NO

BASIC DESIGN STUDY REPORT

ON

THE PROJECT FOR

KIRITIMATI ISLAND

COASTAL FISHERIES DEVELOPMENT

IN

THE REPUBLIC OF KIRIBATI

DECEMBER 2004

JAPAN INTERNATIONAL COOPERATION AGENCY

ICONS INTERNATIONAL COOPERATION INC.

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PREFACE

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

JICA sent to Kiribati a study team from May 23 to July 2, 2004.

The team held discussions with the officials concerned of the Government of Kiribati, 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 Kiribati from October 24 to November 4, 2004 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 the Republic of Kiribati for their close cooperation extended to the teams.

December, 2004

Seiji KOJIMA
Vise-President
Japan International Cooperation Agency

December, 2004

Letter of Transmittal

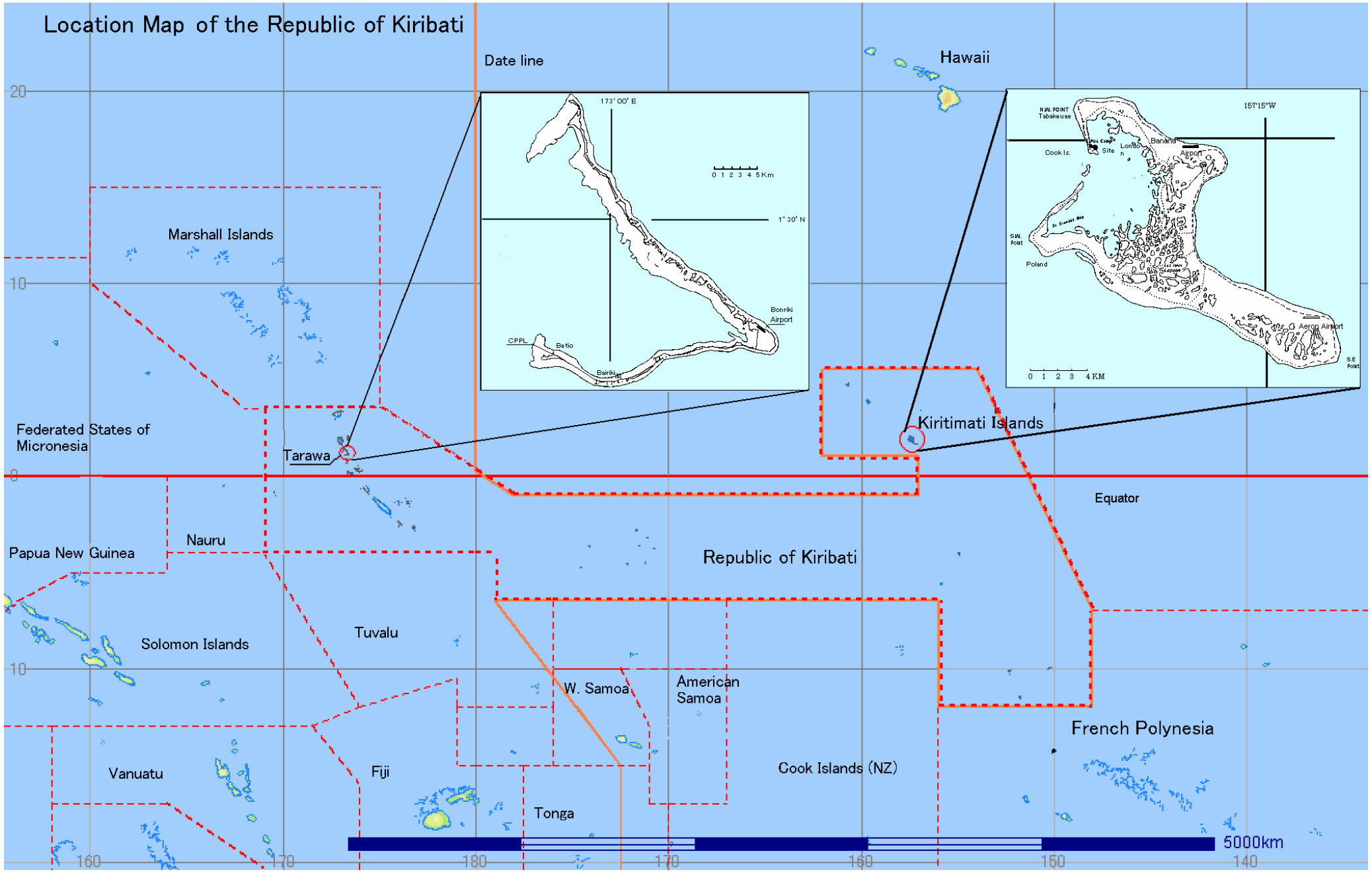
We are pleased to submit to you the basic design study report on the Project for Kiritimati Island Coastal Fisheries Development in the Republic of Kiribati.

This study was conducted by ICONS International Cooperation Inc., under a contract to JICA, during the period from May, 2004 to January, 2005. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Kiribati 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,

Kohsuke SHIMAZU
Project Manager,
Basic design study team on
the Project for Kiritimati Island Coastal Fisheries Development
in the Republic of Kiribati
ICONS International Cooperation Inc.


Location Map of the Republic of Kiribati
Date line
Hawaii
Marshall Islands
Federated States of Micronesia
Tarawa
Kiritimati Islands
Equator
Papua New Guinea
Nauru
Republic of Kiribati
Solomon Islands
Tuvalu
W. Samoa
American Samoa
French Polynesia
Vanuatu
Fiji
Cook Islands (NZ)
Tonga
5000km
20
10
0
10
160
170
180
170
160
150
140
173° 00' E
1° 30' N
0 1 2 3 4 5Km
Bonriki Airport
CPPL
Betio
Bairiki
157°15"W
Cook Is.
Banana
Airport
Poland
Aeron Airport
0 1 2 3 4KM

THE PROJECT FOR KIRITIMATI ISLAND COASTAL FISHERIES DEVELOPMENT PERSPECTIVE

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ABBREVIATION

B/D	Basic Design
BOD	Biochemical Oxygen Demand
CPPL	Central Pacific Producers Limited
DL	Datum Level
EIS	Environmental Impact Statement
EL	Earth Level
FAO	Food and Agriculture Organization of the United Nations
FD	Fisheries Division
HWLN	Mean Neaps High Water Level
HWLS	Mean Spring High Water Level
IEE	Initial Environment Evolution
IMO	International Maritime Organization
KMEL	Kiritimati Marine Export Ltd.
KSSL	Kiribati Shipping Service Limited
KTC	Kiribati Teachers College
LWLN	Mean Neaps Low Water Level
LWLS	Mean Spring Low Water Level
MELAD	Ministry of Environment Land and Agriculture Department
MFMRD	Ministry of Fisheries and Marine Resources Development
MHS	Moroni High School
MLPID	Ministry of Line and Phoenix Islands Development
MLWL	Mean Low Water Level
MSL	Mean Sea Level
PWD	Public Works Department
RC	Reinforced Concrete
S/S	Suspended Solids
SB	Survey Base
SSB	Single-side Band
VHF	Very High Frequency
AU$	Australian Dollar
US$	United States Dollar

Summary

Summary

The Republic of Kiribati is an island country which stretches across the equator and date line in the Central Pacific Ocean. It consists of 33 islands divided into three groups -- Gilberts proper, Northern and Southern Line, and the Phoenix Islands. The land area of the country is small at 746km^2, but its 200 miles of sea coast covers vast waters, 3,900km east to west and 2,100km north to south. The population in late 2000 was estimated at 84,500, of which approximately 36,700 were living in Tarawa, the capital of the country.

Kiritimati Island, the Project site, belongs to the Line Islands and is the largest among the 33 islands of Kiribati. It is located about 2,100km south of the Hawaiian Islands and about 3,200km east of the capital, Tarawa. Its land area covers 388km^2, occupying 52% of the total land area of the country. The land is flat, less than 5m above sea level, and has no streams.

It has a tropical marine climate. There are no seasonal changes, consequently, the average temperature is 27℃ throughout the year. Average rainfall is approximately 700mm. The difference between the lightest and heaviest rainfall years is extreme -- a minimum of 177mm in 1954 compared to a maximum of 3,686mm observed in 1997.

Kiribati has no agriculture production except for copra due to its coral sand soil. It has a pressing population problem due to a high population growth rate. Fisheries have a great potential but are less developed because of poor infrastructure. The Kiribati Government recognizes that copra production and fishery development will be the mainstay for future economic growth of the country.

According to the World Bank, in 2002 the Gross National Income (GNI) was US$77 million, GNI per capita was US$811, and the economic growth rate was 1.4% in 2003. The contribution per industry to the Gross Domestic Product (GDP) consisted of 39.7% government service, 25.5% commerce and industry, 13.5% transportation and communication, 4.9% agriculture, and 4.5% fisheries. Regarding foreign trade, in 2000 total imports of AU$67.9 million exceeded by tenfold the total exports of AU$ 6.2 million.

From 1995-2000, Kiribati showed a population growth increase of 27%. In that same 7-year period, Kiritimati Island's population increased 50% due to immigration from Tarawa. As a result, there was an urgency to develop key industries, in particular fisheries, on Kiritimati Island. Consequently, the Kiritimati branch of Central Pacific Producers Limited (CPPL Kiritimati), which exported frozen lobster and fresh fish to Hawaii, began transporting frozen fish to Tarawa using the inter-island ferry. This expanded its business in 2002, and its transporting volume increased to 16.5 tons in 2003.

Although the receiving side, the main office of CPPL (CPPL Tarawa), gathers fishery products from all outer islands including Kiritimati Island, the total quantity of 156 tons in 2003 was not sufficient to satisfy the demand in Tarawa. Consequently, CPPL Tarawa plans to increase the transportation of frozen fish from Kiritimati Island to 72 tons by 2007.

On Kiritimati Island, the fishing industry is the mainstay of the island's economy. It supports

the livelihood of 104 households, 23% of the island's 458 total. CPPL Kiritimati receives all edible fish caught by island fishermen and transports them to Tarawa, but its landing/processing facilities and equipment have deteriorated. The present condition makes it impossible for CPPL Kiritimati to increase frozen fish production and transport it to Tarawa, by increasing fish purchases from local fishermen. Therefore, improvement of these facilities and equipment is urgently needed.

Against this background, the Kiribati Government and its Ministry of Fisheries and Marine Resources Development (MFMRD) formulated the "Kiritimati Island Coastal Fisheries Development Project." Its aim is to improve and achieve undeveloped offshore migratory species and landing facilities, construct a fishery product processing facility, and provide related equipment and materials for CPPL Kiritimati. The Government of Japan was requested to offer Grant Aid to implement this Project.

Upon their request, the Government of Japan conducted a preliminary study in October 2003. The preliminary study revealed that: (1) edible fish species are abundant around Kiritimati Island, (2) water necessary for the Project will be supplied because water supply is available on the island, (3) a generator system is necessary to run the refrigerating and ice making machines, (4) fishery products are in short supply in Tarawa even though it is gathered from neighboring islands, and (5) CPPL Kiritimati transports frozen fish to Tarawa and this business operates in the black.

Based on the result of the preliminary study, the Government of Japan decided to conduct a basic design study and the Japan International Cooperation Agency (JICA) sent the following study teams:

- Basic Design Study Team from May 23 to July 2, 2004 to Tarawa and Kiritimati Islands.
- Draft Report Explanation Team from October 24 to November 4, 2004 to Tarawa.

Based on the results of the preliminary study, the teams studied and examined the background and contents of the Project, the natural conditions of the proposed site, the implementation and maintenance system of the Project, the construction conditions on Kiritimati Island, etc. Through the site survey and subsequent analysis in Japan, the teams designed an appropriate scale and contents of the Project as a Grant Aid Program.

As a scheme of the Project, it has been considered appropriate to include rehabilitation of wharf and slipway, construction of processing/preservation facilities, and provision of fishing boats and processing related equipment. The Basic Design Study has been conducted as shown in Table 1, 2, and 3.

Table 1 Contents and Scale of Civil Engineering Facilities

Name of Facility	Dimensions	Contents of Work
1. Mooring wharf	Length 30m Upper pavement 30m (L) × 6m (W)	Wharf and revetment : Precast concrete block gravity-type construction, Mooring wharf with bitts and fenders Stairs : Stacking of perforated precast concrete block, Pavement: Placing of precast concrete plate Slipway : Construction of ramps with precast concrete plate
2. Revetment of reclaimed land	Revetment L = 23 m Upper pavement (1) 11 m (L)×6.0 m(W) Upper pavement (2) 10 m(L)×2.5m(W) Stairs width 7.2m (corners of revetment)	
3. Slipway	Ramp-1 15 m (L)×8 m (W) Working place 8 m(L)×10 m(W) Ramp-2 7 m(L)×7 m (W) Lifting trolley 7m (L)×5.5m (W) (one unit)	
4. North revetment	Revetment length L=21m	

Table 2 Contents and Scale of Building Facilities

Name of Facility	Dimensions	Contents of Work
Handling Place	Floor area 536.2m^2 Handling/Processing space, Refrigeration system space (ice-making machine: 1.5t/day, ice bin: 3t capacity, relocation of existing freezing system, freezing store: 12t capacity), Preparation space; Packing materials store; Office; Branch manager room; Machinery room; Water tank.	・ RC construction, one-story building, wooden truss, aluminum sheet heat isolation roofing, ・ Water supply / drainage, air-conditioning / ventilating equipment, power trunk wiring, lighting, etc.
Meeting Hall	Floor area 63.0m^2 Meeting room, Store (1) for fishing gear, Store (2) for meeting room equipment	・ RC construction, one-story building
Generator House	Floor area 37.5m^2 Electric room (relocation of 45KVA generator and installation of one unit of 60KVA generator and a fuel tank of 3 ton capacity)	・ RC construction, one-story building
Exterior facility	Parking lot for 7 vehicles, pavement = 440m^2 (55m × 8m)	・ Parking lot: Only leveling ・ Pavement between the revetment and facility

Table 3 Contents and Scale of Equipment and Materials

Item	Contents	Quantity	Remark
1 Fishing boats	KIRI-5 type: 11.8m Kiribati type canoe, 40HP outboard engine, 25HP outboard engine in reserve, spare parts and tools unit, safety equipment, VHF radio, insulated fish box of 100L capacity (2 units)	4 boats	The existing 2 boats plus 4 boats to be provided will operate.
2 Processing / Packing table	Processing table for washing and processing fish; Packing table for packing products.	2 units each	
3 Crane truck	Equipped with a front winch of 2 ton capacity	1 unit	
4 Chest freezer	700L type -20℃	1 unit	
5 Others: Carrying devices (push carts, pallet forks, fish boxes, insulated fish boxes, water tank lorry), band saw, platform scale, meeting hall equipment (tables, chairs), winter clothes, cleaning tools			

When the Project is implemented under the Grant Aid Program of the Government of Japan, the

total period will be 14 months including 3 months for detailed design, 11 months for construction and 10.5 months for procurement of equipment and materials. Its cost is estimated at JY741 million (JY739 million for the Japanese portion and JY2 million for the Kiribati portion).

CPPL Kiritimati has over 20 years experience in purchasing fish, primary processing, and preservation shipment. They also have experience operating and maintaining similar equipment and machines, so problems are not anticipated in the operation of the facilities. As the fish handling space is planned to meet its operation/maintenance costs in revenues from the operation of proposed facilities, management of the Project is expected to proceed smoothly.

With the implementation of the Project the following effects can be expected.

(1) Direct effects

1) Utilization of undeveloped offshore fishery resources

Introduction of medium-size fishing boats and off shore fishing will make it possible to acquire abundant resources as skipjack and tuna around Kiritimati Island.

2) Safe and efficient preparation work for fishing and landing work.

Improvement of the wharf and revetment will enable transport vehicles to park alongside fishing boats allowing preparation of fishing and landing work to be done safely and efficiently.

3) Increase in the serviceability of fishing boats

Improvement of the slipway will make it possible to increase the life of a fishing boat through periodic inspection for maintenance as well as drying of its hull on the slipway.

4) Improvement in the quality of fish through efficient landing, handling, and preservation

Introduction of an ice-making machine and insulated fish boxes will lengthen preservation days.

(2) Indirect effects

1) Increase in incomes of fishermen

Yearly purchasing quantities of CPPL Kiritimati for shipment to Tarawa from local fishermen will increase, resulting in an increase to the incomes of fishermen.

2) Reduction of imports of food through utilization of domestic frozen fishery products

Increase in supply of frozen fish to institutional consumers will make it possible to substitute partly frozen fish for canned fish or meat, resulting in reduction of food imports.

3) Contribution to sound management of CPPL

An increase in handling quantities of fish at CPPL Tarawa will contribute to their sound management.

With expectations of effectiveness and efficiency of proposed facilities, equipment, and materials, the following two recommendations are made:

(1) Establishment of spare/repair parts supplying system

Procurement of spare/repair parts in Kiritimati Island requires many days due to its remoteness. It is necessary to establish a spare parts stockpiling system to meet needs quickly.

(2) Total permeation of energy and water conservation

Refrigeration work (freezing and ice-making) is conducted in daytime temperatures of up to 30℃. All workers must develop a habit to prevent cooled air from escaping and other energy loss. At the same time, all employees must become accustomed to using water carefully since it is a very limited resource on Kiritimati Island.

Appropriateness of the Project under the Grant Aid Program of the Government of Japan is verified as follows:

Coastal fishery is aimed at utilizing high-potential, undeveloped migratory species as the mainstay to support the economy of Kiritimati Island. The Kiribati Government also places emphasis on the coastal fishery of Kiritimati Island for future development.

The beneficial range of the Project is wide including approximately 800 people from 104 fishing households (23% of all households in Kiritimati Island), and 36,700 people in the capital Tarawa (according to 2000 census).

In Tarawa, half of the frozen fish from Kiritimati Island is supplied to a hospital and schools. The animal protein from fresh fish plays an important role in rehabilitation and maintenance of national health.

CPPL Kiribati has ample experience in management of similar facilities, equipment, and materials which the Project will provide. Negative environmental influences will not exceed those of prior facilities.

Based on examination, verification, and considering the contributions toward the development of industries in outer islands, promotion of coastal fisheries and the basic policy of the Kiribati Government, it is concluded that the Project deserves to be implemented under the Grant Aid Program of the Government of Japan.

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Chapter 1 Background of the Project

Chapter 1 Background of the Project

1-1 Background and Circumstances of the Request

The Republic of Kiribati regards “rectification of economic differentials between islands” as one of its basic issues in its National Development Strategies 2000-2003. The basic policy of its fisheries plan for Kiritimati Island is to develop artisanal fisheries and activate the island economy through a small-scale tuna fishing industry, full-scale purchasing of fish from local fishermen, and increasing transport of fishery products to Tarawa.

CPPL Kiritimati has been exporting frozen lobsters and fresh fish to Hawaii. To expand the business, in 2002 CPPL Kiritimati began transporting frozen fish by inter-island ferry. Transported quantities increased to 16.5 tons in 2003. Although the receiving side, CPPL Tarawa, gathers fishery products from all outer islands including Kiritimati Island, the total quantity of 156 tons in 2003 was not able to meet the demand in Tarawa.

CPPL has a plan to increase the transportation of frozen fish from Kiritimati Island, with its large potential of fishery resources, to 72 tons in 5 years. However, deterioration of the handling/landing facilities of CPPL Kiritimati makes it difficult to maintain fish quality and to preserve frozen products, resulting in poor purchases of fish from local fishermen.

Problems with the existing facilities at CPPL Kiritimati are as follows:

(1) Abundant migratory species are less exploited due to shortage of offshore fishing boats.
(2) Deteriorated and half collapsed landing wharf and slipway make it impossible to land catches safely and to haul up and repair fishing boats.
(3) An old warehouse is used as the handling/processing place. Its deterioration and lack of water supply/drainage equipment makes it difficult to produce quality fishery products.
(4) Lack of an ice-making machine used by small fishing boats for preservation makes it difficult to keep their catch fresh.
(5) The inadequate refrigeration/preservation facility restricts purchase and preservation of fish from local fishermen.

Against this background, Grant Aid was requested to improve the landing wharf, construct a fish handling facility, and procure related equipment and materials to resolve problems at CPPL Kiritimati’s facility. This in turn would help increase purchases of fish from local fishermen, develop coastal fisheries through exploitation of undeveloped migratory species, establish a system to produce frozen fishery products and then to ship them stably to Tarawa.

1-2 Contents of the Request

(1) Project components requested from the Preliminary Study and Basic Design Study (B/D), prioritized and additional requests

According to the request from the Kiribati side, a preliminary study was conducted in October 2003. The results of the B/D based on the confirmed items and their priority in the preliminary study are shown in Table 1-1. A difference was that "A" priority of the high pressure cleaning machine was changed to "C" priority, and also in the B/D an additional request for a set of cleaning tools (brushes, hoses, scrapers, etc.) with "A" priority was made. Water for daily life at Kiritimati Island is very important because its only source are wells and rainwater. Therefore, consumption must be controlled as much as possible. The B/D team's judgment that a set of cleaning tools requires less consumption of water than the cleaning machine is appropriate.

Table 1-1 Requested Items in Minutes of B/D and their Priority

Items		Quantity	Priority in Preliminary Study	Priority in Minutes of B/D
1. Facility				
1-1 Handling place for fishery products	Office	1	A	A
	Meeting room		A	A
	Working space		A	A
	Store		A	A
	Machinery room (cold store, ice making/storage facility, air-blast freezing system)		A	A
	Septic tank		A	A
1-2 Generator room		1	A	A
1-3 Septic tank		1	A	A
2. Drainage, ventilation work		1	A	A
3. Repair of a slipway and wharf in part	Slipway for small fishing boat, jetty, sea wall	1	A	A

Items		Quantity	Priority in Preliminary Study	Priority in Minutes of B/D
4. Equipment and machinery				
4-1 Fishing boat	KIRI-5 type (11.7m outrigger canoe) (Accessories) 4 cycle outboard engine 40 HP:1 unit Spare 25 HP : 1 unit Insulated box – 250L : 1 unit VHF handy radio : 1 set Safety equipment : 1 set Lifejacket, whistle, red smoke signal, etc.	4	A	A
4-2 Quality management equipment				
① Ice making machine	Plate ice 1 ton/day, 2 ton storage capacity	1	A	A
② Blast freezer	200kg -35℃	1	C	C
③ Freezing room	4 ton -25℃	1	A	A
4-3 Equipment for processing				
① Working table	For gutting work	2	A	A
	For processing and packing lobster	2	A	A
② Packing machine	For strapping	1	A	A
③ Weighing machine		1	B	B
④ Lobster preservation basket	Wooden box	2	B	B
⑤ High pressure cleaning machine		1	A	C
⑥ Cleaning tools	Scraper, deck brush, hose, etc.	1	-	A
4-4Carriage equipment				
① Truck crane	1 ton hanging capacity for fish box	1	A	A
② Fish carriage equipment and materials	Push cart, insulated fish box	1	B	B
4-5 Equipment for sales	Pickup truck with a hood	1	B	B
4-6 Radio equipment				
① SSB		1	C	C
② VHF		1	C	C
4-7 Diesel generator	60KVA	1	A	A
4-8 Accessories	Rainwater tank, freshwater tank, fuel oil tank, septic tank, etc.	1	A	A

(Note: Priority A>B>C>)

After the preliminary study a request concerning a jetty and a slipway was made as shown in Table 1-2.

Table 1-2 Additional Requests after the Preliminary Study

Additional items requested until B/D	Disposition
Construction of a fish landing jetty	Part of repaired revetment is to be used as a landing place.
Construction of a slipway capable of lifting the "Tekokona III" and local fishing boats and installation of a winch.	Its necessity will be examined by the Japanese side.

(2) Additional items requested after signing Minutes of B/D

After completion of the B/D, the Kiribati side made a request. The details of the additional request are as follows:

1) The B/D team arrived at Tarawa on June 4 (Friday), 2004 and discussed with officials concerned about Kiribati until June 9 (Wednesday), when the Minutes of Discussion were signed between the B/D team leader and the assistant secretary of MFMRD. The B/D team left Tarawa for Fiji on June 10 (Thursday).
2) During the discussion, the Minister of MFMRD, the undersecretary, the chief of Fisheries Division (FD), and the CPPL manager were absent due to an official trip abroad. Only the CPPL manager returned home earlier and was present at the signing of the Minutes of Discussion. The others returned to Tarawa on June 12 (Saturday).
3) One member of the B/D team stayed until June 17 and met with Kiribati officials including the MFMRD Minister, the undersecretary, and the CPPL manager. At this discussion the following request was added.

Table 1-3 Additional Items Requested after the B/D Study

Additional requested item	Reason of request
Retail room	This is necessary to meet the local demand of fish and ice.
Cold storage unit	Two units of cold storage are necessary to store fish.
Change the priority of blast freeze from C to A	Following an increase in the number of fishing boats from 2 to 6, it is expected that daily landing will treble to 600 kg, resulting in a shortage of freezing capacity. It is necessary to provide a freezer with 200kg capacity.
Chest freezer	This is necessary for storage of frozen fish and ice for local people.
Vacuum sealer	This is required to pack processed fillets and loins for marketing.
Band saw	This is required to cut large fish bodies and frozen products.

Chapter 2 Contents of the Project

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

(1) National Strategies and Project Objectives

In the National Development Strategies 2000-2003, the Republic of Kiribati regards "rectification of economic differentials between islands" as one of its basic issues. Under this national policy, the basic policy of the Fisheries Development Plan for Kiritimati Island, one of the outer islands, is determined so as to develop artisanal fisheries and activate the island economy through development of a small-scale tuna fishing industry, commencement of full-scale purchase of fish from local fishermen, and increase of transportation of fishery products to Tarawa.

The requested Project aims to promote coastal fisheries in Kiritimati Island through introduction of fishing boats, rehabilitation of landing facilities and slipway, construction of primary processing/preservation facilities, and provision of related equipment and materials. The outcome will establish a stable shipment system of fishery products to Tarawa through production of frozen fish and purchase of fish from local fishermen, as well as improve the shortage of fishery products in Tarawa, the receiving side.

The Project conforms to the National Development Strategies of Kiribati in food security, import reduction, and industry development in outer islands, as well as to the Fisheries Development Plan of the Ministry of Fisheries and Marine Resources Development (MFMRD) which aims to promote fisheries through effective utilization of fishery resources at Kiritimati Island. From this point of view, the Project occupies an important position in both the National Development Strategies and Fisheries Development Plan.

(2) Outline of the Project

CPPL Kiritimati commenced to transport its frozen fish to Tarawa by the inter-island liner to expand its business in 2002. As a result, the transported quantities increased to 16.5 tons in 2003. On the other hand, though the receiving side, CPPL Tarawa, gathers fishery products from all outer islands including Kiritimati Island, the total quantity of 156 tons in 2003 was not enough to meet the demand in Tarawa.

CPPL has a plan to increase the transportation of frozen fish from Kiritimati Island to 72 tons in five years, offering a large development potential of fishery resources. However, deterioration of the landing/handling/processing facilities of CPPL Kiritimati makes it difficult to ensure fish quality and preservation of frozen products, which results in poor purchasing of fish from local fishermen. Improvement of these facilities is a pressing problem.

With these considerations, grant aid aimed at improvement of the landing place, construction of a fish handling facility, and procurement of related equipment and materials to resolve problems at CPPL Kiritimati facilities, was requested to Japan. Aid would help increase purchases of fish from local fishermen, promote coastal fisheries through exploitation of undeveloped migratory species, establish a system to produce frozen fishery products and ship them stably to Tarawa.

The items to be included in the Project are the improvement/repair of the seaside facilities at CPPL

Kiritimati in Ronton Harbor: revetment, wharf, slipway, construction of a fish handling space, meeting hall, and generator house, provision of offshore fishing boats, and fish handling/processing/shipping related equipment and materials. When these facilities are completed and equipment supplied, promotion of coastal fisheries and activation of the economy in Kiritimati Island as well as improvement in the shortages of fishery products in Tarawa can be expected.

2-2 Basic Design of the Requested Japanese Assistance

2-2-1 Design Policy

(1) Basic policy of the management plan

The items to be planned in the Project are the improvement/repair of the seaside facilities at CPPL Kiritimati in Ronton Harbor: revetment, wharf, slipway, and construction of fish handling space, meeting hall, and generator house.

Transportation and supply of fishery products to Tarawa from every outer island is a longstanding issue of the Kiribati Government. Various measures continue to be implemented by the Kiribati Government. The many development projects on the outer islands conducted by the Government of Japan are all inline of this movement. The Project is basically consistent with this Policy. The following are design policies of the Project:

1) The existing mooring wharf for fishing preparation and landing is fragile. The slipway is rundown and unusable. A facility providing safe landings and capable of hauling fishing boats up for repair shall be planned.
2) The existing processing facility is a converted warehouse, having no water supply/drainage equipment, and poor hygiene conditions. Ice for keeping fish fresh is in short supply. To resolve these problems, a facility shall be planned to produce frozen products using fresh fish along with preservation and shipping.
3) The proposed facility shall be of low-cost type. Since the public power in Kiritimati Island is limited, an independent power generation system for equipment such as the refrigerating machine, ice-making machine, and existing freezer shall be introduced. A power-saving processing method shall be applied instead of a power-consuming freezing system. Also a concentrated operation to shorten running hours of generators will be made.
4) Underground water for public service is a very important resource in Kiritimati Island. Rainwater shall be utilized as much as possible.
5) The scale and contents of the facilities, along with suitable equipment for the technical level and management ability at CPPL Kiritimati shall be planned.

(2) Basic policy of marine civil engineering work

The basic design policies are as follows.

1) The foreshore and water area at the Project site will have little change in shoreline and no bottom

deformation. The layout plan and structural design shall be made to avoid turbulence to the environment and to maintain its stable natural condition .

2) At Kiritimati Island, accumulated sand and coral stones are available for national projects. Secondary products for construction shall be imported from abroad.

3) Regarding steel materials at Kiritimati Island, heavy anticorrosive treatment is necessary.

(3) Basic policy of construction plan

1) A layout plan shall be designed for ease of quality/hygiene management. Flow paths of men and fish will be clarified.

2) Natural ventilation/lighting shall be fully utilized to reduce the air-conditioning equipment and enabling maintenance costs to be minimized.

3) Locally-used construction methods and materials shall be used to the utmost.

4) Extreme care to prevent salt damage shall be used.

(4) Basic policy of equipment design

1) Salt-resistant equipment shall be selected.

2) Specifications matching local technical levels will be considered.

3) Instruments shall be designed for ease in maintenance.

4) Energy-saving and cost effective equipment shall be used.

5) At Kiritimati Island, procurement of spare parts takes 2 to 4 months. Minimum spare parts necessary for regular inspection shall be granted.

(5) Basic policy of materials

All materials are used in the Project site. The following points shall be considered in planning:

1) Specifications taking anticorrosive measure into account shall be applied.

2) All materials shall be designed for ease of cleaning since they are used in the facilities to handle foodstuffs.

3) Materials that directly touch foodstuffs shall be capable of water cleaning.

4) Materials permitting easy maintenance and operation will be used.

5) Similarly to the case of equipment, minimum spare parts shall be provided for materials requiring regular maintenance, i.e., outboard motors.

2-2-2 Basic Plan (Construction Plan / Equipment Plan)

2-2-2-1 Examination of Design Conditions

(1) Examination of receiving quantities at the facility

The inter-island ferry, which is the basic distribution means for shipping frozen fish produced in Kiritimati Island to Tarawa, calls once every two months. CPPL sets 12 tons as a target to fish, process, and preserve during this interval, i.e. 72 tons a year, and this target will be attainable due to fishing boats increased by the Project and proposed staffing. Daily landing will be 600kg by five KIRI-5 type boats leased by CPPL Tarawa, and in case part of them cease fishing for various reasons, purchase from local fishermen shall be increased as much as possible. Also the catch by the "Tekokona III" for trial operation will be added. Power will be increasingly consumed during production of frozen fish due to operation of the freezing store, which requires running of two generators. In order to reduce production costs, concentrated operation shall be conducted to shorten the running time of generators as much as possible. According to examination based on these basic data the operation shall be concentrated into two weeks to 20 days once every two months. This concentrated operation is the condition to determine the scale.

1) Catching performance of KIRI-5 type fishing boat

CPPL Kiritimati operated two KIRI-5 type fishing boats operated by its own crew members until 2002. The rate of operation of two boats was both 18 trips per month from June to December (rough season) in 2002 and the catch per trip was 100- 120kg. Based on this catch performance, 600kg by total 6 KIRI-5 type boats, adding 4 boats provided by the Project, shall be the standard figure of daily landing. In addition to this, purchase from local fishermen shall be increased as much as possible to reduce operation costs with the operation period shortened due to increasing handling quantities.

Contract for leasing fishing boats to groups of fishermen commenced in 2003 but the rate of operation has decreased. CPPL Kiritimati is now considering an increase of purchasing prices and review of lease cost to try and raise the rate of operation.

The catch of fish of CPPL Kiritimati from 2001 to 2003 is as shown in Table 2-1.

Table 2-1 Purchase of Fish by CPPL Kiritimati

(Unit: ton)

Year	From fishing boats			Aquaculture	From fishermen	Total
	Tunas	Kingfish	Others	Milkfish	Lobster	
2001	36.47	15.2	9.6	5.0	17.8	84.3
2002	23.6	5.4	14.7	15.0	18.7	77.4
2003	6.8	2.9	6.1	28.0	4.8	48.6

Source: CPPL Kiritimati
-Milkfish are hauled from culture ponds of FD.

2) Proportion of migrating fish to reef fish

Kiritimati fishermen are generally catching reef fish, and the present catching proportion of migratory fish is estimated to be less than 20 - 30%. However, since this proportion will be increased due to introduction of KIRI-type fishing boasts, the basic proportion of receiving fish will be 60% of migratory species and 40% of reef fish.

3) Receiving quantity of the facility

① KIRI-5 type fishing boat 6 boats (existing 2 boats plus proposed 4 boats)

Proposed 4 boats are to be leased to fishermen groups of 4 fishing villages

0.1t/boat × 6 boats = 0.6t/day

② Purchase from local fishermen

Purchase from local fishermen shall be increased as much as possible.

③ Lobster

As it has been, production of 12t/year is received.

4) Necessity of freezing and primary processing

① Necessity of freezing

The only means of transportation to Tarawa from Kiritimati Island is the shipping service, and since the voyage to Tarawa takes about one week the shipment of fish products in the fresh state is out of the question. Freezing of fishery products is essential.

② Necessity of primary processing

A simple processing method as shown below is planned so that operation efficiency may be raised and 100% of the fish catch may be utilized.

a) Large bodies are cut up into small pieces able to be placed in the freezer easily so as to raise slow freezing efficiency.

b) Tuna heads are also cut into pieces suitable for small household pots. In Kiribati, edible parts of fish are consumed as food. Bones are used as feed for chicken or hog after crushing.

c) When fresh fish is in short supply, frozen products are sold locally. Sometimes large bodies are cut into fillets if consumers so desire.

d) Lobsters are frozen as lobster tails after heading.

5) Freezing plan

As shown in Table 2-2 below, the daily freezing quantity is 570kg. The existing semi air-blast freezer is not able to handle medium and large migratory fish due to narrow space (10cm) between its piping shelves. The capacity of the existing semi air-blast freezer is 370kg/4-8 hours, which is unable to handle even daily catches of KIRI-5 boats in one operation.

Since the requested air-blast freezer requires a lot of maintenance and operation costs, it was

cancelled.

Instead, in addition to the existing semi-air-blast system, a freezing corner shall be installed in the newly provided freezing store so that 200kg of fish on three freezing dollies can be kept for 24 hours for efficient slow freezing. Actually there is a record showing that these slow frozen products were sold in Tarawa with freshness after catching.

The proportion of larger fish of tuna and kingfish (more than 15cm high and wide) among migratory fish was confirmed to be about 50% at the site survey. Hence a half of landed migratory fish will be processed.

Table 2-2 Freezing Plan

(unit: ton/day)

		(Raw materials)	Reef fish	Migratory fish	Processed migrating fish		Total
					Yield rate	Products (Raw materials)	
Minimum	6 KIRI-5 boats	(0.6)	0.4	0.1	70%	0.07 (0.1)	0.57

Since 50% of migratory fish are processed, the quantity of raw materials differs from the frozen quantity. The figure in parentheses shows the weight of raw materials.

Since lobsters kept alive in a basket are frozen in a planned way, there is no overlapping of freezing work of lobster and fish.

6) Shipment

① Frozen Fish (Proposed quantity of 12 tons/operation/2 months)

Shipment of products for Tarawa by the "Moamoa" of CPPL Kiritimati or any inter-island ferry once every two months is planned. Operation for shipment will commence about 20 days before arrival of the freighter, setting the target at 12 tons.

② Lobster (for Hawaii, 500kg/shipment)

The shipment of lobsters is continued as always. Since the shipment is made as air freight once every one or two months, one shipment of 500kg at average is planned. Collected lobsters are kept alive in baskets and are headed and frozen 5 days before shipment. The target is 4 tons a year.

2-2-2-2 Civil Facilities Plan

（1） Study for Installation of Jetty and Repair Plan of Slipway

The necessity and construction method of additional the requested jetty and slipway were examined and the results are as follows.

1) Examination of necessity

・Mooring/landing wharf

The wharf used at present by out-rigger type fishing boats for mooring and landing in Ronton Harbor is in danger of collapse due to corrosion of ground steel plates and sheet piles in two or three years. It is necessary to construct a safe mooring and landing site. Also at the end of inlet used at present by small fishing boats for landing, the stone masonry revetment is almost collapsed, resulting in difficult loading work. It is necessary to repair this part.

・Slipway

All the outrigger-type fishing boats of Kiribati are wooden ship made of plywood, which will require airing on land once or twice a year and repairing of scratches for waterproofing, and application of corrosion-resistant paint. At this point, it is necessary to install a ramp (slipway). The existing slipway in Ronton Harbor is superannuated with its concrete floor broken and ragged. It is necessary to repair.

2) Comparative study of jetty installation and improvement of quay

It was requested to install a landing jetty as a landing place for small fishing boats by way of installing floating bridge or fixed jetty in the bay in front of the north quay. However, as a result of the natural condition survey, it turned out as follows:

・If the jetty is installed, the fishing boat cannot turn due to the narrow space in the bay.

・This plan will require a newly fixed installation in the bay, which may cause accretion of sand.

・The traffic line for landing will be longer than the current condition, which will make the landing work more difficult.

On the other hand, if improvement of the quay that is now temporarily used for landing/ mooring of fishing boats is chosen, it will be as follows:

・The improvement of the temporary quay will enable safer landing/loading. In addition, the traffic line for landing will be the shortest distance.

・It is possible to improve it without major obstacle.

・Since this is an improvement of the existing facilities, it will not cause accretion of sand.

As a result of the comparison, an improvement plan of the temporary quay shall be chosen due to the competitiveness.

3) Improvement of slipway and installation plan of winch

・Slipway

All the outrigger fishing boats in Kiribati are made of plywood, need to dry up on land and to repair and paint for maintenance once or twice a year. There is a slipway in Kiritimati Island, which is in great need for improvement. It cannot be used for safer landing due to deterioration from aging, cracked concrete slabs on the floor, and initiation of bumpy surfaces.

If new installation of slipway is considered instead of improvement, it will require drilling. If the improvement of the existing facilities is chosen, it will not require new drilling of the shoreline.

Given these points, improvement of the existing slipway is proposed.

・A study of lift-up system of fishing boats

Since it is impossible to lift up a larger boat than the KIRI-5 type fishing boat or an outrigger type fishing boat such as the "Tekokona III" now operating off Kiritimati Island on the slipway by manpower due to the size and weight of the vessel, machine-power will be essential. On the other hand, this type of boat can be lifted up by a winch mounted on a truck when the boat is put on a lifting lorry, and in order to take care of ship-lifting approximately 10 times / year, it is easier to use a small truck rather than install a winch. Though lifting-up by a truck without winch is possible, a winch is necessary to take down a vessel gradually causing no damage even if the vessel is small.

Considering these points, the use of a truck winch is taken for the plan.

The present condition of Ronton Harbor, on which the examination was made, is shown in Fig. 2-1 and the results of above examination and the appropriateness of the plan are shown in Table 2-3.

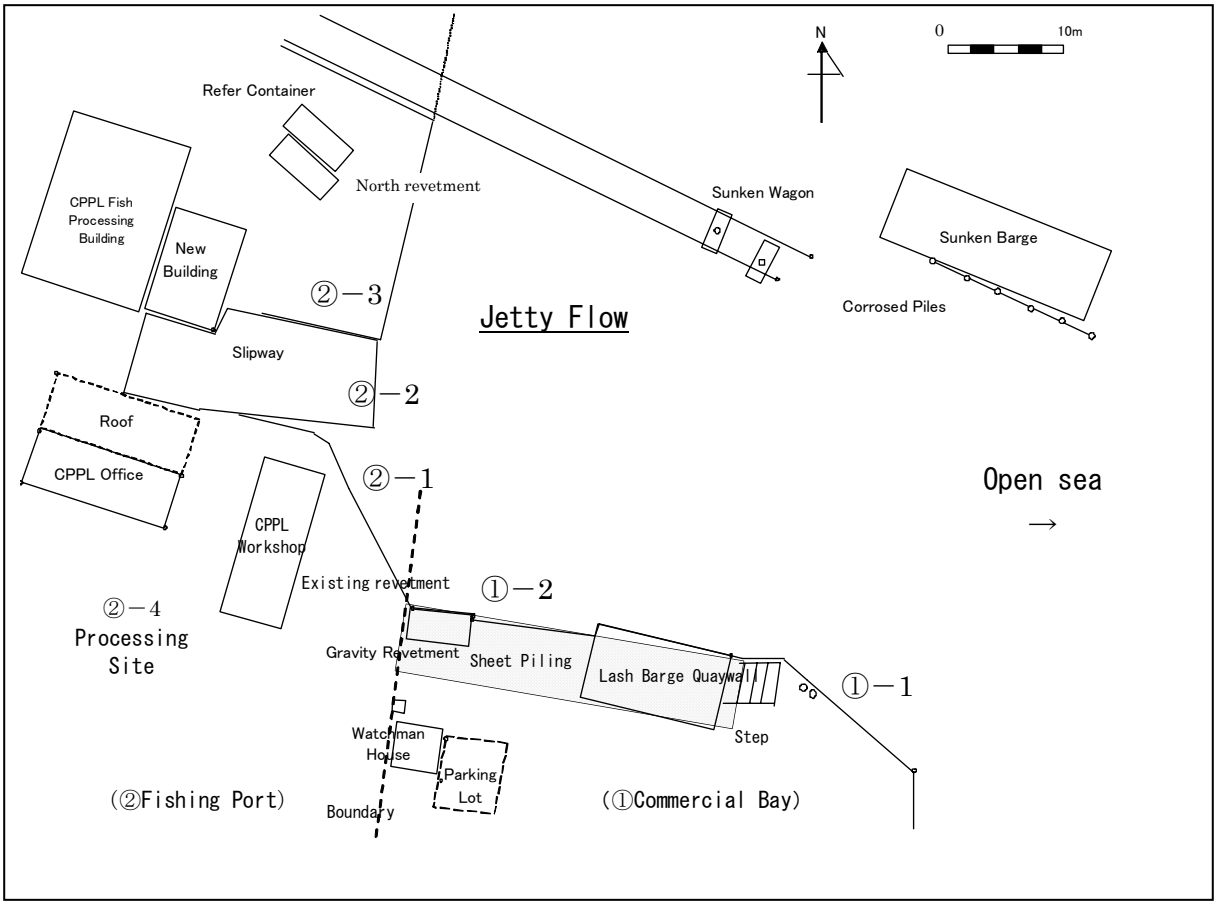


Fig. 2-1　Outline of London Harbor

Table 2-3(1) Requested Items and Outline of Investigation Result : Study on Unloading Facilities and Slipway

Contents of requested plan	Necessity
1. Landing jetty or landing site Plan of repair of the existing facilities or separate new construction as unloading, mooring place for fishing boat.	・Unloading base of the small fishing boat to CPPL is the London harbor. (The outline is shown in the Fig. on the following page.) ・The London harbor is divided into the commercial bay site near the entrance of the bay shown in ① and the fishing port site of the inner part of the bay shown in ②.
1) Repair plan of unloading/mooring place for outrigger type fishing vessel. (intended for the site in the commercial bay under control of Port Authority)	Fig ①－1: Since the height from the water surface of the foundation is 2m at the concrete plank quay for large vessel, the fishing boat can not perform mooring and unloading.
	Fig ①－2: The height from the water surface of the foundation 1m and the mooring and unloading for the outrigger type fishing boat is possible only this part inside the bay. However, sinking is predicted due to the corrosion of iron plate used as the foundation and plank of the quay for two to three years, and the necessity for repair is high.
2) Repair plan of unloading /mooring place for boat-type fishing vessel. (intended for the site in the fishing harbor under control of Fishery bureau)	Fig.②－1: The height from the water surface is 1 m or less, and the place is possible to perform unloading for the boat type fishing vessel. However, since the stone piling shore protection is about to collapse, the necessity for repair is high to perform the work of unloading and loading.
3) New construction plan for a floating pier or a fixed pier as the facilities replaced with the above 1), 2).	・It is the system which asks others for the place for unloading for the small fishing boat and installs the floating pier or the fixed pier inside of the bay of the front of Fig.②－3, but it is possible to respond the mooring and the unloading for the fishing boat with the above two plans 1), 2), and the necessity of adopting this plan is low.
2. Repair of slip way and installation plan of winch. 1) Repair of the slip way.	・All the outrigger type fishing boat of the country "Republic of Kiribati" are wooden ships made of plywood. The wooden ships needs to be raised ashore one or twice a year to dry, and carry out repair of the crack for waterproofing and corrosion proof, and applying of paint. An inclined road (slip way) is required as a place where the fishing boat is pulled up ashore. ・Since the existing slip way (Fig.②－2) is superannuated, the concrete board of the floor surface is cracked and safe raising of the ship cannot be performed, its necessity for repair is high.
2) Installation plan of the winch for lifting a fishing boat to the slip way.	・When it becomes more than an outrigger type fishing boat, mechanical power is needed for raising because of the size and the weight. ・In the case of Tekokona Ⅲ type, it is subject to distortion force ashore, which is not subject to on the sea when it is raised ashore. The stock way is required for protecting this force and the crack of the ship bottom.

Table 2-3(2) Requested Items and Outline of Investigation Result : Study on Unloading Facilities and Slipway

Feasibility (Validity on management operation/financial analysis)	Handling in this plan (proposal)	Condition for scale setting
・After repair of the unloading facilities, the management maintenance administration expense does not occur.	・Coping with the repair of the existing facilities is proposed.	・Large change is not made for the scale of the existing facilities.
・It is the facilities without necessity for repair.	・It does not become the intended site of this plan.	・It is out of the intended subject.
・By repairing of the part of Fig.①－2, the work place suitable for unloading and loading for the outrigger vessel can be secured. ・After repair, the management maintenance administration expense is not taken.	・By repairing of this place, it is used as the place for unloading and mooring of the outrigger type fishing vessel.	・Priority is give to the scale of the existing facilities, but since the unloading work is concentrated around 3:00 p.m. it is taken into consideration that one boat secures the length for coming alongside the pier while the other boat is in mooring.
・By repairing of the part of Fig②－1, the work for unloading and loading is safely performed and also the shortest unloading line of flow can be obtained. ・Repair work can be performed without special obstacle. ・After repair, the management maintenance administration expense is not taken	・The repair of this place is planed. ・Since the small ship is affected for working by even ebb-and-flow difference of 20 to 30 cm, stair type alongside pier to quay system is proposed.	Same as the above.
・When a pier is installed, it becomes impossible to turn a fishing boat, since the inside of the bay is narrow. ・Since this is the plan to install a new fixed thing inside the bay, there is possibility that bank sand may be produced.	・Since this system has many disadvantage points, this system is excluded from the subject of the study of the project.	・It is the out of intended subject.
・The superannuated existing slip way is located at the place shown in Fig.②－2 in the London harbor. Digging of the new seashore is avoided by using this place as a repair site. ・After repair, the management maintenance administration expense does not occur.	・Since it is considered to be optimal to repair the existing slip way of Fig.②－2 from the easiness of construction and the position for raising of the ship, this repair is proposed.	・Consider as the scale which an intended fishing boat can be bridged over and the work can be performed on both sides, and materials can be conveyed.
・The lubrication for protecting the stock way from rust , the measure for maintenance become important. It takes some expense for removing the rust. Repair expense for the ship is taken as another account with the facilities management. ・Other operation maintenance administration expense does not occur.	・Since raising of a ship can be performed by a light truck, the winch is not needed. ・When raising Tekokona Ⅲ which CPPL is commissioned to administrate and control by Fishery office, the cart for raising is planned.	・Consider as the type and the scale of the cart which does not have a bad influence on the hull and the ship bottom at the time of lifting and fixing of the Tekokona Ⅲ of wooden ship.

(2) Design Conditions for Civil Facilities

The relation between Design Conditions for Civil Facilities and the result of Natural Condition Survey is as follows.

1) Datum level for the Project

Tidal levels measured at the Ronton Harbor tidal observatory give elemental tidal information on overall area of Kiritimati Island. These data are sent to and analyzed at Hawaii University. Hawaii University publishes the Tide Table every year. Based on the 2004 Tide Table the design tidal levels are obtained as follows.

Design tidal level

Mean Springs High Water Level (HWLS)	+1.17m
Mean Neaps High Water Level (HWLN)	+0.80m
Mean Sea Level (MSL)	+0.70m
Mean Neaps Low Water level (LWLN)	+0.54m
Mean low water level (MLWL)	+0.42m
Mean Springs Low Water Level (LWLS)	+0.32m
Datum Level (DL)	±0.00m

Others

Kiritimati Island has no experience of tsunamis and earthquake-induced seiches.

Hence, the datum of the elevation height for the Project is put at the same level of tidal datum level.

2) Wave

Design wave is determined as follows.

Design velocity of wind:	V=20m/sec
Design wave height:	H1/3 = 0.72m
Wave direction:	East

Data are shown as follows.

① Wind statistics

Wind statistics for wind velocity and wind direction observed at Kiritimati airport in 2001 and 2002, and data of year 2000 observed offshore near the site are used.

Prevailing wind direction

Frequency by wind directions analyzed from the data of Kiritimati airport in 2001 and 2002 is shown in the following Table 2-4 and Fig. 2-2. According to the analyzed data, it is clear that wind from eastern directions including northern east and southern east is prevailing by 90% as specially 70% at east.

Table2-4　Distribution of Wind Velocity by 8 Directions

Velocity (knots)	1～5	6～10	11～15	16～20	21～25	26～30	n	Ratio n/Σn
N	5	17	21	4	0	0	47	2.35
NE	5	49	17	4	0	0	75	3.75
E	464	879	58	7	1	1	1410	70.43
SE	22	216	127	36	7	1	409	20.43
S	2	5	4	2	0	0	13	0.65
SW	1	8	5	4	1	0	19	0.95
W	1	9	7	8	2	2	29	1.45
NW	0	0	0	0	0	0	0	0.00
Number							**2002**	

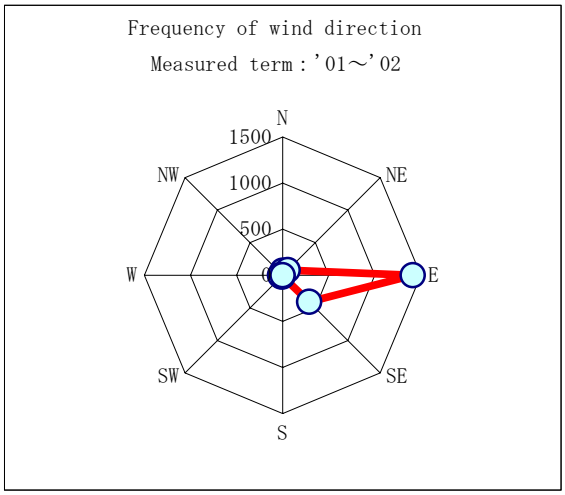
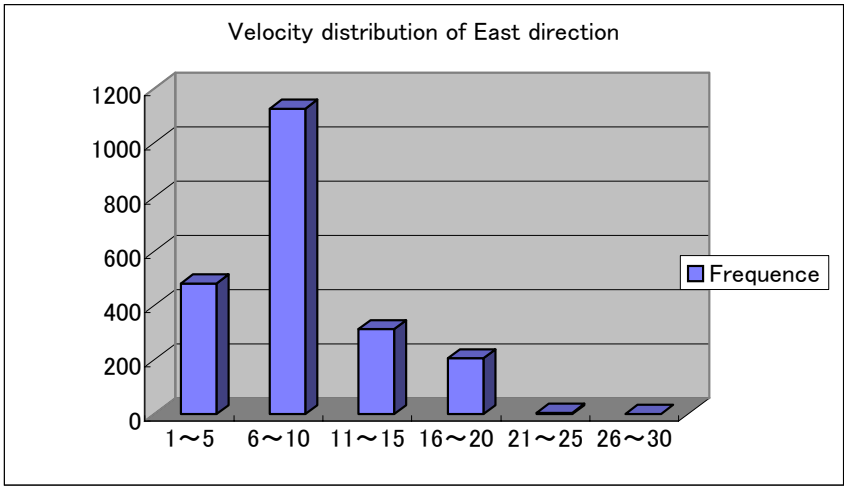


Fig. 2-2　Frequency by Wind Directions

Distribution of wind velocity by prevailing wind directions

Velocity	V	20～26	25～21	20～16	15～11	10～6	5～1	knot
Medium	$V_{m,N}$	28	23	18	13	8	3	knot
Number	n	1	5	206	313	1127	482	nos.
	'00	0	4	199	255	248	18	nos.
	'01	0	0	3	42	484	256	nos.
	'02	1	1	4	16	395	208	nos.
	n/2	1	3	103	157	564	241	
Accumulate	Σn	1	6	212	525	1652	2134	
Median	m	1	4	109	369	1089	1893	m = Σn + n/2

velocity	Frequence
1～5	482
6～10	1127
11～15	313
16～20	206
21～25	5
26～30	1
Total	2134



Design velocity of wind

Design velocity of wind shall be determined as the wind speed corresponding to a probability term, estimating, after analysis of statistics, probability of occurrence for wind speed based on a reliable data for a long observation term. The reappearance term are determined in consideration with the life span of structure, importance, economical matters, etc. and the Japanese standard of a fishing port of 30 years shall be applied due to few local data.

The result of computing the wind data for 3 years:

Non-excess probability: $P=1-K/N/Rp = 0.999953$

Wind velocity corresponding to above $V > 30$ knot

Where;

K = Observation terms = 3 years

N = Total number of data = 2,134

Rp = Reappearance term = 30 years

Considering rather poor reliability due to short observation terms and the site condition situated in a prevailing trade wind zone, design velocity of wind was determined as V=20m/sec by taking 20% up for observed maximum wind speed (26 – 30knot); that is,

Design velocity of wind: $V = 20$ m/sec

② Design Wave Height

The distance between the site and the eastern other side of the harbor was measured at 6,500 m on the chart and the east side of the harbor is a shallow water area. The Bretshneider method was used to calculate the wave height.

Design wave height: $H1/3 = 0.75$m

Following shows the wave height of wind velocity of 15m, 17.5m and 20m.

Water depth	h	2	2	2	m Constant
Wind speed	V	20	17.5	15	m/sec
Fetch	F	6500	6500	6500	m
Gravity	g	9.8	9.8	9.8	m/s^2
	gF/V^2	159.3	208	283.1	
	gh/V^2	0.049	0.064	0.087	
	gH/V^2	0.0176	0.0213	0.0256	
Significant wave	H	0.72	0.67	0.59	m

③ Currents and current force

Since there is very low currents (less 10cm/sec) in the Project sea area, at the observation of 120 times, currents and currents force are neglected in design of fishing port facilities.

④ Tractive force acting on the mooring post

The tractive force on bitts and berthing energy of a boat shall be estimated based on the performance of the "Tekokona III", which is the maximum boat in size utilizing the mooring facilities.

Berthing energy: $E = WV^2/4\ g = 22 \times 0.52/4 \times 9.8 = 0.14$ (ton- m).

Where;

W = Estimated weigh = 22 tf

V = Approaching speed; 0.50 m/s for a boat less than 20 G/T

Tractive effort : 1.0 tf (10 kN) for a boat less than 10 G/T

⑤ Surcharge on Apron

A load of the crane truck procured by the Equipment Plan shall be applied to the design surcharge.

(3) Civil Facilities Plan

1) Outline of the Civil Facilities

Summarize in the above examination outline of the marine civil engineering facilities is shown as Table 2-5.

Table 2-5 Outline of Civil Engineering Facilities

Name of facility	Dimensions	Contents of work
1. Mooring wharf	Length: For Tekokona III - 16m, For KIRI boat - 14m	Precast concrete construction with mooring bitts and fenders
Pavement	30m (L) × 6m (W)	Placing of precacst concrete plates
2. Bulkhead of reclaimed land	Revetment (1) - 11m long, Revetment (2) - 12m long	Precast concrete block
Pavement	Revetment (1) - 6m wide, Revetment(2) - 2.5m wide	Placing of precast concrete plate
Stair	Corners of Revetment (1) & (2): 7.2m wide	Stacking of perforated precast concrete block
3. Slipway	Ramp-1 - 15m (L) × 8m (W), Working place - 8m (L)×10m (L), Ramp-2 - 7m (L)×7m (W)	Placing of precast concrete plate
Lifting trolley	7m (L)×5.5m (W)	Wheels are made of hard rubber
4. North bulkhead	21m long	Precast concrete block construction

2) Facility Plan

① Waterways

At present, two fishing boats of KIRI-5 type (11.7m) and the "Tekokona III" (13.5m) are navigating in the planned water area. The facilities for these boats shall be planned.

Area of basin for ship maneuvering:

The area of basin for turning the bow of a ship shall exceed the area of circle with the diameter of 2 times the overall length of the ship. As the overall length of the objective ship is 13.5m, an area of 27m by diameter is determined.

Area of basin for mooring:

The width of 8.4m is applied taking 1.5 times of the objective ship (5.6m width)

Depth of basin : Plan and design depth is -1.0m below datum level.

② Mooring facilities

New mooring facilities are designed reutilizing the almost broken north revetment of the old Ronton Harbor. The face-line of the mooring facility shall be set on the same line of the revetment. Since mooring facilities are requested having bulkheads of reclaimed soil, the structural type may be determined with quay-wall structure such as concrete gravity type or steel sheet pile type. A steel sheet pile type is very costly because of the need to procure pile driving machinery or piling pontoon from abroad. A concrete

gravity type is applied as an economical and easy method of execution by means of crane truck available in the local area. When large scouring is anticipated in front of the mooring facilities due to flow or turbulence, the front of the mooring facilities shall be protected with concrete backs against scouring. In order to prevent scouring from the base and soil flow-out, sucking prevention sheets shall be placed at the base of revetment and back filling.

Two berths shall be planned so that a KIRI-5 type boat can prepare for fishing or land the catch when the "Tekokona III" occupies a berth for preparation for the next voyage. The planning process to determine dimension of mooring facilities is as follows:

a) Berth length on offshore side

16m 13.2 times 1.15

c) Berth length on landside

14m 11.7 times 1.15

Mooring facilities are shown in Fig. 2-3.

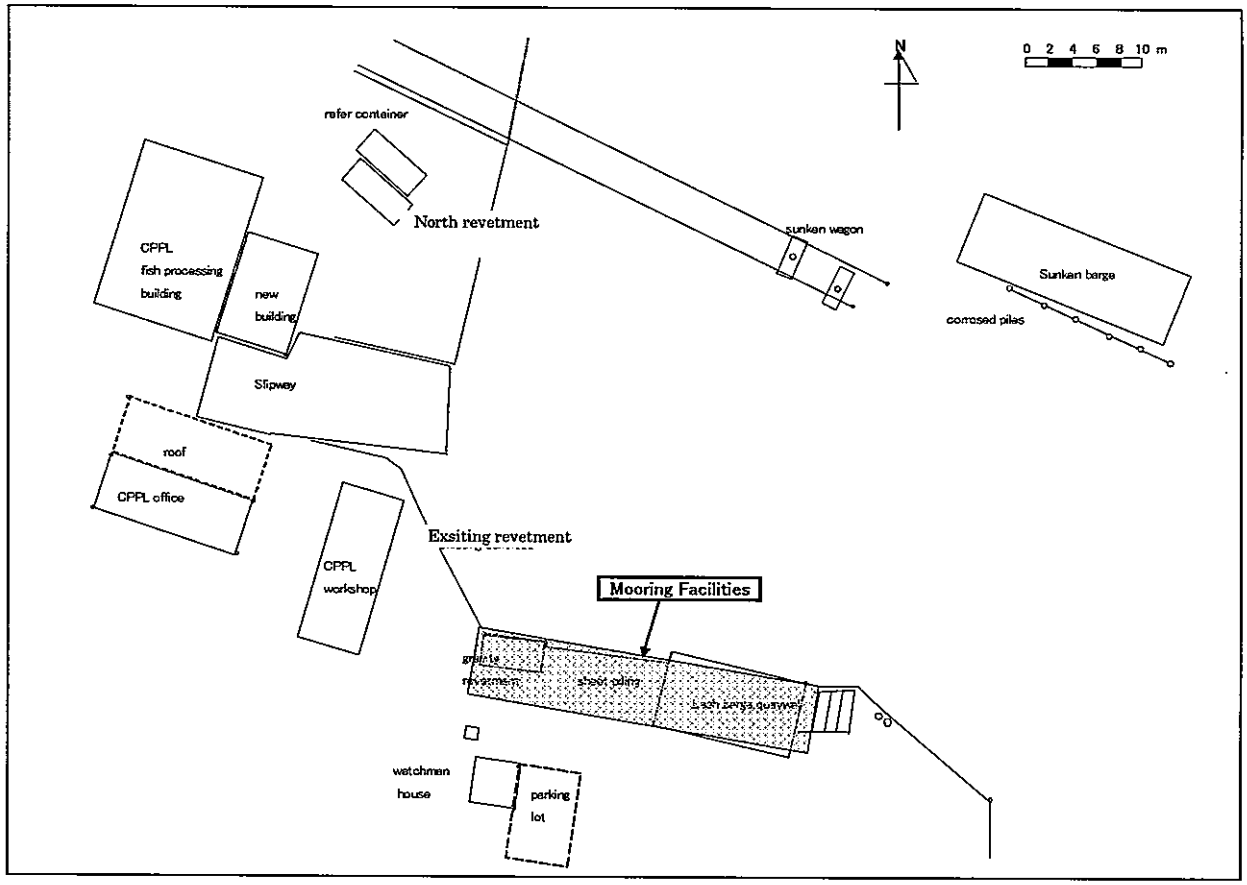


Fig. 2-3 Location of Mooring Facilities

③ Revetment of reclaimed land

Revetment of slipway-ward is planned at the location of crossing perpendicular to extension of the mooring quay-walls. The revetment shall be planned as a stairs structure to get close to the water and enable two fishing boats without outrigger to moor. Structure of the stairs shall be applied to dissipate

reflection of waves.

④ Slipway

Since many parts of the slipway shall be installed in the water, the precast concrete method shall be applied from the cost and water saving point of view. Precast concrete shall be made and cast at the site. The facility shall be able to use a lifting lorry.

The slipway is utilized by KIRI-5 type fishing boats and the "Tekokona III." Based on the results of the natural condition survey and the examination on civil engineering, the width of the slipway shall be widened by 1.5 m; Pavement of the upper surface of the mooring wharf and the upper surface of the revetment on the west side of the mooring wharf shall be 6.0 m wide, and that of the working area on land area shall be 10 m wide (1.5m wider than slipway width).

The KIRI-5 fishing boat and the "Tekokona III" were made of marine plywood and their bottoms are too soft to pull up without a slipway trolley. One unit of trolley for the slipway shall be provided. The trolley is operated with a winch on a truck.

⑤ North revetment

In order to prevent scoring from the base and soil flow-out, sucking prevention sheets shall be placed at the base of revetment and back filling. A gravity type revetment is determined by considering the purpose of small fishing boats being able to moor.

The width of revetment of the upper surface south of the slipway shall be 3.5 m so that a crane truck can proceed. Revetment shall be of precast concrete plates laying construction. Since the north revetment is out of the fish landing traffic line, no pavement is executed.

2-2-2-3 Fisheries Facilities Plan

(1) Layout plan

The Project site is situated at the hinterland of the land that was once Ronton harbor in Ronton area, the northwest end of the lagoon of Kiritimati Island. The CPPL Kiritimati's office, processing factory, store and workshop are situated on the north of the proposed construction site, and the office of the Fisheries Division is also adjacent. At the east side of these buildings there is a slipway facing the sea.

In planning a layout of new facilities, traffic lines from the existing buildings shall be shortened as much as possible and a layout capable of receiving a pleasant easterly wind shall be planned with air-conditioning facilities minimizing.

The handling place for fish products is constructed along the north-south axis, so that its entrance may be placed at the position where the traffic lines from the slipway and the wharf cross each other. The meeting hall is placed at the south side of the handling place, the position that is easy to receive an east wind.

To avoid noise to the office in the handling space and the meeting hall, the generator room is placed at the western road side, downwind the two buildings. .

The plot plan of the project site is shown in Fig. 2-4.

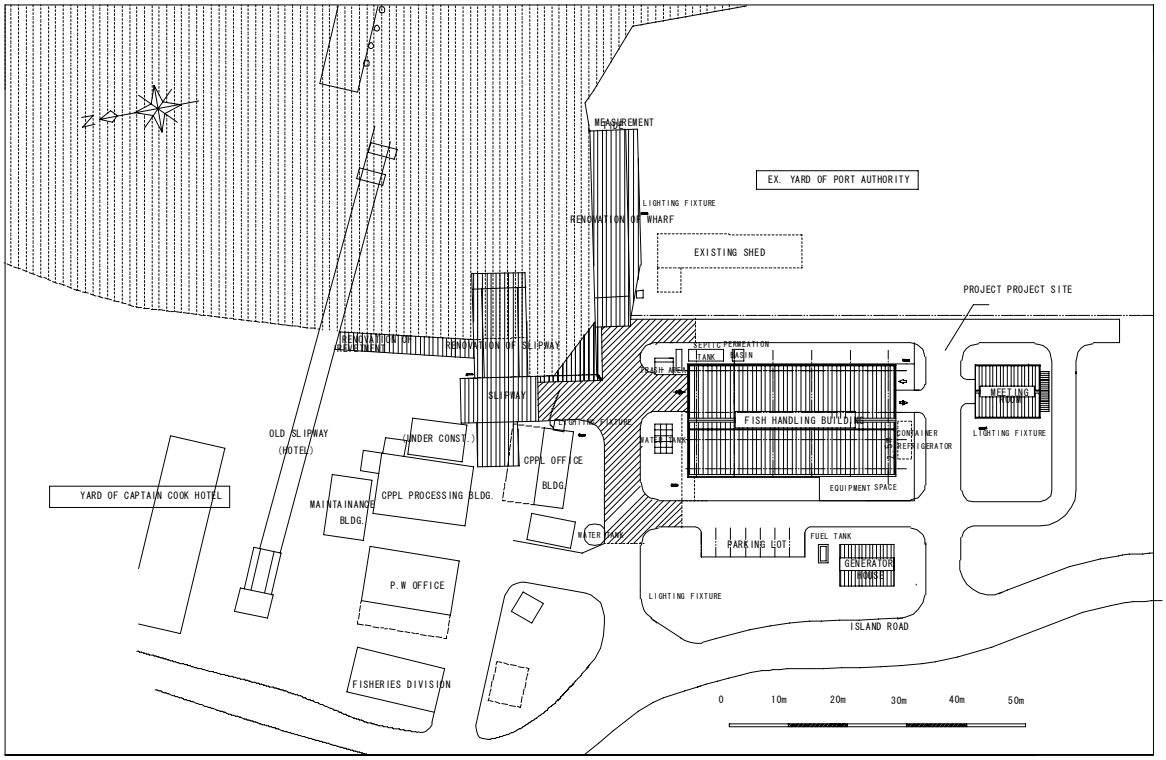


Fig. 2-4 Plot Plan of the Project Site

(2) Outline of the facilities

Table 2-6 below is the detail of the facilities and the design condition for each room will be mentioned after P2-22.

Table 2-6 Details of Facilities

Facility	Dimensions and Quantity	Summary
Construction of Handling Place	Floor area 536.2m^2	RC construction One-story building Foundation : RC direct foundation Roof : Wooden truss, aluminum sheet heat isolation roofing Exterior wall : Concrete block sticking - Water supply/drainage, sanitary air-conditioning, ventilation work, etc. - Power wiring and generator system, including lighting, outlet, telephone, fire alarm work, etc.
1. Fish Handling Building		
Handling space	44.0m^2	Weighing, sorting, washing, deforesting
Preparation space	36.8m^2	Cutting, sorting,
Processing space	36.8m^2	Heading work of fish and lobster
Packing space	36.8m^2	Packing, bagging
Shipping space	45.8m^2	Arrangement, selection, shipment
Retailing space	22.0m^2	Retail selling for local consumers
2. Refrigeration system space		
Ice bin / ice making machine	16.3m^2	
Freezing system (relocation)	8.0m^2	
Freezing store	45.0m^2 (including anteroom 13.5 m^2)	
3. Anteroom	13.3m^2	Preparation for entering to clean working space
4. Packing materials store	16.0m^2	Storing materials for packing
5. Locker room	5.7m^2 × 2 = 11.4m^2	Preparation for entering working space
6. Toilet	8.4m^2 (M), 5.4m^2 (F)	For Workers, clerks, visitors
7. Office	52.0m^2	For Workersand clerks
8. Branch Manager room	11.2m^2	Working room of Branch Manager
9. Machinery room	87.5m^2	Installation of refrigeration system
10. Entrance hall, passage	39.5m^2	

Facility	Dimensions and Quantity	Summary
Construction of Meeting Hall	Floor area 63.0m^2	RC construction One-story building Foundation : RC direct foundation Roof : Wooden truss Aluminum sheet roofing Waist-high wall : Concrete block sticking - Lighting, outlet, telephone, fire alarm, etc.
1. Meeting room	48.0m^2	Room for meeting, training, celebration, etc.
2. Store (1)	7.5m^2	For fishing gear
3. Store (2)	7.5m^2	For fixtures of meeting room
Construction of Generator House	Floor area 37.5m^2	RC construction One-story building Foundation : RC direct foundation Roof : Wooden truss Aluminum sheet roofing Exterior wall : Concrete block sticking - Water supply/drainage, ventilation work - Power wiring, generator system, including lighting, outlet, telephone, fire alarm work.
1. Electric room	12.5m^2	Distribution switch board, panel board, maintenance corner
2. Generator room	25.0m^2	Installation of two generators including the existing one.

The followings are the design condition for each room.

(3) Design condition for each room

<Fish Handling Building>

The handling place is constructed to shipment frozen fishery products to Tarawa, to retail fish to local islanders, and to export lobster tails and fresh fish to Honolulu.

Instead of the existing unhygienic and unproductive facilities, a fish processing facility that is more hygienic and easy to do quality control is planned. In panning cost-saving shall be emphasized. In order to maximize hygiene management and quality control, each space is arranged so that the traffic line of products may not to move backwards, and, the path of flow of workers is also planned in such a way as the entering path and leaving path are separated.

1) Planning

The delivery entrance is placed at the position that the traffic lines from the slipway and the wharf cross each other. From the delivery entrance at the north end of the handling place to the exit of products at the south end of the handling place, the handling space, preparation space, processing space, packing space, and shipment space are placed in that order following the traffic line of products.

The office room is placed close by the handling space to permit easy control for going in and out of products, and such related equipment as an ice-making machine/ice bin, packing materials store, and existing semi air-blast freezer are arranged at each production space.

On one side of the packing materials store the preparation room of workers is placed and the exit and passage are placed on the other side, and the changing room and toilet (men and women) are placed at the backyard. The retail selling corner able to access directly from the outside is placed close by the handling space. The machinery room of refrigeration system is placed at the backyard of the freezing system and the freezing store.

2) Condition of establishment of scale of each room

① Handling Space

The handling space is designed to handle 600kg of fish, a daily landing of KIRI-5 type fishing boats. Usually coastal fishing boats of Kiri-5 sail out fishing at near sunrise, 06:00 to 07:00, and return concentratedly 16:00 to 17:00 before sunset, and CPPL Kiritimati boats are not exception. At the proposed facility therefore landing of 6 KIRI-5 boats concentrates in an hour from 16:00 to 17:00. It is confirmed that weighing landing of one boat takes 15 minutes and thus total 15 minutes × 6 boats = 90 minutes-boat concentrate in 60 minutes. Since 90 minutes-boat ÷ 60 minutes = 1.5 boats, a space capable of handling landing of 2 boats together, 3 rounds during 16:00 to 17:00, shall be prepared.

・Space for fish box of fish landing

A space which is capable of handling a landing of 2 boats together, 200kg, is required. The landing is finally stored in 4 boxes and transferred on two pallets. A space for two pallets plus a working space, 1.2 m wide around boxes, is calculated to be 15.0m^2

・Space of Sorting, weighing, and recording

A space for 2 CPPL workers to weigh, register, and select (to reject damaged and defective fish) plus for one representative of fishermen is required.

Required space is 11m^2 including a space for weighing machine (0.5m × 0.4m).

・Space for large fish boxes

Weighed fish are transferred to large boxes (350kg capacity), which are required two boxes. Required space is calculated to be 5m^2 (box size: 1.1m × 1.1m).

・Passage

The width of passage is determined to 2m to have safety travel of pushcart and pallet fork. Required space is calculated 2m×6.5m =13 m^2. Weighed fish are kept at this space for processing next morning.

The layout and space of Handling Space is shown in Fig.2-5 and required space of Handling Space is calculated as Table 2-7.

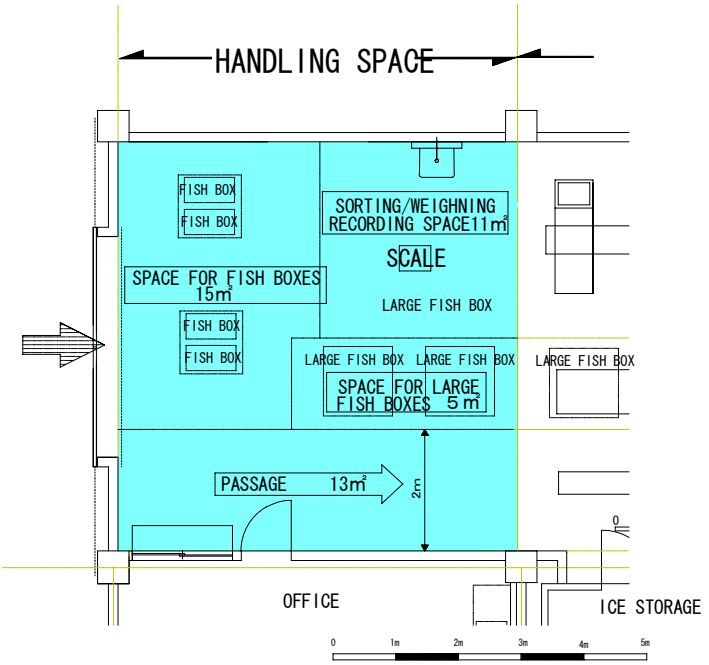


Fig. 2-5 Layout and Space of Handling Space

Table 2-7 Space Requirements of Handling Space

Items	Required Space (m^2)
Space for fish box of fish landing	Approx. 15m^2
Space for selecting, weighing, recording	Approx. 11m^2
Space for large fish boxes	Approx. 5m^2
Passage 2m×6.5m	Approx. 13m^2
Total	Approx. 44m^2

② Preparation Space

A space for cleaning 100kg fish is required. Two workers wash fish of 50kg each in one hour. Following spaces are required in Preparation Space.

・Space for two working tables

A space for 2 working tables (1.8m × 0.6m each), 2 workers (60cm wide working space is necessary around the table.) plus for 2 waste boxes (0.8m × 0.4m each) is required. It is calculated to be 11.0m^2.

・Space for two large fish boxes for raw materials

A space for two large fish boxes (1.1m×1.1m) for raw materials: 5.0m^2

・Space of two large fish boxes for primary processed

A space of two large fish boxes (1.1m×1.1m) for primary processed: 5.0m^2

・Tank space

A space for a tank (1.2m×1.1m): 3.0m^2

・Passage

The width of passage is determined to 2m. Required space is calculated 2m×6.5m =13m^2.

The layout and space of Preparation Space is shown in Fig.2-6 and required space of Preparation Space is calculated as Table 2-8.

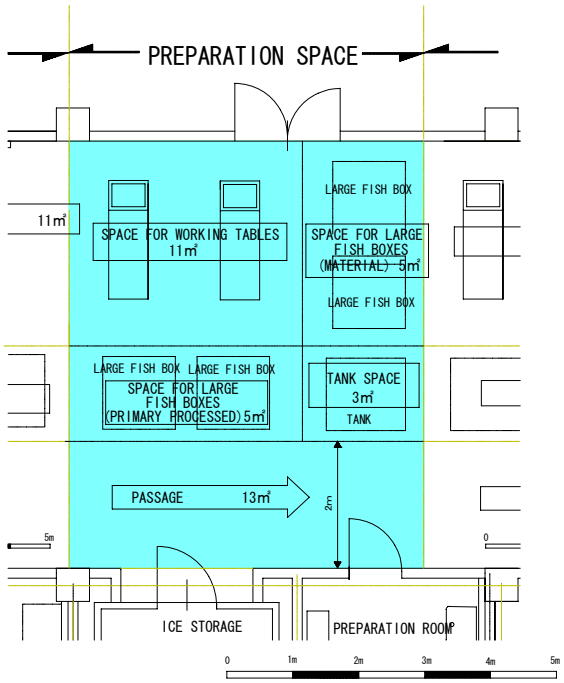


Fig. 2-6 Layout and Space of Preparation Space

Table 2-8　Space Requirements of Preparation Space

Items	Required Space (m^2)
Space for 2 working tables	Approx. 11m^2
Space for two large fish boxes for raw materials	Approx. 5m^2
Space for two large fish boxes for primary processed products	Approx. 5m^2
Tank space	Approx. 3m^2
Passage	Approx. 13m^2
Total	Approx. 37m^2

③ Processing Space

A space for primary processing work (heading, dressing, etc.) of fish of 100kg is required. Two workers process fish of 50kg each in one to two hours. Work on freezing pans (putting fish in freezing pans and extracting frozen fish from them) is done on the working table. Following spaces are required in this Processing Space.

・Space for working tables

A space for two working tables (1.8m×0.6m) and a working space (60cm wide around the table). Total space is required 11.0m^2.

・Tank space

A space of a tank (1.2m×1.1m)　3m^2

・Space of band saw

A space of a band saw (1.0m×0.6m)　3m^2

・Space of 2 large fish boxes

A space of 2 large fish boxes (1.1m×1.1m each);

one for raw materials fish and one for products　5m^2

・Space of push cart

A space of one pushcart (1.1m×1.1m)　3m^2

・Passage

The width of passage is determined to 2m. Required space is calculated　2m×6.5m =13 m^2.

The layout and space of Processing Space is shown in Fig.2-7 and required space of Processing Space is calculated as Table 2-9.

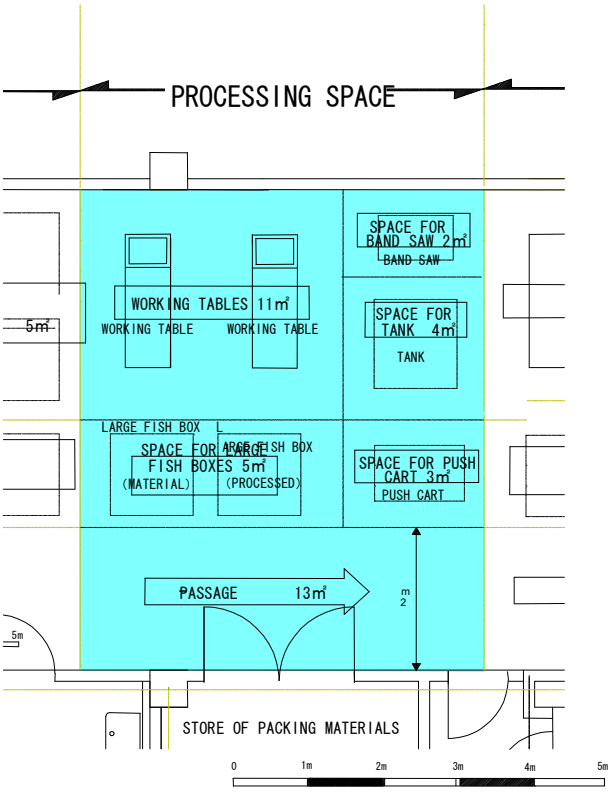


Fig. 2-7 Layout and Space of Processing Space

Table 2-9 Space Requirements of Processing Space

Items	Required Space (m^2)
Space for working tables	Approx. $11m^2$
Tank space	Approx. $3m^2$
Space of band saw	Approx. $3m^2$
Space of 2 large fish boxes	Approx. $5m^2$
Space of push cart	Approx. $3m^2$
Passage	Approx. $12m^2$
Total	Approx. $37m^2$

④ Packing Space

A space for packing frozen fish and lobsters is planned. Following spaces are required in this Packing Space.

・Space of two packing tables

A space of two packing tables (1.8m×0.6m each) plus a working space (60 cm wide around the table) is required to have a space of $13.0m^2$.

・Space for storing packing materials

A space for storing packing materials (cartons for lobsters) which are stacked on a pallet (1.1m×1.1m) is required to have a space of $4.0\ m^2$.

・Space of 2 large fish boxes

A space of 2 large fish boxes (1.1m×1.1 m each), each 570 kg capacity, 4m^2

・Space of pallet fork

A space of a pallet fork (0.8 m×0.7 m)　　2.0m^2

・Space of push cart

A space of one pushcart (1.2 m×0.75 m)　　1.6m^2

・Passage

The width of passage is determined to 2m.　Required space is calculated　2m×6m =12 m^2.

The layout and space of Packing Space is shown in Fig.2-8 and required space of Packing Space is calculated as Table 2-10.

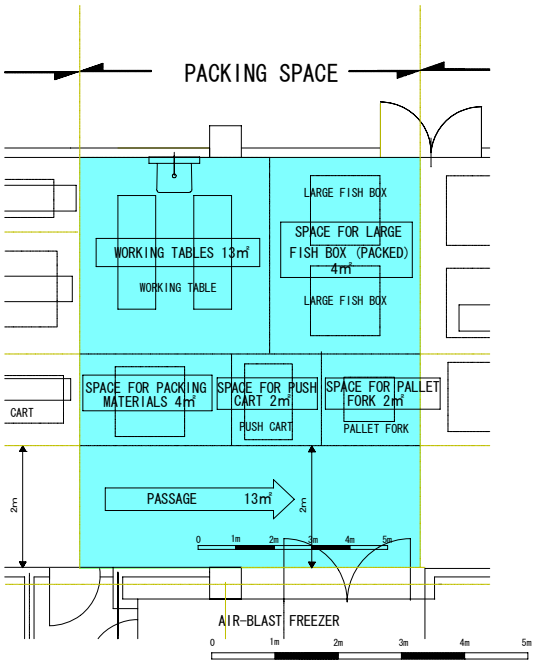


Fig. 2-8　Layout and Space of Packing Space

Table 2-10　Space Requirements of Packing Space

Items	Required Space (m^2)
Space of two packing tables	Approx. 13m^2
Space for storing packing materials	Approx. 4m^2
Space of 2 large fish boxes	Approx. 4m^2
Space of pallet fork	Approx. 2m^2
Space of push cart	Approx. 2m^2
Passage	Approx. 12m^2
Total	Approx. 37m^2

⑤ Retail Selling Corner

According to sales records of CPPL Kiritimati, annual total number to fish consumers in the Island was increased to 2,100 in 2003 from 1,000 in 2002. Retail Selling Corner is located by the Shipping space. From a hygienic point of view a direct entrance is placed so that consumers may not enter the Processing Space. Following spaces are required in this Retail Selling Corner.

・Fish Exhibition corner

Fish sales are done exhibiting fish in a chest-freezer and a large fish box. Space for a chest-freezer (1.8m×1.0m), 4 m^2 and a large fish box (1.1m×1.1m), 4m^2 are required.

・Reception space

A reception space facing outside directory is designed as a space of 8m^2.

・A space for recording

For an account and reporting of fish sales, a recording space is required to have 6m^2.

The layout and space of Retail Selling Corner is shown in Fig.2-9 and required space of Retail Selling Corner is calculated as Table 2-11.

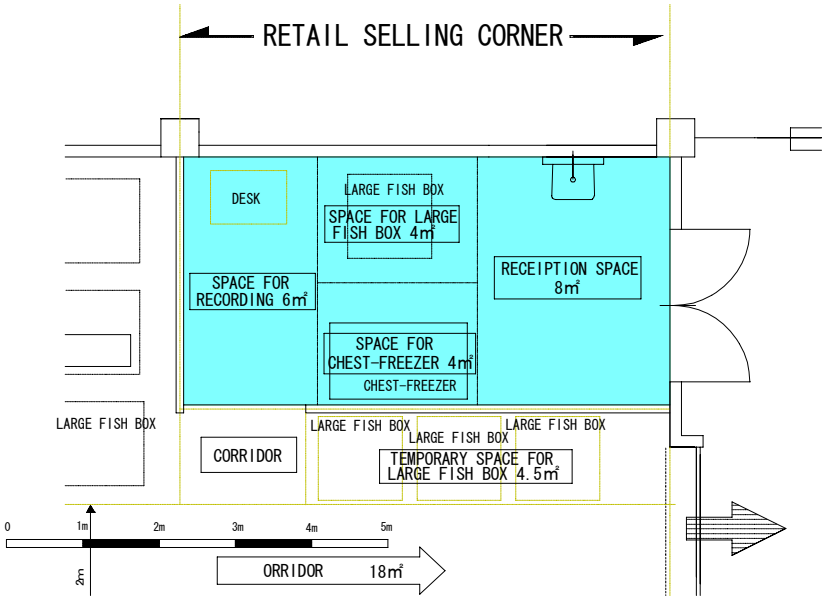


Fig. 2-9 Layout and Space of Retail Selling Corner

Table 2-11 Space Requirements of Retail Selling Corner

Items	Required Space (m^2)
Fish Exhibition corner	Approx. 4m^2+4m^2
Reception space	Approx. 6m^2
A space for recording	Approx. 8m^2
Total	Approx. 22m^2

⑥ Shipping Space

A space consisting of a place for fish boxes and a temporary lay down space of fish boxes is planned as a shipping place.

Following spaces are required in this Shipment Space.

・A space for fish boxes

A space for placing 6 large fish boxes (1.1 m×1.1 m each)　22 m^2

・A temporary space for fish boxes

At the time when fish products are transferred to a container freezer and shipment is conducted, temporary lay down space of fish boxes is required. A space for three large fish boxes (1.1m×1.1m each) is required 4 m^2.

・Passage

The width of passage is planned as 2m. Also the passage area to the retail shop of 2 m^2 is added. Required space is 20 m^2.

The layout and space of Shipping Space shown in Fig.2-10 and required space of Shipping Space is calculated as Table 2-12.

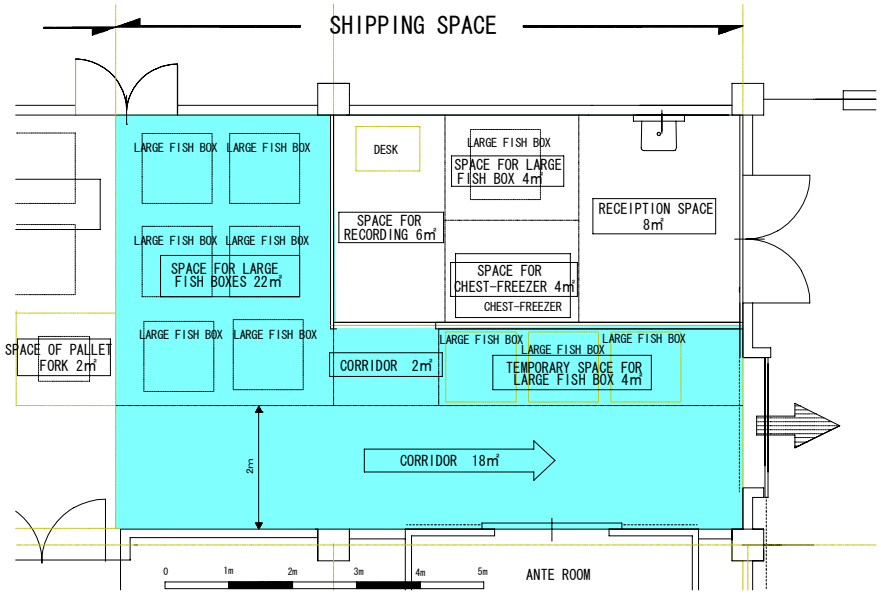


Fig. 2-10　Layout and Space of Shipping Space

Table 2-12　Space Requirement of Shipping Space

Items	Required Space (m^2)
A space for fish boxes	Approx. 22m^2
A temporary space for fish boxes	Approx.4m^2
Passage	Approx. 20m^2
Total	Approx. 46m^2

⑦ Anteroom

Workers shall wash their hands and change their boots before entering the working space. Space which two workers are able to enter together is planned. Figure 2-11 shows the layout of anteroom space and required spaces are shown in Table 2-13.

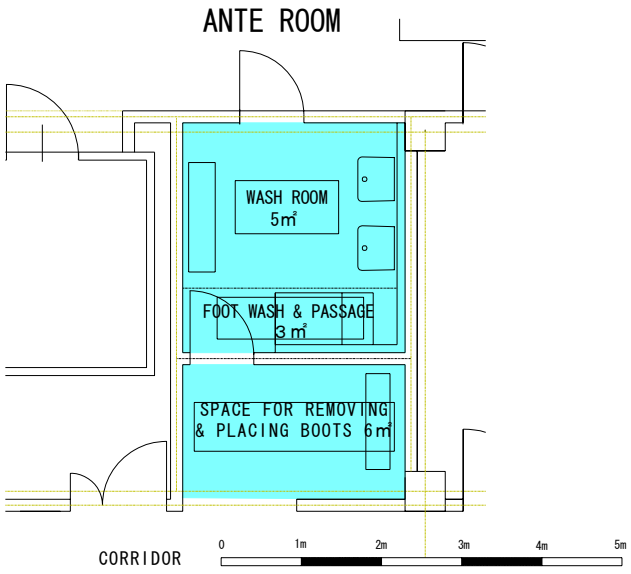


Fig. 2-11 Layout and Space of Anteroom

Table 2-13 Space Requirements of Anteroom

Items	Required Space (m^2)
Space of changing foot wares	Approx. $6m^2$
Wash room	Approx. $5m^2$
Checking space	Approx. $3m^2$
Total	Approx. $14m^2$

⑧ Store of packing materials

A space covering an area of about $16m^2$, stacking 4 piles of packing materials (1.1 m × 1.2 m) on the both side on the passage, shall be prepared to store packing materials. Following spaces are required in this Store of packing materials.

The layout and space of Store of packing materials is shown in Fig.2-12 and required space of Store of packing materials is calculated as Table 2-14.

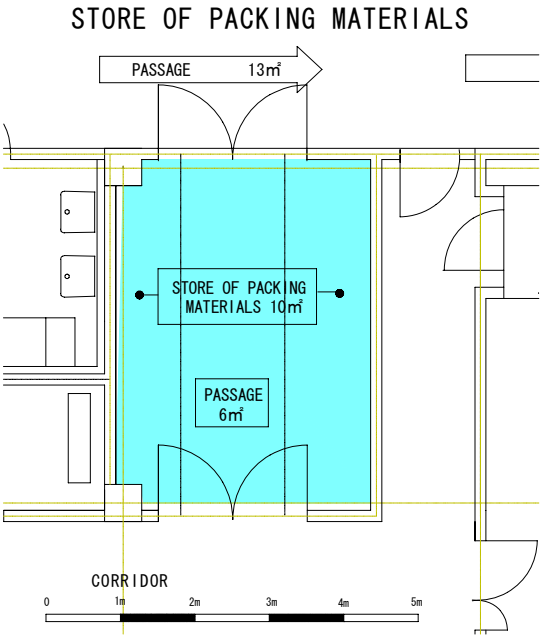


Fig. 2-12 Layout and Space of Store of Packing Materials

Table 2-14 Space Requirements of Store for Packing Materials

Items	Required Space (m^2)
Store	Approx. $10m^2$
Passage	Approx. $6m^2$
Total	Approx. $16m^2$

⑨ Locker Room

Two Locker Rooms, for male and female each, with about 8 m^2 size, permitting two persons to change their cloths together, are provided.

The layout and space of Locker Room shown in Fig.2-13 and required space of Locker Room is calculated as Table 2-15.

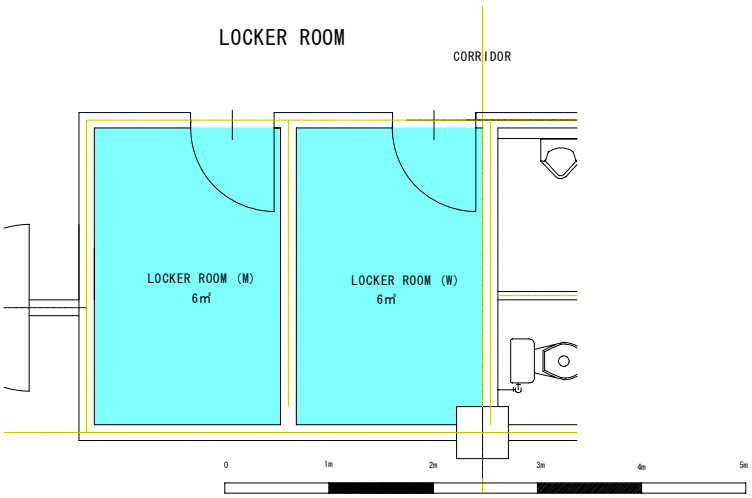


Fig. 2-13 Layout and Space of Locker Room

Table 2-15 Space Requirements of Locker Room

Items	Required Space (m^2)
Locker room for male	Approx. $8m^2$
Locker room for female	Approx. $8m^2$
Total	Approx. $16m^2$

⑩ Toilet

The number of employees of the Factory is 8 (3 women and 5 men). A toilet for men is provided with one bowl, one urinal and a mop washing sink, and a toilet for women is equipped with one bowl and a washing stand with mirror. The layout and space of Toilet shown in Fig.2-14 and required space of Toilet calculated as Table 2-16.

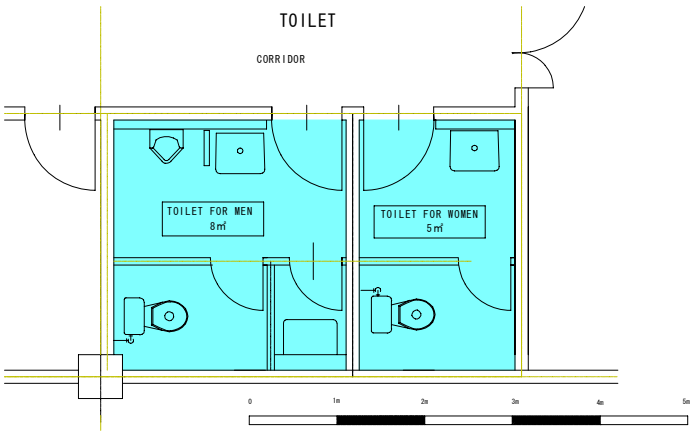


Fig. 2-14 Layout and Space of Toilet

Table 2-16 Space Requirements of Toilet

Items	Required Space (m^2)
Toilet for male	Approx. $8m^2$
Toilet for female	Approx. $5m^2$
Total	Approx. $13m^2$

⑪ Office Space

The existing fishing gear store and fishermen-waiting place are removed due to wharf renovation in part, and the existing office is to be diverted to some other purposes (fishing boat maintenance tools store, fishing gear store, and crew rest room) . An office for 5 persons (the branch manager, the chief accountant, two clerks, and the processing superintendent) shall be newly installed.

The branch manager's room shall be partitioned and is provided with an air-conditioner due to keep such office equipment as computer, copying machine, safe, etc. The rest shall be an open space with

necessary ceiling fans equipped. The required space is calculated based on the current standard. A meeting space is also provided. The total required space is 63m^2.

The layout and space of Office space shown in Fig.2-15 and required space of Office space is calculated as Table 2-17.

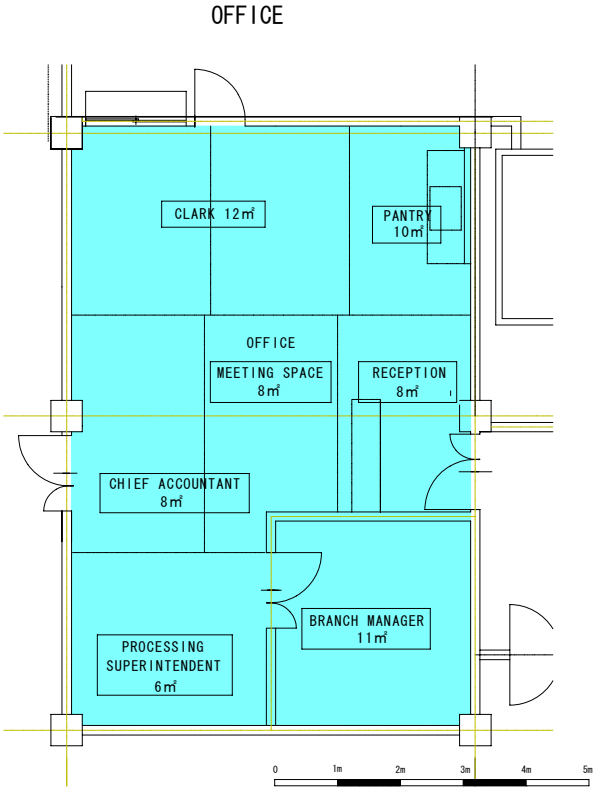


Fig. 2-15 Layout and Space of Office Space

Table 2-17 Space Requirements of Office Space

Rank	Standard Space	Number of People	Required space (m^2)
Branch manager	11	1	11
Chief accountant	8	1	8
Clerk	6	2	12
Processing superintendent	6	1	6
Reception counter	8		8
Meeting space	8	1	8
Pantry	10	1	10
Total			Approx. 63m^2

⑫ Machinery Room

A machinery room covering a space of some 87m^2 is provided. Inside the room a blast freezing machine, an engineer space at which the engineer can look over materials and records, space for controller of refrigerating machines and a space of tools and spare parts shall be provided.

The layout and space of Machinery Room is shown in Fig.2-16 and required space of Machinery Room is calculated as Table 2-18.

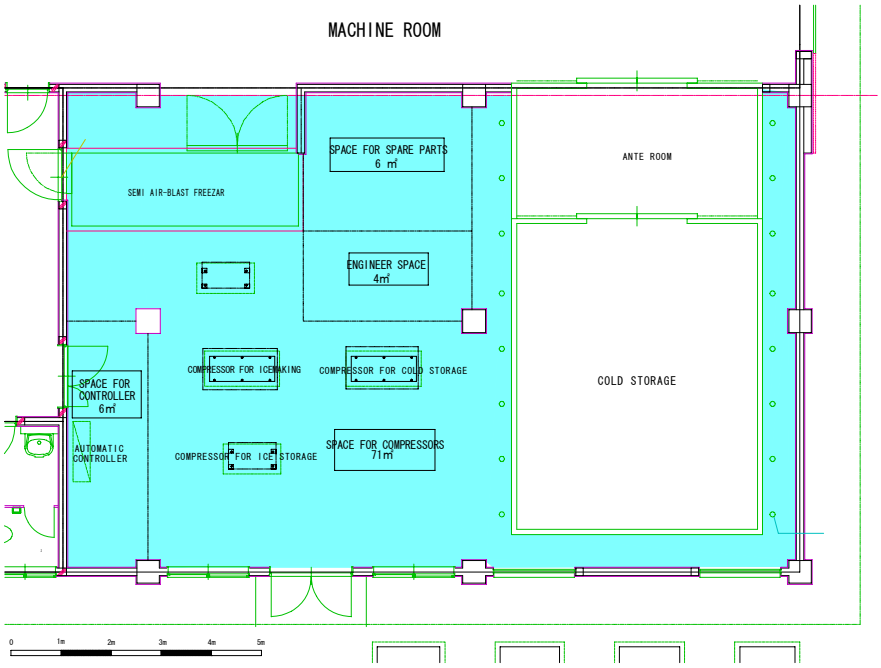


Fig. 2-16 Layout and Space of Machinery Room

Table 2-18 Space Requirements of Machinery Room

Items	Required Space (m^2)
Space of compressors Three compressors (for the ice-making machine, ice bin and freezing store) are installed. The existing semi air-blast freezer is also placed in this room	Approx. $71m^2$
Engineer Space 1 person $\times 4m^2 = 4m^2$ The size is based on the local standard.	Approx. $4m^2$
Space for control panel	Approx. $6m^2$
Space of tools, spare parts, etc. Two bottles of refrigerant $1.0m^2$ Tool shelf 1.2m×0.5m $0.6m^2$ Spare parts shelf 2.0 m×2.0 m $4.0m^2$ Total $5.6m^2$	Approx. $6m^2$
Grand Total	Approx. $87m^2$

<Meeting Hall>

A meeting hall capable of seating 20 to 30 fishermen shall be constructed. Chairs and tables shall be of stackable and movable type. Two stores, one for chairs and tables and one for fishing gear, are attached.

The layout and space of Meeting Hall shown in Fig.2-17 and required space of Meeting Hall is calculated as Table 2-19.

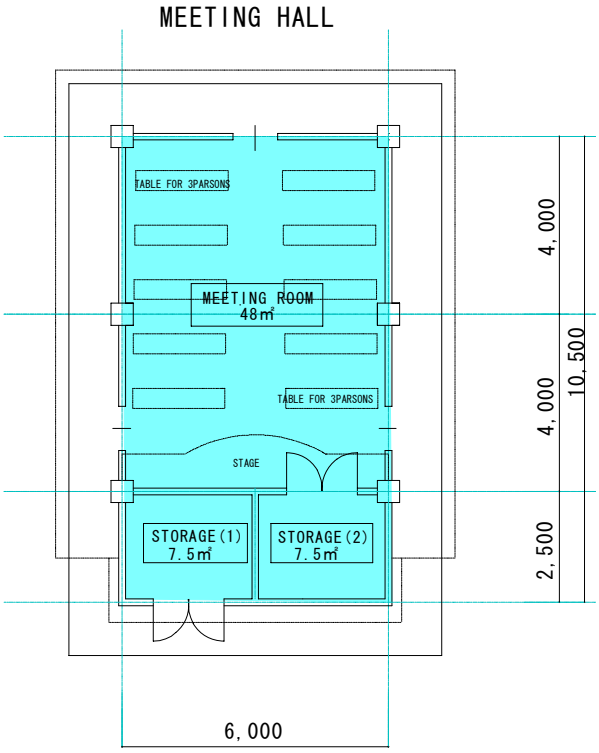


Fig. 2-17 Layout and Space of Meeting Hall

Table 2-19 Space Requirements of Meeting Hall

Items	Required Space (m^2)
Meeting room 1.6m^2/person×30 persons	Approx. 48m^2
Store (1) 7.5m^2 3 seat movable type chair/table 10 sets	Approx. 7.5m^2
Store (2) 7.5m^2 Buoys, fishing nets, etc.	Approx. 7.5m^2
Total	Approx. 63m^2

<Generator House>

In a Generator House, the existing 45KW generator and a newly supplied 60KVA with distribution switch boards and panel boards, plus an electric room in which the engineer and the night operation watchman are working for maintenance or recording, shall be installed.

The layout and space of Generator House shown in Fig.2-18 and required space of Generator House calculated as Table 2-20.

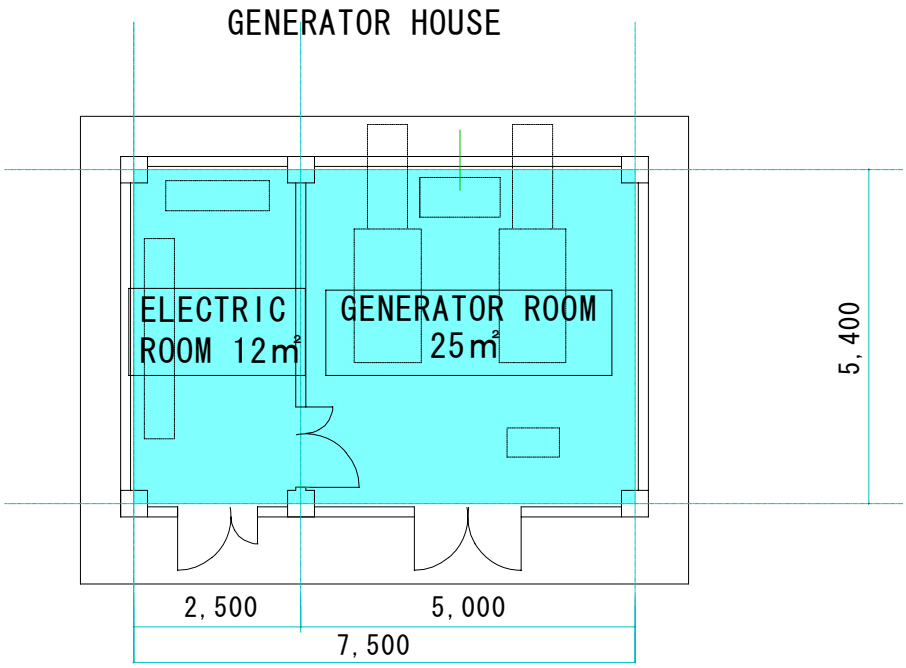


Fig. 2-18 Layout and Space of Generator House

Table 2-20 Space Requirements of Generator House

Items	Required Space (m^2)
Generator room 2 sets of generator	Approx. $25m^2$
Electric Room $7m^2$ plus a recording desk	Approx. $12m^2$
Total	Approx. $37m^2$

3) Examination of equipment

The design principle of each equipment is as follows.

3)-1 Freezing/cold storage equipment

① Cold storage

Since the catch of KIRI-5 fishing boats is landed at around 16:00 every day, the day's landing must be stored until the next morning. Keeping way of landed fish in ice preservation and in cold storage was compared and the result was as follows.

In case of ice preservation

Since landed fish was already iced on board, there is no need to cool more. When a well-insulated fish box is used for one night preservation, the ratio of weight of fish an ice required is 1 : 0.3, and thus ice of 180kg is required a night because proposed fish to be preserved is 600kg. Based on the current price of ice of AU$ 0.1/kg, the cost is calculated as follows.

600kg×0.3×AU$ 0.1/kg = AU$ 18

In case of refrigerator preservation

The electric capacity of the refrigerator to be used for preservation of fish of 600kg is some 4.0KVA/hour, and when the existing 45KVA generator with the fuel consumption of 4.5 l/hour is used, its fuel cost per KVA is calculated as follows based on the current price of fuel oil of AU$ 1.0/l.

4.5 l/hour × AU$ 1.0/l÷45 KVA= AU$ 0.1/KVA

Hence, the fuel cost of 24 hour running of 4.0 KVA/hour is

4.0 KVA/hour × AU$ 1.0×24 hour = AU$ 9.6.

Furthermore, since an average yearly maintenance cost of a refrigerator of the same size is AU$ 1,200, AU$ 1,200 ÷120 day/year = AU$ 10/day must be added to AU$ 9.6. Based on the result of cost comparison, ice preservation (AU$ 18) shall be planned, not refrigerator preservation (AU$ 19.6).

Hence, from the viewpoint of management simplifying and cost-saving, the introduction of a refrigerator is not appropriated. Received fish shall be kept in insulated boxes with ice for one night.

② Semi air blast freezer

The existing semi air blast freezer is to be used for refrigeration after relocation. The capacity of it is about 370kg of small fishes for 5 to 8 hours operation. When 6 KIRI-5 type boats are introduced by the Project, the quantity to be frozen a fishing day is 570kg, and if the catch of the “Tekokona III” is received, the handling quantity increases to 910kg. In this case, the remaining 200 - 540kg are to be subject to slow freezing in the freezing store.

Because the existing semi air-blast freezer is not capable of freezing large migratory species due to narrow space (10cm) of its piping shelves, large fishes shall be cut up in suitable size for freezing.

Examination of the newly requested air blast freezer

In the Project decreasing of operation/maintenance cost is an important theme. Any component which will produce a new operation/maintenance cost shall be rejected unless it is essential to the Project. Slow freezing products of Kiritimati Island have been sold at Tarawa immediately after transportation from the Island without trouble on quality. Also since Kiritimati Island is a remote island it is difficult to arrange maintenance parts when necessary. The requested air blast freezer therefore shall be cancelled in the Project.

③ Freezing store

Since the existing freezing container (store) is made on an assumption that frozen products are loaded in at one time and carried with keeping a certain temperature, it is impossible to deal with a sudden change in temperature due to large heat loss caused by the wider opening. Also since the capacity of the freezing machine is at the minimum level, in case products are getting in and out the container daily the freezing machine makes frequently trouble due to overload, and electric charges will increase. Hence, a

freezing store capable of keeping 12 ton of frozen products (collected quantity of fish for shipment) shall be planned. This freezing store shall be used for slow freezing of such large fish as tuna unable to handle by the existing semi air-blast freezer. For this purpose a lorry for slow freezing is to be placed near the opening, and loading work to the lorry shall be made at a newly prepared anteroom.

From the space-saving point of view, products are stacked in bags (locally available, 30kg capacity) in the store. Products are carried to the wharf in fish boxes for shipment.

Design

Space of the anteroom for packing work of frozen products and loading work to the lorry shall cover an area of 13.5 m^2 (2.7 m×5.0 m). In order to reduce the cooling load in the freezing corner caused by the flow of warm air as well as to prevent cooling efficiency from decreasing caused by icing with moisture, a cooling equipment for dehymidification purpose shall be planned.

A space capable of stacking 12 ton products within 1m high, the maximum height that man can give a 30kg bag a lift, is 31.5m^2, and its dimensions are designed as the Fig. 2-19 shows, 5.0m×6.3m. Its indoor temperature shall be -25℃ so that freezing products can be kept in good condition less than -18℃.

From the energy-saving point of view, the electric capacity to the store shall be less than 11KVA of the existing container.

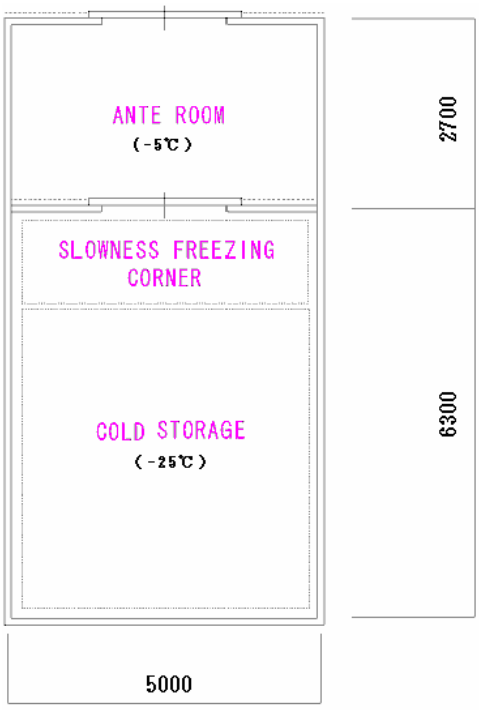


Fig. 2-19 Stacking in Freezing Store

④ Ice-making machine and Ice-bin

The main business of the Project is to produce frozen products for Tarawa with 600 kg of fish received daily. To keep freshness of material fish for frozen product maintaining low temperature of the

fish by using ice is necessary. Therefore ice-making machine and ice bin shall be introduced. Ice will be used for loading fish boats and for cooling landed fish. Required volume of ice and capacity of ice bin are estimated as follows.

In the tropical waters the ratio of required volume of ice to fish weight to be quickly cooled is 1:1. The current consumption of ice on board a KIRI-5 boat is 100kg/day. Total required quantity of ice for fishing boats therefore is 100kg/day×6 boats = 600kg/day.

All fishing boats of Kiritimati Island operate usually only in daytime and land their catch in evening. Landed catch is weighed immediately after landing, but to avoid rise of temperature of fish body while waiting, total 60 kg of ice, 5 kg a fish box of 50 kg capacity, are necessary.

Since freezing work is conducted next day, weighed catch must be kept large cooling fish boxes after sorting during night. For this preservation purpose 180 kg of ice is required for 600 kg catch (fish: ice = 1:0.3). Processing/freezing work is conducted for each 50 kg capacity fish box, and to prevent fish from deterioration during working hour 60 kg of covering ice are required (5 kg of ice for 50 kg capacity fish box each are required and total number of boxes is 12).

Washing water before processing or freezing must be lowered from 28 ℃(seawater temperature) to 0 ℃ by using ice. Required volume of water is 500 l (500 kg). In order to cool this volume of water 175 kg of ice, (500 kg ×28 ℃) ÷80 Kcal/kg (Specific heat of ice), shall be planned.

Daily required volume of ice is calculated at 1.2 tons as shown in Table 2-21, 600 kg for fishing boats, 475 kg for covering during weighing, sorting, and overnight preservation, plus 100 kg for local selling.

Table 2-21 Required Quantity of Ice

Usage	Quantity of Ice
For preservation on board	600kg
Covering from landing to processing	475kg
Local selling	100kg
Total	1,175kg

An ice-making machine capable of producing ice of 1.5t/day able to deal with fluctuation of catch is designed. Surplus will sell actively to local fishers. Ice shall be of plate ice type due to unmeltability and easy handling.

An ice bin capable of storing 3 tons, 2 days production, is planned because, adding to the above mentioned volume, ice for cultured Milk fish landing and fluctuation of demand of ice is expected. The ice bin shall be of the integrated type to reduce loss of produced ice.

3)-2 Generator

① Utilization plan of generator

The power plant at Ronton area is supplying power all through the day, but its 250KVA generator is running always at a load of 80% to 90%, having no remaining power. Existing chilled storage, freezing store, ice-making machine and container freezer in CPPL Kiritimati rely on above public power. When public demand exceeds the capacity of the Ronton power plant, CPPL Kiritimati are requested to stop some of their machinery. Among the existing facilities of CPPL Kiritimati facilities, therefore, the semi air-blast freezer introduced in 2003 is equipped with an independent 45KVA generator. Thus the proposed facilities and equipment must be operated through independent power generation. Table 2-22 below shows required electric power of the Project.

Table 2-22 Required Electric Power of Equipment

(unit : KVA)

Equipment	16 hours/day running during collection of fish	8 hours/day for freezing (maximum operation)	Waiting for shipment	After shipment
Ice-making machine	26.5	26.5		
Ice bin	4.0	4.0		
Existing semi air-blast freezer		26.2		
Freezing store	9.6	9.6	9.6	
Freezing container			11.1	
Lighting	2.0	2.0	2.0	
Outlet (including power outlet)	4.5	4.5	4.5	4.5
Total	46.6	72.8	27.2	4.5
		46.3 In case ice-making machine stopped		

Among the machinery the following equipment is ordinary used during collecting fish.

② Standing generator during collecting fish

The refrigerating equipment requires starting power when it start in addition to the running power. The freezing store uses the maximum electricity among them, requiring running power of 9.6KVA and starting power of 19.6KVA. Hence, a standing generator capable of producing some 10KVA, more than running power of 9.6KVA, is necessary.

A generator capable of generating power of 46.6KVA ＋10KVA = 56.6KVA, that is a 60KVA type generator, is provided accordingly. The existing semi air blast freezer is to be operated with the existing 45KVA generator as before.

4) Sectional Plan

The sectional plan of the facilities has a close relation with ventilation, lighting, and insulation.

The Handling Place for fishery products shall have no air-conditioning system except the office from the energy-saving point of view. An insect control method is of importance because the Place handles food stuffs; all openings shall be equipped with mosquito nets. An adequate opening is placed on the east side of the building, and a small roof for ventilation is installed on the top of the roof. An opening is also placed on the west side of the Place so that ventilation in the building may become well. The eaves height of the Place shall be 3.3m to insure a suitable space of execution of works under the beam because the height of prefabricated insulated panels to be installed at the freezing facilities is 2.5m.

5) Structural Plan

The following points are given consideration in the structural plan.

- Since a lot of water will be used for processing and handling of fish and cleanup of equipment in the production space, a washable structure shall be applied.
- A structure suitable to high temperature and humidity, strong against salt damage, and suitable to the nature of soil shall be applied.
- A structure to allow easy maintenance shall be applied.
- Local availability of equipment and materials shall be considered.

In Kiritimati Island, public buildings have generally RC pillars, beams, foundation, concrete block stuck walls, and galvanized sheet iron roofing on wooden roof truss. Besides, steel frame construction with galvanized metal sheet wall and roof is found.

The structural plan of the Fish Handling Building shall be of RC foundation, pillars, and beams, and aluminum corrugated sheet roofing on wooden roof truss.

① Construction standard

There are no sound regulations and standards regarding construction and designing in Kiribati. Design and Construction method for all of public facilities, private houses, and buildings for business are examined and inspected by the PWD each time, which the light of referring to foreign regulations and standards independently.

The Project shall follow the regulations and design standards of Japan, adjusting them reasonably based on natural conditions of Kiribati having no earthquakes and storms.

② Design load

- live load:

Production space:	10 KN/m^2
Office:	3 KN/m^2
Toilet:	5 KN/m^2

- Wind load:

Since the proposed building is of one-story construction, a wind pressure for an average of wind velocity

of 35m/sec for 10 minutes at a position 10m high, q = 2.2 kN/m^2

Each coefficient is used according to the guide line of The Ministry of Land, Infrastructure and Transportation, Japan Building Center.

As an exposure coefficient, a value 1.2 times general value, Cf = 1.2, is used because the shape of the building is a rectangle.

According to these values the wind load of wall and roof windward is calculated to be 2 kN/m^2.

- Earthquake load

Based on the Japan's regulation, a zone coefficient Z = 0.5 is used. The minimum value in Japan is o.7 of Okinawa Prefecture, and further deduction of 0.2 is suitable for Kiritimati Island having no earthquake. A story-shearing force coefficient Co = 0.2 is used because the building is one-story house of RC rigid frame structure.

③ Foundation

The geological formation of the Project site is uniform and the soil is also homogeneous.

Surface to 20cm: coral sand mixed with gravel, tight N = 5 to 20

5cm to 40cm: coral sand mixed with gravel, very tight N = 10 to 50

30cm to 1.5m over: rounded stone and gravel, very dense N value is not available.

Based on these values a bearing capacity of the soil of 340 KN/m^2over was confirmed between the surface and 30cm over deep. The proposed facility of the Project requires the bearing capacity of the soil of 50KN/m^2 due to one-story building. Foundation shall be of continuous footing.

④ Conditions of structural materials

Main structural materials are as follows.

Concrete :	FC 18 – 21 N/mm^2
Reinforcing bar :	SD 295 (thin D10 - D 16)
	SD 345 (thick D19 - D 25)
Reinforcing plate :	SS 400
Bolt :	SS 400

6) Equipment Plan

6)-1 Electric Equipment

a) Outlet

Though business hours of the Handling Place are almost daytime, lighting at places far away windows and lighting in part during cloudy weather are necessary. From the energy-saving viewpoint wiring shall be made for each wiring group corresponding the distance from windows. Lighting of each room is as follows.

Production space : 300 lux

Locker room, Passage : 200 lux

Office, ordinary rooms : 300 lux

b) Powering Equipment

Power to the ice-making machine/ice bin, freezing equipment, and freezing store are supplied by generators.

c) Telephone

Telephone wire piping is installed to the Office Room.

6)-2 Water supplying equipment

A tank receiving rainwater from the roof through eaves gutters shall be installed. Water is distributed to each room from this tank with a pressure pump. Public water service is utilized in case of shortage of rainwater.

6)-3 Drainage Equipment

Side ditches in the preparation space, processing space, packing space, and handling space shall be made of concrete, being covered with stainless steel grating. Both ends of the bottom of ditch is given a curved surface with 30mm semi diameter for ease of cleaning. Water gradient shall be about 1/75 based on local execution ability. The drainage basin shall be covered with a stainless steel trash basket to reduce a load of the septic tank.

6)-4 Air-condition/Ventilation Equipment

a) Air-condition (cooling) Equipment

The branch manager's office ($10m^2$) shall be equipped with the separate type air-conditioner to prevent damage by the salt in sea air. Other spaces in the office shall be installed ceiling fans.

b) Ventilation

The room without the product space shall be equipped with ventilating fans.

6)-5 Fire-extinguishing Equipment

The heat sensing equipment and necessary wiring and piping shall be provided in the spaces of the Fish Handling Building, the Meeting Hall, and the Generator House, and a fire alarm shall be installed in the Office in the Fish Handling Building. Furthermore, another fire alarm is required in the Meeting Hall because fishermen use frequently it for meeting or repairing fishing gear after usual office hours.

7) Building Materials Plan

① Roof

In Kiritimati Island corrugated sheets of galvanized sheet iron are generally used for roofing. They

have resistance against salt-damage in some degree, but the serviceable life is as short as 4 to 5 years due to rain leaking caused by rusty bolts and needles. The Project shall apply aluminum corrugated sheet having resistance against salt-damage and ultraviolet ray. Heat insulation shall be treated to the Handling Place.

② Exterior Finishing

Pillars, beam frames, and parts of concrete block mortar finish together shall be painted with synthetic resin emulsion paint after primer coating by virtue of easy maintenance and economic efficiency.

③ Interior Finishing

a) Floor

Epoxy resin coating, durable and cleaning-easy, is applied on the floors of the production spaces and the entrances. At the corner of floor and wall, the rise shall be curved with 30mm semi diameter to keep cleanness. The floors of other parts such as Office, Locker rooms and Anteroom are covered with length vinyl sheet in view of easy cleaning.

b) Ceiling/Wall Finishing

The ceiling and wall of the production spaces of the Handling Place shall be finished with hardly stained, cleaning-easy, water proof backing and coating as seen in the following Table 2-23.

Table 2-23 Interior Finish

	Room and space	Floor	Baseboard	Wall	Ceiling	Remark
Fish Handling Building	1. Production Space					
	Handling space	Concrete trowel, epoxy resin paint	Mortar trowel, epoxy resin paint	(under beam) Mortar trowel, acrylic resin paint (on beam) Calcium silicate board, acrylic resin paint	Acrylic resin paint	Plastic curtain
	Preparation space	Ditto	Ditto	Ditto	Ditto	Working table with sink×2
	Processing space	Ditto	Ditto	Ditto	Ditto	Working table
	Packing space	Ditto	Ditto	Ditto	Ditto	Packing table×2
	Shipping space	Ditto	Ditto	Ditto	Ditto	Plastic curtain
	Retail selling corner	Ditto	Ditto	Ditto	Ditto	Chest freezer
	2. Anteroom	Concrete trowel, epoxy resin paint	Mortar trowel, epoxy resin paint	Mortar trowel, acrylic resin paint	Calcium silicate board, acrylic resin paint	Locker/shoe box, wash basin, foot washing place, mirror
	3. Packing materials store	Concrete trowel, vinyl sheet coating	Vinyl baseboard	Mortar trowel, acrylic resin paint	Calcium silicate board, acrylic resin paint	Steel shelf
	4. Locker rooms	Ditto	Ditto	Ditto	Ditto	Steel shelf×5
	5. Toilet	50×50mm Mosaic tile	150×150mm Ceramic tile	150×150mm Ceramic tile	Calcium silicate board, acrylic resin paint	

	Room and space	Floor	Baseboard	Wall	Ceiling	Remark
Fish Handling Building	6. Office	Concrete trowel, vinyl sheet	Vinyl baseboard	Mortar trowel, synthetic resin emulsion paint	Calcium silicate board, acrylic resin paint	
	7. Manager room	Ditto	Ditto	Ditto	Ditto	Air conditioner
	8. Machinery room	Concrete trowel		Mortar trowel, synthetic resin emulsion paint	Calcium silicate board, synthetic emulsion paint	Machinery base, pipe rack
	9. Entrance hall, passage	Concrete trowel, vinyl sheet	Vinyl baseboard	Mortar trowel, synthetic resin emulsion paint	Calcium silicate board, synthetic resin emulsion paint	
	10. Refrigerating equipment space, Cold storage, Ice bin, Freezing system Freezing store	Concrete trowel			Calcium silicate board, synthetic resin emulsion paint	Prefabricated insulation panel, pipe rack
Meeting Hall						
	1. Meeting room	Concrete trowel	Concrete trowel	(pillar frame) Natural stone (beam frame) Mortar trowel, synthetic resin emulsion paint	Slab roofing	Stacking table×10, stacking chair×30, lectern, white board (2m)
	2. Store (1) (2)	Concrete trowel	Concrete trowel	Mortar trowel, synthetic resin emulsion paint	Calcium silicate board, synthetic resin emulsion paint	
Generator House						
	1. Electric room	Concrete trowel	Concrete trowel	Mortar trowel, synthetic resin emulsion paint	Slab roofing	
	2. Generator room	Concrete trowel	Concrete trowel	Mortar trowel, synthetic resin emulsion paint	Roofing slab	

8) Other Equipment

① Rainwater receiving tank

The amount of rainfall rather fluctuates in Kiritimati Island. A monthly rainfall of 980mm was recorded in a rainy season (2002 April), while an annual rainfall of 843mm (2000) was experienced. Water supply depends upon lens water (gathered in the ground through penetration), which is threatened with drying up by lavish spending. Utilization of rainwater therefore shall be prior to public water service, which is utilized only when rainwater is scarce. A 45 ton type rainwater receiving tank (stainless steel) shall be installed to collect rainwater from the roof of the Fish Handling Building, and a system capable of using the public water service in case the water volume in the tank lowers to less than 10 tons shall be provided. About 40 tons of rainwater will be collected a month when the Handling Place roofing area of some 660m^2 receives a monthly rainfall of 70mm, allowing to consume water of some 1.3 ton daily.

② Parking lot

For an existing transportation vehicle, a truck with crane and winch and 5 vehicles of workers of

CPPL Kiritimati, a parking lot shall be provided on the west side of the Fish Handling Building, between the Meeting Hall and the Generator House. The parking lot for 7 vehicles, not-paved, shall be bordered with concrete block.

③ Place to leave fish wastes

A place, 2.5m×1.0m, where fish wastes collected from side ditches of the Handling Place are kept until they are dumped to a public garbage area shall be provided.

④ Pavement

The road from the slipway to the delivery entrance of the Fish Handling Building shall be paved with concrete due to easy transportation.

⑤ Septic tank

In Kiritimati Island, Public water relies on the lens water under the ground. There is no public drainage system in Kiritimati Island. Waste water come from public facilities in the island is treated with simple septic tank, and sank in to the ground. Since the Water quality is not enough good to waste into the ground strait, risky to pollute lens water. Direct discharge of easy treated waste water must invite marine pollution, sinse the seashore of the Project site faces the lagoon, in which seawater circulation is very poor. A septic tank system shall be provided to treat wastewater from the premise.

The total volume and usage of fresh water are as follows.

Water for ice-making :	1.1ton
Water for Floor wash :	1.0ton
Water for primary processing of fish :	0.5ton
Water for workers in CPPL	0.2ton
Total	2.8ton

Objective volume of wastewater to be treated is 2.2ton, avoiding the volume of fisherman's ice 0.6ton used on the sea. The original wastewater is supposed to contain BOD.6000mg/L. Aimed water quality after treatment should be BOD.200mg/L.

Peak coefficient of 3.0 shall be applied because drainage will concentrate in operation hours (8 hours) of the Handling Place (24 hours÷8 hours = 3.0). If its operation is made for 24 hours the inflow to the septic tank is 2.2 ton÷24 hours =0.09 ton/hour, but since the operation will be concentrated in 8 hours, the proposed capacity of the system shall be 0.09 ton/hour×3.0 =0.27 ton/hour.

Well-specified FRP unit typed septic tank should be provided.

⑥ Fuel Oil Tank

At Kiritimati Island fuel oil is generally delivered by the KOIL's truck once a week. A three ton type fuel oil tank capable of storing fuel oil for one week or half a week requirement shall be provided.

2-2-2-4 Equipment/Material Plan

(1) Provision of the equipment and materials

The equipment and materials to be provided in the Project shall be utilized for fishing activities and transportation in and around the Project site and Kiritimati Island.

(2) Power specifications

The specifications of outlet contain Australia and US specifications. In accordance with the present electric wiring system in Kiritimati Island, both systems are used. Power will be supplied as follows.

Source: 3 phase, 415V, 4 wires, 50Hz
Single phase 220V, 3 wires, 50Hz
Single phase 110V, 3 wires, 50Hz (through transformer of the switchboard)

(3) Procurement and stock of spare parts

No sales agent is available in Kiritimati Island. All spare parts are imported from Tarawa or Honolulu, taking 2 to 4 months usually, or 6 months sometimes. In order to prevent troubles spare parts necessary for usual maintenance and inspection must be procured together with the equipment itself, and then CPPL Kiritimati has to maintain the supply system.

(4) Basic Design of the equipment and materials

1) KIRI-5 type fishing boat

In order to develop the fishery outside reef of Kiritimati Island it is necessary to strengthen the fishing feet. Proposed 4 fishing boats will be leased to 4 groups of 4 fishing villages and their catches are bought by CPPL Kiritimati. The rent for the boat shall be deposited as counterpart fund. The boat of this type spreads most in Kiribati as canoe suitable for coastal fishing and fishermen have much experience in its handling.

Scale and Specifications :

The legal equipment for coastal fishing boat stipulated by the International Maritime Organization (IMO) shall be provided. Moreover, besides the main 40 HP outboard engine a 25 HP outboard engine in reserve shall be taken on board for safety at sea. A water-tight type VHF radio shall be provided for communication with other boats and CPPL Kiritimati and for emergency. At present the 16 Channel is assigned to FD and CPPL for fisheries use. Instead of the requested 200 L fish box, two insulated fish boxes (100L capacity each), easy manhandling, shall be provided to keep the catch on board.

One set of special tools for disassembly, a propeller in reserve, propeller nuts, nut pins, V belts, throttle wires, etc. shall be supplied.

Since the procurement of spare parts takes as long period as 2 to 4 months, such parts as gaskets, spare carburetors, and cooling water impellers, shall be supplied as an initial stockpile, and a stock system

capable of supplying spare parts when necessary shall be planned..

The boat will be moored at the revetment before the premise after returning to Ronton harbor, when her VHF radio, legal equipment, spare parts, etc. are taken charge of CPPL Kiritimati until leaving for fishing in the next morning. For four villages 4 boats shall be supplied.

2) Processing Table

A processing table for gutting after washing in the preparation space shall be planned. Handling volume is 100 kg migratory fish among landed 600 kg of fish daily. Four tables, each for 2 workers, shall be supplied.

3) Packing machine

At present strapping work is made by hand, and because of its working frequency it is judged that there is no need to introduce an automatic strapping machine. However, two working tables around which two persons can work shall be provided due to local unavailability. On these tables such work as pulling frozen products out of freezing pans and packing lobsters into boxes is conducted.

4) Vacuum sealer

It is judged that there is no need to introduce of a vacuum sealer due to its frequency in use and expensive packing materials (AU$ 0.2/sheet).

5) Band saw

One unit of band saw will be necessary for cutting up heads and bodies of large species for putting them in freezer or cooking by small household pots. Two kinds of edge, one for fresh fish and one for frozen tuna heads, shall be supplied with two edges in reserve. The main part shall be made of washable and anti-rusting stainless steel. Introduction of a band saw makes it possible to reduce working hours for cutting up frozen heads and bodies one third. The cost of the unit will be electricity rates of 1KW/hour plus prices of the edge exchanging once a year (AU$ 200).

6) Weighing platform

One accurate weighting machine is necessary for weighing fish and ice. A washable and anti-rusting stainless steel-made weighing platform measurable 150 kg with digital display of pound and kilogram shall be placed in the Handling Space.

7) Reservation box of lobster

This item was cancelled due to easy availability locally.

8) Cleaning tools

Instead of a high pressure cleaning machine using water in large quantities, a set of cleaning tools

including a hose, nozzle, hose reel, scrapers, bushes, etc. shall be supplied.

The hose, 20m long, equipped with a handgrip to stop water and the reel adjustable the length of hose are provided.

9) Transport equipment

① Truck with crane and front winch

A truck mounted a crane shall be provided for transporting products to the harbor, carrying milkfish from the culture ponds, hauling fishing boats up on the slipway, and delivery work in Island. Also a winch necessary for the loading and unloading of products and hauling boats up on the slipway shall be provided. The specifications of the crane, winch, and truck body are as follows.

Crane :

In handling fish boxes weighing 420kg (350kg of fish plus 70kg of box), a two ton crane of maximum load of 400kg is short of capacity due to its working radius of 5m. A 2.6 ton crane capable of lifting 0.5 ton load distanced 5 m is planned.

Front winch:

In order to haul up a lifting lorry on the slipway a front winch shall be mounted on the truck. The lifting load of the lorry (platform) is 0.6 ton to 0.8 ton, and a 1.6 ton capacity type front winch is applied in view of safety.

Truck body:

Selection of a truck body was made with reference to a capacity capable of loading and operating the above-mentioned crane and winch plus efficiency of carriage of fish boxes. As a result, a 4 ton type capable of loading 12 empty fish boxes, double column of double line of 3 boxes, or 10 loaded fish boxes weighing about 4 tons shall be designed.

The specifications of the crane track is as follows.

- Chassis: 4.8m long
- Front winch: stainless steel, 2 ton/m, lifting capacity - 3 ton maximum, 12mm wire, 4 side roller

Spare parts of the engine and crane are not prepared because these machinery is a multipurpose thing and available from neighboring countries.

② Pushcart and others

a. Pushcart

One pushcart is necessary for such various works as transport of fish boxes and ice indoors and delivery of catches and ice outdoor. Periodical lubrication and exchange of tires once 2 to 3 years are required for maintenance.

b. Pallet fork

A pallet fork capable of carrying a fish box of 420kg, 350kg of fish plus 70kg of box itself, is designed. For this purpose a 500kg type pallet, hand-operated and stainless steel-made, shall be supplied. Maintenance similar to the pushcart is required.

c. Fish box (50kg capacity)

For handling fish in the handling space 50kg capacity small fish boxes are designed. Required number is calculated to be 8 boxes at maximum as follows.

For handling space	before weighing	for 2 boats: 100kg/boat×2 boats	4 boxes
For handling Space	After weighing	(temporarily keeping)	2 boxes
After sorting	for migratory species and reef fish each		2 boxes
	Total		8 boxes

Besides, other 2 boxes for fish refuse are used in the processing space and total 10 fish boxes shall be provided. Its size is 80-85cm×40-45cm×30-35cm, about 100 L capacity.

d. Insulated fish box (350kg capacity)

Large insulated fish boxes used for preservation of fresh fish in the Handling Place and transport of products to the CPPL refrigeration vessel “Moamoa” are designed. Total 10 boxes, a capacity of the 4 ton truck, shall be supplied.

e. Water tank lorry

Washing iced fish with public service water of such high temperature as 28℃ causes a sudden rise of temperature of fish, and thus must be avoided in view of maintenance of quality. A water tank lorry to produce iced water for washing fish is designed. The tank with a drain cock, 1.1m×1.0m×0.9m in size, shall be placed on the lorry equipped with wheels. Because the gradient of the floor in the Handling Place is as slow as 1/75, a simple break is enough to stop the lorry naturally.

10) Truck with hood

Since the crane track can be also used for delivery work, the necessity of this vehicle is not high. This item shall be not included in the Project.

11) Chest freezer

The number of small buyers increased to 2,100 people in 2003 from about 1,000 people in 2002, and thus a chest freezer is necessary to address these increasing customers for home consumption. Chest freezer is planed for its convenience of keeping and handling small quantity of fish. Comparing to operating the cold room, chest freezer uses less energy and local fish selling is possible throughout the whole year. A chest freezer capable of keeping one day distribution (200-300kg) of fish is designed, and the over 600L type able to accommodate smaller tuna whole shall be supplied. Required running cost is about AU$430 in case of the public power service, but when the generator is running its surplus power is sufficient to run it.

Specifications of chest type freezer

Temperature: -20℃

Capacity: More than 600L

Source: Single phase, 240V, 50Hz

12) Precautions against the cold

Precautions against the cold are necessary for working in the freezing store, whose indoor temperature is as low as -25℃. Winter clothes, winter headgears, winter gloves and winter boots for three workers are provided.

13) Tables / Chairs in the Meeting Hall

Since there is no proper meeting place at present various meetings of CPPL Kiritimati are held in its workshop, narrow, ill-ventilated, and, in particular, inconvenience to writing. Usually 20 to 30 people are present at meetings, lectures, and briefings held by the Fisheries Division. Ten tables of three abreast type and thirty chairs shall be provided. They are of stackable and movable type and stored in the store adjoining the Meeting Hall.

5) List of equipment and materials

The equipment and materials to be provided or installed are shown in Table 2-24.

Table 2-24 Equipment Plan

No.		Items	Requested Quantity	Additional Request	Planned Quantity	Installation							
								Inside					
						Sea	Outdoor	Handling Place	Processing Space	Office	Meeting Hall	Store	Machinery House
1	KIRI-5 type fishing boat												
	1-1	Hull	4		4	4							
	1-2	Outboard engine and spare parts	4		4	4							
	1-3	Outboard engine in reserve	4		4	4							
	1-4	VHF	4		4	4							
	1-5	Legal equipment	4		4	4							
	1-6	Insulated box	4		4	4							
	1-7	Maintenance tools for outboard engine	-	-	1								1
2	Processing table												
	2-1	Processing table A	2		2			2					
	2-2	Processing table B	2		2			2					
3	3-1	Packing machine	1		0								
	3-2	Packing table	-		2			2					
4	Vacuum sealer		-	1	0								
5	Band saw		-	1	1				1				
6	Weighing platform		1		1				1				
7	Preservation box of lobster		1		0								
8	8-1	High pressure cleaning machine	1		1							1	
	8-2	Cleaning tools											
9	Transport equipment												
	9-1	Truck with crane	1		1		1						
	9-2	Pushcart and fish box	1										
	①	Dolly			1				1				
	②	Pallet fork			1				1				
	③	Insulated fish box (350kg)			10				10				
	④	Fish box (50kg)			10				10				
	⑤	Water tank lorry			1			1					
10	Equipment for sales												
	10-1	Truck with hood	1		0								
11	Chest freezer		-	1	1				1				
12	Winter clothes			3	3				3				
13	Meeting room: Table Chair			 10 30	 10 30						 10 30		

2-2-3 Basic Design

2-2-3-1 Basic Design

After the examination in Japan, Basic Design of facilities, equipment and materials of the project are as shown in Table 2-25.

Table 2-25 Basic Design

Items	Contents	Quantity	Remarks
1. Marine civil engineering facility			
1-1 Slipway, Revetment	Renovation of existing slipway (ramp) Repair of revetment in part	Complete	
2. Building facility			
2-1 Handling Place for fishery products	Delivery, Preparation, Processing, Packing, Shipment, Retail Selling, Office, Changing Room, Anteroom, Toilet, Machinery Room, Refrigeration Equipment Room	Complete	
2-2 Generator House	Generator 2 units	Complete	
2-3 Meeting Hall	30 persons 2 stores for chair/table and fishing gear	Complete	
2-4 Drainage equipment		Complete	
3. Equipment/ Machinery for Facility			
3-1 Refrigeration equipment			
① Existing semi air blast freezer	370kg/5-8 hr (real)	Complete	Relocation
② Freezing store	45m^2 (including ante room 13.5 m^2)	Complete	
③ Ice-making machine	1.5t/day Ice bin : 3t	Complete	
3-2 Generator			
① 60KVA	60KVA 3 phase, 415V, 50Hz	Complete	Newly-supplied
② Existing 45KVA unit	Relocation of existing unit	Complete	Relocation
3-3 Septic tank	2.2t/day	Complete	
3-4 Water tank	Rainwater, 45 ton (practical use : 40 ton)	Complete	
3-5 Fuel oil tank	for generator, 3KL	Complete	
4. Equipment/Materials			
4-1 Fishing boat	KIRI-5 type, 11.7m type outrigger canoe, 40HP outboard engine, 25HP in reserve, safety equipment, VHF, fishing box (100L)×2	4 boats	Establishment of 6 boats operation system including existing 2 boats
4-2 Working table	for washing fish	2 units	
	for processing fish & lobster	2 units	
4-3 Packing	Working table	2 units	
4-4 Band saw	for fresh and frozen fish	1 unit	

Items	Contents	Quantity	Remarks
4-5 Weighing machine	100kg type, digital display of kg & pound	1 unit	
4-6 Cleaning tools	Nozzle, hose, deck brush, etc	1 set	
4-7 Truck with crane	Front winch 2 ton, crane 5m, 420kg	1 unit	
4-8 Transport equipment			
① Pushcart	400kg capacity	1 unit	
② Pallet fork	500kg max., hand-pushed type	1 unit	
③ Fish box (50kg)	Stackable type 50kg	10 boxes	
④ Fish box (350kg)	Insulated, 700L	10 boxes	
⑤ Water tank/lorry	Water tank for washing fish 800L	1 unit	
4-9 Chest freezer	700L type, -20℃	1 unit	
4-10 Winter clothes	Winter clothes, headgears, gloves and boots	3 sets	
4-11 Table and chair for meeting room	10 tables and 30chairs	1 set	

2-2-3-2 Basic Design Drawing

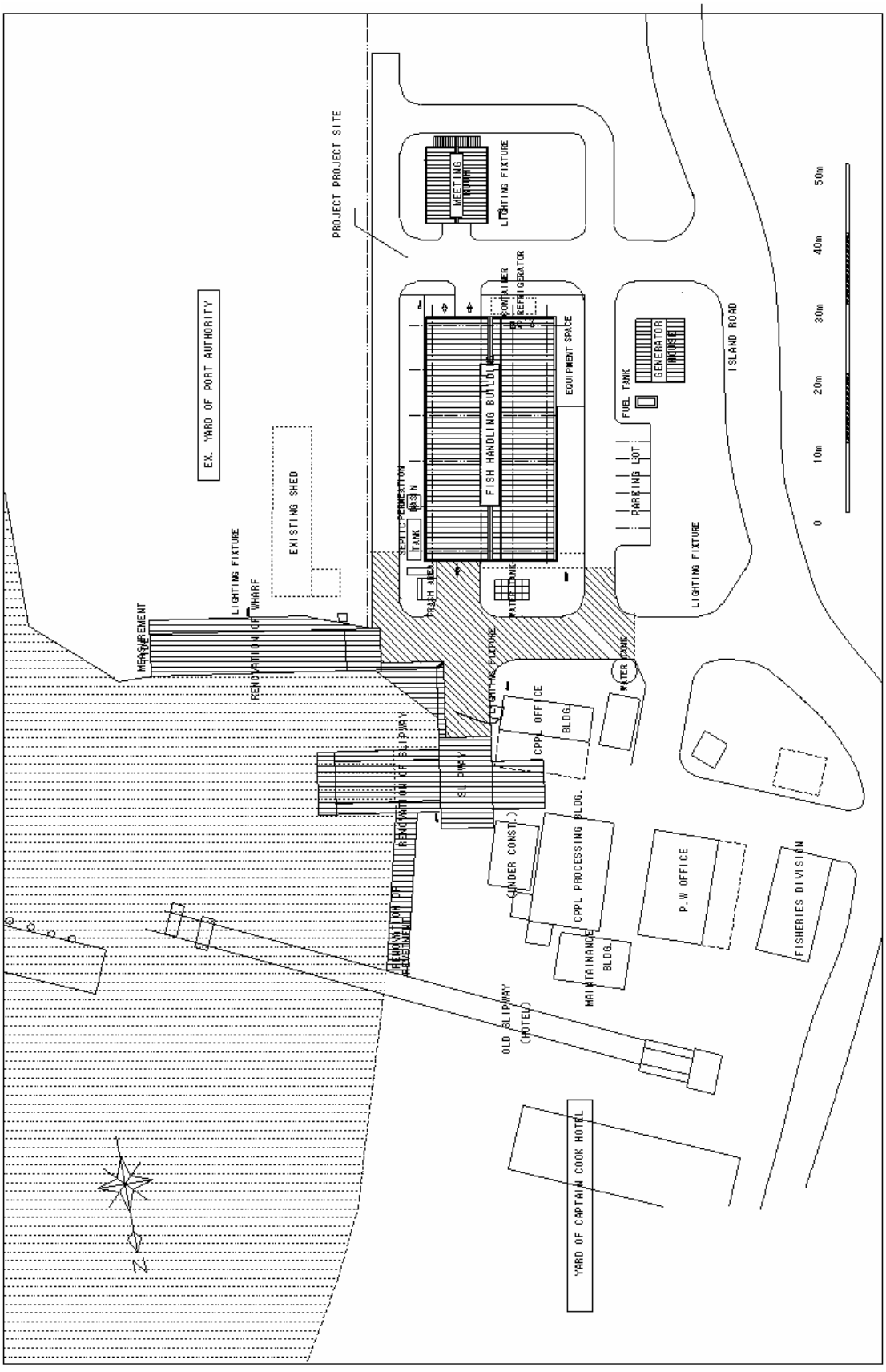


Fig. 2-20 Plot Plan of the Project Site

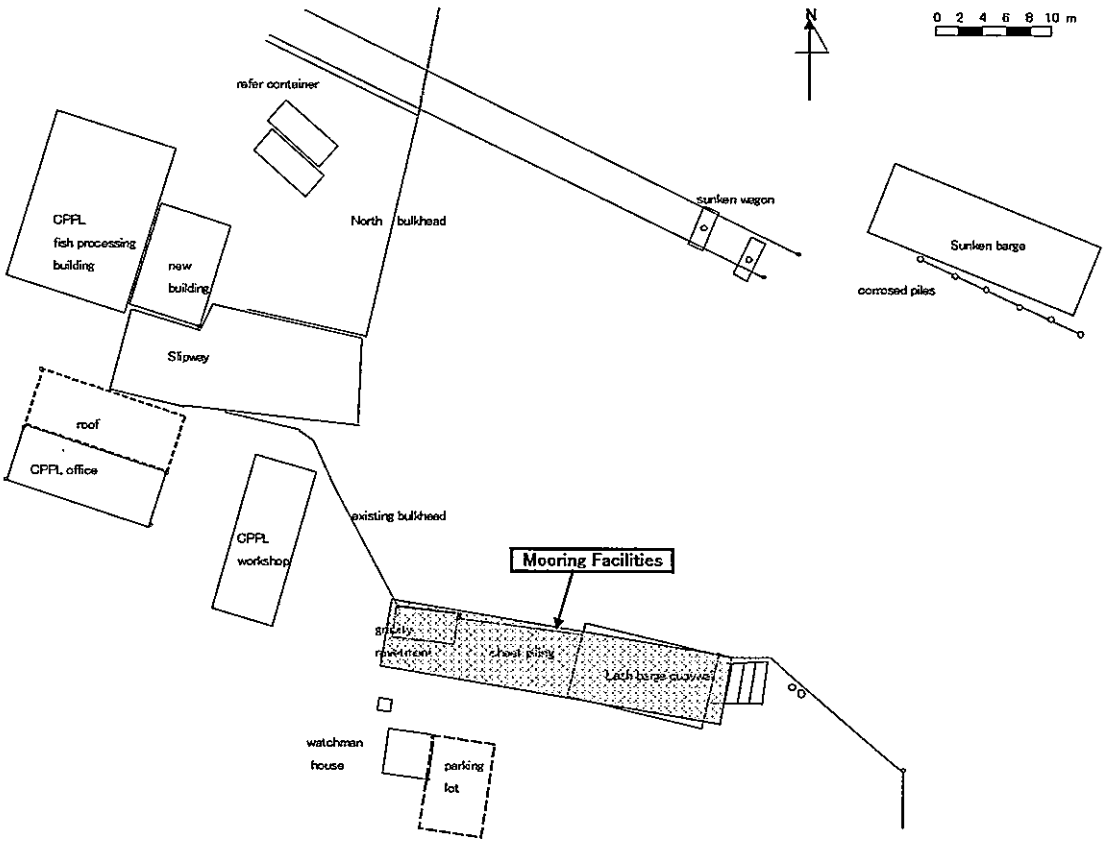


Fig. 2-21 Location of the Mooring Facilities

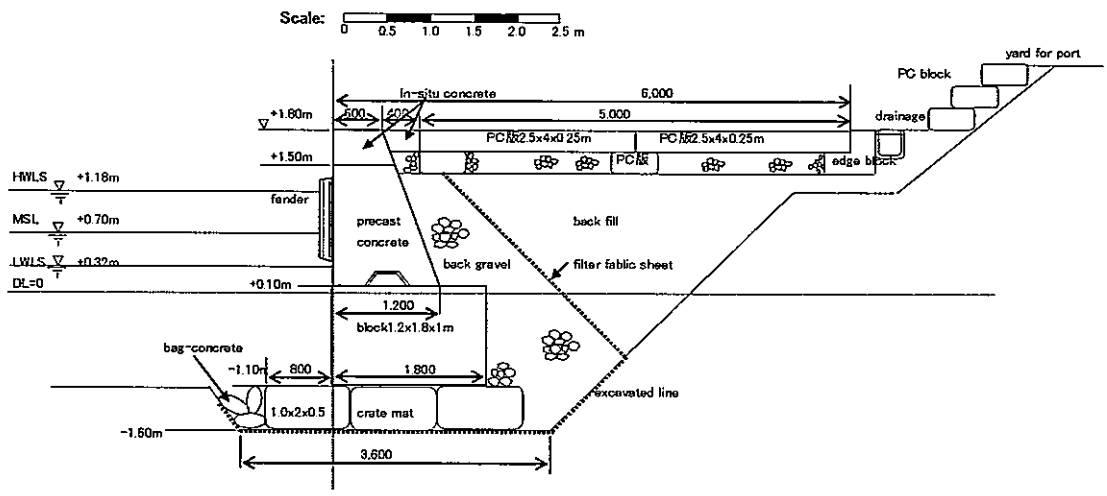


Fig. 2-22 Typical Cross-section of the Mooring Facilities

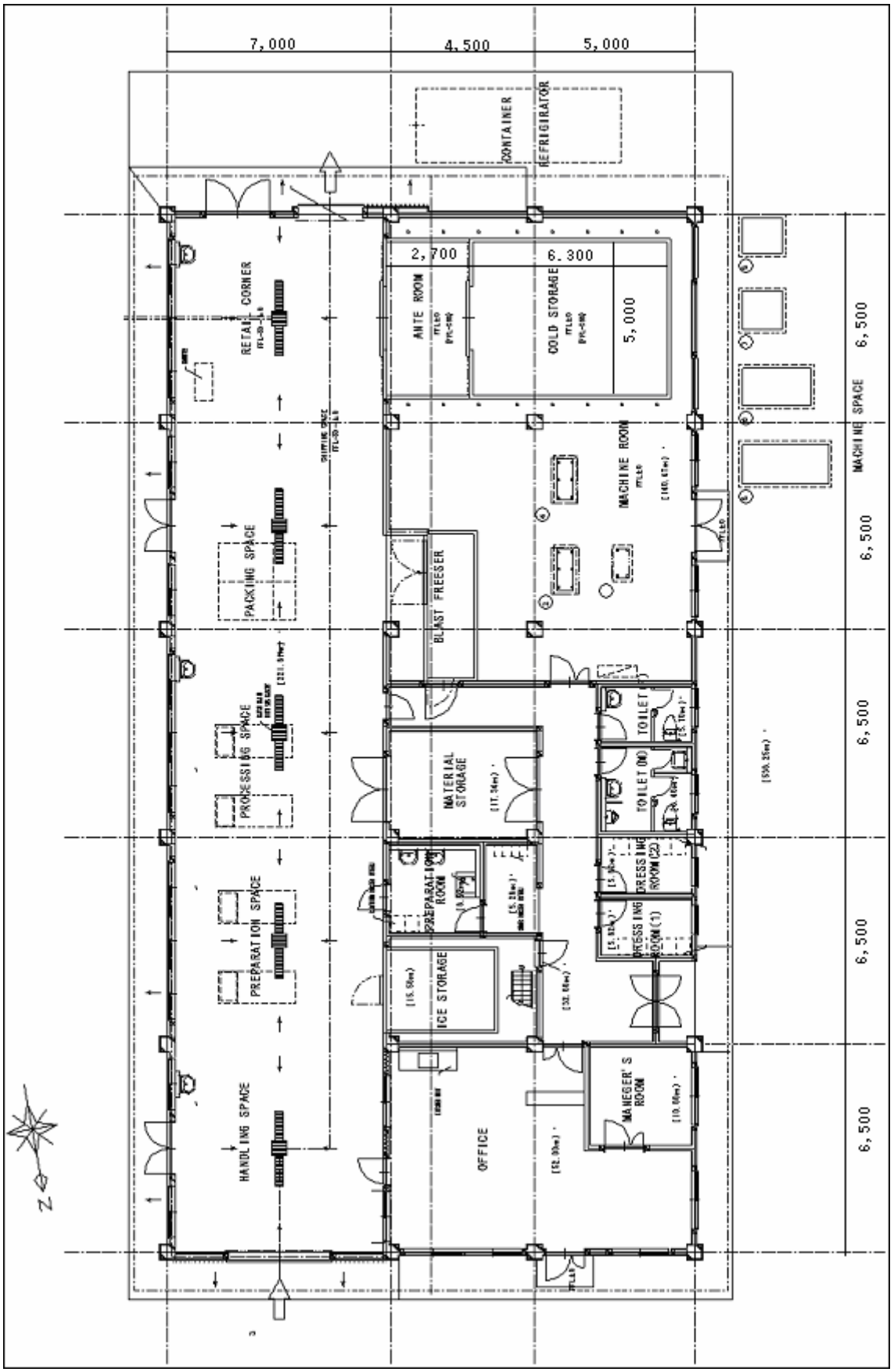


Fig. 2-23 Floor Plan of the Handling Room

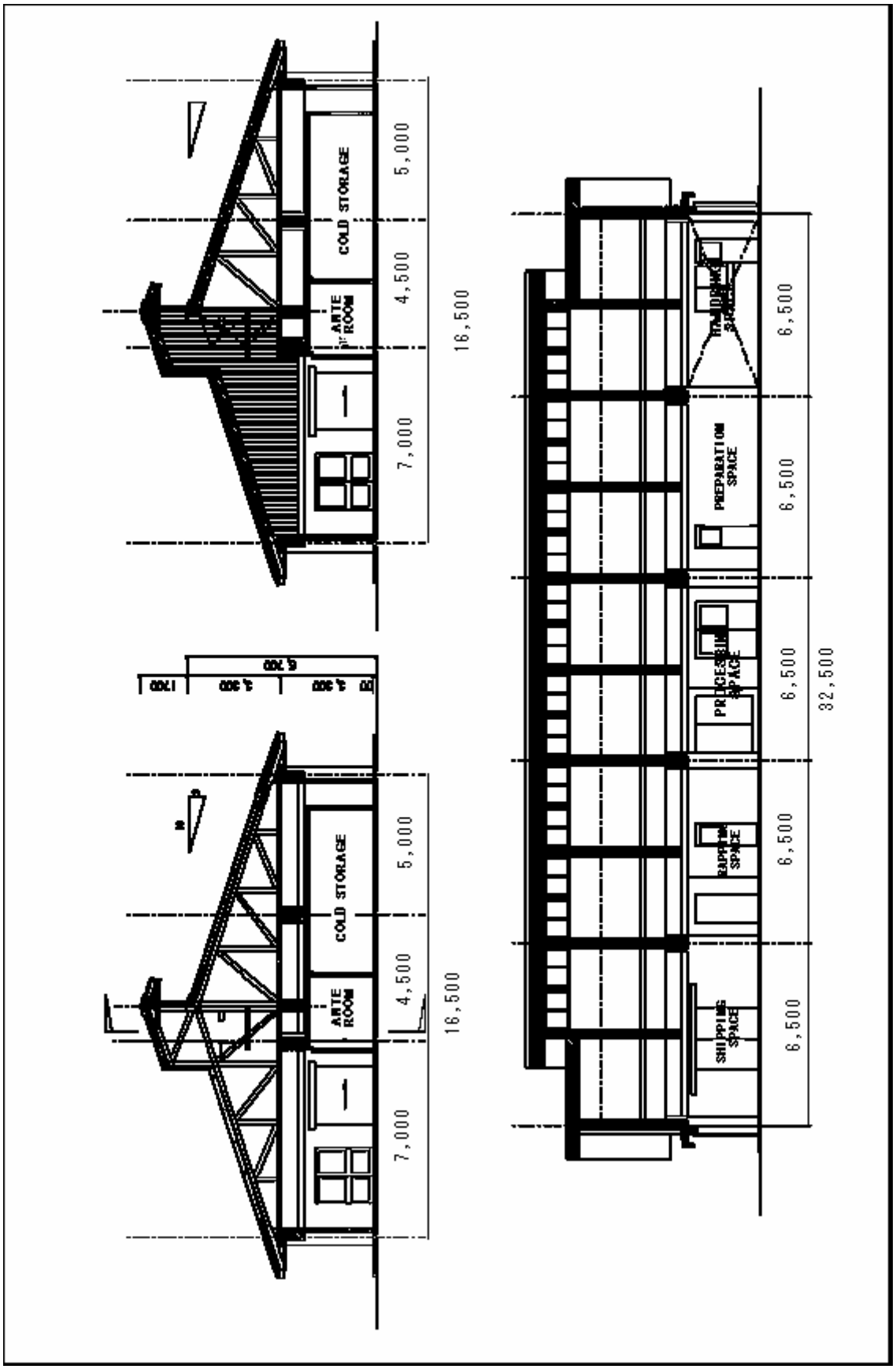


Fig. 2-24 Elevation of the Handling Room

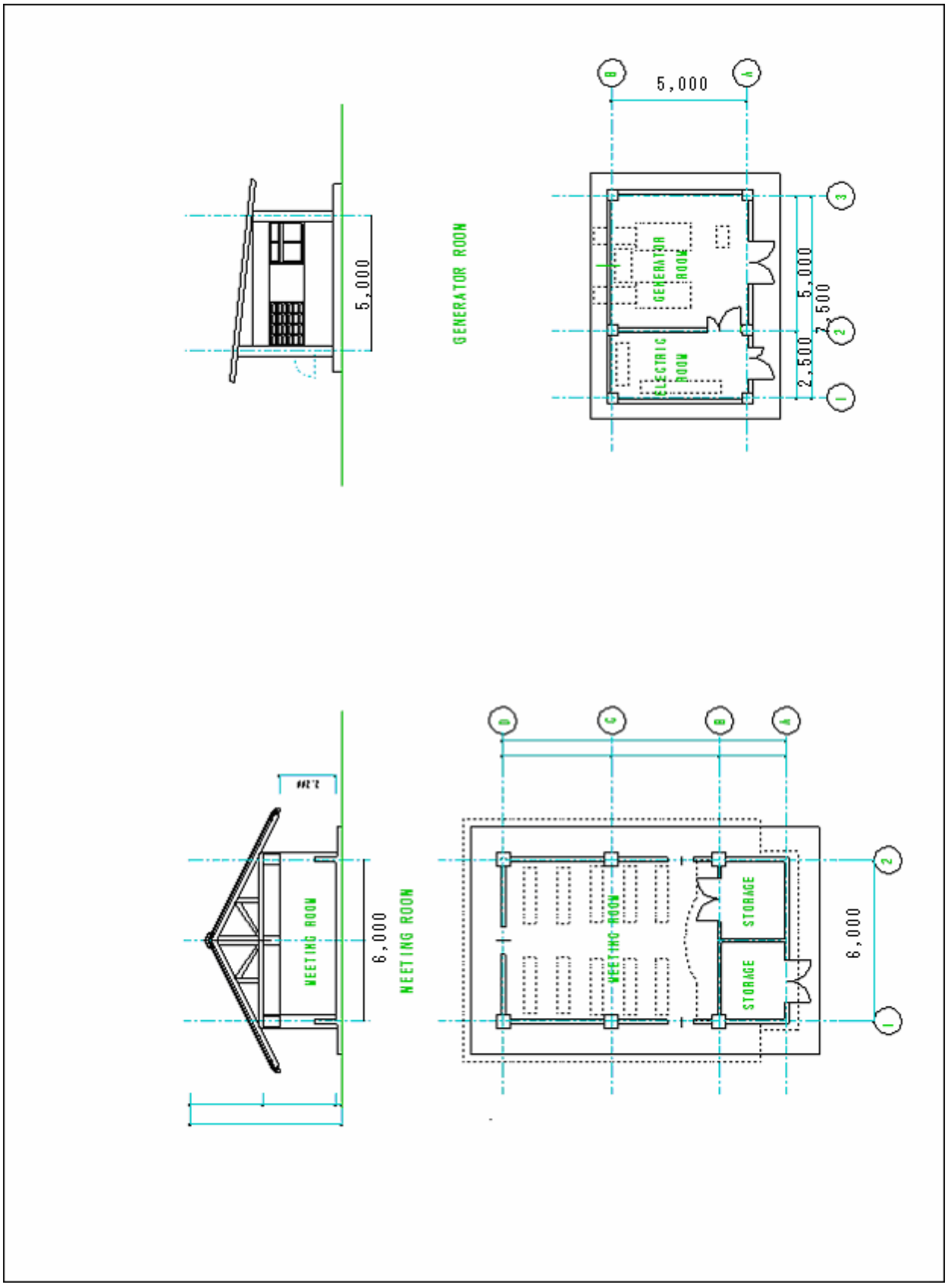


Fig. 2-25 Generator Room and Meeting Room

2-2-4 Implementation Plan/Integration

2-2-4-1 Implementation Policy/Procurement Policy

(1) Implementation policy

1) The term of works must be complied because the Project is a grant aid program of Japan. A proper progress schedule satisfying the contract conditions within the term of validity of Exchange of Notes shall be prepared.

2) A pontoon will be removed at the Kiribati's expense, and in order to continue the functions of the existing fish processing facility and CPPL office during the Project works, the landing site shall be temporarily moved. During the repairing work is conducted on the north side of the revetment, landing shall be made at part of the foreshore of landing place of Captain Cook Hotel. No work is followed. Although this movement does not hinder the traffic of the Hotel's leisure boat, consent of the Hotel must be obtained.

3) The Consultant and the Contractor shall full exchange opinions with the Project-related governmental bodies including the MFMRD, FD, and the Ministry for Line and Phoenix Groups in view of the smooth execution of the Project through good communication and mutual understanding.

(2) Procurement plan

1) It seems that procurement of labor and materials is not easy at Kiritimati Island. Extreme care shall be used to procure high quality materials without waste as well as to recruit skilled workers through a plan for efficient operation of construction machinery and skilled labor.

2) Large scale civil engineering and building works in Kiritimati Island have been conducted by construction companies of Tarawa or Guam, not local contractor. It is necessary to anticipate the building market at the time of execution of the Project.

3) Special consideration shall be taken into the transportation plan so that the main structural materials essential for foundation and construction works constituting the critical path can be procured without delay.

2-2-4-2 Implementation Conditions

The following points shall be given consideration in implementation and procurement.

(1) Execution policy

1) Water-saving execution method shall be applied. Local people depend upon scanty lens water drawn from the underground for daily use, and the Project is also forced to utilize this water in execution of works. Concrete work shall be minimized to save water and washing and cleaning shall be done with seawater as long as nothing interferes.

2) Extreme care shall be used in the transportation schedule because Kiritimati Island has no direct shipping service from abroad.

3) The execution method suitable for the construction machinery available at Island shall be used. Transportation of the construction machinery from and to abroad entails a huge expenditure due to the hiring of a special-purpose vessel.

4) Since the construction site is close to the offices of the FD and PWD, anti-noise measures shall be taken. Also the outward flow of earth and sand caused by revetment works shall be minimized.

(2) Procurement policy

1) Anti-rusty measures shall be applied to the refrigeration equipment, processing equipment and materials, transport equipment and so on.

2) Spare parts have to be procured from Tarawa or Honolulu, taking two to four months. Such spare parts that are necessary to exchange after initial operation of some four months must be supplied through a spare parts stocking system to be established by CPPL Kiritimati.

3) Procurement of the equipment and materials constituting the critical path shall be placed under strict process management to avoid delay of the construction period and delivery.

2-2-4-3 Scope of Works

(1) Scope of works in implementation and procurement

N0	Items	Japan	Kiribati
1	To secure land		●
2	To clear the site and the removal of a pontoon		●
3	Construction of fence		●
4	Construction of a parking lot	-	-
5	Road		
	1) Access within the site	●	
	2) Outside the site		●
6	Construction of buildings	●	
7	To provide facilities for electricity, water supply, drainage, and gas		
	1) Electricity		
	a. The distribution line to the site		●
	b. Transformer and distribution within the site	●	
	c. Main power receiving board	●	
	2) Water supply		
	a. The public water distribution main to the site		●
	b. The supply system within the site	●	
	3) Seawater supply		
	a. Seawater supply	-	-
	b. Seawater supply within the site	-	
	4) Drainage		
	a. The public drainage main to the site		-
	b. Drainage within the site (drainage way, septic tank)	●	
	5) Telephone system		●
	6) Furniture and equipment		
	a. General furniture		●
	b. Project equipment	●	
8	Payment of the following commission to the Japanese foreign exchange bank in accordance with the banking arrangement		
	1) Advising commission of A/P		●
	2) Payment commission		●
9	Import and customs clearance		
	1) Transportation to Kiribati	●	
	2)Tax exempt and customs clearance at Kiribati		●
	3) Internal transportation in Kiribati	●	-
10	Provision for procedural conveniences for the entry to, stay in and departure from Kiribati of Japanese nationals involved in the Project.		●
11	Exemption of all the taxes including internal taxes and other fiscal levies which may be imposed in Kiribati with respect to the supply of the equipment and materials and services procured by the Contractor of the Project.		●
12	Appropriate and effective management and maintenance of facilities constructed and equipment provided under the Grant.		●
13	To bear all the expense, other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and installation of the equipment.		●

(1) To secure the Project site

The proposed Project site is owned by the Government of Kiribati, and MFMRD proceeds with the formalities of utilization of it by the Project.

(2) To level the ground and to remove a pontoon from the site

An old pontoon abandoned on the beach shall be removed at the Kiribati's expense. Following the repair work of the revetment work the fishing gear store, wooden and zinc-coated roofing, shall be removed at Kiribati's expense.

(3) To install necessary fences

Necessary fences and gates enclosing the Project shall be installed at Kiribati's expense.

(4) Parking lot

Construction of a parking lot necessary for the Project is responsible to the Japanese side.

(5) Roads

Improvement of roads within the Project site is responsible to Japan, while the roads outside the site is responsible to Kiribati, but, because access roads to the site are already constructed, no work is followed to the Kiribati side

(6) Proposed building facilities

Construction of the Handling Space, Meeting Hall, Generator House, and Exterior Work concerning the Project are responsible to the Japanese side.

(7) Connection of electricity, water supply, sewage, and gas

1) Electricity

Electricity will be distributed through a pull box to be installed in the underground tube along the rode west of the site. The distribution word and installation of a electric meter shall be borne by the Kiritati side, and provision of the receiving/transforming equipment (3 phase-416V to shingle-220V and 110V) is responsible to the Japanese side.

2) Water supply

Installation of a meter on the existing public water main in the site shall be made at the Kiribati's expense. Work ahead the meter is responsible to the Japanese side.

3) Sewage

There is no sewage facility in Kiritimati Island. Sewage from the Project facilities is percolated down through the soil after treament.

4)The telephone system

To provide the telephone line to the facilities shall be made at the Kiribati's expense. Piping and wiring within the site shall be conducted by the Japanese side. One to two circuits for telephone and facsimile respectively are planned.

5) Office fixture and equipment

Such office fixtures as desks and chairs which are not included in the component of the Project shall be procured at the Kiribati's expense. The existing 2 KIRI-5 type fishing boats, one semi air blast freezer, and

one 45 KVA generator are owned by CPPL, which offers these equipment and materials to the Project, and the relocation work of the semi air blast freezer and the generator shall be made by the Japanese side.

(8) Banking arrangement and payment of commissions

The Kiribati side must bear the payment to the Consultant, Contractors, and commission to the Japanese foreign exchange bank for the banking service based upon the B/A.

(9) Transportation and customs clearance

1) Transportation from Japan by sea or air shall be made by the Japanese side.

2) It is expected that tax exemption and customs clearance in Kiribati are carried out smoothly with cooperation of the Kiribati side.

3) Transportation in Kiribati is borne by the Japanese side.

(10) Entry of verified personnel and execution of their business

The Kiribati side shall cooperate with verified personnel in obtaining of permission, customs procedure, etc.

(11) Tax exemption

Tax exemption concerning construction machinery used in the Project carried in and out shall be made through cooperation of the Kiribati side.

(12) Effective utilization of the Project facilities

Effective utilization of the Project facilities on line with the aim of the Project is responsible to the Kiribati side.

(13) Equipment and materials not including the Project

Procurement of tools necessary for maintenance of the hull of fishing boat which is not included in the Project is responsible to the Kiriabti side.

2-2-4-4 Consultant Supervision

The Consultant shall conduct the Detailed Design, prepare necessary Tender Documents, and assist at Tendering and the conclusion of Contracts. After the commencement of the works, the Consultant shall send a proper resident engineer to the Project site for supervision of working progress, security, and so on. In Japan, the Consultant shall give the approval to execution drawings, and investigate the equipment and materials procured in Japan. With the progress of the Project, the Consultant shall send the technical experts at need for the attendance in the inspection or guidance of execution of works. The progress of the Project shall be reported to the Kiribati authorities concerned, the Japanese Embassy and JICA office in Fiji at the Consultant discretion.

(1) Execution Supervision Plan

1) Policy of Supervision

a) The consultant shall maintain close communication with the MFMRD, which is the implementation agency, and the Ministry of Finance and Planning in accordance with the progress of the work to ensure

the smooth execution of construction works. Detailed discussion on the schedule and requirements shall be particularly required in regard to the provision of alternative sites and detours to ensure the continuation of the present CPPL's function, the prohibition of entry to the work site by unauthorized persons and the leveling and other land preparation work at the site as well as its surrounding area due to coordination with the work to be undertaken by the Japanese side.

b) Prior to the commencement of the building work, the Consultant shall scrutinize the work execution plan and working drawings submitted by the Contractor to check the suitability of the temporary facilities plan, the schedule plan, the quality of the planned construction materials, the selected construction method and others.

c) Prior to the delivery of the Project, the Consultant shall check the compliance of the completed work with the design specifications. Should any modification be required, the Consultant shall give the Contractor appropriate instructions.

d) The comprehensive supervision of the Project shall be made by the chief supervisor with technical assistance of building, equipment and facility engineers.

2) Consultant Supervision

The Consultant shall execute the following works.

a) Corporation for the conclusion of construction contracts

The Consultant shall prepare the necessary tendering documents including tender qualification, technical specifications, drawings, etc., calculate the Project cost, attend the tender and the conclusion of agreements, and then give advice on selection of contractor and contract conditions.

b) Instructions to contractors

The Consultant shall examine the execution plans and give contactors proper guidance in their executing manners and executing process.

c) Examination and approval of execution drawings and manufacturing drawings

The Consultant shall examine executing drawings, manufacturing drawings, materials, and finish samples, and then give approval to them.

d) Supervision of works

The Consultant shall give approval to the equipment and materials procured, confirm the executing manners, and give instructions in quality control and installation of the machinery.

e) Presence at inspection

The Consultant shall perform required inspections of construction or manufacturing works at need in the middle of the works, and give approval to them. On the completion of works the completion inspection shall be made and then the approval shall be given. By the delivery of the equipment and materials, the Consultant shall be present at quantity check or performance testing, and confirm the result of training in operation and maintenance, and then give approval.

f) Reporting

Reporting on the progress of construction works, procurement of the equipment and materials and the

points at issue and their results shall be made to Kiribati authorities concerned and the Japanese Embassy and JICA office in Fiji.

g) Attendance at delivery

On the completion and delivery of the Project, the Consultant shall present necessary documents for delivery.

h) Assistance of procedure of payment approval

The Consultant shall confirm the amount of work done payable in the contracts, and render help to examine the demand for payment and to take proceedings.

3) Transportation Plan

The domestic shipping service between Kiritimati Island and Tarawa is available only once every two or three months. About 1,000 ton of extra cargoes of Japan will make it possible for a tramper cruising around neighboring islands of Kiribati to visit Kiritimati Island. The sea transportation from Honolulu depends on a chartered ship only. They have no shipping service between Fiji and Kiritimati Island and even chartering any vessel seems to be not easy. Cargoes from Fiji are carried to Kiritimati Island via Tarawa

Direct service from Japan to Kirtimati island

The chartered direct marine service from Japan to Kiritimati Island will transport the equipment and materials for temporary works, precast concrete, cement, reinforcing rods, frame materials timbers, executing tools and so on.

The marine service between Japan and Tarawa (once every two months) and the tramper service between Tarawa and Kiritimati Island

The refrigeration machinery procured in Japan will be carried with this service. The shipping service from Japan to Tarawa is operated once every 2 months and transportation from Tarawa to Kiritimati Island can be made by the “Nei Matangare” and the “Moamoa”. Transportation of large and heavy cargoes can be made by the “Nei Matangare” or the “Mataraoi” of a private enterprise, but the service is limited (once every 2 months). Operation of the “Moamoa” will be also considered. Other materials can be transported from the viewpoint of the execution period. This service is less expensive than the container service.

Transportation of the equipment and materials of the Project is divided into four as follows.

First

At the commencement of work: Reinforcing rods for foundation of buildings, cement, concrete plant, equipment and materials for temporary works, constructon machinery, piping, etc.

Route: Japan → Kiritimati Island (detour of regular shipping)

Second

Windows, doors, electric materials, electric panels, paint, roofing materials, refrigeration machinery, finishing materials, roofing materials, ceiling materials, etc.

Route: Japan →Kiritimati Island (detour of regular shipping)

Third

Equipment and Materials will be carried through the regular shipping and domestic service.

Route: Japan → Tarawa (transshipment) → Kiritimati Island Regular shipping and domestic service.

Fourth

Returning construction machinery from Kiritimati

Route: Kiritimati Island → Japan (detour of regular shipping)

Cement, reinforcing rods, etc. will be stored in used containers at the Project site. These cargoes will be transported as follows.

First shipment	Japan	(straight) →	Kiritimati Island
Second shipment	Japan	(straight) →	Kiritimati Island
Third shipment	Japan	Tarawa	Kiritimati Island
Fourth shipment	Kiritimati Island.	(straight) →	Japan.

2-2-4-5 Procurement Plan

(1) Construction equipment and materials

Items	Procurement Source
Concrete Block (non-structural materials)	Kiritimati Island.
Aggregate (coral sand)	Kiritimati Island
Aggregate (coral stone)	Kiritimati Island
Cement	Japan
Concrete admixture	Japan
Reinforcing rod	Japan
Plywood	Japan
Paint (OP, EP)	Japan
Tile	Japan
Sash and doors	Japan
Wire	Japan
Bulb, switch	Japan
Pipes	Japan
Refrigeration machinery	Japan
Roofing materials	Japan
Timber	Japan
Generator	Japan
Mooring equipment	Japan

(2) Main construction machinery

Large machinery is available at Kiritimati Island, but no many kinds. Drills and small tools necessary for works must be brought in.

Construction Machinery	Procurement Source
Backhoe	Kiritimati Island, Japan
Crane truck - 45t	Kiritimati Island
Container truck 40 feet	Kiritimati Island
Fork lift 30t	Kiritimati Island
Concrete breaker (backhoe attachment)	Japan
Concrete plant	Japan
Vibration sieve	Japan
10 ton dump truck	Japan
Vibration compactor	Japan
Agitator vehicles	Japan
Crawler crane 50ton	Japan
Crane truck 20ton	Japan
Electric generator	Japan

2-2-4-6 Quality Control

(1) Construction equipment and materials

Precast concrete shall be inspected in regard to its size, strength, and crack at the production site. Quantity and specifications of the equipment and materials shall be checked carefully to avoid delay of works due to not often shipping service.

(2) Concrete work

Coral sand is used for both sand and light aggregate for construction at the site, and thus extreme attention shall be paid to chloride contents, grading, and curing after placing.

2-2-4-7 Soft Component

No soft component is required because all the facilities and equipment to be introduced by the Project are operable through necessary instruction in handling at the initial stage of introduction.

2-2-4-8 Implementation Schedule

When the Project is implemented under the Grant Aid Program of the Government of Japan, the Consultant will prepare the tender documents and provide assistance for tender to decide the Contractor to conduct the building work and for conclusion of the Contract with the selected contractor following the Exchange of Notes (E/N) regarding the implementation of the Project between the Governments of Kiribati and Japan. The actual work at the site will then start.

The Project will be implemented in accordance with the following schedule.

(1) Detailed Design

Based on the present Basic Design Study Report, the Consultant will conduct the detailed design and prepare the tender documents for the selection of the Contactor. The work is expected to take two months to complete after signing of E/N.

(2) Tendering

After the completion of the detailed design, applications for the tender for the building work under the Project will be publicly invited and bidders will be selected through pre-qualification of the applicants. These selected bidders will be invited by the Project implementation agency to place their bids for the tender which will be witnessed by Project-related persons. The process from the public announcement of the tender to approval of the agreement for the building work will take some 1.5 months to complete.

(3) Building Work

The signing of the agreement for the building work will be followed by certification of the agreement by the Government of Japan and the Project will proceed to the actual implementation stage. Assuming the smooth progress of the work to be taken by the Kiribati side, the building work is expected to take approximately 11 months to complete.

The general implementation schedule for the Project is attached in Table 2-26.

Table 2-26 Implementation Schedule of the Project

	Monthly order	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Year	2004												2005			
	Items / Month	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
Detailed Design	Exchange of Notes	▲															
	Consultant Agreement	▨															
	Preparation of Tender Documents & Drawings	□															
	Explanation of Tender Documents		▨														
	Tender Announcement			▲													
	Distribution of Tender Documents to Tenders			□													
	Receipt of Questionnaire				□												
	Answer to Questionnaire				□												
	Tendering					▲											
	Tender Evaluation					▨											
	Conclusion of Agreement					▲											
Supervision	Approval of Drawings					□											
	Execution Supervision (building)						□	▨	▨	▨	▨	▨	▨	▨	▨	▨	
	Procurement Supervision (equipment/materials)									□	□	□	□			▨	
	Inspection & Shipment Supervision											□	□	□	□	□	
	Delivery/Installation Supervision															△	
	Completion and Handing Over															▲	
	Final Report															▲	
Consultant	Project Manager	▨	□	▨	▨	□											
	Marine Civil Engineer	▨	□	▨	▨	□		□	□	□	□	□	□	▨			
	Architect	▨	□	▨	▨	□		□	□	□	□	□	□	□	▨		
	Equipment Planning Engineer		□	▨	□			□	□	□	□	□	□	□	▨		
	Tender Document		□														
	Resident Engineer (Marin Civil Engineer)							▨	▨	▨	▨	▨	▨	▨	▨		
	Resident Engineer (Architect)							▨	▨	▨	▨	▨	▨	▨	▨		

Work in Japan □ Work in Kritimati Is. ▨
Main event ▲ (E/N, Tender, etc.)

2-3 Obligation of Recipient Country

Major work to be conducted by the Kiribati side is shown on “2-4-3 Scope of Work”, and in the Project the following items to be borne by the Kiribati side are added.

(1) Counterpart fund

The rent for the KIRI-5 type boats shall be accumulated by the Government of Kiribati as the counterpart fund. CPPL is fairly experienced in this system at such four outer islands as Abaiang, Abemama, Arunuka, and Kuria.

(2) Temporary movement of the landing site

The repair work of the revetment will start at the landing place of the Captain Cook Hotel on the north of the slipway. During the work landing will be conducted at the fore shore of the landing place. However, the work followed by the movement shall entail no expenditure on the Kiribati side. During the work the Kiribati side can use the merchant ship wharf at the entrance of Harbor as a mooring berth of fishing boats without expenses.

(3) Initial operation cost (start-up cost, and cost of furniture and utensils, etc. not included in the Project)

Such utensils as knives and utensils for processing, office fixture, fish bags, not including in the Project, shall be procured at the Kiribati’s expense.

(4) Securing the budget and staff necessary for the operation and management of the Project

One night watchman must be employed due to 24 hour running of generators.

2-4 Project Operation Plan

The facilities and equipment and materials to be provided by the Project shall be owned by the MFMRD, and managed and operated by FD Kiritimati and CPPL Kiritimati together.

(1) Management plan

CPPL intends to increase the shipment to Tarawa to 72 tons in 2007 compared to 25 tons in 2004. The following Table 2-27 shows its production target.

Table 2-27 Production Target (unit : ton)

	2004	2005	2006	2007
Shipment from all outer islands	250	300	350	400
Shipment from Kiritimati	25	25	50	72
Catch of CPPL Kiritimati	30	30	60	85
Production of tuna fillet at Tarawa	30	35	40	50
Increase of loading of inter-island ferry	200	250	250	250

(2) Management and operation of the processing facilities and equipment and materials

The business to operate the facilities and equipment and materials is a continuation of the current business of CPPL, but one night operation watchman has to be employed due to all night operation of generators.

Proposed staffing is as Table 2-28.

Table 2-28 Staffing of CPPL Kiritimati

Rank	Number	Duty
Branch manager	1	Management responsibility of CPPL Kiritimati
Chief accountant	1	Accounting
Chief of general affairs-cum-accountant	2	General affairs, accounting
Chief engineer (Refrigeration)	1	Refrigerating equipment
Mechanic (Generator, outboard engine)	1	Generator, outboard engine, hull of boat
Processing Superintendent	1	Supervision of facilities
Workman (fish handling, processing)	2	Sales of ice, weighing, processing
Night operation watchman	1	Night watch 120 days/year

(3) Management and operation of the fishing boats and the counterpart funds

The “Tekokona III” will be operated under the experimental fishing budget of FD. The KIRI-5 type boats shall be leased to fishermen under technical assistance of FD engineers. The counterpart funds will be deposited after the system which CPPL is implementing at four outer islands, Abaiang, Maiana, Kuria, and Arunuka.

2-4-1 Production Business at Kiritimati Island

The main tasks of CPPL Kiritimati will be the sales of frozen fishery products at Tarawa and of lobster tails at Honolulu. In order to examine the appropriateness of this task, basic values are shown as follows.

The shipment of fresh fish for Honolulu has been ceased due to suspension of regular air service (once a week) since 2004 January. At present the only available service for frozen lobster tails is a cargo air service once every 1.5 to 2 months. The income and expenditure of this sales activity are estimated as follows based on results of the site survey, interview survey, and estimated average values. Also labor costs are allotted to employees depending on the operation of facilities and equipment in their charge plus expected operation days in accordance with the future operation plan.

(1) Basic values for the estimation of income and expenditure (for 2 months) of the production activity of frozen fishery products

The target is to produce 11 tons of products (12 tons of raw fish) for 20 days and to ship them once two months.

Table 2-29 Basic Values for the Estimation of Income and Expenditure of 2 Month Activity

(Unit: AU$)

Items	Unit	Remarks	Estimation
Buying price of fish: 12t	AU$ 1.54/kg (estimate)	Basic price is AU$ 0.7/lb	18,480
Selling price	AU$ 2.2/kg (raw fish conversion) (current price)	Basic price is AU$ 1.0/lb	26,400
Sales of ice	AU$ 1.0/kg (current price)	Raw fish ice =1:1	1,200
Production of frozen products	Production:550kg/day	8 hours freezing hours with 2 freezers, the remaining hours with one freezer.	
Operating generator: 60 KVA	Fuel consumption: 7.5l/hr	24 hour operation during production period	3,600
Operating generator: 45 KVA	Fuel consumption: 4.5l/hr	6 hours operation	540
Fuel price	AU$ 1.0/l		
Water rates	AU$ 5.0/ton: A rainwater tank of 45t capacity is installed.	Processing and ice production use 1.7t, cleaning 1.1t, totaling 2.8t/day, of which 1.5t is supplied from the public water and 1.3t with the rainwater tank.	150
Transportation costs	0.3 l/km×120km	Fuel for truck	36
Labor cost (wage schedule)	120 days of operation: AU$ 15,035	Allotted depending on operating days in accordance with the wage schedule.	2,506
Operation days	20 days during 2 months	Operation for only 20 days	

(Notes)
- In order to secure raw fish the buying price of AU$ 0.7/lb is applied in stead of AU$ 0.6/lb (2003 record).

- The price of ice is 2003 record for fishing boat.
- Water is used 26 ton a day.
- Labor costs are allotted depending on working days of each operation, operating frequency of equipment, and the degree of pressure of employee's work. Details are shown on Table at the end of the Chapter.

(2) Basic values for the estimation of income and expenditure of the production activity of lobster tails

Based on the previous results, one production lot of 500kg (750kg of lobster raw materials) , producing 250kg twice, is established, and, in accordance with the air cargo freight which is served 8 times a year, a yearly shipment of 4 tons of products is planned. Though products of 4 tons require 12 tons of lobster, because the yearly catch in 2001 and 2002 was about 18 tons (average 1.5 tons a month) respectively and resource conservation according to size limitation and catch restriction of brooding adult lobsters, the estimated values are reasonable. As in the past, lobsters caught are kept alive in a pen until the quantity necessary for treatment is gathered.

Table 2-30 Basic Values for the Estimation of Income and Expenditure of the Production Activity of Lobster Tails (500kg)

(Unit: AU$)

Items	Unit	Remarks	Estimation
Buying quantity: 1,500kg	Unit price: AU$ 6.0/kg	2003 results	9,000
Shipment: 500kg	Unit price: AU$ 30/kg	2003 results, yield rate=33%	15,000
(Production of frozen products)	Freezing quantity: 250kg/day	Freezing hour: 6 hours, only 45KVA unit is used, preservation in freezing is 5 days.	
Generator: 45KVA	Fuel consumption: 4.5l/hr	Production is made 2 times. Operating days are 6 days including freezing hours and preservation days before shipment.	648
Fuel price	AU$1.0/ℓ		
Water rates	AU$ 5.0/ton	Consumption: 0.5 ton/day	15
Packing materials costs	AU$ 25/20 kg	Carton case price (current price)	625
Transportation costs	0.3ℓ/km×120 km	Fuel for truck	36
Labor costs	AU$ 8,460/year are allotted depending on working results of each operation	Calculated on the wage schedule.	1,058

(Note) Since products are export goods, public water is used for cleaning them.

(3) Profitability of the production activity

Based on these basic values, profitability of the production activity of frozen fishery products and lobster tails is estimated in the following Table 2-31. Also the flow of production and shipment of frozen fishery products is showed on the following page.

Table 2-31 Estimation of Income and Expenditure of the Production Activity

(Unit: AU$)

Items	Production of frozen fish		Production of lobster tails		Total
Quantity and frequency of shipment	**12,000kg/ time**	**6 times a year**	**500kg/ time**	**8 times a year**	
Income					
Shipment amount (based on unit price in 2003)	26,400	158,400	15,000	120,000	278,400
Sales of ice for fishing boats	1,200	7,200	0	0	7,200
(Total income)	27,600	165,600	15,000	120,000	285,600
Expenditure					
Purchase of raw materials	18,480	110,880	9,000	72,000	182,880
Operation of generators	4,140	24,840	648	5,184	30,024
Water rates	150	900	15	120	1,020
Packing materials	0	0	625	5,000	5,000
Transportation costs	36	216	36	288	504
Repair	500	3,000	250	2,000	5,000
Labor costs:					
Allotment depending on proportions of income	2,506	15,035	1,058	8,460	23,495
Other expenditure	300	1,800	300	2,400	4,200
Total	26,112	156,671	11,932	95,452	252,123
Balance (Income－Expenditure)	1,977	8,929	3,069	24,548	33,477

Estimated fish catch used for the estimation will be attainable when proposed fishing boats are introduced. Also estimated lobster catch will be attainable due to resource conservation according to size restriction. Consequently, as shown on above Table 2-31, profitability of production activity will be is secured.

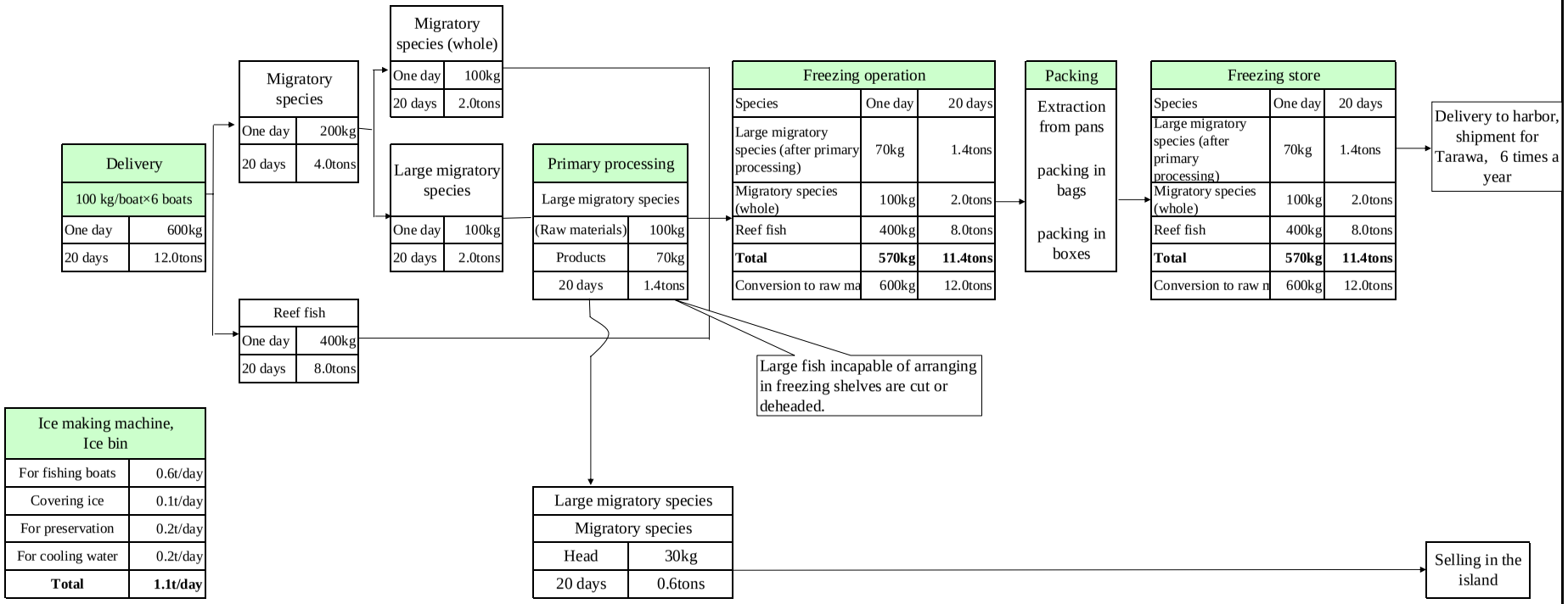
Table 2-32 Allotment of Labor Costs

Operation	Production of frozen fish	Production & management of lobsters	Tekokona III	Sales of fish in the island, fish aquaculture	Administration and agent business	Total
Proportion of allotment	26%	18%	16%	30%	10%	100%

Planed fish flow chart is attached next page

Table 2-33 Flow from Production to Shipment

Operation in the facility: 20 days for fish collection, 6 times a year	Receiving fish	Storing	Preparation	Primary processing	Freezing	Packing	Refrigerating preservation	Shipment
	weighing and sorting from 4pm to 5pm	One night storing in insulated boxes	Washing and sorting	Cutting of large migratory species, preparation for freezing	6 to 8 hours or 24 hours	Extraction from pans, packing in bags, packing in boxes	20 days, 6 times a year	Shipment and transportation



Flow of operation	Receiving fish	Preservation	Preparation	Processing	Freezing	Packing	Refrigerating preservation	Shipment
Refrigerating equipment	Ice making machine, ice bin	Ice making machine, ice bin	Ice making machine, ice bin	Ice making machine, ice bin	Existing semi air blast freezer (370kg/4-8 hrs), freezing store (200kg/24 hrs)		Freezing store (12 ton capacity)	
Using equipment	Weighing scale, insulated boxes, dolly, fish boxes, pallet fork	Fish boxes (350kg), pallet fork	Processing table with sink, fish boxes (50kg), fish boxes (350kg), water tank lorry	Processing table with flat upper bed, hand saw, dolly, fish boxes (50 kg & 350 kg)	Freezing shelve	Packing table, fish boxes (50kg & 350kg), dolly, pallet fork	Dolly	Fish boxes (350kg), pallet fork, chest freezer, crane truck

2-4-2 Income and Expenditure of the KIRI-5 Type Fishing Boat

(1) Basic values for estimation

According to the performance of the existing KIRI boats, results of site survey, and the Project plan, the conditions of the accounts of KIRI type boat are as in Table 2-34.

Table 2-34 The Conditions of Account of KIRI-5 Type Boat

Fishing days	120 days/year (proposed fishing days)
Fuel oil costs	Gasoline: AU$ 1.12/L (current price)
Fuel consumption	60L/day (according to the result of the site survey)
Fishing boat	KIRI-5 type 11.8m type outrigger canoe, 4.4m wide
	Price of hull AU$ 14,700 (estimate)
	Depreciation 8 years (CPPL standard)
	Outboard engine (4 cycle) AU$ 5,250 (estimate)
	Depreciation 4 years (according to the result of the site survey)
	Maintenance costs AU$ 700/year (according to the results of the existing boat) Painting, exchange of hull planks, mooring ropes, lubricating oil of outboard engine, etc.
Ice	Unit price - AU$ 0.1/kg (CPPL price), consumption - 100kg (present state)
Catch	100kg/boat - one day trip, 8 hour fishing (average of the existing KIRI boats)
Buying price of catch	14 AU$ 1.54/kg (AU$ 0.7/lb)
Crewmember	5 persons (according to the result of the site survey)

Profitability per boat is shown as below.

(2) Income and expenditure of the KIRI type fishing boat

Based on the above data the income and expenditure of a KIRI-5 boat is estimated as shown in Table 2-35 below.

Table 2-35 Income and Expenditure of a KIRI-5 Type Fishing Boat

Operation costs		AU$
Fixed costs		
Depreciation of boat	AU$ 14,700÷8 years÷120 days/year = AU$ 15/day	15
Depreciation of outboard engine	AU$ 5,250÷4 years÷120 days/year = AU$ 11/day	11
Maintenance costs	AU$ 700/year÷120 days/year = AU$ 6/day	6
Total		(32)
Variable costs		
Ice	AU$ 0.1/kg×100 kg = AU$ 10	10
Fuel costs	AU$ 1.12/l × 60 l = AU$ 67	67
		(77)
Total operation costs		109

Proceeds of catch		AU$
Proceeds of fish	AU$ 1.54/kg×100 kg/trip = AU$ 154	154
Balance		45

When a catch per trip is 100kg to 120kg, a profit of AU$ 45 to 76 can be expected, and each fisherman of 5 crewmembers can earn AU$ 9 to 15 per day, which is almost similar to a wage of a government worker. In case a catch is less than 70kg no profit is yield, but such case is extremely rare.

2-5 Estimated Cost of the Project

In the case of the implementation of the Project with grant aid provided by the Government of Japan, the total Project cost is estimated to be J¥ 741 million, and the breakdown of this cost based on the calculation conditions is shown as the following Tables.

This cost estimate is provisional and would be further examined by the Government of Japan for the approval of the Grant.

(1) Cost estimation to be borne by the Japanese Government

Table 2-36 Estimated Cost **J¥ 739 million**

Construction of buildings at Kiritimati Island (Total floor area: about 651.82m^2)
Improvement/repair of slipway and revetment

Description		Cost (J¥ million)		
Facility	Handling space, generator house, meeting hall	400	640	673
	Slipway, revetment	240		
Equipment & materials	Handling space equipment, table and chair in meeting room		33	
Detailed design, consultant supervision				66

(2) Cost estimation to be borne by the Kiribati side

Estimated cost to be borne by the Kiribati side is about AU$ 34 thousand (J¥ 2.7 million) as shown in Table 2-37 below.

Table 2-37 Estimated Cost to be Borne by the Kiribati Side about J¥ 2.7 million

Contents	Amount
Disassembling & removal to secure the site	
Removal of decayed pontoon and disassembling of warehouse	AU$ 7,000
Infrastructure connecting work	
Installation of distribution switch box and power meter, connection of telephone circuit	AU$ 11,000
Installation of water distribution box and water meter	AU$ 5,000
Commission for banking arrangement	AU$ 11,300
Total	AU$ 34,300
Conversion	J¥ 2,742 thousand

AU$ 1 = J¥ 80.10

(3) Calculation conditions

1) Date December 2004

2) Exchange rate US$ 1 = J¥ 110.08 AU$ 1 = J¥ 80.10

3) Execution period including detailed design, construction work, and procurement of equipment and materials shall conform to the Implementation Schedule of the Project (See Table 2-26, page 2-70).

4) The Project shall be implemented in accordance with the Grant Aid Program of Japan.

Chapter 3 Project Evaluation and Recommendations

Chapter 3 Project Evaluation and Recommendations

3-1 Project Effect

With the implementation of the Project including improvement and repair of the existing facilities, construction of a new fish handling facility, and provision of related equipment and materials, the following effects can be expected.

(1) Direct effects

1) Exploitation and utilization of undeveloped offshore fishery resources

Introduction of medium-size fishing boats will make it possible for local fishermen to operate offshore. The proportion of such offshore species as tuna and skipjack to the total catch by local fishermen is currently less than 20-30%. This proportion of offshore fishery resources will rise to more than 50%, resulting in effective utilization of undeveloped offshore resources.

2) Safe and efficient preparation work for fishing and landing work

There are fears that the upper floor of the existing wharf and revetment may collapse if a truck passes on it due to its deteriorated state. Consequently, transport vehicles cannot reach the end of the wharf. Improvement of the wharf and revetment will enable vehicles to park alongside fishing vessels safely so that preparation work for fishing (loading of ice and fishing gear) and landing work can be conducted safely and efficiently.

3) Increase in the life and safety of fishing boat

Proposed fishing boats may be hauled up on an improved slipway. The boats are made of waterproof plywood and periodic inspection, maintenance, and hull drying will increase their serviceability, i.e., prolong the efficacy of waterproof glue used for plywood planks. Also introduction of KIRI-5 type fishing boats equipped with communications apparatus and spare outboard engines will improve the safety of offshore fishing operations.

4) Improvement in the quality of fish through efficient landing, handling, and preservation

Introduction of an ice-making machine, insulated fish boxes, and improvement in the landing site and handling/preservation facilities will enable lower body temperatures for fish. Shortened handling hours of fish will result in an increase of daily handling quantities from 200kg to 600kg. Also the preservation period will extend from one day to three days.

5) Supply of fishery products to Tarawa

Since it will be possible to make more than one shipment of frozen fishery products to Tarawa every two months, demand of consumers, in particular, that of institutional consumers such as hospitals and schools, will be satisfied.

(2) Indirect effects

1) Increased incomes to fishermen

Increase in purchases of fish from Kiritimati Island's local fishermen will increase shipments to Tarawa. This means larger incomes for fisherman.

2) Reduction of imports of food through utilization of frozen fishery products

Increased supply of frozen fish to institutional consumers will make it possible to substitute partly frozen fish for canned fish or meat. Proposed increase in supply of 55 tons will reduce the imports of food directly.

3) Contribution to sound management of CPPL

Increase in handling quantities of fish at CPPL Tarawa will contribute to their sound management.

3-2 Recommendations

In order to promote the effective and efficient utilization of proposed facilities, equipment and materials, the following two recommendations are made.

(1) Establishment of spare/repairing parts supplying system

Kiritimati Island and Hawaii are connected by air transport, and a regular flight taking four hours is operated once a week. The inter-island ferry is operated once every two months and it takes about one week between Kiritimati Island and Tarawa. Thus transportation of parts from Japan will take a minimum of 10 days.

The proposed facilities, equipment and materials are of the same type that CPPL Kiritimati has used before, so it will be able to function without trouble for one or two years. It is necessary to establish a spare parts stockpiling system to quickly meet subsequent needs and not suspend operations for long periods of time.

(2) Total permeation of energy and water conservation

Kiritimati Island belongs to the tropical marine climate, averaging 27℃ throughout the year. Daytime temps rise to more than 30℃. It is essential to limit opening hours of the cold storage or ice bin doors to prevent cooled air to escape and there be energy loss.

Water is a very important resource in Kiritimati Island and it must be used carefully. Rainwater will be the preferred source so a tank will be constructed in the Project. All employees must become accustomed to conserving water by using minimal amounts to wash work tables and floors.

Appendices

1. Member List of the Study Team

1-1 Basic Design Study

1	Leader	Tetsuo YABE	Grant Aid Management Department Japan International Cooperation Agency
2	Technical Advisor	Susumu ITO	Fisheries Agency
3	Project Coordinator	Hisashi SUZUKI	Japan International Cooperation Agency Fiji Office
4	Project Manager / Fisheries Distribution Planning / Equipment Planning	Kohsuke SHIMAZU	ICONS International Cooperation Inc.
5	Fishery Facility Planning	Kaname MOTOKI	ICONS International Cooperation Inc.
6	Civil Engineer / Natural Condition Survey	Masahiro YOKOGAWA	ICONS International Cooperation Inc. (Fujii Survey & Design Co. Ltd.)
7	Construction & Procurement Planning / Cost Estimation	Masakazu ISHII	ICONS International Cooperation Inc.

1-2 Draft Basic Design Study

1	Leader	Shumon YOSHIARA	Japan International Cooperation Agency Fiji Office
2	Technical Advisor	Masahiro HORIE	Fisheries Agency
3	Project Manager / Fisheries Distribution Planning / Equipment Planning	Kohsuke SHIMAZU	ICONS International Cooperation Inc.
4	Fishery Facility Planning	Kaname MOTOKI	ICONS International Cooperation Inc.

2. Study Schedule

2-1 Basic Design Study

No.	Date		Activities	Accommodation
1	23 May	Sun	Narita → Honolulu （Official②, ⓐⓑⓒⓓ）	Honolulu
2	24 May	Mon	Honolulu → (Kiritimati)	Kiritimati
3	25 May	Tue	→ Kiritimati Discussion with Central Pacific Producers Ltd. (CPPL)	Kiritimati
4	26 May	Wed	Discussion with CPPL	Kiritimati
5	27 May	Thu	②ⓐⓑ: Discussion with CPPL ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Kiritimati
6	28 May	Fri	②ⓐⓑ: Discussion with CPPL ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Kiritimati
7	29 May	Sat	②ⓐⓑ:Site survey ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Kiritimati
8	30 May	Sun	②ⓐⓑ:Team meeting ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Kiritimati
9	31 May	Mon	②ⓐⓑ: Discussion with CPPL ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Kiritimati
10	1 Jun	Tue	①:Narita → (Auckland) ②ⓐⓑ:Kiritimati → (Honolulu)	In air / Kiritimati
**	(31 May)	(Mon)	②ⓐⓑ:→ Honolulu → Auckland	Kiritimati
11	2 Jun	Wed	①②ⓐⓑ:Auckland → Nadi → Suva ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Suva Kiritimati
12	3 Jun	Thu	①②③ⓐⓑ:Courtesy call to Embassy of Japan and JICA Fiji Office, Suva → Nadi ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Nadi Kiritimati
13	4 Jun	Fri	①②③ⓐⓑ:Nadi → Tarawa, Courtesy call to Ministry of Fisheries and Marine Resources Development (MFMRD) ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Tarawa Kiritimati
14	5 Jun	Sat	①②③ⓐⓑ:Inspection of existing fishery facilities ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Tarawa Kiritimati
15	6 Jun	Sun	①②③ⓐⓑ:Team meeting ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Tarawa Kiritimati
16	7 Jun	Mon	①②③ⓐⓑ:Discussion with MFMRD ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Tarawa Kiritimati
17	8 Jun	Tue	①②③ⓐⓑ:Discussion with MFMRD ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Tarawa Kiritimati
18	9 Jun	Wed	①②③ⓐⓑ:Discussion with MFMRD, Signature on the Minutes of Discussion ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Tarawa Kiritimati
19	10 Jun	Thu	①②③:Tarawa → Nadi → Suva ⓐ: Survey of fisheries distribution and CPPL ⓑ:Tarawa→ Nadi ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Suva / Tarawa Nadi Kiritimati
20	11 Jun	Fri	①②③: Report to Embassy of Japan and JICA Fiji Office, Suva → Nadi ⓐ: Survey of fisheries distribution and CPPL ⓑ:Nadi → Honolulu ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Nadi / Tarawa Honolulu Kiritimati
21	12 Jun	Sat	①②③:Nadi → Narita ⓐ:Survey of fisheries distribution and CPPL ⓑ:Survey of existing fisheries facilities ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Tarawa Honolulu Kiritimati

No.	Date		Activities	Accommodation
22	13 Jun	Sun	ⓐ: Survey of fisheries distribution and CPPL ⓑ: Survey of existing fisheries facilities ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Tarawa Honolulu Kiritimati
23	14 Jun	Mon	ⓐ: Survey of fisheries distribution and CPPL ⓑ:Honolulu → Kiritimati ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Tarawa In air Kiritimati
24	15 Jun	Tue	ⓐ: Survey of fisheries distribution and CPPL ⓑ: → Kiritimati ⓒ:Natural Condition Survey ⓓ:Kiritimati →(Honolulu)	Tarawa / In air Kiritimati
**	(14 Jun)	(Mon)	ⓓ:Kiritimati → Honolulu	
**	(15 Jun)	(Tue)	ⓓ:Research for cost estimation	
25	16 Jun	Wed	ⓐ:Survey of fisheries distribution and CPPL ⓑ:Survey of construction conditions ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Tarawa Kiritimati Honolulu
26	17 Jun	Thu	ⓐ:Tarawa → Majuro ⓑ:Survey of construction conditions ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Majuro Kiritimati Honolulu
27	18 Jun	Fri	ⓐ:Majuro → Honolulu ⓑ:Survey of construction conditions ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Honolulu Kiritimati
28	19 Jun	Sat	ⓐ:Survey of fisheries distribution ⓑ:Survey of construction conditions ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Honolulu Kiritimati
29	20 Jun	Sun	ⓐ:Survey of fisheries distribution ⓑ:Survey of construction conditions ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Honolulu Kiritimati
30	21 Jun	Mon	ⓐ:Survey of fisheries distribution ⓑ:Survey of construction conditions ⓒ:Natural Condition Survey ⓓ:Honolulu → (Nadi)	Honolulu Kiritimati In air
31	22 Jun	Tue	ⓐ:Survey of fisheries distribution ⓑ:Survey of construction conditions ⓒ:Natural Condition Survey ⓓ:→ Nadi → Suva, Research for cost estimation	Honolulu Kiritimati Suva
32	23 Jun	Wed	ⓐ:Survey of fisheries distribution ⓑ:Survey of construction conditions ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Honolulu Kiritimati Suva
33	24 Jun	Thu	ⓐ:Survey of fisheries distribution ⓑ:Survey of construction conditions ⓒ:Natural Condition Survey ⓓ: Survey of harbor transportation condition	Honolulu Kiritimati Suva
34	25 Jun	Fri	ⓐ:Survey of fisheries distribution ⓑ:Survey of construction conditions ⓒ:Natural Condition Survey ⓓ:Research for cost estimation	Honolulu Kiritimati Suva
35	26 Jun	Sat	ⓐ:Honolulu → (Nadi) ⓑ:Survey of construction conditions ⓒ:Natural Condition Survey ⓓ:Data arrangement	In air Kiritimati Suva
36	27 Jun	Sun	ⓐ: → Nadi → Suva, Team meeting ⓑ:Survey of construction conditions ⓒ:Natural Condition Survey ⓓ:Research for cost estimation, Team meeting	Suva Kiritimati
37	28 Jun	Mon	ⓐⓓ:Report to Embassy of Japan and JICA Fiji Office, Suva →Nadi → Brisbane ⓑ:Survey of construction conditions ⓒ:Natural Condition Survey	Brisbane Kiritimati
38	29 Jun	Tue	ⓐⓓ:Brisbane → Narita ⓑⓒ:Kiritimati → (Honolulu)	In air

No.	Date		Activities	Accommodation
**	(28 Jun)	(Mon)	ⓑⓒ: → Honolulu	Honolulu
**	(29 Jun)	(Tue)	ⓑ:Survey of construction conditions ⓒ:Honolulu → (Narita)	Honolulu/ In air
39	30 Jun	Wed	ⓑ:Survey of construction conditions ⓒ: → Narita	Honolulu
40	1 Jul	Thu	ⓑ:Honolulu → (Narita)	In air
41	2 Jul	Fri	ⓑ: → Narita	

Officials : ①Team Leader ②Technical Advisor ③Project Coordinator
Consultants : ⓐProject Manager / Fisheries Distribution Planning / Equipment Planning ⓑFishery Facility Planning
ⓒCivil Engineering / Natural Condition Survey ⓓConstruction & Procurement Planning / Cost Estimation

2-2 Draft Basic Design Study

No.	Date		Activities	Accommodation
1	24 Oct	Sun	②ⓐⓑ: Narita → (Sydney)	In air
2	25 Oct	Mon	②ⓐⓑ:Sydney →Nadi ①:Suva →Nadi	Nadi
3	26 Oct	Tue	①②ⓐⓑ:Nadi → Tarawa Courtesy call to Ministry of Fisheries and Marine Resources Development (MFMRD) Explanation of the Draft Basic Design Report	Tarawa
4	27 Oct	Wed	A.M.: Discussion with MFMRD over the Draft Basic Design Report P.M.: Preparation of Minutes of Discussion	Tarawa
5	28 Oct	Thu	A.M. Discussion with MFMRD Explanation of the Draft Basic Design Report Discussion of Minutes of Discussion P.M.: Correction of Minutes of Discussion ①②:Inspection of existing grant aid facilities ⓐⓑ:Collection of data	Tarawa
6	29 Oct	Fri	A.M.: Signature on the Minutes of Discussion P.M.: ①②:Inspection of existing grant aid facilities ⓐⓑ:Courtesy call to the Ministry of Environment and CPPL	Tarawa
7	30 Oct	Sat	Transfer to the northern part of Tarawa	Tarawa
8	31 Oct	Sun	Team meeting	Tarawa
9	1 Nov	Mon	A.M.: Courtesy call to Fisheries Division Inspection of Tungal Hospital P.M.: Tarawa →Nadi	Nadi
10	2 Nov	Tue	Nadi → Suva (by land)	Suva
11	3 Nov	Wed	A.M.: Courtesy call to Embassy of Japan and JICA Fiji Office P.M.: ②ⓐⓑ : Suva →Nadi	Nadi
12	4 Nov	Thu	②ⓐⓑ: Nadi → Narita	

Officials : ①Team Leader ②Technical Advisor
Consultants : ⓐProject Manager / Fisheries Distribution Planning / Equipment Planning ⓑFishery Facility Planning

3. List of Parties Concerned in the Recipient Country

3-1 Basic Design Study

(1) Tarawa, Kiribati

Name of Organization and Title	Name
Ministry of Fisheries and Marine Resources Development (MFMRD)	
Minister	Hon. Tetabo NAKARA
Permanent Secretary	Mr. David YEETING
Deputy Secretary	Mr. Raimon TAAKE
Chief Fisheries Economist	Mr. Tetoaiti TABOKAI
MFMRD (Fisheries Division)	
Director of Fisheries	Mr. Mauria KAMATIE
Principal Fishery Officer, MFMRD Fisheries Tanaea	Mr. Ribwanatake AWIRA
Advisor, OFCF Expert	Mr. Hisashi IKEDA
Central Pacific Producers Ltd. (CPPL)	
General Manager	Mr. Barerei ONORIO
Ministry of Environment, Land and Agriculture Department	
Permanent Secretary	Mr. Tikabu TIKAAI
Tungal Hospital, Ministry of Health and Medical Services	
Dietician	Ms. Enny KAEKI

(2) Kiritimati Island, Kiribati

Name of Organization and Title	Name
Ministry of Line & Phoenix Islands Development	
Minister	Hon. Tawita TEMOKU
Permanent Secretary	Ms. Toramweai ITANRAOI
MFMRD Fisheries Division Kiritimati	
Senior Fisheries Officer	Mr. Kintoba TEARO
Central Pacific Producers Ltd. (Kiritimati Branch)	
Manager	Mr. Mean ROBUTI

(3) Honolulu, Hawaii

Name of Organization and Title	Name
Fresh Island Fish Co. Inc.	
VP of Purchasing	Mr. Kazu INAKOSHI
Tropic Fish & Vegetable Center	
General Manager	Mr. Glenn TANOUE
Air Kiribati Honolulu	
General Manager	Mr. William E. PAUPE

(4) Fiji

Name of Organization and Title	Name
Embassy of Japan	
Ambassador	Mr. Kenro IINO
First Secretary	Mr. Shigeki TAKAYA
JICA Fiji Office	
Director	Mr. Tadashi IKESHIRO
Staff	Mr. Masayoshi ONO

3-2 Draft Basic Design Study

(1) Kiribati

Name of Organization and Title	Name
Ministry of Fisheries and Marine Resources Development	
Minister	Hon. Tetabo NAKARA
Deputy Secretary	Mr. Raimon TAAKE
Deputy Director of Fisheries, Fisheries Tanaea	Mr. Jonny KIRATA
Economist	Ms. Tuaia IEREMIA
Advisor, OFCF Expert	Mr. Hisashi IKEDA
Ministry of Environment, Land and Agriculture Department	
Environment Inspector	Mr. Kantoa TONGANIBEIA
Agriculture / Biochemistry Reserve Officer	Ms. Nenenteiti Ruaty
Central Pacific Producers Ltd. (CPPL)	
President	Mr. Barerei ONORIO
Tungal Hospital, Ministry of Health and Medical Services	
Dietician	Ms. Enny KAEKI

(2) Fiji

Name of Organization and Title	Name
Embassy of Japan	
Ambassador	Mr. Kenro IINO
First Secretary	Mr. Shigeki TAKAYA
JICA Fiji Office	
Director	Mr. Tadashi IKESHIRO
Staff	Mr. Hisashi SUZUKI

4. Minutes of Discussions

MINUTES OF DISCUSSIONS OF THE BASIC DESIGN STUDY ON THE PROJECT FOR KIRITIMATI ISLAND COASTAL FISHERIES DEVELOPMENT IN THE REPUBLIC OF KIRIBATI

In response to a request for Grant Aid from the Government of the Republic of Kiribati (hereinafter referred to as "Kiribati"), the Government of Japan decided to conduct a Basic Design Study on the Project for Kiritimati Island Coastal Fisheries Development Project (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Kiribati the Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Tetsuo YABE, Senior Assistant to the Managing Director, Office of Technical Coordination and Examination, Grant Aid Management Department, JICA and is scheduled to stay in the country from May 25 to June 22, 2004.

The Team held a series of discussions with the officials concerned of the Government of Kiribati and conducted a field survey at the study area.

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

Tarawa, June 9, 2004

Tetsuo YABE
Leader
Basic Design Study Team
JICA

Raimon TAAKE
Deputy Secretary
Ministry of Fisheries and Marine Resources Development

ATTACHMENT

1. Objective

The objective of the Project is to develop artisanal fishery in Kiritimati Island through rehabilitation and construction of unloading facilities, construction of fish handling facilities and procurement of equipments for unloading / handling/ processing activities.

2. Project Site

The site of the Project is located in London area, Kiritimati Island as shown in ANNEX-1.

3. Responsible and Implementing Agency

The responsible and implementing agencies are the Ministry of Fisheries and Marine Resources Development (hereinafter referred to as "MFMRD") and the Central Pacific Producers Ltd. (hereinafter referred to as "CPPL") respectively. The organization charts of MFMRD and CPPL are as shown in ANNEX-2.

4. Items Requested by the Kiribati Side

After discussions with the Team, the items described in ANNEX-3 were finally requested by the Kiribati side. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

However, final components of the Project will be decided after further study.

5. Japan's Grant Aid Scheme

5-1. The Kiribati side has understood "Japan's Grant Aid Scheme" explained by the Team, as described in ANNEX-4.

5-2. The Kiribati side will undertake the necessary measures, as described in ANNEX-5, for smooth implementation of the Project, as a condition for the Japanese Grant Aid to be implemented.

5-3. The Kiribati side has understood the necessity for the completion of the Counterpart Fund reserved for the equipment concerned within the settled period.

6. Schedule of the Study

6-1. The consultants will proceed with further study in Kiribati until June 22, 2004.

6-2. JICA will prepare the draft report in English and will dispatch a mission around October, 2004 to explain its contents.

6-3. In case the contents of the report are acceptable in principle by the Kiribati side, JICA will complete the final report and send it to the Kiribati side by March, 2005.

7. Other Relevant Issues

7-1. KIRI-5

The Kiribati side guaranteed not to claim against the Government of Japan and JICA with regard to any result caused by any accident at sea with using the locally constructed outrigger plywood boat called as KIRI-5 in the outer reef fishing operation at Kiritimati Island.

7-2. Fresh Water for Ice Making

The Government of Kiribati promised to assure the supply of fresh clean water for ice making for the Project.

7-3. Additional Requests

The Kiribati side has additionally requested the jetty and slipway with winch in Kiritimati Island through diplomatic channel to the Government of Japan.

After discussion, both sides tentatively agreed as follows,

(1) to renovate the existing wharf as a mooring and fish-landing site for the fishing boats including Tekokona III, instead of the jetty.

(2) to renovate and extend the existing slipway for the fishing boats including Tekokona III.

7-4. Securing the Land for the Project

The Kiribati side shall secure the land necessary for the Project in Kiritimati Island before the draft report explanation team will visit Kiribati.

7-5. Environmental Impact

Both sides understood that the environmental issues to be assessed would be following, such as:

(1) Contamination of water by the construction works

(2) Polluted water by fish processing

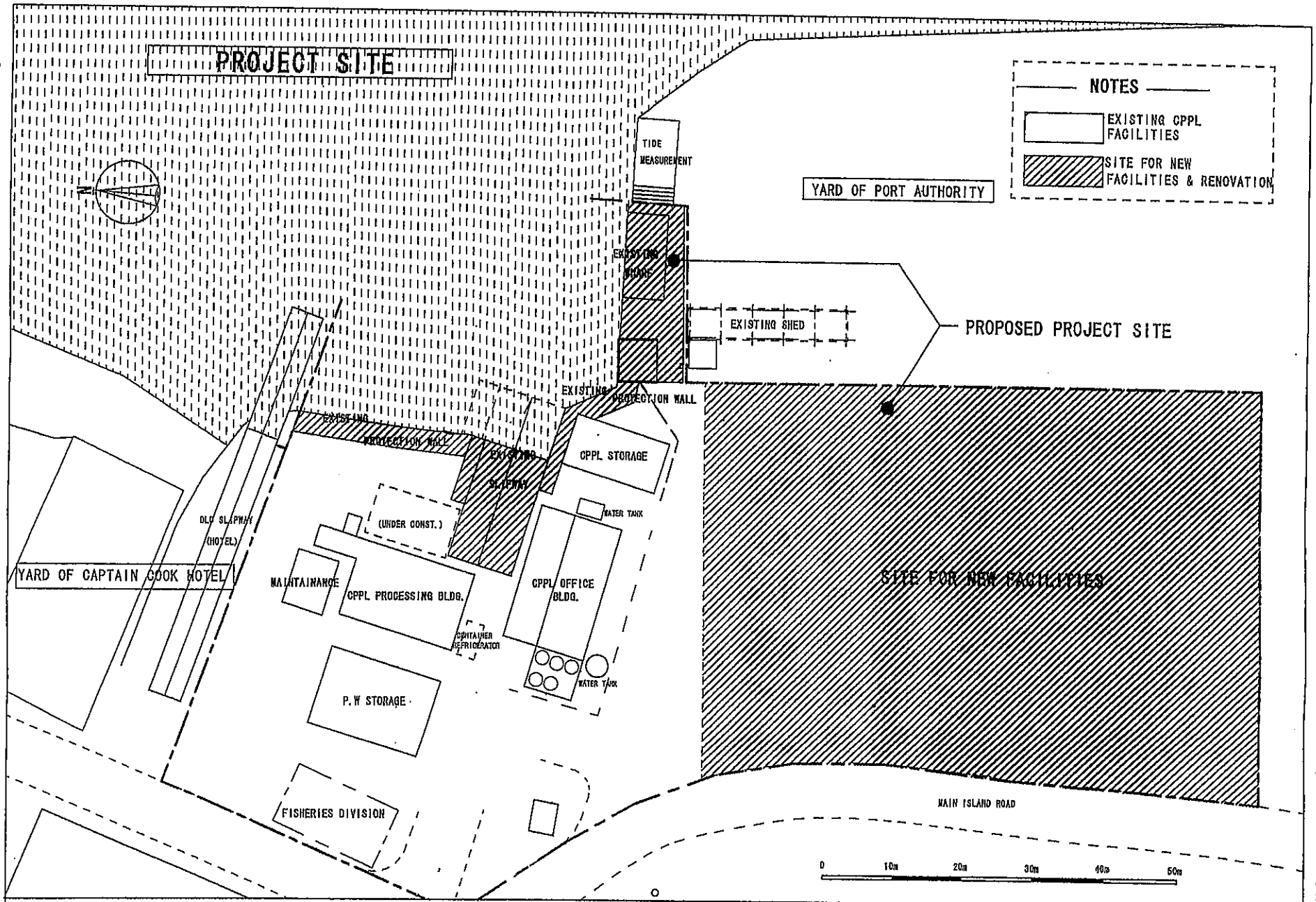
The Kiribati side shall obtain the approval of EIA by the Ministry of Environment before the draft report explanation team will visit Kiribati.

7-6. Removal of the Pontoons Moored at the Project Site

The Kiribati side shall complete the removal of two pontoons at the Project site as soon as possible after signing of E/N.

7-7. Sand Sedimentation and/or Erosion

In case that the sand sedimentation and/or erosion may occur at the Project site, the Kiribati side shall take necessary measures against it.



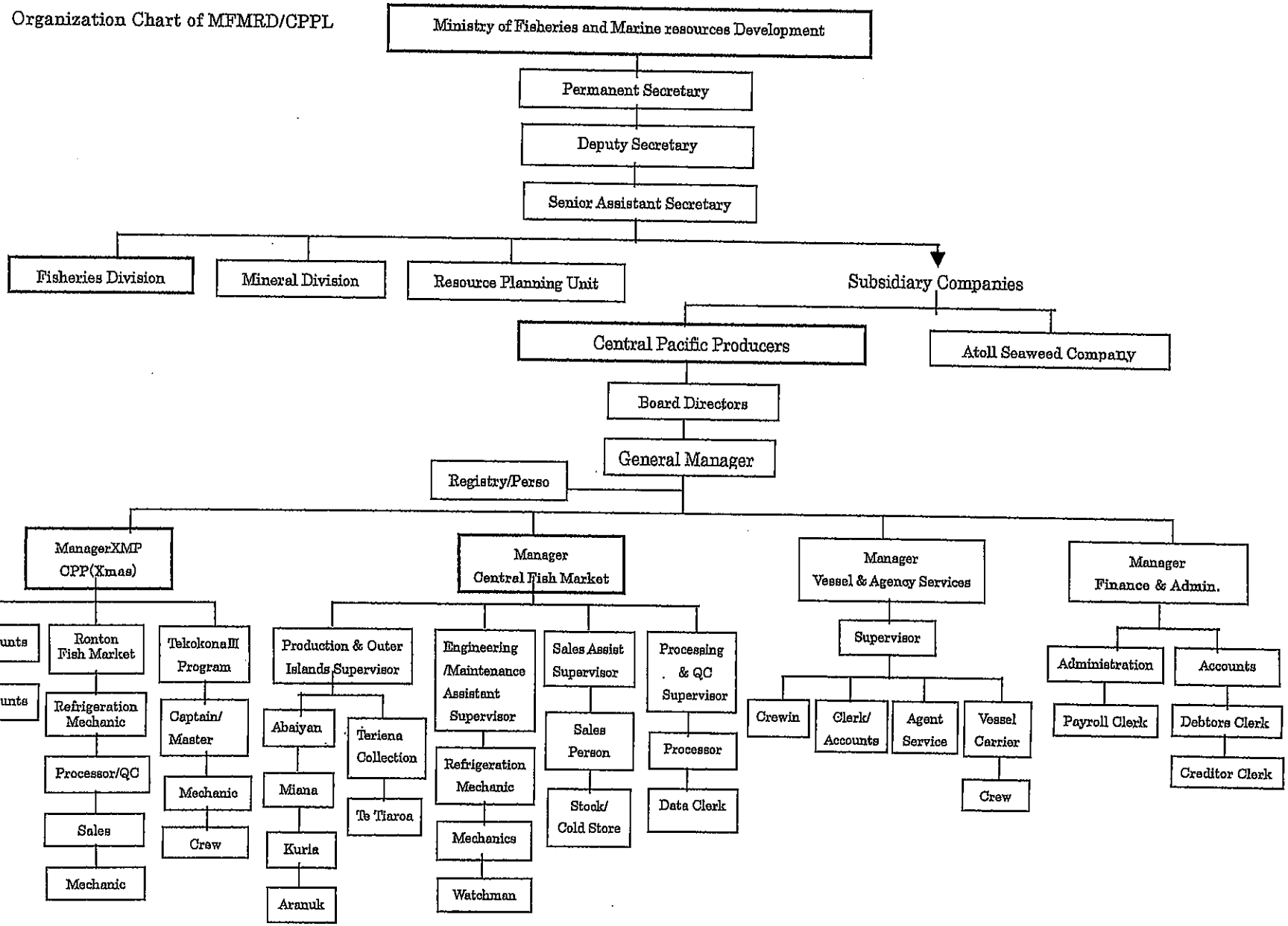
THE PROJECT FOR KIRITIMATI ISLAND COASTAL FISHERIES DEVELOPMENT IN THE REPUBLIC OF KIRIBATI

PROJECT SITE

A-10

ANNEX-1

Organization Chart of MFMRD/CPPL



A-11

ANNEX-2

Project Component

(1) Facilities

	ITEMS	Priority
1.	Building: -1 Fish Handling Building: Office, Meeting Room, Machine Room, Toilet Zone for Cold Storage, Ice Making Machine, Air Blast Freezer -2 Diesel Generator House: Generator Room, Fuel Tank, Workshop: -3 Septic Tank:	 A A A
2.	Plumbing Works, Ventilation Works, Space for Refrigerated Containers	A
3.	Renovation of Slipway for Fishing Boats, Wharf and Protection Wall	A

(2) Equipment

No.	Items	Q'ty	Outline	Priority
1.	Fishing Boats	4 boats	Outrigger Type, Plywood, KIRI-5 Type, Length 11.7 m, Width 1.4 m, With 40hp Outboard Engine (4-Stroke) and Stand-by Engine 25hp Insulated Box:250(l)×1 VHF Radio (Handy Type) ×1, Safety Equipment ×1 set Life Jacket, Whistle, Smoke Candle.	A
2.	Equipment for Quality Control Facilities	1 unit		
	Ice Making Machine, Ice Storage	1 unit	1 ton Plate Ice, 2 ton Ice Storage	A A
	Air Blast Freezer	1 unit	200kg, −35℃	C
	Cold Storage	1 unit	4 ton, −25℃	A
3.	Processing Equipment			
	Fish Gutting Table Lobster Cutting and Wrapping Table, Strapping Machine	2 units 2 units 1 unit		A A A
	Weighing Machine	1 set	150kg Floor Type, Salt Water-resistant	B
	Live Lobster Keeper Box	2 units	Wooden Box	B
	High Pressure Cleaning Machine	1 unit	For Cleaning the Floor with Fresh Clean Water	C
	Washing Tools	1 set	Scraper, Deck Brush, Hose etc.	A
4.	Handling Equipment			
	Truck with Crane	1 set	1ton Crane for Lifting Fish Box	A
	Handling Materials and Equipment	1set	Push Cart, Insulated Fish Box	B
5.	Sales Support Equipment			
	Truck with Awning	1unit	Pickup Truck, 4WD	B
6.	Radio Equipment			
	VHF	1unit	VHS Handy Type 20W	C
	SSB	1unit	100W	C
7.	Diesel Generator	1unit	60KVA	A
8.	Incidental Equipment			
	Rainwater Storage Tank	1unit		A
	Fresh Water Tank	1unit	Internal Water Supply	A
	Fuel Tank	1unit		A
	Septic Tank	1unit		A

Japan Grant Aid Scheme

Japan's Grant Aid

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

1. Grant Aid Procedures

Japan's Grant Aid Program is executed through the following procedures.

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

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

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

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Scheme, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes (E/N) signed by the Governments of Japan and the recipient country.

Finally, for the smooth implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. Basic Design Study

(1) Contents of the Study

The aim of the Basic Design Study (hereinafter referred to as "the Study"), conducted by JICA on a requested project (hereinafter referred to as "the Project") is to provide a basic document necessary for appraisal of the Project by the Government of Japan. The contents of the Study are as follows:

a) Confirmation of the background, objectives, and benefits of the requested Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.

b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economical point of view.

c) Confirmation of items agreed upon by the both parties concerning a basic concept of the Project.

d) Preparation of a Basic Design of the Project

e) Estimation of cost of the Project

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

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

(2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA.

The consulting firm(s) used for the Study is (are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

3. Japan's Grant Aid Scheme

(1) Exchange of Notes (E/N)

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

(2) "The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedure such as exchanging of Notes, concluding contracts with (a) consulting firm(s) and (a) contractor(s) and final payment to them must be completed.

However, in case of delays in delivery, installation or construction due to unforeseen factors such as natural disaster, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments..

(3) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant Aid may be used for the purchase of products or services of a third country.

However, the prime contractors, namely, consulting constructing and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

(4) Necessity of the "Verification"

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

(5) Undertakings required to the Government of the Recipient Country

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

a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction,

b) To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,

c) To secure buildings prior to the procurement in case the installation of the equipment,

d) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid,

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

f) To accord Japanese nationals, whose services may be required in connection with the supply of the products and services under the Verified contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

(6) "Proper Use"

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

(7) "Re-export"

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

(8) Banking Arrangements (B/A)

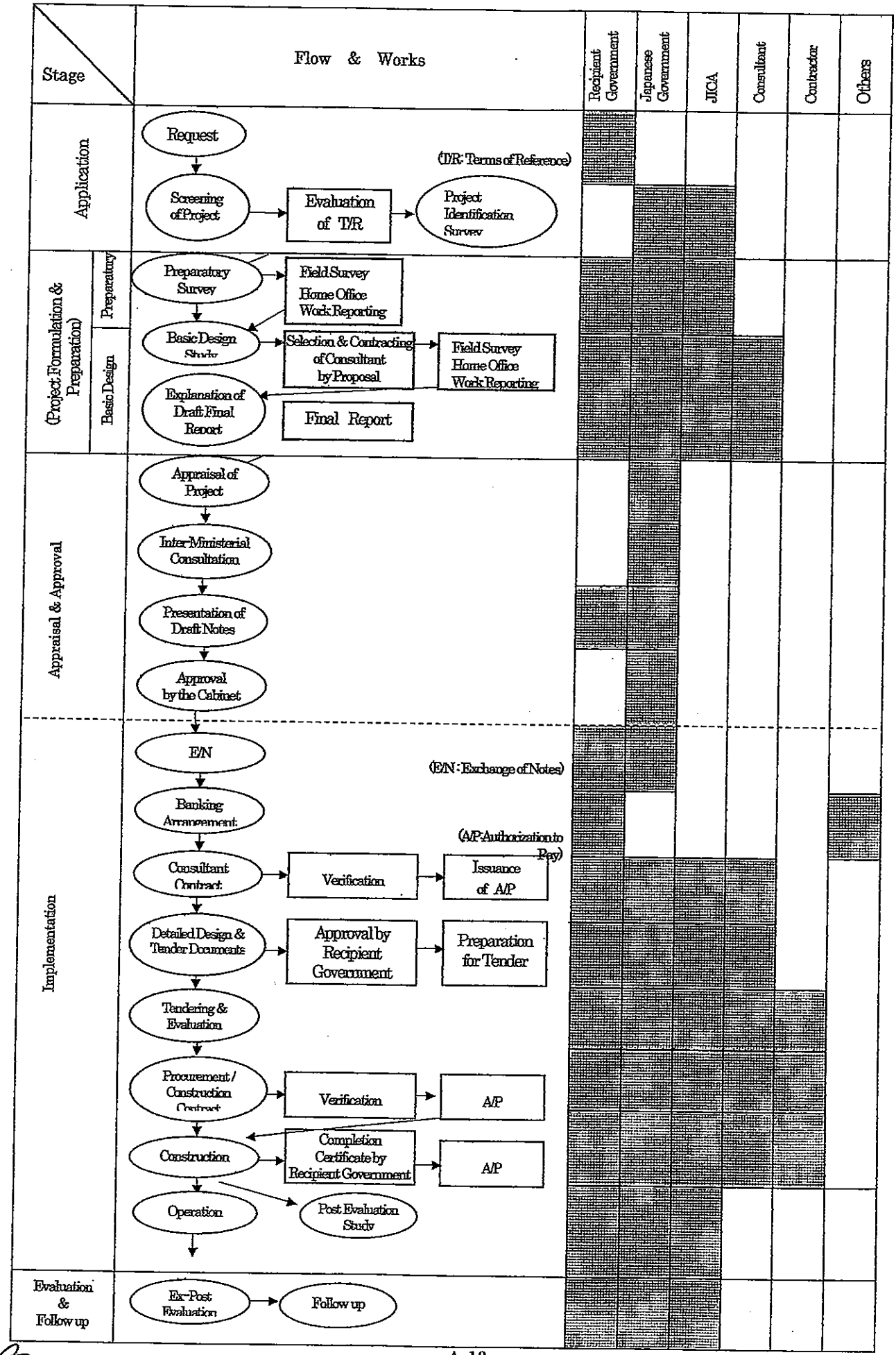
a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions to the Bank.

Flow Chart of Japan's Grant Aid Procedures



ANNEX-5

Major Undertakings to be taken by Each Government

No	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure land		●
2	To clear, level and reclaim the site when needed		●
3	To construct gates and fences in and around the site		●
4	To construct the parking lot	●	
5	To construct roads		
	1) Within the site	●	
	2) Outside the site		●
6	To construct the buildings	●	
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities		
	1) Electricity		
	a. The distributing line to the site		●
	b. The drop wiring and internal wiring within the site	●	
	c. The main circuit breaker and transformer	●	
	2) Water supply		
	a. The city water distribution main to the site		●
	b. The supply system within the site (receiving and elevated tanks)	●	
	3) Sea water supply		
	a. Sea water distribution main to the site		●
	b. The supply system within the site	●	
	4) Drainage		
	a. The city drainage main (for storm, sewer and others) to the site		●
	b. The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site	●	
	5) Gas Supply		
	a. The city gas main to the site		●
	b. The gas supply system within the site	●	
	6) Telephone System		●
	7) Furniture and Equipment		
	a. General furniture		●
	b. Project equipment	●	
8	To bear the following commission to the Japanese foreign exchange bank for the banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
9	To ensure unloading and customs clearance at port of disembarkation in recipient country		
	1) Marine (Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	(●)	(●)
10	To accord Japanese nationals, whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.		●
11	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts.		●
12	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant.		●
13	To bear all the expenses, other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and installation of the equipment.		●

MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY
ON
THE PROJECT
FOR
KIRITMATI ISLAND COASTAL FISHERIES DEVELOPMENT
IN
REPUBLIC OF KIRIBATI
(CONSULTATION ON THE DRAFT REPORT)

In May 2004, Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Basic Design Study Team on the Project for Kiritimati Island Coastal Fisheries Development (hereinafter referred to as "the Project") and has prepared the draft report of the study based on the discussions, site surveys and technical examination in Japan.

In order to explain and to consult the Government of Kiribati on the components of the draft report, JICA sent to Kiribati the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Shumon YOSHIARA, Vice Resident Representative, JICA Fiji Office, JICA from 25th October to the 1st November, 2004.

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

Tarawa, 29th October, 2004

Mr. Shumon YOSHIARA
Leader
Draft Report Explanation Team
JICA

Mr. Raimon TAAKE
Deputy Secretary
Ministry of Fisheries and Marine Resources Development

ATTACHMENT

1. Components of the draft report

Kiribati side agreed and accepted the components of the draft report explained by the Team. The Project component is as shown in Annex-1 and Project site is as shown in Annex-2.

2. Japan's Grant Aid System

2-1. Kiribati side understood the Japan's Grant Aid Scheme as explained by the Team and will take necessary measures described in Annex-4 which had been confirmed in the Minutes of Discussions of the Basic Design Study signed on 9 June 2004 on condition that the Grant Aid by the Government of Japan is extended to the Project.

2-2. Kiribati side will undertake the necessary measures, as described in Annex-5, for smooth implementation of the Project.

3. Schedule of the Study

JICA will complete the final reports in accordance with the confirmed items and send them to the Government of Kiribati around March 2005.

4. Other Relevant Issues

4-1. Both sides confirmed that the alternative land for existing fish landing activity during the construction period for the Project had already been secured by Kitibati side as per ANNEX 3.

4-2. Kiribati side promised to remove the existing pontoons by the beginning of December 2004.

4-3. Kiribati side promised to secured the necessary budget for the all the cost to be borne by Kiribati side including removal of existing facilities and to inform the completion of the above mentioned removal to the Embassy of Japan in Fiji and JICA Fiji Office by the middle of December 2004.

4-4. Both sides reconfirmed that Kiribati side guarantees not to claim against the Government of Japan and JICA with regard to any result caused by any accident at sea with using the locally constructed outrigger plywood boat called as KIRI-5 in the outer reef fishing operation at Kiritimati Island.

4-5. Kiribati side promised to complete the reservation of the Counterpart Fund for the equipment concerned within the settled period.

4-6. Kiribati side promised to manage and maintain properly the facilities and equipment of the Project, especially the construction of the spare parts and consumables stock holding system according to the recommendation of Draft Report of the Project.

4-7. Kiribati side promised to obtain the approval of EIA by the Ministry of Environment by the end of this year.

4-8 Use of the site for the Project had already been admitted by the Government of Kiribati.

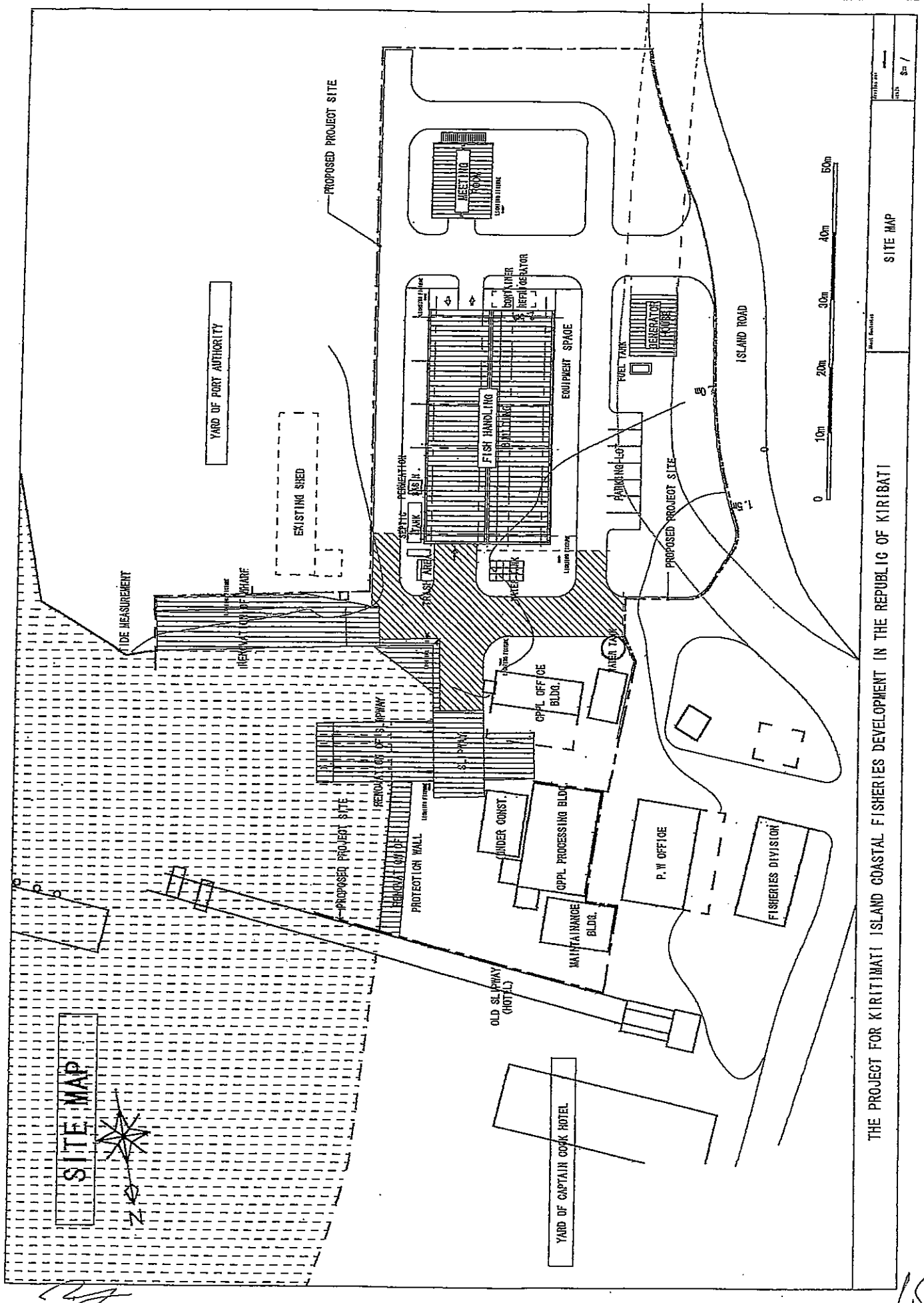
4-9. Kiribati side will confirm before the end of this year on the proposed site required for the construction temporary yard. Total area required is 8,500 m^2.

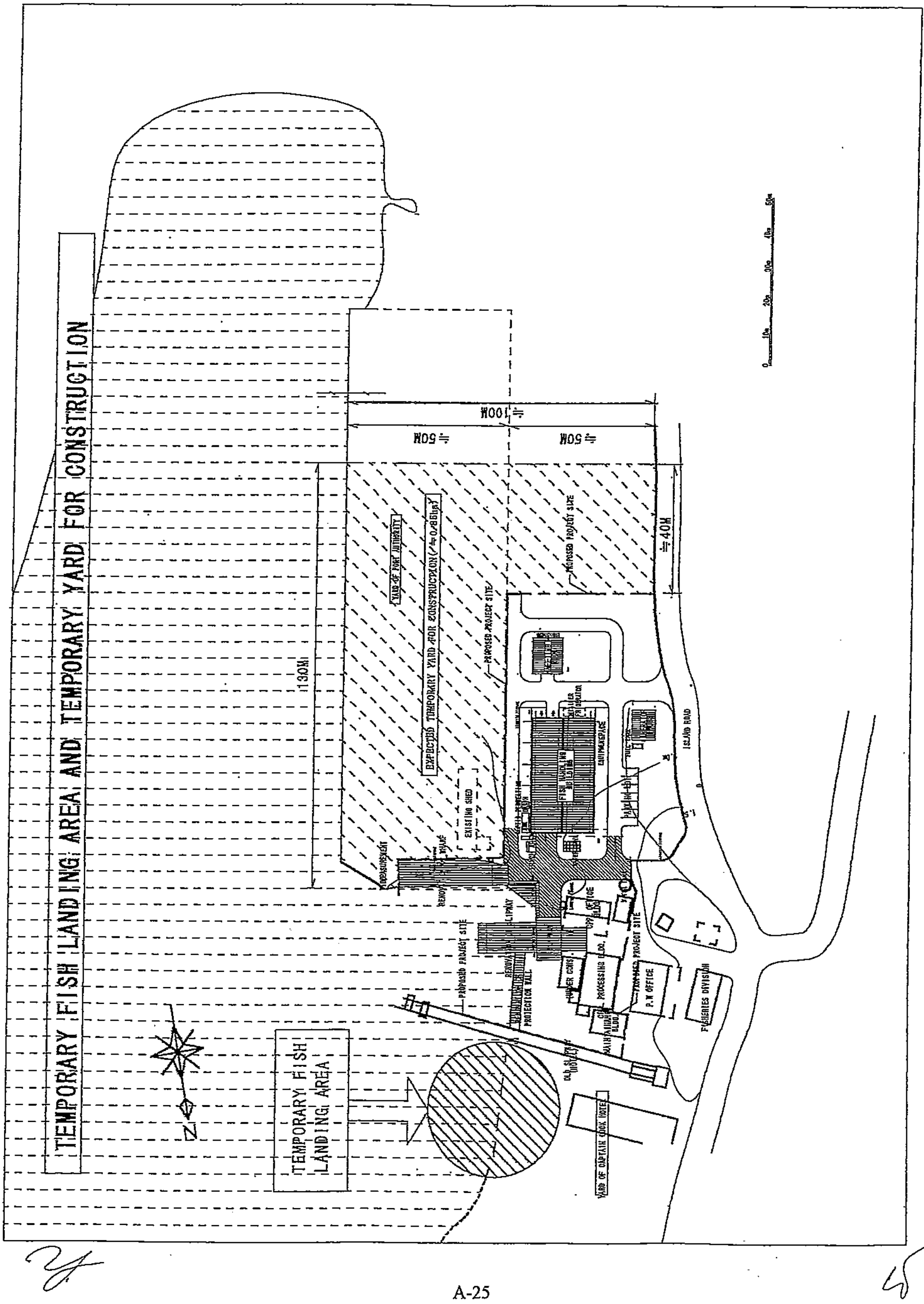
Project Component

ANNEX- 1

Items	Contents	Quantity	Remarks
1. Marine civil engineering facility			
1-1 Slipway, Revetment	Renovation of existing slipway (ramp) Repair of revetment in part	Complete	
2. Building facility			
2-1 Handling Place for fishery products	Delivery, Preparation, Processing, Packing, Shipment, Retail Selling, Office, Changing Room, Anteroom, Toilet, Machinery Room, Refrigeration Equipment Room	Complete	
2-2 Generator House	Generator 2 units	Complete	
2-3 Meeting Hall	30 persons 2 stores for chair/table and fishing gear	Complete	
2-4 Drainage equipment		Complete	
3. Equipment/Materials			
3-1 Refrigeration equipment			
① Existing semi air blast freezer	370kg/5-8 hr (real)	Complete	Relocation
② Freezing store	Floor 6m×4.5m	Complete	
③ Ice-making machine	1.5t/day Ice bin : 3t	Complete	
3-2 Generator			
① 60KVA	60KVA 3 phase, 415V, 50Hz	Complete	Newly-supplied
② Existing 45KVA unit	Relocation of existing unit	Complete	Relocation
3-3 Septic tank	2.2t/day	Complete	
3-4 Water tank	Rainwater, 45 ton (practical use : 40 ton)	Complete	
3-5 Fuel oil tank	for generator, 3kl	Complete	
4. Equipment/Materials			
4-1 Fishing boat	KIRI-5 type, 11.7m type outrigger canoe, 40HP outboard engine, 25HP in reserve, safety equipment, VHF, fishing box (100L)×2	4 boats	Establishment of 6 boats operation system including existing 2 boats
4-2 Working table	for washing fish	2 units	
	for processing fish & lobster	2 units	
4-3 Packing	Working table	2 units	
4-4 Band saw	for fresh and frozen fish	1 unit	
4-5 Weighing machine	100kg type, digital display of kg & pound	1 unit	
4-6 Cleaning tools	Nozzle, hose, deck brush, etc	1 set	
4-7 Truck with crane	Front winch 2 ton, crane 5m, 420kg	1 unit	

Items	Contents	Quantity	Remarks
4-8 Transport equipment			
① Pushcart	400kg capacity	1 unit	
② Pallet fork	500kg max., hand-pushed type	1 unit	
③ Fish box (50kg)	Stackable type 50kg	10 boxes	
④ Fish box (350kg)	Insulated, 700L	10 boxes	
⑤ Water tank/lorry	Water tank for washing fish 800L	1 unit	
⑥ Slipway trolley	Pulling up Tekokona III	1 unit	
4-9 Chest freezer	700L type, -20℃	1 unit	
4-10 Winter clothes	Winter clothes, headgears, gloves and boots	3 sets	
4-11 Table and chair for meeting room	10 tables and 30chairs	1 set	


SITE MAP
THE PROJECT FOR KIRITIMATI ISLAND COASTAL FISHERIES DEVELOPMENT IN THE REPUBLIC OF KIRIBATI
PROPOSED PROJECT SITE
YARD OF PORT AUTHORITY
EXISTING SHED
TIDE MEASUREMENT
RENOVATION OF WHARF
MEETING ROOM
CONTAINER REPAIR GERATOR
FISH HANDLING
EQUIPMENT SPACE
FUEL TANK
GENERATOR (NEW)
ISLAND ROAD
PARKING LOT
PROPOSED PROJECT SITE
SEPTIC TANK
TOILET
WATER TANK
GPPL OFFICE BLDG.
RENOVATION OF SLIPWAY
SLIPWAY
PROPOSED PROJECT SITE
PROTECTION WALL
UNDER CONST.
GPPL PROCESSING BLDG.
P.W OFFICE
FISHERIES DIVISION
MAINTAINANCE BLDG.
OLD SLIPWAY (HOTAL)
YARD OF CAPTAIN COOK HOTEL
N
0
10m
20m
30m
40m
50m


TEMPORARY FISH LANDING AREA AND TEMPORARY YARD FOR CONSTRUCTION
TEMPORARY FISH LANDING AREA
EXPECTED TEMPORARY YARD FOR CONSTRUCTION
YARD OF PORT AUTHORITY
PROPOSED PROJECT SITE
EXISTING SHED
FISH HANDLING BUILDING
P.W OFFICE
FISHERIES DIVISION
PROCESSING BLDG.
YARD OF CAPTAIN COOK HOTEL
ISLAND ROAD
PROTECTION WALL
OLD SLIPWAY
≒100M
≒50M
≒50M
≒40M
130M
N

Japan's Grant Aid Scheme

Japan's Grant Aid

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Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and approval by the Cabinet of Japan)
Determination of Implementation	(Exchange of Notes between the both Governments of Japan and the recipient country)

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

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

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Scheme, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes (E/N) signed by the Governments of Japan and the recipient country.

Finally, for the smooth implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. Basic Design Study

(1) Contents of the Study

The aim of the Basic Design Study (hereinafter referred to as "the Study"), conducted by JICA on a requested project (hereinafter referred to as "the Project") is to provide a basic document necessary for appraisal of the Project by the Government of Japan. The contents of the Study are as follows:

a) Confirmation of the background, objectives, and benefits of the requested Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.

b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economical point of view.

c) Confirmation of items agreed upon by the both parties concerning a basic concept of the Project.

d) Preparation of a Basic Design of the Project

e) Estimation of cost of the Project

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

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

(2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA.

The consulting firm(s) used for the Study is (are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

3. Japan's Grant Aid Scheme

(1) Exchange of Notes (E/N)

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

(2) "The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedure such as exchanging of Notes, concluding contracts with (a) consulting firm(s) and (a) contractor(s) and final payment to them must be completed.

However, in case of delays in delivery, installation or construction due to unforeseen factors such as natural disaster, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments..

(3) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant Aid may be used for the purchase of products or services of a third country.

However, the prime contractors, namely, consulting constructing and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

(4) Necessity of the "Verification"

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

(5) Undertakings required to the Government of the Recipient Country

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

a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction,

b) To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,

c) To secure buildings prior to the procurement in case the installation of the equipment,

d) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid,

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

f) To accord Japanese nationals, whose services may be required in connection with the supply of the products and services under the Verified contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

(6) "Proper Use"

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

(7) "Re-export"

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

(8) Banking Arrangements (B/A)

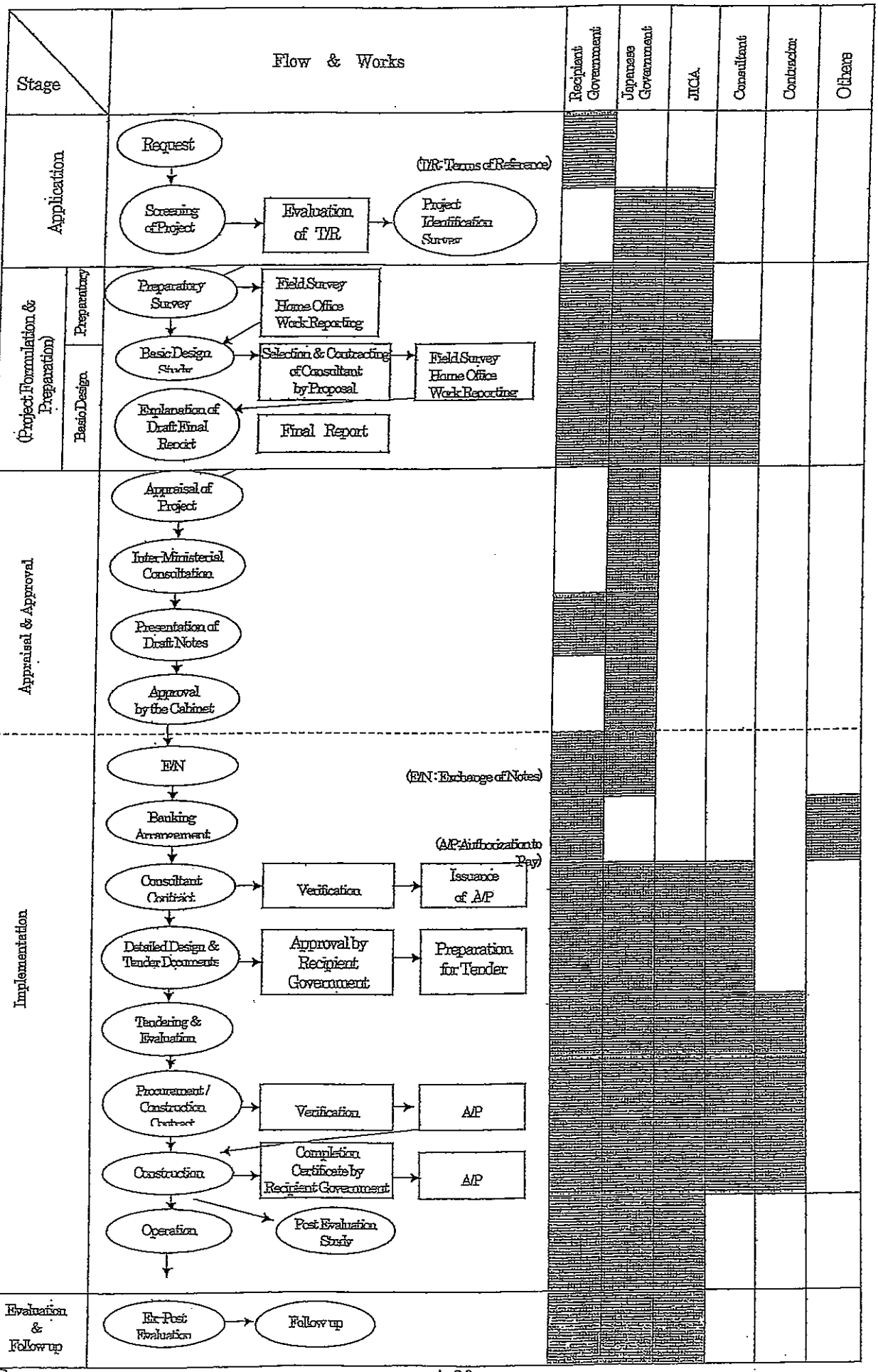
a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions to the Bank.

Flow Chart of Japan's Grant Aid Procedures

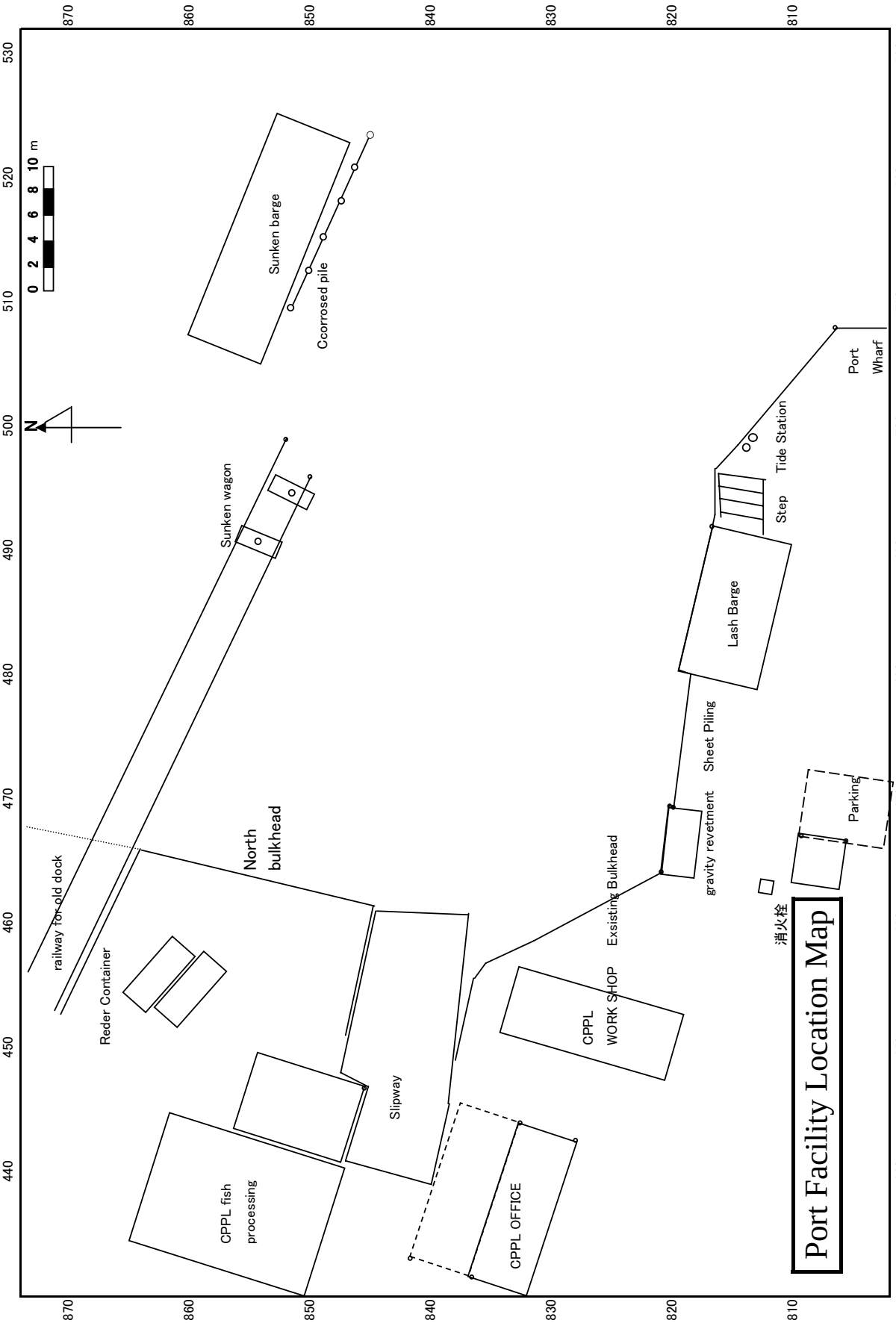


ANNEX-5

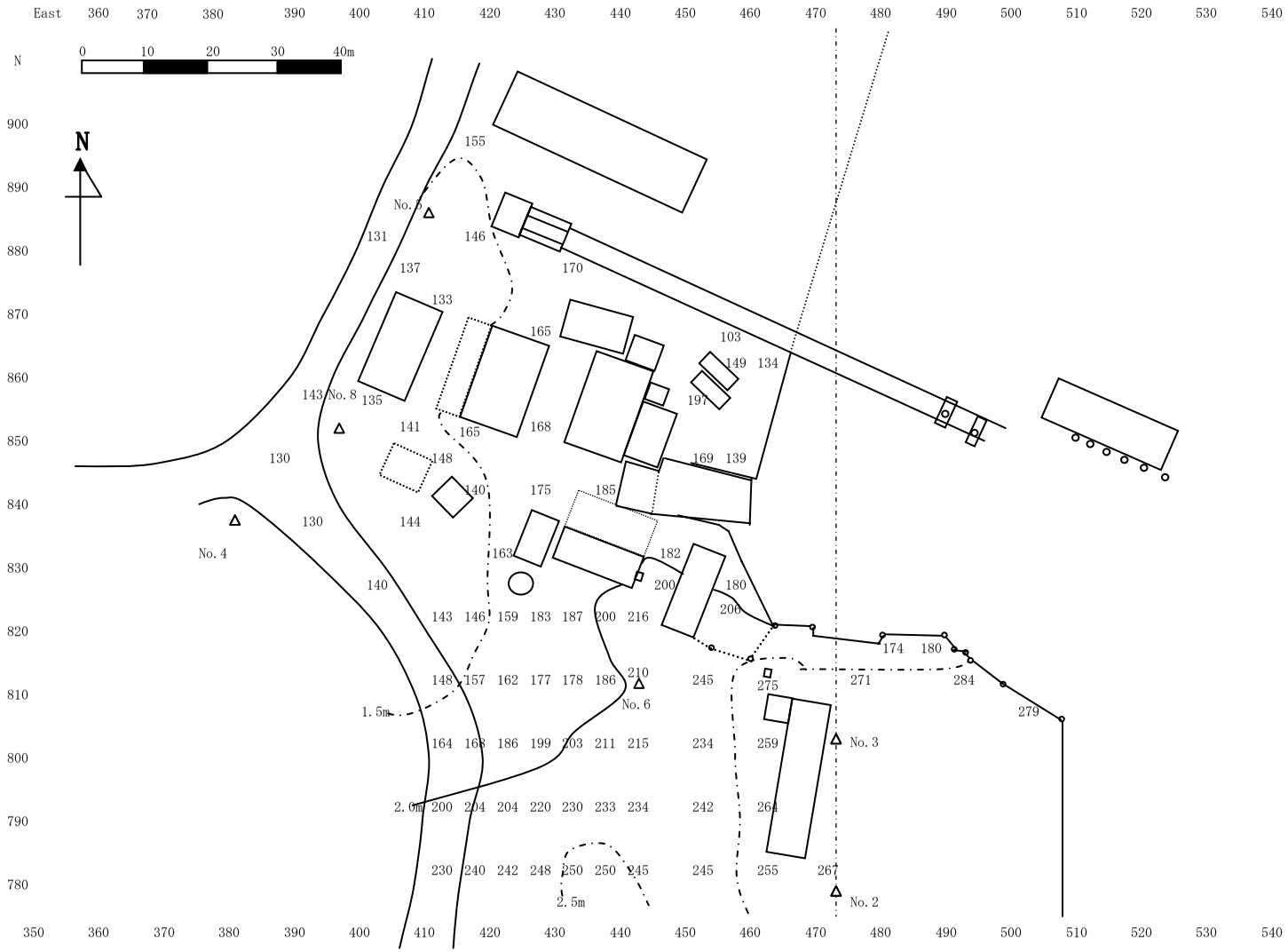
Major Undertakings to be taken by Each Government

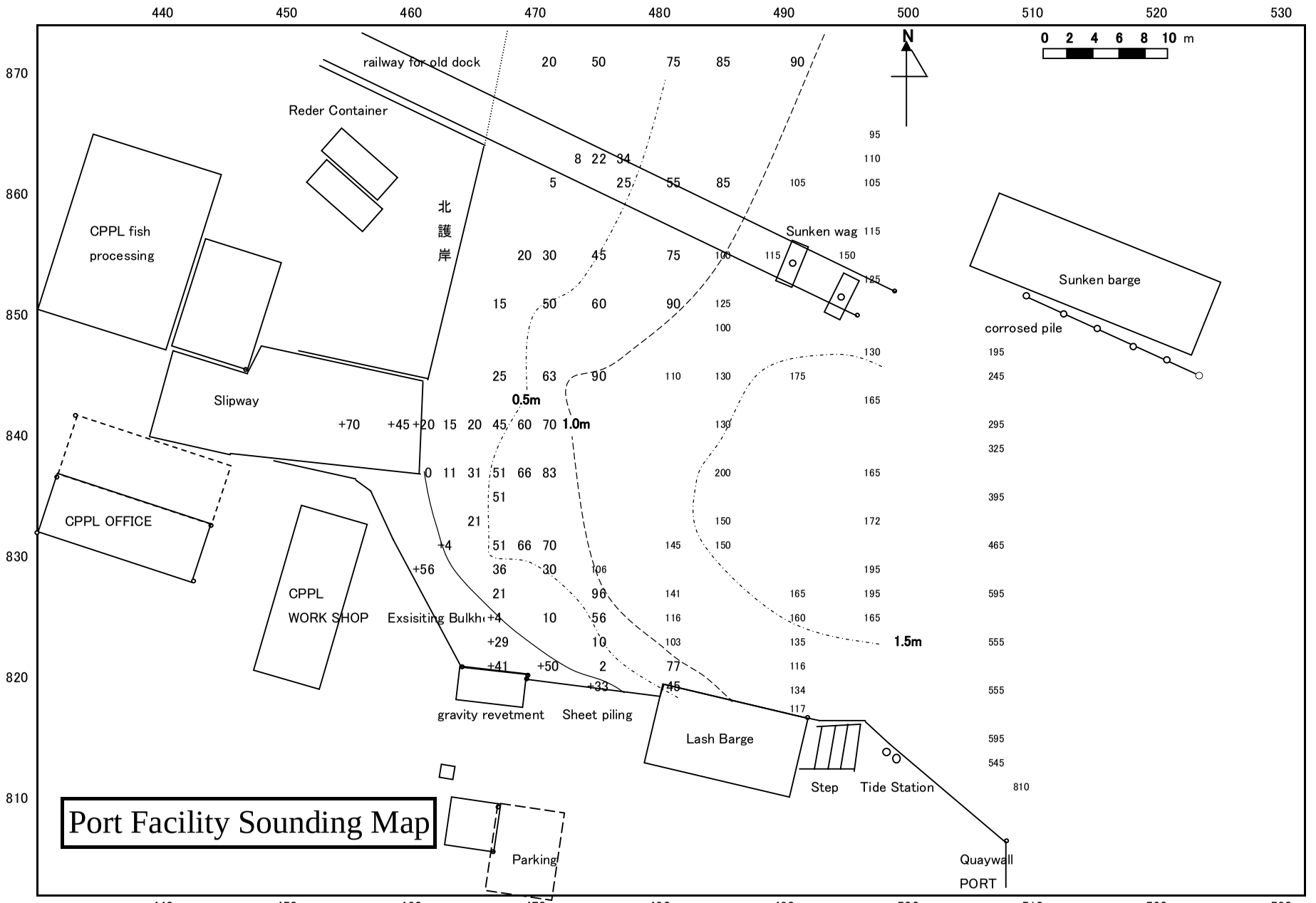
N0	Items	Japan	Kiribati
1	To secure land		●
2	To clear the site and the removal of a pontoon		●
3	Construction of fence		●
4	Construction of a parking lot	-	-
5	Road		
	1) Access within the site	●	
	2) Outside the site		●
6	Construction of buildings	●	
7	To provide facilities for electricity, water supply, drainage, and gas		
	1) Electricity		
	a. The distribution line to the site		●
	b. Transformer and distribution within the site	●	
	c. Main power receiving board	●	
	2) Water supply		
	a. The public water distribution main to the site		●
	b. The supply system within the site	●	
	3) Seawater supply		
	a. Seawater supply	-	-
	b. Seawater supply within the site	-	
	4) Drainage		
	a. The public drainage main to the site		-
	b. Drainage within the site (drainage way, septic tank)	●	
	5) Telephone system		●
	6) Furniture and equipment		
	a. General furniture		●
	b. Project equipment	●	
8	Payment of the following commission to the Japanese foreign exchange bank in accordance with the banking arrangement		
	1) Advising commission of A/P		●
	2) Payment commission		●
9	Import and customs clearance		
	1) Transportation to Kiribati	●	
	2)Tax exempt and customs clearance at Kiribati		●
	3) Internal transportation in Kiribati	●	-
10	Provision for procedural conveniences for the entry to, stay in and departure from Kiribati of Japanese nationals involved in the Project.		●
11	Exemption of all the taxes including internal taxes and other fiscal levies which may be imposed in Kiribati with respect to the supply of the equipment and materials and services procured by the Contractor of the Project.		●
12	Appropriate and effective management and maintenance of facilities constructed and equipment provided under the Grant.		●
13	To bear all the expense, other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and installation of the equipment.		●

5. Natural Conditions Survey Result



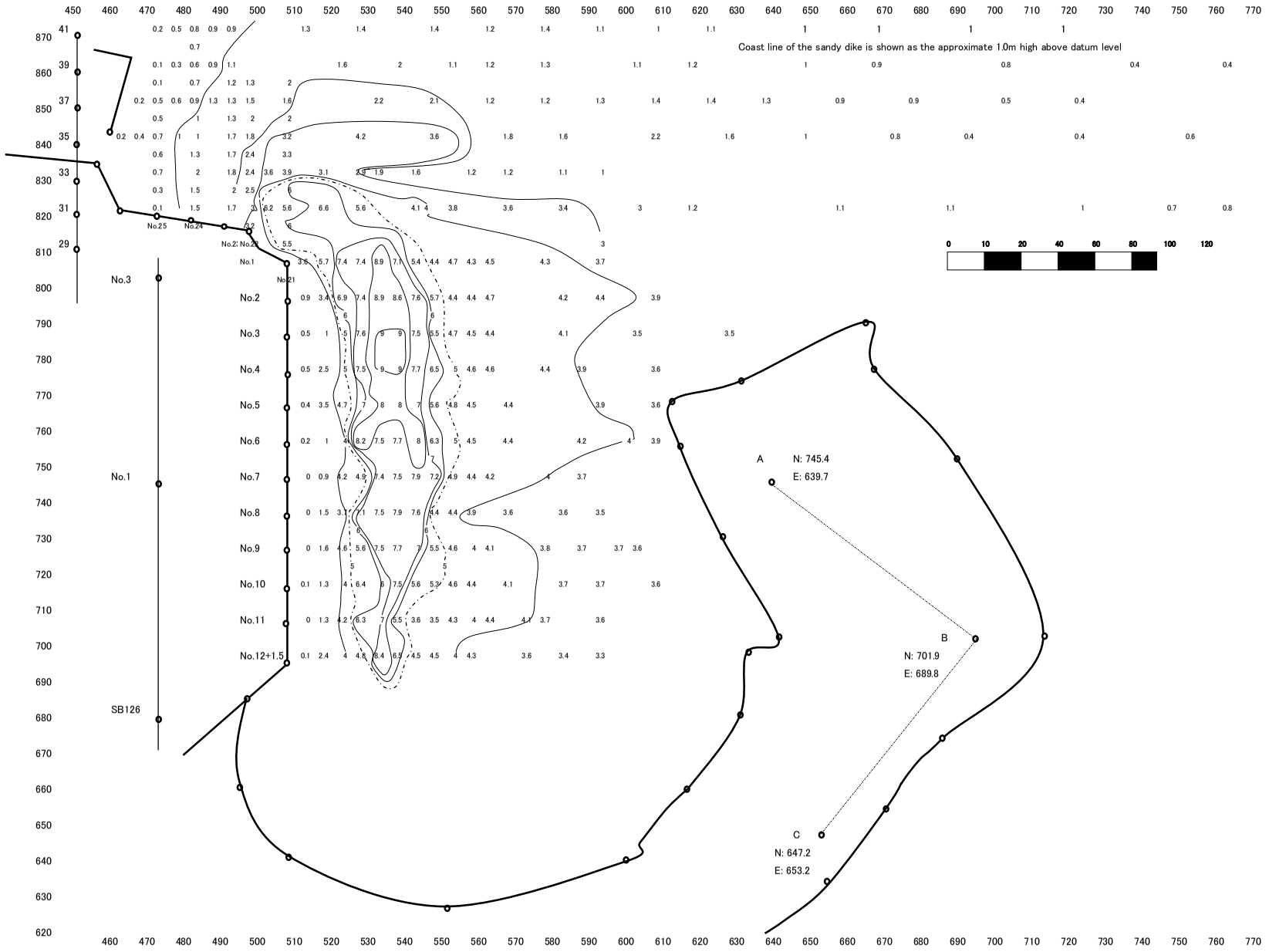
Land Area Topographic Survey Result



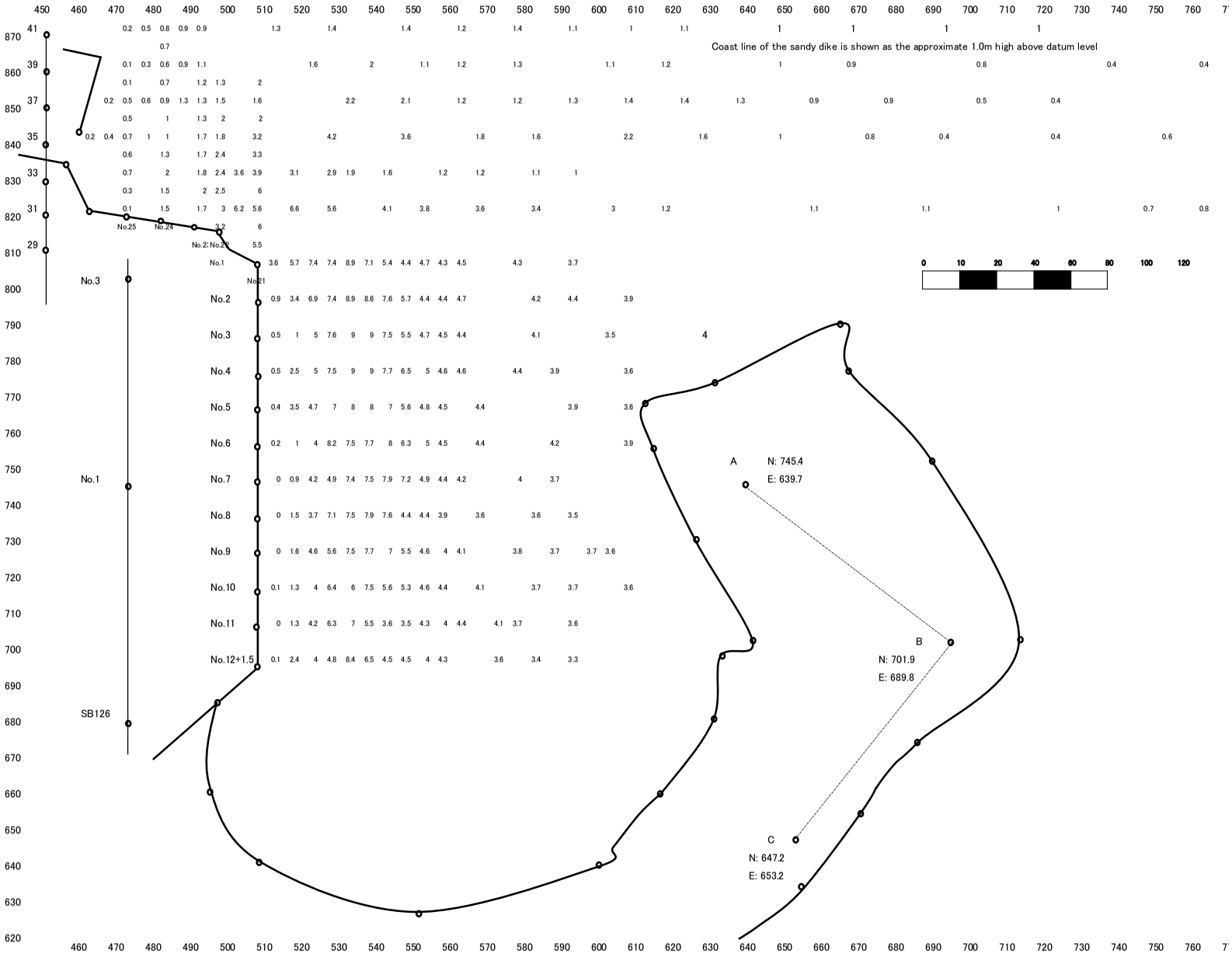


Port Facility Sounding Map

Ronton Port Facility Sounding Map



Ronton Port Area Sounding Map



5. Natural Conditions Survey Result

Soil Exploration by Swedish Sounding Method JIS A 1221

Project Name: Basic Design for Kiritimati Island Coastal Fisheries Development

Location: Civil Facility Date of survey : 11th, June, 2004

Number of hole : C-No.1 (Slipway) Surveyor : Masahiro Yokogawa

Surface ground level : '+0.34m

Weather : clear

A	B	C	D	E	F	G	H	I
Load	Number of half a turn	Accumulated penetration	Penetration	Number of half a turn penetrated per meter	0.002 x kN	0.067 x Nsw	N-Value	N-Value
kN	Na	cm	cm	Nsw	kN'	N'sw	F+G	0 5 10 15 20 25 30 35 40 45 50
330		0	0					
610		5	5					
890		8	3					
890	30	26	18	167	1.78	11.17	13	
890	20	39	13	154	1.78	10.31	12	
890	20	47	8	250	1.78	16.75	19	
890	18	79	32	56	1.78	3.77	6	
890	10	87	8	125	1.78	8.38	10	
890	20	89	2	1000	1.78	67.00	69	

Soil Exploration by Swedish Sounding Method JIS A 1221

Project Name: Basic Design for Kiritimati Island Coastal Fisheries Development

Location: Civil Facility Date of survey : 11th, June, 2004

Number of hole : C-No.2 (Slipway) Surveyor : Masahiro Yokogawa

Surface ground level : 0.58m

Weather : clear

A	B	C	D	E	F	G	H	I
Load	Number of half a turn	Accumulated penetration	Penetration	Number of half a turn penetrated per meter	0.002 x kN	0.067 x Nsw	N-Value	N-Value
kN	Na	cm	cm	Nsw	kN'	N'sw	F+G	0 5 10 15 20 25 30 35 40 45 50
330		2	2					
610		6	4					
890	20	27	21	95.24	1.78	6.38	8	
890	20	42	15	133.33	1.78	8.93	11	
890	20	62	20	100.00	1.78	6.7	8	
890	20	63	1	2000.00	1.78	134.0	136	
890								
890								
890								
890								
890								

Soil Exploration by Swedish Sounding Method JIS A 1221

Project Name: Basic Design for Kiritimati Island Coastal Fisheries Development

Location: Civil Facility Date of survey : 11th, June, 2004

Number of hole : C-No.3 (Slipway) Surveyor : Masahiro Yokogawa

Surface ground level : ±0

Weather : Clear

A	B	C	D	E	F	G	H	I
Load	Number of half a turn	Accumulated penetration	Penetration	Number of half a turn penetrated per meter	0.002 x kN	0.067 x Nsw	N-Value	N-Value
kN	Na	m	cm	Nsw	kN'	N'sw	F+G	0 5 10 15 20 25 30 35 40 45 50
330		1	1					
610		3	2					
890		4	1					
890	20	22	18	111.11	1.78	7.44	9	
890	18	57	35	100.00	1.78	6.7	8	
890	45	72	15	250.00	1.78	16.75	19	

Soil Exploration by Swedish Sounding Method JIS A 1221

Project Name: Basic Design for Kiritimati Island Coastal Fisheries Development

Location: Civil Facility Date of survey : 11th, June, 2004

Number of hole : C-No.4 (Slipway) Surveyor : Masahiro Yokogawa

Surface ground level : +1.90m

Weather : Clear

A	B	C	D	E	F	G	H	I
Load	Number of half a turn	Accumulated penetration	Penetration	Number of half a turn penetrated per meter	0.002 x kN	0.067 x Nsw	N-Value	N-Value
kN	Na	m	cm	Nsw	kN'	N'sw	F+G	0 5 10 15 20 25 30 35 40 45 50
330		1	1					
610		2	1					
890		9	7					
890	35	32	23	152.17	1.78	10.20	12	
890	40	46	14	285.71	1.78	19.14	21	
890	85	75	29	293.10	1.78	19.64	21	
890	40	84	9	444.44	1.78	29.78	32	

Soil Exploration by Swedish Sounding Method JIS A 1221

Project Name: Basic Design for Kiritimati Island Coastal Fisheries Development

Location: Civil Facility Date of survey : 11th, June, 2004

Number of hole : C-No.5 (Slipway) Surveyor : Masahiro Yokogawa

Surface ground level : -0.41m

Weather : Clear

A	B	C	D	E	F	G	H	I
Load	Number of half a turn	Accumulated penetration	Penetration	Number of half a turn penetrated per meter	0.002 x kN	0.067 x Nsw	N-Value	N-Value
kN	Na	m	cm	Nsw	kN'	N'sw	F+G	0 5 10 15 20 25 30 35 40 45 50
330		3	3					
610		6	3					
890		32	26					
890	6	58	22	27.27	1.78	1.83	4	
890	3	76	18	16.67	1.78	1.12	3	
890	10	98	22	45.45	1.78	3.05	5	
890	10	116	18	55.56	1.78	3.72	6	
890	10	118	2	500.00	1.78	33.50	35	

Soil Exploration by Swedish Sounding Method JIS A 1221

Project Name: Basic Design for Kiritimati Island Coastal Fisheries Development

Location: Civil Facility Date of survey : 11th, June, 2004

Number of hole : C-No.6 (Slipway) Surveyor : Masahiro Yokogawa

Surface ground level : +0.10m

Weather : Clear

A	B	C	D	E	F	G	H	I
Load	Number of half a turn	Accumulated penetration	Penetration	Number of half a turn penetrated per meter	0.002 x kN	0.067 x Nsw	N-Value	N-Value
kN	Na	m	cm	Nsw	kN'	N'sw	F+G	0 5 10 15 20 25 30 35 40 45 50
330		1	1					
610		3	2					
890		7	4					
890	10	30	23	43.48	1.78	2.91	5	
890	10	56	26	38.46	1.78	2.58	4	
890	5	76	20	25.00	1.78	1.68	3	
890	7	108	32	21.88	1.78	1.47	3	
890	2	138	30	6.67	1.78	0.45	2	
890	2	158	20	10.00	1.78	0.67	2	
890	15	175	17	88.24	1.78	5.91	8	
890	10	177	2	500.00	1.78	33.50	35	
890								

Soil Exploration by Swedish Sounding Method JIS A 1221

Project Name: Basic Design for Kiritimati Island Coastal Fisheries Development

Location : Building Facilities
Date of survey : 11th, June, 2004
Number of hole : Arch.-No.1 No.6; -20m
Surveyor : Masahiro Yokogawa
Surface ground level : 2.64m
Weather : clear

A	B	C	D	E	F	G	H	I
Load	Number of half a turn	Accumulated penetration	Penetration	Number of half a turn penetrated per meter	0.002 x kN	0.067 x Nsw	N-Value	N-Value
kN	Na	cm	cm	Nsw	kN'	N'sw	F+G	0 5 10 15 20 25 30 35 40 45 50
50								
330		1	1					
330	15		0					gravel stone
610			0					
890			0					
890	30	20	19	158	1.78	10.58	12	
890	30	27	7	429	1.78	28.71	30	
890	20	30	3	667	1.78	44.67	46	

Soil Exploration by Swedish Sounding Method JIS A 1221

Project Name: Basic Design for Kiritimati Island Coastal Fisheries Development

Location : Building Facilities
Date of survey : 11th, June, 2004
Number of hole : Arch. No.2 No.6-10; 10m
Surveyor : Masahiro Yokogawa
Surface ground level : 2.03m
Weather : clear

A	B	C	D	E	F	G	H	I
Load	Number of half a turn	Accumulated penetration	Penetration	Number of half a turn penetrated per meter	0.002 x kN	0.067 x Nsw	N-Value	N-Value
kN	Na	cm	cm	Nsw	kN'	N'sw	F+G	0 5 10 15 20 25 30 35 40 45 50
330								
610								
890		1	1					
890	20	15	14	143	1.78	9.57	11	
890	20	21	6	333	1.78	22.33	24	
890	20	23	2	1000	1.78	67.00	69	

Soil Exploration by Swedish Sounding Method JIS A 1221

Project Name: Basic Design for Kiritimati Island Coastal Fisheries Development

Location : Building Facilities Date of survey : 16th, June, 2004

Number of hole : A-No.3 No.6-10; 20m Surveyor : Masahiro Yokogawa

Surface ground level : 1.86m

Weather : clear

A	B	C	D	E	F	G	H	I
Load	Number of half a turn	Accumulated penetration	Penetration	Number of half a turn penetrated per meter	0.002 x kN	0.067 x Nsw	N-Value	N-Value
kN	Na	cm	cm	Nsw	kN'	N'sw	F+G	0 5 10 15 20 25 30 35 40 45 50
330			0					
610		2	2					
610	10	15	13	77	1.22	5.15	6	
610	20	21	6	333	1.22	22.33	24	
890		21	0					
890	30	26	5	600	1.78	40.20	42	
890	30	28	2	1500	1.78	100.50	102	

Soil Exploration by Swedish Sounding Method JIS A 1221

Project Name: Basic Design for Kiritimati Island Coastal Fisheries Development

Location : Building Facilities Date of survey : 16th, June, 2004

Number of hole : A-No.4 No.6-25; 20m Surveyor : Masahiro Yokogawa

Surface ground level : 2.40m

Weather : clear

A	B	C	D	E	F	G	H	I
Load	Number of half a turn	Accumulated penetration	Penetration	Number of half a turn penetrated per meter	0.002 x kN	0.067 x Nsw	N-Value	N-Value
kN	Na	cm	cm	Nsw	kN'	N'sw	F+G	0 5 10 15 20 25 30 35 40 45 50
330			0					
570			0					
890			0					
890	20	10	10	200	1.78	13.4	15	
890	20	19	9	222	1.78	14.89	17	
890	30	25	6	500	1.78	33.5	35	

Soil Exploration by Swedish Sounding Method JIS A 1221

Project Name: Basic Design for Kiritimati Island Coastal Fisheries Development

Location : Building Facilities
Number of hole : A-No.5 No.6-30; 5m
Surface ground level : +2.5m
Weather : clear

Date of survey : 16th, June, 2004
Surveyor : Masahiro Yokogawa

A	B	C	D	E	F	G	H	I
Load	Number of half a turn	Accumulated penetration	Penetration	Number of half a turn penetrated per meter	0.002 x kN	0.067 x Nsw	N-Value	N-Value
kN	Na	cm	cm	Nsw	kN'	N'sw	F+G	0 5 10 15 20 25 30 35 40 45 50
330								
610								
890		2	2					
890	20	17	15	133	1.78	8.93	11	
890	20	23	6	333	1.78	22.33	24	
890	30	30	7	429	1.78	28.71	30	

Soil Exploration by Swedish Sounding Method JIS A 1221

Project Name: Basic Design for Kiritimati Island Coastal Fisheries Development

Location : Building Facilities
Number of hole : A-No.6 No.6-20; 10m
Surface ground level : +2.30m
Weather : clear

Date of survey : 16th, June, 2004
Surveyor : Masahiro Yokogawa

A	B	C	D	E	F	G	H	I
Load	Number of half a turn	Accumulated penetration	Penetration	Number of half a turn penetrated per meter	0.002 x kN	0.067 x Nsw	N-Value	N-Value
kN	Na	cm	cm	Nsw	kN'	N'sw	F+G	0 5 10 15 20 25 30 35 40 45 50
330								
610								
890		1	1					
890	10	11	10	100	1.78	6.7	8	
890	20	14	3	667	1.78	44.7	46	
890	20	18	4	500	1.78	33.5	35	
890	20	20	2	1000	1.78	67	69	

Soil Exploration by Swedish Sounding Method JIS A 1221

Project Name: Basic Design for Kiritimati Island Coastal Fisheries Development

Location : Building Facilities
Date of survey : 16th, June, 2004

Number of hole : A-No.7 No.6+10; 12m
Surveyor : Masahiro Yokogawa

Surface ground level : +1.86m

Weather : clear

A	B	C	D	E	F	G	H	I
Load	Number of half a turn	Accumulated penetration	Penetration	Number of half a turn penetrated per meter	0.002 x kN	0.067 x Nsw	N-Value	N-Value
kN	Na	cm	cm	Nsw	kN'	N'sw	F+G	0 5 10 15 20 25 30 35 40 45 50
330								
610		3	3					
610	10	17	14	71	1.22	4.79	6	
610	20	21	5	400	1.22	26.80	28	
890	30	27	6	500	1.78	33.50	35	
890	20	31	4	500	1.78	33.50	35	

Soil Exploration by Swedish Sounding Method JIS A 1221

Project Name: Basic Design for Kiritimati Island Coastal Fisheries Development

Location : Building Facilities
Date of survey : 16th, June, 2004

Number of hole : A-No.8 No.6+10; 30m
Surveyor : Masahiro Yokogawa

Surface ground level : +1.43m

Weather : clear

A	B	C	D	E	F	G	H	I
Load	Number of half a turn	Accumulated penetration	Penetration	Number of half a turn penetrated per meter	0.002 x kN	0.067 x Nsw	N-Value	N-Value
kN	Na	cm	cm	Nsw	kN'	N'sw	F+G	0 5 10 15 20 25 30 35 40 45 50
330								
610								
890								
890	20	14	14	143	1.78	9.57	11	
890	20	30	16	125	1.78	8.38	10	
890	20	40	10	200	1.78	13.40	15	
890	20	42	2	1000	1.78	67.00	69	

Soil Exploration by Swedish Sounding Method JIS A 1221

Project Name: Basic Design for Kiritimati Island Coastal Fisheries Development

Location : Building Facilities
Date of survey : 11th, June, 2004
Number of hole : A-No.9 No.6-10m; -10m
Surveyor : Masahiro Yokogawa
Surface ground level : +2.34m
Weather : clear

A	B	C	D	E	F	G	H	I
Load	Number of half a turn	Accumulated penetration	Penetration	Number of half a turn penetrated per meter	0.002 x kN	0.067 x Nsw	N-Value	N-Value
kN	Na	cm	cm	Nsw	kN'	N'sw	F+G	0 5 10 15 20 25 30 35 40 45 50
330								
330	10	4	4	250	0.66	16.75	17	
610	20	16	12	167	1.22	11.17	12	
890	5	18	2	250	1.78	16.75	19	
890	30	25	7	429	1.78	28.71	30	
890	30	40	15	200	1.78	13.40	15	
890	40	53	13	308	1.78	20.62	22	
890	40	63	10	400	1.78	26.80	29	
890	20	66	3	667	1.78	44.67	46	

Soil Exploration by Swedish Sounding Method JIS A 1221

Project Name: Basic Design for Kiritimati Island Coastal Fisheries Development

Location : Building Facilities
Date of survey : 11th, June, 2004
Number of hole : A-No.10 No.6-10m; 5m
Surveyor : Masahiro Yokogawa
Surface ground level : +2.11m
Weather : clear

A	B	C	D	E	F	G	H	I
Load	Number of half a turn	Accumulated penetration	Penetration	Number of half a turn penetrated per meter	0.002 x kN	0.067 x Nsw	N-Value	N-Value
kN	Na	cm	cm	Nsw	kN'	N'sw	F+G	0 5 10 15 20 25 30 35 40 45 50
330								
610								
890			1					
890	11	8	7	157	1.78	10.53	12	
890	40	13	5	800	1.78	53.60	55	
890	40	14	1	4000	1.78	268.00	270	
890								
890								
890								
890								

6. References

No.	Title	Published by	Year
1	2003 Annual Report Kiritimati	Ministry of Fisheries and Marine Resource Development	2004
2	Drawing of Tekokona III	Ministry of Fisheries and Marine Resource Development	2001
3	Environment ACT 1999	Ministry of Environment and Social Development	2000
4	Environment Regulations 2001	Ministry of Environment and Social Development	2001
5	National Development Strategies 2000-2003	Ministry of Finance and Economic Planning	2000
6	National Development Strategies 2003-2007	Ministry of Finance and Economic Planning	2003
7	Kiribati Statistical Yearbook 2002	Ministry of Finance	2002
8	Report on the 2000 Census of Population	Ministry of Finance	2002
9	Demographic Analysis Report on the 2000 Census of Population	Ministry of Finance	2004
10	National Trade Statistics	Ministry of Finance	2002