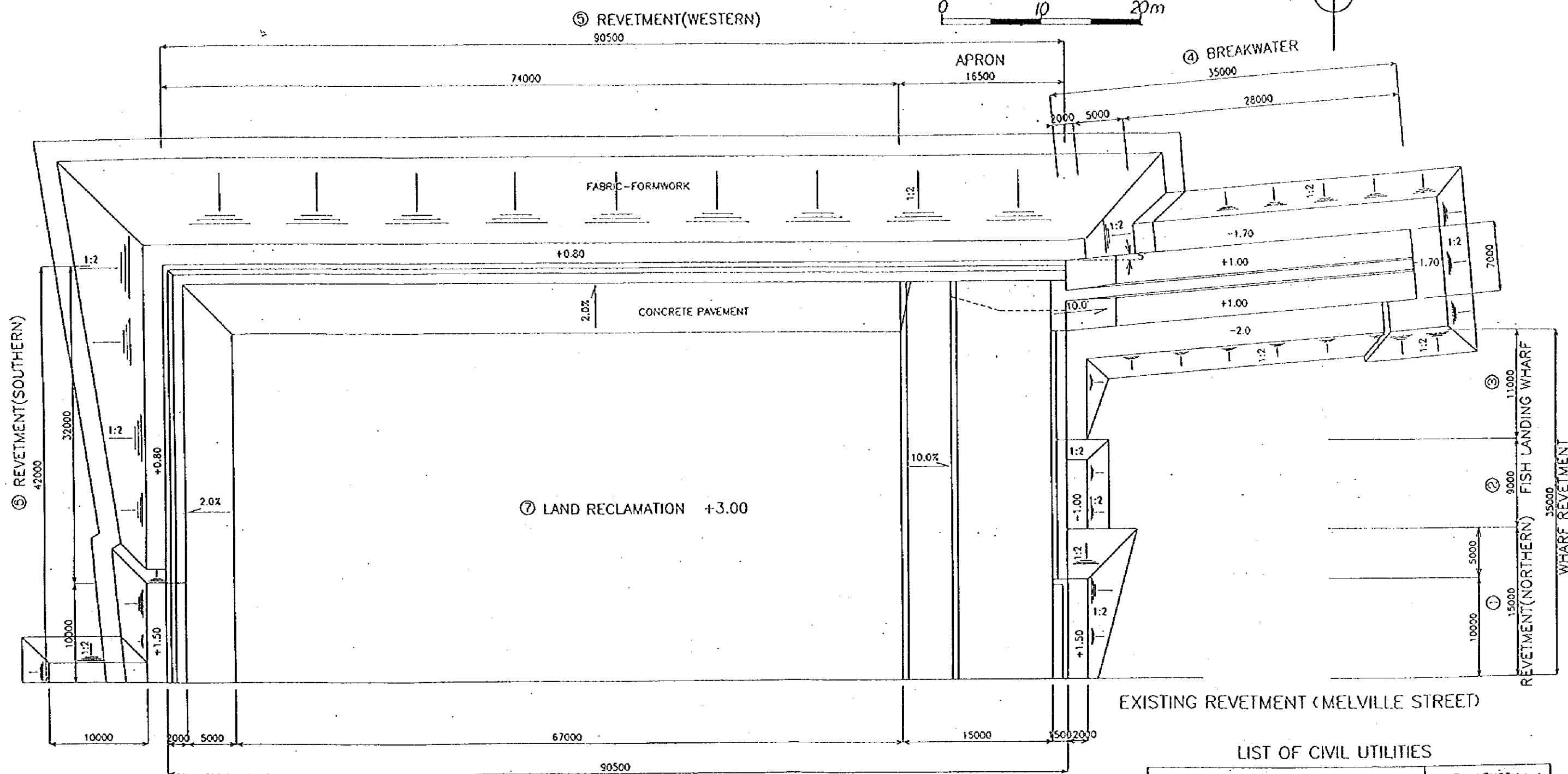
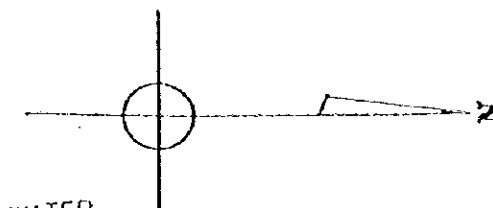


CIVIL UTILITIES LAYOUT PLAN

S=1/400



EXISTING REVTMENT (MELVILLE STREET)

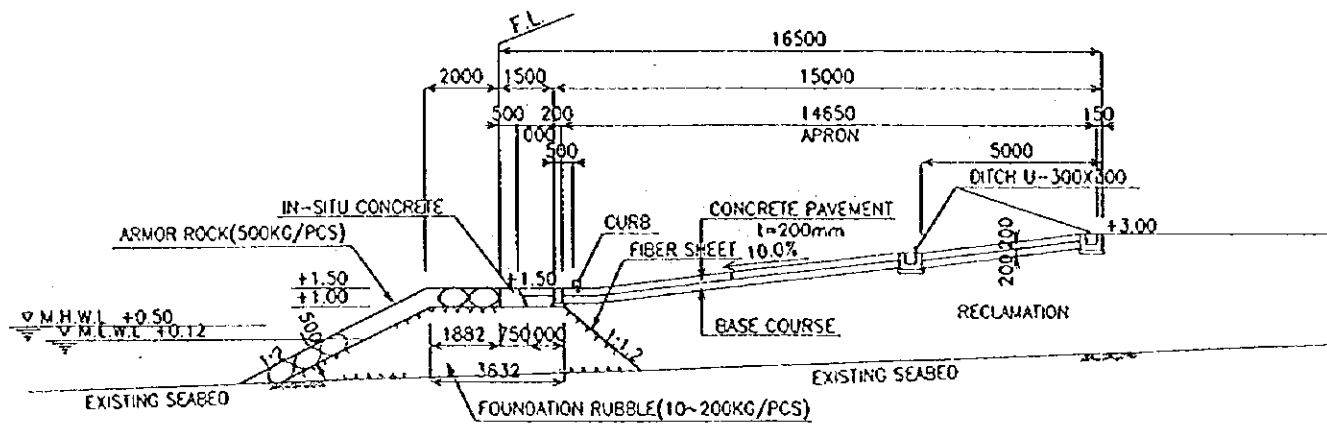
LIST OF CIVIL UTILITIES

UTILITY NAME	TOTAL LENGTH (m)
① REVTMENT(NORTHERN)	15.0
② FISH LANDING WHARF(-1.0m)	9.0
③ FISH LANDING WHARF(-2.0m)	11.0
④ BREAKWATER	35.0
⑤ REVTMENT(WESTERN)	90.5
⑥ REVTMENT(SOUTHERN)	42.0
⑦ LAND RECLAMATION	90.5x42

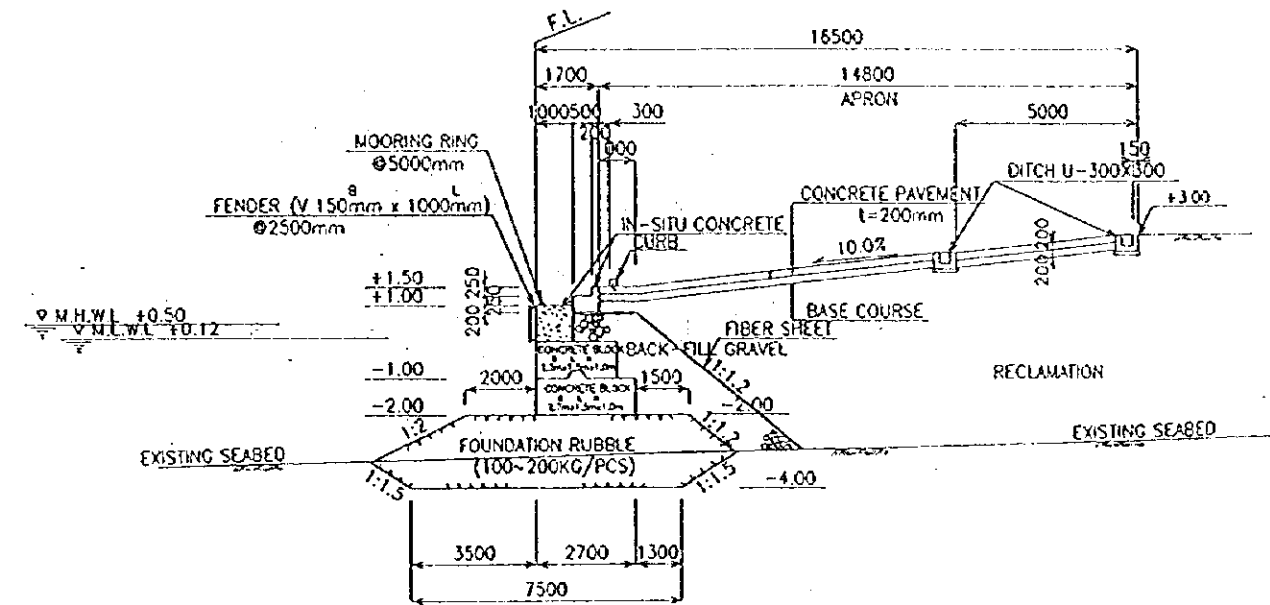
CIVIL UTILITIES STANDARD SECTION-1

S=1/200

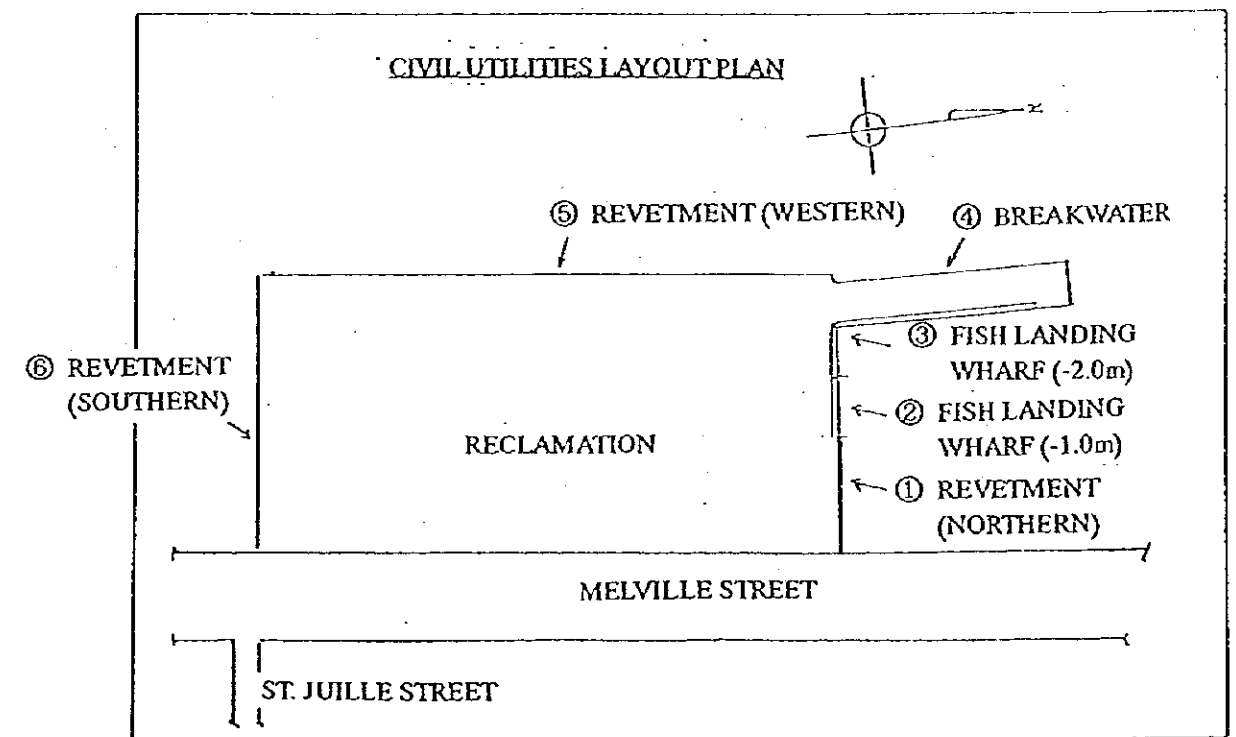
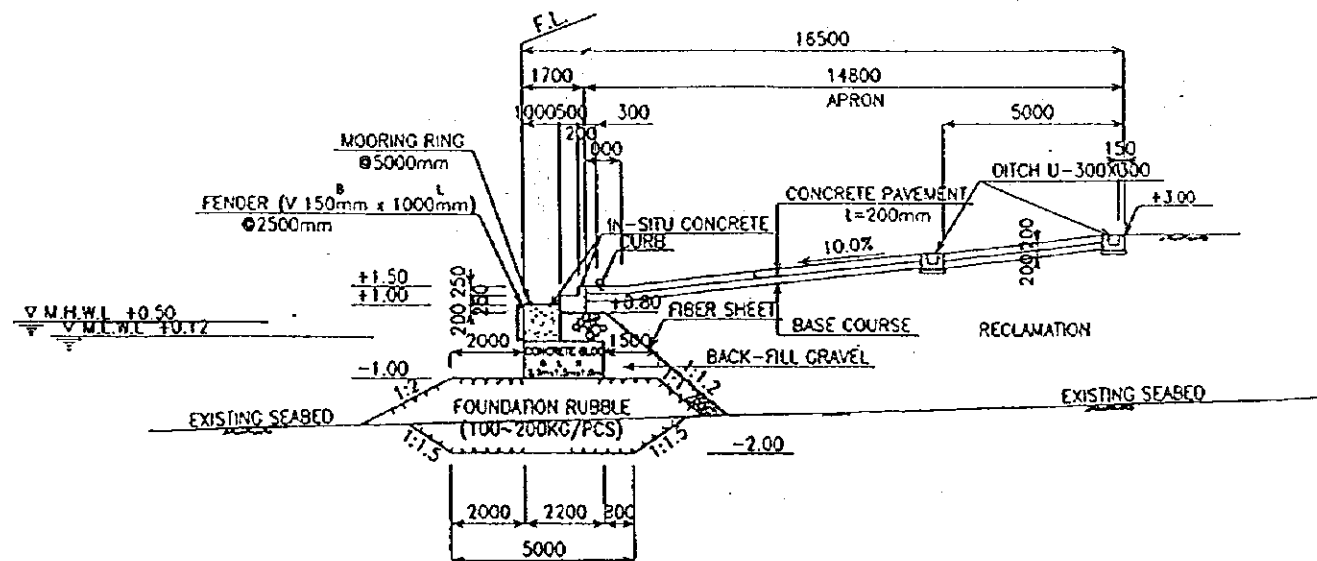
① STANDARD SECTION OF REVETMENT(NORTHERN)



③ STANDARD SECTION OF FISH LANDING WHARF(-2.0m)



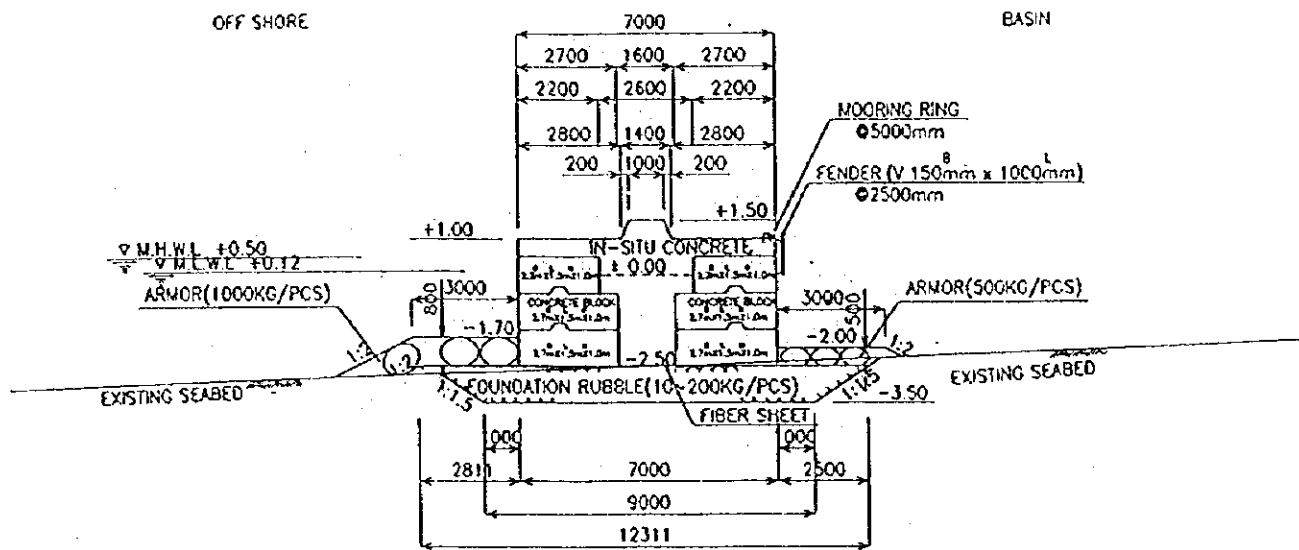
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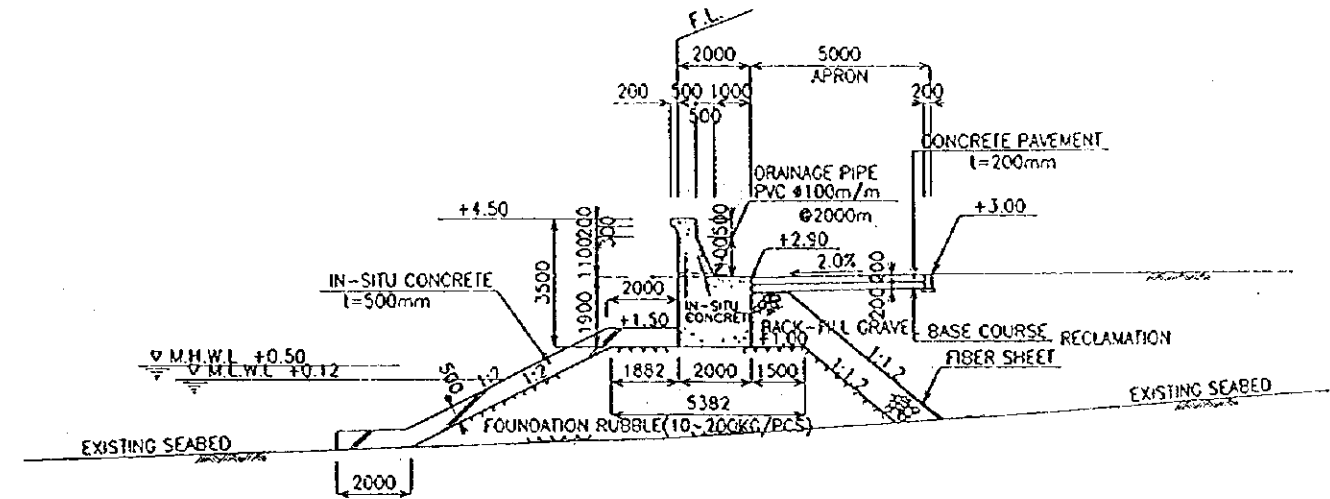
CIVIL UTILITIES STANDARD SECTION-2

S=1/200

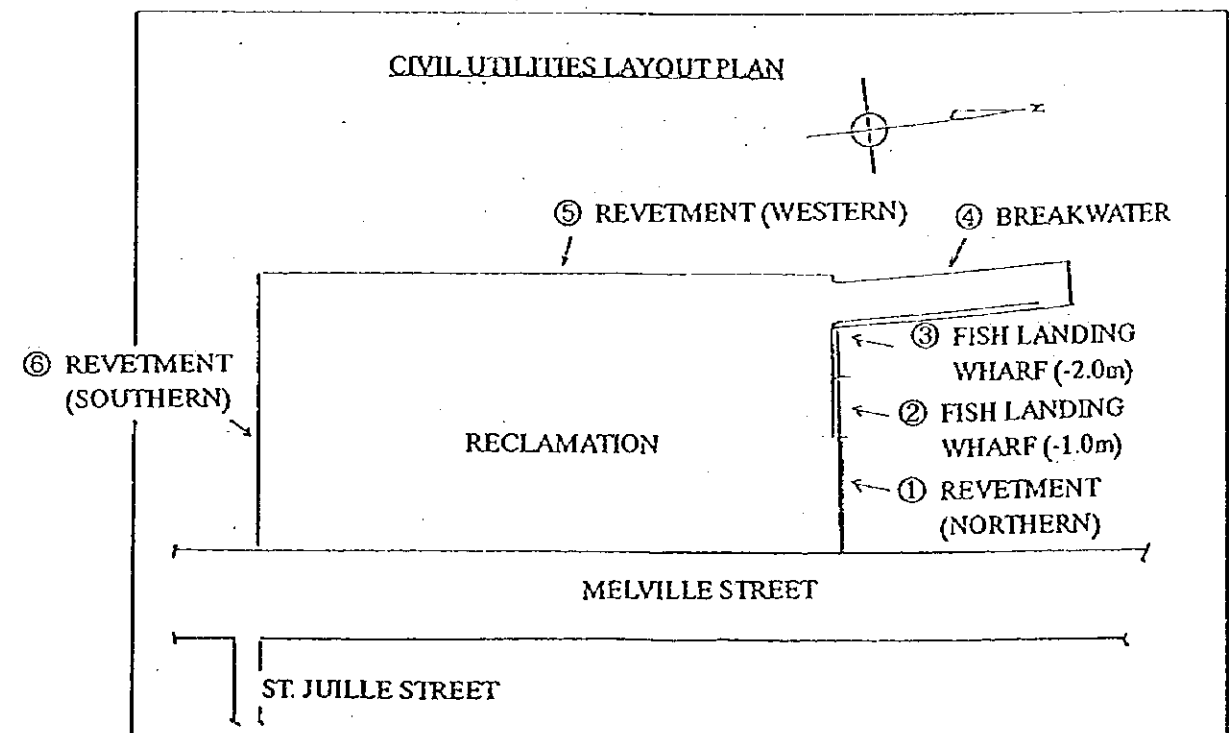
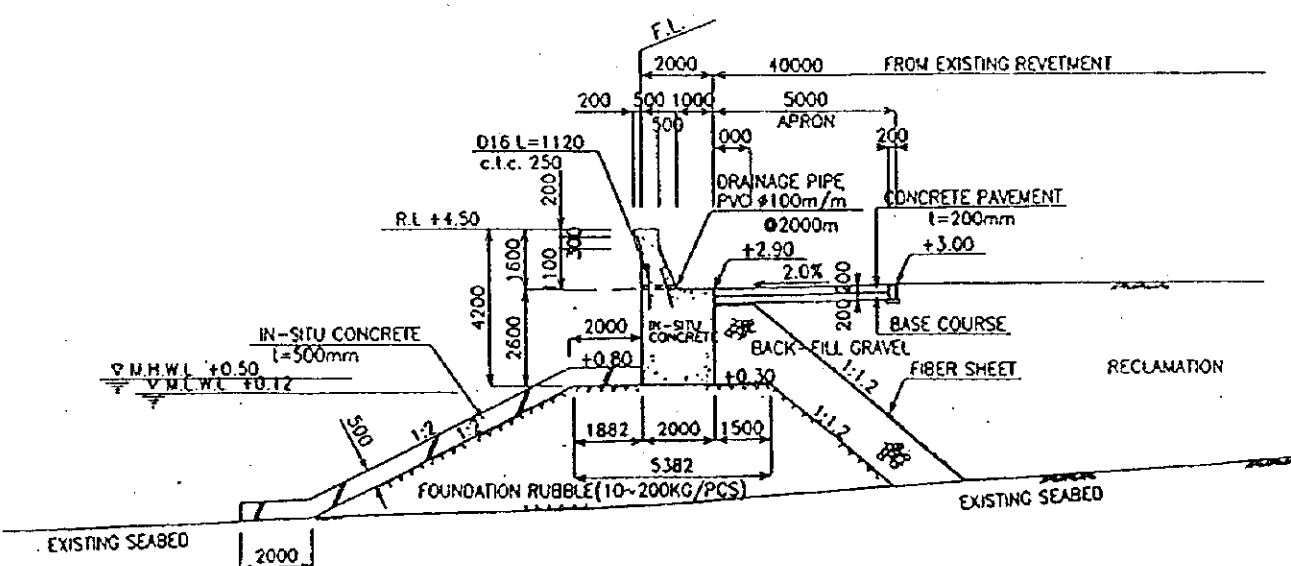
④ STANDARD SECTION OF BREAKWATER & WHARF

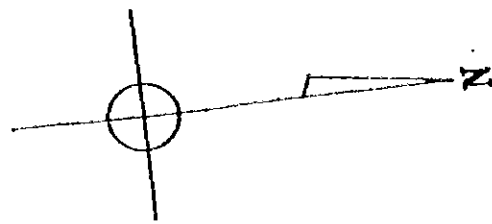


⑥ STANDARD SECTION OF REVETMENT(SOUTHERN)



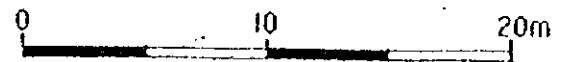
⑤ STANDARD SECTION OF REVETMENT(WESTERN)



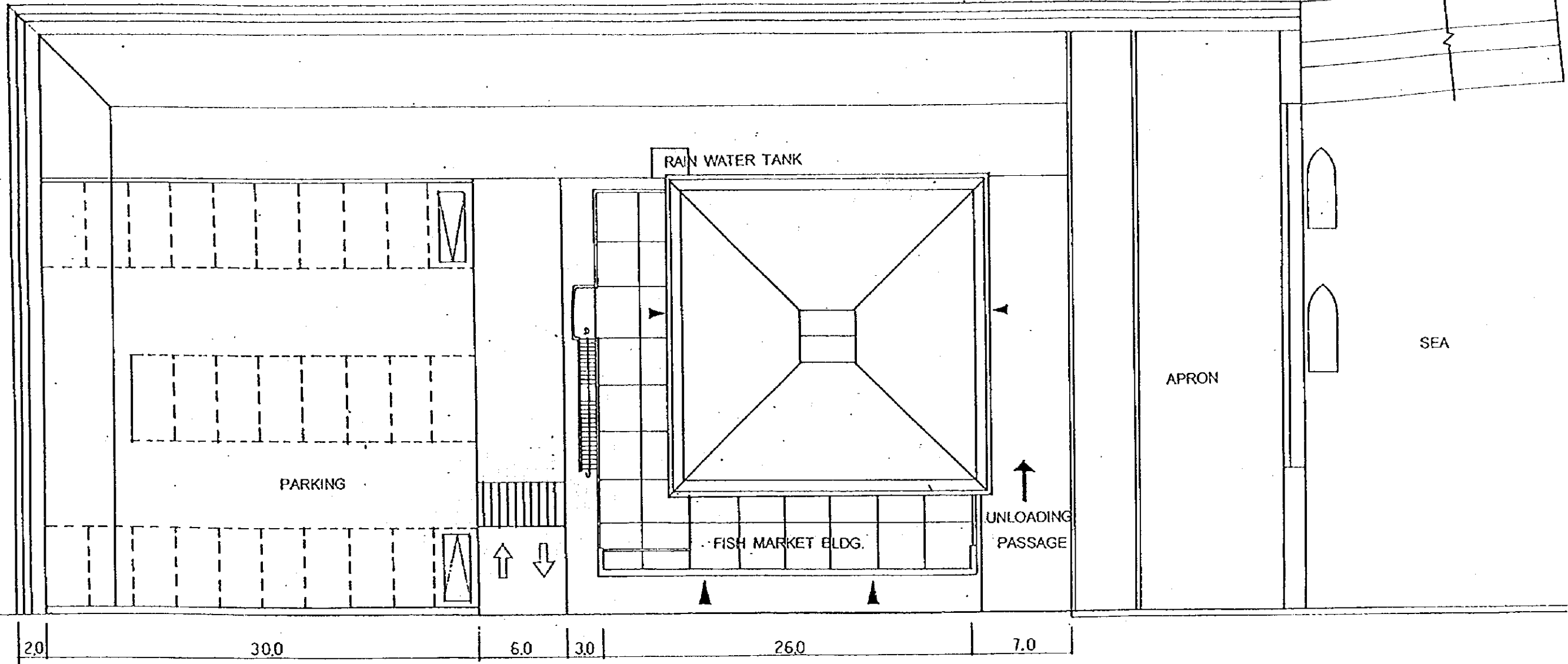


PLOT PLAN OF BUILDING

SEA



20
100
30.0



APRON

SEA

UNLOADING
PASSAGE

FISH MARKET BLDG.

RAIN WATER TANK

PARKING

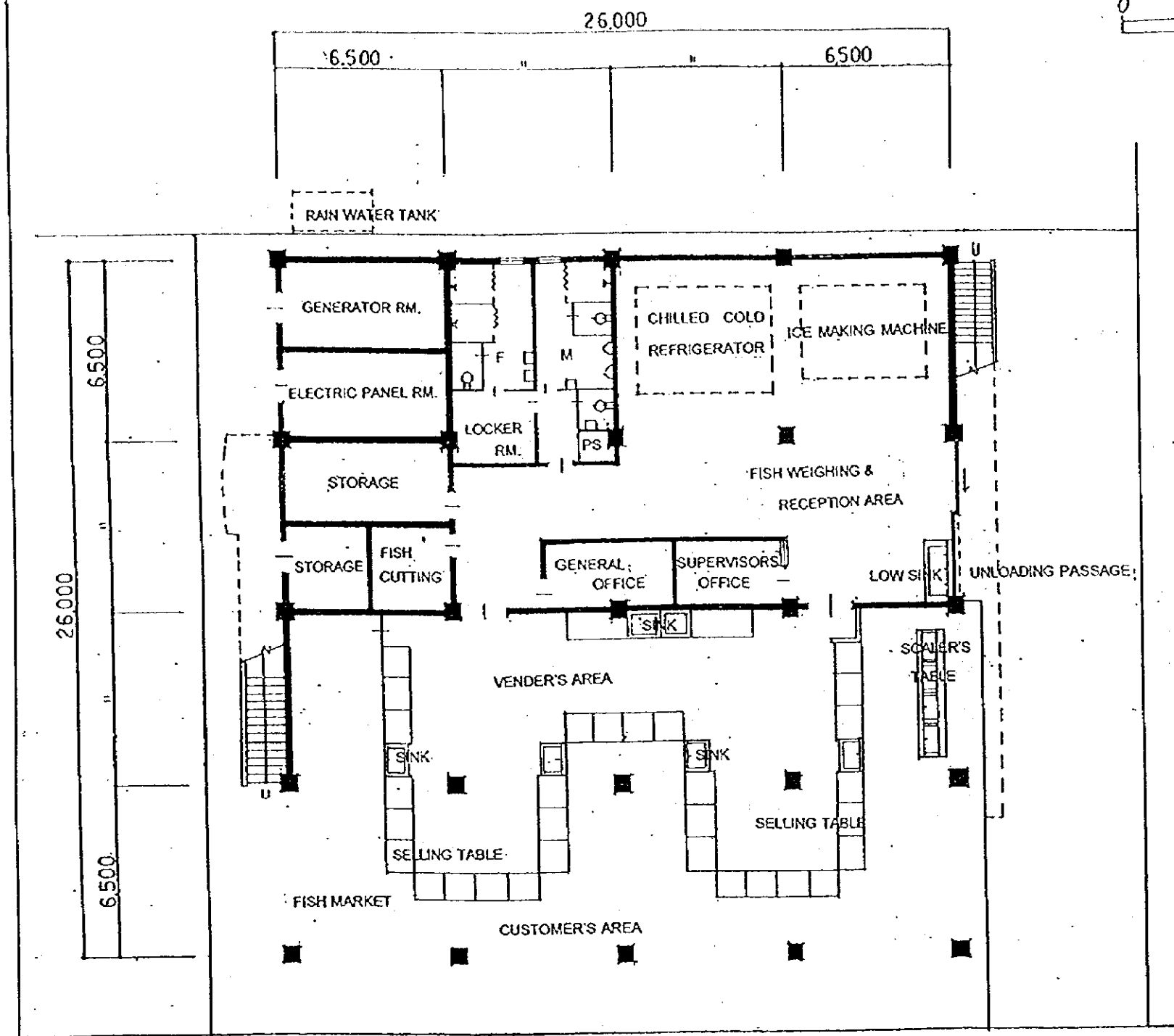
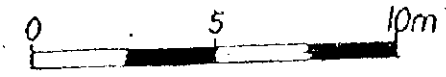
20 30.0 6.0 3.0 26.0 7.0

MELVILLE STREET

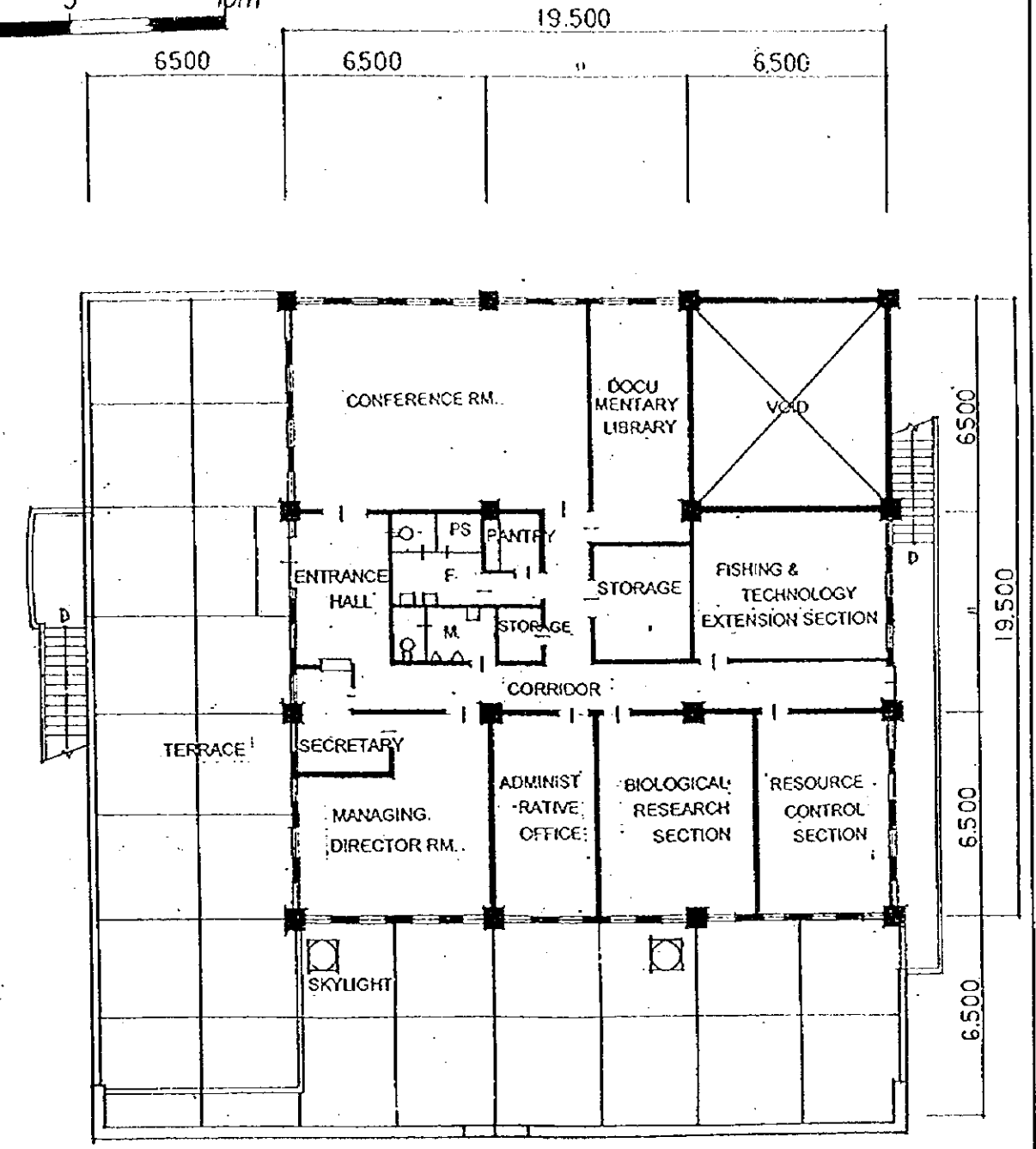
SLJUILLE STREET

PLOT PLAN

FLOOR PLAN OF THE BUILDING



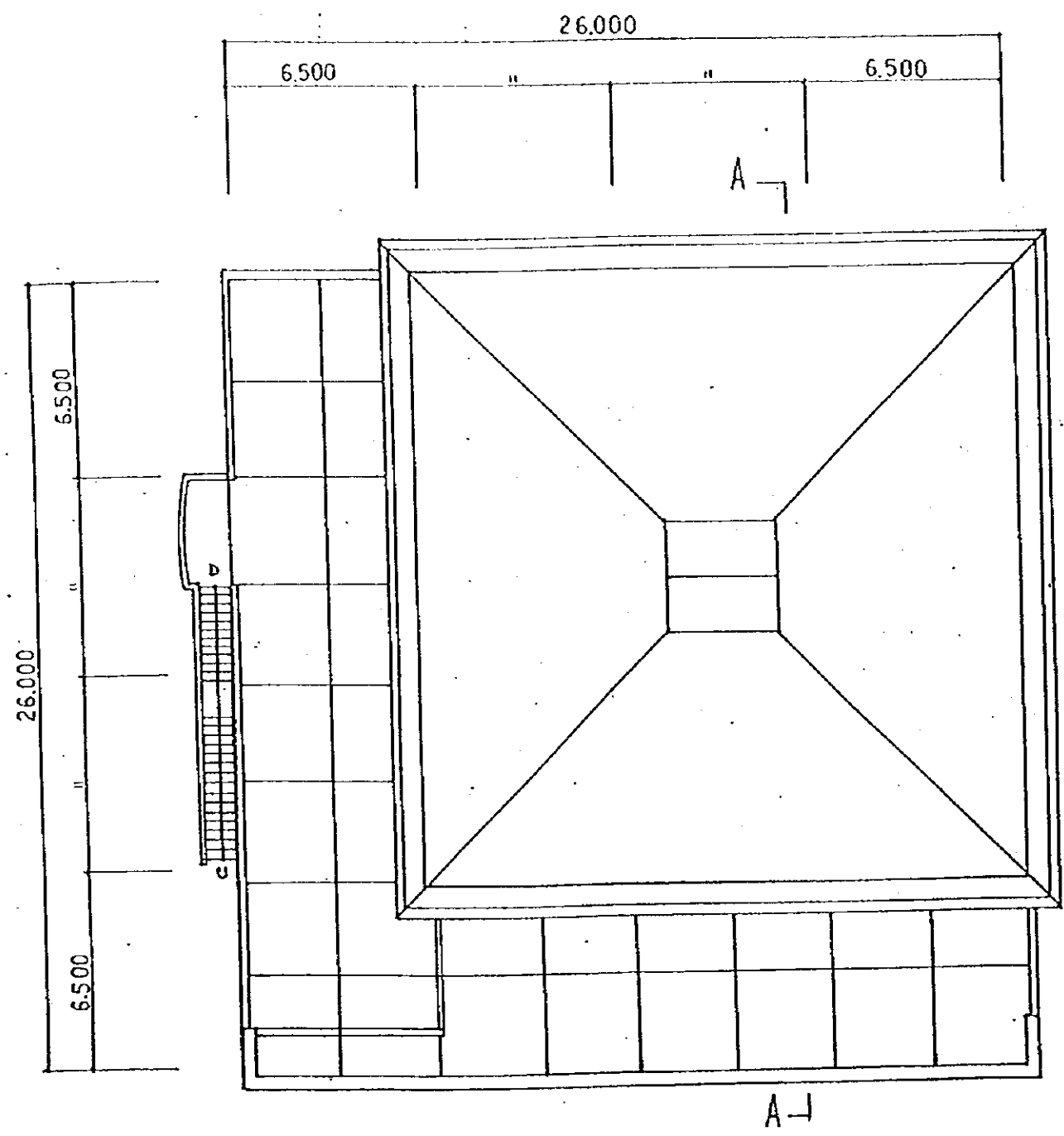
1ST. FLOOR PLAN



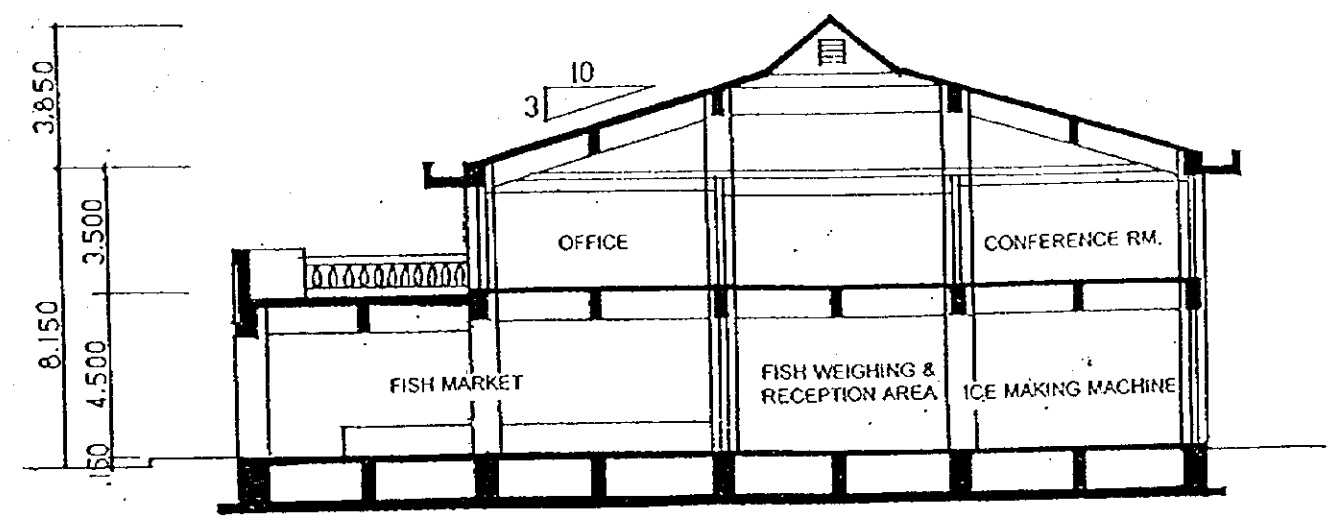
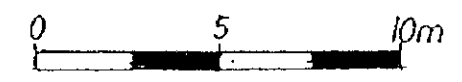
2ND. FLOOR PLAN

MELVILLE STREET

ROOF PLAN AND SECTION PLAN

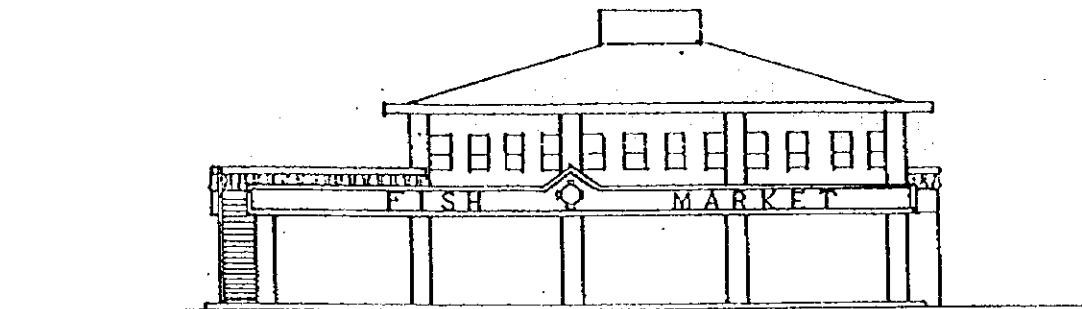
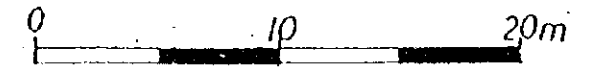


ROOF PLAN

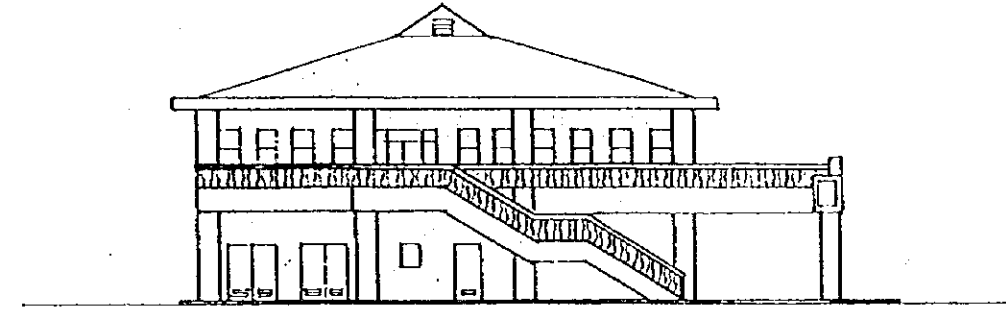


A - A SECTION

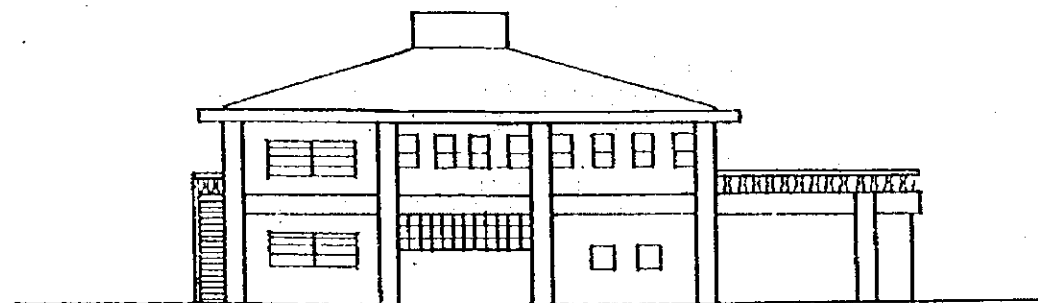
ELEVATION OF BUILDING



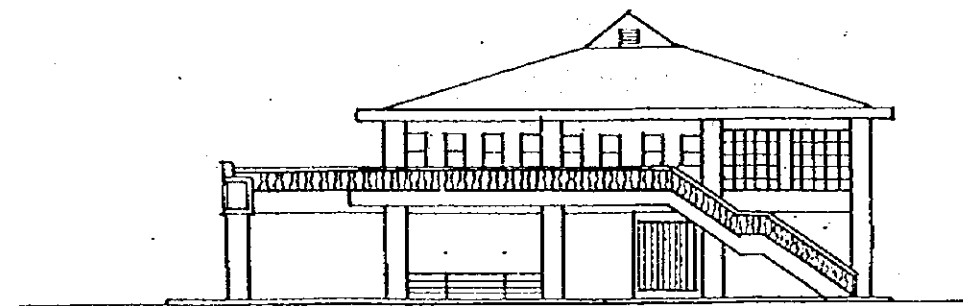
EAST



SOUTH



WEST



NORTH

ELEVATION

Chapter 3

Implementation Plan

Chapter 3. IMPLEMENTATION PLAN

3-1 Implementation Plan

3-1-1 Implementation Concept

The Project shall be implemented with the following concept in accordance with the intention of Japan's Grant Aid Scheme.

- (1) The Ministry of Agriculture, Lands, Forestry and Fisheries; and Fisheries Division; and other organizations including Physical Planning Office of the Ministry of Finance, and the Ministry of Local Government, the consultant and contractors will thoroughly exchange views for mutual understanding and cooperate for smooth implementation of the Project.
- (2) As the land acquisition around the existing fish market is difficult, the coastal area along Melville Street will be reclaimed and provided for the Project. Currently, only a-vehicle-wide (about 3m wide) space is left on the coastal side of Melville Street and many shops are lined on the other side of the street to form a shopping area. Therefore, at the first stage of construction works, land reclamation would be undertaken during the night when the traffic is light, while in the daytime the road should temporarily closed or regulated for alternate passage on one side. Before the implementation of the Project frequent discussions will be held with the Government of Grenada concerning concrete measures, i.e. when and how the traffic be regulated and so on.
- (3) Procurement of materials and labor forces is relatively easy as the site lies nearly in the middle of St. George's. An effective operational plan shall be designed including procurement of construction materials and skilled workers so that machinery of good quality may be secured while useless materials are eliminated.

(4) The coastal area to be reclaimed is owned by the Government of Grenada. The construction works involve care for the neighborhood; acquisition of an alternative land and transfer for continuous services during the construction period; and consideration on expected problems arising from removal of existing jetty and brick-shed. The implementation plan should be designed to avoid long working hours at the site as much as possible.

(5) Countermeasures against noise

Noise of various kinds will be produced by the construction works of the Project. Although there will not be any source of particularly big noise, and little influence on the surrounding area is expected, some measures against noise problems should be taken whenever necessary, so that the neighborhood may be least affected.

(6) To maintain accuracy and quality of construction works, special consideration should be given for the followings.

1) Countermeasures to salt damages

As the construction site is sustainable to salt damages, salt-resistant materials shall be selected for the construction as much as possible. Aggregates shall be washed with water when necessary to keep the salt-density under permitted level. The ice-making, refrigerating and other machineries and equipment which will be placed temporarily outdoor before installation should be protected with vinyl sheet and other countermeasures to salt damages should be taken for materials and equipment to be used for the works.

2) Procurement of construction materials

As to the procurement of the materials for the works corresponding to critical path such as foundation works, main structural members of wharf and building facilities, etc., special consideration should be given; so that the materials may be locally procured as much as possible to avoid delay of the delivery, and the construction methods common in the local area should be

introduced in the Project.

(7) Implementation Schedule

The construction works of the Project consists of civil engineering works mainly for the reclamation/embankment and construction works for fish market facilities. Before the construction of the fish market facilities, the site should be reclaimed at the first stage. As it is essential to leave the reclaimed land for some time until it gets stable, the construction of the Project facilities in the area should be proceeded with the following schedule.

- 1) The Project is divided into two phases.
- 2) At the first phase, reclamation will be performed to create project site, and civil structures (revetment, breakwater) and other fish landing wharf which will replace the existing jetty to be removed will be constructed.
- 3) At the second phase, buildings will be constructed for the fish market to be moved and the fishery development center (fish market/fishery development center facilities, parking lot; and provision of materials/equipment).

3-1-2 Implementation Conditions

As for large-scale civil engineering and construction works in Grenada, St. George's commercial port wharf, large-scale resort hotels, St. George's College (School of Medicine) building, Point Salines International Airport, the trunk road in the island, shore protection works, a government building and national stadium, etc. have been under construction. A Caribbean construction company based in Trinidad Tobago and a Miami based American companies are among the experienced contractors in these civil and building construction works.

- (1) The local contractors based on Trinidad Tobago deals with works in various

fields of both public and private sectors. Fostering of experts and enterprises of medium standing has not been advanced and skilled workers and experts are not sufficient in number. Therefore, introductions of expatriates from neighboring countries should be studied. In Grenada Island, many road construction and rehabilitation works are being undertaken and expected to continue for some more years. The government building and National Stadium are under construction, and a large-scale resort hotel with 400 rooms is scheduled to be constructed in the near future. In case other construction projects of similar scale are planned at the said period, problem of shortage of skilled workers will be worsened. Also, shortage of necessary materials and the price hike will be expected. Therefore, in implementing the Project, a good grasp of the situation of the construction market shall be required and necessary measures shall be taken.

- (2) The annual precipitation of St. George's, situated along the coastal area of Grenada Island, is as small as approximately 1,000-1,150mm with squalls throughout the year. The mean temperature is around 26.8°C (average highest at 31.3 °C and lowest at 22.3°C), the humidity is considerably high at 75-84% throughout the year (annual average at 78%). Under those circumstances, the labor conditions for outer construction work are quite severe. The government offices are closed on Saturdays and Sundays with five-day week. But they work on weekends at some construction sites of private companies. However, to secure the Project site, the coastal area is planned to be reclaimed. However, Melville Street, which faces the site, is used to the utmost with a bus terminal/standby lot, and general public parking lot, causing heavy traffics of vehicles and people. Under these circumstances, special attention is required for safety measures during the construction works, transportation of construction materials and preparation of temporary stock yard. Traffic control such as total or partial closure of the coastal road is necessary. While establishing a system for close cooperation with the traffic agency and the traffic division of the Police Department, official notification to the general public, or the users of the facilities, is

required for their full understanding of the above, and any alternative measures should be discussed when necessary. Procedural plans shall be designed concerning land preparation for the site, closure of sea area for the reclamation works, removal of existing facilities, as well as required time to remove, with local practices and situation fully taken into account.

3-1-3 Scope of works

Scope of works for the Project borne by the Government of Grenada is shown in Table 3-1-1. Removal of structural obstacles at the site, connection works of electricity, water supply/sewerage, telephone should be completed before actual start of the construction works. The Government of Japan is responsible for the other construction works and procurement of materials.

Table 3-1-1 Scope of Works borne by the Recipient Country

1)	Removal of structural obstacles at site (existing jetty, fish sale temporal shed, mooring buoy, etc.)
2)	Connection works of electricity
3)	Connection works of water supply and sewerage (included connection to public sewer system)
4)	Connection works of telephone
5)	Acquisition of alternative land for continued public services and other necessary measures
6)	Procurement of furniture and fixtures in the facilities

3-1-4 Consultant Supervision

Basic policies and important points of the construction supervision are as follows:

- (1) To carry out the construction smoothly, the consultant will have close contact with the Ministry of Agriculture, Lands, Forestry and Fisheries in accordance with the progress of work. Particularly, the schedule and implementation methods for the preparation of alternative land which is necessary for continued public services, removal of the structural obstacles, block-out of the reclamation area and its surroundings, etc. should be fully discussed with the Government of Grenada by the Consultant in advance of the commencement of the works as those items have significant relations with the Japanese contractor's scope of works.
- (2) Before the start of works, the Consultant shall examine the construction plan and drawing carefully, and judge the appropriateness of the plan, time schedule, quality of planned materials and construction method.
- (3) At the time of delivery of the Project facilities following the completion of the construction works, the Consultant shall check whether or not the completed contents meet the designed specification, and give suitable instructions if revision is necessary.
- (4) The Project Manager shall supervise total construction works, and a civil engineer and an architect will assist him with technical matters.

3-1-5 Procurement Plan

The construction materials which are locally available are only aggregates, sands, gravels, soils for banking, etc. There are local contractors who can supply aggregates and paste cements by a concrete mixer. Cements, bars, structural

steels, and plywood are imported from Trinidad Tobago, The United States, Venezuela, Brazil, etc. and usually there are local stocks.

Construction materials (cement, bar, wooden mold, metal mold, etc.) will be procured locally in principle. But some materials which are not available locally and those inadequate for quality and quantitative reasons will be procured from the third countries or Japan, and shall be shipped to Grenada.

As for construction machinery, those for construction works will be locally available but machine-loaded boats or barges for civil engineering works shall be procured in Trinidad Tobago or neighboring Caribbean nations.

Table 3-1-2 Procurement List

Items	Transportation method
①Construction machinery Crane boat Work boat Anchor lift boat Tow boat Diver's boat	Marine transportation from the third countries -//- -//- -//- -//- -//-
②General construction materials	Locally procured

3-1-6 Implementation Schedule

When the implementation of Project is approved in accordance with the Japan's Grant Aid Scheme, i)Exchange of Note (E/N) will be concluded between both Governments, ii)Consultant must complete tender document, iii)Consultant must proceed with bidding and contractual process for construction works, and then start the works.

The implementation schedule shall be planned in accordance with the followings:

(1) Detailed design works

Based on Basic Design Study Report, the Consultant will perform detailed design and prepare bidding documents for the selection of a contractor of construction works. Necessary period for that work will be expected 2 to 2.5 months.

(2) Bidding works

After completion of detailed design works, the Consultant will invite publicly Japanese candidate companies or participants in the bidding for the construction works of the Project, and then examine their qualifications for participation and decide the participants. Based on the examination results, the client of the Project will invite participants for bidding works in the presence of the parties concerned. It will take about 2.5 months from above publicity to the conclusion of the contract.

(3) Construction works

After conclusion of construction contract, contract verification will be obtained from the Japanese government for the commencement of the Project. Conditioned that works borne by the government of Grenada be progressed smoothly without any serious problems, the necessary period for civil engineering works at the first phase will be about 10 months, and the period for construction at the second phase is expected to be about 16.5 months.

Table 3-1-3 Implementation Schedule (1/2)

A. Phase - I

	1	2	3	4	5	6	7	8	9	10	11	12
Detail Design- I (Civil Works)												
		(Site survey)										
			(Works in Japan)									
			(Site survey)									

	1	2	3	4	5	6	7	8	9	10	11	12
Supervision- I (Civil Works)												
		(Preparation Works)										
			(Construction Works :Revetment)									
		(Reclamation Works)										
						(Finishing Works & Delivery)						

3-1-7 Obligations of the Recipient Country

Respective Scope of works for the Project borne by the government of Grenada and Japan is shown in Table 3-1-4.

Table 3-1-4 Respective Scope of Works borne by both Governments

Contents of Work	Japan	Grenada
1. Land acquisition, site preparation; measures to continue public services by providing alternative land during the construction period		○
2. Extension of infrastructure to the site (electricity, water supply and sewerage, telephone)		○
3. Removal of structural obstacles at site		○
4. Construction works (1) Land preparation: shore protection/reclamation, fish market, landing wharf, parking lot, etc. (2) Fence, guard box, plantation, etc.	○	○
5. Import procedure, customs clearance (1) Transportation to Grenada & domestic transportation (2) Tax exemption and customs clearance	○	○
6. Payment of commission to Japanese banks of foreign exchange regarding Banking Arrangement (B/A)		○
7. Legal advantage or favor for embarkation, disembarkation and stay at Grenada of Japanese people for the Project.		○
8. Effective and efficient management of the Grant Aid Project facilities		○
9. Bearing of all the cost incurred in construction of facilities, transportation of furniture & materials, and installation works that cannot be covered by the Grant Aid		○
10. All the procedure of application for approval or authorization regarding construction works		○
11. Exemption of all the taxes levied on materials and services to be obtained in Grenada by contractors		○

3-2 Project Cost Estimation

The costs for the works borne by the recipient country are estimated at about EC\$69,000, and the details are as follows:

Table 3-2-1 Project Cost Estimation

(Unit: EC\$1,000)

1st Stage		2nd Stage	
Items	Amount	Items	Amount
1) Removal of existing jetty and buildings in the site	5.0	1) Connection works for electricity	6.4
2) Removal of mooring buoy in the reclamation area	—	2) Connection works for water supply	15.0
3) Removal of substitution land & others for continued public services	5.0	3) Connection works for sewage	15.0
4) Traffic control for the works	10.8	4) Traffic control for the works	10.8
5) Preparation of temporary stockyard for reclamation works	—	5) Preparation of temporary stock yard for construction works(use reclamation site)	—
6) Others (Bank commission, etc.)	0.5	6) Others (Bank commission, etc.)	0.5
Total	21.3	Total	47.7
Grand Total			69.0

3-3 Operation and Maintenance Plan

(1) Operation and Maintenance plan

Fisheries Division assumes maintenance and management of the planned facilities as they have experience in running the existing fishery centers (fish markets). As the fish market and landing jetty are public facilities, the utilization fee or rental fee will be collected by the government according to the principle of the beneficiaries pay and the management cost will be covered by the government fund.

1) Fish Market Facilities

The major duties of management of the fish market are maintenance and repair of the market facilities, and attached fish landing wharf and parking lot. The major businesses of the market are collection of facility rentals (fish retail booth, cold storage, landing wharf, parking lot) and sale of ice. Also, cleaning in the premises and waste disposal and other routine work are included. Contents of the duties at the fish market and the necessary number of staffs, which is 7 in all, to perform them are given in Table 3-3-1.

Table3-3-1 Staffs for the Melville Street Fish Market

Position	No. of Staffs	Contents of Duties
Supervisor	1	<ul style="list-style-type: none"> • Responsible for daily operation of the Market • Liaison with local fishermen and responsible officers • Submission of records and business reports
Assistant Supervisor	1	<ul style="list-style-type: none"> • Assistance to supervisor • Management of cold storage • Maintenance and repair of the market equipment
Market Clerk	1	<ul style="list-style-type: none"> • Weighing of fish catches • Collection of facility rentals • Submission of records of collection and business reports
Cold-room Attendant	1	<ul style="list-style-type: none"> • Sale of ice • Collection of rentals for cold storage • Management of ice-making and refrigerating facility
Cleaner	1	<ul style="list-style-type: none"> • Cleaning in the fish market premises and environs
Security Guard	2	<ul style="list-style-type: none"> • Peace maintenance in the facilities (Currently no security guard is stationed)
Total	7	

2) Fishery Development Center

The Fishery Development Center will perform supporting services for diffusion of fishing technology, development of fishery statistics, fishery resources management, and etc., as the base for future fishery development and educational center for fishermen. It is planned to provide support services for fishermen, fishing community and other fishery-related people through those activities. The major functions of the fishery development center are the following three:

- ① **Base for fishery activities**
 Base for fishery activities
 Centralization of fishery activities at local fish centers. Compilation and development of fishery statistics by collecting catches' data and other fishery-related data, as well as fishery information.
- ② **Central institution for supervision, control and inspection of fishing activities**
 Restriction of the use of fishing gear and methods to protect coastal fish resources; establishment and spread of closed-season, observations of fishery activities and investigation into the actual fishery conditions.
- ③ **Training center for fishery development**
 For exploitation of off-shore fish resources it is essential to improve the function of fishing boats, introduce larger boats and modernize fishing technology. Technical training will be provided for fishermen, fishery businessmen and others in fishery-related businesses.

Staffs needed for the major duties of the Fishery Development Center are as follows:

Table 3-3-2 Staffs for Fishery Development Center

Position	No. of Staffs
Center's Director	1
Administration Department	
Secretary	1
Accountant	1
General affairs	2
Business Department	
Fishery statistics	3
Fish resources management	3
Fishing technology extension	3
Total	14

(2) Operation and Maintenance Plan

According to the principle of beneficiaries should pay, the facility rentals should be collected as part of national revenue and the costs for the operation and maintenance of the Project facilities will be covered by the government (Fisheries Division) budget. The annual costs for the operation and management of the Melville Street Fish Market and the Fishery Development Center are as follows:

1) Melville Street Fish Market

As given in Table 3-3-3, the annual maintenance costs for the facilities are roughly estimated at EC\$180,000 (about 9 million yen). After the completion of new Fish Market, the revenue from ice sale and facility rentals is estimated at about EC\$200,000. Judging from the above, it will leave an annual profit of about EC\$20,000 (about 1 million yen), which will make possible to maintain the facilities.

Table 3-3-3 Annual Maintenance Costs

(Unit: EC\$1,000)

Revenue		Expenditure		Remarks
Item	Amount	Item	Amount	
1. Facility rentals	202.7	1. Labor costs	67.9	
Fish retail booth	23.2	5 Market staffs	49.9	
Fish storage	11.5	2 Security guards	18.0	
Ice sale	168.0	2. Direct costs	98.3	
		Electric charges	78.0	
		Water charges	11.5	
		Sewerage charges	7.7	
		Fuel expenses	1.1	
		(emergency generator)		
		3. Maintenance costs	13.0	
		Fish market facilities	2.0	Inspection & repair
		Refrigerating equipment	10.0	Inspection & maintenance
		Others (wharf, pavements)	1.0	Inspection & repair
Sub Total (A)	202.7	Sub Total (B)	179.2	
Balance (A) - (B) = 202.7 - 179.2 = 23.5				

Note: Renewal expenses for each facility/equipment are not included in the above.

Grounds for the figures of revenue and expenditure are given below.

① Revenue

Revenues are generated from rentals of fish retail booth, cold storage and other facilities; and ice sales.

- Rentals of fish retail booth; EC\$23,149

Rentals are collected according to the amount of fish handling.

Calculated at the unit cost of @ = EC\$0.11/kg, exchanged at EC\$0.05/lbs.

Calculation is based on about 700kg per year, and 50 weeks' operation with 6 day-week.

$$Ia = 0.11 \times 700 \times 6 \times 50 = 23,149(\text{EC\$})$$

- Ice storage: EC\$11,574

Applied the same unit cost of fish sale booth (same as the current storage fee).

Storage amount is 350kg per day, which is an annual average and a half of the daily amount is to be secured on the day before.

$$Ib = 0.11 \times 350 \times 6 \times 50 = 11,574(\text{EC\$})$$

- Ice sale: EC\$167,993

The price of ice is EC\$0.2 per pound, the same as present price.

Calculation is based on about 1,270kg per day of annual average ice production, with the unit price of @ = EC\$0.44/kg.

$$Ic = 0.44 \times 1270 \times 6 \times 50 = 167,993(\text{EC\$})$$

② Expenditure

Expected expenditures are labor costs, direct costs and maintenance cost.

• Labor costs; EC\$67,900

Staffs	@(EC\$)	No. of Staffs	Costs (EC\$)
Supervisor	13,260	1	13,260
Assistant Supervisor	10,000	1	10,000
Market Clerk	9,000	1	9,000
Cold-room Attendant	8,820	1	8,820
Cleaner	8,820	1	8,820
Sub Total			49,900
Security Guard	9,000	2	18,000
Total			67,900

• Direct Costs: EC\$98,385

Items	@ (EC\$)	Amount	Costs (EC\$)
Electric Charges	0.143/kwh	630kwh/day	78,076
Water Charges	3.30/kl	11.65kl/day	11,537
Sewerage Charges (rated at 2/3 of water charges)	2.20/kl	11.65kl/day	7,692
Fuel Expenses	0.09/l	1200l/year	1,080
Total			98,385

• Maintenance Costs: EC\$13,000

Maintenance costs for the facilities are allotted for the buildings, refrigerating equipment, and others including wharf and pavement; and the annual costs for EC\$2,000, EC\$10,000 and EC\$1,000 respectively. A total of EC\$13,000 is secured.

2) Fishery Development Center

The total operational costs for the Fishery Development Center is estimated at about EC\$65,000 (about 3.25million yen) as given below. All the costs will be covered by the annual budget of Fisheries Division which is about EC\$590,000 (about 29.5 million yen) estimated at the achievement of 1996 fiscal year. As the management costs for Fishery Development Center is

estimated at 10% of the total budget, there will be no problem. The director and other responsible positions will be assumed by the personnel from the Fishery Division;

Item	Expenses (EC\$1,000)
Expenses for business activities (travel expenses, etc.)	42.2
Others (communication, fuel and light expenses)	22.9
<hr/>	
Total	65.1

Chapter 4

Project Evaluation and Recommendations



Chapter 4. PROJECT EVALUATION AND RECOMMENDATIONS

4-1 Project Effect

Grenada's fishery has been steadily developing as an industry which obtains foreign currency with growing exports of tuna and other fisheries. It plays an important role in providing quality animal protein for the people who have strong predilection for fish. The fishery, therefore, is a key industry for the national economy, promoting food self-sufficiency, generating employment opportunities, and obtaining foreign currency by encouraging fish exports while saving it by replacing imported fish. The sea area surrounding Grenada is rich in marine resources and noted for seasonal good fishing grounds for tuna. The fishery is important as a promising sector in the nation's economy because they have no other noticeable resources to be exploited.

Nevertheless, supply of marine food for general consumers is chronically insufficient, resulting in import of fish and fish products in large quantities. As the coastal fishery resources included bottom fish/conch shellfish, which has long supported nation's fishery, have been depleting and the fish catches are decreasing, it is necessary to shift to exploitation of offshore fishery resources which are abundant in pelagic fish and expected to have room for further development. For that purpose, a system for education for fishery development should be established aiming at adequate exploitation and management of fishery resources.

The distribution system for exporting marine products has been largely improved since the completion of the facilities of Grenada Commercial Fisheries Ltd. (GCFL) by Japan's Grant Aid. However, most of the other fishery facilities in the nation are old and decrepit, and insufficient in number. Particularly, belated development of fishery distribution facilities causes serious post harvest loss, wasting important animal protein resources to decrease handling amount of fishes. As a part of efforts for effective fishery development, establishment of a sanitary market to activate the fish distribution in the island, and reduction of post harvest loss to make effective use of resources should be quite important.

Among others, the fish market at Melville Street in densely populated St. George's

handles a large amount of fishes, exceeding the capacity of the existing old market. As a result, much of the fish is sold on the road outside the existing market. It is not sanitary and quality preservation of fresh fish is quite difficult. Moreover, it is a big obstacle to the traffic. For that reasons, the development of Melville Street fish market is given precedence over the other development plans for fish markets in Grenada Island.

Meeting the above problems, the construction of the public fish market facilities under the Project is expected to bring about the following effects:

- (1) The development of a public fish market with attached fish landing wharf and parking lot in the heart of St. George's will alleviate the current congestion at the market and terminate fish sales on the road, while promoting sanitary fish sales. Use of ice and refrigerator will improve freshness of fish catches and prevent quality deterioration. As a result, efficient landing, preservation of freshness, and sanitary fish sales will attract people, leading to decrease of post harvest loss, which will contribute to the improvement of fish distribution in Grenada.
- (2) With the development of the fish landing wharf attached to the market the fishermen who have not been able to ship their catches to the market may send them directly to the market in the capital city. Then the volume of fish dealing will increase and contribute to stable supply of fish. The fishermen's income will increase as well.
- (3) Melville Street Fish Market, the largest central market in Grenada, collects a mass of information on fishery. Making it an educational base for fishery development will contribute greatly to the activation of offshore fishery, diffusion of fishing skill, improvement of technology for fish catches' quality preservation, and management of coastal fish resources.
- (4) The traffic lines of people, vehicles and commodities on the both sides of Melville Street in front of the Project site will be re-arranged in the reclaimed area.

They will be effectively laid out so that the cause of present congestion around the market may be eliminated.

When the Project is implemented, the fishery-related people (about 500) in St. George's who are the users of Melville Street fish market and about 30,000 residents of St. George's who use the market as their distribution center will be the direct beneficiaries of the Project.

The population of indirect beneficiaries of the Project is estimated at about 100,000, actually the total population of Grenada, with the development of distribution system and fishing technology.

Examining the above, the construction of the fish market and the fishery development center has been concluded appropriate and worthwhile for Japan's Grant Aid.

4-2 Recommendations

After the reconstruction of Melville Street fish market, it is recommended that the Government of Grenada should take measures to deal with the followings to encourage effective utilization of the facilities, to improve the fish distribution system and to promote fishery development plans.

(1) Management of fish market and maintenance of equipment

The market facilities are designed to be maintained and managed by the present staffs. However, sale of ice is added to the services of the market, and the fish landing wharf and the parking lot will be expanded, so that capable staffs and more budget are required to maintain and manage the market facilities and equipment. Therefore, it is most important for the operation of the market to collect utilization fee or rental fee which should be fair and impartial. The fee should be fixed after having taken into account of the opinions of local residents (consumers), fish retailers, fishermen and others concerned. Also, it is necessary to establish a system by organizing groups of beneficiaries to operate the facilities and equipment with their own efforts,

without any increase in the number of staffs.

(2) Preparation for renewal of the equipment

The average life of ice-making and refrigerating equipment expected around 10 years. The cost for renewal is around EC\$160,000 (about 8 million yen at the rate of EC\$1.00=50.37 yen). It should be saved from the daily revenue. The annual revenue from the businesses at the fish market is estimated at EC\$24,000 and it is necessary to save part of the revenue for the renewal of the equipment.

(3) Management of Fishery Development Center

As the objective of the fishery development centers' services is to support fishermen and fishery-related people, it is necessary to have fishermen and small-scale fish retailers to cooperate with fish distributors and build a system which will provide general information consisting of the fishery information from the fishery centers at major landing beaches throughout the country, and the market information from Melville Street fish market.

(4) Consistency with the St. George's development plans

The government of Grenada formulated plans for the development of St. George's in September, 1991, led by Physical Planning Office of the Ministry of Finance. In line with the plans, and led by the Physical Planning Office and the Ministry of Local Government, a project for construction of a port for tourism/trading is underway, which is in the southern side sea area of the Project site. To promote effective utilization of the facilities of the Project, it is particularly necessary for the following four projects to give full consideration on the consistency among the following projects.

- ① Construction project of new St. George's Port (tourism/trading) and urban development plan
- ② Construction project for a coastal circuit road in St. George's
- ③ Expansion project for the bus terminal in St. George's
- ④ Development project for a vegetable and fruit market

(5) Consideration on traffic congestion

St. George's is located on a slope facing the sea, with rows of houses extended along steep slopes and the roads are so narrow that the traffic congestion is serious. The congestion is caused by sharp increase in vehicles, and shortage of parking spaces. To cope with the problem, some countermeasures should be taken, i.e. traffic control and development of the bus terminal.

To make up for the lost space for 20 to 25 cars due to the construction of the new market, a parking lot with a capacity of 30 cars is prepared in the Project site, so that it may not cause traffic troubles around the site. Further, to make the fish market facilities effectively utilized, comprehensive measures should be taken to alleviate the congestion at the whole Melville Street, including the bus terminal.

(6) Shore Protection Works & Disaster Prevention

At the determination of the Project site, it was made clear at the request of the Government of Grenada as they have plans for construction of new St. George's Port (tourism/trading) and the urban development plan, that a pocket will be formed between the Project site and the southerly part of the existing reclaimed land. From the standpoint of disaster prevention against high-sea, it is not desirable to leave the pocket for a long period. It is judged it has little effect on the implementation of the Project for a short time. However, it should be removed as soon as possible by putting the waterfront development plan into practice as part of countermeasures against heavy surf at hurricanes and other disasters in the urban area.

Appendices

APPENDICES

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6. Cost borne by the Recipient Country

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7. References

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1. Member List of Study Team

1-1 Preliminary Study

Mr. H. KITANI	Leader	Development Specialist, Institute for International Cooperation, JICA
Mr. S. SUZUKI	Technical Adviser	Fisheries Agency
Mr. T. SHIMODA	Project Coordinator	Second Project Study Team, GRANT Aid Project Study Department, JICA
Mr. K. TAKEUCHI	Fisheries Market Planner	Department2 , Project Study Team Japan International Cooperation System(JICS)
Mr. M. Yoshioka	Facilities Planner	Department2 , Project Study Team Japan International Cooperation System(JICS)

1-2 Basic Design Study

Mr. H. KITANI	Leader	Development Specialist, Institute for International Cooperation, JICA
Mr. Y SOMEYA	Technical Adviser	Deputy Director, Fishing port Construction, Fishing Port Department, Fisheries Agency
Mr. M. HANAOKA	Grant Aid Adviser	Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs
Mr. M. KONDO	Chief Consultant/ Fisheries Market Planner	CRC Overseas Cooperation Inc.
Mr. E. KAWABATA	Civil-Engineering Planner	Pacific Consultants International
Mr. T. KAWADA	Facilities and Equipment Planner	CRC Overseas Cooperation Inc.
Mr. H. OOKI	Natural Condition Surveyor	Pacific Consultants International
Mr. M. ISHII	Construction Planner/ Estimator	CRC Overseas Cooperation Inc.

1-3 Draft Basic Design Study

Mr. H. KITANI	Leader	Development Specialist, Institute for International Cooperation, JICA
Mr. Y SOMEYA	Technical Adviser	Deputy Director, Fishing port Construction, Fishing Port Department, Fisheries Agency
Mr. M.KONDO	Chief Consultant/ Fisheries Market Planner	CRC Overseas Cooperation Inc.
Mr. E. KAWABATA	Civil-Engineering Planner	Pacific Consultants International

2. Survey Schedule

2-1 Preliminary Study

	Day	Week	Itinerary			Accommodation
1	30-Mar	Mon.	Dpt. Tokyo Arr. New York			New York
2	31-Mar	Tue.	Dpt. New York 7:10(AA699) Arr. Puerto Rico 12:10 Dpt. Puerto Rico 13:25 (AA811) Arr. Grenada 15:13			Trinidad
3	1-Apr	Wed.	Discussion with fisheries Div. Site survey			St. George's
4	2-Apr	Tue.	Ditto above			St. George's
5	3-Apr	Fri.	Internal meeting			St. George's
6	4-Apr	Sat.	Ditto above			St. George's
7	5-Apr	Sun.	Leader	Tec. Advisor/ Project Coordinator	Market Planner, Facility Planner	St. George's
8	6-Apr	Mon.	Discussion with fisheries Div. Site		Survey at Gouyave	St. George's
9	7-Apr	Tue.	Ditto above		Survey at GCFL, Malville street	St. George's
10	8-Apr	Wed.	Ditto above		Survey at GCFL, Malville street	St. George's
11	9-Apr	Thu.	Ditto above		Survey at GCFL, Malville street	St. George's
12	10-Apr	Fri.	Signed Minutes of Discussions	Dpt. Grenada 6:10 (LI361) Arr. Trinidad 6:45 Meeting with Embassy of Japan in Port of Spain	Survey at Grand Mal, Victoria, Sotelus	St. George's
13	11-Apr	Sat.	Dpt. 15:22 (AA1458) Arr. Puerto Rico 17:00 Dpt. Puerto Rico 18:25 (AA688) Arr. New York 22:25	Dpt. Trinidad 8:15(AA1818) Arr. Miami 12:14 Dpt. Miami 13:40(AA932) Arr. New York 16:38	Survey at Grand Mal, Victoria, Sotelus	St. George's
14	12-Apr	Sun.	Dpt. New York 15:00(JL007)		Documentation Work	St. George's
15	13-Apr	Mon.	Arr. Tokyo		Survey at Mellville Street	St. George's
16	14-Apr	Tue.			Survey at Grand Mal, Victoria, Sotelus	St. George's
17	15-Apr	Wed.			Survey at Grand Mal, Victoria, Sotelus	St. George's
18	16-Apr	Thu.			Collection data./ report survey result to Fisheries Div.	St. George's
19	17-Apr	Fri.			Dpt. Grenada(LI351)9 :55 Arr. Trinidad 20:30 Report to Embassy of Japan in Port of Spain	Trinidad
20	18-Apr	Sat.			Dpt. Trinidad 8:19(AA181 8) Arr. Miami 12:15 Dpt. Miami 15:15(AA1770) Arr. New York 12:15	New York
21	19-Apr	Sun.			Dpt. New York 13:30(JL005)	
22	20-Apr	Mon.			Arr. Tokyo 16:10	

2-2 Basic Design Study

	Day	Week	Itinerary	Accommodation
1	11-Aug	Tue.	Dpt. Tokyo11:00(NH010)Arr. New York10:30	New York
2	12-Aug	Wed.	Dpt. New York12:05(AA1819)Arr. Trinidad 20:53	Trinidad
3	13-Aug	Thu.	Officials and Chief Consultant; 10:00 Visit Embassy of Japan Others; Arrange Natural Condition Survey Work and Market Price Survey(Consultants) All members; Dpt. Trinidad19:30(LI334). Grenada20:05	St. George's
4	14-Aug	Fri.	09:45 Meeting with Minister of Agriculture and Fisheries, 10:30 Meeting with Min. Agriculture, Min.Works 13:00 Site survey	St. George's
5	15-Aug	Sat.	09:00~16:00 Survey at Grand Mal, Goyave, Granville	St. George's
6	16-Aug	Sun.	09:00~16:00 Survey at Mellville ST. Fish Market PM Information and data collection 18:30 Internal meeting Grant Aid Adviser; Arr. Grenada 20:44 (AA1235)	St. George's
7	17-Aug	Mon.	09:00 Meeting with Fisheries PM Collection data & information 18:30 Internal meeting	St. George's
8	18-Aug	Tue.	09:00 Meeting with fisheries PM Collection data & information 18:30 Internal meeting	St. George's
9	19-Aug	Wed.	10:00 Meeting with Fisheries Div. 13:00 Collection data and information 15:00 Discussion with General director of fisheries	St. George's
10	20-Aug	Thu.	10:00 Signed Minutes 12:30 Lunch meeting 17:00 Internal meeting	St. George's
11	21-Aug	Fri.	Officials; Dpt. Grenada 10:15(LI361) Arr. Trinidad 10:50 14:00 Report the result of the survey to Embassy of Japan in Port of Spain Consultant members; Continue Survey , Prepare Natural Condition Survey 15:00 Discussion with Fisheries Div.	St. George's
12	22-Aug	Sat.	Officials; Dpt. Trinidad08:35(AA1818)Via. Miami Arr. New York16:36 Consultants; Continue survey, Material Survey at Queen's park	St. George's
13	23-Aug	Sun.	Officials; Dpt. New York12:15(NH009)→ Consultants; Continue Site survey, Natural Condition survey Planning the civil and facilities and equipment	St. George's
14	24-Aug	Mon.	Officials ; Arr. Tokyo14:50 Consultants; Continue Survey, Start Topographic survey, 08:30 Visit Water & Swage, port to collection data 15:00 Discussion with Fisheries (Basic component of Civil work and Facilities plan)	St. George's
15	25-Aug	Tue.	Continue Survey, Natural Condition survey (Topographic, Tide) 08:00 Discussion with Fisheries(Basic component of the civil work and facilities)	St. George's

	Day	Week	Itinerary	Accommodation
16	26-Aug	Wed.	Natural Condition Survey (Bathymetric survey-1) 9:00 Start tide survey 8/26 to 9/8 & 25 hours current condition survey 10:00 Meeting with Fisheries Div.	St. George's
17	27-Aug	Thu.	Continue Survey, Natural Condition Survey(Bathymetric survey-2, prepare borehole survey) 10:00 Survey Landing Jetty	St. George's
18	28-Aug	Fri.	Continue Survey, Natural Condition Survey(Borehole survey#1), Meeting with Fisheries.	St. George's
19	29-Aug	Sat.	Continue Survey, Natural Condition Survey(Borehole survey#2) 08:00 Construction Materials survey 19:00 internal meeting	St. George's
20	30-Aug	Sun.	Natural Condition Survey(Borehole #3) Grenada Island east area and South area Survey Facilities and Equipment Planner ; Dpt.Grenada08:20 Via. New York to Tokyo)	St. George's
21	31-Aug	Mon.	Continue survey, Natural Condition survey 10:00 Data collection at Fisheries Div. 13:00 Discuss about the Cost Estimation Borne by Grenada	St. George's
22	1-Sep	Tue.	Natural Condition Survey, Collection data (Construction /Cost Estimation planner; Dpt. Grenada 08:20(LI361) Arr. Trinidad (10:35)	St. George's
23	2-Sep	Wed.	Natural Condition survey Data collection, 13:00 Meeting with Fisheries Div. (Construction planner/Cost estimator :Collection data in Trinidad)	St. George's
24	3-Sep	Thu.	Site Survey ,Natural Condition Survey (Construction planner/Cost estimator :Collection data in Trinidad)	St. George's
25	4-Sep	Fri.	Continue Survey, Natural Condition Survey 13:00 Meeting with Fisheries Chief Consultant; Dpt. Grenada10:00(LI361)Arr.Trinidad10:35 14:00 Chief Consultant Report Survey result to Embassy of Japan in Trinidad & Tobago	St. George's
26	5-Sep	Sat.	Continue Survey, Natural Condition Survey Chief Consultant and Construction planner/Cost Estimator Dpt. Trinidad 08:35(AA1818) Vir Miami Arr. New York16:36	St. George's
27	6-Sep	Sun.	Natural Condition survey Chief Consultant and Construction planner/Cost Estimator Dpt. New York12:15(NH009)	St. George's
28	7-Sep	Mon.	Natural Condition Survey Chief consultant and Construction planner/Cost Estimator; Arr. Narita14:50 Civil Engineering planner; Dpt .Grenada10:15(LI361)Arr. Trinidad10:50	St. George's
29	8-Sep	Tue.	Natural Condition Survey Civil Engineering planner; Survey Contraction Company in Trinidad	St. George's

	Day	Week	Itinerary	Accommodation
30	9-Sep	Wed.	Civil Engineering Planner; Dpt. Trinidad 08:35 via Miami Arr. New York 16:36 Natural Condition Surveyor; Dpt. Gremada 10:15(LI361) Arr. Trainidad 10:50	Trinidad
31	10-Sep	Thu.	Check the result of the Natural Condition Survey, Collection data Civil Engineering Planner; Dpt. New York 12:15(NH009)	Trinidad
32	11-Sep	Fri.	Natural Condition Surveyor ; Data collection Civil Engineering Planner; Arr. Tokyo 14:50	Trinidad
33	12-Sep	Sat.	Natural Condition Surveyor ; Dpt. Trinidad 08:35 Via Miami Arr. New York 16:36	New York
34	13-Sep	Sun.	Natural Condition Surveyor ; Dpt. New York 12:15(NH009)	
35	14-Sep	Mon.	Natural Condition Surveyor; →Arr. Tokyo 14:50	

2--3 Draft Basic Design Study

	Day	Week	Itinerary		Accommodation
1	21-Oct	Wed.	Dpt. Tokyo 11:00(NH010) Arr. New York10:30(All members)		New York
2	22-Oct	Thu.	Leader and Advisor	Consultants	Trinidad
			Dpt. New York 12:15 (AA1819) Arr. Trinidad 20 : 39		
3	23-Oct	Fri.	Visit Embassy of Japan in Trinidad & Tobago, Dpt.Torinidad19:00(LI334) Arr. Grenada19:35	Explain Draft B/D Report to Fisheries Div.	St. George's
4	24-Oct	Sat.	Site Survey , Meeting with Fisheries Division		St. George's
5	25-Oct	Sun.	Site Survey		St. George's
6	26-Oct	Mon.	Site Survey		St. George's
7	27-Oct	Tue.	Meeting with Ministry of Agriculture (Minister and PS) Meeting with Fisheries Division		St. George's
8	28-Oct	Wed.	Meeting with Fisheries Division		St. George's
9	29-Oct	Thu.	Signed Minutes		St. George's
10	30-Oct	Fri.	Dpt. Grenada 10:05(LI361) Arr. Trinidad 10:40 Report the result of the survey to Embassy of Japan in Trinidad and Tobago		St. George's
11	31-Oct	Sat.	Dpt. Trinidad 09:35 Via Miami Arr. New York16:38		New York
12	1-Nov	Sun.	Dpt. New York 09:30(NH009)		
13	2-Nov	Mon.	Arr. Tokyo 14:50		

3. List of Party Concerned in the Recipient Country

3-1 Preliminary Study

Ministry of Foreign Affairs	Permanent Secretary	Mrs. Madonna Harford
Ministry of Finance	Senior Planning Officer	Ms. Helen Roden
Ministry of Finance	Planning Officer	Mr. Marvyn Haynes
Ministry of Agriculture, Lands, Forestry and Fisheries	Minister	Hon. Mark Isacc
Ministry of Agriculture, Lands, Forestry and Fisheries	Permanent Secretary	Mr. William Joseph
Ministry of Agriculture, Lands, Forestry and Fisheries	Fisheries Officer	Mr. Johnson St. Louis
Ministry of Agriculture, Lands, Forestry and Fisheries	Fisheries Officer	Mr. Roland A. Baldeo
Ministry of Agriculture, Lands, Forestry and Fisheries	Fisheries Officer	Mr. Moran A. Mitchel
Grenadian Commercial Fisheries Limited	Manager	Mr. Miguel Vincent

3--2 Basic Design Study

Ministry of Agriculture, Lands, Forestry and Fisheries	Minister	Hon. Michael Batiste
Ministry of Agriculture, Lands, Forestry and Fisheries	Permanent Secretary	Mr. William Joseph
Ministry of Agriculture, Lands, Forestry and Fisheries	Chief Fisheries Officer	Mr. James Finlay
Ministry of Agriculture, Lands, Forestry and Fisheries	Fisheries Officer-I (Acting CFO)	Mr. Paul E. Phillip
Southern Fishermen's Association	Chairman	Mr. James Nicholas
Ministry of Local Government	Coordinator (Town of St. George's), Advisor for the Minister	Mr. Roy St. John
Physical Planning Unit	Director	Mr. Cesil Frederick
Ministry of Works	Civil Engineer	Mr. John C. St. Louis
Ministry of Agriculture, Lands, Forestry and Fisheries	Fisheries Officer	Mr. Johnson St. Louis
Ministry of Agriculture, Lands, Forestry and Fisheries	Fisheries Officer	Mr. Moran A. Mitchell
Ministry of Agriculture, Lands, Forestry and Fisheries	Fisheries Officer	Mr. Roland A. Baldeo
Ministry of Agriculture, Lands, Forestry and Fisheries	Fisheries Officer (Resources)	Mr. Justine Rennie
Ministry of Agriculture, Lands, Forestry and Fisheries	Fisheries Officer (Aquaculture)	Mr. Juke K. Andrews
Ministry of Agriculture, Lands, Forestry and Fisheries	Assistant Secretary (Fisheries Division)	Ms. Charlene James

3-3 Draft Basic Design Study

Ministry of Agriculture, Lands, Forestry and Fisheries	Minister	Hon. Michael Batiste
Ministry of Agriculture, Lands, Forestry and Fisheries	Chief Fisheries Officer	Mr. James Finlay
Ministry of Agriculture, Lands, Forestry and Fisheries	Fisheries Officer-I (Acting CFO)	Mr. Paul E. Phillip
Southern Fishermen's Association	Chairman	Mr. James Nicholas
Physical Planning Unit	Director	Mr. Cesil Frederick
Ministry of Works	Civil Engineer	Mr. John C. St. Louis
Ministry of Agriculture, Lands, Forestry and Fisheries	Fisheries Officer	Mr. Johnson St. Louis
Ministry of Agriculture, Lands, Forestry and Fisheries	Fisheries Officer	Mr. Roland A. Baldeo
Ministry of Agriculture, Lands, Forestry and Fisheries	Planning Officer (Agriculture)	Mr. Aaron Francois

4. Minutes of Discussion

4-1 Basic Design Study

MINUTES OF DISCUSSIONS

ON

THE BASIC DESIGN STUDY ON THE PROJECT FOR
CONSTRUCTION OF MELVILLE STREET FISH MARKET

IN

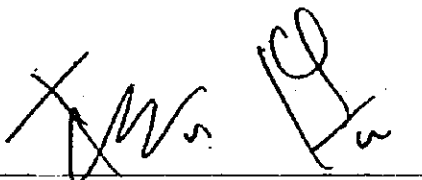
GRENADA

In response to a request from the Government of Grenada, the Government of Japan has decided to conduct a Basic Design Study (hereinafter referred to as "the Study") on the Project for Construction of Melville Street Fish Market in Grenada (hereinafter referred to as "the Project"), and entrusted the Study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Grenada a Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Hiroshi Kitani, Development Specialist, JICA, and is scheduled to stay in the country from August 13, 1998 to September 9, 1998. The Team held discussions with the officials concerned of the Government of Grenada and conducted field surveys at the study area.

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

St. George's, August 20, 1998



Mr. Hiroshi Kitani
Leader
Basic Design Study Team
Japan International Cooperation Agency



Hon. Michael Baptiste
Minister for Agriculture, Lands,
Forestry and Fisheries
Government of Grenada



ATTACHMENT

1. Objective of the Project

The objective of the Project is to construct a fish market in St. George's for the improvement of fish distribution in Grenada.

2. Project Site

The project site is an offshore area along Melville Street shown in the map of ANNEX-1.

3. Responsible Agency and Implementing Agency

The Ministry of Agriculture, Lands, Forestry and Fisheries is the Responsible and Implementing Agency of the Project. The organization charts of the Ministry and the Fisheries Division as an operating organization are shown in ANNEX-2.

4. Major items requested by the Government of Grenada

After series of discussions, the items listed in ANNEX-3 are finally requested by the Government of Grenada. However, the final items, quantity and specifications covered under the project will be subject to further studies.

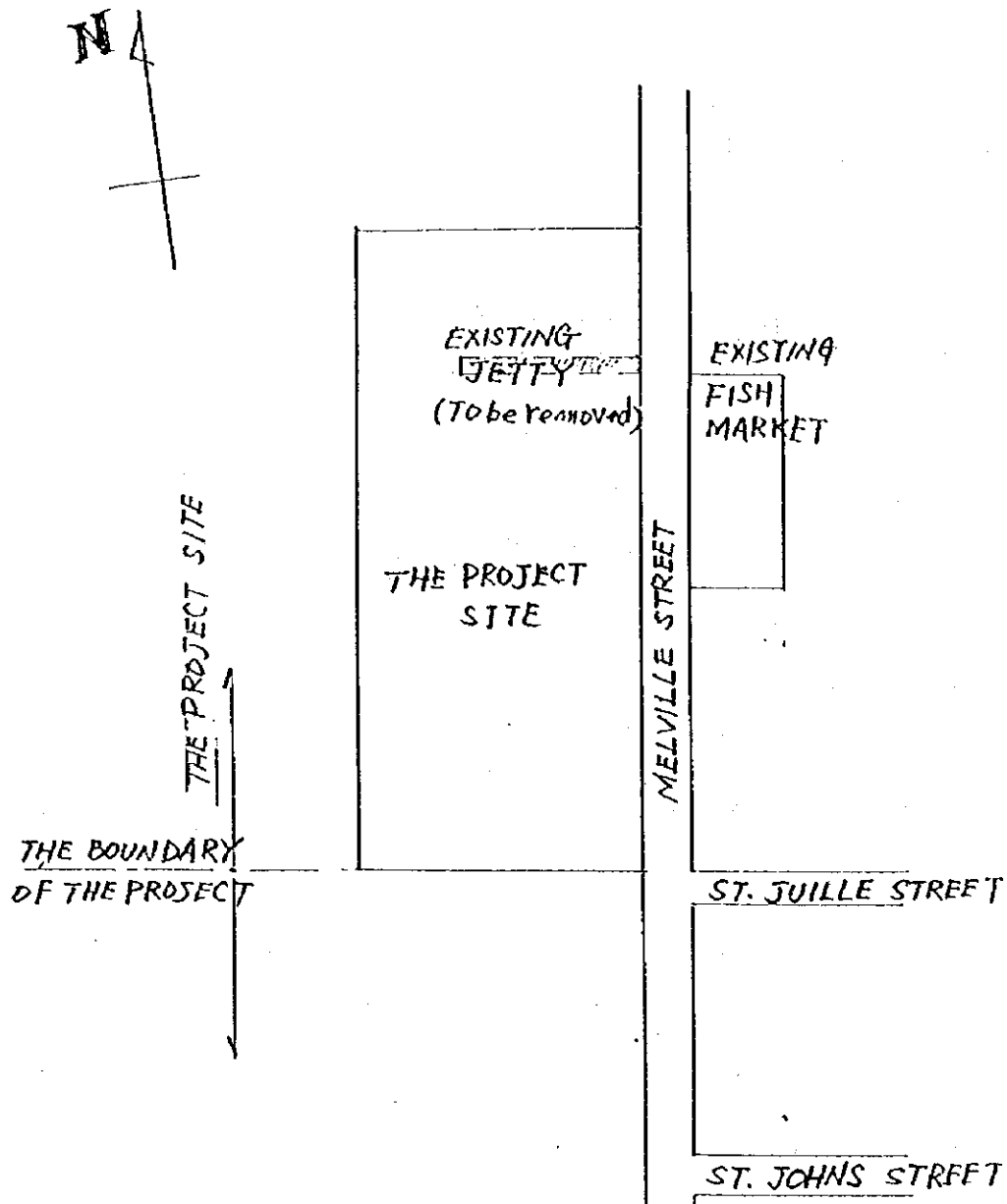
5. Japan's Grant Aid System

- 1) The Government of Grenada has understood the system of Japan's Grant Aid described in ANNEX-4 and explained by the Team.
- 2) The Government of Grenada will take necessary measures described in ANNEX-5 for smooth implementation of the Project on condition that the Grant Aid from the Government of Japan is extended to the Project.

6. Further Schedule of the Study

- 1) The Team will proceed to further study in Grenada until September 9, 1998.
- 2) JICA will prepare a draft report in English and dispatch a mission to Grenada in order to explain its contents around the end of October, 1998.
- 3) In case that the contents of the report are accepted in principle by the Government of Grenada, JICA will complete the final report and send it to the Government of Grenada around January, 1999.

ANNEX-1 PROJECT SITE

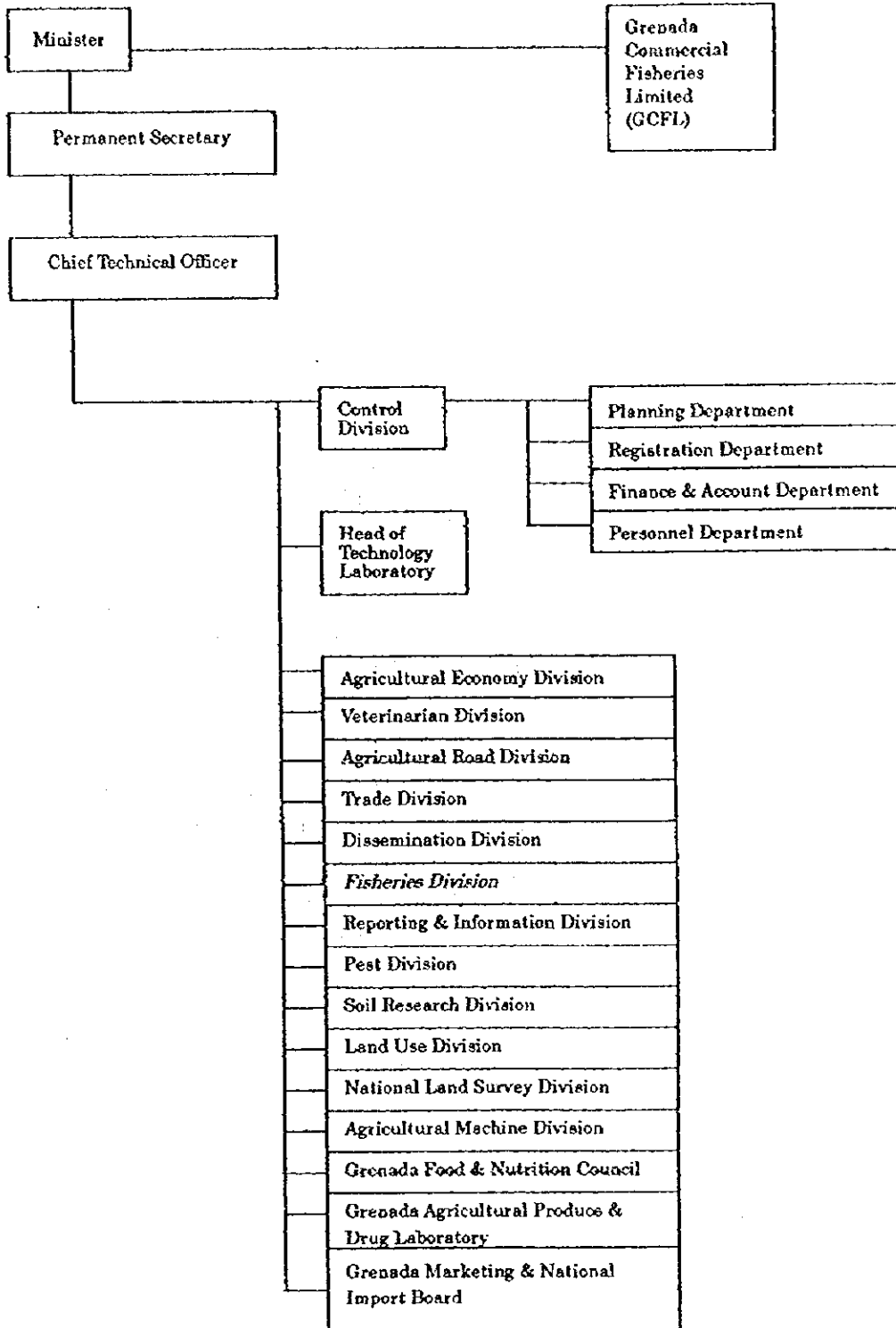


--- The southern boundary of the Project site is the extended line of the north corner of St. Juille Street.

--- The northern boundary of the Project site and the west corner of the fish landing wharf will be decided after further study.

ANNEX-2 ORGANIZATION CHART

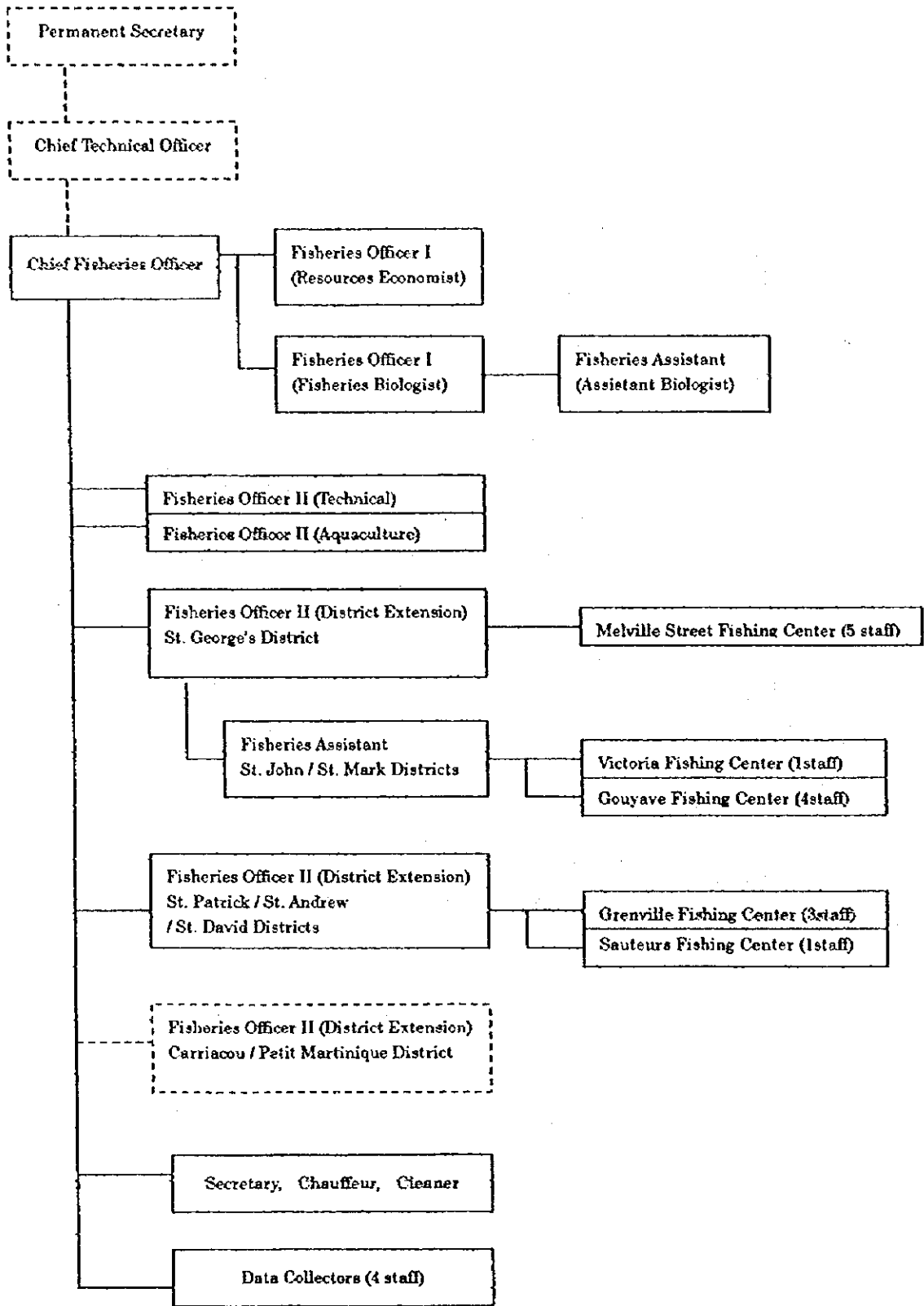
Ministry of Agriculture, Lands, Forestry and Fisheries



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ANNEX-3 ITEMS REQUESTED BY THE GOVERNMENT OF GRENADA

The following items are requested by the Government of Grenada:

- 1) Fish market building consisting of:
 - Ice making / storage plant
 - Retailing counters with water tap
 - Cold / chilled storage
 - Dry store
 - Fish handling space
 - Supervisor's office
 - Sanitary rooms
 - Septic tank
 - Vender's lockers

- 2) Fisheries development center on the 2nd floor of the fish market consisting of:
 - Management office
 - Conference room
 - Seminar rooms
 - Sanitary room

- 3) Fish landing wharf

- 4) Parking lot accommodating approximately 30 cars

- 5) Equipment
 - ① Sea water pump
 - ② Push carts
 - ③ Insulated boxes
 - ④ Fish boxes
 - ⑤ Scales (Retail scales, Platform scale)
 - ⑥ Radio sets

However, construction of above facilities and provision of the equipment, including selection of their numbers and specifications, are subject to the further studies by the Team.

ANNEX-4 JAPAN'S GRANT AID SYSTEM

1. Grant Aid Procedures

1) Japan's Grant Aid System is executed through the following procedures.

Application (Request made by a recipient country)
Study (Basic Design Study conducted by JICA)
Appraisal & Approval (Appraisal by the Government of Japan and
Approval by the Japanese Cabinet)
Determination of Implementation (The Notes exchanged between the
Governments of Japan and the recipient country)

2) Firstly, a request for the Grant Aid submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for the Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using a Japanese consulting firm.

me-b.
Thirdly, the Government of Japan appraises the project so as to see whether or not it is suitable for the Grant Aid, basing on the Basic Design Study report prepared by JICA, and then it is submitted to the Cabinet for approval.

Fourthly, once the project is approved by the Cabinet, its implementation is officially determined by signing the Exchange of Notes between the Governments of Japan and of the recipient country.

Finally, in the course of implementation of the project, JICA will take charge of expediting the execution of the project by assisting the recipient country in such matters as preparing tenders, contracts and so on.

1/10

2. Basic Design Study

1) Contents of the Study

The aim of the Basic Design Study, conducted by JICA on the requested project, is to provide basic documents necessary for the appraisal of the project by the Government of Japan. The contents of the study are as follows:

- a) to confirm the background, objectives and benefits of the project and also institutional capacity of the agencies concerned of the recipient country necessary for the project implementation;
- b) to evaluate the appropriateness of the project from the technical, social and economic points of view;
- c) to confirm items agreed on by both parties concerning the basic concept of the project;
- d) to prepare a basic design of the project; and,
- e) to estimate costs of the project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

4 B
The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the project. Such measures must be guaranteed even through they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the project. Therefore, the implementation of the project is confirmed by all relevant organizations of the recipient country in the Minutes of Discussions.

2) Selection of Consultants

For the smooth implementation of the study, JICA selects a consultant among those who registered at JICA by evaluating competitive proposals submitted by those consultants. The selected consultant carries out the Basic Design Study and prepares a report based on the terms of reference made by JICA.

10/20
At the beginning of the implementation after the Exchange of Notes, JICA recommends the same consultant who participate in the Basic Design Study to the recipient country for the services of Detailed Design and construction supervision of the project in order to maintain the technical consistency between the Basic Design and the Detailed Design.

3. Japan's Grant Aid Scheme

1) What is the Grant Aid?

The Grant Aid Program provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

3) Period

The period of the Grant Aid means the one fiscal year which the Cabinet approves the project for. Within the fiscal year, all procedure such as exchanging of the Notes, concluding contracts with consulting firms and contractors and final payment to them must be completed. However, in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

4) Purchase of Products and Services

Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely consulting, contracting or procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

5) Necessity of Verification

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This verification is deemed necessary to secure accountability to Japanese taxpayers.

6) Undertakings required to the Government of the recipient country

In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:

(1) to secure land necessary for the sites of the project prior to commencement of the construction;

(2) to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities outside the site;

(3) to secure buildings prior to the procurement in case the installation of the equipment;

(4) to ensure tax exemption and prompt execution for unloading, customs clearance at the ports of disembarkation and internal transportation of the products purchased under the Grant Aid;

(5) to exempt Japanese nationals from customs duties, internal taxes and other duties which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts;

(6) to accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such as facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their works.

7) Proper Use

The recipient country is required to maintain and use the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign the necessary staff for this operation and maintenance of them as well as to bear all the expenses other than those covered by the Grant Aid.

8) Re-export

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

9) Banking Arrangement (B/A)

- a) The Government of the recipient country or its designated authority shall open an account in the name of the Government of the recipient country in a bank of Japan (hereinafter referred to as "the Bank"). The Government of

Japan will execute the Grant Aid by making payments to the Bank in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

- b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of recipient country or its designated authority.

W.B.

W.B.

ANNEX-5 UNDERTAKINGS REQUIRED OF THE GOVERNMENT OF GRENADA

In addition to the undertakings mentioned in the section 3. 6) of ANNEX-4, following necessary measures shall be taken by the Government of Grenada on condition that the Grant Aid by the Government of Japan is extended to the Project.

1. to make lands available for acquisition of construction materials such as soil and rock;
2. to construct gates and fence of the Project site;
3. to procure office furniture for the Project ;
4. to bear commissions to the Japanese foreign exchange bank for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to Pay" and other payment commissions;
5. to provide necessary permissions, licenses and other authorizations for implementing the Project;
6. to take necessary measures such as traffic controls of the Melville Street, and removals of existing jetty, fishing boats, fish retail shed, street side parking lots, and other possible obstructs around the site for smooth implementation of the Project. Alternative sites and/or provisions for continuing existing public services during the construction works of the Project are to be planned and informed.
7. to guarantee appropriate budget for operation of facilities of the Project; and,
8. to bear all the expenses other than those covered by the Grant Aid, necessary for the Project.

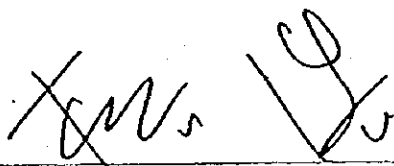
MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY ON THE PROJECT FOR
CONSTRUCTION OF MELVILLE STREET FISH MARKET
IN
GRENADA
(Consultation on the Draft Basic Design)

The Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched to Grenada the Basic Design Study Team on the Project for Construction of Melville Street Fish Market in Grenada (hereinafter referred to as "the Project") in August 1998. As a result of the series of discussions, field surveys in Grenada and technical examination in Japan, JICA prepared the Draft Basic Design on the Project.

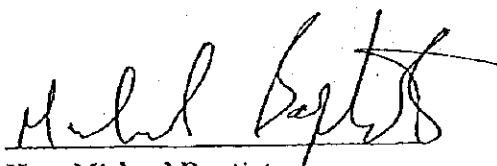
In order to explain and discuss with the Government of Grenada the components of the Draft Basic Design, JICA sent to Grenada the Draft Basic Design Explanation Team (hereinafter referred to as "the Draft Team"), which is headed by Hiroshi Kitani, Development Specialist, JICA, and is scheduled to stay in the country from October 22, 1998 to October 30, 1998.

As a result of discussions, both parties have confirmed the main items described on the attached sheets.

St. George's, October 29, 1998



Mr. Hiroshi Kitani
Leader
Draft Basic Design Explanation Team
Japan International Cooperation Agency



Hon. Michael Baptiste
Minister for Agriculture, Lands,
Forestry and Fisheries
Government of Grenada

ATTACHMENT

1. Major Components of the Draft Basic Design

The Government of Grenada has agreed and accepted in principle the major components of the Draft Basic Design proposed by the Draft Team. The main items, quantity are described in ANNEX-1.

2. Responsible Agency and Implementing Agency

The Ministry of Agriculture, Lands, Forestry and Fisheries is the Responsible and Implementing Agency of the Project.

3. Management and Maintenance

The Ministry of Agriculture, Lands, Forestry and Fisheries will maintain and use properly the equipment purchased under the Project and assign the necessary staff for operation and maintenance of them.

4. Japan's Grant Aid System

- 1) The Government of Grenada has understood the system of Japan's Grant Aid Program described in ANNEX-2 and explained by the Draft Team.
- 2) The Government of Grenada will take necessary measures described in ANNEX-3 for smooth implementation of the Project on the condition that the Grant Aid from the Government of Japan is extended to the Project.

5. Further Schedule of the Study

The Draft Team will make the Final Report in accordance with the confirmed items and send it to the Government of Grenada around January 1999.

6. Other Relevant Issues

- 1) The Government of Grenada will take necessary measures such as traffic control of Melville Street, full explanation to the fishermen, fish retailers, shop owners and the people in St. George's, and also removals of existing jetty, fishing boats, fish retail shed, street side parking lots, and other possible obstructions around the site for smooth implementation of the Project.

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- 2) Alternative sites and/or provisions for continuing existing public services during the construction works of the Project are being discussed, and the Government of Japan will be informed of the details of final plan in due course in accordance with the implementation schedule of the Project.
- 3) The Government of Grenada will guarantee appropriate budget for operation of facilities of the Project.

ANNEX-1 COMPONENTS OF THE DRAFT BASIC DESIGN

Major Items	Specifications	Remark
1. Facilities		
1-1 Fish market facilities (1) Ice making/storage plant (2) Fish retailing counters (3) Cold/chilled storage bin (4) Store (5) Handling space (6) Market supervisor's room (7) Sanitary rooms (8) Vendor's lockers	Fish market building: the first floor is about 676 m ² . Ice making capacity is about 2.0 tons/day. Ice storage capacity is 6 tons. Retailing booth×30, Sink×6 About 1.5 tons (divided into 2 portions) Supervisor room×1, Staff room×1 Shower, Toilet	Ice storage capacity of 3 days of ice making 30 Vendors
1-2 Fisheries development center (1) Administration office, etc. (2) Conference room (3) Office of business department (4) Sanitary rooms	The 2 nd floor of fish market building of about 338 m ² . Center director's room, Reception/Secretary room, General affairs/Accounting office, Office store, Used for conference and training course, etc. 3 business departments of Fishery resources control, Fishing technology & extension, and Biological research Toilet, Pantry, Locker	
1-3 Fish landing wharf (1) Revetment(south & west) (2) Landing wharf (3) Breakwater (4) Reclamation	Total length: South 42m, West 90.5m For small fishing boat×1 berth, For medium size fishing boat×2 berths Total length 35m Parallel with beach 90.5m Right angle to beach 42m Embankment + 3.0m	Parapet height: +4.5m Approach revetment is 15m.
1-4 Parking lot (1) Parking lot (2) Pavement on the premises	Parking capacity about 30cars, asphalt pavement Concrete pavement	
2. Equipment		
2-1 Sea Water Pump	Head 15m, Aperture 1inch 1 unit	
2-2 Pushcart	Loading capacity: 300kg, Dimension of loading platform is 1.20m×0.90m. 5 units	
2-3 Insulated Box	750 liter type, lid (attached with handle) 2 units	
2-4 Fish box	Outer dimension 720mm×480mm×200mm Material: Polyethylene 60 boxes	
2-5 Scale	For retailing: Desktop balance type, 0~20lbs 33sets Platform scale: Floor put type, 0~200lbs 2sets	
2-6 Radio Set	Marine band VHF 3watts/10watts switching type, attached with wiring material and antenna equipment 1 set	

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ANNEX-2 JAPAN'S GRANT AID SYSTEM

1. Grant Aid Procedures

- 1) Japan's Grant Aid System is executed through the following procedures.

Application (Request made by a recipient country)
Study (Basic Design Study conducted by JICA)
Appraisal & Approval (Appraisal by the Government of Japan and
Approval by the Japanese Cabinet)
Determination of Implementation (The Notes exchanged between the
Governments of Japan and the recipient country)

- 2) Firstly, a request for the Grant Aid submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for the Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using a Japanese consulting firm.

Thirdly, the Government of Japan appraises the project so as to see whether or not it is suitable for the Grant Aid, basing on the Basic Design Study report prepared by JICA, and then it is submitted to the Cabinet for approval.

Fourthly, once the project is approved by the Cabinet, its implementation is officially determined by signing the Exchange of Notes between the Governments of Japan and of the recipient country.

Finally, in the course of implementation of the project, JICA will take charge of expediting the execution of the project by assisting the recipient country in such matters as preparing tenders, contracts and so on.

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1) Contents of the Study

The aim of the Basic Design Study, conducted by JICA on the requested project, is to provide basic documents necessary for the appraisal of the project by the Government of Japan. The contents of the study are as follows:

- a) to confirm the background, objectives and benefits of the project and also institutional capacity of the agencies concerned of the recipient country necessary for the project implementation;
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- c) to confirm items agreed on by both parties concerning the basic concept of the project;
- d) to prepare a basic design of the project; and,
- e) to estimate costs of the project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the project. Such measures must be guaranteed even through they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the project. Therefore, the implementation of the project is confirmed by all relevant organizations of the recipient country in the Minutes of Discussions.

2) Selection of Consultants

For the smooth implementation of the study, JICA selects a consultant among those who registered at JICA by evaluating competitive proposals submitted by those consultants. The selected consultant carries out the Basic Design Study and prepare a report based on the terms of reference made by JICA.

At the beginning of the implementation after the Exchange of Notes, JICA recommends the same consultant who participate in the Basic Design Study to the recipient country for the services of Detailed Design and construction supervision of the project in order to maintain the technical consistency between the Basic Design and the Detailed Design.

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2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

3) Period

The period of the Grant Aid means the one fiscal year which the Cabinet approves the project for. Within the fiscal year, all procedure such as exchanging of the Notes, concluding contracts with consulting firms and contractors and final payment to them must be completed. However, in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

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Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely consulting, contracting or procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

5) Necessity of Verification

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals.

Those contracts shall be verified by the Government of Japan. This verification is deemed necessary to secure accountability to Japanese taxpayers.

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In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:

(1) to secure land necessary for the sites of the project prior to commencement of the construction;

(2) to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities outside the site;

(3) to secure buildings prior to the procurement in case the installation of the equipment;

(4) to ensure tax exemption and prompt execution for unloading, customs clearance at the ports of disembarkation and internal transportation of the products purchased under the Grant Aid;

(5) to exempt Japanese nationals from customs duties, internal taxes and other duties which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts;

(6) to accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such as facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their works.

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- b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of recipient country or its designated authority.

MB



ANNEX-3 UNDERTAKINGS REQUIRED OF THE GOVERNMENT OF GRENADA

In addition to the undertakings mentioned in the section 3. 6) of ANNEX-2, following necessary measures shall be taken by the Government of Grenada on condition that the Grant Aid by the Government of Japan is extended to the Project.

1. To make lands (quarry sites) available for acquisition of construction materials such as soil, gravel and rock;
2. to construct gates and fence of the Project site;
3. to procure office furniture for the Project ;
4. to bear commissions of a Japanese bank for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to Pay" and other payment commissions;
5. to provide necessary permissions, licenses and other authorizations for implementing the Project;
6. to bear all the expenses other than those covered by the Grant Aid, necessary for the Project.

5.Result of the Site Survey and Wave Analysis

5-1 Topographic and Bathymetric Survey

5-2 Soil investigation and Boring Survey

5-3 Material Survey

5-4 Wave Analysis

5-5 Tide and Current Survey

5-1 Topographic and bathymetric survey

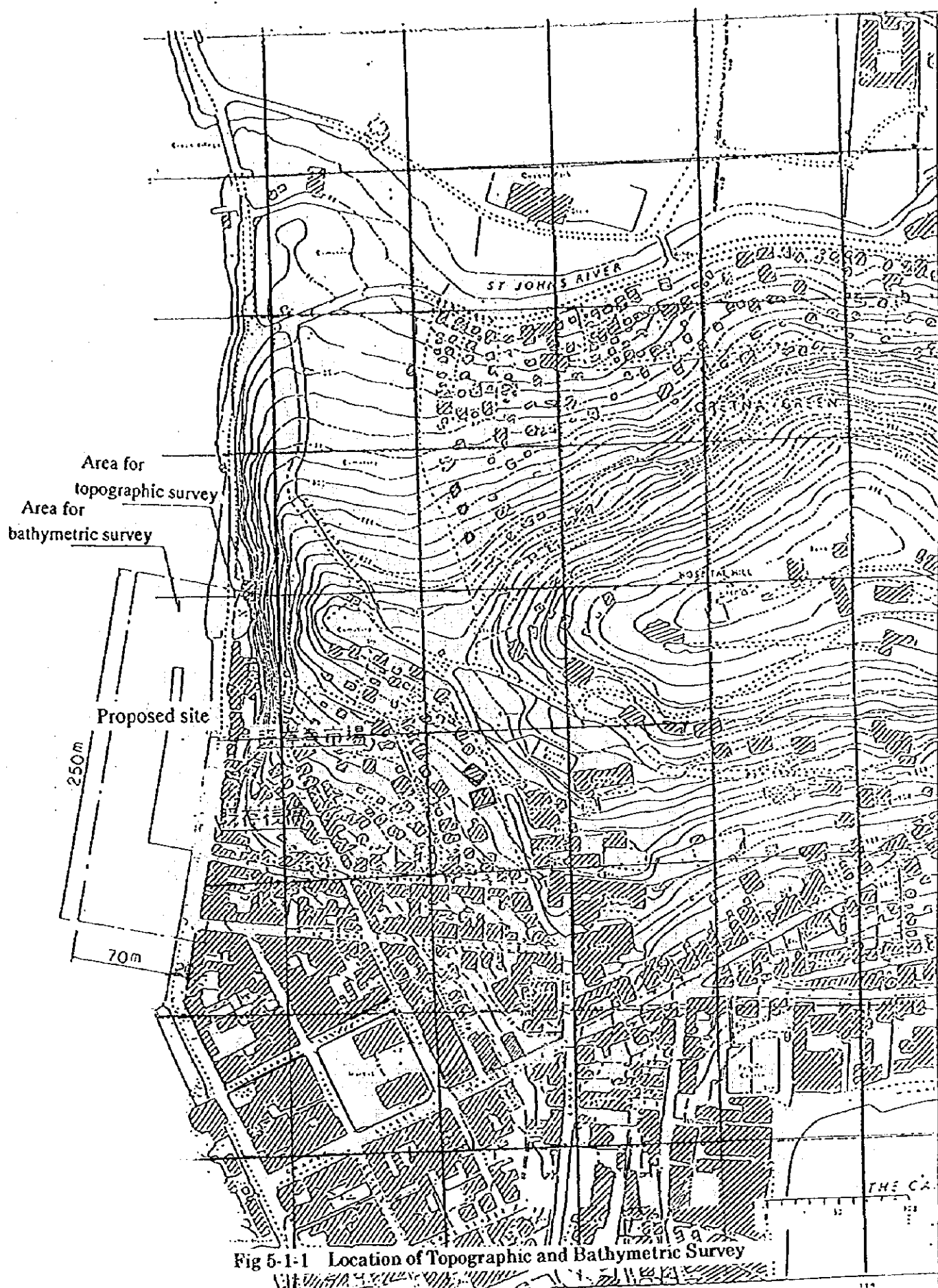
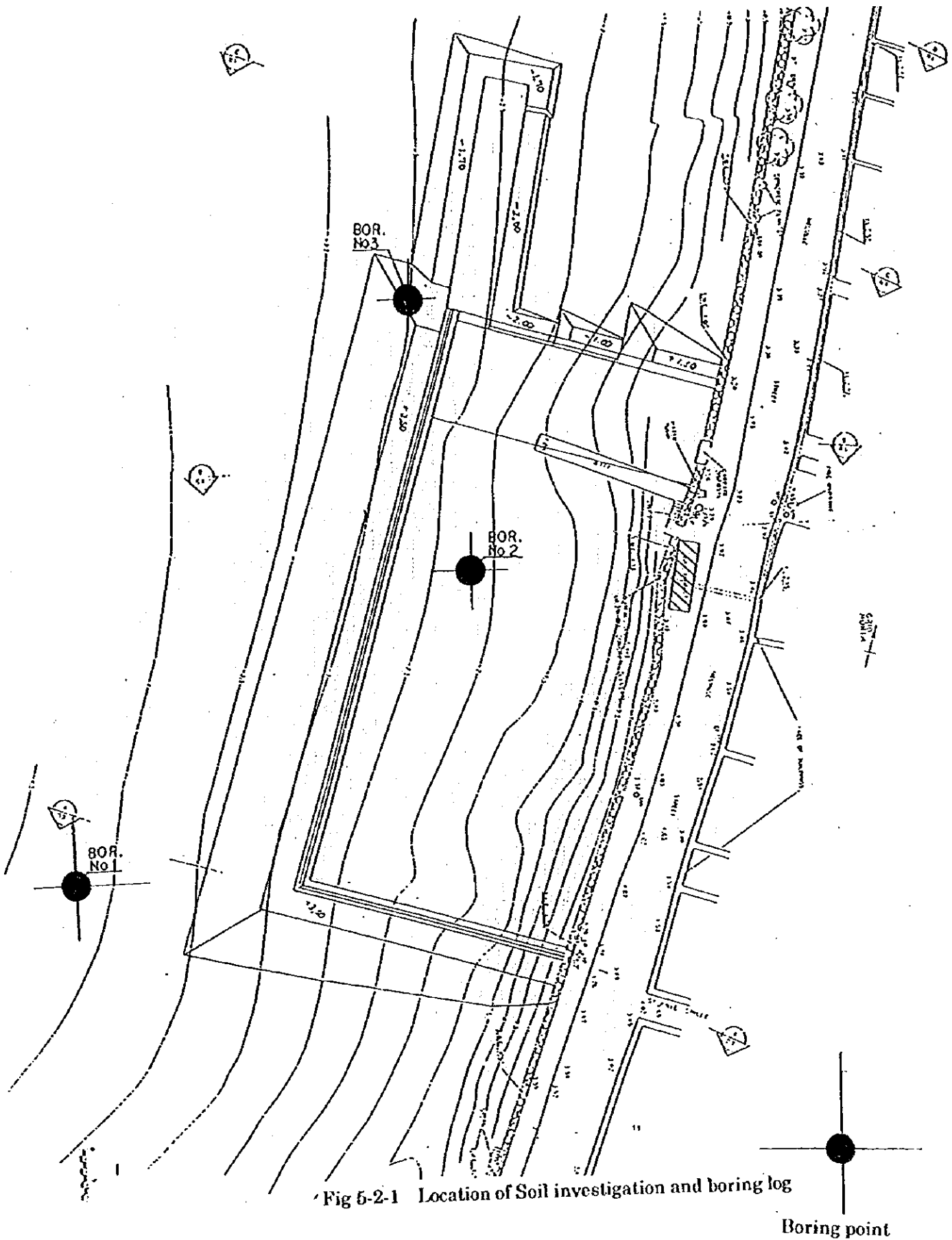


Fig 5-1-1 Location of Topographic and Bathymetric Survey

5-2 Soil investigation and Boring Survey



LEE YOUNG & PARTNERS - GEOTECHNICAL DEPARTMENT
BOREHOLE TEST RECORD

JOB No. W-706

BORING No. 2

SHEET 1 OF 1

PROJECT FISH MARKET JETTY

DATE STARTED 28 AUG. '98

LOCATION GRENAADA

TYPE BORING WASH PERCUSSION

DATE COMPLETED 28 AUG. '98

DEPTH - M	SAMPLE NUMBER	SOIL PROFILE DESCRIPTION				S.P.T. VALUE* (BLOWS/300mm)	MOISTURE CONTENT (%)	SPECIFIC GRAVITY	SHEAR STRENGTH KN/m ² WATER CONTENT % STD. PENETRATION TEST* N-VALUE (BLOW/300mm) C _u (KN/m ²) & φ	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	CONSOLIDATION TEST	HYDROMETRICS TEST	SIEVE (N.A.S.)	C _u (KN/m ²)	φ DEGREES	UNCONFINED COMPRESSION TEST	POCKET PEN	SHEAR VANE (KN/m ²)
		STRATIGRAPHIC PLOT	SOIL CLASSIFICATION	X FINE SAND	Z SAND															
1																				
2																				
2.5	1	SW-SM		5.48		5	18.4	2.78												
3				72.8																
3.5	2	SM		15.5		8	25.4													
4				64.44																
5	3	SW-SM		10.8		10	20.8													
6				83.89																
7	4	SW-SM		12.5		82	16.4	2.47												
8	5	SP-SM		4.5		>	31.2													
8.5				91.6																
9				56.23																
10				66.23																
11				83.89																
12				10.8																
13				15.5																
14				72.8																
15				18.4																

SOIL CLASSIFICATION AS PER ASTM D 2487-93
 WATER DEPTH N/A HOURS AFTER DRILLING

POCKET PEN (KN/m²) & C_u

DRILLER B.S. SANTI
 WATER ENCOUNTERED N/A

LEGEND

WASH PERCUSSION	GRAVEL	SAND	UNCEMENTED CALCAREOUS MATTER	LOAM	SCHIST
UNDISTURBED (S-CLBY)	SILT	CLAY	PEAT	LIMESTONE	HARD SHALE
UNDISTURBED (NO RECOVERY)					
AUGER					
DIAMOND CORE					

PLASTIC LIMIT LIQUID LIMIT
 X NATURAL WATER CONTENT, W
 Δ H - VALUE (S.P.T.)
 φ φ (Angle of Internal Friction)
 W - Wet Sieve
 O - Dry Sieve

▼ POCKET PENETROMETER
 ■ UNCONFINED COMPRESSION TEST
 ⊙ TRIAXIAL TEST
 Δ VANE SHEAR TEST
 ○ C_u (KN/m²)
 ⊕ C_u (Unconfined Compression Strength)
 *MAUWER WEIGHT - 1100 DROP - 30"

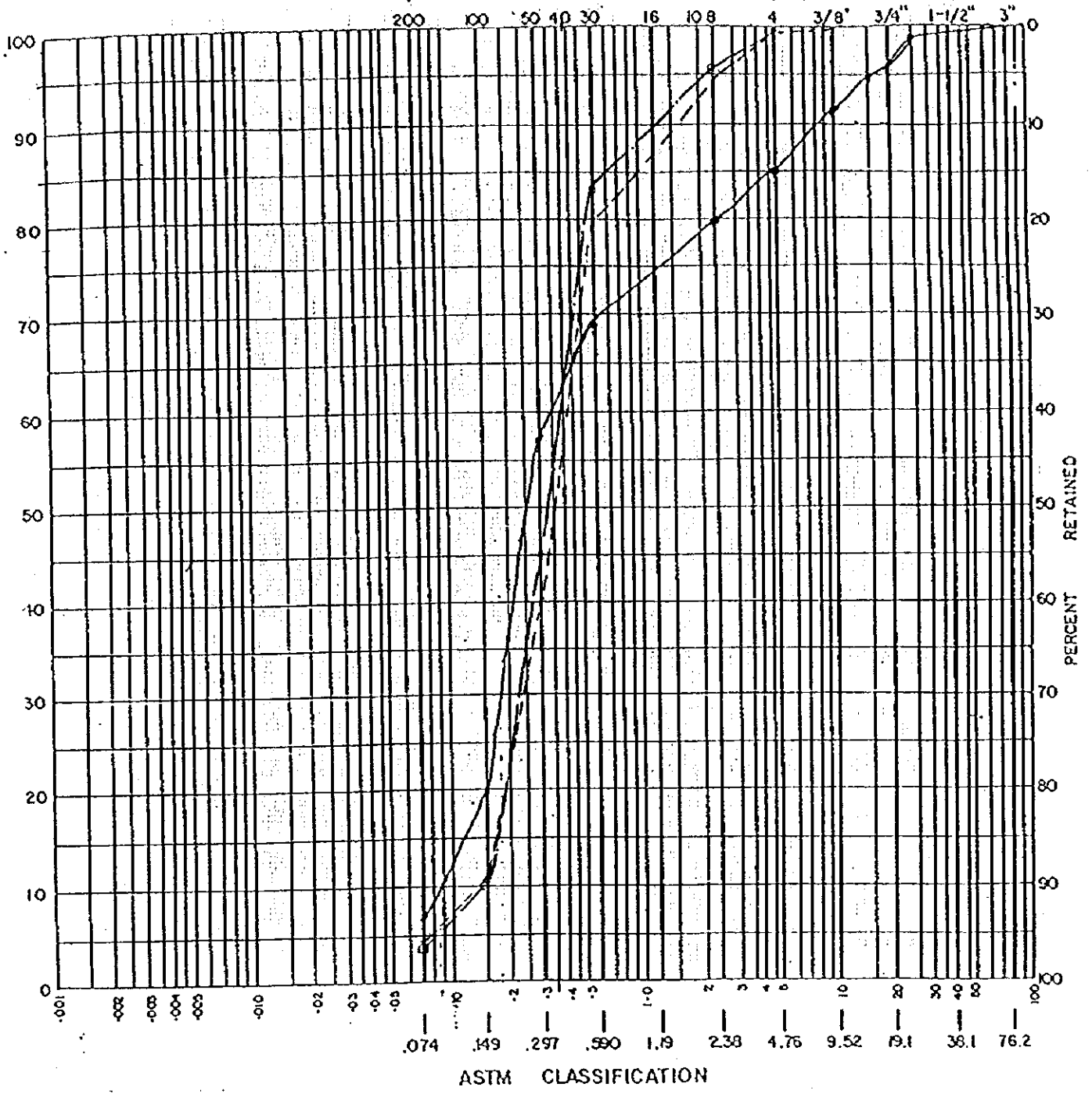
NOTE % OF GRAVEL IS NOT SHOWN ON THIS SHEET

Fig 5-2-3 Boring record 2

HYDROMETER ANALYSIS

SIEVE ANALYSIS

CLEAR SQUARE OPENINGS



- : No. 1
- - - - - : No. 2
- · - · - : No. 3

5--3 :Material survey

1. Filling material

Quarry of the filling material for the construction of the project is available in Grenada. The location of quarry is at Queen's Park in St. George's, Telescope in Grenville and quarry at Mt. Hartman estate. The result of sieve analysis is as follows.

Table 5-3-1 Sieve analysis of the filling material and gravel

Sieve size	% passing						
	Filling material				Gravel		
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 1	Sample 2	Sample 3
1 1/2"	100	100	99	100			
1"	97	97	95	94	100	100	100
3/4"	94	94	94	89	92	62	88
1/2"	75	75	77	75	37	1	54
3/8"	60	60	62	60	20		1
#4	35	35	35	36	11		
#8	20	20	21	21	6		
#16	12	12	12	12			
#30	9	9	10	8			
#50	7	7	8	5			
#100	6	6	5	4			
#200	5	5	3	3			

Specific gravity 2.60 to 2.62

2. Aggregates

Aggregate is also available at the quarry mentioned above. Sieve analysis is shown in above table.

3. Stone

Rubble stone is available at Quarry of Telescope and Queen's park.

4. Concrete Plant

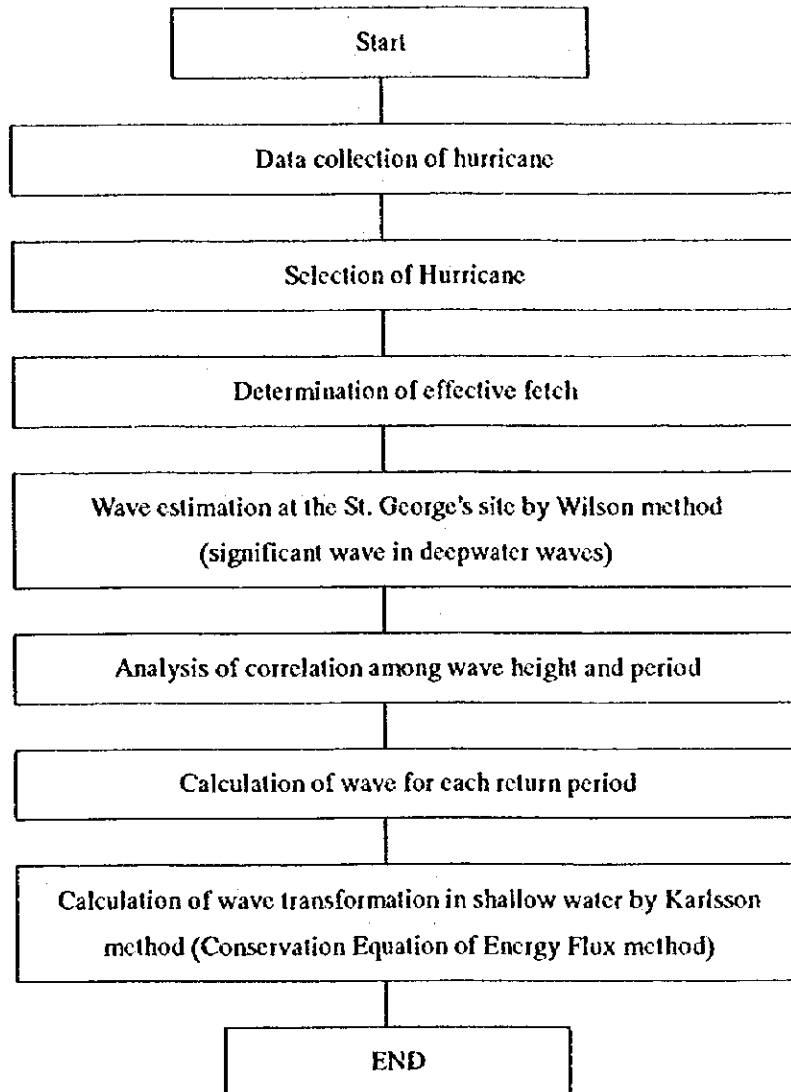
Concrete plant is in the Queen's Park of Private Company.

5. Asphalt plant

Asphalt plant of private company is located in Halifax Harbour, north of Happy Hill.

5-4 Wave Analysis

In order to determine the design wave for the project, Hurricane wave was estimated by collecting the weather report and data as mention in the main report. The wave is estimated as following flow chart.



Based on the evaluation of the wave estimation study, deep water wave of 30 years return period of different direction and its equivalent deep water wave are summarized as follows.

Table 5-4-1 Deep water wave and equivalent deep water wave of 30 years return period

Offshore wave Direction		Wind wave						Swell	
		WSW	W	WNW	NW	NNW	N	NNW	N
Deep water waves	$H_{1/3}$	2.4m	2.6m	2.7m	2.8m	2.9m	2.9m	2.9m	2.9m
	$T_{1/3}$	6.0s	6.3s	6.5s	6.6s	6.7s	6.8s	11.4s	9.9s
Equivalent deep water waves	$H_{1/3}$	2.0m	2.4m	2.5m	2.4m	1.8m	1.2m	1.2m	0.9m
	Dire.	268°	274°	289°	299°	306°	309°	298°	303°

The relation of wave height and return period according to wave direction is shown in the Fig. 5-4-1 and 5-4-2. Among the estimated wave, WNW is the biggest equivalent deep water wave at the proposed site. The direction and height of equivalent deep water wave of the WNW wave for 30 years return period are as shown in Fig 5-4-3 and 5-4-4, respectively.

And Swell from NNW direction, the direction and height of equivalent deep water wave are also attached in Fig 5-4-5 and 5-4-6.

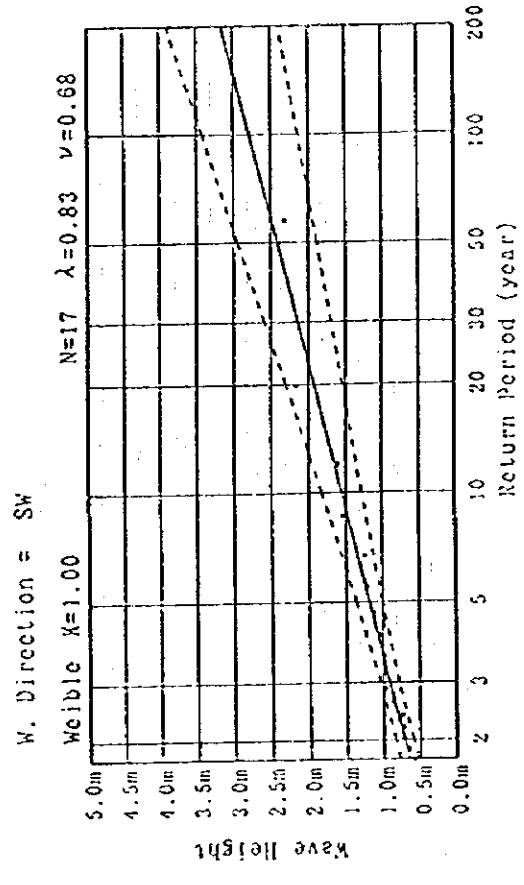
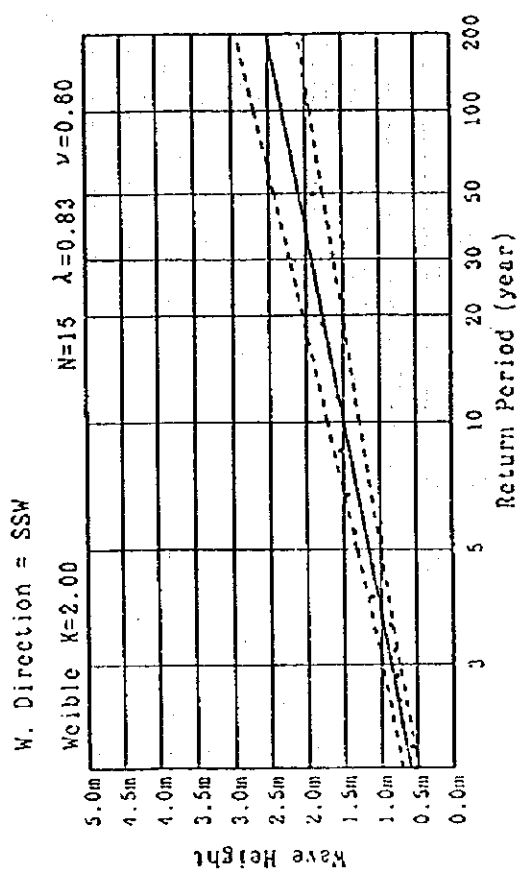
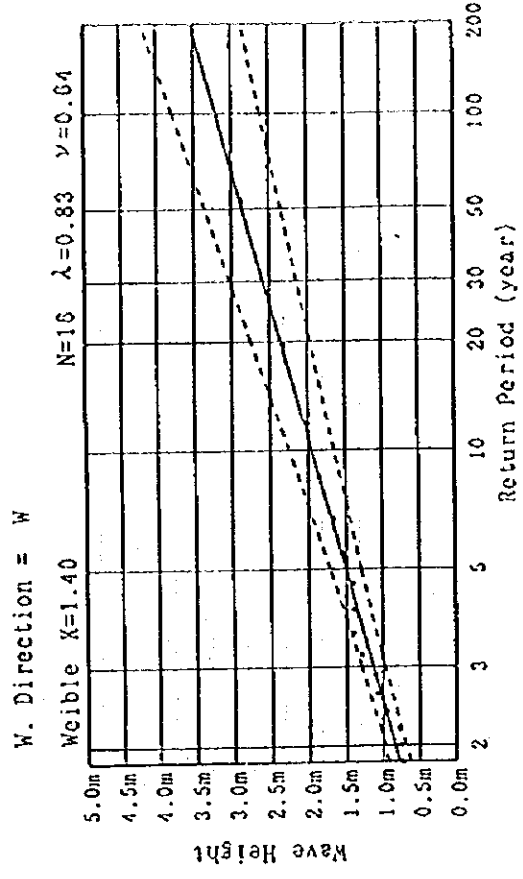
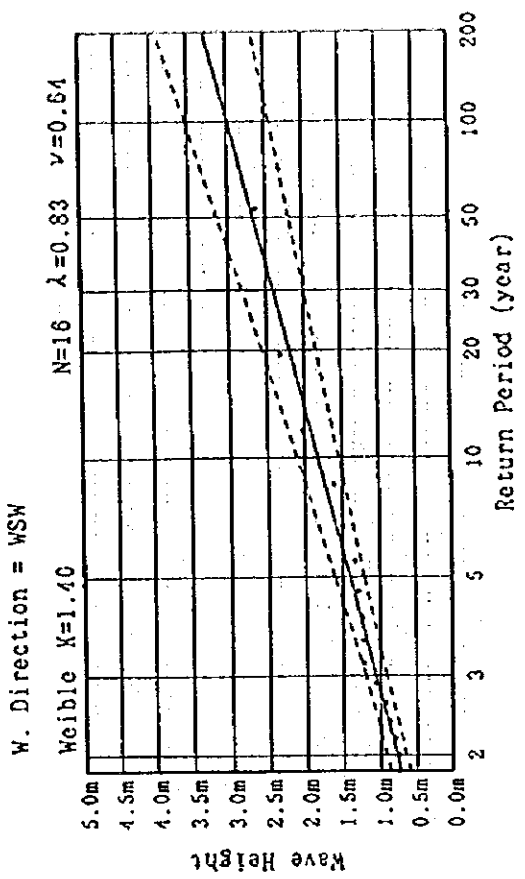


Fig 5-4-1 The relation of wave height and return period by wave direction

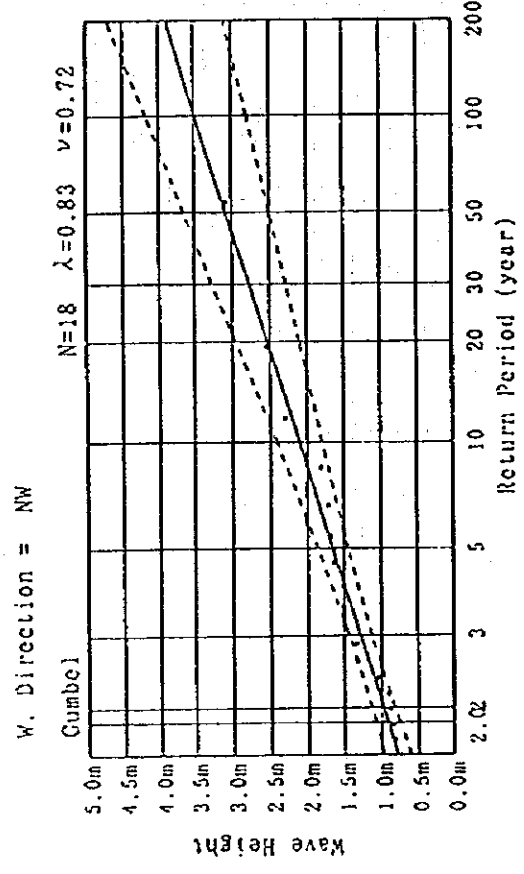
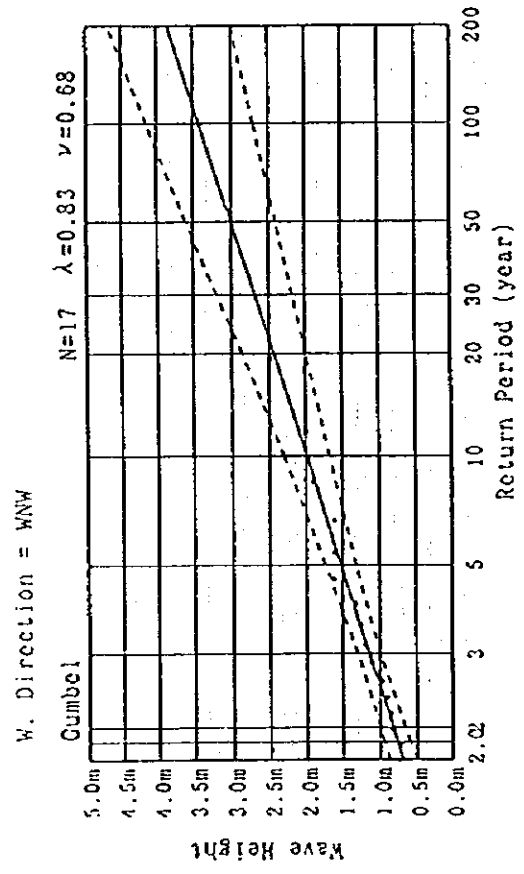
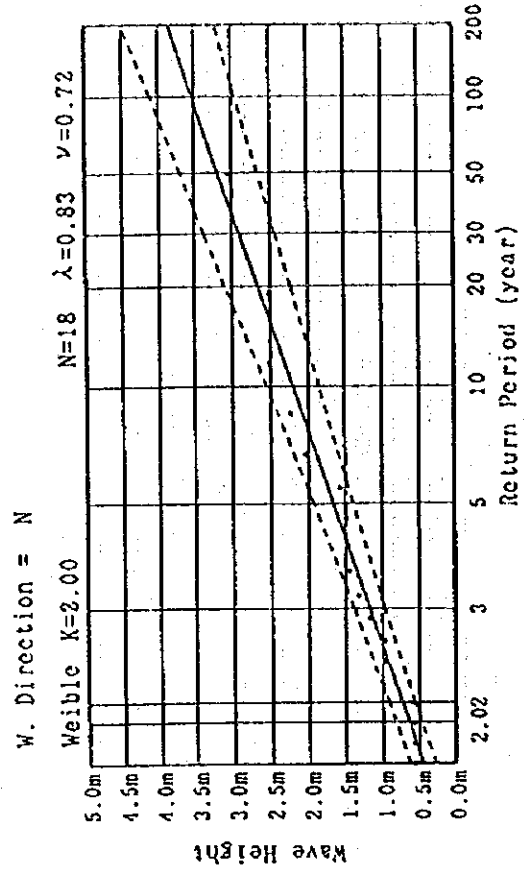
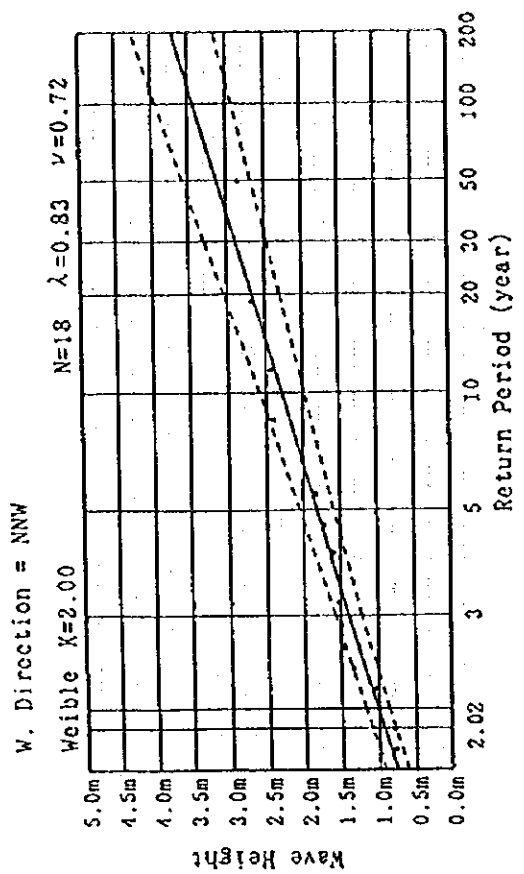


Fig 5-4-2 The relation of wave height and return period by wave direction

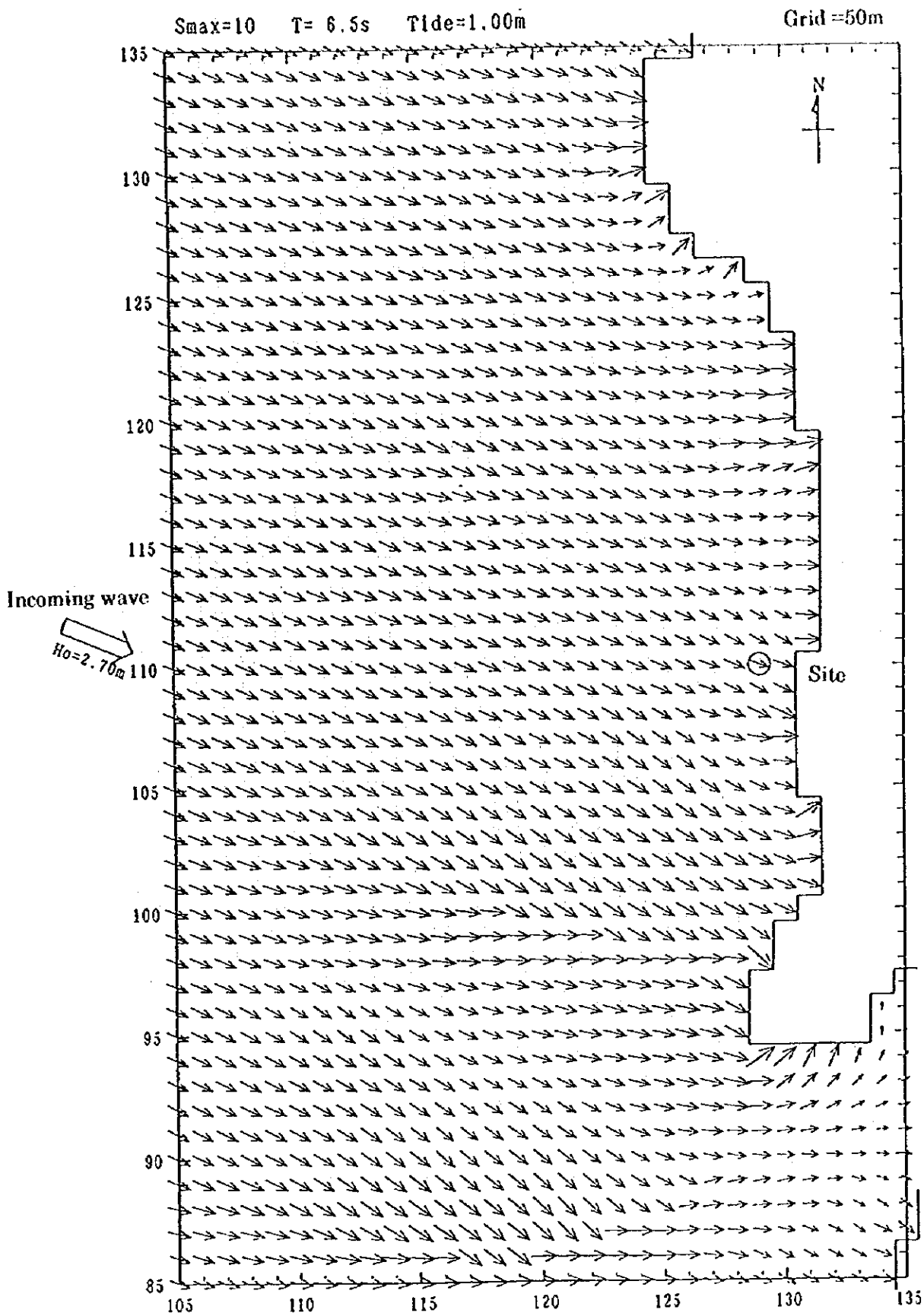


Fig 5-4-3 Wave direction for WNW wave of 30 years return period

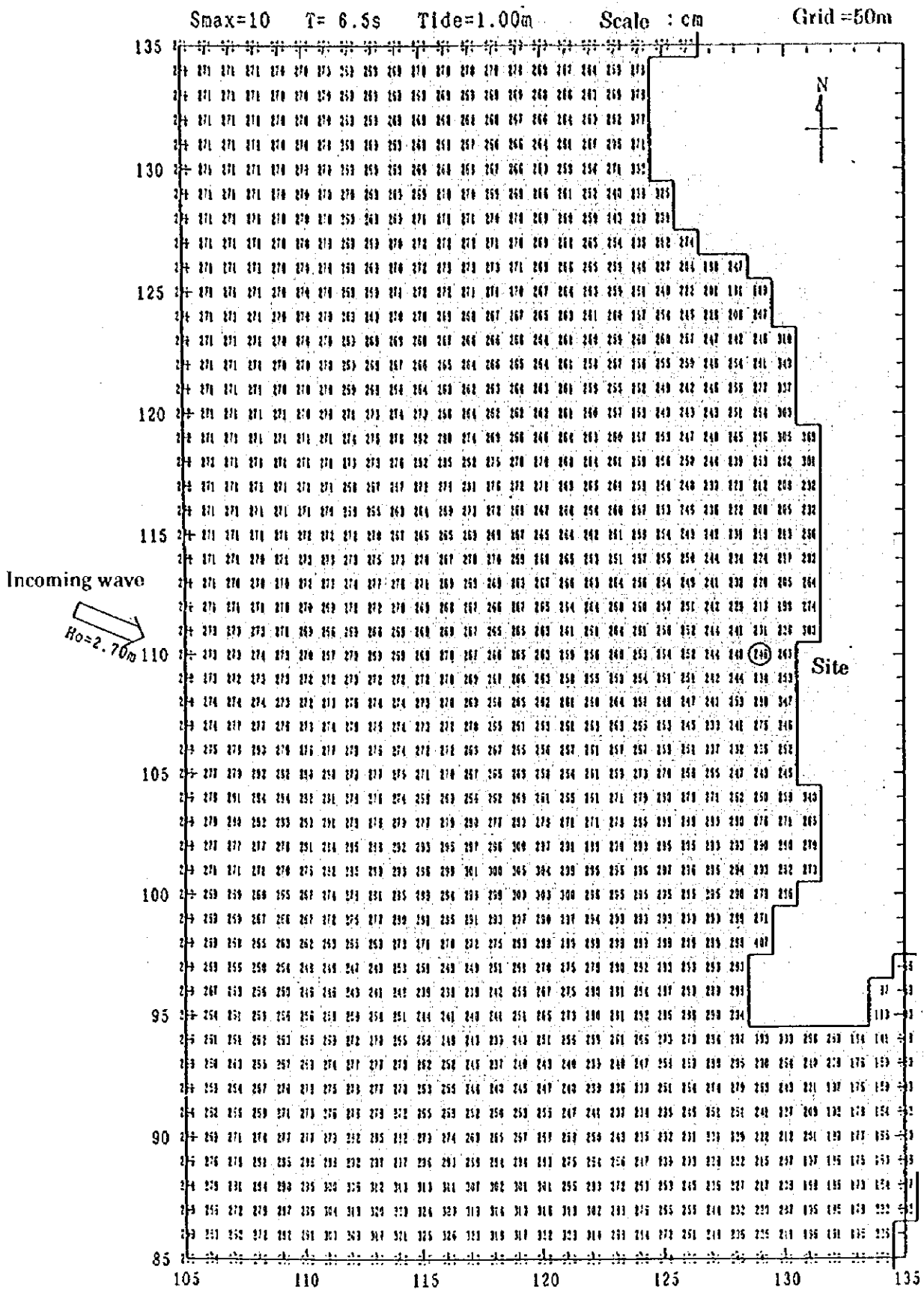


Fig 5-4-4 Wave direction for WNW wave of 30 years return period

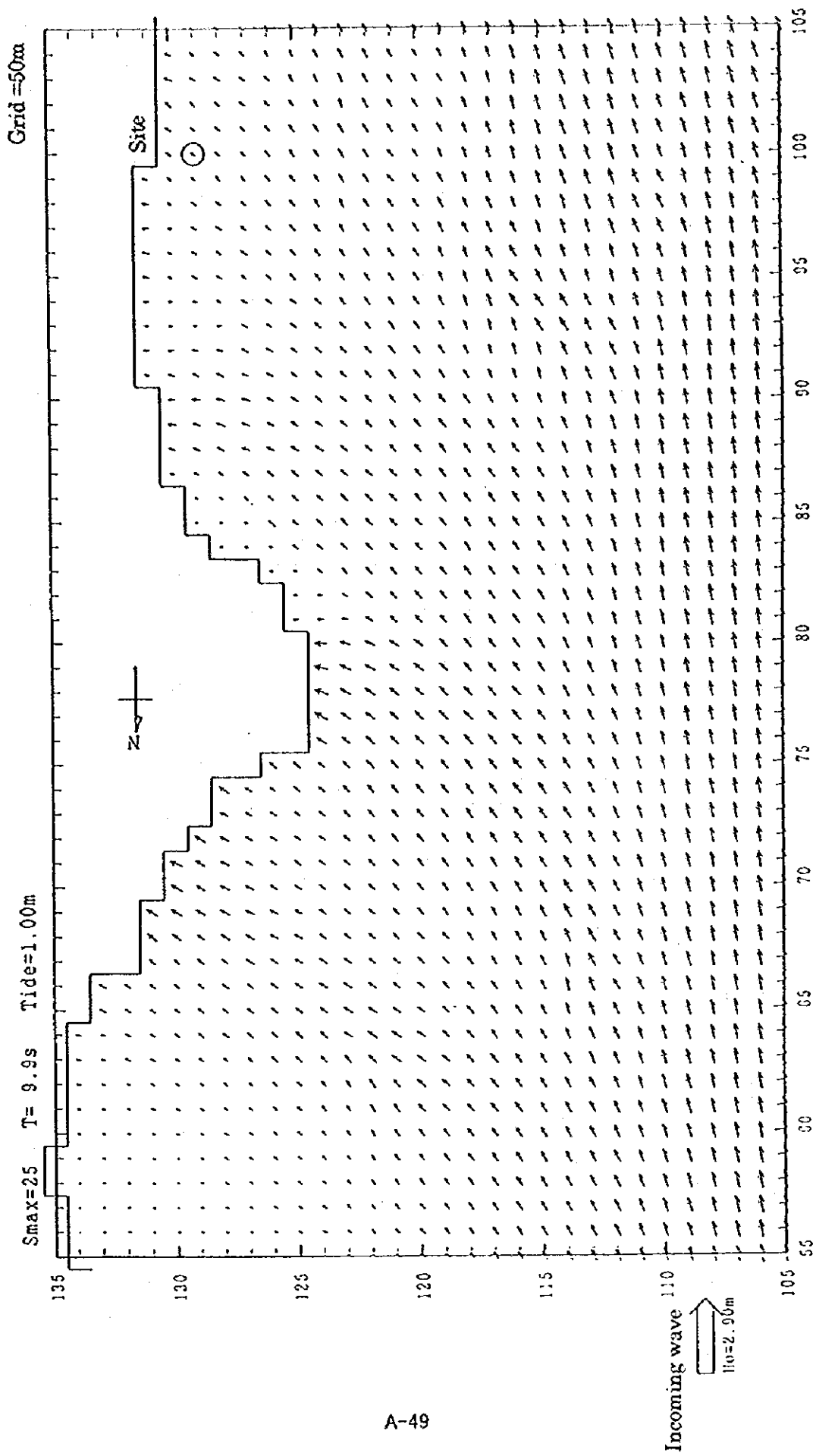


Fig 5-4-5 Wave direction for N wave of 30 years return period

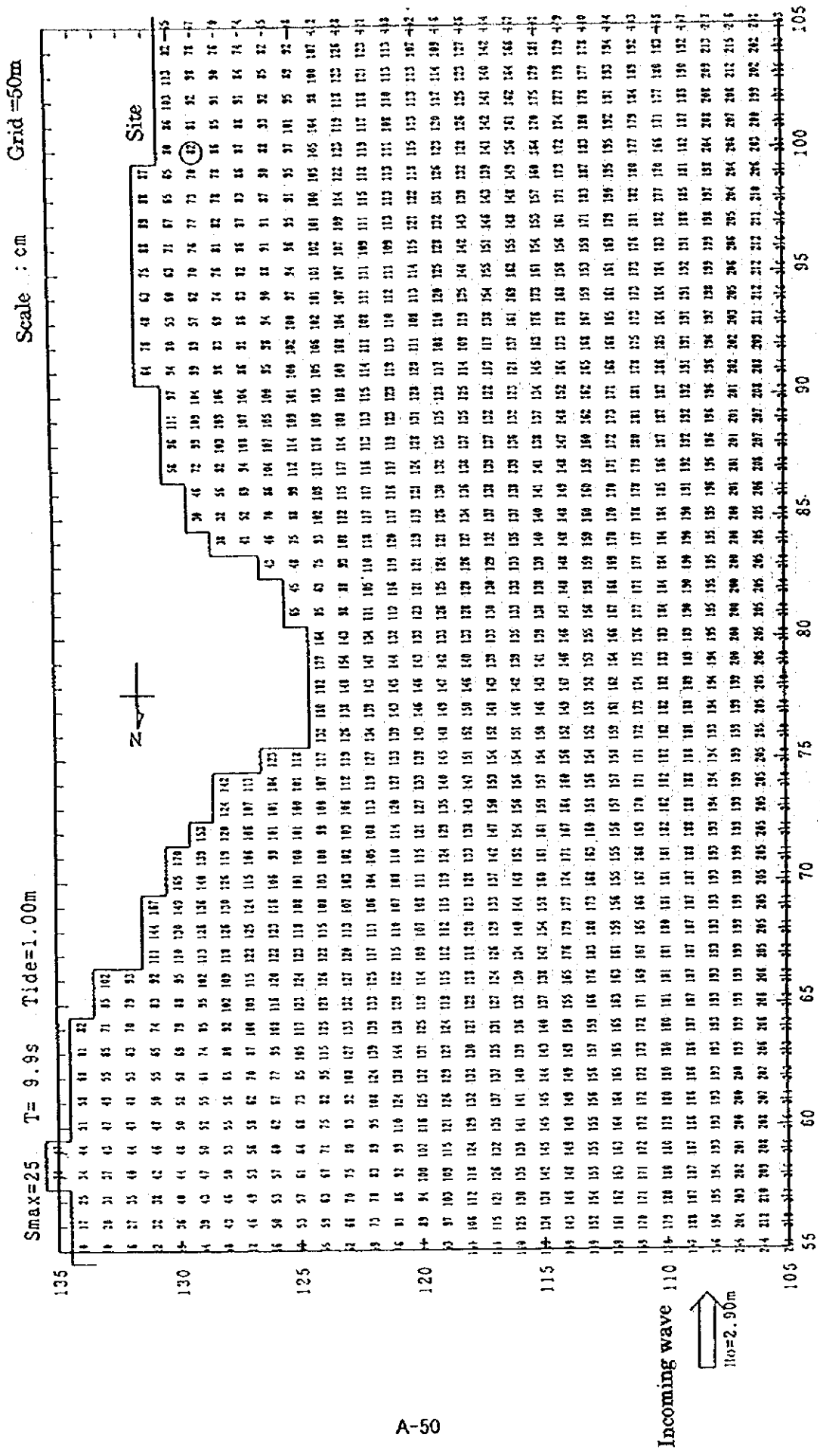
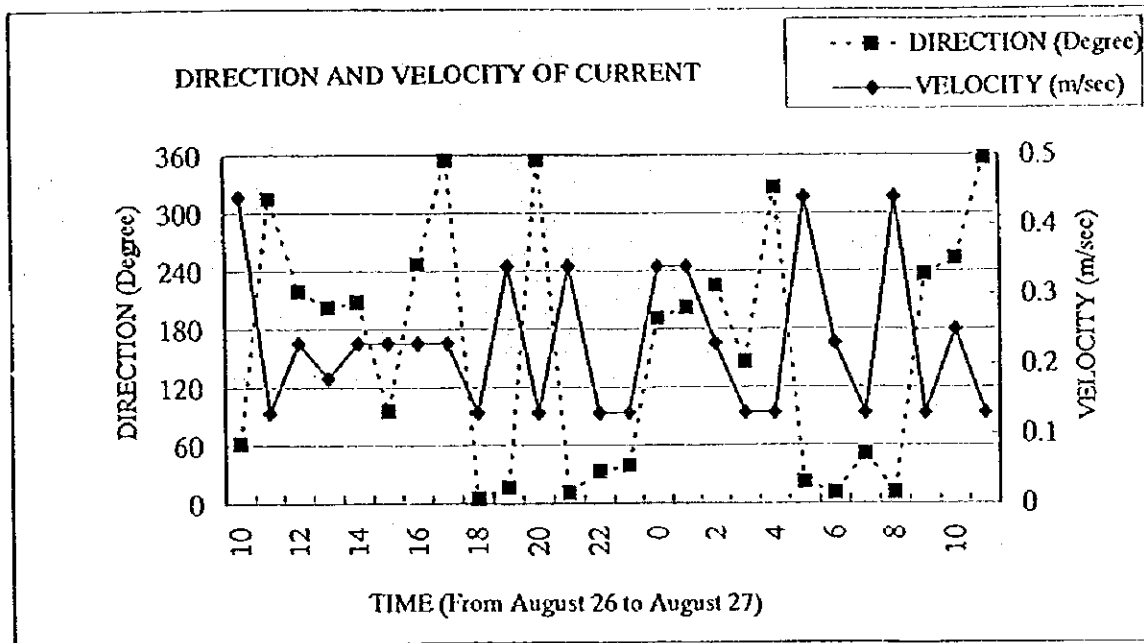
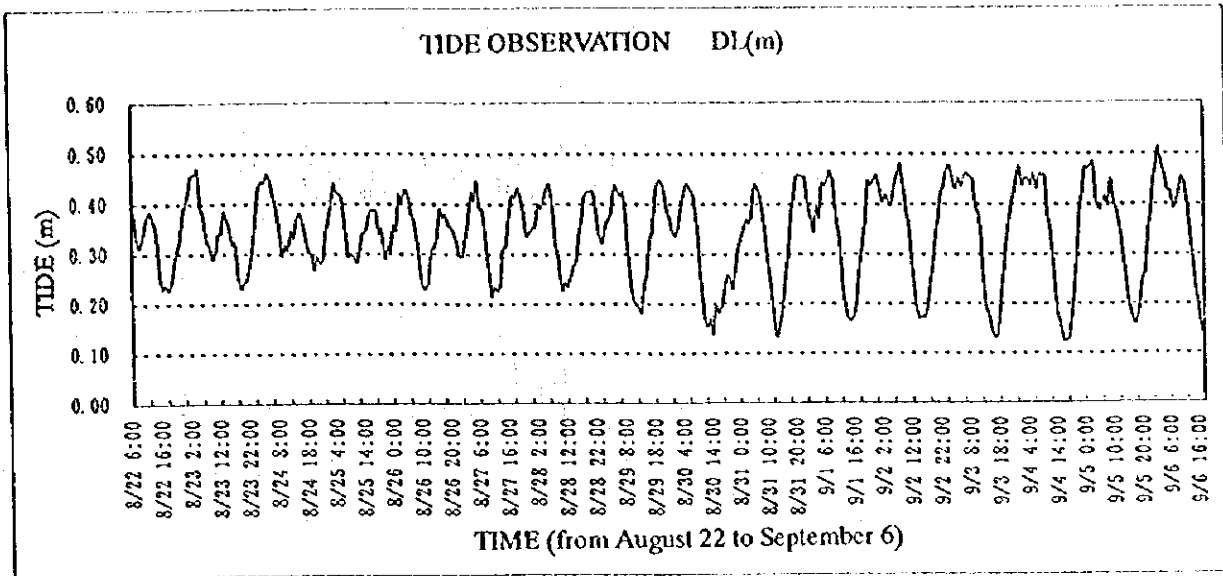


Fig 5-4-6 Wave height for N wave of 30 years return period

5-5 Tide and Current Survey



7. References

Name of References	Issued by	Published in
(1) List of Vendors who operates at the Melville Fish Market	Ministry of Agriculture, Forestry, Lands and Fisheries, Fisheries Division	1998
(2) Fishermen' s Associations	Ministry of Agriculture, Forestry, Lands and Fisheries, Fisheries Division	1998
(3) Monthly Fish Production for the year 1996	Ministry of Agriculture, Forestry, Lands and Fisheries, Fisheries Division	1997
(4) Revenue collected at Fish Centers (1995, 1996, 1997, 1998 (Jan.-July))	Ministry of Agriculture, Forestry, Lands and Fisheries, Fisheries Division	1998
(5) Summary of Fish Production(Monthly 1984-1995)	Ministry of Agriculture, Forestry, Lands and Fisheries , Fisheries Division	1996
(6) Monthly Fish Production for the year 1997	Ministry of Agriculture, Forestry, Lands and Fisheries, Fisheries Division	1998
(7) Summary of Estimated Annual Fish Production for Grenada (1978-1997)	Ministry of Agriculture, Forestry, Lands and Fisheries, Fisheries Division	1998
(8) Daily Fish Landing for Melville St. Fish Market for the Months Jan. and Feb. 1995	Ministry of Agriculture, Forestry, Lands and Fisheries	1996
(9) Daily Fish Storage at the Melville St. Fish Market (Apr.26-1997~Sept.3-1998)	Ministry of Agriculture, Forestry, Lands and Fisheries, Fisheries Division	1998
(10) Melville Street Market Staff: General Work Duties	Ministry of Agriculture, Forestry, Lands and Fisheries, Fisheries Division	1998

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