

Chapter 7 Ferry Terminal Development Plan

7.1 Factors Concerned with Ferry Terminal Planning

7.1.1 Dimension and Capacity of Ferry Boat

1. The proposed scale for the ferry terminal in the long-term development plan (2019) must be in accordance with the dimensions and capacity of ferry boats. Ferry boats that will be operated on the nine routes in 2019 are shown in Table 7.1.1.

Table 7.1.1 Dimensions and Capacity of Ferry Boat

Ferry boat size GRT	Dimension			Passengers	Capacity		
	LOA (m)	Breadth (m)	Full Loaded Draft (m)		Vehicles		
					8t Truck & Bus	2t Truck & Sedan	Total
5,000	100.0	18.0	4.9	800	34	42	76
3,000	90.0	16.0	3.9	600	27	34	61
1,000	70.0	14.0	3.7	500	19	23	42
500	50.0	12.0	2.5	400	12	14	26
300	40.0	10.0	1.8	300	8	9	17

7.1.2 Length and Water Depth of Berth

2. The length of a berth should be determined by adding an allowance of about 0.2 times the overall length of the ferry boat, and the water depth is determined by adding almost 0.5 to 1.0m as a depth allowance to the full loaded draft as shown in Table 7.1.2.

Table 7.1.2 Length and Water Depth of Berth

Ferry boat size GRT	Berth	
	Length (m)	Water Depth (m)
5,000	120	-6.0
3,000	110	-5.0
1,000	85	-4.5
500	60	-3.0
300	50	-2.5

7.1.3 Required Scale for Ferry Terminal

3. Required number of berths for each terminal was already calculated in Chapter 5 and is shown in Table 7.1.3.

(1) Passenger terminal and parking area

4. The passenger terminal consists of a passenger waiting room, canteen, administration office etc. Parking lots should have a sufficient area, both for vehicles ready for rolling-on and vehicles waiting for arriving passengers.

5. The required area of the passenger terminal and parking area is determined by the formulas as shown in Appendix A7.1.1 and Table A7.1.1. Table 7.1.3 shows the result of calculations for the area of the passenger terminal and parking area of each terminal.

Table 7.1.3 Required Scale for Ferry Terminal

Terminal Site (from/to the other site)	Boat Size GRT	No. of Berth	Area (m ²)				Remark
			Terminal Building	Parking			
				Loading	Waiting	Total	
Surabaya (- Banjarmasin) (- Ujung Pandang) Total	5,000	2	6,700	10,000	8,000	18,000	
	5,000	1	3,400	4,100	3,300	7,400	
		3	10,100	14,100	11,300	25,400	
Banjarmasin (- Surabaya)	5,000	2	6,700	10,000	8,000	18,000	
Jakarta (- Pontianak)	5,000	1	3,400	5,000	4,000	9,000	
Pontianak (- Jakarta)	5,000	1	3,400	5,000	4,000	9,000	
Ujung Pandang (- Surabaya)	5,000	1	3,400	4,100	3,300	7,400	
Kendari (- Ambon) (- Wawonii) Total	3,000	1	2,100	3,300	2,500	5,800	
	300	*(1) 1	900	700	1,000	1,700	Existing
		2	3,000	4,000	3,500	7,500	
Ambon (- Kendari) (- Srong) Sub Total (- Waiprit) Total	3,000						
	1,000	1	2,600	4,000	3,000	7,000	
		1	2,600	4,000	3,000	7,000	
	500	*(1) 2	3,400	3,400	4,000	7,400	Existing
		3	6,000	7,400	7,000	14,400	
Sorong (- Ambon) (- Patani) (- Fakfak) Total	1,000						
	1,000	1	2,200	2,800	2,500	5,300	
	300						Planned
		1	2,200	2,800	2,500	5,300	
Selayar (- Labuhan Bajo)	1,000	1	1,700	2,300	2,100	4,400	
Labuhan Bajo (- Selayar) (- Sape) Total	1,000	1	1,700	2,300	2,100	4,400	
	500	*(1) 1	1,700	1,700	2,000	3,700	Existing
		2	3,400	4,000	4,100	8,100	
Manokwari (- Biak)	1,000	1	1,700	2,300	2,100	4,400	
Biak (- Manokwari) (- Serui) Total	1,000	1	1,700	2,300	2,100	4,400	
	300	*(1) 1	1,100	1,000	1,300	2,300	Existing
		2	2,800	3,300	3,400	6,700	
Wahai (- Babang)	1,000	1	1,400	1,800	1,600	3,400	
Babang (- Wahai)	1,000	1	1,400	1,800	1,600	3,400	
Patani (- Srong)	1,000	1	1,400	1,800	1,600	3,400	

Note : Figure in parenthesis indicates the number of existing berths.

7.2 Ferry Terminal Development at Each Site

7.2.1 Basic Premises for Ferry Terminal Development

6. In selecting a ferry terminal development site, study must be made from different angle: the present conditions of the area concerned and the direction of its future development, socio-economic condition, natural conditions and environmental influence.

7. Therefore, the ferry terminal development sites are evaluated from the following viewpoints (details are shown in Appendix Table A7.2.1).

- 1) Convenience
- 2) Safety
- 3) Economy
- 4) Flexibility of the plan
- 5) Environmental protection

7.2.2 Proposed Ferry Terminal Development at Each Site

8. The study team conducted the field survey to select the site for ferry terminal development on each route in the long term development plan. In this section, we will select the ferry terminal development site on each route according to the results of the field survey based on the above basic premises and make a proposal for the ferry terminal development plan at the selected site.

(1) Surabaya – Banjarmasin

f) Surabaya

9. It is necessary to consider developing Surabaya ferry terminal as a base to link the above route and Surabaya-Ujung Pandang route.

10. The existing Ujung ferry terminal, managed by PT. ASDP, connects with Kamai in Madra Island in Surabaya port. However, there is no room for expansion either on water or land. In addition, the existing Surabaya port is also very congested, therefore, Lamong Bay area has been planned as the future port development area by PELINDOIII.

11. Concerning the Tuban area as mentioned in Part I of Chapter 5, Tuban is located

about 160km from Surabaya city, or more than 2 hours by car. Moreover, the coast in Tuban faces the open sea and is subjected to relatively rough waves, which means that breakwaters would likely be required to protect against waves and to secure a sufficient water depth, the same as Tanjung Priok and Semarang ports. Therefore, Tuban can not be recommended as a site for the new ferry terminal.

12. Meanwhile, one of the candidate terminal sites is in the northern part of Gresik industrial development zone. However, the land area has already been earmarked for industrial zone use, therefore, this site is not available.

13. Lamong Bay is located in the Surabaya port area. At present, PELINDOIII has a comprehensive port development plan for the container terminal, including an industrial zone, commercial center and the passenger terminal in Lamong Bay.

14. The ferry terminal development at Lamong Bay site was consented to by PELINDOIII on the condition that the ferry terminal would be developed together with the passenger terminal in a comprehensive port development plan. Therefore, Lamong Bay is being examined as a candidate site of the new ferry terminal (See Figure A7.2.1).

15. According to the above, ferry terminal development in Lamong Bay site must be thought of as a comprehensive development plan including the passenger terminal. Therefore, it is necessary to coordinate with PELINDOIII so that Lamong Bay will be the site for both ferry terminal development and the passenger terminal development.

16. Land area of Lamong Bay is damp because some rivers flow into the area; it is shoaling about 2km from the shoreline. Therefore, the seabed is expected to be soft ground and thus it is necessary to select an appropriate arrangement plan and structural types for the mooring facility and onshore facility.

17. In the terminal layout plan of Lamong Bay site, it is necessary to consider PELINDOIII's future port development plan, in which the mooring facility and onshore facility are planned to be connected with access bridge. It should be noted that the length of the access bridge has a large influence on the construction cost.

18. The structure of mooring facility will be dolphin type due to the relatively short work term and low cost, while reclamation work is planned for the onshore facility. However, detailed data on natural conditions is lacking (particularly soil conditions and sounding), therefore it may be necessary to revise the layout plan and structural type after

the necessary surveys are conducted.

2) Banjarmasin

19. The existing inland waterway ferry service site of PT. ASDP, the area next to Banjarmasin port site (adjacent to the passenger terminal of Banjarmasin port) and Barito Bridge site will be examined as candidates for the ferry terminal in Banjarmasin.

20. Banjarmasin port is managed by PELINDOIII. The port area consists of the Martapura Terminal and the Trisakti Terminal. The Trisakti Terminal has a total quay wall length of about 510m and is located to the left side of the Barito river. Passenger terminal of 90m is located far upstream of Trisakti Terminal.

21. At present, PELINDOIII has a future port development plan at an area 1,500m upstream from the passenger terminal. However, this area is owned by various parties, both public and private; in addition, illegal residents are also observed.

22. The existing inland waterway ferry service site has a wooden pier and land area of 100m x 100m, and transports passengers and cargo but not cars. This is the site where PELINDOIII is planning the above mentioned future port development.

23. The area next to Banjarmasin port site is located upstream of Barito river facing the passenger terminal across from the small Teluk Dklam river and is situated in the future port development area.

24. At present, the area next to Banjarmasin port is owned by the army, private enterprise, and government institutions. The area possessed by the army is being leased to a private company for the shipment of timber and coal (contract expires in 2002). There are no houses on the upstream side of this area for about 500m.

25. Barito Bridge site is located downstream of Barito Bridge on the left side of Barito river. Barito Bridge, located 10km upstream of Banjarmasin port, was built in April of this year. It is also 18km from the city of Banjarmasin by road.

26. There is a materials factory for road construction adjacent to Barito Bridge site. There are also some farms and a bush, but no residences. In addition, this site faces Pakut Island, located at midstream of the Barito river. The distance between Pakut Island and the site is about 400m and a water depth of - 5.0m can be secured for slightly less than

300m.

27. The existing inland waterway ferry service site is the planned area for future port development, but it is near private enterprises and government institutions, as well as squatters. Therefore, in the case of ferry terminal construction in this area, negotiations for acquisition of the site are expected to take a long time.

28. The area near to Banjarmasin port site is owned by the army and others, the area possessed by the army is now being leased to the private sector. Compared with the existing inland waterway ferry service site, negotiations to acquire the site would not take such a long time as no relocation of inhabitants would be necessary.

29. Acquisition of the Barito Bridge site seems to be easier than the above two sites because it is a natural land area, but the turning basin of ferry boat would be small since it is so close to Pakut Island. Even if the water area is expanded by dredging, maintenance dredging would be necessary because siltation seems to occur.

30. In comparing the above three sites, the area near Banjarmasin port site seems to be the best candidate as a site for ferry terminal development because comprehensive development with the existing Banjarmasin port is possible. In addition, it is rated highly from the standpoints of convenience, economy and relocation of inhabitants. But it is necessary for the Indonesian government to examine a future port development plan and the possibility of land acquisition for the ferry terminal development plan. (See Figure A7.2.2).

31. Two mooring facilities for ferry boat of 5,000GRT and onshore facility are planned to be arranged consecutively without the access bridge at the proposed ferry terminal development site. The mooring facility is planned as an extension of the berth line of the future development of the Banjarmasin port as much as possible. The type of structure of the mooring facility is steel pipe pile type.

(2) Jakarta - Pontianak

1) Jakarta

32. At present, reclamation work on the base of the west side break water in Tanjung Priok is being conducted as part of the comprehensive coastal area development plan by the third sector. PELINDO II will get 25% of the reclamation area.

33. PELINDO II has a port redevelopment plan in the reclamation area, including construction of a Ro-Ro berth. However, the construction plan of the ferry terminal calls for a change in the above Ro-Ro berth construction plan, and this has been consented to by PELINDO II (refer to Figure A7.2.3).

34. Further coordination with PELINDO II is necessary for the ferry terminal development at the Tanjung Priok port. And it is necessary to consider the construction progress of the comprehensive coastal area development plan by the third sector.

35. One berth for ferry boat of 5,000GRT and mooring facility and onshore facility are planned consecutively without the access bridge. The berth line of the mooring facility may correspond to PELINDO II's plan.

2) Pontianak

36. There is one berth of the Kota ferry terminal linking Kota with Sintan in the existing Pontianak port area, which is managed by PELINDO II. There is no expansion area for the future port development including the ferry terminal development.

37. The Bundaran Jeruju site is located about 5km downstream of the Kapuas Kacil river from the Pontianak port, and there are many small residences outside of the Bundaran Jeruju site, which makes it hard to consider as a ferry terminal development area. Therefore, Jeruju site is being examined as a candidate site of the ferry terminal in Pontianak.

38. A rakyat berth is currently being constructed at the Bundaran Jeruju site using local government funds. The area purchased from a private owner that will be developed as a ferry terminal is a stretch of 200m downstream of this rakyat berth, where there are no residences, only a privately owned land area overgrown with weeds.

39. Ferry terminal development at Jeruju site is planned for one berth of 5,000GRT ferry boat, the mooring facility and onshore facility are planned to be arranged consecutively. The mooring facility is planned as an extension of the berth line of the rakyat berth as much as possible. The structure of mooring facility is planned to be steel pipe pile type.

(3) Surabaya - Ujung Pandang

1) Surabaya

40. The candidate site for the ferry terminal in Surabaya is mentioned above.

2) Ujung Pandang

41. There is no area to the north seaside of the existing Ujung Pandang port due to severe shoaling. Barombon area is located at the south seaside of the existing Ujung Pandang port and the required depth of about -6.0m can only be obtained about 100m from coastline, however, it has a problem of littoral drift and seasonal winds. Therefore, the Ujung Pandang port site is being examined as a candidate site for the ferry terminal in Ujung Pandang port area (See Figure A7.2.4).

42. PELINDOIV has drafted a long-term development plan of Ujung Pandang port till 2018. The west, east and south side breakwater will be constructed and the quay wall within the breakwater will be expanded in the plan.

43. The ferry terminal plan will be incorporated in the above Ujung Pandang port long-term development plan as a part of a comprehensive plan for Ujung Pandang port. The plan has been consented to by PELINDOIV.

44. There seems to be no objection to developing the ferry terminal and Ujung Pandang Port jointly from the standpoint of comprehensive port development. However, it is necessary to further coordinate within the Indonesian government for the ferry terminal development at the Ujung Pandang port.

45. The selected ferry site is for the long term ferry development plan, but it seems valid for the short-term development plan as well. Therefore, it is necessary to decide on a construction site for ferry terminal development at an early stage. However, the ferry terminal development site depends on the construction progress of the long term development plan in Ujung Pandang port.

46. The ferry terminal layout plan is planned for one berth of 5,000GRT ferry boat, however it is necessary to coordinate with PELINDOIV for the berth line of the quay wall, length of berth and ferry terminal plan.

(4) Kendari - Ambon

1) Kendari

47. The existing Kendari ferry terminal site and Lapuko site are being examined as candidate sites for the ferry terminal in Kendari. The former which is currently constructed connects with Wowoni Island while the latter is currently being constructed as a local port for Perinitis.

48. Kendari ferry terminal site is located about 100m west of the commercial port in Kendari Bay, near the city, and has good road access. And the site is entirely protected from the influence of waves because it is located in the inner bay and the water depth is more than 6.0m. Future expansion space can be secured by reclaiming the off shore area to the west.

49. Lapuko site, selected as the future local port development area by BAPPEDA, is located about 50km south of the city and next to the mouth of the local port. The coastline is sandy beach, behind which is a mangrove site, breeding ground, and a variety of trees and shrubs. The water depth is 2.0m for 4 -500m offshore after which the depth suddenly increases.

50. Compared with Lapuko site, the existing Kendari ferry terminal site is superior on all counts as a candidate site for the ferry terminal development except in terms of "flexibility of the plan".

51. The layout plan of the ferry terminal includes one berth to accommodate ferry boat of 3,000GRT and will consider comprehensive management and operation utilizing the existing ferry terminal.

2) Ambon

52. It is necessary to consider developing Ambon ferry terminal as a base to link the above route and Ambon - Sorong route.

53. The study team surveyed the bay area of Ambon and the whole surrounding area of Ambon Island. The bay area of Ambon is unsuitable as a ferry terminal site because there are many private houses and company establishments, and though there is a vacant site, the water depth in front suddenly increases (which is characteristic of Ambon Bay).

54. There are no suitable sites for a ferry terminal except for Hunimua ferry terminal site and Torehu port site because seasonal waves greatly affect the whole area surrounding Ambon Island.

55. Torehu Port is currently used by small cargo and passenger ships plying between surrounding islands. There is an unused water front area of about 300m within Torehu Port, however, this area should be reserved for future expansion.

56. Hunimua ferry terminal site which has a mooring dolphin of 500GRT capacity is located about 40km from Ambon city, with a good access road. There is a marine park and beach on the north side of the ferry terminal while on the south side there is nothing but palm trees and farms, though much of the area is owned by the air force.

57. In the ferry terminal layout plan, One dolphin berth is constructed to accept to accommodate 3,000GRT ferry boats for the existing and new routes. The land area can be expanded using the palm tree and farm. The plan will also consider comprehensive management and operation with the existing ferry terminal.

(5) Ambon - Sorong

1) Ambon

58. The candidate site for the ferry terminal in Ambon is mentioned above.

2) Sorong

59. It is necessary to consider developing Sorong ferry terminal as a base to link the above route and Patani - Sorong route.

60. There is a ferry terminal linking with Jefman Island Airport in Sorong area. Although there is a wooden pier, the site is not used because vehicles cannot be transported. And now the airport is being moved from Jefman to Sorong. Construction will be completed in 2 years, after which the Sorong - Fak Fak route will open.

61. In the future development of the ferry terminal, the existing wooden pier will be demolished, and a new pier will be constructed that can accommodate 1,000GRT ferry boats for the new Ambon - Sorong and Patani - Sorong routes. Required land for development can be secured by offshore reclamation.

(6) Selayar - Labuhan Bajo

1) Selayar

62. The existing Pamatata ferry terminal site and Patumbukang site are being examined as candidate sites for the ferry terminal in Selayar Island.

63. The existing Pamatata ferry terminal is located at the north end of Selayar Island linking with Bira which is located at the east end of south Sulawesi. This site is plagued by insufficient water depth and strong seasonal winds.

64. Repair works to cope with 500GRT at Pamatata ferry terminal are now ongoing. However, an additional berth for 1,000GRT ferry boats would be a problem in terms of securing a sufficient water depth and new breakwaters would have to be constructed to defend against seasonal winds.

65. Patumbukan site is a small scale bay and is located at the south east end of Selayar Island and has a length of 500m and width of 250m. The inner bay is very calm because there is a coral reef which acts as a natural breakwater at the bay entrance. KANWIL office plans to make a future ferry terminal at this site.

66. Bay entrance and inner bay area of Patumbukan site seem to be rather small, however, this can be overcome by setting navigation aids and dredging. Therefore Pamatata site treats only the existing route between Bira and Pamatata, while Patumbukang is selected as the new ferry terminal site for the Selayar - Labuhan Bajo route.

67. In the ferry terminal layout plan, a new dolphin berth of 1,000GRT ferry boat is constructed and the land area for development will be secured by land reclamation. The mooring basin will also be secured by dredging to the extent possible.

2) Labuhan Bajo

68. The existing Labuhan Bajo ferry terminal with Sape of Sumbawa Island is located at the west end of Flores Island. It is equipped with a dolphin berth, terminal building of 700m² and a parking lot of 1,000m².

69. The existing Labuhan Bajo ferry terminal, located in the north end of town,

offers good land access, and the sea is calm throughout the year. There is sufficient offshore and onshore area to cope with the existing Labuhan Bajo and new Selayar - Labuhan Bajo routes for the future ferry terminal development.

70. Therefore the existing Labuhan Bajo ferry terminal site is selected as the ferry terminal site for the new Selayar - Labuhan Bajo route for the above reason and from the viewpoint of comprehensive management and operation with the existing ferry terminal.

71. In the ferry terminal layout plan, it is necessary to consider the requirement of one ferry berth to accommodate 1,000GRT ferry boat for the existing and new routes according to the demand forecast.

72. Therefore, the existing dolphin berth is improved for 1,000GRT ferry boat, while the onshore development area will be obtained by reclamation offshore in front of the existing parking lot including the existing fish market area.

(7) Manokwari - Biak

1) Manokwari

73. South Wosi site and south Sowi site are candidate sites for the ferry terminal in Manokwari area. Both sites have similar conditions in terms of location and oceanography. However, BAPPEDA plans to build related airport facilities at south Wosi site and use south Sowi site as a base for maritime and land traffic. Therefore, south Sowi site is being examined as a candidate site for the ferry terminal.

74. South Sowi site is located about 5km south west from Manokwari city. The land area of the site is a 200m copse that stretches from the coast to the main road. The coast is a sandy beach and the sea bottom slope is sharp, but this site seems to have sufficient offshore and onshore area for ferry terminal development. However, acquisition of the site requires negotiation with the owner.

75. Layout plan for ferry terminal is planned for one berth of 1,000GRT ferry boat. The new berth will be constructed in front of the land site which will be obtained by reclamation to the extent possible.

2) Biak

76. The Mokmer ferry terminal, the site recommended by the previous study, which will connect to Saubeba in Yarpem Island, is currently being constructed in Biak by local government budget. Therefore, Mokmer ferry terminal site is selected as the ferry terminal for Manokwari - Biak route.

77. In the ferry terminal layout plan, it is necessary to consider the berth under construction for 300GRT ferry boat for the existing route and additional one new berth for 1,000GRT ferry boat for the new route according to the demand forecast. Onshore area for development will be secured by reclamation of both east and west sides.

(8) Wahai - Babang

1) Wahai

78. Wahai is the biggest city on the north side of Seram Island. Wahai site is located about 3km east of Wahai town and has a pier managed by KANWIL (length: 70m, width: 8m, front depth: - 5.0m).

79. East, west and south sides of the bay are shaded, and it is calm all year round. There are no facilities except the pier of KANWIL. Therefore, the new ferry terminal site is selected near the existing pier in the inner part of the bay.

80. In the ferry terminal layout plan, land for development is obtained by offshore reclamation. One new berth for 1,000GRT ferry boat will be constructed in front of this area.

2) Babang

81. Babang site is located in Babang bay and about 16km east from the biggest city of Labuha in Bacan Island. The port function was moved to the bay from Labuha in 1981 to reduce the influence of winds.

82. There is a pier (length:70m, width:8m,front depth:-5.0m) managed by KANWIL and a oil pier of PERTAMINA and an abandoned revetment under reclamation by a private company in the bay. The development of the ferry terminal in Babang site is planned to be diverted from the above revetment and site.

83. In the layout plan of the ferry terminal, the revetment will be rearranged, development area will be obtained by reclamation of the land, and mooring facility is planned to be steel pipe pile type. The planned depth of the pier is -10.0m, which is the present depth in front of the revetment.

(9) Patani - Sorong

1) Patani

84. There are few candidate sites in or around Patani because location and oceanographic conditions present problems from the port development point of view. However, there is one site called Sif, located about 13km west of Patani by road.

85. Sif site was used by a lumbering company for the transport of lumber until 1983. The depth of the old jetty is -5.0m and the diameter of turning basin is about 200m. The mooring basin is kept calm by a coral reef. Therefore, Sif site is selected for the development of a ferry terminal in Patani area.

86. In the layout plan of ferry terminal for one berth of 1,000GRT ferry boat, the area of the mooring basin is secured by dredging including the land area to the extent possible, while required onshore area is obtained by land reclamation. The type of the mooring facility is steel pipe pile type. But a detailed survey on natural conditions is necessary to determine whether waves could overpass the coral reef under high tides.

2) Sorong

87. The candidate site for the ferry terminal in Sorong is mentioned above.

7.2.3 Layout Plans of Ferry Terminal

88. The general ferry terminal layout plans by each ferry boat size are shown from Figure 7.2.1 to 7.2.4. However, it may be necessary to modify these layout plans after the detailed survey on natural conditions and coordination with related organizations.

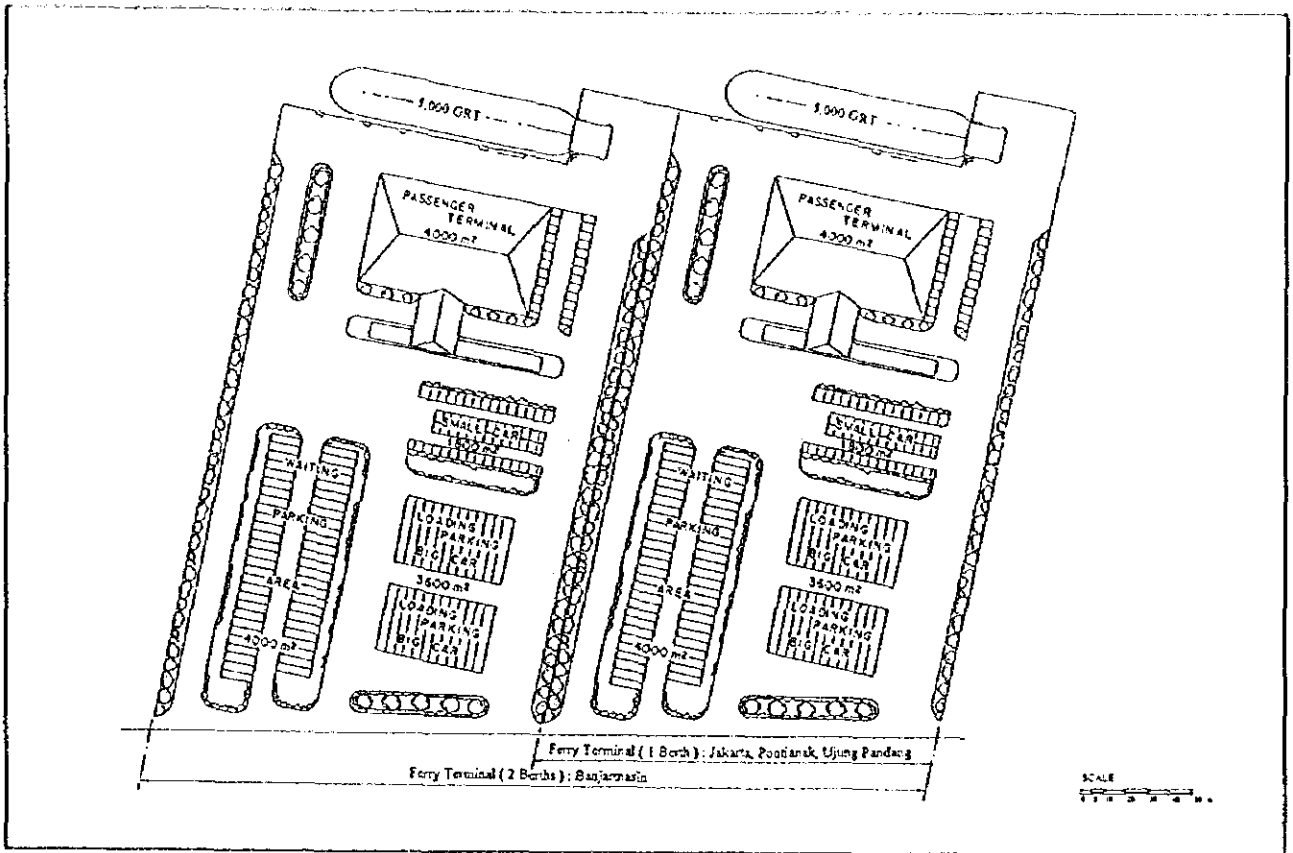


Figure 7.2.1 General Layout Plan of Ferry Terminal (5,000 GRT)

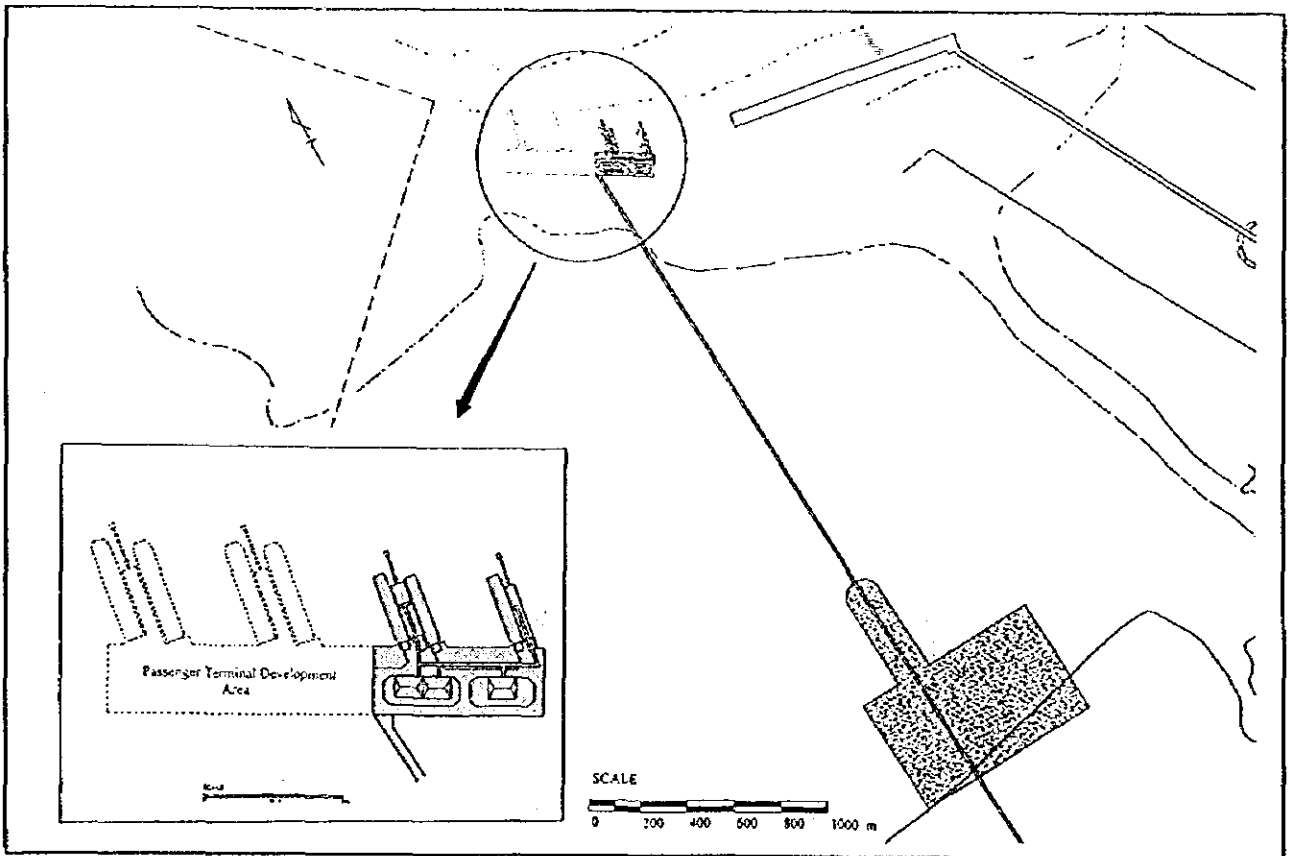


Figure 7.2.2 General Layout Plan of Ferry Terminal (5,000 GRT, at Surabaya site)

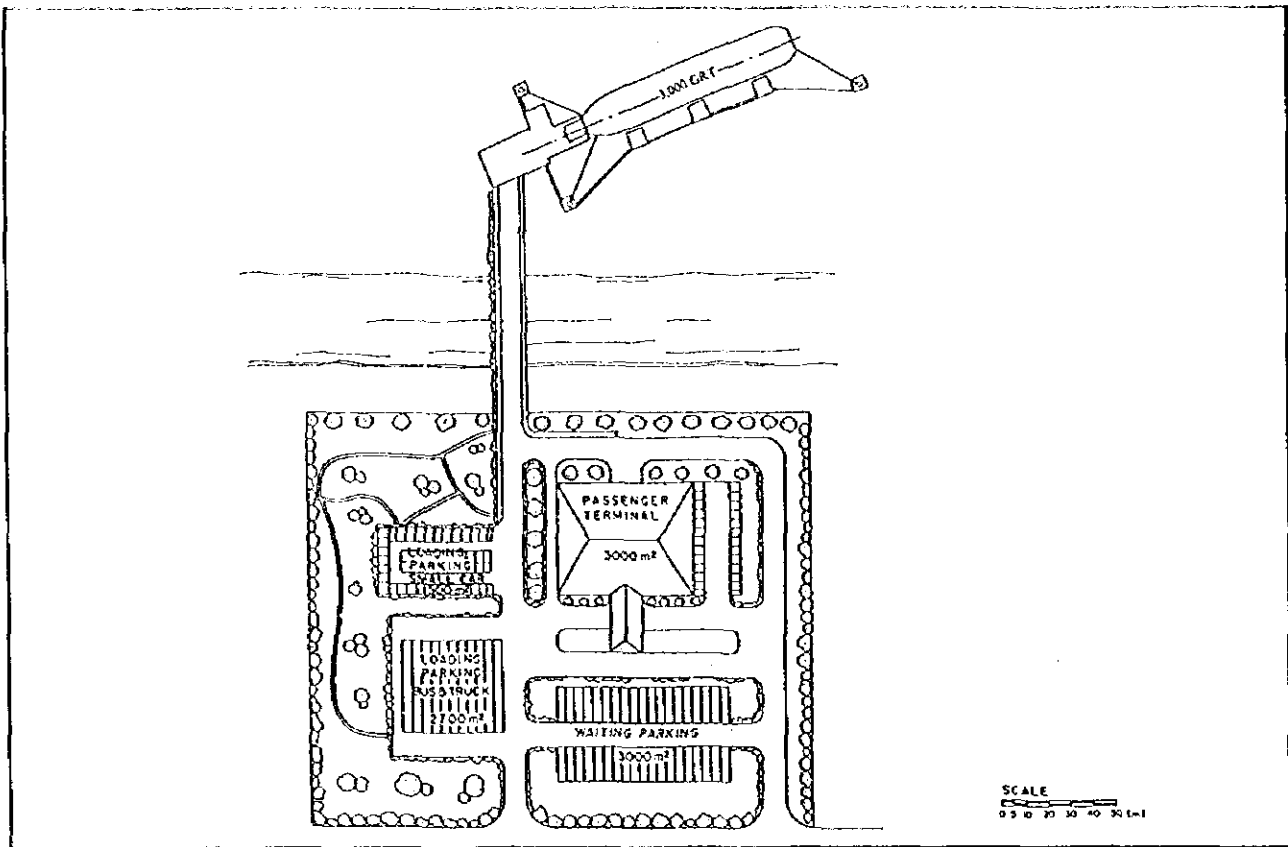


Figure 7.2.3 General Layout Plan of Ferry Terminal (3,000 GRT)

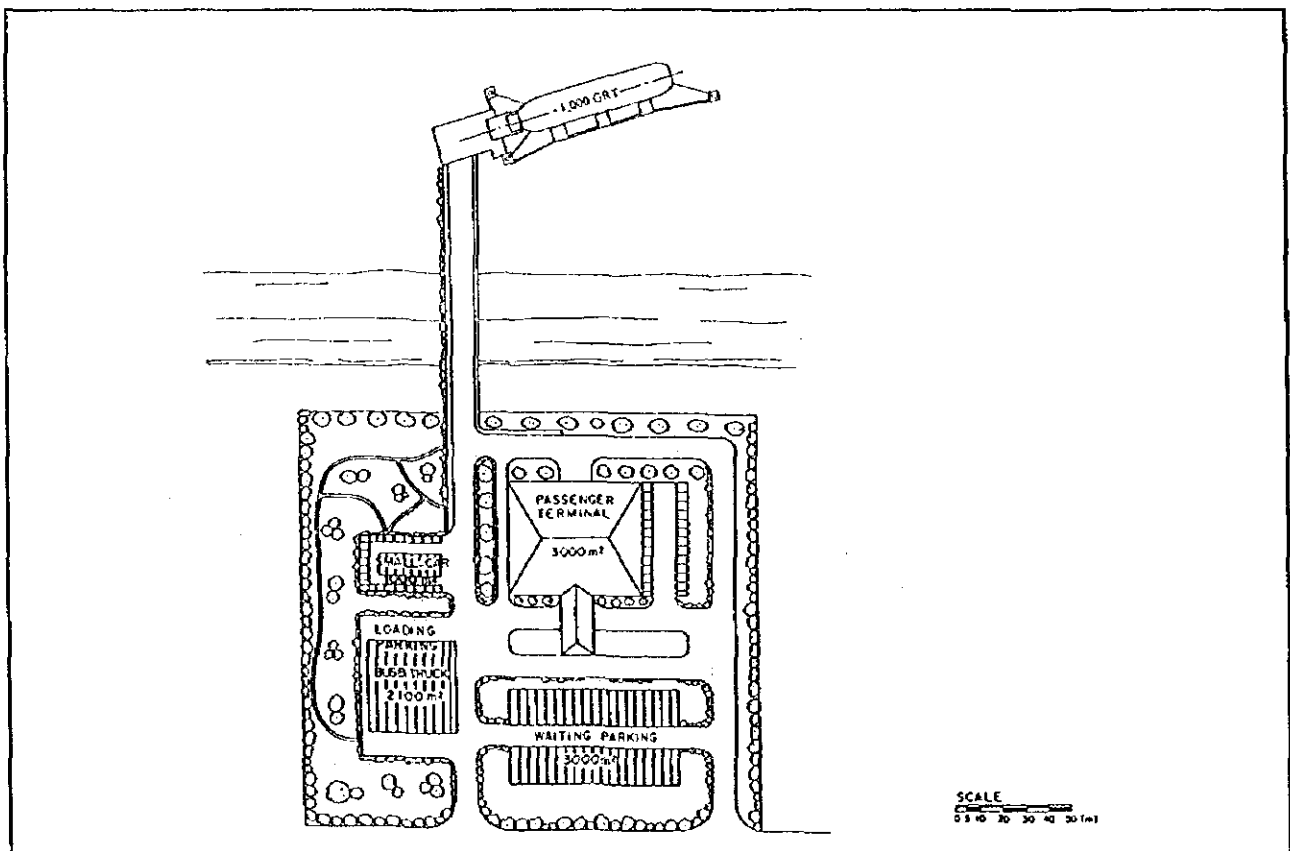


Figure 7.2.4 General Layout Plan of Ferry Terminal (1,000 GRT)

Chapter 8 Preliminary Design and Cost Estimation

8.1 Preliminary Design

8.1.1 Objective Ferry Boat

(1) Maximum and minimum size of objective ferry boats

1. In the preceding Chapters, the sizes of ferry boats to be introduced in each route were explained. However, it should be considered that the proposed ferry sizes are the maximum sizes for the design of mooring facility in each ferry terminal and the other smaller sizes of ferry boats should be accepted by the same terminal for flexible operation of ferry services. Therefore, the maximum and minimum sizes of objective ferry boats were established for the preliminary design of proposed ferry terminals as shown below.

Table 8.1.1 Size of Objective Ferry Boat

No.	Route		Size of Ferry Boat (GRT)	
			Maximum	Minimum
1	Jakarta	Pontianak	5,000	1,000
2	Surabaya	Banjarmasin	5,000	1,000
3	Surabaya	Ujung Pandang	5,000	1,000
4	Kendari	Ambon	3,000	1,000
5	Ambon	Sorong	1,000	500
6	Selayar	Labuhan Bajo	1,000	500
7	Manokwari	Biak	1,000	500
8	Wahai	Babang	1,000	500
9	Patani	Sorong	1,000	500

(2) Standard dimensions of ferry boat

2. The standard dimensions of ferry boats have been determined for the preliminary design purpose considering the dimensions of existing and planned ferry boats in Indonesia as shown below (See Table 8.1.2).

Table 8.1.2 Standard Dimensions of Ferry Boat

Gross Tonnage		(GRT)	5,000	3,000	1,000	500
Length Over All		(m)	100	90	70	50
Moulded Breadth		(m)	18	16	14	12
Full Loaded Draft		(m)	4.9	3.9	3.7	2.5
Free Board	Empty	(m)	1.4	1.3	1.2	1.0
	Full Loaded	(m)	0.5	0.5	0.5	0.5
Ship Ramp	Length	(m)	6.0	5.5	5.3	4.3
	Width	(m)	7.0	7.0	7.0	6.0
Capacity	Passenger	(person)	800	600	500	400
	8t Truck and Bus	(unit)	34	27	19	12
	2t Truck and Sedan	(unit)	42	34	23	14

8.1.2 Natural Conditions for Preliminary Design

(1) Tide

3. The tidal water elevations such as the High Water Spring (HWS) and Low Water Spring (LWS) at the location of ferry berth are very important for the design of mooring facilities. In this stage of this study, however, the exact values of HWS and LWS are not known yet in some terminal sites since no observation had been executed. For the preliminary design purpose, therefore, the following tide elevations were established based on the available tide data at the nearest national tide observation stations.

Table 8.1.3 Tide Elevations in Each Terminal Site

Route	Site	HWS (m)	LWS (m)	Site	HWS (m)	LWS (m)
1	Jakarta	+1.40	+0.20	Pontianak	+1.80	0.00
2	Surabaya	+2.74	0.00	Banjarmasin	+2.97	0.00
3	Surabaya	+2.74	0.00	Ujung Pandang	+1.80	0.00
4	Kendari	+2.60	0.00	Ambon	+2.20	0.00
5	Ambon	+2.20	0.00	Sorong	+2.00	0.00
6	Selayar	+2.39	0.00	Labuhan Bajo	+2.70	0.00
7	Manokwari	+2.22	0.00	Biak	+1.55	0.00
8	Wahai	+1.92	0.00	Babang	+1.35	0.00
9	Patani	+1.60	0.00	Sorong	+2.00	0.00

(2) Wave at berth

4. The wave height at the berth during loading or unloading operation is necessary to be considered for the design of movable bridge. Therefore, following wave heights were estimated in each terminal site for the preliminary design purpose.

Table 8.1.4 Wave Height during Loading/Unloading Operation

Route	Site	Wave Height (m)	Site	Wave Height (m)
1	Jakarta	0.0	Pontianak	0.0
2	Surabaya	0.3	Banjarmasin	0.0
3	Surabaya	0.3	Ujung Pandang	0.0
4	Kendari	0.3	Ambon	0.3
5	Ambon	0.3	Sorong	0.3
6	Selayar	0.3	Labuhan Bajo	0.3
7	Manokwari	0.3	Biak	0.3
8	Wahai	0.3	Babang	0.3
9	Patani	0.3	Sorong	0.3

(3) Subsoil condition

5. The exact subsoil condition at the berth in each terminal site is not known yet. For the preliminary design of mooring facilities, the subsoil condition and elevation of bearing layer in each terminal site were assumed referring to the marine facilities in the vicinity as shown below (See Table 8.1.5).

Table 8.1.5 Assumed Subsoil Conditions

Site	Sea Bottom to Bearing Layer	Elevation of Bearing Layer
Jakarta	Soft Silty Clay	LWS -30m
Pontianak	Soft Silty Clay	LWS -30m
Surabaya	Soft Silty Clay	LWS -60m
Banjarmasin	Soft Silty Clay	LWS -40m
Ujung Pandang	Soft Silty Clay	LWS -30m
Kendari	Soft Silty Clay	LWS -30m
Ambon	Soft Sandy Clay	LWS -30m
Selayar	Soft Silty Sand	LWS -20m
Labuhan Bajo	Soft Silty Sand	LWS -20m
Manokwari	Soft Silty Sand	LWS -20m
Biak	Soft Silty Sand	LWS -20m
Wahai	Soft Silty Sand	LWS -20m
Babang	Soft Silty Sand	LWS -20m
Patani	Soft Silty Sand	LWS -20m

8.1.3 Layout

6. As explained in the previous section, the berth for 5,000GRT ferry boat is designed to be able to accommodate the ferry boats between 1,000GRT and 5,000GRT, and the berths for 3,000GRT ferry boat and 1,000GRT ferry boat are designed to be accommodate the ferry boats between 1,000GRT and 3,000GRT, and between 500GRT and 1,000GRT respectively.

(1) Layout of breasting dolphins

7. The breasting dolphins should be arranged to accommodate the planned ferry boat safely in any loading condition and in any tidal condition. To satisfy the above conditions, breasting dolphins should be located in positions parallel with the hull of ship and it is preferable that they are located as far apart from each other as possible. If only one type of ferry boat is operated for the route, 2 breasting dolphins will be enough. However, it is preferable for flexible operation that other types of ferry boat can be accommodated at a berth. For this purpose, 3 breasting dolphins should be provided in positions parallel with the hull of ferry boat.

8. In addition to these side breasting dolphins, one bow breasting dolphin should be provided in front of the movable bridge to protect the movable bridge against collision of ferry boat.

(2) Layout of mooring dolphins

9. At the end of berth, the mooring dolphins for bow line and stern line are provided as these lines can work effectively against the movement of the ferry boat by wind and current forces for both longitudinal and transversal directions. Therefore, the mooring dolphins are allocated at the positions from where bow and stern lines can be taken with an angle of 30 to 45 degrees to the face line of the berth.

10. In addition to the above bow and stern lines, spring lines are applied to keep the ferry boat safely especially against strong wind and current. For these spring lines, the mooring posts are installed on the breasting dolphins. The layouts of berth for the objective ferry boats of 5,000GRT, 3,000GRT and 1,000GRT are presented in Figure 8.1.1.

8.1.4 Design of Breasting Dolphin

(1) Crown height

11. The crown height of breasting dolphin should be determined considering the high tide elevation, wave condition and the free board elevation of objective ferry boat. Based on the these conditions presented in above sections, the crown height of breasting dolphin for each terminal site is determined as shown in the table below.

Table 8.1.6 Crown Height of Breasting Dolphin

(Datum Level: LWS)

Site	Crown Height	Site	Crown Height
Jakarta	+3.00m	Selayar	+3.50m
Pontianak	+3.50m	Labuhan Bajo	+3.50m
Surabaya	+5.00m	Manokwari	+4.00m
Banjarmasin	+4.00m	Biak	+3.00m
Ujung Pandang	+3.50m	Wahai	+4.00m
Kendari	+4.50m	Babang	+3.00m
Ambon	+4.00m	Patani	+3.00m

(2) Fender system

12. The fender system installed on a breasting dolphin should absorb the ship's berthing energy which can be calculated by the following formula.

$$E = 1/2 m V^2 C_e C_m C_s C_c$$

- Where :
- E = Ship's berthing energy (t.m)
 - m = Mass of ship = W_s/g (t)
 - W_s = Displacement of ferry boat (t)
 - g = Acceleration of gravity (9.8 m/sec²)
 - V = Berthing speed (m/sec)
 - C_e = Eccentricity factor (0.50 as one fourth point berthing)
 - C_m = Virtual mass factor
 - C_s = Softness factor (1.0 as standard)
 - C_c = Shape factor of berth (1.0 as standard)

13. Actual berthing velocity is high for smaller ships and low for bigger ships. In this design, the berthing velocity of 30cm/sec and 20cm/sec were applied for 1,000GRT ferry boat or less and 3,000GRT ferry boat or more respectively.

14. The berthing energy acts as a line load on the breasting dolphin at an elevation from LWS+0.20 - +0.50m up to the crown height. Therefore, the frontal frame is provided to cover this range with suitable number and size of fenders. Also the selected fender should be able to meet the following requirements;

- to absorb the berthing energy sufficiently,
- to absorb the berthing energy with small reaction force,
- to allow thin thickness of frontal frame as much as possible,
- to resist against the ship's sliding force sufficiently, and
- to be of a reasonable price.

Considering the above factors, the recommended fenders for each objective ferry boat are as follows (See Table 8.1.7).

Table 8.1.7 Berthing Energy and Recommended Fender Type

Objective Ferry Boat (GRT)	Displacement Ws (ton)	Berthing Velocity (m/sec)	Approach Angle (degree)	Berthing Energy (ton-m)	Recommended Rubber Fender Type (Example)
1,000	1,200	0.30	10	5.92	C630H (R1), 3 Units
3,000	3,800	0.20	10	6.13	C800H (R1), 2 Units
5,000	6,100	0.20	10	10.10	C800H (RH), 2 Units

(3) Typical section of breasting dolphin

15. From the economic and coastal engineering points of view, it is recommended as the structure of breasting dolphins in this design that the super structure is concrete and the substructure is steel pile foundation. The typical section of breasting dolphins is presented in Figure 8.1.2.

8.1.5 Design of Mooring Dolphin

(1) Crown height of mooring dolphin

16. The crown height of mooring dolphin is determined that 0.3m to 1.0m and 0.5m to 1.50m is higher than the HWS for the tidal range of 3.0m or more and for the tidal range of less than 3.0m respectively.

17. From the view point of construction cost, the low crown height is preferable. However, at locations affected by irregular high water, waves and subsidence, these

conditions should be considered sufficiently to determine the crown height. In this design, the following crown heights are recommended for the mooring dolphin in each terminal.

Table 8.1.8 Crown Height of Mooring Dolphin

(Datum Level: LWS)

Site	Crown Height	Site	Crown Height
Jakarta	+2.50 m	Selayar	+3.00 m
Pontianak	+3.00 m	Labuhan Bajo	+3.00 m
Surabaya	+4.00 m	Manokwari	+3.00 m
Banjarmasin	+3.50 m	Biak	+3.00 m
Ujung Pandang	+3.00 m	Wahai	+3.00 m
Kendari	+3.50 m	Babang	+2.50 m
Ambon	+3.50 m	Patani	+3.00 m

(2) Mooring force

18. The tractive force acting on a mooring post is determined by the wind force and current force acting on a ferry boat at each terminal site.

19. Bow and stern lines are also used to maneuver the ferry boat at berthing and deberthing operations as assistance to the ship's propeller. Therefore, the mooring dolphins and mooring posts should have enough strength to resist these forces.

20. This design recommends to use the following capacity of mooring posts on the mooring and breasting dolphins for each ferry boat (See Table 8.1.9).

Table 8.1.9 Tractive Force of Mooring Post

Objective Ferry Boat (GRT)	Tractive Force on Bollard (ton) (Mooring Dolphin)	Tractive Force on Bitt (ton) (Breasting Dolphin)
1,000	25	25
2,000	35	35
5,000	50	35

(3) Typical section of mooring dolphin

21. The structural type of mooring dolphin is the same as that of breasting dolphin, namely, a concrete super structure and steel pile foundation. A typical cross section of mooring dolphins is shown in Figure 8.1.3.

8.1.6 Design of Movable Bridge

(1) Gradients

22. In order to load or unload vehicles, a ramp should be provided to connect the ferry boat and the mooring facility smoothly. According to the International Study Commission of Permanent International Association of Navigation Congress (PIANC), the following ramp requirements are recommended for connection between Ro/Ro ships and the terminal.

- Where the water level variation is less than $\pm 0.75\text{m}$, a fixed shore ramp or incline suitable for receiving ship ramps should be provided where necessary.
- Where the water level variation exceeds $\pm 0.75\text{m}$, shore facilities such as a bridge ramp and ancillary equipment should be provided to reduce the net range of water level and bridge ramp variation to $\pm 0.75\text{m}$.

23. The International Study Commission of PIANC also made recommendations on the gradient of ramp as follows.

- The maximum gradient of the bridge ramp or fixed shore ramp should not exceed 1 in 10 (or 1 in 8 in exceptional circumstances), but particular attention should be paid to the change of gradient and these should be as smooth as possible to enable low ground clearance equipment to be handled safely.

24. On the other hand, the Technical Standards of Port and Harbor Facility in Japan specify the gradient of ramp for ferry boats as follows;

- The gradient during the use of a movable bridge shall be determined as follows;
 - 1) The gradient should not be more than 17% in the case of a movable bridge used exclusively for vehicles 1.7m wide or less.
 - 2) The maximum gradient should not be more than 12% in the case of a movable bridge used exclusively for vehicles 2.5m wide or less.
- The gradient of the fixed portion of a vehicle ramp should be determined as follows;
 - 1) The gradient should be 12% or less, in the case of a ramp used

exclusively for vehicles 1.7m wide or less.

- 2) The gradient should be 10% or less, in the case of a ramp used exclusively for vehicles 2.5m wide or less.

25. Considering the situation of the project sites and the above recommendations and standard, movable bridges are planned to be installed in all terminal sites except Jakarta and a maximum gradient of 12% is applied for movable bridges with the live load condition T-20, while maximum gradient of 17% for movable bridges with T-14.

(2) Width of movable bridge

26. The width of movable bridge should be determined based on the width of ferry boats and ship ramps of objective ferry boats as illustrated in Figure 8.1.4: Width of Movable Bridge. The width and length of ship ramp for each objective ferry boat were assumed based on the existing ferry boats in Indonesia as shown below (See Table 8.1.10).

Table 8.1.10 Width and Length of Ship Ramp and Free Board

Objective Ferry Boat (GRT)	Width of Ship Ramp (m)	Length of Ship Ramp (m)	Elevation of Free Board (m)
1,000	7.0	5.3	1.2
3,000	7.0	5.5	1.3
5,000	7.0	6.0	1.4

(3) Length of movable bridge

27. The length of movable bridge should be determined considering the tidal range, length of ship ramp, elevation of free board of ship, change of draft by loading conditions, hinge elevation of movable bridge, allowable gradient and pitching of ferry boat by wave action as illustrated in Figure 8.1.5: Length of Movable Bridge.

28. Considering all the above factors, the width and length of movable bridge in each terminal were designed as shown in the table below (See Table 8.1.11).

Table 8.1.11 Size of Movable Bridge in Each Terminal

Route	Site	Movable Bridge		Site	Movable Bridge	
		Width (m)	Length (m)		Width (m)	Length (m)
1	Jakarta	-	-	Pontianak	11.0	5.0
2	Surabaya	11.0	12.0	Banjarmasin	11.0	8.0
3	Surabaya	11.0	12.0	Ujung Pandang	11.0	5.0
4	Kendari	10.0	10.0	Ambon	10.0	8.0
5	Ambon	9.0	9.0	Sorong	9.0	8.0
6	Selayar	9.0	8.0	Labuhan Bajo	9.0	7.0
7	Manokwari	9.0	9.0	Biak	9.0	6.0
8	Wahai	9.0	9.0	Babang	9.0	5.0
9	Patani	9.0	6.0	Sorong	9.0	8.0

8.1.7 Access Way

29. Access way to connect the on-land facility and off-shore mooring facility is provided where necessary. Structural types of access way are rock mound causeway or reinforced concrete trestle. One or combined both types are applied to the structure depending on the sea bed condition. Generally, the rock mound causeway is adopted where the water depth is less than LWS and the concrete trestle is adopted where the water depth is greater. The width of the access way has been decided as 10m or more for the terminals of long distance routes and 8m for the other terminals.

8.1.8 Terminal Building

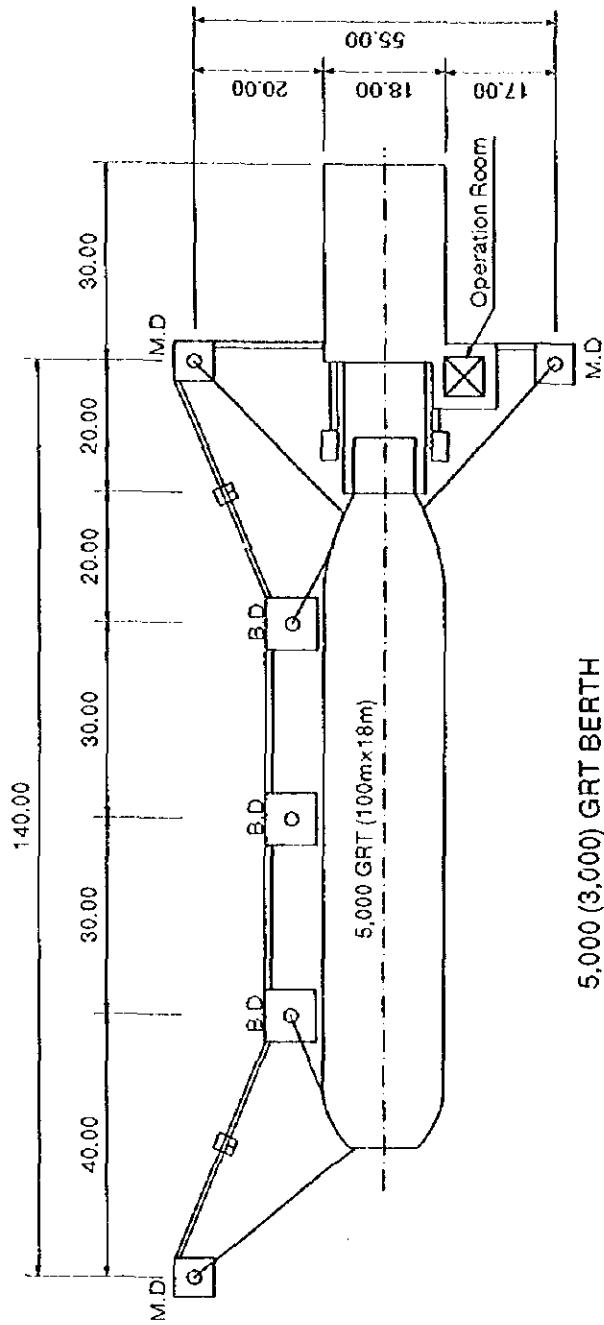
30. The total area of terminal building in each site was calculated in the previous Chapter. The terminal building should be designed to be comfortable and convenient for the passengers while its external appearance should suggest some special feature of that province or district. The terminal building should be located facing to the sea and mooring facility to provide a comfortable environment to the waiting passengers and other users.

8.1.9 Parking Lots

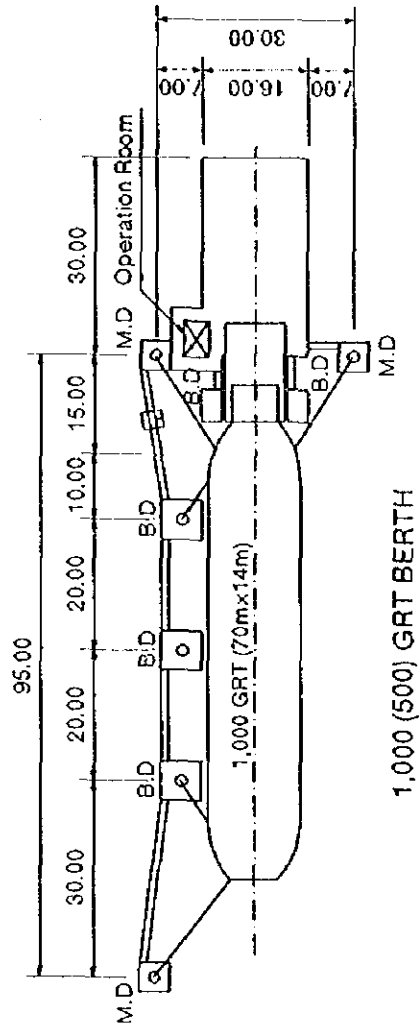
31. The required parking spaces were planned and presented in the previous Chapter. The parking lots should be arranged considering the smooth movement of vehicles and should be designed considering the settlement of subsoil, maintenance of pavement and drainage against heavy rain.

8.1.10 Electricity and Water Supply

32. The electricity for power supply to the movable bridge and for lighting to the terminal building and parking area is considered to be supplied by PLN for all terminals. However, the public water supply will not be available in some terminal sites. In such terminals, water is planned to be obtained from the deep wells drilled in the terminal sites. Accordingly, the utilities of electricity and water supply are considered to be installed within the terminal site. Fuel for the ferry boats and vehicles will be supplied by fuel trucks of PERTAMINA. Therefore, facilities for fuel supply are not included in this design.



5,000 (3,000) GRT BERTH



1,000 (500) GRT BERTH

Figure 8.1.1 Layout of Mooring Facility

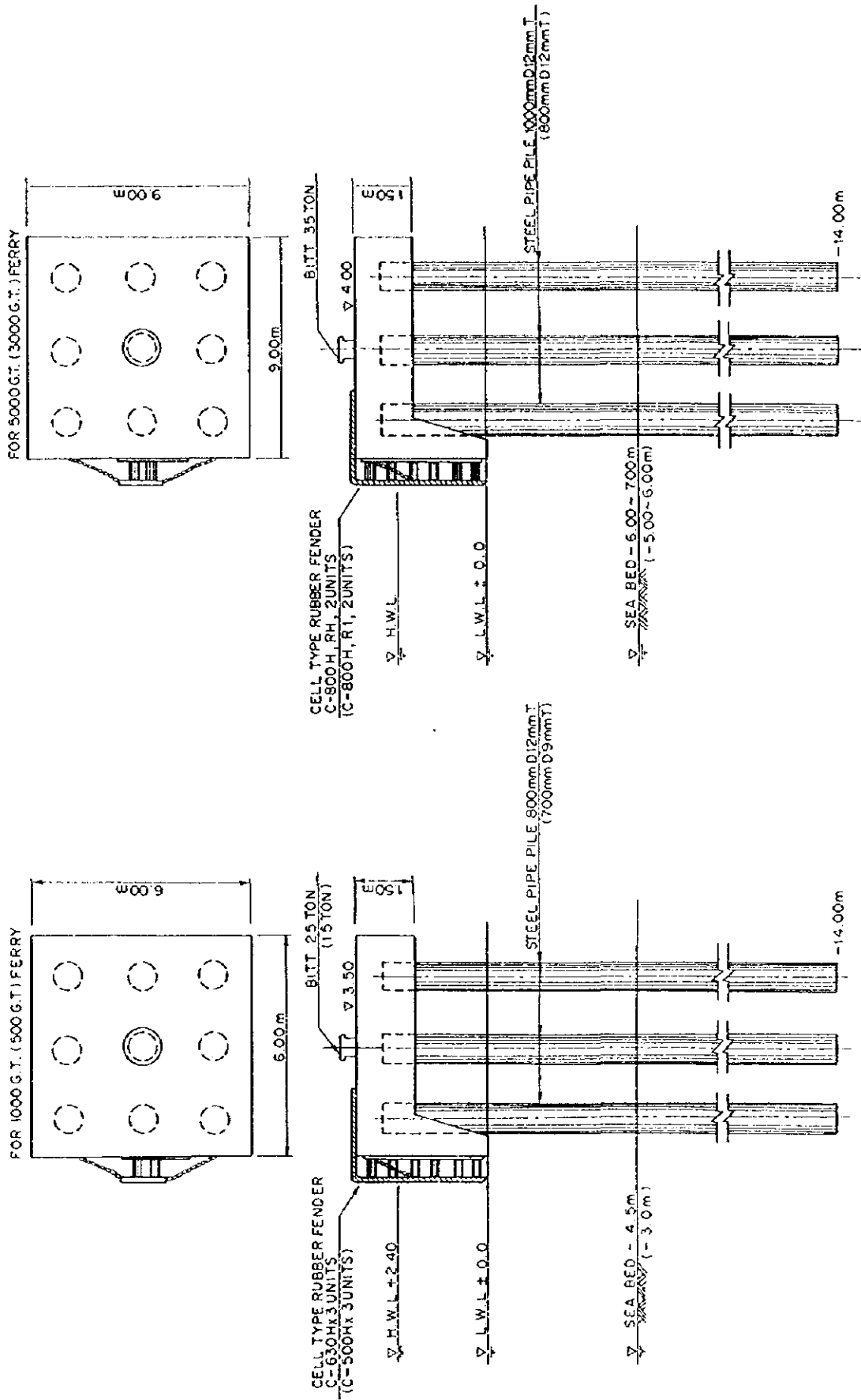


Figure 8.1.2 General Plan of Breasting Dolphin

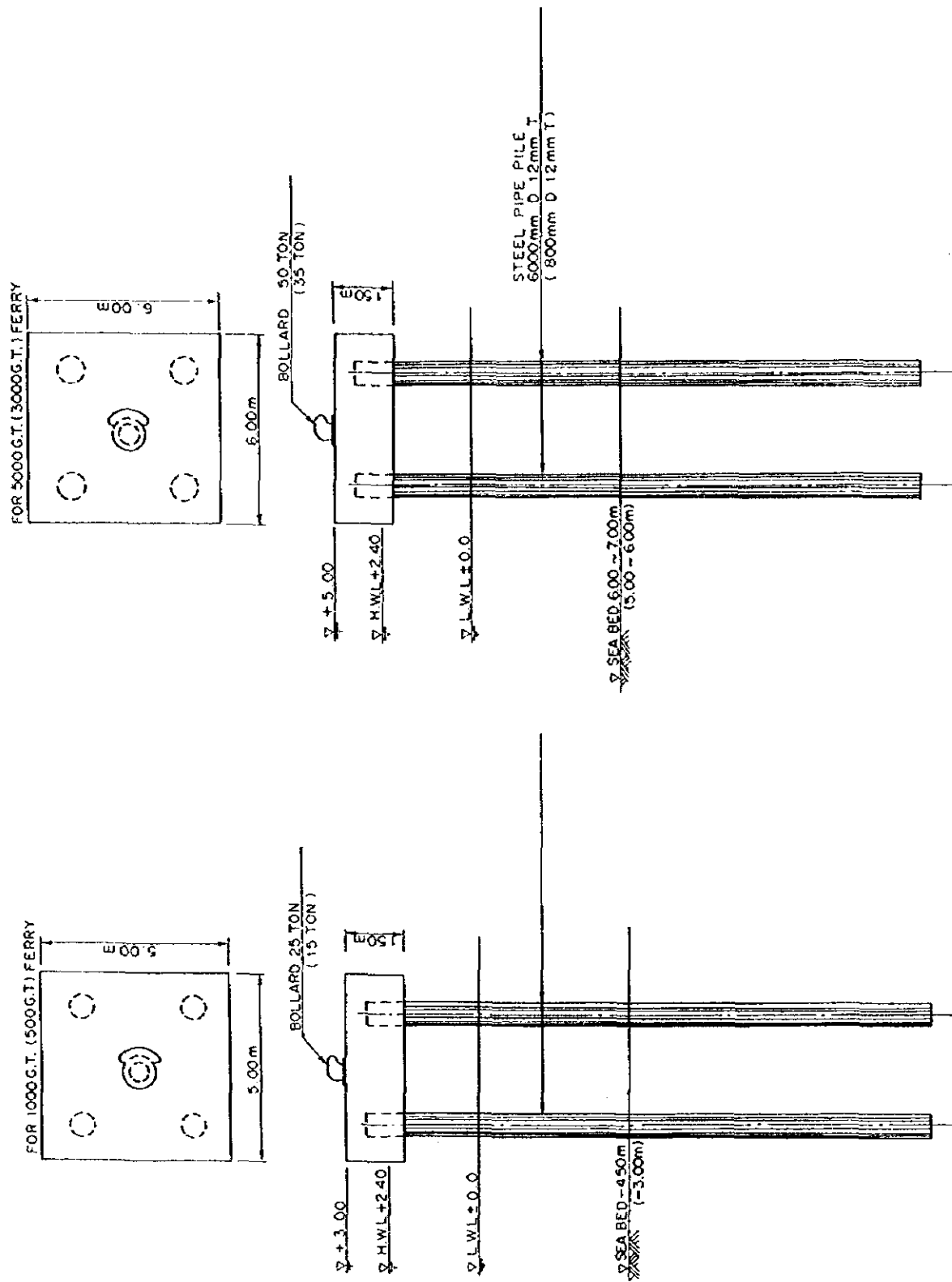


Figure 8.1.3 General Plan of Mooring Dolphin

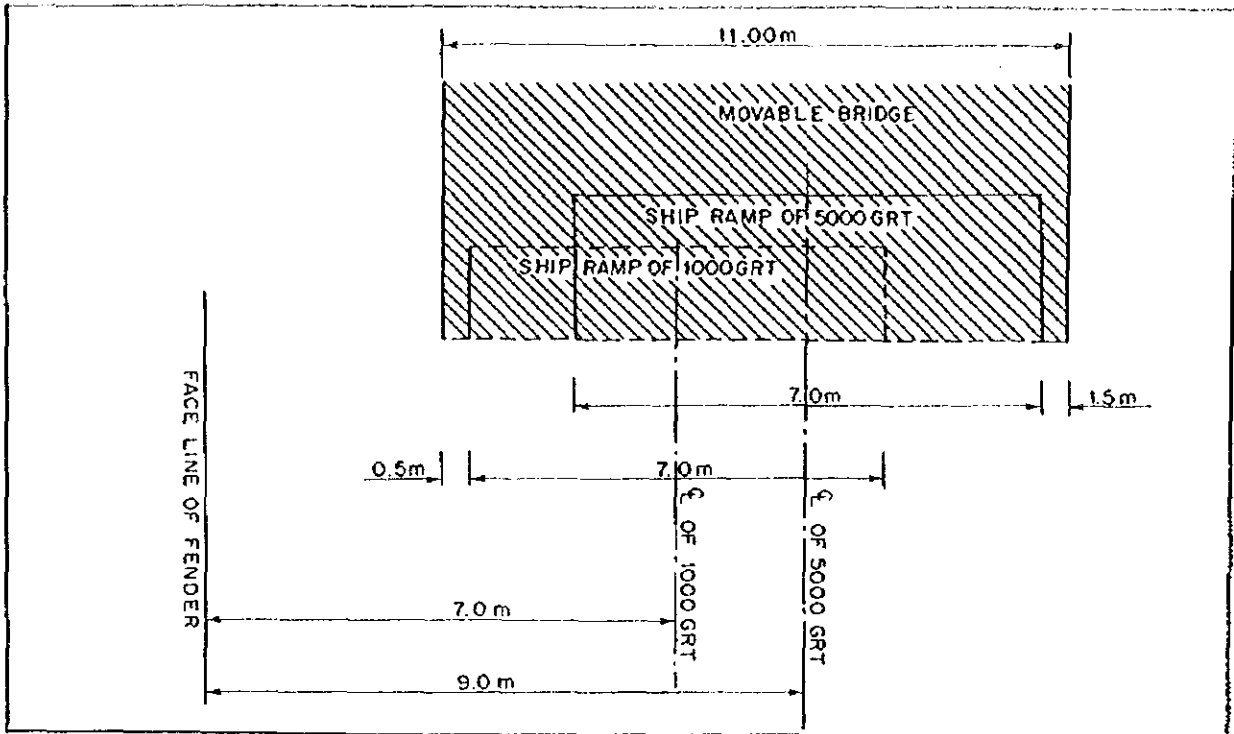


Figure 8.1.4 Width of Movable Bridge

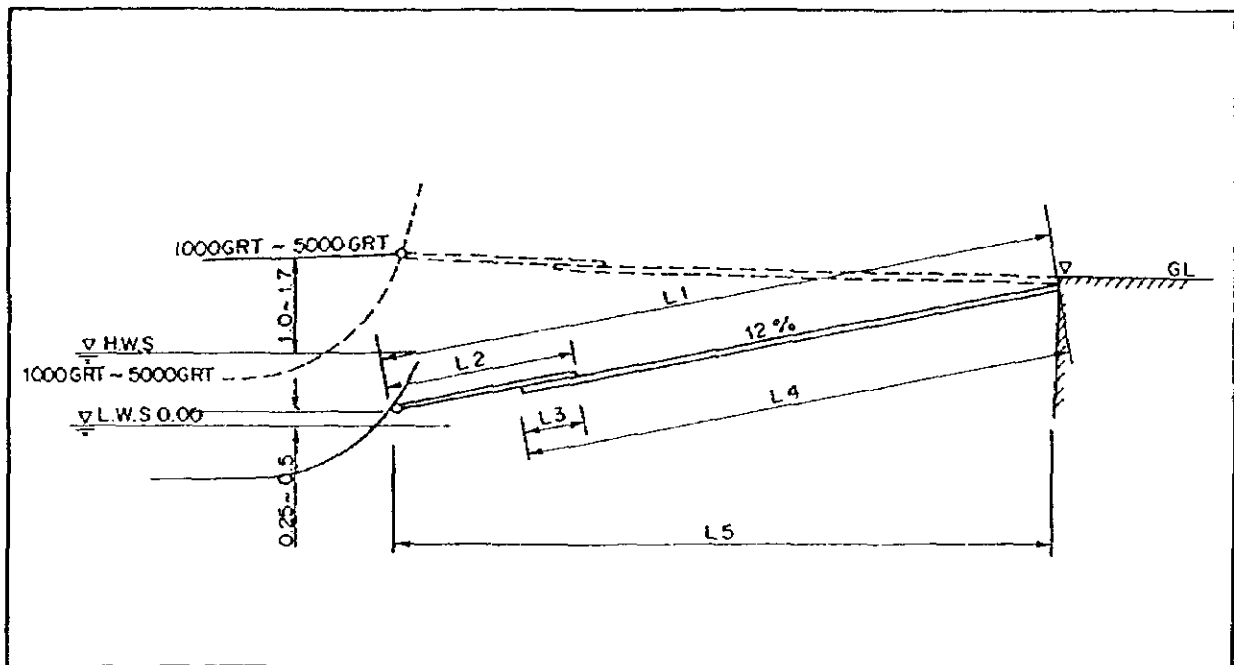


Figure 8.1.5 Length of Movable Bridge

8.2 Cost Estimation

8.2.1 General

33. Along with the site visit, information and data of the basic cost of the major construction works, unit prices of the materials and labour were collected from contractors in the provinces where the proposed ferry terminals are to be developed.

34. The basic cost of the works and unit prices for provinces have been surveyed and the differences are compared between the provinces concerning availability of materials, labour, construction equipment and accessibility to the sites.

35. The capacity and the capability of local contractors were also checked with respect to their experiences of marine construction works considering the magnitude of planned ferry terminal facilities.

8.2.2 Findings in Each Region

(1) Jakarta and Surabaya (Java)

36. There are many contractors which have experience in construction of marine facilities, especially for ferry terminal. Those contractors have large numbers of construction equipment, experienced engineers and skilled labour. Almost all of the construction materials are available in the Java region.

(2) Pontianak and Bajarmasin (West and Southeast of Kalimantan)

37. There are some branch offices of contractors in this region which have experience with marine facilities. The large construction equipment will be mobilized from Jakarta or Surabaya. The major construction materials such as steel pipe pile, cement, steel products and others will be provided from Java. Sand, stone and rocks can be procured locally. Skilled labour is available in the region.

(3) Ujung Pandang, Kendari, Selayar and Labuhan Bajo (South Sulawesi and Flores)

38. There are some contractors in Ujung Pandang carrying out the marine works for the ferry terminal facilities, and these contractors cover the construction projects in

the eastern part of Indonesia; Sulawesi, Maluku and Irian Jaya.

39. In the Kendari area, there are some branch office of contractors, whose head offices are in Jakarta, sufficiently experienced in marine works.

40. In the Selayar and Labuhan Bajo area, the contractors in Ujung Pandang or Kendari will cover the construction works of the marine facilities.

41. The major construction materials except steel pipe pile are procured in the Ujung Pandang area, and delivered to Kendari, Selayar and Labuhan Bajo. The steel pipe pile and fenders will be provided from Java; Jakarta and Surabaya. Sand, stones and rocks are available within the region respectively.

42. The skilled labour for construction can be employed in Ujung Pandang and Kendari. In Labuhan Bajo and Selayar, whole skilled labour excluding unskilled labour is mobilized from Ujung Pandang or Kendari area.

(4) Ambon, Wahai, Babang and Patani (Maluku and Maluku Utara)

43. There are some local contractors and branch offices of national contractors in Ambon which have experience with marine works, and those contractors cover the construction works including marine facilities in the Maluku area (Ambon, Wahai, Babang and Patani) and Irian Jaya. They have a sufficient amount of construction equipment in their market area.

44. Concerning construction materials, steel products and steel pipe pile are provided from Java (Jakarta and Surabaya) to each region. And cement is provided from Ujung Pandang and stocked in Ambon. The cement would be delivered to Wahai, Babang and Patani from Ambon. Sand, stones (aggregates) and rocks can be procured locally in the region.

45. The skilled labour for construction excluding unskilled labour is mobilized from Ambon.

(5) Sorong, Biak and Manokwari (Irian Jaya)

46. There are some local contractors in Sorong and Biak who have mainly experience with road construction. Therefore, the construction equipment for marine

works will be mobilized from Ambon or Ujung Pandang.

47. Steel products and steel pipe piles are provided from Java. Cement is provided from Ujung Pandang, and qualified concrete aggregates are provided from the Sulawesi region. Filling material, rocks and stones are available within the region.

48. The skilled labour for marine works will be mobilized from Ambon or Ujung Pandang, the other unskilled labour can be employed locally. In Manokwari, whole equipment, major materials and labours must be mobilized from Biak or directly from Ambon and Ujung Pandang.

8.2.3 Basic Cost of Construction Work

(1) Unit price of labour, material and equipment

49. Unit price of each element such as labour, major material and major equipment were determined on the basis of the data collected site survey in 1997. The determination of the unit costs take into account the conditions of each planned site mentioned in the previous section 6.1 (Findings from Each Region) and adjusted price increase of 10%. The unit cost of the each element is summarized in Table 8.2.1.

(2) Basic cost of the works

50. The basic costs of the construction works are obtained by accumulating labour cost, material cost, equipment cost and indirect cost such as general temporary works, overheads profit and so on. Particularly, the works such as dredging work, building works and demolition work are hindcast on the basis of the empirical prices heard from the major contractors in each region.

51. Price of maritime facilities such as fender system, bollard and navigation aids are based on the market prices in Jakarta and adjusted considering some mobilization fee to the construction site.

52. Unit cost of Movable Bridge for ferry terminal includes costs of design, manufacture in Japan, workshop test, delivery and installation, based on the CIF Jakarta prices and adjusted accessibility of each region.

53. The unit costs of the construction works for each terminal site are shown in

Table 8.2.2.

(3) Exchange rate of the imported materials

54. The basic costs of imported goods are based on the exchange rate of foreign currency as follows; US\$1.00= 3,605 Rupiah = 120.1 Yen (as of October, 1997).

Table 8.2.1(1) Unit Price of Construction Materials,
Labour and Equipment (as of August 1997)

(unit : 1,000 Rupiah)

Item	Unit	Jakarta	Surabaya	Banjarmasin	Pontianak	U. Pandang	Kendari	Ambon
Materials								
Cement	ton	235	264	280	280	245	290	280
Coarse Aggregate	m ³	35	35	60	60	30	25	40
Fine Aggregate	m ³	50	45	40	20	35	30	45
Re-Bar	ton	1,350	1,600	1,700	1,800	1,450	2,000	2,200
Steel Pipe Pile	ton	1,980	2,000	2,000	2,000	2,100	2,200	2,700
Filling Material	m ³		18	15	15	15	15	20
Armour Stone	m ³	40	20	35	35	35	35	40
Gravel	m ³	40	20	35	35	35	35	40
As-Con Hot Mix	ton	115	115	115	120	115	120	150
Labour								
Foreman	day	22	20	20	20	20	18	18
Operator	day	25	30	35	30	25	25	25
Skilled Labour	day	15	16	20	15	15	15	12
Unskilled Labour	day	10	10	10	12	8	8	8
Supervisor	day	30	30	30	30	25	25	20
Carpenter	day	15	15	20	15	15	15	12
Welder	day	17	20	20	25	20	20	20
Equipment								
Crane 50 ton	day	700	700	1,000	1,000	800	900	1,000
Truck Crane 25 ton	day	450	500	500	600	500	700	800
Concrete Truck	day	250	300	350	350	350	350	400
Dump Truck	day	100	150	250	250	200	250	300
Excavator (1 m ³)	day	400	450	550	650	600	600	750
Barge (300 ton)	day	300	350	500	500	400	400	500
Tugboat	day	630	600	700	800	700	800	800
Batcher Plant	day	1,150	1,150	1,200	1,200	1,200	1,200	1,200
Asphalt Finisher	day	400	450	500	500	500	500	500
Wheel Loader	day	210	210	400	400	400	400	400
Generator	day	80	80	100	100	100	120	120
Buldozer	day	400	450	500	500	600	600	900

Table 8.2.1(2) Unit Price of Construction Materials,
Labour and Equipment (as of August 1997)

(unit : 1,000 Rupiah)

Item	Unit	Sorong	Selayar	Manokwari	Lab. Bajo	Biak	Wahai	Babang	Patani
Materials									
Cement	ton	350	270	400	350	350	350	350	350
Coarse Aggregate	m ³	50	30	80	50	150	50	40	50
Fine Aggregate	m ³	70	25	100	30	100	30	45	45
Re-Bar	ton	2,600	2,000	2,800	2,200	2,100	2,200	2,600	2,600
Steel Pipe Pile	ton	2,900	2,200	3,000	2,700	2,900	2,700	2,900	2,900
Filling Material	m ³	20	15	20	15	20	15	20	20
Armour Stone	m ³	40	25	50	50	50	50	40	35
Gravel	m ³	30	25	45	35	30	35	40	35
As-Con Hot Mix	ton	150	120	150	150	150	150	150	150
Labour									
Foreman	day	15	20	25	20	25	20	20	10
Operator	day	20	25	20	25	35	25	20	20
Skilled Labour	day	15	15	20	15	18	15	15	10
Unskilled Labour	day	10	8	10	10	10	10	8	8
Supervisor	day	25	25	25	25	30	25	20	20
Carpenter	day	15	15	20	15	18	15	15	10
Welder	day	18	25	20	20	20	20	20	15
Equipment									
Crane 50 ton	day	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Truck Crane 25 ton	day	800	800	800	800	800	800	800	800
Concrete Truck	day	500	500	500	500	500	500	500	500
Dump Truck	day	300	350	300	300	250	300	350	300
Excavator (1 m ³)	day	750	650	750	700	750	700	750	750
Barge (300 ton)	day	500	500	500	500	400	500	500	500
Tugboat	day	800	800	800	800	800	800	800	800
Batcher Plant	day	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Asphalt Finisher	day	500	500	500	500	500	500	500	500
Wheel Loader	day	400	400	400	400	400	400	400	400
Generator	day	120	120	120	120	120	120	120	120
Buldozer	day	900	900	900	900	900	900	900	900

Table 8.2.2(1) Basic Cost of Major Works (as of August 1997)

(unit : 1,000 Rupiah)

Item	Unit	Jakarta	Surabaya	Banjarmasin	Pontianak	U. Pandang	Kendari	Ambon
Quay Construction								
Steel Pipe Pile Work								
D600, t=12mm	m	513	523	535	539		535	689
D800, t=12mm	m	663	674	686	690		686	893
D1000, t=12mm	m		794	831	834		830	
Corrosion Protection								
D600mm	no	4,000	4,000	4,000	4,000		4,000	4,500
D800mm	no	5,300	5,300	5,300	5,300		5,300	6,000
D1000mm	no	6,600	6,600	5,600	6,600		6,600	7,000
Steel Sheet Pile (IV)	m			207				
Tie-Rod and Anchorage	set			1,068				
RC Beam and Slab	m ³	917	996	1,174	1,183		1,198	1,281
RC Coping	m ³	526	575	641	649		667	720
Fender System								
Cell Type 800H	unit		35,000		35,000		36,000	38,000
Cell Type 630H	unit							30,000
Bollard 35 ton	unit	7,000	7,000	7,000	7,000	7,000	7,000	7,500
Civil Work								
Dredging & Reclamation	m ³	12	12	16				
Embankment	m ³	24	24	21	21		21	21
Slope Protection	m ³	69		84				
Mound Stone	m ³		39	63	64		63	72
Geotextile Filter Sheet	m ³	9	8	9	9		9	9
RC Wall	m ³	526	575	641	649		667	720
Site Clearance, Grading	m ²		3	3	3	2	3	3
Paving Work								
Road, Parking	m ²	42	36	44	45	43	44	53
Walk Way	m ²	28	26	34	34	33	34	39
Building								
Terminal Building	m ²	800	800	900	1,000	1,000	1,000	1,200
Gate House	m ²	500	500	600	700	700	700	800
Utilities								
Drainage	m ²	5	5	6	6	5	6	7
Sewerage (Building)	m ²	10	10	10	10	10	10	12
Landscaping	m ²	4	3	3	3	4	3	3
Water Supply (Building)	m ²	20	20	20	20	20	20	22
Navigation Aids								
Light Buoy (small)	unit	12,500	12,500	12,500	12,500			
Light Buoy (medium)	unit	25,000	25,000	25,000	25,000			

Table 8.2.2(2) Basic Cost of Major Works (as of August 1997)

(unit : 1,000 Rupiah)

Item	Unit	Sorong	Selayar	Manokwari	Lab. Bajo	Biak	Wahai	Babang	Patani
Quay Construction									
Steel Pipe Pile Work									
D600, t=12mm	m	730	586	753	689	732	689	731	729
D800, t=12mm	m	950	751	753	689	952	894	950	949
D1000, t=12mm	m								
Corrosion Protection									
D600mm	no	4,500	4,200	4,600	4,500	4,500	4,500	4,500	4,500
D800mm	no	6,000	5,500	6,200	6,000	6,000	6,000	6,000	6,000
D1000mm	no	7,000	6,700	7,200	7,000	7,000	7,000	7,000	7,000
Steel Sheet Pile (IV)	m								
Tie-Rod and Anchorage	set								
RC Beam and Slab	m ³	1,398	1,227	1,531	1,336	1,468	1,336	1,397	1,396
RC Coping	m ³	825	672	921	750	878	750	798	803
Fender System									
Cell Type 800II	unit								
Cell Type 630II	unit	30,000	30,000	32,000	30,000	30,000	30,000	30,000	30,000
Bollard 35 ton	unit	7,500	7,200	7,700	7,500	7,500	7,500	7,500	7,500
Civil Work									
Dredging & Reclamation	m ³		24						22
Embankment	m ³	28	22	28	22	28	22	28	28
Slope Protection	m ³								
Mound Stone	m ³	57	71	79	64	58	64	72	66
Geotextile Filter Sheet	m ³	9		9	9	9	9	9	9
RC Wall	m ³	825	672	921	750	878	750	798	803
Site Clearance, Grading	m ²	3	3	3	3	3	3	3	3
Paving Work									
Road, Parking	m ²	57	42	69	57	77	57	53	67
Walk Way	m ²	41	33	48	40	50	40	39	40
Building									
Terminal Building	m ²	1,200	1,200	1,300	1,200	1,200	1,200	1,200	1,200
Gate House	m ²	800	800	900	800	800	800	800	800
Utilities									
Drainage	m ²	7	6	8	6	7	6	6	6
Sewerage (Building)	m ²	12	10	15	12	12	12	12	12
Landscaping	m ²	3	3	3	3	3	3	3	3
Water Supply (Building)	m ²	22	20	24	20	22	20	20	20
Navigation Aids									
Light Buoy (small)	unit		13,000						13,000
Light Buoy (medium)	unit		26,000						26,000

8.3 Project Cost for Terminal Development

8.3.1 Assumptions for Cost Estimation

55. The construction cost of ferry terminal at each site is estimated based upon the following assumptions.

(1) Dredging and reclamation

56. The dredging and disposal work which exceeds 500,000m³ is assumed to be executed by suction cutter dredger, while less than 500,000m³ is assumed to be executed by grab bucket dredger or barge mounted clamshell crane for small scale dredging work. If the dredged materials can be utilized for reclamation, the materials such as sand or good soil would be filled to reclamation area for decreasing quantity of filling work.

(2) Loading deck and dolphins

57. The cost of construction materials for captioned facilities are mainly accumulated in unit cost of the works based on the materials on site, therefore the transportation fee of materials is not included.

58. The fender system was planned to use double cell type fender for dolphins, and V type fender for quay walls. Catwalk between dolphins is assumed as steel structure type supported by dolphins for pedestrians' walking.

(3) Civil work (Filling, protection stone and pavement)

59. Filling material and protection stone was assumed to be provided from surrounding area less than 30km distance from the site. Additional filling for settlement or subsoil conditions was taken into account when fixing the quantity.

60. Cost of pavement for Parking area and Passage(Road area) in the planned terminal is assumed to have same structure against 20 ton truck loading condition and planned as asphalt concrete layer .

(4) Building work (Terminal building)

61. Minimum required space by this study was adopted for the quantity of terminal

building area for cost estimation. However, it is known empirically that 30 - 40% of the required space is necessary to be added as actual construction area of the building. Therefore, 50% of the surveyed unit price (including inflation), which is general construction cost of the RC building in the region of terminal site, was added to the cost of building work.

(5) Utilities (Drainage, water supply, electricity supply and sewerage)

62. Water supply and electricity supply are assumed to be provided by local public companies as far as the entrance of terminal site, and the cost of water supply is considered only for distribution to the terminal building. Electricity will be supplied to terminal building and lighting system will be installed.

63. Drainage is planned to be installed in the paving area on the land. Sewerage is installed for terminal building only, and sewer water is to be collect to septic tank installed under the ground for natural treatment.

8.3.2 Construction Cost

64. The construction cost is estimated on the basis of the quantity of construction works for the planned facilities and the basic cost of the works. Based on the above-mentioned scale of the ferry terminal facilities (8.1 Preliminary Design) including utilities, the project cost was estimated for individual ferry ports. The construction cost for the ferry terminal is summarized in Table 8.3.1, and detail costs of the works for each ferry terminal are shown in Appendix 8.3 .

8.3.3 Engineering Fee, Physical Contingency and VAT

65. In addition to the construction cost, the engineering fee for the detailed design and construction supervision, the physical contingency and VAT are included in the project cost as follows;

Engineering Fee	: 10 % of the construction cost
Physical Contingency	: 10 % of the construction and engineering cost
VAT	: 10% of the construction and engineering cost (including physical contingency)

Table 8.3.1 Cost of Construction Works for Each Terminal

FACILITIES	ITEM / SITE	(prices in 1,000 Rupiah)									
		Jakarta	Pontianak	Surabaya	Banjarmasin	Ujung Pandang	Kendari	Ambon	Sorong		
Waterfront	Mobilization and Demobilization	1,563,945	685,636	4,443,092	1,163,063	1,054,118	678,747	992,334	724,298		
	Site Clearance and Grading	-	135,000	-	-	-	-	261,300	-		
Facilities	Dredging and Reclamation	4,800,000	-	-	288,000	9,776,000	1,228,500	-	-		
	Access Road and Bridge	33,285,000	-	-	-	-	-	-	-		
Terminal	Quay and Loading Deck	6,406,636	2,105,280	27,738,600	10,139,045	5,232,820	1,630,746	2,776,860	954,980		
	Breasting Dolphin	-	1,650,660	6,931,890	-	-	2,123,355	3,862,502	1,365,360		
Facilities	Mooring Dolphin	-	642,126	2,642,616	-	-	736,835	1,291,388	453,270		
	Catwalk	1,230,000	108,000	270,000	-	-	140,400	232,375	74,100		
Terminal	Movable Bridge	1,230,000	1,230,000	6,600,000	3,460,000	1,230,000	2,483,000	3,952,000	1,460,000		
	Trestle	-	-	90,680,000	-	12,062,400	-	-	-		
Facilities	Causeway	-	-	734,310	-	-	-	981,383	440,690		
	Revetment and Slope Protection	1,924,315	2,532,450	-	955,470	2,371,890	329,472	-	-		
Terminal	Terminal Building and Gate House	2,725,000	3,407,000	9,165,000	6,036,000	2,707,000	3,519,100	4,066,400	2,648,000		
	Pavement	758,100	812,250	1,240,200	1,190,200	707,350	674,960	964,600	672,600		
Facilities	Landscaping and Fence	610,200	629,650	655,950	629,250	636,550	381,225	1,015,560	527,000		
	Utilities	392,250	460,300	1,394,500	563,300	413,250	327,340	442,320	457,720		
Terminal	Navigation Aids	-	-	50,000	-	-	-	-	-		
	Total	53,695,446	14,398,352	152,546,158	24,424,328	36,191,378	14,253,679	20,839,021	9,778,015		

FACILITIES	ITEM / SITE	(prices in 1,000 Rupiah)									
		Selayar	Labuhan Bajo	Manokwari	Blak	Wahai	Babang	Patani			
Waterfront	Mobilization and Demobilization	773,356	620,745	658,932	741,540	731,872	577,529	728,513			
	Site Clearance and Grading	-	-	86,400	-	-	-	86,400			
Facilities	Dredging and Reclamation	845,000	990,000	-	672,000	1,452,000	-	1,142,000			
	Quay and Loading Deck	808,470	912,210	1,007,110	1,948,960	1,824,420	1,175,840	1,173,920			
Terminal	Breasting Dolphin	1,184,190	1,315,470	1,435,545	1,380,360	1,315,470	1,365,165	1,364,295			
	Mooring Dolphin	386,505	433,840	477,265	461,920	433,840	453,455	452,740			
Facilities	Catwalk	57,000	62,700	79,800	61,750	62,700	74,100	74,100			
	Movable Bridge	1,460,000	1,420,000	1,520,000	1,020,000	1,520,000	1,060,000	1,130,000			
Terminal	Trestle	1,119,420	-	697,230	-	-	-	1,320,660			
	Causeway	185,280	197,360	226,160	179,930	246,700	-	110,450			
Facilities	Revetment and Slope Protection	420,630	424,900	-	347,130	498,310	277,000	415,760			
	Terminal Building and Gate House	2,048,000	2,048,000	2,219,000	2,048,000	1,688,000	1,688,000	1,688,000			
Facilities	Pavement	415,800	564,300	786,600	646,800	535,800	498,200	564,300			
	Landscaping and Fence	413,750	235,200	557,100	235,800	571,800	347,000	528,500			
Terminal	Utilities	260,400	263,800	407,500	266,600	306,280	280,350	304,200			
	Navigation Aids	62,500	-	-	-	-	-	52,000			
Terminal	Total	10,440,301	9,488,525	10,158,642	10,010,790	11,187,192	7,796,639	11,155,838			

Chapter 9 Initial Environment Examination

9.1 Initial Environment Examination

1. The amendment to the government law for the Environmental Impact Assessment (EIA) was promulgated in 1993. However, as there is no Initial Environment Examination (IEE) system in Indonesia at present, the study team conducted an IEE based on JICA's guideline to grasp the environmental impact of the project.

2. The purpose of this IEE is to examine the potential impact of the total 15 ferry ports. The environmental impact is one of the major items for selecting the location of ferry terminals in the development plan. It is necessary to carry out initial environmental study and examination.

3. Based on the above background and aims, IEE on the 15 terminals has been conducted. The environmental impact of each item which could potentially cause impact to the environment was studied and evaluated.

4. The results of these studies and examinations are shown in Table 9.1.1, and details and data are given in the attached Appendix A9.1.

5. The items graded as A, B or C require a more detailed study and survey on the environmental impact regarding the ferry port development plan in future.

Table 9.1.1 Result of IEE

No.	ELEMENT OF ENVIRONMENTAL IMPACT	Banjarasin	Surabaya	Ujung Pandang	Selayar	Kendari	Ambon	Wahai	Patani	Babang	Biak	Manokwari	Sorong	Labuhan Bajo	Jakarta	Pontianak
1	Resettlement of inhabitants	B	C	D	B	D	D	C	B	C	D	B	B	D	C	C
2	Economic activities	C	D	C	C	D	C	C	C	C	C	C	C	C	C	C
3	Traffic and life facilities	B	C	B	C	B	C	C	C	D	D	D	C	D	B	B
4	Division of regional area	C	D	D	D	C	D	D	D	D	D	D	D	D	D	C
5	Historical and cultural heritage	D	D	D	D	D	D	D	D	D	D	C	D	D	D	D
6	Water right and common right	D	C	D	C	D	D	D	C	C	D	D	D	D	C	C
7	Hygiene and health	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
8	Waste and garbage	D	C	D	D	D	D	D	D	C	C	C	C	C	D	D
9	Risks and hazards	C	D	C	D	C	C	D	D	D	D	D	D	D	C	C
10	Topography and geology	C	C	C	C	D	D	C	D	D	D	C	D	D	C	C
11	Soil erosion	D	D	D	D	D	D	C	D	D	D	C	D	D	D	C
12	Underground water	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
13	Hydrological regime for river and lake	C	B	D	D	D	D	D	D	D	D	C	D	D	D	C
14	Coastal zone	D	D	C	D	C	C	C	D	C	C	C	C	D	C	D
15	Ecology, fauna, flora	C	B	C	B	C	C	C	B	C	C	C	D	B	C	C
16	Meteorology	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
17	Landscape	D	C	D	D	D	D	D	D	D	D	D	D	D	D	D
18	Air Pollution	D	D	B	D	C	D	D	D	D	D	D	D	D	D	D
19	Water pollution	C	C	B	C	B	B	B	C	B	B	B	C	B	C	C
20	Soil contamination	D	D	D	D	D	D	D	D	D	D	D	D	D	C	D
21	Noise and vibration	C	D	C	D	C	D	D	D	D	D	D	D	D	C	C
22	Land subsidence	D	C	C	C	C	C	C	D	D	C	C	D	D	D	D
23	Offensive odor	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D

A : High magnitude of impact is expected

B : Low magnitude of impact is expected

C : Unknown (Need study; provide consideration that it will become clear after the site investigation and survey)

D : No effect is expected, and does not require consideration for the items of EIA.

APPENDICES

PART 1

Table A1.1.1 The Total Area and Number of Administrative Units by Province in 1995

Province	Area (km ²)	Percentage of Total Area	Number			
			Regencies	Municipalities	Districts	Villages
D.I. Aceh	55,392	2.89	8	2	142	5,638
North Sumatra	70,787	3.69	11	6	243	5,234
West Sumatra	49,778	2.59	8	6	103	2,180
Riau	94,561	4.93	5	2	78	1,280
Jambi	44,800	2.33	5	1	54	1,138
South Sumatra	103,688	5.40	8	2	101	2,790
Bengkulu	21,168	1.10	3	1	31	1,137
Lampung	33,307	1.74	4	1	77	1,987
Sumatra	473,481	24.67	52	21	829	21,384
D.K.I. Jakarta	590	0.03	-	5	43	265
West Java	46,300	2.41	20	5	526	7,148
Central Java	34,206	1.78	29	6	532	8,513
D.I. Yogyakarta	3,169	0.16	4	1	73	438
East Java	47,921	2.50	29	8	609	8,427
Java	132,186	6.89	82	25	1,783	24,791
Bali	5,561	0.29	8	1	51	644
West Nusa Tenggara	20,177	1.05	6	1	59	597
East Nusa Tenggara	47,876	2.49	12	-	114	1,892
East Timor	14,874	0.77	13	-	62	442
Nusa Tenggara	88,488	4.61	39	2	286	3,575
West Kalimantan	146,760	7.65	6	1	108	1,395
Central Kalimantan	152,600	7.95	5	1	82	1,215
South Kalimantan	37,660	1.96	9	1	109	2,169
East Kalimantan	202,440	10.55	4	2	73	1,118
Kalimantan	539,460	28.11	24	5	372	5,897
North Sulawesi	19,023	0.99	4	3	85	1,442
Central Sulawesi	69,726	3.63	4	1	64	1,395
South Sulawesi	72,781	3.79	21	2	185	2,708
Southeast Sulawesi	27,686	1.44	4	1	64	858
Sulawesi	189,216	9.86	33	7	398	6,403
Maluku	74,505	3.88	4	1	56	1,518
Irian Jaya	421,981	21.99	9	1	120	2,284
Total	1,919,317	100.00	243	62	3,844	65,852

Source : Department of Home Affairs

Table A1.1.2 Population and Number of Households by Province
1980, 1990 and 1995 (October)

Province	Population (000)			Growth Rate of Population		Household (000)			Average Household Size		
	1980	1990	1995	1980-1990	1990-1995	1980	1990	1995	1980	1990	1995
D.I. Aceh	2,610	3,416	3,848	2.73%	2.41%	531	697	830	4.9	4.9	4.6
North Sumatra	8,351	10,252	11,115	2.07%	1.63%	1,548	2,023	2346	5.4	5.1	4.7
West Sumatra	3,406	4,000	4,323	1.62%	1.57%	704	868	972	4.8	4.6	4.4
Riau	2,164	3,279	3,900	4.24%	3.53%	413	679	854	5.2	4.8	4.6
Jambi	1,444	2,018	2,370	3.40%	3.27%	300	438	531	4.8	4.6	4.5
South Sumatra	4,628	6,312	7,208	3.15%	2.69%	857	1,266	1545	5.4	5.0	4.7
Bengkulu	768	1,179	1,409	4.38%	3.63%	150	252	316	5.1	4.7	4.5
Lampung	4,624	6,016	6,658	2.67%	2.05%	872	1,251	1470	5.3	4.8	4.5
Sumatra	27,995	36,472	40,831	2.68%	2.28%	5,375	7,474	8,864	5.2	4.9	4.6
D.K.I. Jakarta	6,481	8,228	9,112	2.42%	2.06%	1,164	1,740	2039	5.6	4.7	4.5
West Java	27,450	35,382	39,207	2.57%	2.07%	6,101	8,180	9453	4.5	4.3	4.1
Central Java	25,367	28,516	29,653	1.18%	0.79%	5,286	6,414	7155	4.8	4.4	4.1
D.I. Yogyakarta	2,750	2,913	2,917	0.58%	0.03%	593	729	807	4.6	4	3.6
East Java	29,169	32,488	33,844	1.08%	0.82%	6,479	7,845	8648	4.5	4.1	3.9
Java	91,217	107,527	114,733	1.66%	1.31%	19,623	24,908	28,102	4.6	4.3	4.1
Bali	2,470	2,777	2,896	1.18%	0.84%	485	601	692	5.1	4.6	4.2
West Nusa Tenggara	2,724	3,369	3,646	2.15%	1.59%	594	767	860	4.6	4.4	4.2
East Nusa Tenggara	2,737	3,268	3,577	1.79%	1.82%	496	619	721	5.5	5.3	5
East Timor	555	748	840	3.03%	2.35%	109	149	170	5.1	5.0	4.9
Nusa Tenggara	8,486	10,162	10,959	1.82%	1.52%	1,684	2,136	2,443	5.0	4.8	4.5
West Kalimantan	2,485	3,228	3,636	2.65%	2.41%	458	640	754	5.4	5.0	4.8
Central Kalimantan	954	1,396	1,627	3.88%	3.11%	186	306	372	5.1	4.6	4.4
South Kalimantan	2,063	2,597	2,893	2.33%	2.18%	444	597	699	4.6	4.4	4.1
East Kalimantan	1,215	1,875	2,314	4.43%	4.30%	235	399	526	5.2	4.7	4.4
Kalimantan	6,717	9,096	10,470	3.08%	2.85%	1,323	1,942	2,351	5.1	4.7	4.5
North Sulawesi	2,115	2,477	2,649	1.59%	1.35%	399	549	661	5.3	4.5	4.0
Central Sulawesi	1,284	1,703	1,938	2.86%	2.62%	233	347	414	5.5	4.9	4.7
South Sulawesi	6,060	6,981	7,558	1.42%	1.60%	1,117	1,399	1635	5.4	5	4.6
Southeast Sulawesi	942	1,349	1,587	3.66%	3.30%	174	263	333	5.4	5.1	4.8
Sulawesi	10,401	12,510	13,732	1.86%	1.88%	1,923	2,558	3,043	5.4	4.9	4.5
Maluku	1,408	1,853	2,087	2.78%	2.41%	229	344	409	6.2	5.4	5.1
Irian Jaya	1,107	1,630	1,943	3.95%	3.58%	216	333	441	5.1	5.0	4.4
Total	147,331	179,250	194,755	1.98%	1.67%	30,373	39,695	45,653	4.9	4.5	4.3

Source: Statistic Indonesia 1995

Note: Based on Population Census 1980, 1990, and 1995 Intercensal Population Census Survey

Table A1.1.3 Percentage to Total Area and Population Density by Province
1980, 1990 and 1995 (October)

Province	Area (km ²)	Percentage of Total Area	Percentage of total population			Population density per km ²		
			1980	1990	1995	1980	1990	1995
D.I. Aceh	55,392	2.89	1.77	1.90	1.98	47	62	69
North Sumatra	70,787	3.69	5.67	5.72	5.71	118	145	157
West Sumatra	49,778	2.59	2.31	2.23	2.22	68	80	87
Riau	94,561	4.93	1.47	1.84	2.00	23	35	41
Jambi	44,800	2.33	0.98	1.13	1.22	32	45	53
South Sumatra	103,688	5.40	3.14	3.52	3.70	45	61	70
Bengkulu	21,168	1.10	0.52	0.66	0.72	36	56	66
Lampung	33,307	1.74	3.14	3.35	3.42	139	181	200
Sumatra	473,481	24.67	19.00	20.35	20.96	59	77	86
D.K.I. Jakarta	590	0.03	4.41	4.60	4.68	11023	13999	15445
West Java	46,300	2.41	18.61	19.73	20.13	593	764	847
Central Java	34,206	1.78	17.20	15.90	15.23	742	834	867
D.I. Yogyakarta	3,169	0.17	1.87	1.62	1.50	868	919	920
East Java	47,921	2.50	19.79	18.12	17.38	609	678	706
Java	132,186	6.89	61.88	59.97	58.91	690	814	868
Bali	5,561	0.29	1.67	1.55	1.49	444	500	521
West Nusa Tenggara	20,177	1.05	1.85	1.88	1.87	135	167	181
East Nusa Tenggara	47,876	2.49	1.86	1.82	1.84	57	68	75
East Timor	14,874	0.77	0.38	0.42	0.43	37	50	56
Nusa Tenggara	88,488	4.61	5.75	5.07	5.63	96	11	124
West Kalimantan	146,760	7.65	1.69	1.80	1.87	17	22	25
Central Kalimantan	152,600	7.95	65.00	0.78	0.84	6	9	11
South Kalimantan	37,660	1.96	140.00	1.45	1.49	55	69	77
East Kalimantan	202,440	10.55	83.00	1.05	1.19	6	9	11
Kalimantan	539,460	28.11	456.00	5.07	5.38	12	17	19
North Sulawesi	19,023	0.99	143.00	1.38	1.36	111	130	139
Central Sulawesi	69,726	3.63	87.00	0.95	1.00	18	25	28
South Sulawesi	72,781	3.79	411.00	3.89	3.88	83	96	104
Southeast Sulawesi	27,686	1.44	64.00	0.75	0.81	34	49	57
Sulawesi	189,216	9.86	706.00	6.98	7.05	55	66	73
Maluku	74,505	3.88	96.00	1.04	1.07	19	25	28
Irian Jaya	421,981	21.99	80.00	0.92	1.00	3	4	5
Total	1,919,317	100.00	100.00	100.00	100.00	77	93	101

Source: Statistic Indonesia 1995

Note: Based on Population Census 1980, 1990, and 1995 Intercensal Population Census Survey

Table A1.1.4 Number of Transmigrant Families by Region of Destination
(1990/1991 - 1994/1995)

Region of Destination	1990/1991	1991/1992	1992/1993	1993/1994	1994/1995	Total	
						1990-1995	Share
D.I. Aceh	2,083	3,280	2,091	6,164	7,412	21,030	3.5%
North Sumatra	960	2,425	1,376	1,819	1,979	8,559	1.4%
West Sumatra	2,365	1,602	398	8,357	7,826	20,548	3.4%
Riau	14,590	10,483	16,051	24,253	22,306	87,683	14.5%
Jambi	6,875	4,983	2,129	9,307	14,162	37,456	6.2%
South Sumatra	9,313	8,441	4,057	22,840	13,099	57,750	9.6%
Bengkulu	2,490	2,293	1,944	2,358	4,928	14,013	2.3%
Lampung	5,126	7,734	1,892	9,245	3,989	27,986	4.6%
Sumatra	43,802	41,241	29,938	84,343	75,701	275,025	45.5%
West Nusa Tenggara	585	600	1,369	2,441	1,906	6,901	1.1%
East Nusa Tenggara	100	300	0	1,053	2,911	4,364	0.7%
East Timor	100	250	94	3,093	4,687	8,224	1.4%
Nusa Tenggara	785	1,150	1,463	6,587	9,504	19,489	3.2%
West Kalimantan	4,622	8,130	6,307	24,863	24,176	68,098	11.3%
Central Kalimantan	2,660	3,037	5,562	13,583	12,902	37,744	6.3%
South Kalimantan	2,041	1,977	1,580	7,975	6,451	20,024	3.3%
East Kalimantan	4,146	3,796	3,906	15,769	12,647	40,264	6.7%
Kalimantan	13,469	16,940	17,355	62,190	56,176	166,130	27.5%
North Sulawesi	495	250	0	680	586	2,011	0.3%
Central Sulawesi	2,112	4,152	2,836	11,125	9,561	29,786	4.9%
South Sulawesi	1,855	3,740	537	5,219	7,028	18,379	3.0%
Southeast Sulawesi	762	1,504	2,467	3,889	6,404	15,026	2.5%
Sulawesi	5,224	9,646	5,840	20,913	23,579	65,202	10.8%
Maluku	490	1,651	2,814	6,028	9,781	20,764	3.4%
Irian Jaya	3,913	4,622	6,105	19,821	22,759	57,220	9.5%
Total	67,683	75,250	63,515	199,882	197,500	603,830	100%

Source : Department of Transmigration

Table A1.1.5 Gross Regional Domestic Product at 1993 Constant Prices
(Excluding oil and its products)

Province	GRDP (Billion Rp.)								Growth Rate (%)	
	1988	1989	1990	1991	1992	1993	1994	1995	('88-95)	('90-95)
D.I. Aceh 1)	3,339	3,601	3,858	4,133	4,477	4,826	5,295	5,721	8.0	8.2
North Sumatra 1)	11,917	13,085	14,170	15,214	16,416	17,733	19,525	21,354	8.7	8.5
West Sumatra	4,331	4,613	4,970	5,283	5,637	6,027	6,476	7,016	7.1	7.1
Riau 1)	3,899	4,317	4,621	5,081	5,653	6,055	6,616	7,243	9.3	9.4
Jambi 1)	1,667	1,839	1,982	2,083	2,230	2,398	2,591	2,810	7.7	7.2
South Sumatra 1)	6,875	7,502	7,569	7,894	8,406	8,855	9,688	10,662	6.5	7.1
Bengkulu	958	1,029	1,106	1,198	1,286	1,392	1,487	1,608	7.7	7.8
Lampung	3,659	3,960	4,270	4,484	5,030	5,411	5,797	6,400	8.3	8.4
Sumatra	36,644	39,976	42,545	45,372	49,135	52,697	57,474	62,815	8.0	8.1
D.K.I. Jakarta	33,783	37,073	40,250	43,389	47,134	51,106	55,505	60,638	8.7	8.5
West Java 1)	33,515	36,446	39,709	42,712	45,879	49,520	53,499	58,103	8.2	7.9
Central Java 1)	23,222	24,687	26,474	28,225	30,157	31,927	34,335	37,134	6.9	7.0
D.I. Yogyakarta	3,068	3,260	3,409	3,586	3,835	4,058	4,387	4,742	6.4	6.8
East Java 1)	34,560	37,138	40,119	42,966	45,986	49,142	52,713	57,028	7.4	7.3
Java	128,149	138,604	149,962	160,879	172,991	185,754	200,440	217,646	7.9	7.7
Bali	3,748	4,077	4,438	4,806	5,226	5,690	6,117	6,602	8.4	8.3
West Nusa Tenggara	1,751	1,906	2,077	2,230	2,421	2,551	2,736	2,956	7.8	7.3
East Nusa Tenggara	1,476	1,558	1,667	1,780	1,917	2,097	2,276	2,478	7.7	8.3
East Timor	326	350	390	431	480	515	567	620	9.6	9.7
Nusa Tenggara	7,300	7,891	8,572	9,247	10,043	10,853	11,696	12,656	8.2	8.1
West Kalimantan	3,749	3,926	4,205	4,482	4,799	5,148	5,536	6,062	7.1	7.6
Central Kalimantan	2,196	2,299	2,471	2,679	2,917	3,067	3,310	3,609	7.4	7.9
South Kalimantan 1)	3,072	3,288	3,526	3,782	4,112	4,523	4,926	5,375	8.3	8.8
East Kalimantan 1)	5,713	6,084	6,456	6,927	7,662	8,253	8,859	9,830	8.1	8.8
Kalimantan	14,729	15,597	16,657	17,870	19,490	20,990	22,631	24,876	7.8	8.4
North Sulawesi	1,855	1,963	2,153	2,352	2,561	2,807	3,018	3,272	8.4	8.7
Central Sulawesi	1,158	1,260	1,370	1,489	1,615	1,755	1,885	2,038	8.4	8.3
South Sulawesi	5,199	5,536	5,909	6,472	6,973	7,512	8,088	8,737	7.7	8.1
Southeast Sulawesi	832	920	1,040	1,158	1,213	1,289	1,374	1,472	8.5	7.2
Sulawesi	9,044	9,679	10,472	11,471	12,362	13,363	14,365	15,519	8.0	8.2
Maluku 1)	1,756	1,873	2,061	2,245	2,378	2,441	2,600	2,742	6.6	5.9
Irian Jaya 1)	2,369	2,663	3,163	3,817	4,224	4,508	4,797	5,871	13.8	13.2
Total	199,992	216,282	233,432	250,903	270,623	290,606	314,003	342,124	8.0	7.9
Annual Growth Rate (%)		8.1	7.9	7.5	7.9	7.4	8.1	9.0		
Average Growth Rate (%)									8.0	7.9

Source: Statistic Indonesia 1990 - 1995

Note : 1) Excluding oil and its product

Table A1.1.6 Per Capita GRDP at 1993 Constant Prices
(Excluding oil and its products)

Province	Per Capita GRDP ('000 Rp.)								Growth Rate (%)	
	1988	1989	1990	1991	1992	1993	1994	1995	('88-'95)	('90-'95)
D.I. Aceh 1)	1,023	1,076	1,124	1,175	1,242	1,308	1,403	1,482	5.4	5.7
North Sumatra 1)	1,194	1,291	1,378	1,454	1,543	1,640	1,778	1,916	7.0	6.8
West Sumatra	1,113	1,175	1,239	1,296	1,362	1,434	1,518	1,621	5.5	5.5
Riau 1)	1,291	1,366	1,400	1,485	1,595	1,651	1,743	1,846	5.2	5.7
Jambi 1)	892	943	977	993	1,029	1,072	1,122	1,179	4.1	3.8
South Sumatra 1)	1,150	1,218	1,193	1,211	1,255	1,288	1,373	1,474	3.6	4.3
Bengkulu	886	907	931	974	1,009	1,054	1,088	1,136	3.6	4.1
Lampung	631	669	707	727	799	842	884	958	6.1	6.3
Sumatra	1,051	1,118	1,161	1,210	1,281	1,343	1,433	1,533	5.5	5.7
D.K.I. Jakarta	4,278	4,589	4,873	5,144	5,471	5,810	6,181	6,620	6.4	6.3
West Java 1)	988	1,050	1,118	1,178	1,239	1,310	1,387	1,477	5.9	5.7
Central Java 1)	822	869	927	980	1,038	1,091	1,164	1,251	6.2	6.2
D.I. Yogyakarta	1,053	1,119	1,170	1,230	1,314	1,391	1,503	1,626	6.4	6.8
East Java 1)	1,075	1,148	1,233	1,309	1,389	1,472	1,567	1,683	6.6	6.4
Java	1,219	1,302	1,391	1,472	1,562	1,656	1,765	1,893	6.5	6.4
Bali	1,367	1,476	1,595	1,712	1,845	1,992	2,124	2,275	7.6	7.4
West Nusa Tenggara	534	572	614	649	693	719	760	809	6.1	5.7
East Nusa Tenggara	466	483	509	533	563	605	646	692	5.8	6.3
East Timor	452	475	520	559	607	638	686	736	7.2	7.2
Nusa Tenggara	737	785	841	893	955	1,017	1,080	1,152	6.6	6.5
West Kalimantan	1,214	1,239	1,295	1,346	1,407	1,475	1,550	1,660	4.6	5.1
Central Kalimantan	1,685	1,698	1,759	1,847	1,950	1,989	2,082	2,204	3.9	4.6
South Kalimantan 1)	1,236	1,292	1,353	1,420	1,510	1,626	1,734	1,853	6.0	6.5
East Kalimantan 1)	3,420	3,419	3,419	3,515	3,727	3,849	3,962	4,217	3.0	4.3
Kalimantan	1,723	1,763	1,821	1,898	2,013	2,108	2,211	2,364	4.6	5.4
North Sulawesi	768	802	867	934	1,004	1,086	1,153	1,234	7.0	7.3
Central Sulawesi	720	759	801	848	895	948	993	1,046	5.5	5.5
South Sulawesi	768	804	845	910	965	1,023	1,084	1,153	6.0	6.4
Southeast Sulawesi	664	705	766	825	837	861	889	923	4.8	3.8
Sulawesi	751	787	835	897	948	1,006	1,062	1,127	6.0	6.2
Maluku 1)	994	1,032	1,108	1,177	1,217	1,220	1,270	1,309	4.0	3.4
Irian Jaya 1)	1,572	1,693	1,930	2,243	2,393	2,465	2,535	3,001	9.7	9.2
Total	1,151	1,223	1,298	1,372	1,455	1,536	1,634	1,752	6.2	6.2
Annual Growth Rate (%)		6.3	6.1	5.7	6.1	5.6	6.3	7.2		
Average Growth Rate (%)									6.2	6.2

Source: Statistik Indonesia 1990 - 1995

Note: 1) Excluding oil and its product

Table A1.1.7 Approved Domestic Investment Projects by Province (1988 -1995)

	Number of Projects										Capital (Billion Rp.)									
	1988	1989	1990	1991	1992	1993	1994	1995	1988	1989	1990	1991	1992	1993	1994	1995				
D.I. Aceh	13	9	19	8	8	4	5	6	314.0	236.3	228.2	151.4	1,450.1	304.9	127.6	280.6				
North Sumatra	43	26	47	24	17	11	29	27	736.8	379.2	913.4	824.9	1,955.6	1,491.8	804.7	1,703.8				
West Sumatra	5	7	17	11	3	4	11	11	129.3	146.5	456.2	157.4	42.9	15.9	573.3	716.4				
Riau	26	42	37	17	8	15	31	35	1,280.2	1,312.5	5,821.8	3,255.7	1,175.2	961.4	3,682.5	4,309.9				
Jambi	3	3	11	2	3	5	8	7	308.2	383.7	620.0	1,058.8	55.3	279.3	1,066.5	737.7				
South Sumatra	32	24	22	11	8	11	17	23	773.7	437.7	1,771.4	555.0	519.6	854.0	360.5	3,628.2				
Bengkulu	6	7	6	4	4	3	4	5	36.8	78.2	79.4	20.2	161.9	57.5	192.9	1,167.2				
Lampung	13	21	32	9	8	9	12	9	326.3	617.5	891.3	426.2	355.2	508.9	1,710.6	531.2				
Sumatra	141	139	191	86	59	62	117	128	3,905.4	3,591.7	10,781.7	6,449.6	5,695.8	4,473.7	8,518.6	13,075.0				
D.K.I. Jakarta	54	56	96	98	86	131	185	170	1,040.8	1,663.1	3,272.3	3,604.4	4,002.0	8,328.9	5,968.3	11,645.2				
West Java	311	312	590	302	144	167	241	191	6,043.5	10,195.6	27,333.4	13,511.7	7,876.1	11,681.8	15,863.0	19,338.0				
Central Java	39	41	102	53	16	28	45	41	751.2	808.5	5,715.0	3,634.5	1,507.2	2,768.1	5,766.9	5,499.0				
D.I. Yogyakarta	19	9	29	11	9	5	13	3	189.9	47.5	420.3	334.3	116.9	220.6	422.9	39.9				
East Java	96	99	116	80	37	68	95	80	1,038.7	2,781.4	2,424.6	3,908.2	2,935.2	3,776.6	8,444.9	5,285.3				
Java	519	517	933	544	292	399	579	485	9,064.1	15,496.2	39,165.6	24,993.1	16,437.4	27,276.0	36,466.0	41,807.4				
Nusa Tenggara	29	30	64	47	33	29	52	59	468.3	617.0	2,463.4	1,725.2	1,616.0	561.1	1,785.5	1,525.8				
West Kalimantan	25	11	26	26	3	7	11	5	745.8	422.0	1,793.3	2,421.0	322.2	540.2	932.0	1,051.0				
Central Kalimantan	2	5	7	2	1	1	16	13	25.1	134.8	104.8	192.3	2.3	2.8	873.2	1,857.9				
South Kalimantan	14	15	17	12	6	6	3	6	178.4	211.9	174.1	567.9	1,157.7	1,107.8	366.1	195.2				
East Kalimantan	17	5	11	17	7	13	9	16	541.4	264.1	3,149.0	1,228.1	1,774.9	1,726.7	1,942.4	5,274.9				
Kalimantan	58	36	61	57	17	27	39	40	1,490.7	1,032.8	5,221.2	4,409.3	3,257.1	3,377.5	4,113.7	8,379.0				
North Sulawesi	9	7	9	12	7	8	7	7	73.8	214.0	144.0	386.1	188.3	275.4	583.6	1,062.9				
Central Sulawesi	6	10	8	7	2	4	3	7	109.3	50.0	426.5	451.9	33.2	122.5	30.9	1,219.5				
South Sulawesi	20	13	30	30	11	7	11	24	128.7	114.0	547.5	323.8	178.3	679.4	369.3	51.9				
Southeast Sulawesi	2	3	3	2	0	2	3	7	4.6	50.7	127.0	52.1	300.0	61.6	673.0	376.5				
Sulawesi	35	32	50	51	20	21	24	45	316.4	428.7	1,245.0	1,213.9	699.8	1,138.9	1,656.8	2,710.8				
Maluku, Irian Jaya and East Timor	32	20	30	19	15	10	12	18	354.5	420.4	1,001.5	2,293.7	1,635.6	2,621.2	748.5	2,355.3				
Various Area	8	3	0	0.0	0.0	0.0	0.0	0.0	81.6	320.4	0.0	0.0	0.0	0.0	0.0	0.0				
Total	822	777	1,329	804	436	548	823	775	15,680.9	21,907.0	59,878.4	41,084.8	29,341.7	39,448.4	53,289.1	69,853.3				

Source: Statistik Indonesia 1990 -1995

Table A1.1.8 Approved Foreign Investment Projects by Province (1988 -1995)

	Number of Projects										Capital (Million US\$)									
	1988	1989	1990	1991	1992	1993	1994	1995	1988	1989	1990	1991	1992	1993	1994	1995				
D.I. Aceh	1	1	1	0	0	2	4	6	966.0	50.0	192.0	0.0	0.3	528.6	1,050.2	1,624.8				
North Sumatra	2	3	5	5	5	9	8	19	193.5	2.6	359.9	36.0	657.8	78.0	225.3	658.1				
West Sumatra	0	0	1	0	1	2	4	7	25.4	5.2	1.5	0.0	3.2	65.7	97.7	118.4				
Riau	7	10	21	39	35	35	50	53	370.3	350.8	247.0	950.8	1,734.4	609.4	3,964.3	598.8				
Jambi	0	0	0	0	0	0	2	0	0.0	0.0	0.0	0.0	0.0	0.3	39.3	24.1				
South Sumatra	1	1	1	1	3	0	3	10	3.9	256.7	44.4	5.0	5.6	0.0	82.9	1,968.3				
Bengkulu	0	0	0	0	0	1	1	3	0.0	0.0	0.0	0.0	0.0	34.0	8.6	19.7				
Lampung	1	2	1	0	4	2	3	4	2.8	51.0	58.3	3.3	51.1	52.0	46.7	451.8				
Sumatra	12	17	30	45	48	51	75	102	1,561.9	746.3	903.1	995.1	2,452.4	1,368.0	5,515.0	5,464.0				
D.K.I. Jakarta	34	75	108	86	90	111	115	207	241.6	548.7	1,619.3	4,216.6	1,132.5	1,669.1	1,832.3	4,030.8				
West Java	54	140	217	183	113	98	155	293	1,187.8	1,385.2	3,691.7	2,376.2	4,486.8	2,508.0	4,446.3	12,447.4				
Central Java	2	7	6	10	3	14	18	22	23.7	1,729.2	109.7	130.6	42.5	50.3	1,830.2	726.8				
D.I. Yogyakarta	0	0	4	1	2	2	0	6	0.0	0.0	6.9	37.0	48.4	56.3	0.2	79.5				
East Java	9	23	30	25	22	38	47	72	252.3	348.8	972.8	426.9	281.8	2,282.6	6,247.3	10,207.5				
Java	99	245	365	305	230	263	335	600	1,705.4	4,011.9	6,400.4	7,187.3	5,992.0	6,566.3	14,356.3	27,492.0				
Nusa Tenggara	14	25	23	16	14	6	11	51	361.8	229.5	609.7	556.8	520.9	51.5	36.5	328.6				
West Kalimantan	1	0	2	1	0	0	2	6	45.3	5.0	6.8	12.8	0.0	2.0	7.7	175.3				
Central Kalimantan	0	0	0	0	1	0	0	1	80.3	8.6	10.8	2.7	6.0	0.0	0.0	73.4				
South Kalimantan	0	1	4	2	2	1	5	3	12.6	13.2	122.6	4.5	361.5	9.8	1,951.0	84.9				
East Kalimantan	3	0	2	0	3	1	3	8	9.2	553.3	560.7	4.0	73.9	1.0	99.6	1,315.7				
Kalimantan	4	1	8	3	6	2	10	18	147.4	580.1	700.9	24.0	441.4	12.8	2,058.3	1,649.3				
North Sulawesi	0	2	0	8	3	4	6	6	0.0	102.4	8.0	7.2	25.6	32.0	40.5	164.3				
Central Sulawesi	2	1	0	2	1	0	3	3	24.3	4.0	1.4	2.0	2.0	0.0	6.3	105.6				
South Sulawesi	1	3	3	1	0	2	2	1	0.0	4.9	121.4	1.6	3.1	8.2	6.2	0.5				
Southeast Sulawesi	4	0	1	0	3	0	3	6	19.5	0.0	3.6	2.1	60.6	0.0	1,395.3	2,114.0				
Sulawesi	7	6	4	11	7	6	14	16	43.8	111.3	134.4	12.9	91.3	40.2	1,448.3	2,384.4				
Maluku, Irian Jaya and East Timor	3	0	2	2	0	1	4	12	680.4	200.0	1.6	2.5	815.2	105.4	309.9	2,596.4				
Various Area	2	1	0	0	0	0	0	0	0.0	41.1	0.0	0.0	0.0	0.0	0.0	0.0				
Total	141	295	432	382	305	329	449	799	4,500.7	5,920.2	8,750.1	8,778.6	10,313.2	8,144.2	23,724.3	59,914.7				

Source: Statistik Indonesia 1990-1995

Table A1.2.1 Road Length by Province (1988-1995)

Province	Road Length (km)							
	1988	1989	1990	1991	1992	1993	1994	1995
D.I. Aceh	9,829	10,293	10,832	12,579	12,774	-----	13,541	13,911
North Sumatra	22,301	24,078	25,423	27,575	27,575	-----	29,924	29,924
West Sumatra	9,914	11,211	14,962	15,705	15,705	-----	17,503	17,503
Riau	9,779	10,660	10,660	11,625	11,647	-----	12,776	12,776
Jambi	5,344	6,152	6,042	6,818	7,775	-----	8,835	8,835
South Sumatra	9,810	11,427	11,452	11,922	12,407	-----	12,919	14,916
Bengkulu	3,935	3,899	4,012	4,516	4,643	-----	5,283	5,729
Lampung	6,397	6,902	7,452	7,712	7,778	-----	8,384	11,055
Sumatra	77,309	84,622	90,835	98,452	100,304	105,071	109,165	114,649
D.K.I. Jakarta	4,620	4,849	5,211	5,473	5,683	-----	6,001	8,487
West Java	17,146	19,662	20,917	24,991	25,001	-----	27,023	27,396
Central Java	17,924	20,010	20,876	22,407	22,446	-----	23,799	24,359
D.I. Yogyakarta	6,208	6,858	10,137	10,879	10,985	-----	14,200	14,200
East Java	24,678	25,162	26,948	29,345	29,725	-----	32,010	32,010
Java	70,576	76,541	84,089	93,095	93,840	100,330	103,033	106,452
Bali	6,107	6,294	6,294	6,506	7,503	-----	7,856	7,856
West Nusa Tenggara	4,118	4,270	4,570	5,517	5,517	-----	5,947	6,953
East Nusa Tenggara	13,557	13,912	14,940	15,158	15,355	-----	15,947	15,947
East Timor	1,645	1,645	1,645	5,278	5,541	-----	7,426	7,426
Nusa Tenggara	25,427	26,121	27,449	32,459	33,916	-----	37,176	38,182
West Kalimantan	7,013	8,596	8,697	9,025	9,030	-----	10,169	11,357
Central Kalimantan	7,858	8,509	9,482	12,087	12,087	-----	14,367	13,367
South Kalimantan	5,354	6,336	6,110	6,565	6,830	-----	7,533	7,533
East Kalimantan	4,065	4,823	4,686	5,223	5,483	-----	6,178	6,699
Kalimantan	24,290	28,264	28,975	32,900	33,430	36,097	38,247	38,956
North Sulawesi	7,253	7,235	7,442	7,586	7,841	-----	8,538	9,518
Central Sulawesi	6,242	7,794	8,186	8,902	8,902	-----	9,534	9,534
South Sulawesi	25,492	22,034	22,524	23,189	23,909	-----	25,028	27,263
Southeast Sulawesi	5,106	5,383	5,529	6,219	6,219	-----	6,643	6,643
Sulawesi	44,093	42,446	43,681	45,896	46,871	-----	49,743	52,958
Maluku	5,300	5,083	5,177	6,569	7,032	-----	7,981	8,968
Irian Jaya	7,939	8,098	8,521	9,999	10,048	-----	11,533	12,249
Indonesia	254,934	271,175	288,727	319,370	325,441	344,892	356,878	372,414

Source: Statistic Indonesia 1990-1995

Table A1.2.2 Type and Registered Motor Vehicles by Province

(Unit : '000 cars)

Region	Cars, Buses and Trucks										Motor Cycles										Total				
	1988	1989	1990	1991	1992	1993	1994	1995	1988	1989	1990	1991	1992	1993	1994	1995	1988	1989	1990	1991	1992	1993	1994	1995	
	D.I. Aceh	28	31	32	37	37	37	37	37	114	119	122	140	147	149	157	169	142	150	154	177	184	186	194	206
North Sumatra	169	183	191	202	211	223	237	254	462	474	507	524	524	550	570	619	631	657	698	726	735	774	807	873	
West Sumatra	42	45	48	52	55	59	63	70	95	98	102	105	112	117	124	134	137	143	150	157	167	176	187	204	
Riau	40	41	42	42	44	47	53	63	128	130	130	131	138	154	165	187	167	171	172	174	182	201	218	250	
South Sumatra 1)	209	213	220	228	240	240	244	252	445	445	456	464	464	545	597	597	643	658	676	692	785	785	841	848	
Sumatra	487	513	533	561	587	607	635	676	1,234	1,267	1,317	1,364	1,466	1,515	1,612	1,705	1,721	1,780	1,850	1,925	2,053	2,122	2,247	2,382	
D.K.I. Jakarta	700	758	845	935	995	1,072	1,340	1,480	736	757	804	860	917	991	1,345	1,541	1,436	1,515	1,649	1,795	1,912	2,063	2,685	3,021	
West Java	301	316	341	367	391	407	420	426	493	482	506	535	560	569	579	584	794	798	847	902	951	976	1,000	1,010	
Central Java 2)	234	286	306	326	340	364	395	445	897	1,086	1,089	1,172	1,290	1,380	1,566	1,807	1,132	1,371	1,395	1,499	1,629	1,744	1,961	2,252	
East Java	336	368	408	503	522	539	541	574	1,135	1,152	1,303	1,416	1,426	1,516	1,568	1,730	1,471	1,519	1,712	1,919	1,949	2,055	2,109	2,303	
Java	1,571	1,727	1,900	2,132	2,248	2,383	2,696	2,924	3,201	3,477	3,703	3,984	4,193	4,456	5,058	5,662	4,832	5,204	5,603	6,115	6,441	6,839	7,754	8,586	
Nusa Tenggara	78	89	102	105	120	126	135	157	260	286	340	374	397	421	458	531	339	375	442	479	516	546	593	688	
West Kalimantan	19	21	22	24	25	26	28	31	81	91	98	106	114	125	138	152	101	111	120	130	139	151	166	183	
South Kalimantan 3)	29	31	44	49	51	51	53	62	134	140	145	152	156	197	207	272	162	171	190	201	207	248	260	334	
East Kalimantan	37	39	43	45	48	51	53	57	84	90	97	103	179	179	179	179	121	129	140	148	227	230	232	235	
Kalimantan	85	91	110	118	124	128	134	150	299	321	340	361	449	500	524	603	384	411	450	479	573	628	658	752	
North Sulawesi 4)	41	57	57	57	57	57	58	73	80	80	85	86	100	123	123	191	121	137	142	143	157	180	181	264	
South Sulawesi 5)	67	71	78	83	87	94	99	112	240	245	252	261	269	272	289	307	307	316	331	344	356	366	388	419	
Sulawesi	107	128	135	140	144	151	157	185	320	325	337	347	369	395	412	498	428	453	472	487	513	546	569	683	
Maluku	8	8	9	14	14	15	15	16	15	16	17	34	34	34	34	34	23	25	26	48	48	49	49	50	
Irian Jaya	15	14	16	18	20	21	22	24	29	30	29	30	34	34	37	44	44	44	45	48	54	54	58	68	
Indonesia	2,351	2,570	2,806	3,087	3,257	3,429	3,794	4,132	5,420	5,722	6,083	6,495	6,941	7,355	8,135	9,077	7,771	8,292	8,889	9,582	10,198	10,785	11,929	13,209	

Source : Statistik Indonesia 1990-1995

Note : 1) Including Jambi, Bengkulu & Lampung

2) Including D.I. Yogyakarta

3) Including Bali & East Timor

4) Including Central Kalimantan

5) Including Central Sulawesi

6) Including Southeast Sulawesi

Table A3.1.1(1) Shipping Operator & Terminal Management Body

	Route	Shipping Operator		Terminal Management Body			
		ASDP	Private	MOCKANWIL	ASDP	DGSC	PEMPA
No.1	Balohan	○		⊙			
	Malahayati					○	
No.2	Meulaboh	○		⊙			
	Sinabang			⊙			
No.3	Sibolga	○				○	
	Nias						
No.4	AJIBATA		○	○			
	TOMOK			○			
No.5	T. Pungkur	○		○			
	TO. Uhan			○			
No.6	Rumbai Jaya	○		○			
	Mumpa			○			
No.7	Padang	○					
	Mentawai						
No.8	Jambi	○					
	Pangkal Pinang						
No.9	M. Tebo	○					
	K. Kuning						
No.10	B. Bedarah	○					
	DS. Pintas						
No.11	Palembang	○		⊙			
	Muntok		○				
No.12	Sadai	○		○			
	Tanjung RU			○			
No.13	Merak	○			⊙		
	Bakauheni		○		⊙		
No.14	M. Ancol	○					
	P. Tidung			○			
No.15	M. Ancol	○					
	P. Kelapa			○			
No.16	Jakarta	○					○
	Surabaya		○				
No.17	Cilacap	○		⊙			
	Kalipucang		○	⊙			
No.18	Cilacap	○		○			
	Majingklak			○			
No.19	Jepara	○					○
	K. Jawa						○
No.20	Ujung	○			⊙		
	Kamal		○		⊙		
No.21	Ketapang	○			⊙		
	Gilimanuk		○		⊙		
No.22	Jangkar			⊙			
	Kalianget		○	⊙			
No.23	Kalianget			○			
	Kangean		○				
No.24	Padang Bai	○			⊙		
	Lembar		○		⊙		
No.25	Lombok				⊙		
	Potolano		○		⊙		
No.26	Sape	○		⊙			
	Komodo					○	
No.27	Komodo	○				○	
	Labuan Bajo			○			
No.28	Kota	○					
	Siantan			○			
No.29	Semutai	○		○			

⊙ : Terminal Office

Note: This table is based on data from DGLT and PT.ASDP

Table A3.1.1(2) Shipping Operator & Terminal Management Body

	Route	Shipping Operator		Terminal Management Body			
		ASDP	Private	MOCKANWIL	ASDP	DGSC	PEMPA
No.30	Karliasa	○		○			
No.31	R Jaya	○		⊙			
	T Batang						
No.32	IL Batang						
	Kctapang				⊙		
No.33	Tayan	○		○			
	Sanggau						
No.34	P. Telo	○		○			
	Maluen			○			
No.35	P. Pisau	○					○
	Ielawa						
No.36	T. Ancam	○					
	Tj. Selor						
No.37	IJ Selor	○					
	Sebakung						
No.38	Mamuju			○			
	Bahkpapan		○		⊙		
No.39	Penajam	○			⊙		
	Balikpapan		○		⊙		
No.40	Batulin	○		○			
	T. Serdang		○	○			
No.41	Bitung	○		○			
	Pananaro		○	○			
No.42	Bitung	○		○			
	Ternate						
No.43	Pangimana	○		○			
	Gorontalo			○			
No.44	Luwuk	○		○			
	Salakan			○			
No.45	Salakan			○			
	Banggai						
No.46	Bira	○		⊙			
	Pamatata			⊙			
No.47	Bajoe			⊙			
	Kolaka		○	⊙			
No.48	Siwa	○					
	Tobako						
No.49	Torobulu	○		○			
	Tampo			○			
No.50	Tampo			○			
	Maligano		○				
No.51	Bau-bau	○		○			
	Tolandona						
No.52	Kupang	○					
	Rote			○			
No.53	Kalabahi	○		○			
	Ende					○	
No.54	Ende					○	
	Larantuka		○	○			
No.55	Kupang	○					
	Kalabahi			○			
No.56	Sabu	○					
	Waingapu					○	
No.57	Waingapu	○				○	
	Rajua						
No.58	Ende	○				○	
	Waingapu					○	
No.59	Kupang	○					
	Ende					○	

⊙ : Terminal Office

Note: This table is based on data from DGLT and PTASDP

Table A3.1.1(3) Shipping Operator & Terminal Management Body

	Route	Shipping Operator		Terminal Management Body			
		ASDP	Private	MOC/KANWIL	ASDP	DGSC	PEMPA
No.60	Waiwerang	○				○	
	Lewoleba					○	
No.61	Baranusa	○		○		○	
	Kalabahi			○			
No.62	Balauring	○					
	Baranusa			○		○	
No.63	Dilli	○					
No.64	Iiwaki					○	
	Tobelo	○				○	
No.65	Daruba					○	
	Tobelo					○	
No.66	Subaim					○	
	Bastiong	○		○			
No.67	Sidangole			○			
	Ternate						
No.68	Payahe						
	Saketa	○					
No.69	Saketa						
	Babang						
No.70	Ternate	○					
	Rum			○			
No.71	Poka	○			⊙		
	Galala				⊙		
No.72	Hunimua	○			⊙		
	Waipirit		○		⊙		
No.73	Haruku						
	Tolehu						
No.74	Haruku	○					
	Saparua						
No.75	Saparua						
	Waitei						
No.76	Galala	○			⊙		
	Hamlea						
No.77	Tual	○				○	
	Elat					○	
No.79	Tual	○				○	
	larat					○	
No.80	Larat	○				○	
	Saumlaki					○	
No.81	Tual	○				○	
	Dobo					○	
No.82	Sorong	○		○			
	Jeffman			○			
No.83	Jeffman	○		○			
	Kalobo			○			
No.84	Merauke	○		○			
	Poo			○			
No.85	Tn. Merah	○					
	Bade						
No.86	Mapura Jaya	○					
	Fak Fak						
No.87	Biak	○					
	Serui						
No.88	Serui	○					
	Nabire						
No.89	Agats	○		○			
	Ewet						
No.90	Tanah merah	○		○			
	Merauke			○			

⊙ : Terminal Office

Note: This table is based on data from DGLT and PT ASDP

Table A3.1.2 Revenues & Expenses in MOC's Terminal Office in 1996/97

(Unit : 1.000 Rp.)

	Office	Revenue	Expense				Total	Expense /Revenue
			Personnel	Operation	Maintenance	Trip		
No. 1	Kalipucang	9.335	63.248	58.077	41.103	2.000	164.433	17.61
No. 2	Cilacap	13.825	164.281	72.390	42.035	2.600	281.306	20.35
No. 3	Jangkar	17.562	67.082	61.505	28.790	3.000	160.377	9.13
No. 4	Kalianget	29.750	76.559	60.235	42.970	3.000	182.764	6.14
No. 5	Balohan	13.297	62.744	49.104	28.570	5.500	145.918	10.97
No. 6	Palembang	12.000	54.295	42.436	45.860	5.500	148.091	12.34
No. 7	Kayu Arang	20.000	84.146	47.960	38.700	5.500	176.306	8.82
No. 8	Balik Papan	23.059	96.799	47.605	71.022	3.500	218.926	9.49
No. 9	Panajam	12.063	88.312	43.830	53.390	3.500	189.032	15.67
No. 10	Rasau Jaya	2.051	61.219	33.270	24.220	4.000	122.709	59.83
No. 11	Bajo'e	190.388	163.647	100.591	94.545	5.200	363.983	1.91
No. 12	Bira	20.066	94.691	38.564	33.675	5.000	171.930	8.57
No. 13	Pamatata	25.707	110.335	43.946	50.517	5.000	209.798	8.16
No. 14	Kolaka	194.591	139.752	74.690	96.300	5.500	316.242	1.63
No. 15	Torobulu	13.531	62.707	34.980	28.800	5.000	131.487	9.72
No. 16	Tampo	22.337	50.873	32.405	27.780	5.000	116.058	5.20
No. 17	Sape	17.000	75.762	37.450	26.650	5.000	144.862	8.52
Grand Total		636.562	1.516.452	879.038	774.932	73.800	3.244.222	5.10

Source: DGLT

Table A3.2.1(1) Branch Office of PT. ASDP

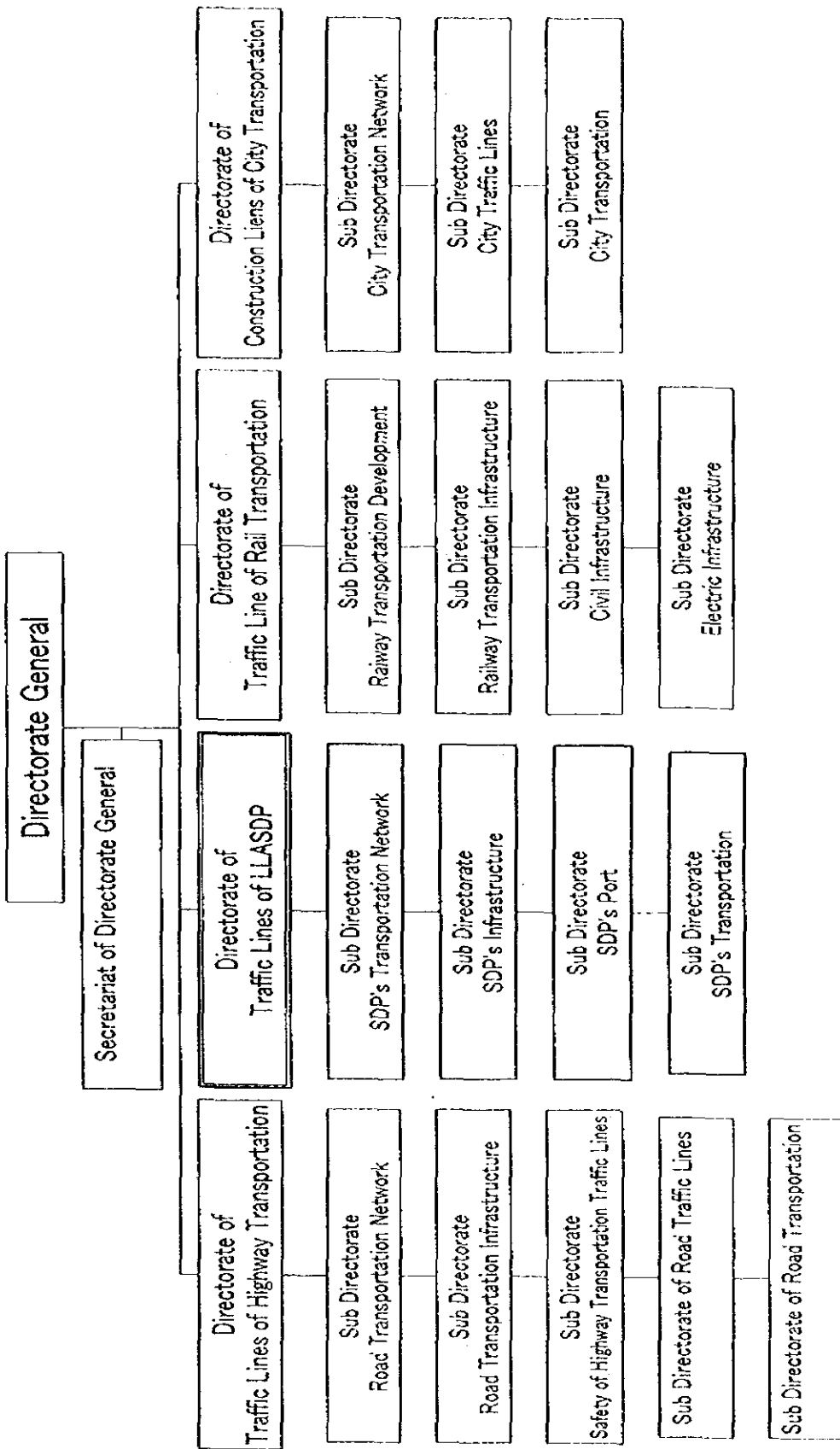
No.	Class	Name of the Office	Shipping Route
1	I	A-1 Merak Branch	① Merak --- Bakauheni
			② Merak --- Bakauheni
2	A-1	Ketapang Branch	① Ketapang --- Gilimanuk
			② Ketapang --- Gilimanuk
			③ Ketapang --- Gilimanuk
			④ Ketapang --- Gilimanuk
			⑤ Padang Bai --- Lembar
3	A-1	Surabaya Branch	① Ujung --- Kamal
			② Ujung --- Kamal
			③ Ujung --- Kamal
			④ T. Psur --- Tanjung Uban
4	A-2	Lembar Branch	① Padang Bai --- Lembar
			② Padang Bai --- Lembar
			③ Batam --- Singapura
5	II	B-1 Balik Papan Branch	① Balik Papan --- Panajam
			② Balik Papan --- Panajam
			③ Tarakan - Tanjung Selor - Sembakung
			④ Tarakan - Tanjung Selor - Sembakung
6	B-1	Ambon Municipality Branch	① Poka --- Galala
			② Poka --- Galala
			③ Poka --- Galala
			④ Telchu - Haruku - Saparua
			⑤ Hunimua --- Waipirit
			⑥ Ternate --- P. Bacan
			⑦ Galala --- Namlea
			⑧ Galala --- Namlea
7	III	C Batam Branch	① Telaga Pungur --- Tanjung Uban
			② Rumbai Jaya --- Mumpa
			③ Rumbai Jaya --- Mumpa
8	C	Jambi Branch	① Jambi --- Tanjung Pinaang
			② Desa Pintas --- Betung Berdarah
			③ Muara Tebo --- Kuamang Kuning
9	C	Bangka Branch	① Sadai --- Tanjung Pandan
			② Palembang --- Kayu Arang
10	C	Pontianak Branch	① Tanjung Harapan --- Teluk Kalong
			② Kota --- Siantan
			③ Kota --- Siantan
			④ Teluk Batang --- Rasau Jaya
			⑤ Tayan --- Terayu
11	C	Bajoc dan Pamatata Branch	① Bira --- Pamatata
			② Pare-pare --- Nunukan
			③ Pare-pare --- Nunukan
			④ Siwa --- Lasusua
12	C	Bau Bau Branch	① Torobulu --- Tampo
			② Bau Bau --- Tolandona
13	C	Luwuk Branch	① Pagimana --- Gorontalo
			② Luwuk --- Salakan
			③ Salakan --- Banggai

Source: PT.ASDP

Table A3.2.1(2) Branch Office of PT. ASDP

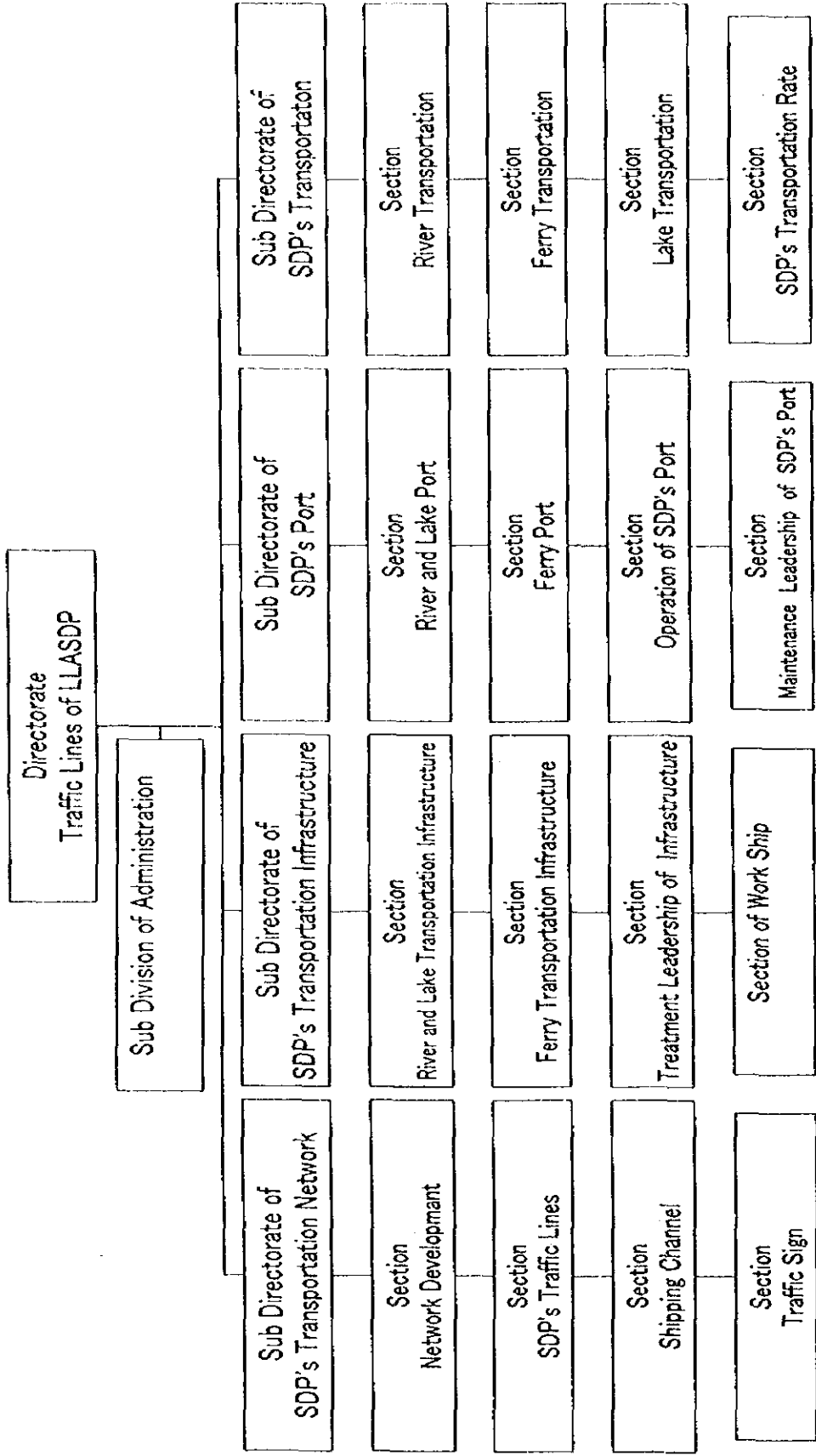
No.	Class	Name of the Office	Shipping Route		
14	C	Bitung Branch	① Tante	--- Sidangole	
			② Bitung	--- Pananaro	
			③ Ternate	--- Ruum	
			④ Ternate	--- Bitung	
			⑤ Tebelo	--- Daruba	
			⑥ Batulicin	--- Tanjung Serdang	
15	III	Sape Branch	① Sape	--- Labuhanjp	
			② Sape	--- Labuhanjo	
			③ Sape	--- Komodo	
			④ Sape	--- Komodo	
16	C	Kupang Branch	① Kupang	--- Rote	
			② Kupang	--- Lantuka	
			③ Kupang	--- Sabu	
17	C	Waingapu Branch	① Kupang	--- Ende	
			② Ende	--- Waingapu	
			③ Waingapu	--- Sabu	
18	C	Kalabahi Branch	① Kupang	--- Kalabahi	
			② Kalabahi	--- Atapupu	
			③ Barausa	--- Balauring	
			④ Barausa	--- Kalabahi	
			⑤ Lantuka	--- Waiwerang	
19	IV	D	Banda Aceh Branch	① Balohan	--- Malahayati
20		D	Meulaboh Branch	① Meulaboh	--- Sinabang
21		D	Sibolga Branch	① Sibolga	--- Nias
				② Sibolga	--- Nias
22		D	Padang Branch	① Padang	--- Sikakap
23		D	Cilacap Branch	① Cilacap	--- Kalipucang
				② Cilacap	--- Majingklak
24		D	Jakarta Branch	① Marina Anchol	--- P. Kelepa
				② Marina Anchol	--- P. Tidung
25		D	Batu Licin Branch	① Batulicin	--- TJ. Serdang
				② Batulicin	--- TJ. Serdang
				③ Pulau Telo	--- Maluen
				④ Pulau Pisau	--- Kalawa
26		D	Dilli Branch	① Dilli	--- Ilwaki
27	D	Tual Branch	① Tual	--- Elat	
			② Tual	--- Larat	
			③ Larat	--- Saumlaki	
			④ Tual	--- Dobo	
28	D	Sorong Branch	① Sorong	--- Jelman	
			② Jelman	--- Kalobo	
29	D	Biak Branch	① Sorong	--- Jelman	
			② Jelman	--- Kalobo	
30	D	Merauke Branch	① Mapura Jaya	--- Poniako	
			② Bade	--- Tanah Merah	
			③ Merakue	--- Poo	
			④ Agats	--- Awer	
			⑤ Merakue	--- Tanah Merah	
31	D	Jepara Branch	①	*not operated yet	

Source: PT.ASDP



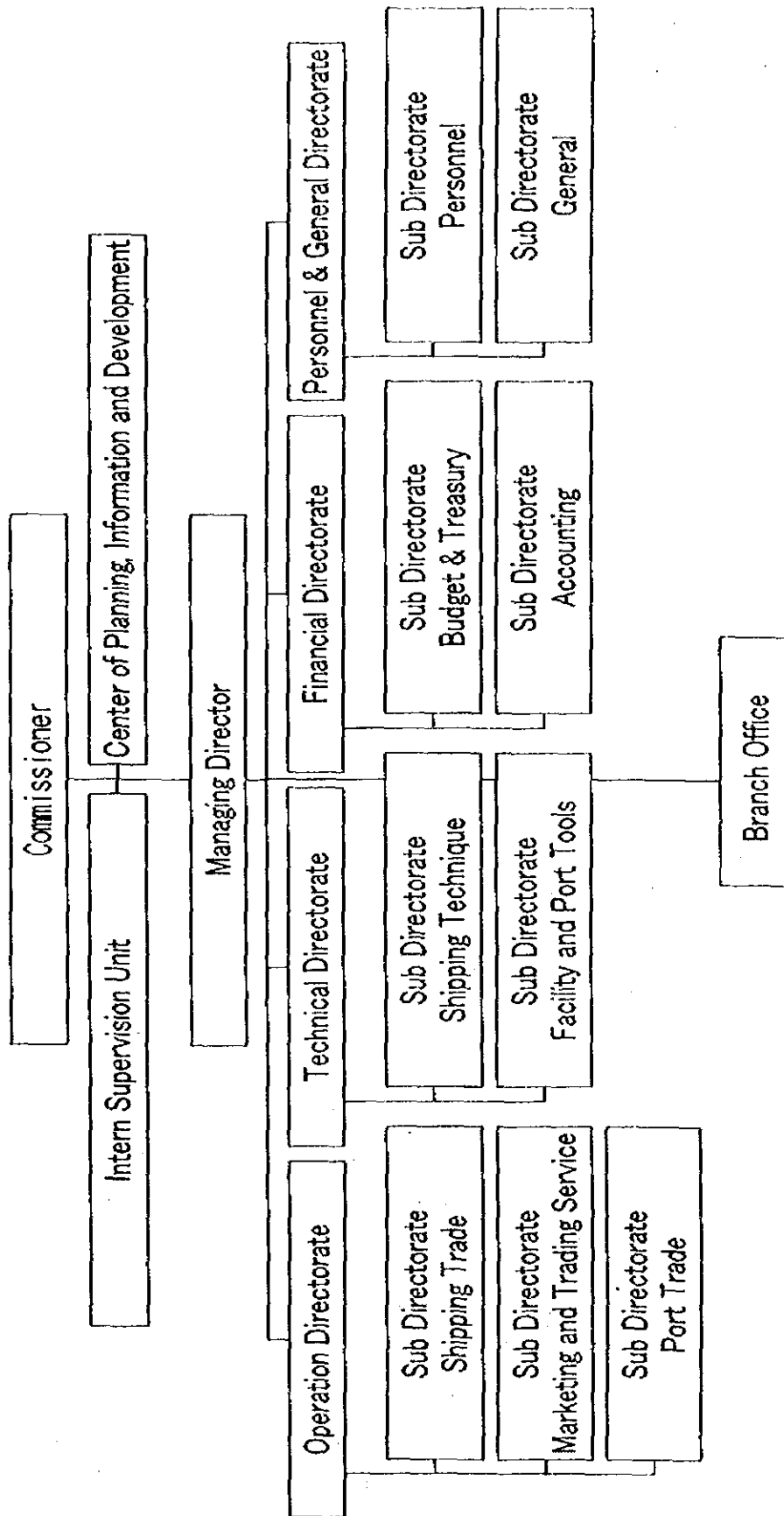
Source: DGLT

Figure A.3.2.1 Organizational Structure of DGLT



Source: DGLT

Figure A3.2.2 Organizational Structure of LLASDP



Source: PT. ASDP

Figure A3.2.3 Organizational Structure of PT. ASDP

Table A4.1.1(2) Ferry Transportation Record in 1987 - 1995

(2) Vehicle-4

Number	Route	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	Merak	642,562	706,531	744,734	935,772	995,822	1,010,939	1,137,413	1,389,755	1,544,362
2	Ketapang	391,002	398,382	530,313	658,315	685,187	745,596	803,315	865,705	898,182
3	Pedangbai	27,130	29,977	35,726	49,415	78,212	84,572	84,268	85,387	76,738
4	Baliapapan							279	1,214	2,202
5	Ternate							86	395	481
99	Merak			0						
101	Balohan						3,953	4,687	5,000	5,245
102	Meulaboh	177	251	284	203	436	502	689	818	2,427
103	Ajibata	14,949	13,034	17,903	28,554		44,075	48,432	51,833	
104	Sibolga						649	1,325	3,954	6,115
106	Pedang								17	7
108	T.Pungkur								21	
109	Palembang	1,993	1,884	1,884	2,353	2,416	2,170	3,658	3,632	5,457
110	Sadai									396
111	Jambi		3,726	3,911	4,108	2,419	2,199	1,352		
112	M. Tebo								303	303
113	Ds. Pintas								232	232
114	Pangkal Balam					94	235	184	412	47
198	Sabang	1,772	2,010	2,511	2,867	3,679				
199	Bangka		33	397	416					
201	Marina/Jakarta									3
202	Marina/Jakarta									
203	Kalipucang	0	0	0						
204	Citacup									
205	Ujung	840,514	893,390	730,783	1,064,528	809,688	858,081	916,803	1,538,548	1,099,201
206	Jangkak	2,139	495	948	1,578	1,971	1,237	280		885
207	Kaliangget							9		11
209	Jakarta									*(3,498.7)
301	Lombok			11,856	11,532	31,029	43,134	55,806	90,042	116,876
302	Sape		187	334	449	749	1,139	1,580	2,090	1,949
304	Ende						162	131	323	408
305	Waingapu								22	60
306	Kupang					134		569	474	431
307	Kupang		20	110	178	164	61	337	62	87
308	Kupang	46	92	1,814	2,687	3,213	952	6,095	2,921	2,825
309	Kupang		182	502	500	638	613	841	749	1,159
310	Larantuka			433			34		95	58
311	Lewoleba						122		146	9
312	Waiwarang				322	322	12	378	14	6
313	Barauring									15
314	Barauring								22	19
315	Baranusa								132	247
316	Balauring								5	5
317	Kucang		22	125	121	158	389	339	178	241
318	Atapupu							8	21	79
319	Kupang									3
399	Lombok	3,368	3,613				61	9		
401	Tayan								1,421	1,276
402	R. Jaya						70	173	639	420
403	Sekura		8,198	3,919	8,641	3,183	6,756	557		2,261
404	Kartiasa	27,322	21,494	7,552	19,017	10,299	104,56	8,124	99,531	
405	Kota					101,801	1,327			6,513
406	Semutai	42,208	45,764	28,891	26,077	27,018	83,988	98,774		
407	TI Batang									
408	P.Pisau								7,210	9,012
409	P.Telo								8,566	10,707
410	Batulicin							15,711	32,284	40,238
411	Baliapapan	28,828	30,056	21,500	33,340	36,950	61,728	91,753	91,216	197,530
412	Tarakan									
413	Tarakan									
414	Tarakan									
499	Kodya Pontianak	42,471	83,512	30,342	199,866					
501	Bitung								93	230
502	Pagimana							164	399	513
503	Luwuk	62	192	106	111	197	314	537	477	352
504	Safakan								34	21
506	Beise	7,886	8,420	6,830	12,240	14,672	15,255	22,204	21,587	30,538
507	Bira	4,270	4,623	6,404	3,413	5,588	4,974	2,925	4,705	5,404
508	Torobulu	1,607	3,238	2,787	2,922	3,556	5,003	4,966	6,158	6,535
509	Tampo						208			
510	Baubau					2,240	2,365	3,369	3,364	3,431
599	Baubau			221	232					
603	Bastiong						554	3,651		
603	Ternate								10,741	24,230
607	Ternate									10,282
608	Ga'ala							195	234	348
609	Poka	89,556	98,680	183,074	559,692	212,890	287,274	302,284	395,682	510,689
610	Hunimua	3,058	2,719	4,093	14,272	5,694	7,174	7,997	18,699	24,584
614	Toal								19	20
615	Toal								4	34
616	Toal								10	6
617	Larat								9	4
702	Sorong			0						
703	Bak								3	35
704	Serui								3	62
708	Merak			0						
	Total	1,972,717	2,158,112	2,380,863	3,642,100	3,038,419	3,248,537	3,612,256	4,745,212	4,652,769

Source: DATA ANGKUTAN PENYEBERANGAH TAHUN INI 1987 - 1995 ; DGLT

Table A4.1.1(3) Ferry Transportation Record in 1987 - 1995

(3) Vehicle - 2

Number	Route	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	Merak Bakauheni	34,530	39,539	13,124	11,348	16,574	15,933	14,856	15,069	27,816
2	Ketapang Gilimanuk	0	0	0	66,959	168,901	106,302	108,355	101,816	134,470
3	Padangbai Lombok	11,531	13,299	15,793	10,872	34,325	34,720	36,276	48,246	61,456
4	Balikpapan Mamuju							74	221	
5	Ternate Bitung							43	195	413
99	Merak Panjang	0	0	0						
101	Galohan Malafayati						5,750	7,718	7,618	8,806
102	Meulaboh Sinabang	324	273	294	210	239	547	298	398	
103	Ajibata Tomok	12,083	7507	7758	7892		3,001	3,201		
104	Sibolga Nas						343	510	1,458	1,588
108	Padang Sikakap								14	79
108	T.Pungkur Tg.Uban								255	44
109	Palemang Kaywarang	1,590	1,132	1,132	650	714	540	921		2,769
110	Sasai Tg. Pandan									367
111	Jambi K.Tunggal/T.Pinang	0	0	0	0	3,344	1,329	1,949	176	428
112	M. Tebo Kuamang Kuning								8	8
113	Oa Pintas Betung bedarah								12	12
114	Pangkal Batam T. Pandan					180	426	444	505	38
193	Sabang Malafayati	2,688	2,898	4,327	5,008	5,596				
199	Bangka Belitung	339	195	0	0					
201	Marina/Jakarta P. Kelepa								18	7
202	Marina/Jakarta P. Tidung								1	2
203	Kaipucang Cilacap	232	94	129	135	153	215	17	675	44
204	Cilacap Sidareja					27	102			
205	Urung Kamal	799,102	797,548	837,423	993,126	827,381	1,032,832	1,103,876		1,380,811
206	Jakarta Kaliangot	1,968	2,700	2,198	3,319	3,916	4,721	4,038	5,603	6,545
207	Kaliangot Kangean							848	1,531	1,643
209	Jakarta Surabaya									
301	Lombok Pototano			0	3,241	5,416	10,248	14,888		20,702
302	Sape Komodo I. Bajo	0	76	0	0		182		291	279
304	Ende Waingapu						254	305	439	
305	Waingapu Sabu								32	
306	Kupang Ende								465	480
307	Kupang Sabu		150	0	0		235		243	361
308	Kupang Rote	723	1,058	0	0		2,343		10,858	5,411
309	Kupang Lantuka	0	289	0	0		432	635	871	817
310	Lantuka Waiwerang			0			19		48	3
311	Lewoleba Lantuka						30		80	
312	Waiwerang Lewoleba				881		1		2	1
313	Baraurung Lewoleba									15
314	Baraurung Baranusa									7
315	Baranusa Kalabahi								128	405
316	Balaurung Kalabahi									
317	Kupang Kalabahi		60	0	0		406		294	405
318	Atapupu Kalabahi							58	50	56
319	Kupang Nakliu						102		2	
399	Lombok Atas	3,237	3,135							
401	Tayan Trayu								1,861	2,326
402	R. Jaya TI Batang								62	181
403	Sekura		23,355	11,533	23,559	6,293	19,891	371		200,592
404	Kartasa	33,700	57,772	28,423	53,491	46,589	32,840	20,398	851,998	
405	Kota Stanton					449,603	456,428	320,578		966,610
406	Semutei	8,458	10,360	4,067	9,721	3,140	34,798	17,482		
407	TI Batang Ketapang									
408	P.Pisau Ka'awa (P.Telo Sbr)								6,646	8,307
409	P.Telo Maluen (P.Telo Sbr)								9,941	49,707
410	Batuficin Ijg Serdang							3,276	22,194	53,818
411	Balikpapan Pangam	18,580	15,988	10,709	12,260	11,435	19,498	34,798	38,390	102,534
412	Tarakan Ijg Selor									
413	Tarakan Ancam									
414	Tarakan Sembakung									
499	Kodya Pontianak	722,160	632,676	224,884	416,122					
501	Bitung Pananero								20	22
502	Pagimana Gorontalo							115	426	
503	Luwuk Salakan	176	150	209	219	247	456	729	837	359
504	Safatan Banggai								9	11
506	Bajoe Kotaka	1,839	1,932	1,462	2,300	1,995	2,035	2,721	1,528	2,745
507	Bira Panatata	3,268	3,311	3,905	2,320	2,980	2,299	2,165	3,018	2,744
508	Torobulu Tempo	1,098	0	845	0	1,403	1,571	1,836	2,994	2,952
509	Tempo Mafigano									
510	Saubau Tolandora					3,193	5,105	6,700	5,480	4,377
599	Barubau Wara			239	250					
603	Bastiong Sidangole						1,017	2,011		
603	Ternate Sidangole								5,084	12,717
607	Ternate Ruyun									5,082
608	Galala Namlea							298	624	957
609	Poka Galala	183,700	189,594	292,544	310,892	323,873	415,328	407,013	468,510	635,787
810	Hunimua Waipint	4,029	3234	4775	7552	4109	4,459	5,180	9,388	11,208
814	Tual Etat									99
815	Tual Dobo									10
816	Tual Larat								50	18
817	Larat Saumlaki								19	16
702	Serong Jefmany/Kalobo			0						
703	Biak Serui								34	64
704	Serui Nabire								10	51
708	Merauke			0						
Total		1,824,749	1,808,291	1,458,431	1,942,413	2,017,616	2,216,816	2,123,077	1,628,441	3,719,501

Source : DATA ANGKUTAN PENYEBERANGAN TAHUN IN 1987 - 1995 ; DGLT

