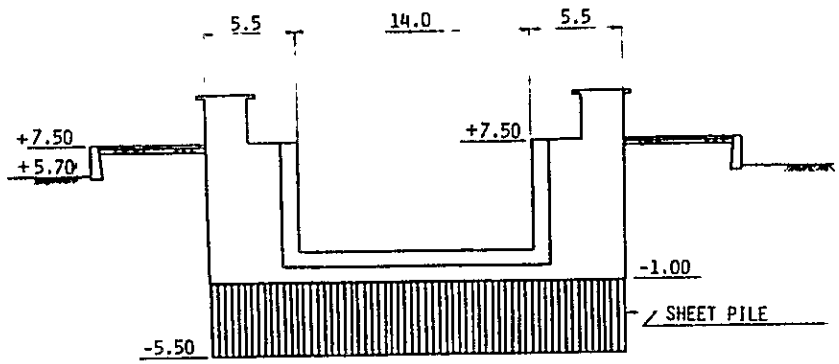
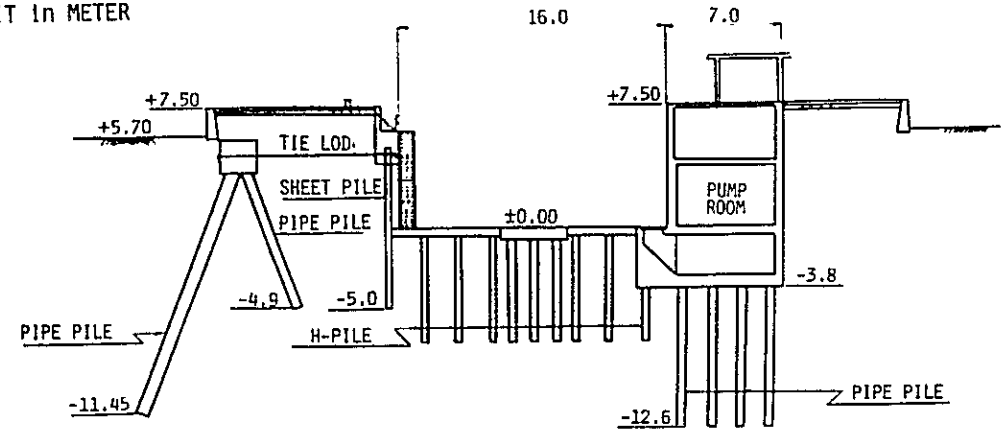
UNIT In METER

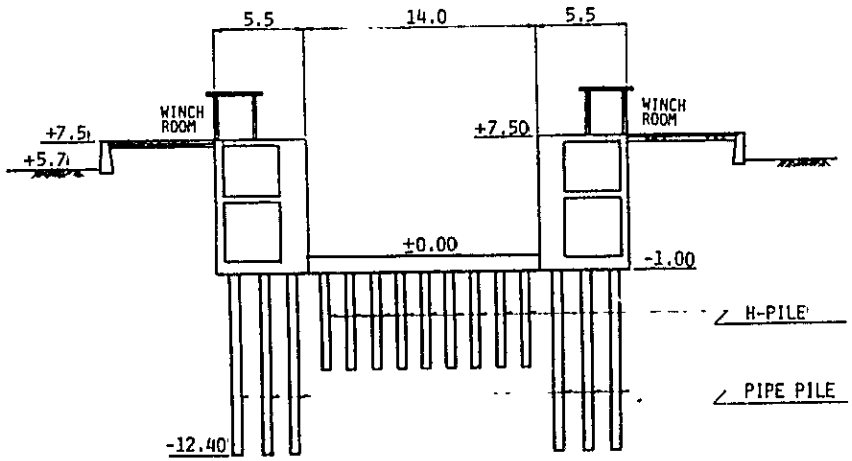
B-B CROSS SECTION



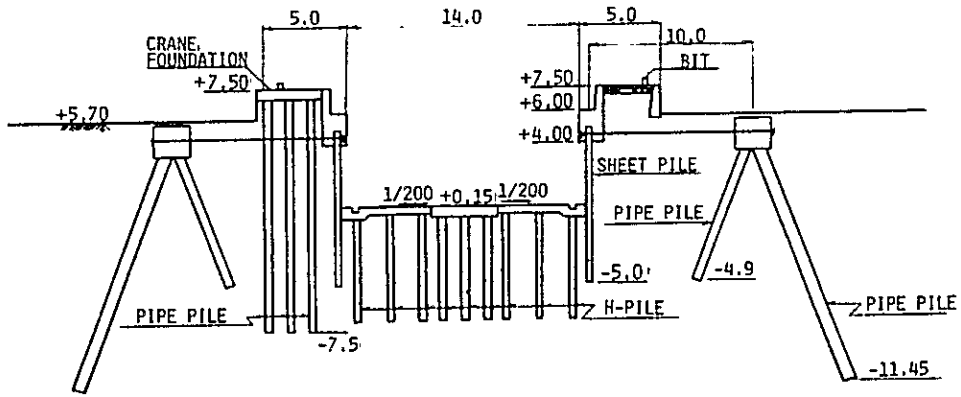
D-D CROSS SECTION



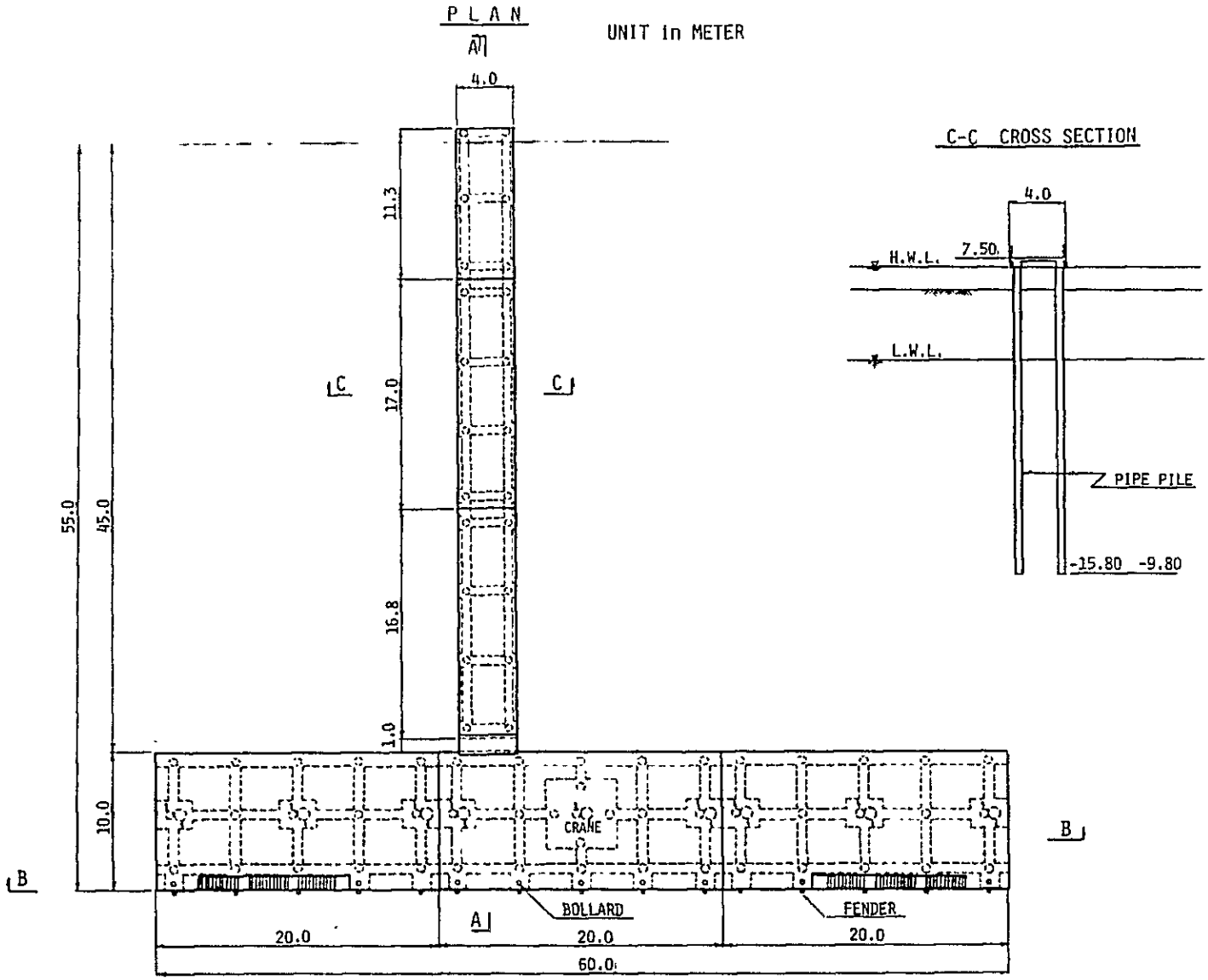
C-C CROSS SECTION



E-E CROSS SECTION



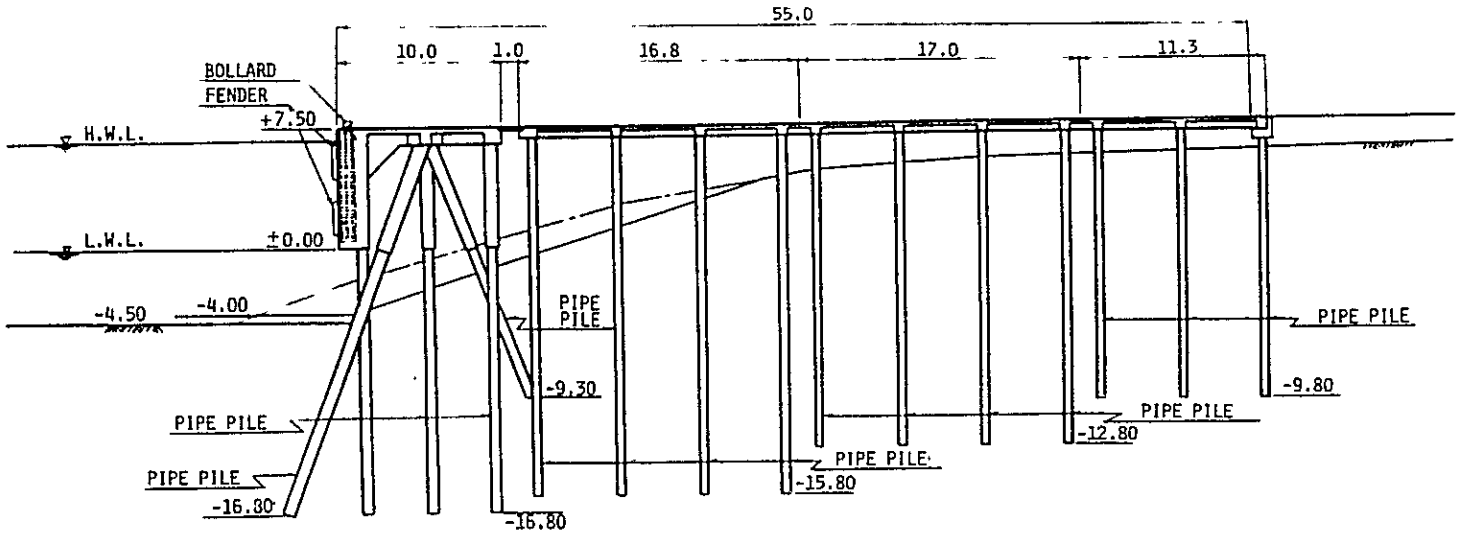
DRY DOCK, SECTION (2)



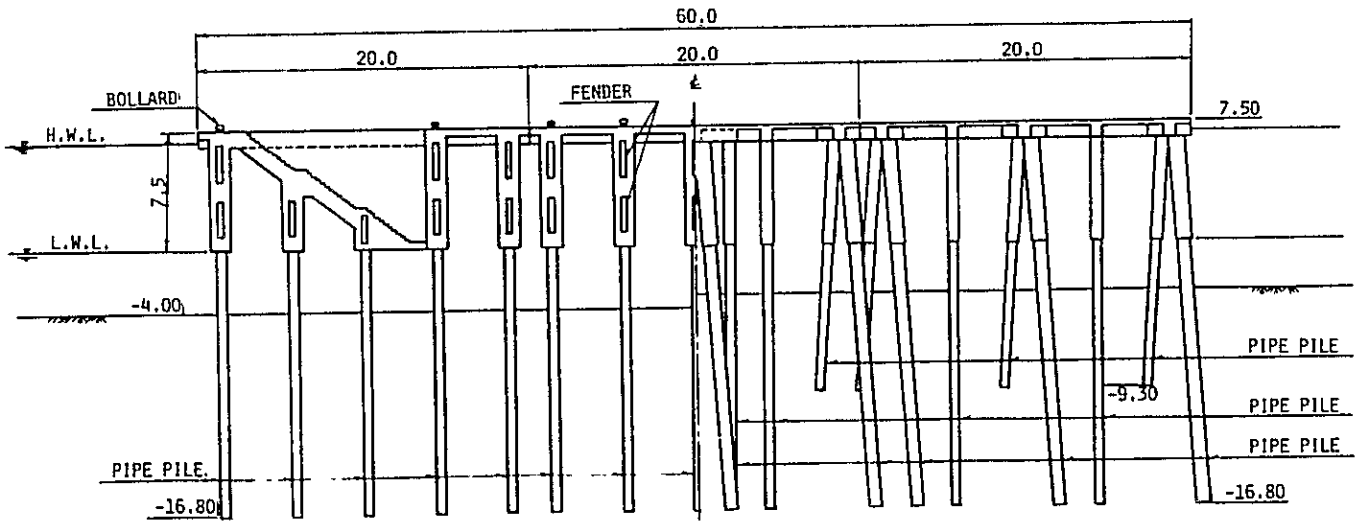
REPAIRING JETTY, PLAN

A-A CROSS SECTION

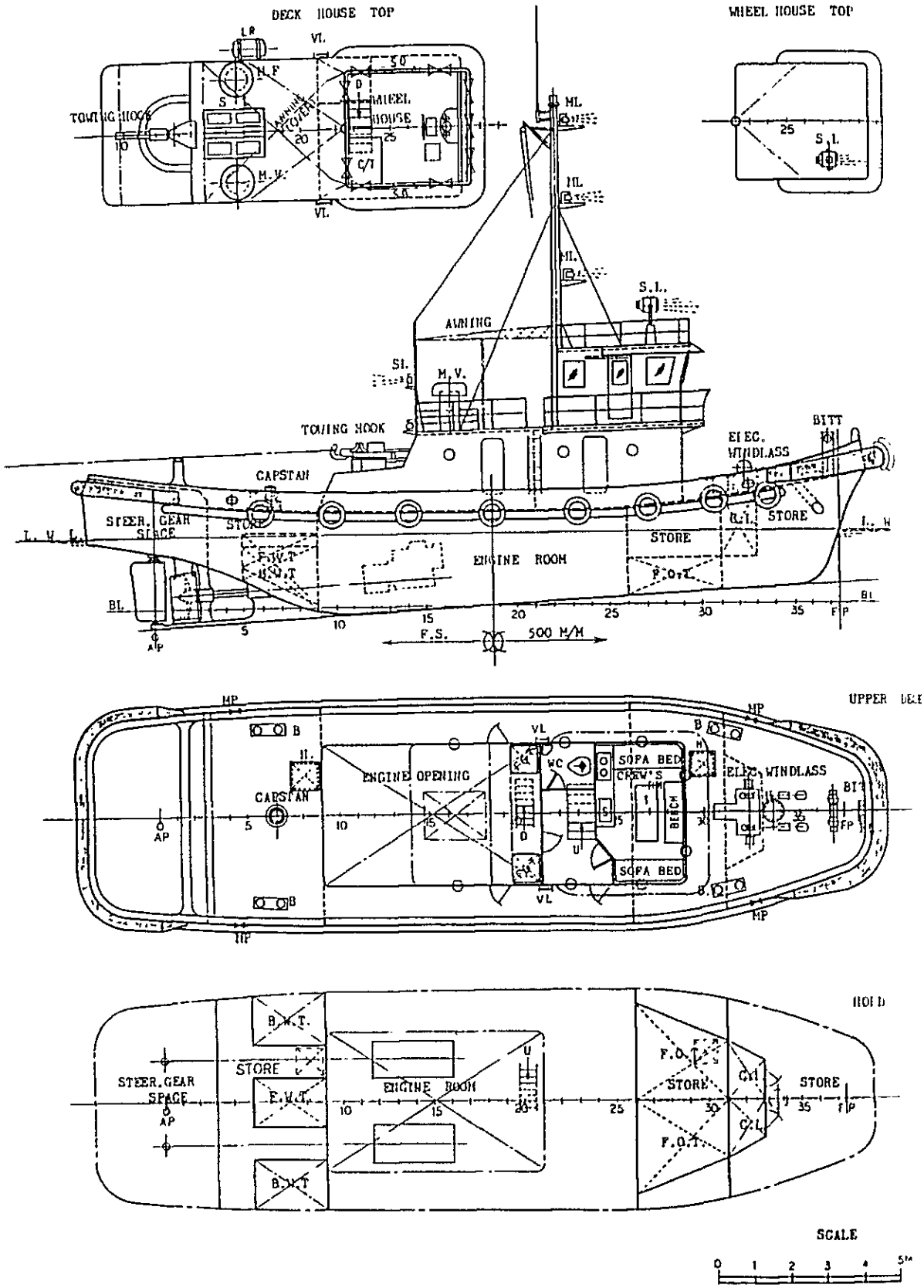
UNIT in METER



B-B CROSS SECTION



REPAIRING JETTY, SECTION



TUG BOAT GENERAL ARRANGEMENT

4・10 Scope of the Construction:

4・10・1 Scope of the Plan:

At present, some 70 vessels of the PPFC fleet are inspected or serviced each year at the Gyaung Waing Fishing Boat Repair Center. However, with the planned improvement and expansion of the existing facilities and the introduction of new equipment, based on a grant-in-aid from Japan, the subject program is intended to upgrade the capacity of the Fishing Boat Repair Center to 100 vessels a year. The scope of the project is as shown below:

1) Site preparation for the Fishing Boat Repair Center.

2) Construction and Modification of facilities at this Center.

3) Provision of equipment and materials for the Center.

4) Provision services required to the implement and supervise the above project.

5) Carrying out the necessary procedures and obtaining the required permissions and approvals to implement the above plan.

4・10・2 Division of Responsibility between the Government of Burma and the Japanese Side:

Assuming the project is implemented on the basis of a grant-in-aid from Japan, the respective areas of responsibility for our two countries would be as follows:

(1) Responsibilities of and Services by the Burmese Government

1) Removal of all obstacles, including buildings, if necessary from the proposed site and necessary leveling.

2) Improvement and preparation of the existing facilities.

3) Procuring the necessary water supply.

4) Payment of all duties, commissions, and other charges in connection with the customs clearance of all materials and equipment imported into Burma for the subject project.

5) Obtaining tax and other exemptions for construction equipment, materials and Japanese technicians rendering services in Burma for this project.

6) Obtaining and providing permissions, clearaces, licenses, and other privileges for persons from Japan, as required to implement this program.

7) Making budgetary provisions for the effective maintenance and repair of the facilities to be built under this grant-in-aid and for preparation of the required materials, parts, and furnishings.

(2) Responsibilities of the Japanese Government

1) Procurement of all construction equipment, materials and labor.

2) Ocean and inland shipment of materials and equipment imported for the construction program and the placing of transport insurance.

3) Consulting services in connection with the detail design, assistance in bidding tenders, and construction supervision.

SECTION 5 PROJECT IMPLEMENTATION

5・1 Implementing Organization:

When the subject Plan is implemented, the implementing organization for all aspects of the fishing vessel repair center will be PPFC, which falls under the jurisdiction of the Ministry of Livestock Breeding and Fishery. Direct responsibility for the project will lie with the Engineering Division of the Marine Fisheries Department, one of the principal PPFC divisions, which will take care of planning, procedural matters, and supervision and operation of the faicilities upon completion. Construction, structural work, related facility checks, licenses and permits, and other technical operations will be the responsibility of the Civil Engineering Section of the Administration Department.

5・2 Construction Plan:

5・2・1 Construction Methods:

The construction works under this Plan will be carried out under a contract for design and construction between the PPFC and a corporation(s) of Japanese national. Based on detailed design prepared by the consultants, PPFC will file a construction application, which will be approved following a technical evaluation by the Civil Engineering Section. After establishment tender qualification, making tenders, and the evaluation of tender documents, the contracting organization(s) will be selected. The Construction contract is to be signed after approval by the cabinet of the Burmese government.

5・2・2 Construction Plan:

(1) Cooperating Organizations:

It should be noted, in connection with the construction program, that the subject project includes not only ordinary construction work but structural work in the river portion of the port area.

Ordinary construction will be under the jurisdiction of the Construction Corporation (C.C.), while structural works in the port area will be under that of the Burma Ports Corporation (BPC). Thus, it will be necessary to request the cooperation of both these organizations in the construction program. To prevent any loss of operating efficiency due to a split of orders, considerable advance discussion and review will be necessary.

The BPC feels that the construction of the buildings under this Plan, being related to the port structural work, should be well within its capability. There will, therefore, be a need in the implementing stage to make a selection of the cooperating organization on the basis of a study and examination of capabilities and operating conditions in both these corporations.

(2) Building Construction:

Steel frames and iron bars for the principal building structures will be procured from Japan, with the remaining finishing and basic materials obtained locally.

The main materials that can be obtained in Burma are such items as cement, aggregate, brick, timber, and corrugated slate sheets. However, since aggregate for concrete is not produced in the Rangoon area, while obtainable, it will be relatively expensive, sand are produced on the Rangoon River and supplies are adequate. Grain sizes are generally fine, so that it will be necessary to make adjustments in mixing the aggregate.

These materials are all adequately available on the Burmese market but, during the dry season, when the volume of construction work picks up, there may be temporary shortages of certain items. Accordingly, a flexible procurement plan is called for.

There is ample supply of construction labor, but proper measures will have to be taken to assure the availability of skilled labor.

With regard to the construction, particular consideration will have to be given to the rainy season, during which it would be wise to assume that no foundation work can be undertaken. It would, therefore, be desirable to schedule the peak of the construction activity for the dry season.

(3) Civil Works:

(1) Construction Methods:

The construction works for the dry dock may be broken down as follows:

a) Sheet piling
b) Steel pipe piling
c) H-section steel pile driving
d) Form work
e) Reinforced iron work
f) Concrete works
g) Dock construction
h) Paving works
i) Dredging
j) Appurtenance work
k) Provisional work (provisional cofferdam etc.)

The above construction activities will all be undertaken, based on a provisional cofferdam, as shore-based construction so as to prevent the entry of river water.

The construction works for the repair jetty will be as follows:

a) Steel pipe driving
b) Form works
c) Reinforced iron bar works
d) Concrete works
e) Covering works
f) Appurtenance work

A portion of this work can be undertaken on shore, but construction will be based largely on floating equipment.

(2) Preparation Yard:

A wide yard will be required for the storage of construction materials, the form works and reinforced iron bar works. An open space will be used for this purpose to minimize any disturbance to the works within the existing site area.

(4) Facilities Construction:

The main items of equipment are to be procured from Japan. The terminal equipment, for reasons of maintenance and administration, will, to the maximum extent possible, be procured locally but, since quality and availability will not necessarily be constant, there is a need to develop a flexible equipment procurement plan.

5) Provisional works:

For the provisional equipment for the construction program, we plan to use equipment of the Construction Corporation, supplemented by equipment brought in by the contractor from overseas.

One cannot be enitrely complacent about the types, performance, and rental periods of the equipment available from local sources, and so a considerable effort will be required to obtain these items.

One unique feature of the Burmese system is that under its tax laws, the title to all equipment brought in from abroad effectively shifts to the Burmese side. The importation of simple items of provisional equipment, then, can lead to an escalation of costs. This equipment should, therefore, be selected on the basis of a carefully developed provisional plan.

5・3 Supervisory Plan:

When the subjecet plan is implemented, the consultant will, upon the signing of a consultant contract, establish in Japan a Plan Administration Head Quarter, which will set about implementing the program.

A Design Team, to be composed of both a Design and Supervision Team, will, upon the exchange of contract, deploy the required personnel to the group for the various construction, works, facility, boat-building, and machinery operations and will prepare design specifications for the tender documents.

Following the completion of the tender documents, the Head Quarter will obtain the Plan approvals from PPFC, conduct qualitification evaluations, put out tenders, evaluate the bid, and select the contractor(s).

After the construction contract(s) are signed, the Design Team will check construction plans and manufacturer lists, supervise factory production, and inspect the final products along with the tugboat. The supervision of the tugboat construction, in particular, will be accomplished by dispatching technicians to the boat-yard to supervise each stage of construction, from hull to main and auxiliary engines and riggings.

The Supervision Team will, upon conclusion of the construction contract(s), dispatch supervisory technicians to Burma to coordinate activities with the contractor(s), sit in at completion inspections, and prepare reports on their supervisory tasks. This local supervision will be maintained over the entire construction period. The required

supervisory technicians for the construction, works, and equipment phases, will be dispatched in accordance with the progress of the construction program.

5・4 Implementation Schedule:

The subject Plan divides generally into three schemes, civil works, building construction,and the provision of equipment.

Based on a consideration of the implementation schedules for each scheme, the construction activities have been classified into:
... construction that must be carried out ahead of the other works;
... construction works that can be done together
... and construction that can be done independently.

An optimum time-table for the project has been established from the standpoint of construction cost, construction time, material procurement, and the provisional plan.

(1) Civil Works:

The primary facilities under the civil works scheme are the repairing jetty and dry dock. Following are the approximate time requirements for each segment of the work for each facility:

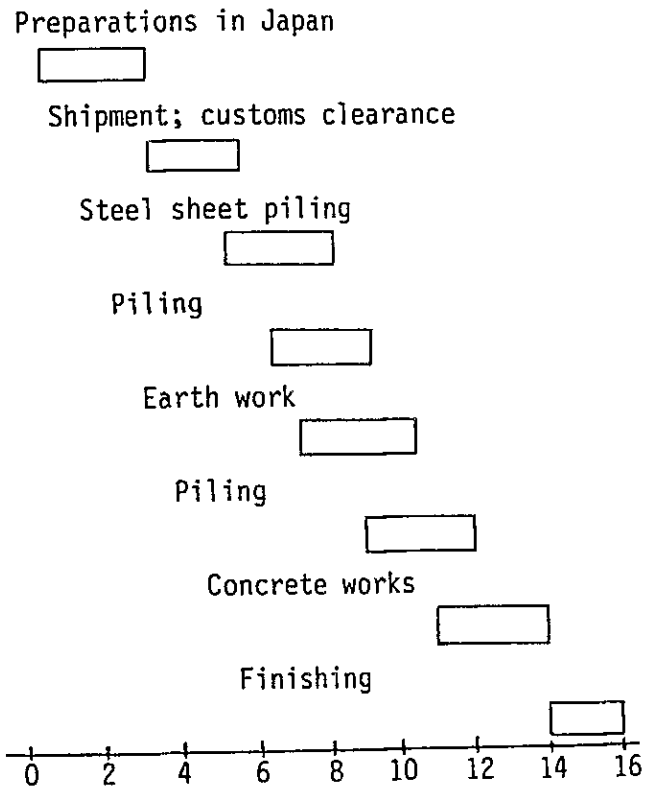
a)	Repairing jetty	11 months
	1. Procurement of equipment and materials in Japan	3 "
	2. Shipment; customs clearance	2 "
	3. Preparatory construction	1 "
	4. Substructure work (piling)	3 "
	5. Superstructure work and finishing	4 "

Items 4 and 5 can overlap. On the basis of a 2-month overlap, we have established the total construction time at 11 months.

b) Dry Dock — 16 months

1.	Procurement of equipment and materials in Japan	3 "
2.	Shipment; customs clearance	2 "
3.	Sheet piling	2 "
4.	Earth works	3 "
5.	Piling	6 "
6.	Concrete works	3 "
7.	Finishing	2 "

Items 4-6 can overlap. Based on a one-month overlap for stages 4-6, we have estimated the total construction period at 16 months, as per the following progress chart:



2) Building Construction Scheme — 10 months

The main facilities included in this scheme are the iron works' shop, the machine shop, the generator house, and the shower and lavatory building. The approximate construction time-table will be as follows:

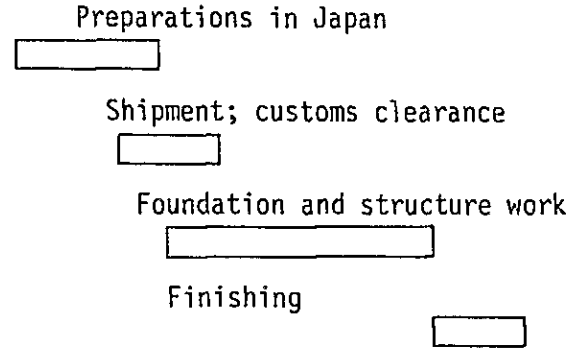
a)	Iron Work's Shops;	
	Machinery Shop	10 months
	(360 sq.m for each building)	
	1) Preparations in Japan	3 "
	2) Shipment; customs clearance	2 "
	3) Foundation and structural work	5 "
	4) Finishing work	2 "
b)	Generator House, Shower and Lavatory Building	9 months
	1) Preparations in Japan	3 "
	2) Shipment; customs clearance	2 "
	3) Foundation and structural work	3 "
	4) Finishing	1 "
c)	Other	
	Exterior works	5 months
	Equipment for exterior works	4 "

The time required for the building construction scheme, as shown in the chart below, will be 10 months in all.

Iron Work's Shop:

&

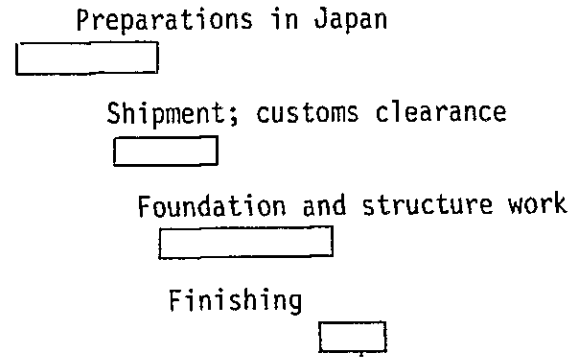
Machine Shop



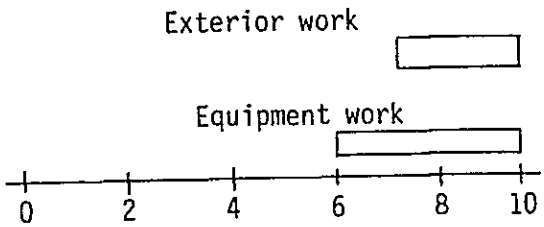
Generator House;

&

Showers and Lavatory Building



Other



3) Provision of Machinery — 9 months

The main items included in this scheme are cranes, fork-lifts, and other material handling equipment; lathes, milling machines, and other machine tools; tug-boat; and other components and spare parts.

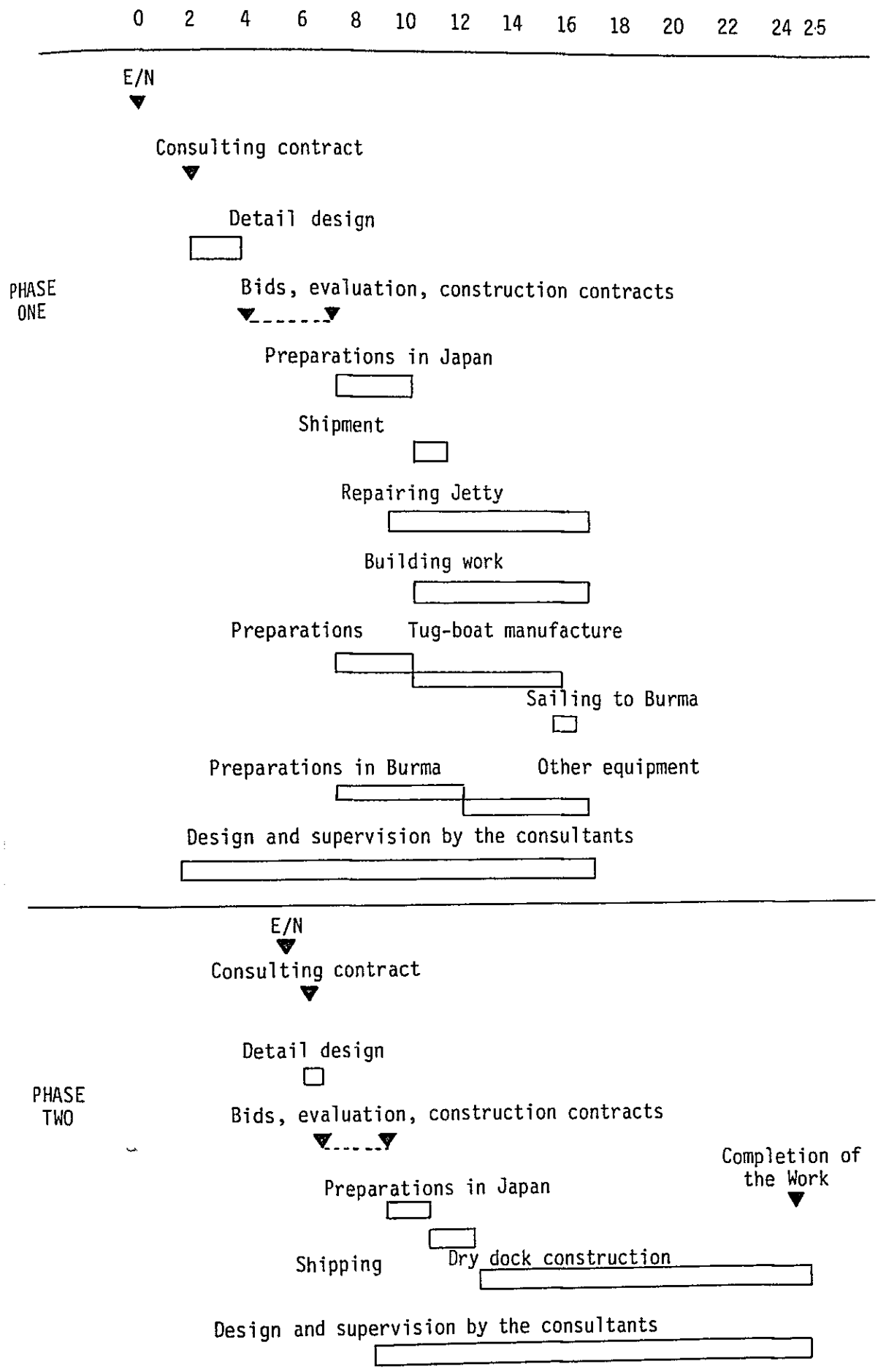
The procurement time for ordinary types of machinery in Japan is 2-3 months but, after allowing for the time required to manufacture large items, such as the cranes, we have chosen to allow a period of 6 months.

The longest period within this group of equipment items will be that for the tug-boat. We estimate 3 months for preparation and approval of design plans; 4.5 months for production, and 1.5 months for sailing the vessel to Burma - for a total of 9 months in all.

Based on the above examination, there should, in principle, be no problems, from the standpoint of either scheduling or the implementation plan, to undertaking the construction and equipment schemes simultaneously within a single year. However, with respect to the civil works scheme, if the dry dock and repair jetty operations were to be undertaken at the same time, the number of heavy equipment items needed for the provisional construction stage would about double, thereby creating considerable waste in the provisional plan.

In addition, were the construction period to overlap with the rainy season, serious problems would develop in connection with the earth work on the dry dock, which consumes the longest period, making it difficult to complete within a single fiscal year.

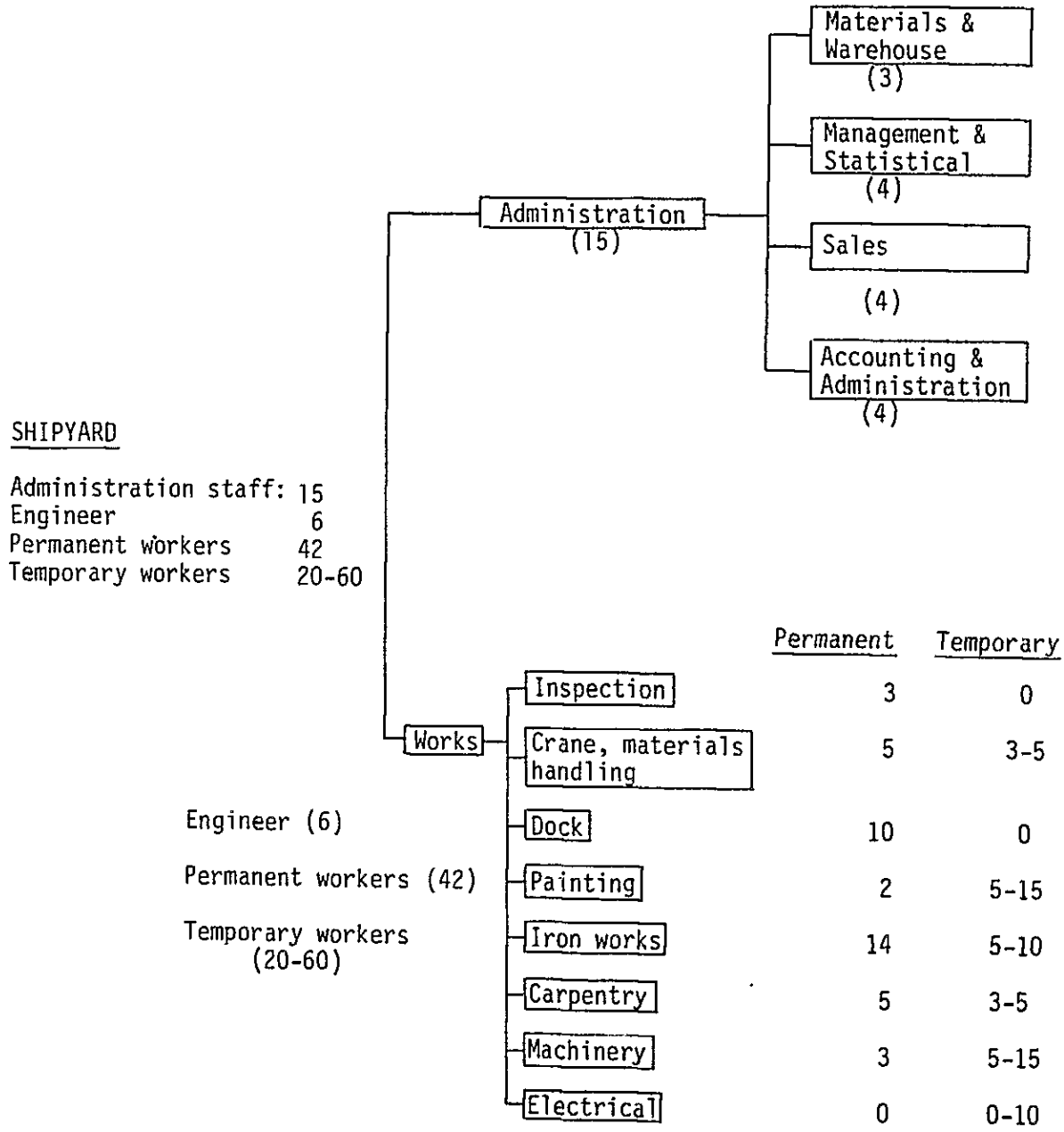
In light of the above factors, we have decided that the optimum implementing schedule for the subject Plan would, as shown below, be one that extends over a period of 25 months, straddling 2 fiscal years and 2 construction seasons.


0 2 4 6 8 10 12 14 16 18 20 22 24 25
E/N
Consulting contract
Detail design
PHASE ONE
Bids, evaluation, construction contracts
Preparations in Japan
Shipment
Repairing Jetty
Building work
Preparations
Tug-boat manufacture
Sailing to Burma
Preparations in Burma
Other equipment
Design and supervision by the consultants
E/N
Consulting contract
Detail design
PHASE TWO
Bids, evaluation, construction contracts
Completion of the Work
Preparations in Japan
Shipping
Dry dock construction
Design and supervision by the consultants

SECTION 6 MANAGEMENT PLAN

6 • 1 Personnel Plan :

The typical organizational structure in Japan for a shipyard capable of repairing 100-150 vessels a year is shown below:



Thus, with 15 office workers, 6 engineers, 42 permanent workers, and 20-60 temporary workers, such a yard can service some 100-150 vessels per year. However, in the case of Japan, peripheral industries are well developed, and so the shipyard operations are greatly facilitated by outside contracting. If these outside contractors were converted to in-plant operations, we may estimate roughly that a regular worker of about 100 persons would be required.

Against this standard, PPFC employs 51 regular staff, 240 temporary workers, and 260 daily workers, for a total of 551 in all, in the shore section of its Engineering Division (Cf. Section 2.4.2). Even excluding the Communications and Electronics Section, which engages in different work, the total remains over 400 persons. Accordingly, even with an expansion and upgrading of the facilities, so long as the number of vessels to be serviced does not greatly exceed the 153 vessels presently owned by PPFC, the personnel requirements of the subject project should be amply covered.

There is, however, a need to reassess the operations of the Dockyard Branch, Workshop Branch, and Repair and Maintenance Branch with a view to possibly integrating these units. If, based on the expansion and upgrading of the facilities, the existing operations could be rationalized, in improving the repair efficiency of the Engineering Division as a whole.

6・2 Operating Costs:

6・2・1 Labor Costs:

The wage system in the Engineering Division of PPFC's Marine Fisheries Department is based on a combination of a basic wage and production incentives. The basic wage is determined on the basis of qualifications at the time of employment, taking into account years of experience.

The basic wage scale is as follows:

Managerial level	450-1300	kyat	per month
Engineering level	450-1300	"	"
Technician foreman level	320-400	"	"
Ordinary workers	205	"	"

Production incentives at the managerial level run 90-550 kyat per month and at the non-managerial level run 90-400 kyat per month.

Total labor costs at present run 300,000 kyat per year but, as previously explained, since even with the projected expansion and upgrading of the repair facilities, this expansion will entail no additional personnel requirements, the project can be implemented within the parameters of the current payroll.

6·2·2 Power Costs:

Since all power requirements for the repair facilities will be provided by in-house generators, power costs may be categorized as fuel costs.

There will be two regular generators in the Repair Center with a generating capacity of 225 KVA each. The power requirements of the dock drainage pump and of the water pump for cleaning hull bottoms will come to about 170 KVA, but these pumps are expected to operate only once every two weeks for a period of 3 hours.

Assuming that all other equipment operates at 75% of capacity, the average daily load will work out to:

$$280 \text{ KVA} \times 0.75 + 170 \text{ KVA} \times \frac{3 \text{ hours}}{2 \text{ weeks} \times 5 \text{ days} \times 8 \text{ hrs.}}$$

$$= 210 + 6.4 \text{ KVA}$$

$$\doteqdot 217 \text{ KVA}$$

Accordingly, the fuel consumption become:

$$(270 \text{ PS}) \times 2 \times \frac{217 \text{ KVA}}{450 \text{ KVA}} \times 0.185 \text{ kg/hr. PS} \times \frac{1}{0.85 \text{ kg/lit.}}$$

$$\times 50 \text{ weeks} \times 5 \text{ days} \times 8 \text{ hrs.}$$

$$= 113{,}350 \text{ liters}$$

PPFC's purchase price for diesel fuel is 3.38 kyat per gallon. On this basis, total fuel costs will come to:

$$113{,}350 \times \frac{3.38}{4.546} \text{ Kyat} = 84{,}276 \text{ kyats/annum}$$

The cost of lubricating oil, at 10% of fuel costs, will come to 8,428 kyat per annum.

6・2・3 Cost of Materials and Replacement Parts:

Breakdown of PPFC's cost of materials for reparing vessels in 1981/1982 are as shown below.

Item	Quantity	Amount (in kyat)
Coconut Fibres	411 band	13,660 kyat
Enamelled wire	86 kg	17,015
Electrodes	27.6 ton	646,422
Timber	402.0 ton	
Teak	89.0 ton	
Hard wood	226.0 ton	
Others	87.0 ton	
Oxygen	4,996 M^3	
Accetylene	1,569 M^3	
Paints	31,640 lit	
Resin Dust	2,727 kg	34,860
Zinc Blocks	4,368 kg	36,531
Pipes	217 M.	184,180
Electric Bulbs	4,774 pcs.	114,976
Bolts/Nuts	1,934 dozens	53,196
Ball Brgs	829 pcs.	58,804
Total		1,200,000

At present, only about 90 of the 153 vessels owned by PPFC are being repaired per year. We can thus anticipate that, when repairs can be made on the entire PPFC fleet, material costs will increase by a factor of some 30% to 1,560,000 kyat.

Replacement parts are currently being imported in a volume of 1,500,000 kyat per year. Since the budget for replacemente parts naturally increases in response to a more complete program for inspection, checks and repairs, a shortage of parts has been cited as another major cause of operating down-time for the PPFC fishing vessels.

Based on an expansion and upgrading of the repair facilities, there will, it is true, be a slight increase also in the number of items produced internally but, nonetheless, there will probably be a need overall to increase the imports of replacement parts by at least 30%. Accordingly, the annual parts budget can be anticipated to run 1,950,000 kyat under the proposed plan.

6・2・4 Outside Contracting Expenses; Other Costs:

Outside Contracting

At present, the PPFC contracts out the repairs on some 30 vessels a year to BPC, DMA and other shipyards at an annual cost of about 3,500,000 kyat. However, with the exception of private facilities which repair the wooden ships, once the Fishing Boat Repair Center is upgraded and expanded, this outside contracting will become unnecessary. Accordingly, these outside expenses are expected to fall by more than 70% to a level of only 1,050,000 kyat.

Forklifts

Forklifts are to be provided for the Fishing Boat Repair Center for use in transporting components and materials. Assuming that the fuel consumption of each forklift is 3 gallons a day, the annual cost of their fuel will be:

2 unit x 3 gallons x 3.38 kyat x 5 days + 50 weeks = 5,070 kyat/year

Water

Hull of vessels are washed-up with high-pressured water upon docking. These water, as it is required to be fresh water, can not be obtained within the planned site, will be supplied by water supply boat. Number of vessels to be docking are 26 vessels for the slipway and 35 vessels for the dry dock, accordingly the annual cost of water will be:

200 lit./min. x 2 units x 60 min. x 61 times x
30 kyat/cu.m = 43,930 kyat.

Tugboat

The docking facilities, including the floating dock, will receive 100 vessels per year. Thus, if we set the number of operating dates for the tugboat at:

100 times x 2 days = 200 days,

the fuel expenses for the tugboat become:

$$200 \text{ days} \times 8 \text{ hrs.} \times 625 \text{ ps} \times 0.185 \times \frac{1}{0.85} \times \frac{3.38}{4.546}$$

$$= 161{,}822 \text{ kyat}$$

$$\doteq 162{,}000 \text{ kyat}$$

Assuming that all other running costs for the tugboat will equal the fuel costs, the annual operating expenses for this boat work out to 324,000 kyat.

Other Expenses

All other expenses are estimated at 10% of the above total.

Total Expenses

Summarizing now the above cost elements, the annual projected budget for operating the facility will be as follows:

(in '000 kyat)

Cost Category	Current Operating Cost (1981/82)	Incremental Costs Based on the Expansion and Upgrading Program	Total
Labor	300	-	300
Power	-	92.7	92.7
Materials	1,200	360	1,560
Replacement parts	1,500	450	1,950
Outside contracting	3,500	(-2,450)	1,050
Fuel	-	5	5
Water	-	44	44
Operating costs	400	100	500
Tugboat operating costs	-	324	324
TOTAL	6,900	(-1,074.3)	5,177.7

SECTION 7 PROJECT EVALUATION

7・1 Financial Review:

7・1・1 The Fishing Boat Repair Center :

The Fishing Boat Repair Center, since it is intended to perform repairs on the PPFC fleet, will not in itself be an income generating facility. Thus, the impact of this Center, based on an expansion and upgrading of the repair facilities, will be evident only through a change in the level of expenditures. We anticipate that, as seen in the analysis of operating costs in Section 6.2, there will be a saving in total expenses of 1,074,300 kyat per year, based on a huge drop in outside contracting costs.

7・1・2 The Marine Fisheries Department:

The impact of the upgrading and expansion of the repair facilities will show up as an improvement in the operating ratios for the fishing vessels operated by the Marine Fisheries Department of the PPFC. This improved operating rate will lead to an increase in fish catches, as a result of which the Corporation's export and domestic sales revenues will both expand. In Section 2.3.3, Table 2.6, we presented the average operating results for the PPFC fleet. The subject plan will eliminate the existing underutilization based on the 10% backlog of vessels currently awaiting dock space.

Docking operations and repair works on water presently consume an average of 100 days a year. However, based on an upgrading of the cranes, repair jetty, and machine tools, a 50% reduction in operating time should be possible at the outset, and, in the future, efforts should be made to reduce this time to only 30 days. When these non-operating days are then shifted to fishing operations i.e., are converted to fishing days, the following increases in the catch volume of the PPFC trawl vessels can be anticipated:

Table 7.1 Anticipated increase in the catch volume of PPFC trawler

	Type of Fishing (Vessel)	Number of Vessels	Present Catch (tons)	No. of Fishing Days per Vessel Per Year	Catch per Fishing Day Per Vessel (tons)	Increase in the Number of Fishing Days Per Vessel			Increase in the Catch Per Vessel (tons)	Increase in the Total Catch (tons)	Total Catch Volume After the Increase (tons)
						Based on Eliminating the Backlog Awaiting Dock Space	Based on a Shortening in Operating Time	Total			
1	100 Series (Korea)	10	3,548.05	109.2	3.25	36	51	87	282.75	2,827.5	6,375.55
2	500 Series (Korea)	3	1,729.56	102.0	5.65	36	51	87	491.55	1,474.65	3,204.21
3	500 Series (Japan)	2	779.08	65.5	5.95	36	51	87	517.65	1,035.3	1,814.38
4	400 Series (Norway)	9	707.18	47.8	1.64	36	51	87	142.68	1,284.12	1,991.3
5	500 Series (Norway)	2	1,419.45	111.5	6.37	36	51	87	554.19	1,108.38	2,527.83
6	400 Series (Australia) (100 ton class)	10	762.67	86.9	0.88	36	51	87	76.56	765.6	1,528.27
7	400 Series (Australia)	3	361.65	95.0	1.27	36	51	87	110.49	331.47	693.12
8	400 Series (U.K.)	10	999.01	99.8	1.00	36	51	87	87.00	870.0	1,861.01
9	400 Series (Denmark)	4	573.25	103.3	1.39	36	51	87	120.93	483.72	1,056.97
	Total	53	10,879.9	89.6	2.29	36	51	87	264.86	10,180.74	21,060.64

Since no data are available on fish catches by vessel type, if we apply the species composition of the PPFC trawl vessels, as shown at the Appendix Ⅲ-7 of this report, we see that export species, such as Thread Fin, Yellow Croaker, Chub Mackerel, and Milk Fish, comprise about 9% of total catch and shrimp (White and Tiger) and lobster about 1%. On this basis, the breakdown of the presumed incremental catch can be estimated as follows:

Shrimp and lobster for export	101.81 tons
Fish for export	916.27
Fish for the domestic market	9,162.66
Total	10,180.74

The breakdown of PPFC sales is as follows:

(In tons and millions of kyat)

	1980/1981		1981/1982		1982/1983	
	Volume	Value	Volume	Value	Volume	Value
Exports	-	81.7	-	115.8	-	140
Fish (marine)	4,218	23.0	5,752	35.8	-	-
Shrimp	2,253	58.4	2,665	77.6	-	-
Other Items	-	0.3	-	2.4	-	-
Domestic Fish Sales	21,962	65.7	28,304	86.5	40,737	96.3
Other Sales	-	77.6	-	71.7	-	57.7
Total		225		274		294

From the above table, the unit values work out to:

Export fish	5,453	-	6,224	kyat/ton
Export shrimp	25,921	-	29,118	kyat/ton
Domestic fish	2,364	-	3,056	kyat/ton

Based on export values per ton of 6,000 kyat for exported fish, 28,000 kyat for shrimp, and 2,800 kyat for domestic fish, the value of the incremental catch, based on an expansion and upgrading of the Fishing Boat Repair Center, would rise as follows:

Fish Exports	916.27 ton	x	6,000 kyat	=	5,497,620 kyat
Shrimp Exports	101.81 "	x	28,000 "	=	2,850,680 "
Domestic Fish	9,162.66 "	x	2,800 "	=	25,655,450 "
			Total increment:		34,003,750 kyat

The expenses required to achieve the above increase may be estimated at 22,552,000 kyatt, broken down between: 11,276,000 kyat for fuel and an identical amount for all other costs. Accordingly, the net profit for the incremental catch may be estimated at 11,451,000 kyat.

As shown above, based on an upgrading and expansion of the PPFC Fishing Boat Repair Center, the PPFC, which now depends heavily on outside contractors for its repairs, will be in a position to decrease these outside contracts. We may anticipate that, based on a reduction in these outside costs, there will be an overall saving of 1,074,000 kyat per year in total operating expenses. At the same time, based on the elimination of the waits for docking facilities and a shortening in the time of repair operations, there will be an improved utilization of fishing vessels, on the basis of which we can expect an increase in net catch earnings of 11,451,000 kyat per year.

7・2 Economic Analysis:

Following are the principal benefits that can be expected from the Fishing Boat Repair Center Project.

1) An increase in catches based on improved fishing vessel utilization.

2) A decrease in outside contracting.

3) Improved supplies of animal protein, based on an increase in the domestic supply of fish products and a resulting improvement in nutritional levels.

4) A reduction in vessel wear-and-tear as a result of the program of regular inspections and repairs.

The benefits from the increased catches can be measured on the basis of the foreign exchange that will be earned from the exports of fish and shrimp and on the basis of sales revenues from the domestic sale of catches.

The reduction in the outside contracting costs, based on the use of PPFC's own facilities, will be a simple transfer of costs from other public corporations to PPFC and so would not constitute per se a net benefit for the national economy. However, by decreasing the amount of outside contracts, new capacity will develop in the BPC and BDC facilities which can certainly be diverted to other productive activities. Accordingly, the reduction in these outside contracting costs may indeed be calculated as a benefit of the program.

The improvement in the country's nutritional levels and the decrease in vessel wear-and-tear as a result of the repair program would be difficult to measure quantitatively and so have been excluded from the evaluation criteria.

The following new or increased costs can be expected as a consequence of implementing the proposed project:

1) an increase in power and fuel costs.
2) an increase in material costs.
3) an increase in the cost of replacement parts.
4) water costs.
5) an increase in operating costs.
6) an increase in the costs of operating the fishing vessels.
7) an increase in tugboat operating costs.

We have not planned for any increases in labor costs, since we have concluded that implementation of the project will not ncecessitate any increases in personnel.

We have valued the above costs and benefits in terms of domestic market prices.

Turning now to the useful life of the proposed facilities, in Japan, a dry dock has a useful life of 45 years, a jetty 50 years, a tugboat 10 years, buildings 35 years, and Equipment for steel vessels building 12 years. We have set 45 years as the project life and have assumed that all of the various facilities will be renewed upon termination of their useful lives.

The results of this cost/benefit analysis are given in next page.

With a discount rate of 8%, the cost-to-benefit ratio works out to 142.9%, and the Net Present Value to 166,257,000 kyat. The Internal Rate of Return is seen to be 27.36%, making it clear beyond doubt that implementation of this project will contribute to the Burmese economy.

Cost/Benefit Analysis

(in '000 kyat)

Year	Cost										Benefit					Net Benefit
	Investment	Fuel for Power	Material	Spare Parts	Fuel	Water	Overhead	Fishing Boat Operating Cost	Tug Boat Operating Cost	Total	Fish Export	Shrimp Export	Domestic Sales	Decrease of Outside Contracting	Total	
1	40,000	47	180	225	3	22	50	22,552	324	63,403	4,581	331	5,727	0	10,639	-52,764
2	30,000	93	360	450	5	44	100	22,552	324	53,928	18,325	1,324	22,907	2,450	45,006	-8,922
3	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
4	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
5	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
6	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
7	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
8	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
9	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
10	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
11	3,333	93	360	450	5	44	100	22,552	324	27,261	18,325	1,324	22,907	2,450	45,006	17,745
12	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
13	6,667	93	360	450	5	44	100	22,552	324	30,595	18,325	1,324	22,907	2,450	45,006	14,411
14	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
15	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
16	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
17	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
18	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
19	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
20	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
21	3,333	93	360	450	5	44	100	22,552	324	27,261	18,325	1,324	22,907	2,450	45,006	17,745
22	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
23	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
24	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
25	6,667	93	360	450	5	44	100	22,552	324	30,595	18,325	1,324	22,907	2,450	45,006	14,411
26	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
27	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
28	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
29	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
30	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
31	3,333	93	360	450	5	44	100	22,552	324	27,261	18,325	1,324	22,907	2,450	45,006	17,745
32	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
33	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
34	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
35	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
36	13,333	93	360	450	5	44	100	22,552	324	37,261	18,325	1,324	22,907	2,450	45,006	7,745
37	6,667	93	360	450	5	44	100	22,552	324	30,595	18,325	1,324	22,907	2,450	45,006	14,411
38	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
39	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
40	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
41	3,333	93	360	450	5	44	100	22,552	324	27,261	18,325	1,324	22,907	2,450	45,006	17,745
42	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
43	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
44	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
45	0	93	360	450	5	44	100	22,552	324	23,928	18,325	1,324	22,907	2,450	45,006	21,078
Total	106,666	4,315	16,020	20,025	223	1,958	4,450	1,014,840	14,580	1,192,900	810,881	58,587	1,013,635	107,800	1,990,900	798,002

SECTION 8 CONCLUSIONS AND RECOMMENDATIONS

The major priority in the Burmese Government's program for fisheries development is being placed on the development of the coastal and marine fisheries, based on an investment in the modernization of the PPFC facilities and an expansion of both the domestic and exportable supply of fish products.

The PPFC has been actively engaged in a program to build up its fishing fleet as well as ice-making and refrigeration facilities. Since 1977, in particular, there has been a 3.5 fold expansion in steel and FRP vessels. However, despite this rapid increase in vessel strength, Burma's vessel repair facilities in general remain inadequate, while the repair facilities of the PPFC itself have also lagged behind in development. As a result, the planned expansion of fish production has run into a serious snag, owing to a decline in fishing vessel utilization.

As a consequence of the above situation, the PPFC is under considerable pressure to expand its Fishing Boat Repair Center in the Gyaung Waing area, where it maintains a slipway.

If the subject plan is carried out, the PPFC will then be able to repair 100 fishing vessels a year, on its slipway, floating dock and dry dock. This will eliminate the present bottleneck caused by the wait for dock access and help shorten the time required for repair operations, both of which factors have been cited as prime reasons for the drop in fishing vessel utilization. Also, on the basis of a major increase in the number of fishing days, it will become possible to achieve an increase in fish production as well. With an expanded supply of fish, we can expect not only an improvement in the nutritional levels of the Burmese people but a contribution as well to foreign exchange earnings based on expanded exports of fish and shrimp.

With regard to the maintenance and operating costs of this Fishing Boat Repair Center, as a result of an increase in the number of repairs,

there will naturally be an increase in material and fuel costs over present levels. But, despite these increases, there will be no need to expand personnel beyond existing levels, while there will also be a significant drop in the amounts paid to utilize outside repair facilities-- i.e., for outside contracting costs. On an overall basis, then, it can be anticipated that costs will be less than at present.

On the basis of PPFC's current technical capabilities, we anticipate no particular difficulties with respect to the operation of the Fishing Boat Repair Center. Future problems will, rather, concern how to operate the facilities more efficiently and the possibility of rationalyzing operations.

For the above reasons, the Basic Design Survey Team came to the conclusion that the plan to upgrade and expand the PPFC Fishing Vessel Repair Center at Gyaung Waing would be of immense benefit to the Burmese economy and that there would, therefore, be considerable significance in the Government of Japan making a grant-in-aid for this project.

In order to more effectively utilize the plan facilities in the future and further develop the fishing vessel repair capabilities of the PPFC, consideration should, we believe, be given to the following points.

1) An effort should be made to procure materials and components for repair operations according to plan.

The size of the PPFC Fishing Boat Repair Center upon completion of the subject project, will be almost comparable to the repair facilities of a medium-class ship-building yard in Japan. In order to efficiently utilize this capacity, it is naturally essential that materials and replacement parts for repair use be procured in a smooth and timely manner. For, if the procurement of such items is subject to delays, the productive efficiency of the entire facility will decline, and this would be tantamount to lowering the capacity of the complex. It is vital, therefore, that a major effort should be made to insure the procurement of parts and materials according to plan.

2) An effort should be made to improve technical levels.

Only by fully utilizing the subject facilities can their capabilities be given full play. At present, the facilities are merely being "used"; to give full play to the capacity of the improved facilities, it will be necessary in the future to take steps to rapidly upgrade the technical and skill levels of the technicians and workers operating and managing the complex. Particularly with respect to machine tools, we feel that mere fabrication of machinery components for the PPFC fishing vessels will only serve to lower the utilization ratios for machine tools in the machine shop. There is, therefore, a clear need to actively increase the amount of equipment, such as through the in-house production of small types of machinery for vessel use, and to nurture greater skills among the work force in the handling of machine tools with a view to maintaining and improving technological levels. It is vital, in this connection, to take advantage of the training programs offered by Japan and other countries as a means of developing trained technicians.

3) An effort should be made to rationalize management and raise productivity.

In our opinion, decisive measures should be taken to review existing customs with respect to such areas as working hours and work rules.

There is a need to unify concepts of plant management, introduce scientific management methods, and generally rationalize production control.

Based on such rationalization measures, productivity will inevitably rise, but there is a compelling need to maintain continuing and persistent efforts until such time as technology, product quality, and costs reduction are brought up to international levels.

4) A move should be made toward specialization and division of labor.

The ship-building industry becomes viable only with the cooperation of a large number and variety of peripheral industries. For, no matter how concentrated the investment in any one ship-building yard, there are definite limits to the cost saving that can be achieved, so that it is unrealistic to expect total results from such investments.

Accordingly, in fields where high utilization ratios cannot be obtained only through the repair operations within PPFC, or in certain highly specialized technical areas, efforts should be made to foster the growth of peripheral industries as well as sub-contracting operations, with a view to specialization and division of labor.

APPENDIX

Appendix I-1 Basic Design Study

Appendix I-1-1 Team Members

Mr. Junichi FUJITA	Team Leader	Fishing Boat Inspector, Fishing Boat Div. Fisheries Agency, Ministry of Agriculture, Forestry and Fisheries (MAFF)
Mr. Shoji NAKANO	Planning, Fishing Boat Repair	Office for the Overseas Fishery Cooperation, Fisheries Agency, MAFF
Mr. Naoyoshi SASAKI	Project Coordinator	Basic Design Div., Grant Aid Dept., Japan International Cooperation Agency (JICA)
Mr. Kuniaki TAKAHASHI	Fisheries Development	Fisheries Engineering Co., Ltd.
Mr. Toshiya OGASAWARA	Planning, Shipyard	Fisheries Engineering Co., Ltd.
Mr. Taizo KANEKO	Architect	Fisheries Engineering Co., Ltd.
Mr. Masayoshi SAKURADA	Naval Architect	Fisheries Engineering Co., Ltd.
Mr. Yutaka OCHI	Civil Engineer	Fisheries Engineering Co., Ltd.

Appendix I-1-2 Burmese Discussants

NAME	ORGANIZATION	TITLE
Colonel AUNG WIN	Ministry of Livestock Breeding and Fisheries (MLBF) People's Pearl and Fishery Corporation (PPFC)	Deputy Minister & Managing Director
U SAN MYINT	PPFC	Additional Managing Director
U TIN MAUNG MYINT	MLBF	Director, Planning and Statistics Dept.
U KHIN MAUNG HTUN	PPFC	General Manager, Pearl Culture Dept.
Lt.Cdr. HAN HTUN	PPFC	General Manager, Marine Fisheries Dept.
Lt.Cdr. THEIN MYINT	PPFC	Chief Engineer, Marine Fisheries Dept.
U THAN HTAY	PPFC	General Manager, Planning and Budget Dept.
U C. YIN CHAN	PPFC	Asst. General Manager Freshwater Fisheries Dept.
Dr. SAN AUNG	PPFC	Manager, Marine Research Div.
U HTWE	PPFC	Dy. Chief Engineer, Engineering Div.
U WUN NA	PPFC	Manager, Cold Stores Dept.
DAW TIN TIN HTAY	PPFC	Manager, Planning and Budget Dept.
U KHIN LATT	PPFC	Manager, Civil Engineering Dept.

NAME	ORGANIZATION	TITLE
U OHN MYA	PPFC	Naval Architect, Engineering Div.
U MYO MYINT	PPFC	Mechanical Engineer, Engineering Div.
U HLA MAUNG	PPFC	Manager, Workshop Branch
U SAW WAI LIN	PPFC	Manager, Communication Branch
U AUNG KHIN SHEIN	PPFC	Marine Superintendent, Marine Fisheries Dept.
U KYAW HTUN	PPFC	Mechanical Engineer, Engineering Div.
DAW MEY PEW AYE	PPFC	Manager, Freshwater Fisheres Dept.
U NYANA	Burma Dockyard Corporation (BDC)	Chief Engineer
U THA HLA	BDC	Store Officer
U HLA MG	BDC	Naval Architect
Lt.Cdr. HLA MYINT	Burma Port Corporation (BPC).	Chief Mechanical Engineer
U MAUNG MAUNG HLA	BPC	Chief Civil Engineer
U TIN HTUT	BPC	Dredging Master
渡 部 彰 三	PPFC	Guarantee Engineer
白 蛹 克 巳	PPFC	Master Fisherman

Appendix I-1-3 Survey Itinerary

Day	Date	Itinerary	Description
1	June 6 (Sun.)	Tokyo $\xrightarrow{TG741}$ Bangkok	
2	June 11 (Mon.)	Bangkok $\xrightarrow{TG305}$ Rangoon (RGN)	
3	June 12 (Tue.)	RGN Japanese Embassy PPFC Ahlone Office PPFC GYAUNG WAING Slipway	Courtesy call on Japanese Embassy Discussion on the Plan Visit to the site
4	June 13 (Wed.)	RGN PPFC Floating Dock Dock Corporation Sinmalike Dockyard	Discussion on the Plan Visit to Floating Dock and Sinmalike Dockyard
5	June 14 (Thu.)	RGN PPFC	Discussion on the Plan
6	June 15 (Fri.)	RGN PPFC	Discussion on the Plan
7	June 16 (Sat.)	RGN	Discussion within the team
8	June 17 (Sun.)	RGN	Discussion within the team
9	June 18 (Mon.)	RGN Port Corporation PPFC Ahlone Office	Visit to the dry dock Interim discussion with PPFC

Day	Date	Itinerary	Description
10	June 19 (Tue.)	RGN PPFC Ahlone Office	 Discussion on the Plan
11	June 20 (Wed.)	RGN PPFC Ahlone Office	Discussion on PPFC's activities Discussion on the Plan
12	June 21 (Thu.)	RGN PPFC Ahlone Office	 Discussion on the Plan
13	June 22 (Fri.)	RGN PPFC Ahlone Office Japanese Embassy JICA Team Leader and Mr. Nakano RGN $\xrightarrow{UB221}$ Bangkok	 Signature of Minutes of Discussions Reporting of the outline of the Project
14	June 23 (Sat.)	RGN Team Leader and Mr. Nakano Bangkok $\xrightarrow{JL766}$ Tokyo	Data and information collection
15	June 24 (Sun.)	RGN	Data and information collection
16	June 25 (Mon.)	RGN PPFC GYAUNG WAING Keighley Office	 Field Survey Data Collection

Day	Date	Itinerary	Description
17	June 26 (Tue.)	RGN PPFC GYAUNG WAING Japanese Embassy PPFC Ahlone Office	 Field Survey Interim Report Discussion on the Plan
18	June 27 (Wed.)	RGN PPFC GYAUNG WAING PPFC Ahlone Office	 Discussion on the soil test Discussion on the Plan
19	June 28 (Thu.)	RGN PPFC Ahlone Office	 Discussion on the Plan
20	June 29 (Fri.)	RGN PPFC Ahlone Office Japanese Embassy JICA RGN $\xrightarrow{UB221}$ Bangkok	 Reporting of the result of the survey
21	June 30 (Sat.)	Bangkok $\xrightarrow{JL766}$ Tokyo	

Appendix I-2 Draft Final Report Explanation

Appendix I-2-1 Team Members

Mr. Junichi FUJITA	Team Leader	Fishing Boat Inspector, Fishing Boat Div. Fisheries Agency, Ministry of Agriculture, Forestry and Fisheries (MAFF)
Mr. Naoyoshi SASAKI	Project Coordinator	Basic Design Div., Grant Aid Dept., Japan International Cooperation Agency (JICA)
Mr. Kuniaki TAKAHASHI	Fisheries Development	Fisheries Engineering Co., Ltd.
Mr. Toshiya OGASAWARA	Planning, Shipyard	Fisheries Engineering Co., Ltd.
Mr. Masayoshi SAKURADA	Naval Architect	Fisheries Engineering Co., Ltd.

Appendix I-2-2 Burmese Discussants

NAME	ORGANIZATION	TITLE
U NYUNT MG	Foreign Economic Relation Department (FERD)	Director General
U NYUNT LWIN	FERD	Deputy Director
Colonel AUNG WIN	Ministry of Livestock Breeding and Fisheries (MLBF) People's Pearl and Fishery Corporation (PPFC)	Deputy Minister & Managing Director
U SAN MYINT	PPFC	Additional Managing Director
U KAN NYUNT	PPFC	General Manager, Project
Lt.Cdr. HAN HTUN	PPFC	General Manager, Marine Fisheries Dept.
Lt.Cdr. THEIN MYINT	PPFC	Chief Engineer, Marine Fisheries Dept.
Lt.Cdr. KYAW LWIN	MLBF	Additional Director, Planning and Statistics Dept.
U AYE ZAW WIN	PPFC	Deputy General Manager Cold Stores, Processing Marketing and Export
U HTWE	PPFC	Deputy Chief Engineer, Engineering Div.
U OHN MYA	PPFC	Naval Architect, Engineering Div.
U MYO MYINT	PPFC	Mechanical Engineer, Engineering Div.
U HLA MAUNG	PPFC	Manager, Workshop Branch
U SAW WAI LIN	PPFC	Manager, Communication Branch
U AUNG KYAW AYE	PPFC	Engineer, G.R.P. Branch
U BATHAN CHAIN	PPFC	Engineer, Civil Engineering Dept.
U KYAW HTUN	PPFC	Mechanical Engineer, Engineering Div.

Appendix I-2-3 Survey Itinerary

Day	Date	Itinerary	Description
1	Aug. 31 (Fri.)	Tokyo —TG741→ Bangkok	
2	Sep. 1 (Sat.)	Bangkok —TG305→ Rangoon (RGN)	Discussion on the Survey Schedule
3	Sep. 2 (Sun.)	RGN	Discussion within the Study Team
4	Sep. 3 (Mon.)	RGN Japanese Embassy JICA office PPFC FERD	Courtesy call on Embassy, discussion on the Plan Courtesy call on PPFC, discussion on the Plan Courtesy call on FERD, discussion on the Plan
5	Sep. 4 (Tue.)	RGN PPFC	Discussion on the Plan
6	Sep. 5 (Wed.)	RGN PPFC	Discussion on the Plan
7	Sep. 6 (Thu.)	RGN PPFC	Discussion on the Plan
8	Sep. 7 (Fri.)	RGN	Discussion within the Team
9	Sep. 8 (Sat.)	RGN PPFC Team Leader RGN —TG306→ BKK	Signature of Minutes of Discussions
10	Sep. 9 (Sun.)	RGN Team Leader BKK —TG604→ NRT	Discussion within the Team
11	Sep. 10 (Mon.)	RGN Japanese Embassy PPFC RGN —TG306→ BKK	Reporting Reporting
12	Sep. 11 (Tue.)	BKK —TG604→ NRT	

Appendix I - 2 Minutes of Discussions

MINUTES OF DISCUSSIONS

ON

THE EXPANSION PROJECT FOR FISHING BOAT REPAIRSHOP

In response to the request made by the Government of the Socialist Republic of the Union of Burma for the expansion project for fishing boat repairshop in Burma (hereinafter refered to as "the Project"), the Government of Japan has sent, through the Japan International Cooperation Agency (hereinafter refered to as "JICA"), a team headed by Mr. Junichi FUJITA to conduct a basic design study for 21 days from June 10, 1984. The team carried out a field survey, had a series of discussions and exchanged views with the authorities concerned.

As the result of the study and discussions, both parties have agreed to recommend to their respective Governments to examine the results of the survey attached herewith towards the realization of the Project.

Rangoon, June 21, 1984

Junichi Fujita

Junichi FUJITA
Team Leader
The Japanese Survey Team

U SAN MYINT

U San Myint
Add: Managing Director
People's Pearl & Fisheries
Corporation

中野荘次

Shoji NAKANO
Deputy Team Leader

Han Tun

Lt. Cdr. Han Tun
General Manager
Marine Fisheries Department

N. SASAKI

Naoyoshi SASAKI
Project Coordinator

Thein Myint

Lt. Cdr. Thein Myint
Chief Engineer

M I N U T E S

1. The objectives of the Project are to expand and upgrade the fishing boat repair facilities owned by People's Pearls and Fisheries Corporation(PPFC) for the purpose of improvement of fishing boat's efficiency in pursuit of increase of fish production,and in the consequence,to improve the financial situation of PPFC.

2. The Proposed site of the facilities for the Project is GYANG WAING,which is allocated to the PPFC for the fishing boat repairshop by the Government of Burma, as shown in Annex I.

3. The Ministry of Livestock Breeding and Fisheries is responsible for the administration of the Project, and the PPFC is the executing agency of the Project.

4. The Japanese Survey Team will convey to the Government of Japan the desire of the Government of the Socialist Republic of the Union of Burma that the former takes necessary measures to cooperate in implementing the Project and provide the latter with the items listed in Annex II within the scope of Japanese economic cooperation in grant-aid system.

5. The Government of the Socialist Republic of the Union of Burma will take the necessary measures listed in Annex III on condition that the grant assistance by the Government of Japan is extended to the Project.

6. Both sides confirmed that the Japanese Survey Team explained the Japanese Grant Aid Programme and Burmese side understood it.

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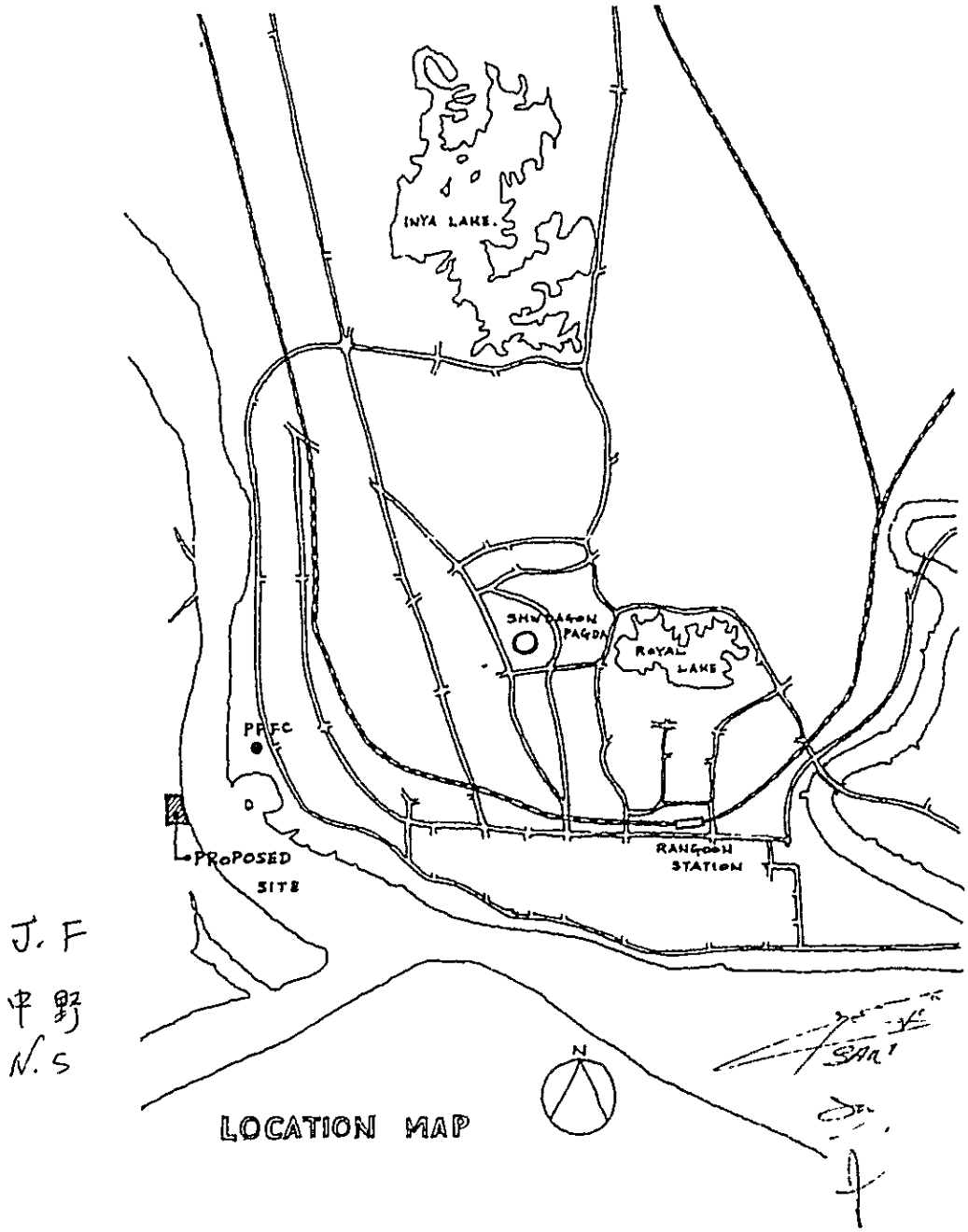
ANNEX I

Location of the Site



ANNEX II

Items requested in order of priority by the Government of the Socialist Republic of the Union of Burma, the cost of which will be borne by the Government of Japan in the limitation of the budget of Japanese Government and scheme of Japanese grant aid.

Facilities and equipment for the expansion of the fishing boat repairs facilities to cope with 100 vessels owned by PPFC.

1. Power Station
   (1) Electricity supply
   (2) Water Supply
   (3) Air Supply
2. Dry Dock
3. Concrete jetty with a fixed crane.
4. Tug Boat.
5. Haulage and Transportation Equipment Fork lift(s)
6. Shop and/or shop's equipment
   (1) Welding, plating and plumber shop
   (2) Calibration Apparatus
   (3) Engine and refrigeration repairshop
   (4) Electrical repair shop
   (5) Machine shop
   (6) GRP/Insulation Repair shop
   (7) Carpentry shop
   (8) Docker shop
   (9) Electronic repairshop
   (10) Drawing shop
7. Spare parts for emergency repairs

ANNEX III

Items to be undertaken by the Government of the Socialist Republic of the Union of Burma are as follows ;

1. To provide data and information necessary for the design and the expansion of the fishing boat repairshop,
2. To secure a lot of land necessary for the expansion of the fishing boat repairshop.
3. To clear and level the Project site prior to construction,
4. To ensure prompt unloading and customs clearance in the Socialist Republic of the Union of Burma.
5. To exempt the Japanese nationals concerned from customs duties, internal taxes and other fiscal levies imposed in the Socialist Republic of the Union of Burma with respect to the supply of the products and services for the Project,
6. To provide the necessary permissions, licences and other authorizations for carrying out the Project.
7. To bear all expenses necessary for the execution of the Project other than those to be borne by the Japanese Grant,
8. To maintain and use the facilities, equipment and materials properly with due diligence.

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A N N E X IV

Memorandum for the Expansion Project for Fishing Boat Repairshop of P. P. F. C.

As a result of careful study and thorough discussions between P.P.F.C. and the Japanese Basic Design Team, we have arrived at the following conclusions with regard to the P.P.F.C. fisheries development particulary in terms of the P.P.F.C's fishing boat repairshop.

1. Major Constraints to the high operational rate of the fishing boats are identified as follows:-
   (a) Dock and workshop facilities are inefficient and inadequate to effectively maintain all the fishing support crafts of P.P.F.C.
   (b) Shortage of genuine spare parts and materials P.P.F.C. has to import due to economic and financal situations.
   (c) Shortage of fund for capital investment in fisheries development including the fishing boat repair facilities.

2. To overcome these constraints, both parties consider the following measures to be taken.
   (a) Japanese Basic Design Team will recommend the appropriate basic design for the Project to the Government of Japan.
   (b) P.P.F.C. shall operate the upgraded and expanded repair facilities with full efficiency and effectiveness. Both parties clearly understand that sucess of the project is duely related to the P.P.F.C's concentrated efforts for increase of it's production and the promotion of export based upon the Burma's marine fisheries development programme.

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I-3-2 Draft Final Report Explanation

MINUTES OF DISCUSSIONS

ON

THE DRAFT FINAL REPORT ON THE BASIC DESIGN STUDY

ON

THE EXPANSION PROJECT FOR FISHING BOAT REPAIRSHOP

IN

THE SOCIALIST REPUBLIC OF THE UNION OF BURMA.

The Government of Japan has sent, through the Japan International Cooperation Agency (JICA), a Basic Design Study Team to the Socialist Republic of the Union of Burma from Aug. 31 to Sep. 11, 1984, for the purpose of presenting and explaining the Draft Final Report on the Basic Design Study (the Report) on the Expansion Project for Fishing Boat Repairshop. The team held meetings with the officials concerned to explain and to discuss the Report. As a result of the discussions, both parties have agreed to the following items :

1. The Burmese side principally has agreed to the basic design proposed in the Report, and appropriate alterations (Annex 1) agreed during the discussions will be incorporated in the Final Report
2. The Final Report (12 copies in English) on the Project will be submitted to the Burmese side by the end of Oct. 1984.
3. Land clearing and levelling of the proposed site shall be completed by the Burmese side by the end of Feb. 1985. (Annex 2)

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4. Modification of the existing buildings shall be completed by the Burmese side prior to the commencement of the construction work. (Annex 3)

Rangoon, Sep. 7, 1984.

Junichi Fujita

Junichi Fujita.
Team Leader
Basic Design Study Team.

U Kan Nyunt
General Manager for the Projects
P.P.F.C.

Witnesses:

1.

2.

1.

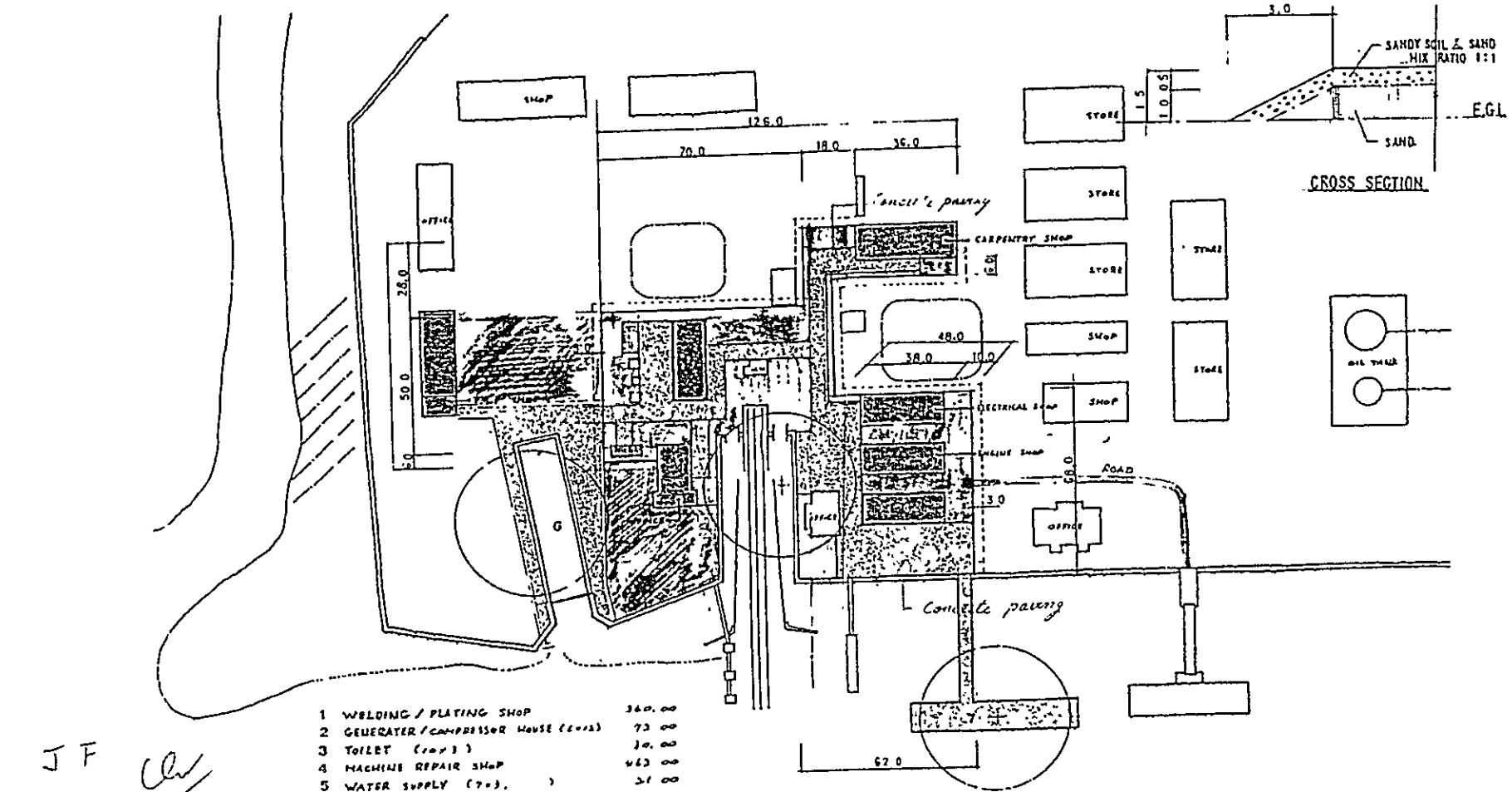
2.

Annex (1)

Appropriate alterations

1. Manual operation arrangement for Dry Dock Flap Gate shall also be included.
2. Capstans for the dolphin shall be included.
3. Air compressor set complete with fittings for tube well shall be included.
4. Spare crucible for tilting furnace shall be included.
5. Furnaces with blowers shall be included.

Annex (2)



1	WELDING / PLATING SHOP	360.00
2	GENERATER / COMPRESSOR HOUSE (2×12)	72.00
3	TOILET (2×3)	30.00
4	MACHINE REPAIR SHOP	452.00
5	WATER SUPPLY (7×3,)	21.00
	TOTAL	945.00
6	DRY DOCK (60m × 15m × 15m)	
7	MOORING QUAY (10m × 60m)	

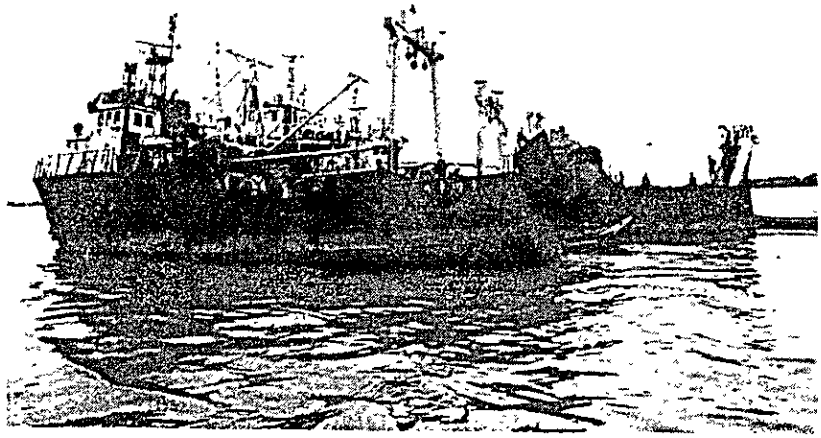
Annex 3

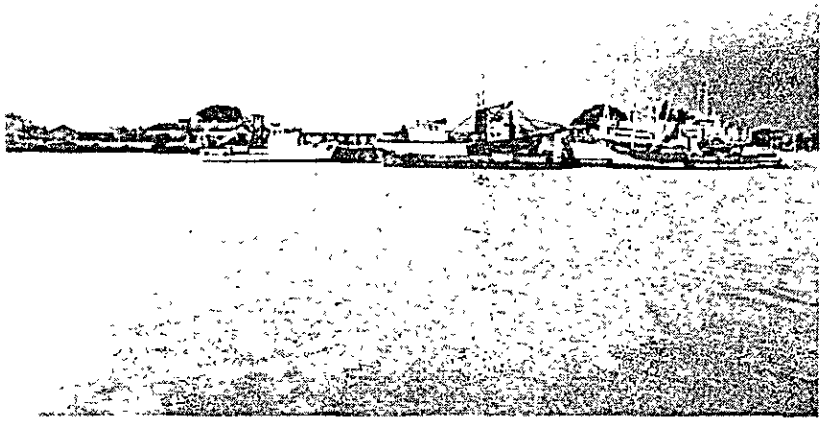
Modification of the Existing Buildings

	Undertakings by the Burmese side	Undertakings by the Japanese side
Engine Repair Shop	(a) Painting (b) Lighting	(a) Foundation of Equipment. (b) Partition for the Diesel Test Shop and the store. (c) Power distribution network necessary for equipment. (d) Installation of Equipment.
Electrical Repair Shop	(a) Painting (b) Lighting	(a) Power distribution network necessary for equipment (b) Installation of Equipment, if necessary.
Carpenter Shop	(a) Painting (b) Lighting	(a) Foundation of the Equipment, if necessary. (b) Power distribution network necessary for equipment. (c) Installation of Equipment.
The F.R.P.Repair Shop and the Mould loft	(a) Raising the floor to be at the same level. (b) Painting (c) Lighting	(a) Partition for the F.R.P repair shop & Insulation. (b) Air conditioning for the F.R.P repair shop (c) Power distribution network necessary for equipment.

Ⅱ. PHOTOGRAPHS

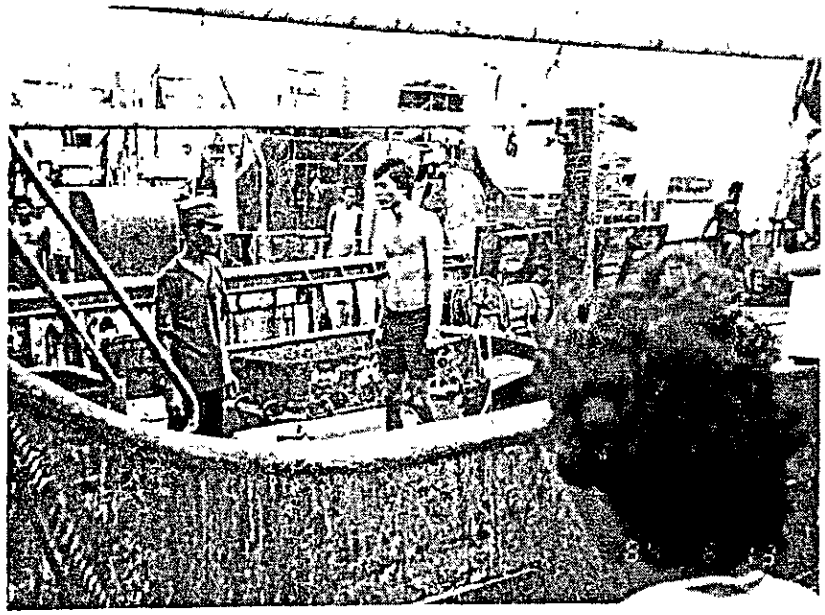
Fishing Fleet of PPFC

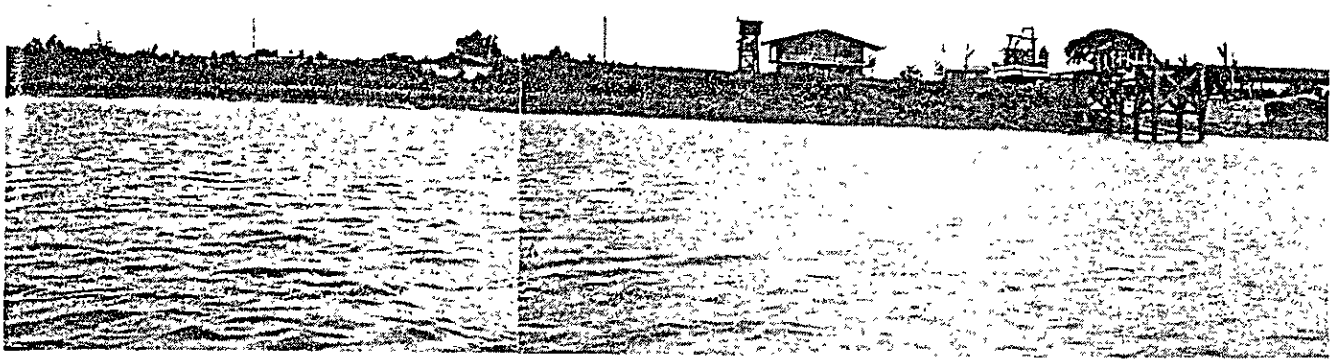




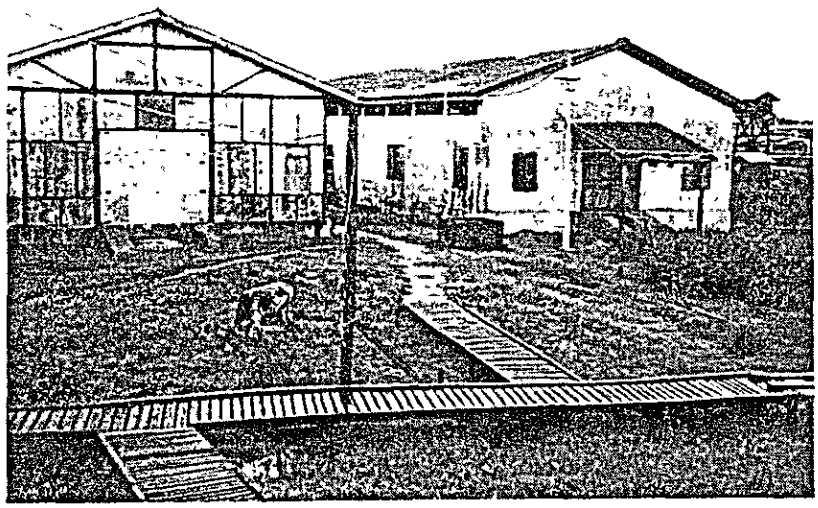
Fishing Fleet

Fishing Vessel



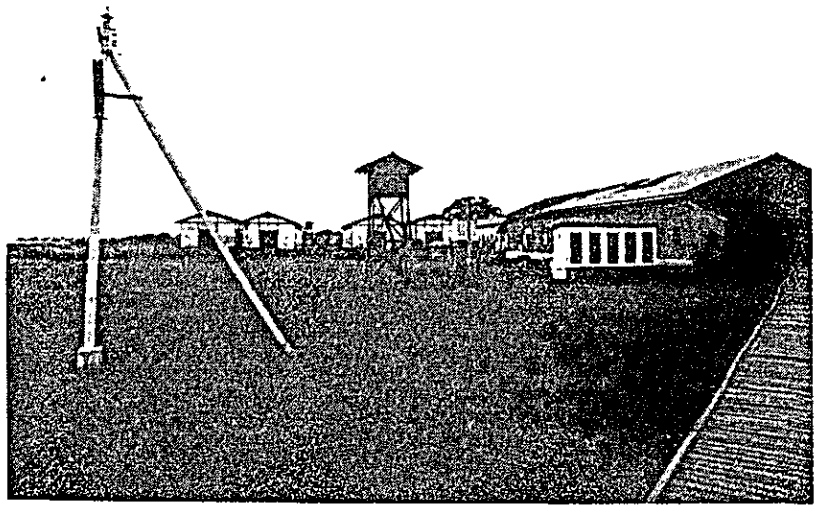


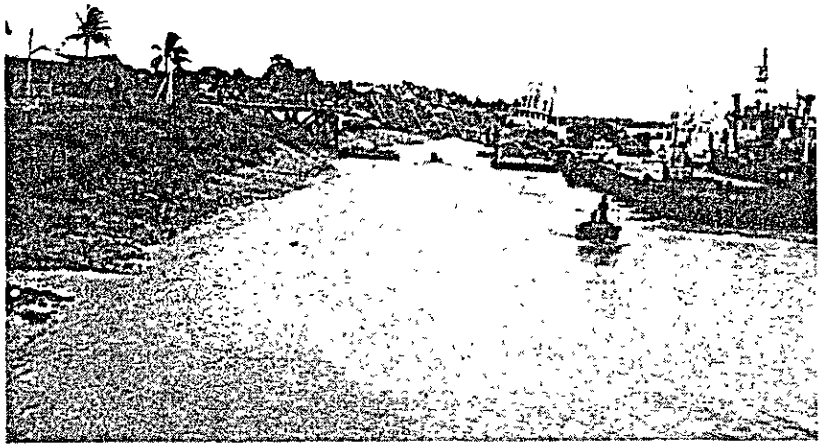
Proposed Site for Dry Dock (right : Existing Slipway)



Existing Facilities
(right : Generator House, left : Iron Work Shop)

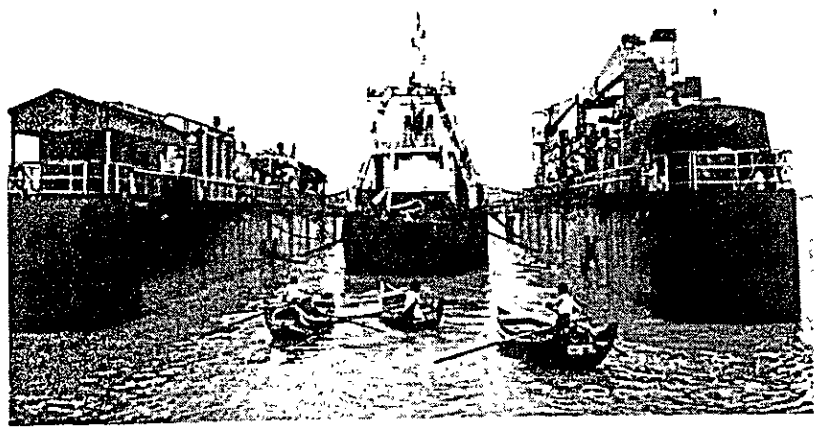
Existing Facilities
(Carpenter's Shop & Stores)

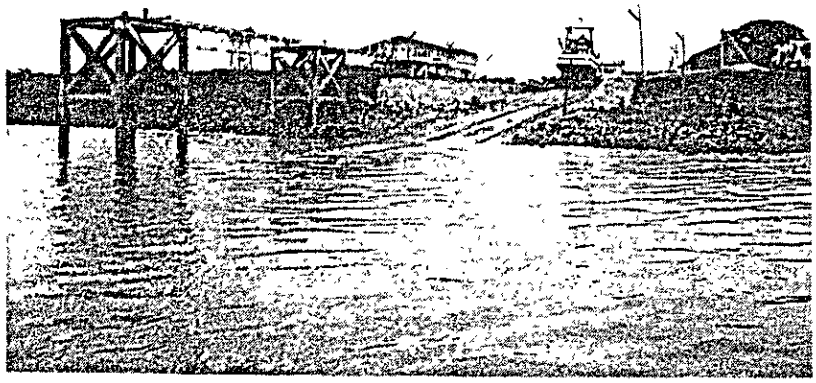




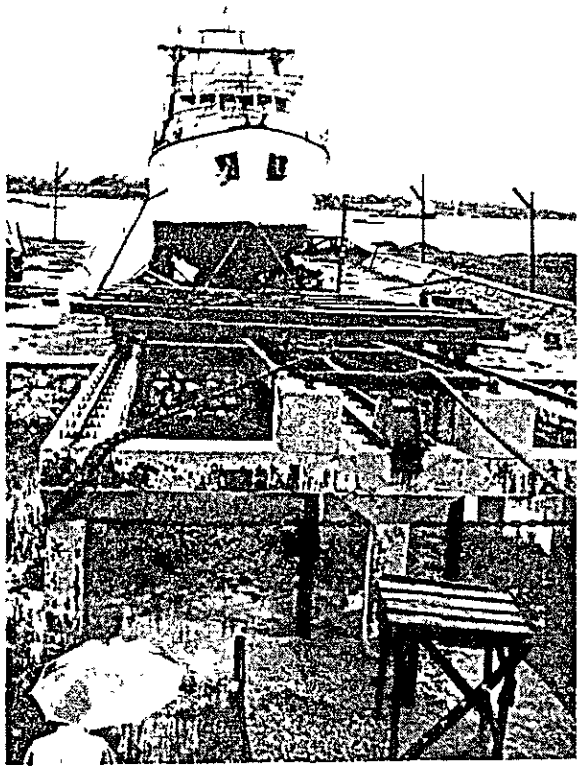
Floating Jetty

Floating Dock





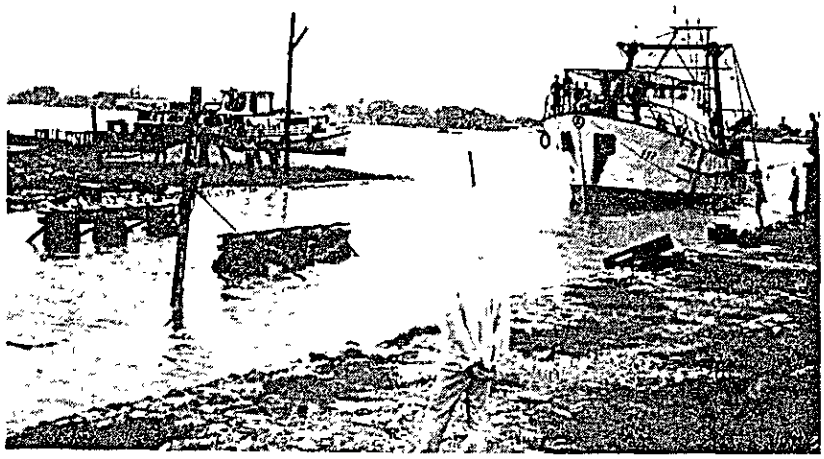
Slipway

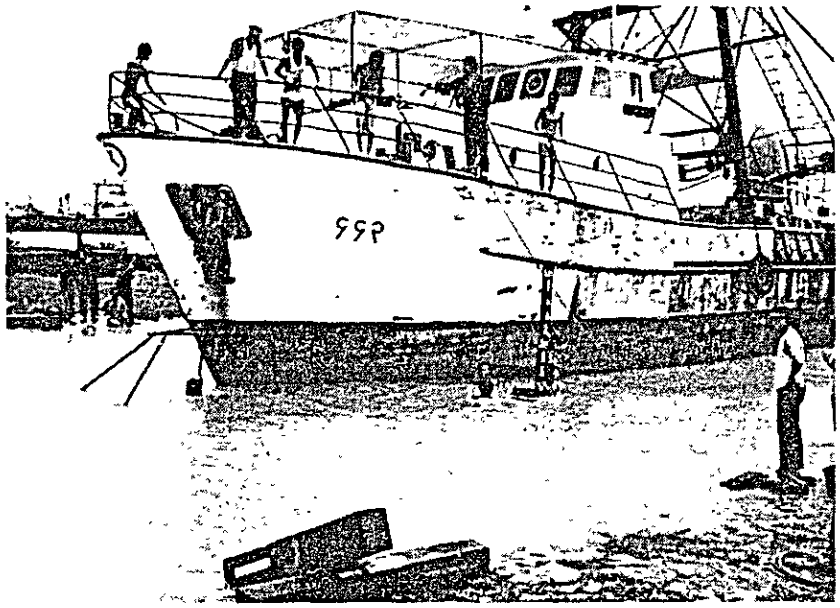


Slipway

Slipway

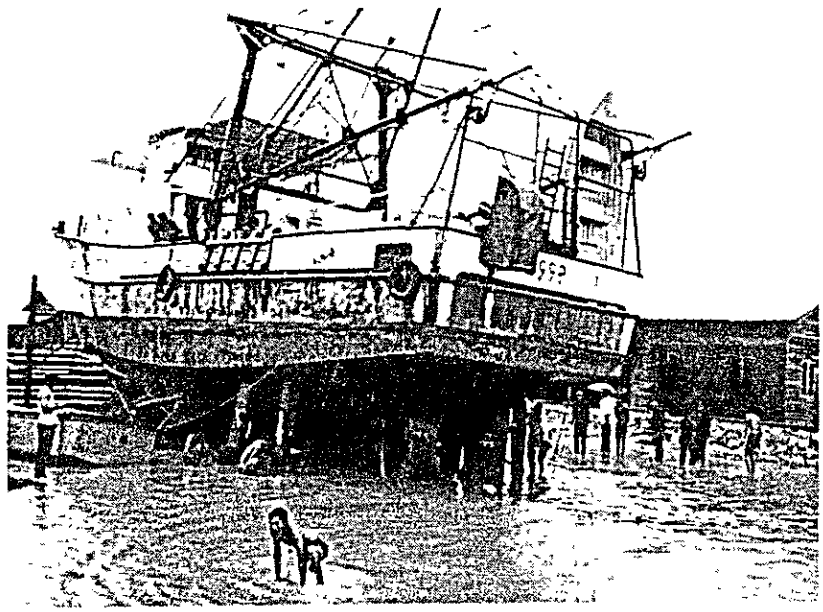
Docking Work (1)

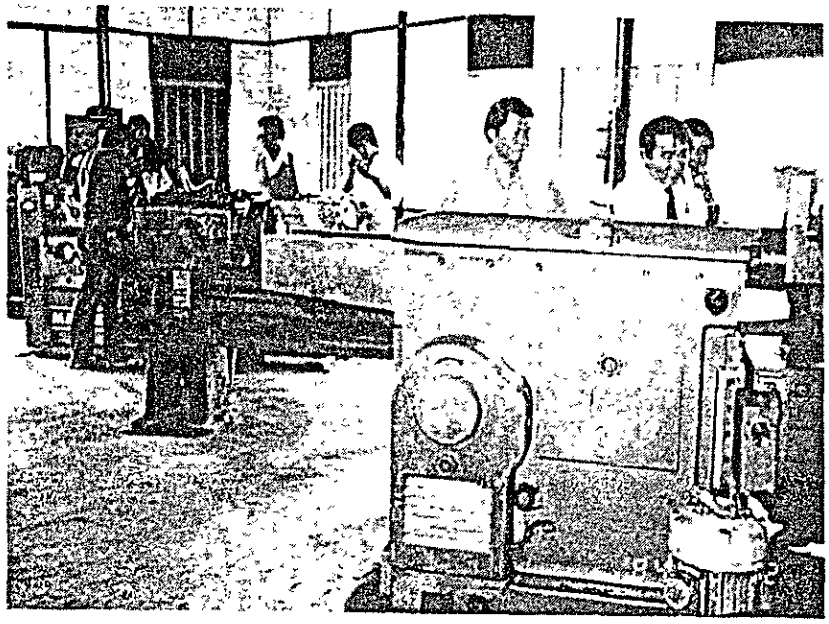




(2)

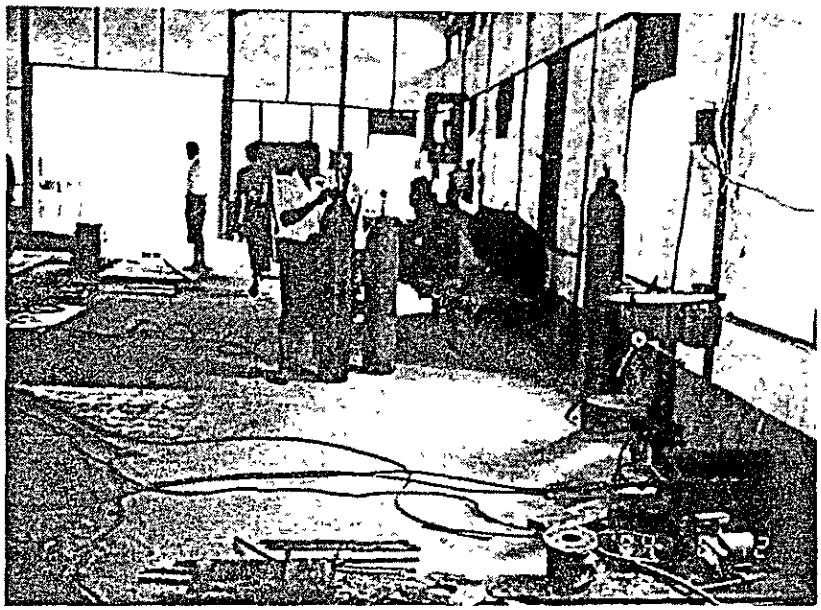
(3)





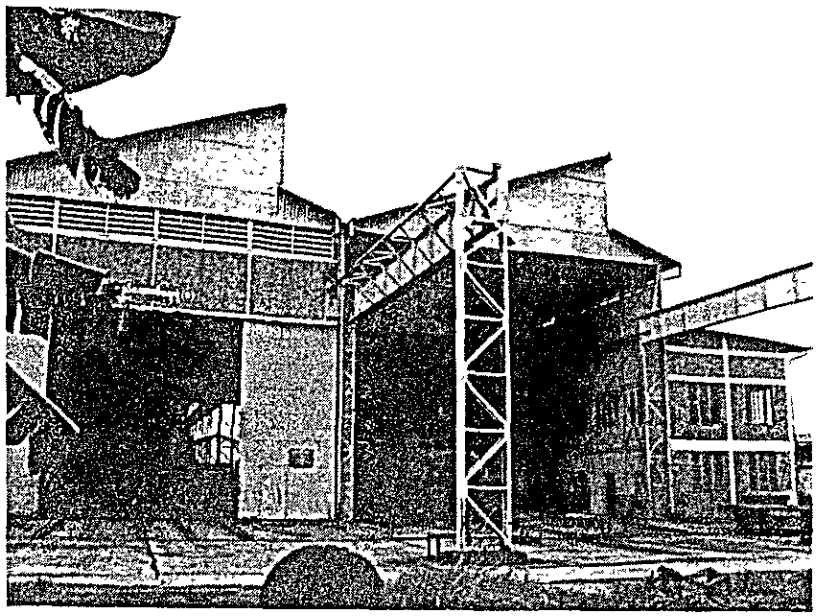
Machine Shop

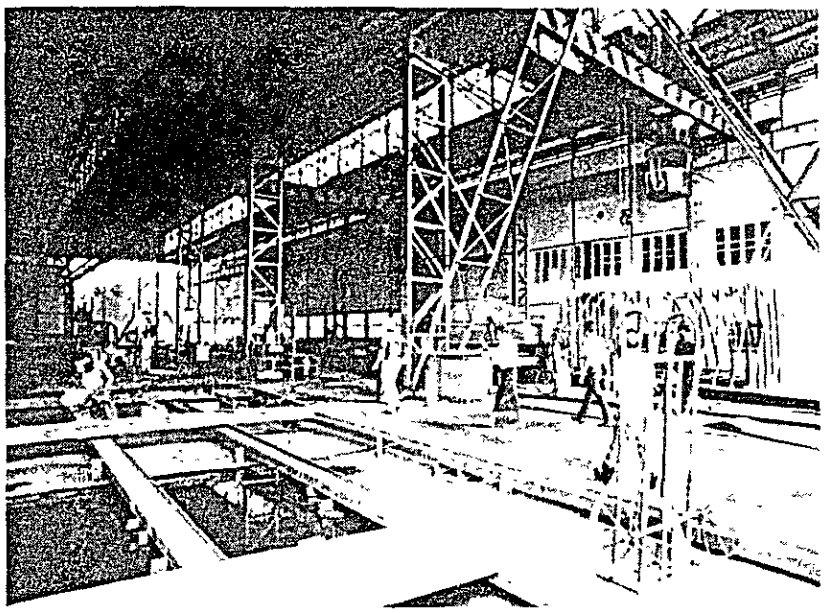
Iron Work Shop



Foundry

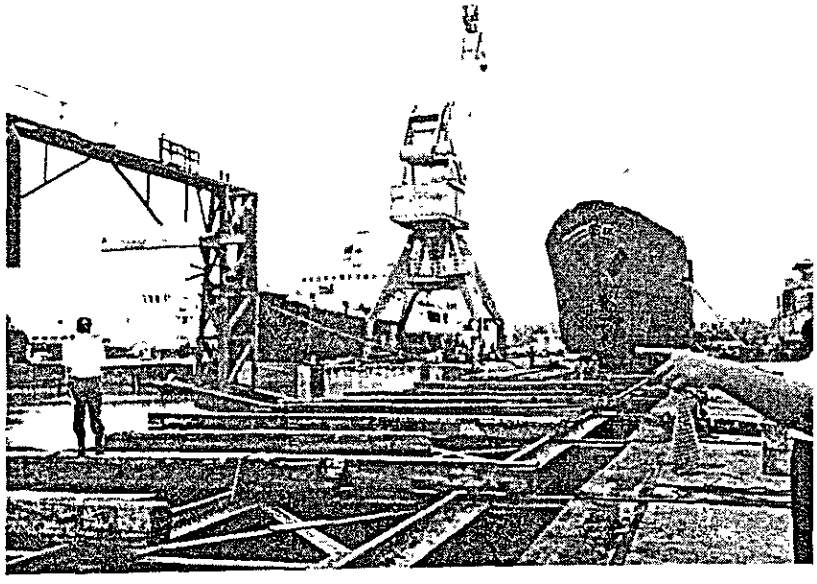
Iron Work Shop,
Sinmalike Dockyard,
BDC

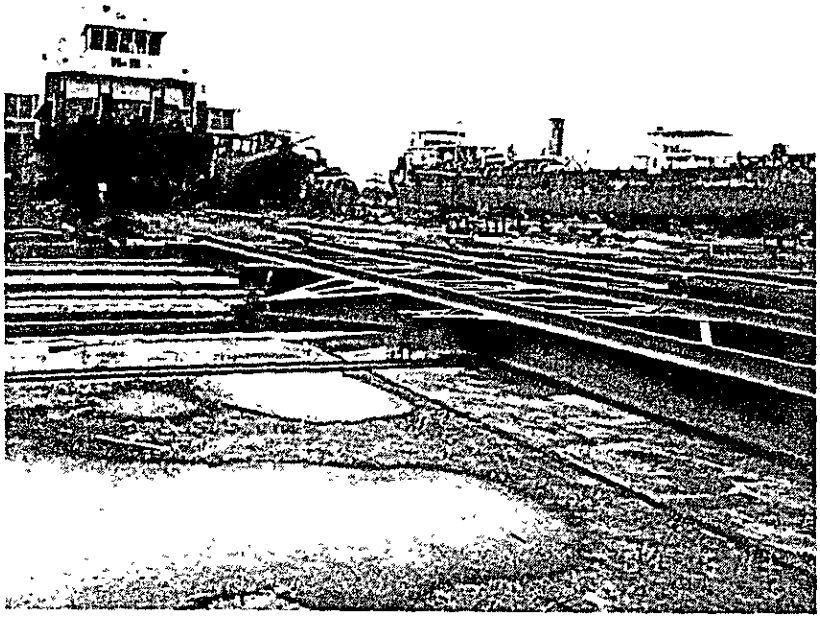




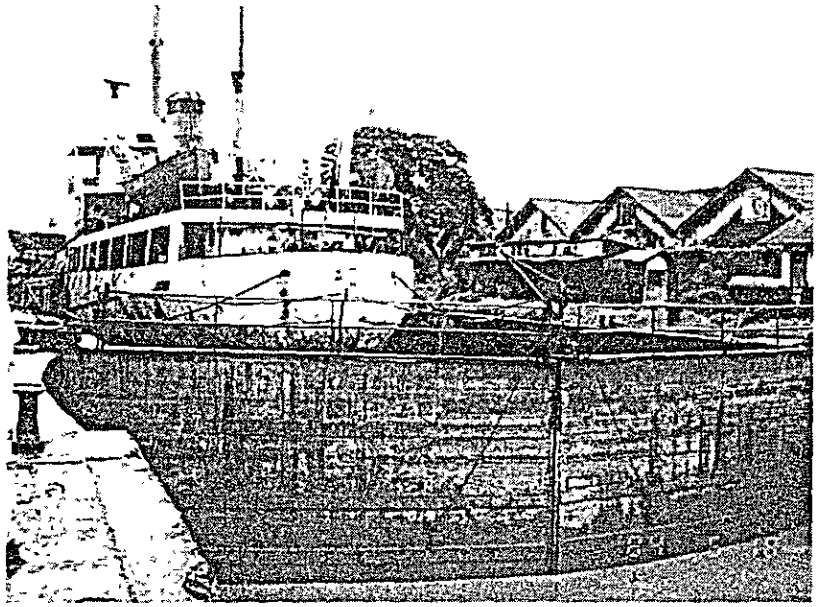
Iron Work Shop,
Sinmalike Dockyard,
BDC

Crane & Slipway,
Sinmalike Dockyard,
BDC

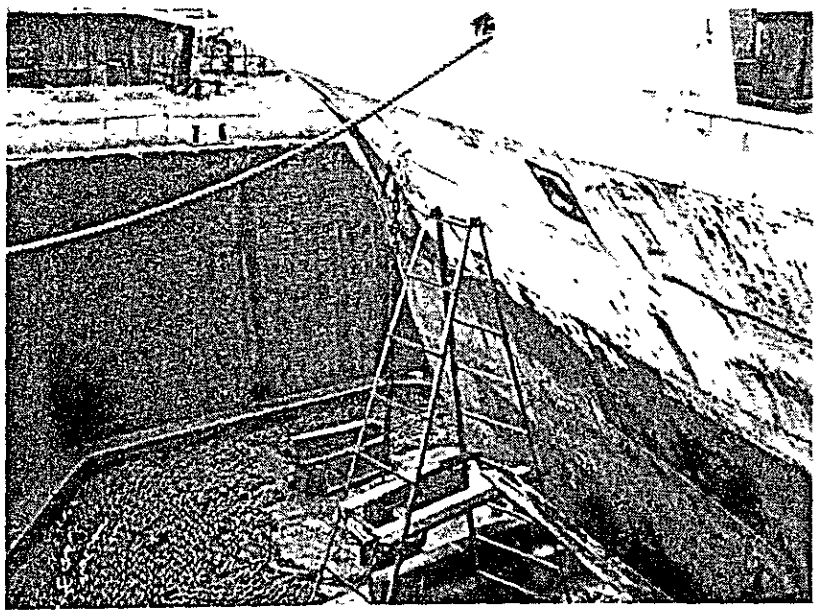




Slipway,
Sinmalike Dockyard,
BDC



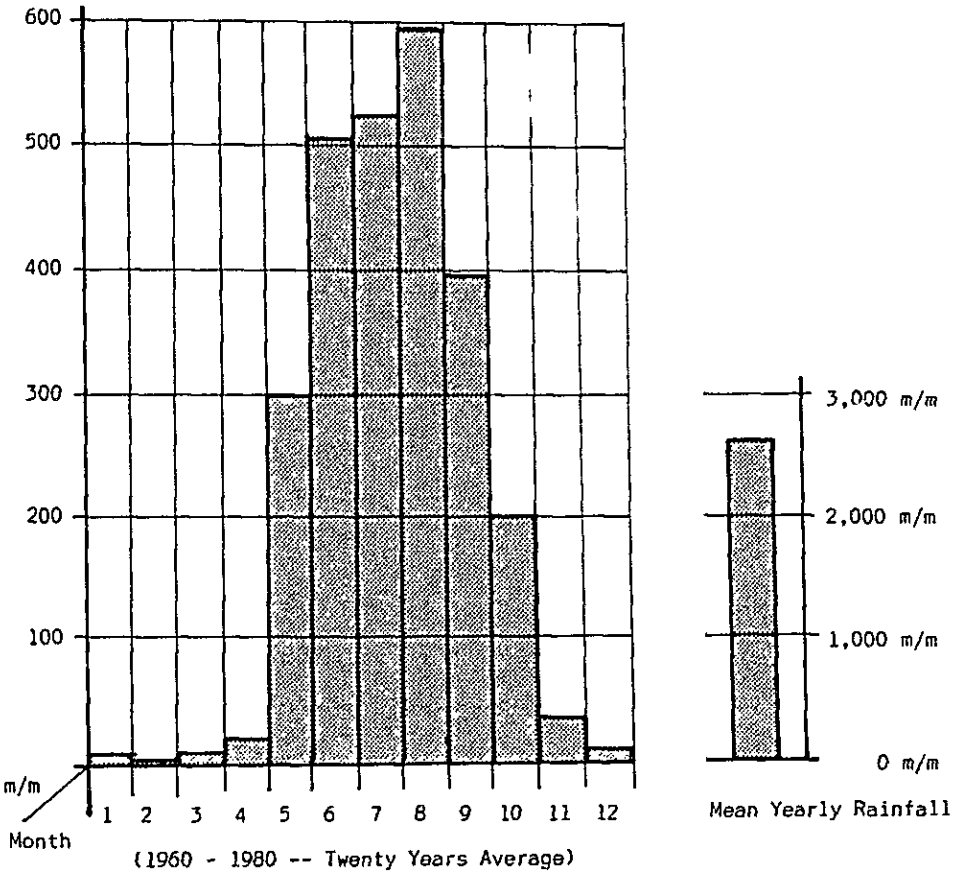
Dry Dock,
Sat Sun Dockyard,
BPC



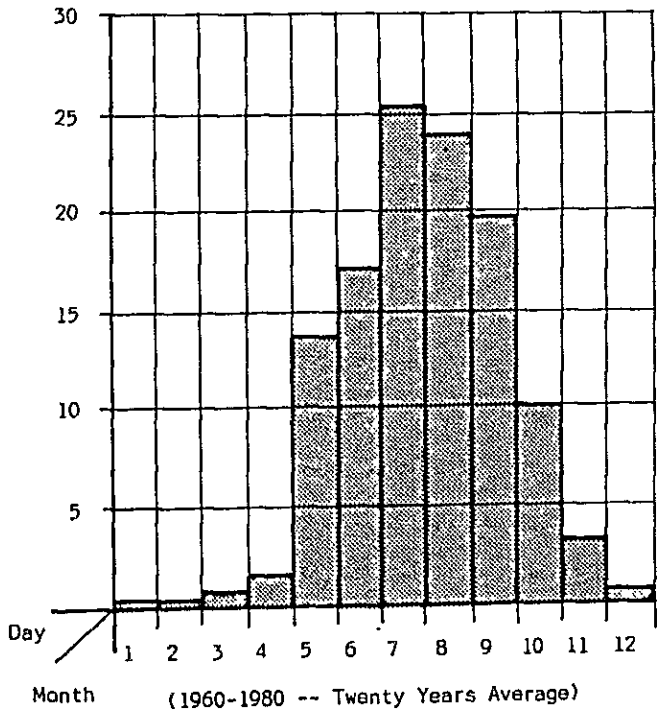
Dry Dock,
Sat Sun Dockyard,
BPC

Ⅲ. D A T A

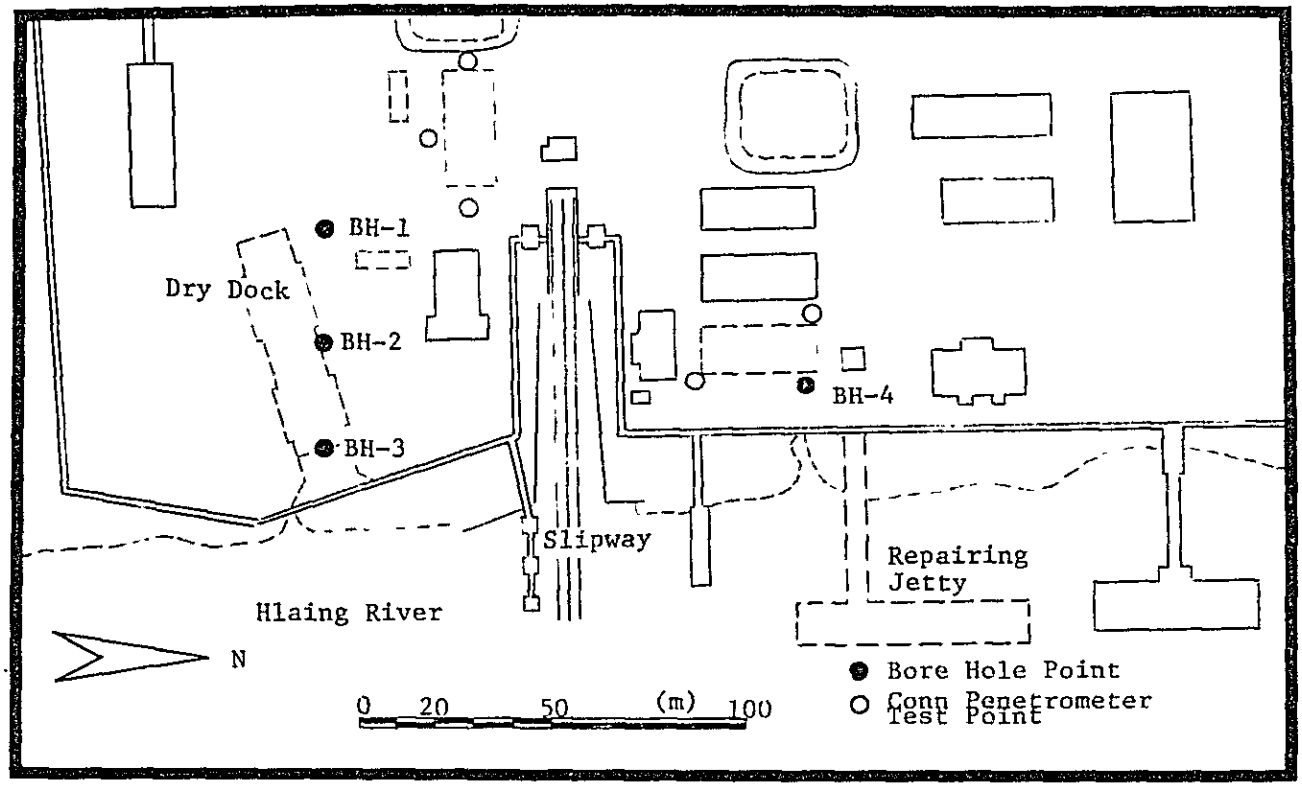
III-1 Mean Monthly Rainfall



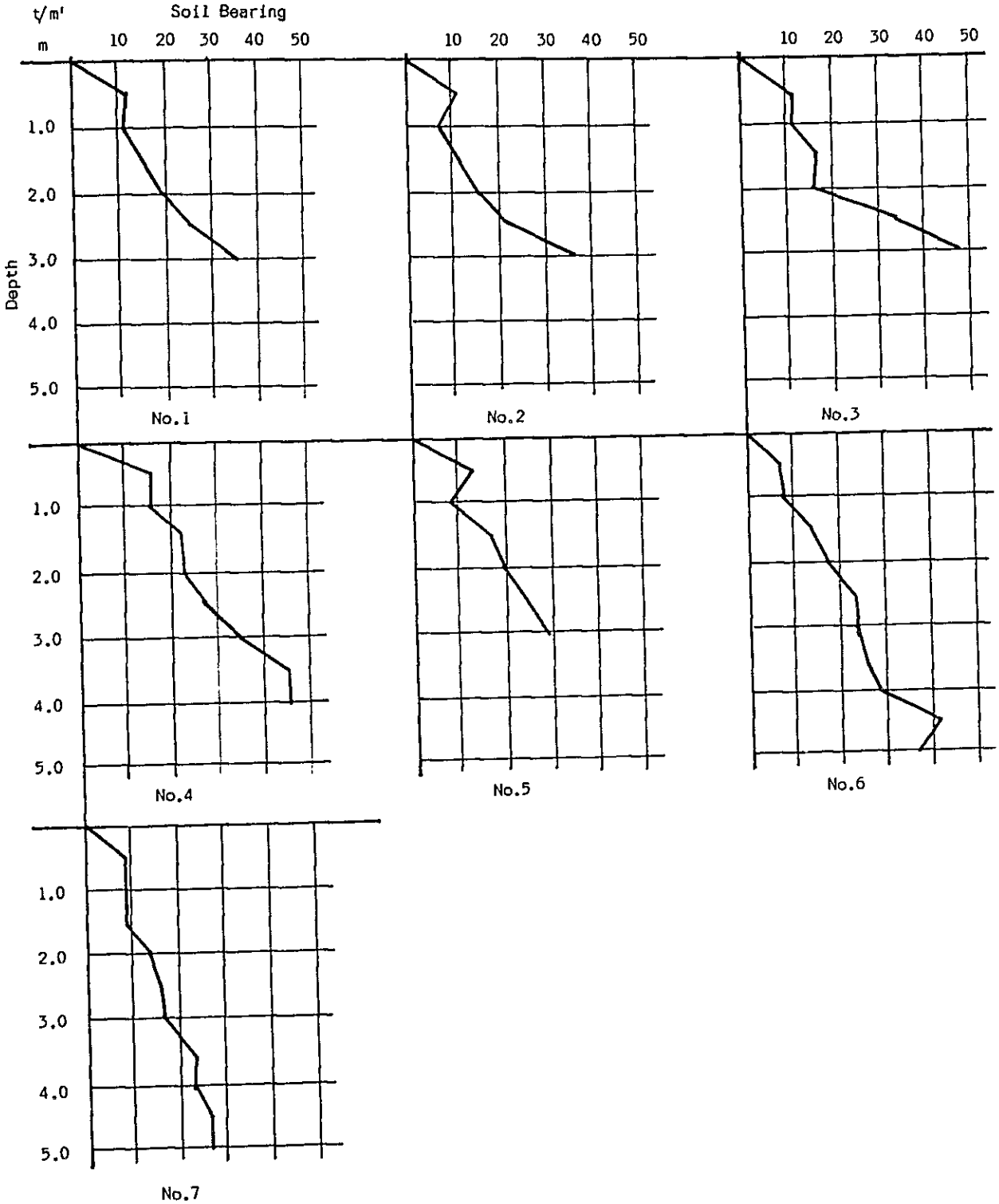
III-2 Mean Monthly Rain Days



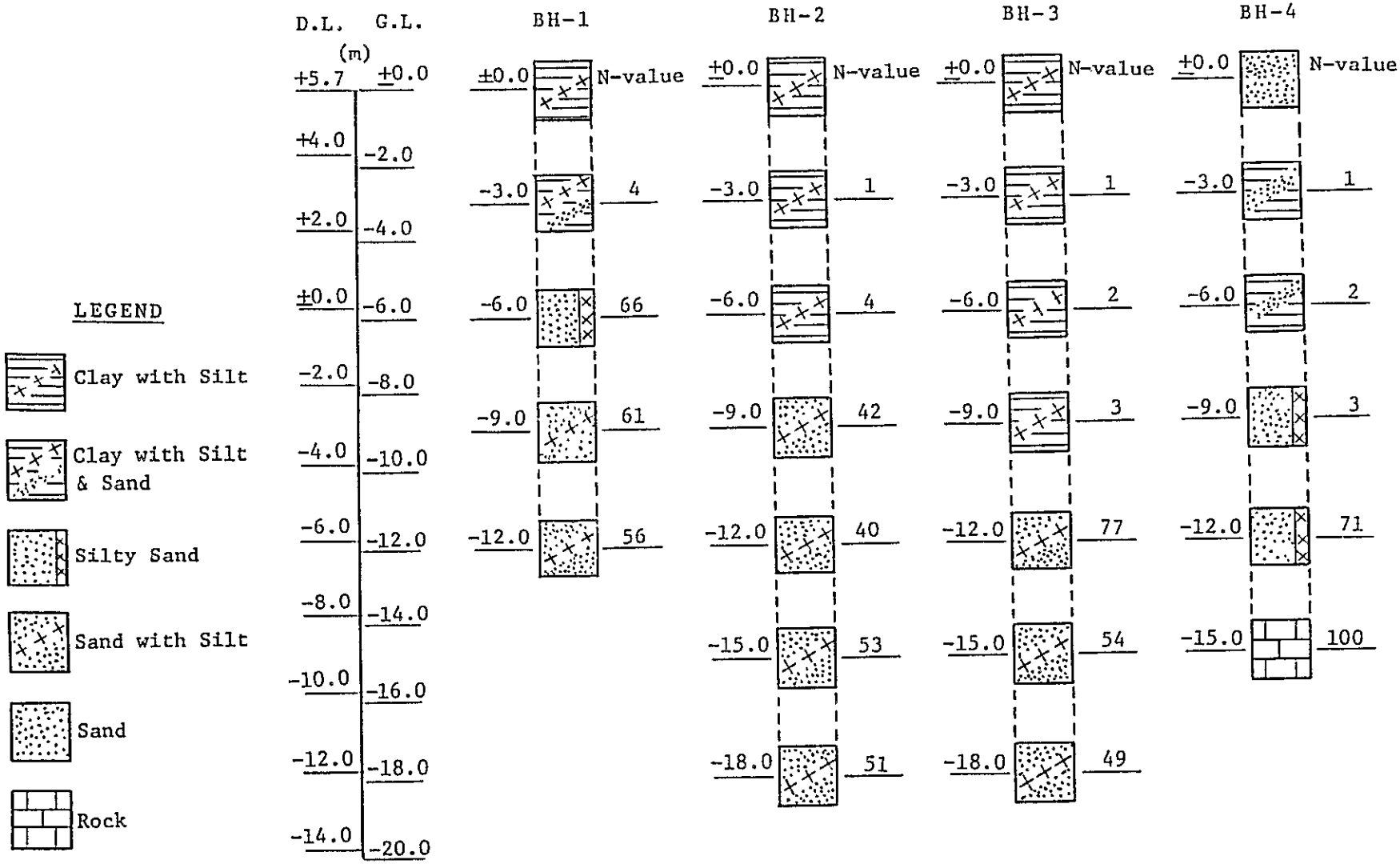
Ⅲ-3 Soil Tests Points



Ⅲ-4 Soil Bearing Test Results



Ⅲ-5 Drilling Log



III-6 Results of Soil Analysis

Bore Hole No.	Depth (m)	Specific Gravity	Density (t/m³)		Water Content (%)	Consistency		Cohesion (kg/m²)	Friction Angle (tan ø)
			Dry	Wet		Liquid Limit (%)	Plastic Limit (%)		
BH-1	-3	2.76	1.73	1.21	43	50	26	281.2	0.0866
	-6	2.86	1.75	1.46	20	-	-	421.8	0.0566
	-9	2.62	1.52	1.24	23	-	-	632.7	0.5272
	-12	2.79	1.69	1.46	16	-	-	70.3	0.7536
BH-2	-3	2.85	1.66	1.05	57	64	32	1406.0	0.0087
	-6	2.73	1.63	0.98	65	58	29	632.7	0.0175
	-9	2.76	1.90	1.59	20	38	21	703.0	0.4245
	-12	2.65	1.65	1.44	14	-	-	843.6	0.6128
BH-3	-3	2.69	1.66	1.05	58	61	29	597.6	0.0332
	-6	2.91	1.59	0.99	60	63	27	562.4	0.0349
	-9	2.82	-	-	-	39	21	-	-
	-12	2.72	1.55	1.33	17	-	-	1602.8	0.3819
	-15	2.60	1.54	1.29	19	-	-	246.1	0.6200
	-18	2.62	1.55	1.30	18	-	-	-	-
BH-4	-3	2.60	1.69	1.12	51	53	26	703.0	0.0175
	-6	2.70	1.64	1.07	53	52	26	632.7	0.0201
	-9	2.88	-	-	-	33	19	-	-
	-12	2.78	1.46	1.17	25	-	-	-	-

III-7 Catch Composition of PPFC's Marine Trawlers

(1980/81) (M.T.)

SR NO	NAME OF FISH		CATCH	
	ENGLISH COMMON NAME	SCIENTIFIC NAME	TON	%
1	Red Pony Fish	Liovnathus insidiator	1420.91	16.8
2	Javalin Fish	Pomadasys- argyreus	788.08	9.3
3	Herring	Ilisha elongata	800.88	9.5
4	Sea Cat Fish	Arius venosus	736.34	8.7
5	Ribbon Fish	Trichiurus savala	599.76	7.1
6	Croaker	Sciaena coiter	422.67	5.0
7	Sea Eel	Muraenesox telabonides	426.53	5.0
8	Red Snapper	Lutianus Sp.	171.08	2.0
9	Pony Fish	Liovnathus Sp.	226.89	2.7
10	Yellow Croaker		353.80	4.2
11	Croaker	Otolithus maculatus	182.63	2.2
12	Thread Fin	Polynemus indicus	191.01	2.3
13	Sickle Fish	Drepane punctata	55.77	0.7
14	White or Silver Pomfret	Pampus argenteus	56.86	0.7
15	Rays	Trygonidae	96.33	1.1
16	Shark	Aprionodon acutidens	74.00	0.8
17	Horse Mackerel	Chorinemous lysan	45.39	0.5
18	Thread Fin Bream	Nemipterus japonicus	244.63	2.9
19	Lizard Fish	Saurida Sp.	100.84	1.2
20	Wolf Herring	Chinocentrus Sp.	26.45	0.3
21	Milk Fish	Chanos chanos	47.84	0.6
22	Croaker	Sciaena blekeri	21.76	0.3
23	Spiny Eel	Mastacembelus Sp.	12.27	0.1
24	Dolphin Fish	Coryphaena hippurus	18.45	0.2
25	Horse Mackerel	Carangoides-ferdau	82.64	1.0
26	Spotted Field Perch	Nandus marmoratus	12.87	0.2
27	Squid/Cuttle Fish	Sepia Sp.	9.40	0.1
28	Goat Fish	Upeneus Sp.	88.35	1.0
29	Chub Mackerel	Rastrelliger neglectus	29.89	0.4
30	Lobster	Penulirus Sp.	6.59	0.1
31	White Shrimp	Peneaus merguiensis	21.52	0.3
32	Tiger Shrimp	Peneaus monodon	39.26	0.5
33	Others		1019.45	12.0
34	Sole Fish	Cynoghossus Sp.	20.10	0.2
			8451.24	100.0%

(1982/83)

(M.T.)

SR NO	NAME OF FISH		CATCH	
	ENGLISH COMMON NAME	SCIENTIFIC NAME	TON	%
1	Red Pony Fish	Liovnathus insidiator	1379.81	12.4
2	Javalin Fish	Pomadasys-argyreus	1213.70	10.9
3	Herring	Ilisha elongata	1911.85	17.2
4	Sea Cat Fish	Arius venosus	851.22	7.7
5	Ribbon Fish	Trichiurus savala	563.91	5.1
6	Croaker	Sciaena coiter	274.86	2.5
7	Sea Eel	Muraenesox telabonides	372.94	3.4
8	Red Snapper	Lutianus Sp.	163.72	1.5
9	Pony Fish	Liovnathus Sp.	99.17	0.9
10	Yellow Croaker		553.79	5.0
11	Croaker	Otolithus maculatus	183.41	1.6
12	Thread Fin	Polynemus indicus	229.12	2.1
13	Sickle Fish	Drepane punctata	103.29	0.9
14	White or Silver Pomfret	Pampus argenteus	104.93	0.9
15	Rays	Trygonidae	519.60	4.7
16	Shark	Aprionodon acutidens	73.23	0.7
17	Horse Mackerel	Chorinemous lysan	35.76	0.3
18	Thread Fin Bream	Nemipterus japonicus	131.79	1.2
19	Lizard Fish	Saurida Sp.	84.68	0.8
20	Wolf Herring	Chinocentrus Sp.	48.21	0.4
21	Milk Fish	Chanos chanos	46.64	0.4
22	Croaker	Sciaena blekeri	33.38	0.3
23	Spiny Eel	Mastacembelus Sp.	8.38	0.1
24	Dolphin Fish	Coryphaena hippurus	29.95	0.3
25	Horse Mackerel	Carangoides-ferdau	61.59	0.6
26	Spotted Field Perch	Nandus marmoratus	18.87	0.2
27	Squid/Cuttle Fish	Sepia Sp.	24.08	0.2
28	Goat Fish	Upeneus Sp.	143.65	1.3
29	Chub Mackerel	Rastrelliger neglectus	20.91	0.2
30	Lobster	Penulirus Sp.	12.51	0.1
31	White Shrimp	Peneaus merguiensis	40.09	0.4
32	Tiger Shrimp	Peneaus monodon	26.97	0.2
33	Others		1719.30	15.5
34	Sole Fish	Cynoghossus Sp.	0.06	-
			11085.37	100.0%

(1981/82) (M.T.)

SR NO	NAME OF FISH		CATCH	
	ENGLISH COMMON NAME	SCIENTIFIC NAME	TON	%
1	Red Pony Fish	Liovnathus insidiator	1674.40	16.0
2	Javalin Fish	Pomadasys-argyreus	1039.12	10.0
3	Herring	Ilisha elongata	1142.00	11.0
4	Sea Cat Fish	Arius venosus	825.22	7.8
5	Ribbon Fish	Trichiurus savala	651.95	6.1
6	Croaker	Sciaena coiter	376.36	3.6
7	Sea Eel	Muraenesox telabonides	389.46	3.7
8	Red Snapper	Lutianus Sp.	327.06	3.1
9	Pony Fish	Liovnathus Sp.	299.14	2.8
10	Yellow Croaker		308.36	3.0
11	Croaker	Otolithus maculatus	172.57	1.6
12	Thread Fin	Polynemus indicus	337.31	3.2
13	Sickle Fish	Drepane punctata	139.95	1.3
14	White or Silver Pomfret	Pampus argenteus	112.78	1.1
15	Rays	Trygonidae	120.53	1.1
16	Shark	Aprionodon acutidens	92.98	0.8
17	Horse Mackerel	Chorinemous lysan	74.60	0.7
18	Thread Fin Bream	Nemipterus japonicus	168.87	1.6
19	Lizard Fish	Saurida Sp.	66.39	0.6
20	Wolf Herring	Chinocentrus Sp.	37.16	0.4
21	Milk Fish	Chanos chanos	19.50	0.2
22	Croaker	Sciaena blekeri	45.11	0.4
23	Spiny Eel	Mastacembelus Sp.	13.32	0.1
24	Dolphin Fish	Coryphaena Hippurus	26.65	0.2
25	Horse Mackerel	Carangoides-ferdau	87.55	0.8
26	Spotted Field Perch	Nandus marmoratus	28.83	0.3
27	Squid/Cuttle Fish	Sepia Sp.	11.91	0.1
28	Goat Fish	Upeneus Sp.	22.81	0.2
29	Chub Mackerel	Rastrelliger neglectus	21.04	0.2
30	Lobster	Penulirus Sp.	8.90	0.1
31	White Shrimp	Peneaus merguiensis	41.41	0.4
32	Tiger Shrimp	Peneaus monodon	34.92	0.3
33	Others		1814.34	17.2
34	Sole Fish	Cynoghossus Sp.	1.73	-
			10534.23	100.0%

III-8 Catch Composition of PPFC Freshwater Fisheries

(1982/83)

SR NO	NAME OF FISH		CATCH	
	ENGLISH COMMON NAME	SCIENTIFIC NAME	Kg	%
	Freshwater Fishes			
1	Mouth Breeder Fish	Tilapia mossambica	288,895.84	13.29
2	Barb Fish	Barbus stigma	495,881.88	22.81
3	Climbing Perch	Trichogaster labiosus	284,018.48	13.06
4	Climbing Perch	Anabas testudineus	66,764.40	3.07
5	Glass Fish	Ambassis baculis	49,895.36	2.29
6	Carplet	Amblypharyngodon mola	42,426.80	1.95
7	Snakehead Fish	Ophiocephalus striatus	111,829.96	5.14
8	Fish Fry	-	143,047.36	6.58
9	Cat Fish	Clarius batrachus	54,387.32	2.50
10	Snakehead Fish	Ophiocephalus punctatus	46,676.04	2.15
11	Small Assorted Fishes	-	41,470.68	1.91
12	Scorpion Fish	Heteropneustes fossilis	72,479.80	3.33
13	Dwarf Cat Fish	Mystus bleekeri	94,944.52	4.37
14	Goby Fish	Gobius nunus	38,213.64	1.76
15	Featherback Fish	Notopterus notopterus	4,368.96	0.20
16	Featherback Fish	Notopterus notopterus	5,052.84	0.23
17	Sheat Fish	Wallago attu	34,114.80	1.57
18	Carplet Fish	Rohtee belangeri	27,110.84	1.25
19	Small Assorted Fishes	-	12,511.56	0.57
20	Spotted Field Perch	Nandus Marmoratus	3,442.36	0.16
21	Featherback Fish	Notopterus notopterus	29,782.40	1.37
22	Sheat Fish	Ompok pabo	16,204.84	0.74
23	Carp	Labeo calabasu	7,317.68	0.34
24	Butter Cat Fish	Pseudotropius acutirostris	11,330.76	0.52
25	Carp	Catla catla	18,340.12	0.84
26	Spiny Eel	Mastacembelus zebrinus	10,158.16	0.47
27	Carp	Labeo rohita	2,935.60	0.14
28	Carplet Fish	Rohtee cotio	23,329.00	1.07
29	Carp	Cirrhina mrigala	3,642.44	0.17
30	Flying Barb	Chela sardinella	1,215.24	0.06

(1982/83)

SR NO	NAME OF FISH		CATCH	
	ENGLISH COMMON NAME	SCIENTIFIC NAME	Kg	%
31	Butter Cat Fish	Eutropiichthyes vecha	447.72	0.02
32	Sea Perch Fish	Lates calcarifer	2,937.24	0.14
33	Gar Fish	Belone cancila	2,983.16	0.14
34	Carp	Labeo kontius	1,366.12	0.06
35	Barb Fish	Barbus sewelli	32.80	0.002
36	Snakehead Fish	Ophiocephalus marulius	121.36	0.006
37	Dwarf Cat Fish	Mystus seenghala	149.24	0.007
38	Assorted Fishes	-	52.48	0.002
39	Imperialangel Fish	Holaeanthus imperator	103.32	0.005
40	Carp	Catlocarpio siamenses	4.92	0.0002
41	Croaker	Sciaena coitor	121,628.96	5.60
42	Carp	Labeo gonius	2,464.92	0.11
			2,174,111.92	100.0%

(1982/83)

SR NO	NAME OF FISH		CATCH	
	ENGLISH COMMON NAME	SCIENTIFIC NAME	Kg	%
	Freshwater Prawn			
1	Freshwater Prawn	Palaemon mirabilis	441,848.80	77.3
2	"	Metapenaeus monoceros	87,375.92	15.3
3	"	Metapenaeus lysianassa	13,608.72	2.38
4	"	Penaeus penicillatus	1,379.24	0.24
5	"	-	16,933.00	2.96
6	"	Palaemon mirabilis/ Metapenaeus monoceros	4,821.60	0.84
7	"	Palaemon villosimanus	5,525.16	0.97
8	Tiger Prawn	Penaeus monodon	8.20	0.0014
			571,500.64	100.0%

Ⅲ-9 Chart A-1 Flow Rate Chart.