:

The fuel supply facility is intended to stabilize the supply of fuel to fishing vessels using the Project facilities and improve the overall efficiency of these fuel supply operations. This is to be accomplished by directly purchasing fuel from oil tankers berthing at the Project jetty and then storing it in fuel tanks. In addition, it is planned to modernize the fuel supply operation from a safety standpoint as well. Fuel tanks and fuel supply facility must, accordingly, be provided for the above purposes.

The volume of fuel oil to be supplied at the Project facilities has been set at 80% of the capacity of the fuel tanks on the fishing boats using the Project port, with demand calculated on a daily basis. The fuel tank can be replenished every 30 days by direct tanker deliveries, but constant attention must be paid to maintaining a stable supply. We feel, therefore, that a reserve fuel supply must be maintained at all times, equivalent to 25% of projected consumption.

Table 3.3.26 Fuel Demand

Vessel Type	Fuel Tank Capacity (cu.m)	Fuel Supply Volume per Vessel (80%) (cu.m/time)	Number of Vessels (V) per Month uUsing fuel Supply Facilities	Monthly Supply Requirements (cu.m)
Offshore	23.0	18.4	8 x 26 times/yr / 12 = 17 Vessels	312.8
Large Coastal	4.0	3.2	156 x 28 times/yr/ 12 = 364 Vessels	1,164.8
Small Coastal	0.2	0.16	192 x 45 times/yr/12 = 720 Vessels	115.2
			Total	1,592.8

Note: cf. Table 2.2.1 (Principal Particulars and Operating Patterns of Target Plan Fishing Vessels") for the fuel tank capacities of the various vessel types.

Accordingly, while monthly fuel supplies have been set at 1,592 cu.m, allowing a 25% reserve, as suggested above,

1,592.8 x 125% = 1,991 cu.m (rounded up to 2,000 cu.m)

Based on the likelihood of regular shutdowns to permit tank repairs, the required fuel inventory should be divided between two tanks. On this basis, the size of the fuel tanks becomes :

1,000 (cu.m/tank) x 2 tons = 2,000 cu.m

b) Structure :

For this Project we have specified round steel tanks, with a capacity of 1,000 kl and standard dimensions: diameter 10,640 mm x height 12,185 mm x 2 units

c) Safety equipment and piping:

In connection with the design of the tank storage facilities for dangerous substances, the Plan will be based on the standards of the American Petroleum Institute (A.P.I.), in which compulsory provisions have been set for safety facilities.

< Oil Fence >

As previously discussed, the installation of the oil fence will be pursuant to A.P.I. standards. In the A.P.I regulations, when fuel oil or other dangerous substances are stored, it is mandatory that an oil retaining wall be installed, based on the following provisions, so as to prevent any spill over.

i) The capacity of the oil retaining wall must be set at 11% or more of tank capacity. Thus, when 2 storage tanks are used, the oil retaining wall capacity must be at least 110% that of the larger of the two tanks.
ii) The height of the oil retaining wall is to be at least 0.5 m.
iii) When the tank diameter is below 15 m, the oil retaining wall must be located at a distance from the tank equivalent to at least 1/3 of tank height; with a diameter of 15m or more, this distance must be at least 1/2 of tank height.

Since the maximum capacity of each of the 2 tanks will be 1,000 kl, in accordance with the above standards, when the height of the oil retaining wall is 1.5 m, the required oil retaining area will be in the order of 19m x 41m.

< Fire Fighting System >

As described above, the installation of the fire fighting facility will be based on A.P.I. standards. When fuel oil and other dangerous substances are stored, the A.P.I requires that foam extinguishers be installed as a fire preventive measure. Thus, in the Project fuel tank as well, fire extinguishers based on A.P.I standards have been specified.

< Fuel Receiving and Delivery Facilities >

The fuel receiving pipe facilities for this project involve the installation of a fuel receiving terminal on the newly constructed jetty as well as receiving pipe to transfer the fuel from the

oil tanker to the fuel storage tank. Fuel delivery facilities will utilize the fuel receiving pipes mentioned above. A branch pipe will be laid from the main pipe to carry fuel to the existing jetty.

The pipes will be laid inside the channel in the interest of both safety and ease of maintenance. As piping material, we plan to use epoxy-coated steel for rust prevention purposes.

< Terminal Facilities >

The terminal facilities for the fuel delivery pipes to be installed on the Project jetty will comprise check valves, stop valves, and a flange with attached hose. The connection to the tank will be accomplished with flexible hoses (8" diameter x 5m x 3 units).

Accordingly, the terminal equipment for the fuel supply facilities in this Project will be made up of check valves, stop valves, flow meters, hose joints, and fuel delivery hoses.

The following diagram shows the diagram of the fuel supply facilities:

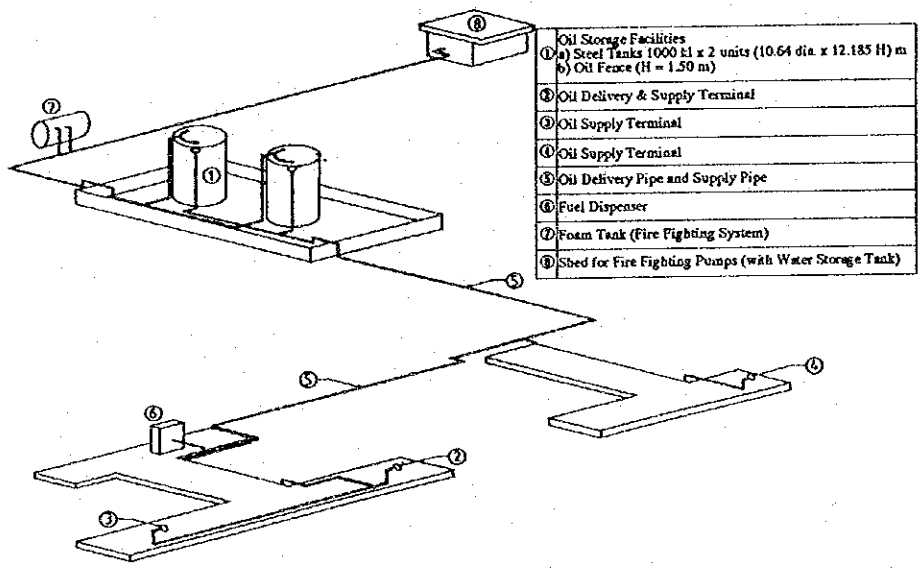


Figure 3.3.11 Diagram of Fuel Oil Supply System

Following is a summary of the required area and scale for the Project facilities, as derived from the preceding analysis:

Table 3.3.27 Summary Chart of Project Facility Scale

Facility Designation	Plan size / Area
1. Coastal Engineering Works	
a) Landing Jetty (for large coastal boat) Connecting Bridge	15 m x 120 m = 1,800 sq.m 10 m x 45 m = 450 sq.m
b) Pontoon Jetties (for small coastal boat) Movable Connecting Bridge	6 m x 30 m x 2 units = 600 sq.m 4 m x 30 m x 2 units = 240 sq.m
c) Shore Protection	290 m
2. Buildings	
a) Ice-making Plant	1,966.0 sq.m
b) Fish Handling cum Market Building	3,720.0 sq.m
c) Chilling / Cold Storage	627.5 sq.m
d) Workshop	210.0 sq.m
e) Administration Building	868.0 sq.m
f) Warehouse	196.0 sq.m
g) Public Lavatory	40.0 sq.m
h) Substation	42.0 sq.m
i) Shed for Fire Fighting Facility & Waste Water Treatment Facility	48.0 sq.m
j) Elevated water tank	50 tons (Freshwater 40 tons, River water 10 tons)
3. Plant facilities	
a) Ice-making Plant	200 tons / day (Ice Storage Capacity : 1,000 tons)
b) Fuel Storage & Delivery System	1,000 kl x 2 units
c) Quick Freezers	4.5 tons / day (1.2 tons x 6 hrs x 2 units)
d) Cold storage	135 tons (-25 degree C)
e) Chilling Storage	100tons (- 5 degree C)
f) Waste Water Treatment System	120 cu.m / day (Activated Sludge Process)

The following figure shows the flow chart for the fish/ice handling within the Project facilities:

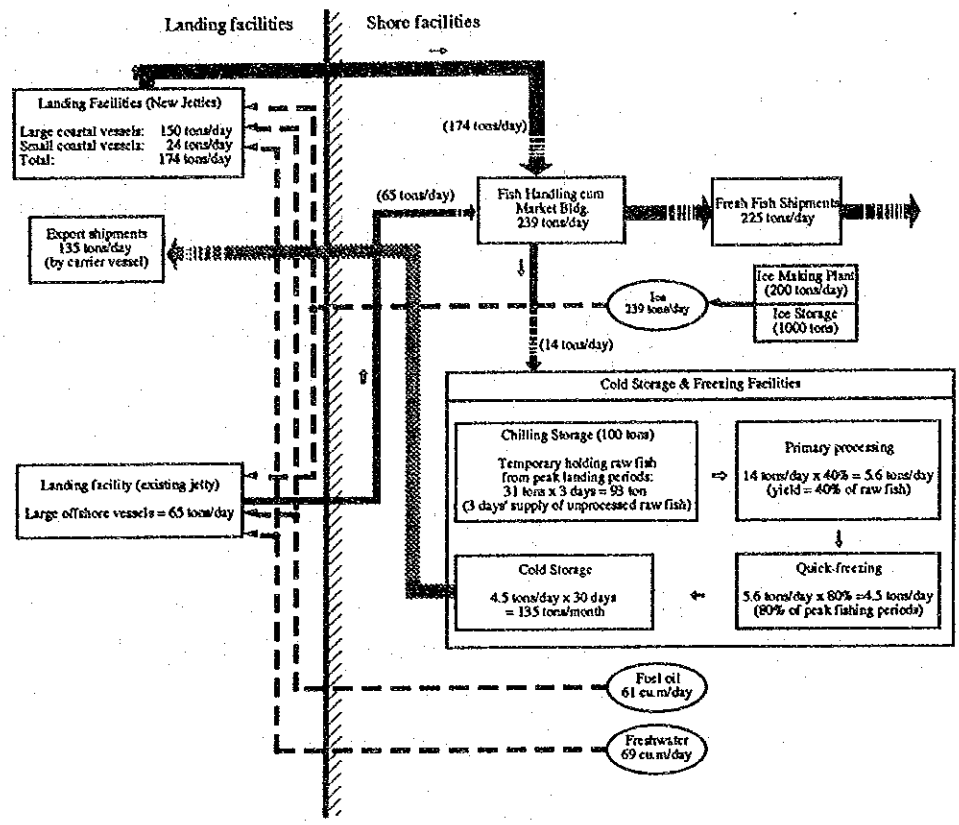


Figure 3.3.12 Flow Chart of Fish/Ice Handling System for the Project Facilities

3.3.5 Equipment and Vehicles:

The equipment and vehicles required for this Project will include radio equipment, transport vehicles, fish/ice handling equipment, ice crushers, workshop equipment, environmental protection equipment, and fire extinguishing equipment.

1) Radio equipment:

The required radio equipment will comprise 1 SSB unit of about 150 W for communicating with offshore fishing vessels plus 1 international and 2 portable VHF units for liaison with vessels entering port.

2) Transport vehicles:

A truck will be needed to bring in ice-making cans, bags of brine, and other materials for the

Project facilities, along with a van for administrative liaison. There will also be a requirement for a truck crane (5 tons) for unloading catches from offshore fishing vessels as well as for 2 forklifts (2 ton) for transporting catches and ice (i.e., one for each function). The truck crane will be used to move catches from the landing vessel to the jetty, while the forklifts will be used in turn to move catches from the jetty to the handling area and to carry ice from the ice-making plant to the jetty. One 2-ton forklift will be required to handle the catch of a single large coastal fishing vessel and to service the ice needs of 4 fishing vessels: 7 vessels/4 vessels = 1.75 units. Thus, 2 forklifts will be needed for the large coastal vessels. The catch and ice requirements for small coastal boats will call for 1 forklift (of 1 ton) for each pontoon jetty, for a total of 2 units.

3) Fish/Ice handling equipment:

Belt conveyor and roller conveyors are required for landing catches from fishing vessels. These conveyors will be used to move the catch from vessel to jetty.

In terms of quantities, offshore vessels will use 2 sets of belt conveyors (with each set composed of 2 conveyors). In the case of the large coastal vessels, 1 set of 2 belt conveyors and one set of 3 roller conveyors will be needed per vessel. When 6 boats among 7 boats will dock simultaneously, a total of 18 sets (6 x 3) will be needed.

For small coastal vessels, ice and catches are moved via forklifts; thus, 15 spare pallets for forklift use will be required. Using pull cars with forklifts to haul ice and catches for offshore and large coastal vessels, 15 cars will be needed, each with a load capacity of 50 pcs of 50-kg ice blocks.

Platform scales will be furnished to weigh the catches. The number of scales required in the fish handling cum market, assuming a minimum requirement of 300 sq.m per unit, will be :

3600 sq.m/300 sq.m = 12 scales

Hand trucks will be needed for small movements within the handling area. The number of hand trucks has been calculated on the assumption that one unit will handle 5 tons. Since landings from the offshore vessel will total 65 tons, 65/5 = 13 trucks. Landings from coastal vessels will total 179 tons. However, with a turnover rate of twice a day,

179 / (2 x 5) = 17.9 or 18 units.

The combined hand truck requirement, therefore, will come to 31 units.

Under present conditions, bamboo baskets are used to transport even species of high

commercial value. However, these baskets can damage the fish, thereby diminishing market value. We plan, therefore, to introduce, on a pilot basis, plastic fish-carrying containers. The daily volume of raw fish destined for the quick-freezer will be 14 tons. Thus, figuring the capacity of the plastic container at 35 lit/unit, as shown below, 14 kg can be stored in each container.

35 lit/container x 0.4 kg/lit = 14 kg/container. Accordingly, the number of containers required becomes :

(14,000 kg) ÷ 14 kg/container = 1,000 containers

4) Equipment for supplying operation:

Ice crushers will be required for loading the ice onto the fishing vessels. These ice crushers will be small and portable, with 2 units each to be used for offshore vessels, 4 units for large coastal vessels, and 4 units for small coastal boats, and 2 units for spares. Since the ice will be supplied principaly for vessels, 3 units of ice crushers will also be used in the fish handling area for iced shipments of fresh fish. Accordingly, portable type small ice crushers will be required 15 units.

Resin shooters will also be needed to load ice from the crusher into the vessel's fish hold.

In order to supply freshwater to the fishing vessels, there will also be a requirement for hose reels equipped with a push car and a meter. 1 reel of 4-inch diameter will be needed for the offshore vessels and 2 reels of 2-inch diameter for the coastal boats.

5) Workshop equipment:

The principal operations to be performed at the workshop include repairs on freezing equipment and pumps, fabrication of ice cans, production and repairs on plank covers for the ice-making tank, and electrical repairs. The main items of equipment will be electric welders, gas welders, compressors, circular saws, pipe benders, chain blocks, electric testing instruments, and hand tools.

6) Environmental protection equipment:

As a countermeasure against oil spills from fishing vessels and other sources, the Project will provide an oil fence and adsorption materials. In order to enclose the jetties for offshore and coastal vessels, a 600m long fence will be needed. For the adsorption materials, figuring that the maximum likelihood of an oil leak will be from the large offshore vessels, we have specified an adsorption capacity of 23 tons of fuel oil.

Three high-pressure washing machines will also be required for use in washing down the floors in the handling area.

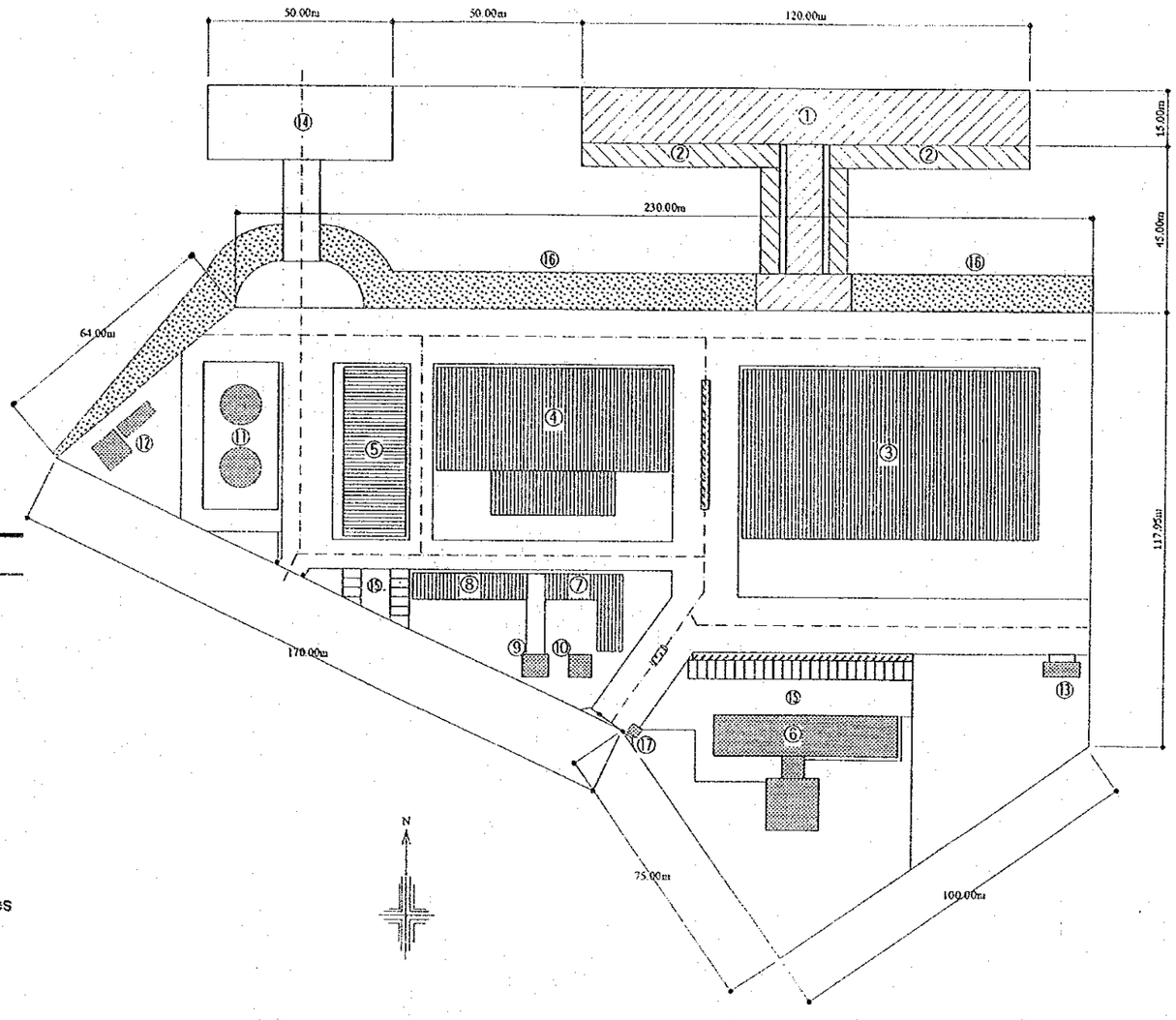
7) Fire fighting equipment:

To deal with fires that break out on fishing vessels at anchor, 5 mobile marine fire extinguishers will be provided.

Table 3.3.28 Equipment and Vehicle List

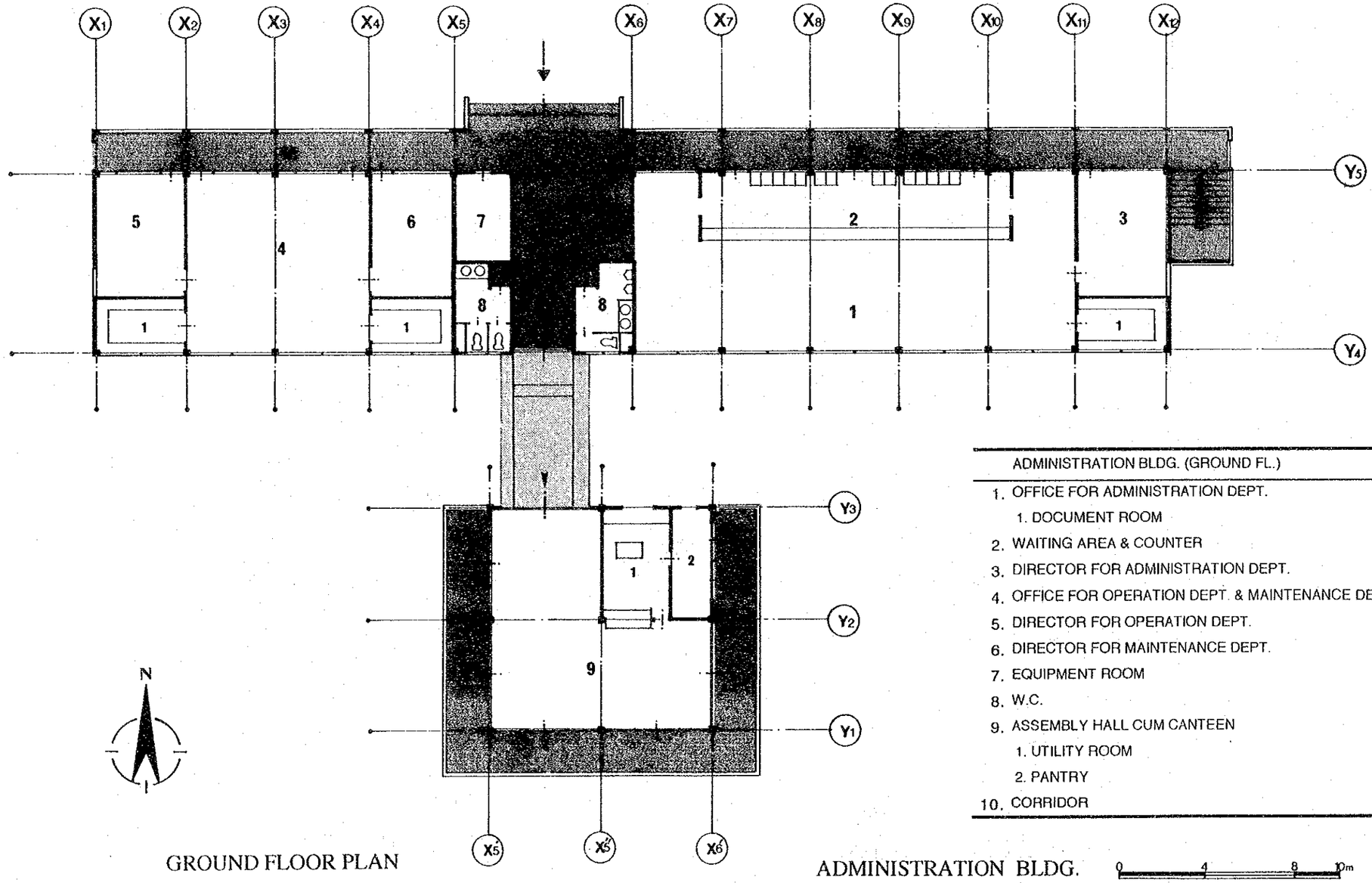
	Item	Q'ty
1)	Radio equipment	
	a) SSB	1 unit
	b) VHF	1 unit
	c) Portable VHFs	2 units
2)	Transport vehicles:	
	a) Truck	1 unit
	b) Van	1 unit
	c) Truck crane (5 ton)	1 unit
	d) Forklifts (2 ton)	3 units
	e) Forklifts (1 ton)	2 units
3)	Fish/ice handling equipment:	
	a) Belt conveyors	18 units
	b) Roller conveyors	18 units
	c) Forklift pallets	15 units
	d) Pull cars	14 units
	e) Platform Scales	12 units
	f) Hand trucks	31 units
	g) Plastic containers	1,000 units
4)	Supply equipment:	
	a) Ice crushers	15 units
	b) FRP shooters	15 units
	c) Freshwater hose reel (4 inch)	1 reel
	d) Freshwater hose reel (2 inch)	2 reels
5)	Workshop equipment:	1 set
6)	Environmental protection equipment:	
	a) Oil fence	600 m
	b) Adsorbent materials	160 boxes
	c) High-pressure washing equipment	3 units
7)	Fire extinguishers:	
	a) Mobile marine extinguishers	5 units

3.3.6 Basic Design Plan:



	Name of Facilities
1.	New Pile Jetty
2.	Pontoon Jetties
3.	Fish Handling cum Marketing Bldg.
4.	Ice Making Plant
5.	Chilling / Cold Storage
6.	Administration Bldg.
7.	Warehouse
8.	Workshop
9.	Substation
10.	Elevated Water Tank
11.	Fuel Oil Tanks
12.	Shed for Fire Fighting Pumps & Waste Water Treatment Facilities
13.	Public Lavatory
14.	Existing Jetty
15.	Parking
16.	Shore Protection
17.	Guardhouse

LAYOUT PLAN

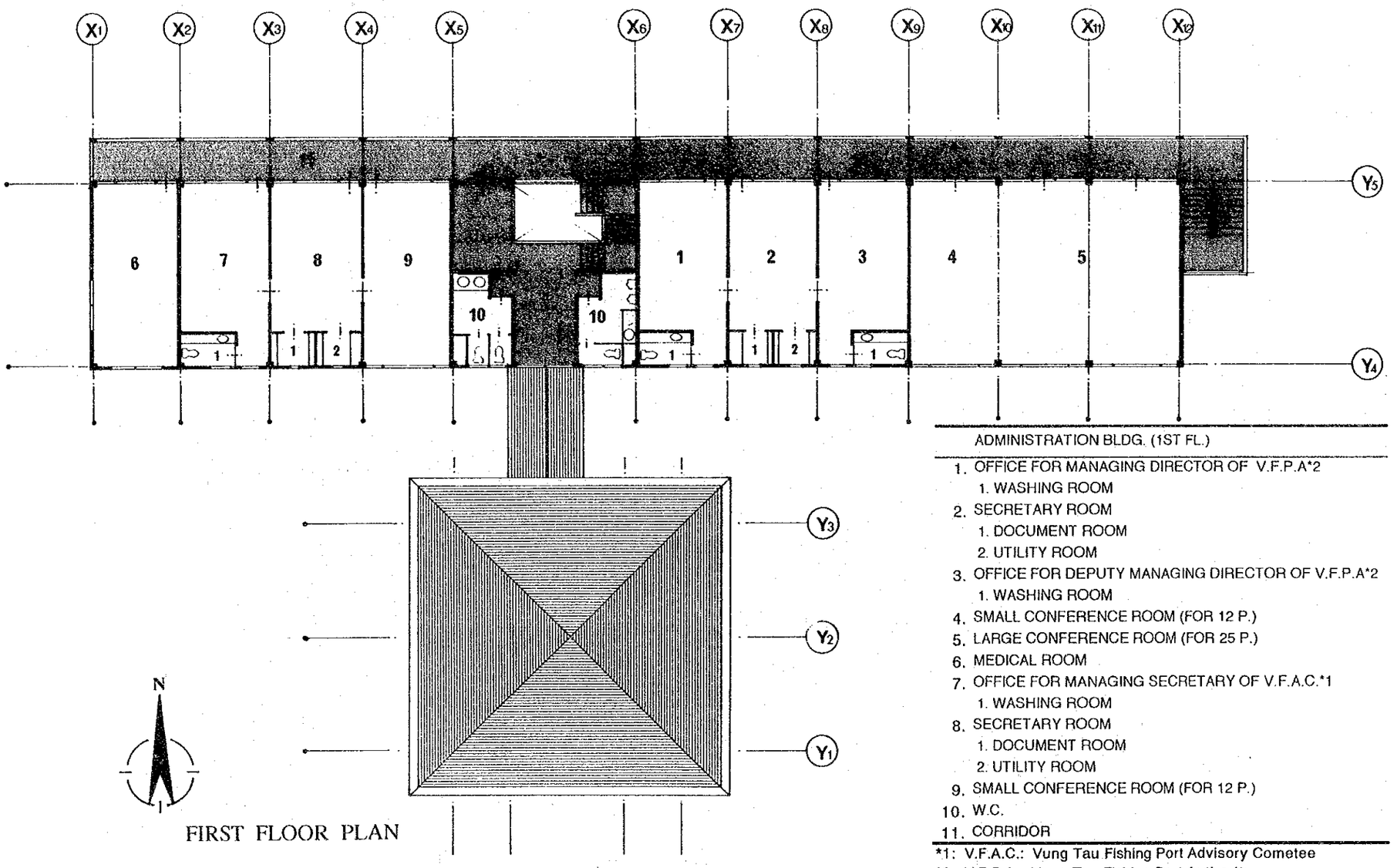


	ADMINISTRATION BLDG. (GROUND FL.)
1.	OFFICE FOR ADMINISTRATION DEPT.
	1. DOCUMENT ROOM
2.	WAITING AREA & COUNTER
3.	DIRECTOR FOR ADMINISTRATION DEPT.
4.	OFFICE FOR OPERATION DEPT. & MAINTENANCE DEPT.
5.	DIRECTOR FOR OPERATION DEPT.
6.	DIRECTOR FOR MAINTENANCE DEPT.
7.	EQUIPMENT ROOM
8.	W.C.
9.	ASSEMBLY HALL CUM CANTEEN
	1. UTILITY ROOM
	2. PANTRY
10.	CORRIDOR

GROUND FLOOR PLAN

ADMINISTRATION BLDG.

0 4 8 10m



FIRST FLOOR PLAN

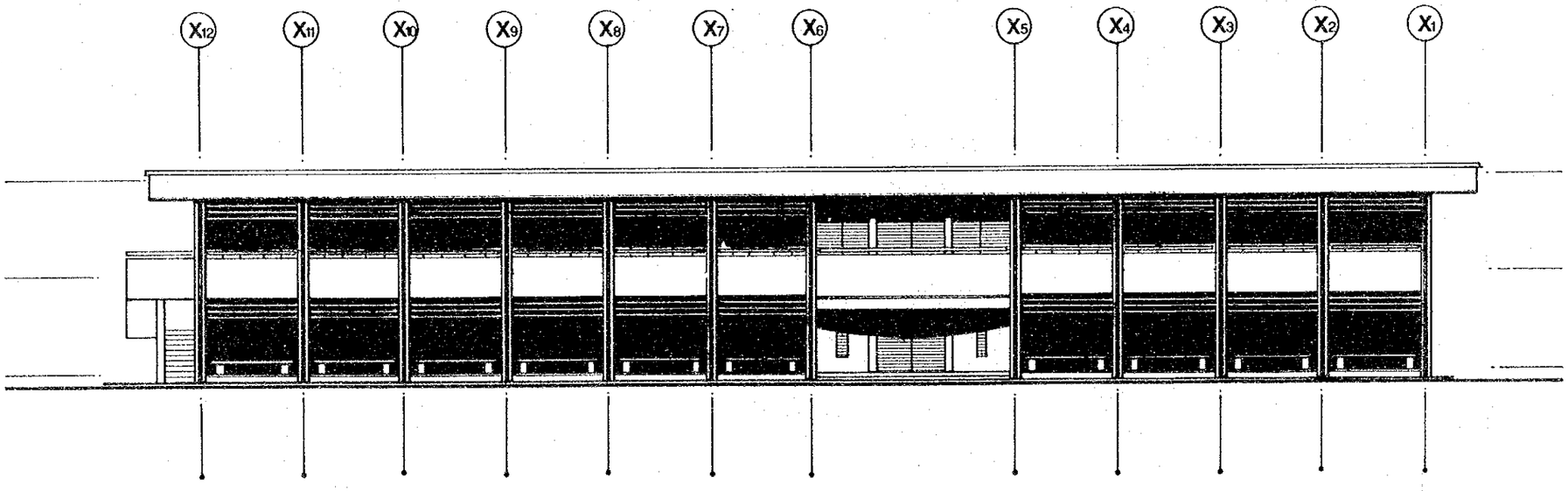
ADMINISTRATION BLDG. (1ST FL.)

1. OFFICE FOR MANAGING DIRECTOR OF V.F.P.A*2
   1. WASHING ROOM
2. SECRETARY ROOM
   1. DOCUMENT ROOM
   2. UTILITY ROOM
3. OFFICE FOR DEPUTY MANAGING DIRECTOR OF V.F.P.A*2
   1. WASHING ROOM
4. SMALL CONFERENCE ROOM (FOR 12 P.)
5. LARGE CONFERENCE ROOM (FOR 25 P.)
6. MEDICAL ROOM
7. OFFICE FOR MANAGING SECRETARY OF V.F.A.C.*1
   1. WASHING ROOM
8. SECRETARY ROOM
   1. DOCUMENT ROOM
   2. UTILITY ROOM
9. SMALL CONFERENCE ROOM (FOR 12 P.)
10. W.C.
11. CORRIDOR

*1: V.F.A.C.: Vung Tau Fishing Port Advisory Cometee
*2: V.F.P.A.: Vung Tau Fishing Port Authority

0 4 8 10m

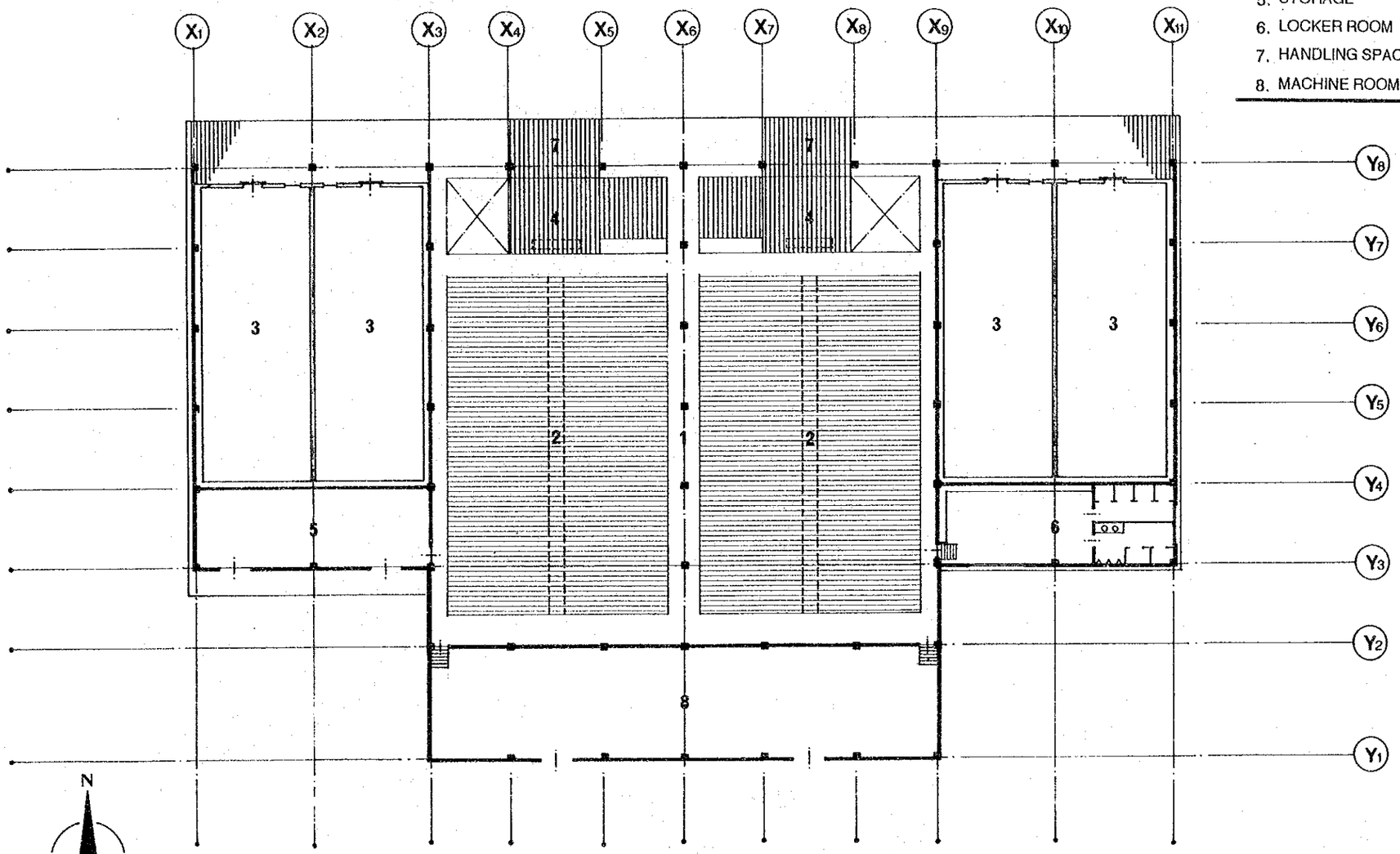
ADMINISTRATION BLDG.



NORTH ELEVATION

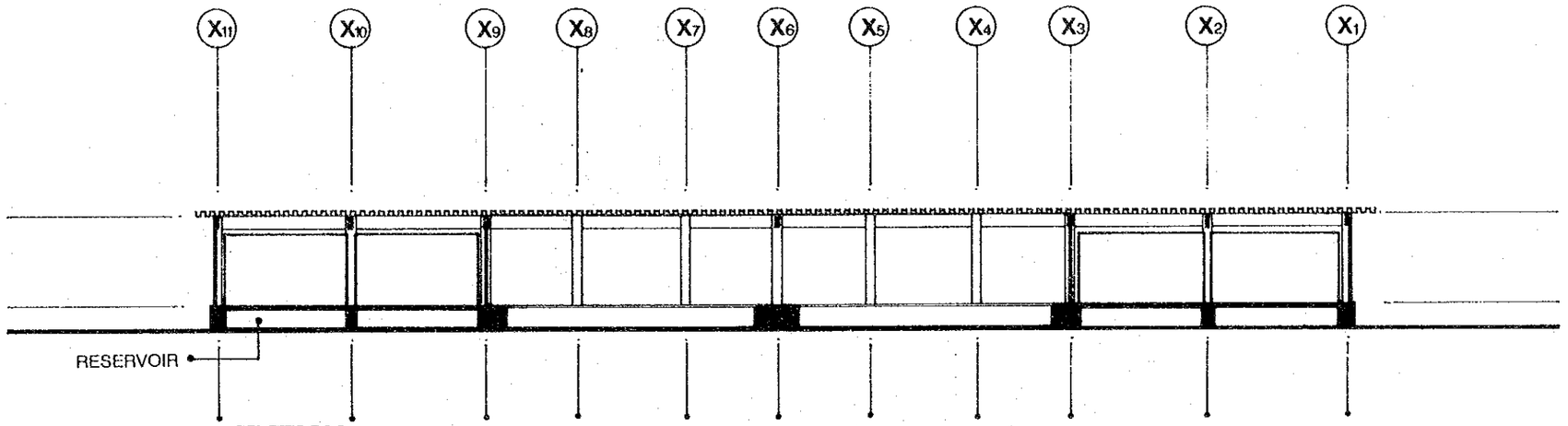
ADMINISTRATION BLDG. 0 4 8 10m

ICE MAKING PLANT
1. ICE MAKING ROOM
2. ICE MAKING TANK (50 tons/day)
3. ICE STORAGE (250 tons/unit)
4. THAWING, FILLING SPACE
5. STORAGE
6. LOCKER ROOM
7. HANDLING SPACE
8. MACHINE ROOM

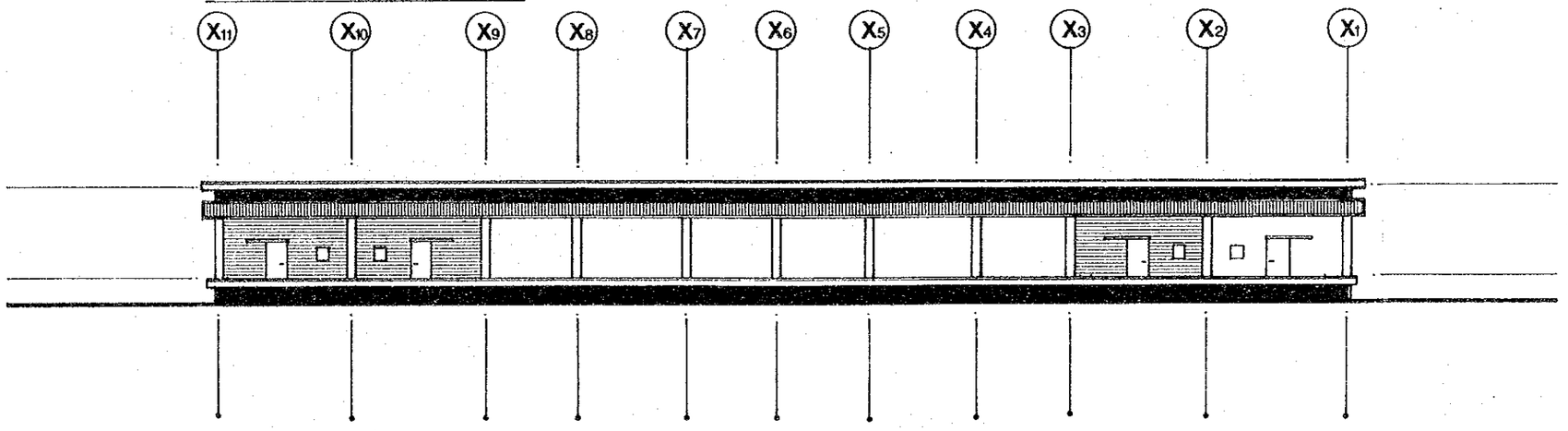


FLOOR PLAN

ICE MAKING PLANT 0 5 10 15m



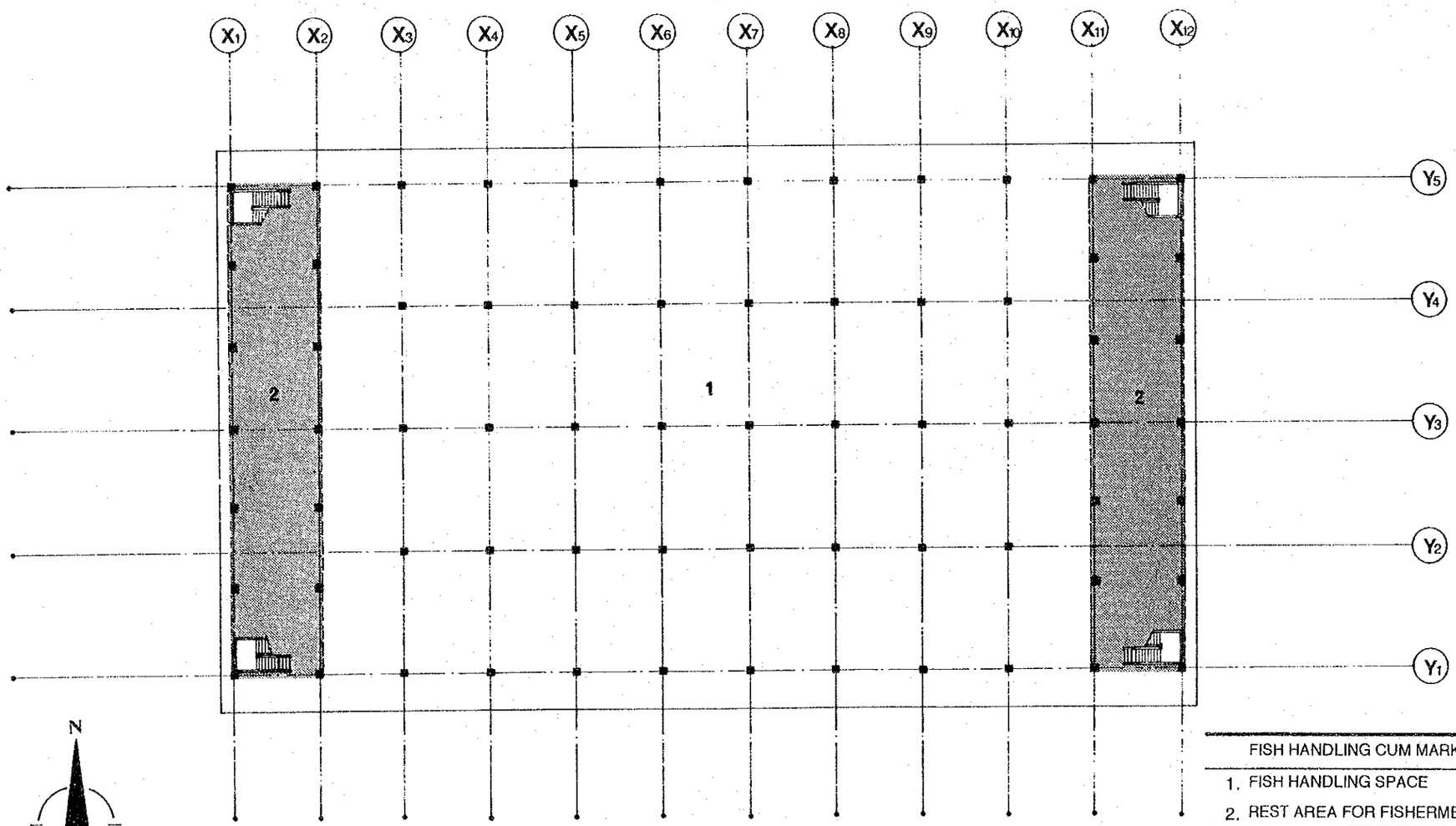
SECTION



NORTH ELEVATION

ICE MAKING PLANT

0 5 10 15m



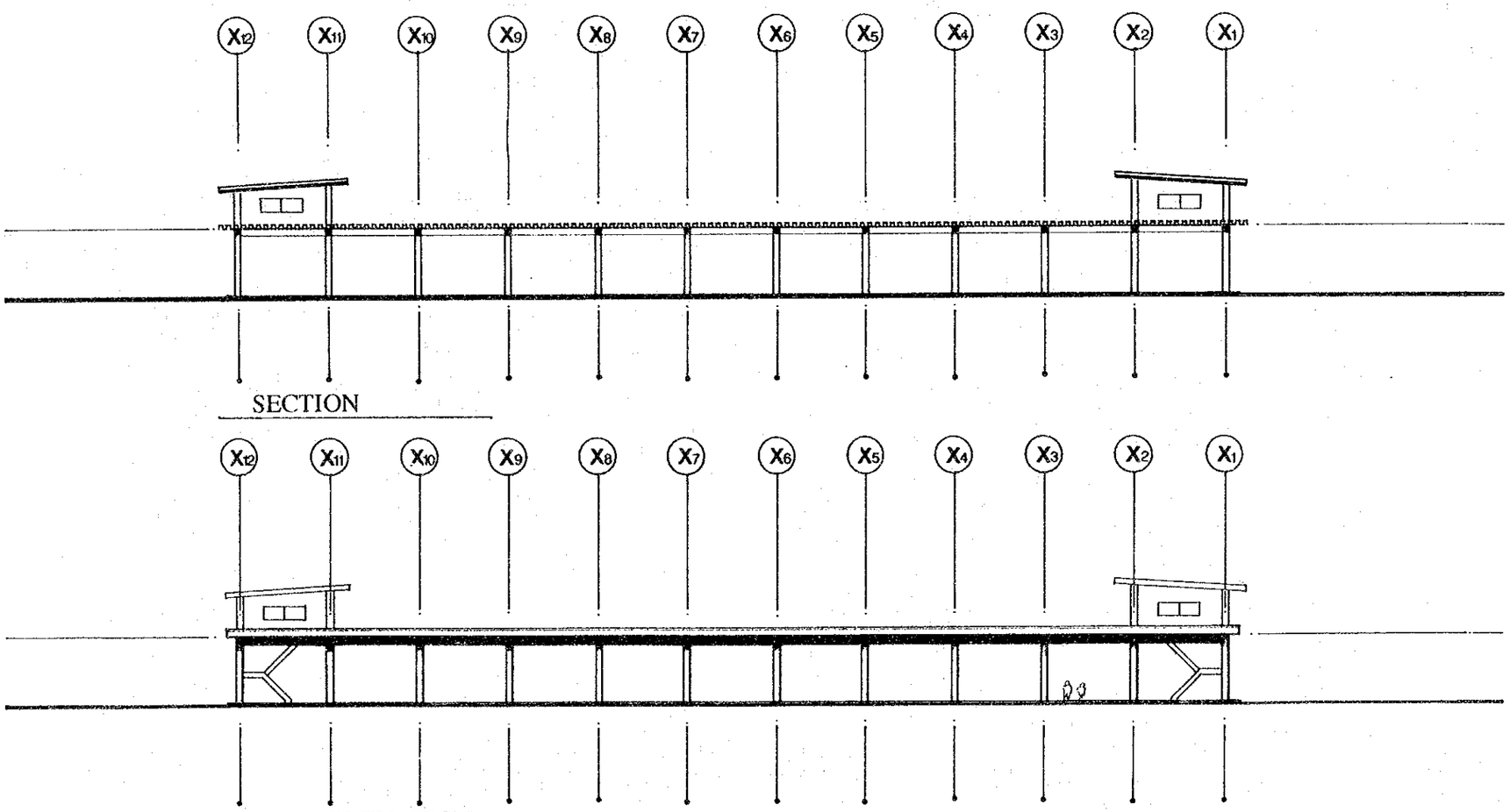
FISH HANDLING CUM MARKET BLDG.

1. FISH HANDLING SPACE
2. REST AREA FOR FISHERMEN & BROKERS (1ST FL.)

FLOOR PLAN

FISH HANDLING CUM MARKET BLDG.

0 5 10 15 20m

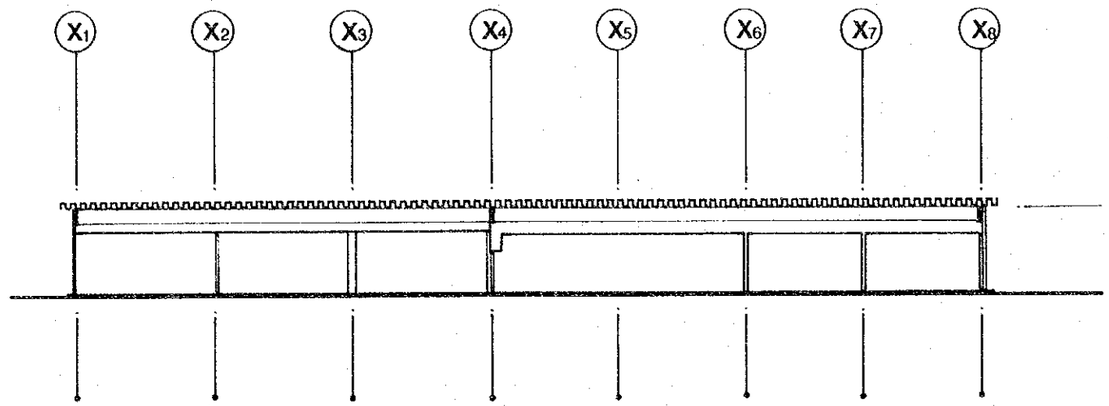


SECTION

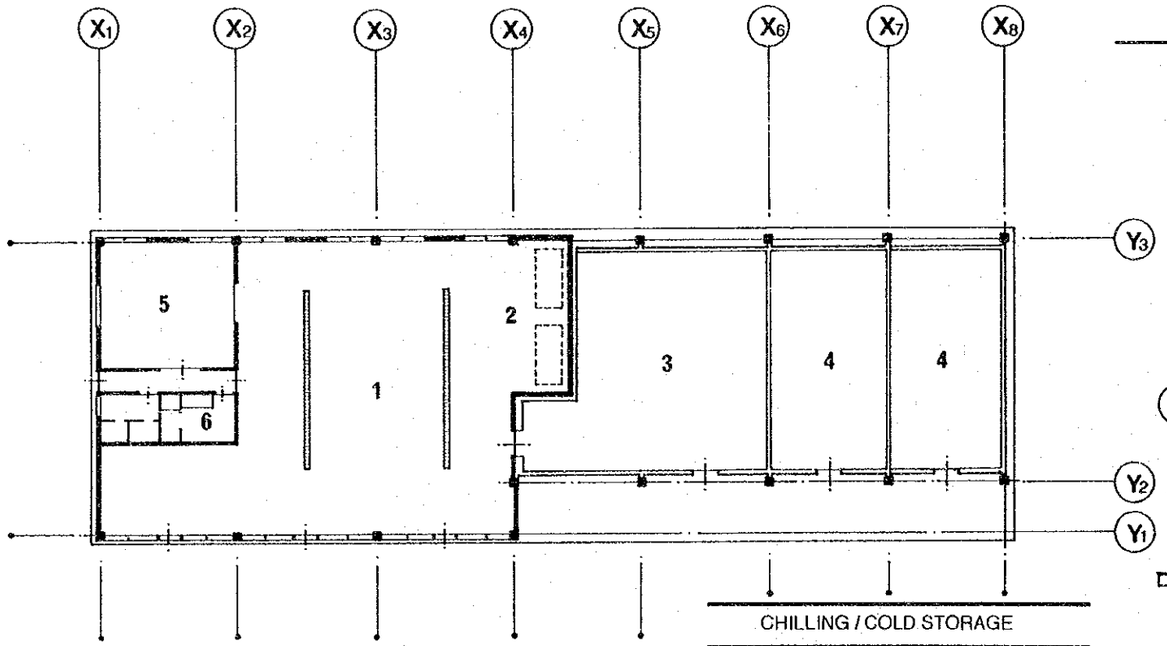
NORTH ELEVATION

FISH HANDLING CUM MARKET BLDG.

0 5 10 15 20m



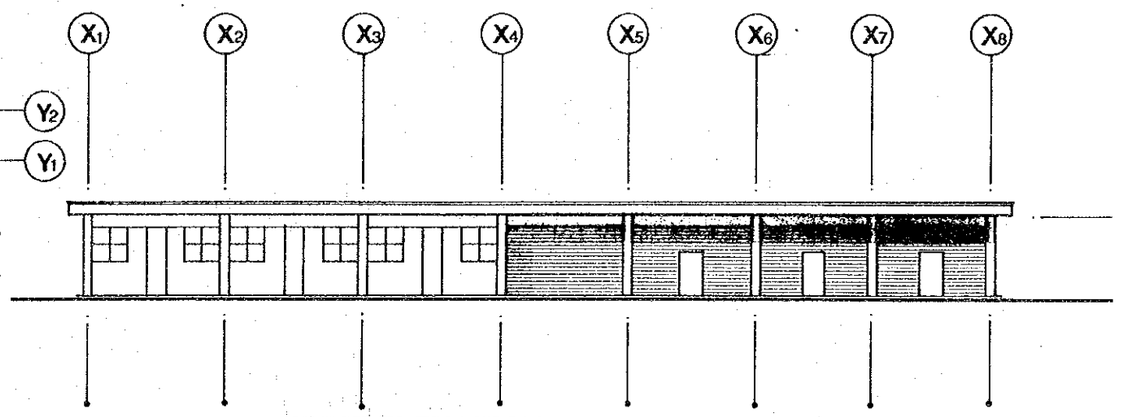
SECTION



CHILLING / COLD STORAGE

1. PROCESSING SPACE
2. QUICK FREEZER (-35 degree C.)
3. CHILLING STORAGE (-5 degree C.)
4. COLD STORAGE (-25 degree C.)
5. FIELD OFFICE
6. WASHING ROOM
7. HANDLING SPACE

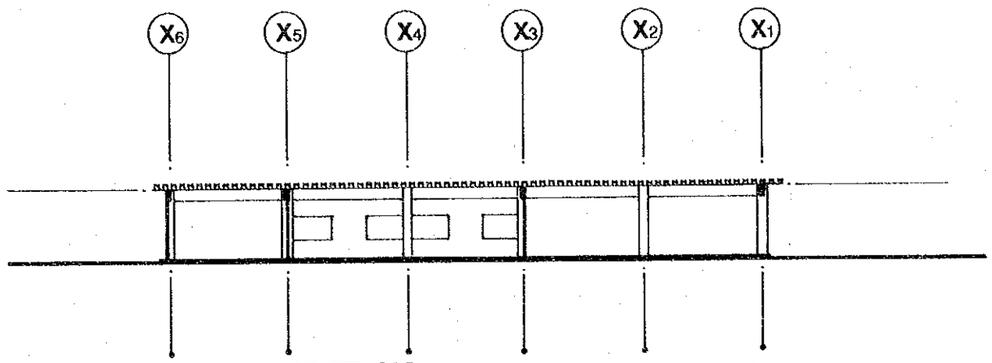
FLOOR PLAN



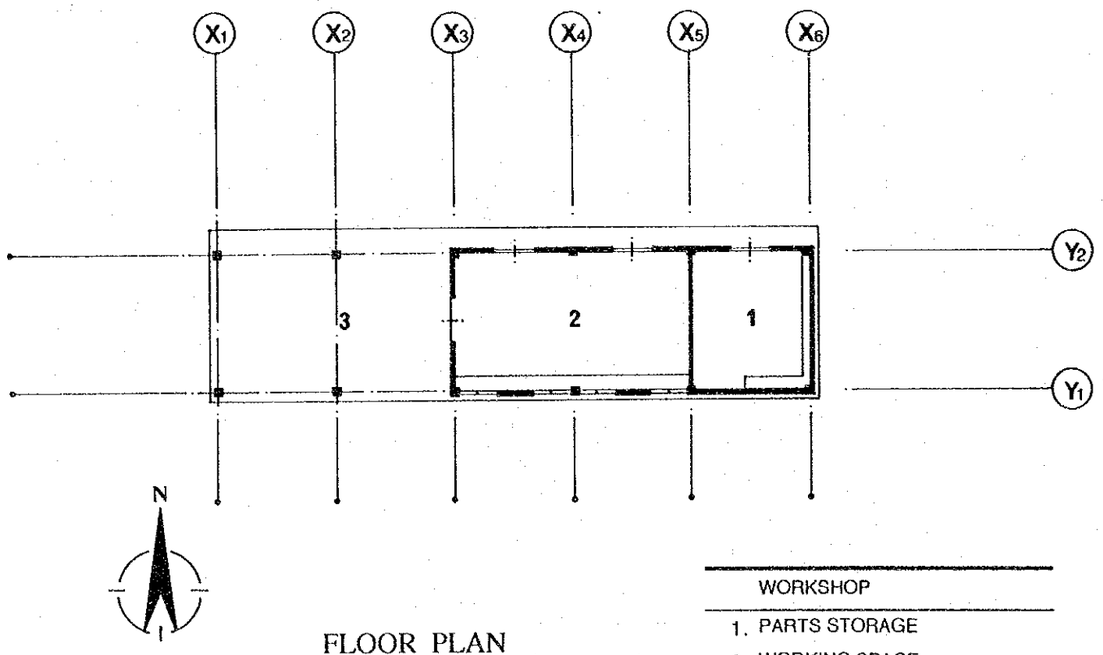
WEST ELEVATION

CHILLING / COLD STORAGE

0 5 10m

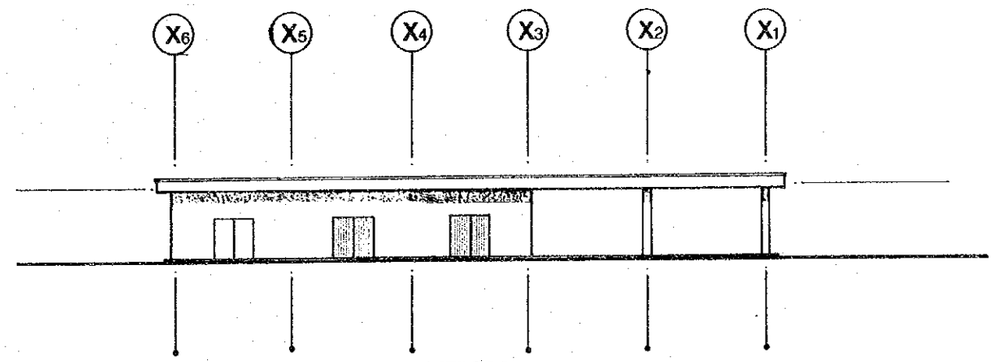


SECTION



FLOOR PLAN

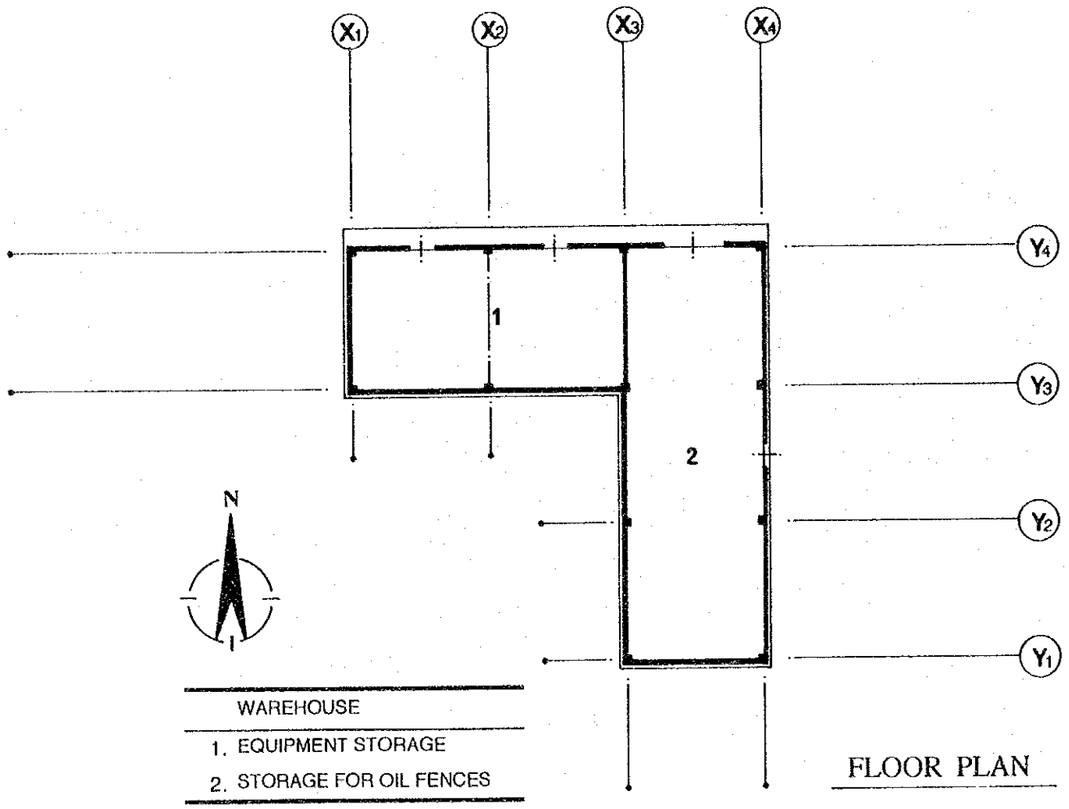
WORKSHOP
1. PARTS STORAGE
2. WORKING SPACE
3. COVERED WORKING SPACE



NORTH ELEVATION

WORKSHOP

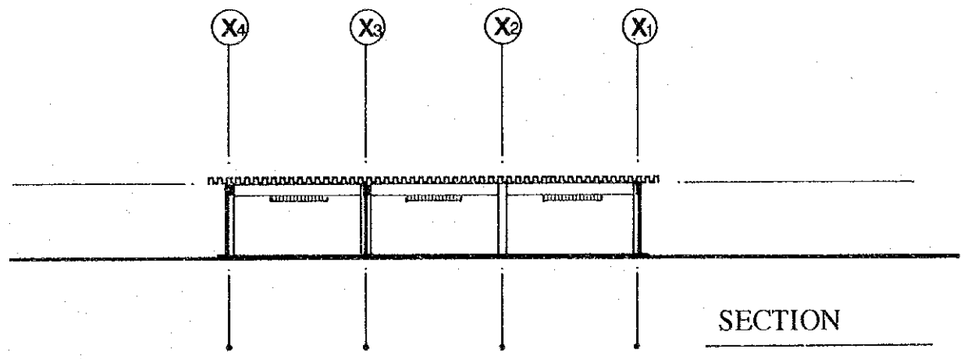
0 5 10m



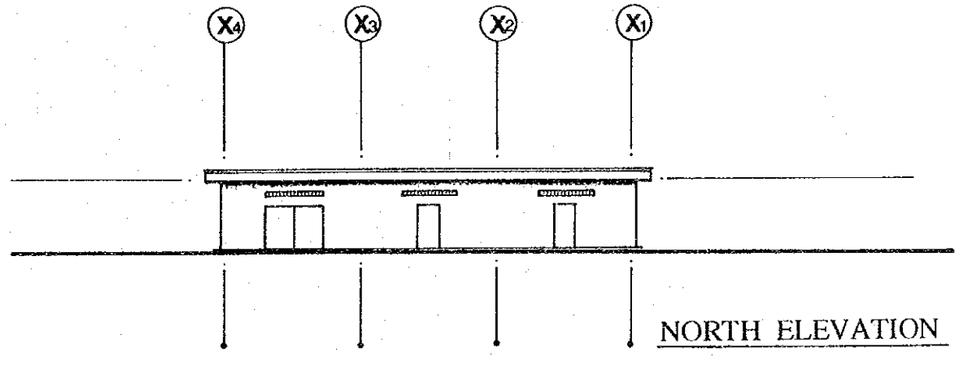
WAREHOUSE

1. EQUIPMENT STORAGE
2. STORAGE FOR OIL FENCES

FLOOR PLAN



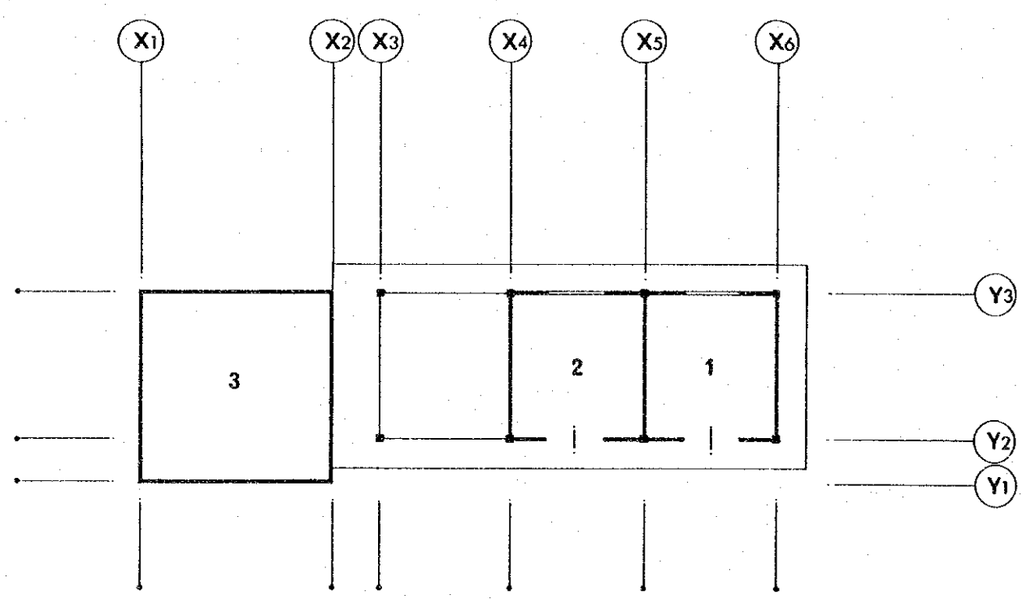
SECTION



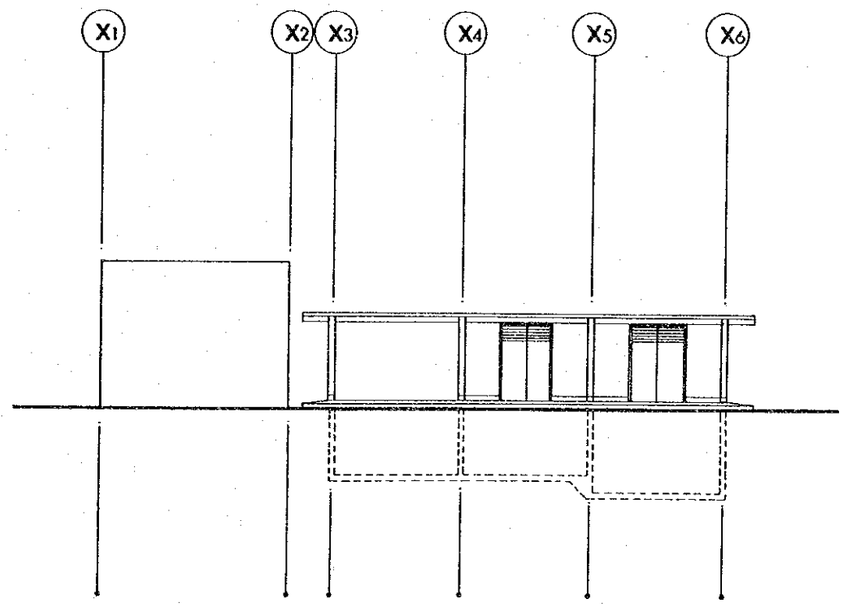
NORTH ELEVATION

WAREHOUSE

0 5 10m



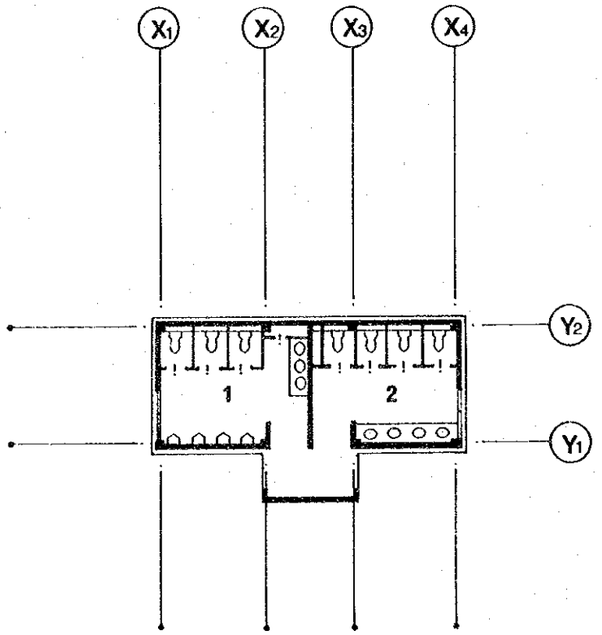
FLOOR PLAN



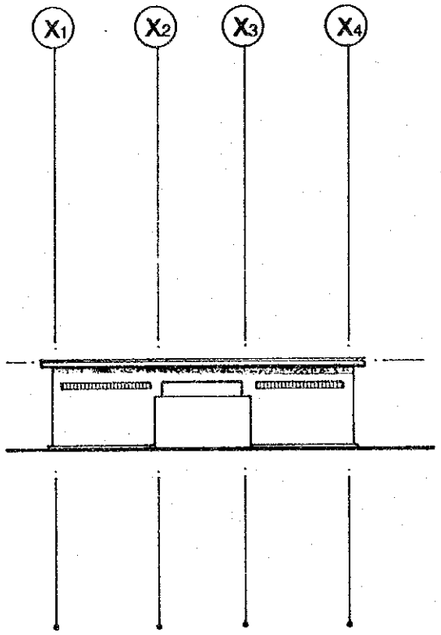
EAST ELEVATION

SHED FOR FIRE FIGHTING PUMPS
& WASTE WATER TREATMENT FACILITIES

0 5 10m



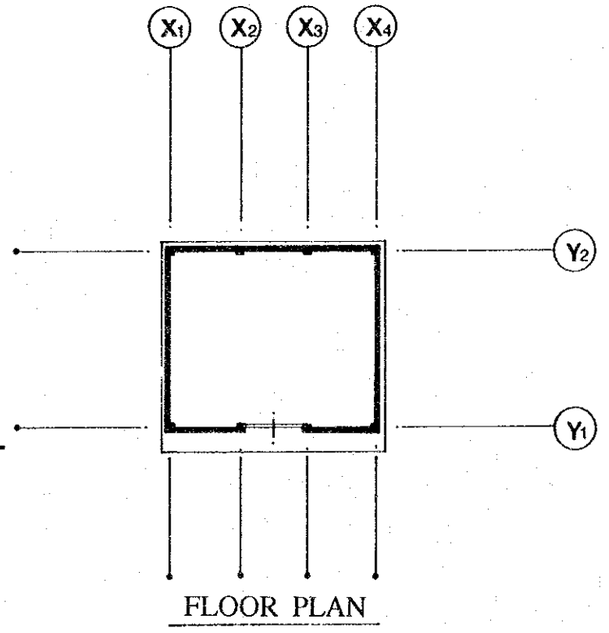
FLOOR PLAN



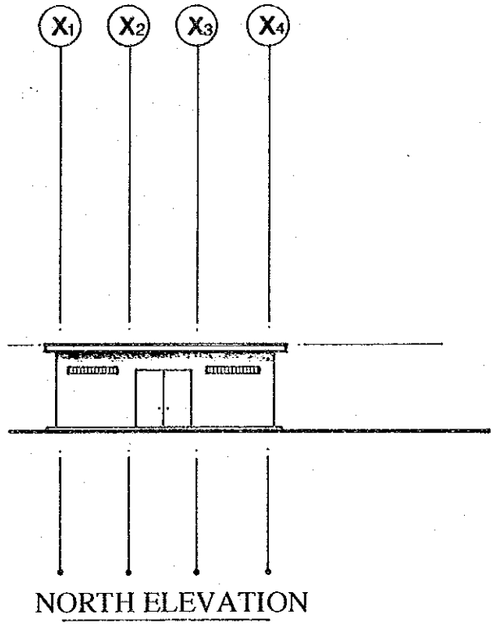
NORTH ELEVATION

PUBLIC TOILET

PUBLIC TOILET
1. W.C. (M)
2. W.C. (F)

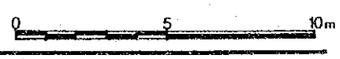


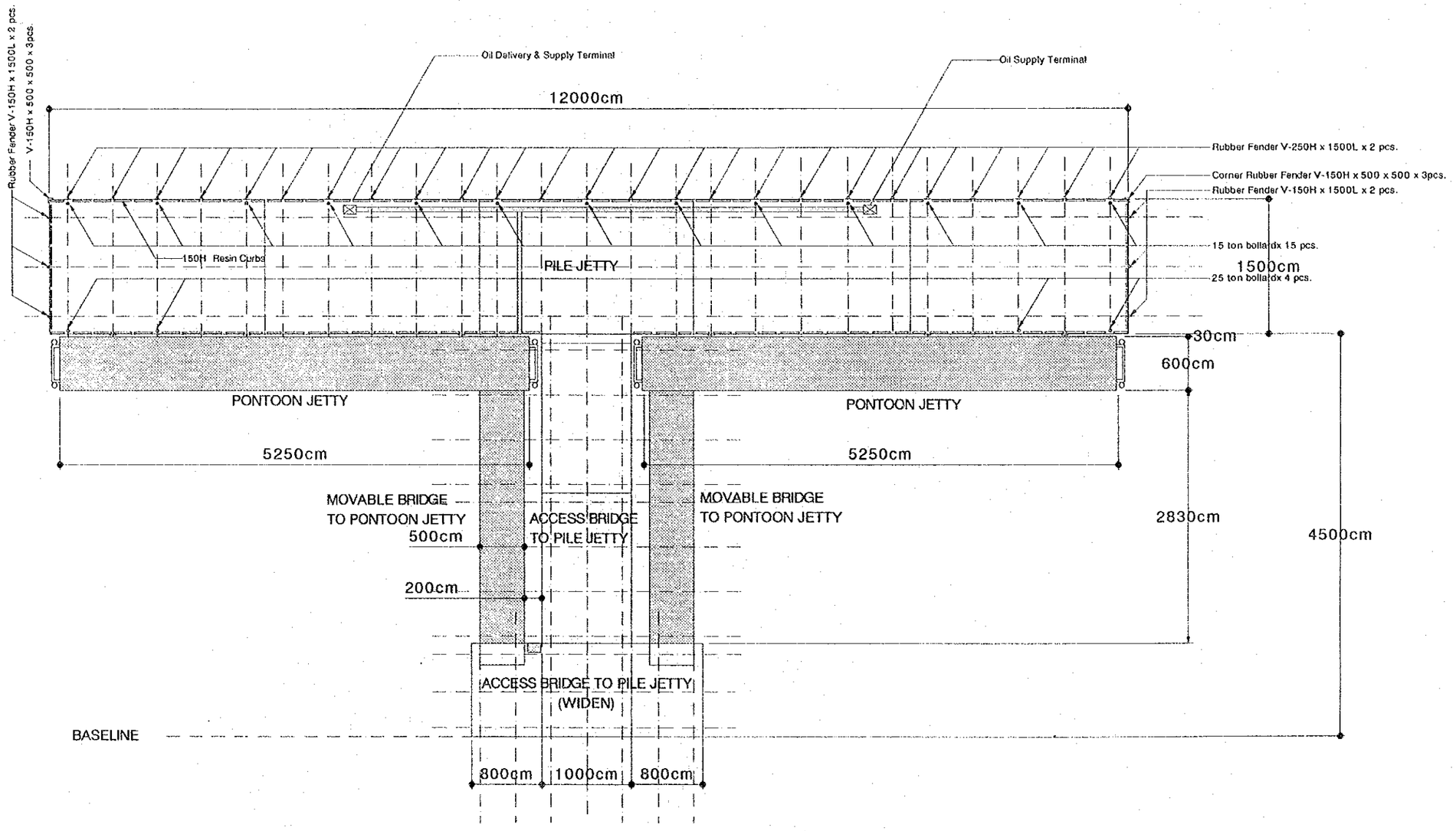
FLOOR PLAN



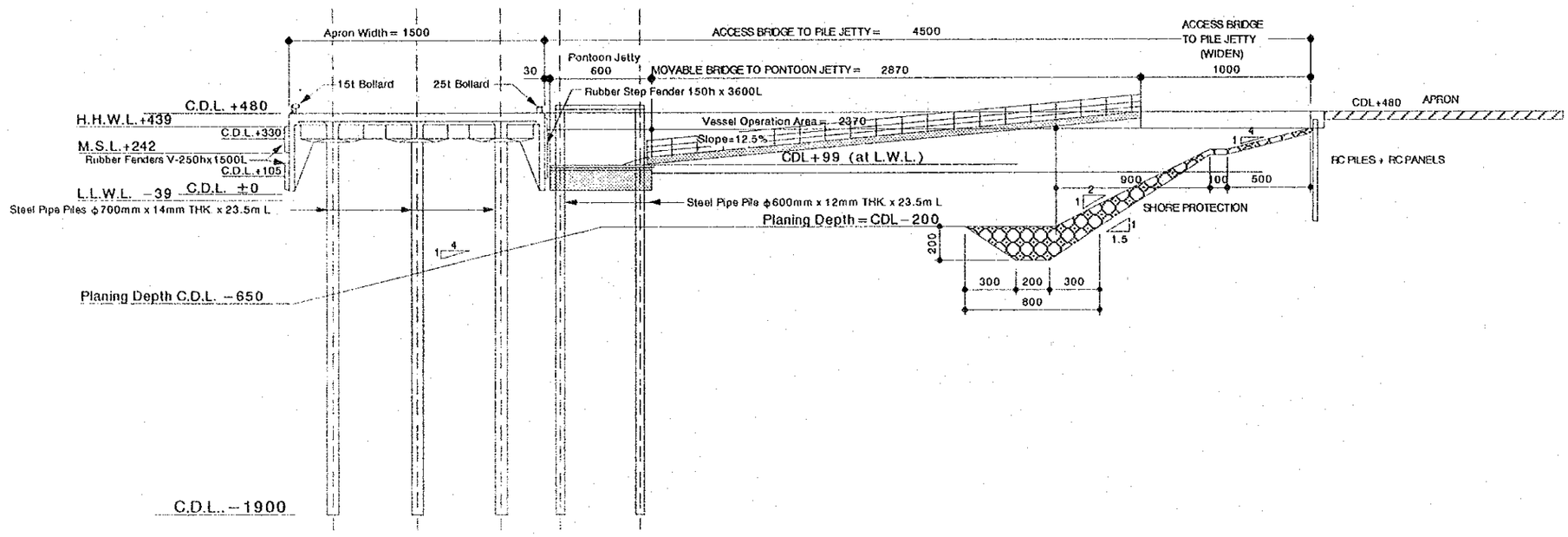
NORTH ELEVATION

SUBSTATION





GENERAL PLAN OF PILE JETTY AND PONTOON JETTIES



SECTION OF PILE JETTY AND PONTOON JETTIES

3.4 Construction Plan:

3.4.1 Construction Guidelines:

The Construction Plan for this project was developed on the basis of the following guidelines, after taking into account the natural and social conditions in the Project area, including the present state of the local building and other industries.

(1) The Project facilities cover a broad spectrum of technical fields. The coastal civil engineering phase includes the pile and pontoon landing jetties; the construction facilities comprise the Administration Building, Fish handling cum Market building, Warehouse, and Workshop; and the equipment facilities incorporate the Ice-making plant, Chilling/Cold Storage, Quick freezing facilities, Oil tanks, and Waste water treatment facilities.

(2) While it is quite possible to secure the necessary skilled and unskilled labor in the Project area (including Ho Chi Minh City), consideration should also be given to providing technical guidance from Japan in the various fields involved.

(3) With respect to construction materials, with the exception of the steel piles, steel components for the pontoon jetties, fenders, and certain other incidental items, local procurement is fully feasible for the coastal civil engineering phase of the project. In the case of the machinery and equipment, except for the foundation work, it will be necessary to consider sourcing from Japan and third countries. In the case of the building facilities, excluding only a portion of the roofing materials (polyvinyl chloride coated sheet irons), the principal materials can all be readily obtained locally. Even in the case of the electrical and other facilities, we plan to rely heavily on local procurement, though pumps and valves will have to be obtained from Japan or third countries.

(4) The facility plan has been based on a careful consideration of topography, oceanographic and meteorological conditions, and climate so as to achieve harmony with the surrounding environment. Particularly in connection with the marine portions, the project, we have sought to minimize any negative impact on the natural environment.

(5) Judging from the expected scale of the Project facilities and local constructions, the construction period will require more than one year. We have deemed it appropriate, therefore, to divide the overall construction work into two phases.

3.4.2 Special Considerations in Connection with the Building and Other Construction Work:

< Peculiarities and difficulties >

The Project facilities will comprise three different categories: coastal civil engineering, buildings construction, and mechanical installation works.

With regard to the coastal civil engineering works, SOWESFOOD is presently constructing a 50m pile jetty within the Project site. Since the target vessels for the SOWESFOOD jetty will not be the same as those for the pile jetty to be newly constructed under this Project, the pile specifications too will differ: whereas the existing jetty uses RC squared piles, the Project jetty will use steel pipe piles.

With respect to the buildings construction, no particular problems are anticipated, apart from procurement of the heavy equipment required for the pile driving operation. However, in the case of the pontoon jetties set behind the pile jetty, the plan is to build this facility at a local dry-dock. Thus, careful consideration in this plan must given to construction period, labor, and materials procurement. In the buildings construction , apart from the roofing material (polyvinyl chrolide coated sheet iron), it is expected that all items can be sourced locally. And, since we plan to use construction methods that are generally accepted in the area, no problems are foreseen during this phase.

With respect to the construction period, labor supply, and material procurement, since the construction site at Vung Tau is 125 km from Ho Chi Minh City, a detailed material procurement and supervision plan will be required. Meticulous control of the individual construction processes is essential if overall schedules are to be strictly maintained. Equipment machinery, tools, and piping and steel materials will be brought in from Japan. No particular problems are anticipated with regard to the foundation and finishing work.

The Project incorporates local construction methods throughout. Apart from piling, pontoon materials, and a portion of the machinery and equipment, the great bulk of the materials and labor will be locally procured. Since this project is to be implemented under a grant-aid from Japan, it is essential that the understanding of local contractors be obtained through ample consultation and liaison.

The supervisory structure in Vietnam will involve the continuing presence of a general project superintendent, supplemented by the dispatch, for the required periods, of an engineering supervisor, construction supervisor, administrative supervisor (including interpreters), and a mechanical/ electrical supervisor. In addition, technicians will be dispatched, as necessary, on

short-term assignment in connection with the construction equipment, pontoon jetties, fuel tanks, freezing facilities, welding operations, and electrical work.

The following chart outlines the various construction processes for the coastal civil engineering, building, and Mechanical phases:

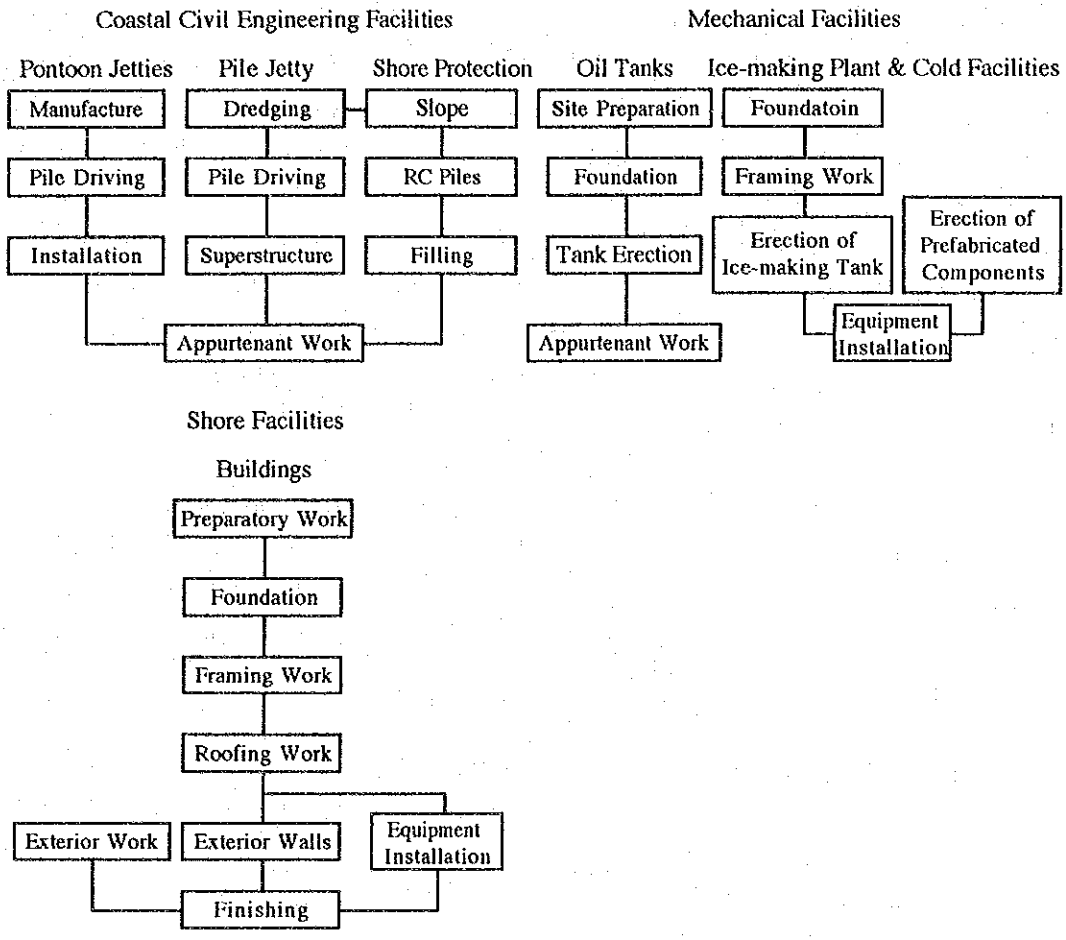


Figure 3.4.1 Construction Phases

3.4.3 Project Supervision Plan:

The Project will be carried out in accordance with the following sequence. After the Exchange of Notes between the Governments of Vietnam and Japan, based on the Agreed Minutes on Procedural Detail (which will be attached to the Notes), JICA will recommend a Consultant to the Government of Vietnam to undertake the Detail Design and supervise the construction program. The Government of Vietnam and the recommended Consultant will then

conclude a contract, based on which the Consultant will prepare all necessary documents for Project implementation, including the detailed designs and drawings, specifications, calculations of project costs, a draft of contract and tender documents and submit these documents to the Government of Vietnam for its approval.

With the approval, the Consultant will assist the Government of Vietnam to make a Notice of Tender(s) public in Japan, to pre-qualify applicants for the Tender(s), and to call for the Tender(s) for the Project in accordance with the JICA's "Guideline for Procurement under the Japanese Grant". After opening of the Tenders in the presence of the Vietnam authorities, the Consultant will prepare a Tender Evaluation Report, in which tenders will be evaluated financially and technically, and a successful tenderer(s) will be recommended to the Government of Vietnam for awarding the contract(s) for the Project. After signing the Contract(s) by the Government of Vietnam and Contractor(s), two copies of the original contract is to submit to the Government of Japan for verification. After verification by the Government of Japan, one copy of the Contract will be returned through diplomatic channel. These contracts will become effective upon their verification by the Government of Japan.

Following the contract(s), the Consultant will check the construction schedule proposed by the contractor(s), examine shop drawings, and conduct inspections on the materials and equipment being procured in Japan, while supervising the field work in Vietnam. In order to insure the progress and accuracy of the construction work, the Consultant will dispatch engineers to Vietnam and exercise supervision over the project through completion and turnover.

3.4.4 Construction Materials Procurement Plan :

(1) Principal Construction Material :

Materials for the Project will in principle, be procured in Vietnam whenever feasible. With regard to the coastal civil engineering work as well, although the steel pipe piles, pontoon steel members, and fenders will be procured from Japan, all other items can be sourced locally.

Among the construction material for the Plant facilities, steel materials for the tanks, refrigeration equipment, prefabricated elements, and pipes will be brought in from Japan, but the other materials for the foundation and finishing work will be procured in Vietnam.

In the case of the roofing materials, which are one of the main materials for the building facilities, galvanized steel plates and cement blocks are available locally, though, since the Project facilities will use wide spans, for securing the durability and preventing from corrosion problems due to salt damages, we have determined that polyvinyl chloride coated sheet iron would be ideal

for this application. The roofing materials will, accordingly, be sourced from the third country, such as Singapore, while all other items will be procured in Vietnam.

The procurement breakdown, by country of origin, for the principal materials is shown in the following table.

Table 3.4.1 Procurement Breakdown, by Country of Origin , for the Main Construction Materials

Item	Country of Origin
Sand	Vietnam
Gravel	
Cement	
Re-bars	
Wood	
Tiles, stone	
Fittings / fixture	
Paints	
Sanitary equipment	
Roofing Materials	Third Country (Singapore)
Steel pipe piles	Japan
Fenders	
Steel plating (for tank use)	
Refrigeration equipment	
Steel pipes	
Pumps, valves, fittings	
Switchboards	
Switches and outlets	Vietnam or Japan
Electric wire, cables	
Pipes for water supply and drainage (PVC)	

(2) Main Construction Equipment :

The major items of construction equipment needed for this Project include platform barges for the pile driving work during the coastal civil engineering work, a large crane, and pile driving equipment. Since in Vietnam 300 - 400 mm diameter piles driving are practiced commonly, pile driving equipment of such class is locally available. However, local equipment of driving steel pipe piles of 600 mm diameter and over is hardly available, as called for in the facility plan, and so this equipment must, in our judgment, be brought from Japan. On the other hand, local available equipment will be more than satisfactory for shore-based pile driving and other heavy equipment. We plan all other construction equipment to be rent in Vietnam.

(3) Procurement of the Principal Equipment Items :

Most of these products are not available locally, and if available, quality of them does not meet our requirements. Therefore they will, in principle, will sourced in Japan. However, incidental fixtures will be procured in Vietnam.

3.4.5 Shipping Plan:

Several shipping companies maintain liners and trampers between Japan and Vietnam, with the transit time about two weeks. Vessels do not call directly at Vung Tau port, but most ships call at Ho Chi Minh City, so we may expect, whenever cargo becomes in bulk, shipping services are available to Vung Tau, which is situated at the mouth of the Saigon River. The Project area is very close to the commercial port (only 500m as the crow flies), with roads connecting the two facilities, and so no problems are anticipated with the shipping arrangements.

3.4.6 Allocation of Responsibility:

(1) Areas of Responsibility to be Assumed by the Government of Japan:

If this Project is implemented on the basis of a grant-aid from Japan, the Government of Japan will be responsible for the following items.

a) Construction of the landing jetties for coastal fishing vessels, Fish handling cum market building, ice-making plant, chilling/cold storage, quick freezer, Administration building, Oil tanks, Workshop, Warehouse, Public lavatory, Substation, Shed for fire fighting pumps and waste water treatment equipment, elevated water tanks, exterior facilities and incidental construction.
b) Equipment and vehicle procurement, as required for the Project facilities.
c) Consulting services, including the Detail Design, assistance with tenders, and construction supervision.

(2) Areas of Responsibility to be Assumed by the Government of Vietnam :

If this Project is implemented under a grant-aid from Japan, the Government of Vietnam will assume responsibility for the following items :

a) Securing the land necessary for the construction of the Project facilities and clear, level and reclaim the site prior to commencement of the construction, and landscaping and other required exterior work after completion of the facilities.

b) Acquiring all construction and other necessary permits and licenses, as required for Project implementation.

c) Construction of the jetty for offshore fishing vessels.

d) Intake construction for distribution of power, water, and telephone lines into the site as well as procedures and costs related to this work.

e) Ensuring prompt customs clearance for, and obtaining the necessary duty exemptions on, all imported materials under the Project.

f) Exempting Japanese nationals present in Vietnam for Project implementation from all taxes and surcharges with respect to the performance of project services.

g) Issuance of authorizations to pay, based on banking arrangements with the foreign exchange bank in Japan and to bear commissions to the Japanese foreign exchange bank.

h) Sounding regularly in the port area after completion of the facilities for securing required water depth, and maintain dredging based on the result of survey.

i) All other items required for Project implementation not specifically included in the responsibilities assumed by the Government of Japan.

3.4.7 Implementation Schedule :

The optimum implementation schedule has been determined from the standpoint of the Temporary Plan, Materials Procurement Plan, construction period, and construction costs. We believe that the construction work should logically be divided into 2 phases, as outlined below :

Phase 1: Construction of foundations for the oil tanks, substation, warehouse, workshop, shed for fire fighting pumps and waste water treatment equipment, elevated water tank, dredging, and shore protection works.

Phase 2: Construction of the pile jetty, pontoon jetties, fish handling cum market building, ice-making plant, chilling/cold storage and freezing facilities, oil tanks, waste water treatment facilities, exterior facilities, and procurement of equipment and vehicles.

On the above basis, the estimated time requirements for Phase 1, as shown in the following Project Implementation Schedule, will be 7 months for the detailed design work, including the time needed to secure construction approvals from the Government of Vietnam, and another 7 months for construction. Phase 2 will require 7 months for the detailed designs, 11 months for the construction work, and 10 months for the procurement of equipment and vehicles.

The Project for the Construction of Fishing Port Facilities at Vung Tau

Description of Work		month 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
Detail Design		E/N (Phase 1)
Exchange of Notes		Consultant Contract (Phase 1)
		E/N (Phase 2)
		Consultant Contract (Phase 2)
Phase 1		
Detailed Design		
Confirmation/Approval		
Tender		
Phase 2		National Committee for Procurement & Evaluation
Detailed Design		
Confirmation/Approval		
Tender / Evaluation		Tender
Phase 1		
●Administration Bldg.	Piling	
	Earthwork	
	R. concrete	
	Block, Finishing	
●Storage, Workshop, Elevated Tank, Substation	Piling	
	Earthwork	
	R. concrete	
	Framing, Roofing	
	Finishing	
●Oil Fence, Foundation of Oil Tanks, Waste Water Treatment Facility	Piling	
	Earthwork	
	Concreting	
	Finishing	
●Shore Protection	Piling	
	Earht work	
	Concreting	
	Slope	
●Dredging		Phase 1 (7 months)
Phase 2		
●Fish Handling cum Market Bldg.	Piling	
	Excavation	
	R. concrete	
	Framing	
	Roofing	
	Finishing	
●Ice-making Plant	Piling	
	Earthwork	
	R. Concrete	
	Framing	
	Roofing	
	Finishing	
	Mechanical Work	
●Chilling / Cold Storage	Piling	
	Earthwork	
	R. Concrete	
	Framing	
	Roofing	
	Finishing	
	Mechanical Work	Chilling / Cold Storage
●Pili Jetty	Piling	
	Superstructure	
	Appurtenat Work	
●Pontoon Jetties	Fabricating in V.N	Preparatory Work at Dry Dock
●Oil Tanks		Phase 2 (11 months)
●Equipment	Fabrication in JP	Phase 2 (Equipment) (10 months)
	Shipping	
	Inst. & Handover	

3.5 Estimated Costs to be borne by the Vietnam Government:

Description of Work	US$
(1) Jetty construction(for Offshore Vessel)	(Necessary Amount)
(2) Site preparation (Sand filling)	60,000
(3) Electric Power leading-in	40,000
(4) City Water Leading-in	17,000
(5) Telephone Lines	3,000
(6) Other expenses	12,000
Total	US$ 132,000

Estimating Conditions:

a) Time of estimate : November, 1994

b) Exchange rate used : US$ 1.00 = ¥ 100.00

c) Project period : As shown in the required detailed design, construction period, and Project Implementation Schedule

d) Other : This Project will be implemented in accordance with the Government of Japan's program and procedures for grant-aid cooperation.

SECTION FOUR : PROJECT EVALUATION AND RECOMMENDATIONS

4.1 Project Benefits:

The aim of this Project is to provide an infrastructure for Vietnam's coastal and offshore fishing vessels and, by improving fish landing, supply, and distribution conditions, to achieve sustainable development of coastal fishery resources along with development of offshore resources in the southeast of the country. The project will also furnish fishing port facilities to support an expansion of offshore fisheries production and an increase in the added value of coastal catches together with vehicles and equipment for modernizing fish distribution within the port area. In Table 4.1, we have summarized the problem areas handicapping fishery development in Vietnam, which the subject Project seeks to solve, along with the scope and size of the benefits that can be anticipated from Project implementation.

Table 4.1 Present Problem Areas and Anticipated Benefits from Project Implementation

Problem Area	Project Countermeasures	Benefits / Improvements
Despite the abundant fishery resources in southeast Vietnam, there is a critical shortage of fish landing facilities in this region. The only jetties in the Vung Tau vicinity are a 50 m facility jetty at Ben Da and a 60 m facility at Phuoc Tinh. As a result, landing operations are extremely time-consuming.	• Construction of a fish landing jetty for large coastal fishing vessels (15 x 120m) • Construction of pontoon jetties for small coastal fishing vessel (6m x 50m x 2 units) • Shore protection (290m)	When the Plan facilities are completed, the two jetties will be able to accommodate 156 large coastal fishing vessels and 192 small coastal boats. Berthing and landing times will be reduced to a total of 7 hours for the large and 4 hours for the small vessels. (Under present conditions, including time spent waiting for tides, the total waiting period can run as high as 24 hours.)
Owing to the lack of jetty space and the considerable distance from ice-making facilities, skiffs must be used to bring in ice, fuel, and water supplies, resulting in a considerable waste of time and labor while further aggravating jetty congestion.	• Construction of an ice-making facility (200 tons/day) • Construction of oil tanks (1000 kl x 2 units) • Construction of a Elevated water tank (40 tons)	Time required to load ice on the large coastal vessels will be reduced to only 45 minutes and, in the case of the small coastal boats to just 30 minutes. These levels are only 1/3 to 1/2 of present time requirements.
The lack of jetties for large fishing vessels is seriously impeding vessel enlargement and modernization, which are essential to the development of offshore fisheries.	• Installing fuel and freshwater supply facilities on the jetty for offshore vessels (20m x 50m) which is now being constructed by SOWESFOOD.	Once the large fishing vessels are able to use the jetty on a regular basis, this will remove the major obstacle deterring private fishermen from switching over to larger vessels.
Owing to the lack of fish handling areas at present fishing bases, the fish must be sorted, sold, and packed under unsanitary conditions	• Construction of a fish handling bldg.(3,720 sq.m)	With the new handling area, it will become possible to sort, sell, and pack 239 tons of fish per day (76,760 tons annually), with catches handled under proper sanitary conditions.
Since freezer and cold storage facilities are lacking in the area, fish of both high and low commercial value is being handled in the same manner, thereby diminishing added value.	• Construction of a chilling/cold storage facility (including a quick-freezer 4.5tons/day, a cold storage holding 135 tons, and a chilling storage with a capacity of 100 tons)	It will be possible to fillet 14 tons of raw fish per day of species with a high commercial value, equivalent to 4.5 tons per day of processed products. After quick freezing, the products can be sold on the export market.
Landings from fishing vessels rely entirely on manual labor, consuming a considerable amount of time. The increased congestion and shortage of landing jetties result in catch deterioration.	• Trucks, forklifts, belt conveyors, and other vehicles will be provided, along with fish/ice handling equipment	With rationalization of fish landing and ice loading operations, it will be possible to prevent quality deterioration in the fish resulting from long exposure under a scorching sun.
Since per-capita fish intake in Vietnam has been declining, an increase in fish production is called for.	• Building fishing port facilities for use by both the offshore and coastal fisheries.	It is anticipated that catch volume will expand by 13,440 tons annually on the basis of increased frequency in vessel operations. Through an increase in the volume of fish entering distribution channels, it will be possible provide enough fish to feed the equivalent of an additional 156,800 persons in South Vietnam. Moreover, 900,000 persons will have access to fresh fish of good quality.
New employment opportunities must be provided in the fishery sector.	• Direct employment will be provided by the Port Authority. • Indirect employment will be generated through an increase in fish distribution volume.	Direct employment at the Plan facilities will be provided for 91 persons, but it is estimated that some 5,000 new jobs will be generated indirectly in the processing and distribution sectors.

4.2 Verification of Project Appropriateness :

The Plan facilities comprise a fishing Port complex for offshore vessels and both large and small coastal vessels operating in southeast Vietnam. The beneficiaries from Project implementation will include not only the state company mentioned in the original Vietnam Request document but also many coastal fishermen and fish brokers handling their catches. The fishing vessels operating in the Vung Tau area that are considered potential users of the Project facilities presently include 84 offshore, 1,595 large coastal, and 2,364 small coastal vessels. The Plan facilities will be able to serve 9.52% of these offshore, 9.78% of the large coastal, and 8.12% of the small coastal vessels. The new port will be capable of handling 76,760 tons of catches per year.

Vehicles and equipment are to be provided under this Project to modernize port facilities and physical distribution therein. These items are intended to promote fishing activity in offshore waters, which are richly endowed with unexploited resources, increase total fish production, and raise the added value of coastal catches by reducing post harvest loss.

Accordingly, the ultimate aim of the project is to increase the supply of fish products for the people of Vietnam, maintain employment, and earn additional foreign exchange through an expansion of fish exports.

The executing agency for this Project is the Ministry of Fisheries in Vietnam. Operation and management of the Project facilities will be entrusted to an independent organization, the Vung Tau Fishing Port Authority, which is to be established under the wing of SOWESFOOD, a state company belonging to the Ministry of Fisheries which is the implementing organ for fishery development in South Vietnam. An Advisory Committee for this Vung Tau Port Authority will also be organized to ensure that the port is be fairly administered under a public service philosophy. This Advisory Committee will reflect the views of the fishermen and brokers who use the new facilities, the Ministry of Fisheries, SOWESFOOD, the Fisheries Department of Ba Ria-Vung Tau, and other interested parties. The Project facilities have been designed to exclude facilities of a highly sophisticated nature whose operation or handling would require special technical guidance or training. They can, therefore, be amply run by recruiting experienced staff from existing facilities in the vicinity.

This Project has been positioned as a high-priority project under the national fisheries development plan drawn up by the Vietnam Government: "Directions and Objectives for Vietnam

Fisheries Development During 1991-2000 Period". This National Plan is specifically targeted at:

(1) the sustainable development of the coastal fisheries, along with an increase in vessel size, through conservation of coastal fishery resources, improvements in fishing methods, and a strengthening of the fishing infrastructure; and
(2) offshore fishery development through the construction of offshore fishing bases. The subject Project is thus intended to tackle the core problems in the nation's fisheries development and so can be expected to play a crucial role in the National Fisheries Development Plan .

It is anticipated that the operating and maintenance costs for the Plan facilities can be fully covered by revenues earned through project implementation. This operating surplus, which is projected for virtually every project year, should be sufficient to replace, in due course, all facilities and equipment, apart from the pile and pontoon jetties and buildings: viz., the ice-making plant, chilling/cold storage and freezing facilities, vehicles, and other equipment, and to maintain the required water depth in the Port area by dredging regularly. The project, accordingly, can be expected to function on a continuing, self-supporting basis until the jetties and buildings reach the end of their useful lives.

By improving the efficiency of fish landing operations, the Project will reduce post harvest loss and achieve effective utilization of coastal resources, while also contributing to the expansion of offshore fisheries production through the development of untapped offshore resources. Additionally, Project implementation can be expected to play a major role in solving the grave problem of environmental degradation resulting from chronic overfishing of coastal stocks.

There is, moreover, virtually no possibility that the Plan construction work will impose any direct burden on the local environment or that ongoing facility operations after completion will become an environmental hazard.

Under the grant-aid cooperation scheme and system established by the Government of Japan, no special problems are envisaged in connection with Project implementation in terms of objectives, beneficiary groups, framework, construction period, or scope of responsibility to be assumed by the beneficiary country.

4.3 Conclusions and Recommendations:

As discussed above, implementation of the subject Project will lead to the qualitative and

quantitative development of fish distribution on the basis of a marked improvement in the freshness levels of coastal catches, an expansion of offshore fish production, and a growth in employment opportunities. The Project will not only foster fisheries development but also contribute in a major way to the solution of the pressing environmental problems that have been addressed in Vietnam's National Development Plan. It has been determined, therefore, that there will be considerable significance in implementing this Project under a grant-aid from Japan.

We anticipate no problems with respect to the operating structure or manpower plan, as developed by the Vietnam side. It is projected, in this connection, that operating and maintenance costs can be fully covered by Project revenues, which should assuage concern over operating budgets.

In carrying out the subject Project, we believe that results can be further enhanced by making the following improvements and modifications in the Authority's operating approach.

1) Fair and efficient operations :

The Plan facilities constitute the first full-scale fishing port complex in the Vung Tau area for both the offshore and coastal fisheries. Thus, latent demand for such facilities among fishing vessels operating in the vicinity is extremely strong, with fishermen's expectations also running high. However, this fact does not mean that the new port will be patronized regardless of the level of fee schedules established. For, imperfect though they may be, a few landing areas already exist in the area at which ice and fuel are being supplied. In order to compete successfully with these facilities, it is essential that a suitable fee schedule be established and that port operations be conducted on a fair and impartial basis. Otherwise, patronage by coastal vessels could fall for short of expectations, resulting in non-fulfillment of Plan targets for landing volume and ice and water demand. In such a situation, an operating deficit would develop, thereby undermining the viability of port operations and maintenance. Similarly, failure to maintain proper cost controls would also run the risk of operating costs exceeding income. While costs are indeed expected to be defrayed by operating revenues, as pointed out in Section 2.4.2 ("Operating and Maintenance Plan"), if we were to assume a hypothetical reduction of 15% in ice selling prices or a 30% increase in labor costs from the stipulated levels, an operating deficit could well result under either scenario. It is essential, therefore, that the port Authority operate on a fair and efficient basis to forestall such an eventuality.

2) Development of management skills within the Port Authority:

While fair and efficient operating guidelines are expected of the Port Authority, it must be

recognized that, under Vietnam's previous planned economy, public facilities were operated by government organizations. In many cases, such operations tended to give precedence to management convenience over user interests or benefits. Vietnam has had only limited experience thus far in managing public facilities under a market economy, and so development of the requisite administrative skills has understandably lagged. The Port Authority, which is to be the management organization for this Project, will be operating the facilities in conjunction with users and government agencies. It intends, therefore, to institute an equitable and efficient management system, fully reflecting the views of Port users. In order to develop smooth and harmonious operating methods, many of which will be new to Vietnam, there is a compelling need to nurture executive skills among Authority managers and to familiarize then with new management techniques. In this connection, it would be desirable to encourage the management cadre to enroll in management training seminars, supported by the dispatch of experts from advanced countries.

3) Rationalization of fish distribution:

Under this Project, it should be possible to lower the fish damage ratio from landing to final shipment to consuming markets or processors. Even so, post harvest loss during the distribution stage from catch to consumer are likely to remain a problem, since corrective measures that can be taken solely at the fishing port facility are limited in scope. However, by upgrading port facilities and equipment, improvements can be made in fish hauling methods from vessels and on shore. Keeping freshness in catches is directly linked to better fish prices. If this fact can be demonstrated through the Project facilities, it would provide a strong impetus to equipment upgrading among both fishermen and the fish distribution trade, which could be expected to lead to still further improvement in fish damage ratios. In this Project, equipment is to be provided for modernization of the fish distribution process within the Port but these improvements should not be confined to the implementation phase; it is desirable that the Port Authority initiate its own independent improvements in facilities and equipment, in accordance with local conditions, with a view toward further rationalization of the fish distribution function.

4) Environmental protection:

Careful consideration has been given in this Project to treatment of the waste water from processing operations so as to prevent any adverse impact on the environment. Concern remains, however, over pollution caused by drainage from washing operations in fish holds and from bilge. We have provided for special treatment facilities of such waste water within the fishing port facilities, but fishermen must also be made conscious of pollution problems when performing these operations. It is essential that the Port Authority develop regulations and systems for

treatment of fish hold and bilge water and implement a vigorous public relations and extension program to stimulate concern and awareness among fishermen vis-a-vis the compelling need for environmental protection.

5) Statistical Improvements:

Although this Project is oriented to the development of fishing facilities geared to coastal and offshore fishing vessels and to the supply of equipment for modernizing the fish distribution process, it also has the additional objective of preventing environmental destruction from overfishing of coastal resources. There is no denying the fact that coastal catches in Vietnam Waters have, by and large, been excessive in relative to resource size. Under present conditions, however, it would simply not be realistic or feasible to impose a complete closure on coastal fishing activity. The proper approach would be to develop meticulous, fine-tuned policies for resource conservation by estimating resource levels in individual fishing grounds on the basis of catch fluctuations in those waters. For this purpose, however, the present methods of collecting statistics on catch and landing volume are both inadequate and incomplete. Statistical procedures must be improved so that precise data can be generated on catch volume by species in particular grounds. Since one of the duties of the Port Authority will be to gather catch and landing statistics, it is incumbent on the Authority to contribute actively to the refinement of methodology for compiling catching and landing statistics and to tabulate and analyze this data with a view to achieving sustainable development of coastal fisheries.

6) Encouraging a shift from coastal to offshore operations:

A shift from the coastal to the offshore fishery is a central theme in the Directions and Objectives for Vietnam Fisheries Development During 1991-2000 Period and so constitutes one of the objectives of the Project. The infrastructure to support this offshore shift will be provided under this Project but, in order to achieve an effective transition, there will be a need not only to build new fishing vessels for offshore use but also to encourage existing coastal vessels to transfer to the offshore fishery through an attractive program of incentives .

7) Maintaining Orderly Jetty Use:

Judging by the latent demand for the fishing port facilities among fishing vessels operating in the vicinity, it is possible that, once the facilities are completed, there will be a severe concentration of small-size coastal boats seeking to use the Plan jetty at a given time. In anticipation of such congestion, it is essential that the Vung Tau Fishing Port Authority develop rules, with the consent of the Advisory Committee, to ensure small fishermen equal access to the facilities, with due consideration being given a vessel's port of registry.

APPENDICES

APPENDIX 1 - 1 MEMBER LIST (Field Survey)

FUNCTION	NAME	ORGANIZATION
Leader	KASAI Akira	Technical Special Assistant to the President, JICA
Project Coordination, Programme Officer	KATO Toshinobu	2nd Basic Design Div., Grant Aid Study & Design Dept., JICA
Fisheries Development Planning	MAE Akihiro	Dupty Director, Office of the Overseas Fisheries Cooperation, Fisheries Agency
Interpreter	NAGAI Ran	Japan International Cooperation Center
Chief Consultant	TAKAHASHI Kuniaki	Fisheries Engineering Co., Ltd.
Facilities Construction Planner	KANEKO Taizo	Fisheries Engineering Co., Ltd.
Station Facilities, Equipment Planner	WATANABE Kunihiro	Fisheries Engineering Co., Ltd.
Port Civil Engineer, Natural Condition Surveyor	KUBO Shinsuke	Fisheries Engineering Co., Ltd.
Construction Planner, Cost Estimator	INKI Toshihito	Fisheries Engineering Co., Ltd.

APPENDIX 1 - 2 MEMBER LIST (Consultation of Draft Report)

FUNCTION	NAME	ORGANIZATION
Leader	KASAI Akira	Technical Special Assistant to the President, JICA
Fisheries Development Planning	TAZOE Noboru	Office of the Overseas Fisheries Cooperation Fisheries Agency
Interpreter	NAGAI Ran	Japan International Cooperation Center
Chief Consultant	TAKAHASHI Kuniaki	Fisheries Engineering Co., Ltd.
Facilities Construction Planner	KANEKO Taizo	Fisheries Engineering Co., Ltd.

APPENDIX 2 - 1 SURVEY ITINERARY (Field Survey)

DAY	DATE	DESCRIPTION					
		MEMBER	CONSULTANTS				
		KASAI, KATO, MAE, NAGAI	TAKAHASHI	KANEKO	WATANABE	INKI	KUBO
1	Jun 7 (Tue)	Lv. Tokyo, Ar. Bangkok					
2	Jun 8 (Wed)	Lv. Bangkok Ar. Hanoi Visit SPC, Embassy of Japan					
3	Jun 9 (Thu)	Visit Ministry of Fisheries (MOF) : Discussion at MOF Lv. Hanoi, Ar. HCM					
4	Jun 10 (Fri)	Visit Consulate General of Japan					
5	Jun 11 (Sat)	Lv. HCM by car, AR Vung Tau					
6	Jun 12 (Sun)	Visit Fishing Vessel Landing Places in Vung Tau					
7	Jun 13 (Mon)	Visit People's Committee of Ba Ria-Vung Tau, Lv. Vung Tau by car, Ar. HCM					
8	Jun 14 (Tue)	Discussion with Vice Minister (MOF), SOWESFOOD					
9	Jun 15 (Wed)	Discussion with SOWESFOOD					
10	Jun 16 (Thu)	Discussion on Minutes, Visit Consulate General of Japan					
11	Jun 17 (Fri)	Lv. HCM, Ar. Hanoi, Discussion with MOF on Minutes					
12	Jun 18 (Sat)	Concluding Minutes of Discussions, Visit to Minister of Fisheries					
13	Jun 19 (Sun)	Free		Lv. Tokyo, Ar. Bangkok			
14	Jun 20 (Mon)	Report to Embassy of Japan, Lv. Hanoi, Ar. Bangkok	Lv. Hanoi, Ar. HCM	Lv. Bangkok, Ar. HCM			
15	Jun 21 (Tue)	Lv. Bangkok, Ar. Tokyo	Lv. HCM, Ar. Vung Tau, Site Survey, Arrangement for Soil Survey				
16	Jun 22 (Wed)		Start Surveying, Drilling				
17	Jun 23 (Thu)		Visit Ben Da/Ben Dinh, Surveying, Drilling, Measurement of River Current				
18	Jun 24 (Fri)		Surveying, Drilling, Measurement of Current, Observation of Tides				
19	Jun 25 (Sat)		Surveying, Drilling, Measurement of Current, Observation of Tides, Sounding				
20	Jun 26 (Sun)		Visit People's Committee of Xuyen Moc Dist., Fishing Boats landing place				
21	Jun 27 (Mon)		Collection of information and data for , Lv. Vung Tau, Ar. HCM			Survey, Drilling, Sounding	
22	Jun 28 (Tue)		Collection of information & data			Survey, Drilling, Sounding	
23	Jun 29 (Wed)		Collection of information & data			Collection of data, Drilling, Sounding	
24	Jun 30 (Thu)		Lv. HCM, Ar. Hanoi Visit MOF	Collection of information & Data		Lv. Vung Tau, Ar. HCM	Collection of information, Drilling
25	Jul 1 (Fri)		Lv. Hanoi, Ar. Bangkok	Do		Lv. HCM, Ar. Bangkok	Do
26	Jul 2 (Sat)		Lv. Bangkok, Ar. Tokyo	Do		Lv. Bangkok, Ar. Tokyo	Do
27	Jul 3 (Sun)			Do			Do
28	Jul 4 (Mon)			Lv. Vung Tau, Ar. HCM			Lv. Vung Tau, Ar. HCM
29	Jul 5 (Tue)			Collection of Data			Lv. HCM, Ar. Vung Tau
30	Jul 6 (Wed)			Collection of Data			Collection of Information
31	Jul 7 (Thu)			Lv. HCM, Ar. Bangkok			Do
32	Jul 8 (Fri)			Lv. Bangkok, Ar. Tokyo			Do
33	Jul 9 (Sat)						Do
34	Jul 10 (Sun)						Do
35	Jul 11 (Mon)						Lv. Vung Tau, Ar. HCM
36	Jul 12 (Tue)						Collection of Information
37	Jul 13 (Wed)						Lv. HCM, Ar. Bangkok
38	Jul 14 (Thu)						Lv. Bangkok, Ar. Tokyo

APPENDIX 2 - 2 SURVEY ITINERARY (Consultation of Draft Report)

DAY	DATE	DESCRIPTION		
		MEMBER	CONSULTANTS	
		KASAI, TAZOE, NAGAI	TAKAHASHI	KANEKO
1	Oct 10 (Mon)		Lv. Tokyo, Ar. Bangkok	
2	Oct 11 (Tue)	Lv. Tokyo, Ar. Bangkok	Lv. Bangkok, Ar. HCM	
3	Oct 12 (Wed)	Lv. Bangkok, Ar. HCM Discussion with SOWESFOOD		
4	Oct 13 (Thu)	Report to Consulate General of Japan, Discussion with SOWESFOOD		
5	Oct 14 (Fri)	Lv. HCM, Ar. HANOI, Discussion with SPC on Draft Report		
6	Oct 15 (Sat)	Discussion with MOF on Draft Report		
7	Oct 16 (Sun)	Collection of Information & Data		
8	Oct 17 (Mon)	Discussion with MOF		
9	Oct 18 (Tue)	Discussion with MOF on Minutes of Discussions		
10	Oct 19 (Wed)	Concluding Minutes of Discussions, Discussion with SPC on Tender Procedures in Vietnam and National Committee for Procurement & Evaluation (N.C.P.E.)		
11	Oct 20 (Thu)	Lv. HANOI, Ar. Bangkok		
12	Oct 21 (Fri)	Lv. Bangkok, Ar. Tokyo		

APPENDIX 3 - 1 LIST OF PERSONS MET (Field Survey)

Name	Title / Organization
Mr. Nguyen Tan Trinh	Minister of Fisheries
Mr. Huynh Cong Hoa	Vice Minister, Ministry of Fisheries
Mr. Ngo Si Hoanh	Chief of Cabinet, Ministry of Fisheries
Dr. Ho Van Hoanh	Director, International Cooperation Department, Ministry of Fisheries
Mr. Le Ngoc Phuoc	Director General, South-West Fishing Service Corporation (SOWESFOOD)
Mr. Phan Duc Toan	Vice Director General, SOWESFOOD
Eng. Nguyen Thanh Tong	Vice Director, Fishing Port Dept. at Vung Tau, SOWESFOOD
Mr. Le Trong Nam	International Cooperation Dept., Ministry of Fisheries
Mr. Phan Doanh	Vice Director, Department of Agriculture-Forestry-Fishery, State Planning Committee (SPC)
Mrs. Le Thi Thong	Economist, Dept. of Agriculture-Forestry-Fishery, SPC
Mr. Nguyen Thao Nguyen	Economist, Dept. of Agriculture-Forestry-Fishery, SPC
Mr. Nguyen Van Hang	Vice Chairman, People's Committee of Ba Ria-Vung Tau Province
Dr. Phan Bach Nhut	Vice Director, Investment & Foreign Economic Relations Committee, Ba Ria-Vung Tau People's Committee
Mr. Le Xuan Quynh	Deputy Head of Office, Ba Ria-Vung Tau People's Committee
Mr. Pham Thanh Phuong	Director, Fisheries Dept., Ba Ria-Vung Tau People's Committee
Mr. Luu Quang Hai	Director, Electric Distribution Center Ba Ria- Vung Tau

Name	Title / Organization
Eng. Tran Thanh Minh	Director, Survey and Design Company No.625
Eng. Le Can An	Technical Director/Chief Engineer, Survey and Design Company No.625
Capt. Truong Van Xe	Acting Director, Vietnam Salvage Corporation (VISAL)
Mr. Vo Van Kien	General Director, Vung Tau Import Export Petroservices Company (VIECO-PS)
Eng. Tran Ngoc Thanh	Director, Water Supply Company of Ba Ria-Vung Tau Province (WASUCO)
Eng. Hoang Huy Hien	Director, House Developing Company, Ba Ria-Vung Tau Province
Mr. Nguyen Cong Thanh	Chairman, Xuyen Moc District People's Committee, Ba Ria-Vung Tau Province
Mr. Mai Van Dung	Vice Chairman, Xuyen Moc District People's Committee, Ba Ria-Vung Tau Province
Mr. Kiyoshi KOINUMA	Councillor, Embassy Japan
Mr. Masao MIYAZAKI	Second Secretary, Embassy of Japan
Mr. Takahiro SASAKI	Second Secretary, Embassy of Japan
Mr. Shinji KUBOTA	Consul General, Consulate General of Japan
Mr. Kazuo MINAGAWA	Consul, Counsulate General of Japan
Mr. Toshiro HYOGO	Resident Architect, Choray Hospital, AXS Satow Inc.

APPENDIX 3 -2 LIST OF PERSONS MET (Consultation of Draft Report)

Name	Title / Organization
Mr. Nguyen Tan Trinh	Minister of Fisheries
Dr. Ho Van Hoanh	Director, International Cooperation Department, Ministry of Fisheries
Mr. Ngo Si Hoanh	Chief of Cabinet, Ministry of Fisheries
Mr. Le Ngoc Phuoc	Director General, South-West Fishing Service Corporation (SOWESFOOD)
Mr. Tran Duc Try	Representative, International Cooperation Dept., Ministry of Fisheries
Eng. Nguyen Thanh Tong	Vice Director, Vung Tau Fishing Port Dept., SOWESFOOD
Prof.Dr.Nguyen Quang Thai	Standing member of National Committee for Procurement Evaluation Chief of Secretariat Office, NCPE/Vice President, Development Strategy Institute, State Planning Committee (SPC)
Mr. Phan Doanh	Vice Director, Department of Agriculture-Forestry-Fishery, SPC
Mr. Tran Khen	Senior Expert, Department of Agriculture-Forestry-Fishery, SPC
Mrs. Le Thi Thong	Senior Economist, Dept. of Agriculture-Forestry-Fishery, SPC
Mr. Pham Bai	Regional Economic Department, SPC
Mr. Akihiko FURUYA	Minister, Embassy of Japan
Mr. Takahiro SASAKI	Second Secretary, Embassy of Japan
Mr. Shinji KUBOTA	Consul General, Consulate General of Japan

APPENDIX 4 - 1 MINUTE OF DISCUSSIONS (Field Survey)

MINUTES OF DISCUSSIONS
BASIC DESIGN STUDY ON THE PROJECT FOR THE CONSTRUCTION OF FISHING PORT FACILITIES AT VUNG TAU IN THE SOCIALIST REPUBLIC OF VIETNAM

In response to a request from the Government of the Socialist Republic of Vietnam, the Government of Japan decided to conduct a Basic Design Study on the Project for the Construction of Fishing Port Facilities at Vung Tau (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Vietnam a study team, which is headed by Mr.Akira KASAI, Technical Special Assistant to the President, JICA, and is scheduled to stay in the country from June 8 to July 13, 1994.

The team held discussions with the officials concerned of the Government of Vietnam and conducted a field survey at the study area.

In the course of discussions and field survey, both parties have confirmed the main items described on the attached sheets. The team will proceed to further works and prepare the Basic Design Study Report.

Hanoi, June 18, 1994

Mr. Akira KASAI
Leader
Basic Design Study Team
JICA

Dr. Ho Van Hoanh
Director, International
Cooperation Department
Ministry of Fisheries

Mr. Le Ngoc Phuoc
Director General
South-West Fishing Service
Corporation

ATTACHMENT

1. Objective

The objective of the Project is to construct fishing port facilities at Vung Tau for obtaining sustainable development of both coastal and offshore fisheries in South-east Vietnam.

2. Project site

The site of the Project is located at Cat Lo in Vung Tau. (Project area and site map is attached as ANNEX-I.)

3. Executing Organization, Operating Agency

(1) Executing Organization
Ministry of Fisheries is responsible for the administration and execution of the Project.

(2) Operating Agency
Ministry of Fisheries agrees that Vung Tau Fishing Port Authority (tentative name) as the operating agency for the fishing port facilities shall be established under SOWESFOOD in case Japan's Grant Aid is executed. Vung Tau Fishing Port Authority is responsible for the operation and management of the fishing port facilities provided under the Project.

The Advisory Committee to the Authority shall be established, which will consist of representatives from Ministry of Fisheries, SOWESFOOD, Fisheries Department of People's Committee of Ba Ria-Vung Tau Province and Fishermen's Associations or Fisheries Departments in other relevant provinces. (Organogram of the Vung Tau Fishing Port Authority is attached as ANNEX-II.)

Ministry of Fisheries further agrees that,

1) should SOWESFOOD be placed under private management, the Government of the Socialist Republic of Vietnam will consult with the Government of Japan of the functions of the Authority concerning management and operation of Vung Tau fishing port facilities to keep their publicness,
2) the Vung Tau Fishing Port Authority shall have its own account,
3) SOWESFOOD ensures that utilization of the land necessary to manage the facilities by the Authority, and
4) opinions of fishermen and fish brokers should be reflected in the management and operation of the facilities.

4. Items requested by the Vietnamese side

After discussions with the Basic Design Study Team, the following modern and appropriate items were finally requested by the Vietnamese side.

1) Facilities
   a) Fish landing jetty for coastal fishing vessel
   b) Shore protection
   c) Offices
   d) Fish Handling cum Marketing Building
   e) Ice Making Machine and Ice Storage
   f) Chilling Storage
   g) Cold Storage
   h) Fuel Tank
   i) Water Tank
   j) Quick Freezing Machine
   k) Other incidental facilities in the site

2) Equipment
   a) One Number of Truck
   b) One Number of Van

(Notes)

1) Target Vessels for the Vung Tau Fishing Port
   a) Offshore fishing vessel, length ab.30~35m, 8 Nos.
   b) Coastal large fishing vessel, length ab.15~18m, 156 Nos.
   c) Coastal small fishing vessel, length ab.7~11m, 19 Nos.

2) Rough layout plan of the site suggested is attached as ANNEX-III.

3) However, the final components of the Project will be decided after further studies.

5. Japan's Grant Aid system

(1) The Vietnamese side has understood the system of Japanese Grant Aid explained by the team.

(2) The Vietnamese side will take necessary measures, described in Annex IV for smooth implementation of the Project, on condition that the Grant Aid Assistance by the Government of Japan is extended to the Project.

6. Schedule of the Study

(1) The consultants will proceed to further studies in Vietnam until July 13.

(2) JICA will prepare the draft final report of the Project in English, and dispatch a mission in order to explain its contents to the Government of Vietnam around September 1994.

(3) In case that the contents of the draft final report is accepted in principle by the Vietnamese side, JICA will complete the final report and send it to the Vietnamese side around January 1995.