[Appendices]

1. Member Lists of Study Team

Name	Job Title	Occupation
Hiroshi Enomoto	Team Leader	Chief Representative, Timot-Leste Office, JICA
Koichi Miyake	Team Leader (DBD)	Executive Technical Adviser, Economic Infrastructure Department、JICA
Kayo Sonobe	Project Coordinator	Assistant Director, Urban and Regional Development Division Ⅱ, Urban and Regional Development Group, Economic Infrastructure Department, JICA
Yuzo Suzuki	Chief Consultant/Port Planner	Director, Overseas Operation Division, JPC
Shuji Matsuda	Port Facility Designer	Senior Engineer, Technical Section Ⅱ, Technical Department, JPC
Tetsuro Shimose	Architect	Manager, Azusa Sekkei Co., Ltd.
Yoshitaka Inoue	Construction & Procurment Planner/ Cost Estimator	Construction Planning Expert, Overseas Operation Division, JPC
Kenichi Nishino	Site Surveyor	Senior Engineer, Overseas Operation Department, JPC

Note: JPC (Japan Port Consultants, Ltd.)

2. Site Survey Itinerary

(1) The First Site Survey

No	Date	Day	Ms. SONOBE Kayo	Mr. SUZUKI Yuzo	Mr. MATSUDA Shuji	Mr. NISHINO Kenichi	Mr. SHIMOSE Tetsuro	Mr. INOUE Yoshitaka	Mr. HARADA Koichiro
			Study Planning/JICA	Chief Consultant/ Port Planner	Port Facility Designer	Natural Condition Surveyor	Architect	Construction & Procurement Planner/ Cost Estimator	Environmental Planner
1	11th Oct	Sun		Narita → Denpasar					
2	12th Oct	Mon		AM: Denpasar → Dili, PM: 15:30 JICA Office, 16:30: Courtesy Call to Minister of Infrastructure (with Mr. Enomoto)					
3	13th Oct	Tue		AM: APORTIL PM: DATA Collection from APORTIL					
4	14th Oct	Wed	Narita→Denpasar	GTZ, UNDP, NAKROMA	AM: Data Collection from APORTIL, PM: Interview with Dili Port Project Office, NAKROMA				
5	15th Oct	Thu	AM:Depasar→Dili PM: 15:30 JICA Office, 16:30 EOJ	AM: Interview with Ship Agents, PM: 16:30 EOJ	Data Collection from APORTIL, MOI, Dili Port Project Office	Consultation with Local Consultant	Visit to Construction Companies, Construction Materials CompaniesData		
6	16th Oct	Fri	10:00 MOI (Mr. Fernando da Cruz, Director General) & APORTIL (Mr. Constantino Pereira) 13:30 MOF (Mr. Helder da Costa and Mr. Jose Abilio) 15:30 Secretary of State (Mr. Chris, Chief of Office)				Collection from MOI		
7	17th Oct	Sat		AM: Visit to Carabera Port PM: Internal Meeting & Data Analysis					
8	18th Oct	Sun		Data Analysis					
9	19th Oct	Mon	10:00 Meeting with ADB (Mr. Chen Chen) PM : Dili→Oecusse	AM: Data Collection & Analysis PM: Dili → Oecusse					
10	20th Oct	Tue	06:00 Arr. at Oecusse 10:00 Courtesy Call to Secretary of State, 11:00 Site Survey		Arr. at Oecusse Site Survey of Mahata Terminal & Oebau Terminal, Hinterland of Both Terminals				
11	21st Oct	Wed	Oecusse→Dili (by land)	Visit to Oecusse District Office & Site Survey	Site Survey on Pier, Trestal, yard, revetment, road, fence, fender, bollard & lighting facility	Supervision on Natural Condition Survey	Site Survey on Utility (water supply & treatment, electricity, telecomunication), Port Office, Container House, Layout Planning of Buildings	Site Survey of loading place for materials & machines, concrete plant, quality of workforce, dumping area, rental price of boat etc.	
12	22nd Oct	Thu	JICA Office, MOF, MOI, EOJ (for signing)	Visit to Sakato Gate, Visit to NGO Bodies					
13	23rd Oct	Fri	Dili→Denpasar→	Survey on Border Traffic			Site Survey, Oecusse → Dili		
14	24th Oct	Sat	→Narita	Internal Meeting on Terminal Planning			Arr. at Dili Internal Meeting on Construction Planning		
15	25th Oct	Sun		Data Analysis			Data Analysis		
16	26th Oct	Mon		Interview with Ship Agents, Stevedor Companies, Forwarders, Cargo Owners in Oecusse	Seismic exploration on fundation PC pile + 2 persons from Japanese sub-contracted company	Supervision on Natural Condition Survey	Survey on unit price of building materials, workforce	Survey on unit price of construction materials, transportaion cost of work ship, machines and materials, workforce	
17	27th Oct	Tue		Interviews continued, Oecusse → Dili			Interview with WFP about warehouse	Visit to MOJ about Labor Law	
18	28th Oct	Wed		Arr. At Dili, Data Collection from APORTIL			Dili → Denpasar → Surabaya		
19	29th Oct	Thu		Interviews with Cargo Owners, Stevedor Companies in Dili	Oecusse → Dili (by Land)		Data Collection about quality and price of materials at Surabaya		
20	30th Oct	Fri		Visit to Customs Office	Dili → Narita	Data Check from Consultants	Surabaya →Denpasar → Narita	Surabaya →Denpasar→ Narita	
21	31st Oct	Sat		Data Analysis	Arr. at Narita		Arr. at Narita	Arr. at Narita	
22	1st Nov	Sun		Data Analysis		Data Analysis			Narita → Denpasar →
23	2nd Nov	Mon		Discussion with APORTIL & PT PAL about Safe Navigation of Nakroma		Data Check from Consultants			Denpasar → Dili, JICA Office, Visit to Dili Port
24	3rd Nov	Tue		Discussion with APORTIL about Terminal Planning & Maintenance					Visit to APORTIL, Dili Port Project Office
25	4th Nov	Wed		Discussion with MOI about Future Development in the Country		Dili → Oecusse			Visit to MODE, MOH, MOAFF & MOJ
26	5th Nov	Thu		Interview with Cargo Owner, Forwarder		Supervison on Natural Condition Survey			Visit to NGO Bodies, Survey on Fishery Activities
27	6th Nov	Fri		Visit to JICA Office & EOJ, APORTIL, MOF, MOI		Supervision on Site Survey, Oecusse → Dili			
28	7th Nov	Sat		Visit to Dili Port Project Office		Arr. at Dili Data Analysis			Data Analysis
29	8th Nov	Sun		Dili → Narita		Dili → Narita			Data Collection, Dili → Oecusse
30	9th Nov	Mon		Arr. at Narita		Arr. at Narita			Arr. At Oecusse Site Survey on Environmental Matters (dumping area, route to dumping area etc), Visit to Oecusse District Office
31	10th Nov	Tue							Visit to Stakeholders Oecusse → Dili
32	11th Nov	Wed							Arr. at Dili Data Collection & Analysis
33	12th Nov	Thu							Visit to UNDP, MOI
34	13th Nov	Fri							Survey on Fishery Activities
35	14th Nov	Sat							Analysis of Result of Environmental Survey
36	15th Nov	Sun							
37	16th Nov	Mon							Dili → Narita
38	17th Nov	Tue							Arr. at Narita
39	18th Nov	Wed							
40	19th Nov	Thu							
41	20th Nov	Fri							
42	21st Nov	Sat							
43	22nd Nov	Sun							

(2) The Second Site Survey

No	Date	Day	Ms. SONOBE Kayo	Mr. SUZUKI Yuzo	Mr. MATSUDA Shuji	Mr. SHIMOSE Tetsuro	Mr. INOUE Yoshitaka	Mr. NISHINO Kenichi
			Study Planner	Chief Consultant/ Port Planner	Port Facility Designer	Architect	Construction & Procurement Planner/ Cost Estimator	Site Surveyor
1	17th Jan	Sun	Narita → Denpasar					
2	18th Jan	Mon	AM: Denpasar → Dili, PM: JICA Office,					
3	19th Jan	Tue	Visit MOF,APORTIL, EOJ, Presentation of Draft Rehabilitation Plan & Discussion with MOI, APORTIL & SOS		Visit APORTIL, Presentation of Draft Rehabilitation Plan & Discussion with MOI, APORTIL & SOS			
4	20th Jan	Wed	Report to EOJ, Signing of M/M (Ministers of MOF and MOI)	Discussion with APORTIL on Rehabilitation Plan	Visit to Dili Port Rehabilitation Project Office	Survey on Local Construction Companies & Work Force at Dili		
5	21st Jan	Thu	Dili → Denpasar	Dili → Oecusse (on road)			urvey on Local Contract	
6	22nd Jan	Fri	Denpasar → Narita	Site Survey on Pier & Terminal			Dili → Oecusse (on road)	
7	23rd Jan	Sat		Site Survey on Navigation Aid Facility	Site Survey on Pier & Revetment	Oecusse → Dili (on road)	Survey on Construction Materials at Oecusse	
8	24th Jan	Sun		Data Analysis, Internal Meeting		Data Analysis	Data Analysis, Internal Meeting	
9	25th Jan	Mon		Presentation on Draft Plan at Oecusse, Oecusse →Wini→Atanbuwa		Survey on Local Contructor & Work Force at Dili	Presentation on Draft Plan, Oecusse→Wini→ Atanbuwa	
10	26th Jan	Tue		Atanbowa → Atapupu → Dili (on road)			Atanbowa → Atapupu → Dili (on road)	
11	27th Jan	Wed		Attendance of Port Facility Maintenance Seminar by JICA, Discussion with APORTIL on Reahbilitation Plan				
12	28th Jan	Thu		Discussion with APORTIL on Rehabilitation Plan	Stability Calculation on Pier & Revetment	Survey on Construction Materials at Dili	Dili → Kupang	
13	29th Jan	Fri		Visit to Customs Office on Tax Exemption		Dili → Denpasar	Construction Materials Survey at Kupang	
14	30th Jan	Sat		Data Analysis & Internal Meeting		Denpasar → Narita		Narita → Denpasar
15	31st Jan	Sun		Data Analysis			Kupang → Surabaya	Denpasar → Dili
16	1st Feb	Mon		Discussion with GTZ	Dili → Oecusse (by ferry)		Survey on Construction Materials, Machines & Work Vessels at Surabaya	Dili → Oecusse (by ferry)
17	2nd Feb	Tue		Visit to Port Users	Site Survey on Pier			Site Survey on Pier
18	3rd Feb	Wed						
19	4th Feb	Thu		Report to Aportil, EOJ & JICA Office				
20	5th Feb	Fri		Dili → Denpasar	Site Survey on Pier, Oecusse → Dili (by ferry)		Surabaya → Denpasar	Site Survey on Pier, Oecusse → Dili (by ferry)
21	6th Feb	Sat		Denpasar → Narita	Arrive at Dili, Dili → Denpasar		Denpasar → Narita	Arrive at Dili, Dili → Denpasar
22	7th Feb	Sun			Denpasar → Narita			Denpasar → Narita

(3) Explanation Visit on Draft Basic Design

No	Date	Day	Mr. MIYAKE Koichi	Mr. SUZUKI Yuzo	Mr. MATSUDA Syuji	Mr. HARADA Koichiro
			Team Leader	Chief Consultant/Port Planner	Port Facility Designer	Environmental Planner
1	17-Jul	Sat				Narita → Denpasar
2	18-Jul	Sun	Narita → Denpasar			Denpasar → Dili
3	19-Jul	Mon	Denpasar → Dili PM: Meeting with JICA Office, Courtesy Call to Japanese			Dept. of Environment (EMP) PM: Dili → Oeccee (by ferry)
4	20-Jul	Tue	Discussion with APORTIL			Public Consultation on EMP PM: Oeccee → Dili (by ferry)
5	21-Jul	Wed	AM: Discussion with APORTIL PM: Site Survey at Hema Port & Carabella Port			Report to DOE on Public Consultation
6	22-Jul	Thu	AM: Discussion with Minister of MOI PM: Presentation of DBD, Signing of M/D			Dili → Denpasar
7	23-Jul	Fri	AM: Report to JICA Office and Japanese Embas Dili → Denpasar			Denpasar → Narita
8	24-Jul	Sat	Deapsar → Narita			

3. List of Parties Concerned in the Recipient Country

Ministry of Infrastructure	
Mr. Pedro GM	Minister
Mr. Domingos D.S. Caero	Secretary State of Public Works
Eng. Fernando Carvalho da Cruz	Director General of Transports, Equipments & Communication
Mr. Jose Piedade	Director General of Public Works
APORTIL(Port Administration)	
Mr. Constantino Ferreira Soares	Director
Silva Mr. Natalino Duval N.Unes Carvalho	Harbour Master、Head of Maritime Department
Mr. Helder	Head of Technical Department
Mr. Viriato Alves	Head of Port Operation and Stevedoring
Mr. Lino Barreto	Head of Administration and Finance
Mr. Reiner Quiel	Technical Adviser
Mr. Kowa Kajima	Technical Adviser, Chief of Planning Section
Ministry of Finance	
Mr. Helder Da Costa, PhD	Adviser, Aid Effectiveness Directorate & Coordinator of National Priorities Secretariat
Mr. Masaru Todoroki	Aid Coordination Adviser
Mr. Jose Santos	Director of Legal Tax, Import Division
Secretary of State of Oecusse	
Drs. Jorge da Conceica Teme, MA	Secretary State of Oecusse Region
Mr. Zeferino da Cruz Sau	Chief of Oecussi Office
Ministry of Economy and Development	
Francisco Poto	Staff of National Directorate of Environment (DNMA)
Luis Belo	Staff of National Directorate of Environment (DNMA)
Administration Office of District Oecussi	
Mr. Jose "Tanesib" Anuno	Administrator of Oecussi District
Mr. Julio Mota	Director of Land and Property
Mr. Jose Teme Suni	Chief of Sanitation and Water Supply
Parlamento Nacional、Republic Dmocratica de Timor-Leste	
Mr. Manuel Tilman	Presidente de Bancada
Secretary State for Security	
Clarimundu P. Ximenes	Advisor
GTZ (German Development Cooperation)	
Mr. Klaus Hutten	Team Leader, Maritime Transport Services Development Program (MTSD)
Mr. Jose Aponte Q.	Port Advisor, Maritime Transport Services Development Program (MTSD)
ADB (Asian Development Bank)	
Mr. Chen Chen	Infrastructure Specialist, Special Office in Timor-Leste
Ms. Sally Bannah	Team Leader, Infrastructure Technical Assistance, ADB TA4942-TIM
UN-WFP	
Mr. Francisco Noronha	Project Manager

UNPOL	
Mr. Gunasguaran	Advisor
Mr. Julio dos Nacimento	Staff
Port Users	
Mr. Rafael Ribeilo	General Manager, SDV Logistics (East Timor)
Mr. Constancio Guterres	Director/Owner, Timor Stevedores
Mr. Delpin Dias	Director, Beethoven Line Agency
Mr. Lourenco de Oliveira	President, National Entrepreneur Association
Mr. Flarinando Coimbra	Boarder Director, Bequeli Ocean Agency
Mr. Troy Adams	Manager, Crocodile Agency
Mr. Armindo Pinto	Director, Haburas Timor
The Project for the Rehabilitation of Dili Port	
Mr. Yutaka Terao	Ex-Project Manager, The project for the Rehabilitation of Dili Port, Wakachiku Construction Co.
Mr. Hiromi Hiraki	Project Manager, The project for the Rehabilitation of Dili Port, Wakachiku Construction Co.
Mr. Tsutomu Kubo	Resident Supervisor on Construction, The project for the Rehabilitation of Dili Port, Ides Inc.
Embassy of Japan in Timor-Leste	
Iwao Kitahar	Ambassador
Shinobu Yamaguchi	Ex-First Secretary
Masamiti Abe	First Secretary
JICA Timor-Leste Office	
Mr. Enomoto Hiroshi	Chief Representative
Mr. Okumura Masami	Representative
Ms. Tomomi Uchikawa	Representative

4. Minutes of Discussions
(1) The 1st Survey

Minutes of Discussions
On
Preparatory Survey for Basic Design
On
Oecusse Port Urgent Rehabilitation Project
In
Timor-Leste

Referring to the result of Preparatory Survey for Preliminary study in March and April 2009, the Government of Japan decided to conduct a Preparatory Survey for Basic Design on Oecusse Port Urgent Rehabilitation Project in Timor-Leste (hereinafter referred to as "the Project") and entrusted the survey to the Japan International Cooperation Agency (hereinafter referred to as "JICA")

JICA sent to Timor-Leste the Preparatory Survey Team (hereinafter referred to as "the Team"), headed by Mr. Hiroshi Enomoto, Chief Representative, JICA Timor-Leste Office, and is scheduled to stay in the country from October 15 to 23, 2009.

The Team held discussions with the officials concerned of the Government of Timor-Leste and conducted a field survey.

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

Dili, October , 2009

榎本宏

Hiroshi Enomoto
Leader
Preparatory Survey Team for Basic Design
Japan International Cooperation Agency
Japan

Pedro Lay da Silva
Minister
Ministry of Infrastructure
The Democratic Republic of Timor-Leste

(Witnessed by)

Emilia Pires
Minister
Ministry of Finance
The Democratic Republic of Timor-Leste

ATTACHMENT

1. Objective of the Project

The objective of the Project is to rehabilitate the Oecusse port facilities to secure safety and efficient handling of passengers as well as cargos.

2. Project site

The Project site is located at Mahata in Oecusse, as shown in Annex 1.

3. Items Requested by the Government of Timor-Leste

According to the revised request submitted to the Embassy of Japan in Timor –Leste in July, 2009, items below were requested by Timor-Leste. On the basis of the result of the natural condition survey, strength survey of the existing facilities and needs assessment in the first field survey, the requested items and their scale and size will be examined. At the beginning of the second field survey (expected to be in February 2010), the Timor-Leste and the Team will discuss the requested items.

(1) Demolition of existing wharf
(2) Construction of wharf and causeway
(3) Restoration of fenders
(4) Installation of bollards
(5) Navigation aid
(6) Rehabilitation of stacking yard
(7) Related facilities such as port office, passenger terminal, gate, ware house, generator room
(8) Lighting system
(9) Repairing fence
(10) revetment

Note: Removal of the existing facilities and preparation of gates and fences in and around the site is to be covered by Timor-Leste

4. Responsible and Implementing Organization

(1) The responsible Ministry is Ministry of Infrastructure. The organization chart of the Ministry is shown in Annex 2.
(2) The implementing organization is APORTIL (Port Authority). The organization chart of APORTIL is shown Annex 3.

5. Japan's Grant Aid Scheme

(1) The Timor-Leste side understands the Japan's Grant Aid Scheme explained by the Team, as described in Annex 4 and 5.

(2) The Timor-Leste side will take necessary measures, as described in Annex 6, for smooth implementation of the Project, as a condition for Japanese Grant Aid to be implemented.

6. Environmental and Social Consideration

(1) The Team explained the Project is categorized as "Category B" according to the JICA Environmental and Social Considerations Guideline (hereinafter referred to as "the JICA Guideline"), since the Project is rehabilitation of the existing port, and its impact on the environment may be limited. Accordingly the related information on the Project and its IEE (Initial Environment Evaluation) as a result of the preparatory survey in April 2009 is now disclosed to the public by JICA web site.

(2) The Timor-Leste side agreed to proceed to necessary procedures concerning the environmental assessment such as stakeholder meetings for public participation of the PAPs (project-affected people) and the environment screening of the Project by the Directorate of Environment in accordance with the relevant laws and regulation in Timor-Leste. The Timor-Leste side agreed to notify the result of the screening.

(3) The team will assist the Timor-Leste with preparing EMP (Environment Management Plan) on the assumption that the Project may be categorized as "B".

7. Forthcoming Procedure

(1) The consultant members of the Team will continue further studies both in Dili and Oecusse until November 21, 2009 as the first field survey. The schedule outline of the Preparatory Survey for Basic Design is as follows:

A) First Field Survey (October 11 to November 21, 2009)

B) Analysis in Japan (October 2009 to January 2010)

C) Second Field Survey (February 2010)

D) Basic Design and Cost Estimate in Japan (March to May 2010)

(2) JICA will prepare the draft report in English and dispatch a mission to Timor-Leste in order to explain its contents around June 2010.

(3) When the contents of the report are accepted in principle by the Government of Timor-Leste, JICA will complete the final report and send it to the Government of Timor-Leste by July 2010.

8. Undertakings by Timor-Leste side during the Survey

The Timor-Leste side confirmed that the following undertakings should be taken by the Timor-Leste expenses.

(1) To provide the Team with available data, information and materials necessary for the execution of the Survey

(2) To prepare the answers for the Questionnaire

(3) To assign full-time counterpart to the Team during their stay in Timor-Leste, to play following roles as the coordinator to the Team;

- To make the appointments and to set up the meetings with authorities, departments and all other factories and firms whatever the Team intends to visit
- To attend the site survey and any other visiting place with the Team and to make any convenience on accommodation, working room, adequate transportation, getting the permissions if required, etc., and
- To assist and to advise the Team for their collection of data and information as much as possible

(4) To secure the permission to photograph and to enter into private properties and restricted areas for the Team for proper execution of the Study, if necessary

(5) To take any measures deemed necessary to secure the safety of the members of the Team

(6) To make arrangements to allow the Team to bring back to Japan any necessary data, maps and materials related to the Study, subject to approval by Timor-Leste, in order to analyze the project and prepare the reports

9. Undertakings by Timor-Leste side during the construction

The Timor-Leste side confirmed that the following undertakings should be taken by the Timor-Leste expenses.

(1) To remove unnecessary existing facilities for the Project such as the wharf

(2) To secure the temporary construction yard which is adjacent to the Oecusse Port

(3) To allocate the budget for the commissions for the banking services based upon banking arrangement (B/A)

(4) To take necessary arrangement for the tax exemption of imported equipments, materials and machineries for the Consultant and Contractor of the Project

(5) To exempt port charges against consignee/consignor for importing construction materials and equipments for the Project including importing construction materials such as rocks, stone aggregate, sand rubble and cement

10. Other Relevant Issues

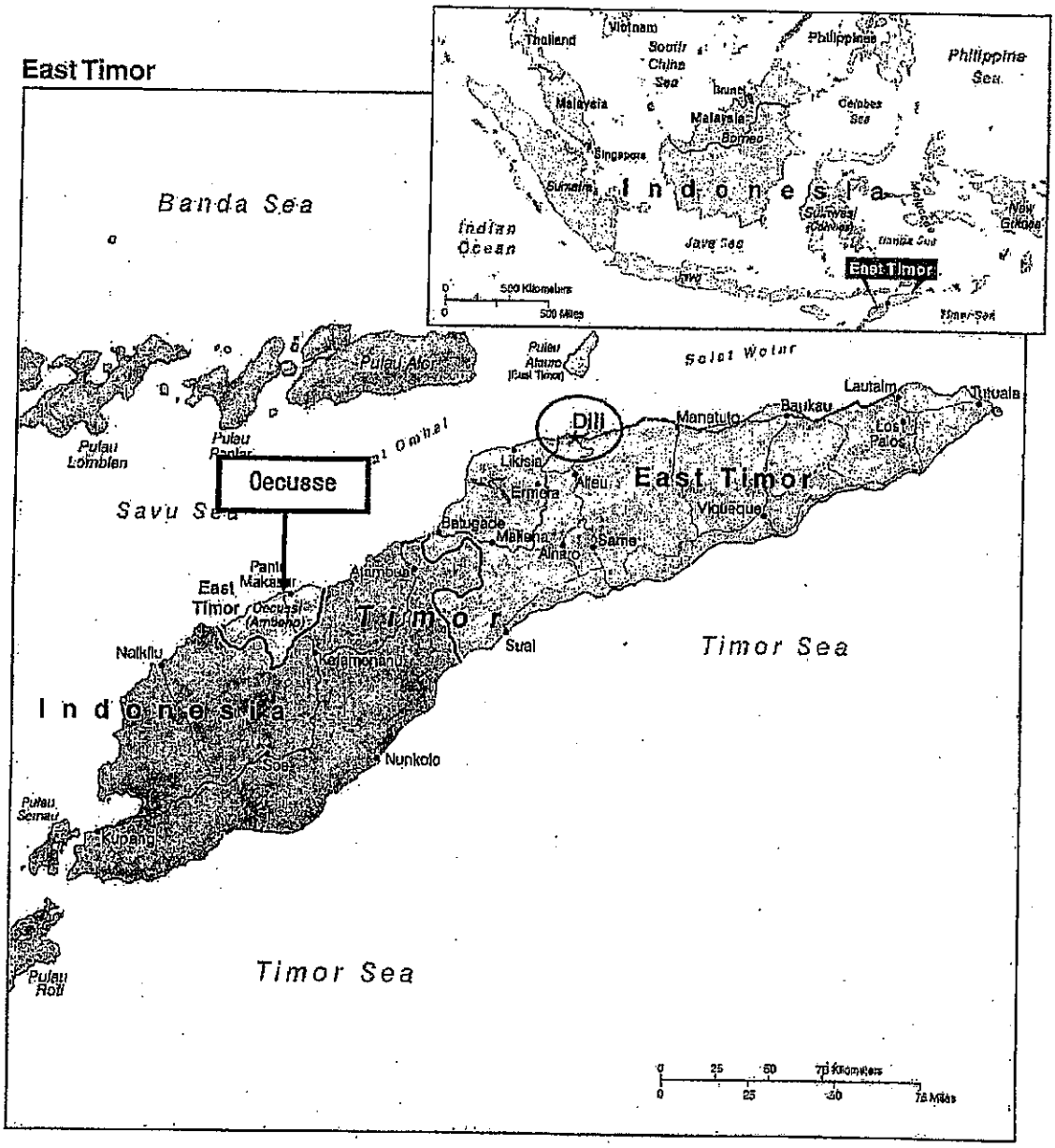
(1) The Timor-Leste side shall secure enough budget and personnel necessary for the operation and maintenance of the facilities implemented by the Project, including the periodical maintenance work after the completion of the Project.

Annex 1	Project Site Map
Annex 2	Organization chart of Ministry of Infrastructure (MOI)
Annex 3	Organization chart of Port Authority (APORTIL)
Annex 4	Japan's Grant Aid Scheme
Annex 5	Flow chart of Japan's Grant Aid Procedures
Annex 6	Major Undertakings to be taken by each Government

/end

Annex-1

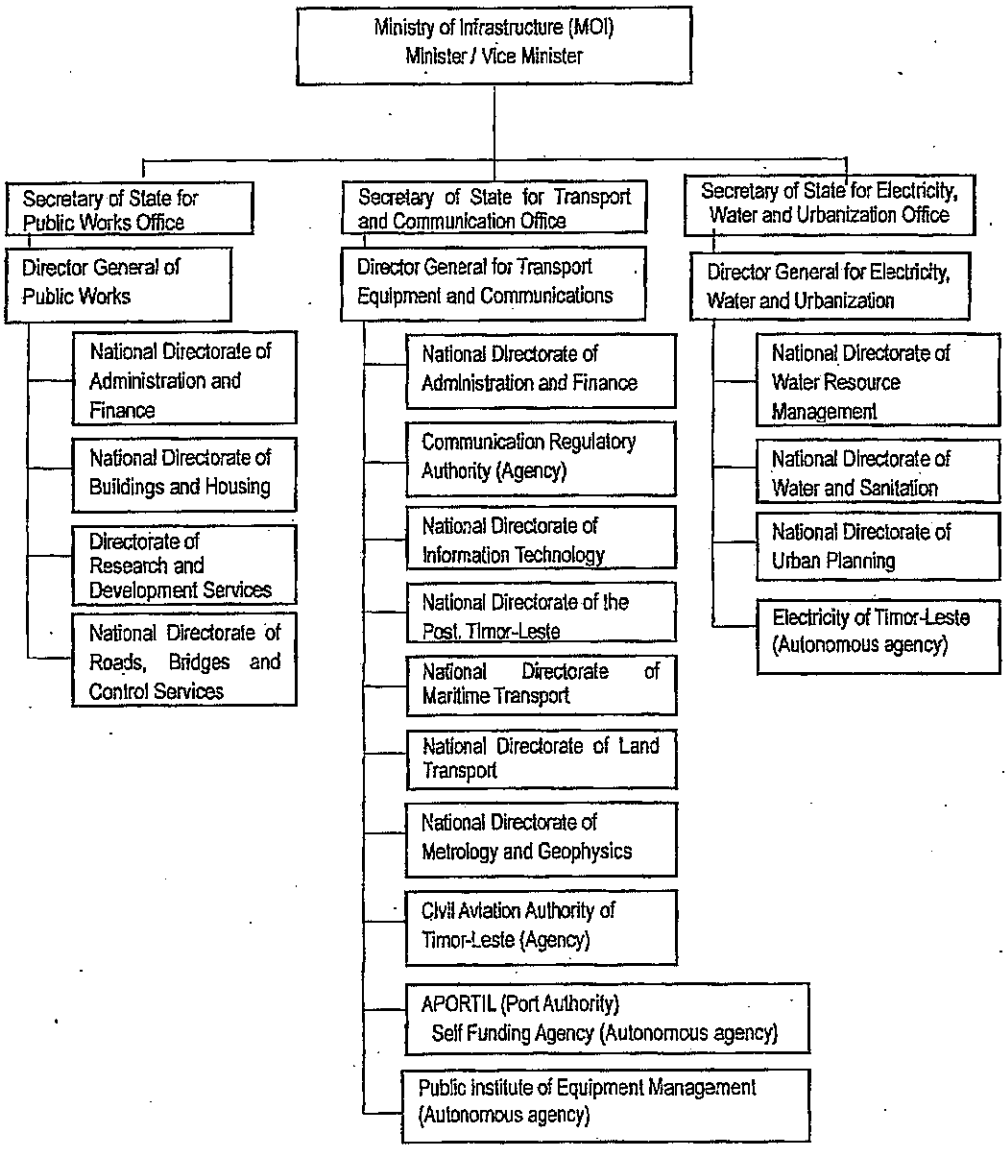
Map of Project Site




Mahata Area
Oebau Area
1km

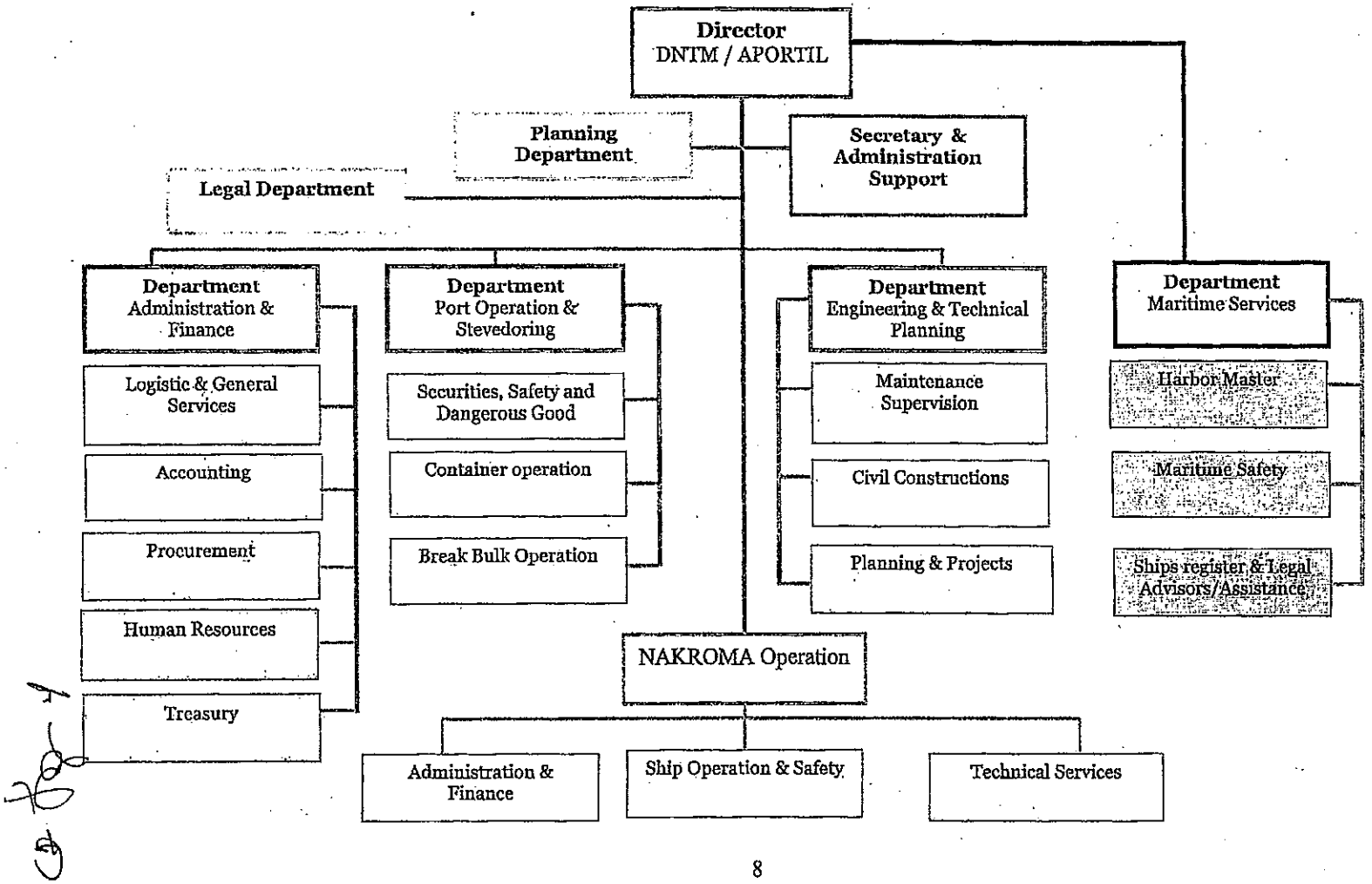
Annex-2

Organization Chart of Responsible Ministry



Organization Chart of the Implementing Organization

Port & Maritime Administrattion



Annex -4

JAPAN'S GRANT AID

The Government of Japan (hereinafter referred to as "the GOJ") is implementing the organizational reforms to improve the quality of ODA operations, and as part of this realignment, JICA was reborn on October 1, 2008. After the reborn of JICA, following the decision of the GOJ, Grant Aid for General Project is extended by JICA.

Grant Aid is non-reimbursable fund to a recipient country 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

Japanese Grant Aid is conducted as follows-

- Preparatory Survey (hereinafter referred to as "the Survey")
  - the Survey conducted by JICA
- Appraisal &Approval
  - -Appraisal by The GOJ and JICA, and Approval by the Japanese Cabinet
- Determination of Implementation
  - -The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as "the G/A")
  - -Agreement concluded between JICA and a recipient country
- Implementation -Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the Survey is to provide a basic document necessary for the appraisal of the Project by JICA and the GOJ. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also

institutional capacity of agencies concerned of the recipient country necessary for the implementation of the Project.

- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed on by both parties concerning the basic concept of the Project.
- Preparation of a basic design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country 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 the Japan's Grant Aid scheme.

JICA 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 Survey, JICA uses (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

The Report on the Survey is reviewed by JICA, and after the appropriateness of the Project is confirmed, JICA recommends the GOJ to appraise the implementation of the Project.

3. Japan's Grant Aid Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the E/N will be singed between the GOJ and the Government of the recipient country to make a plead for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the

necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

The consultant firm(s) used for the Survey Will be recommended by JICA to the recipient country to also work on the Project's implementation after the E/N and the G/A, in order to maintain technical consistency.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm 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 "Verification"

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

(5) Major undertakings to be taken by 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 shown in Annex-7.

(6) "Proper Use"

The Government of recipient country is required to maintain and use the facilities constructed and the 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 the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or 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"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to JICA 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.

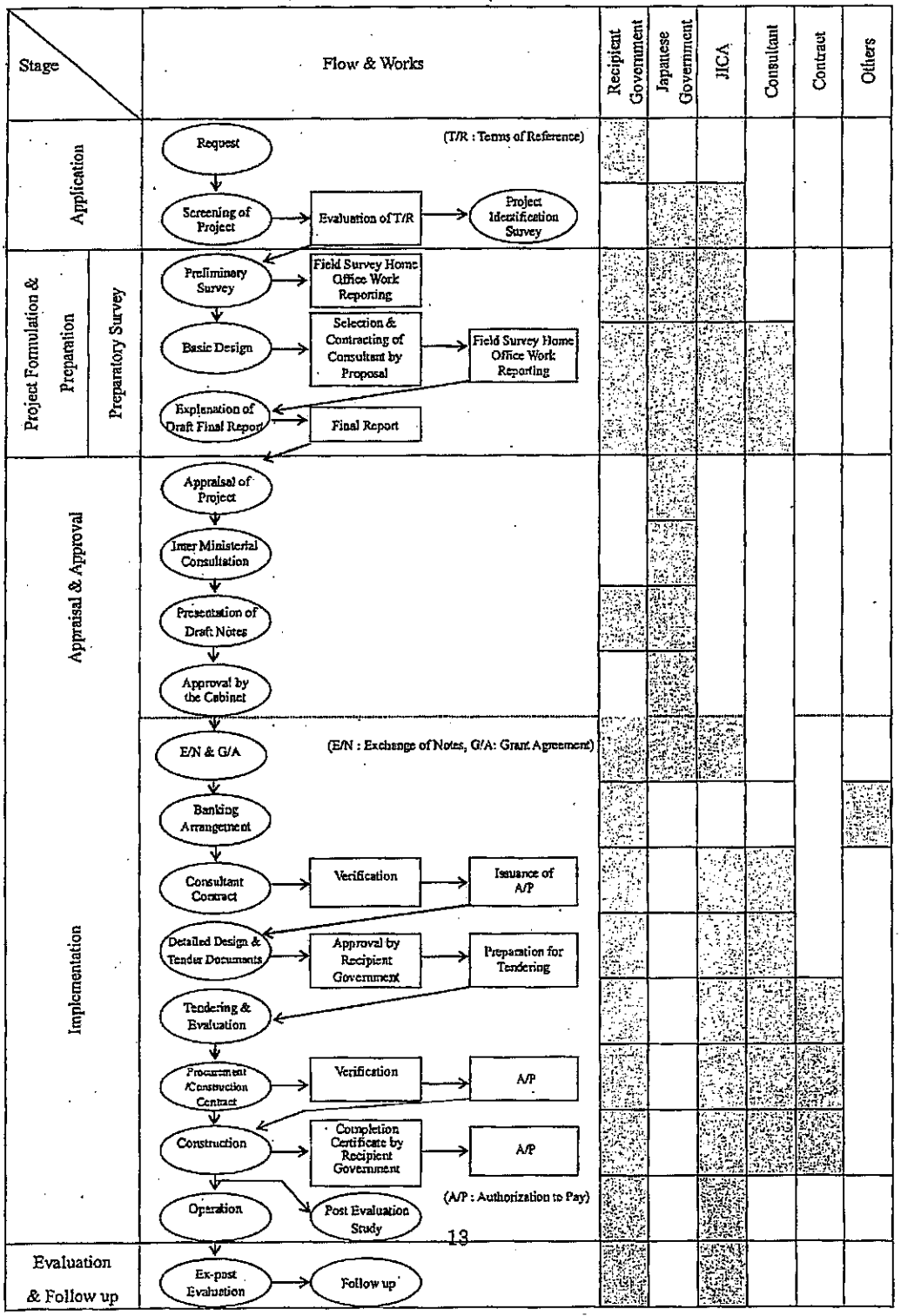
(10) Social and Environmental Considerations

A recipient country must ensure the social and environmental considerations for the Project and must follow the environmental regulation of the recipient country and JICA socio-environmental guideline.

(End)

Grant Aid Procedures

Flow Chart of Japan's Grant Aid Procedures



Annex -6

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 building	●	
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) 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	●	
	4) Gas Supply		
	a. The city gas main to the site		●
	b. The gas supply system within the site	●	
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. The MDF and the extension after the frame/panel	●	
	6) Furniture and Equipment		
	a. General furniture		●
	b. Project equipment	●	
8	To bear the following commissions to the Japanese bank for 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 the recipient	●	
	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 service 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 contracted 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		●

(B/A : Banking Arrangement, A/P : Authorization to pay)

(2) The 2nd Survey

Minutes of Discussions
On
Preparatory Survey for Basic Design
On
Oecusse Port Urgent Rehabilitation Project
In
Timor-Leste

Referring to the result of Preparatory Survey for Preliminary study in March and April 2009, the Government of Japan decided to conduct a Preparatory Survey for Basic Design on Oecusse Port Urgent Rehabilitation Project in Timor-Leste (hereinafter referred to as "the Project") and entrusted the survey to the Japan International Cooperation Agency (hereinafter referred to as "JICA")

JICA sent again to Timor-Leste the Preparatory Survey Team (hereinafter referred to as "the Team"), headed by Mr. Hiroshi Enomoto, Chief Representative, JICA Timor-Leste Office, and is scheduled to stay in the country from January 18 to 21, 2010.

The Team held discussions with the officials concerned of the Government of Timor-Leste and conducted a second field survey.

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

Dili, January , 2010

Hiroshi Enomoto
Leader
Preparatory Survey Team for Basic Design
Japan International Cooperation Agency
Japan

Pedro Lay da Silva
Minister
Ministry of Infrastructure
The Democratic Republic of Timor-Leste

(Witnessed by)

Emilia Pires
Minister
Ministry of Finance
The Democratic Republic of Timor-Leste

ATTACHMENT

1. Objective of the Project

The objective of the Project is to rehabilitate the Oecusse port facilities to secure safety and efficient handling of passengers as well as cargos.

2. Project site

The Project site is located at Mahata in Oecusse. (Same as in the Minutes of Discussion in October 2009, hereinafter referred to as "the M/D in October")

3. Items Requested by the Government of Timor-Leste

After discussions with the Team on the basis of the result of 1st field survey, the items described below were requested by the Timor-Leste side. The layout plan of the Oecusse port is shown in Annex.

(1) Wharf and causeway
(2) Fenders
(3) Bollards
(4) Navigation aid
(5) Stacking yard
(6) Related facilities such as port office, passenger terminal, gate, ware house, generator room
(7) Generator
(8) Lighting system
(9) Revetment

Note: Removal of the existing facilities and preparation of gates and fences in and around the site is to be covered by Timor-Leste

JICA will assess the appropriateness of the request and will recommend to the Government of Japan. JICA will report the result to the Timor-Leste side when explaining the draft report.

4. Responsible and Implementing Organization

(1) The responsible Ministry is Ministry of Infrastructure.
(2) The implementing organization is APORTIL (Port Authority).
(Same as in the M/D in October)

5. Forthcoming Procedure

(1) The consultant members of the Team will continue further studies both in Dili and Oecusse until February 6, 2010 as a second field survey.

(2) JICA will prepare the draft report in English and dispatch a mission to Timor-Leste in order to explain its contents around June 2010.

(3) When the contents of the report are accepted in principle by the Government of Timor-Leste, JICA will complete the final report and send it to the Government of Timor-Leste by July 2010.

6. Undertakings by Timor-Leste side during the Survey

The Timor-Leste side confirmed that the following undertakings should be taken by the Timor-Leste expenses.

(1) To provide the Team with available data, information and materials necessary for the execution of the Survey

(2) To assign full-time counterpart to the Team during their stay in Timor-Leste, to play following roles as the coordinator to the Team;

- To make the appointments and to set up the meetings with authorities, departments and all other factories and firms whatever the Team intends to visit
- To attend the site survey and any other visiting place with the Team and to make any convenience on accommodation, working room, adequate transportation, getting the permissions if required, etc., and
- To assist and to advise the Team for their collection of data and information as much as possible

(3) To secure the permission to photograph and to enter into private properties and restricted areas for the Team for proper execution of the Study, if necessary

(4) To take any measures deemed necessary to secure the safety of the members of the Team

(5) To make arrangements to allow the Team to bring back to Japan any necessary data, maps and materials related to the Study, subject to approval by Timor-Leste, in order to analyze the project and prepare the reports

7. Undertakings by Timor-Leste side during the construction

The Timor-Leste side confirmed that the following undertakings should be taken by the Timor-Leste expenses.

(1) To remove unnecessary existing facilities for the Project

(2) To secure the temporary construction yard which is adjacent to the Oecusse Port
(3) To permit to pump up the underground water
(4) To remove the ex-PKO container houses (Kobe houses) before starting construction.
(5) To allocate the budget for the commissions for the banking services based upon banking arrangement (B/A)
(6) To take necessary arrangement for the tax exemption of imported equipments, materials and machineries for the Consultant and Contractor of the Project
(7) To exempt port charges against consignee/consignor for importing construction materials and equipments for the Project including importing construction materials such as rocks, stone aggregate, sand rubble and cement

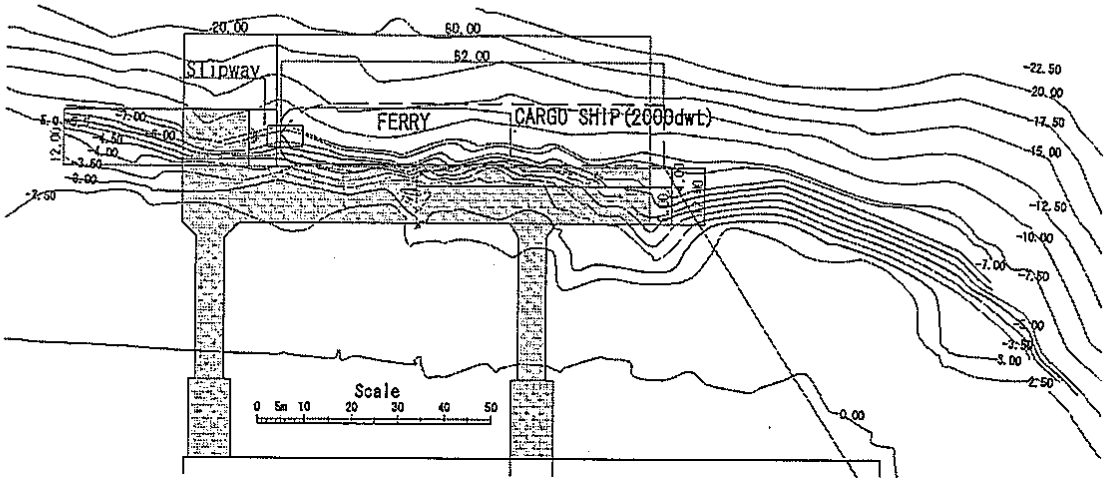
8. Other Relevant Issues

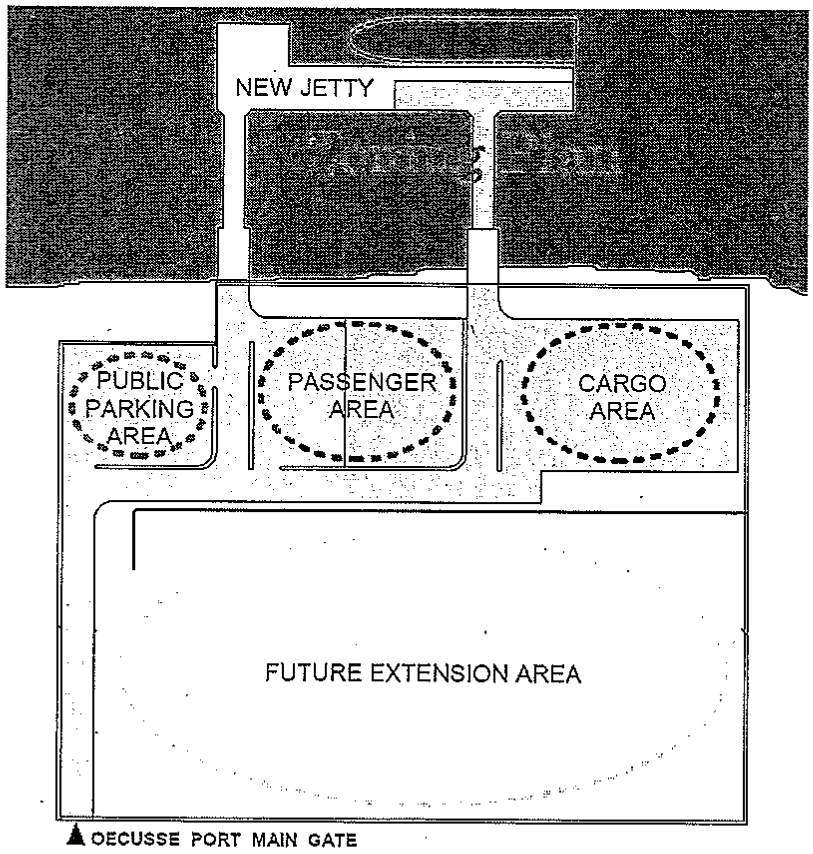
(1) The Timor-Leste side shall secure enough budget and personnel necessary for the operation and maintenance of the facilities implemented by the Project, including the periodical maintenance work after the completion of the Project.
(2) The Timor-Leste side will remount the passenger ladder and the crane of the NAKROMA ferry from the right to left side, when the present layout plan is finally accepted by both Government of Japan and Timor-Leste.
(3) The Timor-Leste side shall secure to supply the electricity from the electric trunk line for the operation of the new terminal.

/end

Layout Plan

Slipway in the West & Widening the Pier





5. Soft Component (Technical Assistance) Plan

(1) Background

APORTIL, Project Implementation Agency, has a lot of experience in pier and yard management through the operation of Dili Port. They also have experience in using temporarily the existing pier at Mahata terminal which shall be renovated in this project.

But the pier faces the open sea. That means vessels may be constrained from using the pier in case of high waves. At that time APORTIL will have to instruct vessels to evacuate from the pier. And the pier is shared by the ferry and vessels, but the ferry has priority to use it over cargo vessels. If some trouble occurs when the ferry lands and boards passengers and vehicles or when vessels handle cargoes, the sailing schedules of other vessels may be adversely affected. If such an occasion arises, APORTIL should promptly inform vessels which are due to enter the port of the unacceptable facility condition and give them appropriate instructions on how to tackle the problem.

A lot of passengers and guests for greeting and sending-off, many ferry-using vehicles and vehicles for pick-up gather in the terminal temporarily. And a lot of cargoes carried in and out by the ferry are also put on the pier for a certain time. Many porters wait for the cargoes to be carried in and out of the ferry on the pier. The pier and the yard are usually very crowded during landing and boarding time. And there is a gate at the entrance of the terminal surrounded by fences. The gate is rather narrow and there are about 10 open-air stalls near the gate. If the traffic control shall be done at the gate likewise at Dili Port, large traffic jams will occur and hinder the traffic flow of people and vehicles. Traffic control should be conducted inside the terminal, but not at the gate.

Furthermore, cargo vessels are expected to call at Oecusse Port. The volume of handling cargo per ship is estimated at 500~1,000 tons. The berth should be managed appropriately not to hinder the ferry operation by the delay of cargo handling work by cargo vessels. Cargo handling works may make the pier dirty. The pier should be kept clean through proper management in order not to hinder the movement of passengers.

As mentioned above, the management condition of Oecusse Port is different from that of Dili Port. And new employees shall be adopted as operation staff. In order to effectively manage Oecusse Port in consideration of natural conditions and facilities' characteristic, a basic manual on management of the pier and the terminal should be provided. The technical instructions will help APORTIL staff in Oecusse to make the manual and to manage the pier and the yard appropriately on the basis of the manual.

(2) Target of Soft Component Plan

The target of the soft component plan is to set up the Oecusse Port office and to establish a safe and efficient management system of the terminal by APORTIL.

(3) Outcome of Soft Component Plan

The outcomes of the soft component plan are as follows.

①Establishment of jetty management and operation system

②Establishment of yard management and operation system

(4) Activities

①Establishment of jetty management and operation system

Technical instructions will be done to APORTIL staffs of engaging in vessel operation and

coordination work on pier utilization. The contents of technical instructions are shown in Table 5-1.

Table 5-1 Activity items on pier management and operation

Activity item	Method
(1)Guidance on safe use of pier	To instruct relevant staffs and vessel operators that there are some considerable matters to use the jetty at open sea from safety point of view on the basis of the basic design concept. To facilitate their understandings, especially about constraints of using the jetty related to wave condition.
(2)Establishment of information acquisition system on weather data	To instruct relevant staffs on the importance of the acquisition of the information about weather condition, wave condition and earthquake for establishing appropriate utilizing system of jetty. To instruct them on how to transfer the information which will be gotten from the meteorological agency on the basis of a text prepared in advance by the consultant.
(3)Drafting of management and operation manual on pier	To instruct relevant staffs on the drafting of the rules about traffic separation into passenger and vehicles, cargo handling system for the ferry such as porter's working rule and cargo traffic rule on the jetty, a utilization way of the jetty on the assumption that the ferry will have priority to use the jetty over other cargo vessels, such as possible berthing time for cargo vessels, berth occupation time period of cargos on the jetty, and packing type of which cargos can be put on the jetty. The instruction shall be done in a workshop by using a text which will be prepared in advance by the consultant.
(4)Guidance on regular walk-around inspection of pier	To instruct them on the regular walk-around inspection method about jetty's concrete floors, rubber fenders, bollards and bits, car stoppers, and criteria of their repairs.

The achievement of the above-mentioned activity will be confirmed as follows.
/Confirmation of personnel assignment on pier management and operation
/Drawing up of management and operation manual on pier
/Establishment of the information acquisition system from the Meteorological Agency
/On-site confirmation of how relevant staffs understand the operation on pier
/On-site confirmation of how relevant staffs understand the regular inspection system

②Establishment of yard management and operation system

Technical instructions will be done to APORTIL staffs of engaging in yard management and operation. The contents of technical instructions are shown in Table 5-2.

Table 5-2 Activity items on yard management and operation

Activity item	Method
(1)Guidance on traffic rule in the terminal	To instruct relevant staffs on the traffic rule in the terminal, such as the separation of traffic flow into passenger and guests, ferry-using vehicles and vehicles for pick-up, and one way traffic system. The draft rule will be prepared on the basis of the land use plan in the terminal by the consultant.
(2)Drafting of operation manual on passenger terminal and parking lots	To instruct them on the drafting of manuals of ticketing way, parking rule, outdoor light operation rule for establishing the basic operation flow.
(3)Drafting of operation manual on warehouse and stacking yard	To instruct them on the drafting of the manual about how to operate the warehouse and the stacking yard by using a text which will be prepared on the basis of the same kind of operation at Dili Port by the consultant for establishing the basic operation flow
(4)Guidance on regular walk-around inspection of relevant facilities in the yard	To instruct them on the regular walk-around inspection method about yard pavement, revetments, outer fences, outdoor lights and drain ditches, and their criteria to be repaired

The achievement of the above-mentioned activity will be confirmed as follows.
/Drawing up of operation manual on passenger terminal and parking lots
/Drawing up of operation manual on warehouse and stacking yard
/On-site confirmation of how relevant staffs understand the traffic control in the terminal and yard operation
/On-site confirmation of how relevant staffs understand the regular inspection system

(5) Schedule of Soft Component Plan

Soft component plan will be done on the schedule shown in Figure 5-1.

Figure 5-1 The Schedule of Soft Component Plan

Item	Schedule					
	24rd month				25rd month	
	1st week	2	3	4	5	6
Establishment of Management and Operation System on Jetty						
/Guidance on safe use of jetty						
/Establishment of acquisition route about weather information						
/Drafting of management and operation manual on jetty						
/Technical guidance on regular walkaround inspection of jetty and its attachment						
Establishment of Management and Operation System on Yard						
/Guidance on traffic rule in the yard						
/Drafting of operation manual of passenger terminal and public parking lot						
/Drafting of operation manual of warehouse and stacking yard						
/Technical guidance on regular walkaround inspection of yard and relevant facilities						

Note: ▭ Work in Japan, ▬ Work in Oecusse △ Terminal Open

(6) Outputs of the soft Component Plan

Outputs are as follows.
/Soft Component Plan Final Report (in both Japanese and English)
/Draft of Pier Management and Operation Manual (in Japanese, English and Tetwn)
/Draft of Yard Management and Operation Manual (in Japanese, English and Tetwn)

(7) Responsibilities of the Recipient Country's Implementation Agency

In order to keep appropriate and effective use of the facilities provided by this project, APORTIL, the recipient country's implementing agency, should bear the following responsibilities
/Assignment the necessary number of management staffs at Oecusse Port office
/Clarification of each staff's responsibility on job
/Implementation of terminal management and operation based on the manual

6. References

	Title of Materials	Issuing organizations	Issuing date	Material Form
1	Vessel Details、2005 - 2009	APORTIL	Oct., 2009	Copy
2	Seafarer Tides 2009	Australian Hydrographic Services	Dec., 2008	Electronic file
3	Avansa Enclave、Estratejiku Hakbesik ida ba Dezenvolbimentu Social, Ekonomiku, Ambiente and Politiku Oe-Cusse Ambeno		Nov., 2007	Electronic file
4	Volume I National Road Network Master Plan (Final Report)	Ministry of Infrastructure	2009	Electronic file
5	Full Size Timor-Leste Map	National Directorate of Land and Poverty and Cadastral Services, Ministry of Justice		Electronic file
6	Oecusse Administrative Boundaries (Scale 1/100,000)		Nov., 2008	Map
7	Pante Macasar City Map (Scale 1/6,000)		Aug., 2009	Map
8	Existing Buildings Information for Dili Port	APORTIL	2009.10.12	Copy
9	Assessment of implementation of standardized budget planning procedures in the Timor Leste Port Administration (Draft Report)	GTZ	Oct., 2009	Copy
9	Maritime Transport Service Development for Timor-Leste (Feasibility Study, Annexes)	GTZ, Kfw	Nov., 2003	Copy
10	The National Infrastructure Plan for Timor-Leste (confidential not for circulation)	MOI	March. 2009	Copy
11	General Budget of the State and State Plan for 2009	Ministry of Infrastructure		Electronic file
12	External assistance 2008-2012 by Country	JICA Timor-Leste Office		Electronic file

7. Others (Site Survey Data)

7.1 Wind/Weather

Table 7-1-1 Wind Data in Oecusse (2007)

Direction \ Month		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Calm	%	42	50	60	50	38	33	43	38	52	57	57	50
NE	Km/hr	7.9	9.1	8.8	7.9	9.1	10.6	10.9	10.6	8.9	6.7	6.7	6.6
	%	4	2	2	5	8	6	6	5	6	4	4	5
E	Km/hr	6.1	7.9	7.0	6.1	10.1	12.0	6.0	10.8	10.2	7.4	5.4	5.7
	%	3	2	1	3	9	13	6	6	3	1	2	4
SE	Km/hr	5.0	6.6	5.1	5.0	8.4	13.8	12.0	15.0	8.9	6.0	7.2	5.8
	%	5	4	7	8	12	19	13	12	4	2	2	5
S	Km/hr	6.1	7.0	6.0	6.1	5.9	6.8	5.6	10.7	6.2	5.6	5.5	5.8
	%	6	7	6	7	6	5	6	6	3	1	3	6
SW	Km/hr	9.1	9.8	5.6	9.1	4.3	7.3	4.0	7.0	5.5	6.3	4.6	12.9
	%	12	8	1	3	3	2	1	2	2	1	1	7
W	Km/hr	14.1	12.3	11.1	14.1	10.2	11.0	12.2	13.7	13.4	13.0	13.0	12.7
	%	14	13	12	9	8	0	7	9	16	18	19	16
NW	Km/hr	12.2	8.9	12.1	12.2	8.7	9.7	8.4	8.9	12.4	9.6	9.7	8.3
	%	12	13	10	10	10	8	8	12	6	12	12	9
N	Km/hr	11.5	7.7	6.2	11.5	8.0	7.2	8.1	8.4	7.1	5.9	6.5	9.1
	%	3	3	3	9	12	9	11	10	8	4	3	3

Source: Preliminary Study Report on Oecusse Port Urgent Rehabilitation Project, April, 2009

Table 7-1-2 Weather Data in Oecusse (2007)

	Max. Temp.	Min. Temp.	Humidity(%)		Rainy Day	A quantity of precipitation	Sunshine duration
	(℃)	(℃)	At 8:00	At 14:00	(day)	(mm)	(hr)
January	32	21	82	78	16	282	6.0
February	32	22	84	78	15	229	6.0
March	33	19	80	76	13	206	8.0
April	35	20	75	74	7	89	8.9
May	35	18	68	68	2	37	9.5
June	34	16	66	63	1	8	9.2
July	33	16	65	65	1	6	9.7
August	34	16	62	67	0	3	10.0
September	35	17	64	72	0	1	11.7
October	35	17	72	76	2	16	10.2
November	34	21	73	75	5	54	9.9
December	32	22	78	77	14	177	7.7
Average	33.7	18.8	72.4	72.4	-	-	8.9
Annual Total	-	-	-	-	-	1,108	-

Source: Preliminary Study Report on Oecusse Port Urgent Rehabilitation Project, April, 2009

7.2 Topography/Bathymetry

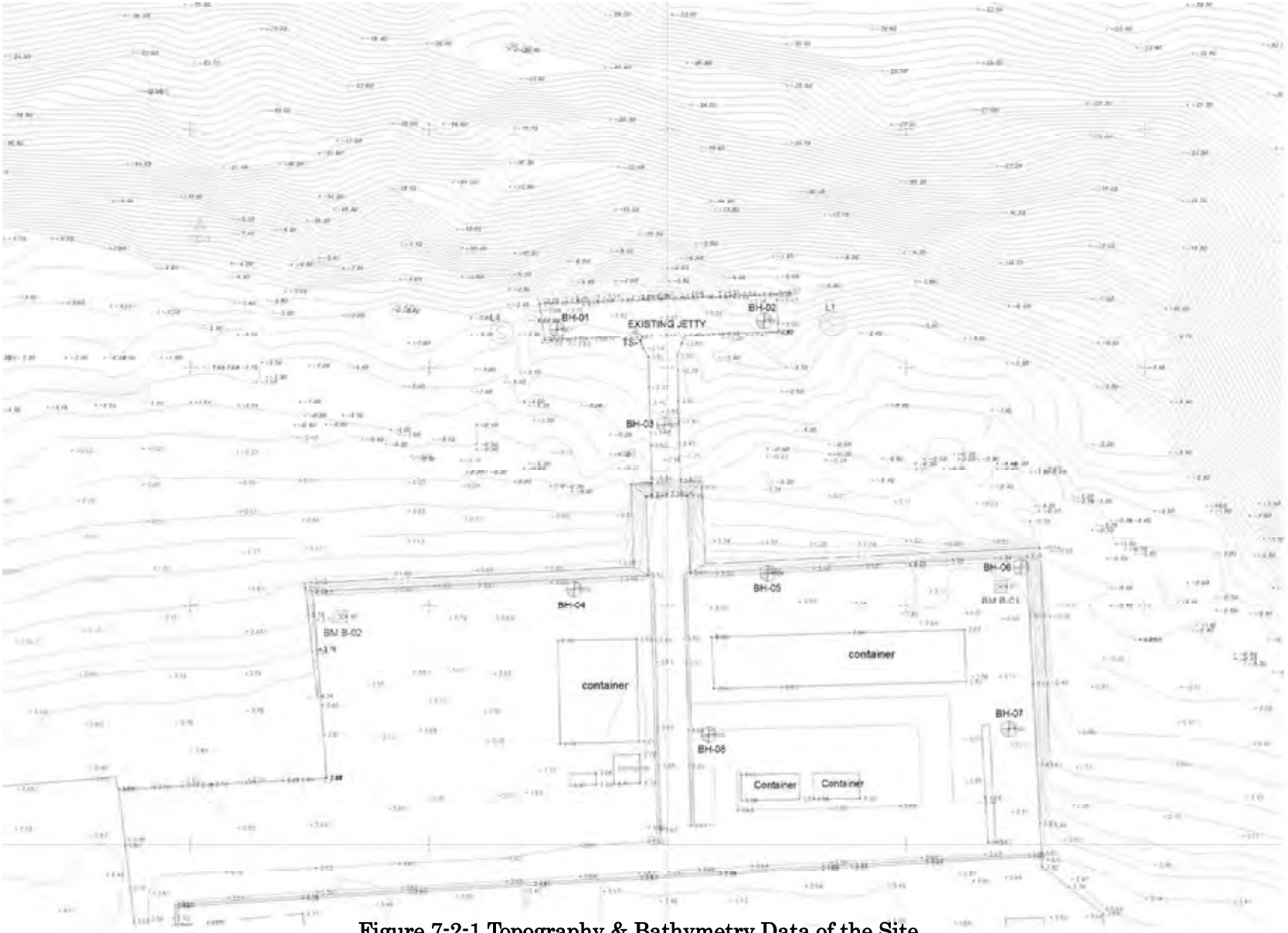


Figure 7-2-1 Topography & Bathymetry Data of the Site

(Cross section data)

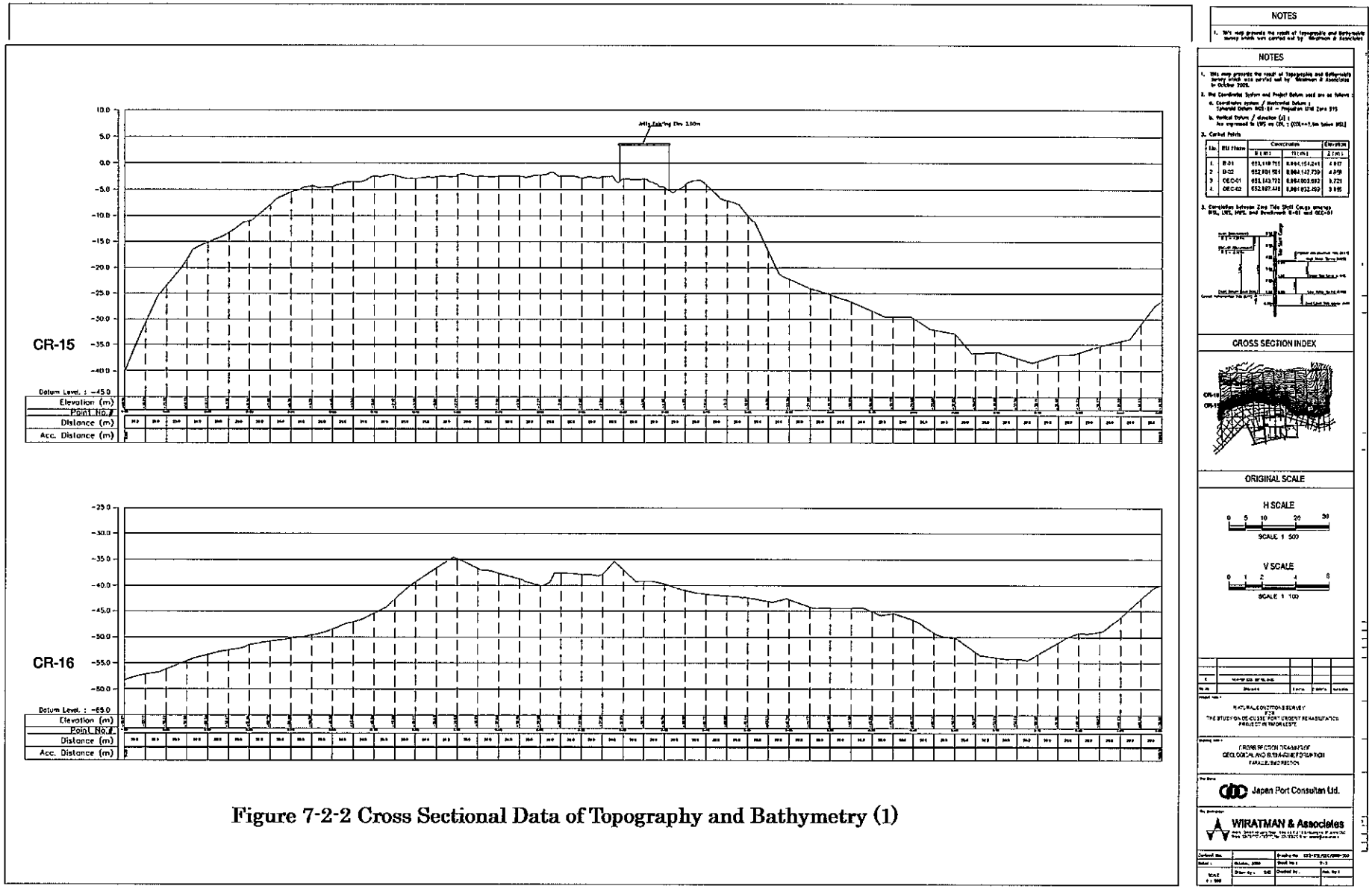


Figure 7-2-2 Cross Sectional Data of Topography and Bathymetry (1)

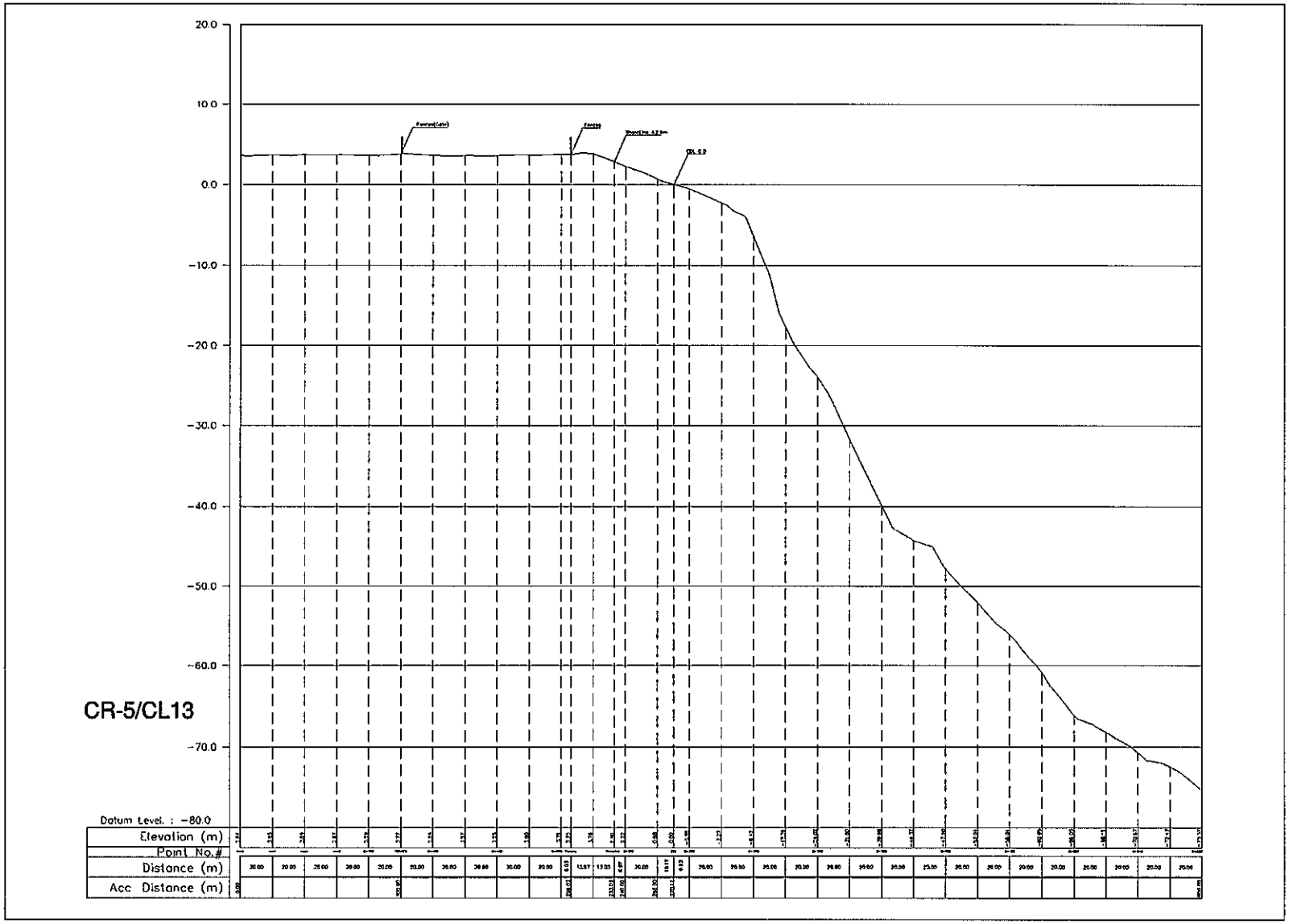


Figure 7-2-2 Cross Sectional Data of Topography and Bathymetry (2)

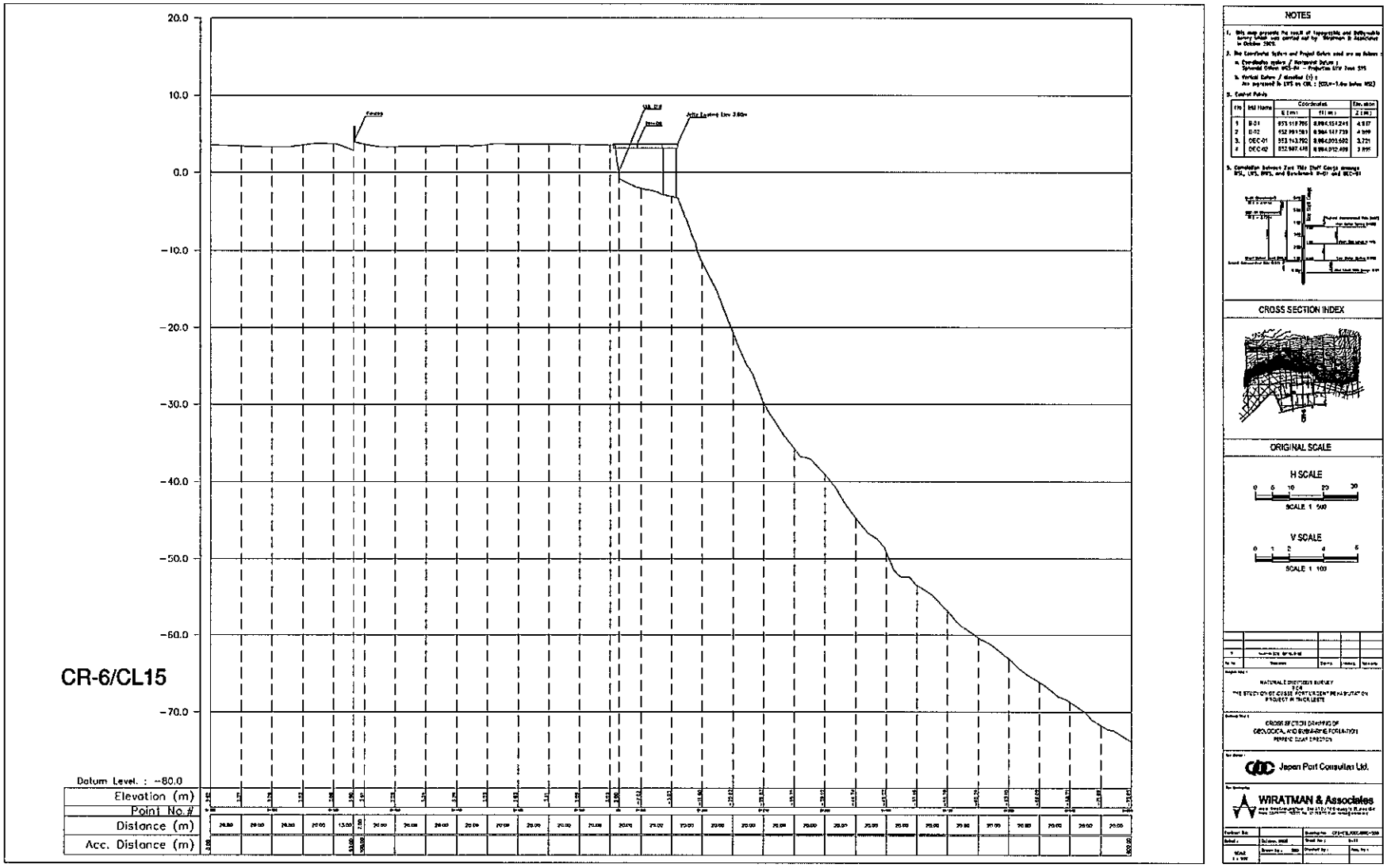


Figure 7-2-3 Cross Sectional Data of Topography and Bathymetry (3)

7.3 Wave

7.3.1 Design Wave

(1) Flow chart of Estimation

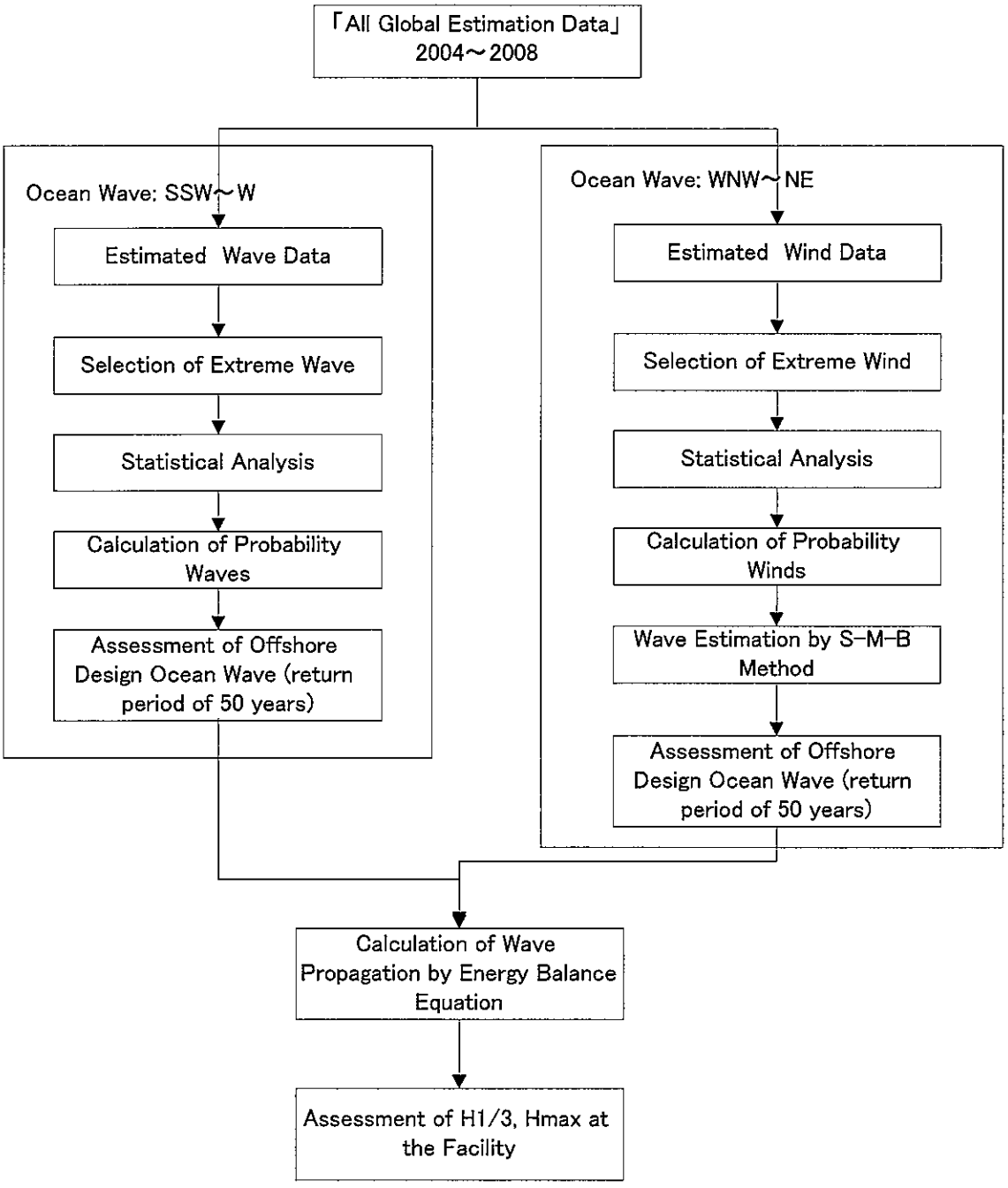


Figure 7-3-1 Flow Chart of Wave Estimation

7.3.2 Results of the estimation

① Directions of probabilistic waves which may attack the project point with high wave height are estimated by using Global Wave Estimation Data as shown in Table 7-3-1.

Table 7-3-1 Estimation results of probabilistic wave based on Global Wave Estimation Data

Data Source	Wave Direction	Return Period of Probabilistic Wave			
		5 years	10 years	30 years	50 years
Global Wave Estimation Data	SSW	3.15m 10.61s	3.46m 11.29s	3.88m 12.21s	4.05m 12.58s
	SW	4.40m 9.72s	4.59m 10.08s	4.85m 10.62s	4.96m 10.84s
	WSW	3.81m 9.42s.	4.23m 10.26s	4.88m 11.56s	5.17m 12.15s
	W	3.82m 9.29s	4.27m 10.01s	4.86m 10.95s	5.10m 11.33s

The project point faces the Savu Sea. That means northern waves will likely be generated by winds passing over the surface of the sea. So wind data are arranged to estimate waves generated by the wind. The probabilistic waves by wind are also estimated. The estimation results are shown in Table 7-3-2.

Table 7-3-2 Estimation results of probabilistic wave based on wind data

Wave Direction	Return Period of Probabilistic Wave			
	5 years	10 years	30 years	50 years
WNW	1.93m 5.35s	2.17m 5.62s	2.48m 5.95s	2.62m 6.08s
NW	2.12m 5.57s	2.39m 5.86s	2.77m 6.24s	2.93m 6.39s
NNW	1.75m 5.09s	1.98m 5.36s	2.32m 5.72s	2.44m 5.85s
N	1.55m 4.83s	1.80m 5.13s	2.13m 5.51s	2.28m 5.67s
NNE	0.89m 3.83s	1.06m 4.13s	1.28m 4.47s	1.38m 4.61s

Generally speaking, probabilistic wave which has a return period of 50 years is used as design wave in port facility design. Design wave in deepwater area as probabilistic waves of 50 years' return period are shown in Table 7-3-3.

Table 7-3-3 Design Wave (probabilistic wave of 50 years' return period)

Wave Direction	Wave Height Ho	Wave Period T	Remarks
SSW	4.05m	12.58s	Ocean wave estimated using Global Wave estimation Data.
SW	4.96	10.84	
WSW	5.17	12.15	
W	5.10	11.33	
WNW	2.62	6.08	Wind wave in Savu Sea estimated by wind data.
NW	2.93	6.39	
NNW	2.44	5.85	
N	2.28	5.67	
NNE	1.38	4.61	

②Design wave at points in front of the port facilities

Among deepwater waves with various directions, waves of WSW~N are selected as the highest wave to attack each facility. Design wave specifications at project points are calculated by using the wave transformation calculation method at shallow water area. Table 7-3-4, 7-3-5 shows design wave specifications at H.W.L. Figure shows the typical results of wave transformation calculation using wave vectors

Table 7-3-4 Design Wave Specification (probabilistic wave of 50 years' return period, H.W.L.)

Location	Deepwater Wave			Facility points				
	Direction	Ho	T	Ho'	Direction	$H_{1/3}$	Hmax	HD
Slipway	NW	2.93m	6.93s	2.65m	323.4°	2.42m	4.36m	4.36m
Pier	NW	2.93	6.93	2.58	326.6	2.38	4.28	4.28
Foot of Trestle	W	5.10	11.33	1.34	348.8	2.14	2.81	3.68
Eastern Revetment	W	5.10	11.33	1.26	347.3	2.12	2.78	3.64
Western Revetment	W	5.10	11.32	1.59	352.2	1.40	1.99	2.56

Table 7-3-5 Design Wave Specification by Each Direction (H.W.L.)

Location	Direction	Ho' (m)	T (s)	Lo (m)	H13 (m)	Hmax (m)	HD (m)	Direction (°)
Slipway	WSW	1.20	12.15	230.3	1.23	2.21	2.21	320.6
	W	2.02	11.33	200.3	2.02	3.64	3.64	318.1.
	WNW	2.11	6.08	57.7	1.94	3.49	3.49	299.7
	NW	2.65	6.39	63.7	2.42	4.36	4.36	323.4
	NNW	2.37	5.85	53.4	2.19	3.93	3.93	340.8
	N	2.26	5.67	50.2	2.09	3.77	3.77	0.1
Pier	WSW	1.14	12.15	230.3	1.26	2.27	2.27	326.8
	W	1.91	11.33	200.3	2.09	3.76	3.76	324.5
	WNW	1.98	6.08	57.7	1.81	3.27	3.27	302.9
	NW	2.58	6.39	63.7	2.38	4.28	4.28	326.6
	NNW	2.35	5.85	53.4	2.15	3.87	3.87	342.3
	N	2.25	5.67	50.2	2.06	3.70	3.70	0.3
Foot of Trestle	WSW	0.83	12.15	230.3	1.73	2.62	2.62	350.6
	W	1.34	11.33	200.3	2.14	2.81	3.68	348.8
	WNW	1.10	6.08	57.7	1.35	2.35	2.35	323.5
	NW	2.00	6.39	63.7	2.06	2.66	3.49	348.1
	NNW	2.04	5.85	53.4	2.03	2.63	3.45	357.3
	N	2.08	5.67	50.2	2.03	2.62	3.44	5.0
Eastern Revetment	WSW	0.76	12.15	230.3	1.62	2.31	2.52	344.9
	W	1.26	11.33	200.3	2.12	2.78	3.64	347.3
	WNW	1.46	6.08	57.7	1.73	2.24	2.86	322.9
	NW	1.88	6.39	63.7	2.12	3.10	3.52	348.2
	NNW	1.92	5.85	53.4	2.05	3.06	3.39	359.7
	N	1.96	5.67	50.2	2.04	3.05	3.38	8.5
Western Revetment	WSW	0.96	12.15	230.3	1.28	1.77	2.28	353.1
	W	1.59	11.32	200.3	1.40	1.99	2.56	352.2
	WNW	1.36	6.08	57.7	1.17	1.57	2.04	340.4
	NW	2.24	6.39	63.7	1.29	1.80	2.32	350.1
	NNW	2.15	5.85	53.4	1.26	1.73	2.23	356.3
	N	2.13	5.67	50.2	1.24	1.71	2.21	2.5

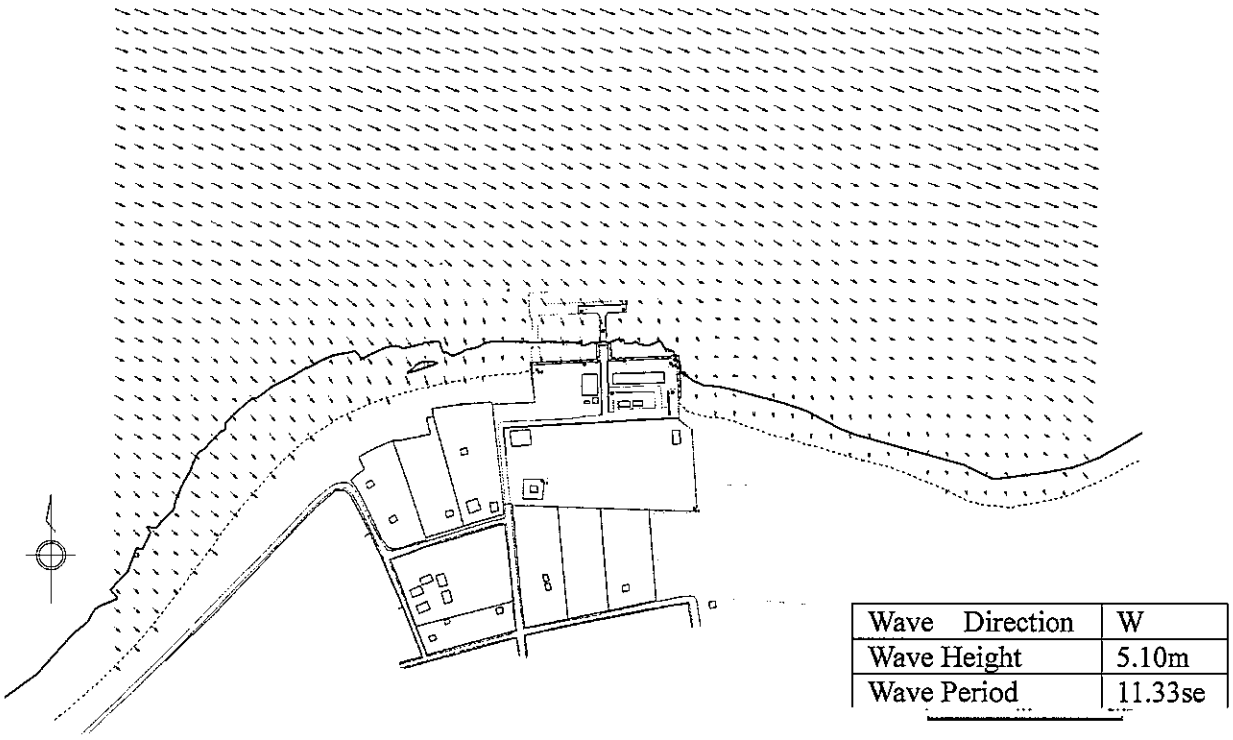


Figure 7-3-2 Wave Vector (W)

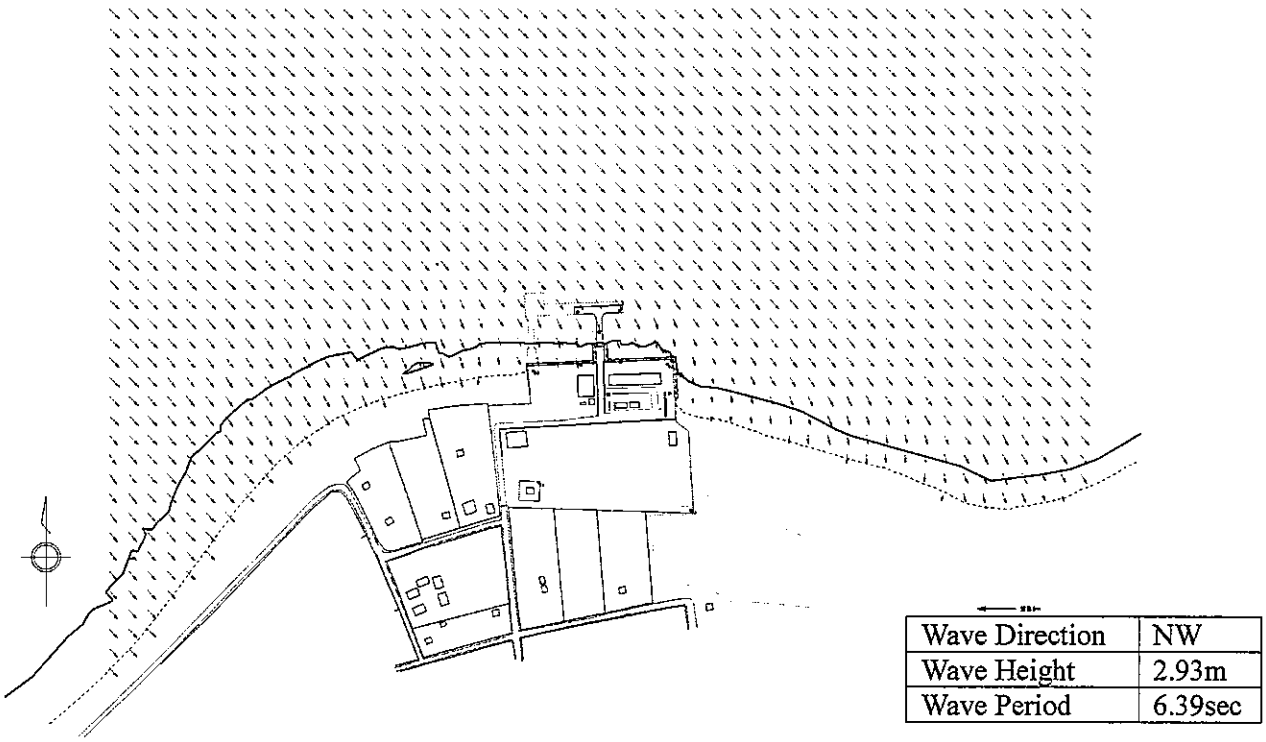


Figure 7-3-3 Wave Vector (NW)

7.3.3 Harbor Calmness

(1) Flow chart of the estimation

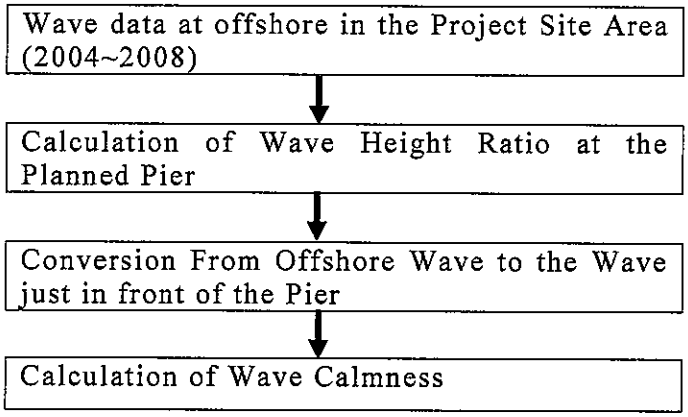


Figure 7-3-4 Flow chart of the estimation of Harbor calmness

Wave Calmness: Wave Calmness is calculated based on the ratio of waves which do not exceed the Critical Operational wave height (0.5m)

(2) Result of the estimation

①Wave condition at offshore area in Oecusse
Figure 3-5 shows the frequency of appearance of wave at offshore area in Oecusse.
About 60% of waves are less than 0.5m-high waves in dry seasons. On the contrary, there are some waves exceeding 1.m high, mostly of WNW, in rainy season.

②Berth Calmness
Table 7-3-6 shows the berth calmness rate at the center of the berth line. The berth calmness is calculated by changing the critical wave height.

Table 7-3-6 The estimation of berth calmness

Critical wave Height (m)	Location	Rainy season (%) (Nov .~ April)	Dry season (%) (May ~ Oct.)	Year around (%)
0.3	Center of the berth	68.0	42.2	55.8
0.5		86.8	82.5	84.8
1.0		96.9	100.0	98.4

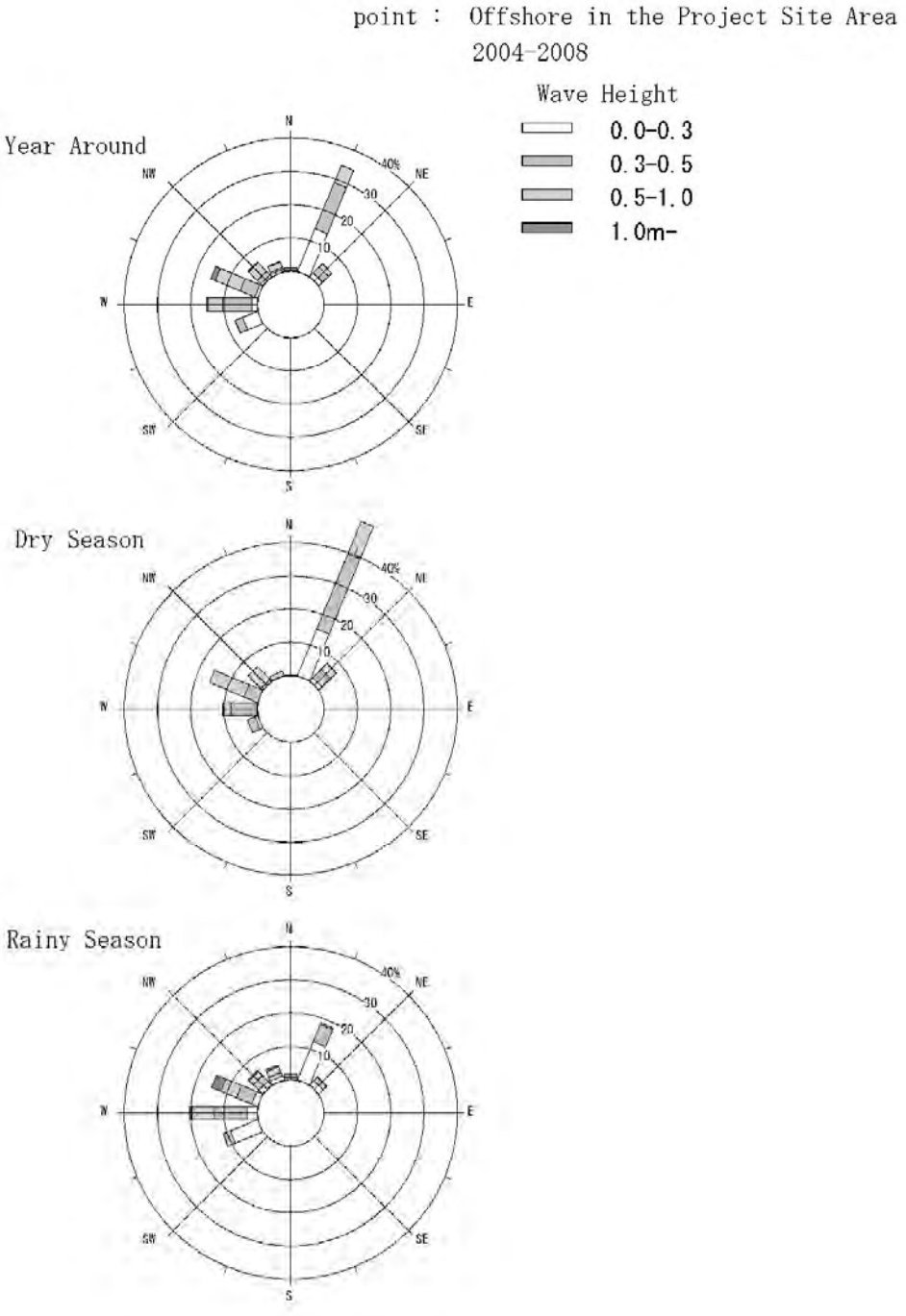


Figure 7-3-5 Frequency of appearance of wave at offshore point in Oecusse

7.4 Tide

7.4.1 Harmonic Constant

Tidal observation was conducted on-site at Oecusse from Oct. 22, 2009 to Nov. 22, 2009. The tide data was analyzed to calculate amplitude and phase of tidal constituents. The analyzed data was compared with the analysis data in 2009 by Australian Hydrographic Service. (Table 7-4-1)

The 4 main constituents of tide (M2, S2, K1, O1) of the observation data are almost the same as the estimation data. The mean water level of the observation data is 0.1m higher than that of the estimation. This may be due to the difference of the height of Chart Datum Level (C.D.L.).

The definition of C.D.L. is CDL±0.0＝MSL－Z0.

The mean water level of the observation shows the height from C.D.L. in Oecusse. On the contrary, the mean water level of the estimation differs from Z0 by about 0.1m. And both Z0 of the observation data and that of the estimation data are the same. Therefore the mean water level of the estimation matches that of the observation data, CDL+1.4m.

Table 7-4-1 The result of Harmonic Analysis

Items	Constituents	Observation		Estimation	
		Amplitude	Phase	Amplitude	Phase
Harmonic Constants	M2	0.64m	322.0°	0.635m	355.5°
	S2	0.29	40.0	0.306	41.5
	K1	0.28	310.0	0.268	308.6
	O1	0.17	262.0	0.172	289.9
	N2	0.16	290.0	0.092	336.3
	M4	0.02	163.0	0.011	58.4
	MS4	0.01	208.0	0.001	69.7
	K2	0.08	40.0	0.086	39.8
	P1	0.09	310.0	0.075	310.5
Mean Sea Level(MSL)		1.4m (CDL+1.4m)		1.3m (CDL+1.4m)	
Z0=M2+S2+K1+O1		1.38m		1.38m	

7.4.2 Design Tidal Level

Design tidal level is defined as follows in Japan.

H.W.L. (Mean monthly-highest water level):
The average of the monthly-highest level, where the monthly-highest water level for a particular month is defined as the highest water level occurring in the period from 2 days before to 4 days after the day of the lunar syzygy (new moon and full moon).

L.W.L. (Mean monthly-lowest water level): The average of the monthly-lowest level, where the monthly-lowest water level for a particular month is defined as the lowest water level

occurring in the period from 2 days before to 4 days after the day of the lunar syzygy (new moon and full moon).

Since there is no long-period observation data of tidal level in Oecusse, H.W.L. and L.W.L. are calculated by using the water level data in 2009 estimated by Australian Hydrographic Service.

Water level of those data is based on the height which is 1.33m lower than MSL. Considering CDL at Oecusse is 1.4m lower than MSL, the design tidal level is defined as follows.

H.W.L. = 2.50+0.07 = 2.57 = CDL+2.6m
L.W.L. = 0.14+0.07 = 0.21 = CDL+0.2m

7.5 Tidal Current

7.5.1 Harmonic Constant

Tidal current observation was conducted on 2 points continuously from Oct. 23, 2009 to Nov. 6, 2009. The observation data of both the East-West current and North-South current were analyzed. The amplitude and phase of each constituent are calculated and tidal current ellipse was drawn up.

Comparing the observation results with the estimation on tidal current ellipse, current direction and current velocity of both data match well.

7.5.2 Simulation of tidal current

Tidal current simulation was conducted to get input data for littoral drift simulation. The simulation was conducted for the current facility condition and future extension plan.

Simulation model and calculation conditions are as follows.

Simulation model: Single layer tidal current calculation model

Condition on tidal level and tidal current: Mean spring tide M2+S2

Current tidal current vectors are calculated when eastern current and western current are at their strongest and shown in Figure 7-5-1.

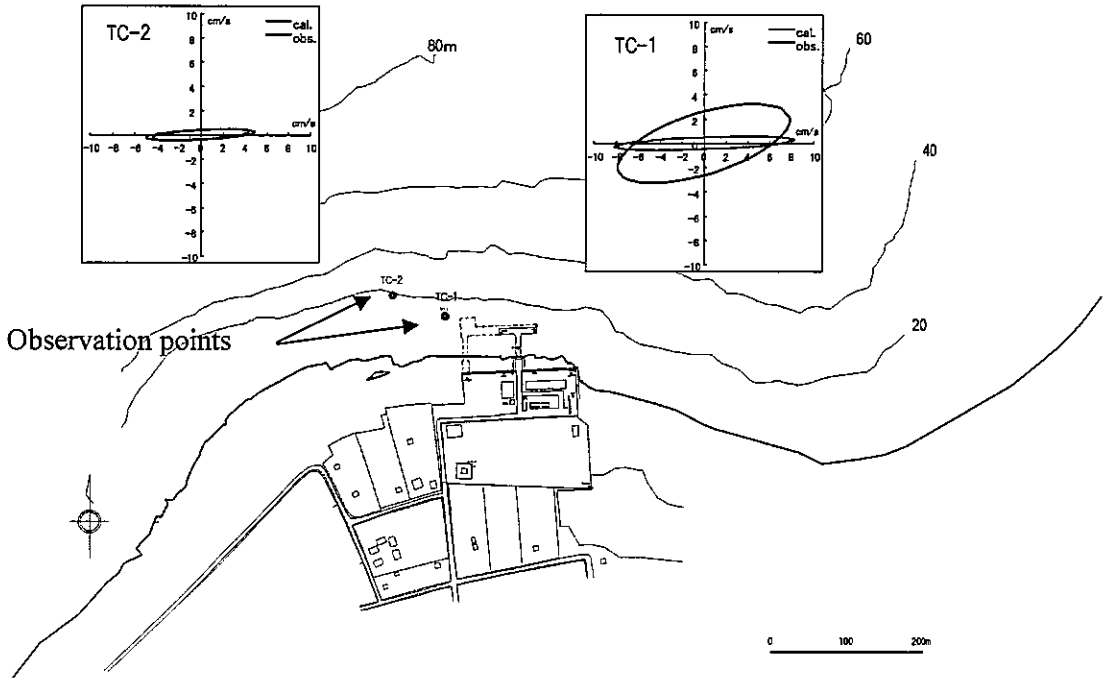


Figure 7-5-1 Tidal current ellipse (Observation and Calculation)

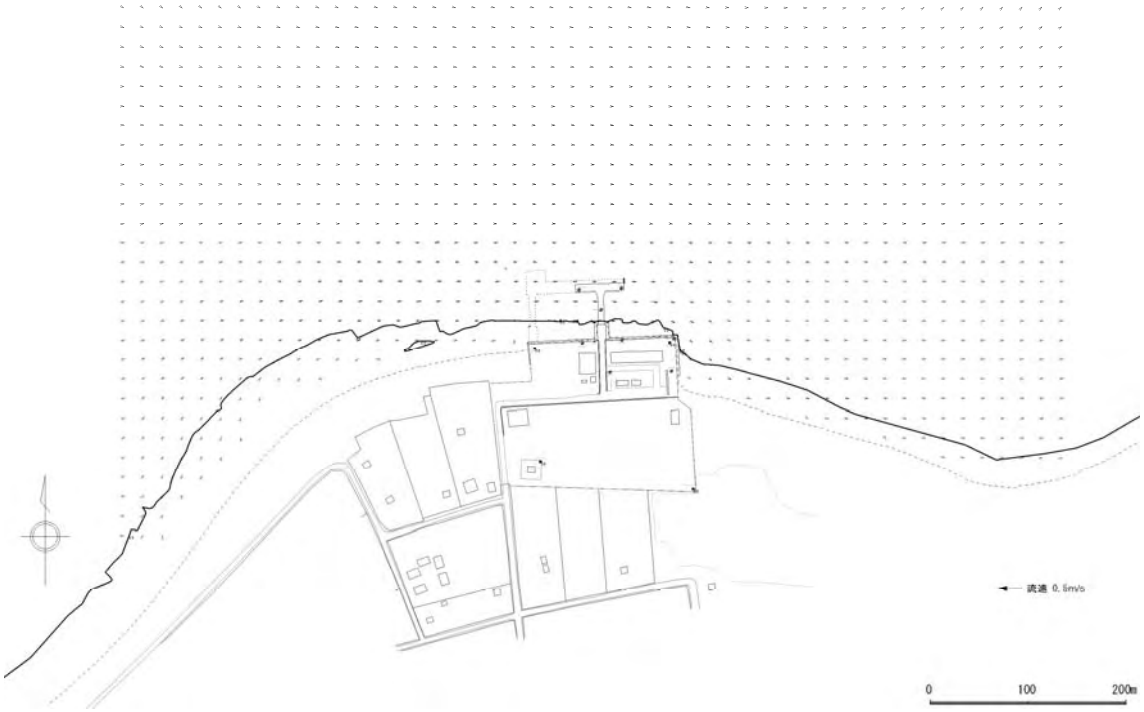


Figure 7-5-2　Tidal Current Vectors (Current reenactment, the strongest of eastern current)

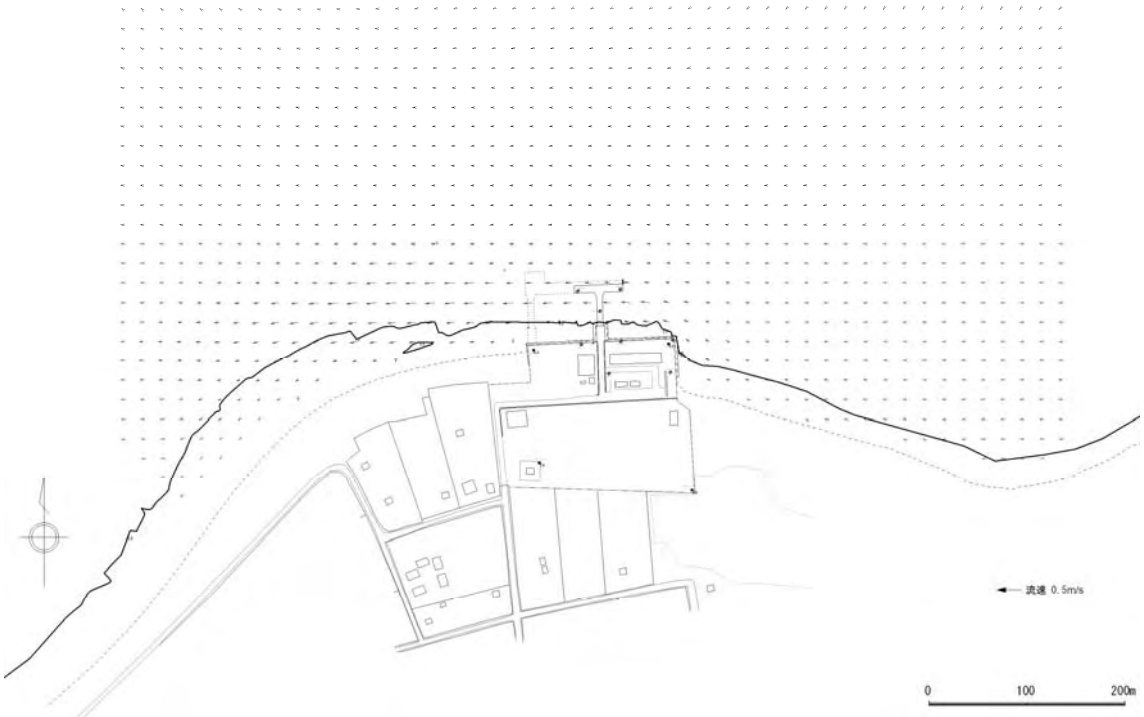


Figure 7-5-3　Tidal Current Vectors (Current reenactment, the strongest of western current)

7.6 Littoral Drift

7.6.1 Wave condition for simulation of tidal drift

Considering that tidal drift is controlled by wave energy, energy-averaged representative wave by season was calculated on the basis of wave estimation data. Table 7-6-1 shows the results of the calculated energy-averaged representative waves. Furthermore, energy-averaged representative waves at high wave attacks are calculated because remarkable deformation of bathymetry happens during high wave attacks as showed in Table 7-6-2.

Table 7-6-1 Energy-averaged representative wave by season

Season	Energy-averaged representative wave by season		
	Wave height	Wave period	Wave direction
Dry season	0.47m	5.5s	348.2°
Rainy season	0.60m	5.4s	310.1°

Table 7-6-2 Energy-averaged representative wave during high wave attacks

Year	Wave height	Wave period	Wave direction	Duration hour
2004	1.16m	4.6s	295.4°	126hr
2005	0.94	5.8	291.1	54
2006	1.00	4.9	301.9	138
2007	1.33	5.6	303.1	90
2008	0.89	5.5	317.7	90
平均	1.06	5.3	301.8	102

Note: wave direction shows the angle clockwise from N

7.6.2 Threshold depth of surface layer sediment movement

Threshold depth of surface layer sediment movement was examined by using wave conditions and grain size of sea bed (D50=about 0.2mm).

Wave condition: Energy-averaged representative wave during high wave attacks
H-1.06m, T=5.3sec, L0=43.8m
Mean grain size: 0.2mm

According to Calculation Diagram for Threshold Depth of Surface Layer Sediment Movement, threshold depth was calculated as follows.

Using d/Lo=4.57×10-6、 H/Lo=0.024,
h/Lo=0.10 → h=4.4m

Considering L.W.L=DL+0.2m, threshold depth of sediment movement is DL-4.2m.
Since the water depth in front of the planned pier is DL-5.0m, it is deeper than the threshold depth. It is estimated that no remarkable threshold will happen around the new pier.

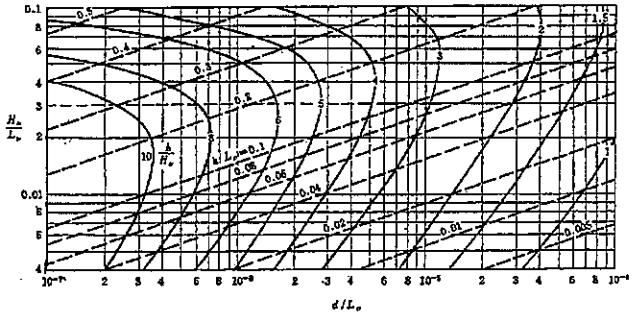


Figure 7-6-1 Calculation Diagram for Threshold Depth of Surface Layer Sediment Movement

7.6.3 Simulation of water depth deformation

(1) Outline of simulation

Figure 7-6-2 shows the flow chart of the simulation of water depth deformation.

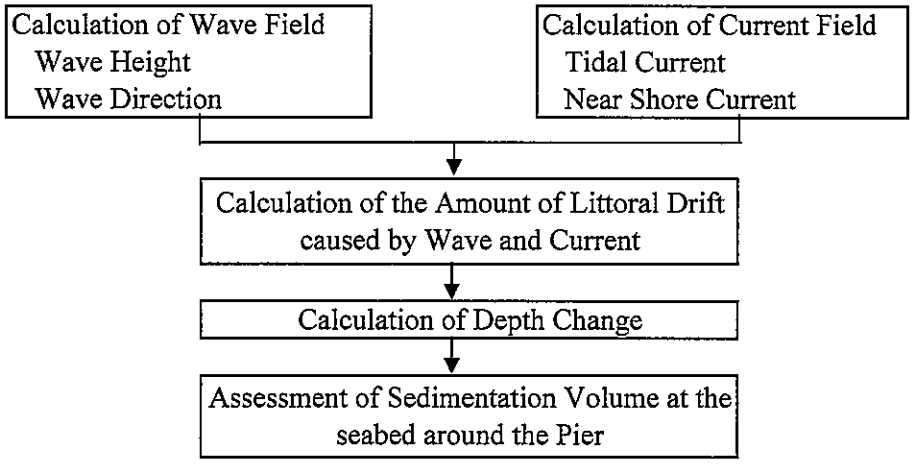


Figure 7-6-2 Flow Chart of Simulation of Water Depth Deformation

(Calculation condition)

Tidal current: Mean Spring Tide

Wave Condition: Energy-averaged representative wave during high wave attacks

H=1.06m, T=5.3s, Wave Direction 301.8°

Duration of Wave Attacks: 510 hours, the same as high wave attack period for a year

(2) Results of calculation

Figure 7-6-3, 7-6-4 show the results of water depth deformation occurring in one year in case of current facility condition and future facility plan. Figure 7-6-5 shows the differences between the two cases.

Based on the result of the simulation, remarkable sand sedimentation is not expected in front of the pier as shown in Table 7-6-3.

Table 7-6-3 Sedimentation volume by the simulation

Case	Total sedimentation volume in calculated area	Front of the pier	
		Total sedimentation volume	Sedimentation volume which may affect ships' berthing (the area which is shallower than -5m deep)
Current	3,988 ㎥/year	45.3 ㎥/year	0.0 ㎥/year
Future plan	3,892 ㎥/year	38.1 ㎥/year	0.0 ㎥/year

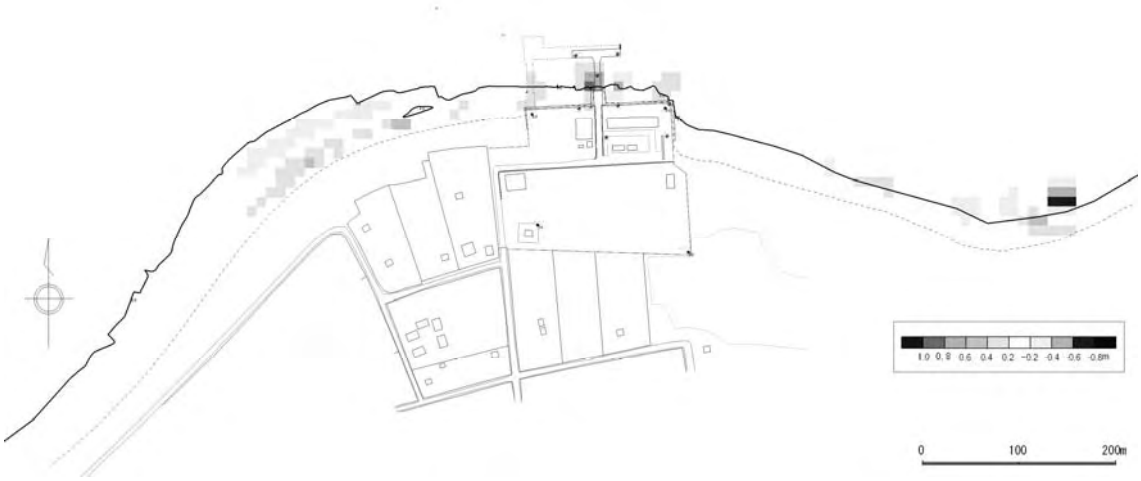


Figure 7-6-3 Calculation of water depth deformation
(1 year wave attack, Current geographical figure)

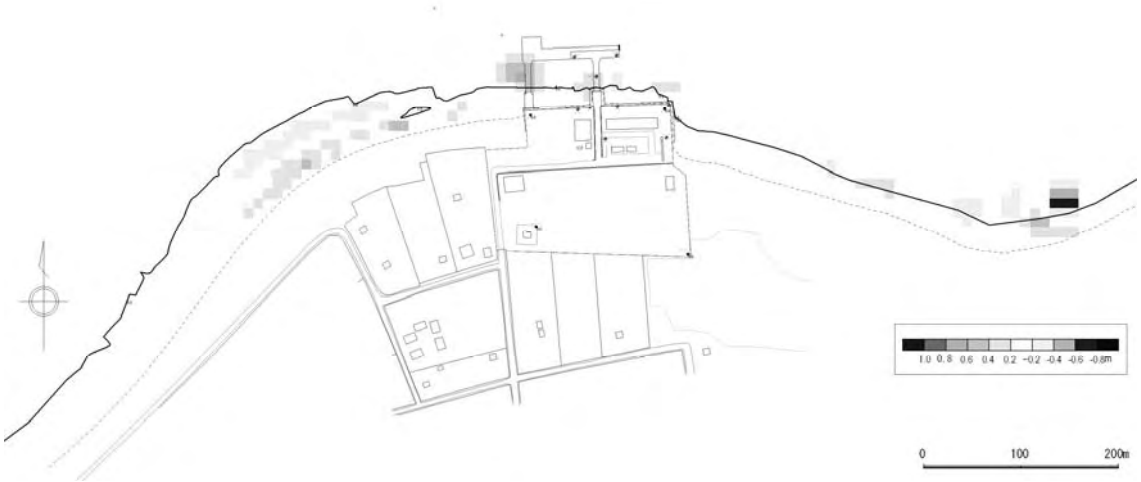


Figure7-6-4 Calculation of water depth deformation
(1 year wave attack, Future geographical figure)

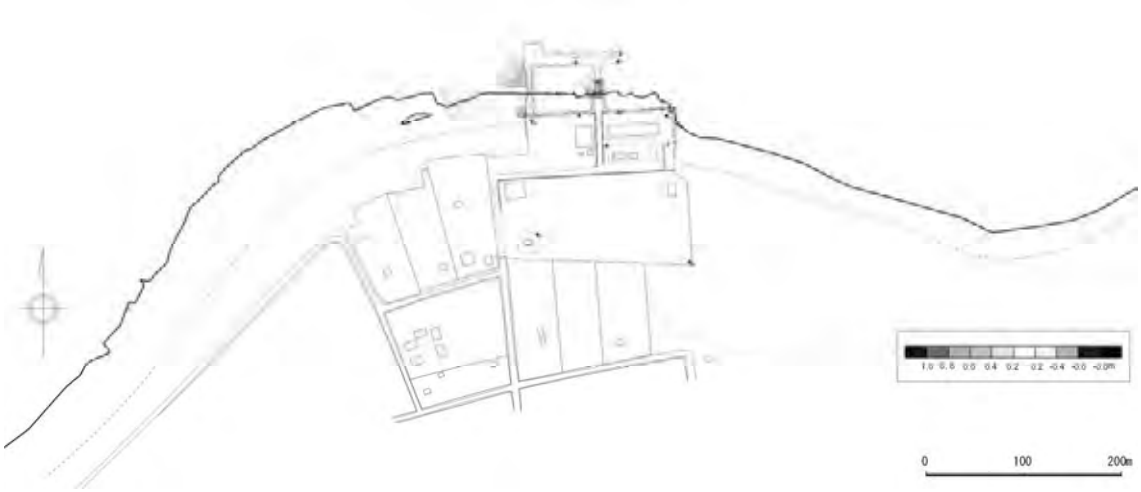


Figure7-6-5 Difference of sand sedimentation (Future case – current case)

7.7 Soil

(Survey points of soil investigation)

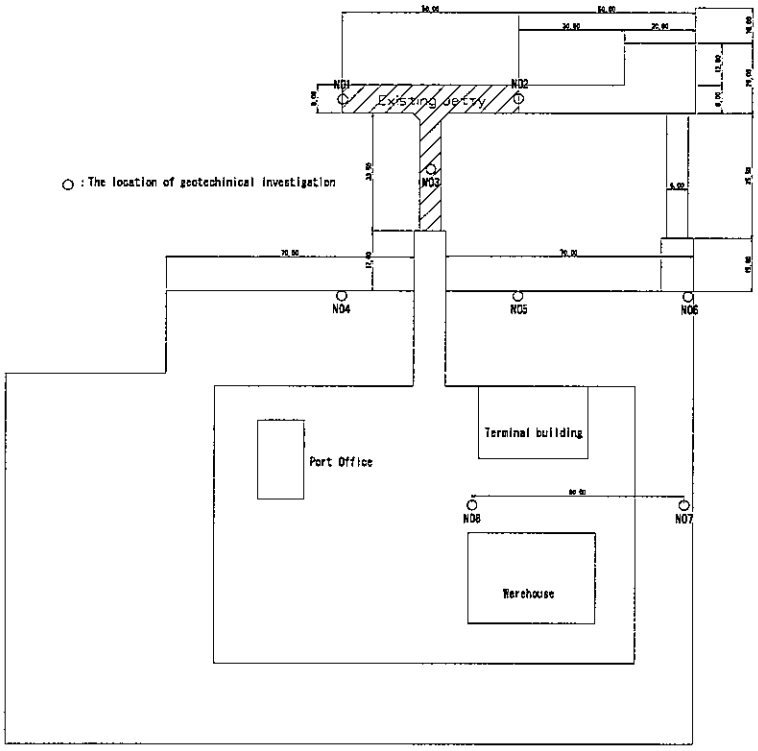


Figure 7-7-1 Survey points of soil investigation

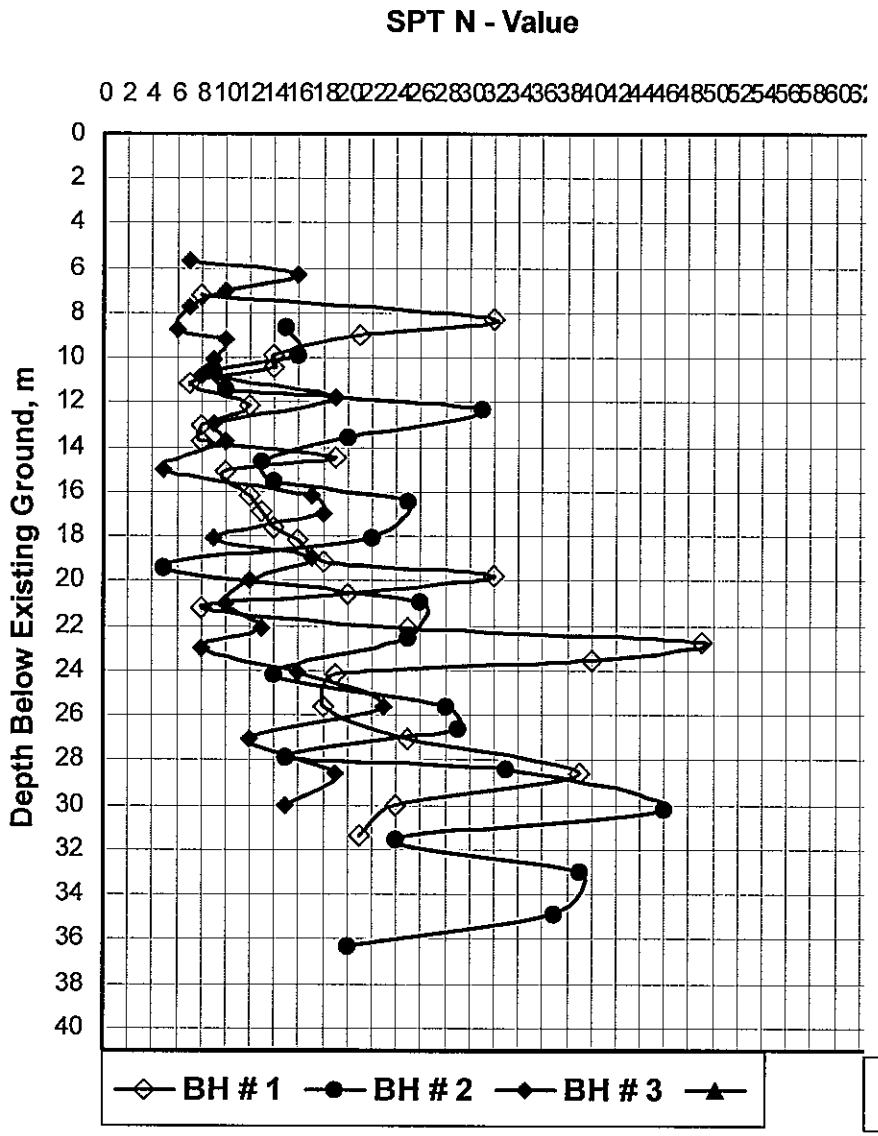


Figure 7-7-2 (1) N values of seaside borings

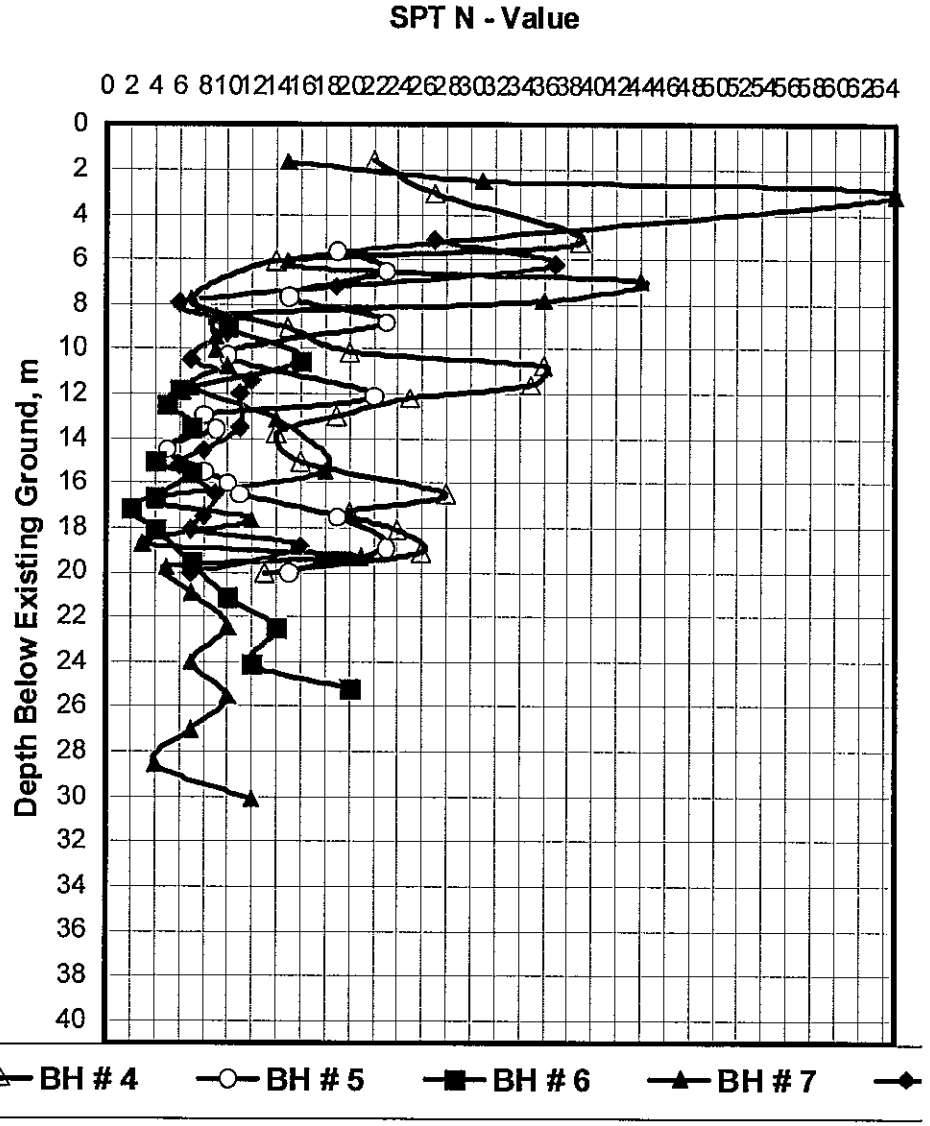


Figure 7-7-2 (2) N values of landside borings

Report No. GET 09-7020

CLIENT: JAPAN PORT CONSULTANTS,LTD			
PROJECT: OECUSSE PORT URGENT REHABILITATION PROJECT, TIMOR LESTE		BORING NO. BH # 1	
DRILLING METHOD: Mud Rotary	DIAM: 96 mm	SHEET: 1 OF 4	
SAMPLING METHOD: 50 mm split spoon barrel	CORE BARREL: NQ3		

DEPTH (m)	SAMPLES	(SPT) (REC) (RQD)	DESCRIPTION	Symbol	-0.075 (%)	Moisture Content % (pH Value)	Specific Gravity	LL [PL] (%)
1		0.00-0.20 0.20-1.00	Jetty concrete slab 0.20 m 1.00 m Water level with reference to top of Jetty					
2								
3								
4								
5								
6		Sea-bed 6.00m	6.00 m					
7		(3/4/4) 6.75-7.20 (S-1)	Loose to medium dense dark grey calcareous fine to medium **SAND (SW)**		10.6	24.3 (4.3)	2.1	
8		(5/11/21) 7.80-8.25 (S-2)	- carbonate Silty with gravelly (gravels are coral and shell fragments below 7.80 m 8.55 m		15.2	11.3 (3.2)	2.28	
9		(5/11/10) 8.55-9.00 (S-3)	Medium dense grey Sandy well graded **GRAVEL** with Silt **(GW-GM)** (Gravels are coral and shell fragments infilled with Silt and Sand layers)		7.8	16.9 (3.3)	2.47	
10		(7/10/4) 9.45-9.90 (S-4)	10.00 m		9.6	18.6 (4.2)	2.48	

DATE	TIME	BORING DEPTH (m)	CASING DEPTH (m)	WATER to DEPTH (m)	REMARKS
25-Oct-09 26-Oct-09		31.35	30.80	1.00	Logger: S. A. Murtaza

PLATE - 3

Figure 7-7-3(1) Boring Log (BH1, 1/4)

Report No. GET 09-7020

CLIENT: JAPAN PORT CONSULTANTS,LTD			
PROJECT: OECUSSE PORT URGENT REHABILITATION PROJECT IN TIMOR LESTE		BORING NO. BH # 1	
DRILLING METHOD: Mud Rotary	DIAM: 96 mm	SHEET: 2 OF 4	
SAMPLING METHOD: 50 mm split spoon barrel	CORE BARREL: NQ3		

DEPTH (m)	SAMPLES	(SPT) (REC) (RQD)	DESCRIPTION	Symbol	-0.075 (%)	Moisture Content % (pH Value)	Specific Gravity	LL [PL] (%)
11		(6/5/9) 10.00-10.45 (S-5) (4/3/4) 10.70-11.15 (S-6)	Loose to medium dense light grey (white) Sandy well graded **GRAVEL** with Silt **(GW-GM)** (Gravels are **coral and shell fragments** infilled with Silt and Sand layers) - medium dense to 10.45 m - loose poorly graded GRAVEL with Sand **(GP)**, 10.45 to 11.15 m		8.8 1.6	18.7 (4.0) 19.9 (4.4)	2.64 2.24	
12		(3/5/7) 11.70-12.15 (S-7)	- Sandy Gravel (GW), 11.15 to 12.15 m		3.8	19.5 (5.4)	2.57	
13		(7/7/1) 12.60-13.05 (S-8)	- loose, 12.15 to 14.00 m - carbonate gravelly fine to coarse **SAND** with Silt **(SW-SM)**, 12.15 to 13.05 m		10.7	16.2 (4.2)	2.61	
14		(4/4/4) 13.35-13.80 (S-9)			9	20.5 (6.4)	2.52	
15		(5/8/11) 14.00-14.45 (S-10) (4/4/6) 14.65-15.10 (S-11)	- carbonate gravelly, Silty fine to coarse **SAND (SM)**, 13.80 to 14.45 m - loose, 14.65 to 15.75 m		23.2 11.8	22.6 (4.1) 22.3 (3.3)	2.16 2.27	
16		(3/4/8) 15.75-16.20 (S-12)			7.1	23.4 (6.4)	2.31	
17		(5/5/8) 16.45-16.90 (S-13)	- carbonate gravelly, Silty fine to coarse **SAND (SM)**, 16.20 to 16.90 m		25.3	25.1 (5.2)	2.35	
18		(3/5/9) 17.20-17.65 (S-14) (4/7/9) 17.70-18.15 (S-15)	- Silty, Sandy Well Graded **GRAVEL (GM)**, 17.70 to 18.70 m		6.6 15.0	25.4 (6.5) 18.6 (5.3)	2.49 2.41	
19		(4/7/11) 18.70-19.15 (S-16) (9/14/18) 19.35-19.80 (S-17)			6.8 7.2	16.6 (4.2) 18.3 (4.3)	2.11 2.7	
20			20.00 m					

DATE	TIME	BORING DEPTH (m)	CASING DEPTH (m)	WATER to DEPTH (m)	REMARKS
25-Oct-09 26-Oct-09		31.35	30.80	1.00	Logger: S. A. Murtaza

PLATE - 3a

Figure 7-7-3(2) Boring Log (BH1, 2/4)

Report No. GET 09-7020

CLIENT: JAPAN PORT CONSULTANTS,LTD

PROJECT: OECUSSE PORT URGENT REHABILITATION PROJECT IN TIMOR LESTE | BORING NO. BH # 1

DRILLING METHOD: Mud Rotary | DIAM: 96 mm | SHEET: 3 OF 4

SAMPLING METHOD: 50 mm split spoon barrel | CORE BARREL: NQ3

DEPTH (m)	SAMPLES	(SPT) (REC) [RQD]	DESCRIPTION	Symbol	-0.075 (%)	Moisture Content % (pH Value)	Specific Gravity	LL [PL] (%)
		(7/12/8) 20.15-20.60 (S-18)	Loose to medium dense light grey (white) Sandy well graded **GRAVEL** with Silt **(GW-GM)** (Gravels are coral and shell fragments infilled with Silt and Sand layers)		14.9	15.3 (4.4)	2.51	
21		(2/5/3) 20.80-21.25 (S-19)	- Silty **(GM)** to 20.80 m - loose, 20.80 to 21.65 m		7.8	16.7 (5.2)	2.37	
22		(6/8/17) 21.65-22.10 (S-20)			7.0	18.8 (4.0)	2.49	
		(8/22/27) 22.30-22.75 (S-21)	- dense, 22.30 to 23.75 m		6.4	16.6 (3.3)	2.22	
23		(11/18/22) 23.10-23.55 (S-22)			7.7	18.1 (4.0)	2.26	
24		(6/8/11) 23.75-24.20 (S-23)	- Silty **(GM)**, 23.75 to 25.15 m		15.1	19.8 (5.4)	2.12	
25								
		(4/7/11) 25.15-25.60 (S-24)			7.0	24.1 (4.0)	2.32	
26								
27		(4/9/16) 26.60-27.05 (S-25)	- Silty **(GM)**, 26.60 to 28.55 m		17.1	15.5 (4.2)	2.68	
28			28.55 m			32.3	2.62	
		(9/17/22) 28.10-28.55 (S-26)	Medium dense light grey Silty, Gravelly fine to coarse **SAND (SM)** (Gravels are Gravels are coral and shell fragments infilled with Silt and Sand layers)		5.2	(4.2)		
29								
		(10/11/13) 29.60-30.05 (S-27)	30.00 m		19.8	23.6 (4.3)		
30								

DATE	TIME	BORING DEPTH (m)	CASING DEPTH (m)	WATER to DEPTH (m)	REMARKS
25-Oct-09 26-Oct-09		31.35	30.80	1.00	Logger: S. A. Murtaza

PLATE - 3b

Figure 7-7-3(3) Boring Log (BH1, 3/4)

Report No. GET 09-7020

CLIENT: JAPAN PORT CONSULTANTS,LTD

PROJECT: OECUSSE PORT URGENT REHABILITATION PROJECT IN TIMOR LESTE | BORING NO. BH # 1

DRILLING METHOD: Mud Rotary | DIAM: 96 mm | SHEET: 4 OF 4

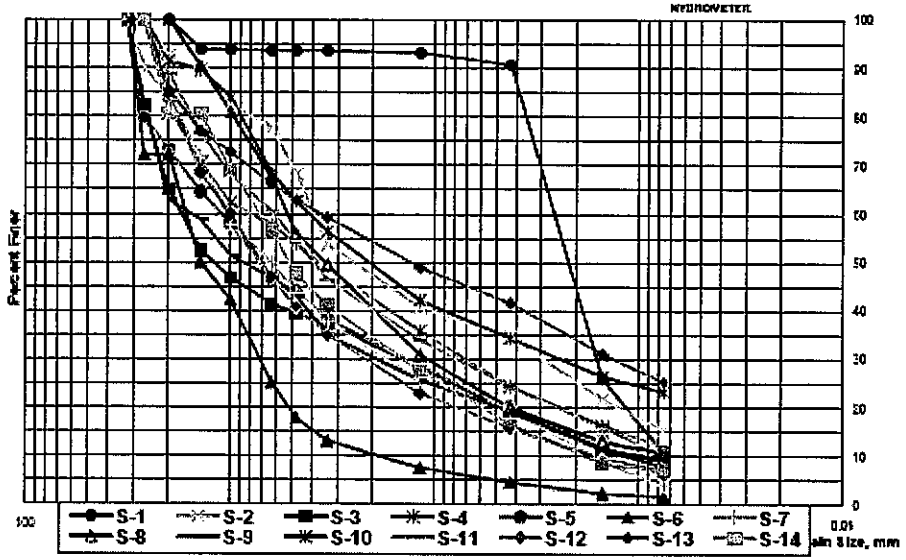
SAMPLING METHOD: 50 mm split spoon barrel | CORE BARREL: NQ3

DEPTH (m)	SAMPLES	(SPT) (REC) [RQD]	DESCRIPTION	Symbol	-0.075 (%)	Moisture Content % (pH Value)	Specific Gravity	LL [PL] (%)
31		(6/9/12) 30.90-31.35 (S-28) No Recovery	Medium dense light grey Silty, Gravelly fine to coarse **SAND (SM)** (Gravels are Gravels are coral and shell fragments infilled with Silt and Sand layers)					
			31.35 m					
32								
33								
34								
35								
36								
37								
38								
39								
40								

DATE	TIME	BORING DEPTH (m)	CASING DEPTH (m)	WATER to DEPTH (m)	REMARKS
25-Oct-09 26-Oct-09		31.35	30.80	1.00	Logger: S. A. Murtaza

PLATE - 3c

Figure 7-7-3(4) Boring Log (BH1, 4/4)

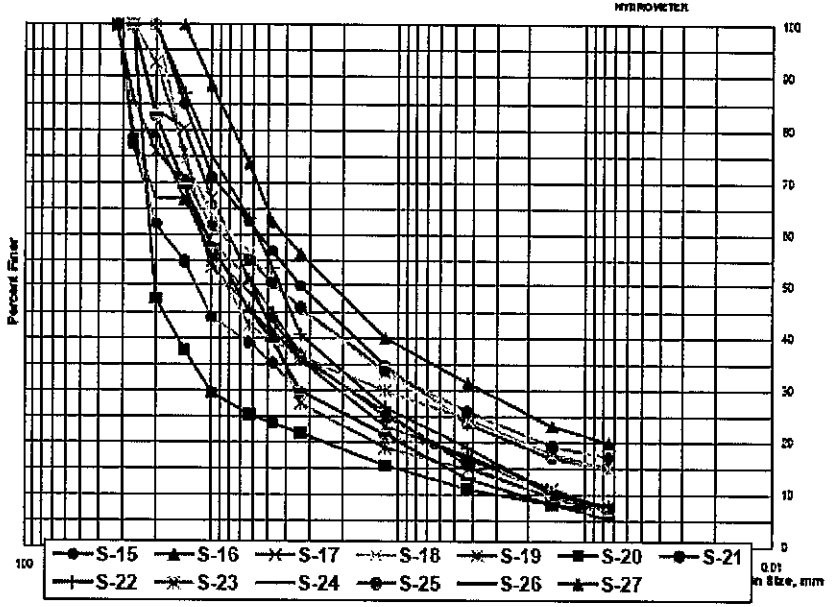


	GRAVEL / KANKAR		SAND			SILT / CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Specimen Identification		Depth m	Sample Nos.	Classification	-0.075
●	BH-1	7.20	S-1	Fine to medium SAND with Silt (SP-SM)	10.6
⨯	BH-1	8.25	S-2	Silty, Gravelly SAND (SM)	15.2
■	BH-1	9.00	S-3	Sandy GRAVEL with Silt (GW-GM)	7.8
⨯	BH-1	9.90	S-4	Sandy GRAVEL with Silt (GW-GM)	5.6
●	BH-1	10.45	S-5	Sandy GRAVEL with Silt (GW-GM)	6.8
▲	BH-1	11.15	S-6	Poorly Graded GRAVEL with Sand (GP)	1.6
+	BH-1	12.15	S-7	Sandy Well Graded GRAVEL (GW)	3.8
△	BH-1	13.05	S-8	Gravelly fine to coarse SAND with Silt (SW-SM)	10.7
—	BH-1	13.80	S-9	Sandy Well Graded GRAVEL with Silt (GW-GM)	9.0
→←	BH-1	14.45	S-10	Gravelly, Silty fine to coarse SAND (SM)	23.2
—	BH-1	15.10	S-11	Sandy Well Graded GRAVEL with Silt (GW-GM)	11.8
◈	BH-1	16.20	S-12	Sandy Well Graded GRAVEL with Silt (GW-GM)	7.1
◆	BH-1	16.90	S-13	Gravelly, Silty fine to coarse SAND (SM)	25.3
⊡	BH-1	17.65	S-14	Sandy Well Graded GRAVEL with Silt (GW-GM)	6.6

GRAIN SIZE CURVES
Geotechnical Investigation
OECUSSE PORT URGENT REHABILITATION PROJECT
TIMOR LESTE

Figure 7-7-4(1) Grain Size Distribution Curve (BH1, 1/2)



	GRAVEL / KANKAR		SAND			SILT / CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Specimen Identification		Depth m	Sample Nos.	Classification	-0.075
●	BH-1	18.15	S-15	Silty, Sandy Well Graded GRAVEL (GM)	15.0
▲	BH-1	19.15	S-16	Sandy Well Graded GRAVEL with Silt (GW-GM)	6.8
X	BH-1	19.80	S-17	Sandy Well Graded GRAVEL with Silt (GW-GM)	7.2
X	BH-1	20.60	S-18	Silty, Sandy Well Graded GRAVEL (GM)	14.9
X	BH-1	21.25	S-19	Sandy Well Graded GRAVEL with Silt (GW-GM)	7.8
■	BH-1	22.10	S-20	Poorly Graded GRAVEL with Silt and Sand(GP-GM)	7.0
●	BH-1	22.75	S-21	Sandy Well Graded GRAVEL with Silt (GW-GM)	6.4
+	BH-1	23.55	S-22	Sandy Well Graded GRAVEL with Silt (GW-GM)	7.7
X	BH-1	24.20	S-23	Silty Well Graded GRAVEL with Sand (GM)	15.1
—	BH-1	25.60	S-24	Sandy Well Graded GRAVEL with Silt (GW-GM)	7.0
●	BH-1	27.05	S-25	Silty Well Graded GRAVEL with Sand (GM)	17.1
—	BH-1	28.55	S-26	Well Graded GRAVEL with Silt and Sand(GW-GM)	5.2
▲	BH-1	30.05	S-27	Silty, Gravelly fine to coarse SAND (SM)	19.8

GRAIN SIZE CURVES
Geotechnical Investigation
OECUSSE PORT URGENT REHABILITATION PROJECT
TIMOR LESTE

Figure 7-7-4(2) Grain Size Distribution Curve (BH1, 2/2)

Report No. GET 09-7020

CLIENT: JAPAN PORT CONSULTANTS,LTD			
PROJECT: OECUSSE PORT URGENT REHABILITATION PROJECT, TIMOR LESTE		BORING NO. BH # 2	
DRILLING METHOD: Mud Rotary	DIAM: 96 mm	SHEET: 1 OF 4	
SAMPLING METHOD: 50 mm split spoon barrel	CORE BARREL: NQ3		

DEPTH (m)	SAMPLES	(SPT) (REC) [RQD]	DESCRIPTION	SYMBOL	-0.075 (%)	Moisture Content (%) (PI)	Specific Gravity	LL [PL] (%)
1		0.00-0.19	Jetty concrete slab 0.19 m 1.00 m Water level with reference to top of Jetty					
2								
3								
4								
5								
6								
7			Sea-bed 7.60m 7.60 m					
8		(3/7/8) 8.20-8.65/S-1	Medium dense grey calcareous fine to medium SAND with Silt (SP-SM)		8.8	23.1 (3.3)	2.2	
9								
10		(7/7/9) 9.45 -9.90/S-2	- carbonate with gravel (gravels are coral and shell fragments below 9.45 m 10.00 m		11.3	22.0 (3.2)	2.39	

DATE	TIME	BORING DEPTH (m)	CASING DEPTH (m)	WATER to DEPTH (m)	REMARKS
23/10/09 24/10/09		36.35		1.00	Logger: S. A. Murtaza

PLATE - 4

Figure 7-7-5(1) Boring Log (BH2, 1/4)

Report No. GET 09-7020

CLIENT: JAPAN PORT CONSULTANTS,LTD			
PROJECT: OECUSSE PORT URGENT REHABILITATION PROJECT, TIMOR LESTE		BORING NO. BH # 2	
DRILLING METHOD: Mud Rotary	DIAM: 96 mm	SHEET: 2 OF 4	
SAMPLING METHOD: 50 mm split spoon barrel	CORE BARREL: NQ3		

DEPTH (m)	SAMPLES	(SPT) (REC) [RQD]	DESCRIPTION	SYMBOL	-0.075 (%)	Moisture Content (%) (PI)	Specific Gravity	LL [PL] (%)
11		(3/4/5) 10.20-10.65/S3	Loose to medium dense light grey (white) well graded GRAVEL with Silt and Sand (GW-GM) (Gravels are coral and shell fragments infilled with Silt and Sand layers)		6.3	25.0 (5.2)	2.18	
		(3/4/5) 11.00-11.45/S-4	- loose to 11.85 m					
12		(10/14/17) 11.85-12.30/S-5			8.4	25.8 (3.2)	2.91	
13		(7/5/15) 13.15-13.60/S-6	- Sandy, 13.15 to 14.25 m		9.7	23.2 (4.2)	2.38	
14		(4/7/8) 14.25-14.70/S-7	- light grey carbonate Silty fine to coarse SAND with Gravel (SM) coraline sand, 14.25 to 15.10 m		18.3	18.9 (3.2)	2.28	
15		(5/6/8) 15.10-15.55/S-8	- Sandy, 15.10 to 16.00 m		7.9	20.9 (4.4)	2.35	
16		(8/10/15) 16.00-16.45/S-9			7.1	19.1 (5.0)	2.64	
17								
18		(8/5/17) 17.60-18.05/S-10	- Sandy, 17.60 to 18.95 m		6.0	23.9 (5.4)	2.27	
19		(3/1/4) 18.95-19.40/S-11	- loose light gray sandy GRAVEL (GW) below 18.95 m		1.4	14.7 (4.3)	2.38	
20			20.00 m					

DATE	TIME	BORING DEPTH (m)	CASING DEPTH (m)	WATER to DEPTH (m)	REMARKS
23/10/09 24/10/09		36.35		1.00	Logger: S. A. Murtaza

PLATE - 4a

Figure 7-7-5(2) Boring Log (BH2, 2/4)

Report No. GET 03-7020

CLIENT: JAPAN PORT CONSULTANTS,LTD

PROJECT: OECUSSE PORT URGENT REHABILITATION PROJECT, TIMOR LESTE | BORING NO. BH # 2

DRILLING METHOD: Mud Rotary | DIAM: 96 mm | SHEET: 3 OF 4

SAMPLING METHOD: 50 mm split spoon barrel | CORE BARREL: NQ3

DEPTH (m)	SAMPLES	(SPT) (REC) (RQD)	DESCRIPTION	SYMBOL	-0.075 (%)	Moisture Content (%) (PI)	Specific Gravity	LL (PL) (%)
21		(5/8/18) 20.5-20.95/S-12	Medium dense light grey (white) well graded GRAVEL with Silt and Sand (GW-GM) (Gravels are coral and shell fragments infilled with Silt and Sand layers)		6.3	19.4 (4.0)	2.36	
22								
23		(4/7/18) 22.15-22.60/S-13	- Silty (GM), 22.15 to 23.75 m		12.1	20.3 (3.2)	1.95	
24		(3/4/10) 23.75-24.20/S-14	- Sandy, 23.75 to 25.20 m		11.2	14.4 (3.3)	2.48	
25		(8/18/12) 25.20-25.65/S-15	- Silty (GM), 25.20 to 26.15 m		16.2	18.7 (4.4)	2.84	
26		(5/18/11) 26.15-26.60/S16			0.8	11.9 (3.3)	2.25	
27		(4/7/8) 27.40-27.85/S-17	- Silty (GM), 27.40 to 28.00 m		18.5	22.6 (3.4)	2.14	
28		(15/19/14) 28.00-28.45/S-18	- dense below 28.00 m		10.4	20.1 (4.0)	2.34	
29								
30		(15/25/21) 29.75-30.20/S-19	- Silty (GM) below 29.75 m		12.2	22.5 (6.2)	2.43	
			30.00 m					

DATE	TIME	BORING DEPTH (m)	CASING DEPTH (m)	WATER to DEPTH (m)	REMARKS
23/10/09 24/10/09		36.35	35.85	1.00	Logger: S. A. Murtaza

PLATE - 4b

Figure 7-7-5(3) Boring Log (BH2, 3/4)

Report No. GET 03-7020

CLIENT: JAPAN PORT CONSULTANTS,LTD

PROJECT: OECUSSE PORT URGENT REHABILITATION PROJECT, TIMOR LESTE | BORING NO. BH # 2

DRILLING METHOD: Mud Rotary | DIAM: 96 mm | SHEET: 4 OF 4

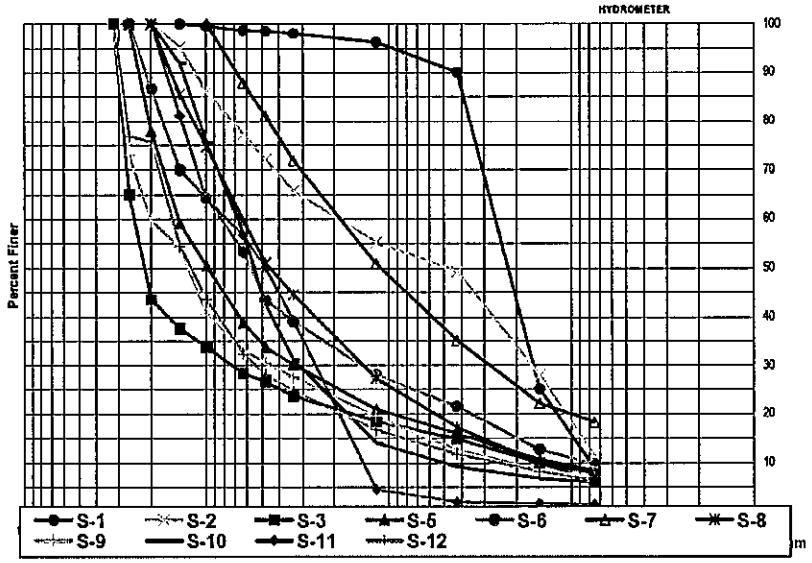
SAMPLING METHOD: 50 mm split spoon barrel | CORE BARREL: NQ3

DEPTH (m)	SAMPLES	(SPT) (REC) (RQD)	DESCRIPTION	SYMBOL	-0.075 (%)	Moisture Content (%) (PI)	Specific Gravity	LL (PL) (%)
31		(5/12/12) 31.10-31.55/S-20	Medium dense to dense light grey (white) Silty, Sandy well graded GRAVEL (GM) (Gravels are coral and shell fragments infilled with Silt and Sand layers)		13.0	18.1 (3.3)	2.34	
32			- medium dense to 32.55 m					
33		(16/22/17) 32.55-33.00/S-21	- dense, 32.55 to 34.90 m		7.1	15.6 (4.3)	2.4	
34			- dense light grey (white) Sandy well graded GRAVEL with Silt (GW-GM) (Gravels are coral and shell fragments infilled with Silt and Sand layers), 32.55 to 34.45 m					
35		(11/19/18) 34.45-34.90/S-22			15.2	15.8 (5.1)	2.38	
36		(8/10/10) 35.90-36.35/S-23	- medium dense below 34.90 m		22.0	17.9 (3.3)	2.15	
37			36.35 m					
38								
39								
40								

DATE	TIME	BORING DEPTH (m)	CASING DEPTH (m)	WATER to DEPTH (m)	REMARKS
23/10/09 24/10/09		36.35	35.85	1.00	Logger: S. A. Murtaza

PLATE - 4c

Figure 7-7-5(4) Boring Log (BH2, 4/4)

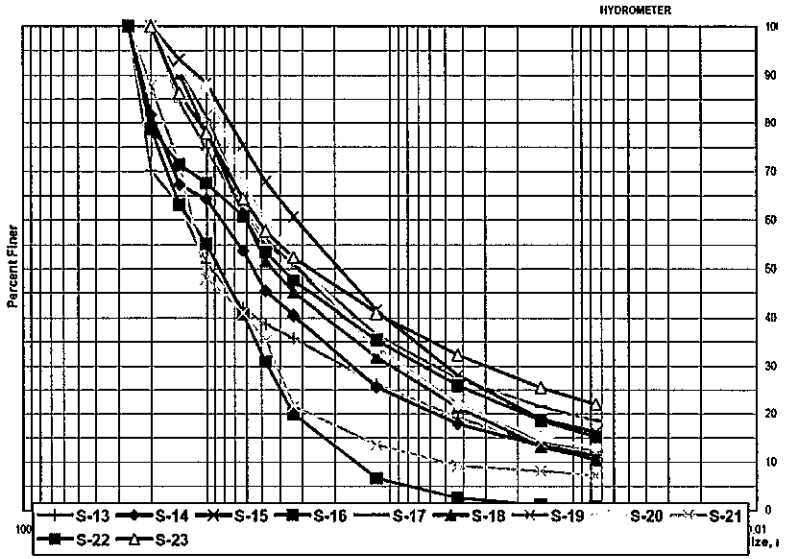


	GRAVEL / KANKAR		SAND			SILT / CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Specimen Identification		Depth m	Sample Nos.	Classification	-0.075
●	BH-2	8.65	S-1	Fine to medium SAND with Silt (SP-SM)	8.8
x	BH-2	9.90	S-2	Fine to coarse SAND with Silt and Gravel (SW-SM)	11.3
■	BH-2	10.65	S-3	Well Graded GRAVEL with Silt and Sand (GW-GM)	6.3
▲	BH-2	12.30	S-5	Well Graded GRAVEL with Silt and Sand (GW-GM)	8.4
●	BH-2	13.60	S-6	Sandy Well Graded GRAVEL with Silt (GW-GM)	9.7
△	BH-2	14.70	S-7	Silty fine to coarse SAND with Gravel (SM)	18.3
→←	BH-2	15.55	S-8	Sandy Well Graded GRAVEL with Silt (GW-GM)	7.9
+	BH-2	16.45	S-9	Well Graded GRAVEL with Silt and Sand (GW-GM)	7.1
—	BH-2	18.05	S-10	Sandy Well Graded GRAVEL with Silt (GW-GM)	6.0
◆	BH-2	19.40	S-11	Sandy Well Graded GRAVEL (GW)	1.4
—	BH-2	20.95	S-12	Well Graded GRAVEL with Silt and Sand (GW-GM)	6.3

GRAIN SIZE CURVES
Geotechnical Investigation
OECUSSE PORT URGENT REHABILITATION PROJECT
TIMOR LESTE

Figure 7-7-6(1) Grain Size Distribution Curve (BH2, 1/2)

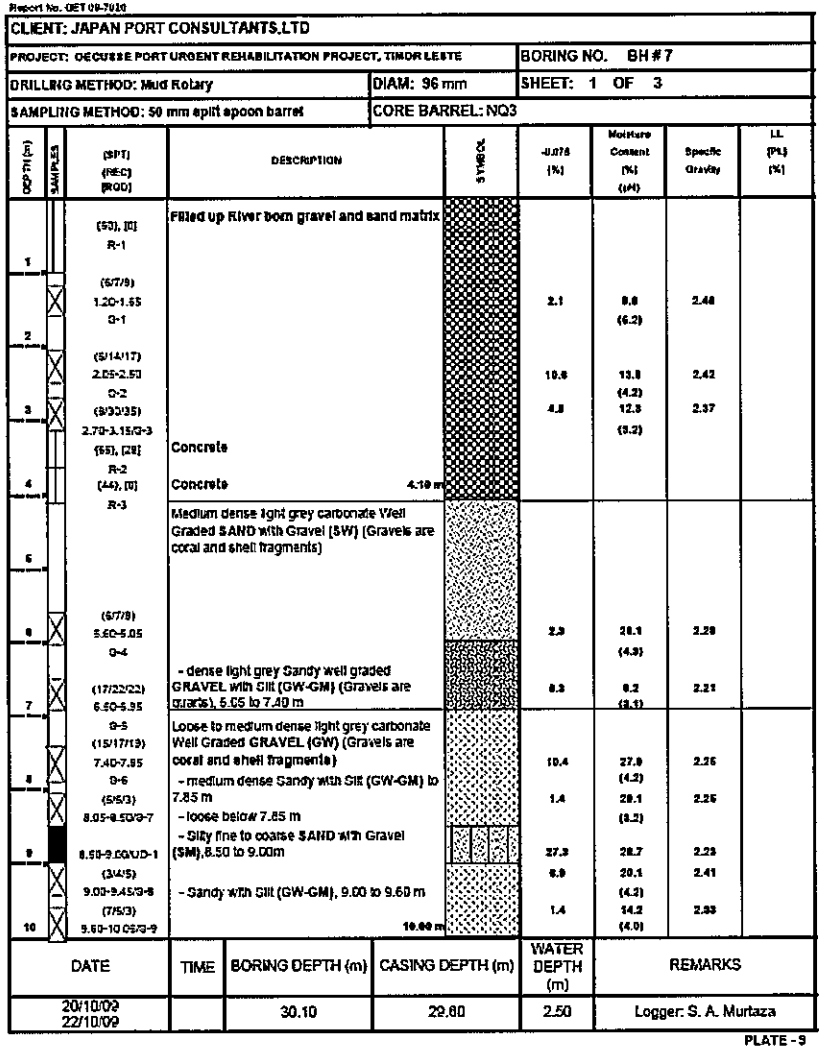


	GRAVEL / KANKAR		SAND			SILT / CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Specimen Identification		Depth m	Sample Nos.	Classification	-0.075
—	BH-2	22.60	S-13	Silty Well Graded GRAVEL with Sand (GM)	12.1
◆	BH-2	24.20	S-14	Sandy Well Graded GRAVEL with Silt (GW-GM)	11.2
x	BH-2	25.65	S-15	Silty, Gravelly fine to coarse SAND (SM)	16.2
■	BH-2	26.60	S-16	Sandy Well Graded GRAVEL (GW)	0.8
—	BH-2	27.85	S-17	Silty, Sandy Well Graded GRAVEL (GM)	18.5
▲	BH-2	28.45	S-18	Sandy Well Graded GRAVEL with Silt (GW-GM)	10.4
x	BH-2	30.20	S-19	Silty, Sandy Well Graded GRAVEL (GM)	12.2
○	BH-2	31.55	S-20	Silty, Sandy Well Graded GRAVEL (GM)	13.0
x	BH-2	33.00	S-21	Sandy Well Graded GRAVEL with Silt (GW-GM)	7.1
■	BH-2	34.90	S-22	Silty, Sandy Well Graded GRAVEL (GM)	15.2
△	BH-2	36.35	S-23	Silty, Sandy Well Graded GRAVEL (GM)	22.0

GRAIN SIZE CURVES
Geotechnical Investigation
OECUSSE PORT URGENT REHABILITATION PROJECT
TIMOR LESTE

Figure 7-7-6(2) Grain Size Distribution Curve (BH2, 2/2)



Report No. OET 09-7010

CLIENT: JAPAN PORT CONSULTANTS,LTD

PROJECT: OECUSSE PORT URGENT REHABILITATION PROJECT, TIMOR LESTE — BORING NO. BH#7

DRILLING METHOD: Mud Rotary — DIAM: 96 mm — SHEET: 1 OF 3

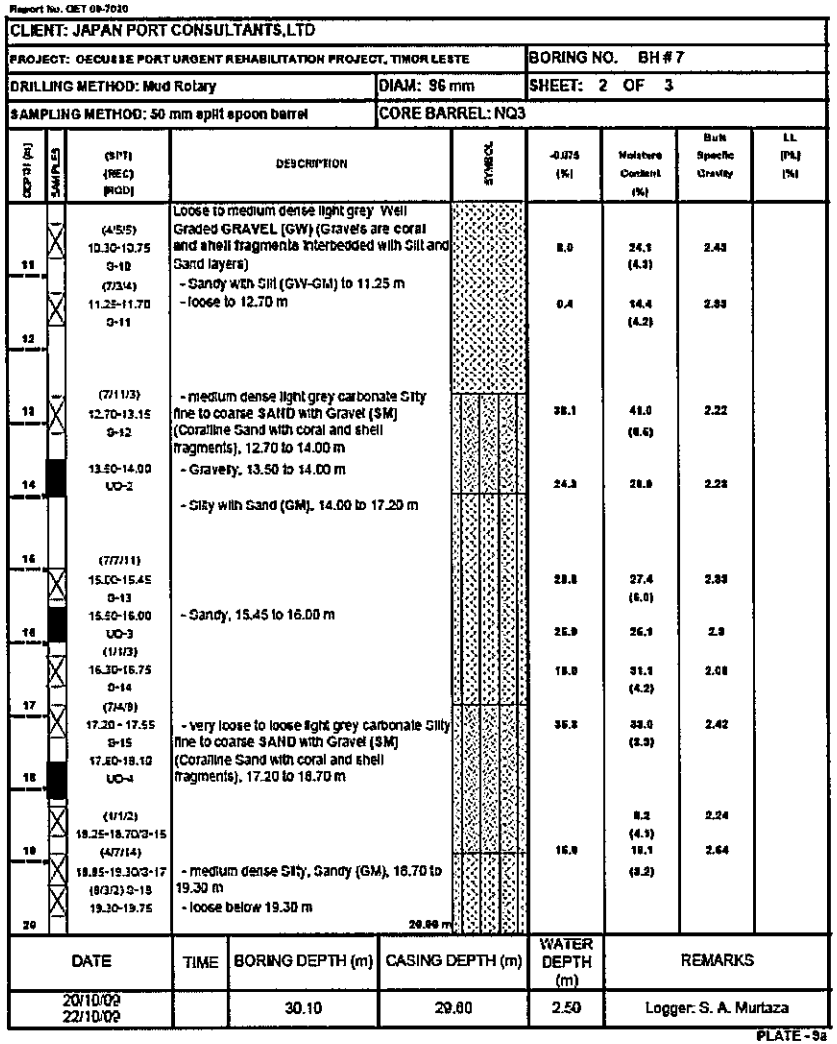
SAMPLING METHOD: 50 mm split spoon barrel — CORE BARREL: NQ3

DEPTH (m)	SAMPLES	(SPT) (REC) [ROD]	DESCRIPTION	SYMBOL	-0.075 (%)	Moisture Content (%) (#4)	Specific Gravity	LL (PL) (%)
1		(53), [0] R-1	Filled up River born gravel and sand matrix					
2		(5/7/9) 1.20-1.65 S-1			2.1	8.8 (6.2)	2.48	
3		(5/14/17) 2.65-2.50 S-2 (9/30/35) 2.70-3.15/S-3			10.8 4.8	13.8 (4.2) 12.8 (8.2)	2.42 2.37	
4		(55), [28] R-2 (44), [0] R-3	Concrete Concrete 4.10 m					
6			Medium dense light grey carbonate Well Graded SAND with Gravel (SW) (Gravels are coral and shell fragments)					
8		(5/7/8) 5.50-5.95 S-4			2.9	28.1 (4.9)	2.28	
7		(17/22/22) 6.50-6.95 S-5	- dense light grey Sandy well graded GRAVEL with Silt (GW-GM) (Gravels are grains), 5.05 to 7.40 m		8.3	8.2 (8.1)	2.21	
8		(15/17/13) 7.40-7.85 S-6	Loose to medium dense light grey carbonate Well Graded GRAVEL (GW) (Gravels are coral and shell fragments) - medium dense Sandy with Silt (GW-GM) to 7.85 m		10.4	27.8 (4.2)	2.26	
9		(5/5/3) 8.05-8.50/S-7 8.50-9.00/UD-1	- loose below 7.85 m - Silty fine to coarse SAND with Gravel (SM),8.50 to 9.00m		1.4 27.3	28.1 (8.2) 28.7	2.26 2.23	
10		(3/4/5) 9.00-9.45/S-8 (7/5/3) 9.50-10.05/S-9	- Sandy with Silt (GW-GM), 9.00 to 9.60 m 10.00 m		8.9 1.4	20.1 (4.2) 14.2 (4.0)	2.41 2.53	

DATE	TIME	BORING DEPTH (m)	CASING DEPTH (m)	WATER DEPTH (m)	REMARKS
20/10/09 22/10/09		30.10	29.80	2.50	Logger: S. A. Murtaza

PLATE - 9

Figure 7-7-7(1) Boring Log (BH7, 1/3)



Report No. OET 09-7010

CLIENT: JAPAN PORT CONSULTANTS,LTD

PROJECT: OECUSSE PORT URGENT REHABILITATION PROJECT, TIMOR LESTE — BORING NO. BH#7

DRILLING METHOD: Mud Rotary — DIAM: 96 mm — SHEET: 2 OF 3

SAMPLING METHOD: 50 mm split spoon barrel — CORE BARREL: NQ3

DEPTH (m)	SAMPLES	(SPT) (REC) [ROD]	DESCRIPTION	SYMBOL	-0.075 (%)	Moisture Content (%)	Bulk Specific Gravity	LL (PL) (%)
11		(4/5/5) 10.30-10.75 S-10	Loose to medium dense light grey Well Graded GRAVEL (GW) (Gravels are coral and shell fragments interbedded with Silt and Sand layers)		8.0	24.1 (4.3)	2.43	
12		(7/3/4) 11.25-11.70 S-11	- Sandy with Silt (GW-GM) to 11.25 m - loose to 12.70 m		0.4	14.4 (4.2)	2.53	
13		(7/11/3) 12.70-13.15 S-12	- medium dense light grey carbonate Silty fine to coarse SAND with Gravel (SM) (Coralline Sand with coral and shell fragments), 12.70 to 14.00 m		38.1	48.0 (8.6)	2.22	
14		13.50-14.00 UD-2	- Gravelly, 13.50 to 14.00 m		24.3	28.9	2.22	
16			- Silty with Sand (GM), 14.00 to 17.20 m					
15		(7/7/11) 15.00-15.45 S-13			28.8	27.4 (6.0)	2.33	
16		15.50-16.00 UD-3	- Sandy, 15.45 to 16.00 m		25.9	26.1	2.9	
17		(1/1/3) 16.30-16.75 S-14			18.0	31.1 (4.2)	2.08	
18		(7/4/9) 17.20 - 17.55 S-15 17.60-18.10 UD-4	- very loose to loose light grey carbonate Silty fine to coarse SAND with Gravel (SM) (Coralline Sand with coral and shell fragments), 17.20 to 18.70 m		35.3	33.0 (2.9)	2.42	
19		(1/1/2) 18.25-18.70/S-15 (4/7/14) 18.85-19.30/S-17			16.9	8.2 (4.1) 18.1 (9.2)	2.24 2.64	
20		(8/3/2) S-18 19.20-19.75	- medium dense Silty, Sandy (GM), 18.70 to 19.30 m - loose below 19.30 m 20.00 m					

DATE	TIME	BORING DEPTH (m)	CASING DEPTH (m)	WATER DEPTH (m)	REMARKS
20/10/09 22/10/09		30.10	29.80	2.50	Logger: S. A. Murtaza

PLATE - 9a

Figure 7-7-7(2) Boring Log (BH7, 2/3)

Report No. OET 09-7010

CLIENT: JAPAN PORT CONSULTANTS,LTD

PROJECT: OECUSSE PORT URGENT REHABILITATION PROJECT, TIMOR LESTE | BORING NO. BH # 7

DRILLING METHOD: Mud Rotary | DIAM: 96 mm | SHEET: 3 OF 3

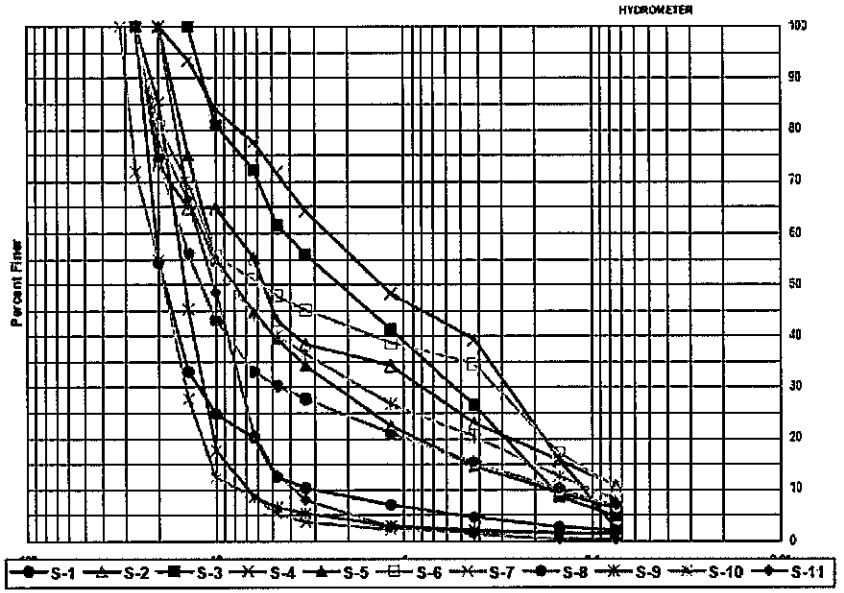
SAMPLING METHOD: 50 mm split spoon barrel | CORE BARREL: NQ3

DEPTH (m)	SAMPLES	(SPT) (REC) (RQD)	DESCRIPTION	SYMBOL	-0.075 (%)	Moisture Content (%)	Bulk Specific Gravity	L.L. (%) / P.I. (%)
21		(5/4/3) 20.45-20.90 0-19	Loose light grey Silty, Sandy Wet Graded GRAVEL (GM) (Gravels are coral and shell fragments interbedded with Silt and Sand layers)		14.9	25.6 (7.1)	2.38	
22		(3/5/5) 22.00-22.45 9-20	- with Sand (GM), 22.00 to 23.55 m		26.1	26.1 (6.2)	2.51	
23								
24		(4/4/3) 23.55-24.00 9-21	- loose light grey carbonate Silty fine to coarse SAND with Gravel (SM) (Coralline Sand with coral and shell fragments), 23.55 to 25.10 m		48.8	21.4 (6.5)	2.65	
25								
26		(3/4/5) 25.10-25.55 9-22			29.9	28.8 (8.9)	2.54	
27		(4/3/4) 26.55-27.00 9-23						
28								
29		(3/1/3) 28.10-28.55 9-24	- very loose, 28.10 to 29.65 m		27.9	27.8 (8.2)	2.55	
30		(5/5/6) 29.65-30.10 9-25	- medium dense below 29.65 m 30.10 m		17.9	24.8 (4.1)	2.47	

DATE	TIME	BORING DEPTH (m)	CASING DEPTH (m)	WATER DEPTH (m)	REMARKS
20/10/09 22/10/09		30.10	29.60	2.50	Logger: S. A. Murtaza

PLATE - 3b

Figure 7-7-7(3) Boring Log (BH7, 3/3)

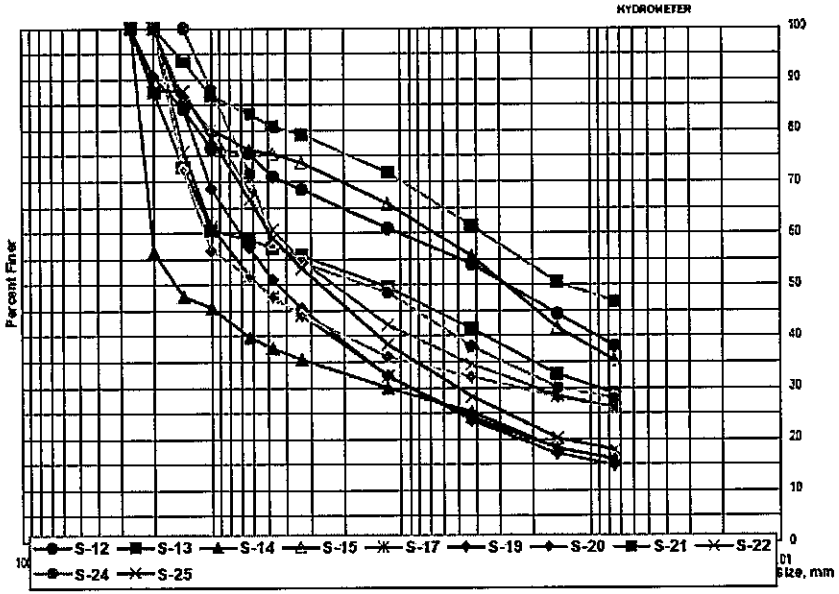


	GRAVEL / KANKAR		SAND			SILT / CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Specimen Identification		Depth m	Sample Nos.	Classification	-0.075
●	BH-7	1.65	S-1	Well Graded GRAVEL (GW)	2.1
△	BH-7	2.50	S-2	Sandy well graded GRAVEL with Silt (GW-GM)	10.6
■	BH-7	3.15	S-3	Gravelly fine to coarse SAND (SW)	4.8
✕	BH-7	6.05	S-4	Well Graded SAND with Gravel (SW)	2.3
▲	BH-7	6.95	S-5	Sandy well graded GRAVEL with Silt (GW-GM)	6.3
▣	BH-7	7.85	S-6	Sandy well graded GRAVEL with Silt (GW-GM)	10.4
✕	BH-7	8.50	S-7	Well Graded GRAVEL (GW)	1.4
●	BH-7	9.45	S-8	Well Graded GRAVEL with Silt and Sand (GW-GM)	6.9
→←	BH-7	10.05	S-9	Well Graded GRAVEL (GW)	1.4
✕	BH-7	10.75	S-10	Sandy well graded GRAVEL with Silt (GW-GM)	8.0
◆	BH-7	11.70	S-11	Well Graded GRAVEL (GW)	0.4

GRAIN SIZE CURVES
Geotechnical Investigation
OECUSSE PORT URGENT REHABILITATION PROJECT
TIMOR LESTE

Figure 7-7-8(1) Grain Size Distribution Curve (BH7, 1/2)



	GRAVEL / KANKAR		SAND			SILT / CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Specimen Identification		Depth m	Sample Nos.	Classification	-0.075
●	BH-7	13.15	S-12	Silty fine to coarse SAND with Gravel (SM)	38.1
■	BH-7	15.45	S-13	Silty well graded GRAVEL with Sand (GM)	28.8
▲	BH-7	16.75	S-14	Silty well graded GRAVEL with Sand (GM)	16.0
△	BH-7	17.65	S-15	Silty fine to coarse SAND with Gravel (SM)	35.3
→←	BH-7	19.30	S-17	Silty, Sandy well graded GRAVEL (GM)	15.9
◆	BH-7	20.90	S-19	Silty, Sandy well graded GRAVEL (GM)	14.9
◈	BH-7	22.45	S-20	Silty well graded GRAVEL with Sand (GM)	26.1
■	BH-7	24.00	S-21	Silty fine to coarse SAND with Gravel (SM)	46.8
x	BH-7	25.55	S-22	Silty, Sandy well graded GRAVEL (GM)	26.0
●	BH-7	28.55	S-24	Silty, Sandy well graded GRAVEL (GM)	27.9
x	BH-7	30.10	S-25	Silty, Sandy well graded GRAVEL (GM)	17.9

GRAIN SIZE CURVES
Geotechnical Investigation
OECUSSE PORT URGENT REHABILITATION PROJECT
TIMOR LESTE

Figure 7-7-8(2) Grain Size Distribution Curve (BH7, 2/2)

7.8 Environmental Conditions

(Survey Area/Location)

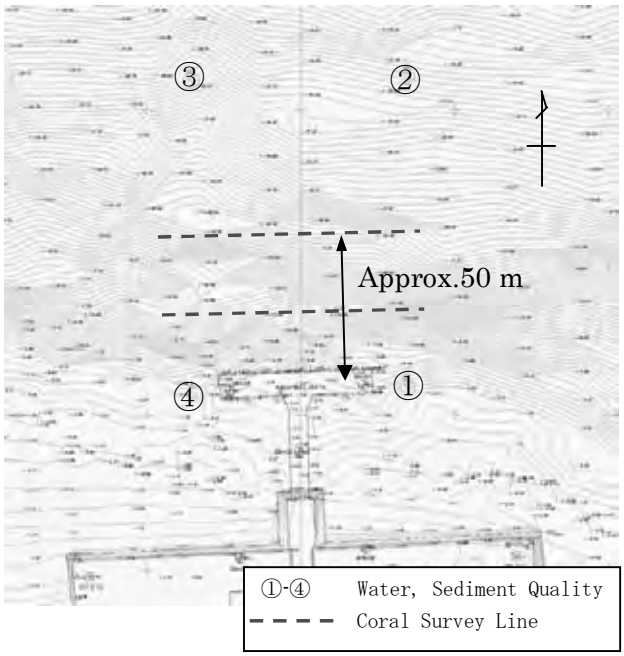


Figure 7-8-1 Survey Location of Marine Quality

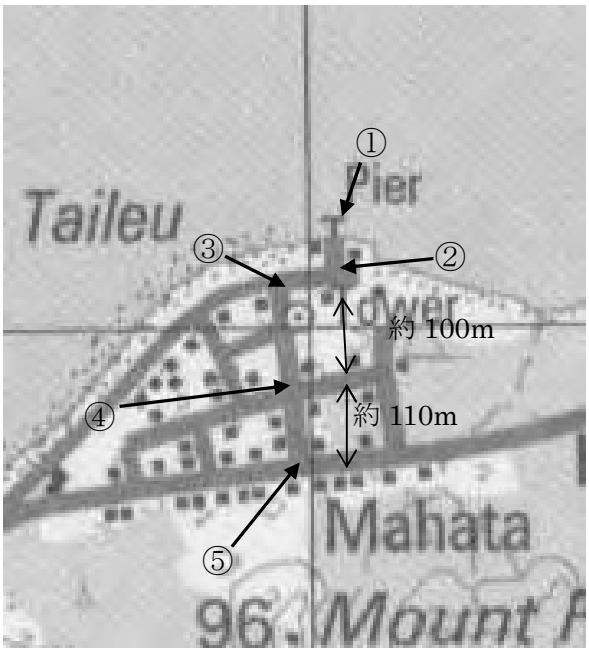


Figure 7-8-2 Noise Survey Location

Figure 7-8-3 Mangrove Survey Area

7.8.1 Water Quality Survey

As shown in Table 7-8-1, the result of the water quality survey revealed that the water is very clear and has not been contaminated by suspended and organic materials.
There are no national water quality standards in East Timor, therefore, those in Indonesia are referred to in the Table below.

Table 7-8-1 Summary of Water Quality Survey Results

Survey Item	Unit	Survey Location				Indonesian Standards
		①	②	③	④	
Temperature	℃	30/29	30/29	29/28	30/28	Natural (1)
Hydrogen-ion Concentration	--	8.25/8.16	8.27/8.12	8.34/8.21	8.25/8.20	6.5-8.5 (1)
Suspended Solid	mg/L	9/11	8/10	6/9	7/11	80 (1)
COD	mg/L	20/23	19/21	16/19	14/21	80 (2)
DO	mg/L	6.5/6.4	6.8/6.5	6.8/6.5	6.7/6.6	5 (2)
Salinity	‰	32.7/33.1	32.5/33.1	33.1/33.4	32.3/33.4	Natural (1)
Transparency	m	>5	>20	>20	>2.8	---
Specific Gravity	g/cm^3	1.025/1.026	1.023/1.025	1.024/1.025	1.024/1.025	---

Note: Upper Layer／Lower Layer
(1) Sea water Quality Standard for Port Area: Decree of Environment Ministry No. 51/2004
(2) Sea water Quality Standard for Fishery: Kep-02/MENLH/1/1988

7.8.2 Seabed Sediment

As shown in Table 7-8-2, seabed sediment in the survey area is characterized by sand with little fine particles. Thus contamination of sediment with organic matter and nutrient salts is at a very low level.
Since no source of heavy metal discharge exists in and around the project site, only a natural concentration level of heavy metal in sediment is observed.
There is no national sediment quality standards in East Timor and Indonesia, therefore, those of the World Bank are referred to in the Table below.

Table 7-8-2 Summary of Sediment Quality Survey Results

Survey Item	Unit	Survey Location				WB Standards
		①	②	③	④	
Water Content	%	87.05	82.85	87.68	85.93	---
Ignition Loss	%	0.17	0.16	0.23	0.41	---
COD	mgO_2/g	30.76	30.09	14.92	13.67	---
Total-N	%	0.02	0.02	0.02	0.02	---
Total-P	ppm	12	6	6	9	---
Oil	ppm	<1	<1	<1	<1	---
Lead	ppm	2.8	2.5	2.5	3.2	530 (1)
Hexa-chromium	ppm	23.8	23.5	22.1	24.4	480 (1)
Arsenic	ppm	1.0	1.5	1.9	3.7	85 (1)
Total Mercury	ppm	ND	0.0026	0.0013	0.0021	1.6 (1)
Alkyl Mercury	ppm	ND	ND	ND	ND	---
Sand Content	%	91	92	94	93	---
Silt Content	%	9	7	1	2	---
Clay Content	%	ND	1	5	5	---

Note: (1) World Bank Technical Paper No. 126, Testing Values (mg/kg^{dry})

7.8.3 Noise Survey

The project site adjoins a residential area According to the result of a noise survey conducted on Friday 23 October 2009, present noise levels in the wharf and terminal areas tend to be rather high due to breaking waves, terminal operation and workers. Daytime background noise level in the residential area behind the terminal (40 to 50 db) is smaller than those in the terminal area because of less number of people and vehicles. However, the noise level sometimes exceeds 70 db due to trucks and mini-buses passing by.

7.8.4 Coral Survey

As shown in Figure 7-8-4, live coral patches are found on the seabed at a depth of 20-25m and approximately 50m off the existing wharf. Since coverage of seabed by coral patches seems to be less 5%, and those are locally common species which can tolerate an increase of water turbidity, potential impact on the coral patches caused by the project will be minor.

Figure 7-8-4 Corals found in the Project Site

7.8.5 Mangrove Survey

Natural mangroves are found along the coast line on both sides of the project site. Since the project site and mangroves are separated by a distance of several kilometers, no negative impact on the mangroves as a result of the project is anticipated.

Environmental Checklist: 17. Ports and Harbors (1)

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
1 Permits and Explanation	(1) EIA and Environmental Permits	① Have EIA reports been officially completed? ② Have EIA reports been approved by authorities of the host country's government? ③ Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? ④ In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	①②③ This project was classified into Category B by the National Directorate for Environment (DNMA) on 21 May 2010, in consideration of feature of the project and a past practice that DNMA has given the same category to a similar project in Dili Port. In the Draft Environmental Guideline #1, 2004 (Environmental Guideline), Category B projects are not required to submit Environmental Impact Assessment (EIA) but required to submit Environmental Management Plan (EMP) to DNMA. APORTIL has submitted a Draft EMP to DNMA for their appraisal and it was approved by the Secretary, State for Environment on 21 August 2010. ④ Since this project will produce little source of environmental pollution, no submission will be required by DNMA other than the EMP.
	(2) Explanation to the Public	① Are contents of the project and the potential impacts adequately explained to the public based on appropriate procedures, including information disclosure? Is understanding obtained from the public? ② Are proper responses made to comments from the public and regulatory authorities?	① Overall scope and potential environmental impacts of the project were generally explained to the primary agencies and personnel concerned during the JICA Study period in 2009. In accordance with requirement of the Environmental Guideline, a public meeting was held on 20 July 2010 to explain EMP and to recieve comments from the public. ② In the meeting above, after responding to the questions and comments given by the public, no more comments were made by them.
	(1) Air Quality	① Do air pollutants, such as sulfur oxides (SOx), nitrogen oxides (NOx), and soot and dust emitted from various sources, such as ships, vehicles, and the ancillary facilities comply with the country's emission standards and ambient air quality standards?	① Potential source of air pollution in the project site is exhaust gas from construction equipment, vehicles and ships to be operated in construction and operation phases. However, construction period is limited in about 20 months and daily port operation is also limited within about 5 ha of open coastal area, no significant air quality degradation caused by the project activities is anticipated. With regard to the environmental standards, no national standards is currently available in East Timor. Therefore, Indonesian emission and ambient quality standards (Environmental Standards) will be applied in case necessary.

Environmental Checklist: 17. Ports and Harbors (2)

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
2 Mitigation Measures	(2) Water Quality	① Do general effluents from the related facilities comply with the country's effluent standards and ambient water quality standards? ② Do effluents from ships and ancillary facilities (e.g., dock) comply with the country's effluent standards and ambient water quality standards? ③ Are adequate measures taken to prevent spills and discharges of materials, such as oils and hazardous materials to the surrounding water areas? ④ Is there a possibility that oceanographic changes, such as alteration of ocean currents, and reduction in seawater exchange rates (deterioration of seawater circulation) due to modification of water areas, such as shoreline modifications, reduction in water areas, and creation of new water areas will cause changes in water temperature and water quality? ⑤ In the case of the projects including land reclamation, are adequate measures taken to prevent contamination of surface water, seawater, and groundwater by leachates from the reclamation areas?	① General effluents from Port Office and Passenger Terminal are properly treated by septic tanks before discharge, thus will comply with the Environmental Standards. ② Effluents from ships are kept in designated containers on land for further treatment and discharge, thus does not degrade ambient water quality in the surrounding water areas. ③ Oil-trap trench is placed around oil-handling facilities, such as generator house, to prevent accidental oil spillage to the surrounding water areas. ④ Since the existing pier is extended with pile (permeable) structure in parallel with shore line, little impact on present coastal current and morphology is anticipated. ⑤ Land reclamation is not included in the project.
	(3) Wastes	① Are wastes from ships and the related facilities properly treated and disposed of in accordance with the country's standards? ② Is offshore dumping of dredged materials and soils properly performed in accordance with the country's standards to prevent impacts on the surrounding waters? ③ Are adequate measures taken to prevent discharge or dumping of hazardous materials to the surrounding water areas?	① Wastes from ships, port office and passenger terminal are collected and placed at the disposal site on land which is designated in 6 km distance from the project site. ② Dredging works is not included in the project. ③ No hazardous material is handled in the project site in both construction and operation phases.
	(4) Noise and Vibration	① Do noise and vibrations comply with the country's standards?	① Since project site is located far from city center, current noise level is low and less than those specified in the Environmental Standards. In operation phase, increased port related vehicles and personnel may create additional noise and vibration in and around the project site. Port manager properly controls port related activities to maintain the noise and vibration levels within the Environmental Standards level.
	(5) Odor	① Are there any odor sources? Are adequate odor control measures taken?	① In both construction and operation phases, no odor source is anticipated.
	(6) Sediment	① Are adequate measures taken to prevent contamination of sediments by discharges or dumping of materials, such as hazardous materials from ships and the related facilities?	① In both construction and operation phases, no hazardous materials, which potentially contaminate sediments, is discharged and dumped into water areas. An exception may be oil spillage during fuel pumping to ships and accidents in the port. To avoid such cases, port manager properly control oil handling and traffic safety in the port based on an emergency response procedure to be established by APORTIL.
	(1) Protected Areas	① Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	① This project is not located in protected areas designated by the country's laws or international treaties and conventions.

Environmental Checklist: 17. Ports and Harbors (3)

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
3 Natural Environment	(2) Ecosystem	① Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? ② Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? ③ If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem? ④ Is there a possibility that the project will adversely affect aquatic organisms? If significant impacts are anticipated, are adequate protection measures taken to reduce the impacts on aquatic organisms? ⑤ Is there a possibility that the project will adversely affect vegetation and wildlife of coastal zones? If significant impacts are anticipated, are adequate measures taken to reduce the impacts on vegetation and wildlife?	① Due to limited number of ecological study conducted in the past, present marine and terrestrial ecosystem conditions in and around the project site has not been known well. In JICA Study conducted in 2009, corals and mangroves were identified in and around the project site. Coral patches with approximate coverage of 5 % are found on seabed between -20 to -25m depth and 50 m offshore from the existing pier structure. These patches mainly consist of *Echinophyllia aspera* and *Euphyllia ancora*, which are common in Asian waters and patient with water turbidity. Ensuring mitigation measure said in 5(1) ②, little impact on the coral ecosystem is anticipated. Mangroves are found in two(2) areas along coast line, i.e.1.5 km East and 5 km West from the project site. These mangroves are well grown and mainly consists of *Rhizophoraceae* and *Nypa fruticans Wurmb*. Because of the distances from the project site, no impact on mangrove ecosystem is anticipated. ② Project site does not encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions. ③ No significant ecological impact is anticipated. ④ Natural beach near the project site is locally known as a sea turtle spawning field. However, the project site is located in limited area comparing with entire length of the natural beach, adverse impact on sea turtle will be minimal. ⑤ Since the project site on land has already been cleared and utilized as port area, no adverse impact on vegetation and wildlife of coastal zone is anticipated.
	(3) Hydrology	① Is there a possibility that installation of port and harbor facilities will cause oceanographic changes? Is there a possibility that installation of the facilities will adversely affect oceanographic conditions, such as induced currents, waves, and tidal currents?	① Since existing pier is extended with pile (permeable) structure in parallel with shore line, little impact on present coastal wave, current and morphology is anticipated. The results of numerical simulation carried out by JICA Study Team shows only small scale of erosion and accumulation at root of existing and extended pier structures, respectively.
	(4) Topography and Geology	① Is there a possibility that installation of port and harbor facilities will cause a large-scale alteration of topographic and geologic features in the surrounding areas or elimination of natural beaches?	① Since the project site on land side has already been cleared and utilized as port related area, no large-scale alteration of surrounding topographic features due to the project is anticipated.

Environmental Checklist: 17. Ports and Harbors (4)

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
4 Social Environemt	(1) Resettlement	① Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement? ② Is adequate explanation on relocation and compensation given to affected persons prior to resettlement? ③ Is the resettlement plan, including proper compensation, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement? ④ Does the resettlement plan pay particular attention to vulnerable groups or persons, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples? ⑤ Are agreements with the affected persons obtained prior to resettlement? ⑥ Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan? ⑦ Is a plan developed to monitor the impacts of resettlement?	① No resettlement is nesessary.
	(2) Living and Livelihood	① Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary? ② Is there a possibility that changes in water uses (including fisheries and recreational uses) in the surrounding areas due to project will adversely affect the livelihoods of inhabitants? ③ Is there a possibility that port and harbor facilities will adversely affect the existing water traffic and road traffic in the surrounding areas? ④ Is there a possibility that diseases, including communicable diseases, such as HIV will be introduced due to immigration of workers associated with the project? Are considerations given to public health, if necessary?	① This project is aimed at sustaining local living conditions as a result of improvement of operational efficiency and safety in the port. Therefore, no adverse impact caused by the project on local living conditions is anticipated. ② Since this project rehabilitate the existing port facilities with small scale extension in limited area, no change in vicinal water use is anticipated. ③ In operation phase, volume of water and road traffic in and around the project site will be increased. In order to maintain traffic safety in and around the project site, local government considers the increased traffic volume into future regional transport development plan. ④ To prevent communicable diseases infection, APORTIL will assist educational and awareness campaign for local residents and workers in corroboration with contractor and local NGO.
	(3) Heritage	① Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage sites? Are adequate measures considered to protect these sites in accordance with the country's laws?	① Since the project site has already been cleared and is in the limited area, there is no possibility that the project damages the local archeological, historical, cultural, and religious heritage sites.
	(4) Landscape	① Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	① Since project site has already been cleared and is in the limited area, there is no possibility that the project adversely affect the local landscape.
	(5) Ethnic Minorities and Indigenous Peoples	① Does the project comply with the country's laws for rights of ethnic minorities and indigenous peoples? ② Are considerations given to reduce the impacts on culture and lifestyle of ethnic minorities and indigenous peoples?	①② This project will not involve particular ethnic minorities and indigenous peoples.

Environmental Checklist: 17. Ports and Harbors (5)

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
5 Others	(1) Impacts during Construction	① Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)? ② If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts? ③ If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts? ④ If necessary, is health and safety education (e.g., traffic safety, public health) provided for project personnel, including workers?	① In construction phase, primary source of noise will be pile driving equipment to be used for the pier extension works. Since the nearest residents house is located about 200 m from the pier construction site, night and early-morning operations of pile driving equipment are avoided. No significant nuisance and damage on residents and building structures due to vibration is expected, because piles are not driven into very hard sub-soil layers. Broken concrete peace produced in existing pier demolition site will be reutilized as armor material on seawall foundation in order to minimize construction waste to be disposed. ② There is a possibility of increasing water turbidity due to concrete slab demolition of the existing pier structure. Excessive increase of water turbidity may cause degradation of marine ecosystem. To avoid this, broken concrete falling down into the water will be minimized. ③ In construction phase, a number of local residents will be employed as construction workers by contractor(s). Special attention is paid to provide impartial employment opportunities to the local residents to avoid social conflict in local communities. ④ Frequent transportation of construction waste to the designated disposal site by heave trucks may cause dust pollution and traffic accident on the road. To avoid these, construction wastes on trucks are covered by sheet and truck drivers are educated to maintain driving speed limit and safety.
	(2) Monitoring	① Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? ② Are the items, methods and frequencies included in the monitoring program judged to be appropriate? ③ Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? ④ Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	① APORTIL will implement proper environmental monitoring based on the approved EMP mentioned in 1 (1). ② An appropriate monitoring program have been prepared in accordance with the Environmental Guideline. ③ APORTIL will establish adequate monitoring framework in corroboration with DNMA. ④ Requirements of environmental monitoring are identified in the Environmental Guideline.
6 Note	Note on Using Environmental Checklist	① Where necessary, impacts on groundwater hydrology (groundwater level drawdown and salinization) that may be caused by alteration of topography, such as land reclamation and canal excavation should be considered, and impacts, such as land subsidence that may be caused by groundwater uses should be considered. If significant impacts are anticipated, adequate mitigation measures should be taken. ② If necessary, the impacts to transboundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, and global warming)	① This project will not alter groundwater hydrology but will make future water demand higher due to increase of population and industries in and around the project site. This potential future demand is considered in regional development plan to be prepared by the local government. ② Considering scope and scale of the project, impact on global issues is not confirmed.

Environmental Checklist: 17. Ports and Harbors (6)

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations

1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are made, if necessary.
In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan' experience).
2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.

8.2 Classified Category B

REPÚBLICA DEMOCRÁTICA DE TIMOR-LESTE
MINISTÉRIO DA ECONOMIA E DESENVOLVIMENTO
SECRETÁRIA DE ESTADO DO MEIO AMBIENTE
DIRECÇÃO NACIONAL DO MEIO AMBIENTE
Fomento Building, Ground Floor, Mandarin, Dili Tlp: +6703339119/9094

Ba : **Sr. Constantino Ferreira Soares,**
Director Nacional dos Transportes Maritimos

Cc : **S. E. Sr. Abilio de Deus de Jesus Lima,**
Secretario de Estado do Meio Ambiente

Data : 21 de Maio de 2010

Numero : 294 /DNMA/V/2010

Assunto : Parecer sobre o projekto Rehabilitasaun do Porto Mahata-Oecusse

Ho respeito,
Bazeia ba pedido nebe Direcção Nacional do Meio Ambiente (DNMA) simu iha 13 de Maio de 2010, husi Direcção Nacional dos Transportes Maritimos ho assunto mak hanesan "Pedido Rehabilitasaun Porto Mahata – Oecusse.

Tuir avaliasaun ba proposta i outline rehabilitasaun porto nebe mak DNMA halo i hare ba planu projektu nebe mak planea tiha ona mak hanesan **Transportasaun (konstrusaun rehabilitasaun i habelar porto): 1 ha i fatin para (terminal): 1 ha, projekto ne'e ami klasifika hanesan kategori B.**

Ne'e duni maka DNMA husu atu bele konsidera requizitus mak hanesan tuir mai ne'e:

1. Aportil tenki halo/kompleta dokumentos Planu de Gestaun Ambiental (PGA) tuir kategoria nebe mak iha, bazei ba Guideline/matadalan DNMA No. 7. Dokumentos PGA ne'e esplika konaba ba oinsa ita bo'ot sira nia plano/manajemento atu kontrola aktividades hahu husi perparasaun, halao aktividades to'o finaliza konstrusaun.
2. Dokumentos PGA nebe halo tiha ona hatama mai iha DNMA atu halo avaliasaun i mos hetan aprovasaun mak foin hahu aktividades.
3. Atu bele minimiza problemas sosiais karik mosu, ami husu atu ita konsultasi mos ho komunidade lokal nebe mak hela besik liu iha projekto ne'e.
4. Aportil tenki halo relatorio aktividades mai iha DNMA konaba progresso aktividades nebe mak iha, durante halao to'o finaliza konstrusaun .
5. Husu atu bele involve/konsultasi Departamento tékniku sira hotu nebe mak iha relasaun ho ita ninia aktividades.

DNMA sei monitoring i orienta bazeia ba dokumentos PGA nebe prepara husi Aportil.

Mak ne'e deit ba atensaun no kooperasaun hato'o obrigado awin.

Augusto Manuel Pinto, MSc (DRCM)
Director da DNMA

（JICA事務所仮訳）

To: Mr. Constantino Ferreira Soares
National Director for Maritime Transportation

Cc: S.E. Sr. Abilio de Deus de Jesus Lima
Secretary State for Environment

Date: 21 May 2010

Number: 294/DNMA/V/2010

Subject: Presentation on Rehabilitation Project of Mahata Port

Based on the request received by National Directorate of Environmental Service (DNSMA), dated on 13 May 2010, from National Directorate of Maritime Transport with subject of "Request for Rehabilitation of Mahata-Oecusse Port"

Accordance to the proposal and port rehabilitation outline instructed by DNSMA and observing the project planned designed already for the transportation (construction rehabilitation and enlarging of the port): 1 ha and docking area: 1 ha, the project is classify as B category.

Therefore DMNA request for consideration on the following requirements:

1. APORTIL should complete the document of Environmental Management Plan according to the existing category, based on the DNMA guideline no.7. The EMP document explain how your plan/management to control the activities, start from the preparation stage, implementation stage till the accomplishment of construction.
2. The drafted EMP document is submitted to DNSMA to assess and get approval before commencing the activities.
3. To minimize any social problem, we request you to consult with the local community residing close to the project site.
4. APORTIL should provide activities report to DNSMA on the progress of the activities, during the initial step till the final construction.
5. To involve all consult, all technical departments related to your activities.

DNSMA will monitor and guide based on EMP document prepared by APORTIL.

Mr. Augusto Manuel Pinto
Director of DNSMA

DEMOCRATIC REPUBLIC OF EAST TIMOR
MINISTRY OF DEVELOPMENT AND ENVIRONMENT
Secretary of State for Tourism, Environment, and Investment
Directorate of Environmental Services

DEVELOPMENT PROPOSAL APPLICATION

This application must be completed in its entirety and submitted to the Directorate of Environmental Services, along with all required and necessary supporting documentation, by any Proponent interested in a new industrial, commercial, or trade activity or capital expenditure project. Guideline #2. Development Proposal and Pollution License Applications should be consulted when completing this application.

Proponent Information

Proponent name: APORTIL (Port Authority) & Maritime Services Business Registration No.: -

Name of individual(s) representing Proponent: Constantino Ferreira Soares

Proponent's address for correspondents: Av. Portugal – Dili Port, Timor Leste

Telephone (fixed): (670)3317264 Telephone (mobile): (670)723 0202 Fax: -

Describe any syndicate that comprises the Proponent: -

Activity/Project Information

New development? ☐ **Modification of existing premises?** ☑ Proposed start date: April 2011

Location Subdistrict: Pante Makassar Suco: Costa Aldeia: Mahata

Longitude/Latitude: Approximate center of project site
9°11' 13.55" S 124° 23' 34.36" E

Further description of location: See Attachments 1 and 2
Land side (Terminal): Bounded by man-made structures
Sea side (Wharf): Approx. 100m from shoreline on CDL-5m isobath

Type of development:
Sector: Transportation
Sub-sector: Construction and expansion of port

Scale of development:
Land side (Terminal): Approx. 1.0 ha
Sea side (Wharf): Approx. 1.0 ha

Attach any/all of the following: 1) maps, plans, and drawings that detail the proposal; 2) detailed description of the activity/project; 3) copies of any existing license, agreement, or memorandum established with UNTAET, ETTA, or the RDTL government; 4) the results of any feasibility study completed for the proposal.
1) see Attachment 1, 2,and 3. 2) see Attachment 4.

Application continues on next page.

FOR OFFICE USE ONLY
Date received: Reference No:
Recorded by:

This application gathers information necessary to evaluate the environmental characteristics of a proposed development. It is not an official form, yet supports the Directorate in its efforts to fulfill its responsibilities under UNTAET Regulations.

Summary of Resource Use

Energy: Construction Stage

Required electricity for the construction works will be supplied by electric generators to be brought by a contractor.

Operation Stage

Required electricity for the port related facilities, including terminal, wharf, port office, passenger terminal building and storage will be supplied by a newly installed electric generator (75 KVA) for eight (8) hours/day.

In a peak condition, electricity consumption of 160 KVA/day for the port related facilities is expected.

Water: Construction Stage

For construction purpose, total water consumption of approx. 10 m^3 /day in construction site, contractor's office and worker's camp is expected.

Potential sources of water are existing city water line, ground water well, river and rain water.

Operation Stage

In a peak condition, water consumption of approx. 4 m^3/day in toilets in the port is expected.

Water will be supplied by the city water line.

Large volume water supply for calling ships is not available in the port, in principle.

Raw materials: Following construction materials are locally procured in Construction Stage.

Soil: Approx. 650 m^3 is used for terminal filling and leveling.

Sand: Approx. 1,350 m^3 is used for concrete production.

Stone and aggregate: Approx. 3,300 m^3 is used for concrete production and structure's foundation.

Summary of Wastes

Air pollution: Source of Air Pollution

Potential source of air pollution in the project site is exhaust gases from construction equipment, vehicles and ships to be operated in construction and operation phases. However, construction period is limited in about 20 months and daily port operation is also limited within approx. 5 ha of an open coastal area, no significant air quality degradation caused by the project activities is anticipated.

Control Plans

Although potential air pollution is insignificant to be used, in order to keep the exhaust gases minimum, construction and operation equipment in the port are periodically inspected and well maintained.

Stock pile of bulky materials, such as sand, soil, crashed stone, etc. in the port will be covered by large enough sheets in order to avoid dust dispersion by wind in and around the port.

Wastewater:

Source of Wastewater

Primly source of wastewater is toilets in the port.

Control Plans

In construction stage, portable toilets will be placed in the construction site, contractor's office and worker's camp to avoid unfavorable odder and ground water contamination. Used tap water for hand washing in toilets will be discharged to the sea through the existing drain ditch.

Accumulated human waste in the potable toilets will be periodically collected and transported to the designated disposal facility.

Concrete mixing and cleaning equipment likely produce turbid waste water. This water will be discharged to the sea through a settlement pond to be installed in the construction site.

In operation stage, a septic tank (3x1.8x2 m) is placed to receive human waste discharge. Residual waste in the septic tank will be periodically collected and transported to the designated disposal facility.

Solid waste:

Source of Solid Waste

No hazardous solid waste will be generated in the port.

In construction phase, large volume of broken concrete brocks will be generated due to the existing deck slab demolition.

In operation phase, general garbage will be generated from ships, port office and passenger terminal.

Control Plans

In construction phase, to avoid an excessive increase of water turbidity, broken concrete dust falling down into the water will be minimized. I addition, to reduce waste volume, broken concrete blocks will be reutilized as armor material on the seawall foundation.

In operation phase, general garbage generated in the port will be collected and transported to the designated disposal site.

Liquid waste:

Source of Liquid Waste

No hazardous liquid waste will be generated in the port.

Major liquid waste likely generated in construction and operation phases in the port is oil and grease used for equipment maintenance.

Control Plans

Waste oil and grease will be kept in appropriate containers until proper treatment or disposal at designated facilities.

Oil-trap trench will be placed around oil-handling facilities, such as generator house, to prevent accidental oil spillage to the surrounding water areas.

Noise pollution:

Source of Noise Pollution

Since project site is located far from city center, current noise level is low.

In operation phase, increased port related vehicles and personnel may create additional noise in and around the project site.

In construction phase, primary source of noise will be pile driving equipment to be used for the wharf extension works.

Control Plan

In operation phase, port manager will properly control port related activities to maintain the noise level within the standard level.

In construction phase, since the nearest residents house is located about 200 m from the pier construction site, night and early-morning operations of pile driving equipment will be avoided.

Attach a copy of the Environmental Management Plan for the activity/project, if available. -Not Available -

This application gathers information necessary to evaluate the environmental characteristics of a proposed development. It is not an official form, yet supports the Directorate in its efforts to fulfill its responsibilities under UNTAET Regulations.

Declaration of Compliance

I, the undersigned Proponent (or representative, there of), hereby state that the information provided in/with this application is accurate and complete. I declare that I and my agents will comply with all applicable laws, rules and regulations relevant to this development.

Signature: _____ Date: _____

Print name: CONSTANTINO FERREIRA SOARES

FOR OFFICE USE ONLY

Community consultation completed: ☐ Date: _____ Notes attached: ☐

Classification: Category A ☐ Category B ☑ Category C ☐ Date: _____

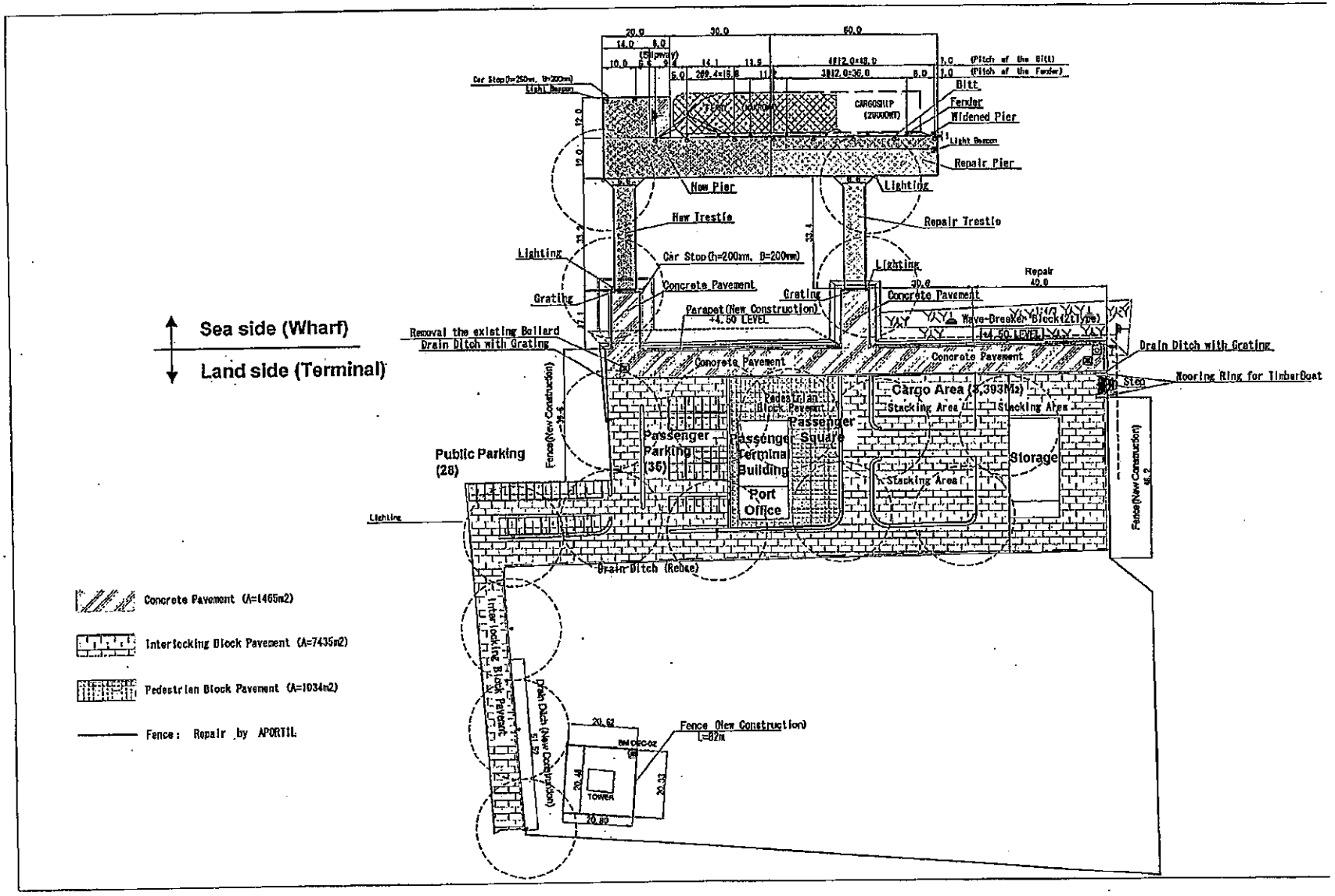
Additional recommendations and notes (attached ☐ if necessary)

The Proponent intends to move forward to the next step in the EIA process? yes ☐ no ☐

If yes, an environmental officer from the Directorate must be assigned to monitor the EIA process.

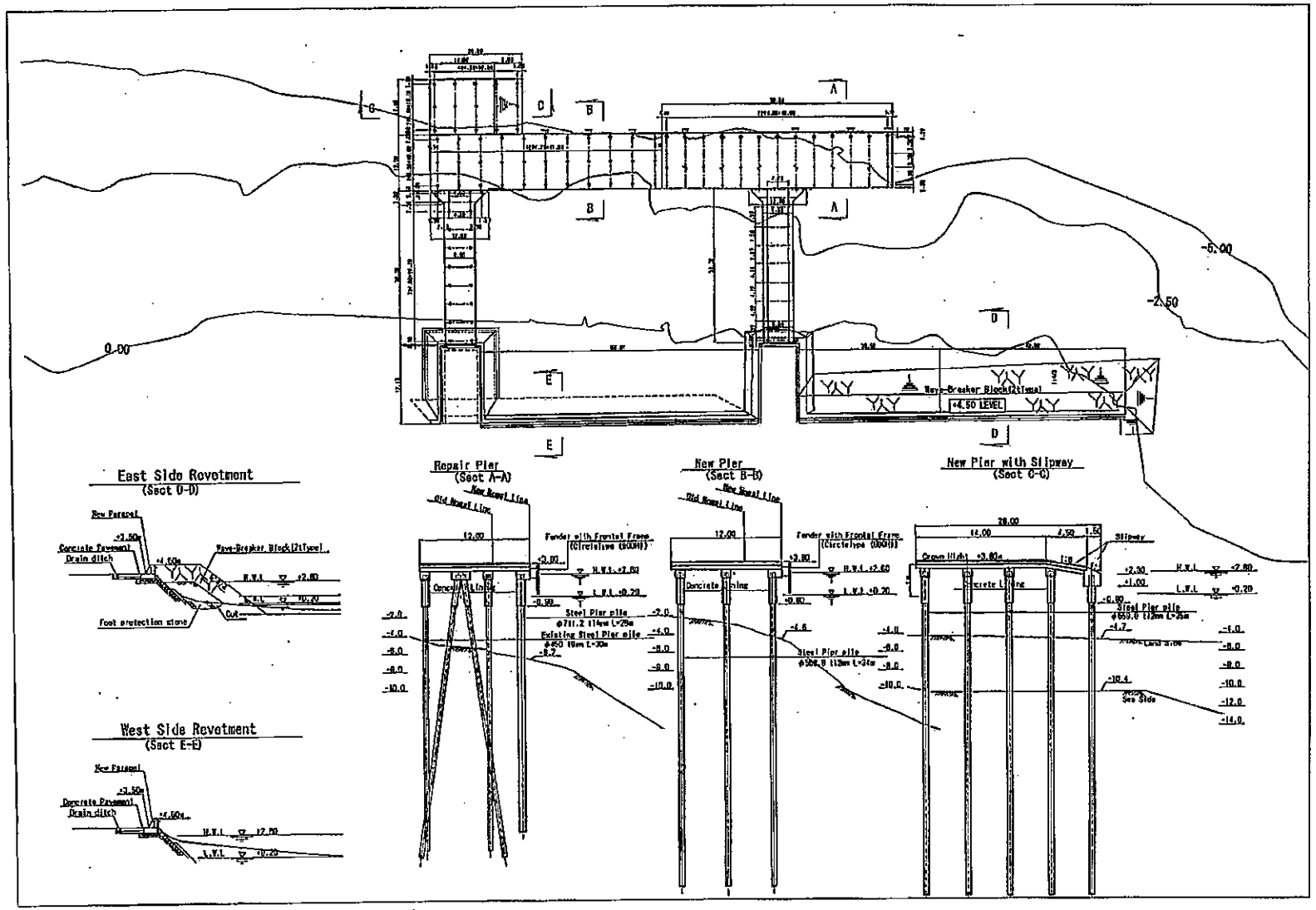
This application gathers information necessary to evaluate the environmental characteristics of a proposed development. It is not an official form, yet supports the Directorate in its efforts to fulfill its responsibilities under UNTAET Regulations.

Attachment - 1 Project Layout Plan



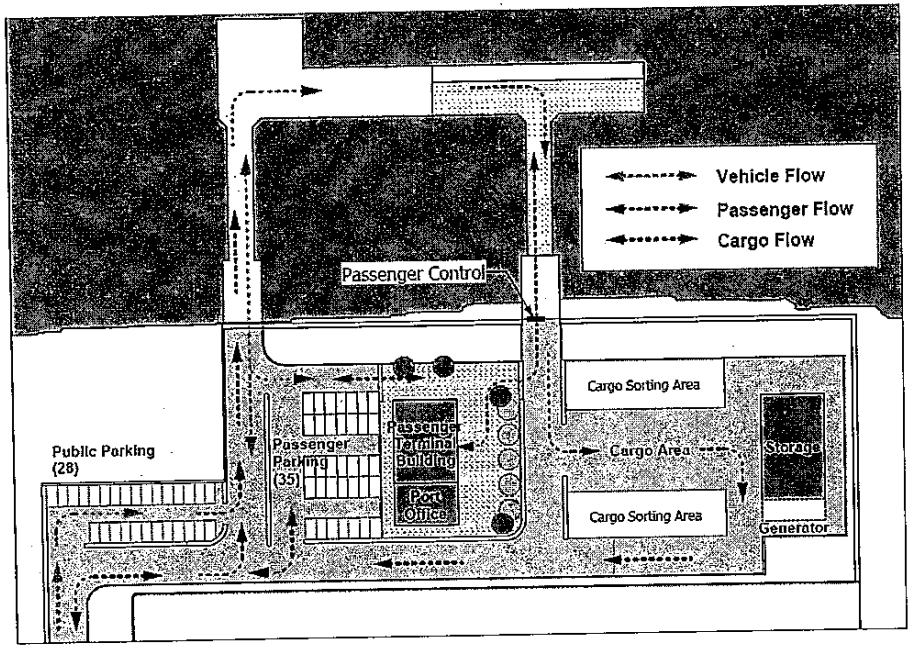
This application gathers information necessary to evaluate the environmental characteristics of a proposed development. It is not an official form, yet supports the Directorate in its efforts to fulfill its responsibilities under UNTAET Regulations.

Attachment - 2 General Drawing of Wharf and Revetment



This application gathers information necessary to evaluate the environmental characteristics of a proposed development.
It is not an official form, yet supports the Directorate in its efforts to fulfill its responsibilities under UNTAET Regulations.

Attachment - 3 General Information of Terminal Buildings



Layout of Buildings

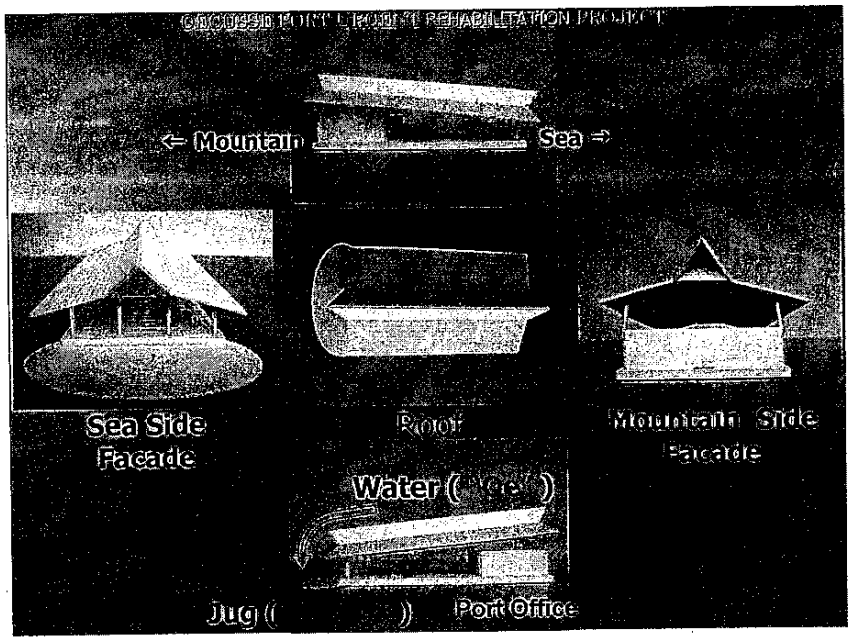


Image of Passenger Terminal and Port Office

Name	Area (m^2)	Capacity	Structure
Passenger Terminal Building	300	400 passengers	RC concrete column + Concrete block wall + Galvanized steel roof
Port Office	150	14 staff	
Storage	450	1,000 ton	Steel frame + Concrete block wall + Galvanized steel roof

This application gathers information necessary to evaluate the environmental characteristics of a proposed development.
It is not an official form, yet supports the Directorate in its efforts to fulfill its responsibilities under UNTAET Regulations.

Draft Environmental Management Plan (EMP)

for

Oecusse Port Urgent Rehabilitation Project

July 2010

Prepared by

National Directorate for Maritime Transport

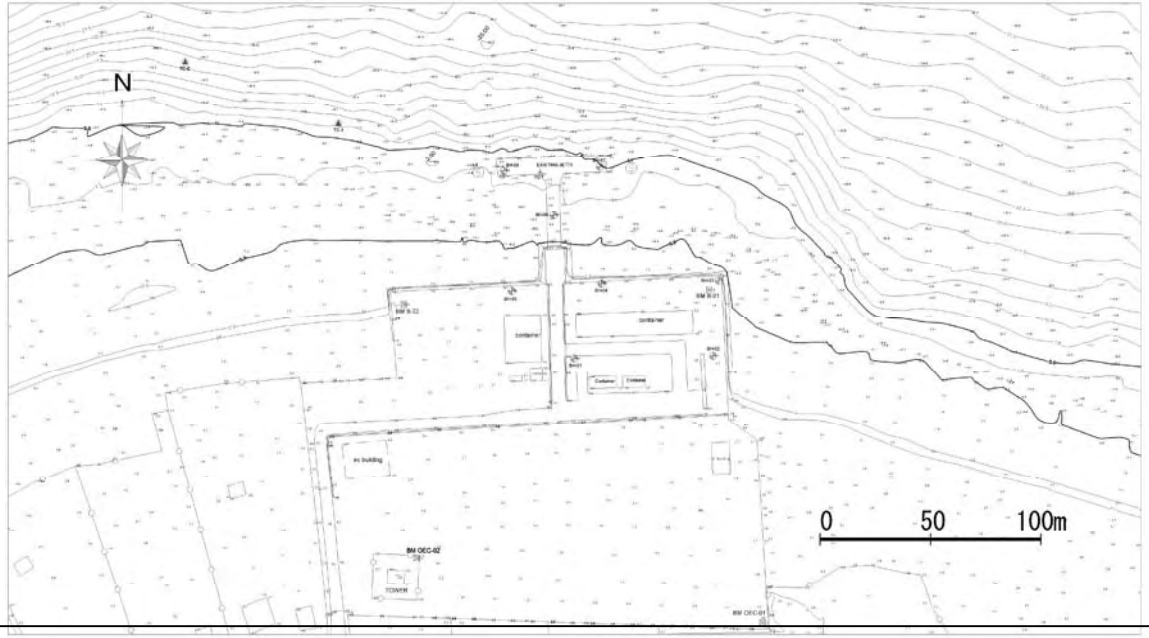
Draft Environmental Management Plan (EMP)
for
Oecusse Port Urgent Rehabilitation Project

TABLE OF CONTENTS

Attachment


INDONESIA
MALUKU
NUSA TENGGARA TIMUR
Project Site
TIMOR-LESTE
Timor
Timor Sea
Regions of
TIMOR-LESTE


Project Site


N
0
50
100m

Project Map

I. Project Description

This Environmental Management Plan (EMP) is prepared for Oecusse Port Rehabilitation Project, which has been classified into Environmental Category B by Direcção Nacional do Meio Ambiente (DNMA).

Content of the EMP accord with the GUIDELINE #7 Preparation of an Environmental Management Plan issued by DNMA, and is implemented by the project proponent, APORTIL, in order to minimize, control or otherwise manage adverse environmental impacts may be arisen from the Project.

Project and activity description is presented below.

1. Project Background

Oecusse Port is located in Oecusse District, which is an enclave surrounded by West Timor of Indonesia. Oecusse is connected with other areas in the country by ferry, which is operated to and from Dili two times a week, and by cars through Indonesian territory.

Road transportation between Dili and Oecusse is not popular because it is necessary for the driver to obtain a visa and a transit pass for the vehicle through the Indonesian Embassy before the start of travel at a total cost of US$60. For this reason, most people choose the ferry for moving between Dili and Oecusse.

At present, the ferry arrives at Oebau area, which has a slipway. There is a T-shaped jetty for cargo vessels at Mahata, which was constructed by the Indonesian Government in 1992. However, it has not been used for cargo handling or maintained at all since the withdrawal of the Indonesian military in 1999. There has been no cargo ship service at Mahata terminal since then.

In such circumstances, it has been realized that development of maritime transport infrastructure is indispensable to improve regional disparities in income and to promote the economic development of Oecusse. In this situation, the Government of East Timor has decided to repair the jetty at Mahata with an assistance from the Japanese Government in order to accommodate ferry and cargo vessels.

2. Project Components

The Project is to repair the existing jetty which has been idle and to extend the jetty to be able to accommodate the ferry 'NAKROMA' and cargo vessels. Some cargo vessels may call at Oecusse Port on the way to or from Dili Port.

The target cargo ships are relatively small class ocean-going ones and their sizes may be less than around 2000DWT. The land terminal will be separated into passenger, cargo and public parking areas. That will contribute to ensure a smooth and safe traffic flow in the terminal area.

The project consists of the following components shown in **Figure I-1,2** and **3**.

(1) Renewal and Extension of the Jetty

- Repair of the existing jetty (630 ㎡) and its extension (1,270 ㎡)
- Repair (140 ㎡) and the construction (140 ㎡) of the transitional part of the trestle
- Installation of 8 sets of rubber fenders (circle type 800H)
- Installation of a bollard (350kN type) and 9 bitts (250kN type)
- Installation of 3 sets of navigation aid facilities

(2) Terminal Development

- Construction of port-related buildings (an administration office of 150 ㎡, a passenger terminal of 300 ㎡, a warehouse and generator room (450 ㎡)
- Construction of pavement in the stacking yard and roads (8500 ㎡)
- Repair of the seawall (140m)
- Construction of 15 sets of outdoor lightings
- Provision of a generator (75kVA)

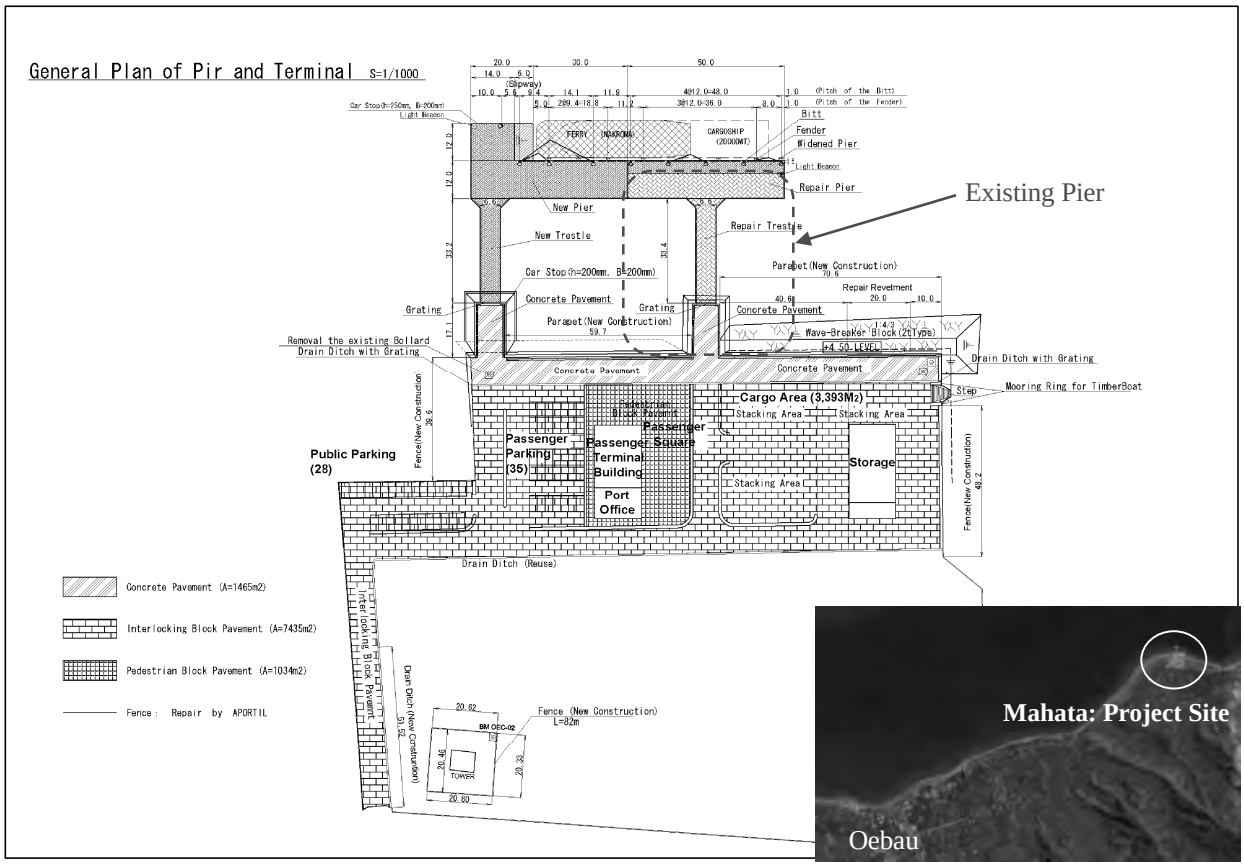


Figure I-1 Project Map

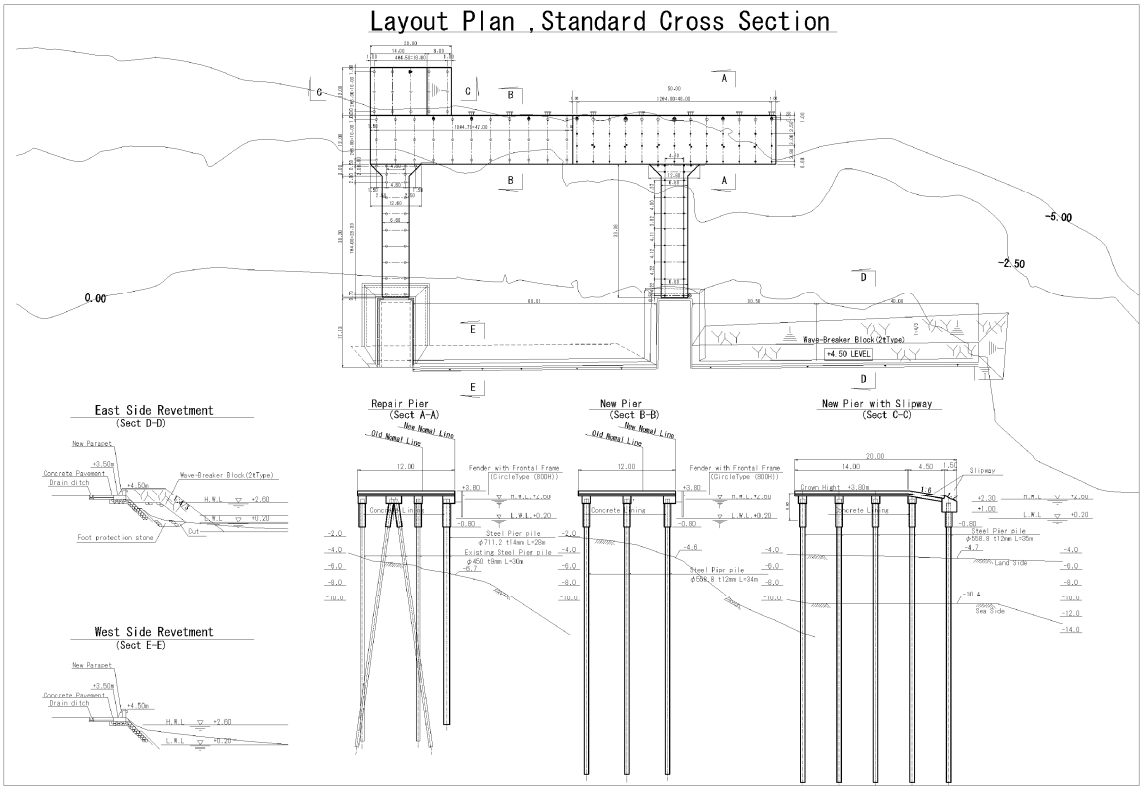


Figure I-2 Typical Cross Section of Port Civil Structures

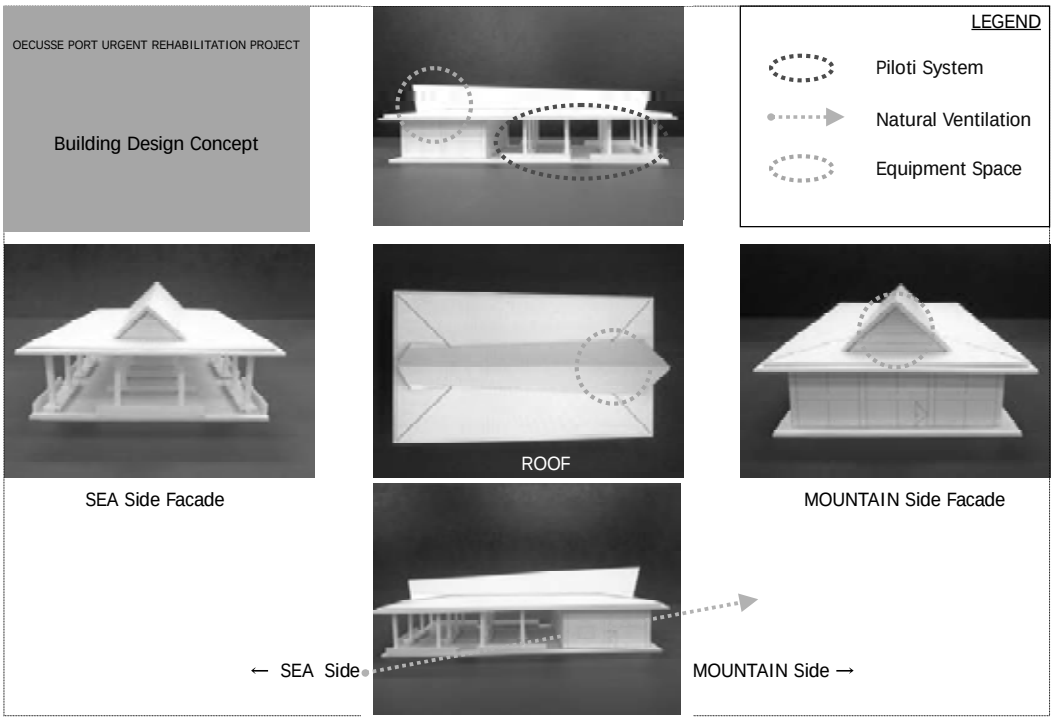


Figure I-3 3D Images of Port Office and Passenger Terminal Buildings

3. Project Schedule

The port rehabilitation works including survey, detailed design, bidding and construction, will be completed in 23 months and then, the port will commence its operation from 24th month as shown in **Figure I-4.**

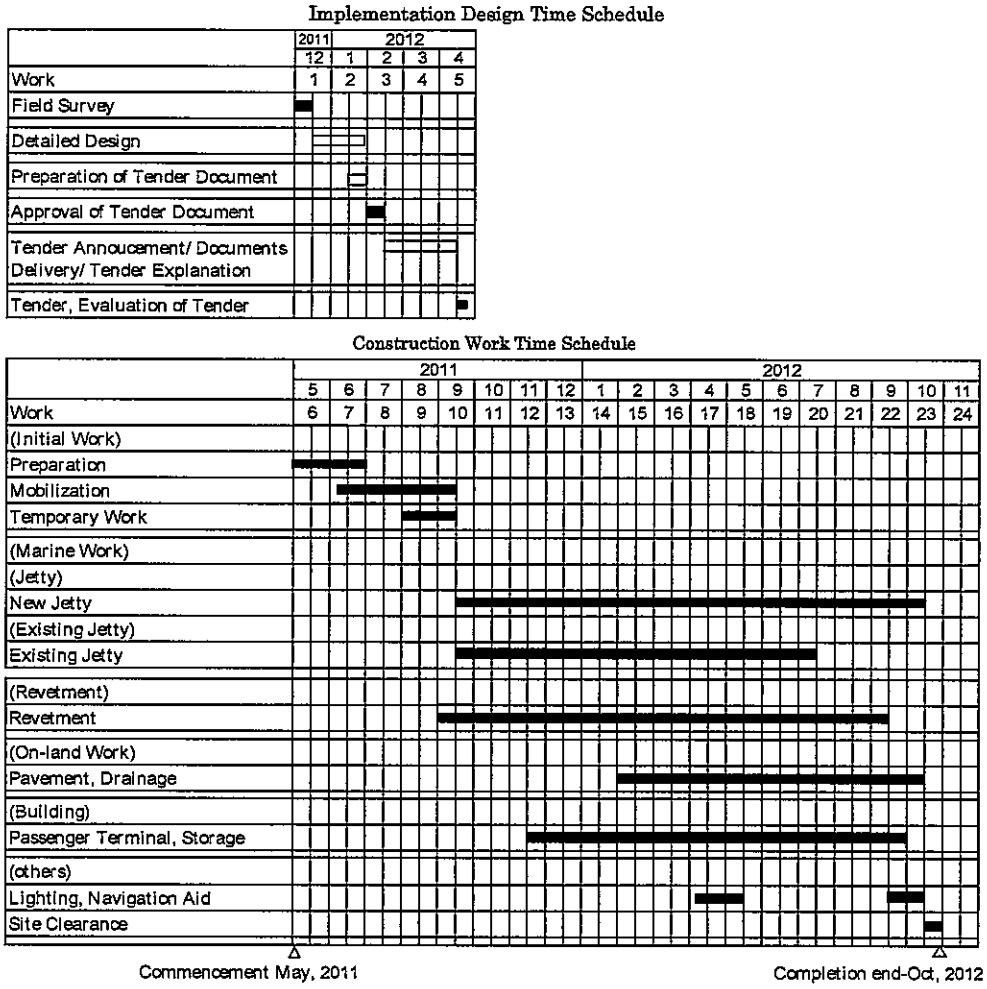


Figure I-4 Planned Project Schedule

4. Construction Materials

Following major construction materials are locally procured.

- Soil for terminal leveling: Approximately 650m^3
- Sand for concrete production: Approximately 1,350m^3
- Stone/Aggregate for concrete production & structure foundation: Approximately 3,300m^3

5. Image of Construction Works

Figure I-5 and **I-6** show image of the on and off shore construction works which will minimize potential negative environmental impacts.

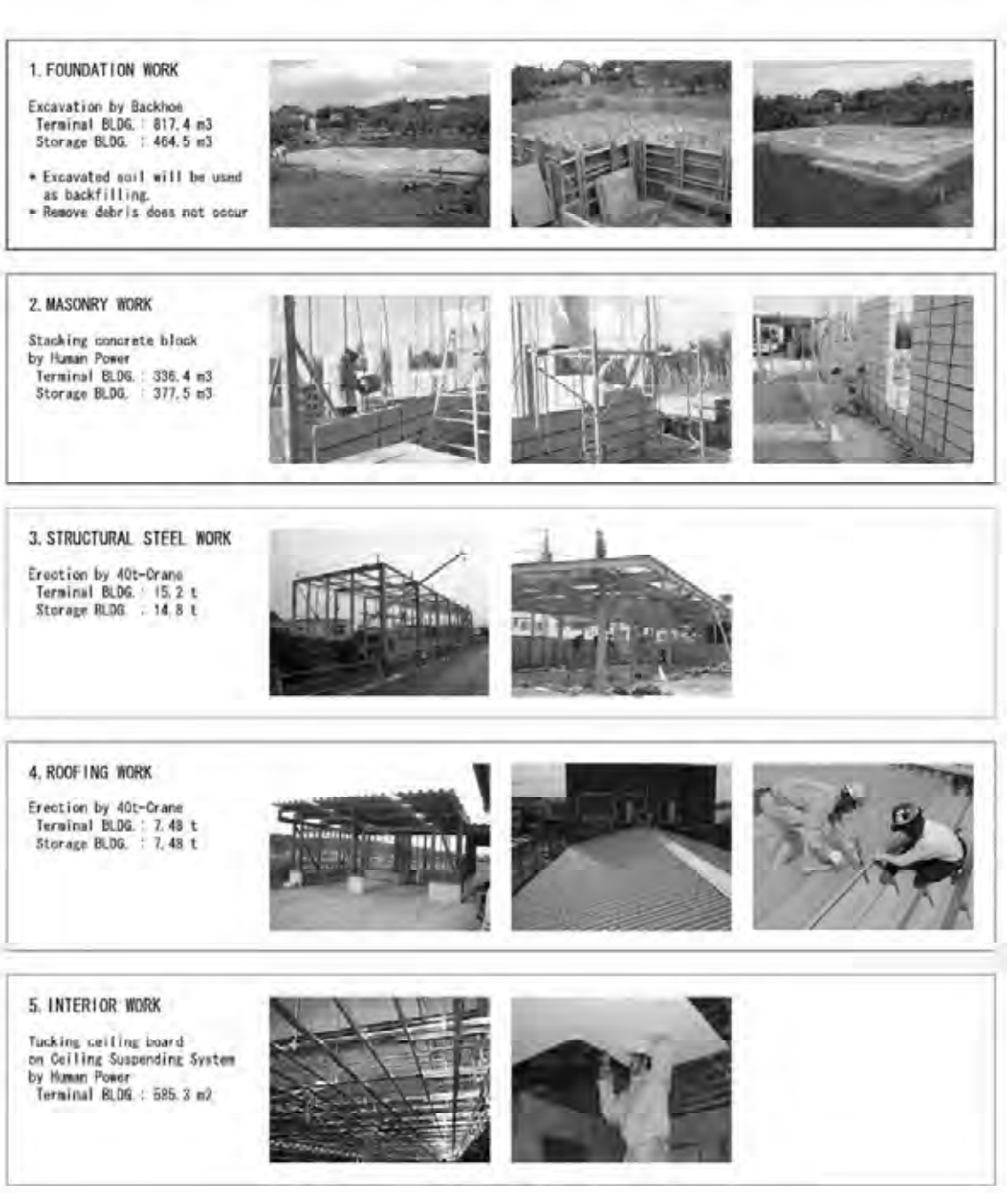
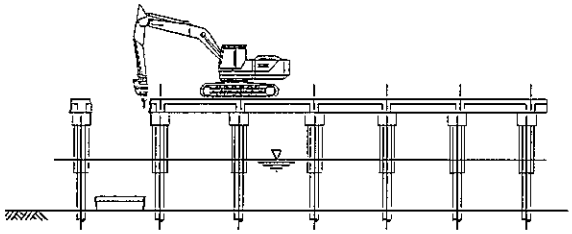
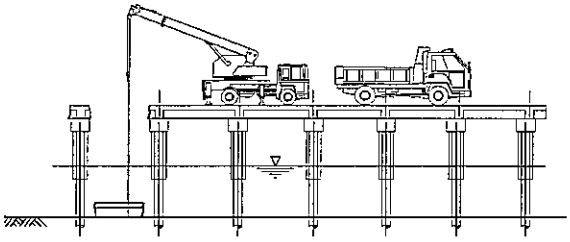


Figure I-5 Image of Building Construction Works

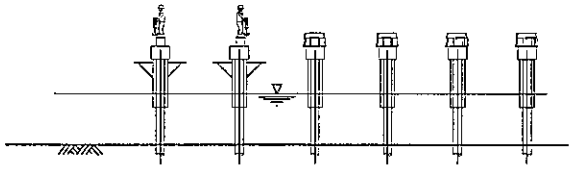
1. Wharf Construction



Demolition of Slab in Large Pieces

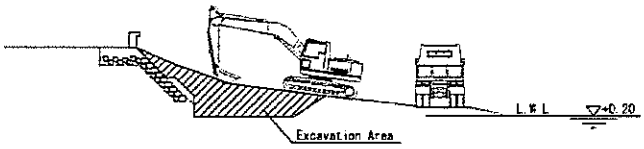


Collection of Broken Slab

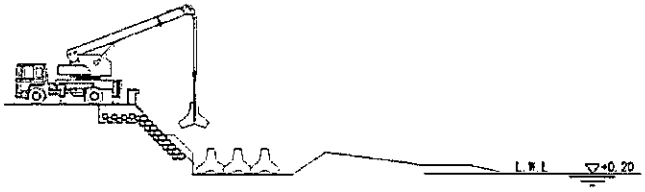


Chipping of Pile Head

2. Seawall Construction



Excavation of Foundation in Low Tide



Placement of Blocks from Land Side

Figure I-6 Image of Wharf and Seawall Construction Works

II. Physical, Biological and Social Impacts, and Mitigation Measures

1. Current State of Environmental Conditions in and around Project Area

The project area is located in a coastal area, consisting of shallow sea close to the land with some coral patches and other valuable marine ecosystems, specialized coastal vegetation like mangroves, and land area close to the sea where the local residents obtain important resources for subsistence and income from the sea and fringe of hilly terrain along the sea.

Since very limited environmental information is available in and around the project area, current state of environmental and social conditions on major aspects can be described as follows based on the findings during the environmental survey conducted by Japan Cooperation Agency (JICA) in Novembers 2009. Summary of the survey results are presented in Attachment.

(1) Physical Environment

Since the project area is not much developed and few sources of pollutants exist, pollution level of environmental qualities, such as ambient air, water, soil qualities are still kept in a minimum range.

Water quality indicates very low turbidity and contamination level of organic substances. Sediment quality also indicates very low contamination level of nutrient salts and organic substances because of that the seabed sediment along the shoreline consists of sand with little composition of silty soil.

Present noise level in the wharf and terminal areas in the port tends to be rather high due to breaking waves, terminal operation and workers. Daytime background noise level in the residential area behind the terminal is smaller than those in the terminal area because of fewer numbers of people and vehicles. However, the noise level is increased due to the trucks and mini-buses passing by.

(2) Biological Environment

No national protected area is designated in and around the project area. However, valuable biological environment, such as coral and mangrove communities can be found along the coastline.

Some live coral patches are found on the seabed in 20-25m depth and approximately 50m off the existing wharf covering approximately less 5% of the seabed surface.

Natural mangroves are found along the coast line on both sides of the project area with distance of approximately 1.5km on east side and 4.5km on west side.

Whales and dolphins migrate in the waters a few hundred meters offshore and sea turtles lay eggs on the natural sand beach nearby the project area in May and June.

On the land side, non-sustainable cutting and burning of trees and free ranging of livestock animals are degrading local vegetation.

(3) Social Environment

The project area is located in Penta Makasar, one of four sub-district in Oecusse district, with a population of about 36,000 person counting about 60% of the district population.

Surrounding the existing port area, approximately 10 residential structures are exist. Major income source of the local community are small scale fishing, farming, breeding livestock, kiosk and construction related works.

Daily commodity supply from outside Oecusse is extremely dependent on the ferry service to/from Dili port.

Although security in the local community is good and the residents support each other, lack of adequate water and electric supply are major concern.

2. Potential Environmental Impacts and Mitigation Measures

The project site is limited in the existing port area, however, with due consideration of the project scope and current state of environmental and social conditions described above, potential environmental impacts of the project and feasible and cost-effective measures to prevent or reduce such impacts to acceptable level are specified in two (2) project phases, i.e. Constriction and Operation Phases.

2.1 Physical Environment

(1) Water Quality

Construction Phase

Potential Impact: Demolition of concrete slab on pier and excavation of seawall foundation may increase seawater turbidity.

Although the construction works does not involve any hazardous materials, spillage of lubricant and fuel from construction equipment may degrade seawater quality.

Effluent from construction worker's camp may degrade surface and seawater quality.

Mitigation Measure: Concrete slab on existing pier is broken into as large peaces as possible to minimize falling of crushed concrete. Seawall foundation is excavated with preventive measures against discharging backfill soil.

Construction equipment is well managed by contractors with periodical maintenance and mechanical inspection.

Effluent from construction rerated facilities on land area is treated by temporally septic tanks before discharge.

Operation Phase

Potential Impact: Although the port terminal does not handle any hazardous materials, effluent from port terminal facilities may affect seawater quality.

Spillage of lubricant and fuel from calling ships may degrade seawater quality.

Mitigation Measure: General effluents from port office and passenger terminal are properly treated by permanent septic tanks before discharge.

Sand trap is placed at the end of surface water drainage to prevent turbid water discharge into the sea.

Effluents from ships are kept in designated containers on land for further treatment and disposal.

Oil-trap trench is placed around the oil-handling facilities, such as generator house, to prevent accidental oil spillage to the surrounding water areas.

Oil handling and water traffic safety are properly controlled by port manager based on established daily and emergency procedures.

(2) Air Quality

Construction Phase

Potential Impact: Exhaust gas from badly maintained construction equipment may affect air quality.

Dust pollution due to frequent transportation of construction waste to the designated disposal site at Palaban by heavy trucks may affect air quality.

Mitigation Measure: Construction equipment is well managed by contractors with periodical maintenance and mechanical inspection.

Construction wastes on trucks are covered by sheet and truck drivers are educated to maintain driving speed limit and safety.

Dust dispersion is minimized by periodical sprinkling water on transportation route.

Operation Phase

Potential Impact: Exhaust gas from badly maintained port related equipment and vehicles may

affect air quality.

Dust pollution due to increased port related traffic in and around the port may affect air quality.

Mitigation Measure: Equipment and vehicles operating in the port are well managed with periodical maintenance and mechanical inspection, and use of low-lead fuel is recommended.

Dust dispersion is minimized by periodical sprinkling water in and around the port area by port manager in corroboration with local government office.

Green belt is placed in the port area to reduce dust dispersion.

(3) Noise and Vibration

Construction Phase

Potential Impact: Pile driving equipment to be used for the pier extension works may be a source of noise and vibration nuisance.

Power generator for construction equipment may emit low level but continuous noise.

Mitigation Measure: Since the nearest residents house is located about 200m from the pier construction site, night and early-morning operations of pile driving equipment are avoided.

Contractors inform local residents with execution plan of noisy construction works in advance.

Lo-noise pile driving equipment is used to minimize unavoidable noise.

Lo-noise power generator is placed as far from resident house as possible.

Operation Phase

Potential Impact: Increased port related vehicles and people may create additional noise.

Mitigation Measure: Port manager properly control port related activities and minimize early morning and midnight port operation.

(4) Waste

Construction Phase

Potential Impact: Construction waste may be generated from existing pier demolition and other

works.

Mitigation Measure: Construction waste is transported to the designated disposal site at Palaban. Reusable construction waste is separately collected for effective reuse program to reduce volume of construction waste disposal. Broken concrete produced in the existing pier demolition site can be reutilized as armor material on seawall foundation.

Operation Phase

Potential Impact: Increased port rerated activities and passengers generate additional waste.

Mitigation Measure: Collected waste from calling ships, port office and passenger terminal transported to the designated disposal site at Palaban.

Reusable waste, such as plastic bottle, steel and wood is separately collected for effective reuse program to reduce the volume of final waste disposal.

2.2 Biological Environment

Construction Phase

Potential Impact: Demolition of existing pier and excavation of seawall foundation may increase water turbidity. This may result in reduction of sunlight into the water area and affect primary productivity of aquatic ecosystem, such as some coral patches observed on seabed approximately between -20 to -25m depth and 50m offshore construction site.

Random anchoring and drugging anchors of construction vessels may destroy the coral patches.

Mitigation Measure: Although the coral patches mainly consist of Echinophyllia aspera and Euphyllia ancora, which are common in Asian waters and patient with water turbidity, increase of water turbidity is minimized.
To avoid the impacts above, concrete slab of existing pier is broken into as large peaces as possible to avoid falling down of small particle of crushed concrete into the sea. Foundation of seawall is excavated carefully preventing washing out of backfill soil.

Anchoring of construction vessels is only allowed in designated area where no existence of the coral patches is confirmed by divers.

Operation Phase

Potential Impact: Port related activities have continuous impacts on ecological habitats in and

around the port area.

Wastes and waste water discharge, oil spills from ships may deteriorate the sea water quality, leading to negative impacts on marine ecology in and around the port area.

Mitigation Measure: Periodical biological survey is conducted in and around the port area to detect if negative impacts occur due to the port operation.

2.3 Social Environment

Construction Phase

Potential Impact: Construction works bring an additional consumption of electricity and water in local community.

Number of construction workers are employed. They may disturb social order in local community and may bring communicable disease.

Partial procurement plan of local work forces and construction materials, such as sand, stone, aggregate, wood, etc. may bring conflict into local community, and natural environmental degradation in remote area due to intensive material exploitation.

Mitigation Measure: Contractors minimize consumption of electricity and water for construction works by using own source and effective use of public source.

Impartial employment opportunity as construction workers should be given to local residents to avoid friction in local community.

To prevent communicable disease infection, contractors educate workers in corroboration with NGOs. Safety control measures are maintain by contractors in corroboration with local government offices concerned.

Procurement plan of local workforces and construction materials is prepared in due consideration of social characteristics of the local community.

Operation Phase

Potential Impact: Possible social impacts may be two folds in terms of livelihood and economic activities. The port related activities enable new employment opportunity for semi-skilled and unskilled workers in the local community. On the other hand, at present, some of the local people stay near project site depend on small-scale business and fisheries and they have no choice but to depend livelihood and deprivation of such economic activities may lead to further socio-economic

insecurity.

Mitigation Measure: One of the key successes in achieving economic development of the local community is to fully make use of local human resource and giving priorities for them. Local intentions are accommodated into project planning. Provision of trainings and improved social awareness programs are considered as overall development programs. The followings are possible assistances that could be provided to contribute to community empowerment: i) Project related job training, ii) Skill training, iii) Credit scheme specific to the project, vi) Fisheries extension, v) Social awareness programs for the community to be integrated into the development planning, vi) Socio-economic support to the vulnerable etc.

In due consideration of the above, port manager operates the port in corroboration with local government offices and NGOs.

III. Monitoring, Reporting and Auditing Schedule

1. Environmental Monitoring Plan

An environmental monitoring plan is devised to examine if there are actually predicted environmental impacts, if the level of impacts meet the prediction, if there are any impacts that had been not predicted and to obtain materials to judge if additional environmental mitigation measures should be needed.

Therefore, it is required to propose a monitoring plan, indicating appropriate timings and methods of the monitoring, and to establish the monitoring criteria, so that prompt additional mitigation measures can be taken if necessary.

1.1 Monitoring Scope

Monitoring scope, including monitoring item, parameter and method, is show in **Table III-1**.

Table III-1 Monitoring Scope

Monitoring Item	Parameter	Method	Frequency (Construction Phase)
1. Physical Environment			
Ambient Water Quality Survey	Temperature, Salinity, pH, Turbidity (equivalent SS)	Field measurement by handy equipment.	During pier demolition: Once / day Other: Once / week
Ambient Air Quality Survey	Dust (TSP)	Field measurement by handy equipment.	Once / month
Noise/Vibration Survey	Noise and Vibration levels	Field measurement by handy equipment.	First 2 weeks during pile driving: Once / day During pile driving: Once / week Other: Once / month
2. Biological Environment			
Live Coral Survey	Location, Coverage, Healthiness, etc.	Field survey by divers.	Once / 6 months
3. Social Environment			
Local Residents Survey	Positive/Negative Satisfied/Dissatisfied, etc.	Field interview by NGO	Once / 6 month

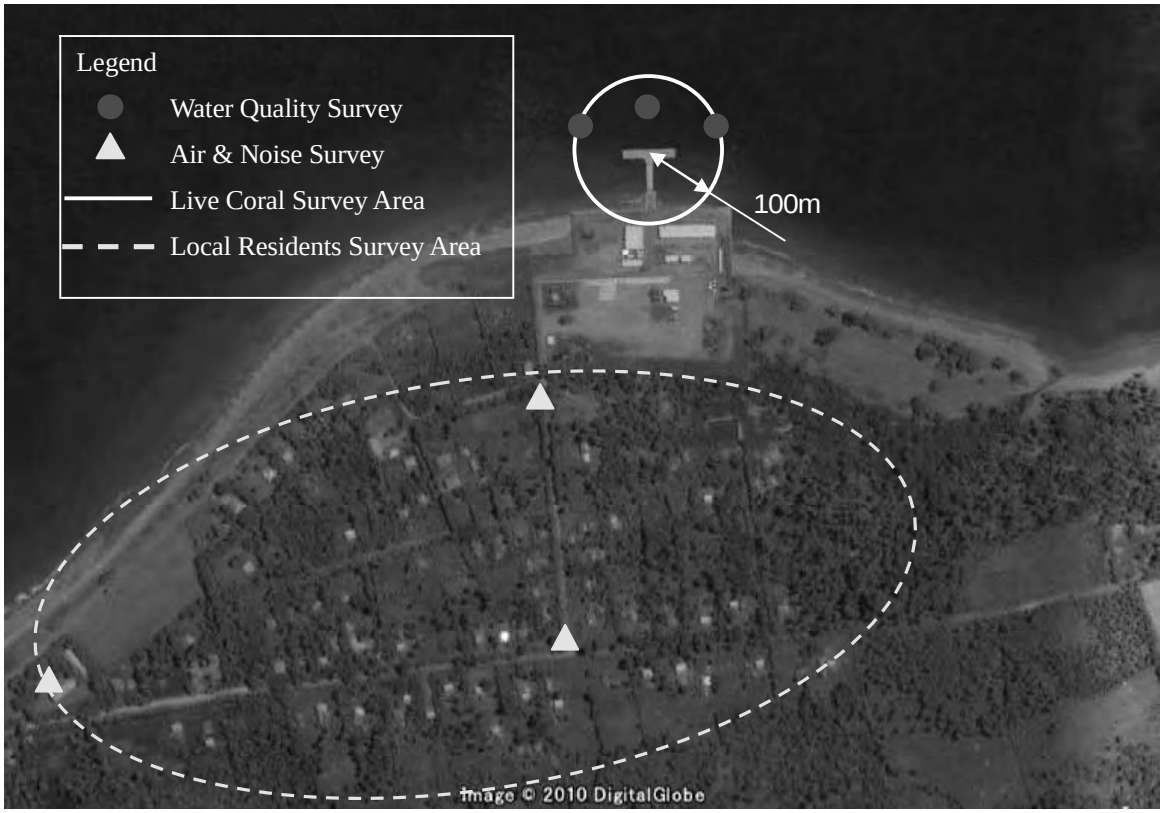
Note: Frequency in operation phase can be decided later based on the actual site conditions but Once / 6 months is recommendable.

Monitoring criteria are defined according to the baseline data obtained before starting construction works. The monitoring data are compared with the baseline data to judge if environmental qualities are maintained or degraded to decide needs of additional mitigation measures.

Survey results in the JICA Study in November 2009 with applicable Indonesian environmental standard values are presented in Attachment for reference.

1.2 Monitoring Location

Planned environmental monitoring is conducted at the locations shown in **Figure III-1**.



III-1 Monitoring Location Map

1.3 Monitoring Schedule

Planned environmental monitoring is conducted during the construction phase at the timings and frequencies shown in **Figure III-2**.

Survey Item \ Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Ope-ration
Water Quality		x			Once/week		Once/day		Once/week			Once/day		Once/week					
Air Quality		x			x	x	x	x	X	x	x	x	x	x	x	x	x	x	
Noise/Vibration		x			Once/day	Once/week			X	x	x	x	x	x	x	x	x	x	
Live Coral		x						x					x					x	
Local Residents		x						x					x					x	
	Baseline Survey					Mid-phase Survey-1						Mid-phase Survey-2				Post-phase Survey			

Figure III-2 Environmental Monitoring Time Schedule during Construction Phase

2. Reporting and Auditing

2.1 Reporting

The results of environmental monitoring is consolidated into Environmental Progress Reports and submitted to DNMA.

Monthly and bi-annual reports are submitted during construction and operation phases, respectively.

This report summarizes the results of monitoring scheme as well as other information relevant to the environmental performance of the construction and operation activities.

2.2 Auditing

In order to assess an effectiveness of the environmental management system, an internal environmental audit is conducted.

Bi-annual and annual audits are conducted during construction and operation phases, respectively.

Audit results are not submitted to DNMA for review/approval, but the latest audit results are ready for the review by DNMA anytime.

IV. Organizational and Management Structure

This EMP is maintained under organizational structure with each responsibility shown in **Figure IV-1** and **2** below.

In the structure below during construction phase, the consultant assesses the monitoring results and APORTIL decides if additional mitigation measures are taken.

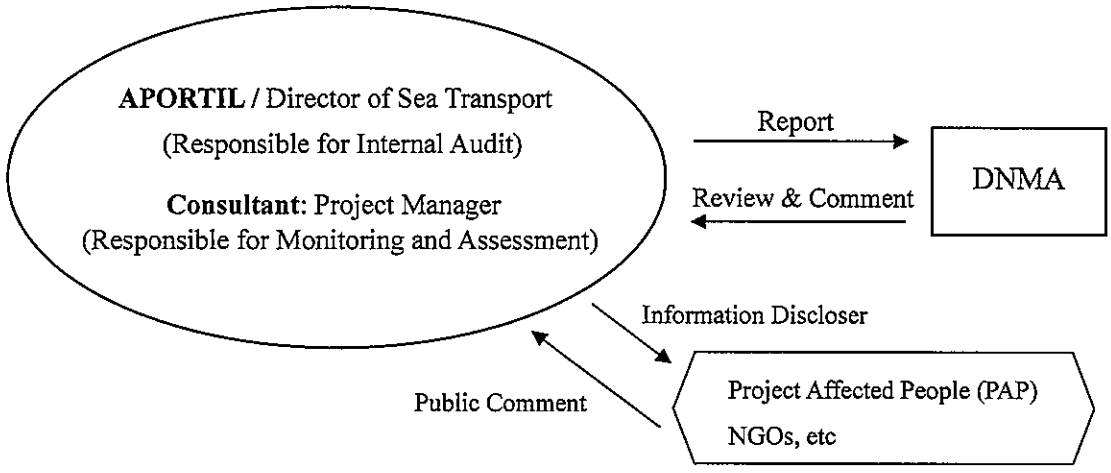


Figure IV-1 Organizational and Management Structure of EMP during Construction Phase

In operation phase, APORTIL continues the EMP in corroboration with DNMA as shown in **Figure IV-2.**

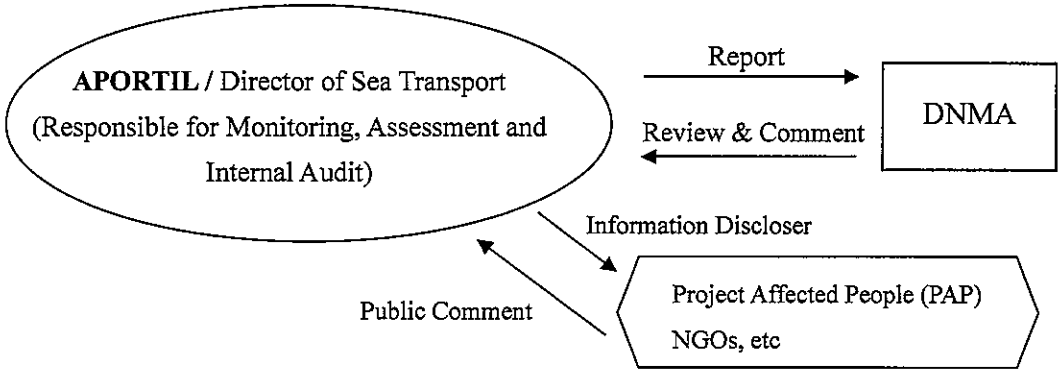


Figure IV-2 Organizational and Management Structure of EMP in Operation Phase

V. Resource and Costs

During the construction phase, APORTIL will carry out the environmental monitoring with the consultant.

In the operation phase, APORTIL continues the environmental monitoring with own recourses.

Table V-1 Approximate Cost for Environmental Monitoring during Construction Phase

Currency: USD

Item	Unit	Unit Rate	Quantity	Amount
1. Equipment for Water Quality Survey	set	2,500	1	2,500
2. Equipment for Air Quality (Dust) Survey	set	3,500	1	3,500
3. Equipment for Noise Survey	set	500	1	500
4. Equipment for Vibration Survey	set	1,000	1	1,000
5. Divers for Live Coral Survey	time	2,000	3	6,000
6. NGO for Local Residents Survey	time	1,000	3	3,000
Total				16,500

VI. Capacity Building and Training

In the construction phase, the EMP is carried out by APORTIL, Consultant and Contractor in corroboration with a district and/or regional offices of DNMA. With full awareness in environmental requirements and responsibilities, continuous training of personnel and strengthening of their abilities can be secured. To realize above, permanent counterparts are assigned for monthly meetings and discussions among the relevant parties.

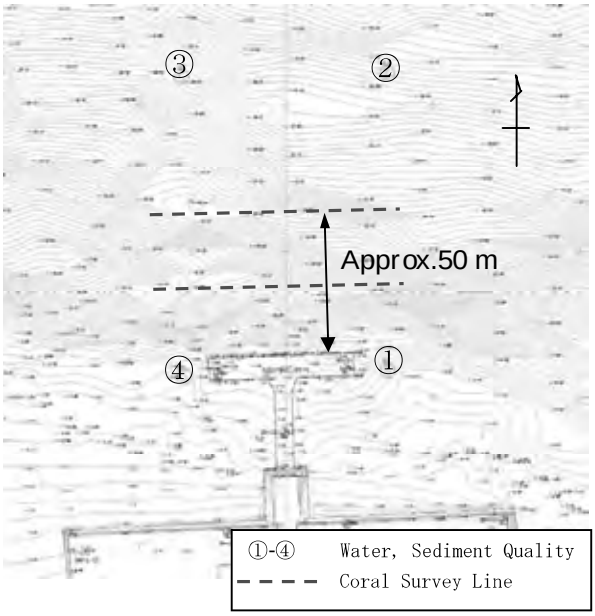
In the operation phase, the EMP is properly maintained by APORTIL using the equipment and capability accumulated during the construction phase.

Attachments

A-1 Results of Environmental Survey conducted by JICA in November 2009

(7) Environmental Conditions

(Survey Area/Location)



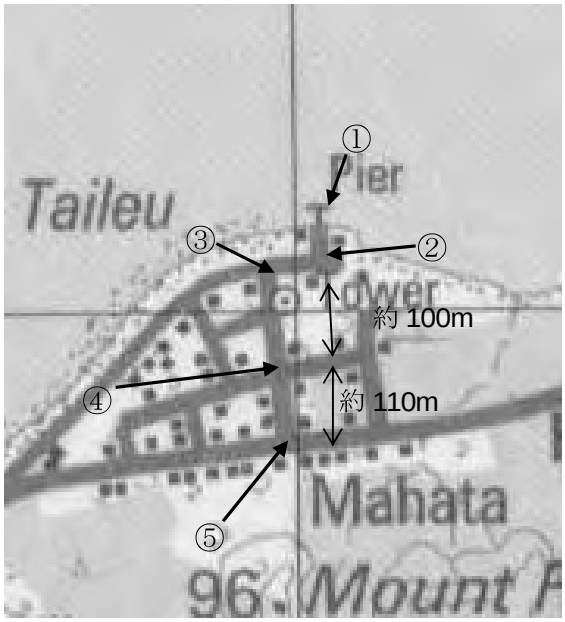


Figure 2-4-4-1 Water/Sediment Quality and Coral Survey Location

Figure 2-4-4-2 Noise Survey Location

Figure 2-4-4-3 Mangrove Survey Area

a) Water Quality Survey

As shown in Table 2-4-4-1, the result of water quality survey revealed that clear

very water is not degraded due to suspended and organic materials.

There is no national water quality standards in East Timor, therefore, those in Indonesia are referred in the Table bellow.

Table 2-4-4-1 Summary of Water Quality Survey Results

Survey Item	Unit	Survey Location				Indonesian Standards
		①	②	③	④	
Temperature	℃	30/29	30/29	29/28	30/28	Natural (1)
Hydrogen-ion Concentration	--	8.25/8.16	8.27/8.12	8.34/8.21	8.25/8.20	6.5-8.5 (1)
Suspended Solid	mg/L	9/11	8/10	6/9	7/11	80 (1)
COD	mg/L	20/23	19/21	16/19	14/21	80 (2)
DO	mg/L	6.5/6.4	6.8/6.5	6.8/6.5	6.7/6.6	5 (2)
Salinity	‰	32.7/33.1	32.5/33.1	33.1/33.4	32.3/33.4	Natural (1)
Transparency	m	>5	>20	>20	>2.8	---
Specific Gravity	g/cm^3	1.025/1.026	1.023/1.025	1.024/1.025	1.024/1.025	---

Note: Upper Layer／Lower Layer
(1) Sea water Quality Standard for Port Area: Decree of Environment Ministry No. 51/2004
(2) Sea water Quality Standard for Fishery: Kep-02/MENLH/1/1988

b) Seabed Sediment

As shown in Table 2-4-4-2, seabed sediment in the survey area is classified sand with little fine particles. Thus contamination of sediment with organic matter and nutrient salts is very low level.

Since no source of heavy metal discharge is exist in and around the project site, concentration level of heavy metal in sediment is about natural concentration.

There is no national sediment quality standards in East Timor and Indonesia, therefore, those presented by the World Bank are referred in the Table bellow.

Table2-4-4-2 Summary of Sediment Quality Survey Results

Survey Item	Unit	Survey Location				WB Standards
		①	②	③	④	
Water Content	%	87.05	82.85	87.68	85.93	---
Ignition Loss	%	0.17	0.16	0.23	0.41	---
COD	mgO_2/g	30.76	30.09	14.92	13.67	---
Total-N	%	0.02	0.02	0.02	0.02	---
Total-P	ppm	12	6	6	9	---
Oil	ppm	<1	<1	<1	<1	---
Lead	ppm	2.8	2.5	2.5	3.2	530 (1)

Hexa-chromium	ppm	23.8	23.5	22.1	24.4	480 (1)
Arsenic	ppm	1.0	1.5	1.9	3.7	85 (1)
Total Mercury	ppm	ND	0.0026	0.0013	0.0021	1.6 (1)
Alkyl Mercury	ppm	ND	ND	ND	ND	---
Sand Content	%	91	92	94	93	---
Silt Content	%	9	7	1	2	---
Clay Content	%	ND	1	5	5	---

Note: (1) World Bank Technical Paper No. 126, Testing Values (mg/kg ^{dry})

c) Noise Survey

The project site adjoins a residential area According to the result of noise survey conducted on Friday 23 October 2009, present noise levels in the wharf and terminal areas tend to be rather high due to breaking waves, terminal operation and workers. Daytime background noise level in the residential area behind the terminal (40 to 50 db) is smaller than those in the terminal area because of less number of people and vehicles. However, the noise level sometimes exceeds 70 db due to trucks and mini-buses passing by.

d) Coral Survey

As shown in Figure 2-4-4-4, live coral patches are found on the seabed in 20-25m depth and approximately 50m off the existing wharf. Since coverage of seabed by the coral patches seems to be less 5%, and those are locally common spices which are patient to increase of water turbidity, potential impact on the coral patches caused by the project will be minor.

Figure 2-4-4-4 Corals found in the Project Site

e) Mangrove Survey

Natural mangroves are found along the coast line on both sides of the project site. Since the distances from the project site are kept several kilometers, no negative impact on the mangroves caused by the project is anticipated.

8.4 Letter of EMP Approve

REPÚBLICA DEMOCRÁTICA DE TIMOR – LESTE
MINISTERIO DA ECONOMIA E DESENVOLVIMENTO
SECRETÁRIO DE ESTADO DO MEIO AMBIENTE

Dili, 13 de Agosto de 2010
Ref. No. 44/SEMA/VIII/10

Sua Exclência
Sr.Eng. Pedro Lay da Silva
Ministro das Infra-Estruturas de Timor Leste

Assunto : **Aprovação do Documento**

Excelência,

Bascando na carta da Sua Excelência No. 667/GMNFRA/VIII/2010 de 06 de Agosto de 2010 com o assunto "Pedido aprovação ao documento Plano de Gestão do Meio Ambiente" queria informar-lhe que depois de uma avaliação profunda feita pelos Técnicos da Direcção Nasional do Meio Ambiente que está sob a minha tutela, decidimos que o documento do Plano de Gestão do Meio Ambiente, referido, **Aprovado.**

Antes da implementação do projecto, a equipa técnica do Meio Ambiente, irá monitorizar e fazer evaluações necessárias segundo as regras ambiennais.

Sem outro assunto subscrevo-me com elevada consideração.

REPÚBLICA DEMOCRÁTICA DE TIMOR – MINISTERIO DA ECONOMIA E DESENVOLVIMENTO – SEMA

ABILIO DE DEUS DE JESUS LIMA
Secretário de Estado

H.E. Mr. Pedro Lay da Silva
Minister for Infrastructure
Democratic Republic of Timor Leste

Subject: Document Approval

Based on your letter No. 667/GMNFRA/VII/2010, dated 6 August 2010 with the subject "Request for Approval for the Document of Environment Management Plan", we would like to inform you that after a thorough evaluation accomplished by the Technical Directorate of National Environment which is under my guardianship, decided that the document referred was approved.

Before the implementation of the project, the technical team of the Environment, will monitor and make evaluation required under the rules environments.

Best Regards,

Abilio de Deus De Jesus Lima

Secretary State for Environment
Ministry of Economic and Development
Democratic Republic of Timor Leste