Ministry of Agriculture and Environment The Commonwealth of Dominica

BASIC DESIGN STUDY REPORT

ON

THE PROJECT

FOR

IMPROVEMENT OF COASTAL FISHERIES DEVELOPMENT

IN

THE COMMONWEALTH OF DOMINICA

January 2001

JAPAN INTERNATIONAL COOPERATION AGENCY ECOH CORPORATION

GR4

CR(3)

00.227

PREFACE

In response to a request from the Government of Dominica, the Government of Japan decided to conduct a basic design study on the Project for Improvement of Coastal Fisheries Development and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Dominica a study team from August 6 to August 27, 2000.

The team held discussions with the officials concerned of the Government of Dominica, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Dominica in order to discuss a draft basic design, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of Dominica for their close cooperation extended to the teams.

January, 2001

Kunihiko Saito

President

Japan International Cooperation Agency

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Improvement of Coastal Fisheries Development in the Commonwealth of Dominica.

This study was conducted by ECOH Corporation, under a contract to JICA, during the period from August 3, 2000 to January 26, 2001. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Dominica and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

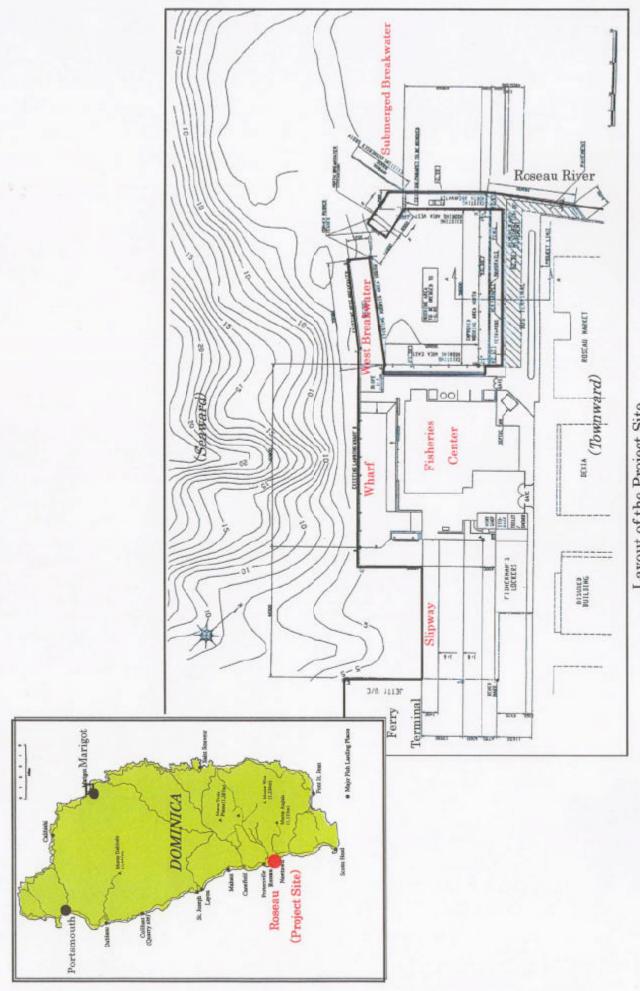
Very truly yours,

Eiichi Matsuura

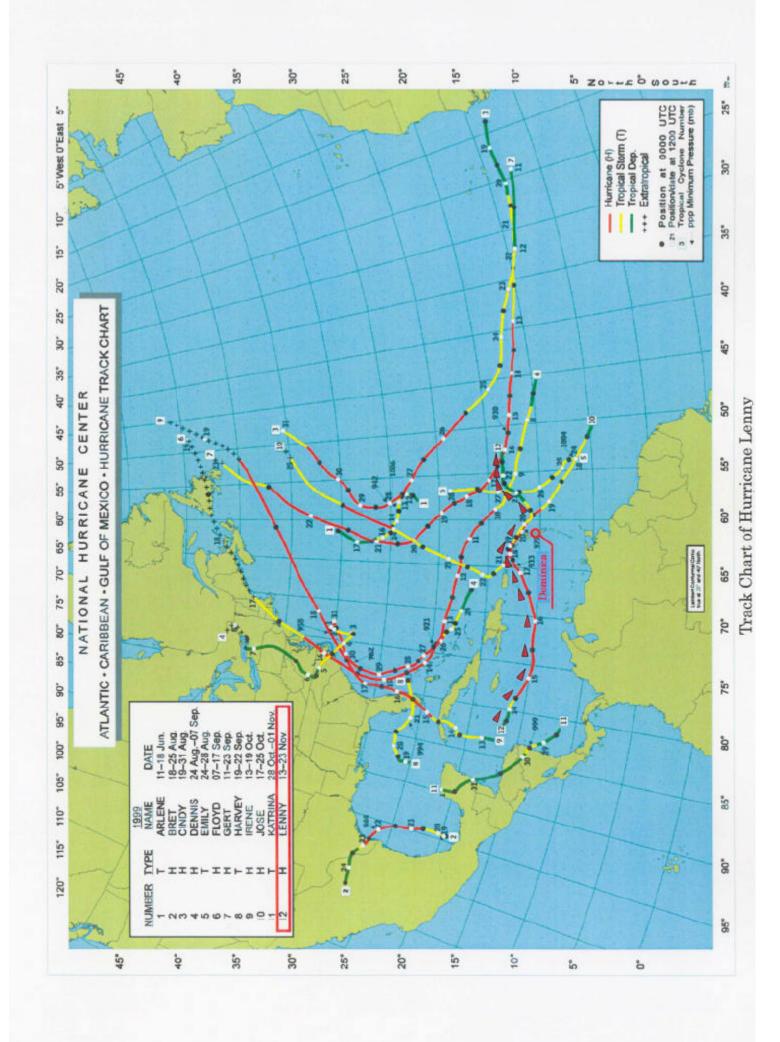
Project Manager,

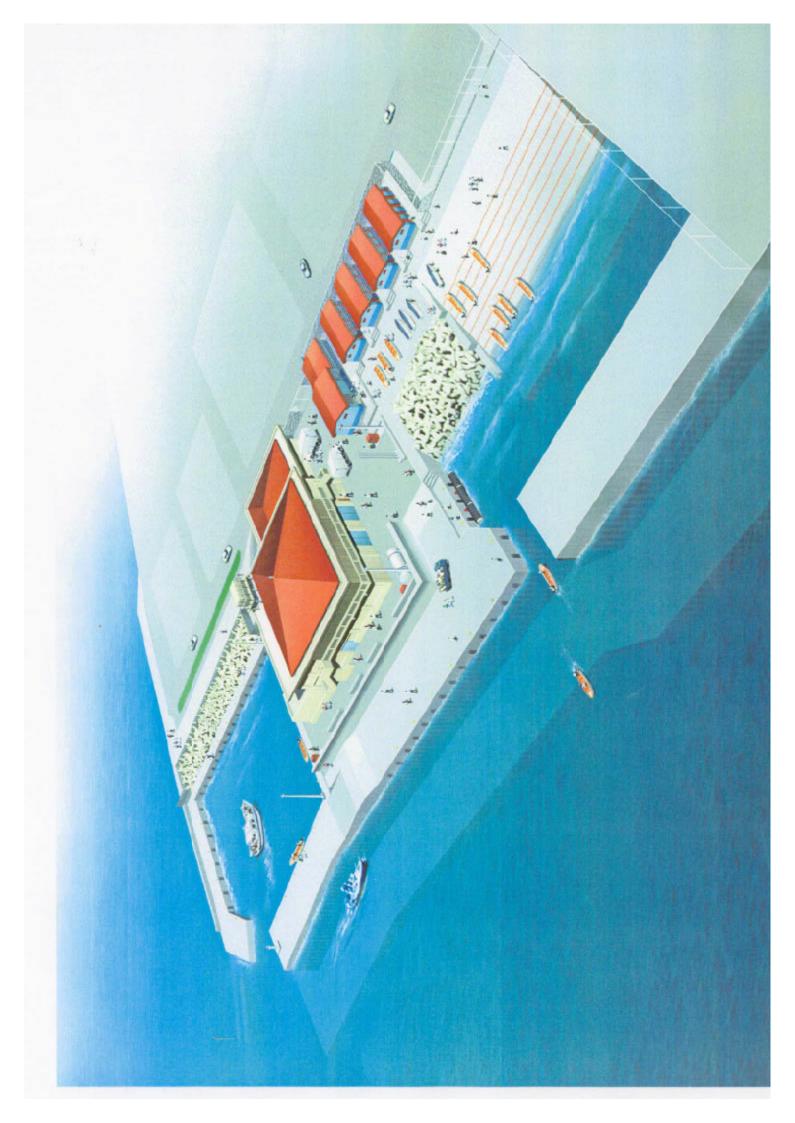
Basic design study team on the Project for Improvement of Coastal Fisheries Development

ECOH CORPORATION



Layout of the Project Site





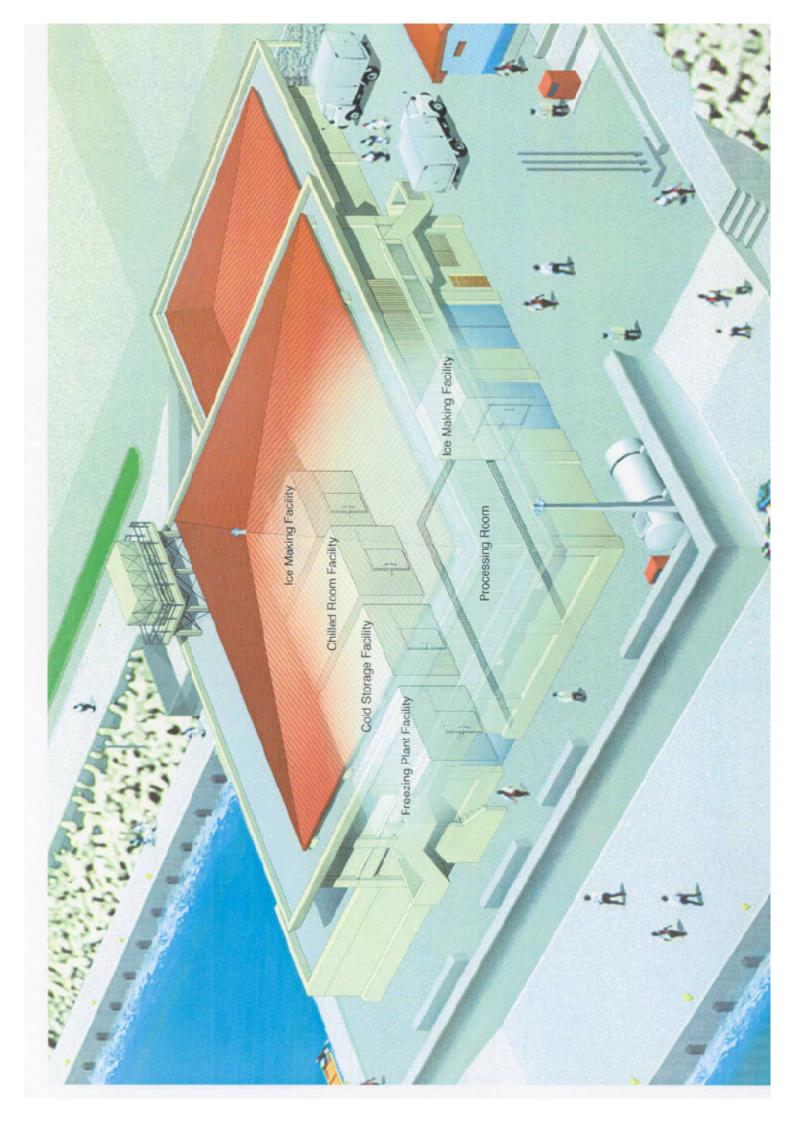


Figure-1-3-1(2) Damages at Protective and Mooring Facilities



Photo-11 Damages Fook at Sliding Gate



Photo-13 Lost Fuel Distributor at North-Western of Fisheries Center

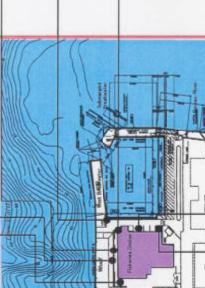
Photo-17 Damages Asphalt Pavement



Photo-9 Lost and Damage Diesel Tank

Photo-8 Lost Fuel Distributor at South-Western of Fisheries Center

Photo-10 Damages Sliding Gate



1

H

Photo-12 Lost Cover of Drain Pit



Photo-16 Lost Cooling Towers









Photo-14 Damages Tip of Lighting Tower

Figure 1-3-1(3) Damages of Facilities around Fisheries Center Building

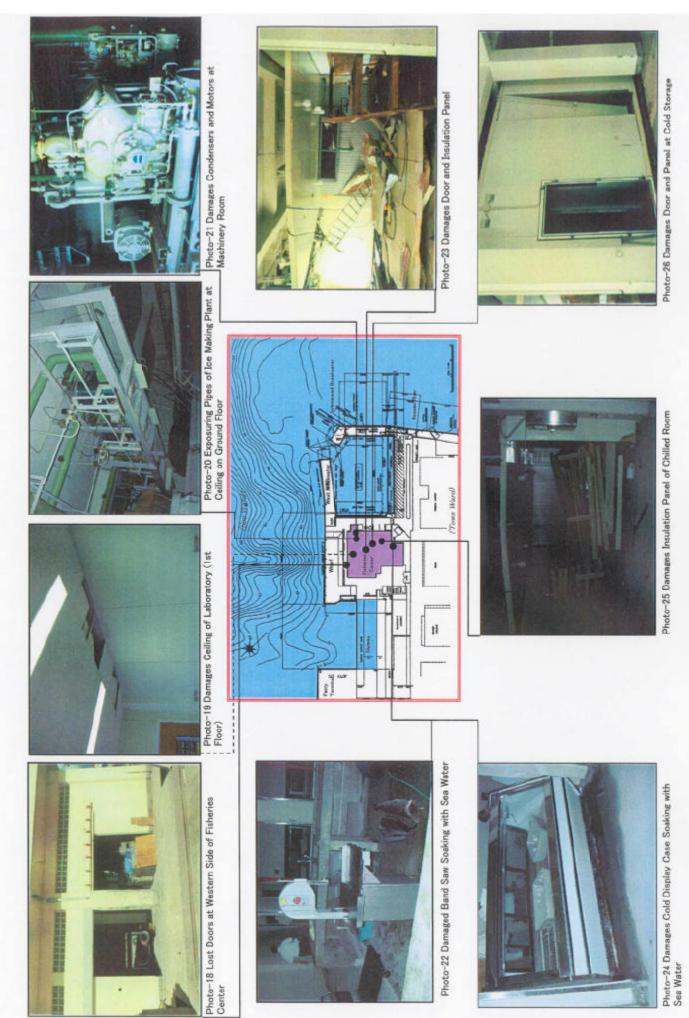


Figure-1-3-1(4) Damages of Facilities Fisheries Center

Contents

Preface
Letter of Transmittal
Location Map/Hurricane Track/Perspective
List of Figures and Tables
Abbreviations

	Page
Chapter 1 Background of the Project	
1-1 Background of the Project	1-1
1-2 Outline of Hurricane Lenny	
1-3 Damages and Causes at the Project Site	1-7
Chapter 2 Contents of the Project	
2-1 Objectives of the Project	
2-2 Basic Concept of the Project	2-1
2-2-1 Contents of the Project and its Appropriateness	
for the Provision of Grant Aid	
2-2-2 Basic Policy of Improvement	
2-2-3 Policy of Improvement for Each Structure	
2-3 Basic Design	
2-3-1 Design Concept	
2-3-2 Basic Design of Civil Engineering Facilities	2-35
2-3-3 Basic Design of Building Facilities and Equipments	2-42
Chapter 3 Implementation Plan	
3-1 Implementation Plan	
3-1-1 Implementation Concept	
3-1-2 Conditions for Implementation	
3-1-3 Scope of Work	
3-1-4 Consultant Supervision	3-6
3-1-5 Procurement Plan ·····	3-7
3-1-6 Implementation Schedule	3-12
3-1-7 Obligations of the Recipient Country	3-15
3-2 Project Cost Estimation for Recipient Country	3-16
3-3 Operation and Maintenance Plan	3-16
Chapter 4 Project Evaluation and Recommendations	···4-1
4-1 Project Effect	· 4- 1
4-2 Recommendations	

	Page
Appendix	
Appendix 1 Member List of the Survey Team	A-1-1
Appendix 2 Survey Schedule	A-2-1~A-2-3
Appendix 3 List of Party Concerned in the Recipient Country	A-3-1
Appendix 4 Minutes of Discussions	A-4-1~A-4-14
Appendix 5 Relevant Data for Natural Condition	A-5-1~A-5-7

.

List of Figures

•	Page
Figure-1-2 (1) The Center of Truck of Hurricane Lenny	- 1-4
Figure-1-2 (2) Probable Offshore Wave Height	
using the Weibull Distribution Method	- 1-6
Figure-1-3-1 (1) Locations and Points of Damaged Facilities	- 1-9
Figure-1-3-1 (2) Damages at Protective and Mooring Facilities	1-10
Figure 1-3-1 (3) Damages of Facilities around Fisheries Center Building	
Figure 1-3-1 (4) Damages of Facilities in Fisheries Center	
Figure 2-2-3 (1) Calculation Measure of Over Flooding Wave	2-17
Figure 2-3-1 (1) Sea Bottom Topographical Condition of West Breakwater	2-27
Figure 2-3-1 (2) Pressure of Shock Waves at West Breakwater	2-28
Figure-2-3-1 (3)Sea Bottom Topographical Condition of Landing Wharf	2-29
Figure 2-3-1 (4) Pressure of Shock Waves at Landing Wharf	2-30
Figure-2-3-1 (5)Sea Bottom Topographical Condition of Slipway	2-31
Figure-2-3-1 (6) Pressure of Shock Waves at Slipway	2-82
Figure-2-3-2 (1) General Layout of Plan 1	2-37
Figure-2-3-2 (2) Cross-section of Landing Wharf	
and Cross-Sections of Parapet Wall	2-38
Figure-2-3-2 (3) Plan and Cross-section of Slipway, Plan 1	2-39
Figure 2-3-2 (4) Cross-section of Slipway, Plan 2	2-40
Figure-2-3-2 (5) Plan and Cross-section of Submerged Groin	
and Cross-section of West-breakwater	2-41
Figure-2-3-3 (1) Concept of Ground Floor Elevation	2-42
Figure-2-3-3 (2) Changes of Activity Line	2-46
Figure-2-3-3 (3) Existing Plan and Cross Section	
of Fisheries Center, Ground Floor	2-48
Figure-2-3-3 (4) Restoration Plan and Cross Section	
of Fisheries Center, Ground Floor	2-49
Figure-3-1-6 (1) Implementation Schedule	3-14

List of Tables

Page
Table-1-2 (1) The Estimated Maximum Wave Condition of Each Direction 1-4
Table-1-2 (2) The Estimated Wave Condition in Time Series
Table-1-2 (3) The Significant and Equivalent Offshore Wave Height
in the Study Area (Estimated Wave Height by Hurricane Lenny) 1-6
Table-1-3-1 (1) Damages at the Project Site
Table-2-2-1 (1) Outline of Damages of Each Facility2-1
Table 2-2-1 (2) The Survey Result of Identifying the Contents of the Project 2-2
Table 2-2-1 (3) The Survey Result of Identifying the Contents of the Project 2-3 $$
Table 2-2-1 (4) The Survey Result of Identifying the Contents of the Project 2-4 $$
Table 2-2-1 (5) The Survey Result of Identifying the Contents of the Project $2-5$
Table 2-2-1 (6) The Survey Result of Identifying the Contents of the Project 2-6
Table 2-2-1 (7) The Survey Result of Identifying the Contents of the Project 2-7
Table 2-2-1 (8) The Survey Result of Identifying the Contents of the Project 2-8
Table 2-2-1 (9) The Survey Result of Identifying the Contents of the Project $2-9$
Table 2-2-1 (10) The Survey Result of Identifying the Contents of the Project $\cdots\cdots$ 2-10
Table 2-2-1 (11) The Survey Result of Identifying the Contents of the Project $\cdots 2-11$
Table 2·2·1 (12) The Survey Result of Identifying the Contents of the Project 2·12
Table 2-2-1 (13) The Survey Result of Identifying the Contents of the Project 2-13
Table 2-2-3 (1) Summarize Two Alternative Plans
for Rehabilitation and Improvement of Slipway 2-22
Table 2-3-1 (1) Design Conditions
Table 2·3·1 (2) Re-examined Maximum Design Wave Height 2-33
Table 2-3-1 (3) Material Loads (after compacting) 2-34
Table 2.3.3 (1) Rehabilitation and Improvement Plans 2-43
Table 2.3.3 (2) Details of Rehabilitation and Improvement 2-50
Table 3-1-5 (1) Procurement Plan of Construction Materials 3-8
Table 3-1-5 (2) Procurement Plan of Major Construction Machineries3-11
Table 3.3 (1) Staffing Plan of Dish Marketing 3-17
Table 3-3 (2) Operating Income and Expenditure Plan 3-18

Abbreviations

ASTM American Society for Testing and Materials

BS British Standards
C.B Concrete Brock

CIDA Canadian International Development Agency

CUBIC Caribbean Uniform Building Code

D.L. Datum Level

E East

EC\$ East Caribbean Dollar
EDF Europe Development Fund

E/N Exchange of Notes ENE East-Northeast

FAO Food and Agriculture Organization of the United Nations

FRP Fiber Reinforced Plastic

ESE East-Southeast

GDP Gross Domestic Product H.A.T High Astronomical Tide

H.W.L High Water Level

JICA Japan International Cooperation Agency

JIS Japan Industry Standard

KVA Kilovolt Ampere

L.A.T Low Astronomical Tide
M.H.H.W Mean Higher High Water
M.H.L.W Mean Higher Low Water
M.L.H.W Mean Lower High Water
M.L.L.W Mean Lower Low Water

M.L Mean Level

N N

NE Northeast

NEIC National Earthquake Information Center

NHC National Hurricane Center

NNE North-Northeast NNW North-Northwest

NW Northwest

PVC Poly Vinyl Chloride

S South

SE Southeast

SSE South-Southeast SSW South-Southwest

SW South West

UN United Nations

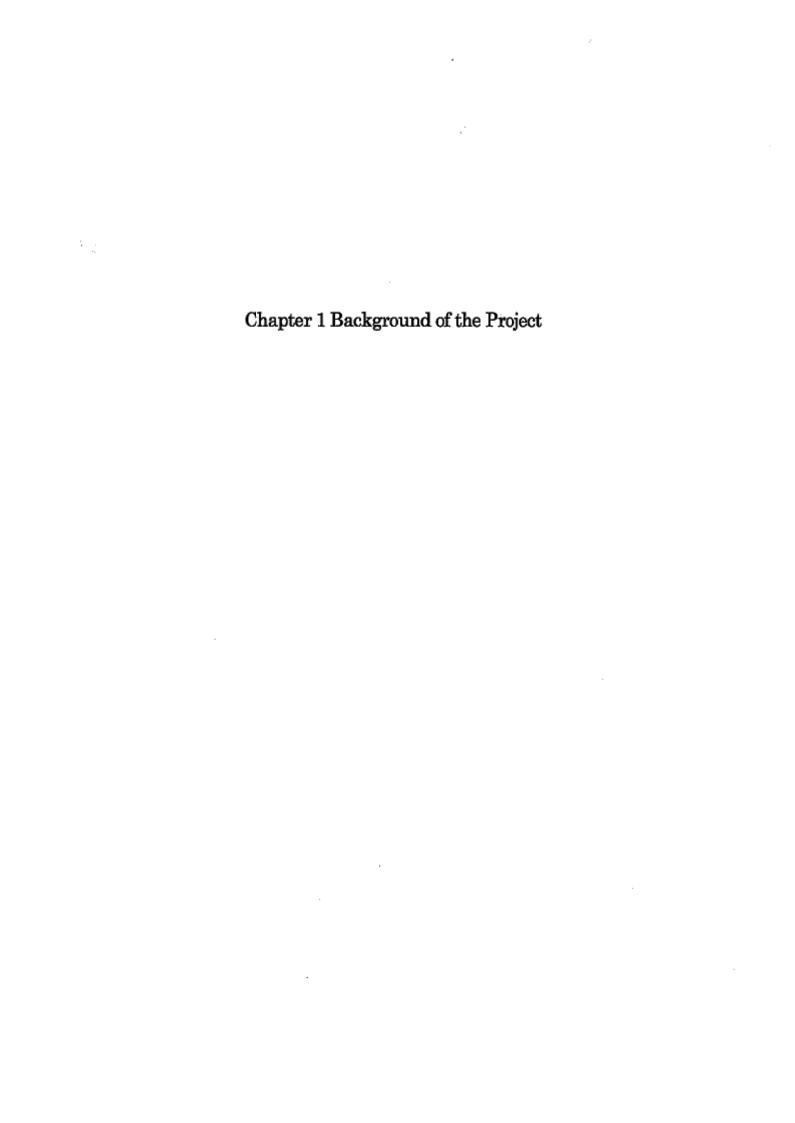
USGS United States Geological Survey

US\$ United States Dollar

W West

WFP World Food Program

WNW West-Northwest WSW West-Southwest



Chapter 1 Background of the Project

1-1 Background of the Project

The commonwealth of Dominica is located in the Windward Islands in the East Caribbean Sea and has a land area of some 790km². Most of the land is mountainous and tropical rain forests covers 65% of it. Many branches run to the east and west from the central mountain of 1,000~1,400m height and a steep mountain and valley makes alternate. Population is concentrating to the city of Roseau, Portmouth and Marigot on the shoreline area of the Island.

Weather condition is divided into two. One is dry season for the period of, December to May, and the other one is wet season for the period of June to November, due to the prevailing Northeast trading wind. Annual average rainfall is 2,200 to 3,300mm and the central zone reaches more than 5,000mm. The temperature is varied 24°C to 30°C by the height of land. The country locates in the midst of a hurricane belt and, in recent years, has suffered extensive damage due to Hurricane David (1979), Allen (1980), Hugo (1989), Luis (1995), Marilyn (1995), Iris (1995) and Lenny (1999).

Fisheries in Dominica are small-scale coastal fisheries conducted by coastal residents using wooden canoes or small boats. The surrounding sea of Dominica is a rich with migratory fish resources (flying fish, skipjack and tuna). However, Dominica has been forced to import some 900 tons of marine products a year because of the following problems.

- (1) Inadequate fishing ports and landing facilities
- (2) Inadequate distribution facilities and channels
- (3) Inadequate facilities to support the promotion, guidance and administration relating to fisheries

Dominica made a request for the construction of Roseau Fisheries Complex as a measure to solve the aforementioned problems. Under the Project, Fisheries Grant Aid Cooperation was provided in fiscal 1993 and 1994 to construct a fisheries complex performing the following functions at Roseau which is the capital of Dominica and a major consumption area with the country's highest concentration of population. The role of Roseau Fisheries Complex is shown in below.

- Landing of the catch and safe mooring of fishing boats
- (2) Distribution and marketing of the catch
- (8) Support and control of fishing activities
- (4) Guidance for fishermen and extension activities
- (5) Development and quality control of marine product processing industries
- (6) Temporary Storage

During the Phase II (construction of ground facilities) work, late August to early September 1995, Hurricanes Luis and Iris damaged the fishing port facilities that were completed during the Phase I period (Landing Wharf, Breakwater and Slipway, etc., handed to the Dominican side in March, 1995 upon completion). However, the port is unable to perform most of the functions. For rehabilitating these facilities, the Government of Dominica has requested to the Government of Japan's provision of Grant Aid. This rehabilitation work was completed in March 1997. After the completion, the disturbance of water in the mooring area has been sometimes observed. Water in the mooring area was sometimes disturbed, even if the outside of the mooring area was not very rough. In the case of large turbulence, waves get over the wharves and make splashes at the corners of the mooring area, which fall on the bus terminal area and the equipment outside of the Center building. It is difficult to forecast when the mooring area becomes turbulent.

Due to the disturbance of the water in the mooring area, there are problems in utilization and maintenance of the facilities. It has become difficult for fishing boats to use the mooring area, while the Fisheries Development Division has made efforts to manage the Complex. Since Roseau Fisheries Complex is essential facilities for fishing and marketing in promotion of the fisheries sectors, it is necessary to improve the condition of the mooring area and encourage people to utilize the complex more effectively. The government of Dominica, therefore, made a request for a Grant Aid to improve the mooring area of the Complex.

In November 1999, Hurricane Lenny hit and damaged the Complex. Slipway and the Fishery Center were severely damaged and the function of center stopped and the fishing industry activity was obstructed. The cause of damage of it has been identified as strong waves over the design wave and the change of sea bottom topographical condition by the hurricane in August and September 1995, therefore, considered to be an act of God. Under these circumstances, the Government of Dominica has requested to the provision of Grant Aid by the Government of Japan to rehabilitate those damaged facilities by hurricane.

1-2 Outline of Hurricane Lenny

The scale of Hurricane Lenny indicates the followings based on the data from National Hurricane Center, USA.

(1) Scale

Hurricane Lenny occurred on the northwest of Caribbean Sea. On November 13, 1999, it developed to the tropical depression near the Islands of Cayman. On November 14, 1999, it run to the southwest direction and reached to the tropical storm near 175

sea miles on the south of Jamaica. Hurricane Lenny proceeded the middle of Caribbean Sea toward East with developing its scale and grew up to the hurricane on the sea beyond 140 sea miles of Dominica. On November 17, 1999, Hurricane Lenny switched her truck to Northeast with bigger scale and passed the south of US Virgin Island. She stopped and switched her truck from East to Southeast there. Her scale weakened with zigzag truck and became to the tropical storm and depression on November 20, 1999. The largest scale of Hurricane Lenny on November 17, 11pm 1999 was as follows.

- 1) The location of center: North Latitude 17.7°, West Longitude 64.2°
- 2) The pressure of center: 929mb
- The maximum wind velocity: 130 knot
- Category level: Hurricane 4

(2) Hurricane Track

The truck of most of Hurricanes on the Caribbean Sea is from Atlantic Ocean to the west. Hurricane Lenny was one of very few cases to move from west to east on the low latitude. She runs the center of Caribbean Sea, North Latitude of 15 degree, from west to east. Small Antilles Islands including the commonwealth of Dominica where locate on the half circle area of right hand side of progress direction and front sea area of her was damaged by the severe wave and swells. The center of truck of Hurricane Lenny is noted on Figure-1-2 (1).

(3) Wave condition on Hurricane Lenny

The probable wave condition that Hurricane Lenny generated in the study area was estimated. The estimation of offshore waves in Dominica offing was done on the basis of her observed data by the US National Hurricane Center (NHC) in Miami. The wave conditions such as the significant wave and the equivalent deepwater wave in the study area was estimated on the basis of the topographical survey map of the study area in 1998 with the transformation calculation of the waves. Using the spectral method (one-point method (Gotoh method) and MRI model), the offshore wave height and period at the point of Dominica offing (North Latitude of 15° 16' 6", West Longitude of 61° 25' 0")was estimated. Table-1-2 (1) shows the estimated maximum wave condition of each directions and Table-1-2 (2) shows the estimated wave condition in time series.

As a result, offshore wave of Dominica caused by Hurricane Lenny was estimated at 7.77m and wave period was 10.54 second. This estimated result met the wave of 50 to 60 year probable cycle based on the result of Weibull distribution on the study report on the coastal fisheries development project in the commonwealth of Dominica in March 1996.

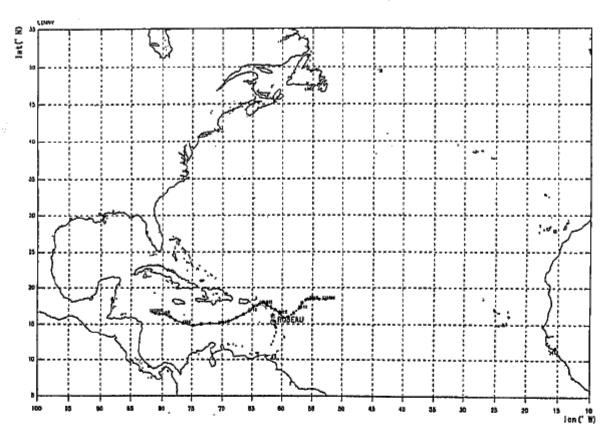


Figure 1-2 (1) The Center of Truck of Hurricane Lenny

Table-1-2 (1) The Estimated Maximum Wave Condition of Each Direction

	Wave			Offshor	e Wave		
No.	Direction	Wave Height (m)	Period (s)	Year	Month	Day	Time
1	NNE	0	0;	0	0	0	0
2	NE	0	0	0	0	0	0
3	ENE	0	0	0	0;	0	0
	E	0	0	0	0	0	0
5	ESE	0	0	. 0	0	0	0
6	SE	0	0	0	Ö	0	0
7	SSE	0.34	2.36	99	11	16	11
. 8	S	0.48	2.69	99	11	16	16
9	SSW	0.86	3.72	99	11	17	6
10	sw	3.31	7.77	. 99	11	17	15
11	WSW	7.77	10.54	99	11	18	7
12	W	0	0	0	0	0	· 0
13	WNW	0	0	0	0,	0	0
14	NW	0	0	0	0	0	0
15	NNW	0	0	0	0	0	. 0
16	N	0	0	0	0	0	0

Table-1-2 (2) The Estimated Wave Condition in Time Series

				T	0	Offshore War	ve	Point of Way	re Hindcasine
No.	Year	Month	Day	Time	Wave Height	Period (s)	Wave Direction	Wind Volocity	
1	99	11	16		(m)			(m/s)	Wind Direction
2	99	11	16	6	0.19	1.92	SSW	3	SSE
- 8	99	11	16	7	0,34	2.36	SSE	4	SSE
4	99	11	16	8	0.19	1,92	SSE	3	S
5 G	99 99	11	16 16	10	0.34	2.36 1.92	SSE	8	SSE
7	99	11	16	11	0.19	2.86	SSE	4	SSE
- 8	99	11	16	12	0.34	2.36	S	4	S
9	99	11	16	13	0.84	2,36	S	4	S
10	99	11	16	14 15	0.34	2.36	S	5	S
12	99	11	16	16	0.48	2.69	S	5	S
13	99	11	16	17	0.48	2.69	SSW	5	S
16	99 99	11	16 16	18 19	0.57	2.84	SSW	6	<u>s</u>
16	99	11	16	20	0.57	2.84	SSW	6	S
17	99	. 11	16	21	0.62	2.92	SSW	7	S
18	99	11	16	22	0,62	2.93	SSW	7	S
19	99	11	16 16	23 24	0.66	2.98 8.00	SSW	8	S
21	99	11	17	1	0.68	3.05	SSW	9 1	S
22	99	11	17	2	0.70	3.10	SSW	9	s
28	99 99	11	17	3	0.73	3.18	SSW	10	S
25	99	11	17	<u>4</u> 5	0.75	3.47	SSW	10	s S
26	99	11	17	6	0.86	3,72	SSW	11	S
27	99	11	17	7	0,96	4.08	SW	12	S
28 29	99	11	17	8 9	1.09	4.52 5.02	SW	12 13	<u>s</u>
80	99	11	17	10	1,49	5.52	SW	13	s
- 31	99	11	17	11	1.76	6.04	SW	14	s
33	99	11	17 17	12	2,07	6.53	sw	15	g
34	99	11	17	13	2.49	7.38	SW	16	SSW
35	99	11	17	15	3.31	7.77	SW	18	SSW
36	99	11	17	16	3.73	8,15	wsw	19	SSW
37	99	11	17	17	4.15	8.49 8.81	wsw	20	SSW
39	99	11	17	19	4.98	9.09	WSW	21	SSW
40	99	11	17	20	5.80	9.35	WSW	21	SSW
41	99 99	11	17	21	5.60	9.56	WSW	21	SSW
43	99	11	17	23	5.90 6.20	9.75	WSW	21	SSW
44	99	11	17	24	6.42	10.02	WSW	22	SSW
45	99	11	18	1	6.61	10.18	wsw	22	SSW
46	99 99	11 11	18 18	3	6.81	10.22	WSW	22	SSW
48	99	11	18	4	7.21	10.38	WSW	23	SSW
49	99	11	18	ð	7.40	10.47	WSW	23	SSW
50 51	99 99	11	18 18	7	7.56	10.54	WSW	23	SSW
52	99	11	18	8	7.74	10.54 10,63	WSW	22	sw
53	99	11	18	9	7.68	10.65	wsw	20	SW
54 55	99 99 :	11	18 18	10	7.53	10.68	WSW	18	SW
56	99	11	18	11	7.40	10.68 10.66	WSW	17 16	SW
57	99	11	18	18	7.07	10.68	WSW	15	SW
58	99	11	18	14	6.98	10.56	wsw	15	sw
59 60	99	11	18	15 16	6.78	10.47	Wsw	15	SW
61	99	11	18	17	6.38	10.88	WSW	14	sw
62	99	11	18	18	6.18	10.11	wsw	14	sw
68	99	11	18	19	5.96	9.98	WSW	13	SW
64 65	99	11	18 18	20	5,73 5,52	9.81 9.64	WSW	13	SW
66	99	_11	18	22	5.82	9.46	WSW	18	SW
67	99	11	18	23_	5.09	9.81	WSW	12	SW
68	99 99	11	18	24	4.89	9.14	WSW	12	sw
70	99	11	19	1 2	4.71	8.96 8.79	wsw	12	SW SW
71	99	. 11	19	3	4,38	8.61	WSW	12	SW
72	99	11	19	4	4.23	8,44	wsw	12	sw
73	99	11	19 19	5 6	4,06 8.92	8.31 8.16	wsw	11	SW
	30 [** !	_AV_		0.05	6,10	W S W	11	sw

Max

Max

1-5

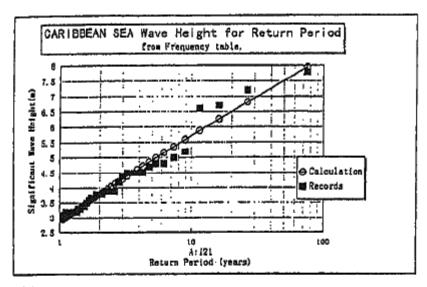


Figure-1-2 (2) Probable Offshore Wave Height using the Weibull Distribution Method

Generally speaking, the offshore wave energy reach the shoreline with the effect of refraction, diffraction and reflection. The wave condition of the study area at the event of Hurricane Lenny was calculated with the method of equivalent energy equation. The wave transformation was carried out regarding the wave direction of SW and WSW that exerts a strong influence on the study area. Table 1-2 (3) shows the significant and equivalent offshore wave height in the study area. The waves on the head line of landing wharf and west breakwater were supposed to the higher wave height because the study area is in the shock breaking wave area from the very steep sea bottom conditions. It is conceivable that the attacked wave by Hurricane Lenny to the study area was over the design wave on a 30-year probable.

Table-1-2 (3) The Significant and Equivalent Offshore Wave Height in the Study
Area (Estimated Wave Height by Hurricane Lenny)

Wave Height and Year of Sea Bottom Condition	Slipway Area	Landing Wharf Area	West Breakwater Area
SW 1993			
Significant Wave	3.30~3.76m	3.10~3.29m	1.39~2.98m
Equivalent Offshore Wave	2.98~3.58m	2.86~3.01m	2.70~2.96m
WSW 1993			
Significant Wave	4.07~5.34m	4.34~5.13m	1.70~2.85m
Equivalent Offshore Wave	6.42~8.59m	6.25~6.60m	6.07~6.79m
SW 1998			
Significant Wave	3.06~3.88m	2.53~3.09m	2.74~3.05m
Equivalent Offshore Wave	2.99~3.77m	2.62~3.07m	2.72~3.05m
WSW 1998			
Significant wave	5.25~6.48m	5.85~6.77m	5.16~5.34m
Equivalent Offshore Wave	8.05~8.78m	5.21~6.93m	5.61~6.75m

1.3 Damages and Causes at the Project Site

1.3.1 Damages at the Project Site

Damages at Project Site are described in Table-1-3-1 (1), and locations and points of damaged facilities are indicated in Figure 1-3-1 (1), then photographs of damaged facilities are shown in Figure 1-3-1 (2), (3) and (4).

Table-1-3-1 (1) Damages at the Project Site

No.			Detail of Damage
	Outline of Damage	Quantity	Detail of Damage
1	Break of Distribution Pipe	2 Places	Besides Slipway
2	Break of Fence Base	16.5m	Length: 16.5m, Height: 1.0m
3	Break of Boat Pulling Upper	9 lines	
4	Damage of Slipway	2 Parts	 Slope of 1/8: Sucking out of filling sand and stone on 2m width of edge of slipway Slope of 1/6: All damaged
5	Break of Light Tower	4 poles	Break of all lights on the top : 2×4 =8
6	Lost of Fuel Distributor	3 units	
7	Flooded Gasoline Tank	1	Flooded underground Gasoline Tank
8	Lost of Light Diesel Tank	1	Lost of Tank, Break of Protection Wall (7.0m x 3.0m)
9	Sliding Gates on Parapet Wall	8	
_10	Cave of Asphalt Concrete	$14.85m^{2}$	3.3m x 4.5m=14.85m ²
11	Cave of Asphalt Concrete (partly)	90.24m ²	9.0x4.8+1.4x6.0+4.2x5.2+4x4.2 =43.2+8.4+21.84+16.8=90.24
12	Damaged of Gates (Partly)	2 gates	Entrance of Mooring Area and Emergency Gate of Slipway
18	Score of Foot Area of Landing Wharf and Breakwater	3 areas	 The area of heavy scoring, zigzag futures of concrete blocks and caving of underwater concrete: 1 area The area of digging as like as a hole on the sheet piles: 2area
14	Damage of Head of Submerged Groin	2 areas	Covering part of concrete blocks and Steel sheet piles area: Flooded out of blocks, break of head of sheet piles and zigzag futures of blocks
15	Damages of Fisheries Center	5 doors	Lost of doors on the west-side
		1 door	Damage door of Emergency Generator Plant beside mooring area
		1 cover	Lost cover of duct for Emergency Generator Plant on west-side
		2 area	Exfoliation of wall of stairs on west-side
		7 pieces	Break window flames on first floor on the north-side

No.	Outline of Damage	Quantity	Detailed of Damage
15	Damages of Fisheries Center	4 units	Lost four cooling towers unit
	Damages of Fisheries Center	1 unit	Break Incinerator
		1 unit	Break Fish Mill Plant
		1 section	Break Ceiling of Laboratory
		Listed	Lost and Break testing Machines
		1 unit	Break Chilled Room
	· · · · · · · · · · · · · · · · · · ·	1 unit	Break Blast Freezer
		1 unit	Break Cold Storage
		1 unit	Break Ice Making Plant
		4 units	Break Compressor for Cold Storage
L			etc.
		4 units	Break Control Panel for Cold
			Storage etc.
		1 unit	Break Generator for Emergency
	-	1 unit	Break Main Panel for Power Supply
		1 unit	Break Main Distribution Panel
		1 unit	Break Accessories of Waste Water
			Treatment Plant

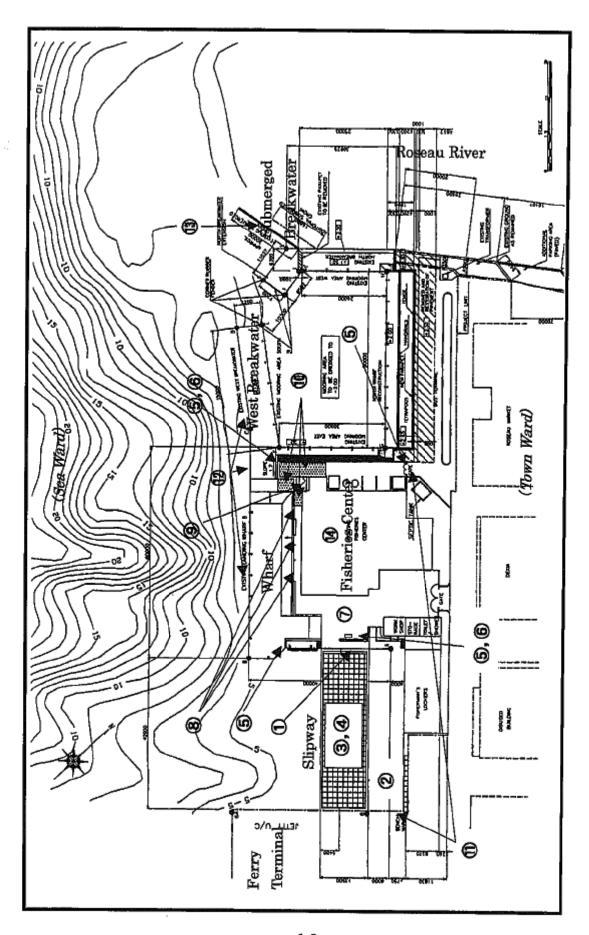


Figure-1-3-1 (1) Locations and Points of Damaged Facilities

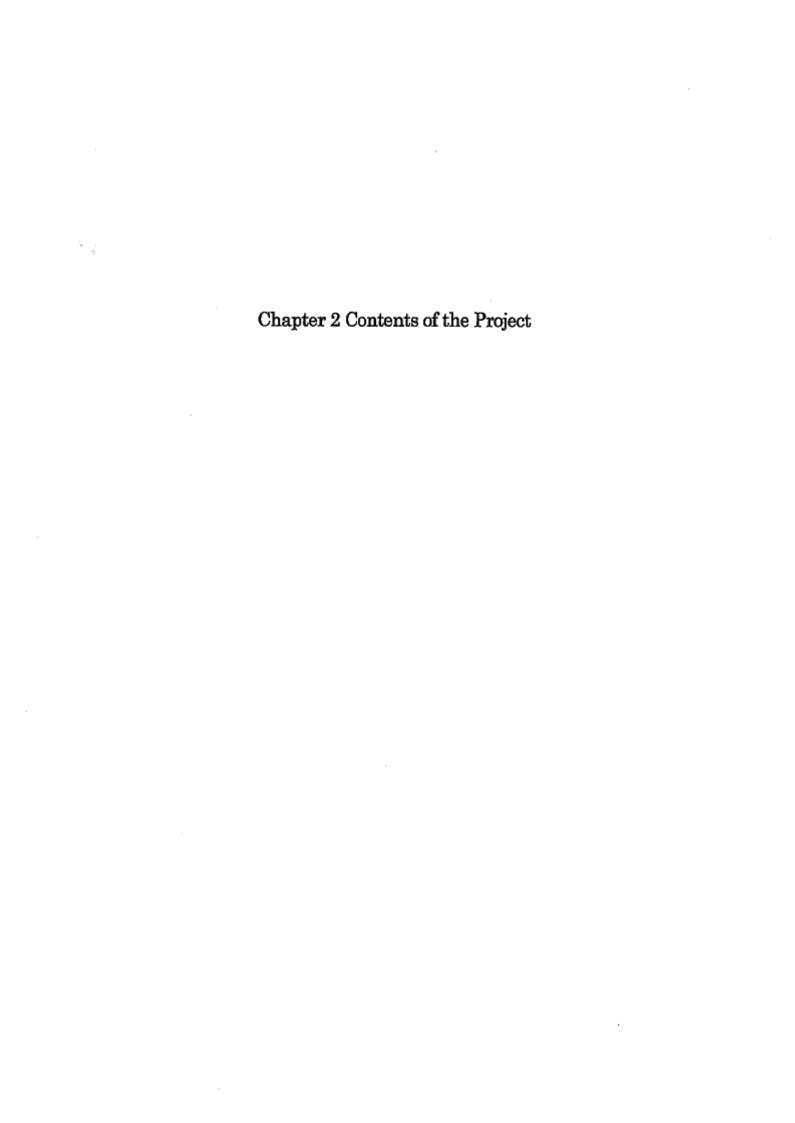
1-3-2 Causes at the Project Site

The causes of damages of the study area are as follows:

- (1) The track of most of Hurricanes on the Caribbean Sea is from Atlantic Ocean to the west. Hurricane Lenny runs the center of Caribbean Sea, North Latitude of 15 degree, from west to east. Small Antilles Islands including the commonwealth of Dominica where locate on the half circle area of right hand side of progressing direction and her front sea area was damaged by severe wave and swells.
- (2) Offshore wave of Dominica induced by Hurricane Lenny was estimated that wave height was 7.77m and wave period was 10.54 second. This estimated result met to the wave of 50 to 60 year probable based on the result of the Weibull distribution on the study report on the coastal fisheries development project in the Commonwealth of Dominica in March 1996.
- (3) Severe waves of Hurricane Lenny broke shockingly at the landing wharf and struck there. The most of water body of shock wave flooded over the apron with the pressure and wave setup. The flooded over wave floated up the gate and pulled up and down from the parapet wall. Those waves struck and broke the doors of Fisheries Center and the facilities and equipments inside the Fisheries Center.
- (4) Severe waves of Hurricane Lenny attacked the area of Fisheries Center faced to the mooring basin. Those waves destroyed the cooling tower, fish waste treatment plant and garbage depot. The northern door and exhaust hole of emergency generating plant were destroyed and it was washed up by seawater.
- (5) Slipway was headed on the severe waves of Hurricane Lenny. The wall of Fisherman's Lockers stopped the running up waves on the slope of slipway and those waves were running back to the foot area of slipway. The running up waves on the slope destroyed the dike, that is the boundary of the city road, and those waves were flooded over the dike and the emergency gate to the city road.
- (6) Severe running back waves scored the foot area of slipway and the concrete blocks on the foot area were destroyed. The filling sand and stones of slipway was taken to the offshore and the concrete plates were left suspended. Severe waves attacked the concrete plates and those were broken and sunk down.
- (7) Hurricane Lenny had a severe rainfall. Roseau River that located on the next of the Complex had a severe flow. The submerged groin was moved out the inserted concrete blocks and bended the head of steel sheet piles toward the south. The

surface flow and flooded over the city drainage was caused the flood damage on the ankle to the Complex.

(8) The severe running back waves after striking the landing wharf and breakwater on the western side of the Complex scored the concrete blocks on the tip of foot area of those areas. Those concrete blocks were slightly moved toward the offshore and the tops of those blocks were zigzag figures. The underwater concrete also moved toward offshore. There are several caves in front of the steel sheet piles.



Chapter 2 Contents of the Project

2-1 Objectives of the Project

Roseau Fisheries Complex, which is expected to be the center of fishery industry in Dominica, had been constructed under a part of the Coastal Fisheries Development Project assisted by the Japanese Grant Aid starting from the fiscal year 1993. However, in November 1999, Hurricane Lenny damaged the Complex. Slipway and the fishery center were severely damaged and the function of the center stopped and the fishing industry activity was obstructed. This Project aims to rehabilitate and improve the damaged facilities and complete the originally designed Fisheries Complex.

2-2 Basic Concept of the Project

2-2-1 Contents of the Project and its Appropriateness for the Provision of Grant Aid

The Government of Dominica has requested the Government of Japan's provision of Grant Aid to rehabilitate and improve the damaged facilities and equipments that is indicated in Table 2-2-1 (1). Field survey was carried out identifying the contents of the Project and its appropriateness for the provision of Grant Aid. Tables 2-2-1 (2) to (13) shows the survey result of the damaged condition and the appropriateness for the provision of Grant Aid by each facility and equipment.

Table 2-2-1 (1) Outline of Damages of Each Facility

No.	Name of Facility	Outline of Damages
1	Slipway	Annihilated including the foot area
2	Parapet Wall with Gates	All gates were annihilated
3	West Breakwater and Landing	Appearance of gap between the underwater concrete and steel
	Wharf	sheet piles and partly damaged underwater concrete on foot area
4	Chilled Room	Annihilated panel for anti-fever
		Salt covered on the coil and fin of cooling unit
		Rusted severely of distribution pipe and valve of freezer unit
5	Cold Storage	Annihilated panel for anti-fever
		Other equipments were severely damaged
6	Blast Freezer	Rusted Ice-making Plant
		Flooded seawater of reduction gear and the inside of pump etc.
		Ice storage room were annihilated
. 7	Machine Room	All exteriors were rusted
		Leaked out of distribution pipe of cooling unit
		The power cable inside the control panel are partly way out and
		cut off
		Lost of one unit of cooling tower and other 3 units were broken. All
		cooling towers are out of order.
8	Fisherman's Locker	Some doors were broken by the running up wave on the slipway

Table 2-2-1 (2) The Survey Result of Identifying the Contents of the Project

EQUIPMENT FOR THE ROSEAU FISHERIES CENTER IN DOMINICA

the state of					Law by Daniely 4 State The	200	٦
nem No.	Name of Equipment	Manuacturer	Description(Type/Model/Index No.)	Outo	A B	3 8	_
Chapter 1970xx	Shapter I Workshop Equipment				-	_	_
I	General tool kit for outboard engine	Toyo	with tool box	2		ŀ	Т
Z-1	Electric drill	Makita	€300-4			-	Т
<u></u>	Electric grinder	Makita	₹-9006	F	-	-	T
Į-4	Electric bench grinder	Makita	\$306-S		_	-	T
<u>ዋ</u>	Electric circular saw (for metal)	Makita	2412-N		-	1	Т
9-1	Electric bench drill	Ensyu Industry	ESD-100A		-	-	T
11	Chlesi set	Hisizet		-	-	-	Т
-8	Motor threading machine	Rex Industry	N-50A		<u> </u>	H	7
6 <u>-1</u>	Chain blocks with tripod	Futaha & Ezaki	AL-1 AL-2 & F2030	1	+	-	Т
I-10	Gear and bearing extractor kit	Super			-	+	Т
1-11	Hydraulic jack	Masada	H02-13		+	+	T
I-12	Hand operated pipe bender	Taiyon	18-1	1	-	+	Т
[-I3	Anvil	Nabeya	07	F		-	Т
I-14	Engineer's vice	Nabeya	150	1	-	+	7
I-15	Micrometer set	Mitutoyo	M110-25 and others		-	+	T
I-16	Slide caliper set	Mitutogo	N-15 & N-20	Ī	+	+	Т
11-17	. Thickness gauge	Fujimi	19sheets	Ī	+	+	Т
1-18	Surface plate kit	Yamaha Motor Co., Ltd.			+	+	T
1-19	Vee-blocks	Nabeya	B-75 & B-150		-	+	Τ
II-20	Tachometer	Yamaha Motor Co., Ltd.		1	+	+	Т
1-2]	Ignition timing checker	Yamaha Motor Co., Ltd.		1	- 	+	Т
I-22	Dial gaugue kit	Yamaha Motor Co., Ltd.		Ī	+	+	T
I-23	Torque wrench	Tounithi		7	+	+	Т
I-24	Cylinder gauge	Yamaha Motor Co., Ltd.		1	+	+	T
I25	Battery charger	Yuasa	YS-1000	1	+	+	Ť
I26	Fuel oil injection tester	Banzal	D7-60	7	+	+	Ť
12-1	Work bench	Sakae ·	KWF-18871	1	+	+	T
82-1 1-28	Steel stelves	Sakae	ML,1745		+	-	Т
62-1	Work tables with caster	Sakae	PAR-150N	1	+	+	Т
08-1	Kepair stand for outboard engine	Yamaha Motor Co., Ltd.		9 6	+	+	Т
100	Carr and stand for outboard engine	Yamaha Moior Co., Ltd.		1	-	+	T
79-1	Electric welding set	Makita	Y-150N	1	+	1	T
250	Battery tester set	Banzai	PB-12 VAM-500	1	+	7	Ţ
\$ 10	Saftery hydraulic set	Banzai .	HA-100	1	+	+	Т
ec 1	rotuing tool set	Yamaha Motor Co., Ltd.		1	+	+	Т
			1.0	Lenged:	A=Damaged B=i.ost		1
					C=Un-useable	apie	

Table 2-2-1 (3) The Survey Result of Identifying the Contents of the Project

Nippon Spirrew TSC-457M 1 1 1 1 1 1 1 1 1	Per throughing tool H for spar's high bear	Species No.	Aleman of Landing					_
State	Super TSC-457M T	1	Manis of Department	- Sunmanara	CHE CONTROLL CONTROL C	-	,	7
Super	Super		Re—threading tool kit for spark plug hole	Wippon Suprew	-	<u>-</u> 1		
Shiota HYS	Shicka H-75		Flare tool kit	Super	12C-457M	II		_
H - 15	Beaueri		Tap and die set	Shiota		1		
Meselfa MFP-15 with accessories crank shall etc 1 1 1 1 1 1 1 1 1	Maissife Maissife		Hollow punch set	Banzai		1		
Control of the cont	Case		Hydraulic oil press	Masada		1		
Feeter Parmel SP-40G	Comparison Com		Air compressor and paint spray	Medil	GH-2B			
Name of the content	Subserful KS-2 Subserful KS-2		Spark plug cleaner and tester	Banzai	SP-40G	_		
Vanseld Stb-50 I	Varmed of Sth-50 Varmed of Sth-50 Varmed of Engineer		Kerosine burner	Sakaefuji	KS-2	1		
Nametha Motor Co., 1Ad. NH-120 & OS-600 1	Vamels Motor Co., 144 Viriable Motor Co.		Gear oil filler	Yamada	St-50	-		
Demopure & Yamada XH-120 & OS-600 1	Care Furnpura & Yamada XH-150 & OS-600		Crank aligned	Yamaha Motor Co., Ltd.		ī		
Cable Caple Capl	Care Care Care Care Care Care Care Case		Syringes	Eurupura & Yamada	KH-120 & OS-600	F		
Solve Solv	Carlot C	1	Grease gum set	Yamada		2		
Continue	Continue		Oil pan and wire brush	Sakse	6300-4	=		
Hansin & Banzai TB-151	Hansin & Banzai TB-151		Hand oil pump	Nabeya	ESP-25	F		
Banzai G-4C C + Holo	Banzaj G-4C		Cart and wrench for oil drum	Hansin & Banzai	TB-151	-		
Touc Contidaya Gibeat Coc +1500	Total Control Contro		Compression gauge set	Bantai	C-IC	+===		
Vamada Motor Co., Ltd., A & B	Vanaba Motor Co., Ltd.		Hand operated crane	Okudaya Giken	OC-FIECO	1		
Tone TC-3000 Tone	Tone TC-3000 Tone TC-3000 Tone TC-3000 Tone TC-3000 Tone TC-3000 Tone Tuborniya Tuborniya & Nachi Morimiro MC240 & MY240 Tuborniya & Nachi Taket T		Special tool kit for outboard engines	Yamaha Motor Co., Ltd.	A&B			
Tone K-60 146 1 Tone Tuborniya SoMax & Nachi Mc240 & MY240 146 1 Morimiro MC240 & MY240 1 Histori Bessel 2600D 1 Assiri Banzai 1923-B 1600 1 Makita 1923-B 1600 1 Makita KiC-32 L-5 1600 1 Makita KiC-32 KiC-32 L-600 1 Makita KiC-32 KiC-3	Tone R-60 146 1 Tubomiya		Hand tool kit with a wagon type container	Tone	TC-3000	1		
Tone Tone Tone Tubouniya 146 1 Tubouniya Sokax & Nachii MC240 & MY240 1 Habet	Tone		Portable tool set with a case	Tone	K-60	1		
Tubomiya Tubomiya	Tuborniya Soldax & Nachi		Socket wrench set	Tone	146	-		
ade for metal use SoMax & Nachii MC240 & MY240 1 Heiset Heiset 1 Heiset 2600D 1 Ressel 2600D 1 Asahi Ressel 2600D I Asahi 1 Bessel 2600D 1 I Bessel 1 Bessel 2600D 1 Bessel 2600D 1 Bessel 2600D 1 Bessel 2600D 1 Banzal 2600D 1 Banzal 1 1 Banzal 1 1 Set 1 1 Set 1 1 Intract 1 1	Action MC240 & MY240 & MY240		Files set for metal	Tubomiya		_		
Moriniro MC240 & M7240 1 Fiszet Essel 2600D 1 Bessel 2600D 1 Asahi Bessel 2600D 1 Bessel Super & Maruzaka 1 Benzel Enjiga & Ebi 1 Benzel Enjiga & Ebi 1 Benzel Halaya Limited UKB-3223, ILI-5 2 Set Ehizak 1923-B 1600 1 for wooden work) Makita 1923-B 1600 1 Afibing gear Enged:	Morimito MC240 & MY240 1 Histort Histort 1 Bessel 2610D 1 Asabi Ressel 2610D 1 Asabi Bessel 2610D 1 Bessel Ressel Ress		Hacksaw frame and blade for metal use	SoMax & Nachi		1)		
Histort Histort Bessel 2600D 1 Bessel Bessel 1 Bessel Super & Marusaka 1 Benzal Benzal 1 Benzal	Histort Histort Eessel 2600D 1 Bessel 2600D 1 Bessel 2600D 1 Bessel 2600D 1 Bessel Essel Essel Essel		Scissors for metal use	Morimiro	MC340 & MY240	1		
Bessel 2640D 1 Bessel 2640D 1 Asahi	Bessel 2600D 1 Bessel 2600D 1 Asahi		Punch set	Histort		I		
Bessel 2640D 1	Bessel 2600D 1		Screw driver set	Bessel		_		
Asabit Ressel Bessel Exper & Marusaka Essel Enjiya & Ebi Enjiya & Ebi Enizat Enjiya & Ebi Enizat E	Asabii Ressel Bessel Eujiya & Ebi I Banzai I I Banzai I I Banzai I I I I I I I I I		Impact driver set	Bessel	Z600D	I		
t Super & Marusaka Subi Banzai & Ebi Banzai Set Set Set Shigask Sowooden work) Marita 1923-B 1923-B 1600 11 Nino Kouki EUC-32 Lenged:	Pessel Bessel Exper & Martusaka I Fujiya & Ebi I Banzai I I Banzai I I Banzai I I I I I I I I I		Allen key set	Asahi		-		
t Super & Marusaka Fujiya & Ebi Banzai Banzai Banzai Banzai Halaya Limited UKB-3223, ILI-5 Set Soft wooden work) Makita Makita Makita Makita Makita Makita Makita Mino Kouki FUC-32 Lenged:	t Super & Marusaka Fujiya & Ebi Banzai Banzai Banzai Halaya Limited UKB-3223, ILI-5 Set Ishizak for wooden work) Makita Makita Nino Kouki Kibing gear Lenged:		Hammer set	Bestel		F		
Pujiya & Ebi Banzai Banzai 1 Banzai Halaya Limited UKB-3223, ILI-5 2 Set Shizak 1923-B 1600 1 for wooden work Makita 1923-B 1600 1 Nino Kouki EUC-32 1 Lenged:	Pujiya & Ebi Banzai Banzai 1 Banzai Halaya Limited UKB-3223, ILI-5 2 Set Khizak 1923-B 1600 1 for wooden work Makita EtC-32 1 Nino Kouki EtC-32 1 Lenged:		Adjustable wrench set	Super & Maruszaka		ī		
Earsion cable reel Banzai UKB-3223, III-5 1 Set Ishizak Ishizak 1 for wooden work) Makita 1923-B 1 for wooden work) Makita 1500-32 1 for wooden work) Makita EIC-32 1 Af fishing gear Longed: Lenged:	Banzaj Banzaj Banzaj Banzaj Halaya Limited UKB-3223, III-5 2 Set Enizak 1923-B 1600 1 for wooden work) Makita EUC-32 1 Affibing gear Nino Kouki EUC-32 1		Pliers set	Fujiya & Ebi		-		
Halaya Limited UKB-3223, ILI-5 Estizak 1923-B I I I I I I I I I	Halaya Limited UKB-3223, ILI-5 Ishizak 1923-B Ishizak 1923-B Ishizak I		Oil filter wrenches set	Banzai				
Shizak 1923-B 1600 1	Shikak 1923-B 1600 1		Portable light and extension cable reel	Hataya Limited	UKB-3223, III-5	2	ļ	
Makita 1923-B 1600 1	Makita 1923-B 1600 1		Electric soldering iron set	Ishizak		-		
Makita 1600 1	Makita 1600 1 Nino Kouki RIC-32 1		Electric circular saw (for wooden work)	Makita	1923-B			
Nino Kouki EIC- 32 1	Nino Kouki EIC-32 1		Electric hand planer (for wooden work)	Makita	1600	-		
Lenged:	Lenged:		Needle tackier	Nino Kouki		ļ-		
1	1		Tools for assembling of fishing gear			<u> </u>		
	Parlost				- pashari	1	amaged	

Table 2-2-1 (4) The Survey Result of Identifying the Contents of the Project

Hand present Probat Foliard Probat Foliard Probat Foliard Probat Foliard Probat Foliard Probat Foliard Folia	Hand present Protect of Polari Tolari To	إ	Section 1	1 Constitution	December (Tena Alfoda) Anday No.)	Onto	41	Hart Statement	Ţ
Heating present Tobart Tob	Dies set	e;	Name of Equipment	Mannaganer	MESTIMON(1) JUST WINES MINES NO.	Calley.	4	۱	<u></u>
1 Dise set Tobari Tobari For 2.86 mm Altuminum 1 Dise set Tobari Tobari for 2.66 mm Altuminum 1 Dise set Tobari Tobari for virt leader Caper 2 Addisht Addisht 2.00 mm for wire leader 1.00 mm for wire leader 3 Solice for the Addisht Tobari 1.50 mm for wire leader 2 4 Minist Particulor & Tobari 1.50 mm for wire leader 2 5 Solice for the Caper Tobari 1.50 mm for wire leader 2 5 Solice for the Caper Tobari 1.50 mm for wire leader 2 Vivine set Tobari 1.50 mm for wire leader 2 Vivine set Tobari 1.50 mm for wire leader 2 Vivine set Tobari 1.50 mm for wire leader 3 Vivine set Tobari 1.50 mm for wire leader 3 Vivine set Tobari 1.50 mm for wire leader 3 Vivine set Tobari 1.50 mm for wire leader 3 Vivine set Tobari 1.50 mm for wire leader 3	Dise set Tobari For 2 M: man Atmenium 5	T.	Hand preser	Tohari	700 mm.E.	2			_
Dies sect Tobard Tobard Ion 2.06 mm Aluminum	Diesest	2	Diesset	Tohari	for 2.85 mm Aluminum	5	3		-
Dies set Tobart	Dies set Tobari Gewele Leafer Copper 5	က	Diesset	Tokari	for 2.05 mm Aluminum	LP	15		
Mini-typesser Tobart Tob	Moint-preser Tobari Z00 mm for wire leafer S	4	Dieset	Tohari	for wire leader Copper	20	15		
2. Muthidity Totabut 2.00 mm for wire leader 3. Spiles 3. On mm for wire leader 3. On mm for wire leader 4. Oblation Hasania Scisores Totabut Totabut 150 mm for wire leader 5. Fileses Thereses Totabut 150 mm for wire leader 2 Pollacio Hasania Scisores Totabut Totabut 150 mm for wire leader 2 Victore set Victore set Totabut Totabut 150 mm for wire leader 2 Victore set Victore set Totabut Totabut 150 mm for wire leader 2 Victore set Victore set Victore set Victore set Victore set 1 Victore set Silde projector set Edit AIR—4400 1 1 Silde projector set Edit Nictore Silde set Nictore Silde set 1 1 Silde projector set Edit Nictore Silde Nictore Silde 1 1 Silde projector set Edit Nictore Silde Nictore Silde 1 1 1 Silde pr	2. Kouffelt Totati 150 mm for vive bedrer 5 4. Obtable dispusaria Totati 150 mm for vive bedrer 5 4. Obtable dispusaria Totati 150 mm for vive bedrer 5 5. These Please Totati 150 mm for vive bedrer 5 5. These Please Totati 150 mm for vive bedrer 5 6. Obtable of vive get Totation Totation 7 7. Video set Totation Totation 1 8. Side projects set Totation Totation 1 8. Side projects set Totation APP - ARP - ARM 1 9. While & Birst ke bourds Totation Totation 1 1. Included first contribute Totation Nature 2 2. Head scale with scrop 30 Lise capacity Dates Nature 1 3. Please first container Sale Nature 1 4. Please first first container Sale Nord Nord 1 5. Trainfact first container Sale Nord 1	77	Mini-presser	Tohari		ın	10	_	
3. Soften Charles Science Totabrit 130 amfort rope work 4. Oblivable Hasma Sciences Totabrit 130 amfort rope work 4. Oblivate Hasma Sciences Totabrit 130 mm for line work Scribe diving set Press Totabrit 130 mm for line work 1 Value offing set Value offine Fig. Pagen 1 Value offine Fig. Pagen Credit offine 1 Value offine Fig. Pagen Credit offine 1 Value offine Fig. Pagen Credit offine 1 Value office Fig. Pagen All Pagen All Pagen Value office Fig. Pagen All Pagen All Pagen	3 3 3 3 3 4 4 4 4	2-2	Kulkiri	Tohari.	200 mm for wire leader	2		_	
Chicato Hasmi Scisores Totatri 150 mm for wire leader	Chichot Hasmi Srisore Tolorid 135 mm for wire leader 5	2-3	Spike	Tohari	150 ram for rope work	2			
÷ Pitess Totant 150 mm for wire leader Scrite diving set and	Place Plac	2-4	Ohkubo Hasami Scissors	Tolari	150 mm for line work	2			
Extraction & Training Equipment Agailung or equivalent Scate diving set Video set Fix-Sink and others Video set Video set Fix-Sink and others Manuals for outboard engines Video set Fix-Sink and others Sink broblects set Fixed ARP-460A Sink broblects set Fixed Six-Sink While & Black bounds Reversible type Underwater camera with strobe light Nikon Reversible type I will scole with scoop 380 Lise capestity Chafflon Heavy duty #MS-20P 2 Fibring top-pen scale with scoop 380 Lise capestity Decree Heavy duty #MS-20P 2 Fibring top-pen scale with scale with scale with scale with scale scale with scale wit	Education & Training Equipment Aquatums According or Cquivalent Various set Training Equipment Training Training set Various set Training Tra	3-5	Pliers	Tohari	150 nun for wire leader	2	2		
Scarled offwing set Agealung or cultivalient Victor set Water Fig. Fig. Name Fig. Fig. Name Mannals for outboard cugines Yamba Teach AIPP—4400 Side projector set Eich AIPP—4400 AIPP—4400 White & Back boards IX Mannals for outboard outper AIPP—4400 White & Back boards IX Nacous AIPP—4400 III Fish Handing and Marchael England Mach of 2005 AIPP—4400 III Fish Handing and Marchael England Mach of 2005 AIPP—4400 2 Hand scale with scrop 30 Lbs capacity Delcon Heavy duty #MCS-20P III 2 Picting top-pen scale Gold School Aiver of 2005 AIPP 2 Picting top-pen scale Gold School Aiver of 2005 Air of 2005 AIPP 2 Picting top-pen scale Bonar Model #1545 Air of 2005 Air of 2005 3 Picting top-pen scale Scale Bonar Model #1540 Air of 2005 4	Scribed (frieng sect) Ageinating or counwhelent 2 Mannales for outboard engines Famina Transh ARP-4400 1 Mannales for outboard engines Famina ARP-4400 1 Silde projector set Exact SID ARP-4400 1 Silde projector set Exact Exact SID 1 While & Black boards Bio Reversible type 2 Unical restrict canact with strobe light Ninon Reversible type 2 In Pala femiling and Marketing Enginement Chair Serve out \$720-4G 18 18 2 Hand scale with scrobe light Detect Factor of \$4720-4G 18 18 3 Paster finds concluder Broad Spring type Reversible type 5 1 Paster find container Soulco Model \$1200 2 100 2 Paster find container Soulco Model \$1200 2 1 3 Paster find container Soulco Model \$1200 2 1 4 Paster find container Soulco Model \$1200<	Chapter II	Educationi & Training Equipment						
Video set WG HR-50/MS and others Name of the control of engines Figh AHP-400 Silde projector set Eth SID -260M While & Black will strobe light Ino Man and Merceting Enginement Chafflon While & Black word will strobe light Nikon Nikon Nikon Inderwater camera with strobe light Nikon Nikon Nikon Inderwater camera with strope light Nikon Nikon Nikon Paral Hearling and Merceting Enginement Chafflon Heary duty FR290-4C 11 2 Hand scale with scoop 300 List capacity Delector Heary duty FR290-4C 13 2 Find form a scale Find form a scale Good S900 14 2 Find form a scale Find form a scale Bonar Model #1550 2 2 Find for for container Sanko Model #1550 3 3 Practic fish container Sanko Model #20200 3 4 Find cat Freezing pen Sanko Model #20200 3 5 Find for the cat Sanko Anchel	Wideo set WC HR-50/IACs and others 1 Mannals for outboard engines Familia AIPP-4000 1 Side projector set EBH AIPP-4000 1 Side projector set EBH SIA ASID-260M 1 Side projector set EBH SIA ASID-260M 1 Recorded projector set EBH SIA ASID-260M 1 Record Side & board ASID ASID ASID 2 Index water cancer with strobe light Niko Index water cancer with strope light Niko Index water cancer water cancer with strope light Niko Index water cancer water cancer with strope light Niko Index water cancer with strope light Index water cancer with strope light Index water cancer wi		Scriba diving set	Aqualung	or equivalent	2			_
Manuals for outboard engines Yannaha ARP-4400 Governade projector set Eish SID-2600A Gift broded projector set Eish SID-2600A While & Black boards Ro Reversible type Underwater carriar wells acrobe light NRan NRan Hand scale with scoop 300 List capacity Detect Reavy duty #7290-4C Pland scale with scoop 30 List capacity Detect Macel #2005 Pland scale with scoop 30 List capacity Detect Macel #2005 Pland scale with scoop 30 List capacity Detect Macel #2005 Pland scale with scoop 20 List capacity Detect Macel #2005 Pland scale with scale with scale fish container Bonar Model #1500 Pland form scale Bonar Model #1500 Pland cat Sanko Model #1500 Prescring pan Sanko Model #2000 Prescring pan Freezing pan Freezing pan Fercating pan Freezing pan Freezing pan Fand cat with hydratulic lift Sakate Freezing pan Fercassing tables	Manuals for outboard engines Yamaha ARP-4400 Cherleast projector set		Video set	JWC	HR-J507MS and others	_	0		
Overfread projector set	Overhead projector set ERH APP = 4410 1 Since beared ERH STD-260tH 1 While & Rizer, bounds In Pack bounds Mixons 1 Underweiter camera with stoble light Mixon Mixon 1 In Fabl Hamiling and Marketing Equipment Chaffillon Harry duty #M29-dC 15 2 Hand scale with scorp 30 Lise capacity Deleton Harry duty #M28-dP 15 2 Pack container Bonar Model #2005 2 Pack container Bonar Model #2005 2 Pack cit fith container Bonar Model #2005 2 Pack cit fith container Saako Model #2007 3 Pack cit fith container Saako Model #2007 3 Peack cit fith container Saako Model #2007 4 Priedic fith container <td></td> <td>Manuals for outboard engines</td> <td>Yamaha</td> <td></td> <td>_</td> <td></td> <td></td> <td>_</td>		Manuals for outboard engines	Yamaha		_			_
Silde projector set Etal SID-260M While & Brack Doards Ito Reversible type Underwater camera with strobe light Nikoun Nikoune Hand scale with scrope 300 List capacity Chafflon Heavy duty #7230-4G 2 Hand scale with scrope 30 List capacity Deleton Heavy duty #7230-4G 2 Hand scale with scrope 30 List capacity Deleton Heavy duty #7230-4G 2 Hand scale with scrope 30 List capacity Horis Model #2030 2 Platforms scale Gold SPB02 2 Insulated fish container Bonar Model #215800 2 2 Plastic fish container Soako Model #215800 3 3 Plastic fish container Soako Model #215800 3 4 Plastic fish container Soako Model #215800 3 3 Plastic fish container Soako Model #215800 3 4 Plastic fish container Soako Model #21800 3 5 Plastic fish container Soako Model #21800 4 6 Plastic fish container Soako Model #21800 4 <td>Siled projector set Each SID-260M 1 While & Back Dougle Hoo Reversible type 2 Under water canners with strobe light Miscon Macuos 1 Hand seale with strop an scale Hand seale with scop 30 List capacity Henre Heavy duty #7280-4G 15 Spring top-pan scale Challon Heavy duty #7280-4G 15 Spring top-pan scale Gold Spring top-pan scale Challon Insulated fish container Board Model #1500 2 Plastic fish container Sanko Model #1580 2 Plastic fish container Sanko Model #1500 30 Prescit fish container Sanko Model #2020 30 Prescit fish container Sanko Model #2020</td> <td></td> <td>Overhead projector set</td> <td>圕</td> <td>AHP-4400</td> <td>-</td> <td></td> <td></td> <td>0</td>	Siled projector set Each SID-260M 1 While & Back Dougle Hoo Reversible type 2 Under water canners with strobe light Miscon Macuos 1 Hand seale with strop an scale Hand seale with scop 30 List capacity Henre Heavy duty #7280-4G 15 Spring top-pan scale Challon Heavy duty #7280-4G 15 Spring top-pan scale Gold Spring top-pan scale Challon Insulated fish container Board Model #1500 2 Plastic fish container Sanko Model #1580 2 Plastic fish container Sanko Model #1500 30 Prescit fish container Sanko Model #2020 30 Prescit fish container Sanko Model #2020		Overhead projector set	圕	AHP-4400	-			0
White & Black boards Ho Reversible type III Pish Handing and Kartering Equipment Nikon Reversible type 2 Hand scale with scrop 20 Lbs capacity Delecon Heavy duty #7290-4G 13 2 Hand scale with scrop 20 Lbs capacity Delecon Heavy duty #7290-4G 13 2 Pland scale with scrop 20 Lbs capacity Delecon Heavy duty #7290-4G 13 2 Pland scale with scrop 20 Lbs capacity Delecon Heavy duty #7290-4G 13 2 Pland scale with scrop 20 Lbs capacity Delecon Heavy duty #7290-4G 13 2 Pland scale with scale Gold #7200S Reavy duty #7290-4G 13 3 Platfic fish container Bonar Model #1500S 2 2 Plastic fish container Sanko Model #1300 2 3 Plastic fish container Sanko Model #1300 2 4 Plastic fish container Sanko Model #1300 3 4 Plastic fish container Sanko Model #1300 4 </td <td>While & Black boards Ito Reversible type 2 III Pear Hearting and Marching Engineer Ito Miscan Reversible type 2 2 Hand scale with scrop 300 List capacity Chariflon Heavy duty #7290-4C 18 2 Hand scale with scrop 20 List capacity Delector Heavy duty #7290-4C 18 2 Hand scale with scrop 20 List capacity Delector More #2005 2 2 Insulated fish container Gold Spring top-rain scale Charifold Charifold Spring top-rain scale Spring top-rain scale Spring top-rain scale Charifold Spring top-rain scale Spring top-rain scale</td> <td></td> <td>Silde projector set</td> <td>路</td> <td>SID-260M</td> <td>-</td> <td>_</td> <td></td> <td></td>	While & Black boards Ito Reversible type 2 III Pear Hearting and Marching Engineer Ito Miscan Reversible type 2 2 Hand scale with scrop 300 List capacity Chariflon Heavy duty #7290-4C 18 2 Hand scale with scrop 20 List capacity Delector Heavy duty #7290-4C 18 2 Hand scale with scrop 20 List capacity Delector More #2005 2 2 Insulated fish container Gold Spring top-rain scale Charifold Charifold Spring top-rain scale Spring top-rain scale Spring top-rain scale Charifold Spring top-rain scale		Silde projector set	路	SID-260M	-	_		
Figh Hendling and Marketing Equipment Nikon Nikon Nikons Nikons Nikons Nikons Nikons Nikons Nikons Nikons Head Sale With scrop 20 Like capacity Detect Head Scale With scrop 20 Like capacity Home Model #2015 Spring top-pear scale Head Scale With scrop 20 Like capacity Home Rodar	Underwater camera with strobe light Nibon Nibono		White & Black boards	Ito	Reversible type	2			
III Figh Hemiling and Marketing Equipment Classifion Heavy duty #7290-4C 1 2 Hand scale with scop 300 Lise capacity Detect Heavy duty #7290-4C 1 2 Hand scale with scop 300 Lise capacity Herns Model #120DS 2 2 Planform scale Gold Syr902 2 2 Insulated fish container Bonar Model #1800 2 2 Plastic fish container Sanko Model #207010 3 3 Plastic fish container Sanko Model #207010 3 4 Plastic fish container Sanko Model #207010 3 5 Plastic fish container Sanko Model #207010 3 6 Freeting pan Andel #207010 3 7 Plastic fish container Sanko Model #207010 9 8 Plastic fish container Sanko Model #207010 9 8 Freeting pan Freeting pan Model #207010 9 8 Fand cart	Hand scale with scorp 30 Lbs capacity		Underwater camera with strobe light	NBoa	Nikonos	-	_	_	b
Hand scale with scoop 300 Lbs capacity Chatilton Heavy duty #7290-4G 11 2 Hand scale with scoop 30 Lbs capacity Deteco Heavy duty #7290-4G 11 Spring top-pan scale Gold Spring top-pan scale Gold Spring top-pan scale 2 Platition scale Insulated fish container Bonar Model #1545 2 2 2 Insulated fish container Saako Model #1580 2 2 2 Plastic fish container Saako Model #13000 3 3 Plastic fish container Saako Model #13000 2 4 Plastic fish container Saako Model #13000 3 3 Plastic fish container Saako Model #13000 2 4 Plastic fish container Saako Model #13000 3 5 Plastic fish container Saako Contec Galvanized 9 6 Freezing pan Freezing pan Freezing pan Freezing pan Freezing pan scale with label printer Fruntscale Freezing pan scale with label printer Freezing tables Freezing tables Freezing tables <td>Hand scale with scoop 300 Lbs capacity Chalilton Heavy duty \$47290-4G 18 2 Hand scale with scoop 300 Lbs capacity Debcoo Heavy duty \$47280-4G 15 2 Fluid scale with scoop 30 Lbs capacity Hone Model \$1205 2 2 Fluid scale with scoop 30 Lbs capacity Bonar Model \$1545 2 2 Insulated fish container Bonar Model \$1545 2 2 Insulated fish container Sanko Model \$1550 2 3 Pastic fish container Sanko Model \$20200 3 4 Pastic fish container Sanko Model \$20200 30 5 Pastic fish container Sanko Model \$20200 30 6 Pastic fish container Sanko Model \$20200 30 7 Pressing pan Sanko Model \$20200 30 8 Hand cart Sanko Model \$20200 30 9 Hand cart Sakae 100 30 1 Hand cart Sakae 100 30 2 Hand cart Sakae 100 30 3 Hand cart</td> <td>Ħ</td> <td>Fish Handing and Marketing Equipment</td> <td></td> <td></td> <td></td> <td>_</td> <td>_</td> <td>Γ</td>	Hand scale with scoop 300 Lbs capacity Chalilton Heavy duty \$47290-4G 18 2 Hand scale with scoop 300 Lbs capacity Debcoo Heavy duty \$47280-4G 15 2 Fluid scale with scoop 30 Lbs capacity Hone Model \$1205 2 2 Fluid scale with scoop 30 Lbs capacity Bonar Model \$1545 2 2 Insulated fish container Bonar Model \$1545 2 2 Insulated fish container Sanko Model \$1550 2 3 Pastic fish container Sanko Model \$20200 3 4 Pastic fish container Sanko Model \$20200 30 5 Pastic fish container Sanko Model \$20200 30 6 Pastic fish container Sanko Model \$20200 30 7 Pressing pan Sanko Model \$20200 30 8 Hand cart Sanko Model \$20200 30 9 Hand cart Sakae 100 30 1 Hand cart Sakae 100 30 2 Hand cart Sakae 100 30 3 Hand cart	Ħ	Fish Handing and Marketing Equipment				_	_	Γ
Hand scale with scoop 20 Lbs capacity Deleco Heavy duty #MCS-20P 11 Spring top-pan scale Homs Model #20US 2 Platform scale Gold St902 2 Insulated fish container Bonar Model #1555 2 Plastic fish container Bonar Model #215800 3 Plastic fish container Sanko Model #21800 3 Plastic fish container Sanko Model #21800 3 Prestic fish container Sanko Model #21800 3 Prestic fish container Sanko Model #21800 3 Prestic fish container Sanko Model #2000 3 Presting pan Freezing pan Sanko Model #2000 3 Hand cat Walled #2000 3 4 4 4 4 Hand cat Walled #2000 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Hand scale with scrop 20 Lbs capacity Deleco Heary duty #MCS-20P 15 Spring top-pen scale Homs Model #20DS 5 Paking top-pen scale God 200 22 Insulated fish container Bonar Model #1545 21 Insulated fish container Saako Model #21800 22 Pastic fish container Saako Model #21800 32 Pastic fish container Saako Model #21800 30 Pastic fish container Saako Model #21800 30 Pastic fish container Saako Model #21800 30 Precing pen Gontec Gontec Gontec 60 Partic band sard Bind #11800 20 30 Frecking pen Bind Gard 30 30 Hand cart Sakae 90 × 600 300 kgs capacity 10 Flectric band saw Bind fight FVC-II 1 Flectric band saw Forthing Machinery Coder made 5 Processing tables Frocessing tables		Hand scale with scoop 300 Lbs capacity	Chatilton	Heavy duty #7290-4G	18		0	
Spring top-pan scale Horns Model #20DS Platform scale Gold SP902 Insulated fish container Bonar Model #1545 2 Plastic fish container Sanko Model #207010 3 Plastic fish container Sanko Model #207010 10 Plastic fish container Sanko Model #207010 5 Plastic fish container Sanko Model #207801 5 Prestic fish container Sanko Model #207801 5 Freeding pan Sakee 1200 x 750 500 kgs capacity 5 Hand cart Sakee 1300 x 750 500 kgs capacity 1 Electric band saw Fuchanita FVC-II FVC-II Electric tap pan scale with label printer Yearum packing mackine Yearum packing mackine Yearum packing mackine Processing tables <t< td=""><td>Spring top pan scale Horns Model #2015 5 Platform scale Gold Styring 2 Insulated fish container Bonar Model #1545 21 Plastic fish container Sanko Model #215800 32 Plastic fish container Sanko Model #21800 30 Plastic fish container Sanko Model #21800 30 Precking pan Container Sanko Model #21800 30 Precking pan Sanko Model #21800 30 40 Hand cart Salase 130 × 750 500 kgs capacity 10 20 Hand cart with hydraulic lift Onther was a sanko Model #21800 10 40 40 50 50 50 50 50 50 50 50 50 50 50 50</td><td>2</td><td>Hand scale with scoop 20 Lbs capacity</td><td>Defecto</td><td>Heavy duty #MCS-20P</td><td>12</td><td></td><td>0</td><td></td></t<>	Spring top pan scale Horns Model #2015 5 Platform scale Gold Styring 2 Insulated fish container Bonar Model #1545 21 Plastic fish container Sanko Model #215800 32 Plastic fish container Sanko Model #21800 30 Plastic fish container Sanko Model #21800 30 Precking pan Container Sanko Model #21800 30 Precking pan Sanko Model #21800 30 40 Hand cart Salase 130 × 750 500 kgs capacity 10 20 Hand cart with hydraulic lift Onther was a sanko Model #21800 10 40 40 50 50 50 50 50 50 50 50 50 50 50 50	2	Hand scale with scoop 20 Lbs capacity	Defecto	Heavy duty #MCS-20P	12		0	
Flatform scale Gold SP902 Insulated fish container Bonar Model #1545 2 Insulated fish container Bonar Model #215800 3 Plastic fish container Sanko Model #215800 3 Plastic fish container Sanko Model #21800 3 Plastic fish container Sanko Model #20200 3 Plastic fish container Sanko Model #20200 3 Preszing pan Freezing pan Contec Calvanized 9 Freezing pan Freezing pan Sakae 1200 × 750 500 kgs capacity 1 Hand cart Sakae 1200 × 750 500 kgs capacity 1 1 Hand cart Band cart Sakae 1200 × 750 500 kgs capacity 1 Hand cart Sakae 1200 × 750 500 kgs capacity 1 Hand cart Fland cart Freezing band kgs Freezing band kgs Freezing band kgs Vacuum packing macking macki	Platform scale Gold Sty902 2 Insulated fish container Bonar Model #1545 21 Pastic fish container Saako Model #215800 32 Plastic fish container Saako Model #202001 30 Plastic fish container Saako Model #202001 50 Plastic fish container Saako Model #202001 50 Precking pen Saako Model #13000 20 Precking pen Saako Model #13000 20 Frecking pen Sakae 1200 × 750 500 kgs capacity 2 Hand cart Sakae 90 × 600 310 kgs capacity 2 Hand cart Sakae 90 × 600 310 kgs capacity 1 Vacrium packing mechine Flectric band saw Flectric band saw Flectric band saw Flectric top pan scale with label printer Flectric top pan scale with label printer Yoshinitu Machinery Order made 6 Processing tables Yoshinitu Machinery Order made 6 6 Processing tables Yoshinitu Machinery Order		Spring top-pan scale	Homs	Model #20DS	5		0	
Insulated fish container Bonar Model #1545 2 Insulated fish container Bonar Model #215800 2 Plastic fish container Saako Model #215800 3 Plastic fish container Saako Model #20201 5 Plastic fish container Saako Model #20201 5 Plastic fish container Saako Model #20201 5 Prescing pan Saako Incore Galvanized 5 Hand cart Sakae 1200 × 750 500 kgs capacity 9 Hand cart Bino cart Okubaya Giken Co., Ltd CPFS-1GS-107 Electric band saw Furukawa Furukawa FvC-1 Vacruun packing machine Furukawa FvC-1 Processing tables Yeshinitu Machinery Order made Processing tables Yoshinitu Machinery Order made Processing tables Yoshinitu Machinery Order made Processing tables Yoshinitu Machinery Order made Chilled fish display case General Refrigeration SSD	Insulated fish container Bonar Model #1545 21 Insulated fish container Bonar Model #15800 22 Plastic fish container Saako Model #271800 32 Plastic fish container Saako Model #271800 50 Plastic fish container Saako Model #202801 20 Hand cart Gontec Galvanized 90 50 Hand cart Sake 100 20 50 Hand cart Sake 100 20 50 Hand cart Sake FWC-11 11 12 Vacuum packing Factric band saw FWC-11 11 12 Processing tables Youthultu Machinery Order made 12 Processin		Platform scale	PjoS	SP902	2			
Insulated fish container Bonar Model #21800 2 Plastic fish container Saako Model #21800 3 Plastic fish container Saako Model #21800 3 Plastic fish container Sanko Model #207010 100 Plastic fish container Sanko Model #20200 5 Prezing pan Contec Galvanized 9 Hand cart Sakae 1200 × 750 500 kgs capacity 9 Hand cart with hydraulic lift Okubaya Giken Co., Ltd CPFS-15S-107 1 Electric band saw Furukawa FVC-11 1 Electric top gan scale with label printer Yanato Scale Nctc.31 1 Processing tables Yoshimiku Machinery Order made Order made Processing tables Yoshimiku Machinery Order made Order made Processing tables Yoshimiku Machinery Order made Order made	Insulated fish container Botear Model #1800 22 Plastic fish container Sanko Model #21880 32 Plastic fish container Sanko Model #21880 32 Plastic fish container Sanko Model #207010 50 Plastic fish container Sanko Model #130901 50 Plastic fish container Sanko Model #13000 30 Preezing pen Sakee 1200 × 750 500 kgs capacity 2 Hand cart Sakee 1200 × 750 500 kgs capacity 10 Hand cart with hydraulic lift Okubaya Giken Co., Ltd CPFS-16S-107 2 Hand cart with hydraulic lift Furukawa FVC-11 1 Vacritum packine Furukawa FVC-11 1 Electric band saw Yoshimiku Machinery Order made 6 Processing tables Yoshimiku Machinery Order made 3 Processing tables Yoshimiku Machinery Order made 3 Chilled fish display case General Refrigeration RSD		Insulated fish container	Bonar	Model #1545	21			
Plastic fish container Sanko Model #23,580 3 Plastic fish container Sanko Model #207010 100 Plastic fish container Sanko Model #202901 5 Plastic fish container Sanko Model #13000 2 Prezing pan Contec Galvanized 2 Hand cart Hand cart 1200 × 750 500 kgs capacity 9 Hand cart Hand cart 90 × 600 300 kgs capacity 1 Hand cart Hand cart 90 × 600 300 kgs capacity 1 Hand cart Hand cart Okubaya Giken Co., Ltd CPFS-1SS-107 1 Hand cart with hydraulic lift Sakae 90 × 600 300 kgs capacity 1 Vacuum packing mackine Flectric band saw Furukawa Furukawa FvC-II Processing tables Yealunitu Machinery Order made Creer made Processing tables Yealunitu Machinery Order made Creer made Chilled fish display case General Refrigeration SSD	Plastic fish container Sanko Model #23,5800 32 Plastic fish container Sanko Model #20,7010 100 Plastic fish container Sanko Model #13,000 20 Prescring pen Contec Cabranized 20 Freezing pen Contec Cabranized 20 Hand cart Sakae 1200 × 750 500 kgs capacity 2 Hand cart Sakae 90 × 600 300 kgs capacity 2 Hand cart with hydraulic lift Sakae 90 × 600 300 kgs capacity 10 Hand cart with hydraulic lift Sakae 90 × 600 300 kgs capacity 1 Vacrium packing machine Purch is a packing machine 1 Reductic top pan acid with label printer Yoshimitu Machinery Order made 6 Processing tables Yoshimitu Machinery Order made 3 Processing tables Chillied fish display case General Refigeration 85D	2	Insulated fish container	Bonar	Model #1800	22		!	
Plastic fish container Sanko Model #207010 100 Plastic fish container Sanko Model #202901 55 Preszing pan Contec Galvanized 2 Freezing pan Contec Galvanized 2 Hand cart Sakae 1200 × 750 500 kgs capacity 9 Hand cart Hand cart 90 × 600 300 kgs capacity 9 Hand cart with hydraulic lift Sakae 90 × 600 300 kgs capacity 1 Hand cart with hydraulic lift Okubaya Giken Co., Ltd CPrS-15S-107 1 Hand cart with hydraulic lift Blectric band saw Model 22 Stainless steef cutter 1 Vacuum packing machine FWc-16 Yeanel Stainless steef cutter Yeanel Stainless steef cutter Yeanel Stainless steef cutter Processing tables Yeanel Machinery Order made Processing tables Yeahiniku Machinery Order made Chilled fish display case General Refrigeration SSD	Plastic fish container Sanko Model #207010 100 Plastic fish container Sanko Model #13000 50 Prezing pan Contec Galvanized 20 Frezing pan Sakae 1200 × 750 500 kgs capacity 2 Hand cart Hand cart with hydraulic lift Sakae 90 × 600 300 kgs capacity 10 Hand cart with hydraulic lift Okubaya Giken Co., Ltd CPIS15S107 2 Electric band saw Bino Model 22 Stainless steel cutter 1 Vacuum packing machine Furukawa FVCII 1 Processing tables Yeshimitu Machinery Order made 6 Processing tables Yeshimitu Machinery Order made 6 Processing tables Yeshimitu Machinery Order made 6 Chilled fish display case General Refrigeration KSD 1		Plastic fish container	Sanko	Model #215800	33			
Plastic fish container Sanko Model #13000 55 Preezing pan Contec Galvanized 2 Freezing pan Sakae 1200 × 750 500 kgs capacity 9 Hand cart Hand cart with hydraulic lift Sakae 90 × 600 300 kgs capacity 1 Hand cart with hydraulic lift Okubaya Giken Co., Ltd CPFS-15S-107 1 Hand cart with hydraulic lift Biro Model 22 Stainless steel cutter 1 Vacuum packing machine Furukawa Furukawa FvC-II Bicctric top pan scale with label printer Yamato Scale Netcell Processing tables Yocklimiku Machinery Order made Processing tables Yoshimiku Machinery Order made Chilled fish display case General Refrigeration 850	Plastic fish container Sanko Model #202901 50 Prezing pan Contec Galvanized 20 Freezing pan Contec Galvanized 20 Hand cart Sakae 1200 × 750 500 kgs capacity 2 Hand cart Sakae 90 × 600 300 kgs capacity 2 Hand cart Sakae 90 × 600 300 kgs capacity 10 Hand cart with hydraulic lift Okubaya Giken Co., Ltd CPFS-15S-107 2 Electric band saw Froch Sakae FVC-11 1 Vacrium packing machine Fwc-15S-107 2 Electric top pan scale with label printer Youlmiltu Machinery Order made 1 Processing tables Yoshimiltu Machinery Order made 6 Processing tables Yoshimiltu Machinery Order made 3 Chilled fish display case General Refrigeration 85D 1	2	Plastic fish container	Saako	Model #207010	100			
Plastic fish container Sanko Model #113000 2 Freezing pan Contec Galvanized 9 Hand cart Sakae 1200 × 750 500 kgs capacity 9 Hand cart Hand cart with hydraulic lift Okubaya Giken Co., Ltd CPFS-15S-107 Hand cart with hydraulic lift Biro Model 22 Stainless steel cutter Vacuum packing machine Furukawa Furukawa Electric top pan scale with label printer Yamato Scale Netcell Processing tables Yockimiku Machinery Order made Processing tables Yockimiku Machinery Order made Chilled fish display case General Refrigeration SSD	Plastic fish container Sanko Model #113000 20 Freezing pan Contec Galvanized 90 Hand cart Sakae 1200 × 750 500 kgs capacity 2 Hand cart Sakae 90 × 600 300 kgs capacity 2 Hand cart Whith hydraulic lift Okubaya Giken Co., Ltd CPFS-107 2 Hand cart with hydraulic lift Okubaya Giken Co., Ltd CPFS-107 2 Electric band saw Frocessing saw Frocessing tables Frocessing tables Frocessing tables Noter made 6 Processing tables Yoshimitu Machinery Order made 6 7 Processing tables Yoshimitu Machinery Order made 3 Chilled fish display case General Refrigeration 8SD 1	3	Plastic fish container	Sanko	Model #202901	20			
Freezing pan Contect Galvanized 9 Hand cart Sakae 1200 × 750 500 kgs capacity 1 Hand cart Sakae 90 × 600 300 kgs capacity 1 Hand cart With hydraulic lift Okubaya Giken Co., Ltd CPFS-167-107 Electric band saw Broot saw Fourtkawa FVC-1 Electric top pan scale with label printer Yanato Scale Netcell Processing tables Yochimitu Machinery Order made Processing tables Yochimitu Machinery Order made Chilled fish display case General Refrigeration SSD	Freezing pan Contec Galvanized 90 Hand cart Sakae 1200 × 750 500 kgs capacity 2 Hand cart Sakae 90 × 600 300 kgs capacity 2 Hand cart Sakae 90 × 600 300 kgs capacity 2 Hand cart with hydraulic lift Okubaya Giken Co., Lid CPFS-16S-107 2 Electric band saw Biro Model 22 Stainless steel cutter 1 Vacuum packing machine Purukawa FVC-II 1 Electric top pan scale with label printer Yamato Scale Netcell 1 Processing tables Yoshimitu Machinery Order made 6 Processing tables Yoshimitu Machinery Order made 3 Chilled fish display case General Refrigeration 8SD	4	Plastic fish container	Sanko	Model #113000	83			
Hand cart Sakae 1200 × 750 500 kgs capacity Hand cart Sakae 90 × 600 300 kgs capacity 1 Hand cart Hand cart with hydraulic lift Okubaya Giken Co., Ltd CPFS-15S-107 Electric band saw Biro Model 22 Stainless steel cutter Vacuum packing machine Furukawa FVC-II Electric top pan scale with label printer Yamato Scale Netcell Processing tables Yochimitu Machinery Order made Processing tables Yochimitu Machinery Order made Chilled fish display case General Refrigeration SSD	Hand cart Sakae 1200 × 750 fkp capacity 2 Hand cart Sakae 90 × 600 300 kgs capacity 10 Hand cart with hydraulic lift Okubaya Giken Co., Ltd CPFS-15S-107 2 Electric band saw Biro Model 22 Stainless steel cutter 1 Vacuum packing machine Purukawa PVC-II 1 Electric top pan scale with label printer Vanato Scale Netcell 1 Processing tables Yoshimltu Machinery Order made 6 Processing tables Yoshimltu Machinery Order made 6 Chilled fish display case General Refrigeration SD Lenged:		Freezing pan	Contec	Galvanized	8	_		
Hand cart Sakae 90 × 600 300 kgs capacity 1 Hand cart with hydraulic lift Okubaya Giken Co., Ltd CPFS-15S-107 1 Electric band saw Biro Model 22 Stainless steel cutter 1 Vacuum packing machine Furukawa FVC-II 1 Electric top pan scale with label printer Yamato Scale Netcell Processing tables Yoshimitu Machinery Order made Processing tables Yoshimitu Machinery Order made Chilled fish display case General Refrigeration 8SD	Hand cart Sakae 90 × 600 300 kgs capacity 10 Hand cart with hydraulic lift Okubaya Giken Co., Ltd CPFS-15S-107 2 Electric band saw Biro Model 22 Stainless steel cutter 1 Vacuum packing machine Furukawa FVC-II 1 Electric top pan scale with label printer Yanato Scale Netcell 1 Processing tables Yoshimitu Machinery Order made 6 Processing tables Yoshimitu Machinery Order made 6 Chilled fish display case General Refrigeration SSD Lenged:		Hand cart	Sakae	1200 × 750 500 kgs capacity	2	-		
Hand cart with hydraulic lift Okubaya Giken Co., Ltd CPFS-167 Electric band saw Bitto Model 22 Stainless steel cutter Vacuum packing machine Furukawa FVC-II Electric top pan scale with label printer Yamato Scale Netcell Processing tables Yoshimitu Machinery Order made Processing tables Yoshimitu Machinery Order made Chilled fish display case General Refrigeration SSD	Hand cart with hydraulic lift Okubaya Giken Co., Ltd CPFS-167-107 2 Electric band saw Biro Model 22 Stainless steel cutter 1 Vacuum packing machine Furukawa FVC-II 1 Electric top pan scale with label printer Yanato Scale Netcell 1 Processing tables Yoshimitu Machinery Order made 6 Processing tables Yoshimitu Machinery Order made 6 Chilled fish display case General Refrigeration SSD Lenged:	2	Hand cart	Sakae	90 × 600 300 kgs capacity	10	_		Γ
Electric band saw Bitto Model 22 Stainless steel cutter Vacuum packing machine Furch. Furch. Electric top pan scale with label printer Yamato Scale Netcell Processing tables Yoshimitu Machinery Order made Processing tables Yoshimitu Machinery Order made Chilled fish display case General Refrigeration SSD	Birot Model 22 Stainless steel cutter 1 Vacuum packing machine Furukawa FVC-II 1 Electric top pan scale with label printer Yanato Scale Netcell 1 Processing tables Yoshimiku Machinery Order made 6 Processing tables Yoshimiku Machinery Order made 3 Chilled fish display case General Refrigeration 8SD Lenged:		Hand cart with hydraulic lift	Okubaya Giken Co., Ltd	CPFS-155-107	2		_	Γ
Vacuum packing machine Furukawa FVC-II Electric top pan scale with label printer Yamato Scale Netcell Processing tables Yoshimitu Machinery Order made Processing tables Yoshimitu Machinery Order made Chilled fish display case General Refrigeration SSD	Vacuum packing machine Furtkawa FVC-II 1 Electric top pan scale with label printer Yanato Scale Netcell 1 Processing tables Yoshindiu Machinery Order made 6 Processing tables Yoshindiu Machinery Order made 3 Chilled fish display case General Refrigeration 83D Lenged:		Electric band saw	Biro	Model 22 Stainless steel cutter	_	0		Γ
Electric top pan scale with label printer Yamato Scale Netcell Processing tables Yoshimitu Machinery Order made Processing tables Yoshimitu Machinery Order made Chilled fish display case General Refrigeration SSD	Electric top pan scale with label printer Yanato Scale Netcell 1 Processing tables Yoshindiu Machinery Order made 6 Processing tables Yoshindiu Machinery Order made 3 Chilled fish display case General Refrigeration 85D Lenged:		Vacuum packing machine	Furtikawa	PVC-II	-			0
Processing tables Yoshimitu Machinery Order made Processing tables Yoshimitu Machinery Order made Chilled fish display case General Refrigeration SSD	Processing tables Yoshindiu Machinery Order made 6 Processing tables Yoshindiu Machinery Order made 3 Chilled fish display case General Refrigeration SSD Lenged:		Electric top pan scale with label printer	Yanato Scale	Netcell	-			Ī
Processing tables Yoshimitu Machinery Order made Chilled fish display case General Refrigeration 8SD	Processing tables Chilled fish display case Chilled fish display case General Refrigeration 83D Lenged:		Processing tables	Yoshimiku Machinery	Order made	9			
General Refrigeration	General Refnigeration 8SD 1.	2	Processing tables	Yoshimitu Machinery	Order made	m	_		
	1		Chilled fish display case	General Refrigeration	CISS CISS	1		_	0
								:	
E=Lost C=Un-useable									

Table 2-2-1 (5) The Survey Result of Identifying the Contents of the Project

				;	Carrie and American	to y The
TETT NO.	1	Manufacturer	Description(Type/Model/Index No.)	À III	4	2
2		General Refrigeration	(S)	-	-	k
11-14	Fitting for fish handing & processing work			1	-	7
	Cutting board		50×27 cm	100	+	+
2	Knife	Dexter/Russell	Model #136S	10	+	+
	Knife	Dexter/Russell	Model #S122-7	18	+	1
c.s	- 1	A&G	Model #54-733	25	+	+
4	- 1	A&G	Shrimo Hearling	2 2	+	+
H3		U.S.	Short white 11	000	 	+
9		A&G	Model #392 / #40G / #395		+	+
Chapter IV	Fish Quality Inspection Equipment			*	+	-
IV-1	Analytical balance	A&D	ER-180A	-	1	Ķ
IV-2	Electric top-pan balance	A&D	FX - 300		+	7
IV-3	Blender	TOSHIBA	17P - 1500	-	+	+
N-4	Homogenizer	TUCH	57-299-02 /05 51-215-01		+	+
§-Aī	Meat chopper	SECONDA NOTION	No.5	1 set	1	+
9-AI	Centrifuge	KOKTISAN	H-103V	-	1	-
IV-7	Hot-plate stirrer	SIBATA	MCH320	- 6	1	9
8-AI	Refrigerator	SAWO	SPITANE	,	1	+
W-9	Incubator	ISUZO	SIV - 11C	1	+	-k
IV-10	Water treatment apparatus	ADVANTEC	PIT-200 CXI -200 TIT-300	100	+	7
N-11	pH meter with spare electrode	TOA	S-M	200	+	+
IV-12	Mercury analyzer	HIRANUMA	H2-1	-	+	+
W-13	Automatic firing apparatus	SIBATA	P665/8 7552-20BC	1	+	k
JV-14	UV Spectrophotometer	SIMADZU	UV - 1201	136	+	ok T
1V-35	Biological microscope	MIKON	LABOPHOT 2	-	+	7
114-16	Stereo Microscope	NIKON	Q-1-2%S	-	+	+
IV-I7	Inversion Microscope	NECON	TMS-12A	<u> </u>		1
IV-18	Colony counter	SIBATA	GI.—558	1	+	+
IV—I9	Drying sterilized	SIBATA	STO - 450	-	+	1
17—Z	Autociave	SIBATA	KS-230	-	+	1
IV-ZI	Themnister themometer	SATO KERYOKI	SK - 1250MC	-	1	
IV-22	Electric Drill	BANZAI	D-6C HD-12	- -	7	1
IV-23	Water qualify checker	Banzai	U-10	-	1	-
IV-24	Salinometer	HORIBA	C- 121	- 0	1	_
IV-25	Hot plate	HORIBA	SIGN	,	1	
IV-26	Cooking table with oven	SIBATA	F7K - 210Z	1	1	이
IV-27-1	Laboratory table	YAMATO	FPR - 150C7	1	+	-
IV-27-2	Side table	YAKATO	FEIT - 150CZ		+	-
			TOTAL TOTAL	*	-	_

Table 2-2-1 (6) The Survey Result of Identifying the Contents of the Project

	Corner table VAMATO FIRE - SECT		16.			
Work base YAMATO FRM - 1902 1 Laboratory table with cabinet YAMATO 1D-803 1 Laboratory table with cabinet YAMATO 1D-804 1 Laboratory table with cabinet VAMATO 1D-804 1 David cast seed of the cabinet VAMATO 1D-804 1 David cast seed of the cabinet VAMATO 2D-125-06 100 Per cities 1D-125-07	Volument Volument		rui succe	YAWATO		
Jaboratory table with cabinet	Laboratory table with cabluct YAMATO 110-580 Laboratory table with cabluct YAMATO 110-580 Laboratory cart		FKM4 - 120GZ	YAMATO	Work table	
Laboratory corf	Laboratory Cart		FFK2 - 180GZ	YAMATO	Laboratory table with cabinet	
Jahonatory Story Laboratory Laborator	Laboratory stor)	1	SWC	YAMATO	Laboratory cart	
December NAMATO	Day desicnate DuCH 11-087 - 01 Clean boar VAMATO Cliff - 3 Clean boar Cliff - 3 Potencies Cliff	4	LD-360	YAMATO	Laboratory stool	
Parceign box Parceign Parce	Petri fables	1	11-057-01	IUCH	Dry desiccate	
The Part of Gabers	Port-1 Gables 10031 22 - 132 - 05 100 Port-2	1	CYH-2	YAMATO	Clean box	
Process Proc	Proceps Process Proc	1001	22-128-05	TOCH	Petri dishes	
Exchange flack MAKI / IUCH 480FX30 73, 54 of 0.7 of	Externesyer flask	\$	56-531-03	TOCHI	Forceps	
Test tube	Test tube	-	4980FK30/50, 56-017-02/04/	℩	Erlenmeyer flask	
Aluminum Trey IUCH	Alumintum Treey 10CH 45 - 175 - 66,007 Volumetric Steeter 10CH 52 - 278 - 68 Volumetric Plattee 10CH 52 - 278 - 66 071,08,09,12 Volumetric Plattee 10CH 52 - 274 - 66,074 Beaker 10CH 10CH 14 - 194 - 11 Settificate 10CH 14 - 194 - 11 Carduated Cylinder 10CH 16 - 231 - 02,04 Carduated Cylinder 10CH 62 - 231 - 02,04 Carduated Cylinder 10CH 62 - 231 - 02,04 Buccaneer Plunted 10CH 62 - 231 - 02,04 Buccaneer Plunted 10CH 62 - 231 - 02,04 Buccaneer Plunted 10CH 62 - 231 - 02,04 Carduated Cylinder 10CH 62 - 231 - 02,04 Buccaneer Plunted 10CH 62 - 231 - 02,04 Carduated Cylinder 10CH 62 - 231 - 02,04 Carduated Cylinder 10CH 63 - 133 - 102 Carduated Cylinder 10CH 63 - 133 - 103 Carduated Cylinder 10CH 63 - 133 - 103 Carduated Cylinder 10CH 63 - 133 - 103 Carduated Cylinder 10CH 63 - 134 - 104 Carduated Cylinder 10CH 63 - 134 - 104 Carduated Cylinder 10CH 10CH 63 - 10 - 103 - 103 Carduated Cylinder 10CH 10CH 10CH 10CH Carduated Cylinder 10CH 10C	l set	56-296-05/07/08/11	IOCHI	Test tube	
Inchesitory Science Inchesity 22-58-03 Section	Laboratory Sciscors 10CH 22 -536 -63	1 set	45-175-06/07	IUCH	Aluminum Tray	'
Volumetric Pipetre Volumet	Volumetric Pipetre Volumet	LE	22-536-03	TOCH!	Laboratory Scissors	
Moceaning Pipette Moce	Meesuring Pipette IUCHI 56 273 - 46/07/08/09/11 Beaker IUCHI 1000BK50, 55 - 214 - 03/05/06 Sterliking Pan IUCHI 74 - 194 - 104 Test Tube Rack Graduated Cylinder IUCHI 56 - 231 - 02/04/05/06/08/10/11 Utility Tray IUCHI 56 - 231 - 02/04/05/06/08/10/11 10CHI 45 - 173 - 10 Utility Bach IUCHI 45 - 196 - 01 1 Sample Dette IUCHI 45 - 196 - 01 1 Sample Dette IUCHI 46 - 135 - 04/05/06 1 Sample Dette IUCHI 52 - 127 - 04/05/06 1 Sample Dette IUCHI 46 - 136 - 01 1 Whatman Filter Paper IUCHI 56 - 10 - 02/04 1 Whatman Filter Paper IUCHI 56 - 10 - 02/04 1 Punnel Sepia Screen IUCHI 46 - 10 - 03/04 1 Whatman Filter Paper IUCHI 56 - 10 - 60/05/06 1 Punnel IUCHI 46 - 10 - 60/05/06 1 Sepia Screen IUCHI 46 - 10 -	1 set	56-274-06/07/08/09/12	IOCHI	Volumetric Pipette	
Peaker P	Beater IMAKI / IUCHI 10008850, 56-214-03/05/06 Sterifizing Pan IUCHI 74-194-01 Craduated Cylinder IUCHI 56-231-02/18/72/05 Graduated Cylinder IUCHI 56-231-02/18/72/05 Utility Tray Buccaneer Plumed IUCHI 45-173-10 Utility Desin IUCHI 45-173-10 10 Dyling Rack IUCHI 45-173-01 1 Sample Bottle IUCHI 45-173-01 1 Sample Bag IUCHI 45-116-01/10 1 Sample Bag IUCHI 45-116-01/10 1 Sample Bag IUCHI 45-116-01/10 1 Semple Vial IUCHI 45-116-01/10 1 Semple Super IUCHI 45-116-01/10 1 Precipitating Vases IUCHI 56-633-07/08/05 1 Punnel IUCHI 56-725-08/01 1 Punnel IUCHI 56-725-08/01 1 WASH Bottle IUCHI 45-103-03 1 WASH Bottle	1 set	56-273-06/07/08/09/11	IUCHI	Measuring Pipette	
Test Tube Rack	Sterifizing Pan IUCHI 74-194-01 Test Tube Rack TGK 360-51-23-12/18/22/05 Clandusted Cylinder IUCHI 56-231-02/14/05/06/08/10/11 Ullity Basin IUCHI 45-196-01 Drying Rack IUCHI 45-196-01 Sample Bottle IUCHI 56-633-07/08/03 Sample Bottle IUCHI 56-633-07/08/03 Procipitating Vases IUCHI 56-633-07/08/03 Punnel IUCHI 56-73-68-00 Sepia Screen IUCHI 56-316-04/06/09 Sepia Screen IUCHI 56-316-04/06/09 Sepia Screen IUCHI 56-316-04/06/09 Punnel IUCHI 56-316-04/06/09 Sepia Screen IUCHI 56-316-04/06/09 WASH IUCHI 56-316	1 set	1000BK50, 56-214-03/05/06	/ \	Beaker	
Test Tube Rack	Test Tube Rack		74-194-01	TOCHI	Sterilizing Pan	
Graduasted Cylinder UCHI 56-231-02/04/05/06/08/10/11 1 set Bursaneer Punned UUCHI 45-173-10 3 Bursaneer Punned UUCHI 45-196-01 10 Uliloy Basin IUCHI 45-196-01 1 Divjug Rack Sample Basin IUCHI 74-153-01 1 Sample Bottle IUCHI 74-153-01 1 1 Sample Bottle IUCHI 52-154-01 1 1 Sample Bottle IUCHI 56-155-02 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 2 1 2 1 2 </td <td>Graduated Cylinder IUCHI 56-231-02/04/05/06/08/10/11 Utility Tray IUCHI 45-137-10 Buccanner Punnel IUCHI 45-136-01 1 Dyrling Basin IUCHI 45-136-01 1 Dyrling Rasin IUCHI 45-136-01 1 Semple Butte IUCHI 45-136-01 1 Semple Wall IUCHI 45-136-01 1 Sample Butte IUCHI 45-136-01 1 Sample Butte IUCHI 45-136-01 1 Weighing paper IUCHI 56-63-01 1 Weighing paper IUCHI 56-63-01 1 Precipitating Vases IUCHI 56-63-01 1 Proniel IUCHI 56-02/04 65-02/04 Punnel IUCHI 45-08-06 1 Punnel IUCHI 45-08-06 1 WASH Bottle IUCHI 45-08-02/04 1 WASH Bottle IUCHI 45-08-02/04 1 WASH Bottle</td> <td>1 set</td> <td>360-51-23-12/18/22/05</td> <td>TGK</td> <td>Test Tube Rack</td> <td>Ĺ</td>	Graduated Cylinder IUCHI 56-231-02/04/05/06/08/10/11 Utility Tray IUCHI 45-137-10 Buccanner Punnel IUCHI 45-136-01 1 Dyrling Basin IUCHI 45-136-01 1 Dyrling Rasin IUCHI 45-136-01 1 Semple Butte IUCHI 45-136-01 1 Semple Wall IUCHI 45-136-01 1 Sample Butte IUCHI 45-136-01 1 Sample Butte IUCHI 45-136-01 1 Weighing paper IUCHI 56-63-01 1 Weighing paper IUCHI 56-63-01 1 Precipitating Vases IUCHI 56-63-01 1 Proniel IUCHI 56-02/04 65-02/04 Punnel IUCHI 45-08-06 1 Punnel IUCHI 45-08-06 1 WASH Bottle IUCHI 45-08-02/04 1 WASH Bottle IUCHI 45-08-02/04 1 WASH Bottle	1 set	360-51-23-12/18/22/05	TGK	Test Tube Rack	Ĺ
Utility Tray IUCH 45-173-10 3 Buconneer Funnel IUCH 62-266-03 10 Utility Basin IUCH 62-266-03 10 Drylung Rack IUCH 74-153-01 1 Sample Bag IUCH 323-66-83-02/04/05/06 1 Sample Bag IUCH 52-157-04/12/15-01 1 Sample Bag IUCH 56-63-07/04/05/06 1 Sample Bag IUCH 52-157-04/12/17-01 1 Weighing paper IUCH 56-63-07/04/05/06 1 Weighing paper IUCH 56-63-07/04/05/06 1 Weighing paper IUCH 56-63-07/04/05/06 1 Precipitating Vasces IUCH 56-63-07/04/06/09 1 Punnel IUCH 56-16-04/06/09 1 Spin Screen IUCH 56-16-04/06/09 1 Punnel IUCH 46-03-04/06/09 1 WASH Bottle IUCH 46-03-04/03 1 Spin Screen IUCH 46-03-04/03 <td>Utility Tray IUCHI 45-173-10 Buccaneer Funnel IUCHI 52-568-03 1 Utility Basin IUCHI 45-1596-01 1 Dyring Rack IUCHI 74-153-01 1 Sample Vali IUCHI 45-136-02/04/05/06 1 Sample Vali IUCHI 45-115-04/10 1 Weighing paper IUCHI 56-633-07/08/03 1 Precipitating Vases IUCHI 56-725-03/01 1 Punnel IUCHI 56-725-03/01 1 Punnel IUCHI 56-725-03/01 1 Punnel IUCHI 56-725-03/01 1 Sepia Screen IUCHI 56-716-04/06/09 1 Sepia Screen IUCHI 45-080-02/04 1 WASH Bottle IUCHI 45-080-02/03 1</td> <td></td> <td>56-231-02/04/05/06/08/10,</td> <td>TUCHI</td> <td>Graduated Cylinder</td> <td></td>	Utility Tray IUCHI 45-173-10 Buccaneer Funnel IUCHI 52-568-03 1 Utility Basin IUCHI 45-1596-01 1 Dyring Rack IUCHI 74-153-01 1 Sample Vali IUCHI 45-136-02/04/05/06 1 Sample Vali IUCHI 45-115-04/10 1 Weighing paper IUCHI 56-633-07/08/03 1 Precipitating Vases IUCHI 56-725-03/01 1 Punnel IUCHI 56-725-03/01 1 Punnel IUCHI 56-725-03/01 1 Punnel IUCHI 56-725-03/01 1 Sepia Screen IUCHI 56-716-04/06/09 1 Sepia Screen IUCHI 45-080-02/04 1 WASH Bottle IUCHI 45-080-02/03 1		56-231-02/04/05/06/08/10,	TUCHI	Graduated Cylinder	
Buccaneer Funnel IUCHI 52 268 43 10 Drylig Basin IUCHI 45-196-01 3 Drylig Back IUCHI 74-136-01 3 Semple Bath IUCHI 45-136-04/10 1 set Semple Vial Semple Vial 1 set 1 set Semple Vial Semple Vial 1 set 1 set Semple Vial IUCHI 56-633-07/08/08 1 set Medding paper IUCHI 56-633-07/08/08 1 set Weighing paper WHATMAN 996-41-03-08/01 1 set Procipitating Vascs TGK 665-04-65-02/04 1 set Sepia Streen TGK 665-04-65-02/04 1 set Sepia Streen TGK 685-01-63-02/04 1 set Sepia Streen TGK 882-02-02-06/05/09 1 set Plastic Bottle TGK 882-03-02-06/05/04/03 1 set Solution Bottle TGK 821-05-02-06/05/04/03 1 set Bursen Burner with Tripod and Tubing SIBATA 54-42-46, IT-04 251-11	Butcaneer Funnel IUCHI 52–266-63 1 Utility Basin IUCHI 45–196-01 1 Darjug Rack IUCHI 74–153-01 74–153-01 Sample Bottle IUCHI 45–115-04/10 7 Sample Bug IUCHI 45–115-04/10 7 Sample Bug IUCHI 56–53-07/08/03 7 Weighing paper IUCHI 56–72-127-01/22/126-01 7 Weighing paper WHATMAN 56–41-03-08/11/27 8 Precipitating Vases IUCHI 56–72-02/04/06/09 1 Punnel IUCHI 56–310-04/06/09 1 Sepia Screen IUCHI 45–080-02/04 1 Sepia Screen IUCHI 45–080-02/04 1 WASH Bottle IUCHI 45–080-02/04/03 1 Plastic Bottle TGK 821-05-02/04/03 1 Plastic Bottle TGK 821-05-02-06/05/04/03 1 Solution Bottle TGK 821-05-02-06 1	6	45-173-10	IOCHI	Ulfilly Tray	
Utility Basin IUCHH 45–196–01 3 Dyring Rack IUCHH 74–153–01 1 set Semple Bottle IUCH 32–15–33–02/04/05/06 1 set Semple Bag IUCH 45–115–04/10 1 set Semple Bag IUCH 56–633–07/08/03 1 set Neighing paper IUCH 56–725–03/01 1 set Weighing paper IUCH 56–725–03/01 1 set Precipitating Vases IUCH 56–725–03/01 1 set Principitating Vases IUCH 56–725–03/01 1 set Sepia Screen IUCH 56–71–64/06/09 1 set Sepia Screen IUCH 565–51–69 1 set Sepia Screen IUCH 565–10,406/09 1 set Souldon Bottle IUCH 45–10,406/09 1 set Plastic Bottle IUCH 45–10,406/03 1 set Souldon Bottle IUCH 45–10,406/03 2 set Jerry Can IUCH 45–080-02/04 3 set Jerry Can	Utility Basin IUCHI 45-196-01 Dryling Rack IUCHI 74-153-01 Sample Bottle 10CHI 74-153-01 Sample Vial IUCHI 45-115-04/10 Sample Bag IUCHI 45-115-04/10 Sample Bag IUCHI 56-633-07/08/63 Disposal Disp IUCHI 22-127-01/22/126-01 Weighing paper IUCHI 56-732-03/01 Precipitating vases TCK WIATMAN 995-41-07/22/126-01 Precipitating vases TCK 655-04-65-02/04 Punnel IUCHI 56-316-04/10/727 Punnel 1UCHI 56-316-04/10/727 Sepia Screin TCK 635-51-03-03 Dui han Tube IWAKI 98201518-60 WASH Bottle ICKH 45-080-02/03 Plastic Bottle TGK 821-05-06/05/04/03 Plastic Bottle TGK 821-05-06-05/05/04/03	10	52-268-03	IOCHI	Buccaneer Funnel	
Drying Rack IUCHI 74-153-01 1 Sample Bottle TGK 323-05-83-12/04/05/06 1 set Sample Vial IUCHI 45-115-04/10 1 set Sample Bottle IUCHI 523-07-07-07/22/126-01 1 set Disposal Dish IUCHI 22-127-01/22/126-01 1 set Weighing paper IUCHI 22-127-01/22/126-01 1 set Precipitating Vases TGK 655-04-65-02/04 1 set Punnel Punnel IUCHI 56-316-04/06/09 1 set Sepia Screen IUCHI 56-31-03-04/06/09 1 set Sepia Screen IUCHI 56-31-03-04/06/09 1 set Spia Screen IUCHI 45-030-01/04/03 1 set Pastic Bottle IUCHI 45-030-01/04/03 1 set Solidon Bottle IUCHI 45-030-01/45-039-01, 5-7511 3 sets Solidon Bottle IUCHI 45-030-01, 45-039-01, 5-7511 3 sets Bunsen Buner with Tripod and Tubing SBATA 54-42-46, 17-04-01, 50-01, 5-7511 1 center of 10-01, 5-7511 </td <td>Drying Rack IUCHI 74-153-01 Sample Bottle TGK 323-05-83-02/04/05/06 Sample Vial IUCHI 45-115-04/10 Sample Bag IUCHI 56-633-07/08/03 Disposal Dish IUCHI 22-127-01/22/126-01 Weighing paper IUCHI 22-127-01/22/126-01 Weighing paper IUCHI 56-633-07/08/09 Procipitating Vases TGK 065-04-65-02/04 Funnel IUCHI 56-316-04/06/09 Sepia Streen TGK 655-04-65-02/04 WASH Bottle IUCHI 45-080-02/03 WASH Bottle IUCHI 45-080-02/03 Plastic Bottle TGK 821-05-06/05/04/03 TGK 821-05-06-05/04/03</td> <td>8</td> <td>45-196-01</td> <td>IUCHI</td> <td>Utility Basin</td> <td></td>	Drying Rack IUCHI 74-153-01 Sample Bottle TGK 323-05-83-02/04/05/06 Sample Vial IUCHI 45-115-04/10 Sample Bag IUCHI 56-633-07/08/03 Disposal Dish IUCHI 22-127-01/22/126-01 Weighing paper IUCHI 22-127-01/22/126-01 Weighing paper IUCHI 56-633-07/08/09 Procipitating Vases TGK 065-04-65-02/04 Funnel IUCHI 56-316-04/06/09 Sepia Streen TGK 655-04-65-02/04 WASH Bottle IUCHI 45-080-02/03 WASH Bottle IUCHI 45-080-02/03 Plastic Bottle TGK 821-05-06/05/04/03 TGK 821-05-06-05/04/03	8	45-196-01	IUCHI	Utility Basin	
Sample Bottle TGK 323-05-83-02/04/05/06 1 set Sample Vial IUCH 45-115-04/10 1 set Sample Vial IUCH 56-83-07/08/03 1 set Disposal Dish IUCH 56-83-07/08/03 1 set Weighing paper IUCH 22-127-01/22/156-01 1 set Wheighing paper IUCH 36-04-05-03/04 1 set Precipitating Vases TGK WHATMAN 996-04-05-02/04 1 set Punel Funnel 1UCH 56-316-04/06/09 1 set Punel Sepia Screen TGK 655-61-03-03 1 set WASH Bottle IUCH 56-316-04/06/09 10 10 WASH Bottle IUCH 45-080-02/03 1 1 set Plastic Bottle IUCH 45-080-02/03 1 1 set Solution Bottle IUCH 45-080-02/03 1 1 set Solution Bottle IUCH 45-080-02/03 1 1 set Solution Bottle IUCH 45-090-01/35-030-01	Sample Bottle TGK 323-05-83-02/04/05/06 Sample Vial IUCH 45-115-04/10 Sample Vial IUCH 56-633-07/08/03 Disposal Dish 1UCH 56-633-07/08/03 Weighing paper IUCH 22-127-01/22/126-01 Whatman Filter Paper WHATMAN 996-41-03-08/11/27 Prunel TGK 665-04-65-02/04 Sepia Screen TGK 635-51-03-03 WASH Bottle IUCH 45-03-03 WASH Bottle IUCH 45-03-03 Plastic Bottle IUCH 45-03-03 Plastic Bottle TGK 851-03-06 TGK 821-05-06-05-04-03	I	74-153-01	IUCHI	Drying Rack	
Sample Vial IUCHI 45–115–04/10 1 set Sample Vial Sample Vial IUCHI 56–633–07/08/03 1 set Disposal Dish IUCHI 22–127–01/22/136–01 1 set Weighing paper IUCHI 22–127–01/22/136–01 1 set Weighing paper IUCHI 26–633–07/08/03 1 set Precipitating vases IUCHI 56–726–03/01 1 set Pruned IUCHI 56–316–04/06/09 1 set Punian Tube IUCHI 45–080–02/09 1 set Plastic Bottle IUCHI 45–080–02/09 1 set Plastic Bottle IUCHI 45–080–02/09 1 set Solution Bottle IUCHI 45–080–02/05 20–05–05/05/04/03 1 set Bursen Burner with Tripod and Tubing SIBATA 54-42-46, IT-04–01, 50–01, 45–031 5 sets	Sample Vial IUCHI 45-115-04/10 Sample Vial IUCH 56-633-07/08/03 Disposal Dish IUCH 22-127-01/22/126-01 Weighing paper IUCH 25-127-01/22/126-01 Weighing paper IUCH 56-725-03/01 Precipitating Vases TGK 055-04-65-02/04 Sepia Screen TGK 655-04-65-02/04 Durhan Tube IWAKI 98201ST8-50 I WASH Bottle IUCH 45-080-02/03 I Plastic Bottle TGK 821-05-06/05/04/03 I TGK 821-05-06-02/03 I	1 set	323-05-83-02/04/05/06	TGK	Sample Bottle	
Sample Bag IUCHH 56-633-07/08/03 1 set Disposal Dish IUCHH 22-127-01/22/126-01 1 set Weighing paper IUCHH 56-725-03/01 1 set Whatman Filter Paper WHATMAN 936-41-03-08 1 set Precipitating Vases ICK 65-04-65-02/04 1 set Prunel IUCHH 56-04-65-02/04 1 set Sepia Streen ICKH 65-04-65-02/04 1 set Sepia Streen ICKH 45-080-02 1 set WASH Bottle ICKH 45-080-02 1 set Pleatic Bottle ICKH 820-178-06/05/04/03 1 set Solution Bottle ICKH 821-05-02-06/05/04/03 1 set Solution Bottle ICKH 45-030-01/45-038-02 2 sets Bursen Burser With Tripod and Tubing SIBATA 54-42-46, IT-04-01, 50-09-01, 5-7511 6 sets	Sample Bag IUCH 56-633-07/08/03 Disposal Dish IUCH 22-127-01/22/126-01 Weighing paper IUCH 25-127-01/22/126-01 Whatman Filter Paper WHATMAN 956-41-03-08/11/27 Promed TGK 055-04-65-02/04 Sepia Screen TGK 655-516-04/06/09 Sepia Screen TGK 655-51-03-03 WASH Bottle IUCH 98201ST8-50 WASH Bottle IUCH 45-080-02/03 Plastic Bottle TGK 820-02/03 TGK 821-05-06-06/05/04/03	1 set	45-115-04/10	IOCHI	Sample Vial	
Disposal Dish IUCHI 22-127-01/22/126-01 1 set Weighing paper IUCHI 56-725-03/01 1 set Whistman Filter Paper TGK WHATMAN 996-41-03-08/17/27 1 set Precipitating Vases TGK 065-04-65-02/04 1 set Punnel IUCHI 56-316-04/06/09 1 set Sepia Screen TGK 635-51-03-03 2 Durhan Tube IWAKI 9820/TST8-60 10 WASH Bottle ICCHI 45-080-02/03 10 Plastic Bottle TGK 821-05-06/05/04/03 10 Jerry Can IUCHI 45-030-01/45-039-02 10 Jerry Can IUCHI 45-037-01/45-039-02 2 2 Bunsen Burner with Tripod and Tubing SIBATA 54-42-46, 17-04-01, 50-09-01, 5-7511 6 2	Disposal Dish IUCHI 22-127-01/22/126-01 Weighing paper IUCHI 56-725-03/01 Precipitating Vases WHATMAN 996-41-03-08/11/27 Prunel Funnel IUCHI 56-316-04/06/09 Sepia Screen TCK 635-51-03-03 1 Durhan Tube IWAKI 9820TST8-50 1 Plestic Bottle IUCHI 45-080-02/03 1 Plestic Bottle TCK 821-05-06/05/04/03 1 Solution Bottle TCK 821-05-06/05/04/03 1	1 set	26-633-07/08/03	. TUCH	Sample Bag	
Weighing paper IUCHI 56-725-03/01 1 set Whatman Filter Paper WHATMAN 996-41-03-08/11/27 1 set Precipitating Vases TGK 065-04-65-02/04 1 set Punnel IUCHI 56-316-04/06/09 1 set Sepia Screen TGK 635-51-03-03 2 Durhan Tube IWAKI 9820TST8-50 10 WASH Bottle IUCHI 46-080-02/03 1 set Plastic Bottle TGK 822-02-06/05/04/03 1 set Solution Bottle TGK 821-05-06/05/04/03 10 Jerry Can IUCHI 45-030-01, 45-039-02 2 sets Bunsen Burner with Tripod and Tubing SIBATA 54-42-46, 17-04-01, 50-09-01, 5-7511 6 sets	Weighing paper IUCH 56-725-03/01 Whatman Filter Paper WHATMAN 996-41-03-08/11/27 Precipitating Vases TGK 065-04-65-02/04 Funnel Funnel 56-316-04/06/09 Sepia Screen TGK 635-51-03-03 Durhan Tube IWAKI 9820TST8-50 I WASH Bottle ICCH 45-080-02/03 I Plestic Bottle TGK 358-22-02-06/05/04/03 I Solution Bottle TGK 821-05-06-06 I	1 set		IUCHI	Disposal Dish	
Whatman Filter Paper WHATMAN 996-41-03-08/11/27 1 set Precipitating Vases TGK 065-04-65-02/04 1 set Punnel IUCHI 56-316-04/06/09 1 set Sepia Screen TGK 635-51-03-03 2 Durhan Tube IWAKI 9820TST8-50 10 WASH Bottle IUCHI 45-080-02/03 1 set Plastic Bottle TGK 358-22-02-06/05/04/03 1 set Solution Bottle TGK 821-05-02-06 10 Jerry Can IUCHI 45-037-01/45-039-02 2 sets Bunsen Burner with Tripod and Tubing SIBATA 54-42-46, 17-04-01, 50-09-01, 5-7511 6 sets	Whatman Filter Paper WHATMAN 936-41-03-08/11/27 Precipitating Vases TGK 655-04-65-02/04 Funnel IUCH 56-316-04/06/09 Sepia Screen TGK 635-51-03-03 Durhan Tube IWAKI 9820TST8-50 I WASH Bottle IUCH 45-080-02/03 I Plestic Bottle TGK 358-22-02-06/05/04/03 I Solution Bottle TGK 821-05-06/05/04/03 I	1 set	56-725-03/01	TUCHI	Weighing paper	
Precipitating Vases TGK 065-04-65-02/04 1 set Punnel IUCHI 56-316-04/06/09 1 set Sepia Screen TGK 635-51-03-03 2 Durhan Tube IWAKI 9820TST8-50 10 WASH Bottle IUCHI 45-080-02/03 1 set Plastic Bottle TGK 358-22-02-06/05/04/03 1 set Solution Bottle TGK 821-05-02-06 10 Jerry Can IUCHI 45-030-02 2 sets Bunsen Burner with Tripod and Tubing SIBATA 54-42-46, 17-04-01, 50-09-01, 5-7511 6 sets	Precipitating Vases TGK 055-04-65-02/04 Punnel	1 set	996-41-03-08/11/27	WHATMAN	Whatman Filter Paper	
Putnet Futnet 56-316-04/06/09 1 set Sepia Screen TGK 635-51-03-03 2 Durhan Tube IWAKI 9820/IST8-50 10 WASH Bottle IUCHI 45-080-02/03 1 set Plestic Bottle TGK 358-22-02-06/05/04/03 1 set Solution Bottle TGK 821-05-06-06 10 Jerry Can IUCHI 45-037-01/45-038-02 2 sets Bursen Burner with Tripod and Tubing SIBATA 54-42-46, 17-04-01, 50-09-01, 5-7511 6 sets	Putmel Futmel 56-316-04/06/09 Sepia Screen TGK 635-51-03-03 Durian Tube IWAST 98201ST8-50 I WASH Bottle IUCH 45-080-02/03 I Plestic Bottle TGK 358-22-02-06/03 I Solution Bottle TGK 821-05-06/03 I	1 set	055-04-65-02/04	TGK	Precipitating Vases	
Sepia Screen TGK 635-51-03-03 2 Durhan Tube IWAKI 98201578-50 10 WASH Bottle IUCHI 45-080-02/03 1 set Plastic Bottle TGK 388-22-02-05/05/04/03 1 set Solution Bottle TGK 821-05-06/05/04/03 10 Jerry Can IUCHI 45-037-01/45-038-02 2 sets Bursen Burner with Tripod and Tubing SIBATA 54-42-46, 17-04-01, 50-09-01, 5-7511 6 sets	Sepia Screen TGK 635-51-03-03 Durhan Tube IWASH Bottle 45-080-02/03 Plestic Bottle TGK 358-22-02-06/05/04/03 Solution Bottle TGK 821-05-05-06	1 set	56-316-04/06/09	LOCH	Fumei	
Durinan Tube IWAKI 98201578-50 10 WASH Bottle IUCHI 45-080-02/03 1 set Plestic Bottle TGK 358-22-02-05/05/04/03 1 set Solution Bottle TGK 821-05-02-06 10 Jerry Can IUCHI 45-037-01/45-038-02 2 sets Bunsen Burner with Tripod and Tubing SIBATA 54-42-46, 17-04-01, 50-09-01, 5-7511 6 sets	Durham Tube IWAKI 9820TST8-50 1 WASH Bettle IUCH 45-080-02/03 Plestic Bettle TGK 358-22-02-06/03 Solution Bottle TGK 821-05-02-06	2	635-51-03-03	TGK	Sepia Screen	
WASH Bottle IUCHI 45-080-02/03 1 set Plestic Bottle TGK 358-22-02-05/05/04/03 1 set Solution Bottle TGK 821-05-02-06 10 Jerry Can IUCHI 45-037-01/45-038-02 2 sets Bunsen Burner with Tripod and Tubing SIBATA 54-42-46, 17-04-01, 50-09-01, 5-7511 6 sets	WASH Bottle IUCH 45-080-02/03 Plastic Bottle TGK 358-22-02-06/03/04/03 Solution Bottle TGK 821-05-02-06	10	98201ST8 -50	IWAKI	Durian Tube	
Plestic Bottle TGK 358-22-02-05/05/04/03 1 set Solution Bottle TGK 821-05-06 10 Jerry Can IUCH 45-037-01/45-038-02 2 sets Bunsen Burner with Tripod and Tubing SIBATA 54-42-46, 17-04-01, 50-09-01, 5-7511 1 set Jerry Can 10 Jerry Can	Plastic Bottle TGK 358-22-02-06/05/04/03 TGK 821-05-02-06	1.set	45-080-02/03	TUCHI	WASH Bottle	
Solution Bottle	Solution Bottle 105-02-06 10	1 Set	358-22-02-06/05/04/03	TCK	Plastic Bottle	
Jerry Can Bursen Burner with Tripod and Tubing SIBATA SIBATA SIBATA 54-42-46, 17-04-01, 50-09-01, 5-7511 6 sets			821-05-02-06	TGK	Solution Bottle	
Sunsen Burner with Thgod and Tubing SBATA 54-42-46, 17-04-01, 50-09-01, 5-7511 6 sets	Jerry Can 1UCH 45-037-01/45-038-02		45-037-01/45-038-02	IUCHI	Jerry Can	
1	SUBSED BUTTER WITH THOOG and Tubing SBATA 54-42-46, 17-04-01, 50-09-01, 5-7511		54-42-46, 17-04-01, 50-09-01,	SIBATA	Sunsen Burner with Tripod and Tubing	
	Lenged: A=	Leaged:				

Table 2-2-1 (7) The Survey Result of Identifying the Contents of the Project

Onty A B C	2 sets	1 set	8	2 sets	23		1 set	-		1.88	1 set	1 set														Sign and sig	Signation of the second of the	98 000 0 iii s				OOO O iii si	SS 0000	25 SS	Set 188 198 198 198 198 198 198 198 198 198				set COOO
		NTIP-60-1000/61-400		8										O MHz	O MEz	O MEz MHs MHs	O MEZ MIS MIS MIS MIS MIS	O MEZ MIS MIS MIS MEZ MEZ MEZ	O MEZ MES MES MES MES MES MES MES	0 MHz MHs MHs MHz MHz MHz Ws, Wordperfect	O MHz MHs MHs MHz MHz MHz Ms, Wordperfect	O MHz MHs MHs MHz MHz MR MR MR MR MR MR MR MR MR MR MR MR MR	O MHz MHs MHs MHz MHz MR Wordperfect	O MHz MHs MHs MHz MHz MR Wordperfect	0 MHz MHz MHz MHz MHz ms, Wordperfect ms, Wordperfect	0 MHz MHz MHz MHz MHz Tz, Wordperfect Ts, Wordperfect Ts, Wordperfect	0 MHz MHz MHz MHz MHz Tz, Wordperfect Tz, Wordperfect Ts, Wordperfect	O MHz MHz MHz MHz MHz Ts. Wordperfect Ts. Wordperfect Ts. Wordperfect	0 MHz MHz MHz MHz MHz Tz, Wordperfect Tz, Wordperfect Ts, Wordperfect	NHE MHE MHE MHE MHE MRE WS, Wordperfect WS, Wordperfect	NHE MHE MHE MHE MHE MRE WS, Wordperfect WS, Wordperfect WS, Wordperfect	NHE MHE MHE MHE MHE MRE MRE MACONDETECT MACONDETECT MACONDETECT MACONDETECT MACONDETECT MACONDETECT	MEs MEs MEs MEs MEs Mesing unit 42	MEs MEs MEs MEs MEs Mesing unit 42	MEs MEs MEs MEs MEs Mesing unit 42	MEs MEs MEs MEs MEs Mesing unit 42	MEs MEs MEs MEs MEs MEs Messing unit 42	Fordperfect sg unit	Fordperfect ag unit
Description(Type/Model/Index No.)	1801 BUNCHU 1/10/50	DISP4027-016/020/030, FINTIP-60-1000/61-400	Burette 50	350-55-19-02/454-51-53-02	SVAD001	6031-01	B-426/B-316/B-412	TM-152	CHB00C/LH-20P			GA300 25 wart 16 ch	300 25 wart 16 ch	GK300 25 wart 16 ch Optiplex 4100/Mxz 486DX4 100 MHz	300 25 wart 16 ch tiplex 4100/Mxe 486DX4 100 tiplex 466/Mxe 486DX2 66 M	Gk300 25 wart 16 cft. Optiplex 4100/Mxe 486DX4 100 Mi Optiplex 466/Mxe 486DX2 66 MHz Optiplex 466/Mxe 486DX2 66 MHz	GM300 25 wart 16 ct. Optiplex 4100/Mxe 486DX4 100 Mi Optiplex 466/Mxe 486DX2 66 MHs Optiplex 466/Mxe 486DX2 66 MHs Optiplex 466/Mxe 486DX2 66 MHs	GM300 25 wart 16 cti. Optiplex 4100/Mxe 486DX4 100 M Optiplex 466/Mxe 486DX2 66 MHs Optiplex 466/Mxe 486DX2 66 MHs Optiplex 466/Mxe 486DX2 66 MHs Optiplex 466/Mxe 486DX2 56 MHs	GM300 25 wart 16 ch Opinler 4100/Mxe 486DX4 100 l Opitler 466/Mxe 486DX2 66 MH Opitler 466/Mxe 486DX2 66 MH Opitler 466/Mxe 486DX2 50 MH Opitlex 450/Mxe 486DX2 50 MH Opitlex 450/Mxe 486DX3 33 MHz	GM300 25 wart 16 ch Optiplex 4100/Mxe 486DX4 100 MHz Optiplex 466/Mxe 486DX2 66 MHz Optiplex 466/Mxe 486DX2 66 MHz Optiplex 466/Mxe 486DX2 66 MHz Optiplex 456/Mxe 486DX2 50 MHz Optiplex 450/Mxe 486DX2 33 MHz Mixrosoft Access, Lotus Windows, Wordperfect	GM300 25 wart 16 cti. Optiplex 4100/Mxe 486DX4 100 Optiplex 466/Mxe 486DX2 66 M Optiplex 466/Mxe 486DX2 66 M Optiplex 466/Mxe 486DX2 66 M Optiplex 450/Mxe 486DX2 50 M Optiplex 450/Mxe 486XX 33 ME Microsoft Access, Lotus Window Xerox 5035	GM300 25 wart 16 cti. Optiplex 4100/Mxe 486DX4 100 Optiplex 466/Mxe 486DX2 66 M Optiplex 466/Mxe 486DX2 66 M Optiplex 466/Mxe 486DX2 60 M Optiplex 450/Mxe 486DX2 50 M Optiplex 450/Mxe 486XX 33 ME Mixrosoft Access, Lotus Window Xerox 5035 Kerox 5035	300 25 wart 16 ch iplex 4100/Mxe 486DX4 100 tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 50 M tiplex 450/Mxe 486DX2 50 M tiplex 450/Mxe 486DX 33 M rosoft Access, Lotus Window rox 5035	300 25 wart 16 ch iplex 4100/Mxe 486DX4 100 tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 60 M tiplex 450/Mxe 486DX2 50 M tiplex 450/Mxe 486SX 33 M rosoft Access, Lotus Window rox 5035 rox 7041	GM300 25 wart 16 cin Optiplex 4100 / Mxe 486DX4 100 MHz Optiplex 466 / Mxe 486DX2 66 MHz Optiplex 466 / Mxe 486DX2 66 MHz Optiplex 466 / Mxe 486DX2 66 MHz Optiplex 450 / Mxe 486DX2 50 MHz Optiplex 450 / Mxe 486DX2 33 MHz Microsoft Access, Lotus Windows, Wordpe Xerox 5035 Xerox 7041 Reciprocating compressor condensing unit /CRW22A-50 / MYCOM-F4WA2	1300 25 wart 16 ch tiplex 4100/Mxe 486DX4 100 tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 66 M tiplex 450/Mxe 486DX2 50 M tiplex 450/Mxe 486DX2 50 M tiplex 450/Mxe 486XX 33 M rosoft Access, Lotus Window rox 5035 rox 7041	1300 25 wart 16 ch tiplex 4100/Mxe 486DX4 100 tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 66 M tiplex 450/Mxe 486DX2 50 M tiplex 450/Mxe 486X 33 M trox 5035 tox 7041	1300 25 wart 16 ch tiplex 4100/Mxe 486DX4 100 tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 66 M tiplex 450/Mxe 486DX2 50 M tiplex 450/Mxe 486DX2 50 M tiplex 450/Mxe 486DX2 50 M tiplex 450/Mxe 486DX2 50 M tiplex 450/Mxe 486XX 33 M rosoft Access, Lotus Window rox 5035 rox 7041	1900 25 wart 16 ch tiplex 4100/Mxe 486DX4 100 tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 66 M tiplex 450/Mxe 486XX 33 M rosoft Access, Lotus Window rox 5035 rox 7041 chrocating compressor conder chrocating compressor conder chrocating compressor conder chrocating compressor conder RW22A-50/MYCOM-F4WA	300 25 wart 16 ch tiplex 4100/Mxe 486DX4 100 tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 66 M tiplex 450/Mxe 486DX3 33 M rosoft Access, Lotus Window rox 5035 rox 7041 SW22A-50/MYCOM-F4WA	1900 25 wart 16 ch tiplex 4100/Mxe 486DX4 100 tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 66 M tiplex 450/Mxe 486SX 33 M rosoft Access, Lotus Window rox 5035 rox 7041 rox 7041	300 25 wart 16 ch tiplex 4100/Mxe 486DX4 100 tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 66 M tiplex 450/Mxe 486DX 33 M rosoft Access, Lotus Window rox 5035 rox 7041 SW22A-50/MYCOM-F4WA	1900 25 wart 16 ch tiplex 4100/Mxe 486DX4 100 tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 66 M tiplex 450/Mxe 486DX2 66 M tiplex 450/Mxe 486SX 33 M rosoft Access, Lotus Window rox 7041 rox 7041	1900 25 wart 16 ch tiplex 4100/Mxe 486DX4 100 tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 66 M tiplex 450/Mxe 486DX2 50 M tiplex 450/Mxe 486SX 33 M rosoft Access, Lotus Window rox 5035 rox 7041	1900 25 wart 16 ch tiplex 4100/Mxe 486DX4 100 tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 66 M tiplex 450/Mxe 486DX2 66 M tiplex 450/Mxe 486SX 33 M rosoft Access, Lotus Window rox 5035 rox 7041 rox 7041	1900 25 wart 16 ch tiplex 4100/Mxe 486DX4 100 tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 50 M tiplex 450/Mxe 486DX2 50 M tiplex 450/Mxe 486DX 53 M rosoft Access, Lotus Window rox 5035 rox 7041 rox 7041	1900 25 wart 16 ch tiplex 4100/Mxe 486DX4 100 tiplex 466/Mxe 486DX2 66 M tiplex 466/Mxe 486DX2 50 M tiplex 450/Mxe 486DX2 50 M tiplex 450/Mxe 486DX2 50 M tiplex 450/Mxe 486DX 25 M rosoft Access, Lotus Window rox 5035 rox 7041 tox 7041 tox 7041 tuble tube type, 65A/80A	GM300 25 wart 16 cit Outiplex 4100/Axe 486DX4 100 Outiplex 466/Axe 486DX2 66 M Outiplex 466/Axe 486DX2 66 M Outiplex 450/Axe 486DX2 50 M Outiplex 450/Axe 486DX2 51 M Outiplex 450/Axe 486DX2 51 M Microsoft Access, Lotus Window Xerox 5035 Xerox 7041 Reciprocating compressor conde /CRW22A-50/AYCOM-F4WA Double tube type, 65A/80A	1300 25 wart 16 cin Liplex 4100/Mxe 486DX4 100 Liplex 466/Mxe 486DX2 66 M Liplex 466/Mxe 486DX2 50 M Liplex 450/Mxe 486DX2 50 M Liplex 450/Mxe 486SX 33 M TOSOIT Access, Lotus Window LOX 5035 FOX 7041 LOX 7041 LOX 1041 LOX 104
Kanufacturer	1801	DISI	Bure	320-	SVA	6031		-MT	ETT.		SULP.	CMD	CWIN .	Optig	Optio Optio	成	Ma Ma Ma Ma Ma Ma Ma Ma Ma Ma	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		O O O O O O O O O O O O O O O O O O O	Option Op	- - - - - - - - - -	- - - - - - - - - -	MOTORIA CAMS Dell Optil Dell Optil Dell Optil Dell Optil Mercsoft etc Micro Xerox Xerox Xerox Xerox Xerox Xerox															
Manu	IWAKI	IWAKI	IWAKI	TGK	SEIKO	SBATA	Laboratoriums—Technik	IWAKI	ADVANTEC		Motorola	TO TOWNS	TO TOWN	Del	Dell	Dell Dell	Del Del Del	Dell Dell Dell	Dell Dell Dell Dell	Dell Dell Dell Dell Marosoff etc	Dell Dell Dell Dell Dell Marosoft etc Xerox	Dell Dell Dell Dell Dell Marcosoft etc Xerox Xerox	Dell Dell Dell Dell Dell Marcosoft etc Xerox Xerox Xerox	Dell Dell Dell Dell Marcsoft etc Xerox Xerox Xerox	Dell Dell Dell Dell Microsoft etc Xerox Xerox Xerox	Dell Dell Dell Dell Marcsoft etc Xerox Xerox Xerox	Dell Dell Dell Dell Marcsoft etc Xerox Xerox Xerox	Dell Dell Dell Dell Marcsoft etc Xerox Xerox Xerox	Dell Dell Dell Marcsoft etc Xerox Xerox Xerox	Dell Dell Dell Microsoft etc Xerox Xerox Xerox	Dell Dell Dell Marcsoft etc Xerox Xerox Xerox	Dell Dell Dell Microsoft etc Xerox Xerox Xerox	Dell Dell Dell Marcsoft etc Xerox Xerox Xerox Xerox	Dell Dell Dell Marcsoft etc Xerox Xerox Xerox Xerox	Dell Dell Dell Marcsoft etc Xerox Xerox Xerox Xerox	Dell Dell Dell Marcsoft etc Xerox Xerox Xerox Xerox	Dell Dell Dell Dell Marcsoft etc Xerox Xerox Xerox Xerox	Dell Dell Dell Dell Marcsoft etc Xerox Xerox Xerox Xerox	Dell Dell Dell Marcsoft etc Xerox Xerox Xerox Xerox Xerox Xerox
pment	ent parts									nipment																		d shell & tube type)	d shell & tube type)	d shell & tube type)	d shell & tube type)	d shell & tube type) I pressure gauges (P)	d shell & tibe type) I pressure gauges (P)	d shell & tube type) I pressure gauges IP)	d shell & tube type) I pressure gauges IP)	d shell & tube type) I pressure gauges (P)	of shell & tube type) I pressure gauges (P)	of shell & tube type) I pressure gauges (P)	d shell & tube type) I pressure gauges IP)
Name of Equipment	Bottle-top Dispenser with Replacement parts	Micro pipette	tes	Burette Stand with Cramp	vatch	Conway analysis set	Nitrogen determination apparatus	Vortex Shaker	Constant Temperature Water Bath	Communication & Dafa Analysis Equipment	D.Z.	Vaujo	nalyzing apparatus	Vir Kaugo Data analyzing apparatus Desk top computer (A)	Vir Kaulo Data analyzing apparatus Desk top computer (A) Desk top computer (B)	Vir Kaulo Data analyzing apparatus Desk top computer (A) Desk top computer (B) Desk top computer (C)	Vir Kaulo Data analyzing apparatus Desk top computer (A) Desk top computer (B) Desk top computer (C) Desk top computer (C)	naulyzing apparatus top conguter (A) top conguter (B) top computer (C) top computer (D)	Virt Kaulo Data analyzing apparatus Desk top computer (A) Desk top computer (B) Desk top computer (C) Desk top computer (C) Notebook type computer Notebook type computer	Virir Kaulo Data analyzing apparatus Desk top computer (A) Desk top computer (C) Desk top computer (C) Desk top computer (C) Notebook type computer Notebook type computer Software	Virk Kaulo Data analyzing apparatus Desk top computer (A) Desk top computer (C) Desk top computer (C) Desk top computer (C) Notebook type computer Notebook type computer Software	Virir Kaulo Data analyzing apparatus Desk top computer (A) Desk top computer (C) Desk top computer (C) Desk top computer (D) Notebook type computer Notebook type computer Software Photo copying machine Facsimile machine	Vir Kaulo Data analyzing apparatus Desk top computer (A) Desk top computer (C) Desk top computer (C) Desk top computer (C) Notebook type computer Notebook type computer Software Photo copying machine Farsimile machine	Viri Kaulo Data analyzing apparatus Desk top computer (A) Desk top computer (C) Desk top computer (C) Desk top computer (D) Notebook type computer Software Photo copying machine Facsimile machine Refrigeration Facilities	Vir Kaulo Data analyzing apparatus Dask top computer (A) Desk top computer (B) Desk top computer (C) Desk top computer (C) Notebook type computer Software Photo copying machine Farsimile machine Refrigeration, Facilities Refrigeration packaged unit	Virir Kaulo Data analyzing apparatus Desk top computer (A) Desk top computer (B) Desk top computer (C) Desk top computer (C) Notebook type computer Software Photo copying machine Facsimile machine Refrigeration Facilities Components and accessories: Components and accessories:	trauto analyzing apparatus top computer (A) top computer (B) top computer (C) top computer (D) sook type computer rare note type computer mile machine geration. Facilities aking Facility geration packaged unit conents and accessories:	Viti Kaulo Data analyzing apparatus Desk top computer (A) Desk top computer (B) Desk top computer (C) Desk top computer (D) Notebook type computer Software Photo copying machine Refrigeration. Racinites Components and accessories: Oil separator Condenser & receiver (Water cooled shell & tube type)	Viti Kaulo Jata analyzing apparatus Desk top computer (A) Desk top computer (C) Desk top computer (C) Desk top computer (C) Sek top computer (C) Sek top computer (C) Sek top computer (C) Sek top computer (C) Software Photo copying machine Refrigeration, Pacifities Co Making Pacifity Refrigeration packaged unit Components and accessories. Oil separator Condenser & receiver (Water coole Condenser & receiver (Water coole Condenser & receiver (Coole	to computer (A) top computer (B) top computer (C) top computer (C) top computer (C) top computer (C) top computer rare to computer rare to computer rare to copying machine mile machine peration. Facilities sking Facility geration packaged unit conents and accessories; eparator coler turn	trauto analyzing apparatus top computer (A) top computer (B) top computer (C) top computer (D) top computer rare to computer (D) top computer rare to computer train top computer train	Vitr Kaulo Data analyzing apparatus Desk top computer (A) Desk top computer (C) Desk top computer (D) Votebook type computer Notebook type computer Software Packing machine Sering machine Sering Facility Components and accessories: Oil separator Condenser & receiver (Water cooled shell & tibe typ Oil cooler Oil purm Gauge hoard with high, low and oil pressure gauges Pressure switches (HP, OP, LP & WP)	Part Raugo Data analyzing apparatus Desk top computer (A) Desk top computer (C) Notebook type computer Software Photo copying machine Serigeration, Facilities Ce Making Facility Cefrigeration packaged unit Condenser & receiver (Water cooled) Oil separator Condenser & receiver (Water cooled) Oil purm Gauge board with high, low and oil p Pressure switches (HP, OP, LP & WP) Softnoid valve (for capacity control)	top computer (A) top computer (B) top computer (C) top computer (C) top computer (D) ook type computer rare coopying machine peration Facilities sking Facility geration packaged unit conents and accessories; eparator ienser & receiver (Water cool) coler num ge board with high, low and o sure switches (HP, OP, LP & I) noid valve (for capacity contr	Vitr Kaulo Data analyzing apparatus Data analyzing apparatus Desk top computer (A) Desk top computer (C) Desk top computer (C) Desk top computer (C) Desk top computer (C) Software Software Photo copying machine Facsimile machine Refrigeration Pacifities Components and accessories: Oil separator Condenser & receiver (Water cooled Oil separator Oil separator Condenser & receiver (High, low and oil pressure switches (HP, OP, LP & WP Solenoid valve (for capacity control) Thermometer set (HT & LT) Common steel base	top computer (A) top computer (B) top computer (C) top computer (D) ook type computer rare copying machine peration Facilities sking Facility geration packaged unit conents and accessories: eparator ienser & receiver (Water cool) coler num ge board with high, low and o sure switches (HP, OP, LP & I mon steel base nr pulley, V-belt, belt cover	Viri Katio Data analyzing apparatus Desk top computer (A) Desk top computer (B) Desk top computer (C) Desk top computer (C) Desk top computer (C) Notebook type computer Software Photo copying machine Farsimile machine Refrigeration Pacifies Components and accessories: Oil separator Components and accessories: Oil separator Condenser & receiver (Water coole Oil separator Condenser & receiver (Fater coole Oil separator Gauge board with high, low and or Pressure switches (HT & LT) Common steel base Motor pulley, V-belt, belt cover Best exchanger	top computer (A) top computer (A) top computer (B) top computer (C) top computer (D) sook type computer rare sook type computer rare string Facilities egeration packaged unit conents and accessories: eparator ienser & receiver (Water cool cooler sum ge board with high, low and o sure switches (HP, OP, LP & I mon steel base nr puller, V-belt, belt cover exchanger	top computer (A) top computer (A) top computer (B) top computer (C) top computer (D) top computer (Mater cool) top copying machine geration packaged unit geration packaged unit coperation packaged unit top copying machine geration packaged unit top computer (Water cool) top copying machine geration packaged unit top computer (Water cool) top cool computer (Water cool) top compute
Hem No.	V-33-32 Bottle		V-33-34 Burettes	V-33-35 Buret	IV-33-36 Stopwatch				V-37 Const	tter V				2.1	2.1	2.1	2.2 2.3 2.4	2.1 2.3 2.4 2.4 2.5	2.1 2.3 2.4 2.5 2.5 2.5	2.1 2.3 2.4 2.4 2.5 2.5 2.5	2.1 2.2 2.4 2.5 2.5 2.5 2.7	2.1 2.2 2.3 2.4 2.5 2.5 2.7	2.1 2.2 2.3 2.4 2.5 2.5 2.6 2.7	2.1 2.2 2.3 2.4 2.5 2.5 2.6 2.7	2.1 2.2 2.4 2.4 2.5 2.5 2.5 2.7 2.7 2.7	2.2 2.3 2.4 2.4 2.5 2.5 2.7 2.7 2.7 2.7	2.2 2.3 2.4 2.4 2.5 2.5 2.7 2.7 2.7	2.1 2.3 1 2.4 1 2.5 1 2.5 1 2.5 1 2.6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2.1 2.3 1 2.4 1 2.5 1 2.5 1 2.5 1 2.5 1 2.6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2.1 2.2 1 2.3 1 2.4 1 2.5 1 2.5 1 2.5 1 2.5 1 2.7 2.1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2.1 2.2 1 2.3 1 2.5 1 2.	2.1 2.2 1 2.3 1 2.4 1 2.5 1 2.5 1 2.5 1 2.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2.1 2.2 1 2.3 1 2.4 1 2.5 1 2.5 1 2.5 1 2.7 2.1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2.1 2.2 1 2.3 1 2.4 1 2.5 1 2.5 1 2.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2.1 2.2 1 2.3 1 2.4 1 2.5 1 2.	2.1 2.2 1 2.3 1 2.4 1 2.5 1 2.5 1 2.5 1 2.5 1 2.5 1 2.7 2.1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	22 2 23 1 2.4 1 2.5 1 2.5 1 2.6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		22 2 22 1 2.5 1 2.

Table 2-2-1 (8) The Survey Result of Identifying the Contents of the Project.

2	Name of Perspectant	Herenfordense	Breezistica (True Alicia) Indus 115		tr.Daniel	į
nem No.	Name of Equipment	Manualants	MENTIFICATION AND MINES INC.)	AIII'A	A B	د
W-A-3	Flake ice machine		R-22 direct expansion/5M3000	4 seis	-	0
W-A-4	Cooling tower		Low noise type/CTA-30NE	2 sets		0
VI-A-5	Cooling water pump		Centrifugal pump/65SG52.2	2 sets		0
VI-A-6	Monitoring panel (A-control panel)		Floor mounted self standing type	1 set		0
VI-A-6-1	Complete with:				_	
	Compressor protection system					0
	Alarm device for water pressure failure					0
	Autometic and manual control for ice making					0
	Wiring materials					0
	Down transformer (10KVA), 20OV, 5OHz, 3Phase					0
	Down transformer (2KVA), 200V, 5OHz, Single phase					0
VI-A-7	Prefabricated ice storage		Prefabricated insulated panel	1 set		0
VI-A-7-1	Complete with:					
	Compartment lamp, door heater (AC, 200V, 55W)					0
	Insulated door (2sets)					0
	Manual single swing door					0
	Plywood (15mm) wall guard, wooden duck boards, wooden					(
	ice stopper, water drain and partition				_)
VI-A-8	Connecting pipes, pipe fittings, valves and fittings for] set		(
	refrigerant circuit)
. 6-¥-IA	Connecting pipes, pipe fittings, valves and fittings for water			1 set		C
VI-A-10	Termination marked of the laws terminations, the termination			,		k
01 4 70	management for low reminerating system			Tags T	-	0
9-1/	Blast Preezer Specifications				_	
VI-B-I	Refrigeration packaged unit		Reciprocating condensing unit/CRW30F~50	l unit		0
VI-B-1-1	Components and accessories:					
	Oil separator					0
	Condenser & receiver (Water cooled, shell & tube type)			1		0
	Inter-cooler			-		0
	Oil cooler			-		C
	Liquid sight glass, & dryer/filter			-		þ
	Gauge board with pressure gauges (HP, LP and OP)					k
	Pressure switches (HP, OP, LP & WP)			1 spf		k
	Capacity control solenoid valve				-	c
	Thermometer with casing (HT, MT & LT)			tes		
	Common steel base			-		k
	Motor priley, V-belt, belt cover			tes	-	k
				Jonnad.	A=Democrad	
				trailing.	Resinct	
					C-Un-useable	.01
						ı

Table 2-2-1 (9) The Survey Result of Identifying the Contents of the Project

			-	Londy Daniel & Charle Town	After June
ICHI NO.	Name of Equipment	Description (Type/Model/Index No.)	Chity	A	B C
VI-B-2	Heat exchanger	Double tube type, 65A/90A	1 set	-	0
VI-B-3	Unit cooler	Al. Plate fin/copper tube floor mounted type	I Set	-	0
VI-B-4	Cooling tower	Low noise type/CTA-30%臣	1 set	-	
VI-B-5	Cooling water pump	Centrifugal type/65SGS2.2	1 set	-	0
VI-B-6	Defrost water pump	Centrifugal type/50SG51.5	1 set	-	0
VI-B-7	Monitoring panel (B-Contorol Panel)	Floor mounted, self standing type	1 set	-	O
VIB-7-I	Complete with:			H	
	Compressor protection system, alarm device for water				-
	pressure failure, automatic and manual control for freezing	-			(
	and wiring materials				>
W-B-8	Prefabricated freezing room	Prefabricated insulation panel	100		C
WI-B-8-1	Complete with:		9	t	
	Compartment lamp, door heater and air damper heater		100	+	
VI-B-9	Connecting pipes, pipe filtings, valves and fixing materials for refrigerant circuit		1 set	+	C
VI-B-10	Connecting pipes, pipe fittings, valves and fixing materials for water circuit		to:	t	c
W-B-11	iping line		ids.	+	oc
Λ <u>I</u> -C	~20°C cold starage facility specifications				
VI-C-1	Refrigeration packaged unit	Reciprocating compressor condensing unit / MYCOM	1 unit		0
1-1-0-1/1	Components and accessories:			t	
	Oil separator		-	-	¢
	Condenser & receiver (Water cooled shell & tube type)			l	
	Intercooler		1	-	C
	Oll cooler		_	t	c
	Liquid sight glass		-	T	C
	Dryer/filter			t	C
	Gauge board with gauges (HP, LP and OP)		tas	-	c
	Pressure switches (HP, LP OP and WP)		TES.	T	
	Solenoid valve for capacity control			t	c
	Thermometer with casing (HT, MT & LT)		Tass .	-	
	Common steel base		-	t	
	Coupling and coupling guard			+	c
VI-C-2	Heat exchanger	Double tube type, 40A / 65A	tes	T	C
VI-C-3	Unit cooler	Al plate fin / copper tube, ceiling mounted type	138	-	
V	Cooling tower	Low noise type/CTA-15NE	1 set	-	0
	Cooling water pump	Centrifugal type/50SCS1.5	1 set	-	0
٩	MONITORING panel (C-Control panel)	Floor mounted, self-standing	1 set	-	0
			I annual.	V-10	

Lenged: A=Damaged
B=Lost
C=Un—useable

Table 2-2-1 (10) The Survey Result of Identifying the Contents of the Project.

					Anna by Daniels & Start Temp	Į
Hem No.	Name of Equipment	Manufacturer	Description (Type/Model / Index No.)	Onto	A B	ပ
VI-C-6-1	Complete with:				_	_
	Compressor protection system, alarm device for water pressure failure, auto and manual control for cooling and wirgn materials					0
VI-C-7	Prefabricated cold storage		Prefabricated insulation	1 set		þ
VI-C-7-1	Complete with:					_
	Compariment lamp, door heater, air damper heater and insulated door (850WX1,700HX100Tnm, manual single swing type) and wooden duck boards.					0
%-C-%	Connecting pipes, pipe fittings, valves and fixing materials for refrigerant line, insulation material for low temperature piping system			1 set		0
6-2-M	Connecting pipes, pipe fittings, valves and fixing materials for water line			1 set		0
VI-C-10	insulation materials for low temperature piping system			1 set		þ
Î.	O'C Chiling from specifications					_
W-D-1	Refigeration packaged unit:		"ALL-IN-ONE" cooling unit /AEI -R2A	unit		0
M-P-I-I	Complete with:		THE PARTY OF THE P	,		1
	Air cooled condenser (50W/unit), air cooler (15WX 2sets/unit) and auto temperature controller					C
M-D-2	Prefabricated chilling room		Prefabricated insulation	1 set		-
VI-D-2-1	Complete with:	-	-			
VI-D-3	Chilled panel		Wetermoof trae	-		ok T
VI-S	Spare parts and hand tools for maintenance VI-S, Spare parts		African April 1900	138		7
VI-S-I	Ice-making facilities					+
-I	Condensing unit (CRW22A-50)					
7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 -	Suction plate valve		Index No.71	4		
2-1-1-A-1A	Discharge plate velve		Index No.110	4		
1 1 1	Spring set for suction plate valve		Index No.72	4 sets		
V - 1 - 1	Spring set for discharge plate valve		Index No.116			-
VI 5 1 1 5	Assembly, discoarge plate valve		Index No.108	1 set		
VI C 1 1	Pirton and comments		Index No.88	4 sets		
VI-S-1-1-8	Region below.		Index No.76-101	. 2 sets		
V-5-1-1-5-1	Assembly chaff machanical mal		Index No.84	4 sets		
2 2 2	country), single inconstituted bell		Index No.32	1 set		
				Lenzed:	A=Damacan	Ļ

Lenged: A=Damaged
B=Lost
C=Un-uscable

Table 2-2-1 (11) The Survey Result of Identifying the Contents of the Project

New York Consider, Insufrance Index No.21 1. Consider, Insufrance Index No.21 1. Consider, Insufrance Index No.21 2. 1. Consider, Insufrance Index No.21 3. 1. Consider, Insufrance Index No.21 3. 1. Consider, Insufrance Index No.21 4. 1. Consider, Insufrance Index No.21 5. 1. The number of without case, I. 45, 50 - 450 C 5. 1. The number of without case, I. 45, 50 - 450 C 5. 1. The number of without case, I. 45, 50 - 450 C 5. 1. The number of without case, I. 45, 50 - 450 C 5. 1. The number of without case, I. 45, 50 - 450 C 5. 1. The number of without case, I. 45, 50 - 450 C 5. 1. The number of without case, I. 45, 50 - 450 C 5. 1. The number of without case, I. 45, 50 - 450 C 5. 1. The number of without case, I. 45, 50 - 450 C 5. 1. The number of without case, I. 45, 50 - 450 C 5. 1. The number of without case, I. 45, 50 - 450 C 5. 1. The number of without case, I. 45, 50 - 45 C 5. 1. The number of without case, I. 1. 1. 1. 1. 1. 1. 1.	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Set o	00
Gasket, head cover Gasket, head before Gasket set Thermometer without case, L/45, 50~200°C Thermometer without case, L/45, 50~450°C Thermometer without case, L/45, 50~450°C Thermometer without case, L/45, 50~450°C Tressure gauge, DUF75D, 1889 cm Pressure switch, DNS~106000 Pressure switch, DNS~106000 Pressure switch, DNS~106000 Differential pressure switch, DNS~1060004 Safety valve, SV20A~PT, 17.28g/cm Fuse metal, FS~2C (45) Coil for solenoid valve, 3SR-7 Coil for solenoid valve, 4SR-3SR-3SR-3SR-3SR-3SR-3SR-3SR-3SR-3SR-3			00
Geasket, handtole cover Gasket, sover plate Gasket sor Gasket sor Gasket sor Thermometer without case, 1/45, 9~200°C Thermometer without case, 1/45, 50~450°C Thermometer without case, 1/45, 50~450°C Thermometer without case, 1/45, 50~450°C Tressure gauge, DUF75D, 200g/cm Pressure switch, DNS-C106Q003 Differential pressure switch, DNS-C106Q004 Pressure switch, PNS-C106Q003 Differential pressure switch, ONS C106NQ004 Safety valve, SN20A-PT, 17.2kg/cm Fuse metal, IS-3C (45) Coil for solended valve, 30AV-L1 Relay, MY4N Timer, HSCR-A8 Star-Gelta fimer, HSCR-CSI. Relay, MY4N Selector switch, ASLS32320N Menciality conductor valve of the property of the solender conductor valve of the solender conduc			0
Gasket, cover plate Gasket, cover plate V-belt, C-125A492s_set Thermometer without case, L/45, 9~200°C Thermometer without case, L/45, 50~150°C Thermometer without case, L/45, 50~150°C Pressure gauge, DUF75D, 201g/cm Pressure switch, INS-C106Q010 Fresure switch, INS-C106Q010 Fresure switch, INS-C106Q010 Fresure switch, INS-C106Q010 Fresure switch, INS-C106Q010 Water spray nozade (7 pcsmaking drum Water spray nozade (7 pcsset) Bearing for gear unit Molded case circuit breaker, INF30~CF Lamp, LS-C, 6, 33 v, 1W Timer, HSCR-A8 Star-delta timer, HSCR-GSI. Relay, MY4N Selector switch, ASLS23200N Menciaff cronduction witch, ASLS232100N Menciaff cronduction witch, ASLS232100N Menciaff cronduction witch, ASLS232100N Menciaff cronduction witch, ASLS2321000			
Gasket set V-belt, C-125X4pcs, /set Thermometer without case, L/45, p200°C Thermometer without case, L/45, p200°C Tressure gauge, DUF730, 20kg/cm ² Pressure gauge, DUF730, 20kg/cm ² Pressure switch, DNS-D606MQ Pressure switch, DNS-C106Q010 Pressure switch, SNS-C106Q010 Pressure switch, ANS-C106Q010 Pressure switch, ANS-C106Q010 Pressure switch, ANS-C106Q010 Roder spray nozde (7 prs. / set) Bearing for gear unit Modor for ice making drum (Maker Guarantee) Ice-making Panel Molded case circuit breaker, NF30-CF Lamp, LS-6, 6, 87, 1W Timer, H3CR-A8 Star-delta finer, H3CR-C81. Relay, MY4N Selector switch, ASLS28201N Magnetir crowderder wSC-R1 for school Magnetir crowderder wSC-R1 for school Magnetir crowderder wSC-R1 for school			0
V-belt, C-125×4pcs./set Thermometer without case, L/45, 60—450°C Thermometer without case, L/45, 60—450°C Tressure gauge, DUF750, 20kg/cm Pressure gauge, DUF750, 16kg/cm Pressure swirth, DNS-1060k00 Pressure swirth, DNS-1060k00 Pressure swirth, DNS-1060k00 Pressure swirth, DNS-1060k00 Pressure swirth, SNS-C106Q003 Differential pressure swirth, CNS C106NQ004 Safety valve, SV20A—PT, 17.2kg/cm Zafety valve, SV20A—PT, 17.2kg/cm Safety valve, SV20A—PT, 17.2kg/cm Coil for solemoid valve, SB19PB-02FRS Coil for solemoid valve, SB19PB-02FRS Coil for solemoid valve, 30MV-II Ice making Unit Ice making unit Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee) Ice making Panel Motor for ice making drum (Maker Guarantee)			0
Thernometer without case, I./45, 0~-200°C Tressure gauge, DUF75D, 20kg/cm ² Pressure gauge, DUF75D, 20kg/cm ² Pressure switch, DNS-D060kQ Pressure switch, SNS-C1066003 Differential pressure switch, ONS C106NQ004 Safety valve, SV20A-PT, 17.2kg/cm ² Fuse metal, FS-3C (465) Coll for solendid valve, SS19PB-02FRS SS18PB-05PB-05PB-05PB-05PB-05PB-05PB-05PB-05			0
Thernometer without case, 1./45,-50~+50°C Pressure gauge, DUF75D, 20kg/cm Pressure gauge, DUF75D, 15kg/cm Pressure switch, DNS-D606MQ Pressure switch, DNS-D606MQ Pressure switch, DNS-D606MQ Pressure switch, DNS-C106Q010 Pressure switch, DNS-D606MQ Safety valve, SNS-C106Q010 Fuse metal, EN-3C (p5) Coil for solenoid valve, SN-7 Coil for			
Pressure gauge, DUF75D, 20kg/cm 2 Pressure gauge, DUF75D, 15kg/cm 2 Pressure switch, DNS-D606MQ Pressure switch, DNS-C106Q010 Pressure switch, DNS-C106Q010 Pressure switch, RNS-C106Q010 Pressure switch, RNS-C106Q004 Safety valve, SV20A-PT, 17.2kg/cm 2 Safety valve, SV20A-PT, 17.2kg/cm 2 Fuse metal, HS-SX-7 Coil for solendid valve, SR-7 Coil for solendid valve, SB19P9-02FRS Sear-delia finet for water circulating tank Geet unit with motor for ice-making drum (Maker Guarantee) Ice-making Panel Modded case circuit breaker, NF30-CF Lamp, LS-6, 6.3V, 1W Timer, H3CR-A8 Skar-delia finer, H3CR-CSI. Relay, MY4N Ranetic conference with ASLS22R20N Mannetic conference with ASLS22R20N Mannetic conference with ASLS22R20N Mannetic conference with ASLS22R20N Mannetic conference with ASLS22R20N			0
Pressure gauge, DUF75D, 15kg/cm Pressure switch, DNS-D606MQ Pressure switch, DNS-D606MQ Pressure switch, SNS-C106Q010 Pressure switch, CNS-C106Q010 Pressure switch, CNS-C106Q010 Pressure switch, CNS-C106Q010 Pressure switch, CNS-C106Q010 Safety valve, SV20A-PT, 17.2kg/cm Safety valve, SV20A-PT, 17.2kg/cm Coil for solenoid valve, SS-7 Coil for solenoid valve, SS-19PB-02FRS Coil for solenoid valve, SS-19PB-		-	0
Pressure switch, DNS-D606AQ Pressure switch, SNS-C106Q010 Pressure switch, SNS-C106Q010 Pressure switch, FNS-C106Q003 Differential pressure switch, ONS C106NQ004 Safety valve, SV20A-PT, 17.2kg/cm Safety valve, SV20A-PT, 17.2kg/cm Safety valve, SV20A-PT, 17.2kg/cm Coil for solenoid valve, SB19PB-02FKS Coil for solenoid valve, SB19PB-02		_	C
Pressure switch, SNS-C106Q010 Pressure switch, FNS-C106Q003 Differential pressure switch, ONS C106NQ004 Safety valve, SV20A-PT, 17.2kg/cm ² Fuse metal, IN-3C (\$\phi\$5) Coil for solenoid valve, SX-7 Coil for solenoid valve, SN-7 Ice—making Unit Cear unit with motor for ice—making drum (Maker Guarantee) Bearing for great unit Modor for ice making drum (Maker Guarantee) Ice—making Panel Modded case circuit breaker, NF30-CF Lamp, IS-6, 6.3V, IW Timer, H3CR-A8 Star delka timer, H3CR-CRI. Relay, MT4N Selector switch, ASISS2820N Push button switch, ASISS2820N Push button switch, ASISS2821N		_	
Pressure switch, FNS-C106Q003 Differential pressure switch, ONS C106NQ004 Safety valve, SV20A-PT, 17.2kg/cm Fuse metal, IN-3C (\$\phi_5\$) Coil for solenoid valve, SX-7 Coil for solenoid valve, SN-7 Icc —making Unit Cear unit with motor for icc—making drum Water spray nozae (7 pcs./set) Bearing for great unit Modor for ice making drum (Maker Guarantee) Icc—making Panel Modded case circuit breaker, NF30-CF Lamp, IS-6, 6.3V, IW Timer, H3CR-A8 Star delka timer, H3CR-CRI. Relay, MT4N Selector switch, ASISS2820N Push button switch, ASISS2820N Push button switch, ASISS2831N			0
Differential pressure switch, ONS C106NQ004 Safety valve, SV20A-PT, 17.2kg/cm Fuse metal, FS-3C (ф5) Coil for solenoid valve, SX-7 Coil for solenoid valve, SB19PB-02FRS Bearing for gear unit Molder case circuit breaker, NF30-CF Lamp, LS-6, 6,3V, 1W Triner, H3CR-A8 Star-delta timer, H3CR-G8L Relay, MY4N Selector switch, ASLS32620N Push button switch, ASLS32620N Push button switch, ASLS32621N Memetir conductor W70-K11 for cast			0
Safety valve, SV20A-PT, 17.2kg/cm ² Fuse metal, ISS-3C (φ5) Coll for solenoid valve, SX-7 Coll for solenoid valve, SR19PB-02FRS Coll for solenoid valve, 30MV-11 Ice-making Unit Ice blade Float valve for water circulating tank Gear unit with motor for ice-making drum Water spray nozzle (7 pcs./set) Bearing for gear unit Motor for ice making drum (Maker Guarantee) Ice-making Panel Molded case circult breaker, NF30-CF Lamp, IS-6, 6.3V, 1W Truner, H3CR-A8 Star-della timer, H3CR-C81. Relay, MY4N Selector switch, ASLS326201N Push button switch, ASLS326201N Manneth conference witch, ASLS326201N Manneth conference witch, ASLS326201N	1	-	0
Fuse metal, FS - 3C (\$\phi 5\$) Coil for solenoid valve, SR-7 Coil for solenoid valve, SB19PB-02FRS Coil for solenoid valve, 30MV-LI Ice making Unit Ice making Unit Ice blade Float valve for water circulating tank Gear unit with motor for ice making drum Water spray nozzle (7 pcs./set) Bearing for gear unit Motor for ice making drum (Maker Guarantee) Ice making Panel Molded case circuit breaker, NF30-CF Lamp, LS-6, 6, 3V, 1W Triner, H3CR-A8 Star-delta timer, H3CR-G81. Relay, MY4N Selector switch, ASLS32620N Push button switch, ALS2821N Mannelir Confurer MC, 21, 10, 61-M1 Mannelir Confurer MC, 21, 10, 61-M1	2		0
			0
			0
	-		0
			C
			<u> </u>
			0
			0
	1		0
	2	sets	0
	2		0
	4		
)
	2		C
			0
	2		
	2		0
	2		0
	2		0
	2		
VI -5 -1 -3 -10 Glass tube fuse, 3A			
Blast freezer		-	+
	Lenged:	ged: A=Damaged	ged
		B=Lost	
		C=Un-useable	seable

Table 2-2-1 (12) The Survey Result of Identifying the Contents of the Project

				Ť	Į	Ser.7
Rem No.	Name of Equipment	Manufacturer	Description(Type/Model/Index No.)	Onty	A B	၁
VI-S-2-1	Condensing Unit		,			
VI-S-2-1-1	Suction plate valve			4	0	
VI-S-2-1-2	Discharge plate valve			4	_	
VI-S-2-1-3	Spring set for suction plate valve			4 sets	1	
VI-S-3-1-4	Spring set for discharge plate valve			4 sets	۲	
VI-S-2-1-5	Assembly, discharge plate velve			1 set	_	
VI-S-2-1-6	Piston ring set			4 sets		
W-S-2-1-7	Priston and connecting rod assy with rings			2 sets	F	
VI-S-2-1-8	Bearing halves					
VI-5-2-1-9	Assembly, shaft mechanical seal			1 set		
VI-S-2-1-10	Gasket, head cover			2		
W-S-2-1-11	Gasket, handhole cover			2	ľ	
VI-S-2-1-12	Gasket, shaft seal cover		-	2	_	
VI-S-2-1-13	Gasket set			1 set		
VI-S-2-1-14	V-belt, C125×4pcs,/set			2 sets		
VI-S-2-1-15	Thermometer without case, L/45,0-200°C			_		
VI-5-2-1-16	Thermometer without case, L/45,-50~+50°C		100	-		
VI-S-2-1-17	The mometer without case, L/15,-50~+50°C			_		
VI-S-2-1-18	Safety valve, SV20A-PT, 17.2kg/cm 2			_		0
VI-S-2-1-19	Coll for solenoid vaive, SX-7			1		
VI-S-2-1-20	Coil for soleaoid valve, SB19PB-03FRS					
VI-S-2-1-21	Coil for solenoid vaive, 30MV-L.1			_		
VI-S-2-2	Air blast control panel					
VI-5-2-1	Magnetic conductor, MSO-11,22kW					_
W-8-3	Cold storage					
W-S-3-1	Condensing unit					L
VI-S-3-1-1	Suction plate valve			Ā		
VI-S-3-1-2	Discharge plate valve			4		
WI-S-3-1-3	Spring set for suction plate valve			4 sets	1	
VI-S-3-1-4	Spring set for discharge plate valve					0
WI-S-3-1-5	Assembly discharge plate velve			1 set		
VI-S-3-1-6	Piston ring set			1		0
VI-S-3-1-7	Piston and connecting rod assy, with rings			2 sets		
VI-S-3-1-8	Bearing halves					
VI-S-3-1-9	Assembly, shaft mechanical seal			1		
W-S-8-1-10	Gasket, head cover			1		
W-S-3-1-11	Gasket, nandhole cover			2		
W-S-3-1-12	Gasket, shaft seal cover				1	
				Lenged	A=Damaged	
					R.L.ost	ł
					C=Un-useable	able

Table 2-2-1 (13) The Survey Result of Identifying the Contents of the Project

			, , , , , , , , , , , , , , , , , , ,		Acres by Complete Study Surgy Surgy	
Item No.	Name of Equipment	Manufacturer	Description (Type/Model/Index No.)	CHIA	A	ပ
W S-3-1-13	Gasket set			1 set)	
VI-S-3-1-14	Thermometor without case, L/C, 0~150°C			1	_	
VI-S-3-1-15	Thermometer without case, 1./C,-50~+50°C				<u> </u>	
VI-5-3-1-16	Pressure gauge, DUF60D, 20kg/cm 2			1		
VI-S-3-1-17	Pressure gauge, DUF60D, 15kg/cm 2			1		
VI-S-3-1-18	Coil for solenoid valve, SX-7			1		_
VI-S-3-1-19	Coff for solenoid valve, SB19PB-03FRS			1	_	_
VI-S-3-2	Cold storage control panel					_
VI-S-3-2-1	Molded case circuit breaker, NF30-CS, 10AT			1		_
VI-S-3-2-2	Thermal relay, TH-K12AB, (0.55~0.95A)			1		<u></u>
VI-S-3-3	Unit cooler					_
VI-S-3-9-1	Defrost heater pole with wire, 380W×1000L			10	_	0
# \$ -10	Chiling room (0°C)					_
VI-S-4-1	Chilling room control panel				_	
VI-S-4-1-1	Molded case circuit breaker, NF30-CS, 30AT			1		
W-S-4-2	Maintenance hand tools					
VI S 4-2-1	Vacuum pump			1 set		0
W-S-4-2-2	Charging tool, with hose			1 set		0
W-5-4-2-3	Manifold gauge			1 set) 1	- C
W-S-4-2-4	Ratchet handle for valve operation			1		0
VI-5-4-2-5	Refrigerant leak detector] set	_	0
VI-S-4-2-6	Cartridge for refrigerant leak detector			12		
VI-S-4-2-7	Service tools with toolbox for Compressor Model W.A.		***	2 sets	_	0
VI-S-4-2-8	Service tools with toolbox for Compressor Model C			1 set	_	_ _
Chapter VII	Waste/Garbage Treatment Equipment				_	-
.M_1	Fish waste treatment machine	Nakayasu Co.Ltd.	K - 24C	-		0
M−2	Incinerate	Daito	BC-400			0
Chapter VI	Vehicle					L
通-1	Refrigerated panel van (1 ton)	Toyota Motor Corp	LNI06R-TRARS3	1		
厘-2	Insulated panel van (2 tons)	Toyota Motor Corp	BU60R-MDBT3	4		
VIII—3	Extension Service Car (Station wagon)	Toyota Motor Corp	FZJ80R-GCMRS	1		
<u>™</u> -4	Extension Service Car (Pick up truck)	Toyota Motor Corp	INI 6R-PRMRS	_		_

Lenged: A=Damaged
B=Lost
C=Un-useable

2-2-2 Basic Policy of Improvement

(1) Experiences due to Damages by Hurricane Lenny

The cause of damages on the study area was attacked by the severe wave attack, which was over the design wave condition on a 30-year probable wave. We have learned a lot of things from this unexpected damage. Those facilities and equipments are needed to rehabilitate to be able to minimize the damages of Fishery Center even if attacked by the wave over a 30-year probable wave nevertheless the basic policy is rehabilitation. Our experiences by this damage are shown as follow:

- The parapet wall with gates, which is located on the landing wharf, served as a
 barrier to wave attack. Over flooding wave of it straightly struck the doors of Fishery
 Center. The allotment of gates and doors for convenience of landing the fish catches
 became with causes of damages inside the building.
- It is conceivable that damages would have been minimum in the event of over flooding of the parapet wall if the quick draining system for over flooding wave was set up.
- 3) Severe waves to be reached to the northern part of Fisheries Center was supposed to be protected if the parapet wall was settled to the end of stairs in the mooring basin. It is conceivable that damages of cooling towers and fish waste treatment plant etc, were minimum if the protection wall has been set there.
- 4) It is conceivable that damages by one flood from the city drainage and surface flow were minimum if the floor level of Fisheries Center was setting up more.
- 5) As the slipway is directly opened to the ocean, it is impossible to protect against flood by running up on the slope of it. Therefore, all fishing boats must to pulling up by using this slipway to the city road on the anomalous wave condition. To avoid damages to the city by running up wave on the slipway, it is necessary to set up the huge parapet wall and emergency gate. The area for them is very tight.
- 6) The receding wave action on the slipway caused scoring of the foot area. The increased depth of foot area caused the attacking wave energy become bigger and bigger. It is indicated that the weak point for wave attacking is immanent.
- 7) The scoring condition on the foot area of the landing wharf and west breakwater with severe running back wave after shocked breaking there was reached to the part of underwater concrete. The existing protecting system with the concrete blocks and

the underwater concrete is impossible to protect the scoring condition. It is necessary to improve the existing protecting system. It is not able to deny that the landing wharf and west breakwater with scoring will slide toward offshore if we will not improve the existing protecting system.

(2) Basic Policy of Improvement

Based on the aforementioned experiences, the basic policy of improvement is as follows:

- Fisheries Center plays a role of central facility for the Complex. It is a keen factor to prevent Fishery Center as the basic policy of improvement.
- 2) It is necessary to reinforce the Fisheries Center for preventing from the shock wave on the anomalous condition. However, the pressure of shock wave on the landing wharf reaches to the Fisheries Center without decrease this pressure. The existing building structure of Fisheries Center is impossible to prevent against this pressure. The most of pressure of shock wave should be weakened with the improved parapet wall and the pressure of wave after over flooding become weaker at the sidewall of Fisheries Center. It is an actual improvement plan that the doors and holes on the west side of Fisheries Center will close and the sidewall of it will reinforce.
- 3) The rehabilitation and improvement of Fisheries Center should be examined the combined solution with the improvement of parapet wall and the reinforcement of west side of it. The space between the parapet wall and Fisheries Center is a role of the catchments basin for over flooding wave. The energy to be reached to the building of Fisheries Center can be decreased greatly if those spaces can be provided wider. Therefore, it is possible to prevent the Fisheries Center from the severe shock wave striking on the anomalous condition if it takes to the combined rehabilitation and improvement plan with the parapet wall, the over flooding basin, the reinforcement of sidewall of the building and the close of doors and holes on the west side of the building. The parapet wall should be placed on the point that is the shock wave striking on the landing wharf.
- 4) It is necessary to improve the foot area of landing wharf and west breakwater because of scoring condition.
- 5) In the event of rehabilitation of slipway, the factor of the suffering to a city must be avoided. The suffering factor is immanent in the case of rehabilitation of the original design of slipway. Therefore, it is necessary to improve the slipway.

2-2-3 Policy of Improvement for Each Structure

Followings are the policy of improvement for each structure.

(1) Necessity of Improvement of the Parapet Wall and Building of Fisheries Center

1) Necessity of Improvement of the Parapet Wall

The existing parapet wall with sliding gate is installed on the point of 3.4m from the building of Fisheries Center and its height is 1.50m above chart datum level (CDL+3.50m). The depression effect for over flood wave of existing parapet walls are as follow:

a. The Depression Effect of Over Flooding Wave

Based on the thesis, "Experimental research of motion of overtopping wave on the breakwater without the parapet", Takahashi, et. al. Collection Volume 38(1) 1991, the height of over flooding wave at the point of striking on the landing wharf is estimated 4.29m for a 30-year probable wave. The height of existing parapet wall is 1.50m. The effect of depression for over flooding wave is 4.29m-1.50m=2.79m. The part of water of 2.79m will over flood. The effect of depression for the over flooding wave of existing parapet wall is 1.50m. Consideration of over flooding wave is described in Figure 2-2-3 (1).

b. The Depression Effect of Water Pressure to the Building of Fisheries Center

The basin (3.4m) between the existing parapet and building is a role of depression for the over flooding wave energy. The quantity of this depression effect can be evaluated as follows:

- ① If there is no basin, the existing parapet will reduce the water pressure (=P) of shock wave on the landing wharf is P=27tf/m2x2.79m=75.83tf/m. The building will be stricken this pressure (=75.33tf/m). However, the existing basin will reduce this pressure to 75.83tf/m2÷3.4m=22.16tf/m.
- ②If there is no parapet wall there, the water pressure is P=27tf/m2x3.79m=102.33tf/m because the top height of landing wharf is 0.50m above chart datum level (CDL+2.50m) and the height of over flood is 4.29m·0.50m=3.79m. Therefore, the doors of building was received the water pressure, 102.33tf/m, because of no sliding gates. The depression effect of existing parapet wall is assumed to 102.33tf/m·22.16tf/m=80.17tf/m.
- ③ However, the building cannot prevent from the shock wave attacking of water pressure, 22.16tf/m based on their structure.
- c. Rehabilitation Method of Existing Parapet Wall and Building of Fisheries Center The parapet wall has the reducing effect against the suffering of building of Fisheries Center by the above examination. It is necessary to rehabilitate the parapet

Figure 2-2-3 (1) Calculation Measure of Over Flooding Wave

wall. However, the existing parapet wall is not sufficiently effective for reducing the water pressure to the building of Fisheries Center. Therefore, it is necessary to move the location of placement that the basin is able to increase for catching volume and size up of height of the parapet wall without gates.

The improvement of these facilities is as follows:

1 Size up of Height of the Parapet Wall

If the height of parapet wall will be set 2.50m (CDL+4.50m), the height of over flooding water will be 4.29m-2.50m=1.79m and the water pressure will be P=27tf/mx1.79m=48.33tf/m. The reducing effect of size up parapet wall is 40% more than the existing parapet wall.

2 Setting up the New Parapet Wall

The new parapet wall will be placed at the point of 7.4m from the west side of building of Fisheries Center. The water pressure of over flood of the new parapet wall to the building is $P=48.33tf/m2 \div 7.4m=6.53tf/m$. The height of over flood water is $1.79m \div 7.4m=0.24m$. Therefore, there is no suffering of the building if the doors of building will be closed and the floor level of it will be leveled up.

The floor of building will be leveled up of 0.40m. The basin need to the function of quickly drainage system for catching water. The hydraulic gradient is 2% on the basin. The receiving water will be divided by the center of basin with the hydraulic gradient of 2%. The water level of center of basin is 35mx0.5x0.02=0.35m. Therefore, the floor level should be Existing Floor Level (CDL+2.75m) + Water Level of Center (0.40m)= The Floor Level after leveling up (CDL+3.15m).

3 Extension of the New Parapet Wall

The existing parapet wall is placed up to the end of building of Fisheries Center and it is not covered the room of emergency generating plant. It is not sufficient to protect the area of northern part of building. The parapet wall should extend to the end of stairs of mooring area for protecting the northern part of the building. The parapet wall should also extend to the southern end of existing parapet wall.

Protection Works of Fisheries Center

The over flooding wave still has the energy of 6.53tf/m to the building. The doors and ventilation mouth at the western side of building should be closed for protecting the over flooding wave. It is also necessary to reinforce the sidewall of building for protecting the over flooding waves. The entrance of west side must be switched to the southern part of building. The distance from landing wharf to the southern entrance should be longer than the west side entrance, but it must not be inconvenient to transport fish catches from the landing wharf.

It is necessary that the layout of facility and equipment in the building should be changed because of switching the entrance to the south.

2) Necessary of Improvement of Slipway

The water depth in front of the slipway is changed to deeper due to score by the running back wave on the slipway. Hurricane Lenny changes the wave condition more severely before suffering. In the event of rehabilitation of existing figure of slipway, the following improvement measures are necessary.

- * It is necessary to protect the scoring of foot area and the sucking of filling sand and stones of slipway with steel sheet pile.
- * The shock wave pressure on the slipway is bigger than the original design because the water depth of foot area of slipway is deeper. It is necessary that the concrete plate of slipway should be thicker and the unit weight of plate should be increased. The earth anchor system needs to support the heavy weight concrete plate.

The slipway is able to rehabilitate by the above-mentioned system. But it is impossible to prevent the Fisherman's Locker Area, dike of city road and city area of next door from over flood suffering by the running up wave on the slipway. For example, in the case of the depth of end of slipway, 0.5m, the running up wave of a 30-year probable reaches to the height of 5.96m at the top of slipway. For preventing from the suffering by this running up wave, the height of dike on boundary needs to be 6.0m. However it is impossible to place on the slipway because of the narrow space. The emergency gate is also needed to improve.

Therefore, the rehabilitation of existing figure of slipway is possible by the above mentioned measures. But the suffering by running up wave to the city side cannot be prevented.

It is most effective measure that the wave energy is reduced in front of sea of the slipway. The energy of offshore wave reaches directly to the study area because of steepness condition of sea bottom condition. It is best solution that the wave energy is compulsory decreased by the breakwater. The dimensions of breakwater are as follows:

a. Dimension of Breakwater

① The Location and Length of Breakwater

The breakwater headline will be set on same line of the wharf of Ferry Terminal. It is apprehended that the turbulent of the mouth of breakwater caused by the current along the breakwater and wharf of Ferry Terminal. But this headline will be set in the view of necessity of wider turning basin behind the breakwater. The mouth of breakwater will be opened to the landing wharf side in order to avoid the conflict between the fishing boat and Ferryboat. The width will be set 7.0m for reducing the induced wave energy although the mouth of breakwater will be assumed some 6.0m to 9.0m of width based on Japanese Standard of Fishery Port. The length of breakwater is estimated as 35m.

② The Crown Height of Breakwater

The crown height of breakwater will be set same level of wharf of Ferry Terminal.

The Structure Type and Width of Breakwater

It is the best way that the structure of breakwater is the combined type with steel sheet pile and gravity structure for the severe condition of scoring in the study area. The role of steel sheet pile is the protection of scoring. The gravity structure consists with concrete filling. This filling concrete resists the shearing force. The width of breakwater is 9m because the stability is required and we need the wider turning basin behind it.

Alternative Plans of Rehabilitation and Improvement of Slipway

The registered fishing boats are 30 in numbers based on the original basic design. It is assumed that those fishing boats are parking on the slipway by two raw. Based on the direction of slipway, we have two alternative plans for rehabilitation and improvement. One is the same direction of existing one. Second one is the switched direction toward Ferry Terminal. Table 2-2-3 (1) summarizes two alternative plans for rehabilitation and improvement of slipway.

c. Evaluation of Alternative Plans for Rehabilitation and Improvement of Slipway

Alternative plans are able to evaluate with the operational condition, the satisfaction of required space for parking of fishing boat and the condition of construction. The evaluated measures above matters are indicated as follows.

① The Operational Condition

The working ratio of fishing boats per day was assumed 60% of 30 registered boats on the original design. The number of rest of boats in normal operating day are estimated 30x0.60=18 boats. According to the original design, the length of slipway for 18 fishing boats is calculated 18 boats x $(1.5m +1.0m) \div 2=22.5m$ based on the same manner of two raw rest and the width of a boat of 1.5m and the clearance is 1.0m.

The length of turning basin is required three times of the length of fishing boat based on the Japanese Standard of Fishery Port. It is calculated $6m \times 3 = 18m$.

② The Satisfaction of Required Space for Parking of Fishing Boat

In the event of anomalous condition, all fishing boats will be moved to the back site on the original design. The slipway will not be attacked from the running up wave to the top of it because the breakwater protect offshore wave. Alternative plans have a space for boat parking area because of settlement of breakwater. The required space for parking of 30 fishing boats is calculated as follows:

The required space; S=(boat length x boat width + clearance 10%) x No. of Boats The length of designed boat; 6.0m The width of designed boat; 1.5m

S=6.0m x 1.5m x 1.1=9.9m² say $10m^2$ per boat Total of S = $10m^2$ x $30 = 300m^2$

Therefore, the total required space for parking is the standard of evaluation for alternative plans.

③ The Condition of Construction

Generally speaking, the cheaper construction cost and the shortened period of construction works are applied for the condition of construction.

Table-2-2-3 (1) shows the comparison of alternative plans with each evaluated item. According to this comparison, Plan 1 is the best solution for rehabilitation and improvement of slipway with a wider parking space and larger turning basin.

Table-2-2-3 (1) Summarize Two Alternative Plans for Rehabilitation and Improvement of Slipway

	Plan 1	Plan 2
Slipway Width	30m	27m
Area of Boat Storage	375 m	667.5 m
Yard	(30m×12.5m=375 m)	$(27m \times 12.5m + 12m \times 15m + 5m \times 30m = 667.5 \text{ m})$
Size of Basin	• 15.4m limited by Breakwater	· 24m, which if enough for boat maneuvering
Breakwater	• Exist	• Exist
Structural Character	 Breakwater will be constructed against the storm waves. Slipway will be restored as smaller scale with same direction of damaged one. Armor blocks will be installed for securing the calmness. Small scaled boat storage yard will be provided. 	storm waves. Slipway will be restored with switched direction toward ferry terminal. Armor blocks will be installed for securing the calmness at basin. Boat storage yard will be provided.
Merit	running up waves.	 Protection capability against storm waves will be satisfied. Damages at town will not be caused by running up waves. Even in stormy sea condition, boats will not be necessary to escape. Boat storage yard will be utilized with multi-purposes.
Demerit	 Area of boat storage yard is slight short to whole boats Due to limited basin area, boat con not approach to slipway straightly 	 Due to limitation of width of slipway, a part of boats shall be rested at boat storage yard

Sub-merged Breakwater

a. The situation of Sub-merged Breakwater

The role of sub-merged breakwater is to prevent the sand deposition to the port mouth from Roseau River. The tip of it, which consists with steel sheet piles, is deformed toward south direction. The deformed steel sheet piles are the area of three concrete apron blocks from the tip. The tip of internal concrete apron blocks among the tip of steel sheet piles is dropping down toward the sea and the next two concrete apron blocks moved to the tip with 1 meter sinking. All concrete apron blocks on the outside of steel sheet piles are moved. Four concrete apron blocks from the tip moved more than 10 meters to the riverside and two blocks in the trunk of sub-merged breakwater 3 meters toward the seaside. The causes of this situation are described below.

- The concrete apron blocks on the south side of sub-merged breakwater are moved by the severe wave.
- The strong stream of Roseau River scored the basement area of two internal concrete apron blocks on the riverside. After then, the strong stream moves these concrete apron blocks to the seaside.
- 3. The strong river stream deformed the tip of steel sheet piles toward the seaside.

b. The Rehabilitation of Sub-merged Breakwater

The deformed sub-merged breakwater is necessary to rehabilitate the functions to prevent the sand deposition to the port mouth from Roseau River. The rehabilitation method is as follows.

- 1. The deformed steel sheet piles will be underwater cut off.
- 2. The new steel sheet piles will drive besides the cutting off piles.
- 3. The deformed concrete apron blocks will place back the original position.
- The underwater concrete will cast to cover the concrete apron blocks among the steel sheet piles.

4) Rehabilitation of West Breakwater

a. The Situation of West Breakwater

In the event of rehabilitation of the previous damages by Hurricane Luis and Iris, the west breakwater was rehabilitated the cut off the crown height and the structure which is protected the shearing force by the hard connecting top of piles with the reinforced coping concrete. The same manner of foot protection of the landing wharf was placed for the reason of protection of sliding force caused by the short length of sheet pile of backward.

The foot area was scored by the severe running back waves and uplifting force in Hurricane Lenny. The tip of foot area is covered with the concrete blocks. Those were slightly moved toward offshore and top of those were zigzag figures. Some part of those is sliding toward offshore and scored the underwater concrete near the sheet pile. It is assumed that the tip of foot area of west breakwater is being scored and shifting toward offshore. It is conceivable to slide the breakwater.

b. The Rehabilitation of West Breakwater

The limitation of usage of the mooring area on the anomalous condition due to the

cut off the crown height of west breakwater are agree by both parties on the previous rehabilitation project. Therefore, the improvement of weakened foot area for protection of sliding of breakwater will be carried out.

The improvement plan of foot area of west breakwater is as follows:

It is assumed that the resistance of shock wave pressure is possible by the passive earth pressure at the forward sheet pile. New steel sheet pile will drive in front of tip of concrete blocks and the underwater concrete of 1m thicknesses will cast on the existing underwater concrete. This improvement plan of foot area is possible to resist the sliding force.

The role of this improvement plan is to sustain the existing breakwater. This plan is impossible to protect the function of mooring area on the anomalous condition. Therefore it is necessary to continue that all fishing boats in the mooring area should escape to any safety area at the anomalous condition.

2-3 Basic Design

2-3-1 Design Concept

(1) Design Concept for Natural Conditions

Design condition concerning natural conditions made the revisions of wave condition regarding the change of sea bottom topographical condition. Other original design conditions shall remain unchanged. The soil conditions were based on the values obtained from the boring and soil tests conducted at this time and the original design. The design conditions for natural conditions are as indicated below.

Table 2-3-1 (1) Design Conditions

		Item	Design Value	Remarks	
	Maximum wi	nd velocity	53.8m/sec.	During approach of hurricanes	
	Maximum wa	eve height (significant)	H=8.0m	30 year probability offing waves,	
۱.,				Ho=7.0m, To=10.5 sec.	
Conditions	Water level	Tide level (high tide)	MHWL=CDL+0.6m		
l iğ		Suction height	Maximum+0.6m	During approach of hurricanes	
	Maximum flo	w velocity	0.5m/sec.		
Sea	Seismic coeff	icient	0.1	Recommended value:0.20	
and	Bottom sedin	nent	Crushed sand mixed with gravel (gravel pieces of 200-30cm diameter in places)		
Climate	Rainfall		2,073mm/year		
哥	Temperature Annual variation		Maximum temperature 35℃	Maximum 34.0℃	
-		Daily difference	11.6℃	Maximum daily difference	
	Humidity	_	80%		
L	Water tempe	rature	Fresh water temperature 32°C		
8			Surface	Foundation Bed	
Conditions	Wet density		1.75~1.90ton/m ³	Ditto	
ği	Moisture con	tent	19%wt	11-14%wt	
	Soil type/Par	ticle size	Sand (0.07-2.0mm) 80%	Sand 45-65%, rest is gravel	
Soil	N value		3~26	26 minimum	
	Layer thickne	888	3m∼5m	Seabed surface and below	

CDL: chart datum level (±0.000 m in the Project)

1) Re-examination of Design Waves

a. Offshore Waves

The study report on the coastal fisheries development project in the commonwealth of Dominica in March 1996, JICA was re-examined offshore waves based on the most powerful 54 hurricanes, in terms of wind velocity at the point of entry into the Caribbean Sea, that passed through an area stretching 400km east to west and 800km north to south (from 59° 36' to 63° 17' W. Long. and 10° 26' to 17° 40' N. Lat.) which encompasses Dominica and St. Vincent, over the past 40 years (1955-1994). Using the spectral method (one-point method (Gotoh method) and MRI

model), 39 offshore waves estimated from observations made at one point in the Roseau region during Hurricanes David and Luis and five more observation points in waters around St. Vincent during hurricanes Allen, Flora and Iris. These estimated offshore waves were then used to calculate the non-excessive probability for each wave height by means of the Weibull distribution. The 30-year probable waves, which used generally in Japan in the design of the Fishing Port Facilities, were obtained in the wave estimations conducted here. As the result, offshore waves with a height of 7.0m, period of 10.5 second and a westerly direction shall be used.

b. Design Maximum Wave Height of Facilities

The maximum wave height on each facility is re-examined because of the change of sea bottom topographical condition. It is shallow in the point of 5 waves distance forward the facilities. Figure 2.3.1 (1), (3) and (5) show the sea bottom profile of west breakwater, the landing wharf B and slipway. Re-examined design maximum wave height of facilities is shown in Table 2-3.1 (2).

c. Design Wave Height of Facilities

① West Breakwater

According to the result of sounding survey in this study, it is indicated that the area surrounding the west breakwater is changed to the occurrence condition of shock wave because of the change of sea bottom topographical condition. Forward area of west breakwater is shallow and offshore area is deeper before Hurricane Lenny. Therefore the shock wave pressure is calculated 17tf/m² using thesis of Coastal Engineering Volume 39, 1992, the shock wave power coefficient from the Mound Shape of Composite Breakwaters by Shigeo Takahashi, et. al. The maximum design wave height at the point of five wave offing is estimated Hmax. =1.8 x 6.0m =10.8m. Calculation results of pressure of shock waves in the vicinity of west breakwater are described in Figure-2-3-1 (2).

② Landing Wharf

This area is steeper than the forward area of west breakwater. The sea bottom Topographical profile changes to steeper than the result of sounding survey in 1998. This area is in shock wave. The shock wave pressure is estimated to $27tf/m^2$ using the above mentioned method of Takahashi's thesis. In this case, the maximum wave height is 10.8m of same of west breakwater. Calculation results of pressure of shock waves in the vicinity of landing slipway are described in Figure 2-3-1 (4).

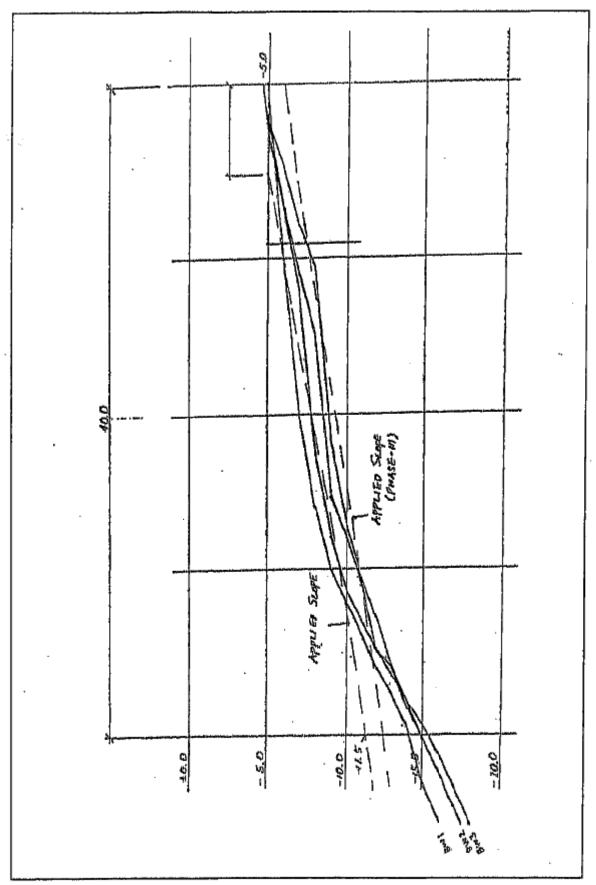


Figure-2-3-1 (1) Sea Bottom Topographical Condition of West Breakwater

	_	_	_	_		_	_	_	_	_	_	_		-		_		
	17.0	12.10	5.60	10,80	10.50	105.90	0.463	30.00	0.862	0.666	0.129	-0.117	1.939	-0.574	1.929	0.237	0.457	0.666
	19.4	12.10	5.60	10.80	10.50	105.90	0.463	25.00	0.862	9990	0.085	-0.100	1.280	-0.491	1.929	0.455	0.878	0.878
i.	26.0	12.10	5.60	10.80	10.50	105.90	0.463	20.00	0.862	0.666	0.041	-0.083	0.621	-0.408	1.929	0.765	1.476	1.476
	29.9	12.10	5.60	10.80	10.50	105.90	0.463	15.00	0.862	9990	-0.002	990.0-	-0.050	-0.324	1.929	0.947	1.826	1.826
	23.8	12.10	2.60	10.80	10.50	105.90	0.463	10.00	0.862	0.666	-0.046	-0.049	-0.928	-0.241	1.929	0.664	1.281	1.281
H1/3=8.0m	19.7	12.10	5.60	10.80	10.50	105.90	0.463	7.50	0.862	0.666	-0.068	-0.041	-1.367	-0.199	1.929	0.469	0.905	0.905
	17.0	12.10	5.60	10.80	10.50	105.90	0.463	5.00	0.862	0.666	-0.090	-0.032	-1.806	-0.158	1.929	0.316	0.609	0.666
(West Breakwater)	17.0	12.10	5.60	10.80	10.50	105.90	0.463	3.00	0.862	999.0	-0.108	-0.025	-2.157	-0.125	1.929	0.226	0.437	0.666
W)	17.0	12.10	5.60	10.80	10.50	105.90	0.463	0:00	0.862	0.666	-0.134	-0.015	-2.684	-0.075	1.929	0.136	0.261	0.666
SE-V)																_	_	
ssure (SEP/2000 PHA)		_	Р	Hd(m)=Hmax	_		d/h	Bm	α1	0.2	Ø11	822	\$1	82	α10	αII	αI	$\alpha = \max(\alpha 2, \alpha 1)$
Calculation of Shock Ways Pressure (SEP/2000 PHASE-V	Pressure of Shock Wave (tf/m2)	Water Depth in Breaking Point	Water Depth at Berm		Design Wave Period	Design Wave Length		Length of Berm	GODA's Coefficient	GODA's Coefficient								Coefficient of Shock Wave Pressure α * = max (α2, α1)

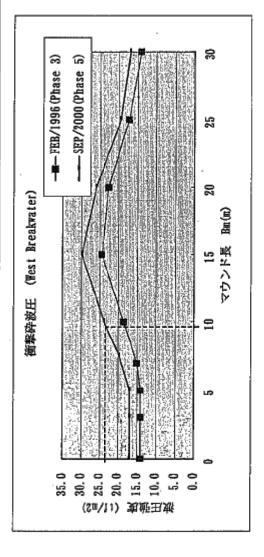


Figure-2-3-1 (2) Pressure of Shock Waves at West Breakwater

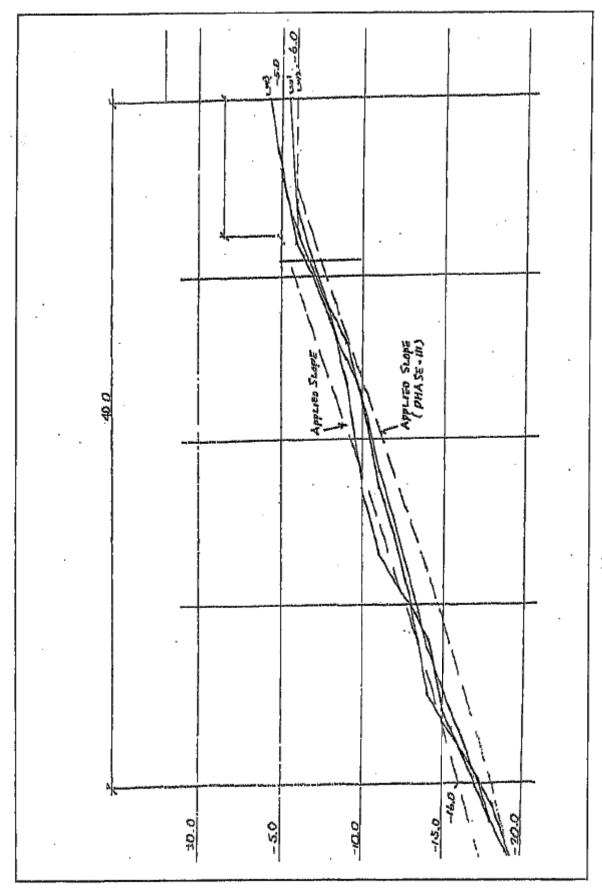


Figure-2-3-1 (3) Sea Bottom Topographical Condition of Landing Wharf

								.:		
Calculation of Shock Wave Pressure (SEP/2000 PHASE-V)	essure (SEP/2000 PHASE-\	9	(Landing Wharf,	£	H1/3=8.0m					
Pressure of Shock Wave (tf/m2)		18.0	19.4	22.5	26.5	29.5	28.6	22.9	18.0	18.0
Water Depth in Breaking Point h	h	16.60	16.60	16.60	16.60	16.60	16.60	16.60	16.60	16.60
Water Depth at Berm	P	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60
Design Wave Height	Hd (m) = Hmax	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80
Design Wave Period	Τ	10.50	10.50	10.50	10.50	10.50	10.50	10.50	10.50	10.50
Design Wave Length	1	120.30	120.30	120.30	120,30	120.30	120.30	120.30	120.30	120.30
	d/h	0.337	0.337	0.337	0.337	0.337	0.337	0.337	0.337	0.337
Length of Berm	Bm	0.00	3.00	5,00	7.50	10.00	15.00	20.00	25.00	30.00
	α1	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800
GODA's Coefficient	α2	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822
	811	-0.089	990.0-	-0.050	-0.031	-0.012	0.027	0.066	0.104	0.143
	822	0.101	0.092	0.087	0.079	0.072	0.057	0.042	0.027	0.012
	81	-1.781	-1.317	-1.008	-0.621	-0.235	0.404	0.984	1.563	2.143
	82	0.304	0.277	0.260	0.237	0.215	0.170	0.125	0.080	0.035
	αIO	1.929	1.929	1.929	1.929	1.929	1,929	1.929	1.929	1.929
	απ	0.320	0.491	0.634	0.822	0.962	0.917	0.654	0.401	0.231
	αī	0.618	0.946	1.222	1.586	1.855	1.769	1.261	0.773	0.446
Coefficient of Shock Wave Pressure $\alpha * = \max(\alpha 2, \alpha I)$	$\alpha * = \max(\alpha 2, \alpha I)$	0.822	0.946	1.222	1,586	1.855	1.769	1.261	0.822	0.822

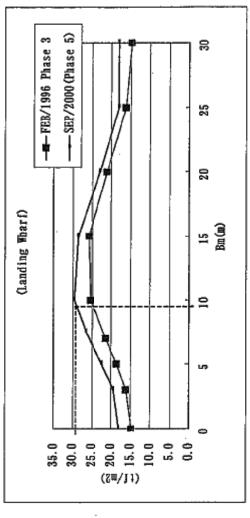


Figure-2-3-1 (4) Pressure of Shock Waves at Landing Wharf

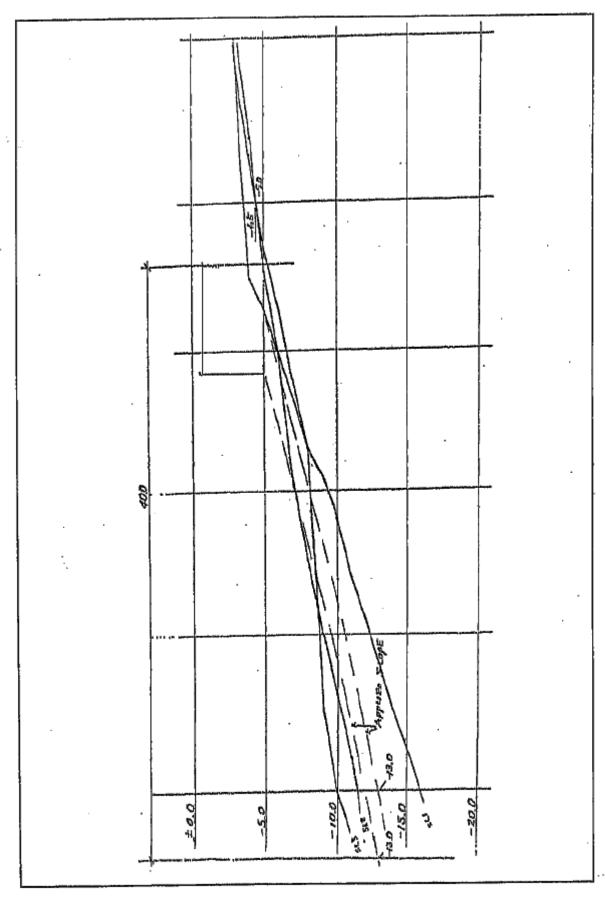


Figure-2-3-1 (5) Sea Bottom Topographical Condition of Slipway

CHOCK HAVE LIE	Concentration was a research (CCI) / Second throng of	- 1	(Stilp way)		HI/3=8.UM					
Pressure of Shock Wave(tf/m2)		17.5	17.5	18.6	22.6	27.0	30.5	25.5	19.1	17.5
Water Depth in Breaking Point	, i	13.60	13.60	13.60	13.60	13.60	13.60	13.60	13.60	13.60
Water Depth at Berm	P	5.60	5.60	5.60	5.60	2.60	5.60	5.60	5.60	5.60
Design Wave Height	Hd(m)=Hmax	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80
Design Wave Period	Т	10,50	10.50	10.50	10.50	10.50	10.50	10.50	10.50	10.50
Design Wave Length		111,30	111.30	111.30	111.30	111.30	111.30	111.30	111.30	111.30
	d/h	0.412	0.412	0.412	0.412	0.412	0.412	0.412	0.412	0.412
Length of Berm	Bm	0.00	3.00	5.00	7.50	10.00	15.00 }	20.00	25.00	30.00
	a.1	0.840	0.840	0.840	0.840	0.840	0.840	0.840	0.840	0.840
GODA's Coefficient	Ø2	0.729	0.729	0.729	0.729	0.729	0.729	0.729	0.729	0.729
	811	-0.116	-0,091	-0.074	-0.053	-0.032	0.010	0.051	0.093	0.135
	\$22	0.032	0.023	0.016	0.008	0.000	-0.016	-0.032	-0.049	-0.065
	81	-2.317	-1.815	-1.481	-1.063	-0.646	0.143	0.769	1.396	2.023
	82	0.097	0.068	0.048	0.024	0.000	-0.080	-0.159	-0.238	-0.317
	αIO	1.929	1.929	1.929	1.929	1.929	1.929	1.929	1.929	1.929
	α!1	0.195	0.317	0.432	0.617	0.823	0.987	0.753	0.453	0.247
	αI	0.376	0.611	0.833	1,190	1.586	1.903	1.453	0.874	0.477
lock Wave Pressure	Coefficient of Shock Wave Pressure Q * = max (Q Q Q 1)	0.779	967.0	0.833	1 190	1 506	1 000	1 455	7000	0440

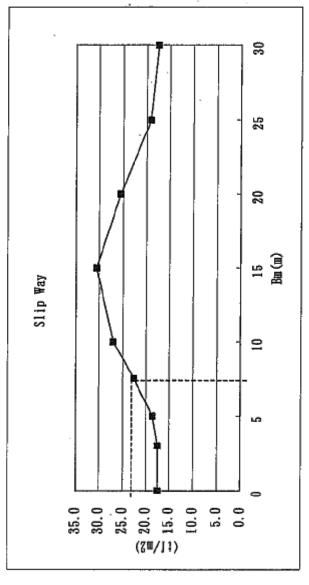


Figure-2-3-1 (6) Pressure of Shock Waves at Slipway

3 Slipway

The sea bottom profile Topographical condition in front of slipway is steep. The gradient of steepness is calmer than other area. However, this area is also zone of shock wave. Therefore, the shock wave pressure is estimated to 23 tf/m2 using the same method of above. The maximum wave height is 10.8m.

Table 2-3-1 (2) Re-examined Maximum Design Wave Height

		Facilities
Prevailing Direction of Offshore Wave		W
Offshore Wave Height H ₀ (m)		7.0
Offshore Wave Period To(m)		10.5
Offshore Wave Length L ₀ (m)		172
Equivalent Offshore Wave Height H ₀ (m)		6.89→7.0
Peak Wave Height	Water Depth (m)	5.6
(Wave before Facilities)	h/H' ₀	0.94
	H max/H' ₀	1.2
	H _{1/3} (m)	6.0
	H max (m)	8,0
Shock Wave Height	Water Depth of Point at 5 Wave Height	18.1
	H max (m)	10,8

Note: HWL:+0.6 m

2) Design Standard for Structures

a. Design Standards

As Dominica does not have its own technical standards, it was decided to conduct the design in conformity with technical standards that are used throughout the world. In Dominica, both BS and ASTM standards are generally applied with regard to steel and concrete materials. For the purpose of the project, the following standards, including BS and ASTM standards, shall be adopted.

Technical Standard for Fishery Port: Japan Fishery Port Association

Guideline for Road Pavement: Japan Road Association

Method of Soil Testing: Japan Soil Engineering Association

Standard Manual of Concrete: Japanese Association Civil Engineers Association

Japan Industrial Standard (JIS): Japan Standard Association

British Standard (BS)

American Society for Testing and Materials (ASTM)

b. Design Loads

The dead loads of materials on the design loads are used the original design in the manner shown in Table-2-3-1 (3)

Table-2-3-1 (3) Material Loads (after compacting)

	Туре	Density	(ton/m³)	Internal Angle	Remarks
		In Air	In Water	of Friction	
Load	Seabed sediment	1.90	1.00	85"	In case of sand only
	(after dredging and compacting)				1.6/0.85ton/m ³
	Reclaiming sediment	1.80	1.00	35°	
	(filling sand)				
	Back filling sediment	2.10	1.24	35*	
	(maximum 70mm)	(1.80)	(1.00)		
	Stones	2.8			
	Plain concrete	2.3			
	Reinforced concrete	2.45			
Live load		1 ton/m²(pier,wharf)			

c. Concept of Construction Conditions

As above mentioned, the facilities of the Project shall be basically designed based on the Japanese Technical Standards, and shall be also conformed to British and American Building Regulation and Standards and the CUBIC Code (Caribbean Unified Criteria). With regard to environmental standards, European and American and/or Japanese criteria shall be adhered to.

Construction materials shall be sufficiently durable and the utmost effort shall be made to use items that are procurable locally (including imported materials). Other materials shall be imported from Japan, USA or other neighboring countries.

d. Concept with Respect to Local Contractors and Local Equipment and Materials

Because the previous works were conducted by local sub-contractors including locally based USA corporate persons, it should be possible for the local sub-contractors to handled the works. However, the special processes such as the placing of steel sheet piles and underwater operations, etc., shall be given to employing foreign technicians. Moreover, special items of equipment such as steel sheet pile placing machines, etc. shall be procured from USA and other neighboring countries.

e. Concept with Respect to the Operation and Maintenance Ability of the Implementing Agency

The maintenance of the Complex in particular the dredging works will be carried out according to necessity with the cooperation of the Ministry of Communications and Public Works.

f. Concept with Respect to the Setting of Scope and Grades of Facilities and Equipment

The size and contents of the facilities shall remain as originally designed, however, with regard to grades, the facilities shall be made stronger than originally designed by giving them the structural strength and stability to withstand the re-examined design waves.

g. Concept of Construction Period

The Project will carry out the two phases works according to the quantity of construction works and over one Fiscal Year of Japan. The marine construction works should not carry out during the Hurricane season, July to November, because this site had two times of damage by Hurricane. It is necessary that the preparatory works, the removal work inside the Fisheries Center and testing of refrigerator etc. during Hurricane season.

2-3-2 Basic Design of Civil Engineering Facilities

The rehabilitation and improvement plan of the landing wharf, west breakwater, submerged groin of north breakwater and slipway is described below.

(1) Landing Wharf

The protection line consisted with the new parapet wall will be placed to the point of seaside on the apron. The area between the parapet wall and the building of Fisheries Center will be functioned as the reducing basin of over flood of shock wave. The drainage water discharging system in the basin will be divided to north and south direction. The improvement of the sidewall of building and its dimensions has been explained as previous chapter.

The foot area of landing wharf will be driven the steel sheet pile at the offing tip of concrete blocks and cast the underwater concrete of 1m thickness on the existing underwater concrete. The foot structures consisted of the steel sheet pile and the underwater concrete is expected to protect the up-lift force by the shock wave on the anomalous condition.

(2) West Breakwater

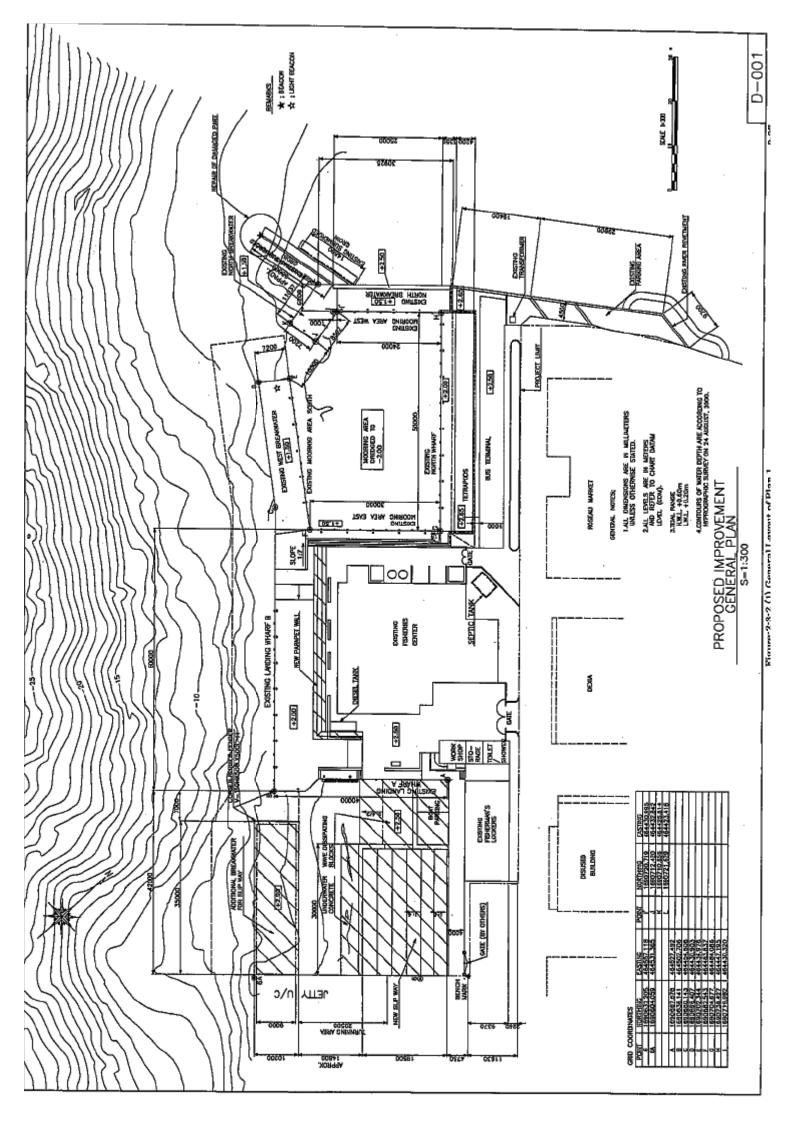
The foot area of west breakwater will be set up same protection measures as the continuous structure of landing wharf. These areas will do the same manner of foot area of landing wharf against the sliding force.

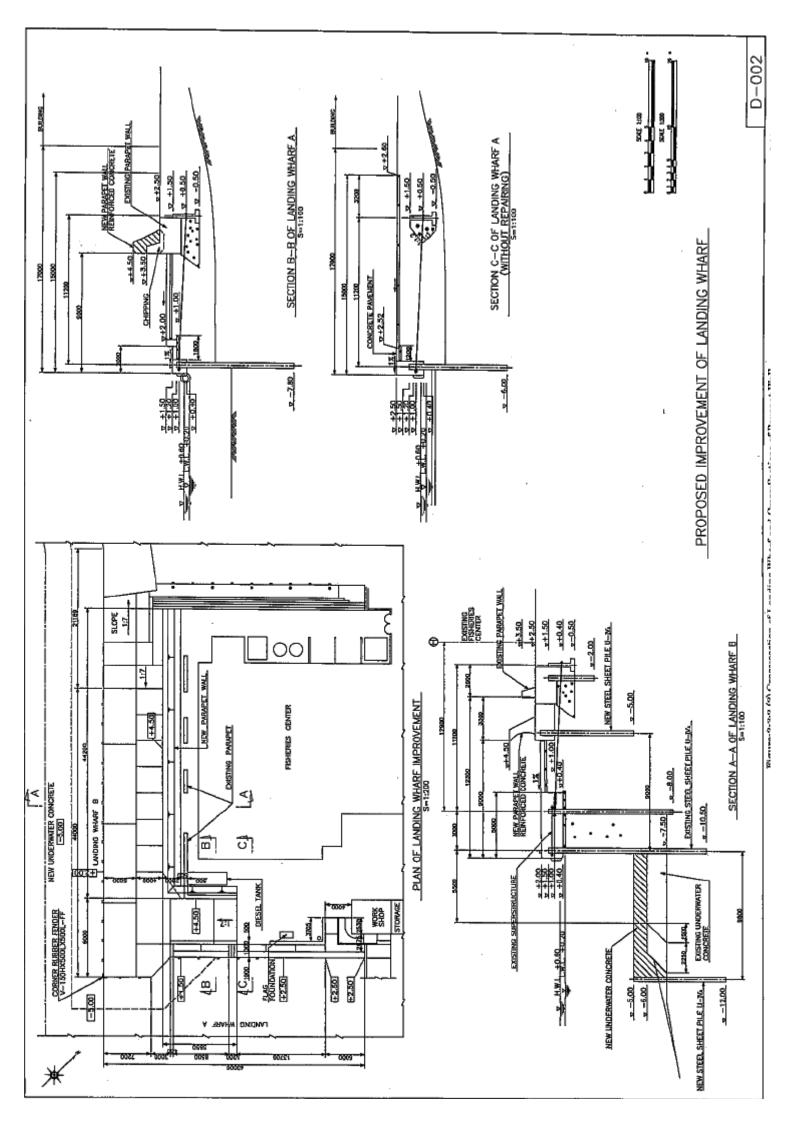
(3) Submerged Groin of North Breakwater

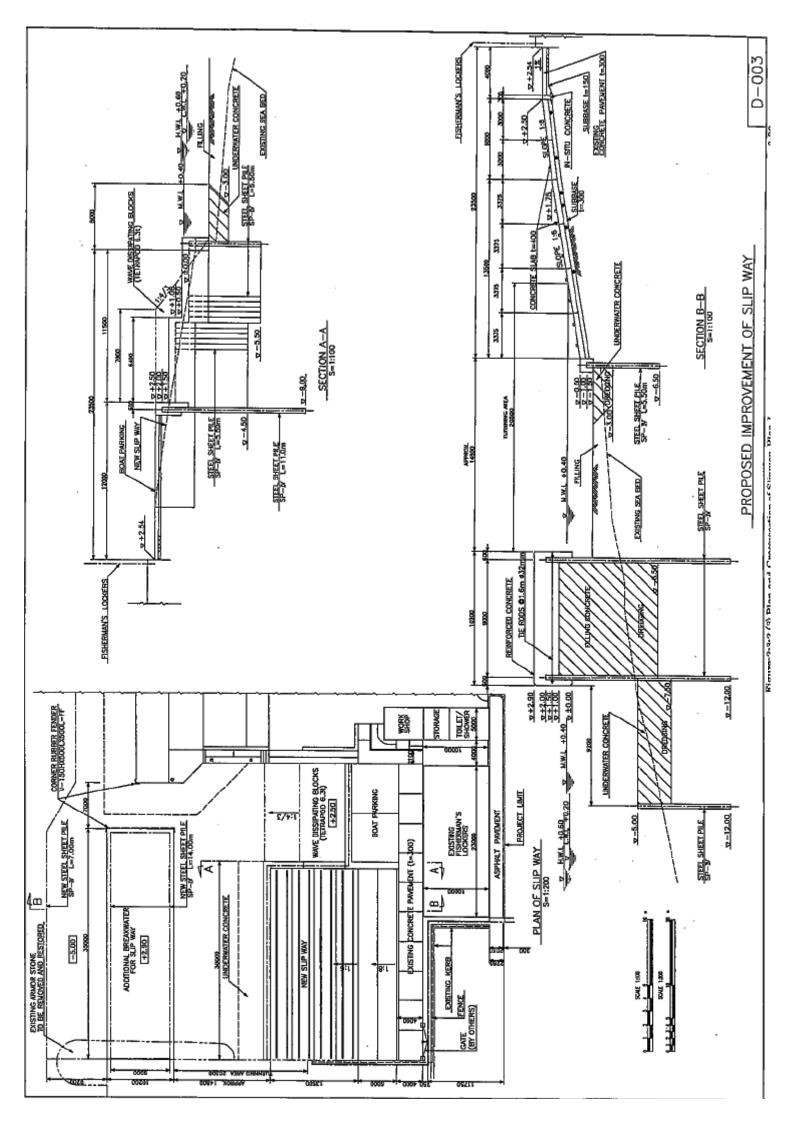
The role of submerged groin of north breakwater is to protect the discharged sand from the river of Roseau to the mooring area. The suffered steel sheet piles will be removed and drive the new steel sheet pile of same size. The remained concrete blocks among the steel sheet piles will be temporally removed and the inside of steel sheet piles will be dredged some 50cm deep and those blocks will be placed back. The underwater concrete will cast on the concrete blocks of 1m thicknesses. The concrete

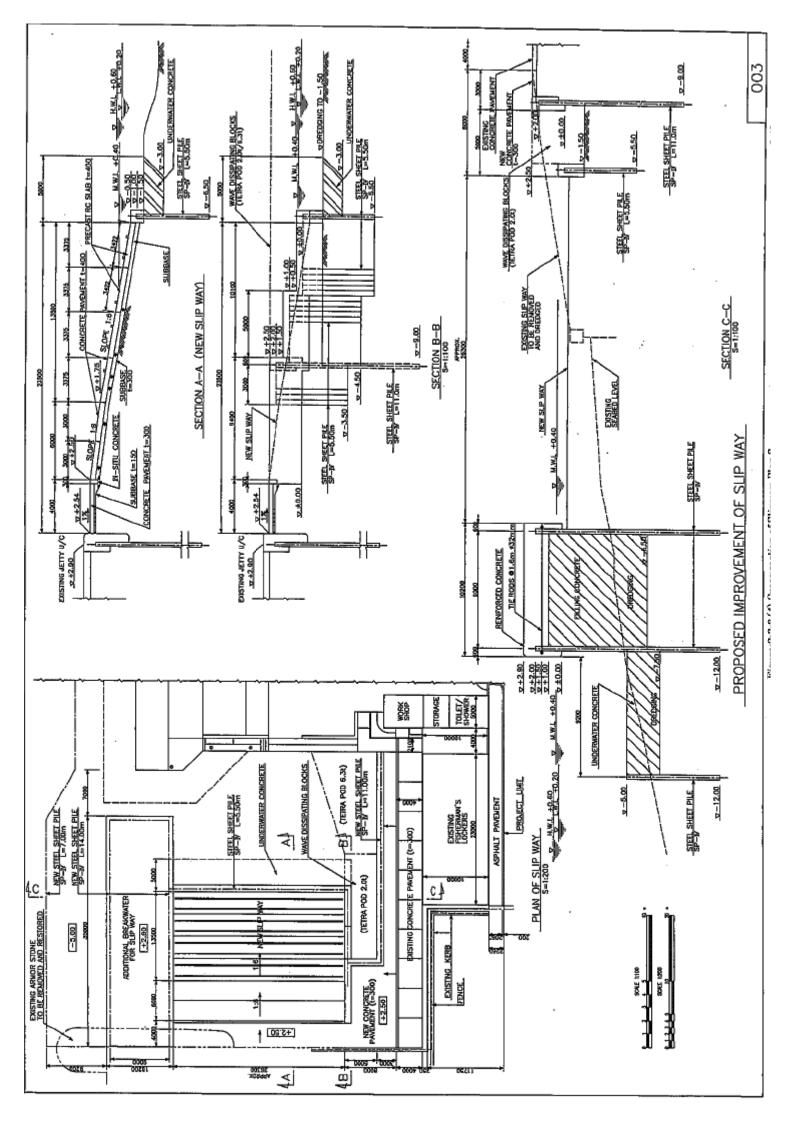
blocks of outside of steel sheet piles will be placed back to the original position. The outside concrete blocks allow moving for attacking over 30-year probable wave conditions because the improvement of submerged groin with the above mentioned works is effective for the role of protection of discharged sand.

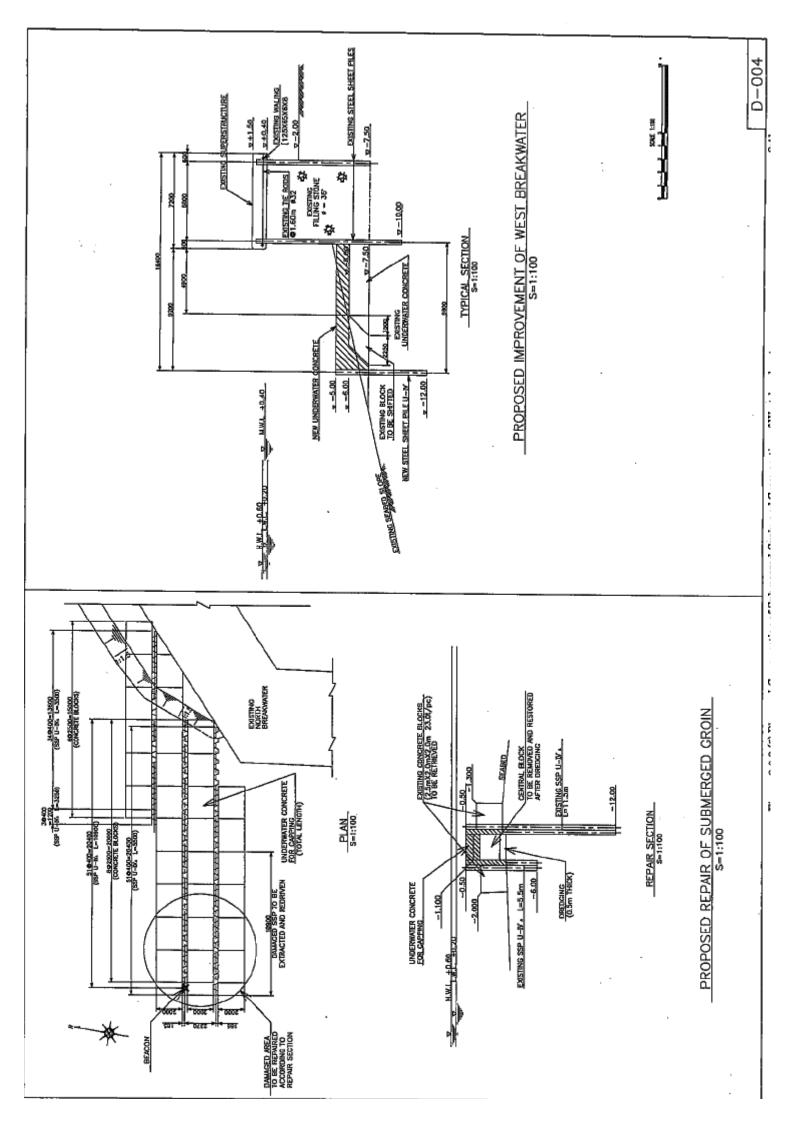
General layout of plan 1 is shown in Figure-2-3-2 (1), cross-section of landing wharf and cross-sections of parapet wall are shown in Figure-2-3-2 (2), plan and cross-section of slipway, plan 1, are shown in Figure-2-3-2 (3), cross-section of slipway, plan 2, is shown in Figure-2-3-2 (4), and plan and cross-section of submerged breakwater and cross-section of west-breakwater is shown in Figure-2-3-2 (5).











2-3-3 Basic Design of Building Facilities and Equipments

(1) Rehabilitation and Improvement Plan of Fisheries Center

It is considered requisite to close the west-side entrance (sea-side) and raise the ground floor elevation by 20 cm and the basement level of major facilities by 40 cm from the necessity of protecting the Roseau Fisheries Complex against the flooding damage, which serves as its central facility. Concept of ground floor elevation is described in Figure-2-3-3 (1).

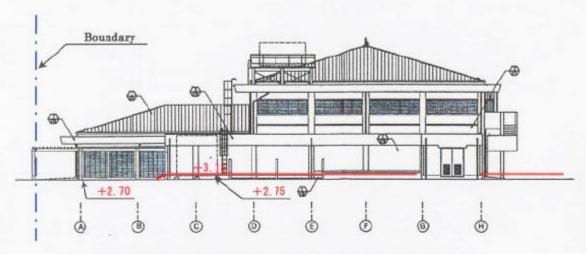


Figure 2-3-3 (1) Concept of Ground Floor Elevation

To realize these ideas, the followings are to be implemented.

- Closure of west side (seaside) entrances and making a small door on the ground floor of building of the Center.
- 2) Strengthen the spandrel wall on the ground floor of building of the Center.
- 3) Switching of the entrance on the ground floor to south side of building of the Center.
- 4) Raising the floor elevation on the ground floor of building of the Center.
- 5) Altering the inner layout on the ground floor of building of the Center.
- 6) Restoration of facility, machinery etc. inside the Center.

The following rehabilitation and improvement plans are carried out.

Table-2-3-3 (1) Rehabilitation and Improvement Plans

	Item of Works	Remarks	
Features of Layout	Closure of west-side (sea-side) entrances Making a small door of west-side (sea-side)	Elimination of weak point in the west-side Keep passage between processing area and wharf	
	Switching of entrance to south	• Improvement of safety of the Center.	
	Alteration of layout	 Change of access route due to switch entrance. 	
	 Raising of floor elevation 	 Reduction of damages by flood 	
	 Construction of new north-side concrete protection wall 	 Reduction of floor damage possibility 	
Features of protection	· Protection of damages by shockwave	No weak points in west-side	
Role	· Reduction of flooded damage from	· Reduction of refrigerators	
	town side (land side)	damage and improvement of	
		floor by floor rising.	
	· Reduction of damage in the north	· Reduction of damage by	
	side area.	north-side wall.	
Features for facility &	· To be rehabilitated to the original		
machinery	shapes basically.		
	 Improvement and restoration of cooling facility by floor raising 	Floor panel to be embedded	
	 Switch to the temperature setting of chilled facility. (0℃~-20℃) 	Increase of function with same facility cost.	

(2) Basic Design of Facilities

1) Building Facility

Although it is basically intended to rehabilitate the original conditions, it would be required to close the west-side entrance, to relocate the entrance to the south-side, to raise the floor elevation, to provide new protection wall for cooling tower, waste incinerator and sewage disposal plant, etc. for which some design changes become necessary. Changes of activity line are described in Figure-2-3-3 (2).

a. Water Supply Facility

Water supply pipes damaged at 5 spots and water taps damaged at 5 spots are to be rehabilitated to the original shapes, However, such water supply pumps, control panels, motors, and other electric items as damaged by the hurricane "LENNY" have low resistance against seawater.

Foundation of two pumps for water supply is to be switched to 400mmH from the existing 200mmH in an attempt to reduce the damage possibility. Installation level of the control panels is raised to highest level as long as it does not interfere with handling and maintenance.

b. Waste Water Treatment Plant

In a similar principle, the wastewater treatment plant is to be rehabilitating to the original conditions, except the floor for motor and electrical equipment. The installation level for control panel, is needed to be raised to a limit height of no interference with handling and maintenance.

c. Electrical Equipment

Most of the electrical equipment is to be rehabilitated to the original conditions, except the main power supply panel, main distribution panel, and emergency generator etc., which are damaged by the hurricane in this time, are needed to raise the installation levels.

Foundation level of the main power supply panel and emergency generator is to be height of 400mm. Wall-type main distribution panel is to be raised to higher position so long as it does not interfere with handling and maintenance.

Under the original designs for emergency generator, the power supplied only to the cold storage. However, there are some testing equipments in the laboratory on the 2nd floor of the Fishery Center that need constant power supply, otherwise the study (records) are feared to be lost by the power failure. To prevent such incident, it is required to make uninterrupted power supply to the testing equipment.

But, total power requirement for the testing equipment is so small (5KVA); it is possible to supply the necessary power from the original generator of 70KVA. The additional supply line wiring to the laboratory is to be implemented.

All other electric items are restored to their original conditions.

d. Fire Hydrant

Fire hydrant facility is to be rehabilitated to the original conditions. As the damaged fire hydrants are located at the east end of the slipway, it would be temporarily removed during the restoration work of the slipway and thereafter be restored to the original conditions

e. Oil Supply Facility

Oil supply system is to be restored to the original positions as well. A diesel oil tank and 3 fuel oil dispensers have been lost by Hurricane "LENNY". In order to reduce the damage possibility in the future, the foundation level of the fuel oil supply equipment is to be raised to height of 400mmH and to be fixed by bolt/nut with its foundations.

f. Waste Disposal Plant and Incinerator

All facilities are suffered from flooding damage caused by hurricane. From this fact, it will be required to raise the floor of its installation to 400mmH in the same way as in the ground floor of the fisheries Center. In addition, construction of new concrete block wall is to be needed to protect the facility against direct wave attacking from north.

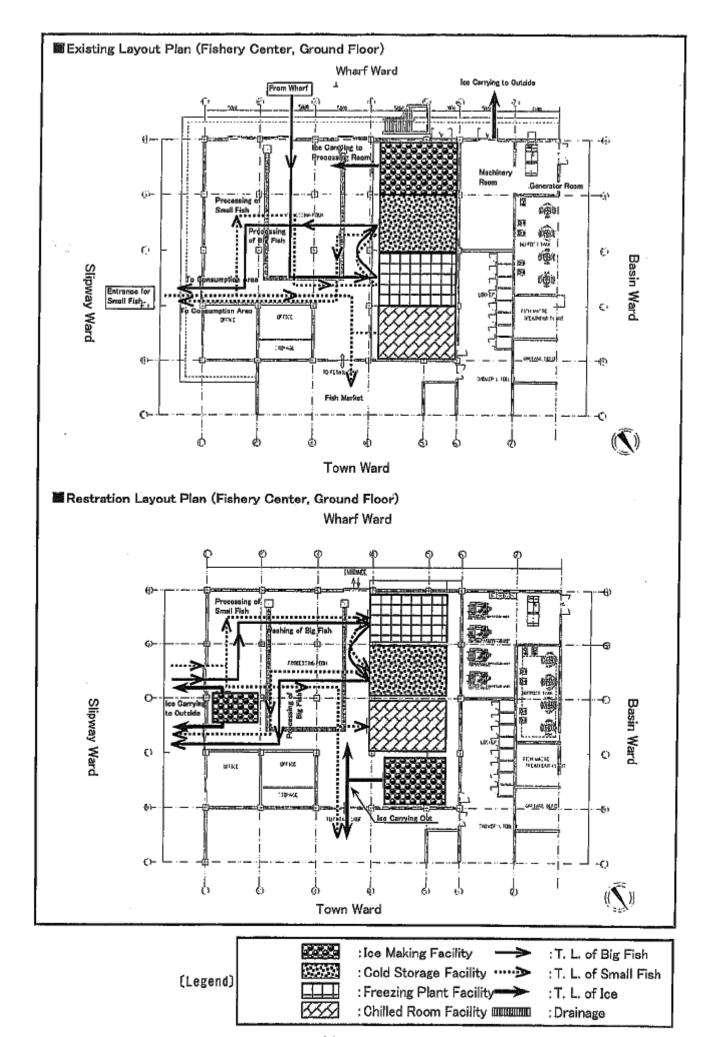


Figure 2-3-3 (2) Changes of Activity Line

2) Basic Design of Equipments

As for the equipments, original design are to be respected, except for the equipment which 7 years have passed since their initial designing and some model changes have been made, for which selections of new equipment are not to be deviated from the original designs.

- a. Equipments for Workshop
- Equipments for Education and Training
- c. Equipments for Fish Processing and Market
- d. Equipments for Laboratory
- e. Equipments for Communication and Laboratory

Basic Design of Storage Facility

Basic design of storage facilities is based on the original models. Because of the closure of west-side entrance and provision of new entrance at south side, need to be changed access route for fishery products and ice products.

In order to minimize the damages by the natural disasters, it will be necessary to change the facility layout. But main specification and capacity of the facilities are to be based on the original design. Existing layout plan on the ground floor of the Fishery Center is shown in Figure-2-3-3 (3). Also the improved layout plan of it is shown in Figure-2-3-3 (4).

- a. Ice Making Plant
- b. Freezing Plant
- c. Cold Storage
- d. Chilled Room
- e. Spare Parts

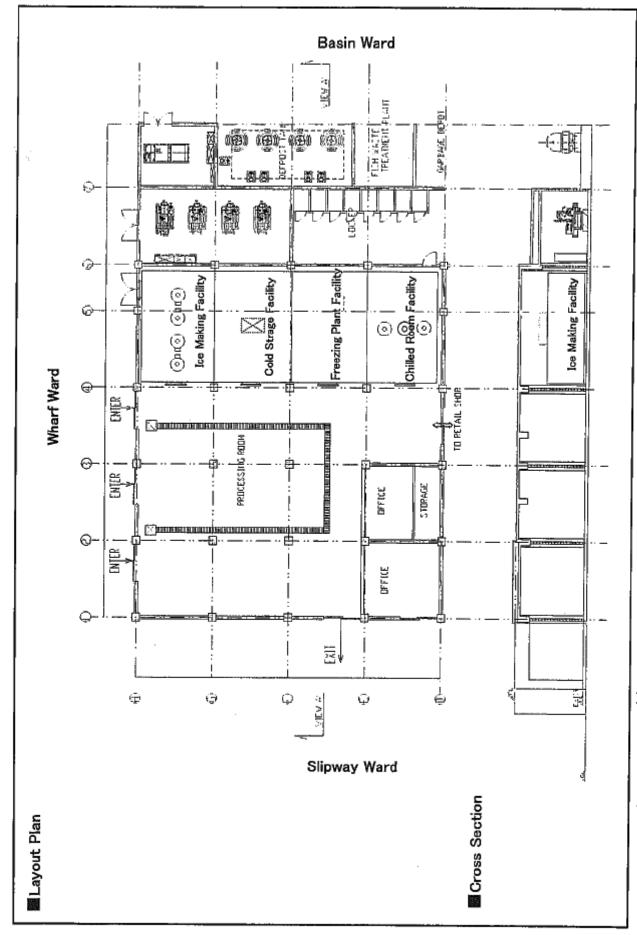


Figure-2-3-3 (3) Existing Plan and Cross Section of Fisheries Center, Ground Floor

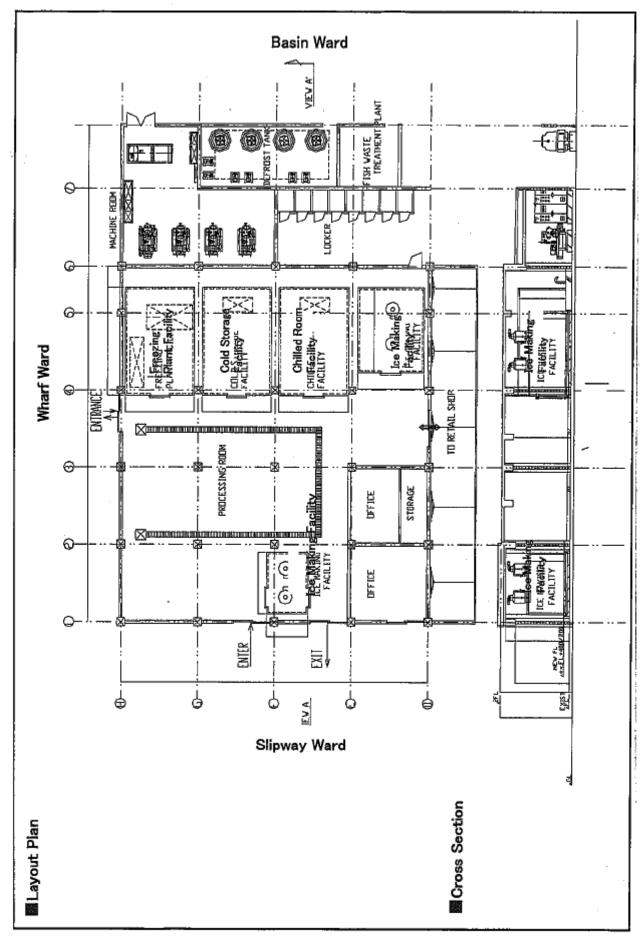


Figure-2-3-3 (4) Restoration Plan and Cross Section of Fisheries Center, Ground Floor

(2) Basic Design Plan and Work Contents

Detail contents for rehabilitation and improvement of the building and facilities are shown in Table-2-3-3 (2).

Table-2-3-3 (2) Details of Rehabilitation and Improvement

A. Fisheries Center Daulding restoration work 1. Fisheries Center ground floor raising work (Height of 400/200mm) 2. Fishery Center ground floor spandrel wall strengthen work 3. Replacing the west side sliding door to steel small door of entrance of Fishery Center. 4. Closure work of west side sliding door of entrance of Fishery Center. 5. Closure work of west side double wing door of entrance of Fishery Center. 6. Replacing the north-side generator room double swing door. 7. Installation work for the south-side new sliding door removal, plastering, door installation, plastering, bar anchor, concrete block (C.B), plastering, painting works. 8. Sliding door replacing between fish processing section and fish market 9. Replacing of wooden double swing door of materials store 1 place Door removal, door installation, painting works. 1 place Door removal, door installation, painting works.		Table-2-3-3 (2) Details of Re				
Desire the second of the secon	No.	Name of Work	Quantity	Contents		
1. Fisheries Center ground floor raising work (Height of 400/200mm) 2. Fishery Center ground floor spandrel wall strengthen work 3. Replacing the west side sliding door to steel small door of entrance of Fishery Center. 4. Closure work of west side sliding door of entrance of Fishery Center. 5. Closure work of west side double wing door of entrance of Fishery Center. 6. Replacing the north-side generator room double swing door. 7. Installation work for the south-side new sliding door replacing between fish processing section and fish market 9. Replacing of wooden double swing door 1 place Scope of work: D line~B line, about 460 m² Reinforcing bar anchor, Reinforcing bar, forms, concrete placing, mortar, painting works. Door removal, doorframe rail fixing, door installation, plastering, painting works. Door removal, door installation, plastering, painting works. C.B. wall removal, reinforcing bar anchor, concrete block (C.B), plastering, painting works. C.B. wall removal, door installation, plastering, doorframe rail fixing, door installation, painting works. Door removal, door installation, painting works.		Fisheries Center				
work (Height of 400/200mm) 2. Fishery Center ground floor spandrel wall strengthen work 3. Replacing the west side sliding door to steel small door of entrance of Fishery Center. 4. Closure work of west side sliding door of entrance of Fishery Center. 5. Closure work of west side double wing door of entrance of Fishery Center. 6. Replacing the north-side generator room double swing door. 7. Installation work for the south-side new sliding door removal, door fentange works. 8. Sliding door replacing between fish processing section and fish market 9. Replacing of wooden double swing door of wooden double swing door removal, door installation, painting works. 1 place places door removal, door installation, painting works. 2 places Door removal, door installation, plastering, painting works. CB. wall removal, reinforcing bar anchor, concrete block (C.B), plastering, painting works. CB. wall removal, reinforcing bar anchor, concrete block (C.B), plastering, painting works. Door removal, door installation, plastering, painting works. Door removal, door installation, painting works. 9. Replacing of wooden double swing door 1 place Door removal, door installation, painting works. Door removal, door installation, painting works.	0	Building restoration work				
2. Fishery Center ground floor spandrel wall strengthen work 3. Replacing the west side sliding door to steel small door of entrance of Fishery Center. 4. Closure work of west side sliding door of entrance of Fishery Center. 5. Closure work of west side double wing door of entrance of Fishery Center. 6. Replacing the north-side generator room double swing door. 7. Installation work for the south-side new sliding door . (F to G line) 8. Sliding door replacing between fish processing section and fish market 9. Replacing of wooden door on the ground floor. 10. Replacing of wooden double swing door of materials store 1 place placing mortar, painting works. 1 place placing bar, forms, concrete placing, mortar, painting works. 2 places Removal, reinforcing bar anchor, concrete block (C.B), plastering, painting works. 2 places Door frame removal, reinforcing bar anchor, concrete block (C.B), plastering, painting works. C.B. wall removal, reinforcing bar anchor removal, plastering, painting works. C.B. wall removal, reinforcing bar anchor removal, plastering, painting works. C.B. wall removal, reinforcing bar anchor removal, plastering, painting works. C.B. wall removal, reinforcing bar anchor removal, door installation, painting works.	1.	Fisheries Center ground floor raising	3 places	Scope of work : D line~H line,		
wall strengthen work Reinforcing bar, forms, concrete placing, mortar, painting works. 3. Replacing the west side sliding door to steel small door of entrance of Fishery Center. 4. Closure work of west side sliding door of entrance of Fishery Center. 5. Closure work of west side double wing door of entrance of Fishery Center. 6. Replacing the north-side generator room double swing door. 7. Installation work for the south-side new sliding door . (F to G line) 8. Sliding door replacing between fish processing section and fish market 9. Replacing of wooden door on the ground floor. 1 place Door removal, door installation, painting works. 1 place Door removal, door installation, painting works. 1 place Door removal, door installation, painting works. 2 places Door removal, plastering, painting works. 3 plastering, painting works. 4 place C.B. wall removal, reinforcing bar anchor removal, plastering, painting works. 5 place Door removal, door installation, painting works. 6 placing of wooden double swing door 1 place Door removal, door installation, painting works. 7 Replacing of wooden double swing door 1 place Door removal, door installation, painting works.		work (Height of 400/200mm)		① line~® line, about 460 m		
Placing, mortar, painting works.	2.	Fishery Center ground floor spandrel	82m	Reinforcing bar anchor,		
3. Replacing the west side sliding door to steel small door of entrance of Fishery Center. 4. Closure work of west side sliding door of entrance of Fishery Center. 5. Closure work of west side double wing door of entrance of Fishery Center. 6. Replacing the north side generator room double swing door. 7. Installation work for the south side new sliding door. (F to G line) 8. Sliding door replacing between fish processing section and fish market 9. Replacing of wooden double swing door 1 place 1 place Door removal, door installation, plastering, painting works. 1 place C.B. wall removal, reinforcing bar anchor removal, plastering, painting works. Door removal, door installation, plastering, painting works. Door removal, door installation, painting works. 1 place Door removal, door installation, painting works.		wall strengthen work		Reinforcing bar, forms, concrete		
steel small door of entrance of Fishery Center. 4. Closure work of west side sliding door of entrance of Fishery Center. 5. Closure work of west side double wing door of entrance of Fishery Center. 6. Replacing the north-side generator room double swing door. 7. Installation work for the south-side new sliding door. (F to G line) 8. Sliding door replacing between fish processing section and fish market 9. Replacing of wooden double swing door floor. 1 place installation, plastering, painting works. 2 places Door removal, reinforcing bar anchor, concrete block (C.B), plastering, painting works. 2 places Door removal, door installation, plastering, painting works. 1 place C.B. wall removal, reinforcing bar anchor installation, plastering, door frame rail fixing, door installation, painting works. 9. Replacing of wooden door on the ground floor. 1 place Door removal, door installation, painting works. 1 place Door removal, door installation, painting works. Door removal, door installation, painting works.				placing, mortar, painting works.		
Center. Closure work of west side sliding door of entrance of Fishery Center. Closure work of west side double wing entrance of Fishery Center. Closure work of west side double wing door of entrance of Fishery Center. Closure work of west side double wing door of entrance of Fishery Center. Closure work of west side double wing door of entrance of Fishery Center. The place of Fishery Center. Closure work of west side double wing painting works. Door removal, reinforcing bar anchor, concrete block (C.B), plastering, painting works. C.B. wall removal, door installation, plastering, painting works. C.B. wall removal, reinforcing bar anchor removal, plastering, painting works. C.B. wall removal, reinforcing bar anchor removal, plastering, painting works. C.B. wall removal, door installation, painting works. Door removal, door installation, painting works. P. Replacing of wooden door on the ground floor. C.B. wall removal, reinforcing bar anchor, concrete block (C.B), plastering, painting works. Door removal, door installation, painting works. Door removal, door installation, painting works. Door removal, door installation, painting works.	3.	Replacing the west side sliding door to	1 place	Door removal, doorframe rail fixing, door		
Center. Closure work of west side sliding door of entrance of Fishery Center. Closure work of west side double wing entrance of Fishery Center. Closure work of west side double wing door of entrance of Fishery Center. Closure work of west side double wing door of entrance of Fishery Center. Closure work of west side double wing door of entrance of Fishery Center. The place of Fishery Center. Closure work of west side double wing painting works. Door removal, reinforcing bar anchor, concrete block (C.B), plastering, painting works. C.B. wall removal, door installation, plastering, painting works. C.B. wall removal, reinforcing bar anchor removal, plastering, painting works. C.B. wall removal, reinforcing bar anchor removal, plastering, painting works. C.B. wall removal, door installation, painting works. Door removal, door installation, painting works. P. Replacing of wooden door on the ground floor. C.B. wall removal, reinforcing bar anchor, concrete block (C.B), plastering, painting works. Door removal, door installation, painting works. Door removal, door installation, painting works. Door removal, door installation, painting works.		steel small door of entrance of Fishery		installation, plastering, painting		
entrance of Fishery Center. 5. Closure work of west side double wing door of entrance of Fishery Center. 6. Replacing the north-side generator room double swing door. 7. Installation work for the south-side new sliding door. (F to G line) 8. Sliding door replacing between fish processing section and fish market 9. Replacing of wooden door on the ground floor. 1 place concrete block (C.B), plastering, painting works. 1 place Door removal, door installation, plastering, painting works. 1 place Door removal, door installation, painting works. 2 places Door removal, door installation, painting works. 1 place Door removal, door installation, painting works. 9. Replacing of wooden door on the ground floor. 1 place Door removal, door installation, painting works. 1 place Door removal, door installation, painting works.		Center.		· '		
entrance of Fishery Center. 5. Closure work of west side double wing door of entrance of Fishery Center. 6. Replacing the north-side generator room double swing door. 7. Installation work for the south-side new sliding door. (F to G line) 8. Sliding door replacing between fish processing section and fish market 9. Replacing of wooden door on the ground floor. 1 place concrete block (C.B), plastering, painting works.	4.	Closure work of west side sliding door of	2 places	Removal, reinforcing bar anchor.		
painting works. 5. Closure work of west side double wing door of entrance of Fishery Center. 6. Replacing the north-side generator room double swing door. 7. Installation work for the south-side new sliding door. (F to G line) 8. Sliding door replacing between fish processing section and fish market 9. Replacing of wooden door on the ground floor. Replacing of wooden double swing door apainting works. 1 place Door removal, plastering, painting works. 2 places Door removal, door installation, painting works. 1 place Door removal, door installation, painting works. 9. Replacing of wooden door on the ground floor. 1 place Door removal, door installation, painting works. 1 place Door removal, door installation, painting works.		entrance of Fishery Center.	-	[
5. Closure work of west side double wing door of entrance of Fishery Center. 6. Replacing the north-side generator room double swing door. 7. Installation work for the south-side new sliding door. (F to G line) 8. Sliding door replacing between fish processing section and fish market 9. Replacing of wooden door on the ground floor. 1 place Door removal, door installation, painting works. 9. Replacing of wooden double swing door of materials store 1 place Door removal, door installation, painting works. 1 place Door removal, door installation, painting works. 1 place Door removal, door installation, painting works.						
door of entrance of Fishery Center. anchor, concrete block (C.B), plastering, painting works. 6. Replacing the north-side generator room double swing door. 7. Installation work for the south-side new sliding door. (F to G line) 8. Sliding door replacing between fish processing section and fish market 9. Replacing of wooden door on the ground floor. 1 place Door removal, door installation, painting works. 9. Replacing of wooden door on the ground floor. 1 place Door removal, door installation, painting works. 1 place Door removal, door installation, painting works. 2 Door removal, door installation, painting works. 3 Door removal, door installation, painting works.	5.	Closure work of west side double wing	2 places			
plastering, painting works. 6. Replacing the north-side generator room double swing door. 7. Installation work for the south-side new sliding door. (F to G line) 8. Sliding door replacing between fish processing section and fish market 9. Replacing of wooden door on the ground floor. 1 place Door removal, door installation, painting works. 9. Replacing of wooden double swing door painting works. 1 place Door removal, door installation, painting works.		•				
6. Replacing the north-side generator room double swing door. 7. Installation work for the south-side new sliding door. (F to G line) 8. Sliding door replacing between fish processing section and fish market 9. Replacing of wooden door on the ground floor. 1 place Door removal, door installation, painting works. 9. Replacing of wooden double swing door of materials store Door removal, door installation, painting works. Door removal, door installation, painting works.		,				
double swing door. 7. Installation work for the south-side new sliding door. (F to G line) 8. Sliding door replacing between fish processing section and fish market 9. Replacing of wooden door on the ground floor. 10. Replacing of wooden double swing door painting works. 11. Place painting works. 12. Door removal, door installation, painting works. 13. Door removal, door installation, painting works. 14. Door removal, door installation, painting works. 15. Door removal, door installation, painting works. 16. Replacing of wooden double swing door painting works.	6.	Replacing the north-side generator room	l place			
7. Installation work for the south side new sliding door. (F to G line) 8. Sliding door replacing between fish processing section and fish market 9. Replacing of wooden door on the ground floor. 1 place Door removal, door installation, painting works. 9. Replacing of wooden door on the ground floor. 1 place Door removal, door installation, painting works.	"		2 174000	'		
sliding door . (F to G line) 8. Sliding door replacing between fish 1 place Door removal, door installation, painting works. 9. Replacing of wooden door on the ground floor. 10. Replacing of wooden double swing door 1 place Door removal, door installation, painting works. 10. Replacing of wooden double swing door 1 place Door removal, door installation, painting works.	7		1 place			
(F to G line) Sliding door replacing between fish 1 place Door removal, door installation, processing section and fish market Painting works. Replacing of wooden door on the ground 1 place Door removal, door installation, painting works. Replacing of wooden double swing door 1 place Door removal, door installation, of materials store Door removal, door installation, painting works.	'`		1 place	,-		
8. Sliding door replacing between fish 1 place Door removal, door installation, processing section and fish market painting works. 9. Replacing of wooden door on the ground 1 place Door removal, door installation, painting works. 10. Replacing of wooden double swing door 1 place Door removal, door installation, of materials store painting works.		-				
processing section and fish market 9. Replacing of wooden door on the ground 1 place Door removal, door installation, floor. 10. Replacing of wooden double swing door 1 place Door removal, door installation, of materials store painting works.						
9. Replacing of wooden door on the ground 1 place Door removal, door installation, floor. painting works. 10. Replacing of wooden double swing door 1 place Door removal, door installation, of materials store painting works.	8.		1 place	,		
floor. painting works. 10. Replacing of wooden double swing door 1 place Door removal, door installation, painting works.						
10. Replacing of wooden double swing door 1 place Door removal, door installation, of materials store painting works.	9.	Replacing of wooden door on the ground	1 place	·		
of materials store painting works.		floor.		painting works.		
	10.	Replacing of wooden double swing door	1 place	Door removal, door installation,		
		of materials store		painting works.		
11. Fishery Center ground floor office 1 place Window/window frame removal, C. B line	11.	Fishery Center ground floor office	1 place	Window/window frame removal, C- B line		
aluminum sash window chipping, window frame/window		aluminum sash window		chipping, window frame/window		
installation, plastering, painting works.				installation, plastering, painting works.		

No.	Name of Work	Quantity	Contents		
12.	Generator room/machinery room	12.5 m	C-B line wall removal, reinforcing bar		
	concrete block partition wall removal.		anchor removal, plastering, painting works.		
13.	Generator room west wall exhaust duct removal and new gallery installation	1 place	Exhaust duct removal, outer hood removal, duct-hood fixing frame removal, C-B line partial removal, plastering, gallery frame fixing, gallery installation, plastering, painting works.		
14.	Laboratory Jalousie & transom glass window replacing on second floor.	3 places	Blind removal, glass and blind installation works.		
15.	Ceiling board replacing of Laboratory	3 рсв	Ceiling board removal, installation works.		
16.	The vertical blind providing of 1st Floor of Fisheries Center (Ocean Side)	2 places	Outer blind installation works.		
17.	The jalousie window glass replacing of conference room	2 places	Blind removal, glass fixing, blind installation works.		
18.	The jalousie window glass replacing of training room	2 places	Blind removal, glass fixing, blind installation works.		
19.	West side staircase outer wall repair of Fishery Center	1 place	Plastering, painting works.		
20.	West-side storm drain repair of Fishery Center	2 places	PVC piping, PVC jointing, metal fixing works.		
21.	New protection wall installation of north-side cooling tower	20 m	Chipping, reinforcing bar for C-B line gallery frame installation, reinforcing structural steel work on tower body.		
22.	North-side waste disposal plant & incinerator floor raising (400mmH)	16 m	Removal of waste disposal plant & incinerator, reinforcing bar anchor, steel bar arrangement, form work, concrete placing, removed facilities, insulation resistance test		

		0	0
No.	Name of Work	Quantity	Contents
23.	New protection wall installation on the	1 complete	Reinforcing bar for C·B line work,
	north-side waste disposal plant &		reinforcing structural steel work on
	incinerator		protection wall, plastering, painting
<u> </u>	Water Supply Facility		
1.	Replacing of water supply pumps	2 pcs	Removal of water supply pipes &
			wirings, pump removal, foundation
			raising, plastering, pump installation,
			piping & wiring works.
2.	Control panel replacing	1 pc	Wiring removal, panel removal,
			installation of new control panel,
			wiring, insulation resistance tests
3.	Water supply piping, water taps	5 places	Pipe cutting, jointing, piping, and
	replacing	each	water tap fixing works.
	Waste Water Treatment Plant		
1.	Blower machine replacing	1 ps	Pipes & wires removal, blower
	*		machine removal, foundation raising,
			blower installation, pipe & wire
			restoring, insulation resistance tests.
2.	Control panel replacing	1 set	Wires removal, control panel removal,
			fixing anchor embedding, control
			panel installation, wire restoring,
			insulation resistance tests
3.	Submergible pump replacing	2 pcs	Pipes & wires removal, submerged
			pump removal, installation of new
			submergible pump, pipe & wire
	·		restoring, insulation resistance tests
④	Electrical Facility		
1.	Emergency generator replacing	1 complete	Pipes & wires removal, exhaust duct
			removal, foundation raising,
İ			plastering, wire & pipe restoring
			works.
2.	Main power panel replacing	1 complete	Pipes & wires removal, main power
			supply board removal, foundation
			raising, plastering, and installation of
			new main power supply board, wire &
			pipe restoring, insulation tests.

No.	Name of Work	Quantity	Contents
3.	Main power distribution panel replacing	1 complete	Pipes & wires removal, main power
			distribution panel removal, fixing
			anchor, installation of new main
			distribution panel wire & pipe
			restoring, insulation resistance tests.
4.	Air-conditioner replacing of Laboratory	1 complete	Pipes & wires removal, air-conditioner
			removal, installation of new
			air conditioner, wire & pipe restoring,
			insulation resistance tests.
5.	Air-conditioner replacing of the office on	1 complete	Pipes & wires removal, air-conditioner
	the ground floor		removal, installation of new
			air-conditioner, wire & pipe restoring,
			insulation resistance tests.
6.	Electric wiring, piping and switch box	1 complete	Removal of pipes, switch box and
	replacing on the second floor		wires and restoring, insulation
			resistance tests.
7.	Lighting equipment replacing inside	26 lights	Removal of wires and lighting
	Fisheries Center		equipment, installation of new lights,
			wire restoring, insulation resistance
			tests.
8.	Tungsten light replacing outside	4 place	Removal of wiring & tungsten halogen
	Fisheries Center		light, new installation, wire restoring,
			insulation resistance tests.
(5)	Fire Extinguishing Facility		
1.	Fire extinguisher improvement of east	1 complete	Removal of fire extinguisher and pipe,
	side of slipway		new piping and new fire extinguisher.
<u> </u>	Fuel Supply Facility		
1.	Fuel oil tank repair	1 complete	Pipes & wires removal, fuel oil supply
			pump removal, tank repair,
			installation of new fuel cil pump, wire
			& pipe restoring, insulation resistance
			tests, painting
2.	Diesel oil tank repair	1 complete	Pipes & wires removal, removal of oil
			fence (concrete wall), fixing anchor
			bolt, band fixing on tank, wire & pipe
			restoring, oil fence restoring,
			plastering, painting.

No.	Name of Work	Quantity	Contents		
3.	Fuel oil dispenser replacing	1 set	Pipes & wires removal, foundation		
0.	I del on dispenser replacing	1 364	raising, dispenser installation, wire &		
			pipe restoring, plastering, painting,		
			insulation resistance tests.		
4.	Diesel oil dispenser replacing	2 set			
4.	Diesei on dispenser replacing	z set	Pipes & wires removal, foundation		
			raising, dispenser installation, wire &		
			pipe restoring, plastering, insulation resistance tests.		
0	Wests Disposed Plant & Incinerator				
"	Waste Disposal Plant & Incinerator		Pipes & wires removal, waste disposal		
		İ	plant removal, foundation raising,		
			plastering, wire & pipe restoring,		
1.	Waste disposal plant improvement	1 complete	Pipes & wires removal, waste disposal		
^	waste diaposar plant improvement	1 complete	plant removal, foundation raising,		
			plastering, wire & pipe restoring,		
			plastering, where the pipe restoring,		
2.	Incinerator improvement	1 complete	Pipes & wires removal, incinerator		
	Industrial improvement	1 complete	removal, foundation raising.		
			plastering, wire & pipe restoring,		
			plastering, insulation resistance tests		
В.	Equipment		English of the Control of the Contro		
0	Workshop Equipment				
1.	Electric welding set	1 set	I -32. 200VAC 50Hz 11kw		
Ø	Educational & Training Equipment				
1.	Video set	1 set	Ⅱ-2.		
	Video Recorder		VHS · Multi-Type · AC280V.		
			50Hz.1 φ		
	TV Monitor		21 inch · Multi·Type · AC230V.		
		i	50Hz.1 φ		
	Video Camera		Handy Type · NTSC		
	TV Stand		Dimension s :760Lx 400W x 800H		
2.	Overhead projector	1 set	II -4.f=330		
			Type: Portable type with carrying belt		
			Lamp: 400W		
			Dimensions: 392L x 473W x 582H		
			Weight: Approx 10.5kg		
			<u> </u>		

No.	Name of Work	Quantity	Contents		
8.	Underwater camera with Flashing light	1 set	Ⅱ-7.		
			Type : Electronically controlled 35mm		
			Amphibious focal plane shutte		
			camera		
			Flash light : Speed light capable to		
			attaching the camera body with		
			bracket arm		
			Accessories : Soft case for camera 1 pc		
			O-ring set for camera 1 pc		
		ĺ	O-ring for battery 1 pc		
			Quick battery charger 1 pc		
3	Fish Handling and Marketing Equipment				
1.	Small Scale	15 sets	Ш-1-1.		
			Scale capacity : Approx.20 lbs		
2.	Large Scale	18 sets	Ш-1-2.		
			Scale capacity: Approx.300 lbs		
8.	Spring top-pan balance	5 sets	Ⅲ-2.		
	·		Scale capacity: Approx.20 lbs		
4,	Electric band saw	1 set	Ш-9.		
			Type : Electric driven band saw		
			suitable for cutting frozen		
			tuna and fish		
			Base structure : Stainless steel.		
			Maximum saw height: 470mm		
			Dimension: 1330L x 1200W x 1972H		
			Power source : 400V.50Hz.3 φ.2.2kw		
5.	Vacuum packing machine	1 set	Ш-10.		
			Type: Batch and manual. Integrated		
			with vacuum pump. Equipped		
		.	with wheels with wheel rock for		
			moving.		
			Dimensions:		
]	1000L x 500W x 1135mmH		
			Power source : 400V.50Hz.3 \(\phi \) .4.0kw		

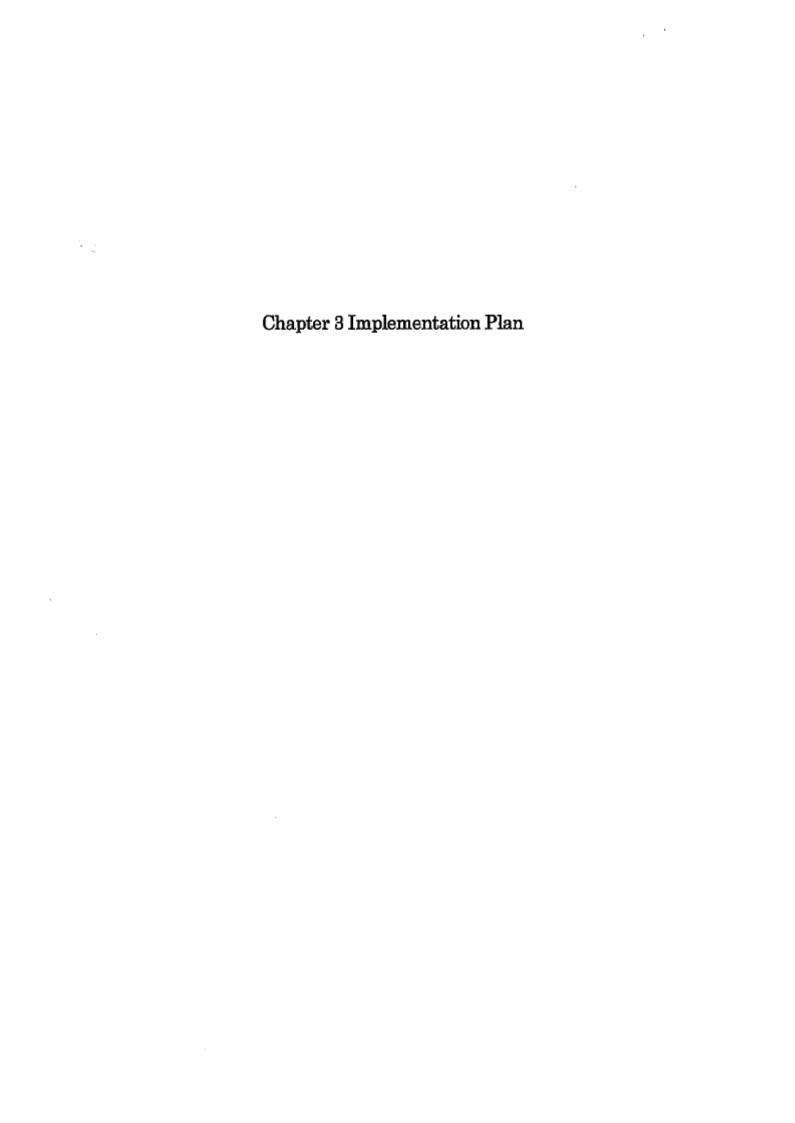
No.	Name of Work	Quantity	Contents	
6,	Chilled Fish Display Case	2 units	Ⅲ-1 3	
		Type : Chilled fish showcase with		
			wide front glass panel for	
7 .:			showing and sliding glass doors	
1			on seller's side and decorative	
			front panel,	
İ			Capacity of display area : 550 liters	
			Dimensions: 2400L x 1000W x 1400H	
			Power Source: 230V.50Hz.1 .	
4	Fish Quality Inspection Equipment			
1.	Analytical Balance	1 set	IV-1.	
			Type: Analytical top-pan balance with	
			weighing Chamber equipped with	
-			semi-automatic calibration.	
			Weight indication: Digital.	
			Measuring range : Approx, 0g to 210g	
			Resolution: 0.1mg	
			Power source: 230V.50Hz.1 \phi.	
2.	Centrifuge	1 set	IV-6	
			Type: Tabletop electric centrifuge with	
			rotor and tubes.	
		Ī	Capacity: Max.600ml(15mlx40pcs,)	
			Speed: 5000rpm/min.	
			Accessories : Swing bucket rotor 1 pc	
			50mlx4-bucket assembly 1 set	
			15mlx32-bucket assembly 1 set	
			Balance 1 pc	
ļ			Power source: 230V.50Hz.1φ.	
3.	Incubator	1 set	IV-9.	
			Type: Low temperature incubator	
			(Forced draft system)	
		!	Temperature range : 0∼70℃	
			Effective capacity: Approx.64 liters	
			Dimensions: 540L x 670W x 960H	
			Power source: 230V.50Hz.1 ¢.	

No.	Name of Work	Quantity	Contents		
4.	Automatic titration apparatus	I set	IV-13		
[Display : 16-figure digital display.		
			Cylinder: 20ml		
			(Resolution at least 0,002ml)		
			Titration accuracy: Approx. ± 0.15%		
			(for 20-ml cylinder use)		
			User memory: Max 10 memories		
			Power source : 230V.50Hz.1 \(\phi \),		
5.	UV Spectrophotometer	1 set	IV-14.		
	·		Operating mode: Photometric.		
			Weave length range: 200~1100 NM		
			Spectral bandwidth: 5 NM		
			Display : LCD with back lighting.		
			Power source: 230V.50Hz.1φ.		
6,	Thermister thermometer	1 set	IV-21.		
			Type : Digital thermometer with		
			thermister suitable for		
			measuring temperature of		
			central part of frozen fish such		
			as Tuna.		
			Handy type for outdoor use.		
			Measuring range: −30~199.9℃		
			Size of Thermister: 3mm in diameter x		
			100·mm(L) Power source : D.C6V		
7,	Water Quality Checker	1 set	(dry battery UM-4x4 pcs.) IV-23.		
'	water equantly officials	1 961	Type : Portable water quality checker		
			with sensors. Out-door use.		
	·		Temperature : 0.50.0 degree C		
			ph: 0~14.00		
			DO: 0~19.9mg/lit.		
			Conductive: 0~99.9mS/cm		
			Turbidity: 0~800MTU		
			Nacl: 0~4.00%		
			Sensor cable : 10m		
			Power source : Battery 6F22 x 1 pc		

No.	Name of Work	Quantity	Contents		
8.	Salinometer	1 set	IV-24.		
			Type: Portable type, suitable for		
			measuring salinity of		
			processed fish at site.		
			Measurement range : 0.1~10%		
			Weight: Approx. 40g		
			Power source : Battery		
	-		Spare parts : 10 pcs		
9.	Hot Plate	1 set	IV-25.		
			Type: Glass ceramic hot plate.		
			Heating temperature : Max.400℃		
			Power source: 230V.50Hz.1φ.		
10.	Dry desiccate	1 set	IV-26.		
			Type: Desiccate with automatic drying		
			unit and with casters.		
			Dimensions: 450L x 450W x 1000H		
			Power source : 230V.50Hz.1 φ.		
11.	Vortex shaker	1 set	IV-36.		
			Type: Vortex type test tube mixer.		
			Rotation: Approx. Max. 2900rpm/min		
			Power source: 230V.50Hz.1 .		
			Spare Parts : Stirring plate 5 pcs		
12.	Constant Temperature Water Bath	1 set	IV-37.		
			Working temperature : 5~70℃		
			Dimensions: 460L x 305W x 155H		
<u> </u>	Communication & Date Analysis Equipment				
1.	Desktop Computer set	I set	V-2.4		
			Power source : 230V.50Hz.1φ.		
2.	Note Type Computer	2 sets	V-2.5 & 2.6		
			Power source : 230V.50Hz.1 φ.		
3.	Photo Copying Machine	1 set	V-3.		
			Type : Photocopying machine with		
			automatic document feeder and		
			Both single & Multi-sheet		
			feeder.		
			Power source : 230V.50Hz.1 ϕ .		
L					

No.	Name of Work	Quantity	Contents
4.	Facsimile Machine	1 set	V-4.
			Type: Desktop and digital Facsimile
			terminal.
			Power source : 230V.50Hz,1 ϕ .
6	Ice Making Machine	1 set	Type: Flake Ice Type
	·		Capacity: 2.5tons/day x 4 sets
			Cooling System :
	·		R-22 Direct expansion system
			Condensing Unit: 22kw x 2sets
			Control Panel: 1 set
			Row water temperature : 25℃
			Ice storage capacity: Approx. 66
			Power source: $400V.50Hz.3 \phi$.
<u> </u>			
Ø	Blast Freezer	1 set	Type: Air Blast Freezer
			Capacity: 2.5 tons/day
	,		Room temperature : −25°C
			Cooling System :
			R-22 Direct expansion system
			Condensing Unit: 22kw x 2sets
			Control Panel: 1 set
			Defrosting method: Water sprinkling
			system
			Power source: 400V.50Hz.3φ
8	Cold Storage	1 set	Storage Capacity : Approx. 30 tons
		!	Room temperature: -20°C
			Cooling System:
			R-22 Direct expansion system
			Condensing Unit: 22kw x 1set
			Control Panel: 1 set
			Defrosting method: Water sprinkling
			system
			Power source : 400V.50Hz.3 φ

No.	Name of Work	Quantity	Contents
9	Chilling room	1 set	Storage Capacity : Approx. 30 tons
			Room temperature : 0~-20°C
			Cooling System : Concurrent use with
			above ③
			R-22 Direct expansion system
			Condensing Unit: Concurrent use with
	·		above ③
			Control Panel : Concurrent use with
			above ③
			Defrosting method: Water sprinkling
			system
			Power source: 400V.50Hz.3 φ
	Spare parts		
1.	Ice Making Machine Spare parts	1 set	(Refrigeration Facility)
2.	Blast Freezer Spare parts	1 set	(Refrigeration Facility)
3.	Cold Storage Spare parts	1 set	(Refrigeration Facility)
4.	Chilling Room Spare parts	1 set	(Refrigeration Facility)
0	Incinerator	1 set	Installation of new incinerator
02	Waste disposal plant	1 set	Installation of new waste disposal
			plant
(3)	Emergency Generator	1 set	Installation of new emergency
			generator
(9)	Diesel Oil Tank	1 set	Installation of new diesel oil tank



Chapter 3 Implementation Plan

3-1 Implementation Plan

3-1-1 Implementation Concept

(1) Basic Concept

- As the implementation of the Project for Improvement of Coastal Fisheries Development, after the Exchange of Notes (E/N) is signed between the Government of Japan and the Government of Dominica, a contract for undertaking consulting services will be concluded between the Government of Dominica and the Consulting Firm having Japanese nationality.
- 2) The Consulting Firm will prepare all documents required for the tender including the drawings, technical specifications, cost estimations, tender and the contract documents. After the approval of these documents by the Government of Dominica, the contractor for this project will be selected from and among Japanese construction companies by examining their pre-qualifications and tender procedures.
- The construction work will be performed by the selected construction company in accordance with the construction contract concluded between the Government of Dominica and the construction company.
- 4) The construction period is to be totally 20 (twenty) months including detailed design for the Project taking into considerations of the scale and complexities of the Project as well as the site conditions at Roseau. It shall be materialized as two phases project.

(2) Implementation concept

The improvement works of the Project will be performed as per the following basic concepts.

- 1) Local labor, equipments and materials shall be utilized as much as possible at the Project. However concerning necessary capability of marine civil engineering that requires matured experience and specialized technology for the Project, there are no local contractors or engineers that possess such experience and technology. Therefore procurement from neighboring countries shall be considered.
- The cold storage and ice making/storage equipment will be procured from Japan and assembled under the instruction and supervision of Japanese experts considering of

keeping the level of the quality and the durability.

- Special attention shall be paid to protecting the surrounding environment, preventing disruption of traffic and market or ferry terminal's activities around the Project Site.
- 4) Close-communication shall be maintained with neighborhood to ensure smooth implementation of the Project.
- 5) Especially careful attention shall be paid to preventing disruption for management of International Ferry Terminal beside the slipway in the Project Site.
- 6) The care shall be taken to ensure the operation of the facilities of Roseau Fisheries Complex during construction period.
- 7) The Project Site is limited due to the close proximity to the road, market, Roseau City Council and International Ferry Terminal, therefore the possible efficient construction method shall be adopted so as to conduct the work smoothly.
- The law, the regulation and the standard of the Government of Dominica shall be respected.

(3) Executing Agency in the Government of Dominica

Agencies, which will be involved in the Project on the part of the Government of Dominica are described below.

- 1) Responsible Agency for the Tender: Ministry of Agriculture and Environment, Fisheries Development Division
- Responsible Agency for Project Implementation: -Ditto-
- 3) Responsible Agency for the Supervision of Construction Work: -Ditto-
- 4) Management Authority after Completion of the Works: -Ditto-
- 3-1-2 Conditions for Implementation
- (1) Conditions for Construction
- 1) Construction Company

Construction companies of Dominica might be utilized as possible as we can.

However, in this country, the number of construction companies is limited and less experience of large scaled works. Therefore, it may be necessary to hire the construction companies having necessary technology and experience from neighboring countries.

2) Construction Machinery

There are a few leasing companies of construction machinery in Dominica. Almost of the available construction machinery are small backhoes, dump trucks and etc. However the number of machinery is limited and maintenance condition is not so sufficient. Heavy construction machinery like floating crane, diver's boat, crawler crane, truck crane and etc. shall be used in the Project.

Thus, basically, the construction machinery will be procured from Dominica and neighboring countries but the machinery, which cannot be supplied from Dominica or the neighboring countries, may be procured from Japan.

Large quantity of concrete will be used in the Project. It is possible to procure of such concrete in domestic market because there is capable ready-mixed concrete plant and agitator truck in Dominica

3) Labor

Experts will be required to supervise for the construction of cold storage facilities and ice making plants to supervise. Japanese experts will be dispatched to Dominica to undertake this responsibility. At the operation of working vessels and piling work of the steel sheet piles, Japanese experts will be required as well. Common skilled labor will be employed in Dominica and neighboring countries.

Goods and Materials to be imported

The procurement sources of materials required for the Project are described below;

- * Local Procurement: Sand, Stone, Cement, Wood and etc.
- * Procurement from Japan or third countries: Steel Frame, Steel Sheet Piles, Underwater

 Concrete Admixture, Boat Pulling Upper,

 Steel Mould and etc.

5) Safety Control

This project is to improve the damaged fisheries facility neighboring existing town. For the construction of breakwater and wharf at the Project Site, it is necessary to clearly mark the construction area and the site with buoys and other signs to secure the safe navigation of International Aviation Ferry or other boats. For the construction of land facilities, the roads and routes, which will be used for the transportation of material and equipment, should be clearly indicated to avoid any nuisance of the city residents. Although, dumping yard of removed material from damaged slipway will be provided in the vicinity of Roseau, the transportation plan will be well-considered preventing from the accident with third party when it is transported through public road.

(2) Care Points for Construction Work

- 1) The Project Site is narrow and close to road, market, Roseau City Counsel, and Ferry Terminal. Therefore, preventing from the accident with third party shall be secured, namely, it shall be provided suitable safety procedure like setting the fence to separate the site from third party, also guiding measure for construction and transportation vehicles to and from the site. These procedures will be secured the safety of residential person in town and private vehicles around the Project Site.
- Special consideration for keeping lifelines of water and electrical supply to other facilities in Roseau Fishery Complex is ensured during construction period.
- An appropriate construction plan will be prepared taking the natural conditions at the sites into account, especially against hurricanes.
- 4) The dispatched Japanese experts will be planned carefully in respect of the number of persons, the timing and duration in accordance with the progress of work.
- Local equipment and material will be used as much as possible and minimize such procurement from foreign countries in order to save cost.
- 6) The project will involve a long-term marine construction works. Therefore special attention will be paid to the navigating boats in the construction sites.

3-1-3 Scope of Work

Scope of work to be undertaken by the Government of Japan and the Government of Dominica are as follows.

(1) Scope of work to be undertaken by the Government of Japan

- 1) Improvement of Civil Engineering Facilities
- * Remove of damaged existing slipway
- * Construction of new slipway facility
- * Construction of seawall (Parapet Wall)
- * Concrete pavement between Fishery Complex Building and Seawall (Parapet Wall)
- * Reinforcement of foot protection of wharf
- * Reinforcement of foot protection of west breakwater
- * Reinforcement of submerged groin

Improvement of Architectural Facilities

* Remove the damaged cold storage facilities on the ground floor

- * Rising the floor level at processing room and cold storage area on the ground floor
- * Closure of the exits and make construction of a small scaled new door at westward on the ground floor
- * Make construction of new exit at southward on the ground floor
- * Rehabilitation of ventilation and lighting system at processing room on the ground floor
- * Switching exits at machinery room on the ground floor
- * Construction of wall in front of cooling towers and fish waste treatment plant
- * Rehabilitation of damaged parts on first floor
- * Rehabilitation of diesel and gasoline distributing system
- * Rehabilitation of lighting system inside the facility
- 3) Rehabilitation of Facilities and Equipments
- * Rehabilitation of Ice Making and Ice Storage Facility: ice production capacity 2.5t/day×4 nos. storage capacity 20m³×1no. and 40m³×1no.
- * Rehabilitation of Cold Storage Facility: storage capacity 78m3×1no.
- * Rehabilitation of Burst Freezing Facility: freezing capacity 2.5t/day
- * Rehabilitation of Chilled Room: storage capacity 69m3×1no.
- * Rehabilitation of Emergency Generator: 70KVA×1unit
- * Rehabilitation of Equipments for Laboratory
- * Rehabilitation of Equipments for Computer Room
- * Rehabilitation of Equipments for Fishermen's Training
- * Rehabilitation of Equipments for Cold Facility
- * Rehabilitation of Equipments for Processing Room
- * Rehabilitation of Equipments for Market
- * Rehabilitation of Equipments for Workshop
- 4) Procurement and settlement, of all equipments, materials and manpower which are required for carrying out the works
- 5) Marine and land transportation of equipments and materials which are necessary for the works and bear the marine insurance.
- 6) Assistance and consultant supervision of the detail design and the tender procedure
- (2) Scope of Work to be undertaken by the Government of Dominica
- 1) To secure the Project Site and arrangement of the surrounding area
- 2) To regulate and control the traffic around the market and the International Ferry Terminal during the construction period
- 3) To provide to temporary construction yards, the collecting site of reclaiming material and

the quarries for obtaining stones

- 4) To provide dumping yard to dispose removed material from the Project Site
- 5) To construct boundary fences, emergency gate and boundary retaining dike

3-1-4 Consultant Supervision

It is the policy of the Government of Japan that a Grant Aid Project will be implemented under the strict supervision of the Consulting Firm that is fully aware of technical details of work during the whole period of the project. The Consulting Firm and his stationer representative will supervise the construction work through the close contact and communications with local engineers in regard to the design, inspection and schedule of work.

(1) Supervisory Policies

- The time frame of the work will be strictly observed by establishing close contact and communications with the persons and organizations concerned on the part of the Government of Dominica to prevent from any delay of the work.
- 2) Provision of prompt and appropriate guidance and advice will be essential for the contractor as to the construction of the facilities in compliance with the drawings and specifications agreed upon. High priority will be accorded to the utilization of local materials and technologies.
- The project will ensure to promote the transfer of technology in the course of the construction and engineering work so as to take effect of Japanese Government of Grant Aid.
- 4) The project will ensure to provide adequate advice and guidance regarding the maintenance and the management of equipment and material delivered for the work.

(2) Supervisory Work

1) Preparation of the Contract

The Consulting Firm in relation to the selection of a contractor, determining the type of contract, drafting the contract documents, evaluating the bills, and attending the contract as a witness, will provide provision of services.

2) Evaluation and Approval of the Drawings

Evaluation will be carried out the drawings, materials, finishing sample and equipment, which will be submitted by the Contractor boats.

3) Instruction on Construction Work

Reviewing construction plan and schedules, providing supervision to the contractor and reporting the progress of work to the Government of Dominica will be carried out.

4) Process of payment

Evaluation of the bills for the payment to the contractor according to the progress of work and upon completion of work will be carried out.

Inspection

The Consulting Firm will inspect, when necessary, the work in progress and provide appropriate instructions to the contractor. The Consulting Services will be finished with having confirmed that the work has been completed and the contract fulfilled, the transfer of the Project with the acceptance of the Government of Dominica. The Consulting Firm will also report to the Government of Japan about the progress of work, payment procedures and status and the delivery of facilities completed.

3-1-5 Procurement Plan

In the process of procurement of materials and equipments being necessary for the project, the following attentions will be considered.

(1) Procurement Policy

Priority should be given to the use of locally available material and equipment if the quality and quantities will meet the need of the project work. In this way the procurement cost from Japan will be minimized.

1) Procurement from Japan

For the special ordered or manufacturing materials and equipments in Japan, of which are procured from Japan, the detailed scheduled plan for procurement and transportation must be prepared, because those will take a long time for manufacturing, packing and shipping of goods until to be completed. Procurement machineries from Japan will be minimized, even when they are not available in the country.

2) Local Procurement

Rubble stones and aggregates that are possible to be locally procured should be carefully examined as to the quarry site, quality and transport capacities.

Cost

In the event of selecting the materials and equipments from Dominica and/or Japan, the cost comparison study should be examined and the cheaper cost ones must be selected.

It should be noted that the prices of procurement from Japan include the charges for

packing, transportation, insurance, and port charges while customs duties and port dues in the country are to be exempted.

On the basis of the above principles and rules, the following plans will be established for the procurement of construction materials and equipments.

(2) Procurement Items

1) Materials

As the result of study, the procurement plan of construction materials are described in Table 3-1-5 (1).

Table-3-1-5 (1) Procurement Plan of Construction Materials

	Table-3-1-5 (1) Procurer	nent Plan o	of Construc	tion Mate	rials
	Construction Material	Proc	urement Co	untry	Remarks
		Local	Japan	Third	1
Civil	Steel Sheet Pile				As the result of
	Steel Pile (H Shape, Channel)		0		our consideration
	Tie-wire		0		for quality,
	Boat Pulling Upper		0		specifications and the appointed date of delivery, materials will be procured at Japan.
	Steel Bar				As the result of
	Stone, Aggregate, Crusher run	0			our consideration
	Cement	0			for cost efficiency,
	Ready-Mixed Concrete	0	l		productivity and quality, materials
	Form Materials	0			will be procured at Dominica.
Arch.	Steel furnishing		0		As the result of our consideration for quality, specifications and the appointed date of delivery, materials will be procured at Japan.
	Steel Bar	0			As the result of
	Glass	0			our consideration
	Sand and Aggregate	0			for cost efficiency,
	Cement	0			productivity and quality, materials
	Ready-Mixed Concrete	0			will be procured
	Form Materials	0			at Dominica.
	Concrete Block	0			
	Timber	0			1
	Wooden furnishing	0			-
	Paint	0			1

	Construction Material	Proc	urement Co	untry	Remarks
		Local	Japan	Third	
Arch.	Resist	0			As the result of
	Tile	0			our consideration for cost efficiency, productivity and quality, materials will be procured at Dominica.
Electric	Cable and Wire	0	0		For the priore of
	Switch, Outlet	0	0		cost efficiency, satisfied quaritied materials will be procured at Dominica.
	Conduit Pipe		0		As the result of
	Panel boards, Switchboards		0		our consideration for quality, specifications and the appointed date of delivery, materials will be procured at Japan.
	Lighting	0			As the result of
	Light Valve	0			our consideration for cost efficiency, productivity and quality, materials will be procured at Dominica.
Plumbi	Pipe	0	0		For the priore of
ng	Valve	0	0		cost efficiency, satisfied quaritied materials will be procured at Dominica.
	Fuel Distributor			0	Due to the priore
	Fuel Pump			0	of cost efficiency and consideration
	Panel boards of Fuel Pump			0	of local diesel supplier, equipments will be procured at the Third Country
	Water Supply Pump		0		As the result of
Air Con.	Air Conditioner		0		our consideration for quality,
	Ventilating and Exhaust Fan		0		specifications and the appointed date of delivery, materials will be procured at Japan.

	Construction Material	Procu	rement Co	untry	Remarks
		Local	Japan	Third	
Equip.	Ice-making Plant with Spare Parts		0		As the result of our consideration for
	Cold Storage Plant with Spare Parts		0		quality, specifications and the appointed date
	Blast Freezer Plant with Spare Parts		0		of delivery, equipments will be
	Chilled Storage Plant with Spare Parts		0		procured at Japan.
	Emergency Generator		0		As the result of our
	Electric Distribution Panel		ŏ		consideration for
	Electric Distribution 1 and		-		quality,
	Equipment for Laboratory		0		specifications and the appointed date of delivery, equipments will be procured at Japan.
	Equipment for Computer Room			0	As the result of our consideration for cost efficiency, productivity and quality, equipments made in US will be procured at Dominica.
	Equipment for Training Room		0		As the result of
	Equipment for Processing Room		0		our consideration for quality, specifications and
	Equipment for Workshop		0		the appointed date of delivery, equipments will be procured at Japan.
	Equipment for Market		0	0	For the priore of cost efficiency, satisfied quaritied equipments will be procured at the Third Country, however, Band Saw and Baccume Packer will be procured at Japan due to the result of our consideration for quality, specifications and the appointed date of delivery.

	Construction Material	Procu	rement Co	untry	Remarks
		Local	Japan	Third	
Equip.	Diesel Tank			0	Due to the priore of cost efficiency and consideration of local diesel supplier, equipments will be procured at the Third Country
	Fish Waste Treatment Machine		0		As the result of
	Incinerator		0		our consideration for quality, specifications and the appointed date of delivery, equipments will be procured at Japan.

2) Construction Machineries

Most of general construction machineries are available through the sub-contractors, which are in Dominica or neighboring country. Construction machineries used in the Project are shown in Table-3-1-5 (2).

Table-3-1-5 (2) Procurement Plan of Major Construction Machineries

Machinery	Ī	Country		Remarks
	Local	Japan	Third*	
Bulldozer D3			0	
Bulldozer D6			0	
Tractor Shovel (JCB class)	0			
Small Buck hoe 0.2 m ³			0	
Buck hoe 0.4m³	0			
Buck hoe 0.7~1.2m3			0	
Big (Jumbo) Breaker		•	0	
Compressed Air Breaker	0			
Dump Truck 2~4t	0			
Dump Truck 7t			0	
Truck Crane 10t	0			
Agitator Truck 10t	0			
Truck Crane 15t	0			
Truck Crane 20~25t			0	
Truck Crane 40t			0	
Crawler Crane 40t	0		0	
Crawler Crane 50t			0	
Crawler Crane 100t			0	
Diesel Hummer D22			0	
Vibration Hummer 30Kw			0	

Machinery		Country		Remarks
	Local	Japan	Third*	
Vibration Hummer 60Kw			0	
Vibration Hummer 120Kw			0	
Generator 40Kva	0		0	
Shovel Loader 0.3m ³			0	
Shovel Loader 1.8m ³			0	
Shovel Loader 2.3m ³	1	-	0	
Blade Grader 3.1m	0			
Tire Roller 12t	0			
Combined Roller 4t			0	
Floating Crane 25t			0	
Floating Crane 40t			0	
Floating Crane 50t			0	
Pontoon 100t	0		0	
Pontoon 200t			0	
Pontoon 300t			0	
Tug Boat 100ps			0	
Tug Boat 200ps			0	
Tug Boat 300ps			0	
Plying Boat 30ps	0			
Plying Boat 50ps	0			
Diving Boat D70ps			0	
Anchor Boat D3t			0	

Note: * These countries means Caribbean Countries.

3-1-6 Implementation Schedule

In the event of implementing the Project under the program of Japanese Grant Aid, , a Japanese Consulting Firm will be appointed by the Government of Dominica after the Exchange of Notes (E/N) is signed between the two countries and the consulting contract will be concluded between the Government and the consulting firm.

E/N will provide detailed designing, tender documentation, procedures of tender, supervising and construction work. The project will be implemented in accordance with the conditions stated in the E/N.

(1) Preparation of Detailed Design

After the consulting contract will be concluded between the executing agency of the Government of Dominica and the Japanese Consulting Firm, the Government of Japan will verify the contract and the consultant will draw up the detailed designs. In the detailed design the tender documents consisting of design drawings, technical specifications, instruction to Tenderers, etc. will be prepared on the basis of the Basic Design Study. In the meantime, consultations will be held with the Government of Dominica regarding the details of the Project and eventually the Government of Dominica will approve the tender documents. Approximate three (3) months will be required for the preparation of a detailed

design for the first and second phase respectively.

(2) Execution of Tender

The contractor, which is a Japanese construction company, will be selected through the tender. The tender procedures will be as follows:

- First invitations will be extended to interested parties;
- 2. Acceptance of the tenders;
- 3. Examination of the pre-qualifications;
- Evaluation of tender documents.
- Submitting the tender,
- 6. Evaluation of the tender,
- 7. Designation of the contractor, and
- 8. Conclusion of the construction contract.

The whole procedure will take one and half (1.5) months in each phase.

(3) Execution of Construction Work

The Contractor will start the construction work after the conclusion of the contract and verification by the Government of Japan. The construction period of the Project is estimated approximate 15 months (Phase1: 10 months, Phase2: 11 months) considering the size of the project and its complexities, and the construction conditions without occurring the unforeseen situations. This construction period is based with avoiding the actual marine construction works during Hurricane season. Therefore, the last quantity of construction period of phase 1 and the procurement and preparation period of phase 2 are over rapped for four (6) months.

Figure 3-1-6 (1) shows the implementation schedule of the Project of phase 1 and phase 2 covering from the Exchange of Notes to the completion of the Project.

Works, Items\Monthes	1 2	8	4	9	6 7	8 2	9	101	0 11	1 12	13	14	15	16	17	118	19	20	Remarks
Consulting Services			_																
Detail Design of Phase 1			╢	Ш			_												
Supervising of Phase 1				Ш	╢╟														
Detail Design of Phase 2	:							<u> </u>											
Supervising of Phase 2					_														
Construction and Procurement																			
Phase 1		\vdash	-				_		_			_	<u> </u>						
Preparatory and Temporary Works of Phase 1									_	\vdash									
Improvement of West Breakwater		П			_					Ш									
Removal and Recovery of the Architecture Facility			-		Ш							1111							
Finish of the Architecture Facility												Ш							
Procurement and Fixing of the Equipments					Ш	$\ \ \ $	$\ \ \ $	$\{[]\}$	$\ \ \ $	$\ \ \ $									
(Trial Run of Cold Facility)									_	<u> </u>	Ш								
(Technical Transfer and Inspection of Cold Facility)										_			Ш						
Demobilization of Phase 1	:		_		\vdash		_			-			Ш	reen					
Phase 2														_					
Preparatory and Temporary Works of Phase 2				$\mid \mid \mid$	\vdash		\vdash												
Improvement of Slipway																			
Improvement of Wharf			\Box																
Improvement of Submarged Breakwater					-	-			\dashv										
Improvement of Seawall			\dashv						\dashv			_	_						
Demobilization of Phase 2		\Box	\dashv	\dashv	\dashv	\dashv	-	\dashv	\dashv			_	_						:

:Phase2 [[[[[[]]]]]] Figure-3-1-6 (1) Implementation Schedule

Legend:Phase1

3-1-7 Obligations of the Recipient Country

The Minutes of Discussions during the Basic Design Study implemented in August/November 2000 confirmed the obligations of the Government of Dominica.

- 1) To secure land which is necessary for the Project prior to commencement of the construction work;
- To provide suitable access to enter the Project Site;
- To approve lands which is necessary for the permission of acquisition of construction soil, stone, sand and aggregates;
- To secure the dumping sites for the dredged and excavated materials in the vicinity of the Project;
- To provide the facilities for distribution of electricity, telephone, water supply and drainage and other incidental facilities to the site;
- To provide the access road and utilities to the Project Site;
- 7) To ensure all the expenses and prompt execution for unloading, customs clearance at the ports of disembarkation and internal transportation of the products purchased under the Grant Aid;
- 8) To exempt Japanese nationals from customs duties, internal taxes and fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts;
- 9) 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;
- 10) To bear the 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;
- To provide the necessary permissions, licenses and other authorizations for implementing the Project;

- 12) To guarantee the certain utilization of facility, which constructed by Japanese Grant Aid;
- 13) To bear all the expenses other than those covered by the Grant Aid, necessary for the Project;
- 14) To secure lands and permission for dumping disposal of concrete or metal materials in the vicinity of the Project Site; and,
- 15) To construct boundary fence, emergency exit with gate and boundary retaining wall at and around the Project Site.

3-2 Project Cost Estimation for Recipient Country

Recipient country burden expense becomes about 20,000 EC dollars. The details are described below.

- ① Emergency exit gate construction (1 place)
- ② Boundary fence construction
- 3 boundary retaining wall construction

Total

20,000 EC\$

Furthermore, total of 112,400 EC \$/month in personnel expense 37,700 EC \$/month, electricity water supply expense 39,300 EC \$/month, machine maintenance repair expense 35,400 EC \$/month become needed as the maintenance cost.

3-3 Operations and Maintenance Plan

(1) Operating Organization and Staffing Plan

The Fisheries Center will be operated by the corporative organization including DEXIA, Fisheries Corporation and Retail Sellers under the reviewed by the Government of Dominica. Other facilities will be operated by the Fisheries Development Division of the Ministry of Agriculture, Planning and Environment as same manner as original plan. The staffing plan is shown below.

 Staffing Plan of Administration, Research & Development and Extension Services under the Fishery Development Division

*Fisheries Development Advisor	1
*Senior Fisheries Officer	1
*Fisheries Officers	2
*Fisheries Extension Officers	5

*Statisticians	3
*Laboratory Staff	3
*Mechanics	3
*Accountant/ General Affairs	2
*Laborers	3

2) Staffing Plan of Dish Marketing

Table-3-3 (1) Staffing Plan of Dish Marketing

Position	Number of Staff	Duties
Market Manager	1	General management
Accountant	1	Data collecting & Collection of the charge of facilities
Mechanics	8	Maintenance of ice-making plant and refrigeration equipment
Fish Handling Staff	8	Weighing, washing and sorting of catch fish
Fish Collecting Staff	8	Collection of catch fish from other fishing villages
Part-Time Workers	8	Fish filleting work

(2) Operating Income and Expenditure Plan

The Project Facilities is possible to operate with a self-accounting system that was planned at the original plan. Because the Fisheries Development Division budgets the salaries of the Fisheries Development Division's staff, the cost of research and development and the extension of fisheries work etc. The necessary cost of operation and maintenance are as shown below.

Personnel Cost: EC\$37,700 per month

(Permanent Staff; 4, Operating Staff; 24)

Utility Cost: EC\$39,300 per month

(Electricity; 57,600KW, Water; 1,200m³, Gasoline; 4kl)

Maintenance and Repair Cost: EC\$35,400 per month

(Maintenance and Repair; EC\$31,250, other cost; EC\$4,150)

Total EC\$112,400 per month

Table-3-3 (2) Operating Income and Expenditure Plan

	o o (2) Operating the		
Expen	diture		g Income
Personnel Cost	EC\$37,700 per	Sales of Ice (Unit	EC\$555,555 per
(Permanent Staff)	month	Price of Ice	month
4, Operating Staff:		1EC\$/Ib)	
24)			
Utility Cost	EC\$39,300 per	Charges for	EC\$49,280 per
(Electricity;	month	Custody of the fish	month
57,600KW, Water;		(1EC\$/kg for	
1,200m³, Gasoline,		15days)	
4kl)			
Maintenance and	EC\$35,400 per		
Repair Cost	\mathbf{month}		
(Maintenance and			
Repair; EC\$31,250,			
other cost			'
EC\$4,150)			
Total of	EC\$112,400 per	Total of Operating	EC\$604,835
Expenditure	month	Income	per month
	Benefit		EC\$492,435 per
			month

Otherwise, it is possible to accumulate the sand at the mouth of mooring area and channel and slipway. The maintenance dredging is necessary under the jointly works with the Ministry of Communication, Works and Housing.

Chapter 4 Project Evaluation and Recommendations

Chapter 4 Project Evaluation and Recommendations

4-1 Project Effect

The request made by the Dominica is to rehabilitate the suffered facilities and equipments that are Fisheries Center, Submerged Groin of North Breakwater, Parapet wall with Gates on the Landing Wharf, Slipway and Equipments in the Fisheries Center.

However, it is necessary to improve the foot area of west breakwater and landing wharf because, those conditions are switched to weaker resistance force for sliding according to the field survey. It is identified to be impossible to rehabilitate the parapet wall with gate because this faces directly to Caribbean Sea and so the shock wave attacks this directly. It is planned that the multiple protection system with the parapet wall and the over floodwater catching basin is effective protection for the Fisheries Center which is core facility of Roseau Fisheries Complex from the severe shock wave attack. The parapet wall is the first protection line but, it may be enough to protect the wave and so the basin together with the parapet wall and the building of Fishery Center can be effective system as multiple protections. The sidewall of building will be improved for protecting the over floodwater. The floor of Fisheries Center will be leveled 20cm up and the basement of refrigerators will be 40cm up for protecting the over flood. This is also effective for usage of inside facilities.

The improvement plan of slipway is the settlement of breakwater and the rehabilitation toward the Ferry Terminal. The role of breakwater is to reduce the wave energy. The running up wave on the slipway will be reduced and the boat-stored area will be provided.

All entrances on the west side of Fisheries Center will be closed. The entrances will be switched to the south. The facilities and equipments inside the Fisheries Center will be rehabilitated and/or improved as a same grade and/or higher specifications. The refrigerator will be improved the wider range of temperature of 0° to -20° C. The emergency generator will be improved the distribution panel which is possible to supply the power to the laboratory for back up. The capacity is same as existing generator, 70KVA. The protection wall will be placed to the cooling towers, the incinerator and the fish mill plant on the northern part of Fisheries Center.

For promotion of the fisheries sector under the development policies for diversifying the primary industry, Roseau Fisheries Complex has important roles as a core facility for contributing to priority issues of enhancing fish landing, marketing and supporting of fishing activities. With this effect, it is anticipated that the Project will contribute to operations at Roseau Fisheries Complex and the promotion of fisheries in Dominica.

In addition to above, the implementation of the Project under the Grant Aid Scheme of Japan is also considered to appropriate in the following point of views.

- ① The direct benefit of the Roseau Fisheries Complex is not only limited to the fishermen in the Project site, but all fishermen in Dominica through the collecting their catch to the Complex.
- ② Roseau Fisheries Complex is not a profit-making facility, but a public service facility since fishermen, fish-vender and consumers utilize it in general.
- 3 The Project will not make any impacts or affects on the surrounding natural and social environment.

4.2 Recommendations

Roseau Fisheries Complex will wholly function due to implementation of the Project. In order to realize the effect, it is necessary for consideration to be given to the followings in addition to the implementation of the Project.

- ① Prevention of Risk during Anomalous Condition
 - It is impossible to deal with the effects of hurricane or anomalous conditions and waves of long period waves. It is necessary to suspend the usage of the mooring area and slipway, and to evacuate fishing boats to other safety places for avoiding suffering from the anomalous conditions.
- ② Necessity of Maintenance Dredging It is predicted that the sand around the mouth of mooring area and channel and slipway are accumulated. Maintenance dredging of said area is still necessary under the assistance of Ministry of Communications, Works and Housing.
- ③ Necessity of Maintenance Management In the view of keeping the function of Roseau Fisheries Complex, it is essential that the building facilities and equipments such as bits on wharves and pumps, the incinerator, fish-waste disposal unit and pipes/ cable-supports, etc. are maintained with necessary measures such as rust removal and painting etc.