31. INITIAL ENVIRONMENTAL EXAMINATION (IEE)

31.1 General

(1) Objectives of IEE

Initial Environmental Examination (IEE) has the following two objectives:

1) To evaluate whether Environmental Impact Assessment (EIA) is necessary for the project or not, and if it is necessary, to define its contents.
2) To examine, from an environmental viewpoint, the measures to mitigate the impact of the project which requires environmental consideration but not a full-scale environmental impact assessment.

(2) EIA Criteria of port development in Indonesia

EIA is required for a development projects larger than a certain scale by the environmental laws of Indonesia and method and regulations are stipulated in EIA Guideline of Indonesia (1999) (see Table 31.2.1).

Table 31.2.1 Criteria of EIA for Port Development Project

Project type	Project description	Criteria of development project which requires EIA
Port development project	Berthing facility	Facility more than 200m in length or 6,000m^2 in area
	Breakwater	More than 200m in length
	Development area	More than 5 ha in area
	Mooring buoy	More than 10,000DWT
Dredging	Initial dredging	Dredged soil volume more than 250,000m^3
	Maintenance dredging	Dredged soil volume more than 500,000m^3
Reclamation		More than 25 ha in area or soil volume 500,000m^3
Soil dumping		Dumped soil volume more than 250,000m^3

Source: Revised Environmental Impact Assessment Procedure in Indonesia

(3) The Method of IEE

The IEE procedure has two steps as follows:

1) Screening: To evaluate whether it is necessary to include the environmental consideration in a development project or not.
2) Scoping: To identify the important environmental impacts by the implementation of a development project, and to define the survey items for EIA based on the findings.

31.2 Components of Development Plan

Main components of the development plan are shown in Table 31.2.2 for Palaran site.

Table 31.2.2 Development Plan for Palaran Site

Facility	Dimension		Environmental Aspect
	6-berth plan	4-berth plan	
Berths	6 berths x 125 m Design depth 6m	4 berths x 125 m Design depth 6m	Total length of the berths are longer than the EIA criteria 200m.
Container terminal Total terminal area Ground slots CFS	 15 ha 2,277 TEU 8,320m^2	 15ha 2,304 TEU 8,320 m^2	 Larger than the EIA criteria scale 5ha in area.
Container handling capacity	442,000 TEU/yr.	455,000 TEU/yr.	
General cargo terminal Shed Open storage	9 berths, Design depth 6m 6,800m^2 31,300m^2	9 berths Design depth 6m	
Dredging Initial dredging Maintenance dredging	- 1,600,000m^3		Initial and maintenance dredging volumes are more than EIA requirement Criteria
Soil dumping Initial dredging Maintenance	- 1,600,000m^3/year		Dumping soil volumes are more than EIA Criteria

31.3 Environmental Scoping of Development Sites

Scoping of Environmental impact was carried out by using scooping checklist as shown in Table 31.3.1.

Table 31.3.1 Environmental Scoping for Palaran Terminal Development

No.	Environmental Items	Evaluation	Description
Social Environment			
1	Resettlement	A	Resettlement of the inhabitant people, timber factory will take place. Land acquisition is required in Palaran.
2	Economic Activities	B	Positive impact is expected by increase of job opportunity.
3	Traffic/Public Facilities	B	The number of the transport vehicles may increase. Traffic volume may increase with the new port development sites.
4	Split of Communities	D	No impact is expected.
5	Cultural Property	D	No cultural property is seen around the development sites.
6	Water Right and Right of Common	D	No impact is expected.
7	Public Health Condition	D	No impact is expected.
8	Waste	B	Industrial waste generated from the construction work and operation phases is expected.
9	Hazards(Risk)	D	No hazard is expected.
Natural Environment			
10	Topography and Geology	D	No impact is expected.
11	Soil Erosion	D	No impact is expected.
12	Groundwater	C	Unknown (further examination is needed in next phase)
13	Hydrological Situation	D	No impact is expected.
14	Coastal Zone	D	No impact is expected.
15	Fauna and Flora	B	Some impact is expected to aquatic biology during the construction and operation phases.
16	Meteorology	D	No impact is expected.
17	Landscape	D	No impact is expected.
Pollution			
18	Air Pollution	B	The exhaust gas generated by the vehicles and heavy equipments in the construction and operation phases is expected since the traffic volume may increase by port development.
19	Water Pollution	B	The water pollution is expected in the construction phase. Decrease of water quality by domestic waste and shipping activities is expected in the operation phase.
20	Soil Contamination	B	The soil contamination by oil, grease, and other materials is expected in the construction phase. Ship operation activities may generate heavy metals that may accumulate in the bottom sediment.
21	Noise and Vibration	B	The noise and vibration are expected by operation of various construction equipments during the construction phase. Also traffic increase in operation phase may cause traffic noise.
22	Land Subsidence	C	Unknown (further examination is needed in next phase)
23	Offensive Odor	D	No impact is expected.

Note : Evaluation categories : A : Serious impact is expected.
B : Some impact is expected.
C : Extent of impact is unknown.
(Examination is needed. Impact may become clear as study progress).
D : No impact is expected.

31.4 Results of the IEE

The Environmental Impact Assessment is required for the development activities of Samarinda port and Palaran.

The basis of the requirement of EIA are as follows:

1) Total lengths of new berths are longer than the EIA criteria 200m.
2) The construction of container terminal of 15 ha exceeds the EIA requirement criteria of 5 ha.
3) The dredged soil volume (initial dredging volume 1.6 million m^3, maintenance dredging volume 1.6 million m^3) in Mahakam river exceeds the EIA requirement criteria (initial dredging volume 0.25 million m^3, maintenance dredging volume 0.5 million m^3).
4) The traffic volume is anticipated to increase on the access road to the project sites.

Regarding the Category A items for "Resettlement" (the problems of resettlement of inhabitants), the existing timber factory and the consequent compensation for land acquisition of new port development project in Palaran are expected. Detail study shall be carried out in the next stage.

Environmental impacts expected particularly in the construction phase such as "air pollution", "water pollution", and "noise and vibration" can be dealt with adopting proper construction methods. Such environmental conscious work methods are considered not to need additional construction cost.

Category "B" and "C" items will be clarified their impacts and magnitude in the next stage of the study and survey.

The Environmental Management Plan (RKL) and the Environmental Monitoring Plan (RPL) will be formulated as one of the procedures of Environmental Impact Assessment (EIA). The appropriate environmental management, implementation of continuous observation and monitoring of the environmental change will be recommended by RKL and RPL.

31.5 Environmental Consideration for the Development Sites

31.5.1 Environmental Conservation for the river basin of Mahakam

Deforestation in the mountainous area in river basin of Mahakam is the one of the problems for conservation of the river basin. There are 56 forest product processing factories (such as sawmill and plywood) along the Mahakam river, and 26 of these factories arelocated in the Samarinda city. Forest products volumes in East Kalimantan have the highest values in Indonesia, 5,534,000 m^3 of Logs, 189,000 m^3 of sawn timber, and 1,197,000 m^3 of plywood.

The logs are felled in the upstream area near the border with east Malaysia. Forest rehabilitation is a measure for maintaining natural conditions in the mountainous area. The people and organizations which use Mahakam River should plant trees and grass on bare land in the river basin.

Forest fires in Kalimantan are another problem for environmental conservation in the river basin. Most of the fires are caused by human activities, such as cigarettes and bonfires. The forest fires should be strictly suppressed.

31.5.2 Measures against Traffic Accident along the Access Roads to Port Areas

The number of vehicles is anticipated to increase in construction and operation phases, especially carrier vehicles like container trailers. This means increased risk of traffic accidents for the people living along the access roads to the new port development area at Palaran. Following countermeasures are recommended to reduce the risks.

1) Public meetings should be held for safety education by IPC. The meeting should be held for the people living along the access roads, on community by community basis.
2) Some publication for safety manners on the roads, like the brochures issued by IPC.
3) The traffic enforcers or the helpers should be arranged for the pedestrians crossing at the public facilities like schools and hospitals.

Measures for other environmental parameters are described in Environmental Management Section.

32. SHORT-TERM PLAN OF SAMARINDA

32.1 Project Description

The Study Team identified a short-term plan based on the master plan (see; Section 30.8) and its phasing plan (see; Section 30.11). This short-term plan is made up of the projects urgently needed in Samarinda Port in response to the needs of the regional economy. The master plan proposes that a major part of container handling activity at port be transferred from the existing port of Samarinda to Palaran after Palaran becomes fully operational. Accordingly, urgent projects are proposed only in Palaran.

32.1.1 Project Profiles

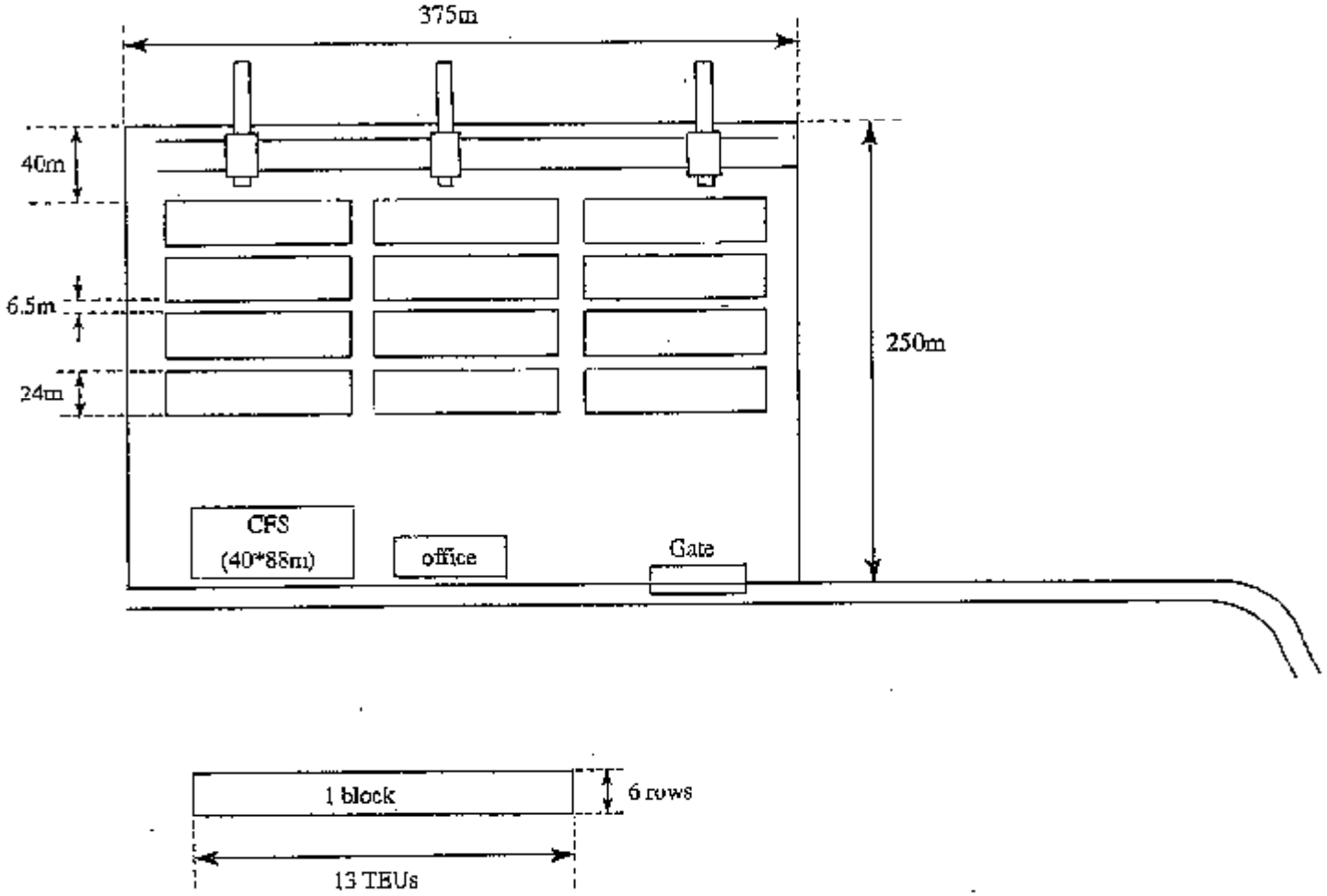
The layout plan for the short-term plan is shown in Figure 32.1.1 (6-berth Scenario) and Figure 32.1.2 (4-berth Scenario). Main components of the plan are shown in Table 32.1.1. Three berths for container need to be created in case of 6-berth scenario, and two berths for container need to be created in case of 4-berth scenario.

Table 32.1.1 Short-term Plan for Palaran

Facility	Dimensions in Case of 6-Berth Scenario	Dimensions in Case of 4-Berth Scenario
New container Berths	3 Berths, 125m/Berth, Draft: 6m	2 Berths, 125m/Berth, Draft: 6m
Container Terminal:		
Total Terminal Area	9.4 ha	7.5 ha
Ground Slot	913 TEUs	913 TEUs
CFS	3,520 m2 (40m x 88m)	3,520 m2 (40m x 88m)
Container Handling Equipment:		
Gantry Crane	3	2
RTG	6	4
Yard Tractor	12	8
Container Handling Capacity	173,500 TEU	168,000 TEU
Access Channel	Width: 80 m, Depth: 6 m	Width: 80 m, Depth: 6 m
Total Cost	Rp. 431 billion	Rp. 330 billion

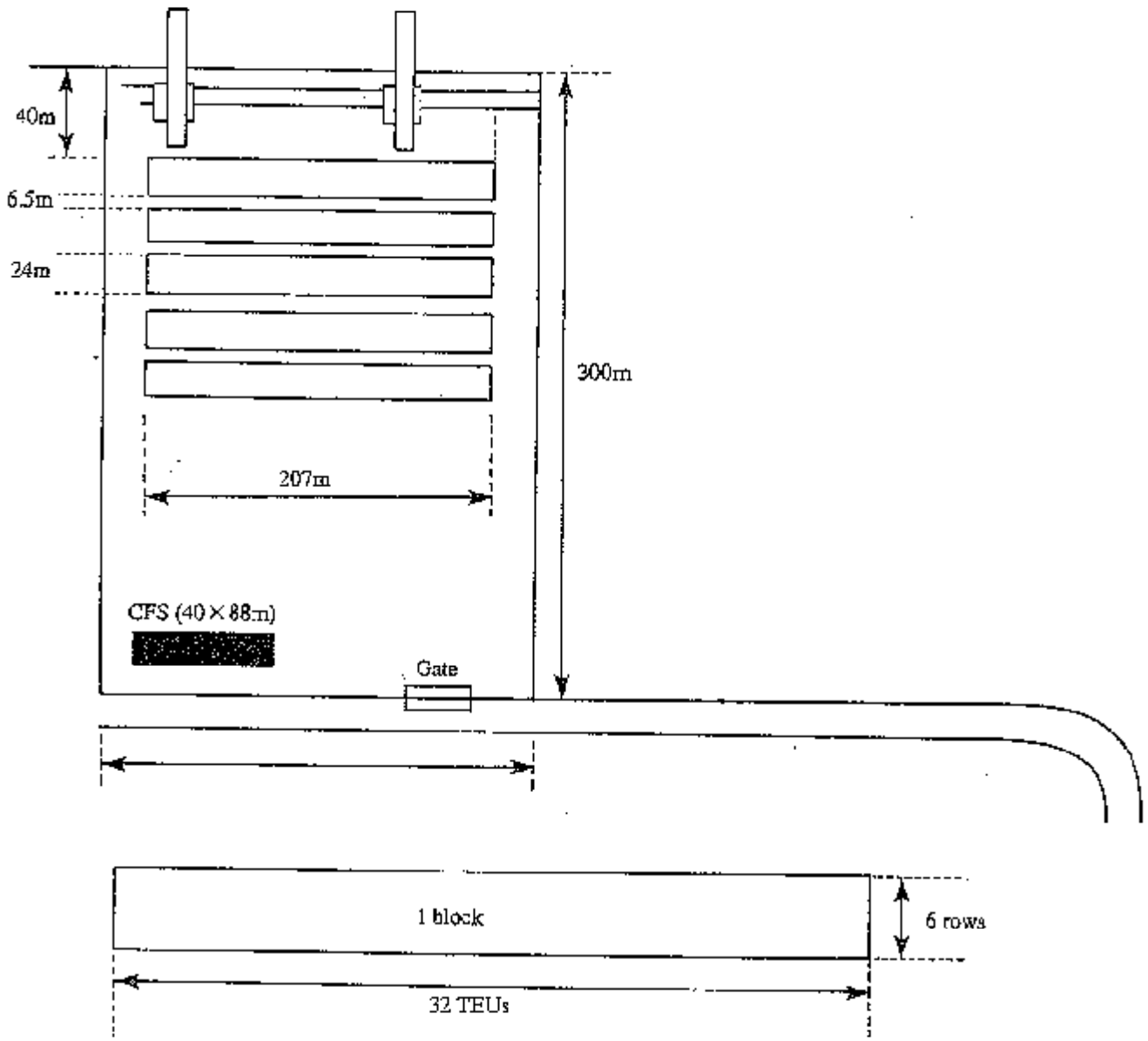
32.1.2 Milestone

The measures to be taken at Palaran up to the short-term target year 2007 are summarized below (Table 32.1.2 and Table 32.1.3). Palaran terminal can deal with the projected volume of container cargo with these measures.



Palaran container terminal (6-berth scenario)
Gentry crane: 3 units
RTG: 6 units (1 over 4 operation)
Yard tractor: 12 units
Ground slots: 936 TEUs (78 TEUs/block)

Figure 32.1.1 Layout Plan of Palaran Container Terminal in 2007 (6-berth Scenario)



Palaran container terminal

- Gentry cranes: 2 units
- RTG: 4 units (1 over 4 operation)
- Yard tractors: 8 units
- Ground slots: 960 TEUs (192 TEUs/block)

Figure 32.1.2 Layout Plan of Palaran Container Terminal in 2007 (4-berth Scenario)

Table 32.1.2 Milestone at Palaran (6-Berth Scenario)

Year	Milestone	Procurement	Construction
2004			1 Container Wharf
2005			1 Container Wharf
2006		3 Gantry Cranes, 6 RTGs, 12 Yard Tractors	1 Container Wharf, CFS, Access Road
2007	New container terminal becomes operational at Palaran. The existing port of Samarinda dedicated to general cargo (7 wharves).		

Table 32.1.3 Milestone at Palaran (4-Berth Scenario)

Year	Milestone	Procurement	Construction
2005			1 Container Wharf
2006		2 Gantry Cranes, 4 RTGs, 8 Yard Tractors	1 Container Wharf, CFS, Access Road
2007	New container terminal becomes operational at Palaran. The existing port of Samarinda dedicated to general cargo (7 wharves).		

32.1.3 Container terminal

(1) Design vessel

Design vessel for the short-term plan is the same as the master plan, 6 m of draft and 110 m of LOA. Hence, the proposed quay length is 125 m as is the case with the master plan.

(2) Terminal

The area for the proposed container terminals can be estimated with the following formulas.

Container terminal area = (Container yard area) / (Yard area ratio)
= 5.8 ha (6-berth Scenario), 5.8 ha (4-berth Scenario)

Container yard area = (Ground slots) / (Land use ratio)
= 3.5 ha (6-berth Scenario), 3.5 ha (4-berth Scenario)

Ground slots = (Container volume) x (Dwelling time) / (Yard operation ratio) / 365 / (Stacking height)
= 913 TEUs (6-berth Scenario), 913 TEUs (4-berth Scenario)

where:

Yard area ratio: 0.6 (CFS within the terminal)

Land use ratio: 260 TEU / ha (RTG system)

Dwelling time: 5 days

Yard operation ratio: 0.6

Stacking height: 4

Container volume: 160,000 TEU/year (6-berth Scenario), 160,000 TEU/year (4-berth Scenario)

Depth of the terminal = (Terminal area) / (Quay length)

= 155m (6-berth Scenario), 232m (4-berth Scenario)

Considering the layout of container terminal facilities, the Team proposes 250m in case of 6-berth scenario, and 300m in case of 4-berth scenario (including the apron of the wharf) as the depth of the terminal area in the target year 2007. Consequently, the container terminal area turns out to be 9.4 ha in case of 6-berth scenario, and 7.5 ha in case of 4-berth scenario.

(3) CFS

Some portion of import/export container will be LCL and thus requires CFS. The area for the proposed container terminals can be estimated with the following formulas. In order to efficiently carry out the stuffing and stripping of containers, CFS should be located on dock.

$S = (W \times D \times p) / (w \times r \times T)$

where:

S : Required floor area of CFS (m2)

W: cargo volume for CFS (ton) = (container cargo volume) x (LCL cargo ratio)

D: average dwelling time (days)

p: peak ratio

w: average stacking weight in CFS (ton/m^2)

r: effective use ratio of floor area in CFS

T: annual operating days (days/year)

These parameters are assumed as follows:

W = 80,000t (6-berth Scenario), 199,500t (4-berth Scenario)

D = 5 days, p = 1.5, w=1.2, r = 0.6, T = 365 days, LCL cargo ratio = 0.05

On the above assumptions, S is calculated as follows:

S = 3,336 m^2 (6-berth Scenario), 8,319 m^2 (4-berth Scenario)

Assuming the depth of CFS as 40m and the width of a bay as 8m, the actual area will be 3,520m^2 in both cases.

(4) Handling Equipment

Taking into account the following factors, a RTG system is recommended for the yard operation.

- Linear quay alignment
- Reliability of equipment
- The terminal will be open to multiple users
- The terminal requires high stowing capacity to maximize the operational income

In order to provide a quay-side productivity of 20 to 24 TEU/hour/berth, each berth needs to have a gantry crane. Each gantry requires two RTG and four yard tractors.

(5) Gate

The Study Team carried out a simplified calculation with the following formula to identify traffic volume of container cargo:

(Traffic volume) = (Annual cargo handling volume) x (20ft container + 40 ft container)/ (20ft container + 2 x 40ft container) x β/12 x γ/30 x σ/12

= 53 vehicles/hour/each way (6-berth Scenario), 133 vehicles/hour/each way (4-berth Scenario)

where:

(Annual cargo handling volume)=160,000 TEU (6-berth Scenario), 399,000 TEU (4-berth Scenario)

(20ft container + 40 ft container)/ (20ft container + 2 x 40ft container) = 2/3

β : Monthly variation = (cargo volume in the peak month) / (average monthly cargo volume) = 1.2

γ : Daily variation = (cargo volume in the peak day) / (average daily cargo volume) = 1.5

σ : Hourly variation = (vehicle traffic volume during the peak hour) / (daily traffic volume) = 1.2

(In-gate capacity) = 60 minutes / (gate processing time) x (working ratio) = 21.6 vehicle / hour

where:

(gate processing time) = 2.5 minutes / vehicle

(working ratio) = 0.9

(Out-gate capacity) = 60 minutes / (gate processing time) x (working ratio) = 43.2 vehicle / hour

where:

(gate processing time) = 1.25 minutes / vehicle

(working ratio) = 0.9

According to the above scenario, the gate needs 6 in-lanes and 3 out-lanes in 2007.

(6) Access Channel

Since the number of calling vessels at Palaran will be relatively small at early stage, the Team proposes the following provisional condition of the access channel :

- Width : 80 m
- Depth : 6 m

32.2 Engineering Design and Cost Estimate for Short Term Plan of Samarinda

32.2.1 Design Conditions

(1) Proposed Vessel

The proposed maximum capacity of the vessel is determined to have following dimensions.

Container Ship : 5,000DWT, Length Overall :110m

Breadth of Ship : 15.7m, Full loaded Draft : 5.5m

Required depth of the berth : 6.5m

(2) Design Codes and Standard

The design criteria of the marine and civil works are based on the following design standards and references.

- Standard Design Criteria for Ports in Indonesia, 1984
- Technical Standards for Port and Harbour Facilities in Japan, 1999

(3) Design Criteria

The particulars of major design criteria for Short Term Development Plan are summarized in Table 32.2.1

Table 32.2.1 General Design Criteria

Description	Palaran
	Container Berth
Seismic coefficient	0.05
Load on berth	3t/m^2
Load on yard	4t/m^2
Truck	T-20
RTG on yard	Max.32t/wheel
Gantry Crane on berth	Max 45t/wheel
Berth top elevation	+3.5
Berthing velocity of ship	15cm/sec
Subsoil condition	Silty sand
Assuming depth of hard strata	-40m~ -25m

(4) Tide Condition

The change of the water surface level due to astronomical tide and flood of the river is determined as follows.

Palaran : HWL = +2.65m, LWL = +-0.0m

32.2.2 Layout of Short Term Development Plan

The new container terminal is planned to be developed in Palaran where a timber factory is now located. This development plan is based on the assumption that the site can be obtained. This development is divided into two alternative scenarios in the master plan:

4-berths scenario and 6-berths scenario.

In the short term development plan, two container berths having 125m length each with related facilities are constructed in the 4-berths scenario, three container berths having 125m length each with related facilities are constructed in the 6-berths scenario.

The container berth is planned to have 22 m width to secure the rail span of the gantry crane with additional space for the hatch covers of container ship at the back of the gantry crane. The rail span of the gantry crane is 12 m which will secure the three lanes for the yard trailers loading/ unloading on the berth.

Retaining wall for the yard behind the berth is planned to be constructed. Container yard is determined as almost the same length as the berth (i.e., 125 m length and width of 300 m to secure the required space for the related facilities with open space).

The general layout of the short development plan for Samarinda is shown in Figure 32.2.1 for 4-berths scenario and Figure 32.2.2 for 6-berths scenario.

32.2.3 Design of port Facilities

(1) Berthing Facilities

The container berth is planned with RC deck structure supported by steel pipe piles. Based on the soil investigations for the site, the sand-stone layer (N value >50) is confirmed as different between the western side, the center of site and the eastern side.

The sand-stone layer is confirmed at DL –40m (BH-1) in the western side, DL –25m (BH-2) in the center of site and DL –17.5m (BH-3) in the eastern side. Thus, the sand stone layer is assumed to be slanting. In the short term development, the berth is planned to construct within the area of BH-1 and BH-2. Therefore, the steel pipe piles are driven into DL –40 in the area from the western end to the center between BH-1 and BH-2, and into DL –25 for the other area.

For the horizontal force on the berth such as vessel berthing, mooring and seismic forces), coupled batter piles are to be used at the line of second pile alignment from the berth face. Based on the alignment of the piles and load on the berth, the adopted diameter of the piles is 600 mm. As per condition in the natural river water, the piles do not take particular corrosion protection into account. The RC deck for the berth consists of RC pile cap, RC beam on the piles and RC slab.

Based on the design vessel size, mooring accessories such as bollard and fender are determined. The capacity of the accessories is planned as 35-ton bollard and cellular type 800 H fender for the container berth. These accessories at the quay face are planned to install at 12 m interval for the container berth.

The typical sections of the berth including major equipment on the berth and yard are shown in Figure 32.2.3.

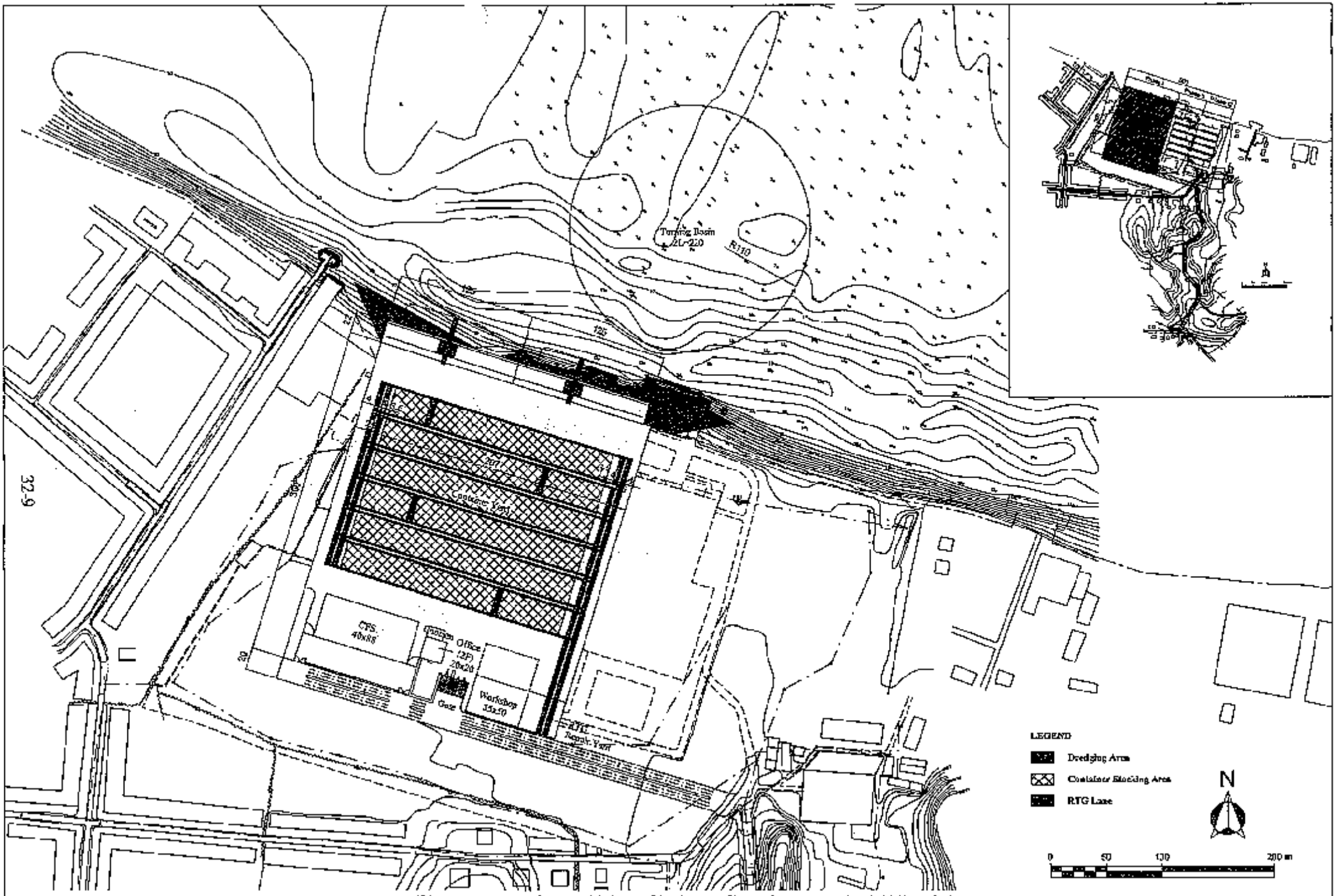


Figure 32.2.1 General Plan of Palaran Container Terminal (4 Berths)

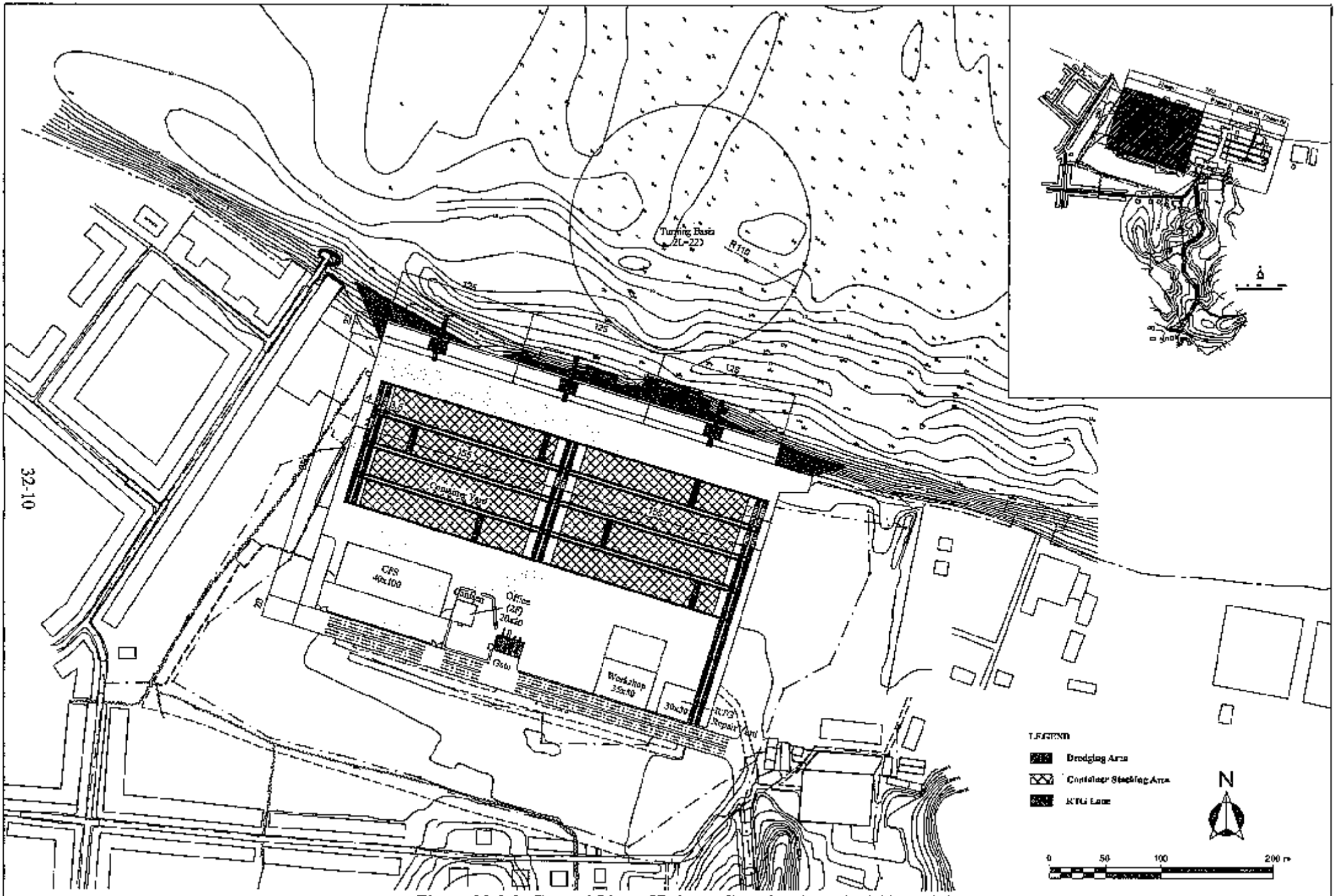


Figure 32.2.2 General Plan of Palaran Container Terminal (6 Berths)

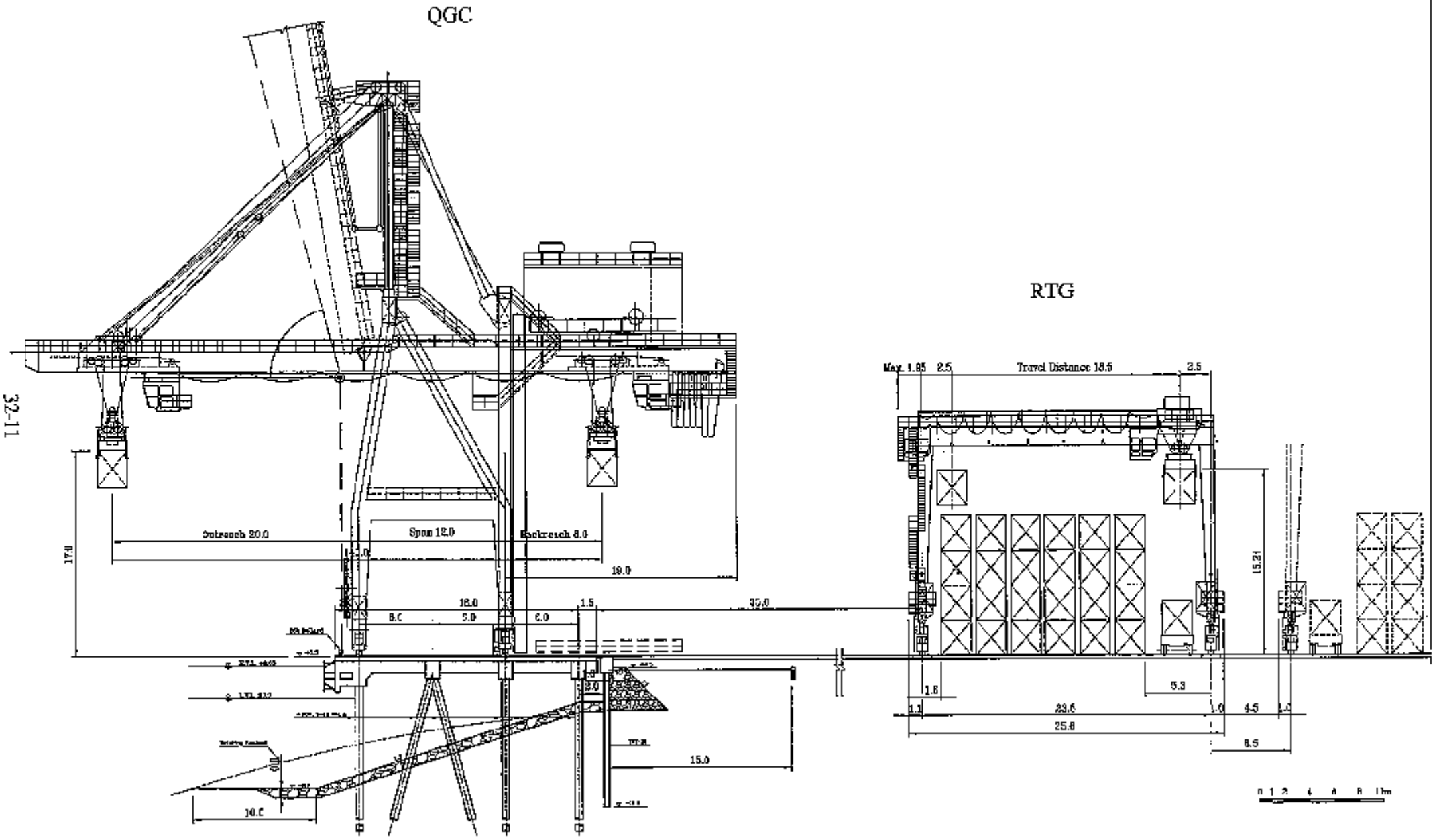


Figure 32.2.3 Palaran Container Terminal

(2) Dredging and Reclamation

Structural dredging work will be bone by using clamshell bucket on barge up to DL –6.5m along the berth where precise dredging work is required and different from those for basin and channel. This dredging work involves about 11700m^3 for the 4-berths scenario and about 21,000 m^3 for the 6-berths scenario. Ground elevation of the existing timber factory yard is approximately +3.5m, which is almost the same height as the planned container yard. Reclamation work is therefore, not required for the container yard except for the area behind the berth.

Due to the site situation, settlement of the proposed container yard will be minimal. Assuming 2 tons/m^2 additional yard load, the settlement of the yard surface is anticipated to be 15 to 25 cm in 20 years.

(3) Retaining Wall

A retaining wall for the yard is planned to be constructed behind the berth. The wall consists of steel sheet pile connected with anchor block wall by tie-rod.

The natural slope of the riverbed at quay area is steep. Since the relevant depth in front of the quay will be deeper in the future due to river erosion, the length of the tie-rod and size of sheet pile wall are bigger than normal condition. Slope protection under the berth is also considered.

(4) Pavement (Road, Container yard)

Roads and paved areas are identified by their type, as follows:

- Container storage areas and general cargo open storage
- RTG runway beam (RTG Lane)
- Container Sleeper
- Roads and other areas of Container Terminal

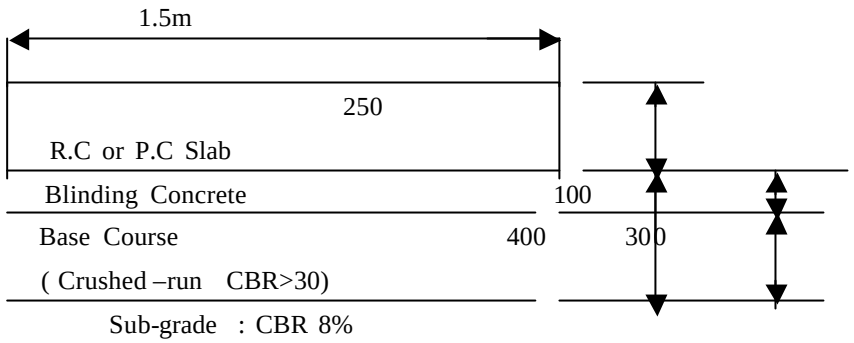
The following pavement types will be considered:

1) Container storage areas and general cargo open storage
   The structure of the pavement for the container storage area except for the RTG lanes and the container sleepers is planned and recommended as follows.

Interlocking Concrete Block	80 mm
Sand and bedding	50 mm
Cement Stabilized base course (30kgf/cm^2, 7days)	200 mm
Crushed –run sub-base course (CBR > 30)	300 mm
Sub-grade (CBR > 8%)	

2) RTG runway beams

Rubber Tired Gantry Crane (RTG) is required the long span passage with 1.5m width in order to stand a loading force of more than 38 tons per wheel. The lanes are generally required to be made of reinforcing concrete slab (RC slab) or PC slab, The section of the recommended structure is as follows.



3) Container Sleeper

The basement sitting for the containers is planned to be the heavy structure Container Sleeper having 1.5m width and the same structure as RTG lane. The containers should be stacked and arranged at fixed positions in the yard for identification of the container.

4) Roads and other areas of Container Terminal

The vehicle traffic lanes adjacent and parallel to the container stacking areas and access road to the terminal are planned and recommended in the following section.

Portland Cement Concrete Surface	250 mm
Base Course (20kgf/cm^3)	300 mm
(Crashed stone for mechanical stabilization)	
Sub-grade (CBR > 8%)	

(5) Access Road

The access road to the terminal from the existing provincial road is included in this project. The existing access road is too narrow and steep to accommodate loaded trailer trucks. The new road is planned with a slope of 5 % maximum and two lanes with a walkway in each direction.

The general plan of the access road including cutting and sloping plan is shown in Figure 32.2.4.

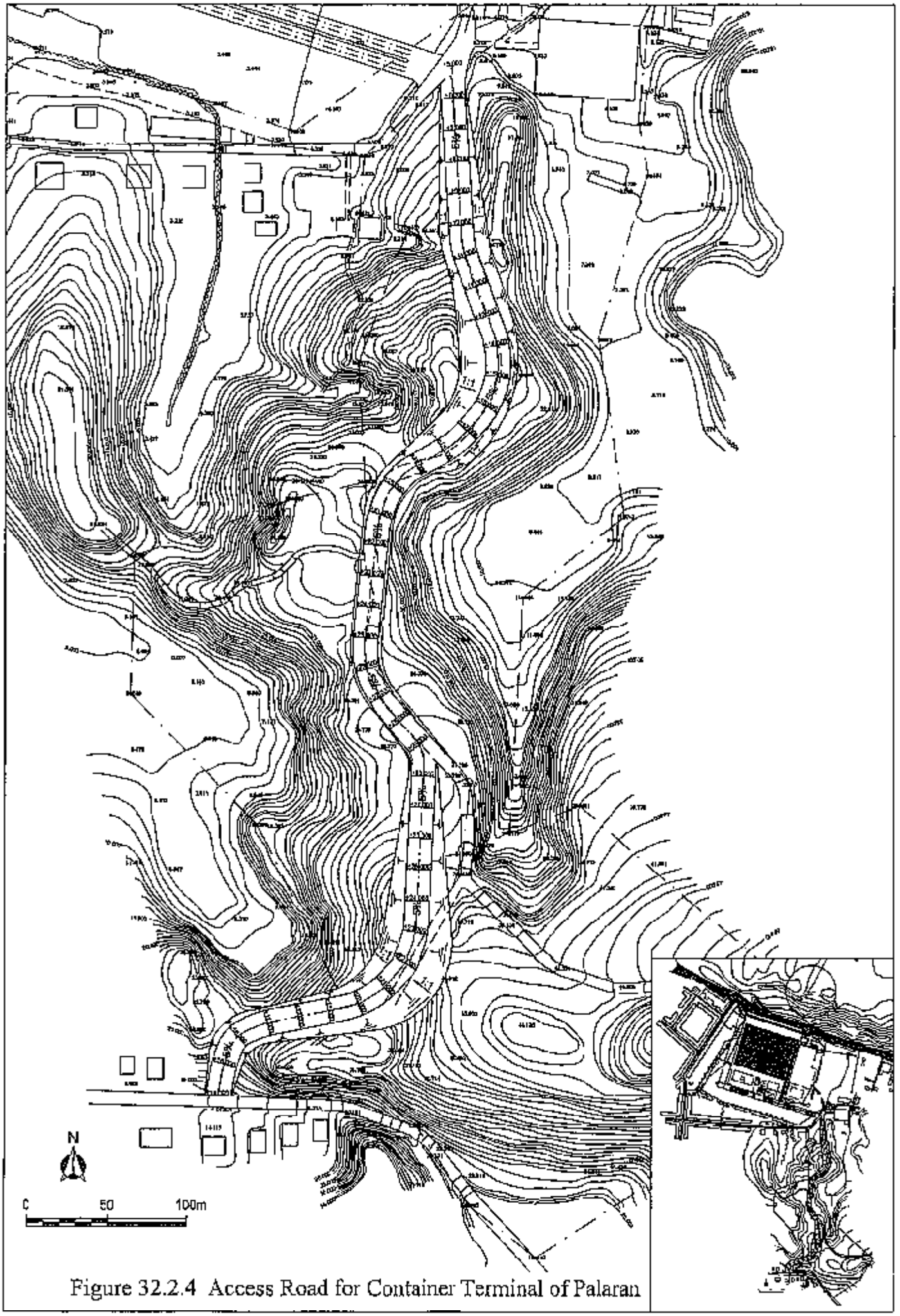


Figure 32.2.4 Access Road for Container Terminal of Palaran

(6) Buildings

The basic design concept of architecture zoning will be adopted to ensure efficient space utilization of the buildings. Design for these buildings and structures shall consider the future port development. The proposed buildings to be established in this project are summarized in Table 32.2.2.

Table 32.2.2 Summary of Buildings

Building	Floor Area (m2)	Number of Peoples	Foundation Structure	Column Structure	Stories
Office Building	800	50	R.C Piles	R.C	2
Maintenance Shop	1,750	10	R.C Piles	R.C	1
Main Gate House	6–Lanes	10	R.C Base	R.C	1
CFS (6 berth)	3,520 (4,000)	10	R.C Piles	R.C	1
Canteen & Workers Room	150	30	R.C Base	R.C	1

1) Terminal Office Building

The building is planned as two stories having 20 m width and 20 m length supported by RC pile foundation. The horizontal zoning concept is that each floor is broadly divided into two parts with a common area, which is allocated at the middle of the building, staircase and void space, in order to provide each area with natural ventilation. The space for this building is vertically and horizontally divided into two floor zones to be utilized by different divisions and common spaces

2) CFS

One container freight station (CFS) in the terminal is recommended. CFS shed has dimension of 40 m width and 88 m length for 4-berth case, 100 m for 6-berth case, with 6 m deep canopy on the both sides and supported by RC pile foundation. The shed has 450 m^2 for damaged cargo storage and 150 m^2 foroperator's room.

One side of the CFS shed has a platform which is 3 m width, 1.3 m height from the ground elevation in order to facilitate cargo handling from/to containers on chassis and the other side of the CFS shed has a slope way for in-coming and out-going containers directly by trucks.

The building will be designed to utilize natural environment resources for lighting and ventilation. Thus, the building will be provided with skylight at the top of the roof and movable high-side windows.

3) Maintenance Shop

The building is planned to have 35 m width and 50 m length supported by RC pile foundation. The routine works of this facility are inspections and repair works for the container handling equipment. Annual and monthly inspections required for vehicles, RTG and other handling equipment utilized in the container terminal are expected to be performed.

One overhead hoist crane shall be installed inside for the aid of repair works. The building will also be provided with skylight at the top of the roof and movable high-side windows.

4) Main Gate

Three lanes for incoming, two lanes for outgoing and one oversize lane for both traffics are planned at the main gate. The gatehouse is designated to process and inspect vehicle and container as they leave or enter the terminal. The checking booths with computer communication lines in the gatehouse are installed at side of the lanes respectively. The gate is a one roof structure having 20 m width and 32 m length supported RC columns. Columns are installed at both sides of the checking booths located between the lanes.

In addition, one track scale with 40 tons capacity will be installed at incoming lanes in the gatehouse in order to check the weight of containers.

(7) Utilities

1) Drainage System

The drainage system (storm water drainage) is based on rainfall intensity and catchments area. The main drainage lines are designed to divide into two main drainage lines with underground RC pipes so these outlets could discharge to the river directory. Storm water is collected into main drainage lines by the concrete trenches installed in the area of terminal.

2) Power Supply System

Since electric power could be received from PLN (National Electric Company) in Palaran, a sub-station to receive it is provided in the terminal. In addition, emergency generator (1000 kVA) is considered for the site. The lighting system for the facilities such as yard, buildings and road for container terminal and electrical power for equipment are provided from the sub station.

3) Water Supply

Since the existing fresh water supply service is not sufficient at Palaran site, a fresh water plant is to be provided using deep well or river water.

The water supply system is arranged to supply the buildings, berthing ships, green belt and fire hydrant systems. The main water pipeline (6”) from the deep well and distribution pipe (4”) in the terminal are installed underground. The water demands are assumed 35 tons/day for the buildings and 80 tons/day for ships.

4) Sewerage System and Other Utilities

Waste water from buildings, canteen, and those toilets are to be discharged to a septic-tank and treated naturally. Therefore, septic-tanks are to be installed for individual facilities around the buildings.

Other utilities such as communication system and navigation aids will be provided in this project.

32.2.4 Scope of Works

The scope of works for the general cargo terminal and the container terminal is summarized in Table 32.2.3.

Table 32.2.3 Scope of Works for Short Term Development in Samarinda

4 Berths Scenario					6 Berths Scenario				
Construction			unit	Quantity	Construction			Unit	Quantity
(1)	Mobilization and Demobilization		L.S	1	(1)	Mobilization and Demobilization		L.S	1
(2)	Dredging & Reclamation				(2)	Dredging & Reclamation			
	1)	Dredging	m3	11,700		1)	Dredging	m3	21,000
	2)	Reclamation	m3	4,500		2)	Reclamation	m3	9,300
(3)	Berth Construction				(3)	Berth Construction			
	1)	Steel Pipe Piling Work (D=600)	m	12,300		1)	Steel Pipe Piling Work (D=600	m	16,200
		Earth auger	point	0			Earth auger	point	0
	2)	Concrete Deck				2)	Concrete Deck		
		Concrete Placing	m3	4,125			Concrete Placing	m3	6,000
		Re-bar Work	ton	454			Re-bar Work	ton	660
	3)	Retaining Wall				3)	Retaining Wall		
		Sheet Piling Work	m	10,150			Sheet Piling Work	m	15,450
		Concrete Coping Work	m3	346			Concrete Coping Work	m3	490
		Tie-rod & Anchor Block	No.	181			Tie-rod & Anchor Block	No.	490
		Backfill Stone	m3	3,250			Backfill Stone	m3	4,900
		Backfill	m3	4,500			Backfill	m3	6,500
	4)	Slope Protection	m2	7,600		4)	Slope Protection	m2	11,400
	5)	Wharf Fittings				5)	Wharf Fittings		
		Fender & Bollard	set	18			Fender & Bollard	set	32
		Crane Rail Fittings	m	500			Crane Rail Fittings	m	750
	6)	Yard Preparation	L.S	1		6)	Yard Preparation	L.S	1
(4)	Yard Pavement				(4)	Yard Pavement			
	1)	Block Paving	m2	27,500		1)	Block Paving	m2	27,500
	2)	RTG Lane	m2	4,950		2)	RTG Lane	m2	4,950
	3)	Container Sleeper	m2	6,425		3)	Container Sleeper	m2	6,425
	4)	Concrete Paving	m2	41,000		4)	Concrete Paving	m2	51,950
(5)	Access Road				(5)	Access Road			
	1)	Cutting & Filling & Grading	L.S	1		1)	Cutting & Filling & Grading	L.S	1
	2)	Concrete Paving	m2	30,500		2)	Concrete Paving	m2	30,500
	3)	Utilities	L.S	1		3)	Utilities	L.S	1
(6)	Buildings				(6)	Buildings			
	1)	Demolishing Existing Facilities	L.S	1		1)	Demolishing Existing Facilities	L.S	1
	2)	CFS (1 Unit)	m2	3,520		2)	CFS (1 Unit)	m2	4,160
	3)	Gate	m2	500		3)	Gate	m2	500
	4)	Terminal Office Building	m2	800		4)	Terminal Office Building	m2	800
	5)	Work Shop	m2	1,750		5)	Work Shop	m2	1,750
	6)	Canteen	m2	150		6)	Canteen	m2	150
(7)	Yard Fence		m	1,100	(7)	Yard Fence		m	1,000
(8)	Drainage System		L.S	1	(8)	Drainage System		L.S	1
(9)	Power Supply & Yard Lighting		L.S	1	(9)	Power Supply & Yard Lighting		L.S	1
(10)	Water Supply System		L.S	1	(10)	Water Supply System		L.S	1
(11)	Sewerage System		L.S	1	(11)	Sewerage System		L.S	1
(12)	Other Utilities		L.S	1	(12)	Other Utilities		L.S	1
Equipment					Equipment				
	1)	Gantry Crane	Unit	2		1)	Gantry Crane	Unit	3
	2)	RTG	Unit	4		2)	RTG	Unit	6
	3)	Tractor & Trailer	Unit	8		3)	Tractor & Trailer	Unit	12

32.2.5 Cost Estimate

The project cost for the short term development in Samarinda is estimated based on the following basic assumptions.

(1) Unit Cost and Exchange Rate

The project cost are estimated based on the unit price as of 2001 and the foreign currency exchange rate of US$ = 9,500 Rupiah (Rp) = 118 Yen.

(2) Construction Cost

The direct construction cost is estimated based on the results of the quantities and the unit price for the construction works. The unit price was obtained by accumulating labour cost with income tax and indirect expense, materials cost and construction equipment cost for operation of the work. In addition to the direct construction works, 6% of the direct construction cost for the common temporary works, 13% of the direct construction cost for site expenses and 8% of the direct construction cost for over head are added for the construction cost. These percentages are based on reference to other similar project in Indonesia.

(3) Procurement Cost

The procurement unit price are determined based on the imported CIF Jakarta price including installation costs of the individual unit price of items and costs of spare parts for two years.

(4) Currency Co mponent

The each unit price was split into foreign currency and local currency portions, both indicated in Rupiah, estimated in the following classifications:

1) The foreign currency component consists of :
   - -Imported Construction materials
   - -Foreign components of depreciation and operation/maintenance cost for construction equipment and plant
   - -Foreign component of domestic materials
   - -Salaries and costs of foreign personnel
2) The local currency component consists of :
   - -Local construction materials
   - -Local components of depreciation and operation/maintenance cost for construction equipment and plant
   - -Salaries and costs of local personnel
   - -Import duty on imported materials
   - -Indonesian taxes

(5) Depreciation Period

For the economic analysis, the depreciation period of the constructed facilities and the procured equipment are determined as shown in Table 32.2.4.

Table 32.2.4 Depreciation Period of the Facilities and Equipment

Facility	Depreciation Period	Remarks
Berth , Retaining Wall	50 years	
Warehouse, CFS	50 years	
Yard Pavement	35 years	
Road Pavement	35 years	
Buildings	40 years	
Equipment	**Depreciation Period**	**Remarks**
Quay gantry Crane	25 years	
RTG	20 years	
Mobile Crane	15 years	
Reach Stacker	15 years	
Tractor & Chassis	10 years	
Forklift	10 years	

(6) Maintenance Cost (Facility, Equipment, Dredging)

The maintenance cost for facilities is set out as 2% of the construction cost of the facility based on the annual maintenance fee of the facilities. Also, the maintenance cost for the equipment is adopted as 3% of the equipment cost. The maintenance dredging cost is determined as annual maintenance dredging cost of the river done by P.T PENGERUKAN INDONESIA (RUKINDO).

Maintenance dredging cost = Rp13,000/m^3.

Maintenance dredging volume : 600,000 m^3

(7) Project Cost

In addition to the construction cost, equipment cost, the engineering fee of 12% for the construction and 3% for the equipment, the physical contingency of 10% for the construction and VAT of 10% for the whole cost are considered in the project cost.

The project cost for the short term development in Samarinda is shown in Table 32.2.5. The equipment cost for Samarinda is shown in Table 32.2.6. The construction cost for Samarinda is shown in Table 32.2.7 for 4 Berth Case and Table 32.2.8 for 6 Berth Case.

Table 32.2.5 Project Cost for Short Term Development for Samarinda

(Unit in Million Rp.)

	Civil Work		Equipment		Total		
	Foreign	Local	Foreign	Local	Foreign	Local	Total
Samarinda - Existing Port	0	0	12,371	1,452	12,371	1,452	13,823
Palaran: 4-Berth Case	100,296	54,643	118,158	15,083	218,454	69,726	288,180
Palaran: 6-Berth Case	124,132	64,735	177,238	22,623	301,370	87,358	388,728
Land Acquisition: 4-Berth						13,200	13,200
Land Acquisition: 6-Berth						13,200	13,200
Compensation						15,000	15,000
Samarinda Total: 4-Berth	100,296	54,643	130,529	16,535	230,825	99,378	330,203
Samarinda Total: 6-Berth	124,132	64,735	189,609	24,084	313,741	117,010	430.751

Table 32.2.6 Equipment Cost for Short Term Development for Samarinda

4 Berth Case					
		Description	Quantity	Unit Price (Million Rp)	Amount (Million Rp)
Existing Terminal	1	Mobile Crane (25t)	3	1,900	5,700
	2	Forklift (7T)	10	650	6,500
		Engineer Fee	3%		366
		VAT	10%		1,257
			Total		**13,823**
Palaran Container Terminal	1	Gantry Crane	2	32,000	64,000
	2	RTG	4	11,200	44,800
	3	Tractor & Trailer	8	1,100	8,800
		Engineering Fee	3%		3,528
		VAT	10%		12,113
			Total		**133,241**
Grand Total					**147,063**
6 Berth Case					
		Description	Quantity	Unit Price (Million Rp)	Amount (Million Rp)
Existing Terminal	1	Mobile Crane (25t)	3	1,900	5,700
	2	Forklift (7T)	10	650	6,500
		Engineer Fee	3%		366
		VAT	10%		1,257
			Total		**13,823**
Palaran Container Terminal	1	Gantry Crane	3	32,000	96,000
	2	RTG	6	11,200	67,200
	3	Tractor & Trailer	12	1,100	13,200
		Engineering Fee	3%		5,292
		VAT	10%		18,169
			Total		**199,861**
Grand Total					**213,684**

Table 32.2.7 Construction Cost of 4 Berth Case for Samarinada

				Description	Unit	Quantity	Unit Price(Rp)	Phase I
1	Direct Construction Cost in PALARAN							
	(1)			Mobilization and Demobilization	L.S	1.00		3,200
	(2)			Dredging & Reclamation				
		1)		Dredging	m3	11,700	65,000	764
		2)		Reclamation	m3	4,500	30,404	139
	(3)			Berth Construction				
		1)		Steel Pipe Piling Work (D=600)	m	12,300	1,899,192	23,463
				Earth auger	point	0	47,500,000	0
		2)		Concrete Deck				
				Concrete Placing	m3	4,125	662,120	2,731
				Re-bar Work	ton	454	5,699,650	2,588
		3)		Retaining Wall				
				Sheet Piling Work	m	10,150	447,772	4,545
				Concrete Coping Work	m3	346	827,139	288
				Tie-rod & Anchor Block	No.	181	4,200,000	760
				Backfill Stone	m3	3,250	70,997	231
				Backfill	m3	4,500	5,404	24
		4)		Slope Protection	m2	7,600	270,408	2,055
		5)		Wharf Fittings				
				Fender & Bollard	set	18	124,000,000	2,170
				Crane Rail Fittings	m	500	1,315,000	658
		6)		Yard Preparation	L.S	1		2,560
	(4)			Yard Pavement				
		1)		Block Paving	m2	27,500	164,670	4,528
		2)		RTG Lane	m2	4,950	468,355	2,318
		3)		Container Sleeper	m2	6,425	411,358	2,643
		4)		Concrete Paving	m2	41,000	183,373	7,518
	(5)			Access Road				
		1)		Cutting & Filling & Grading	L.S	1	491,000,000	491
		2)		Concrete Paving	m2	30,500	183,373	5,593
		3)		Utilities	L.S	1	550,000,000	550
	(6)			Buildings				
		1)		Demolishing Existing Facilities	L.S	1	1,000,000,000	1,000
		2)		CFS (2 Units)	m2	3,520	1,420,000	4,998
		3)		Gate	m2	500	2,250,000	1,125
		4)		Terminal Office Building	m2	800	2,250,000	1,800
		5)		Work Shop	m2	1,750	1,420,000	2,485
		6)		Canteen	m2	150	1,420,000	213
	(7)			Yard Fence	m	1,100	456,000	502
	(8)			Drainage System	L.S	1		1,511
	(9)			Power Supply & Yard Lighting	L.S	1		4,333
	(10)			Water Supply System	L.S	1		1,900
	(11)			Sewerage System	L.S	1		975
	(12)			Other Utilities	L.S	1		250
	Total Direct Cost							**90,909**
3	Indirect Construction Cost							
	(1)			Common Temporary Work	%	6 to 8	D.C	5,455
	(2)			Site Expenses	%	13 to 15	D.C	11,818
	(3)			Overhead	%	8	D.C	7,273
	Total Indirect Cost							24,545
Total Construction Cost								**115,454**
				Physical Contingency	%	10	T.C	**11,545**
				Engineering Fee	%	12	T.C	**13,855**
				VAT	%	10	T.C,P.C,E.F	**14,085**
Total Project Cost								**154,940**
Land Acquisition Fee					m2	**275,000**	**48,000**	**13,200**
Compensation for existing fascility					m2	**15,000**	**1,000,000**	**15,000**

Table 32.2.8 Construction Cost of 6 Berth Case for Samarinda

				Description	Unit	Quantity	Unit Price(Rp)	Phase I
1	Direct Construction Cost in PALARAN							
	(1)			Mobilization and Demobilization	L.S	1		4,200
	(2)			Dredging & Reclamation				
		1)		Dredging	m3	21,000	65,000	1,365
		2)		Reclamation	m3	9,300	30,404	283
	(3)			Berth Construction				
		1)		Steel Pipe Piling Work (D=600)	m	16,200	1,899,192	30,792
				Earth auger	Point	0	47,500,000	
		2)		Concrete Deck				
				Concrete Placing	m3	6,000	662,120	3,973
				Re-bar Work	ton	660	5,699,650	3,762
		3)		Retaining Wall				
				Sheet Piling Work	m	15,450	447,772	6,916
				Concrete Coping Work	m3	490	827,139	405
				Tie-rod & Anchor Block	No.	490	4,200,000	1,140
				Backfill Stone	m3	4,900	70,997	348
				Backfill	m3	6,500	5,404	35
		4)		Slope Protection	m2	11,400	270,408	3,083
		5)		Wharf Fittings				
				Fender & Bollard	set	32	124,000,000	3,968
				Crane Rail Fittings	m	750	1,315,000	983
		6)		Yard Preparation	L.S	1		2,560
	(4)			Yard Pavement				
		1)		Block Paving	m2	27,500	164,670	4,528
		2)		RTG Lane	m2	4,950	468,355	2,318
		3)		Container Sleeper	m2	6,425	411,358	2,643
		4)		Concrete Paving	m2	51,950	183,373	9,526
	(5)			Access Road				
		1)		Cutting & Filling & Grading	L.S	1	491,000,000	491
		2)		Concrete Paving	m2	30,500	183,373	5,590
		3)		Utilities	L.S	1		450
	(6)			Buildings				
		1)		Demolishing Existing Facilities	L.S	1	1,000,000,000	1,000
		2)		CFS (2 Units)	m2	4,160	1,420,000	5,907
		3)		Gate	m2	500	2,250,000	1,125
		4)		Terminal Office Building	m2	800	2,250,000	1,800
		5)		Work Shop	m2	1,750	1,420,000	2,485
		6)		Canteen	m2	150	1,420,000	213
	(7)			Yard Fence	m	1,000	456,000	456
	(8)			Drainage System	L.S	1		1,283
	(9)			Power Supply & Yard Lighting	L.S	1		4,533
	(10			Water Supply System	L.S	1		1,425
	(11			Sewerage System	L.S	1		975
	(12			Other Utilities	L.S	1		250
	Total Direct Cost							**110,815**
3	Indirect Construction Cost							
	(1)			Common Temporary Work	%	6 to 8	D.C	6,649
	(2)			Site Expenses	%	13 to 15	D.C	14,406
	(3)			Overhead	%	8	D.C	8,865
	Total Indirect Cost							29,920
Total Construction Cost								**140,735**
				Physical Contingency	%	10	T.C	**14,074**
				Engineering Fee	%	12	T.C	**16,888**
				VAT	%	10	T.C,P.C,E.F	**17,170**
Total Project Cost								**188,866**
Land Acquisition Fee					m2	355,000	48,000	**13,200**
Compensation for existing fascility					m2	15,000	1,000,000	**15,000**

32.3 Implementation Plan for Short Term Development of Samarinda

32.3.1 Construction Presumption

(1) Working days for construction

The working days considered in the construction schedule are basically every day except Sunday, National holidays and heavy rain days. The number of working days per month is determined as follows

Civil Works: 23 days/month

Building Works: 25 days/month

(2) Productivity of the Works

The following productivity of the works are applied for the construction schedule.

Fabrication and Transportation of Steel Piles: three (3) month from order

Dredging: 300 m^3/day (Clam shell mounted on barge)

Reclamation: 300 m^3/day (reclaimed by dump truck & bulldozer)

Driving of Steel Pipe Pile: 2 piles/day x parties

Driving of Steel Sheet Pile: 10 piles/day

Concrete Work: 25 m^3/day

Pavement (Concrete Block): 120 m^2/day

Pavement (Concrete): 170 m^2/day

Building Construction (RC Office): 10 m^2/day

Building Construction (RC Shed): 20 m^2/day

32.3.2 Project Implementation Schedule

The project implementation schedule includes consulting services for detailed design stage, tendering stage and construction supervision and construction stage of the project. The consulting services before construction are assumed to be for one year. Based on these assumptions for construction, the prospective implementation schedule is prepared as shown in Figure 32.3.1 for the 4-Berth Scenario, in Figure 32.3.2 for the 6-Berth Scenario.

Table 32.3.1 Implementation Schedule for 4 Berth Scenario

Description	Unit	Quantity	Remarks
Consulting Services			
(1) Detail Design (D/D)		1	
(2) Assist to Tender		1	
(3) Contract & Supervision (S.V)		1	
Construction			
(1) Mobilization and Demobilization	L.S	1	
(2) Dredging & Reclamation			
1) Dredging	m3	11700	300m3/day
2) Reclamation	m3	4500	300m3/day
(3) Berth Construction			
1) Steel Pipe Piling Work (D=600)	m	12300	320 pieces (4/day)
Earth auger	point	0	
2) Concrete Deck			
Concrete Placing	m3	4125	25m3/day
Re-bar Work	ton	454	
3) Retaining Wall			
Sheet Piling Work	m	10150	725 pieces (10/day)
Concrete Coping Work	m3	346	
Tie-rod & Anchor Block	No.	181	
Backfill Stone	m3	3250	
Backfill	m3	4500	
4) Slope Protection	m2	7600	75m2/day
5) Wharf Fittings			
Fender & Bollard	set	18	
Crane Rail Fittings	m	500	
6) Yard Preparation	L.S	1	
(4) Yard Pavement			
1) Block Paving	m2	27500	120m2/day
2) RTG Lane	m2	4950	
3) Container Sleeper	m2	6425	
4) Concrete Paving	m2	41000	170m2/day
(5) Access Road			
1) Cutting & Filling & Grading	L.S	1	
2) Concrete Paving	m2	30500	170m2/day
3) Utilities	L.S	1	
(6) Buildings			
1) Demolishing Existing Facilities	L.S	1	
2) CFS (1 Unit)	m2	3520	20m2/day
3) Gate	m2	500	10m2/day
4) Terminal Office Building	m2	800	10m2/day
5) Work Shop	m2	1750	20m2/day
6) Canteen	m2	150	
(7) Yard Fence	m	1100	
(8) Drainage System	L.S	1	
(9) Power Supply & Yard Lighting	L.S	1	
(10) Water Supply System	L.S	1	
(11) Sewerage System	L.S	1	
(12) Other Utilities	L.S	1	
Equipment			
(1) Consulting Services (D/D, Tender, S.V)			
(2) Existing Port			
1) Mobile Crane (25t)	Unit	3	
2) Forklift (7t)	Unit	10	
(3) Palaran			
1) Gantry Crane	Unit	2	
2) RTG	Unit	4	
3) Tractor & Trailer	Unit	8	

Table 32.3.2 Implementation Schedule for 6 Berth Scenario

Description	Unit	Quantity	Remarks
Consulting Services			
(1) Detail Design		1	
(2) Assist to Tender		1	
(3) Contract & Supervision		1	
Construction			
(1) Mobilization and Demobilization	L.S	1	
(2) Dredging & Reclamation			
1) Dredging	m3	21000	300m3/day
2) Reclamation	m3	9300	300m3/day
(3) Berth Construction			
1) Steel Pipe Piling Work (D=600)	m	16200	475pieces (4/day)
Earth auger	point	0	
2) Concrete Deck			
Concrete Placing	m3	6000	25m3/day
Re-bar Work	ton	660	
3) Retaining Wall			
Sheet Piling Work	m	15450	1100pieces (10/day)
Concrete Coping Work	m3	490	
Tie-rod & Anchor Block	No.	490	
Backfill Stone	m3	4900	
Backfill	m3	6500	
4) Slope Protection	m2	11400	75m2/day
5) Wharf Fittings			
Fender & Bollard	set	32	
Crane Rail Fittings	m	750	
6) Yard Preparation	L.S	1	
(4) Yard Pavement			
1) Block Paving	m2	27500	120m2/day
2) RTG Lane	m2	4950	
3) Container Sleeper	m2	6425	
4) Concrete Paving	m2	51950	170m2/day
(5) Access Road			
1) Cutting & Filling & Grading	L.S	1	
2) Concrete Paving	m2	30500	170m2/day
3) Utilities	L.S	1	
(6) Buildings			
1) Demolishing Existing Facilities	L.S	1	
2) CFS (1 Unit)	m2	4160	20m2/day
3) Gate	m2	500	10m2/day
4) Terminal Office Building	m2	800	10m2/day
5) Work Shop	m2	1750	20m2/day
6) Canteen	m2	150	
(7) Yard Fence	m	1000	
(8) Drainage System	L.S	1	
(9) Power Supply & Yard Lighting	L.S	1	
(10) Water Supply System	L.S	1	
(11) Sewerage System	L.S	1	
(12) Other Utilities	L.S	1	
Equipment			
(1) Consulting Services (D/D, Tender, S.V)			
(2) Existing Port			
1) Mobile Crane (25t)	Unit	3	
2) Forklift (7t)	Unit	10	
(3) Palaran			
1) Gantry Crane	Unit	3	
2) RTG	Unit	6	
3) Tractor & Trailer	Unit	12	

32.4 Operation and Management Scheme

In a short-term plan for 2007, following measures are needed.

32.4.1 Development of Port Facilities

Port facilities have not been sufficiently developed due to a lack of funds. Development of port facilities in Samarinda is needed in the short-term. Samarinda ADPEL and the other port-related offices are operating in the port areas. They need to be relocated to outside of the port yard.

32.4.2 Review of Port Working Area and Port Interest Area

It is necessary to review the port working area (land area and water area) and the port interest area (water area) of Samarinda Port. They should be reviewed in accordance with the new port regulation (Government Regulation No.69/2001). The cost-sharing scheme of the maintenance dredging should be taken into account in reviewing those areas.

32.4.3 Simplification of port procedures

IPC IV Samarinda branch office provides various port services such as ship service, cargo service, and terminal service as a port authority. On the other hand, Samarinda ADPEL is managing port and channel navigation safety as a harbormaster in Samarinda port.

It takes a long time for port users to receive permission from the port office, particularly for port entry and berth assignment. Port-related procedures need to be simplified by introducing an EDI system. They should be processed in a fair and prompt manner. Introduction of a processing manual, unification of the application forms, delegation of the authority to local offices and application of standard processing time are among the measures to be considered.

32.4.4 Maintenance Dredging

Maintenance dredging of the access channel is carried out by Ministry of Communications and IPC IV. They make an agreement on this matter every year. The provincial government of Samarinda is expected to bear a part of the cost after decentralization. Therefore, it is necessary to establish a cost-sharing scheme, which is acceptable for the parties concerned.

32.4.5 Improvement of Navigational Safety

Samarinda ADPEL is responsible for the navigation safety in the Samarinda port and Mahakam River. It is necessary to increase light buoys to secure safety for night navigation.

32.5 Economic Analysis of the Short Term Plan for Samarinda

32.5.1 Introduction

The short term plans for Samarinda port were described in Section 32.1 and capital and maintenance costs established in Section 32.2.

The important aspect for economic analysis of any project is to relate the proposed expenditure to their related benefits. Accordingly, the evaluation of the short term plans is undertaken in exactly the same way as the evaluation of the Master Plan, but with the following differences:

1) Capital and maintenance costs are as described in Section 31.2
2) Incremental operating costs are restricted to the short term investment
3) General methodology is as for the Master Plan and as described below
4) Benefits are restricted to the capacity of the short term plans
5) Benefits are related to the impact of the investment which will be largely at Palaran

32.5.2 General Introduction to Economic Evaluation

The purpose of economic evaluation is to provide a view of the feasibility of investment from the national, resource viewpoint. It differs from financial analysis which provides information on the direct financial implications of investment including profitability.

Economic evaluation, therefore, considers only resource costs and excludes transfers such as taxes. It also takes into account the price of local (non-traded) inputs which may be overpriced or underpriced relative to market conditions.

In this project, the 'without' scenario is defined as the existing port at Samarinda having minimal development and very little change occurring in infrastructure, equipment and operational procedures.

In this project, under the 'without' case, the existing port facilities will be used to their maximum capacity with an increasing degree of congestion and delay at the berths and in the terminals. This would result in increased waiting time, lower port efficiency and increased transport costs. Container traffic would also be handled at the existing general cargo berths at lower handling rates than would be anticipated at specialized berths.

Ultimately, traffic would be increasingly diverted to other ports such as Balikpapan and this is already happening to some extent, although Balikpapan will not be an adequate alternative until the planned Kariangau terminal is built. Kariangau is expected to be completed by 2007 and is a key policy objective of East Kalimantan government.

Under the 'with' project scenario the specialized and additional facilities will enable cargo to be handled more efficiently and cost effectively with ships experiencing less queuing and faster on berth turnaround times.

32.5.3 Methodology

This section evaluates the Short Term Plan in economic terms. This plan is developed within the Master Plan which was evaluated in Section 30.13.

Economic analysis is carried out by means of well-developed techniques and the EIRR (Economic Internal Rate of Return) and NPV (Net Present Value) are the two most often used.

To calculate the NPV of a project, the discount rate is input and a discounted project value (i.e., the value of the project in today's values) is the output. If the output is greater than zero, the project is economically feasible.

In Indonesia, in recent years, the minimum rate required for projects has been 15 percent for non-social projects and 12 percent for social projects such as housing.

Both local costs and all benefits are shadow priced. The foreign portion is regarded as already at market prices so no adjustment is made for imported (traded) inputs.

All costs and benefits are expressed in real terms (i.e., there is no allowance for inflation) although costs and benefits may be increased if there is expected to be an increase in real terms (i.e., above the general level of inflation). Costs and benefits are expressed in real or constant values in the base year of study which for this project is 2001.

The exchange rate used throughout is US$1.0=Rp.9,500.

32.5.4 Project Period

Infrastructure projects are expensive but have long economic and physical lives. Hence, the evaluation period is usually at least 20 years, excluding construction, and often 30 years. Thirty years has been chosen for this project. Costs and benefits are specified for each of the project years. Discounting means that costs and benefits after about 20 years usually have relatively small impacts on the economic feasibility. The short-term nature of the title refers to the initial phase of investment as the life of the any infrastructure or equipment will be the same whether in the Master Plan of Short Term Plan.

32.5.5 Project Costs

Costs for each scenario are divided into capital costs and annual costs. Capital costs are incurred both for the initial investment, and any subsequent, phase and for replacement of fully depreciated assets within the 30 year period (usually equipment has an economic life of less than 30 years).

The economic costs of implementing the projects have been estimated based on the financial cost including physical contingency. Price contingency, interest during construction and taxes and duties are then all excluded from the financial cost.

In order to shadow price the projects costs and benefits, a standard conversion factor (SCF) of 0.924 has been generally applied to non-traded (local portion) costs and benefits and a specific factor of 0.75 has been applied to unskilled labour. These factors are currently being applied in other Indonesian project evaluations.

Annual costs (i.e., operating and maintenance costs) are assumed to have only a moderate local content and a SCF of 0.9 has been applied.

All traded costs (foreign portion) have been valued at their border price (i.e., the SCF is assumed as 1.0).

1) Capital Costs and Maintenance Costs
   These have been specified in Section 29.10 and the assumptions made detailed therein. The without scenario envisages minimal development and so the capital and maintenance costs are the incremental costs. Current maintenance expenditure is minimal.

2) Operating Costs
   These have been projected originally for the branch based on 1999 and 2000 data and then converted to incremental costs based on incremental cargo volumes for each scenario. The estimates involve a two-stage process. First a realistic assessment of the base year data is needed to establish the reliability of the data and then the future year costs must be estimated taking into account that some costs will directly vary with cargo growth and other costs are fixed or semi-fixed.

   Base year costs were reviewed in relation to other Indonesian ports including on an IPC-wide basis for the 4 IPCs. Secondly, cost data was disaggregated and an estimate made of the likely proportion of fixed sub-costs and variable sub-costs. Based upon a weighted average of these two, an estimate could be made of the link between cargo growth and operating cost growth. So for example, at Samarinda, as cargo growth increases by 10 %, operating costs were estimated to increase by 5%-6%.

   In the short-term plans the operating costs which were applied in the Master Plan are adjusted in two ways:
   a. Costs are not increased beyond the capacity year
   b. Costs are adapted to reflect the actual short term project (e.g. incremental costs for the existing terminal are excluded)

3) Dredging Costs
   Dredging costs are subsidised (i.e., RUKINDO contracts are less than cost recovery price), and so a substantially increased price has be allowed. However, it is unclear whether any subsidy still remains in our estimated prices. Hence, only dredging costs are shadow priced by removing the taxable element. As dredging is capital intensive, the shadow pricing of dredging would have only a marginal impact in any case.

32.5.6 Benefits-Quantifiable

The principal quantified benefits of each such project are reduction in ship waiting time in port and/or queuing and avoided land transport and /or transhipment costs. The benefits of the land side passenger terminal area improvements include reduced passenger and vehicle waiting times.

All benefits are kept constant from the year in which capacity of the short term plan is reached, as noted for the operating costs. The capacity of the project is described in Section 32.1

a. Ship Queuing and Savings to Ships

Ship waiting time with and without the project are estimated with a simulation model and this is described in Section 20.11. The resulting time savings are then costed by applying the daily cost of the average vessel in key years. Vessel cost per day by was established by surveys with ship operators and charterers. These costs are increased in real terms in line with the increased size of vessel projected over time. There is considerable competition in shipping rates at present with the economic recession in Indonesia and elsewhere, but the possible increase in real costs over time is difficult to estimate.

The three types of vessels handled at Samarinda public port are container, general cargo and passenger vessels. Since passenger vessels get priority on arrival, are relatively few and the proposed terminal is not planned until 2019, savings to passenger vessels are ignored at this stage of the economic analysis.

Ship costs per day are interpolated between 2007 and 2025.

Type of Vessel	GRT, Tonne (t) or TEU	Year	Cost per Day (Rp.m.)
Container	227 teu	In 2007	26.6
	405 teu	**By** 2025	40.9
General Cargo	357 ton/300-400 grt	In 2007	6.2
	899 ton/650-900 grt	**By** 2025	11.4

Notes: Conversion of tonnes to GRT or v.v. based on Indonesian fleet data and load factors

Sources: Research in Indonesia with shipping companies and charterers.

b. Ship Service Time on Berth and Savings to Ships

Benefits are also generated by the faster turnaround of vessels. The simulation model gives time on berth with and without project and annual savings are calculated and costed as in a) above.

c. Avoided Transport Costs

At the point at which the 'without' project capacity is reached, overflow cargo is assumed to be handled elsewhere. In accordance with the likely situation, the It is assumed 100 % will be handled at Balikpapan/Kariangau about 105 km from

Samarinda. The avoided costs (benefits) are based on the economic cost of truck transport based on data used in Indonesia for highway planning.

Road transport costs are based on cost models currently in use in Indonesia. These models are based on the World Bank Highway Development Manual and adapted over many years to Indonesian conditions. The main inputs are vehicle type, speed and road surface.

Heavy truck costs are estimated to amount to Rp 3,096 per truck/km assuming that each truck will carry 10 tonnes payload. A load factor of 90 % is assumed bearing in mind traffic imbalance but also probable truck overloads.

It is quite possible that in a regional port study, there would be justification of including some additional capital costs for 'overflow' ports and other infrastructure. In this study, since a specific Master Plan is being assessed, and the regional infrastructure requirements are not considered in detail.

c. Transport Disbenefits

Palaran is about 20 km from the existing Samarinda port and there will be some disbenefit from the additional distance. However, companies are likely to move in the longer term nearer the port and industrial development areas are planned in the Palaran area. Further, Samarinda city will become increasingly congested and impose penalties on port users.

The disbenefit is assumed to be on the same cost basis as the avoided costs above.

However, for the reasons above, it is assumed that in year 1 of operation the disbenefit for container traffic will be 100 % of the maximum. By 2025 this percentage is assumed to fall to 20 % with the increasing relocation of businesses (In this regard, Palaran is assumed to have more advantageous location than Marang Kayu).

Traffic is forecast only up to 2025 and therefore, by convention, all benefits are kept constant thereafter to avoid overestimation.

32.5.7 Unquantified Costs and Benefits

Environmental and social impacts are usually impossible or very difficult to quantify in monetary terms.

Similarly, the generation of employment and employment opportunities, development of the economy and the facilitation of agriculture, trade and industry are all aspects which this project will help develop in a very important manner.

As described in Chapters 8 and 9, East Kalimantan province is resource rich and requires improved river/sea transport to provide much needed support to exploit these resources.

The Samarinda Port Master plan sets out to significantly support economic development through the phased implementation of infrastructure and equipment, together with associated operational and related improvements.

The net benefits are shadow priced at 0.923. Conventionally, only benefits to Indonesian shippers and others are included. It is, therefore, assumed 10% of benefits accrues to foreign entities.

32.5.8 Residual Values

The cost of land has been allowed to appreciate at 3 % in real terms per year as part of the residual value in 2036. It is also assumed that none of the equipment but that all infrastructure provided between 2020 and 2036 will have 50% life remaining.

The resultant value (about US$18.0 million) has little discernable effect on the EIRR

32.5.9 Results of the Economic Evaluation of the Short Term Plans

The EIRR for the proposed Short-Term Plan was estimated as shown in table 32.5.1 which also shows the sensitivity analysis.

Table 32.5.1 EIRR Analysis for Short-Term Plan-4 Berth Option

Samarinda Port Master Plan	EIRR of the 4 Berth option	All Costs: Plus 10%	Benefits: Minus10%	Costs and Benefits Reductions in columns (2) and (3) Combined
	(1)	(2)	(3)	(4)
EIRR (%)	22.1	20.3	20.1	18.2

The EIRR analysis show that the Short Term Plan is economically viable and that even with two unfavourable factors combined the EIRR remains well above 15 percent. At 15 % discount rate, the Net Present Value (NPV) amounts to Rp. 120,214 million. Any positive value of the NPV means the project is viable.

Table 32.5.2 EIRR Analysis for Short-Term Plan-6 Berth Option

Samarinda Port Master Plan	EIRR of the 6 Berth Option	Costs (plus 10%)	Benefits (minus10%)	Costs and Benefits Reductions in columns (2) and (3) Combined
	(1)	(2)	(3)	(4)
EIRR (%)	18.8	17.1	16.9	15.5

The 6-berth option costs significantly more than the 4-berth but the incremental benefits between options are either small or not easily measurable.

The EIRR analysis show that the 6 berth Short Term Plan is economically viable but that even with two unfavourable factors combined the EIRR remains above 15 percent. At 15 % discount rate, the Net Present Value (NPV) amounts to Rp. 88,013 million. Any positive value of the NPV means the project is viable.

Table 32.5.3 ECONOMIC ANALYSIS - EIRR AND NPV for SHORT TERM PLAN FOR SAMARINDA - 4 BERTH

Number	Year	Container Benefits	General Cargo	Avoided Cost	Benefits	Land Transport Disbenefits	NET BENEFIT	Capital Costs	Maintenance and Dredging Costs	NET COST BENEFITS
1	2004							-6,444	0	(6,444)
2	2005							-107,536	0	(107,536)
3	2006							-171,744	0	(171,744)
4	2007	62,076	564	20,052	82,692	(11,677)	58,992	0	-14,801	44,191
5	2008	64,282	582	31,036	95,901	(11,213)	70,351	0	-15,089	55,261
6	2009	66,583	601	39,551	106,735	(10,254)	80,147	0	-15,386	64,761
7	2010	68,983	601	48,492	118,076	(9,377)	90,296	0	-15,693	74,603
8	2011	71,487	601	48,492	120,580	(8,575)	93,043	0	-16,010	77,032
9	2012	73,047	601	48,492	122,140	(7,841)	94,948	0	-16,010	78,937
10	2013	74,697	601	48,492	123,789	(7,170)	96,875	0	-16,010	80,865
11	2014	76,442	601	48,492	125,534	(6,557)	98,834	0	-16,010	82,824
12	2015	78,287	601	48,492	127,379	(5,996)	100,833	0	-16,010	84,822
13	2016	80,238	601	48,492	129,330	(5,483)	102,879	-15,102	-16,010	71,767
14	2017	82,301	601	48,492	131,393	(5,014)	104,983	0	-16,010	88,972
15	2018	84,483	601	48,492	133,575	(4,586)	107,151	0	-16,010	91,141
16	2019	86,790	601	48,492	135,882	(4,193)	109,394	0	-16,010	93,383
17	2020	89,229	601	48,492	138,322	(3,835)	111,718	0	-16,010	95,708
18	2021	91,809	601	48,492	140,902	(3,507)	114,134	-5,622	-16,010	92,501
19	2022	94,538	601	48,492	143,630	(3,207)	116,650	0	-16,010	100,639
20	2023	97,423	601	48,492	146,515	(2,932)	119,274	0	-16,010	103,264
21	2024	100,473	601	48,492	149,566	(2,682)	122,017	0	-16,010	106,006
22	2025	103,700	601	48,492	152,792	(2,452)	124,887	0	-16,010	108,877
23	2026						124,887	-59,346	-16,010	49,531
24	2027						124,887	0	-16,010	108,877
25	2028						124,887	0	-16,010	108,877
26	2029						124,887	0	-16,010	108,877
27	2030						124,887	0	-16,010	108,877
28	2031						124,887	-63,205	-16,010	45,671
29	2032						124,887	0	-16,010	108,877
30	2033						124,887	0	-16,010	108,877
31	2034						124,887	0	-16,010	108,877
32	2035						124,887	0	-16,010	108,877
33	2036						124,887	-20,724	-16,010	259,395
								-449,725	-477,240	
										171,243
										Residual Value
										Land
										13,200
										36,061
										Infrastructure
										270,364
										135,182

0.923 SCF
0.9 Carried in Indonesian Ships

EIRR= 22.1%

NPV @15%
Rp. 120,214.m.

Capital Costs
-926,965

Assumes Container cappped by 2011
GC by 2009

Table 32.5.4 ECONOMIC ANALYSIS - EIRR AND NPV for SHORT TERM PLAN OF SAMARINDA - 6 BERTH

Number	Year	Container Benefits	General Cargo	Avoided Cost	Benefits	Land Transport Disbenefits	NET BENEFIT	Capital Costs	Maintenance and Dredging Costs	NET COST BENEFITS
1	2004						-	(8,139)	-	(8,139)
2	2005						-	(129,851)	-	(129,851)
3	2006						-	(241,828)	-	(241,828)
4	2007	62,076	1,226	21,164	84,465	11,677	60,465	-	(17,357)	43,108
5	2008	64,282	1,226	32,454	97,963	11,213	72,064	-	(17,731)	54,333
6	2009	65,602	1,223	32,454	99,279	10,254	73,953	-	(17,731)	56,222
7	2010	66,997	1,218	49,909	118,124	9,377	90,337	-	(17,731)	72,606
8	2011	68,472	1,212	59,531	129,215	8,575	100,216	-	(17,731)	82,485
9	2012	70,032	1,204	69,749	140,985	7,841	110,603	-	(17,731)	92,872
10	2013	71,682	1,195	70,856	143,733	7,170	113,442	-	(17,731)	95,711
11	2014	73,426	1,184	71,963	146,573	6,557	116,311	-	(17,731)	98,581
12	2015	75,271	1,171	72,899	149,342	5,996	119,077	-	(17,731)	101,346
13	2016	77,222	1,157	73,666	152,045	5,483	121,748	(19,447)	(17,731)	84,570
14	2017	79,285	1,140	74,347	154,772	5,014	124,404	-	(17,731)	106,673
15	2018	81,467	1,121	74,773	157,361	4,586	126,910	-	(17,731)	109,179
16	2019	83,774	1,099	75,113	159,987	4,193	129,418	-	(17,731)	111,687
17	2020	86,214	1,075	75,794	163,084	3,835	132,288	-	(17,731)	114,557
18	2021	88,794	1,049	76,305	166,148	3,507	135,106	(5,622)	(17,731)	111,753
19	2022	91,522	1,019	76,731	169,272	3,207	137,951	-	(17,731)	120,220
20	2023	94,407	986	76,816	172,210	2,932	140,619	-	(17,731)	122,888
21	2024	97,458	950	76,816	175,224	2,682	143,331	-	(17,731)	125,600
22	2025	100,684	911	76,476	178,070	2,452	145,886	-	(17,731)	128,155
23	2026						145,886	(85,813)	(17,731)	42,342
24	2027						145,886	-	(17,731)	128,155
25	2028						145,886	-	(17,731)	128,155
26	2029						145,886	-	(17,731)	128,155
27	2030						145,886	-	(17,731)	128,155
28	2031						145,886	(94,808)	(17,731)	33,347
29	2032						145,886	-	(17,731)	128,155
30	2033						145,886	-	(17,731)	128,155
31	2034						145,886	-	(17,731)	128,155
32	2035						145,886	-	(17,731)	128,155
33	2036						145,886	(25,070)	(17,731)	274,328
										171,243
										Residual Value
										Land
										13,200
										36,061
										Infrastructure
										270364
										135182

Total Capital and Annual costs= (in Rp m)	1,142,131

EIRR=	18.8%

0.923 SCF
0.9 Carried in Indonesian Ships

NPV @15%
Rp. 88,013 m.

Assumes that container capped in 2008 and GC in 2009

Costs	Net Bs	
-1,142,131	3,798,874	3.326127916

32.6 Financial Analysis

32.6.1 Objective and Methodology of Financial Analysis

(1) Objective

The purpose of the financial analysis is to evaluate the financial feasibility of the project (The project means the short-term development plan at Palaran in this chapter.). When evaluating the financial viability of the project, financial soundness of the executing agency, that is, IPC 4 Samarinda Branch Office, is also assessed.

(2) Methodology

1) Viability of Project

The viability of the project is analyzed using the Discount Cash Flow Method and appraised by the Financial Internal Rate of Return (FIRR). The FIRR is the discount rate that makes the discounted costs and revenues over the project life equal, i.e., the rate "r" that satisfies the following formula:

$$\sum_{i=1}^{n} \frac{Bi - Ci}{(1+r)^{i-1}} = 0$$

Where, n : Project life,
Bi : Revenue in the i-th year : the first year is the base year,
Ci : Cost in the i-th year
r : Discount rate.

The revenues and costs which are taken into account for the FIRR calculation are summarized in Table 32.6.1. The revenue and cost items excluded from the FIRR calculation are also summarized in Table 32.6.2. When the calculated FIRR exceeds the weighted average interest rate of the total funds for the investments of the project, that project is regarded as financially feasible.

Table 32.6.1 Revenues and Costs employed in the FIRR Calculation

Revenues	Cost
1) Operating Revenue by the Project	1) Investments for the Project (including reinvestment for the Project, Installation of Handling Equipment and Replacement/Overhaul of Equipment) 2) Operating Expenses such as Maintenance, Repair, Rental, Personnel and Administration Cost

Table 32.6.2 Revenues and Costs Exempted from the FIRR Calculation

Revenues	Costs
1) Fund Management Income	1) Depreciation Cost 2) Repayment of the Loan Principal 3) Interest on Loan

2) Financial Soundness of Executing Agency of Project

The financial soundness of the executing agency of the project is appraised based on its projected financial statements (Profit and Loss Statement, Cash Flow Statement and Balance Sheet). The appraisal is generally made from the viewpoint of profitability, loan repayment capacity and operational efficiency, using the following formula:

a. Profitability

Rate of Return on Net Fixed Asset:

$$\frac{\textbf{Net Operating Income}}{\textbf{Total Fixed Assets}}$$

This indicator shows the profitability of the investments in terms of Net Fixed Assets. It is necessary to keep the rate higher than the average interest rate of various funds for investments, which have different interest rates.

b. Loan Repayment Capacity

Debt Service Coverage Ratio:

$$\frac{\textbf{Net Operating Income + Depreciation Cost}}{\textbf{Repayment and Interest on Long-term Loans}}$$

This indicator shows whether the operating income can cover the repayment of both the principal and the interest on long-term loans. The ratio should be higher than 1.0 and is desirable to be higher than 1.75 (World Bank recommendation).

c. Operating Efficiency

c.1 Operating Ratio:

$$\frac{\textbf{Operating Expenses}}{\textbf{Operating revenues}}$$

c.2 Working Ratio:

$$\frac{\textbf{Operating Expenses} - \textbf{Depreciation Expenses}}{\textbf{Operating Revenues}}$$

The Operating Ratio shows the operational efficiency of the organization as an enterprise, while the Working Ratio shows the efficiency of the routine operations. When the Operating Ratio is less than 70 - 75% and the Working Ratio is less than 50 - 60%, the operation of the organization is assessed to be efficient.

32.6.2 Assumption for Financial Analysis

(1) Scope of Analysis

The viability of the project is assessed using the revenues and costs related to the project. It is also assumed that IPC4 Samarinda Branch Office will construct the new container terminal at Palaran, and that it will operate and manage the new terminal. Thus, the investment by IPC4 Samarinda Branch Office will be confined to the following:

- All infrastructure construction work of the new container terminal at Palaran.
- Procurement of cargo handling equipment for the new container terminal.
- Construction of port access roads to the new terminal.

(2) Base Year

Price as of year 2001 is used in this financial analysis. Price escalation due to inflation for the future is not considered.

(3) Project Life

Taking account of conditions of the long-term loans and service lives of port facilities, the project life for the financial analysis is determined as 33 years including 3-year design and construction period.

(4) Cargo Handling Volume

To estimate revenues to be generated from both cargo handling at the new terminal and pilot service for container vessels, volumes of cargo shown below (Table 32.6.3) are used in the financial analysis (See Section 25.3).

Table 32.6.3 Future Cargo Volume to be used in Financial Analysis

Year	Container Cargo 6-berth Scenario (1,000 TEUs)	Container Cargo 4-berth Scenario (1,000 TEUs)	General Cargo (1,000 tons)	Remarks
2001	78	78	320	
2002	88	88	290	
2003	100	100	252	
2004	113	113	206	
2005	131	131	350	
2006	148	148	423	
2007	160	160	455	
2008	168	168	548	
2009	169	169	648	
2010	168	168	753	
2011	178	178	866	
2012	189	189	986	
2013	200	200	999	
2014	212	212	1,012	
2015	225	225	1,023	
2016	239	239	1,032	
2017	253	253	1,040	
2018	268	268	1,045	
2019	284	284	1,049	
2020	301	301	1,057	
2021	318	318	1,063	
2022	337	337	1,068	
2023	356	356	1,069	
2024	377	377	1,069	
2025	399	399	1,065	General cargo demand has been saturated in 2025.
2026	423	404	1,065	Container cargo demand (4-berth Scenario) in 2026 has reached to the cargo handling capacity, and cannot surpass it.
2027	442	404	1,065	Container cargo demand (6-berth Scenario) in 2010 has reached to the cargo handling capacity, and cannot surpass it.
2028 to 2036	442	404	1,065	Cargo demand cannot surpass the cargo handling capacity at port.

(5) Revenues and Port Tariff

Revenues for the project will be generated from receiving vessels and handling cargoes charged according to the port tariff. The Study Team will take the following assumptions for determining the future container port tariff at Palaran.

1) The existing Samarinda Port will remain a conventional terminal through the study period.
2) As for cargo handling and marine charge at the existing Samarinda Port, the existing port tariff will be applied.
3) The existing Samarinda Port will raise the port tariff by 25% in 2011 to pay for the new investment (New 175 m wharf).
4) Palaran will be declared as a full container terminal (FCT) in 2007. Most of containers handled at Palaran will be destined for Surabaya. In 2007, Palaran will set up the port tariff equivalent to the present FCT's container tariff adopted by IPC4.
5) Palaran will raise the port tariff by 25% in 2018 (Ten years after the opening of cargo handling operation) to pay for the new investment (Additional container terminal construction).

Table 32.6.4 Container Tariff at the existing Samarinda Port

Terminal	Type of Container	Present to 2010	2010 to 2036
Existing Samarinda	20 feet (Conventional Wharf)	Rp. 85,900	Rp. 107,375
	40 feet (Conventional Wharf)	Rp. 120,800	Rp. 151,000
	Empty (20 feet)	Rp. 42,950	Rp. 53,687
	Empty (40 feet)	Rp. 60,475	Rp. 75,500

Table 32.6.5 Container Tariff at Palaran

Terminal	Type of a Container	Present to 2006	2007 to 2017	2018 to 2036
Palaran	FCL (20 feet)	-	Rp. 201,500	Rp. 251,870
	FCL (40 feet)	-	Rp. 302,250	Rp. 377,810
	LCL (20 feet)	-	Rp. 338,000	Rp. 422,500
	LCL (40 feet)	-	Rp. 507,000	Rp. 633,750
	Empty (20 feet)	-	Rp. 100,750	Rp. 125,940
	Empty (40 feet)	-	Rp. 151,125	Rp. 188,900

(6) Fund Raising

It is assumed that 85 % of the total project cost is financed by foreign funds. The remaining 15 % of the total cost is assumed to be raised by domestic funds. The following conditions are employed for each fund in this financial analysis.

1) Foreign Fund

The foreign loan conditions are assumed as follows:

- Loan period : 30 years
- Grace period : 10 years
- Interest rate : 1.0 % per annum
- Repayment : Fixed amount repayment of principal
- Ratio of investment : Less than 85 % of the project cost

2) Domestic Fund

The domestic loan conditions are assumed as follows:

- Loan period : 10 years
- Interest rate : 18.05 % per annum
  (The real interest rate excluding inflation rate)
- Repayment : Fixed amount repayment of principal

3) Weighted Average Interest Rate

The weighted average interest rate of the funds for investments is 3.55 % per annum under the loan conditions stated above. (1.0 x 0.85 + 18.0 x 0.15 = 3.55)

(7) Expenditure

Capital cost and annual cost for the project are summarized in Table 32.6.5 and Table 32.6.6. Maintenance dredging cost is included in the annual cost of the project.

1) Investment

Initial investment cost for the infrastructure and superstructure developed by IPC4 Samarinda Branch Office are estimated. Since the durable years of infrastructure facilities are longer than the project life, re-investment costs for these facilities are not counted in this analysis.

2) Maintenance Cost

Annual maintenance cost for infrastructure facilities are calculated as 1.6% of the initial construction cost. Annual maintenance cost for superstructure facilities are calculated as 2.60% of the original procurement cost. In addition, the replacement cost is counted in 2016, 2026, 2031 and 2036.

3) Depreciation Cost

Annual depreciation cost for both infrastructure and superstructure facilities is calculated by the straight line method, based on their durable years. Residual value after all depreciation is estimated as being zero.

4) Tax

Taxes to be levied for profit are income tax and deemed dividend tax.

Table 32.6.6 Project Cost of Samarinda Port Development for 2007 (6-berth Scenario)

Disbursement Schedule for Samarinda (6 Berth Case) Feasibility Study-Financial Costs

Unit: Million Rp

Description \ Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	Total
1 Capital Cost																																			
1.1 Existing Port																																			
(1) Construction																																			
1) Construction Cost + Contingency																																			0
2) Engineering Fee for Construction																																			0
3) VAT for Construction																																			0
(2) Equipment																																			
4) Equipment Cost			12,100										6,550					5,750					6,500										11,200		43,100
5) Engineering Fee for Equipment			366																																366
6) VAT for Equipment			1,257										655					575					650										1,120		4,257
1.2 Palaran Container Terminal																																			
(1) Construction																																			
1) Construction Cost + Contingency		#####	31,603																																354,803
2) Engineering Fee for Construction	8,400	4,222	4,222																																16,845
3) VAT for Construction	844	10,743	5,582																																17,170
(2) Equipment																																			
4) Equipment Cost			176,400										15,300										80,400					56,000					11,200		339,300
5) Engineering Fee for Equipment		3,528	1,764																																5,292
6) VAT for Equipment		353	17,816										1,530										8,040					5,600					1,120		34,459
(3) Compensation Fee		15,000																																	15,000
(4) Land Acquisition Cost		13,200																																	13,200
1.3 Passenger Terminal																																			
(1) Construction																																			
1) Construction Cost + Contingency																																			0
2) Engineering Fee for Construction																																			0
3) VAT for Construction																																			0
1.4 Dredging																																			
(1) Initial Dredging																																			
1) Dredging																																			0
2) Engineering Fee																																			0
3) VAT																																			0
Sub-Total	9,205	#####	273,230	0	0	0	0	0	0	0	0	0	21,670	0	0	0	0	6,230	0	0	0	0	95,590	0	0	0	0	155,630	0	0	0	0	27,940	0	687,833
Foreign Portion	5,480	84,597	258,230	0	0	0	0	0	0	0	0	0	19,221	0	0	0	0	5,561	0	0	0	0	84,701	0	0	0	0	33,657	0	0	0	0	24,303	0	540,237
Local Portion	3,808	65,744	42,589	0	0	0	0	0	0	0	0	0	2,449	0	0	0	0	729	0	0	0	0	10,592	0	0	0	0	12,983	0	0	0	0	3,857	0	143,591
Local Goods	134	33,090	11,400	0	0	0	0	0	0	0	0	0	494	0	0	0	0	111	0	0	0	0	3,137	0	0	0	0	3,435	0	0	0	0	163	0	42,874
Local Skilled Labour	2,917	16,130	20,459	0	0	0	0	0	0	0	0	0	1,228	0	0	0	0	335	0	0	0	0	5,316	0	0	0	0	6,823	0	0	0	0	1,383	0	54,383
Local Unskilled Labour	767	22,325	11,099	0	0	0	0	0	0	0	0	0	529	0	0	0	0	183	0	0	0	0	2,153	0	0	0	0	2,325	0	0	0	0	369	0	44,633
																																			0
2 Annual Cost																																			0
2.1 Existing Port																																			0
(1) Maintenance																																			0
1) Facilities							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2) Equipment				366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	11,345
(2) Operation																																			0
1) Administration Cost																																			0
2) Operation Cost																																			0
2.2 Palaran Container Terminal																																			0
(1) Maintenance																																			0
1) Facilities				3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	3,096	95,976
2) Equipment				5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	164,052
2.3 Incremental Operation Cost-all Cargo Facilities																																			0
Operation Cost				2,351	2,856	3,367	3,948	4,384	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	4,514	129,858	259,777
																																			0
2.4 Passenger Terminal																																			0
(1) Maintenance																																			0
1) Facilities																0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(2) Operation																																			0
1) Administration Cost																																			0
2) Operation Cost																																			0
2.5 Maintenance Dredging																																			0
1) Maintenance Dredging				7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	241,800
2) VAT				780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	24,180
Sub-Total	0	0	0	19,685	20,084	20,721	21,375	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	21,848	147,195	837,081
Grand Total	9,205	#####	273,230	19,685	20,084	20,721	21,375	21,848	21,848	21,848	21,848	21,848	43,518	21,848	21,848	21,848	21,848	28,118	21,848	21,848	21,848	21,848	117,438	21,848	21,848	21,848	21,848	177,448	21,848	21,848	21,848	21,848	49,788	147,195	1,524,900

Disbursement Schedule for Samarinda (4 Berth Case)

Table 32.6.7 Project Cost of Samarinda Port Development for 2007 (4-berth Scenario)

Description \ Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	Total
1 Capital Cost																																			
## Existing Port																																			
(1) Construction																																			
1) Construction Cost + Contingency																																			0
2) Engineering Fee for Construction																																			0
3) VAT for Construction																																			0
(2) Equipment																																			
4) Equipment Cost			12,100										8,500					3,700					6,550										12,250		43,100
5) Engineering Fee for Equipment			366																																366
6) VAT for Equipment			1,347										650					370					650										1,330		4,347
## Public Container Terminal																																			
(1) Construction																																			
1) Construction Cost + Contingency		66,700	40,831																																111,554
2) Engineering Fee for Construction	6,656	3,340	3,342																																13,370
3) VAT for Construction	665	8,201	4,470																																13,552
(2) Equipment																																			
4) Equipment Cost			117,465										5,800										73,450					64,000					1,800		257,200
5) Engineering Fee for Equipment		3,693	553																																1,531
6) VAT for Equipment		369	11,848										580										4,330					6,400					350		24,433
(3) Compensation Fee		13,000																																	13,000
(4) Land Acquisition Cost		13,233																																	13,250
## Passenger Terminal																																			
(1) Construction																																			
1) Construction Cost + Contingency																																			0
2) Engineering Fee for Construction																																			0
3) VAT for Construction																																			0
## Dredging																																			
(1) Initial Dredging																																			0
1) Dredging																																			0
2) Engineering Fee																																			0
3) VAT																																			
Sub-Total	7,551	124,660	191,796	0	0	0	0	0	0	0	0	0	14,830	0	0	0	0	6,333	0	0	0	0	46,110	0	0	0	0	70,400	0	0	0	0	23,100	0	307,690
Foreign Portion	4,539	66,750	161,212	0	0	0	0	0	0	0	0	0	14,928	0	0	0	0	5,361	0	0	0	0	38,640	0	0	0	0	62,445	0	0	0	0	20,460	0	304,372
Local Portion	3,012	57,908	31,339	0	0	0	0	0	0	0	0	0	1,902	0	0	0	0	108	0	0	0	0	7,470	0	0	0	0	7,954	0	0	0	0	2,610	0	113,119
Local Goods	90	20,313	8,262	0	0	0	0	0	0	0	0	0	524	0	0	0	0	383	0	0	0	0	3,160	0	0	0	0	2,323	0	0	0	0	722	0	34,672
Local Skilled Labour	2,714	12,798	14,868	0	0	0	0	0	0	0	0	0	943	0	0	0	0	333	0	0	0	0	1,806	0	0	0	0	4,083	0	0	0	0	1,266	0	40,911
Local Unskilled Labour	211	24,790	8,334	0	0	0	0	0	0	0	0	0	420	0	0	0	0	182	0	0	0	0	1,504	0	0	0	0	1,549	0	0	0	0	600	0	37,585
2 Annual Cost																																			0
## Existing Port																																			0
(1) Maintenance																																			0
1) Facilities							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2) Equipment				355	366	360	365	366	368	366	366	366	356	366	366	366	366	366	366	366	356	366	366	366	366	356	366	356	366	366	366	366	365	356	11,349
(2) Operation																																			0
1) Administration Cost																																			0
2) Operation Cost																																			0
## Public Container Terminal																																			0
(1) Maintenance																																			
1) Facilities				2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	2,451	75,982
2) Equipment				3,528	3,528	3,528	3,528	3,528	3,528	3,528	3,528	3,528	3,528	3,528	3,528	3,533	3,528	3,528	3,528	3,528	3,528	3,528	3,528	3,528	3,528	3,528	3,528	3,528	3,528	3,528	3,522	3,528	3,528	3,528	107,368
3 (2) Incremental Operation Costs of Cargo Facilities																																			0
Operation Costs				1,793	2,192	2,405	3,032	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	100,340
## Passenger Terminal (None in PS)																																			0
																																			0
## Maintenance Dredging																																			0
1) Maintenance Dredging				7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	241,813
2) VAT				780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	24,183
Sub-Total	0	0	0	16,718	17,118	17,330	17,957	18,393	18,397	18,363	18,377	18,391	18,391	18,397	18,399	18,391	18,387	18,391	18,397	18,393	18,397	18,391	18,397	18,397	18,397	18,393	18,397	18,393	18,397	18,391	18,359	18,357	18,377	18,397	566,642
Grand Total	7,555	124,660	192,764	16,718	17,118	17,330	17,957	18,393	18,397	18,363	18,377	18,391	33,227	18,397	18,399	18,401	18,387	24,681	18,397	18,391	18,377	18,391	64,507	18,397	18,397	18,393	18,397	88,793	18,397	18,391	18,359	18,357	41,497	18,397	2,073,333

Table 32.6.8 FIRR Calculation (6-berth Scenario)

(Unit:Million USD)

	Year	Revenue (1)	Cost(2)			Difference (1)-(2)	Net Present Value		
			Investment	Expenses	Total		Revenue	Cost	Difference
1	2,004	0	9,288	0	9,288	-9,288	0	9,288	-9,288
2	2,005	0	150,252	0	150,252	-150,252	0	140,394	-140,394
3	2,006	0	257,386	0	257,386	-257,386	0	224,721	-224,721
4	2,007	42,950	0	10,626	10,626	32,324	35,039	8,669	26,370
5	2,008	44,984	0	10,885	10,885	34,099	34,291	8,297	25,993
6	2,009	45,366	0	11,154	11,154	34,212	32,313	7,945	24,368
7	2,010	44,984	0	11,431	11,431	33,553	29,939	7,608	22,331
8	2,011	45,695	0	11,717	11,717	33,978	28,417	7,287	21,130
9	2,012	45,695	0	11,717	11,717	33,978	26,552	6,809	19,744
10	2,013	45,695	0	11,717	11,717	33,978	24,810	6,362	18,449
11	2,014	45,695	0	11,717	11,717	33,978	23,183	5,944	17,238
12	2,015	45,695	0	11,717	11,717	33,978	21,662	5,554	16,107
13	2,016	45,695	14,520	11,717	26,237	19,458	20,241	11,622	8,619
14	2,017	45,695	0	11,717	11,717	33,978	18,913	4,850	14,063
15	2,018	58,176	0	11,717	11,717	46,459	22,499	4,531	17,967
16	2,019	58,176	0	11,717	11,717	46,459	21,023	4,234	16,789
17	2,020	58,176	0	11,717	11,717	46,459	19,643	3,956	15,687
18	2,021	58,176	0	11,717	11,717	46,459	18,355	3,697	14,658
19	2,022	58,176	0	11,717	11,717	46,459	17,150	3,454	13,696
20	2,023	58,176	0	11,717	11,717	46,459	16,025	3,228	12,798
21	2,024	58,176	0	11,717	11,717	46,459	14,974	3,016	11,958
22	2,025	58,176	0	11,717	11,717	46,459	13,991	2,818	11,173
23	2,026	58,176	88,440	11,717	100,157	-41,981	13,074	22,508	-9,434
24	2,027	58,176	0	11,717	11,717	46,459	12,216	2,460	9,755
25	2,028	58,176	0	11,717	11,717	46,459	11,414	2,299	9,115
26	2,029	58,176	0	11,717	11,717	46,459	10,665	2,148	8,517
27	2,030	58,176	0	11,717	11,717	46,459	9,966	2,007	7,959
28	2,031	58,176	105,600	11,717	117,317	-59,141	9,312	18,778	-5,466
29	2,032	58,176	0	11,717	11,717	46,459	8,701	1,752	6,949
30	2,033	58,176	0	11,717	11,717	46,459	8,130	1,637	6,493
31	2,034	58,176	0	11,717	11,717	46,459	7,597	1,530	6,067
32	2,035	58,176	0	11,717	11,717	46,459	7,098	1,430	5,669
33	2,036	58,176	14,520	11,717	26,237	31,939	6,633	2,991	3,641
	Total	1,603,493	640,006	348,738	988,744	614,749	543,825	543,825	0

FIRR= 7.02%

Table 32.6.9 FIRR Calculation (4-berth Scenario)

(Unit:Million USD)

	Year	Revenue (1)	Cost(2)			Difference (1)-(2)	Net Present Value		
			Investment	Expenses	Total		Revenue	Cost	Difference
1	2,004	0	7,355	0	7,355	-7,355	0	7,355	-7,355
2	2,005	0	124,661	0	124,661	-124,661	0	112,320	-112,320
3	2,006	0	178,942	0	178,942	-178,942	0	145,267	-145,267
4	2,007	42,950	0	7,947	7,947	35,003	31,416	5,813	25,603
5	2,008	44,984	0	8,147	8,147	36,837	29,646	5,369	24,277
6	2,009	44,984	0	8,353	8,353	36,631	26,711	4,960	21,751
7	2,010	44,984	0	8,567	8,567	36,417	24,067	4,583	19,484
8	2,011	44,984	0	8,787	8,787	36,197	21,685	4,236	17,449
9	2,012	44,984	0	8,787	8,787	36,197	19,538	3,816	15,722
10	2,013	44,984	0	8,787	8,787	36,197	17,604	3,439	14,165
11	2,014	44,984	0	8,787	8,787	36,197	15,861	3,098	12,763
12	2,015	44,984	0	8,787	8,787	36,197	14,291	2,792	11,500
13	2,016	44,984	9,680	8,787	18,467	26,517	12,876	5,286	7,590
14	2,017	44,984	0	8,787	8,787	36,197	11,602	2,266	9,336
15	2,018	56,140	0	8,787	8,787	47,353	13,046	2,042	11,004
16	2,019	56,140	0	8,787	8,787	47,353	11,754	1,840	9,914
17	2,020	56,140	0	8,787	8,787	47,353	10,591	1,658	8,933
18	2,021	56,140	0	8,787	8,787	47,353	9,542	1,494	8,049
19	2,022	56,140	0	8,787	8,787	47,353	8,598	1,346	7,252
20	2,023	56,140	0	8,787	8,787	47,353	7,745	1,212	6,534
21	2,024	56,140	0	8,787	8,787	47,353	6,980	1,092	5,887
22	2,025	56,140	0	8,787	8,787	47,353	6,289	984	5,304
23	2,026	56,140	58,960	8,787	67,747	-11,607	5,666	6,838	-1,171
24	2,027	56,140	0	8,787	8,787	47,353	5,105	799	4,306
25	2,028	56,140	0	8,787	8,787	47,353	4,600	720	3,880
26	2,029	56,140	0	8,787	8,787	47,353	4,144	649	3,496
27	2,030	56,140	0	8,787	8,787	47,353	3,734	584	3,150
28	2,031	56,140	70,400	8,787	79,187	-23,047	3,365	4,746	-1,381
29	2,032	56,140	0	8,787	8,787	47,353	3,031	474	2,557
30	2,033	56,140	0	8,787	8,787	47,353	2,731	428	2,304
31	2,034	56,140	0	8,787	8,787	47,353	2,461	385	2,076
32	2,035	56,140	0	8,787	8,787	47,353	2,217	347	1,870
33	2,036	56,140	9,680	8,787	18,467	37,673	1,998	657	1,341
34	Total	1,559,450	459,678	261,476	721,154	838,296	338,896	338,896	0

FIRR= 10.99%

32.6.3 Evaluation of Project

(1) Viability

FIRR of the project is shown in Table 32.6.7 and Table 32.6.8. FIRR of each project is exceeding the weighted average interest rate of loan of 3.55 %.

(2) Sensitivity Analysis

Sensitivity analysis is carried out to examine the impact of unexpected future changes such as cargo volume, construction cost, inflation or exchange rate. The following cases are envisioned.

- Case 1 : Investment costs increase by 10 %.
- Case 2 : Revenues decrease by 10 %.
- Case 3 : Investment costs increase by 10 % and revenues decrease by 10 %.

Results of the sensitivity analysis is shown in Table 32.6.9. I all cases, FIRR exceeds the weighted average interest rate of loan (2.575 % per annum).

Table 32.6.9 Results of Sensitivity Analysis

Case	Samarinda 6-berth Case	Samarinda 4-berth Case
Original Case		
Case 1		
Case 2		
Case 3		

(3) Financial Soundness of Executing Agency

Together with the above-mentioned financial analysis of Palaran Container Terminal Project, overall financial soundness of IPC4 Samarinda Branch Office was assessed to confirm the feasibility of the project. In the assessment, current financial statement, loan repayment programs and income prospects for the future were evaluated. Projected financial statements and financial indicators for IPC4 Samarinda Branch Office are shown in Table 32.6.10 and Table 32.6.11.

1) Profitability

The rate of return on net fixed assets exceeds the weighted average interest rate of the funds in each case.

2) Loan Repayment Capacity

The debt service coverage ratio exceeds 1.0 during the project life.

3) Operational Efficiency

The operating ratio keeps below 60% and working ratio also keeps below 50%. This means that the

Table 32 .6.11 Financial Statement for Feasibility Study (6-berth Scenario)

Income Statement

(Unit:USD)

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Operating Revenue	0	0	0	47,950	44,384	45,366	44,084	45,695	45,695	45,695	45,695	45,695	45,695	45,695	58,176	58,176	58,176	58,176
Operating Expenses	0	0	0	10,805	23,641	23,909	24,186	24,473	24,473	24,473	24,473	24,473	24,473	24,473	24,473	24,473	24,473	24,473
Personnel & Administration	0	0	0	1,165	1,425	1,693	1,970	2,257	2,257	2,257	2,257	2,257	2,257	2,257	2,257	2,257	2,257	2,257
Maintenance	0	0	0	9,640	9,640	9,640	9,640	9,640	9,640	9,640	9,640	9,640	9,640	9,640	9,640	9,640	9,640	9,640
Depreciation	0	0	0	0	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576
Net Operating Income	0	0	0	37,145	21,343	21,457	20,798	21,222	21,222	21,222	21,222	21,222	21,222	21,223	33,703	33,703	33,703	33,703
Interest on Long-term Loans	0	330	5,639	22,264	20,536	18,808	17,080	15,352	13,624	11,896	10,168	8,437	6,672	5,819	4,861	4,607	4,351	4,095
Net Surplus	0	-330	-5,639	9,881	806	2,648	3,717	5,870	7,598	9,326	12,054	12,785	14,549	16,101	28,840	25,096	29,352	29,608
Corporation Income Tax					202	662	929	1,467	1,899	2,331	3,013	3,196	3,637	4,026	7,210	7,274	7,338	7,402
Accumulated Earnings	0	-330	-5,968	3,912	4,517	6,504	9,292	13,694	19,392	26,386	35,426	45,015	55,927	68,004	89,634	111,456	133,469	155,675

Cash Flow

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cash Beginning	0	0	-469	-8,501	-8,220	-4,639	321	6,087	13,466	22,140	32,110	43,783	50,339	41,024	40,081	48,691	57,493	66,487
Cash Inflow	9,288	159,252	480,466	32,145	33,919	34,033	33,174	33,798	33,798	33,798	34,798	33,798	33,798	33,798	46,279	46,279	46,279	46,279
Net Operating Income	0	0	0	37,145	21,343	21,457	20,798	21,222	21,222	21,222	22,222	21,222	21,222	21,222	33,703	33,703	33,703	33,703
Depreciation	0	0	0	0	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576
Long-term Loans	9,288	159,252	480,466	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cash Outflow	9,288	159,721	488,498	31,864	30,136	28,608	26,680	24,952	23,224	21,496	20,172	24,046	39,475	30,715	30,459	30,203	29,947	29,691
Investment	9,288	159,252	480,466	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Repayment of principal	0	139	2,393	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,943	16,509	32,803	25,596	25,596	25,596	25,596	25,596
Interest on Long-term Loans	0	330	5,639	22,264	20,536	18,808	17,080	15,352	13,624	11,896	10,168	8,437	6,672	5,819	4,861	4,607	4,351	4,095
Corporation Income Tax				0	202	662	929	1,467	1,899	2,331	3,013	3,196	3,637	4,026	7,210	7,274	7,338	7,402
Cash Balance	0	-469	-8,032	281	3,783	4,963	5,764	7,378	8,674	9,970	11,673	6,556	-9,315	-943	8,610	8,802	8,994	9,186
Cash Ending	0	-469	-8,501	-8,220	-4,639	321	6,087	13,466	22,140	32,110	43,783	50,339	41,024	40,081	48,691	57,493	66,487	75,673

Balance Sheet

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Current Assets	0	0	0	0	0	321	6,087	13,466	22,140	32,110	43,783	50,339	41,024	40,081	48,691	57,493	66,487	75,673
Cash & Deposit	0	0	0	0	0	321	6,087	13,466	22,140	32,110	43,783	50,339	41,024	40,081	48,691	57,493	66,487	75,673
Fixed Assets	9,288	159,540	640,006	640,006	627,430	614,854	602,278	589,701	577,125	564,549	551,973	539,397	526,821	514,244	501,668	489,092	476,516	463,940
Total Assets	9,288	159,540	640,006	640,006	627,430	615,177	608,365	603,167	599,265	596,659	595,756	589,735	567,845	554,326	550,360	546,585	543,005	539,613
Liabilities	9,288	159,870	644,367	638,487	620,667	611,066	601,466	591,866	582,266	572,666	562,723	547,113	514,311	488,715	463,119	437,523	411,927	386,331
Short-term Loans	0	469	8,501	8,220	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Long-term Loans	9,288	159,401	639,867	630,267	620,667	611,066	601,466	591,866	582,266	572,666	562,723	547,113	514,311	488,715	463,119	437,523	411,927	386,331
Net Worth	0	-330	-4,361	1,519	6,763	4,111	6,899	11,301	17,000	24,000	33,033	42,622	53,534	65,611	87,241	109,062	131,076	153,282
Total Liabilities & Net Worth	9,288	159,540	640,006	640,006	627,430	615,177	608,365	603,167	599,265	596,659	595,756	589,735	567,845	554,326	550,360	546,585	543,005	539,613

Financial Indicators

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Rate of Return Fixed Assets					3.4%	3.5%	3.5%	3.6%	3.7%	3.8%	4.0%	3.9%	4.0%	4.1%	6.7%	6.9%	7.1%	7.3%
Debt Service Coverage Ratio					1.13	1.20	1.25	1.35	1.46	1.57	1.73	1.41	0.86	1.10	1.52	1.73	1.95	1.56
Operating Ratio					52.6%	52.7%	53.8%	53.6%	53.6%	53.6%	52.4%	53.6%	53.6%	53.6%	42.1%	42.1%	42.1%	42.1%
Working Ratio					24.6%	25.0%	25.8%	26.0%	26.0%	26.0%	25.5%	26.0%	26.0%	26.0%	20.5%	20.5%	20.5%	20.5%

Income Statement

(Unit:USD)

Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Operating Revenue	58,176	58,176	58,176	58,176	58,176	58,176	58,176	58,176	58,176	58,176	58,176	58,176	58,176	58,176	58,176
Operating Expenses	24,473	24,473	24,473	24,473	24,473	24,473	24,473	24,473	24,473	24,473	24,473	24,473	24,473	24,473	24,473
Personnel & Administration	2,257	2,257	2,257	2,257	2,257	2,257	2,257	2,257	2,257	2,257	2,257	2,257	2,257	2,257	2,257
Maintenance	9,640	9,640	9,640	9,640	9,640	9,640	9,640	9,640	9,640	9,640	9,640	9,640	9,640	9,640	9,640
Depreciation	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576
Net Operating Income	33,703	33,703	33,703	33,703	33,703	33,703	33,703	33,703	33,703	33,703	33,703	33,703	33,703	33,703	33,703
Interest on Long-term Loans	3,839	3,583	3,327	3,072	2,816	2,560	2,304	2,048	1,792	1,536	1,280	1,024	768	512	256
Net Surplus	29,863	30,119	30,375	30,631	30,887	31,143	31,399	31,655	31,911	32,167	32,423	32,679	32,935	33,191	33,447
Corporation Income Tax	0	0	7,594	7,658	7,722	7,786	7,850	7,914	7,978	8,044	8,106	8,170	8,234	8,298	8,362
Accumulated Earnings	185,538	215,658	238,439	261,413	284,578	307,936	331,485	355,226	379,160	403,283	427,610	452,119	476,820	501,714	526,799

Cash Flow

Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cash Beginning	75,673	92,517	109,617	119,378	129,332	139,478	149,816	160,345	171,067	181,981	193,094	204,391	215,881	227,562	239,436
Cash Inflow	46,279	46,279	46,279	46,279	46,279	46,279	46,279	46,279	46,279	46,279	46,279	46,279	46,279	46,279	46,279
Net Operating Income	33,703	33,703	33,703	33,703	33,703	33,703	33,703	33,703	33,703	33,703	33,703	33,703	33,703	33,703	33,703
Depreciation	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576	12,576
Long-term Loans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cash Outflow	29,435	29,179	28,971	28,669	28,411	28,155	27,899	27,644	27,338	27,132	26,876	26,620	26,364	26,108	25,852
Investment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Repayment of principal	25,596	25,596	25,596	25,596	25,596	25,596	25,596	25,596	25,596	25,596	25,596	25,596	25,596	25,596	25,596
Interest on Long-term Loans	3,839	3,583	3,327	3,072	2,816	2,560	2,304	2,048	1,792	1,536	1,280	1,024	768	512	256
Corporation Income Tax	0	0	7,594	7,658	7,722	7,786	7,850	7,914	7,978	8,044	8,106	8,170	8,234	8,298	8,362
Cash Balance	16,844	17,100	17,302	17,954	18,146	18,338	18,530	18,722	18,914	19,113	19,298	19,490	19,682	19,873	20,065
Cash Ending	92,517	109,617	119,378	129,332	139,478	149,816	160,345	171,067	181,981	193,094	204,391	215,881	227,562	239,436	251,501

Balance Sheet

Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Current Assets	92,517	109,617	119,378	129,332	139,478	149,816	160,345	171,067	181,981	193,094	204,391	215,88	227,562	239,436	251,501
Cash & Deposit	92,517	109,617	119,378	129,332	139,478	149,816	160,345	171,067	181,981	193,094	204,391	215,88	227,562	239,436	251,501
Fixed Assets	453,364	438,787	426,211	413,635	401,059	388,483	375,907	363,330	350,754	338,178	325,602	313,026	300,450	287,874	275,297
Total Assets	545,880	548,404	545,590	542,967	540,537	538,298	536,252	534,398	532,735	531,272	529,993	528,907	528,012	527,309	526,799
Liabilities	360,735	335,139	300,544	283,948	258,352	232,756	207,160	181,564	155,958	130,372	104,777	79,181	53,585	27,989	2,393
Short-term Loans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Long-term Loans	360,735	335,139	300,544	283,948	258,352	232,756	207,160	181,564	155,958	130,372	104,777	79,181	53,585	27,989	2,393
Net Worth	185,538	215,658	238,439	261,413	284,578	307,936	331,485	355,226	379,160	403,293	427,610	452,119	476,820	501,714	526,799
Total Liabilities & Net Worth	546,274	550,797	547,933	545,360	542,930	540,692	538,645	536,791	535,128	533,665	532,386	531,300	530,405	529,703	529,192

Financial Indicators

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Rate of Return Fixed Assets	7.5%	7.7%	7.9%	8.1%	8.4%	8.7%	9.0%	9.3%	9.6%	10.0%	10.4%	10.8%	11.2%	11.7%	12.2%
Debt Service Coverage Ratio	1.57	1.59	1.60	1.61	1.63	1.64	1.66	1.67	1.69	1.71	1.72	1.74	1.76	1.77	1.79
Operating Ratio	42.1%	42.1%	42.1%	42.1%	42.1%	42.1%	42.1%	42.1%	42.1%	42.1%	42.1%	42.1%	42.1%	42.1%	42.1%
Working Ratio	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%

Table 32.6.12 Financial Statement for Feasibility Study (4-berth Scenario)

Income Statement

(Unit:USD)

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Operating Revenue	0	0	0	42,950	44,984	44,984	44,984	44,984	44,984	44,984	44,984	44,984	44,984	44,984	44,984	44,984	44,984	44,984
Operating Expenses	0	0	0	7,947	16,803	17,009	17,223	17,443	17,443	17,443	17,443	17,443	17,443	17,443	17,443	17,443	17,443	17,443
Personnel & Administration	0	0	0	896	1,096	1,302	1,516	1,736	1,736	1,736	1,736	1,736	1,736	1,736	1,736	1,736	1,736	1,736
Maintenance	0	0	0	7,051	7,051	7,051	7,051	7,051	7,051	7,051	7,051	7,051	7,051	7,051	7,051	7,051	7,051	7,051
Depreciation	0	0	0	0	8,656	8,656	8,656	8,656	8,656	8,656	8,656	8,656	8,656	8,656	8,656	8,656	8,656	8,656
Net Operating Income	0	0	0	35,003	28,181	27,975	27,761	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541
Interest on Long-term Loans	0	261	4,667	10,663	9,823	8,983	8,144	7,304	6,465	5,625	4,786	3,943	3,073	2,466	2,143	2,220	2,056	1,973
Net Surplus	0	-261	-4,667	24,340	18,358	18,992	19,617	20,237	21,077	21,915	22,756	23,598	24,469	25,075	25,198	25,322	25,485	25,568
Corporation Income Tax					4,590	4,748	4,904	5,059	5,269	5,479	5,689	5,900	6,117	6,269	6,300	6,330	6,361	6,392
Accumulated Earnings	0	-261	-4,928	19,412	33,181	47,425	62,138	77,316	93,124	109,561	126,627	144,326	162,677	181,484	200,382	219,374	238,457	257,634

Cash Flow

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cash Beginning	0	0	-371	-7,018	12,658	30,418	48,653	67,358	86,527	106,326	126,754	147,541	164,253	176,244	191,375	206,599	221,914	237,323
Cash InFlow	7,355	124,661	178,942	35,003	36,837	36,671	36,417	36,197	36,197	36,197	36,197	36,197	36,197	36,197	36,197	36,197	36,197	36,197
Net Operating Income	0	0	0	35,003	28,181	27,975	27,761	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541
Depreciation	0	0	0	0	8,656	8,656	8,656	8,656	8,656	8,656	8,656	8,656	8,656	8,656	8,656	8,656	8,656	8,656
Long-term Loans	7,355	124,661	178,942	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cash OutFlow	7,355	125,032	185,389	15,327	14,487	12,648	12,808	11,969	11,129	10,289	9,722	13,586	8,088	14,797	14,674	14,551	14,427	14,304
Investment	7,355	124,661	178,942	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Repayment of principal	0	110	1,580	4,664	4,664	4,664	4,664	4,664	4,664	4,664	4,936	9,643	15,015	12,331	12,331	12,331	12,331	12,331
Interest on Long-term Loans	0	261	4,667	10,663	9,823	8,983	8,144	7,304	6,465	5,625	4,786	3,943	3,073	2,466	2,343	2,220	2,056	1,973
Corporation Income Tax				0	4,590	4,748	4,904	5,059	5,269	5,479	5,689	5,900	6,117	6,269	6,300	6,330	6,361	6,392
Cash Balance	0	-371	-6,647	19,676	17,760	18,235	18,704	19,169	19,799	20,429	20,786	16,712	11,992	15,131	15,223	15,316	15,408	15,501
Cash Ending	0	-371	-7,018	12,658	30,418	48,653	67,358	86,527	106,326	126,754	147,541	164,253	176,244	191,375	206,599	221,914	237,323	252,823

Balance Sheet

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Current Assets	0	0	0	0	0	48,653	67,358	86,527	106,326	126,754	147,541	164,253	176,244	191,375	206,599	221,914	237,323	252,823
Cash & Deposit	0	0	0	0	0	48,653	67,358	86,527	106,326	126,754	147,541	164,253	176,244	191,375	206,599	221,914	237,323	252,823
Fixed Assets	7,355	132,016	310,958	310,958	302,302	293,647	284,991	276,335	267,680	259,024	250,368	241,712	233,057	224,401	215,745	207,090	198,434	189,778
Total Assets	7,355	132,016	310,958	310,958	302,302	342,300	352,349	362,862	374,005	385,778	397,909	405,965	409,301	415,776	422,344	429,004	435,756	442,601
Liabilities	7,355	132,277	317,866	293,526	301,519	296,855	252,191	287,526	282,862	278,198	273,261	263,619	248,604	236,273	223,942	211,610	199,279	186,948
Short-term Loans	0	371	7,018	12,658	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Long-term Loans	7,355	131,906	310,848	300,180	301,519	296,855	252,191	287,526	282,862	278,198	273,261	263,619	248,604	236,273	223,942	211,610	199,279	186,948
Net Worth	0	-261	-6,928	17,432	781	45,445	100,158	75,336	91,143	107,580	124,648	142,346	160,697	179,504	198,402	217,394	236,477	255,654
Total Liabilities & Net Worth	7,355	132,016	310,938	310,938	302,300	342,300	352,349	362,862	374,005	385,778	397,909	405,965	409,301	415,776	422,344	429,004	435,756	442,601

Financial Indicators

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Rate of Return Fixed Assets					9.3%	9.5%	9.7%	10.0%	10.3%	10.6%	11.0%	11.4%	11.8%	12.3%	12.8%	13.3%	13.9%	14.5%
Debt Service Coverage Ratio					2.54	2.68	2.84	3.02	3.26	3.52	3.72	2.66	2.00	2.45	2.49	2.49	2.51	2.53
Operating Ratio					37.4%	37.8%	38.3%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%
Working Ratio					18.8%	18.6%	19.0%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%

Income Statement

(Unit:USD)

Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Operating Revenue	44,984	44,984	44,984	44,984	44,984	44,984	44,984	44,984	44,984	44,984	44,984	44,984	44,984	44,984	44,984
Operating Expenses	17,443	17,443	17,443	17,443	17,443	17,443	17,443	17,443	17,443	17,443	17,443	17,443	17,443	17,443	17,443
Personnel & Administration	1,736	1,736	1,736	1,736	1,736	1,736	1,736	1,736	1,736	1,736	1,736	1,736	1,736	1,736	1,736
Maintenance	7,051	7,051	7,051	7,051	7,051	7,051	7,051	7,051	7,051	7,051	7,051	7,051	7,051	7,051	7,051
Depreciation	8,656	8,656	8,656	8,655	8,656	8,655	8,656	8,656	8,656	8,656	8,656	8,655	8,656	8,656	8,656
Net Operating Income	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541
Interest on Long-term Loans	1,850	1,720	1,603	1,480	1,356	1,233	1,110	986	863	740	617	493	370	247	123
Net Surplus	25,692	25,815	25,938	26,062	26,185	26,308	26,431	26,555	26,678	26,801	26,925	27,048	27,171	27,295	27,418
Corporation Income Tax	0	0	5,485	6,515	6,546	6,577	6,608	6,639	6,670	6,700	6,731	6,762	6,793	6,824	6,854
Accumulated Earnings	283,325	309,140	329,594	348,640	367,779	387,510	407,334	427,250	447,258	467,359	487,553	507,839	528,217	548,688	569,252

Cash Flow

Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cash Beginning	251,823	274,839	296,979	312,757	328,628	344,591	360,647	376,795	393,035	409,368	425,794	442,312	458,923	475,626	492,421
Cash Inflow	36,197	36,197	36,197	36,197	36,197	36,197	36,197	36,197	36,197	36,197	36,197	36,197	36,197	36,197	36,197
Net Operating Income	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541
Depreciation	8,656	8,656	8,656	8,656	8,656	8,656	8,656	8,655	8,656	8,656	8,656	8,656	8,656	8,656	8,656
Long-term Loans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cash Outflow	14,181	14,038	13,914	13,811	13,688	13,564	13,441	13,313	13,194	13,071	12,948	12,824	12,701	12,578	12,454
Investment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Repayment of principal	12,331	12,331	12,331	12,331	12,331	12,331	12,331	12,331	12,331	12,331	12,331	12,331	12,331	12,331	12,331
Interest on Long-term Loans	1,850	1,720	1,603	1,480	1,356	1,233	1,110	986	863	740	617	493	370	247	123
Corporation Income Tax	0	0	5,485	6,515	6,546	6,577	6,608	6,639	6,670	6,700	6,731	6,762	6,793	6,824	6,854
Cash Balance	22,016	22,159	15,778	15,871	15,963	16,056	16,148	16,241	16,333	16,426	16,518	16,611	16,703	16,796	16,880
Cash Ending	274,839	296,979	312,757	328,628	344,591	360,647	376,795	393,035	409,368	425,794	442,312	458,923	475,626	492,421	509,309

Balance Sheet

Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Current Assets	274,839	296,979	312,757	328,628	344,591	360,647	376,795	393,035	409,368	425,794	442,312	458,923	475,626	492,421	509,309
Cash & Deposit	274,839	296,979	312,757	328,628	344,591	360,647	376,795	393,035	409,368	425,794	442,312	458,923	475,626	492,421	509,309
Fixed Assets	181,123	172,467	163,811	155,155	146,500	137,844	129,188	120,533	111,877	103,221	94,565	85,910	77,254	68,598	59,943
Total Assets	455,962	469,446	476,568	483,783	491,091	498,491	505,983	513,568	521,245	529,015	536,878	544,832	552,880	561,020	569,252
Liabilities	174,617	162,286	149,954	137,623	125,292	112,961	100,630	88,298	75,967	63,636	51,305	38,974	26,643	14,311	1,980
Short-term Loans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Long-term Loans	174,617	162,286	149,954	137,623	125,292	112,961	100,630	88,298	75,967	63,636	51,305	38,974	26,643	14,311	1,980
Net Worth	281,325	309,140	326,594	346,140	367,779	387,510	407,334	427,250	447,258	467,359	487,553	507,839	526,217	546,688	569,252
Total Liabilities & Net Worth	455,942	471,426	476,548	483,763	493,071	500,471	507,963	515,548	523,226	530,995	538,858	546,813	554,860	561,000	571,232

Financial Indicators

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Rate of Return Fixed Assets	15.2%	16.0%	16.8%	17.8%	18.8%	20.0%	21.3%	22.8%	24.6%	26.7%	29.1%	32.1%	35.7%	40.1%	45.9%
Debt Service Coverage Ratio	2.55	2.57	2.60	2.62	2.64	2.67	2.69	2.72	2.74	2.77	2.80	2.82	2.85	2.88	2.91
Operating Ratio	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%
Working Ratio	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%

operation at port will be efficient.

32.6.4 Conclusion

Judging from the above analysis, the project is regarded as financially feasible. And the financial soundness of executing agency, namely IPC4 Samarinda Branch Office is considered to be sound.

32.7 Environmental Impact Assessment (EIA) for Samarinda Port Development

The Environmental Impact Assessment for Samarinda Port Development Plan consists of three portions:

1) Environmental Conditions in Chapter 28 gives existing conditions of Natural and Social E
2) nvironmental,
2) Initial Environmental Examination (IEE) in Chapter 31 gives initial examination of possible environmental impacts, and
3) this Section gives Environmental Management and Mitigation Measures.

This section describes the Environmental Management (EMaP) for the proposed Palaran terminals development plan. It contains specific measures that will enhance potential positive impacts for the purpose of maximizing the beneficial impacts of the proposed project. Likewise, this section contains mitigation measures to minimize and lessen adverse effects at different stages of project implementation.

32.7.1 Identification of the Environmental Impacts

Based on the Initial Environmental Examination presented in Chapter 31. Environmental Impacts have been evaluated with following 4 grades (A – D):

A: Serious impact is expected
B: Some impact is expected
C: Extent of impact is unknown (further examination is needed, impact may become clear as study progress)
D: No impact is expected

From the result of IEE in Chapter 31, important environmental parameters affected by the project items are listed up as shown in Table 31.3.1.

32.7.2 Environmental Management and Mitigation Measures

Based on the analyses and forecasts of possible environmental impacts, it is recommended that the following environmental parameters should be considered as items for environmental management plan of this project:

- Resettlement
- Economic Activities
- Traffic/Public Facilities
- Waste
- Fauna and Flora
- Air Pollution
- Water Pollution
- Soil Contamination
- Noise and Vibration

(1) Resettlement

1) Description

Resettlement (Relocation of people) is the very important socio environmental impact that should be paid attention initially in development plan studies. Resettlement of affected facilities and families is expected for the Palaran Development area because there are one sawmill factory and one community which consists of families of the factory laborers.

There were about 500 laborers employed in the factory in the past, but it is now reduced to about 250 employees. Most of them are from Java Island. The proposed development plan has two alternatives, one is 4-berths, and the other is 6-berths scenario. Six-berths scenario needs a larger area than the 4-berths scenario and also a larger area than the existing sawmill factory and its labor community.

2) Mitigation Measures

- The relocation of sawmill factory and employee residences is expected with project implementation. A detailed relocation program should be planned and implemented in conformity with relevant Indonesian regulation. Land Acquisition and Resettlement Action Plan (LARAP) should be prepared for smooth implementation of Resettlement.
- The proponent (IPC) should communicate frequently with the factory and communities affected by the project.

(2) Economic Activities

1) Description

In construction phase, the construction works of the terminal will provide job opportunities and absorb employee that comes from local people. They can get the new job from this project and indirectly in other new job occupation such as restaurants, boarding houses, car workshops and car rental, etc. In operational phase, business opportunities will open surrounding the terminal to support directly or indirectly the activities of the terminal operation.

2) Mitigation Measures

- Deserve high priority for employment of local people.
- Opportunity of job training should be provided.
- Executing organizations are IPC.

(3) Traffic/Public Facilities

1) Description

The number of container transport trucks may increase with the new terminal operation in Palaran. The traffic accidents, degradation of the roads, re-suspended dust are expected as environmental impacts.

2) Mitigation Measures

a. Traffic Accident

The number of vehicles is anticipated to increase in construction and operation phases, especially carrier vehicles like container trailers. This involves the risks of traffic accident for the people living along the access roads to Palaran terminal development area. Following countermeasures are suggested to avoid the risks. Executive organizations are IPC, Samarinda city, East Kalimantan Provincial Government.

- Public meetings should be held for safety enlightening education by IPC, Samarinda city and East Kalimantan Province. The meetings will be held for the peoples living along access roads, one community by one community basis.
- Some publication for doing safety manners in the roads, like the brochures issued by IPC.
- The traffic enforcers or the helpers should be arranged for the pedestrians crossing at the public facilities like schools and hospitals. They also contribute to solve the split of communities.

b. Degradation of the access roads and re-suspended dust

- Constant monitoring of pits and cracks on the roads pavement, rapid repaving should be required. Good control of pavement will make traffic smooth so as to contribute to higher speed transport.
- IPC and Samarinda city government should sprinkle water to the roads.

(4) Waste

1) Description

Industrial Waste generated by the construction work is expected especially in construction phase such as frame, concrete, used oil and so on. And also waste will be generated in operational phase.

2) Mitigation Measures

- Some dumping sites should be prepared for the industrial waste from the port development activities.
- Some kind of materials can be recycled as construction material.
- Executing organizations are IPC.

(5) Fauna and Flora

1) Description

Some water pollution is expected in construction and operation phases. Oil and grease, heavy metals, coal dust, and soil may flow into the river frequently, when they wash the

heavy equipments, containers and some tools. These pollutants may disturb aquatic biology.

2) Mitigation Measures

- Sedimentation tank or other measures of sufficient capacity to trap silt laden water before discharge into the river should be provided.
- Discharge water should not exceed the environmental standards.

(6) Air Pollution

1) Description

The exhaust gas generated by construction vehicles and heavy equipments in the construction and operation phase is expected. And the traffic volume may increase by port facility construction. Re-suspended dust will be generated during construction and operation phases especially in dry season.

2) Mitigation Measures

- The heavy equipments must be converted from diesel engine to electric machinery, and if diesel equipment is used, they should be inspected to maintain well condition, especially for preventing carbon exhaust.
- For the re-suspended dust, sprinkling of water is recommended especially in dry ason.
- Executing organization is IPC.

(7) Water Pollution

1) Description

The water pollution is expected in construction and operation phases. Oil and grease, heavy metals, coal dust, and soil flux into the river frequently, when they wash the heavy equipments, containers and some tools.

2) Mitigation Measures

- Sedimentation tank or other measures of sufficient capacity to trap silt laden water before discharge into the river should be provided.
- Discharge water should not exceed the environmental standards.
- Executing organization is IPC.

(8) Soil Contamination

1) Description

Soil contamination by oil, grease, and other materials is expected in the construction phase. And ship operation may cause heavy metal accumulation to the bottom

sediment.

2) Mitigation Measures

- Spill and dump prevention and control plan shall be prepared for prevention of soil and sediment contamination.
- Executing organization is IPC.

(9) Noise and Vibration

1) Description

The noise and vibration are expected by operation of various construction equipments during the construction phase. Also traffic increase in operation phase may increase traffic noise.

2) Mitigation Measures

- Scheduling truck loading, unloading, and hauling operations so as to minimize noise and vibration impact.
- Utilization of stationary equipment so as to minimize noise impact.
- Scheduling work to avoid simultaneous activities that both generate high noise of vibration levels.
- Executing organization is IPC.